Sacramento River Nutrient Change Study

A report to the Delta Regional Monitoring Program, State Water Contractors, and Bureau of Reclamation

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Wimpy's Marina – use of dock to scope zooplankton sampling methods

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List of Units

1/d	per day
1/h	per hour
1/m	per meter
ºC	degrees Celsius
cells/L	cells per liter
cfs	cubic feet per second
cm	centimeter
d	day
eggs/female/d	eggs per female per day
GPM	gallons per minute
g/m^2	grams per square meter
individuals/L	Individuals per liter
individuals/m^3	individuals per cubic meter
Kg/d	kilograms per day
km	kilometer
km/h	kilometers per hour
MΩ/cm	megaohms per centimeter
m	meter
m^2	square meter
m^3	cubic meter
m^3/g clam/d	cubic meters of water pumped per gram of clam per day
m/d	meters per day
m/s	meter per second
mph	miles per hour
mg/L	milligrams per liter
mg-C/L	milligrams carbon per liter
mg-N/L	milligrams nitrogen per liter
mL	milliliter
mm	millimeter
nm	nanometer
NTU	Nephelometric Turbidity Unit
ppm	parts per million
%	percent
% saturation	percent saturation
% water column grazed/day	percent of water column grazed per day
‰	per mil
psi	pounds per square inch
QSU	quinine sulfate units
RM	river mile
µg C/L/d	micrograms carbon per liter per day
µg dry weight/L	micrograms dry weight per liter
µg/L	microgram per liter
µM	micromole
µm	micrometer (micron)

$\mu m^3/L$	cubic micrometers per liter
µmol	micromole
µmol photons/m^2/s	micromole photons per square meter per second
µS/cm	microsiemen per centimeter

Executive Summary

The Sacramento River Nutrient Change Study (SRiNCS) was developed with input from multiple stakeholders in the Delta Regional Monitoring Program, as well as the State Water Contractors. We tracked the effects of changes in nutrient loading resulting from a short-term wastewater effluent diversion at the Sacramento Regional Wastewater Treatment Plant (SRWTP). In the summer of 2019, scheduled wastewater effluent diversions occurred during the Effluent Valve Replacement (EVR) project, part of the EchoWater Project upgrade at the SRWTP. During an EVR diversion in early September 2019, no treated effluent entered the Sacramento River for 48 hours, creating a parcel of "without-wastewater" river water approximately 20 miles (32 km) long. We observed the magnitudes and impacts of short-term changes in nutrient loading in water with wastewater (WW+, 9/10/19) and without wastewater (WW-, 9/11/19 and 9/12/19) in the Sacramento River and three downstream channels: Georgiana Slough, the North Fork Mokelumne River, and the South Fork Mokelumne River.

Flow and transport modeling suggested that the proportions of water from three different sources, Sacramento River, SRWTP, and Mokelumne River, varied among the channels. The tidal flux shifted the water in each channel back and forth, and in the case of the South Fork Mokelumne River, caused the predominant input to alternate between Sacramento River water (which included Regional San effluent depending on the phase of our experiment) and Mokelumne River water. As a result, the water in the South Fork Mokelumne River included significant contributions from the Mokelumne River as well as water mixing out of three dead-end side sloughs with longer hydraulic retention time than the main channels, which may have dampened any responses to the changes in wastewater loading.

High resolution boat-based monitoring of water quality complemented and informed the flow modeling efforts and also provided an overview of conditions across the study area each day. Mapping showed that a well-defined WW- treatment, as indicated by changes in the concentrations of ammonium,[1] nitrate, and dissolved inorganic nitrogen (DIN), was produced in the Sacramento River, Georgiana Slough, and North Fork Mokelumne River, while the pattern in the South Fork Mokelumne River was less distinct due to variable contributions from the Sacramento and Mokelumne Rivers. Across the study area, chlorophyll fluorescence (fCHL) did not show a clear increase or decrease in association with the decrease in wastewater nutrient loading. Chlorophyll fluorescence attributed to diatoms decreased in association with the decrease in wastewater nutrient loading from 9/10/19 (WW+) – 9/11/19 (WW-), but only in the North Fork Mokelumne River. Chlorophyll fluorescence attributed to blue-green algae showed a slight decrease from 9/10/19 (WW+) – 9/12/19 (two days of WW- conditions) across the study area.

Based on discrete water-sample measurements from boats sampling in each channel, turbidity decreased significantly with day, as wastewater loading decreased (tests on data from four sample stations in each of the three channels on each of the three days, 9/10/19, 9/11/19, and 9/12/19). Due to

[1] Throughout this report we refer to ammonium (NH_4^+), although in surface waters there is an equilibrium of ammonium and ammonia (NH_3). We used U.S. Environmental Protection Agency (EPA) method 350.1 (US EPA 2005), for ammonia nitrogen, to analyze our discrete water samples. This method measures both ammonium and ammonia in a sample, regardless of the state of equilibrium at the time of sampling. The term "total ammonia nitrogen" is used in wastewater discharge permits, and this study focused on changes in the loading of different forms of nitrogen, including ammonia, from the SRWTP to the Sacramento River. However, in this report we use "ammonium," the term commonly employed by aquatic ecologists, because ammonium is the dominant form in surface water based on temperature and pH.

the decreased turbidity, light availability increased across the three days of the experiment, but this change appeared to be related to changes in the Sacramento River upstream of the SRWTP discharge point. Concentrations of dissolved nitrogen,[2] total Kjeldahl nitrogen (TKN), nitrate, nitrite, and ammonium in discrete samples decreased significantly with day. However, dissolved inorganic carbon (DIC), dissolved organic carbon (DOC), and silica concentrations in discrete samples did not differ significantly with day. Chl-*a* concentrations in the discrete samples did not differ significantly with day. However, carbon uptake, quantified using carbon-13 (^{13}C)-incubations, increased significantly with day, while the enrichment of delta carbon-13 ($\delta^{13}C$) in the particle organic carbon ($\delta^{13}C$-POC) became significantly more negative, consistent with higher fractionation by the Rubisco enzyme with higher rates of carbon fixation. Particulate organic carbon (POC) concentrations did not differ significantly with day. The increase in carbon uptake through time was correlated with a sharp increase in water column clarity, measured as a change in Secchi disk depth and photosynthetically active radiation (i.e., PAR) between 9/10/19–9/11/19.

The density and biovolume of phycocyanin-rich (PC-rich) picocyanobacteria and of phycoerythrin-rich (PE-rich) picocyanobacteria, collected by discrete sampling and measured via microscopy, did not differ significantly with day, as wastewater loading decreased. Discrete sample enumerations of blue-green algae (i.e., cyanobacteria (Cyanophyta)) densities decreased significantly with day, as did total phytoplankton density. However, biovolumes of total phytoplankton and of different phytoplankton divisions did not change significantly with day.

Total zooplankton density and Cladocera density decreased significantly with day, but this appeared to be driven by changes in a single channel, the South Fork Mokelumne River. The biomass of total zooplankton, Cladocera, and all other forms of zooplankton biomass did not differ significantly with day. Zooplankton growth metrics appeared to show little or no effect of wastewater or the lack thereof.

Clam abundance was not anticipated to change between treatments. Clam biomass was assessed on one occasion, two weeks after the other sampling, to provide estimates of grazing, which ranged from 0.2 to 8.4%, as a percentage of the water column grazed per day.

During the short-term (48-hour) removal of wastewater effluent and its associated nutrient load from these three river channels in the Sacramento-San Joaquin Delta (hereafter referred to as “the Delta”), we observed statistically significant changes in the abundance of some forms of phytoplankton, as well as changes in phytoplankton productivity, but turbidity also changed with day. Because water clarity can impact phytoplankton communities, this change in turbidity likely confounded effects resulting from changes in nutrient concentrations with the EVR diversion. It will be interesting and informative to see the potential effects of longer-term nutrient loading reductions resulting from the EchoWater Project upgrade to biological nutrient removal at the SRWTP (greater than 95% reduction in ammonium loading and approximately 75% reduction in dissolved inorganic nitrogen loading in the effluent), as well as other nutrient reductions to the Delta that may occur in the future. Such effects remain to be studied now that the SRWTP biological nutrient removal upgrade is completed, along with the potential effects of buffering factors, including nutrients that may be stored in river sediment or in aquatic vegetation (macrophytes). Additional research focused on the longer-term responses of nutrient cycling, and the

[2] Total dissolved nitrogen is equivalent to filtered total Kjeldahl nitrogen plus nitrate plus nitrite (i.e., dissolved N = filtered TKN + NO_3 + NO_2), where TKN is dissolved organic nitrogen plus ammonium. Therefore, total dissolved N = DON + NH_4^+ + NO_3 + NO_2.

abundance and growth of phytoplankton and zooplankton could inform future Sacramento-San Joaquin Delta ecosystem management.

Introduction

The importance of nutrients for phytoplankton growth and biomass has been intensely studied globally during the past century (Ivlev 1966, Sakamoto 1966, Ryther and Dunstan 1971, Dillon and Rigler 1974, Clasen 1980, Canfield and Bachmann 1981, Moore et al. 2013). However, the role of nutrients in the regulation of phytoplankton in the Sacramento-San Joaquin Delta (hereafter, the "Delta") is not well characterized, and this lack of characterization creates challenges for water-quality regulators and organizations that manage nutrient loads to the Delta and its tributaries (Central Valley Regional Water Quality Control Board 2018, Dahm et al. 2016).

In 2009, researchers from the Central Valley Regional Water Quality Control Board completed a series of river transects down the Sacramento River and found that a rapid decline in chl-*a* concentrations is frequently observed in the lower Sacramento River from the Interstate 80 crossing, upstream of the City of Sacramento, to the confluence with water from Cache Slough (Figure 1), indicating a decline in phytoplankton biomass (Foe et al. 2010). Following the discovery that phytoplankton biomass declines abruptly in the lower Sacramento River, water resource managers became interested in identifying management actions that increase phytoplankton biomass in the north Delta to maintain food supplies for invertebrates and in turn feed local small-sized fishes. In recent years, numerous experiments have investigated the conditions potentially contributing to this observed phytoplankton decline. Parker et al. (2012) theorized that high ammonium concentrations in the Sacramento River from wastewater effluent inputs reduce the growth rates of phytoplankton in this region. Following up on the Parker study, scientists from University of California Santa Cruz and Applied Marine Sciences, Inc., tested the growth responses of phytoplankton species isolated from the Sacramento River and Suisun Bay to increasing concentrations of ammonium in unialgal cultures. The culture studies demonstrated that ammonium concentrations commonly occurring in the Sacramento River were not high enough to inhibit growth of phytoplankton (Berg et al. 2017, Berg et al. 2019). In 2014, the U.S. Geological Survey (USGS) and others completed an adaptive management experiment in the Sacramento River investigating phytoplankton growth through time by tracking parcels of water down the river where diluted wastewater effluent was present or absent (Kraus et al. 2017a). This study found that chl-*a* concentrations in the tracked water parcels declined at a similar rate when wastewater was present or absent, indicating that factors other than ammonium, such as light limitation, river hydrodynamics, or clam grazing, might be driving the observed phytoplankton decline. Similarly, findings from multiple recent papers reviewed in Cloern (2021) have called the ammonium-suppression hypothesis into question. Recently, Dahm et al. (2016) drew attention to the role of multiple forms of nutrients in the wider Delta, as Delta waters have become clearer and harmful algal blooms have become more common, highlighting the opportunity to study how the EchoWater Project upgrade of the Sacramento Regional Wastewater Treatment Plant (SRWTP) to biological nutrient removal may affect primary producers and food webs in the Delta.

The literature reviewed above suggests that nutrient concentrations do not have a strong effect on phytoplankton growth in the lower Sacramento River compared to other potential factors. What these potential factors may be, and their relative importance to phytoplankton growth in relation to nutrients, is not clear. Factors that have been shown to be important for phytoplankton growth in the lower

Sacramento River include irradiance, water residence time, and temperature (Cole and Cloern 1984, Jassby et al. 2002, Jassby 2008). The lower Sacramento River is characterized by fast water transport times (i.e., short residence times), high turbidity, and a relatively deep water column (7– 10 m). However, downstream of the lower Sacramento River is a series of river channels and sloughs that are shallower, less turbid, and have longer water residence times. In these waterways, the impacts of nutrient-related effects on phytoplankton growth may be more important than in the lower Sacramento River (Figure 1). Water and nutrients from the Sacramento River enter Georgiana Slough, and, via the Delta Cross Channel, the North Fork Mokelumne River, and South Fork Mokelumne River, providing an opportunity to test the effects of differences in water transit time, depth, light, temperature, and nutrient loading on phytoplankton and zooplankton productivity and biomass between the Sacramento River main stem and the downstream channels. High resolution boat mapping, performed by the USGS in support of the Delta Regional Monitoring Program, has detected differing patterns in numerous aquatic variables in these channels, including nutrient concentrations, turbidity, and chl-*a* (Bergamaschi et al. 2017, Downing et al. 2017, Kraus et al. 2017b).

In recent years, several publicly owned treatment works in California have undertaken costly major process upgrades to reduce their loading of dissolved inorganic nitrogen (DIN) to the Delta. The environmental outcomes of the nitrogen load reductions currently completed or underway are still uncertain, although they have been investigated by projects such as the Delta Science Program's Operation Baseline program (Richey et al. 2018; Senn et al. 2020). A major uncertainty regarding the management of Delta nitrogen loading is whether, following the current round of publicly owned treatment works nitrogen load reductions, further nitrogen reductions from publicly owned treatment works or other sources may be considered to achieve specific measurable benefits. As discussed in the Central Valley Regional Water Quality Control Board's Delta Nutrient Research Plan (Central Valley Regional Water Quality Control Board 2018), additional scientific investigations are needed to guide the development of Delta nutrient objectives. For example, will a substantial reduction in DIN concentrations have a positive, neutral, or negative effect on desirable phytoplankton growth in the Delta? And more broadly, what is the relative importance of nutrient concentrations, water transport rates, light levels (irradiance), and grazing by zooplankton and clams, in achieving desirable phytoplankton growth?

The goal of our study was to improve the understanding of the factors and processes regulating phytoplankton production in the Delta. We sought to answer the question "Will phytoplankton biomass, phytoplankton productivity, and zooplankton growth rates increase or decline when nitrogen inputs from Regional San are absent in north Delta rivers?" To do this, we monitored river conditions before and during a wastewater effluent diversion at the SRWTP. In the summer of 2019, scheduled wastewater effluent diversions occurred during the Effluent Valve Replacement (EVR) project, part of the EchoWater Project treatment process upgrade to biological nutrient removal at the SRWTP. During an EVR diversion in early September 2019, no treated effluent entered the Sacramento River for a period of 48 hours. Based on prior research (Kraus et al. 2017a) we anticipated that this should create a parcel of effluent-free river water more than 6 miles long in the Sacramento River. We focused our monitoring on river channels in the east Delta (Georgiana Slough, North Fork Mokelumne River, South Fork Mokelumne River), where flows are slower and water depths are shallower than in the main-stem Sacramento River, during two days of wastewater-free exposure. We measured or modeled all factors potentially regulating phytoplankton growth, including nutrient concentrations, water clarity, water quality, water transport, zooplankton abundance, and clam grazing rates. We also measured zooplankton growth in case zooplankton growth responded to potential changes in phytoplankton abundance during the study.

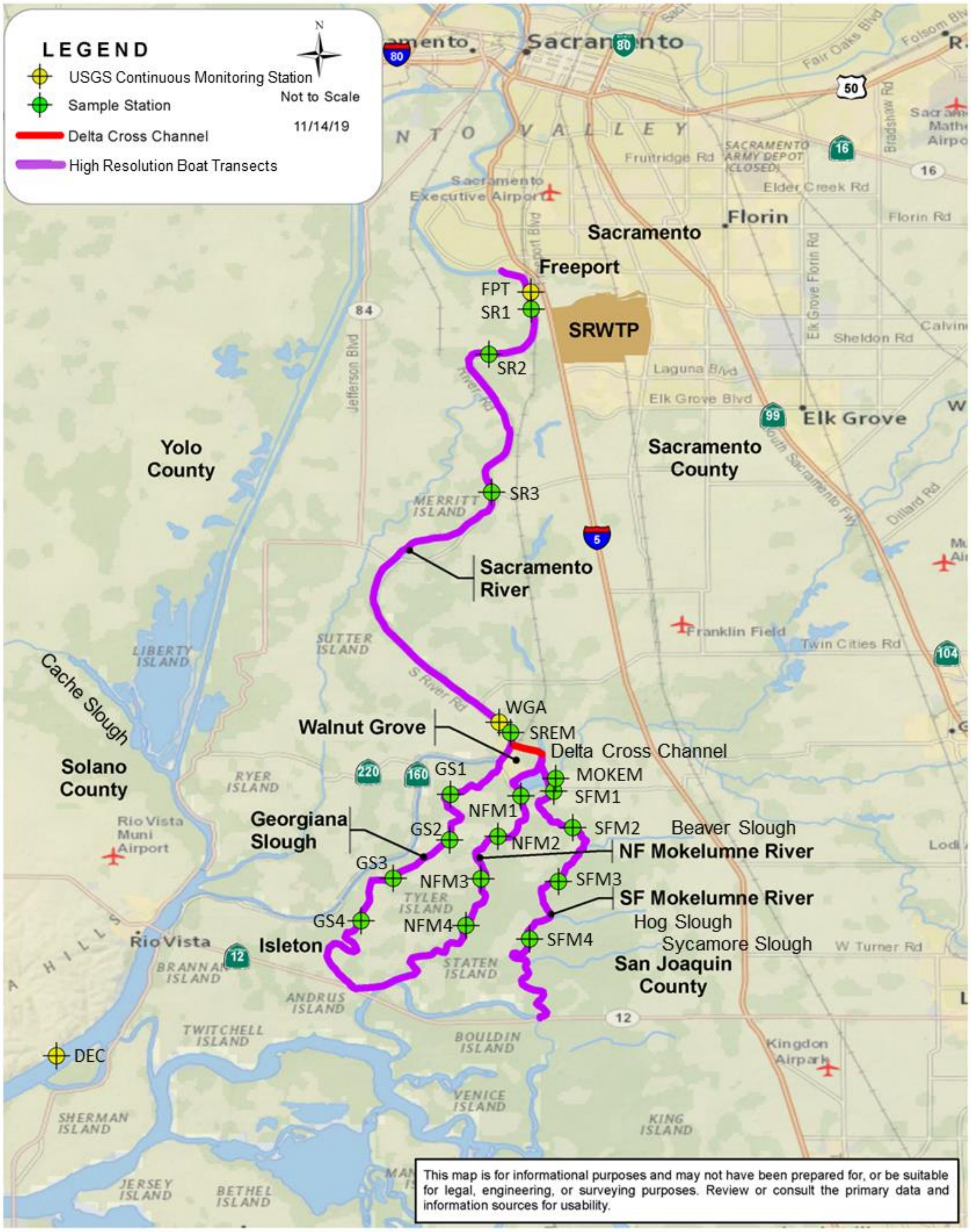


Figure 1. Map of the Sacramento-San Joaquin River Delta showing project sample stations in the lower Sacramento River, Georgiana Slough, North Fork Mokelumne River, and South Fork Mokelumne River, showing high resolution boat mapping transects (purple lines) and the Delta Cross Channel (red line). Yellow circles denote USGS continuous monitoring stations. Green circles denote sample stations.

Conceptual Model

Within our conceptual model, the factors of transit time, light, and nutrient loading result in different outcomes for phytoplankton productivity and biomass occurring in the Sacramento River compared to the three channels (Figure *2*). In the main-stem Sacramento River, where water depth is sufficient to make light limiting to phytoplankton growth (Applied Marine Sciences 2017), we predicted that decreased nutrient loading would have little effect on phytoplankton biomass or the higher levels of the aquatic food web. However, in the channels, where a combination of decreased depth, increased transit time, and decreased turbidity may increase light availability (i.e., euphotic zone depth), we predicted that phytoplankton productivity and biomass would be regulated by nutrient availability. Biogeochemical model predictions (Zhang et al. 2018) suggest that reduced nutrient loading from the SRWTP will result in substantial changes in nutrient concentrations in these channels. During a lower nutrient loading scenario, we would expect to see less phytoplankton growth and biomass than under the current loading scenario. We assume that nutrient loading from other sources upstream of Freeport (Figure 1) is constant, and that during the summer SRWTP effluent is a high proportion of the total nutrient load to the Sacramento River. Also, we assumed that travel through this region occurs through a period of days, during which increases in phytoplankton and zooplankton growth rates and potentially also changes in phytoplankton biomass would be detectable. However, changes in zooplankton abundance and clam biomass would be minimal during this short period and difficult to detect. We did not make an assumption about whether increased phytoplankton biomass would be in the form of beneficial or harmful algal species, but we would be able to observe any changes through the high-resolution boat mapping surveys, and through phytoplankton enumerations (species counts and biomass). We note that there are numerous theories regarding the controls on phytoplankton productivity and biomass in the Sacramento River, and these simplified conceptual diagrams are not able to illustrate all possible mechanisms and outcomes. However, our experimental design allowed us to observe actual outcomes and relate them to a broad set of environmental factors, including nutrient concentrations and forms, residence time, depth, light, temperature, and zooplankton and clam grazing.

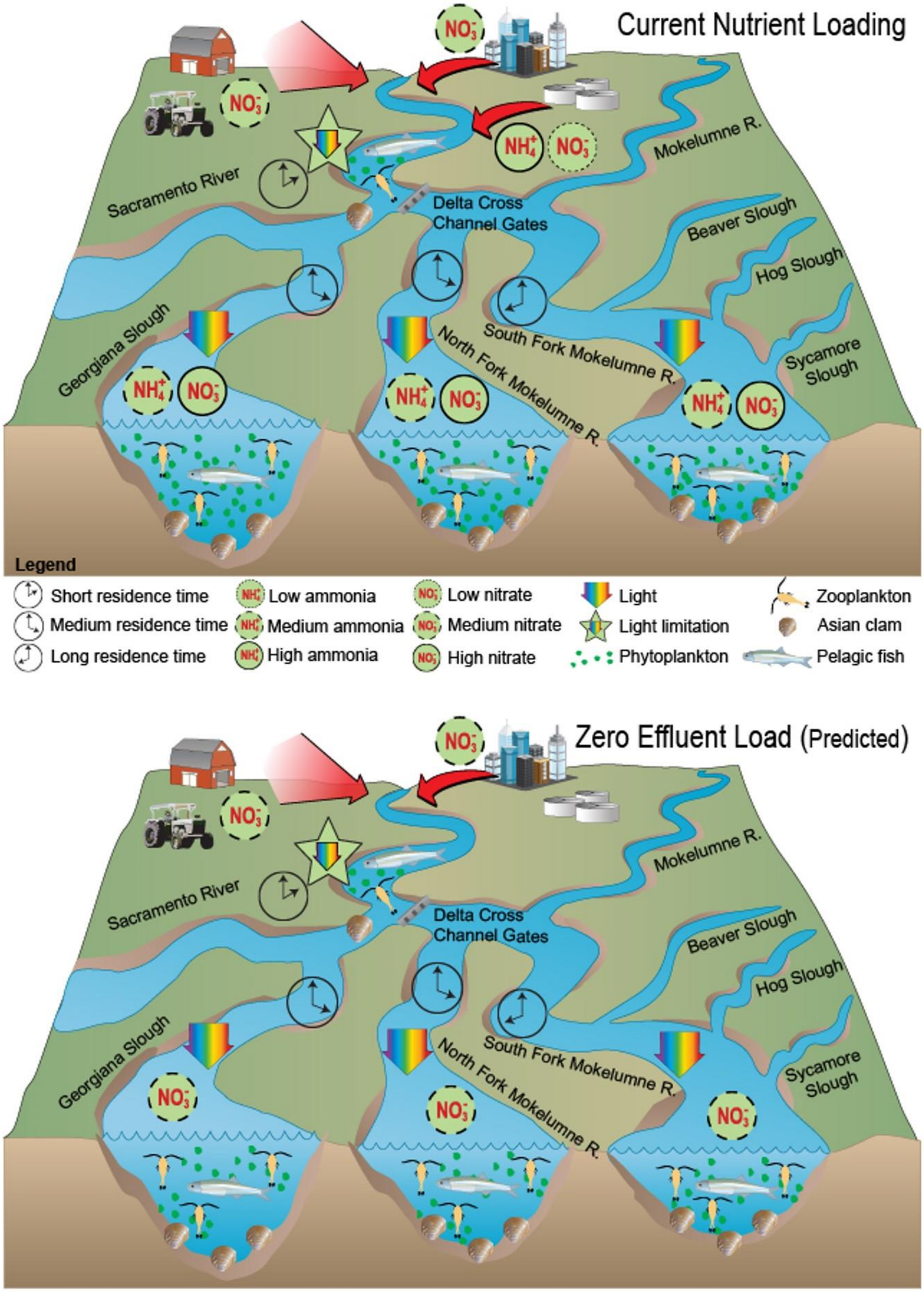


Figure 2. Conceptual model figures showing potential ecosystem conditions in the Sacramento River and the three downstream channels - Georgiana Slough, the North Fork Mokelumne River, and the South Fork Mokelumne River - during current nutrient loading (TOP) and during the zero effluent treatment (BOTTOM). The Delta Cross Channel gates, indicated by a gray bar between the Sacramento River and Mokelumne River, were open for the duration of the study.

The changes in nutrient load and anticipated changes in productivity and biomass can be illustrated more specifically through food-web diagrams (Figure 3). As noted above, increased exposure to light relative to conditions in the main-stem Sacramento River near Walnut Grove is predicted to be available in the three channels, due to a combination of shallower depth and longer hydraulic residence time, resulting in increased phytoplankton growth and biomass during current (baseline) conditions. We anticipated that phytoplankton would spend a longer time in the euphotic zone in the shallower Georgiana Slough and Mokelumne River channels compared with the deeper Sacramento River channel. Whether the light levels were also elevated in these channels relative to the Sacramento River would depend on turbidity levels. Being exposed to non-limiting light for longer durations, due to spending less time below the euphotic zone, increases the potential for rapid phytoplankton growth when other regulating factors, such as sufficient nutrient concentrations and low grazing pressure, are favorable.

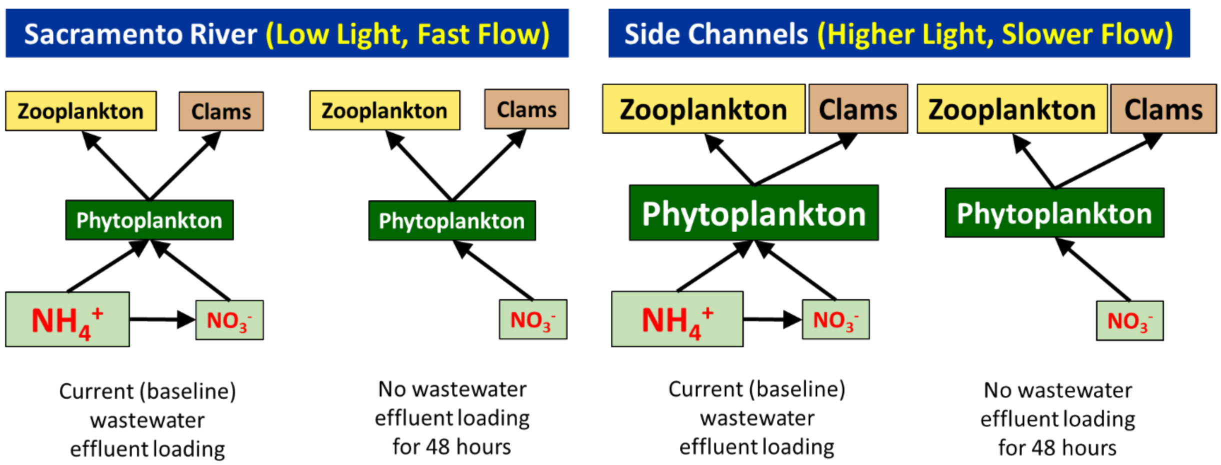


Figure 3. Simplified food web diagrams showing wastewater nutrient load (focusing on ammonium and nitrate) and predicted standing stock biomass in the Sacramento River and the three channels during two scenarios: (1) Current effluent nutrient loading, (2) No effluent loading, as occurs during wastewater effluent diversions (lasting up to 48 hours). The channels are expected to have greater light availability (due to being shallower) and longer residence times in comparison with the Sacramento River. The box size shows biomass at each trophic level relative to the other situations. Note that by the time the effluent reaches the channels, some ammonium will have nitrified to nitrate. Also, when there is no effluent loading from the SRWTP, the river and channels still receive nutrients from other sources.

We also anticipated that the biomass of zooplankton in the channels would be higher than in the Sacramento River, due to the greater availability of phytoplankton biomass to be grazed. During the condition of no wastewater nutrient loading, we anticipated that the already low phytoplankton biomass in the Sacramento River would remain unchanged. However, we anticipated that with no wastewater nutrient loading to the channels, phytoplankton productivity and potentially also phytoplankton biomass would decline. However, in the short time frame of the study, declines in zooplankton and clam biomass would not be observed in the channels.

An overarching assumption of this experiment was that the main factor to be tested would be the presence or absence of treated wastewater. Accordingly, we made the further assumption that, during the three-day study period, inputs to the study region from the Sacramento River upstream of the wastewater treatment plant and from the Mokelumne River would be consistent, allowing us to compare the conditions with wastewater (WW+ (~day 1)) and without wastewater (WW- (~day 2 and day 3)). In addition, we assumed that, aside from anticipated differences in depth and water residence time, the three channels would display similar hydrodynamics to one another. However, as the reader will see, the comparison of WW+ and WW- conditions was confounded by two factors, a change in Sacramento River water quality (namely turbidity) originating from upstream of the wastewater treatment plant discharge point, and complex hydrodynamics in the South Fork Mokelumne River.

Study Area

The study area included the lower Sacramento River and its three connected downstream channels: Georgiana Slough, the North Fork Mokelumne River, and South Fork Mokelumne River (Figure 1). Nutrient concentrations are typically relatively high in the Sacramento River, mainly because it receives water from multiple sources throughout northern California, including surface runoff, agricultural return, urban runoff, and treated discharge from publicly owned treatment works. Sacramento River discharge rates largely depend on precipitation events and water releases from large upstream reservoirs. During typical summer discharge conditions, the Sacramento River will experience tidal flow reversals at Cache Slough, which can extend upstream past Walnut Grove (Figure 1). The Delta Cross Channel connects the Sacramento River to the Mokelumne River (Figure 1, Figure *2*). The Delta Cross Channel gates typically remain open during summer months and remained open for the duration of our experiment. This study area was chosen because of the multiple river channels downstream of the SRWTP that were within the zone of influence of the SRWTP. The channels are close enough to the SRWTP that water parcels with or without treated effluent can be detected and tracked in the river water (i.e., prior to tidal mixing with water from other sources, such as the San Joaquin River). Based on bathymetric charts, we suspected that the channels would be shallower than the main-stem Sacramento River, and this was confirmed by subsequent depth analysis by Resource Management Associates (RMA) (see Appendix 3 of this report). The Sacramento River in our study area had a mean depth of 6.74 m (at Mean Sea Level). In comparison, the mean depth of Georgiana Slough was 5.63 m, the mean depth of the North Fork Mokelumne River was 5.93 m, and the mean depth of the South Fork Mokelumne River was 3.34 m.

Study Design

For this study, we had 17 sample stations in total: three along the main-stem Sacramento River between Freeport and Walnut Grove, a Sacramento River End Member (SREM) station at Walnut Grove, a Mokelumne River End Member (MOKEM) station upstream of the confluence with the South Fork Mokelumne River, and four stations in each of the three channels (Georgiana Slough, North Fork Mokelumne River, and South Fork Mokelumne River) (Figure 1). The three Sacramento River stations and the SREM station were sampled on 9/9/19, for background information. The two endmember stations and the 12 stations in the channels were sampled daily for three days, from 9/10/19–9/12/1919. The focus of our analyses was the 12 sample stations distributed across three channels.

Operators at the SRWTP halted treated effluent releases to the Sacramento River at the discharge point, located just south of Freeport (Figure 1), for approximately 48 hours, from late on 9/9/19 to early on 9/12/19. This 48-hour period was the longest time possible for a wastewater effluent diversion, given the capacity of the emergency storage basins at the treatment plant. From the beginning of the EVR diversion on 9/9/19, a wastewater-free parcel of water (WW-) developed starting at the Freeport Bridge. The length of the WW- parcel increased during the next 24 hours as it traveled down the Sacramento River and into the Delta Cross Channel. The WW- parcel reached Georgiana Slough at the end of the day on 9/ 10/19 and traveled through Georgiana Slough and into the North Fork Mokelumne River and South Fork Mokelumne River by 9/11/19. Sampling in the channels started on 9/10/19 when the WW- parcel was still making its way down the Sacramento River; therefore, the first day of sampling occurred in WW+ water. The second and third days of sampling occurred on 9/11/19 and 9/12/19 in the WW- parcel. In hindsight, we could have improved this study design by continuing to sample for several more days to document any responses to the resumption of effluent loading.

Our study design made use of the already-planned EVR operations at SRWTP to conduct an adaptive management experiment to inform future nutrient management in the Delta. Repeated sampling of discrete stations proceeded throughout the three days, and high resolution boat-based mapping of water quality also proceeded throughout the study area (Figure 1). Throughout our results we have referred to the nutrient "treatment" conditions according to the date of sampling: 9/10/19, 9/11/19, 9/12/19. During the EVR diversion, the loads of ammonium and nitrate from SRWTP were zero (Figure 4), providing an opportunity to investigate the potential impacts of short-term nutrient load reductions that are lower than those mandated in SRWTP's current National Pollutant Discharge Elimination System permit.

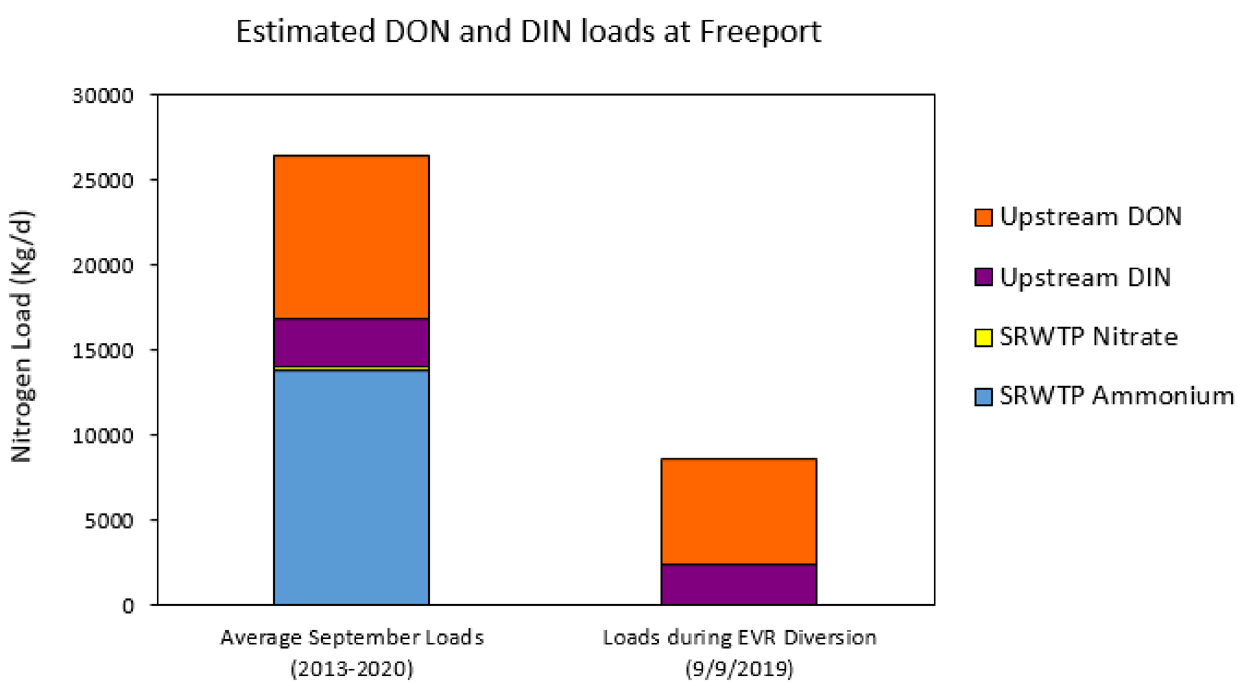


Figure 4. Change in Sacramento River nutrient loads related to the EVR diversion, including dissolved organic nitrogen (DON) and DIN. The average September loads are estimated by multiplying the average nitrogen concentrations in Sacramento River at Freeport during the month of September from 2013–2020 (collected upstream of the SRWTP discharge point as part of Regional San's monthly compliance monitoring) by the corresponding average daily river discharge at Freeport. The average September loads estimate also includes nitrogen loads in wastewater effluent calculated from the average daily ammonium and biweekly nitrate concentrations multiplied by the corresponding daily effluent flows in 2017 (measured by SRWTP personnel). The EVR load estimate is based on ammonium, nitrate, and dissolved TKN discrete water samples collected from the Sacramento River at Freeport on 9/9/2019, multiplied by the corresponding river discharge at Freeport. On 9/9/2019, the ammonium concentration at Freeport was below our method detection limit, so the full TKN concentration is shown as organic nitrogen.

We identified several areas of potential uncertainty in our experimental design as addressed below. One major uncertainty was that the two different treatments were sampled on different days; thus, changes in environmental variables such as water flow, mixing, irradiance, and temperature could confound the impact of the treatments.

Another uncertainty was that the mixing of water in the vicinity of the Delta Cross Channel is complex and uncertain. In addition, Sacramento River water, including nutrients from SRWTP-treated effluent and other nutrient sources, is likely to be diluted by inflows from the Mokelumne River. We included numerical water flow and transport modeling in our study to generate estimates of water transit time, water source percentage at each sample station, and mixing at confluences. These estimates were used in the interpretation of changes in nutrients, phytoplankton, and other variables. The flow and transport modeling are described in a separate report (Resource Management Associates 2020a), which is included as Appendix 2 of this report.

Depth in the main-stem Sacramento River becomes shallower near Isleton, suggesting that phytoplankton growth could potentially increase there, but the water in this region experiences more tidal reversals and mixing with Cache Slough water that would confound our ability to track phytoplankton growth through the lower Sacramento River. Our choice to focus on the channels in the Georgiana Slough and Mokelumne River region of the Delta was predicated on the opportunity to study the effects of multiple factors and stressors on phytoplankton while minimizing the influence of tidal effects and mixing in of waters (e.g., San Joaquin River, Cache Slough) that might confound the change in nutrient loading due to the treatment plant upgrade.

Our focus on Georgiana Slough, the North Fork Mokelumne River, and South Fork Mokelumne River was also based on our assumption, after examining bathymetric charts, that these channels were shallower than the main-stem Sacramento River. We assumed progressively shallower mean depths moving from west (Georgiana Slough) to east (South Fork Mokelumne River), and that phytoplankton might therefore experience greater irradiance and have higher potential for growth change in response to nutrient loading changes. While we measured river depth at specific locations during the experiment, phytoplankton would have experienced somewhat different depth conditions throughout the study area, and we were concerned that our spot measurements might not be representative. RMA therefore conducted a detailed depth study using recently acquired detailed bathymetry data (funded from an existing contract with Regional San).

There are also several dead-end side sloughs in our study area (Beaver, Hog, and Sycamore Sloughs) in which nutrient dynamics, phytoplankton production, and zooplankton production are largely unknown (Figure 1). There is the potential for water from these side sloughs to mix with water in the South Fork Mokelumne River, which could affect the nature of samples collected in the South Fork Mokelumne River. We designed our project to minimize this potential by locating our sample stations as far as possible from the confluences of these side sloughs with the South Fork Mokelumne River.

To provide an overarching view of patterns that might occur along the river channels beyond what discrete water sample stations could adequately capture, we made use of several USGS continuous high resolution monitoring stations (Burau et al. 2016) in our study area (Figure 1). River discharge, velocity, and other water-quality characteristics from three USGS continuous monitoring stations at Freeport (0.2 km upstream of SRWTP), Walnut Grove (29.2 km downstream of SRWTP), and Decker Island (approximately 63 km downstream of SRWTP) were used to plan sampling events and document continuous river conditions.

We completed high-resolution mapping of water quality on the three main days of the study, using in situ sensors on a moving boat to obtain spatially explicit nutrient, phytoplankton, and water-quality data and create maps of spatial variation. The USGS research vessel (R/V) "Landsteiner" was used for this work (Figure 5). In addition, the "Guardian" vessel carried a "mini-mapper" high resolution mapping system that provided continuous water-quality data from the North Fork Mokelumne River to help detect water quality (e.g., specific conductance changes that would indicate the arrival of the parcel of WW- water (Figure 6). Combined, these data assisted us in understanding biogeochemical and biological processes in the hydrologically complex river environment in our study area.

Figure 5. USGS survey research vessel "Mary Landsteiner" and crew conducting a high-resolution water quality mapping run. Photo: Timothy Mussen, Regional San.

Discrete water samples at the SREM station provided data for conditions in the Sacramento River and discrete water samples at the MOKEM station provided data representative of the Mokelumne River where it flowed into our main study area (Figure 1). Data from discrete water samples collected at the three additional stations farther upstream on the Sacramento River on the day before the main study began provided additional background information. We used three small boats to sample the total of 17 discrete water sample stations, which allowed us to sample the three channels simultaneously on the three main days of the study. Regional San's "Guardian" vessel sampled stations in the main-stem Sacramento River on 9/9/19 and in the North Fork Mokelumne River on 9/10/19–9/12/19 (Figure 6). The USGS "Mudslinger" vessel sampled stations in Georgiana Slough and one Sacramento River station on 9/10/19–9/12/19 (Figure 7). The San Francisco State University "Twin Vee" vessel sampled stations in the South Fork Mokelumne River on 9/10/19–9/12/19 (Figure 8).

Figure 6. Crew from Regional San, Applied Marine Sciences, Inc., and San Francisco State University onboard Regional San vessel "Guardian". Photo: Tamara Kraus, USGS.

Figure 7. Crew from Regional San, Applied Marine Sciences, Inc., and USGS onboard the USGS research vessel "Mudslinger". Photo: Tamara Kraus, USGS.

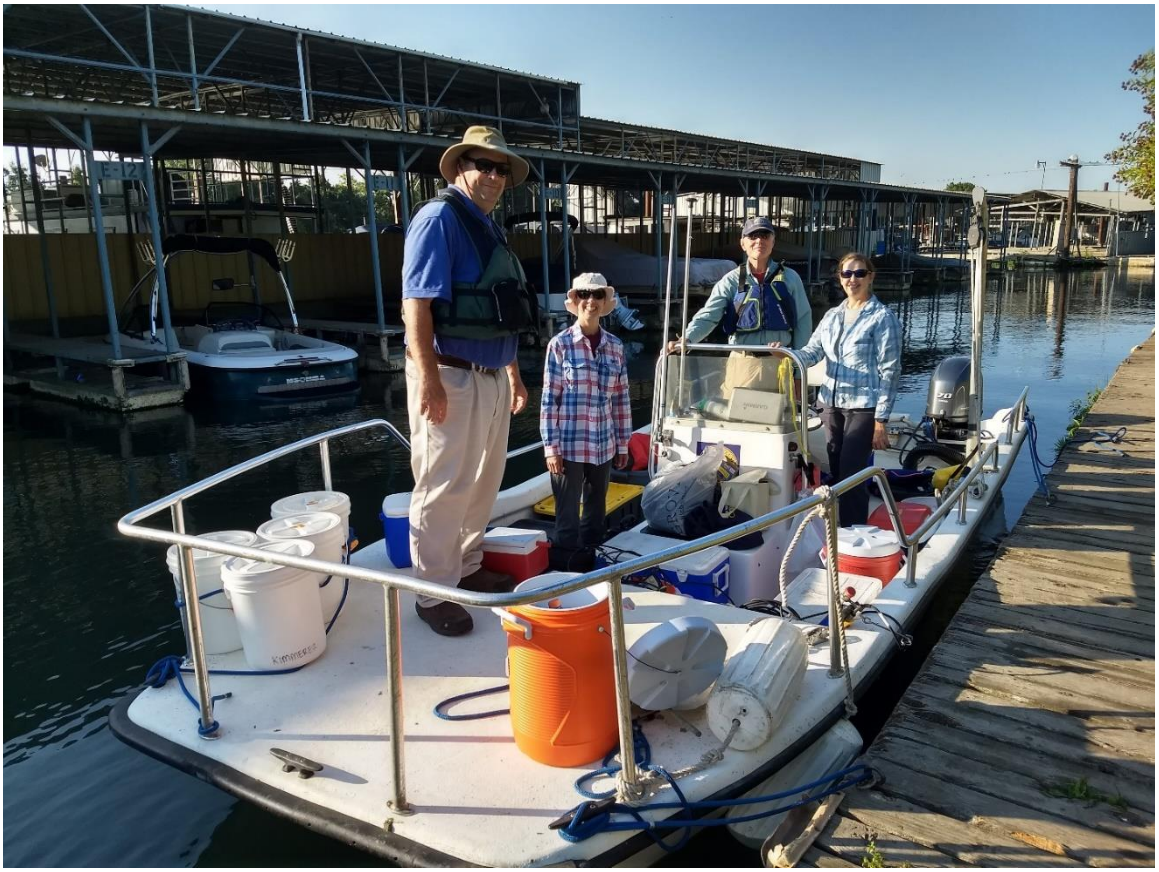


Figure 8. Crew from Regional San, Applied Marine Sciences, Inc., and San Francisco State University onboard the San Francisco State University vessel "Twin Vee". Photo: Lisa Thompson.

Our study design used a food web approach, examining many levels of the Delta food web, including physical factors (e.g., Secchi disk depth, turbidity, flow, temperature, pH, specific conductance, dissolved oxygen, and photosynthetically active radiation at select locations), water chemistry, including dissolved inorganic nutrient concentrations, chl-*a*, phytoplankton biomass and species composition, zooplankton biomass and species composition, and clam biomass. We also examined connections between trophic levels, including phytoplankton uptake assays (carbon uptake), zooplankton growth incubations, and zooplankton and clam grazing rates on phytoplankton. We sought to provide a snapshot of the food web in a single week. However, clam sampling was conducted one week after the other field work due to logistical limitations and with the assumption that clam distribution and biomass would not change significantly due to the nutrient loading change or within a one-week period. Details on this sampling are provided in the Methods section of this report.

The surveys were conducted in September, when Sacramento River flow rates are generally low, to minimize the potential effects of high versus low water years on Sacramento River flows. The late summer timing was also chosen to collect samples at a time of year that cyanobacterial harmful algal blooms typically occur in the Delta so that we would be able to detect HAB species if they were present (Berg and Sutula 2015, Lehman et al. 2017). If visual survey of a station indicated that cyanobacterial harmful algal blooms species such as *Microcystis sp*. were present, the team would have collected separate water samples for BSA Environmental Services, Inc., to measure cyanotoxin concentrations, using the Enzyme-Linked Immunosorbent Assay (ELISA).

Methods

Diversion of Treated Wastewater Effluent from the Sacramento River and Study Area

Operators at the SRWTP halted treated effluent releases to the Sacramento River at the outflow site (latitude 38.454161, longitude -121.501654), located just south of Freeport Bridge, from 23:57 on 9/9/19, to 1:19 on 9/12/19.

Water Flow and Transport Modeling

Numerical modeling of proportional water volumes and mixing were performed by RMA using their suite of Delta numerical model applications. The purpose of the modeling was to better understand water sources, mixing, transport time, and age to improve interpretation of the physical, chemical, and biological data collected during the survey. For example, having proportions of source waters at each location sampled, along with travel-time estimates, allowed more accurate determination of whether changes in phytoplankton biomass and species composition are due to growth, grazing, or dilution by tributary inflows.

RMA staff used their numerical modeling applications RMA2, RMA11, and RMATRK to provide hydrodynamic, transport and particle tracking modeling analyses, respectively, of the study area before and during the EVR diversion period to support analysis of the sampling data. RMA estimated the percentage of source waters supplied to the Georgiana Slough, North Fork Mokelumne River, and South Fork Mokelumne River during the study period. Model calculations helped identify sources of phytoplankton, zooplankton, nutrients, and other chemical constituents by identifying the proportion of water in each river sample from different sources. Upstream sources included the SRWTP effluent stream, the Sacramento, Mokelumne, and Cosumnes Rivers, and potentially a downstream source from the San Joaquin River, depending on inflow levels and tidal mixing. Vertical and cross-channel profiles of temperature, dissolved oxygen, specific conductance, and fluorescent dissolved organic matter (collected by the field crews on the USGS Mary Landsteiner and USGS Mudslinger vessels) were used to test the model's replications of water mixing. RMA also used their particle tracking module to calculate particle transport through the study area and estimate travel time of parcels of water entering the study area from different sources or time points.

RMA staff produced a stand-alone final report that was reviewed and approved by the Delta Regional Monitoring Program in September 2020 (Resource Management Associates 2020a). A copy of this report is included within the current report as Appendix 2.

River Depth Analysis

Phytoplankton growth in turbid estuaries and rivers is strongly affected by the amount of light present in the water, which is a function of solar radiation, water clarity, and river depth (Cole and Cloern 1984, 1987, Cloern 1991, 1996). Depth, light attenuation, and turbidity were measured by shipboard sampling of discrete stations during the Sacramento River Nutrient Change Study (SRiNCS). To distinguish phytoplankton responses to light availability at a higher resolution, RMA developed depth histograms in 1-m intervals for the four study reaches of the 2019 SRiNCS (main-stem Sacramento River, Georgiana Slough, North Fork Mokelumne River, and South Fork Mokelumne River). The depths were derived using the 2-m digital elevation map of the north Delta bathymetry developed by the California Department of

Water Resources. The results of the RMA hydrodynamic model runs performed for the September 2019 field study were processed to develop elevation surfaces of Mean Sea Level, Mean Higher High Water, and Mean Lower Low Water, to describe the range of depth conditions throughout the tidal cycle. The gridded bathymetry was subtracted from the model water-surface elevations to produce 2 m x 2 m grids of water depth for the four study reaches. RMA used the grids to generate color-coded depth maps to visually describe the river depths present within the study regions in each of the Mean Sea Level, Mean Higher High Water, and Mean Lower Low Water conditions.

RMA staff produced a stand-alone final report that was delivered to Regional San staff in December 2020 (Resource Management Associates 2020b). A copy of this report is included within the current report as Appendix 3.

Correlation of RMA Modeled Water Fractions with Discrete Water Sample Water-Quality Characteristics and Constituents

To assess the relationship between RMA flow and transport modeling results and observed discrete water sample water-quality characteristics and constituents, we (1) extracted the modeled fractions of SRWTP effluent and Mokelumne River water for each Georgiana Slough, North Fork Mokelumne River, and South Fork Mokelumne River sample station and sampling time (with sampling time matched to the nearest quarter-hour interval) and (2) compared the extracted water fractions with observed discrete water sample characteristics and constituents (DIC, DOC, chl-*a*, dissolved nitrogen, dissolved TKN, calculated DON, nitrate, nitrite, ammonium, dissolved total phosphorus, silica, and turbidity) using a linear regression model.

High Resolution Water-Quality Monitoring and Mapping

River discharge, velocity, and water-quality characteristics (Table 1) were measured every 15 minutes at three USGS monitoring stations: Freeport (FPT, USGS Station 11447650), located 0.2 km upstream from SRWTP, Walnut Grove (WGA, USGS Station 11447890), located 29.2 km downstream of the treatment plant, and Decker Island (DEC, USGS Station 11455478), located approximately 63 km downstream of the treatment plant (U.S. Geological Survey, 2022; http://waterdata.usgs.gov/usa/nwis). The flow and water-quality monitoring data collected by multiple sensors (Table 1) were used to plan the sampling event and document continuous river conditions during the experiment.

Table 1. Configuration of existing USGS continuous water-quality monitoring stations at Freeport (USGS Station 11447650), Walnut Grove (USGS Station 11447890), and Decker Island (USGS Station 11455478), showing the water-quality instrumentation and infrastructure at each station (U.S. Geological Survey, 2022).

Type	Description
Nitrate Sensor	SUNA Nitrate Analyzer
YSI EXO	EXO Temperature sensorEXO Conductance sensor
	EXO pH sensor
	EXO Dissolved oxygen sensor
	EXO Turbidity sensor
	EXO Fluorescence of dissolved organic matter (fDOM) sensor
	EXO Total algae sensor (fCHL)
	EXO Central Wiper
	YSI signal output adaptors
Infrastructure	Data Collection Platform (enclosure, datalogger, wire and cable, telemetry, solar panels, regulators and batteries)

Underway high-resolution water-quality measurements (Table 2) were collected by USGS personnel from a moving boat (USGS R/V Mary Landsteiner) at speeds up to 13 m/s (~30 mph) following the approach described by Fichot et al. 2015, Downing et al. 2016, Kimmerer et al. 2019, and Stumpner et al. 2020. Sample water was continuously pumped onto the boat using two SHURflo Aqua King II pumps at a pressure of 55 psi and rate of 5 GPM using a pick-up tube mounted at a fixed depth of approximately 1 m below the surface, routed through a 178 µm in-line strainer to remove large debris, and then into a pressure-compensated manifold that maintained system pressure at a prescribed level irrespective of boat speed, and that diverted excess flow to waste. A 2-stage debubbler was used to remove bubbles that could interfere with optical measurements in the flow-through instrumentation (Downing et al. 2016).

Constant flow rates through each flowpath were controlled via inline metering valves installed in the discharge lines (with the exception of the open split that provided water to the ammonium analyzer), and pressures were monitored using a sight gauge with adjustable knob. The manifold delivered water to the instruments listed in Table 2, providing continuous data collection at a frequency of 1 data point per second, allowing for high spatial resolution. Data were streamed to onboard computers in real time so that the investigators could make real-time decisions about instrument performance and identify regions of interest from identifiable changes along each transect. These data were used to detect the presence and absence of treated wastewater effluent and to quantify wastewater-derived constituent concentrations and effects (Kraus et al. 2017b).

Table 2. Measurements made continuously (1/second) during high-speed mapping surveys using the USGS boat-based flow-through system. The "mini-mapper" system deployed on the Guardian vessel did not include the instruments indicated in blue and italics.

Parameter	Instrument
Time	Garmin 16X-HVS global positioning system (GPS) receiver
Position	Garmin 16X-HVS GPS receiver
Temperature	YSI EXO 2; *Seabird model SB45 thermosalinograph*
Specific Conductance	YSI EXO 2; *Seabird model SB45 thermosalinograph*
pH	YSI EXO 2
Dissolved Oxygen	YSI EXO 2
Turbidity	YSI EXO 2 Turbidity: *WetLabs beam transmissometer*
fCHL	YSI EXO 2 Total algae probe; *WETLabs model WETStar chlorophyll fluorometer*
Phycocyanin	YSI EXO 2 Total algae probe
fDOM	YSI EXO 2; *WETLabs Wetstar*
Nitrate	Seabird SUNA V2, Satlantic nitrate analyzer
Ammonium	*Timberline TL-2800 ammonium analyzer*
Phytoplankton taxonomy	*bbe Fluoroprobe*

The manifold delivered water to three flowpaths: (1) A flow-through system consisting of a thermosalinograph that recorded temperature and specific conductance (Sea-Bird Scientific SB45 (TSG), Bellevue, WA); fluorometers that measured fCHL and fDOM (WETLabs WETstar (WS), Philomath, Oregon); a beam transmissometer that recorded transmittance and attenuation (WETLabs model C-Star transmissometer (CStar), Philomath, Oregon), a nitrate analyzer (SUNA V2; Sea-Bird Scientific, Bellevue, Washington). (2) A flow chamber for a multiparameter water quality sonde (YSI EXO2; Xylem Inc. (EXO), Rye Brook, New York) equipped with sensors to measure temperature, specific conductance, turbidity, pH, dissolved oxygen, fDOM and fCHL that then passed water to a fluorometer designed to measure different algal classes (FluoroProbe III (FP); BBE Moldaenke, Kiel, Germany; Beutler et al. 2002). (3) An open-split interface at atmospheric pressure that served water filtered through a 0.20 µm high-capacity in-line filter (Suez Memtrex, 25 cm length, MNY921EGS) to the on-board ammonium analyzer (Table 2). Flow-through instrumentation was connected using Tygon tubing. All tubing was new, and prior to use, all components of the flow-through system were flushed with organic-free, deionized water.

The ammonium analyzer was a continuous flow, gas diffusion/conductivity-based (Carlson 1978) instrument for ammonium analysis (TL-2800; Timberline Instruments, Boulder, Colorado) that was modified for field operation and continuous data collection by the manufacturer. Modifications included installation in a ruggedized housing, addition of an automated line-switching valve, addition of a heating unit to maintain the instrument at a constant above-ambient temperature, and changes to the software. The analyzer was run in continuous mode with frequent periodic introduction of deionized organic-free water (resistivity >18.2 MΩ/cm), and standard solutions to continuously assess instrument performance and to correct for baseline drift during the day. Full standard curves were run at the beginning and end of each day and partial curves run throughout the day each time the boat stopped to sample.

All instrumentation was cleaned, and calibrations were checked prior to each use following the manufacturer's recommendation or as described below. Data for most instruments were recorded at 1-second frequency on a single data logger (CR6, Campbell Scientific, Logan, Utah) together with a timestamp and boat position obtained from a high-resolution GPS receiver (16X-HVS, Garmin, Olathe, Kansas). The FluoroProbe logged data internally and to the host software every 4 seconds. The ammonium analyzer was connected to a stand-alone computer and collected data through its native software.

High resolution data were merged based on time stamp and processed as described by Downing et al. (2016) and O'Donnell et al. (2022). Briefly, flow-through instrumentation was calibrated by applying temperature corrections to all fDOM and fCHL measurements. In addition, fDOM measurements were corrected for turbidity interference and converted to quinine sulfate equivalents. All instruments used with the flow-through system underwent blank and calibration checks as described in the Delta Regional Monitoring Program Quality Assurance Project Plan (Yee et al. 2019). The flow-through system made redundant measurements (e.g., two fCHL fluorometers, two fDOM fluorometers, two thermistors), which allowed technical staff to check constituent measurement accuracy. Nutrient and chlorophyll data were validated by comparing in situ field data with laboratory results. High-resolution data from the SUNA nitrate analyzer were corrected by regressing instrument response against nitrate concentrations obtained from laboratory measurements of discrete samples collected through the course of each day. Individual sample results more than three standard deviations from the regression were judged to be outliers and removed from the regression (Pellerin et al. 2013). All data were 20-second median filtered and were spatially aligned to facilitate comparison between dates as described by O'Donnell et al. (2022).

During the three days of surveys, the USGS crew collected discrete water samples (analyses for concentrations of nitrate, ammonium, total dissolved nitrogen, phosphate, chl-*a* and pheaophytin, DOC, as well as phytoplankton enumeration and picocyanoplankton counts) at approximately 10 stations to validate and calibrate onboard instruments. Data from these surveys were processed as described by Downing et al. (2016) and Stumpner et al. (2020). Processed nutrient and chlorophyll samples were placed in a cooler on wet ice and shipped overnight to the USGS National Water Quality Laboratory in Lakewood, CO. Further details on processing and analysis of discrete samples, the required blanks and duplicates for each sample type, reporting limits (RLs), and method detection limits (MDLs) are described in the Delta Regional Monitoring Program Quality Assurance Project Plan (Yee et al. 2019) as well as the associated ScienceBase data release (O'Donnell et al. 2022). Data collected by the USGS for this study are publicly available at the USGS National Water Information System (NWIS, https://waterdata.usgs.gov/nwis; U.S. Geological Survey, 2022) and ScienceBase (O'Donnell et al. 2022).

Water Column Sampling

At each station on the Sacramento River, Georgiana Slough, and the South Fork Mokelumne River, on each day from 9/10/19–9/12/19, a YSI model EXO2 sonde (Xylem Instruments) was deployed to collect a vertical profile of depth (m), temperature (°C, direct measurement, electronic sensor), pH (direct measurement, glass electrode, reference electrode, and automatic temperature compensation), specific conductance (µS/cm, direct measurement, nickel electrode with automatic temperature compensation; specific conductance readings are automatically corrected to 25°C as part of the specific conductance program within the sonde), dissolved oxygen (mg/L, direct measurement, luminescence based sensor, automatic temperature compensation), and fluorescent dissolved organic matter (QSU). On 9/10/19–9/12/19, three sondes were in use to allow simultaneous sampling on three different boats. The EXO2 sondes were calibrated at the Regional San Environmental Laboratory each morning, and cross-calibrated together for fDOM in ambient river water each day before sampling commenced. Data from each EXO2 sonde were downloaded and stored on the Regional San Environmental Laboratory's servers each evening. On the North Fork Mokelumne River, vertical profiles were sampled as described above, but a Eureka sonde (model Manta+20) with a LI-COR spherical quantum photosynthetically active radiation sensor (model LI-193) was also used to obtain vertical profiles of irradiance. Calibrations and data backup for the Eureka sonde were performed by Applied Marine Sciences, Inc., staff.

Depth and temperature vertical profile data from the sondes were plotted to check for any evidence of temperature stratification at sample stations, which could have predisposed conditions to favor the formation of harmful algal blooms. Surface data (1-m depth) for other sonde variables were copied to field data sheets for subsequent use in graphical and statistical comparisons between sampling dates, stations, and channels.

At each station on Georgiana Slough and the SREM station on 9/10/19–9/12/19, a vertical profile of photosynthetically active radiation (µmol photons/m^2/s) was obtained using a LI-COR underwater quantum sensor (model LI-192SA). The LI-192 uses a silicon photodiode and glass optical filters to create uniform sensitivity to light between 400–700 nm, which closely corresponds to light used by most aquatic plants and algae. A precision optical filter blocks light with wavelengths beyond 700 nm, which is critical for measurements in a water column, where the ratio of infrared to visible light may be high.

Surface-Water Quality

In addition to the USGS continuous monitoring stations and high-resolution mapping surveys described above, water samples were collected at pre-determined locations along the Sacramento River, Georgiana Slough, North Fork Mokelumne River, and South Fork Mokelumne River. For discrete water quality, for each sample type, one sample was collected per station, plus one field duplicate per day. On 9/9/19, only the four stations on the Sacramento River were sampled, for a total of five samples (4 stations plus 1 field duplicate). On each of 9/10/19–9/12/19, the sample stations in Georgiana Slough, North Fork Mokelumne River, and South Fork Mokelumne River were sampled, plus the SREM station and MOKEM station, for a total of 15 samples (14 stations plus 1 field duplicate) per day. In all, a total of 46 samples and 4 field duplicates were collected per sample type.

Our surface-water quality methods are summarized below. Sample collection at all 17 discrete sample stations followed the protocols in section 22 of the 2019 *Regional San Environmental Laboratory Quality Manual* (Regional San Environmental Laboratory 2019). Detailed methods used for water sample collection, storage, and analysis are also included in the Delta Regional Monitoring Program Quality Assurance Project Plan (Yee et al. 2019), including the instrument calibration procedures, maximum holding times to filtration and to analysis, preservative and holding temperature requirements, required blanks, controls, and matrix spikes, reporting limits, and method detection limits. Note that this duplicates the information in the 2019 *Regional San Environmental Laboratory Quality Manual*, but the Delta Regional Monitoring Program Quality Assurance Project Plan (Yee et al. 2019) may be easier for readers to obtain. At each station, surface water (~0.5 m depth) was collected using an acid-cleaned plastic bucket. Triplicate samples for turbidity were measured at each station using a Hach 2100P turbidimeter following method EPA 180.1. Single samples for determination of ammonium (NH_4^+-N), nitrate + nitrite (NO_3^--N + NO_2^--N), TKN (dissolved), dissolved total phosphorus (mainly phosphate as phosphorus, PO_4^{3-}-P), DOC, and silica concentrations were filtered through a 0.45 µm filter, preserved, and stored refrigerated until analysis using standard methods at the Regional San Environmental Laboratory. Sample handling and custody followed the protocols in section 23 of the *Regional San Environmental Laboratory Quality Manual* (Regional San Environmental Laboratory 2019). Sample containers were pre-labeled with the sample location and Laboratory Information Management System barcode. Date and time collected were added to the label at the time of sample collection.

Sample bottles were packed in ice chests with sufficient wet ice to maintain sample transport criteria. Field sheets were filled out at the time of collection and included site code, site description, GPS location, collection date/time, field physical and water chemistry measurements, and sampler(s) name. Water samples collected for analysis at the Regional San Environmental Laboratory were subject to the maximum holding times and sample collection preservation guidelines in the *Manual for the Certification of Laboratories Analyzing Drinking Water* 5th Edition, January 2005 (United States Environmental Protection Agency 2005), 40 Code of Federal Regulations (C.F.R.) § 141.13 (1975), and 40 C.F.R. § 141.23 (1991).At the Regional San Environmental Laboratory, water samples were analyzed using the following methods and instrumentation: ammonium was analyzed using EPA method 350.1 (United States Environmental Protection Agency 2005; Lachat Quick Chem 8500 phenol hypochlorite/colorimetric), nitrate + nitrite was analyzed using method EPA 353.2 (US EPA 2005; Lachat Quick Chem 8500, sulfanilamide/colorimetric), TKN (dissolved) was analyzed using method EPA 351.2 (United States Environmental Protection Agency 2005; Lachat Quick Chem 8000, semi-automated colorimetry and flow injection), dissolved total phosphorus was analyzed using method EPA 365.4 (United States Environmental Protection Agency 2005; Lachat Quick Chem 8000, molybdate-antimony/colorimetric), DOC was analyzed using Standard Methods [SM] 5310B (Clesceri et al. 1998; DOC OI Analytical TOC analyzer, model 1020A, acidification and infrared detection, high temperature combustion, total dissolved carbon minus DIC), DIC was analyzed using Standard Methods (SM) 5310B (Clesceri et al. 1998), and silica was analyzed using method EPA 200.8 (United States Environmental Protection Agency 2005; Agilent 7900 and inductively coupled plasma/mass spectrometry (ICP/MS), model G8403A, pneumatic nebulization into radiofrequency plasma, vacuum extraction into quadrupole mass spectrometer).

For chl-*a*, the laboratory analytical method was based on "10200 H, Spectrophotometric Determination of Chlorophyll" in *Standard Methods for the Examination of Water and Wastewater - 20th edition*

(Clesceri et al. 1998) but was modified such that samples were filtered within 12 hours of field collection, and that sample filters were frozen for up to 6 months prior to analysis. Samples collected for chl-*a* determinations were analyzed at the Regional San Environmental Laboratory following extraction with 90% acetone. Briefly, 20–100 mL water was filtered onto Whatman glass microfiber filters (GF/F) which were placed in petri dishes, wrapped in foil, and preserved frozen until analysis. The frozen filter containing the sampled phytoplankton cells was placed into a grinding tube to which 90% acetone was added. The glass filter was ground with a glass grinder (manufactured by Wheaton and made of Teflon or polytetrafluoroethylene [PTFE]) for 1–2 minutes. The ground filter was rinsed with 90% acetone into a centrifuge tube and extracted overnight in the refrigerator in the dark. Samples were centrifuged, and the supernatant analyzed at 750 nm (Turner Designs Trilogy model 7200-000 fluorometer with fluorescene module #046).

Within the Sacramento River, on 9/9/19 the crew of the Guardian vessel recorded continuous water-quality measurements while sampling at each station. Within the North Fork Mokelumne River, on 9/10/19–9/12/19 the crew of the Guardian vessel recorded continuous water-quality and variable fluorescence (F_v/F_m) measurements while sampling at each station and during times of slow transit. However, the F_v/F_m data were not usable due to the long time between collection of sample and measurement in the instrument.

Note that in the case of some water-quality constituents, namely ammonium, nitrate, nitrite, and dissolved total phosphorus, some results were below the reporting limit. In the case of ammonium and nitrite, some results were also below the method detection limit. For subsequent graphical and statistical analyses, values below the method detection limit were set to zero, and values between the method detection limit and the reporting limit were set to the instrument-reported value for a given sample (Table 3).

Table 3. Reporting limits and method detection limits for discrete water sample water-quality constituents with some low measured values.

Constituent	Reporting Limit (mg/L)	Method Detection Limit (mg/L)
Ammonium	0.5	0.19
Nitrate	0.1	0.02
Nitrite	0.1	0.007
Dissolved total phosphorus (phosphate)	0.2	0.07

Phytoplankton Density and Biovolume

Similar to the description for discrete water-quality samples above, one phytoplankton sample was collected per station visited on a given day, plus one field duplicate per day, for a total of 50 samples. Whole-water samples for phytoplankton identification and enumeration were collected in brown high-density polyethylene (HDPE) bottles and preserved with acid Lugol's solution, a solution of iodine and potassium iodide, at a rate of 5 mL per 250 mL water sample.

Samples of phytoplankton were stored in a cool dry location at the Regional San Environmental Laboratory prior to being shipped overnight to BSA Environmental Services, Inc., at their facility in Beachwood, Ohio, for enumeration.

Phytoplankton samples were filtered onto a 0.2 µm polycarbonate membrane (Nuclepore) and enumerated using a Leica DMLB compound microscope according to McNabb (1960) as described in Beaver et al. (2013). At least 400 natural units (colonies, filaments, and unicells) were enumerated to the lowest possible taxonomic level from each sample. The abundance of common taxa was estimated by random field counts. Rare taxa were quantified by scanning a transect of the filter. In the case of rare, large taxa, half of the filter was scanned and counted at a lower magnification. Cell volumes (biovolumes) were estimated by applying the geometric shapes that most closely matched the cell shape (Hillebrand et al. 1999). Biovolume calculations were based on measurements of 10 organisms per taxon for each sample where possible.

Phytoplankton raw data are presented in Appendix 6.

Picocyanobacteria Density and Biovolume

Picocyanobacteria methods are presented separately from methods for phytoplankton because picocyanobacteria were enumerated using epifluoresence microscopy, whereas phytoplankton were enumerated using inverted microscopy. Because different enumeration techniques were used, the size distributions of picocyanobacteria and phytoplankton may overlap, and their biovolumes cannot be summed to get an overall total. Therefore, results for phytoplankton and picocyanobacteria are also presented separately in the Results section of this report.

Similar to the description for discrete water-quality samples above, one picocyanobacteria sample was collected per station visited on a given day, plus one field duplicate per day, for a total of 50 samples. Each 50 mL whole-water sample was preserved with glutaraldehyde (1 mL 50% glutaraldehyde addition per 25 mL water sample) and stored refrigerated.

Samples of picocyanobacteria were stored in a cool dry location at the Regional San Environmental Laboratory prior to being shipped overnight to BSA Environmental Services, Inc., at their facility in Beachwood, Ohio, for enumeration.

Picocyanobacteria (typically < 2 µm) biovolume was estimated using epifluorescence microscopy. Preserved samples were filtered onto 0.2 µm polycarbonate membranes (Nuclepore), enumerated, and sized using an epifluorescence microscope. Following analyses, samples were stored at BSA Environmental Services, Inc., pending the acceptance of the final SRiNCS report by the Delta Regional Monitoring Program.

Picocyanobacteria raw data are presented in Appendix 7.

Phytoplankton Productivity

Determinations of carbon (C) uptake by phytoplankton were quantified using the stable isotope tracer ^{13}C-bicarbonate, at each of 14 stations on 9/10/19–9/12/19. Whole-water samples were collected using an acid-cleaned plastic bucket that had been rinsed three times with ambient river water before being filled. Water was poured from the bucket into acid-cleaned 250 mL polycarbonate square bottles (Nalgene) after each bottle was rinsed three times. A set of three bottles for each station received ^{13}C-bicarbonate. Isotopes were added at trace levels (approximately 10% of ambient concentrations). After the bottles were spiked with tracer they were placed into a flow-through incubator on deck and shaded with multiple layers of darkened neutral density netting (top and sides) to 40% of surface irradiance. Uptake incubations were terminated after 4 hours via vacuum filtration of 125–250 mL water onto combusted 25 mm Whatman GF/F. Following filtration, samples were placed in sterile 2 mL Eppendorf micro-centrifuge tubes and dried in a drying oven at 50°C overnight. After drying, samples were stored in a desiccator until processed for mass spectrometric analysis at the University of California Davis Stable Isotope Facility. These incubations produced three replicate measurements of atom percent excess of the POC per station, which was used together with the atom percent enrichment of the dissolved pool to calculate specific uptake rates of carbon (*V* (1/h) = Atom % excess / Atom % enrichment x time) according to Glibert and Capone (1993).

Zooplankton Biomass

At each of 14 stations on each day from 9/10/19–9/12/19, we collected one vertical haul zooplankton sample with a 0.5-m diameter, 50-µm mesh, 3:1 Wisconsin-style zooplankton net. In addition, one field duplicate was collected per day, in a different channel each day, for a total of 42 zooplankton samples and three field duplicates. Samples were transferred from the cod end to a 250 mL brown HDPE bottle after rinsing the net three times, and preserved with 1% Lugol's solution, a solution of iodine and potassium iodide (12.5 mL Lugol's per 250 mL water sample). Samples were stored in a cool dry location at the Regional San Environmental Laboratory prior to being shipped overnight to BSA Environmental Services, Inc., at their facility in Beachwood, Ohio. Enumerations of the 45 zooplankton samples were conducted by BSA Environmental Services, Inc., describing species where possible, abundance, and biomass. Zooplankton samples were analyzed using the Utermöhl technique with a minimum tally of 200 organisms (Utermöhl 1958). Dry weight biomass estimates were based on length:width relationships that were applied following methods described in Beaver et al. (2013). Following analyses, zooplankton samples were stored at BSA Environmental Services, Inc., pending the acceptance of the final SRiNCS report by the Delta Regional Monitoring Program.

Zooplankton raw data are presented in Appendix 8.

Zooplankton Growth

We conducted a pilot experiment to determine growth rate of the copepod *Eurytemora carolleeae* in water from the study area. This experiment was planned and conducted because we expected to find few copepods in the site water and had considered using a cultured test organism to assess the quality and quantity of the food available to support growth. This species, formerly common in the estuary but now less so, is easier to culture than *Pseudodiaptomus forbesi* which is more common during September. Although the results showed good growth over three days, we decided to use *P. forbesi* for measuring growth during the main experiment.

Because of crew limitations, we focused all our sampling effort on the North Fork Mokelumne River and South Fork Mokelumne River (Figure 1). We conducted 27 discrete sampling events that included zooplankton abundance, stage distribution, egg production rate, and growth rates. Samples for growth rates were collected at two of the four stations in each of the North Fork Mokelumne and South Fork Mokelumne Rivers.

Zooplankton abundance was sampled with a 50-cm diameter, 53-µm mesh net equipped with a flowmeter, towed below the surface for 3 minutes, then we analyzed the samples at the Estuary and Ocean Science (EOS) Center, San Francisco State University. Subsamples were taken with a Stempel pipet to obtain at least 400 organisms and examined under a dissecting microscope. Organisms were identified to the lowest practicable taxonomic level and counted. Count data were converted to abundance (per m^3) using the sample fraction and the filtered volume determined from the flowmeter.

Twelve growth-rate experiments were completed at two sample stations in each of the North Fork Mokelumne and South Fork Mokelumne Rivers (Figure 1) using a method modified from the Artificial Cohort method (Kimmerer and McKinnon 1987). Experiments were not done in Georgiana Slough because we had only two people from the EOS Center working on the study. One modification of the original method was to use image analysis to estimate volumes of individual copepods, which were converted to carbon content using a previously determined calibration (Kimmerer et al. 2018, Owens et al. 2019).

A further modification of the growth-rate method was necessary because *P. forbesi* was not always abundant in the water of the two distributaries. Because the objective for these experiments was to assess the effect of changes in nutrition on copepods rather than to determine ambient growth rates, we conducted these measurements as bioassays. Copepods were collected during short trips to the San Joaquin River just south of the point where Georgiana Slough meets the combined forks of the Mokelumne River (Figure 1). These copepods were transferred to insulated buckets of water from the study sites for transport to the EOS Center.

The growth-rate incubations were conducted at the EOS Center, where replicate containers of copepods were incubated at constant temperature for a total of 48 hours. At 0, 24, and 48 hours, the contents of four replicate containers were poured through a nylon sieve and concentrated into vials with glutaraldehyde as preservative. Samples were subsequently analyzed for volume and carbon per copepod was calculated. Growth rate was determined as the slope of the natural log of median carbon per copepod (Kimmerer et al. 2018). In all 12 experiments the slope did not differ when the 48-hour time point was eliminated, indicating that growth had been constant for the entire period.

We also collected and analyzed samples for molecular identification of foods consumed by the zooplankton. We collected zooplankton and particulate matter at the growth-rate stations and froze them for later analysis using High-Throughput Sequencing (Holmes 2018, Kimmerer et al. 2018).

Clam Biomass and Grazing

Clams were collected at the 17 sample stations over 9/24/19–9/25/19. Clam sampling was performed separately from the main project sampling, due to time constraints, but soon enough after the main project sampling to reduce the likelihood of clam movements or population biomass changes due to growth or mortality. We sampled clams from the river bottom using a custom-built, 35-cm wide trawling dredge. We used this sampling method because clams commonly live in patchy distributions. The clam trawling dredge covers a larger surface area of the river bottom (approximately 9 m^2), compared to a Ponar scoop sampler, which helps to reduce sample variation. At each location, three transects were sampled parallel to the riverbanks, with transects spaced equally across the river's width, in mid-channel, channel-left, and channel-right. The trawl was deployed from the side of the boat while the boat was stationary in the water. The trawl had a rope connected to a buoy on the basket end and a rope connected to the boat on the inlet end. After the boat moved about 10 m into the river's current, the trawl was tied off to a cleat at the rear of the boat and dragged behind the boat for roughly 1 minute at a speed of approximately 1.8 km/h. Distance traveled was estimated from boat speed and time traveled and verified by recording starting and ending GPS locations. Time of day, average water depth, and field notes were also recorded.

Clams > 5 mm were collected in a wire mesh basket at the back end of the dredge, which allowed finer particles to pass through. At the end of each transect, the clam dredge was lifted to the side of the boat and gently agitated to release fine particles. The clam dredge was then moved into the boat and its contents were emptied into a plastic sorting tub (Figure 9). All clams and other material were removed from the dredge before the subsequent transect pull started. All other material was returned to the river, and the trawl was visually inspected by two researchers to ensure that there were no remaining clams.

All living clams from each transect, including those attached to the trawl's rake, were placed into a labeled mesh storage bag and held on ice in coolers until the end of each sampling day, then transported to the laboratory prior to fixation in buffered 10% formalin in labeled glass containers that evening. After roughly two weeks, the clams were transferred into 70% ethanol for long-term preservation and stored at room temperature.

Clam shell widths were measured with electric calipers to provide raw data to estimate clam biomass and clam grazing rates. Turnover of water by clams (CT, 1/d) was based on Lopez et al. (2006) and was calculated using the following steps. First, pumping rate (PR, m^3/g clam/d) was calculated as a function of temperature (T), based on laboratory experiments:

$$PR = (0.4307e^{0.1113 \times T}) \times 24 \times 0.001$$

Next, daily clam filtration rate (FR, m/d) was calculated as the product of the clam ash-free dry weight (CDW, g/m^2) and PR:

$$FR = CDW \times PR$$

Then CT was calculated from the ratio of FR to river depth (H, m):

$$CT = FR / H$$

Figure 9. Tim Mussen (Regional San) with clams collected from Georgiana Slough.

Quality Assurance/Quality Control Procedures

All data collection, laboratory analyses, flow modeling, and data management, archiving and preservation adhered to the methods and Quality Assurance/Quality Control procedures developed for the project and described in detail in the Delta Regional Monitoring Program Quality Assurance Project Plan, version 5 (Yee et al. 2019). The Quality Assurance Project Plan provides a comprehensive account of the project's procedures, including project tasks, quality objectives and criteria, special training and certifications, documentation and records, sampling process design, sample collection methods, sample handling and custody, analytical methods, quality control, instrumentation (testing, inspection, maintenance, calibration), field supplies, data management (review, verification, validation), assessment and response actions, and reporting.

The Regional San Environmental Laboratory is certified by the California Environmental Laboratory Accreditation Program. Data quality objectives for this project measured both completeness and correctness. An acceptable completeness goal for this project was 90% completeness and included both collection and transport of sample and the laboratory analysis completeness. Completeness was assessed based on the number of samples successfully obtained and validated for use in this study and the proportion of quality-control samples that were within acceptance criteria. Correctness included using the appropriate analytical method, sampling technique, preservation, and all the required quality assurance for the type of analysis performed. Data quality objectives for accuracy, precision, recovery, and contamination were determined through a combination of instrument calibration and the analysis of duplicates, blanks, and spikes. Accuracy, precision, and recovery were assessed through the use of quality control samples by the laboratories. Laboratory spikes and matrix spikes were used to assess accuracy and recovery, and duplicates are used to assess precision. All of the sampling and analysis performed for this project complied with the appropriate laboratory- or method-required quality control. If an analysis was not in compliance with these established method criteria, the lab would have notified the program manager.

Statistical Analyses

For each constituent (i.e., water quality, phytoplankton, and zooplankton constituents), we tested for differences among means across the three sampling dates (9/10/19, 9/11/19, and 9/12/19), and across the three side channels (Georgiana Slough, North Fork Mokelumne River, South Fork Mokelumne River) with 2-factor analysis of variance (ANOVA), using the ANOVA function in SYSTAT 13 (Zar 1984, SYSTAT 2017). Data from the four sample stations in each channel were pooled. Regarding the statistical assumption of independent observations, we did not correct for repeated sampling at the same sample locations throughout multiple days because the water transport rates and tidal fluxes were such that we were not sampling the same parcels of water on different days (see Appendix 2). We checked the statistical assumptions of normal distribution of residuals using quantile-quantile residual plots, and of homogeneity of variances using residual plots (residuals versus predicted values). All pairwise comparisons were made using a Tukey test, using the post hoc POOLED TUKEY function in SYSTAT (Zar 1984, SYSTAT 2017). Secchi depth was not analyzed because of missing data, and the phytoplankton divisions Euglenophyta and Pyrrophyta were not analyzed because they were present at very few dates and sample stations. For each constituent related to phytoplankton productivity (i.e., carbon uptake, δ^{13}C-POC, and POC), we tested for differences among means by date (9/10/19, 9/11/19, 9/12/19) and by channel (SREM, Georgiana Slough, North Fork Mokelumne River, South Fork Mokelumne River, MOKEM) with 2-factor ANOVA, using the aov() function in R (R Development Core Team 2014).

Results

Water Flow and Transport Modeling

The complete RMA flow and transport final report (RMA Modeling of Sacramento River Nutrient Change Study) is included in this report as Appendix 2. Here we summarize the major findings of the flow and transport report and their implications for the interpretation of the other data collected during the SRiNCS.

The final flow simulation from the RMA2 model (calibrated and with an updated grid developed for this project) was used for the RMA11 transport model volumetric simulations. The RMA11 model was calibrated using specific conductance data. Specific conductance varied among the water sources to our study area (Sacramento River, Mokelumne River, and Regional San effluent) and behaved like a conservative tracer. The RMA11 transport model was used to estimate the proportions of each water source represented at different locations and times along the three channels: Georgiana Slough, North Fork Mokelumne River, and South Fork Mokelumne River. Particle tracking simulations were conducted to estimate the times by which water with or without effluent from Regional San would have reached a particular sample station during the experiment.

There were four main insights that emerged from this work. First, the proportions of water from the different sources varied among the channels. Sacramento River water, and thus Regional San wastewater inputs, reached all three channels. During the experiment, Sacramento River water comprised approximately 99% of the flow in Georgiana Slough, 96% in the North Fork Mokelumne River, and 80% in the South Fork Mokelumne River (Appendix 2, Figures 32–34). On 9/10/19, Regional San effluent comprised approximately 0.8% of the flow in Georgiana Slough and the North Fork Mokelumne

River, and 0.6% of the flow in the South Fork Mokelumne River, dropping to 0% on 9/11/19. Meanwhile, Mokelumne River inputs affected the South Fork Mokelumne River, but had very little effect on the North Fork Mokelumne River (less than 1%), and no effect on Georgiana Slough (Appendix 2, Figures 36 and 49).

Second, the tidal flux shifted the water in each channel back and forth, and in the case of the South Fork Mokelumne River, caused the input to alternate between Sacramento River water (which included Regional San effluent depending on the phase of our experiment) and Mokelumne River water (Appendix 2, Figures 51 and 52). The tidal flux also appeared to pull water into and out of the three side sloughs (Hog, Beaver and Sycamore Sloughs, Figure 1) on the east side of the South Fork Mokelumne River. This resulted in the South Fork Mokelumne River containing somewhat discrete parcels of water from different sources. Therefore, the influence of Sacramento River water and Regional San wastewater was dampened in the South Fork Mokelumne River in comparison with the other two channels (Appendix 2, Figure 22).

Third, the river flow rates in the Sacramento River and channels were faster than we anticipated when we designed the experiment. This precluded us from using a Lagrangian sampling design in which we would have floated slowly downriver with the advancing WW+ parcel, sampling alternately between WW+ and WW- parcels (see Kraus et al. 2017a). Instead, the transport model showed that entire study area (i.e., the three channels) was under the influence of wastewater on 9/9/19 (see Appendix 2, Figures 37–42). According to the model, the WW- water reached the more northerly stations in the channels late on 9/10/19 (after we had completed our sampling) (see Appendix 2, Table 1). On 9/11/19, there was a transition period when WW- water reached the more southern stations by the end of the day. On 9/12/19, all stations started out in the WW- state. By late that afternoon the resumption of discharge from SRWTP caused WW+ water to again begin reaching the stations, but this occurred after we had completed our discrete water sampling at each station.

Fourth, there was a level of uncertainty about the transport times predicted by the model. Tides affected the movement of the water within each channel, affected the inputs of Mokelumne River water to the South Fork Mokelumne River (as noted above), and likely pulsed water in and out of the three side sloughs along the South Fork Mokelumne River, but the model couldn't resolve this potential pulsed water phenomenon exactly, mainly due to the lack of data from the two field calibration flow stations that washed out in 2017. Based on calibration data collected during the USGS high-resolution boat mapping cruises and from the cross-river transects collected by one of the discrete water sample boat crews, the modelers knew that their model was off by less than an hour to several hours, but that the model predictions were still accurate at the scale of days.

These combined insights from the flow and transport modeling indicate that the 3-day experimental design was robust to tidal fluctuations and the exact location of a given parcel of water, since the majority of the water in the study area on a given day was in the same condition, either WW+ or WW-. Instead of comparing changes from one station to the next along each channel, we were able to group the data from all 12 stations by day (9/10/19, 9/11/19, 9/12/19).

Based on the results of the RMA flow and transport analyses, we were concerned that our response variables (e.g., water quality, phytoplankton abundance, and productivity) could be affected by inputs from the Mokelumne River that could dilute inflow from the Sacramento River to the extent that chemical and biological responses would be substantially dampened. As a result, otherwise detectable changes in the ecosystem, correlated with the decrease in effluent loading, would become undetectable. However, as will be seen below in the remainder of the Results section, there were substantial changes in the values of many water-quality variables, even when data from the four South Fork Mokelumne River sample stations were pooled with the data from the four sample stations in each of Georgiana Slough and the North Fork Mokelumne River (n=12 total). There were also substantial changes in several phytoplankton abundance and productivity variables.

River Depth Analysis

The full RMA depth analysis report (River Depth Analysis in Support of the Sacramento River Nutrient Change Study) and bathymetric maps for our study area are included in this report as Appendix 3. Here we summarize information from the depth histograms that RMA developed based on the bathymetry data.

Overall, the initial assumptions we made regarding the relative depths of the different channels while designing the experiment were confirmed by the detailed bathymetry data obtained by RMA. As noted in the Introduction, the Sacramento River in our study area had a mean depth of 6.74 m (at Mean Sea Level). In comparison, the mean depth of Georgiana Slough was 5.63 m, the mean depth of the North Fork Mokelumne River was 5.93 m, and the mean depth of the South Fork Mokelumne River was 3.34 m. Depths varied with the tidal cycle, as described below.

The portion of our study area within the Sacramento River was predominantly 7–8 m deep (median depth interval of 7–8 m was 20% of surface area), although this increased to 8–9 m deep at Mean Higher High Water. The maximum depth interval was 18–19 m at Mean Higher High Water (Table 4).

The portion of our study area within Georgiana Slough was predominantly 6–7 m deep (median depth interval was 29% of surface area). This decreased to 5–6 m deep at Mean Lower Low Water. The maximum depth interval was 15–16 m at Mean Higher High Water (Table 4).

The portion of our study area within the North Fork Mokelumne River was predominantly 6–7 m deep (median depth interval was 15% of surface area). This increased to 7–8 m deep at Mean Higher High Water. The maximum depth interval was 13–14 m at Mean Higher High Water (Table 4).

The portion of our study area within the South Fork Mokelumne River was predominantly 3–4 m deep (median depth interval was 23% of surface area). This increased to 4–5 m deep at Mean Higher High Water. The maximum depth interval was 12–13 m at Mean Higher High Water (Table 4).

The depth histograms (not shown) for the Sacramento River and Georgiana Slough were somewhat parabolic, that is, they appeared to follow a somewhat normal distribution. Depth distributions in the North Fork Mokelumne and South Fork Mokelumne Rivers were more skewed. The North Fork Mokelumne River had a higher proportion of its surface area with depths greater than the median depth than did the other channels (Table 4). Conversely, the South Fork Mokelumne River had a higher proportion of its surface area with depths shallower than the median depth than did the other channels.

Table 4. Summary of depth distributions in the four channels in the study area. Data are drawn from the depth analysis report prepared by RMA (River Depth Analysis in Support of the Sacramento River Nutrient Change Study, included in this report as Appendix 3.

Channel	Maximum depth interval at Mean Higher High Water (m)	Median depth interval at Mean Sea Level (m)	Proportion of surface area below median depth interval at Mean Sea Level (%)	Proportion of surface area at median depth interval at Mean Sea Level (%)	Proportion of surface area above median depth interval at Mean Sea Level (%)
Sacramento River	18–19	7–8	49	20	31
Georgiana Slough	15–16	6–7	53	29	17
North Fork Mokelumne River	13–14	6–7	50	15	34
South Fork Mokelumne River	12–13	3–4	43	23	34

Correlation of RMA Modeled Water Fractions with Discrete Water Sample Water-Quality Characteristics and Constituents

We assessed the relationship between RMA flow and transport modeling results and observed discrete water sample water-quality characteristics and constituents. Results of this analysis are given in Table 5 and plotted (including equations) in Appendix 4.

Table 5. Results of linear regression analysis of modeled water fractions (modeled SRWTP effluent fraction, % SRWTP, and modeled Mokelumne River fraction, % MOK) and water-quality parameters. Regressions associated with p-values less than 0.05 are shown in bold.

Characteristic or Constituent	% SRWTP			% MOK		
	R squared	p-value	Slope	R squared	p-value	Slope
DIC	0.0005	0.900	+	**0.6471**	**0.000**	—
DOC	0.0228	0.379	+	**0.3666**	**0.000**	—
Chl-*a*	0.0232	0.376	—	0.0227	0.380	+
Dissolved nitrogen	**0.6537**	**<0.001**	**+**	**0.2196**	**0.004**	—
Dissolved TKN	**0.4939**	**0.000**	**+**	**0.2310**	**0.003**	—
DON, calculated	0.0004	0.914	—	**0.2568**	**0.002**	—
Nitrate	**0.7687**	**0.000**	**+**	0.0772	0.101	—
Nitrite	**0.2956**	**0.001**	**+**	0.0048	0.689	—
Ammonium	**0.8659**	**0.000**	**+**	0.0485	0.197	—
Dissolved total phosphorus	0.0689	0.122	+	**0.1167**	**0.041**	**+**
Silica	0.0098	0.566	+	**0.7496**	**0.000**	**—**
Turbidity	**0.2242**	**0.004**	**+**	0.0510	0.186	—

Dissolved nitrogen, dissolved TKN, nitrate, nitrite, ammonium, and turbidity exhibited significant positive correlations to modeled SRWTP effluent fraction, whereas DIC, DOC, dissolved nitrogen, dissolved TKN, calculated DON, and silica exhibited significant negative correlations with modeled Mokelumne River fraction (Table 5). Dissolved total phosphorus exhibited a significant positive correlation with modeled Mokelumne River fraction. These results could be used to assess RMA model performance along the steep spatial and temporal gradients of this study and to understand the observed effects of source inputs on water-quality characteristics and constituents. The influence of SRWTP effluent on constituents found in high concentrations in this source (i.e., dissolved nitrogen and ammonium) as well as constituents not found in high concentrations in this source but instead produced from SRWTP effluent substrate by biogeochemical processes (i.e. nitrate), are apparent in the regression analysis results. The Mokelumne River water diluted the effluent and affected several water-quality characteristics and constituents, particularly in the South Fork Mokelumne River samples.

High-Resolution Water-Quality Monitoring and Mapping

The results from the USGS high-resolution boat mapping cruises conducted on 9/10/19–9/12/19 clearly show the fluctuations in ammonium and nitrate concentrations during the changes in wastewater loading (Figure 10). By midday on 9/10/19 (WW+ day), there were lower ammonium concentrations in the Sacramento River downstream of the treatment plant discharge point but still high concentrations of ammonium in the Sacramento River near Walnut Grove and in the three channels. Ammonium concentrations in the South Fork Mokelumne River were lower than in the other two channels. On 9/11/19 (WW-) and 9/12/19 (WW-), concentrations of ammonium in the channels were near zero, but on 9/12/19, ammonium concentrations in the main-stem Sacramento increased downstream of the treatment plant discharge location as the 48-hour EVR diversion ended early on 9/12/19. Nitrate concentrations were higher in the channels than in the main-stem Sacramento River on 9/10/19. Nitrate appeared to linger in the South Fork Mokelumne River on 9/11/19, but low concentrations were observed near the input of the Mokelumne River. On 9/12/19, nitrate concentrations in the main-stem Sacramento River increased again after the EVR diversion ended, with increased concentration toward Walnut Grove (presumably due to nitrification of effluent ammonium).

The patterns observed for DIN and DOC from 9/10/19–9/12/19 (Figure 11) were very similar to the patterns observed for nitrate, although the pattern for DOC was weaker.

Specific conductance in each of the three channels showed a slight decline between 9/10/19 (WW+) and 9/11/19 (WW-) (Figure 12). However, the greatest contrast in specific conductance occurred in the South Fork Mokelumne River near the input from the Mokelumne River, particularly on 9/11/19, but this was also apparent on 9/10/19.

The value of fCHL was less than 10 µg/L throughout the study area and study period (Figure 12), and fCHL was generally lowest in Georgiana Slough and highest in the South Fork Mokelumne River, with intermediate values in the main-stem Sacramento River and the North Fork Mokelumne River. Within the North Fork Mokelumne River but not the other channels, fCHL declined from 9/10/19–9/11/19, then stayed the same on 9/12/19. Some higher fCHL values occurred in the upstream segment of the Sacramento River on 9/12/19, but this increase began upstream of the treatment plant discharge point.

Chlorophyll fluorescence attributed to diatoms was slightly higher in the North Fork Mokelumne River than in the other two channels on 9/10/19 (Figure 13). However, on 9/11/19 and 9/12/19, fluorescence was slightly lower in the North Fork Mokelumne River than in the other two channels. Within the North Fork Mokelumne River, but not the other channels, fluorescence attributed to diatoms declined from 9/10/19–9/11/19, then stayed the same on 9/12/19.

Chlorophyll fluorescence attributed to blue-green algae was higher in the South Fork Mokelumne River than in the other two channels on each of 9/10/19, 9/11/19, and 9/12/19 (Figure 13). Fluorescence in each of the three channels and the Sacramento River was slightly lower on 9/12/19 in comparison with 9/10/19.

Chlorophyll fluorescence attributed to Cryptophyta was relatively low throughout the study area and throughout the study period, although somewhat higher values were observed in the southern end of the North Fork Mokelumne River on 9/10/19 (Figure 14).

Chlorophyll fluorescence attributed to green algae was higher in the South Fork Mokelumne River than in the other two channels on 9/10/19, 9/11/19, and 9/12/19 (Figure 14). In the Sacramento River, chlorophyll fluorescence attributed to green algae was higher on 9/12/19 than on 9/10/19, and this difference began upstream of the treatment plant discharge location.

Overall, across the study area, fCHL did not show a clear increase or decrease in association with the decrease in wastewater nutrient loading. Chlorophyll fluorescence attributed to diatoms decreased in association with the decrease in wastewater nutrient loading from 9/10/19 (WW+) to 9/11/19 (WW-), but only in the North Fork Mokelumne River (Figure 13). Chlorophyll fluorescence attributed to blue-green algae showed a slight decrease from 9/10/19 (WW+) to 9/12/19 (two days of WW- conditions) across the study area (Figure 13).

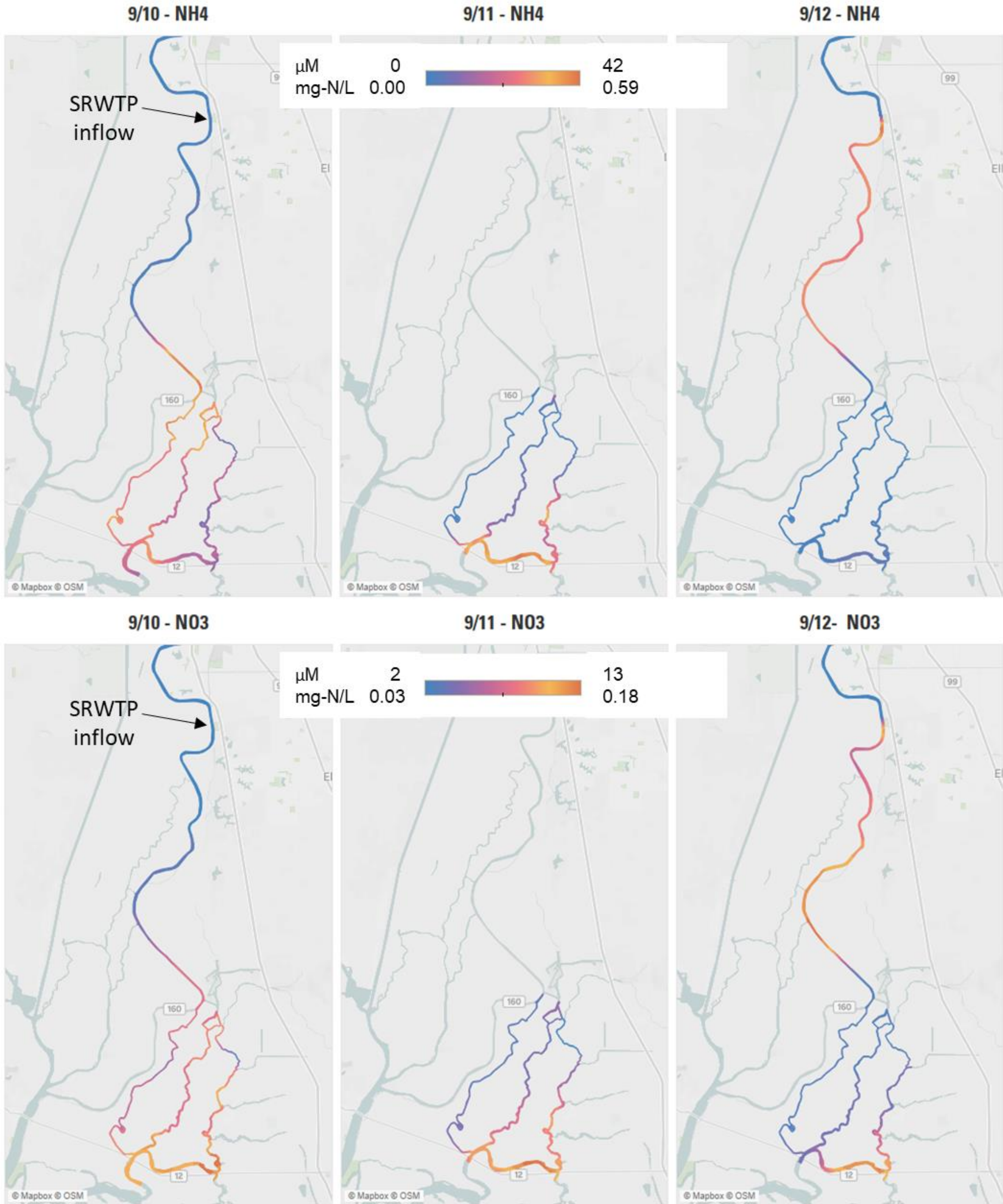


Figure 10. Concentration of ammonium (NH4, top) and of nitrate (NO3, bottom) observed by the USGS high-resolution mapping boat within the study area on 9/10/19–9/12/19. Note that the USGS crew did not sample the Sacramento River on 9/11/19.

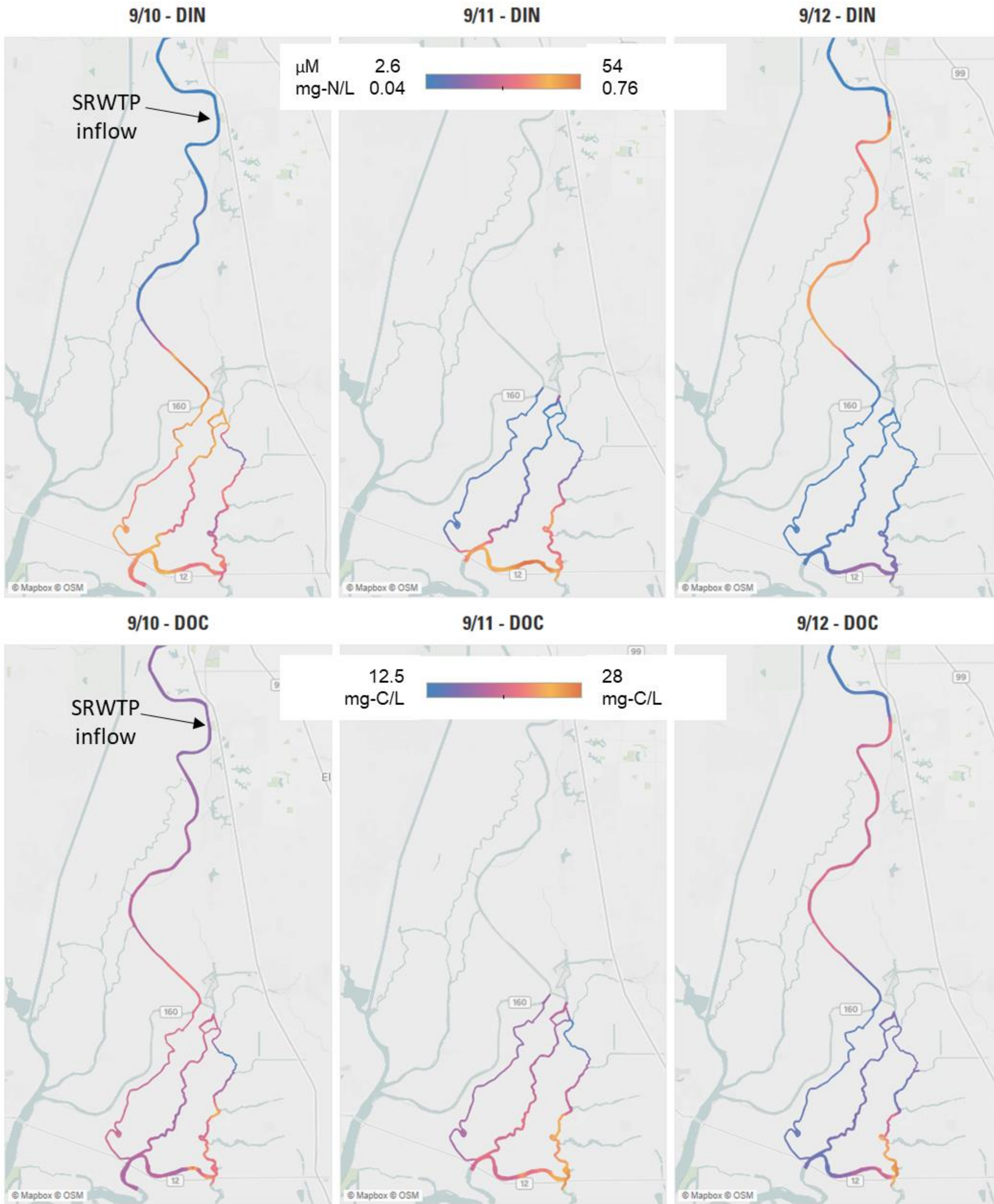


Figure 11. Concentration of DIN (top) and of DOC (bottom) observed by the USGS high-resolution mapping boat within the study area on 9/10/19–9/12/19. Note that the USGS crew did not sample the Sacramento River on 9/11/19.

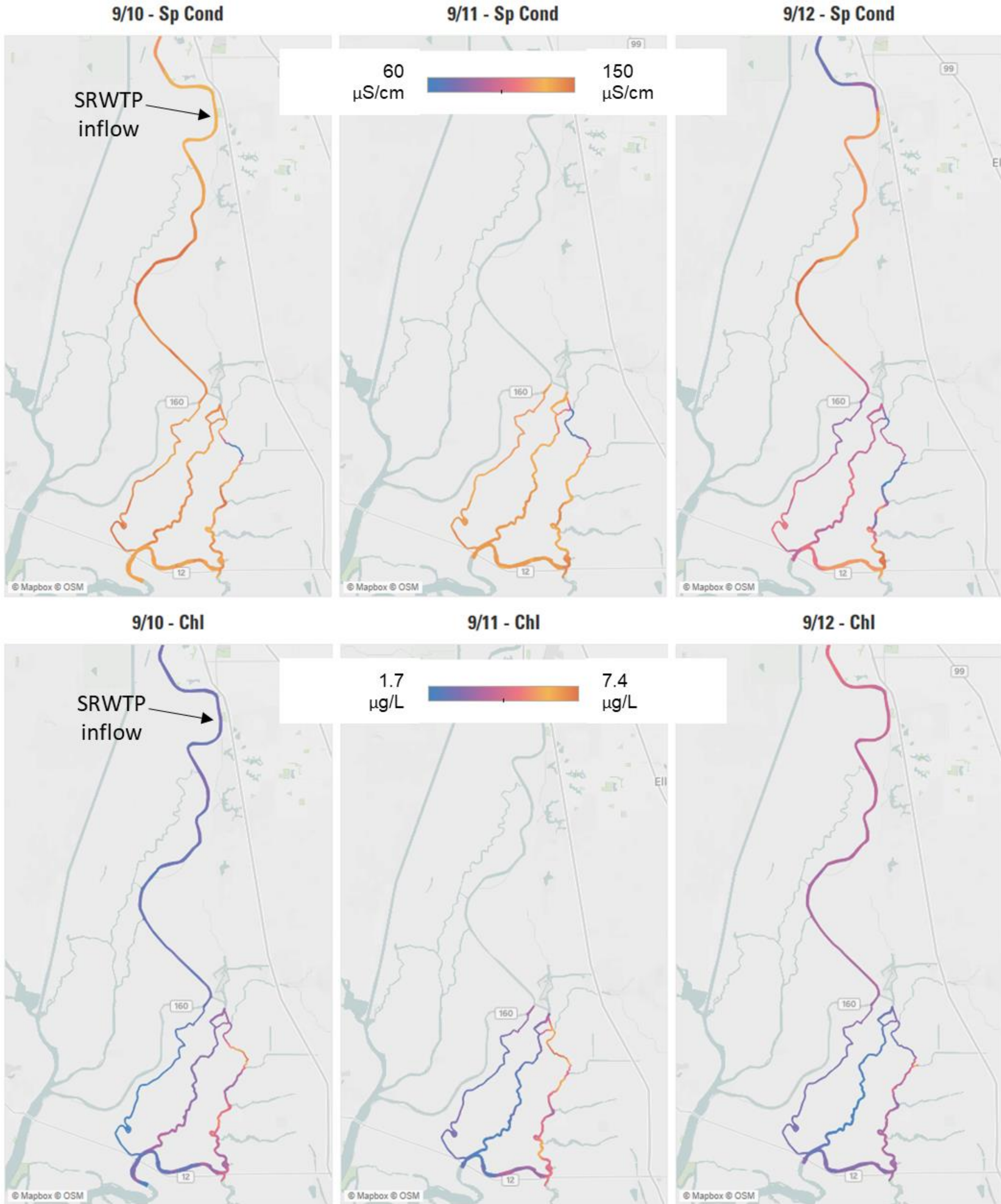


Figure 12. Specific conductance (Sp Cond, top) and concentration of fCHL (Chl, bottom) observed by the USGS high-resolution mapping boat within the study area on 9/10/19–9/12/19. Note that the USGS crew did not sample the Sacramento River on 9/11/19.

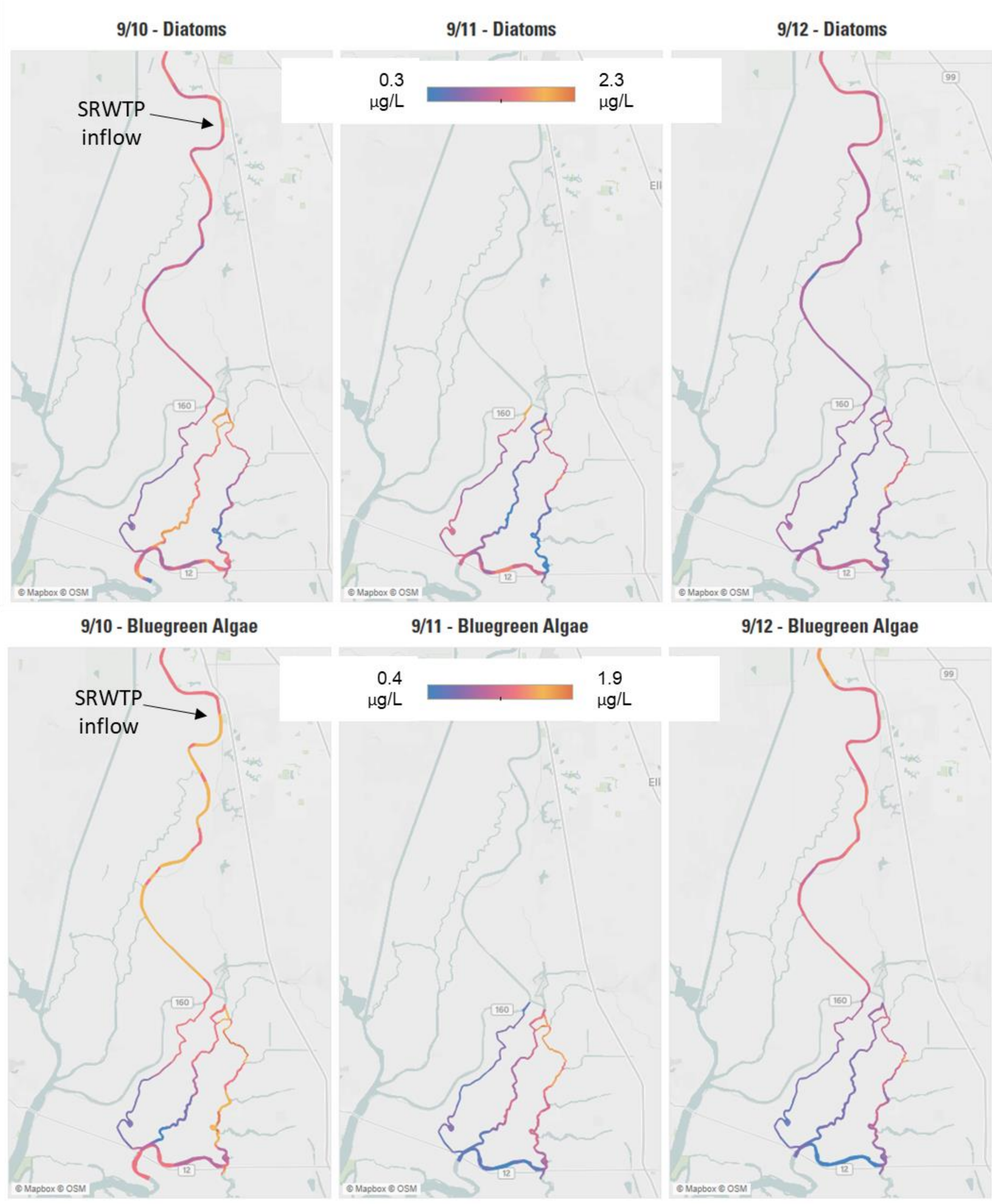


Figure 13. Data generated by the bbe Fluoroprobe during the USGS high-resolution mapping surveys. (TOP) Chlorophyll fluorescence response attributed to diatoms, reported in µg/L (BOTTOM) Chlorophyll fluorescence response attributed to blue-green algae (Cyanobacteria), reported in µg/L. Note that the USGS crew did not sample the Sacramento River on 9/11/19.

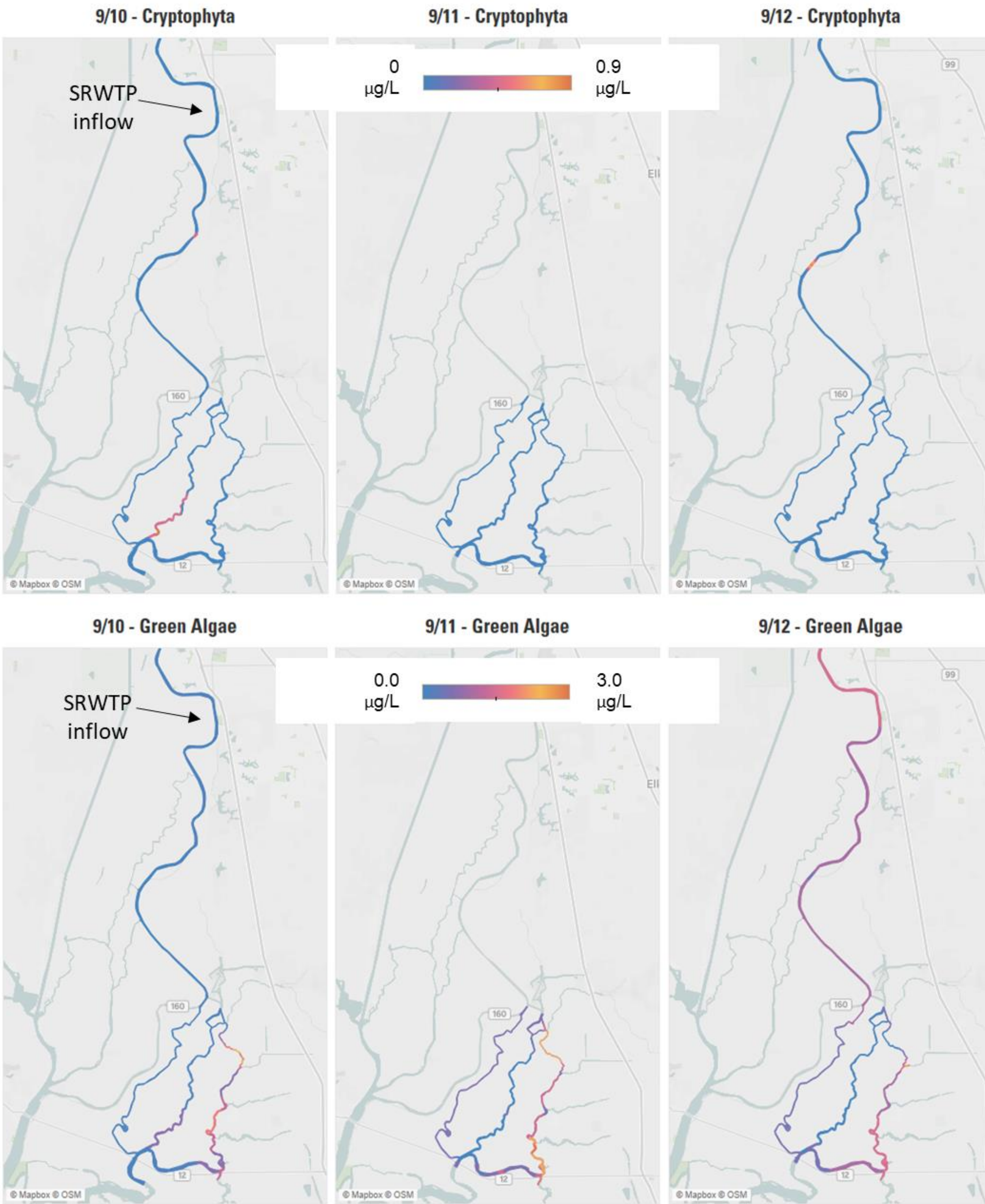


Figure 14. Data generated by the bbe Fluoroprobe during the USGS high-resolution mapping surveys. (TOP) Chlorophyll fluorescence response attributed to Cryptophyta, reported in µg/L (BOTTOM) Chlorophyll fluorescence response attributed to green algae, reported in µg/L. Note that the USGS crew did not sample the Sacramento River on 9/11/19.

Water Column Sampling

Our discrete water sample stations ranged in location from 38.153822 to 38.456503 latitude and from -121.482539 to -121.584361 longitude (Table 6). Note that field data measurements presented below were collected aboard the Guardian, Mudslinger, and TwinVee vessels.

Table 6. Location and names of discrete water sample stations. Latitude and longitude are in decimal degrees.

Tributary	Station name	Station abbreviation	Station number	Latitude	Longitude
Sacramento River	Sacramento River 1	SR1	1	38.456503	-121.502353
	Sacramento River 2	SR2	2	38.434775	-121.522908
	Sacramento River 3	SR3	3	38.368506	-121.5214
	Sacramento River End Member	SREM	4	38.253011	-121.512269
Georgiana Slough	Georgiana Slough 1	GS1	5	38.223233	-121.541328
	Georgiana Slough 2	GS2	6	38.201247	-121.541736
	Georgiana Slough 3	GS3	7	38.182925	-121.568922
	Georgiana Slough 4	GS4	8	38.162442	-121.584361
North Fork Mokelumne River	North Fork Mokelumne River 1	NFM1	9	38.222397	-121.507483
	North Fork Mokelumne River 2	NFM2	10	38.202994	-121.518447
	North Fork Mokelumne River 3	NFM3	11	38.182644	-121.526664
	North Fork Mokelumne River 4	NFM4	12	38.160164	-121.533933
Mokelumne River	Mokelumne River End Member	MOKEM	13	38.230939	-121.490592
South Fork Mokelumne River	South Fork Mokelumne River 1	SFM1	14	38.224786	-121.491506
	South Fork Mokelumne River 2	SFM2	15	38.207314	-121.482539
	South Fork Mokelumne River 3	SFM3	16	38.181264	-121.489256
	South Fork Mokelumne River 4	SFM4	17	38.153822	-121.503183

Depth

River depths measured from the sampling boats ranged from 2.4–11.0 m, with a mean of 6.5 ± 0.3 m (Standard Error, SE) and median of 6.4 m (Figure 15). Depths measured from the boats corresponded well with the depths indicated by the RMA depth assessment. Depths in the main-stem Sacramento River and in the North Fork Mokelumne River tended to be greater than depths in Georgiana Slough and the South Fork Mokelumne River.

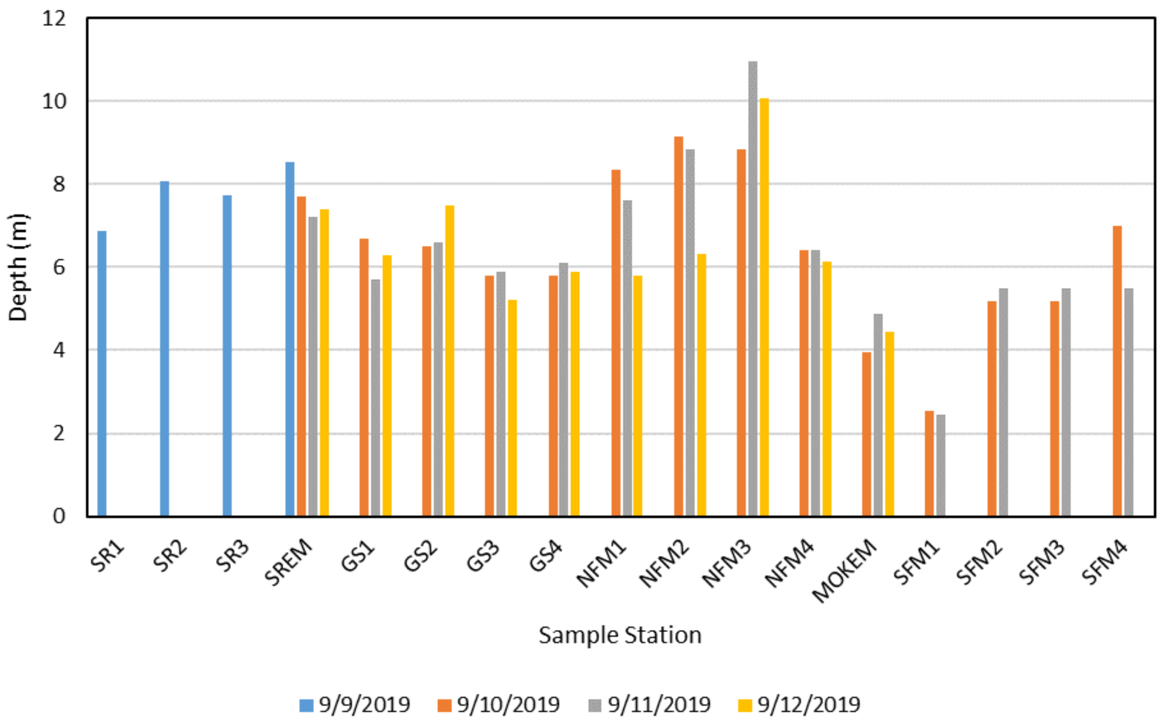


Figure 15. Depth, measured from sample boats, of discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6. Note: Missing data at SFM1–SFM4 on 9/12/19.

Secchi Depth

Secchi depth ranged from 1.0–1.9 m, with a mean of 1.4 ± 0.04 m (SE) and median of 1.4 m (Figure 16). Values are missing from the South Fork Mokelumne River stations on 9/12/19.

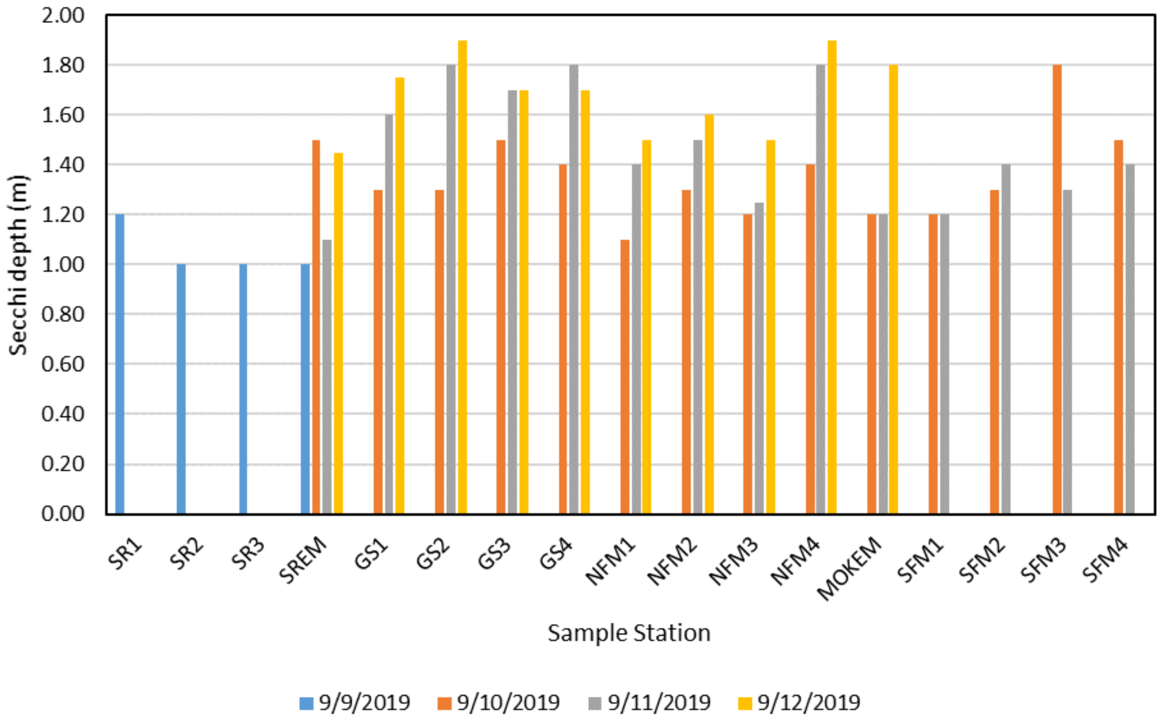


Figure 16. Secchi depth of discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6. Note: Missing data at SFM1–SFM4 on 9/12/19.

Turbidity

Turbidity ranged from 2.7–12.0 NTU, with a mean of 5.4 ± 0.3 NTU (SE) and median of 5.0 NTU (Figure 17). Turbidity values observed in the main-stem Sacramento River on 9/9/19 were greater than values observed at any of the stations on subsequent days.

Using day and channel as factors in a 2-way ANOVA, significant negative differences in turbidity with day were observed (Figure 18, Table 7). Tukey pairwise comparisons indicated the following: 9/10/19 > 9/11/19 (p-value = 0.002); 9/10/19 > 9/12/19 (p-value = 0.000).

Turbidity was also significantly different with channel, with the North Fork Mokelumne River having higher turbidity than the other two channels. Tukey pairwise comparisons: Georgiana Slough < North Fork Mokelumne River (p-value = 0.000); North Fork Mokelumne River > South Fork Mokelumne River (p-value = 0.000).

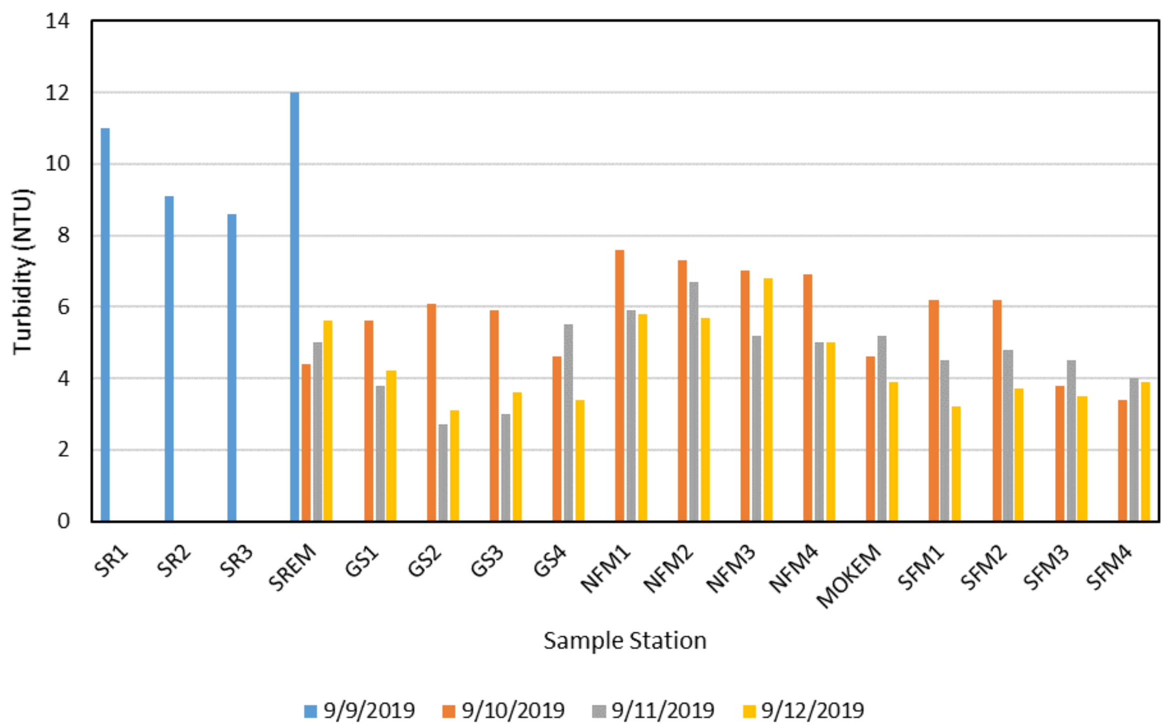


Figure 17. Surface-water turbidity at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

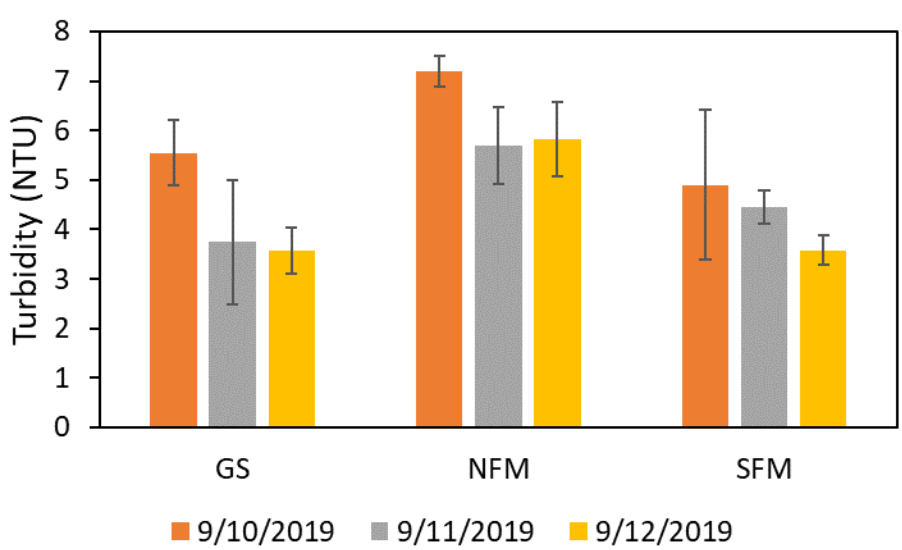


Figure 18. Mean surface water turbidity from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Table 7. P-values and F-values (in parentheses) resulting from 2-way ANOVAs of water quality constituents using day and channel as factors. Significant p-values (< 0.05) in bold. Factor 1, Day = 9/10/19, 9/11/19, 9/12/19 (degrees of freedom, df=2). Factor 2, Channel = Georgiana Slough, North Fork Mokelumne River, South Fork Mokelumne River (df=2). Residuals df = 27 for all constituents.

Constituent	Day (Factor 1) df=2	Channel (Factor 2) df=2	Interaction (Factor 1 x 2) df=4
Turbidity	**1.56E-04** (12.3)	**1.6E-04** (22.8)	0.48 (0.9)
Temperature	0.14 (2.1)	**2.49E-09** (45.1)	0.52 (0.8)
Dissolved oxygen	0.17 (1.9)	**1.30E-03** (8.6)	0.14 (1.9)
Specific conductance	0.60 (0.5)	**7.06E-04** (9.6)	0.99 (0.03)
pH	0.12 (2.3)	**7.91E-04** (9.4)	**0.04** (2.9)
Silica	0.63 (0.5)	**1.17E-06** (23.6)	0.86 (0.3)
DIC	0.85 (0.2)	**1.33E-03** (8.6)	0.85 (0.3)
DOC	0.66 (0.4)	**2.65E-03** (7.5)	0.25 (1.4)
Dissolved nitrogen	**1.34E-09** (47.8)	**3.15E-04** (11.0)	**0.04** (2.9)
Dissolved TKN	**1.39E-09** (47.6)	**7.09E-06** (19.0)	**0.01** (3.8)
Nitrate	**6.34E-07** (25.4)	0.72 (0.3)	0.54 (0.8)
Nitrite	**2.86E-03** (7.3)	0.18 (1.8)	0.37 (1.1)
Ammonium	**2.51E-12** (84.1)	0.14 (2.1)	**2.00E-03** (5.6)
Dissolved total phosphorus	0.08 (2.9)	0.45 (0.8)	**0.02** (3.7)

Temperature

Surface-water temperatures ranged from 19.60–21.53 °C, with a mean of 20.24 ± 0.09 °C (SE) and median of 19.98 °C (Figure 19). Using day and channel as factors in a 2-way ANOVA, temperature was significantly different with channel, with the South Fork Mokelumne River having higher temperatures than the other two channels (Figure 20, Table 7). Tukey pairwise comparisons indicated the following: Georgiana Slough < South Fork Mokelumne River (p-value = 0.000); North Fork Mokelumne River < South Fork Mokelumne River (p-value = 0.000).

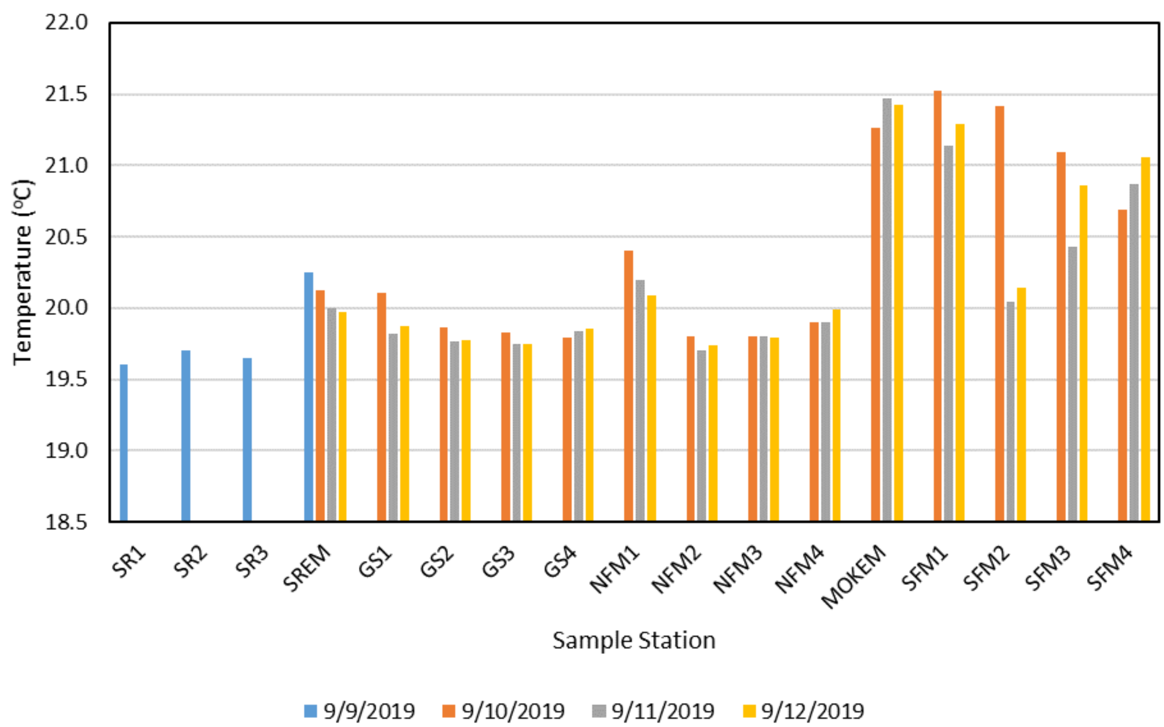


Figure 19. Surface water temperature at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

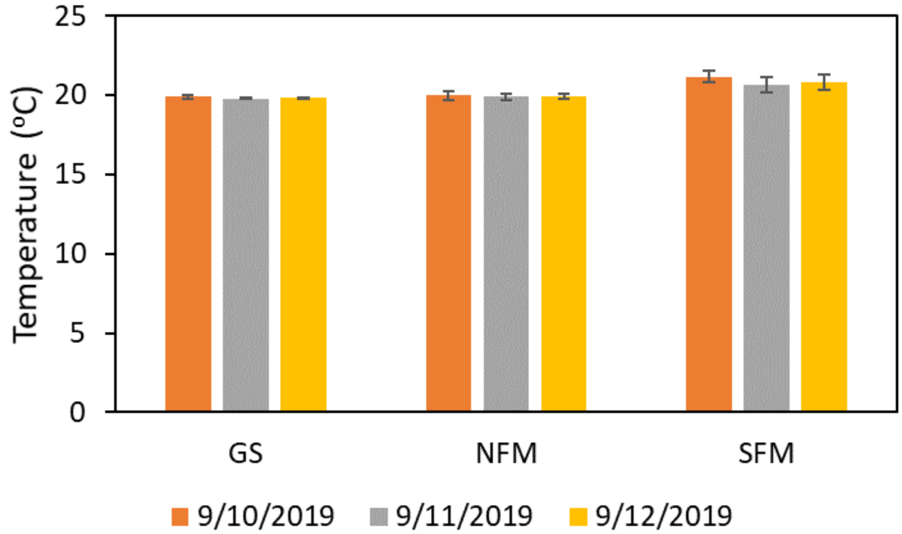


Figure 20. Mean surface water temperature from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Temperature Vertical Profiles

At the SREM and GS stations, there was no evidence of water temperature vertical stratification (Figure 21). Temperatures varied less than 0.5 °C between stations, even though they were sampled at different times of the day, with temperatures being between about 19.7–20.1 °C. Temperature also did not appear to differ between the three days of the study, although the temperature profile data were not analyzed statistically. Temperature profile data from the North Fork Mokelumne River stations are missing due to an issue with the sonde used in that channel. At the MOKEM and SFM stations, there was no evidence of temperature vertical stratification, for stations at which the sonde was allowed to acclimate before being lowered. Of 15 total vertical profiles, eight were very vertical. However, seven showed evidence that the sonde had not been allowed to acclimate, based on a sudden increase in specific conductance readings from 0.1 to over 70 µS/cm in 4 seconds, just as sonde depth began to increase. In particular, on 9/10/19, four out of five vertical profiles showed evidence of "temperature skew" due to the sonde acclimating away from the air temperature toward the water temperature as the sonde was lowered. In spite of this technical issue, temperatures varied less than 2.0 °C among MOKEM and SFM stations, even though they were sampled at different times of the day, with temperatures being between about 20.0–21.7 °C. Despite this wider temperature range, temperatures did not differ among the three days of the study.

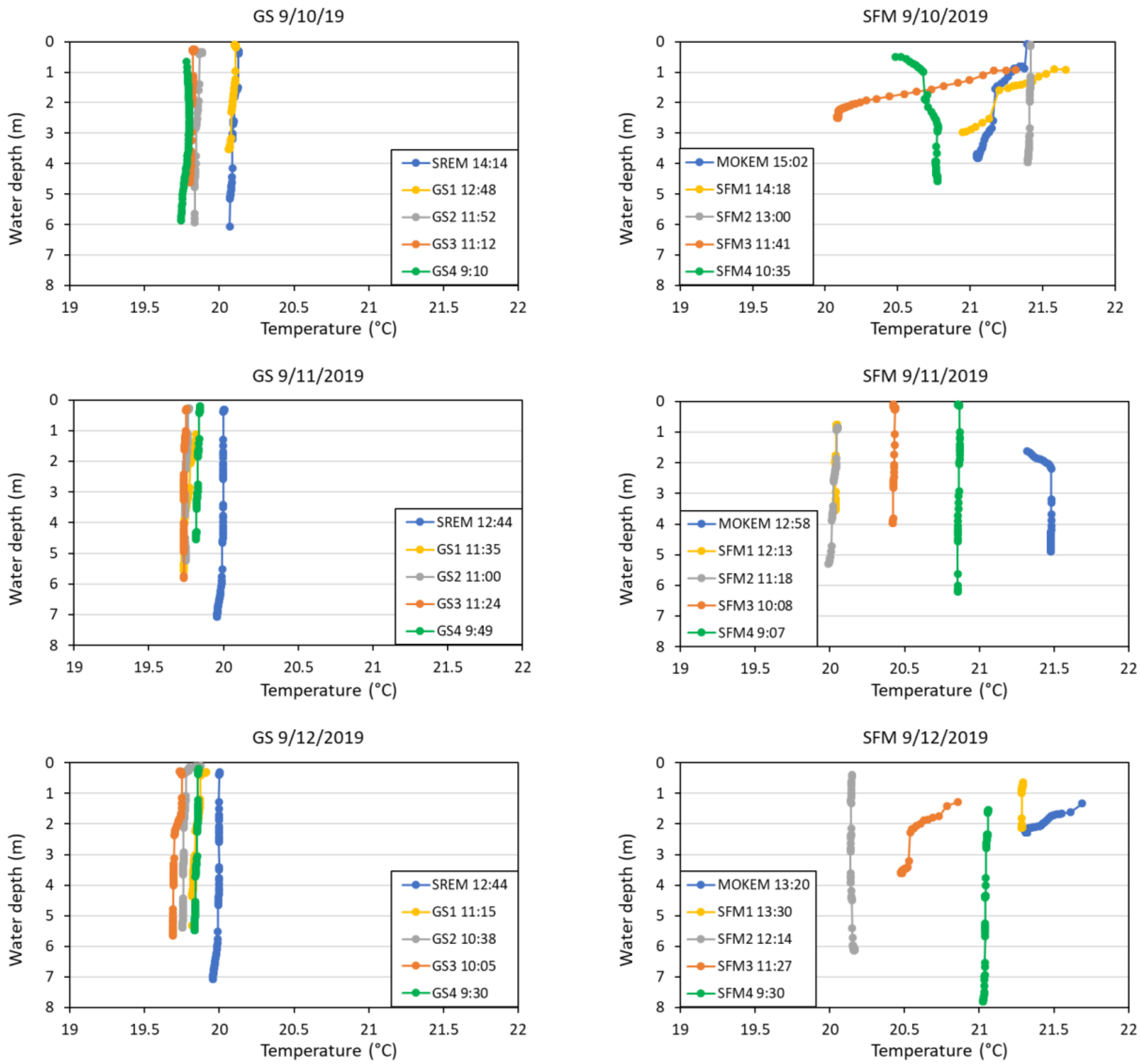
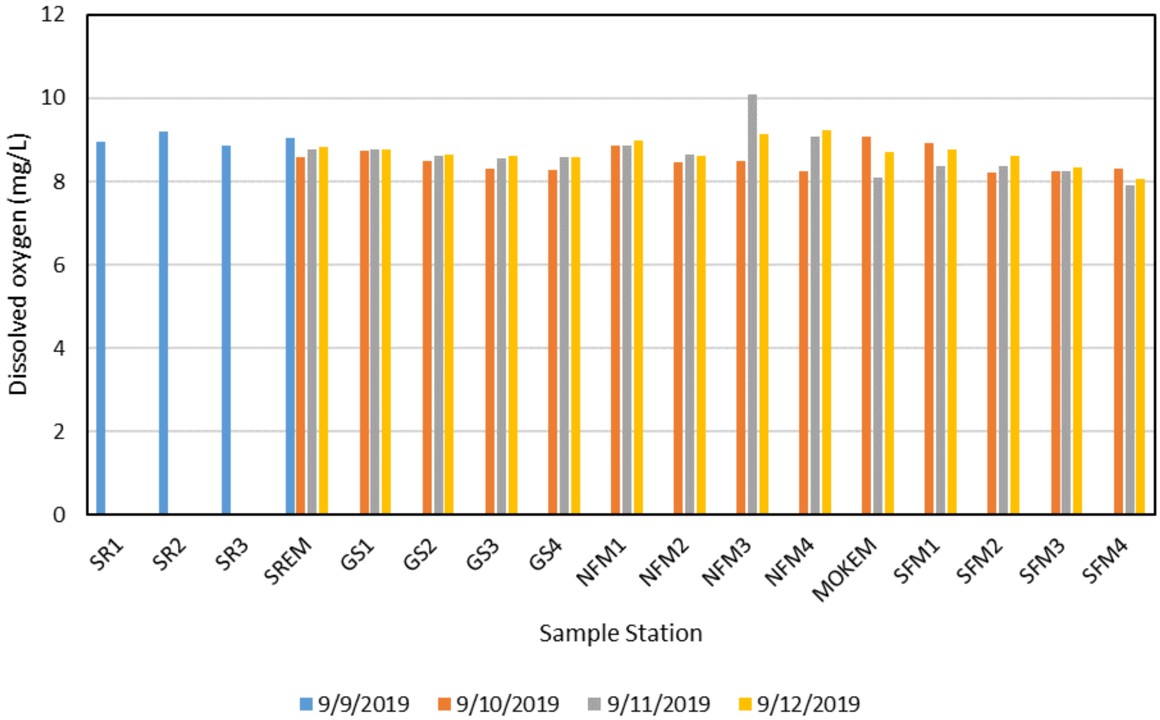


Figure 21. Temperature vertical profiles at the Georgiana Slough stations (GS) and SREM station (left panels), and at the South Fork Mokelumne River stations (SFM) and MOKEM station (right panels), on 9/10/19, 9/11/19, and 9/12/19. Note: Data from the North Fork Mokelumne River are missing.

Dissolved Oxygen

Surface water dissolved-oxygen concentrations ranged from 7.91–10.10 mg/L, with a mean of 8.65 ± 0.06 mg/L (SE) and median of 8.62 mg/L (Figure 22). Using day and channel as factors in a 2-way ANOVA, surface water dissolved oxygen was significantly different with channel, with the North Fork Mokelumne River having higher temperatures than the South Fork Mokelumne River (Figure 23, Table 7). Tukey pairwise comparison indicated the following: North Fork Mokelumne River > South Fork Mokelumne River (p-value = 0.001).



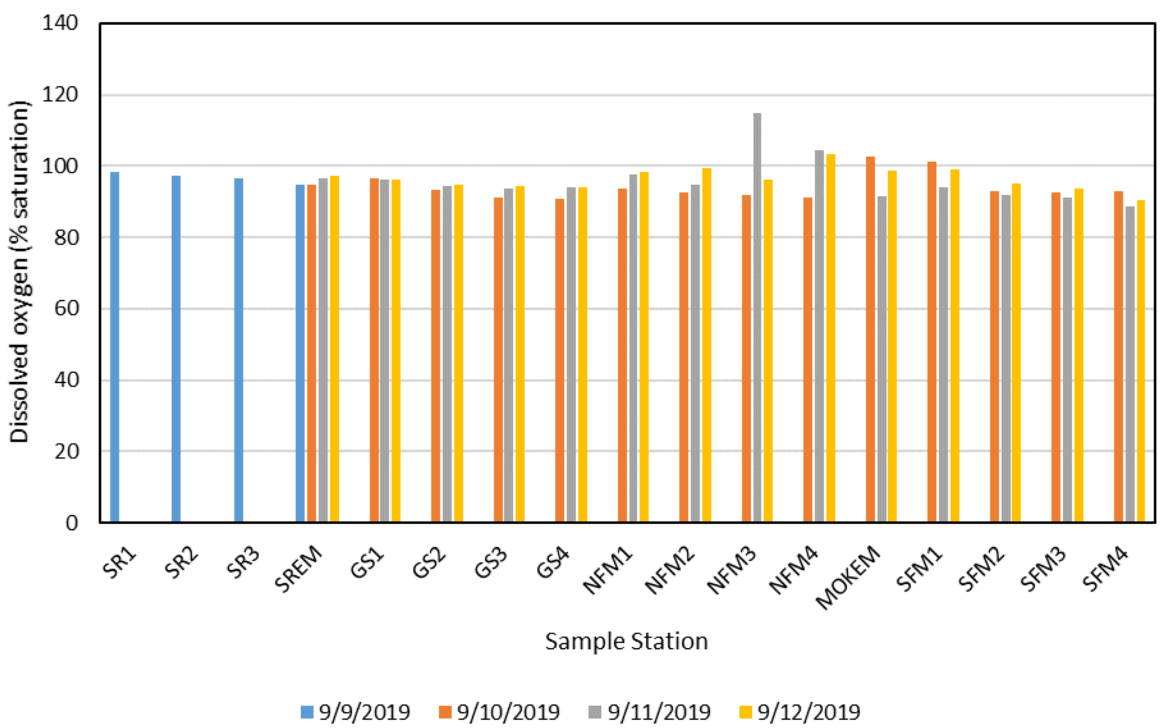


Figure 22. Surface water dissolved oxygen concentration (top) and percent saturation (bottom) at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

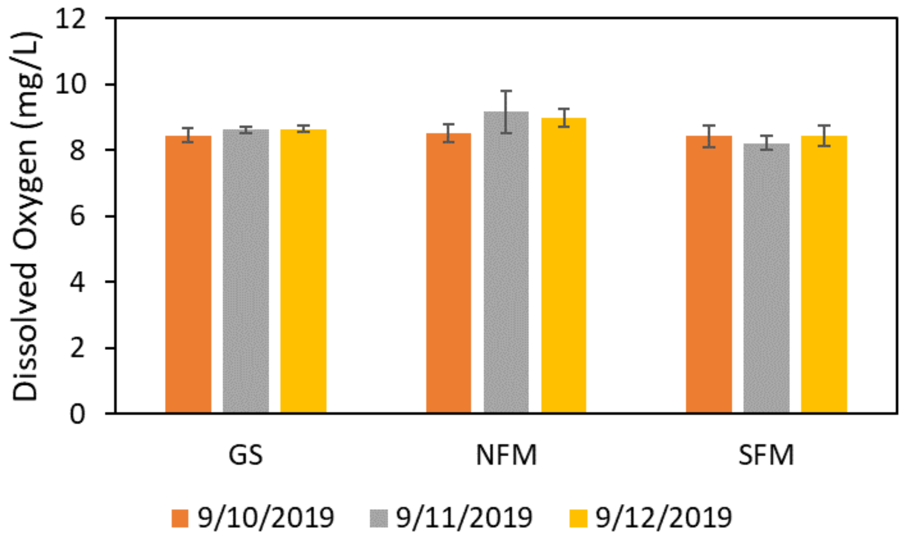


Figure 23. Mean surface water dissolved oxygen from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Specific Conductance

Surface water specific conductance ranged from 40–148 µS/cm, with a mean of 128 ± 3 µS/cm (SE) and median of 134 µS/cm (Figure 24). Using day and channel as factors in a 2-way ANOVA, specific conductance was significantly different with channel, with Georgiana Slough and the North Fork Mokelumne River having higher specific conductance values than the South Fork Mokelumne River (Figure 25, Table 7). Tukey pairwise comparisons indicated the following: Georgiana Slough > South Fork Mokelumne River (p-value = 0.001); North Fork Mokelumne River > South Fork Mokelumne River (p-value = 0.004).

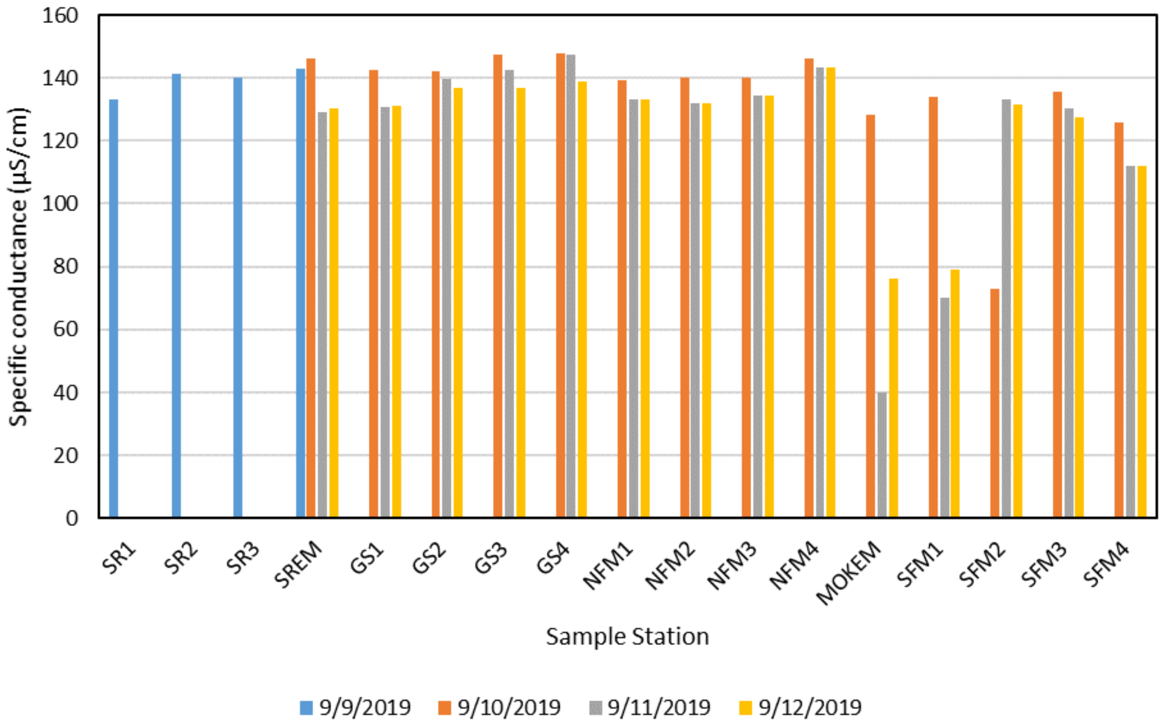


Figure 24. Surface water specific conductance at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

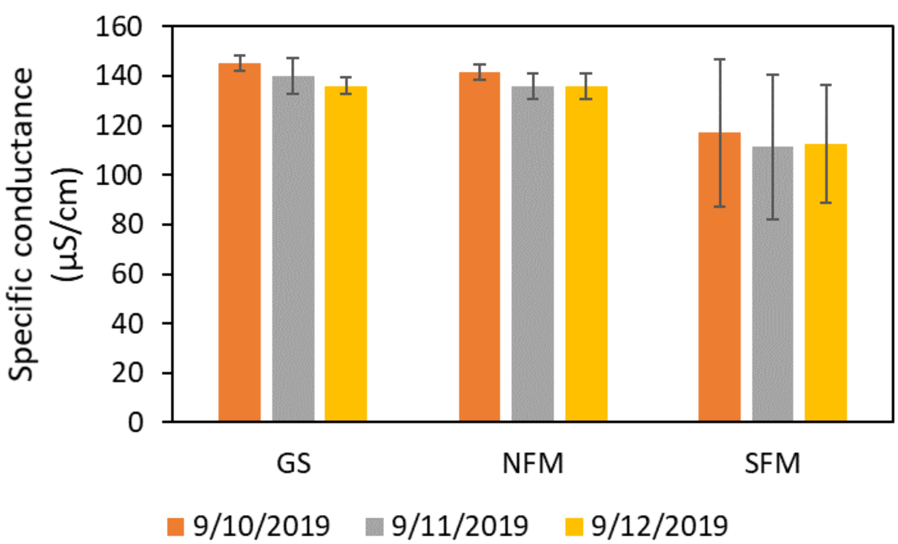


Figure 25. Mean surface water specific conductance from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

pH

Surface water pH ranged from 7.25–8.05, with a mean of 7.59 ± 0.02 (SE) and median of 7.60 (Figure 26). Using day and channel as factors in a 2-way ANOVA, pH was significantly different with channel, and the interaction term was also significant (Figure 27, Table 7). The pH values in the North Fork Mokelumne River were higher than in the South Fork Mokelumne River. Tukey pairwise comparison indicated the following: North Fork Mokelumne River > South Fork Mokelumne River (p-value = 0.001).

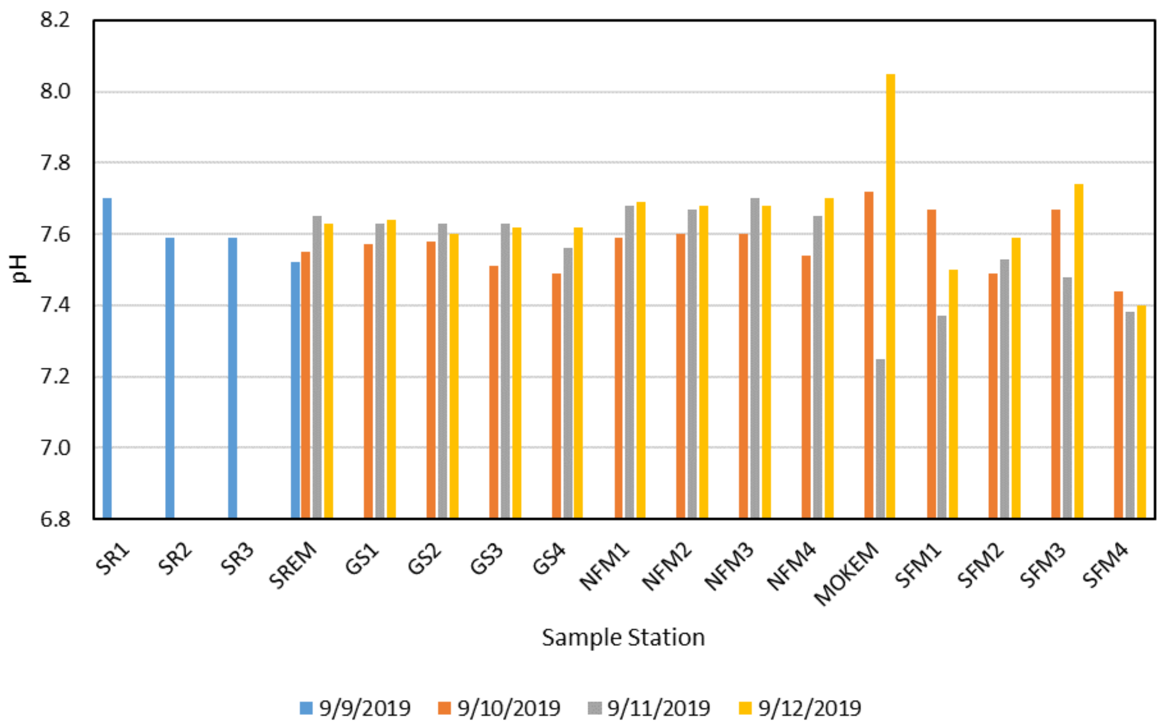


Figure 26. Surface water pH at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

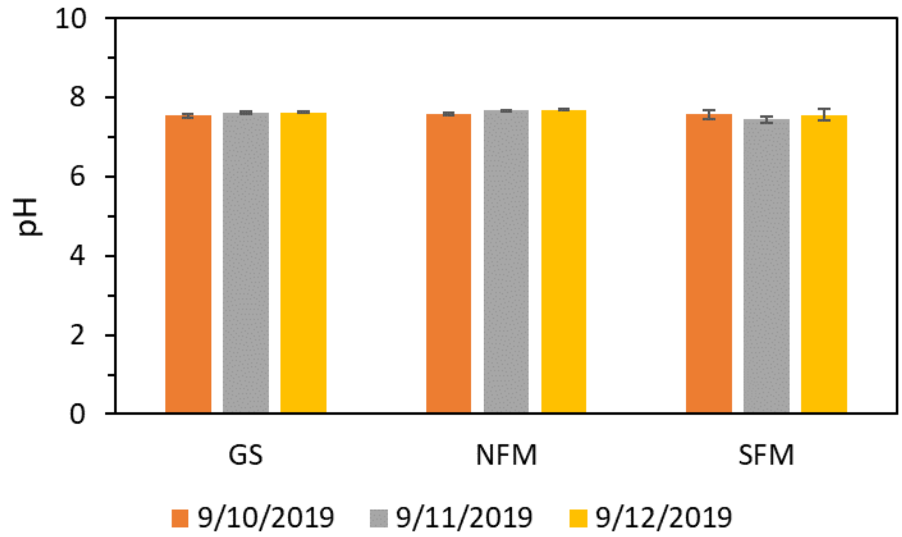


Figure 27. Mean surface water pH from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Surface-Water Quality

Water-quality data are from discrete water samples collected aboard the Guardian, Mudslinger, and TwinVee vessels. The Water-Quality Report of Laboratory Analysis is included as Appendix 5 of this report.

Silica

Surface water silica concentrations ranged from 12–21 mg/L, with a mean of 18 ± 0.3 mg/L (SE) and median of 18 mg/L (Figure 28). Using day and channel as factors in a 2-way ANOVA, surface water silica was significantly different with channel, with Georgiana Slough and the North Fork Mokelumne River having higher silica values than the South Fork Mokelumne River (Figure 29, Table 7). Tukey pairwise comparisons indicated the following: Georgiana Slough > South Fork Mokelumne River (p-value = 0.000); North Fork Mokelumne River > South Fork Mokelumne River (p-value = 0.000).

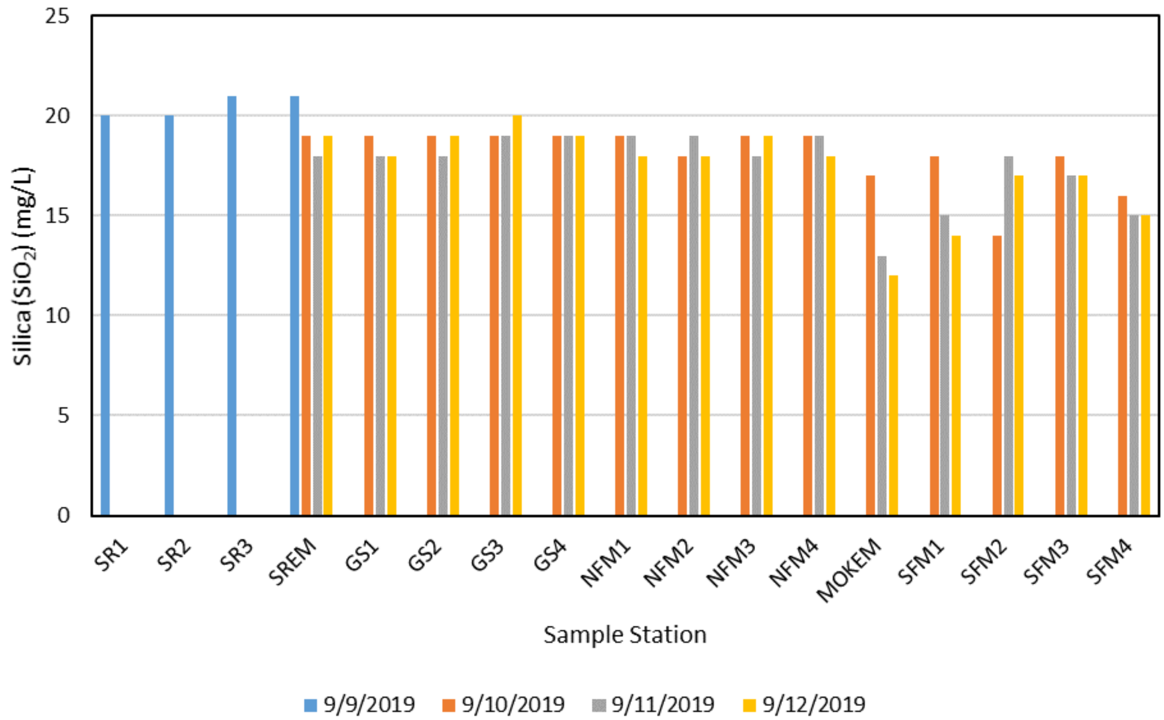


Figure 28. Concentration of silica at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

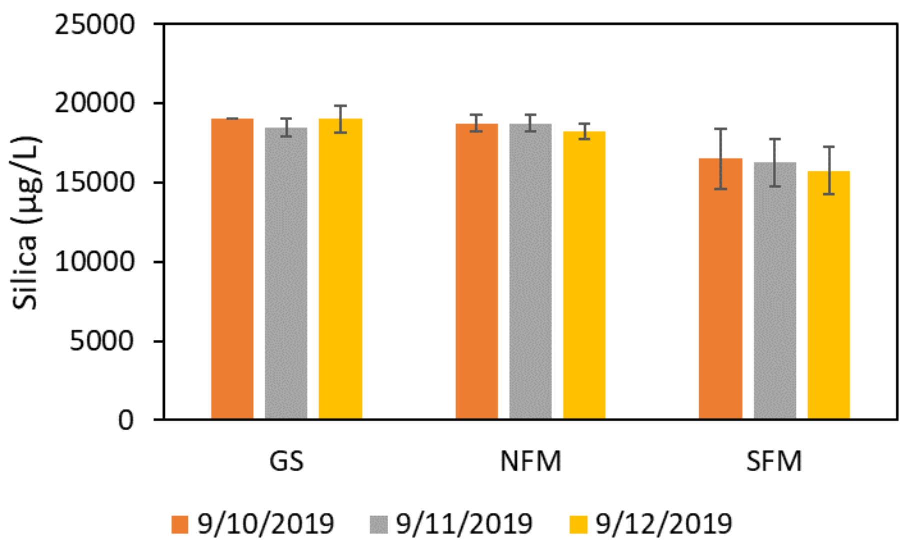


Figure 29. Mean concentration of silica from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Dissolved Inorganic Carbon

Surface water DIC concentrations ranged from 3.1–13.0 mg/L, with a mean of 10.0 ± 0.3 mg/L (SE) and median of 10.5 mg/L (Figure 30). Using day and channel as factors in a 2-way ANOVA, DIC was significantly different with channel, with Georgiana Slough having higher DIC values than the South Fork Mokelumne River (Figure 31, Table 7). Tukey pairwise comparison indicated the following: Georgiana Slough > South Fork Mokelumne River (p-value = 0.001).

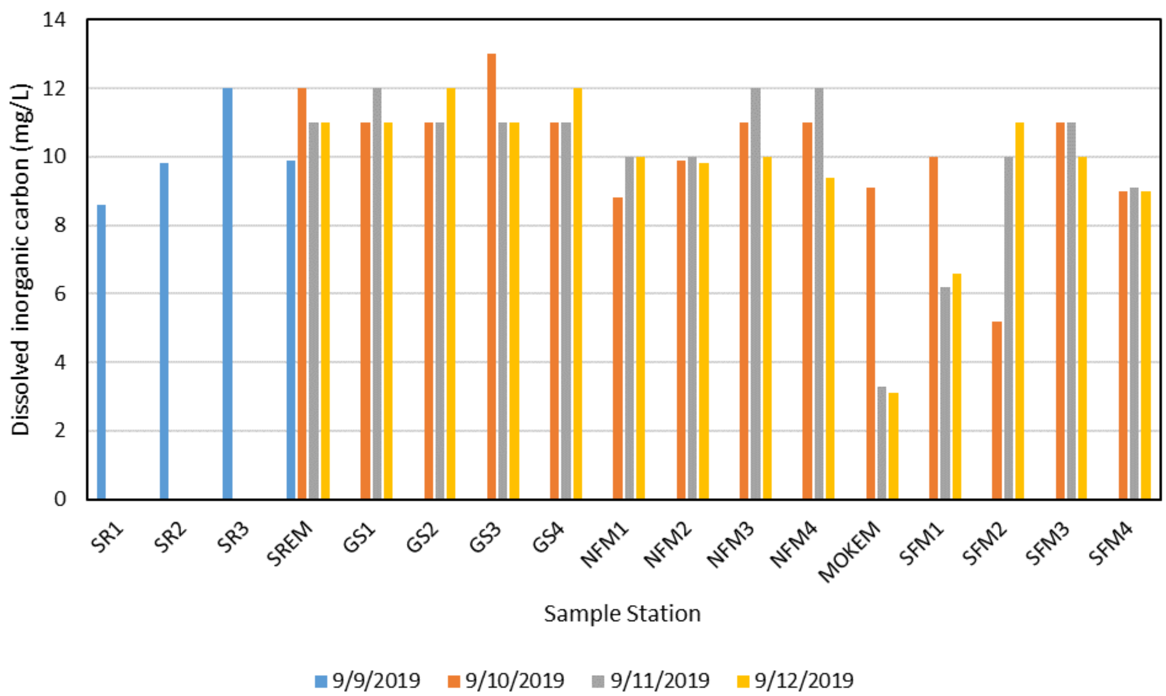


Figure 30. Concentration of DIC at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

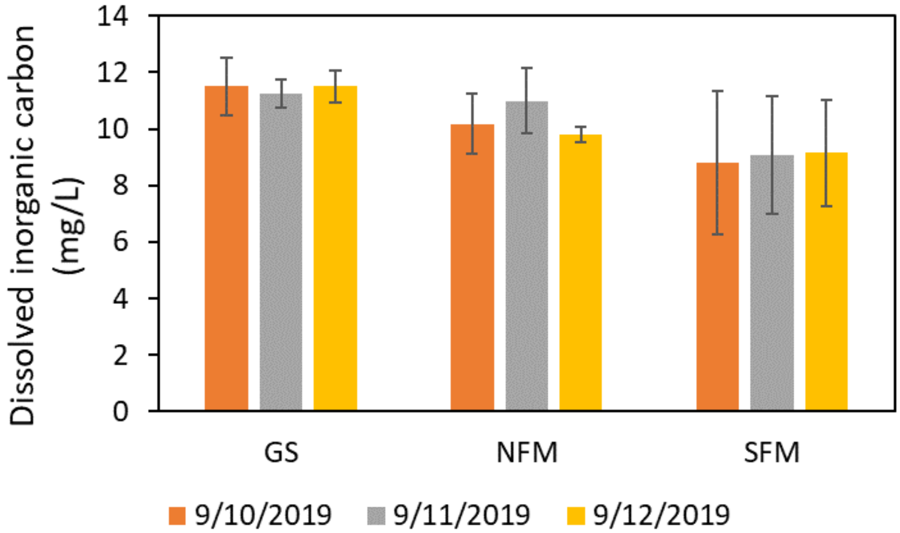


Figure 31. Mean concentration of DIC from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Dissolved Organic Carbon

Surface water DOC concentrations ranged from 2.9–6.7 mg/L, with a mean of 5.1 ± 0.1 mg/L (SE) and median of 5.3 mg/L (Figure 32). Using day and channel as factors in a 2-way ANOVA, surface water DOC was significantly different with channel, with Georgiana Slough and the North Fork Mokelumne River having higher DOC values than the South Fork Mokelumne River (Figure 33, Table 7). Tukey pairwise comparisons indicated the following: Georgiana Slough > South Fork Mokelumne River (p-value = 0.014); North Fork Mokelumne River > South Fork Mokelumne River (p-value = 0.004).

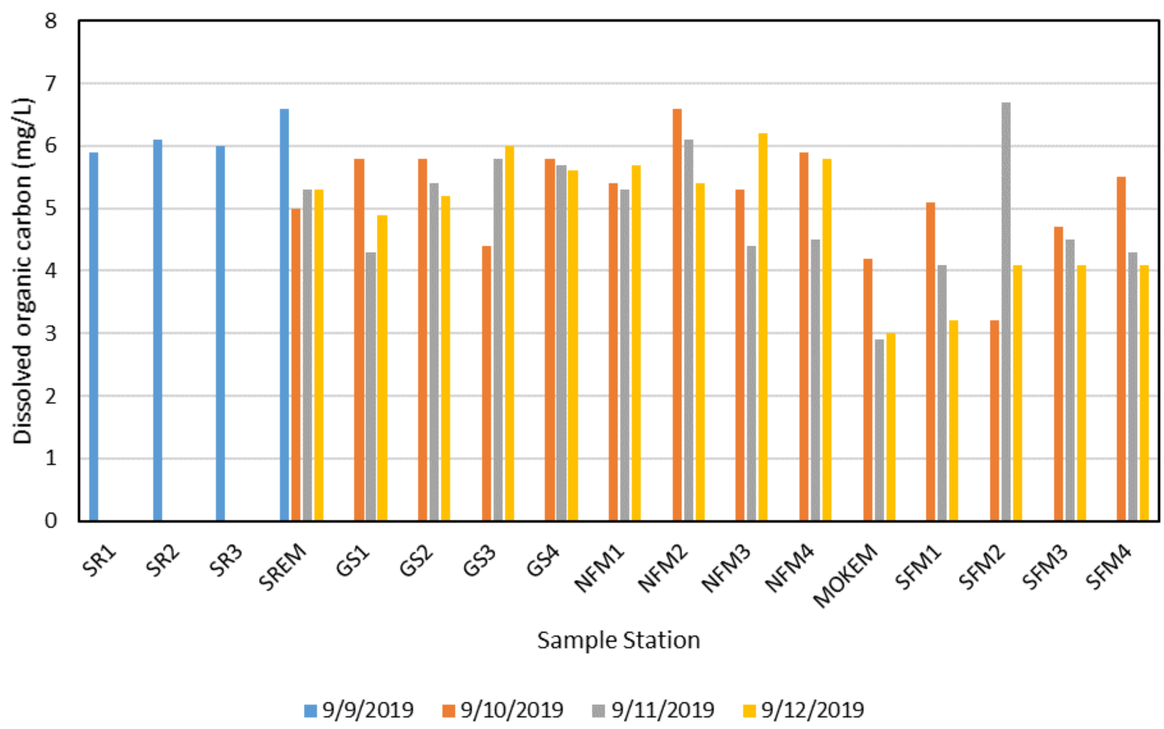


Figure 32. Concentration of DOC at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

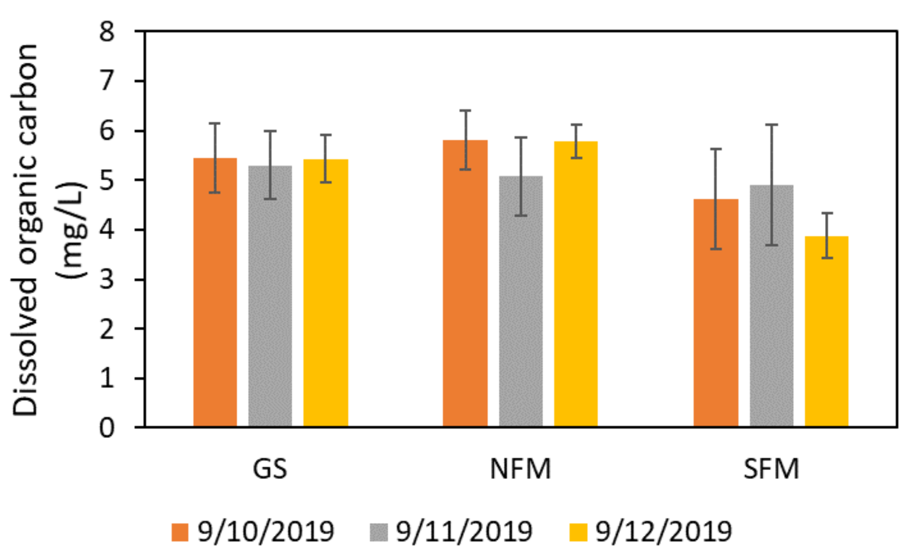


Figure 33. Mean concentration of DOC from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Dissolved Nitrogen as N

Surface water dissolved nitrogen as N concentrations ranged from 0.13–0.63 mg/L, with a mean of 0.34 ± 0.02 mg/L (SE) and median of 0.30 mg/L (Figure 34). Using day and channel as factors in a 2-way ANOVA, dissolved nitrogen as N was significantly different with day and channel, and the interaction term was also significant (Figure 35, Table 7).

Significant negative differences in dissolved nitrogen as N with day were observed, with concentrations on 9/10/19 exceeding concentrations on 9/11/19 and 9/12/19. Tukey pairwise comparisons indicated the following: 9/10/19 > 9/11/19 (p-value = 0.000); 9/10/19 > 9/12/19 (p-value = 0.000).

Georgiana Slough and the North Fork Mokelumne River had higher dissolved nitrogen as N than the South Fork Mokelumne River. Tukey pairwise comparisons indicated the following: Georgiana Slough > South Fork Mokelumne River (p-value = 0.006); North Fork Mokelumne River > South Fork Mokelumne River (p-value = 0.000).

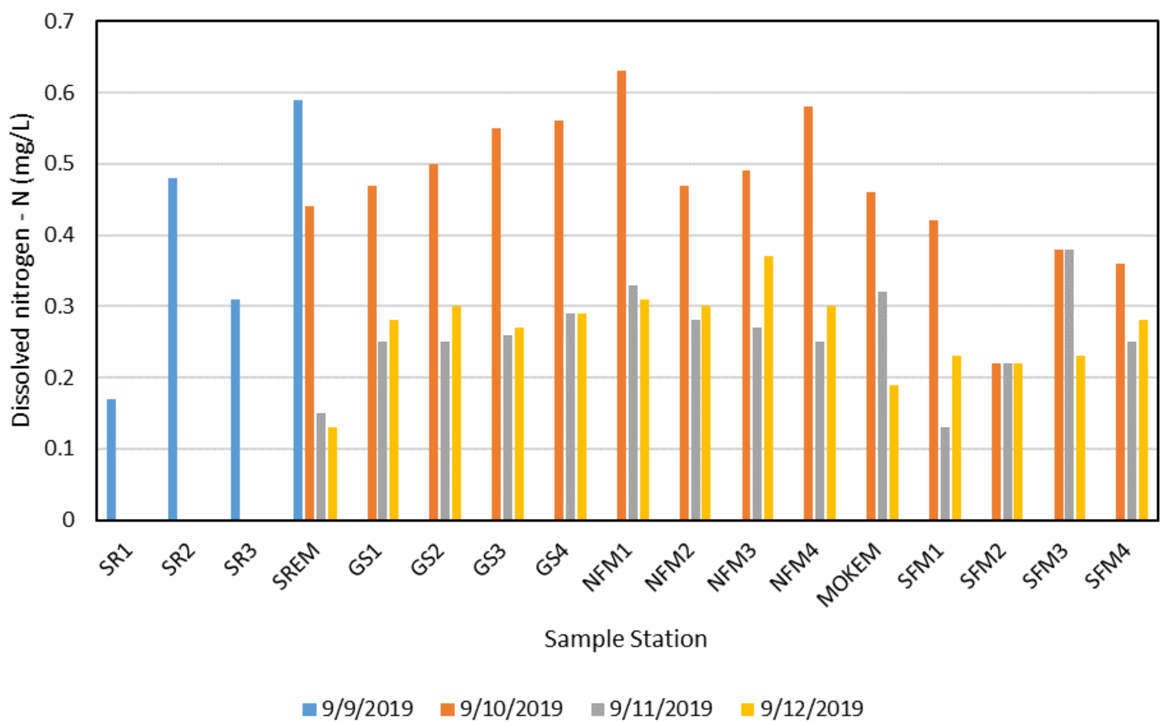


Figure 34. Concentration of dissolved nitrogen as N at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

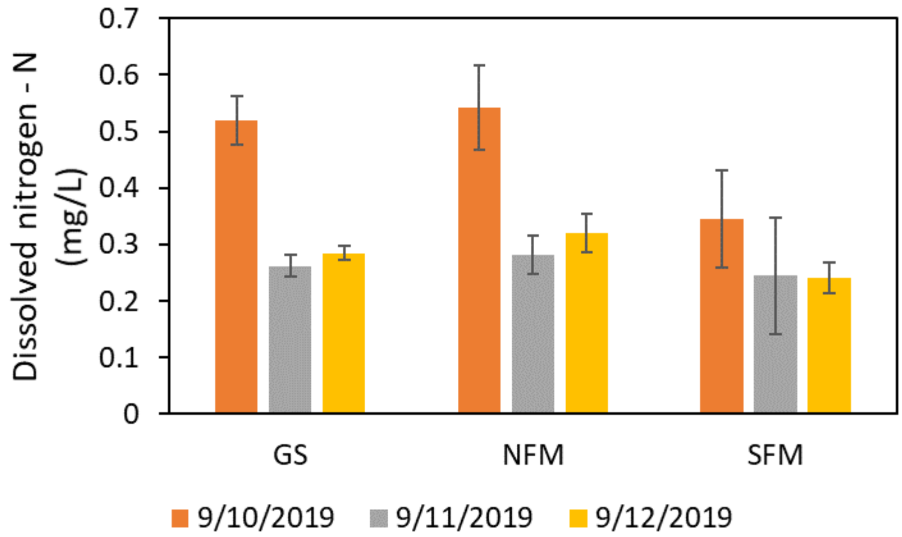


Figure 35. Mean concentration of dissolved nitrogen as N from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Dissolved TKN – N

Surface water dissolved TKN-N concentrations ranged from 0.09–0.51 mg/L, with a mean of 0.26 ± 0.02 mg/L (SE) and median of 0.25 mg/L (Figure 36). Using day and channel as factors in a 2-way ANOVA, dissolved TKN-N was significantly different with day and channel, and the interaction term was also significant (Figure 37, Table 7).

Significant negative differences in dissolved TKN-N with day were observed, with concentrations on 9/10/19 exceeding concentrations on 9/11/19 and 9/12/19. Tukey pairwise comparisons indicated the following: 9/10/19 > 9/11/19 (p-value = 0.000); 9/10/19 > 9/12/19 (p-value = 0.000).

Georgiana Slough had higher dissolved TKN-N than the South Fork Mokelumne River. Tukey pairwise comparison indicated the following: Georgiana Slough > South Fork Mokelumne River (p-value = 0.040).

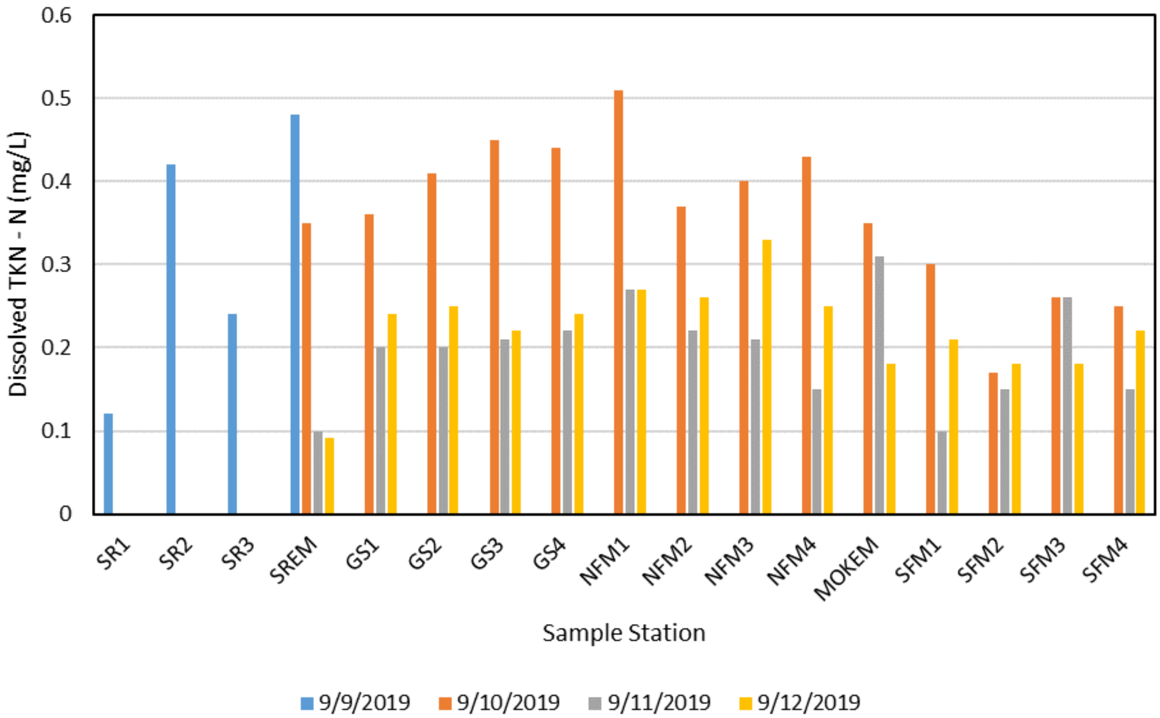


Figure 36. Concentration of dissolved TKN as N at discrete water sample stations, on 9/9/19 – 9/12/19. Station name abbreviations are defined in Table 6.

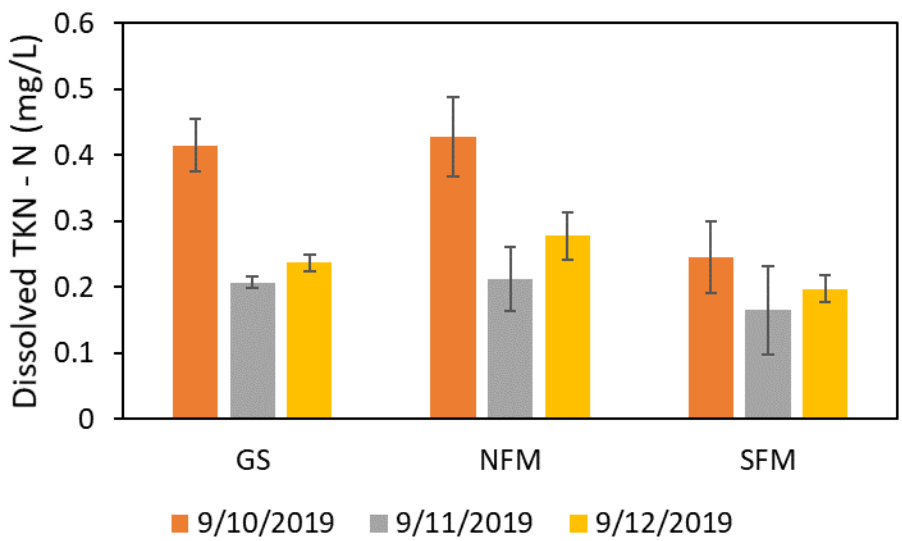


Figure 37. Mean concentration of dissolved TKN as N from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Nitrate – N

Surface water nitrate as N concentrations ranged from 0.010–0.140 mg/L, with a mean of 0.069 ± 0.005 mg/L (SE) and median of 0.055 mg/L (Figure 38). Using day and channel as factors in a 2-way ANOVA, significant negative differences in nitrate as N with day were observed (Figure 39, Table 7), with concentrations on 9/10/19 exceeding concentrations on 9/11/19 and 9/12/19. Tukey pairwise comparisons indicated the following: 9/10/19 > 9/11/19 (p-value = 0.000); 9/10/19 > 9/12/19 (p-value = 0.000).

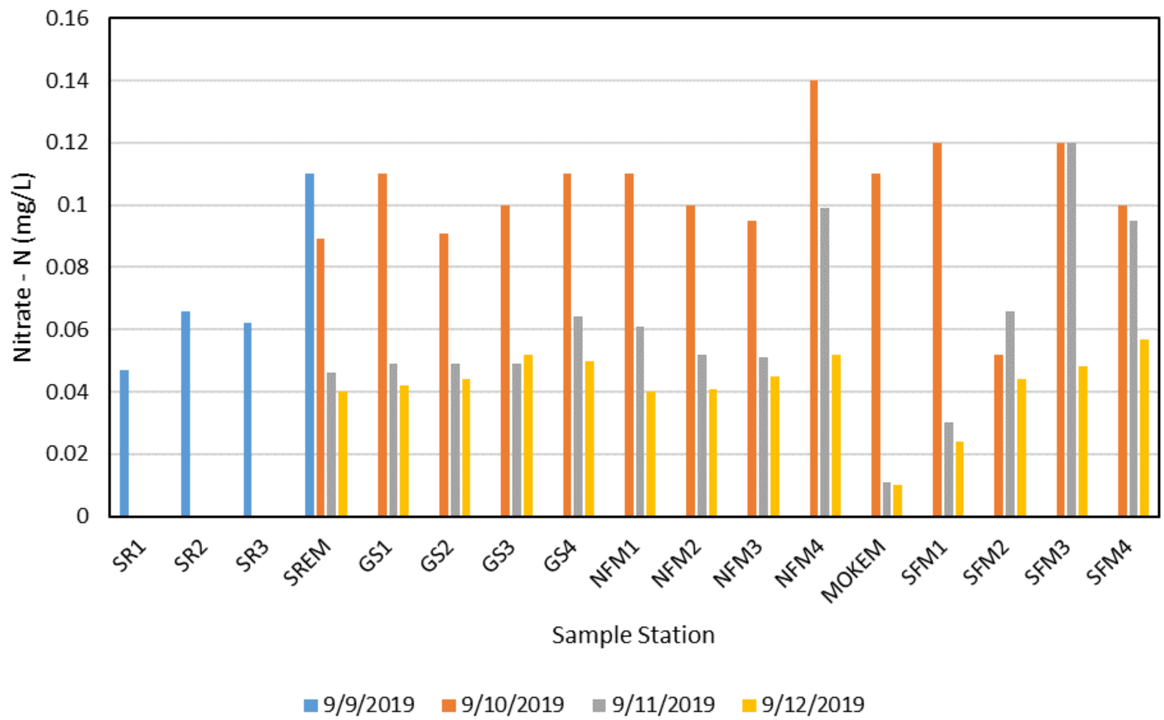


Figure 38. Concentration of nitrate as N at discrete water sample stations, on 9/9/19 – 9/12/19. Station name abbreviations are defined in Table 6.

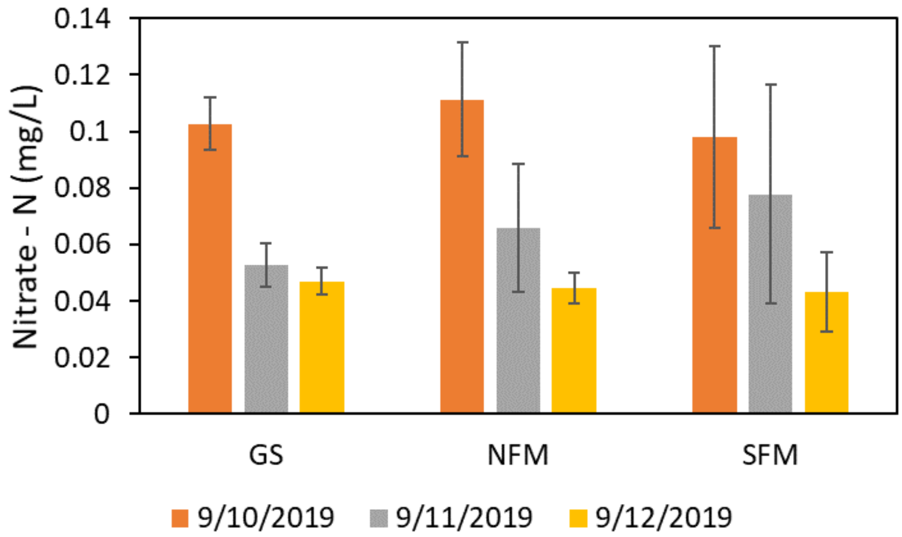


Figure 39. Mean concentration of nitrate as N from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Nitrite – N

Surface water nitrite as N concentrations ranged from 0.0000 (non-detect) – 0.0079 mg/L, with a mean of 0.003 ± 0.000 mg/L (SE) and median of 0.003 mg/L (Figure 40). Using day and channel as factors in a 2-way ANOVA, significant negative differences in nitrite as N with day were observed (Figure 41, Table 7), with concentrations on 9/10/19 exceeding concentrations on 9/12/19. Tukey pairwise comparison indicated the following: 9/10/19 > 9/12/19 (p-value = 0.002).

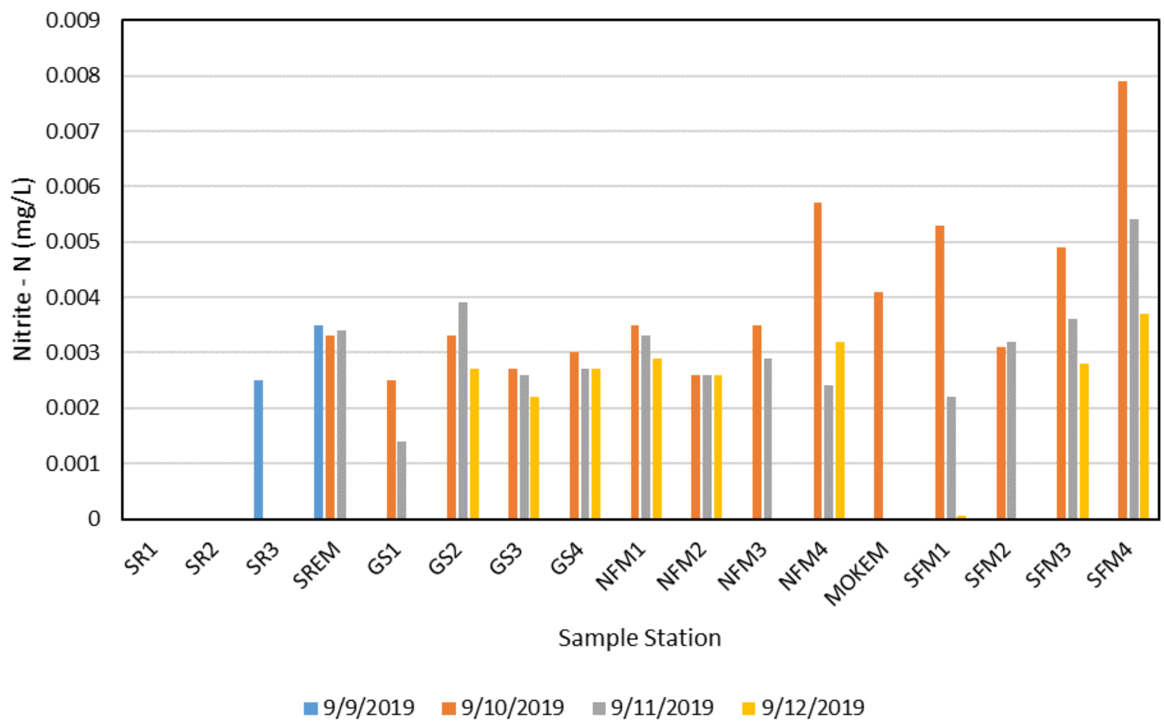


Figure 40. Concentration of nitrite as N at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

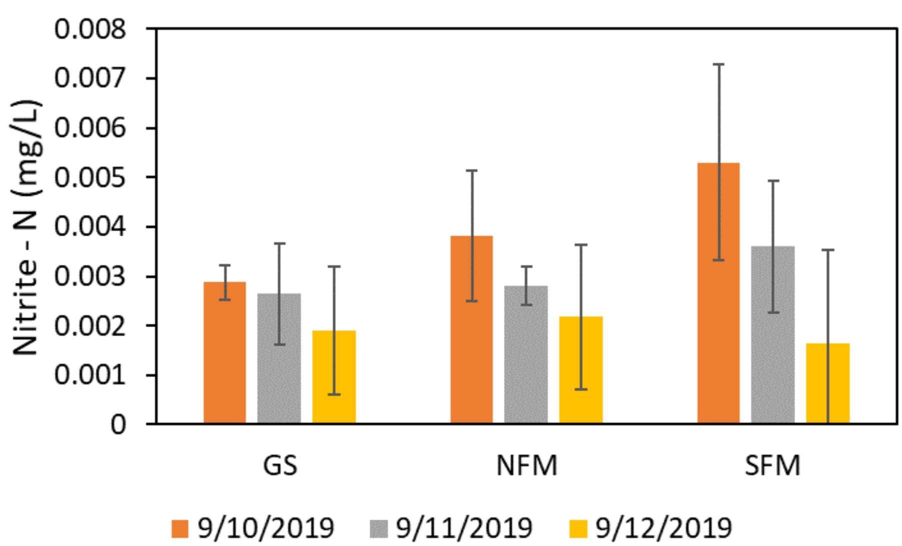


Figure 41. Mean concentration of nitrite as N from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Ammonium – N

Surface water ammonium as N concentrations ranged from 0.000 (non-detect) – 0.270 mg/L, with a mean of 0.064 ± 0.012 mg/L (SE) and median of 0.014 mg/L (Figure 42). Using day and channel as factors in a 2-way ANOVA, significant negative differences in ammonium as N with day were observed (Figure 43, Table 7), with concentrations on 9/10/19 exceeding concentrations on 9/11/19 and 9/12/19. Tukey pairwise comparisons indicated the following: 9/10/19 > 9/11/19 (p-value = 0.000); 9/10/19 > 9/12/19 (p-value = 0.000).

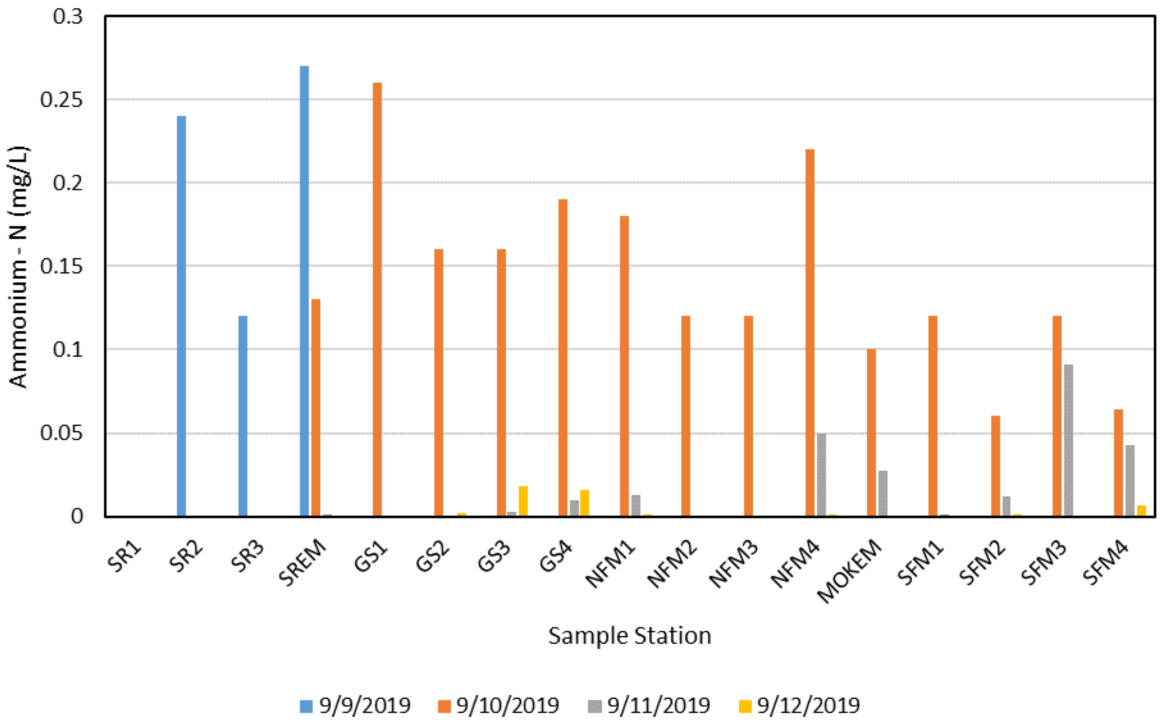


Figure 42. Concentration of ammonium as N at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

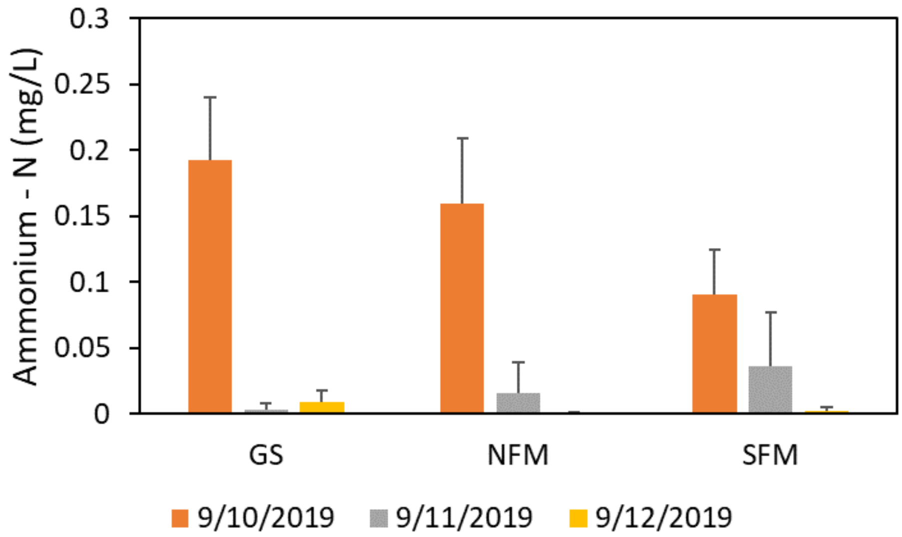


Figure 43. Mean concentration of ammonium as N from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Dissolved Total Phosphorus – P

Surface water dissolved total phosphorus as P concentrations ranged from 0.005–0.220 mg/L, with a mean of 0.052 ± 0.005 mg/L (SE) and median of 0.044 mg/L (Figure 44). Aside from one particularly high value at SFM1 on 9/11/19, values were below 0.100 mg/L. Using day and channel as factors in a 2-way ANOVA, dissolved total phosphorus as P was not significantly different with day or channel, but the interaction term was significant (Figure 45, Table 7).

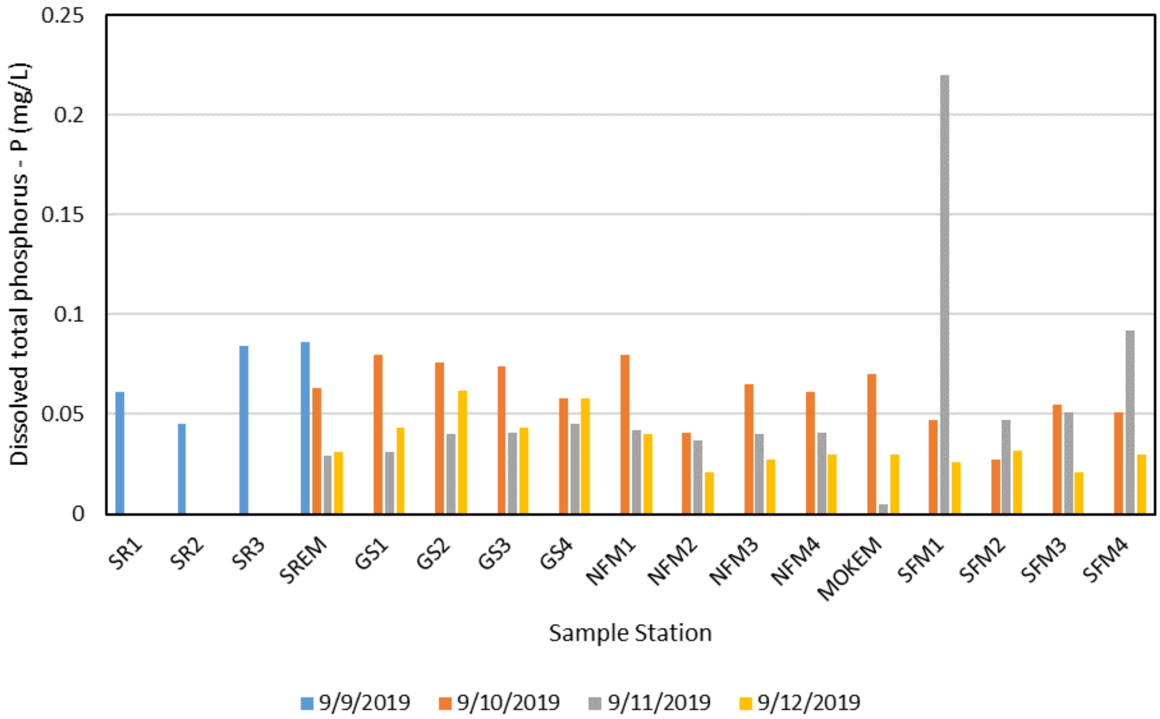


Figure 44. Concentration of dissolved total phosphorus as P at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

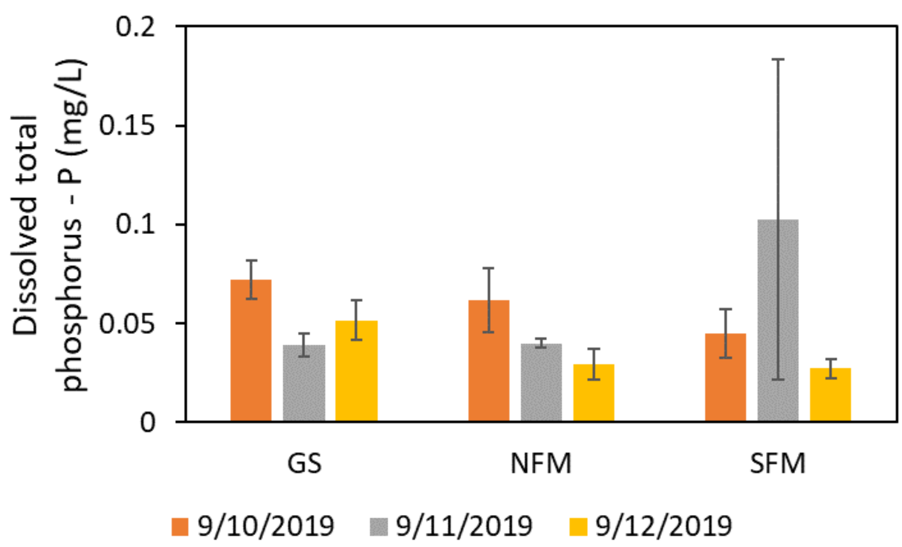


Figure 45. Mean concentration of dissolved total phosphorus as P from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Chl-*a*

Surface water chl-*a* concentrations ranged from 2.35–6.60 µg/L (average of two replicates at each station), with a mean of 3.45 ± 0.11 µg/L (SE) and median of 3.25 µg/L (Figure 46). Using day and channel as factors in a 2-way ANOVA, chl-*a* was not significantly different with day or channel, but the interaction term was significant (Figure 47, Table 8).

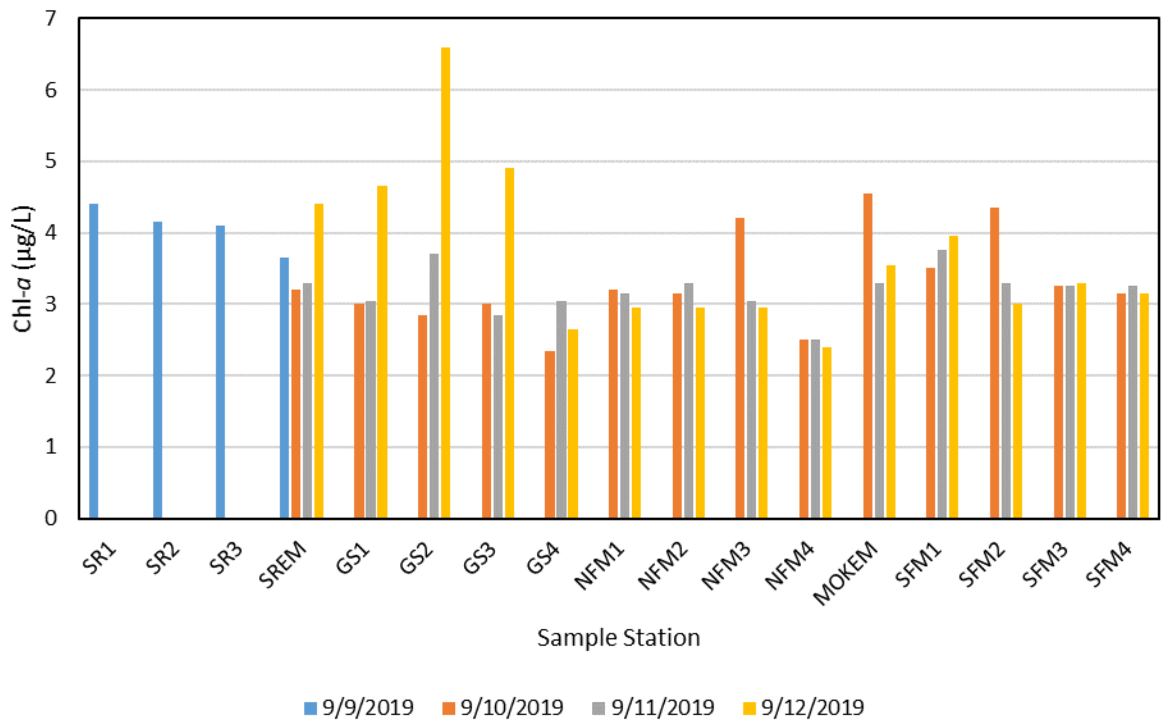


Figure 46. Concentration of chl-a at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6.

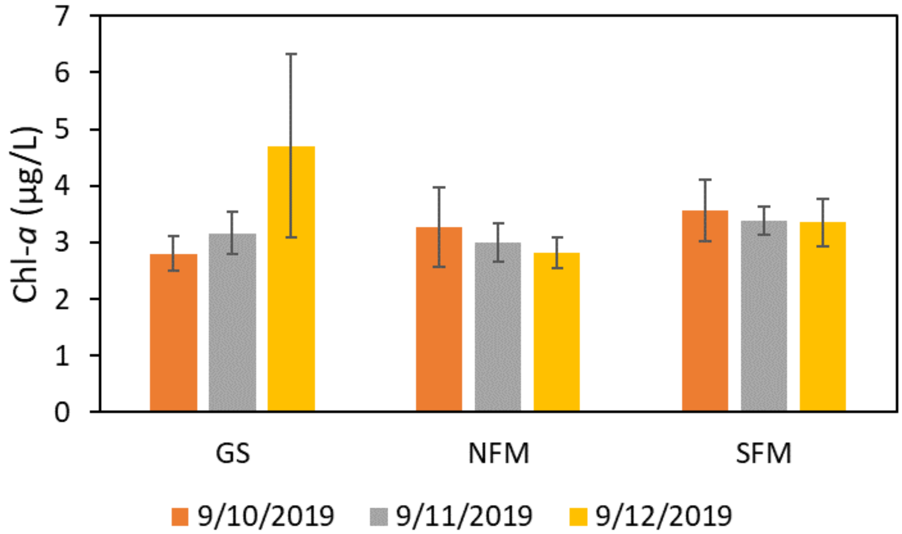


Figure 47. Mean concentration of chl-a from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Table 8. P-values and F-values (in parentheses) resulting from 2-way ANOVAs of chl-a and phytoplankton density and biovolume constituents using day and channel as factors. Significant p-values (< 0.05) in bold. Factor 1, Day = 9/10/19, 9/11/19, 9/12/19 (df=2). Factor 2, Channel = Georgiana Slough, North Fork Mokelumne River, South Fork Mokelumne River (df=2). Residuals df = 27 for all constituents.

Constituent	**Day (Factor 1) df=2**	**Channel (Factor 2) df=2**	**Interaction (Factor 1 x 2) df=4**
Chl-*a*	0.22 (1.6)	0.15 (2.0)	**0.01** (4.0)
Total phytoplankton density	**7.44E-03** (5.9)	0.46 (0.8)	0.91 (0.2)
Bacillariophyta density	0.12 (2.3)	**0.04** (3.7)	0.63 (0.6)
Chlorophyta density	0.24 (1.5)	0.66 (0.4)	0.73 (0.5)
Chrysophyta density	0.35 (1.1)	0.99 (0.007)	0.45 (1.0)
Cryptophyta density	0.78 (0.3)	0.84 (0.2)	0.58 (0.7)
Cyanobacteria density	**5.01E-03** (6.5)	0.53 (0.6)	0.93 (0.2)
Total phytoplankton biovolume	0.40 (0.9)	0.20 (1.7)	0.97 (0.1)
Bacillariophyta biovolume	0.41 (0.9)	0.19 (1.8)	0.97 (0.1)
Chlorophyta biovolume	0.24 (1.5)	0.66 (0.4)	0.73 (0.5)
Chrysophyta biovolume	0.35 (1.1)	0.99 (0.007)	0.45 (1.0)
Cryptophyta biovolume	0.99 (0.02)	0.88 (0.1)	0.79 (0.4)
Cyanobacteria biovolume	0.06 (3.2)	0.69 (0.4)	0.72 (0.5)
PC-rich picocyanobacteria biovolume	0.73 (0.3)	**1.41E-03** (8.5)	0.95 (0.2)
PE-rich picocyanobacteria biovolume	0.09 (2.7)	0.12 (2.3)	0.40 (1.0)

Phytoplankton Density and Biovolume

Phytoplankton raw data are presented in Appendix 6.

Total phytoplankton density ranged from 4,423,190–74,741,417 cells/L, with a mean of 33,982,822 ± 2,364,009 cells/L (SE) and median of 32,587,470 cells/L (Figure 48). Phytoplankton density was dominated by Cyanophyta (cyanobacteria), followed by Chlorophyta and Bacillariophyta, with the other divisions making minimal contributions. Cyanophyta species composition was mainly *Chroococcus* sp., with occasional observations of *Pseudanabaena* sp., *Aphanizomenon* sp., *Planktothrix* sp., *Limnothrix* sp., *Merismopedia* sp., and *Planktolyngbya* sp. One station on one date had *Microcystis* sp. present (SFM3 on 9/12/19).

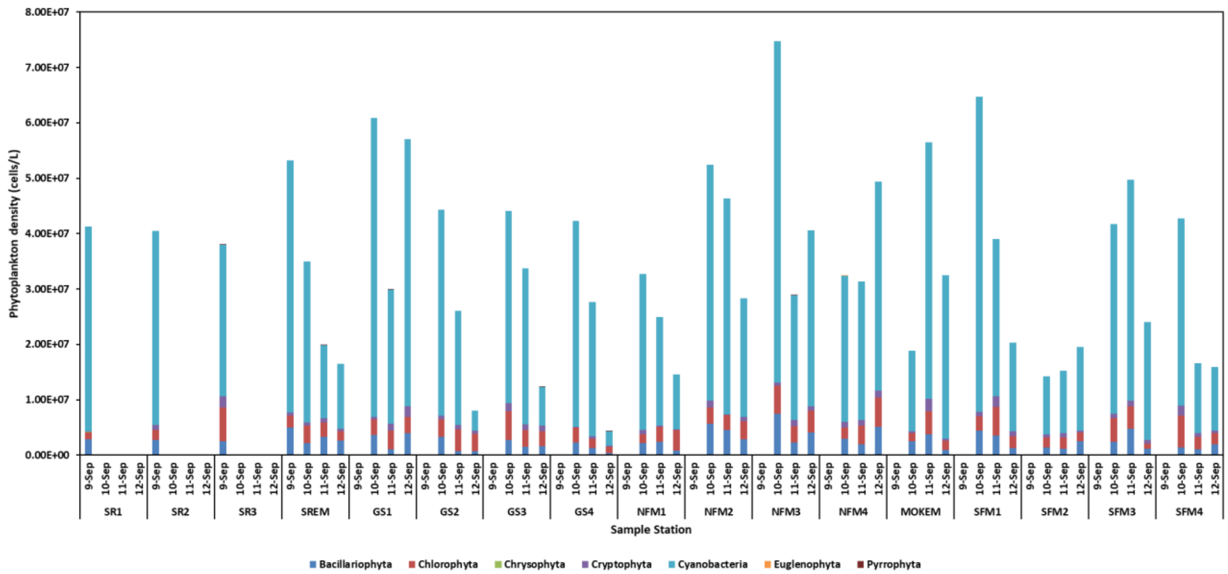


Figure 48. Density of phytoplankton by division at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6. On 9/9/2019, samples were only collected at stations SR1–SREM. No samples were collected at stations SR1, SR2, or SR3 on 9/10/2019–9/12/2019.

Using day and channel as factors in a 2-way ANOVA, significant negative differences in total phytoplankton density with day were observed (Figure 49, Table 8), with densities on 9/10/19 exceeding densities on 9/12/19. Tukey pairwise comparison indicated the following: 9/10/19 > 9/12/19 (p-value = 0.007).

Using the same ANOVA test, Bacillariophyta density was significantly different with channel, with Georgiana Slough having lower Bacillariophyta density than the North Fork Mokelumne River (Figure 50, Table 8). Tukey pairwise comparison indicated the following: Georgiana Slough < North Fork Mokelumne River (p-value = 0.039).

Using the same ANOVA test, no significant differences in the density of Chlorophyta, Chrysophyta, or Cryptophyta were observed (Table 8).

Again, using the same ANOVA test, significant negative differences in Cyanophyta density with day were observed (Figure 51, Table 8), with densities on 9/10/19 exceeding densities on 9/12/19. Tukey pairwise comparison indicated the following: 9/10/19 > 9/12/19 (p-value = 0.004).

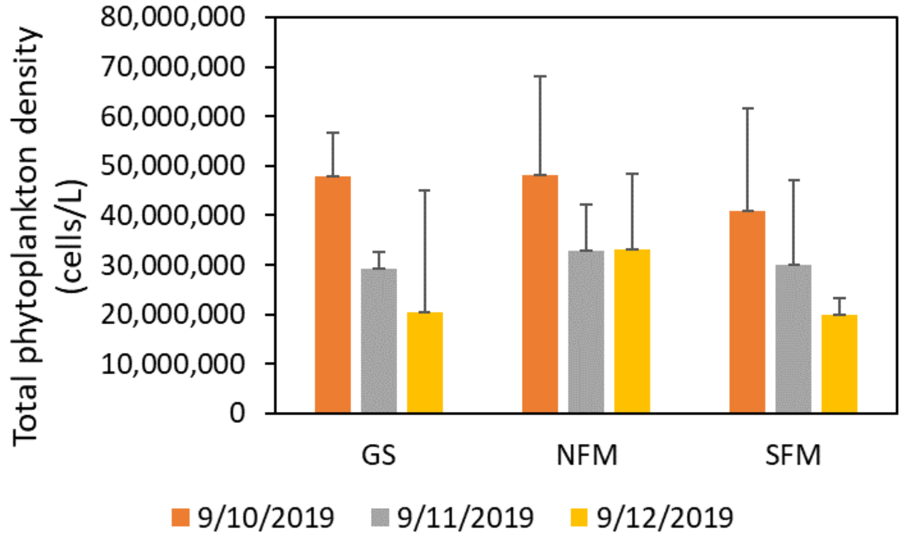


Figure 49. Mean density of total phytoplankton from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

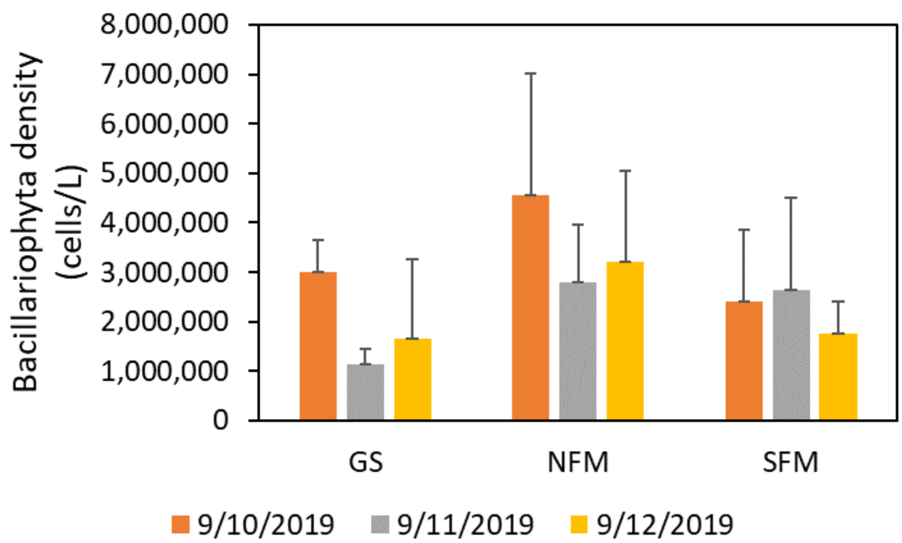


Figure 50. Mean density of Bacillariophyta from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

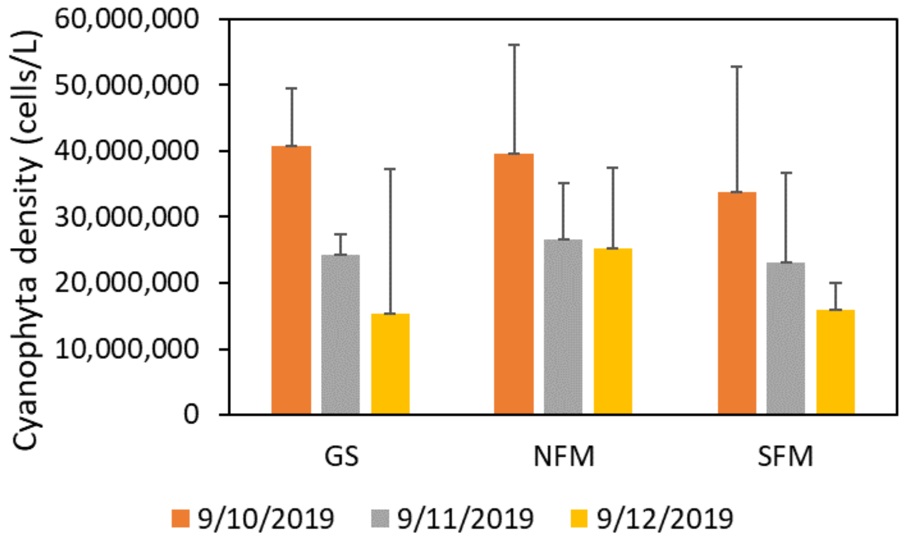


Figure 51. Mean density of Cyanophyta from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Total phytoplankton biovolume ranged from 2.059 E+008–8.418 E+009 µm³/L, with a mean of 1.396 E+009 ± 1.995 E+008 µm³/L (SE) and median of 1.027 E+009 µm³/L (Figure 52). Phytoplankton biovolume was dominated by Bacillariophyta, followed by Cryptophyta, and more distantly by Chlorophyta and Cyanobacteria, with the other divisions making minimal contributions. Using day and channel as factors in a 2-way ANOVA, no significant differences in the biovolume of total phytoplankton, Bacilliarophyta, Chlorophyta, Chrysophyta, Cryptophyta, or Cyanobacteria were observed (Table 8).

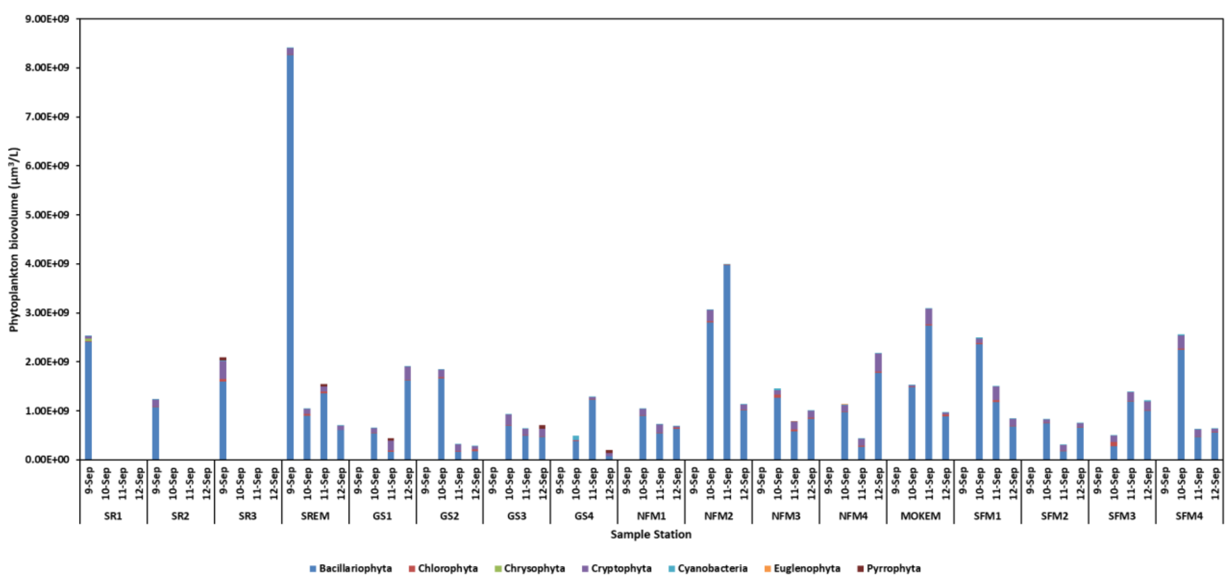


Figure 52. Biovolume of phytoplankton by division at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6. On 9/9/19, samples were only collected at stations SR1–SREM. No samples were collected at stations SR1, SR2, or SR3 on 9/10/19–9/12/19.

Picocyanobacteria Density and Biovolume

Picocyanobacteria raw data are presented in Appendix 7.

Total picocyanobacteria density was variable across stations and sampling dates, showing no clear patterns (Figure 53). PC-rich picocyanobacteria density ranged from 402,124–61,605,397 cells/L, with a mean of 13,237,571 ± 2,319,806 cells/L (SE) and median of 5,901,170 cells/L. PE-rich picocyanobacteria density ranged from 8,217,316–74,594,002 cells/L, with a mean of 21,870,682 ± 1,881,533 cells/L (SE) and median of 17,814,093 cells/L. PC-rich picocyanobacteria generally showed greater density at the MOKEM and South Fork Mokelumne River stations, but PE-rich picocyanobacteria dominated the density at a majority of the remaining stations.

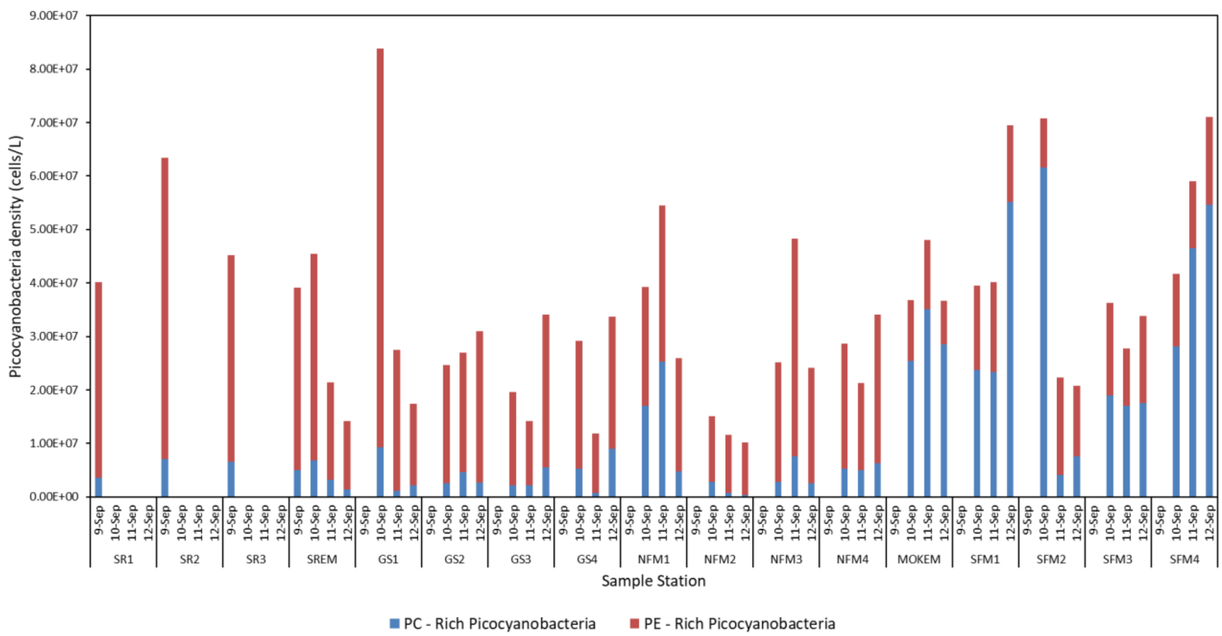


Figure 53. Density of picocyanobacteria at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6. On 9/9/2019, samples were only collected at stations SR1 – SREM. No samples were collected at stations SR1, SR2, or SR3 on 9/10/2019–9/12/2019.

Total picocyanobacteria biovolume was also variable across stations and sampling dates, showing no clear patterns (Figure 54). PC-rich picocyanobacteria biovolume ranged from 267,845–98,337,921 µm^3/L, with a mean of 12,846,476 ± 3,136,025 µm^3/L (SE) and median of 3,986,178 µm^3/L. PE-rich picocyanobacteria biovolume ranged from 2,303,654–76,283,779 µm^3/L, with a mean of 14,366,859 ± 1,949,312 µm^3/L (SE) and median of 10,522,395 µm^3/L. PC-rich picocyanobacteria generally showed more biovolume at the MOKEM and South Fork Mokelumne River stations, but PE-rich picocyanobacteria dominated the biovolume at a majority of the remaining stations. Using day and channel as factors in a 2-way ANOVA, PC-rich picocyanobacteria biovolume was significantly different with channel, with Georgiana Slough and the North Fork Mokelumne River having lower PC-rich picocyanobacteria biovolume than the South Fork Mokelumne River (Figure 55, Table 8). Tukey pairwise comparisons indicated the following: Georgiana Slough < South Fork Mokelumne River (p-value = 0.003); North Fork Mokelumne River < South Fork Mokelumne River (p-value =0.005).

Using the same ANOVA test, no significant differences in PE-rich picocyanobacteria biovolume were observed (Table 8).

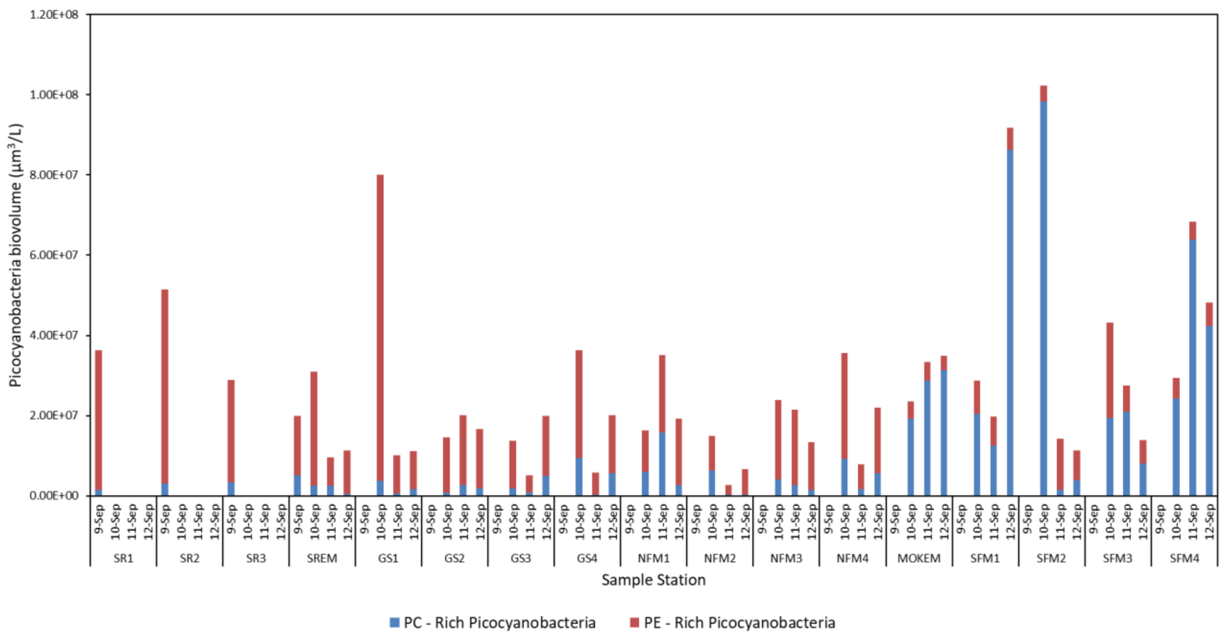


Figure 54. Biovolume of picocyanobacteria at discrete water sample stations, on 9/9/19–9/12/19. Station name abbreviations are defined in Table 6. On 9/9/19, samples were only collected at stations SR1–SREM. No samples were collected at stations SR1, SR2, or SR3 on 9/10/19–9/12/19.

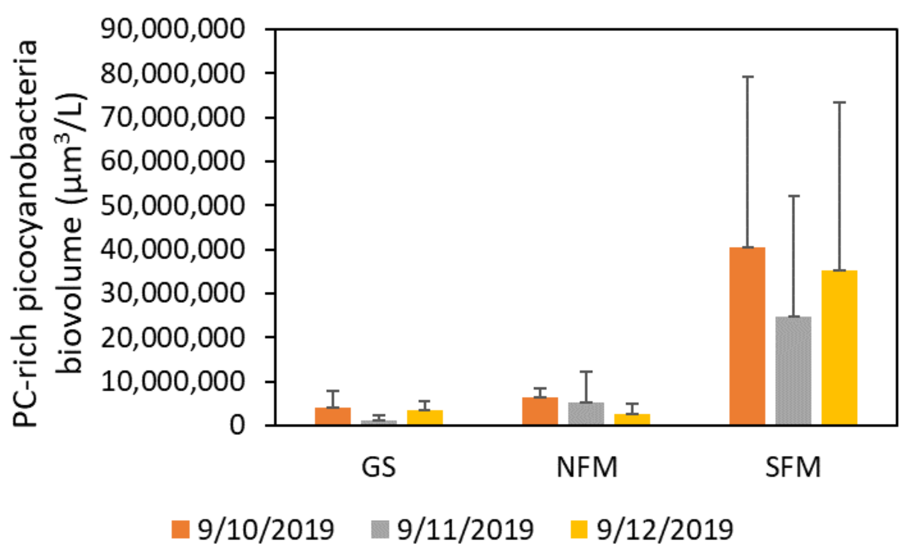


Figure 55. Biovolume of PC-rich picocyanobacteria from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Phytoplankton Productivity

Changes in water column clarity over the course of the three days of sampling corresponded with changes in primary productivity, here represented as carbon uptake measured by ^{13}C tracer additions. As evident from Secchi Disk data, an increase of up to 50% in Secchi depth occurred between 9/10/19–9/11/19 (Figure 16). This increase in water column clarity was reflected in a change in light attenuation (K_d) which decreased by 25% between 9/10/19–9/11/19 and remained 25% lower on 9/12/19 (day 3) as illustrated by photosynthetically active radiation measurements in Georgiana Slough (Figure 56A). The decrease in K_d was less in the Sacramento River, on the order of 14% between the first and third days of the experiment, compared with Georgiana Slough (Figure 56A). Corresponding with the decrease in K_d, the euphotic zone depth (Z_{eu}) increased between 9/10/19–9/11/19 (day 1 and 2) in Georgiana Slough and between 9/10/19–9/12/19 (day 1 and 3) in the Sacramento River (Figure 56B), leading to an increase in the time spent in the euphotic zone (T_{eu}). The increase in T_{eu}, the ratio of euphotic zone depth to mixed layer depth, was greater along the Georgiana Slough stations, where the average depth was 6 ± 0.35m, compared with the Sacramento River stations, where the average depth was 8 ± 0.06 m (Figure 56C).

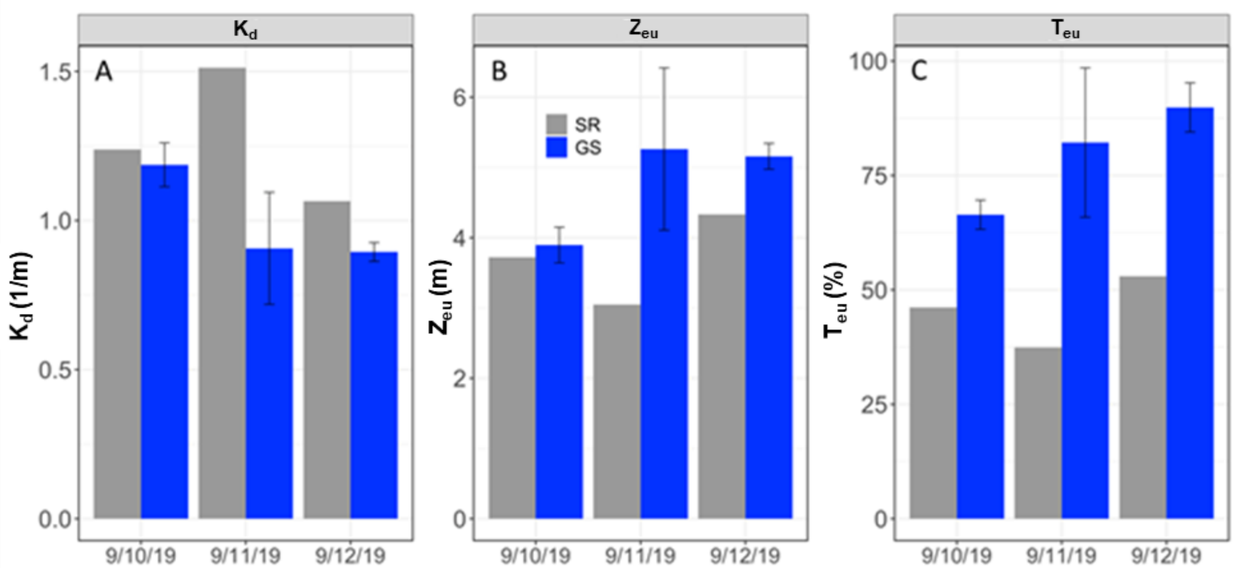


Figure 56. Changes with sampling day in A) light attenuation (K_d), B) euphotic zone depth (Z_{eu}) calculated as 4.6/K_d, and C) time spent in euphotic zone (T_{eu}), calculated as Z_{eu}:Z_m expressed as a percentage, where Z_m is the mixed layer depth. Gray bars represent mean of four Sacramento River (SR) stations and blue bars represent mean of four Georgiana Slough (GS) stations.

Specific rates of carbon uptake ranged from 0.026–0.059 /h, with a mean of 0.035 /h ± 0.001 /h (SE) and median of 0.034 /h (Figure 57). Carbon uptake increased with decreased light attenuation, following an acclimation period of one day (Figure 58). Although light attenuation decreased on 9/10/19, carbon uptake did not increase or increased only slightly on 9/10/19 before increasing on 9/12/19 in most of the channels (Figure 58). Carbon uptake was greater at the MOKEM and South Fork Mokelumne River stations than at other locations, and the increase in carbon uptake was greatest in the Mokelumne River endmember (Figure 58). At the MOKEM station, there was no acclimation period and increases occurred on day 2 relative to day 1, and on day 3 relative to day 2, suggesting that the phytoplankton population at this station may have been acclimated to higher light than the other stations (Figure 58). Drawdown of nitrate was also greater at this station relative to the other stations (Figure 38).

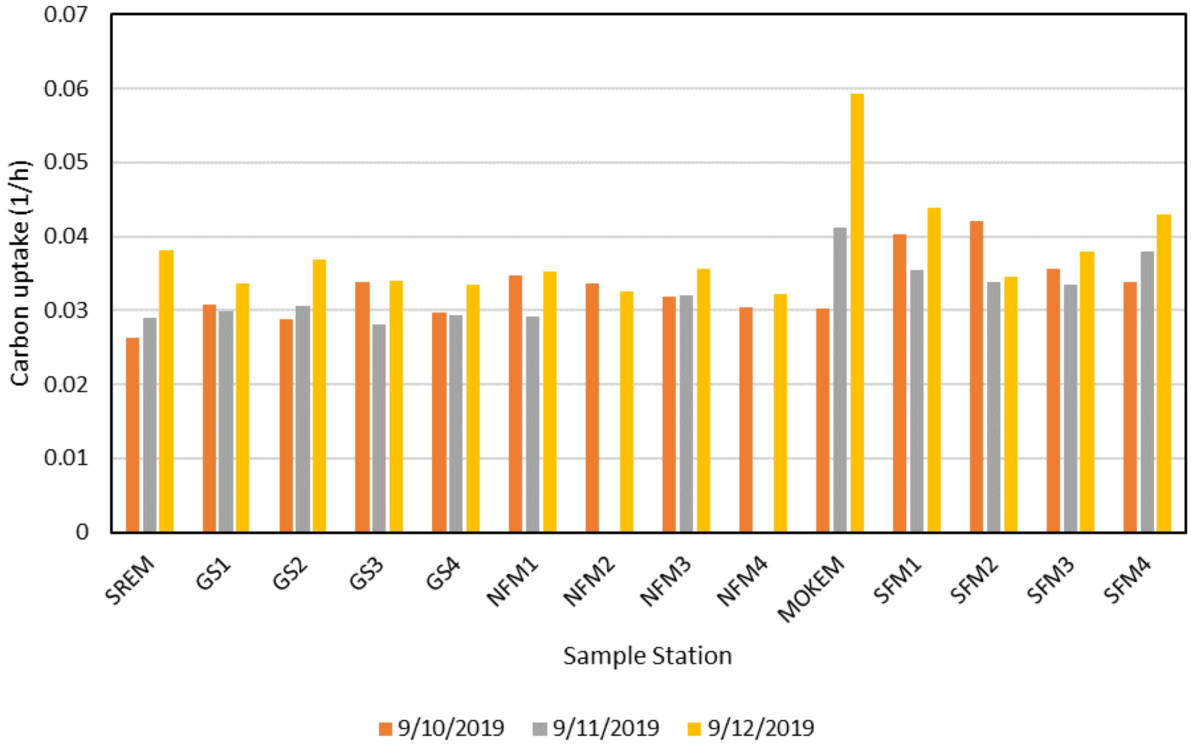


Figure 57. Specific uptake rate of carbon at discrete water sample stations, on 9/10/19–9/12/19. Station name abbreviations are defined in Table 6. Note: Missing data at NFM2 and NFM4 on 9/11/19.

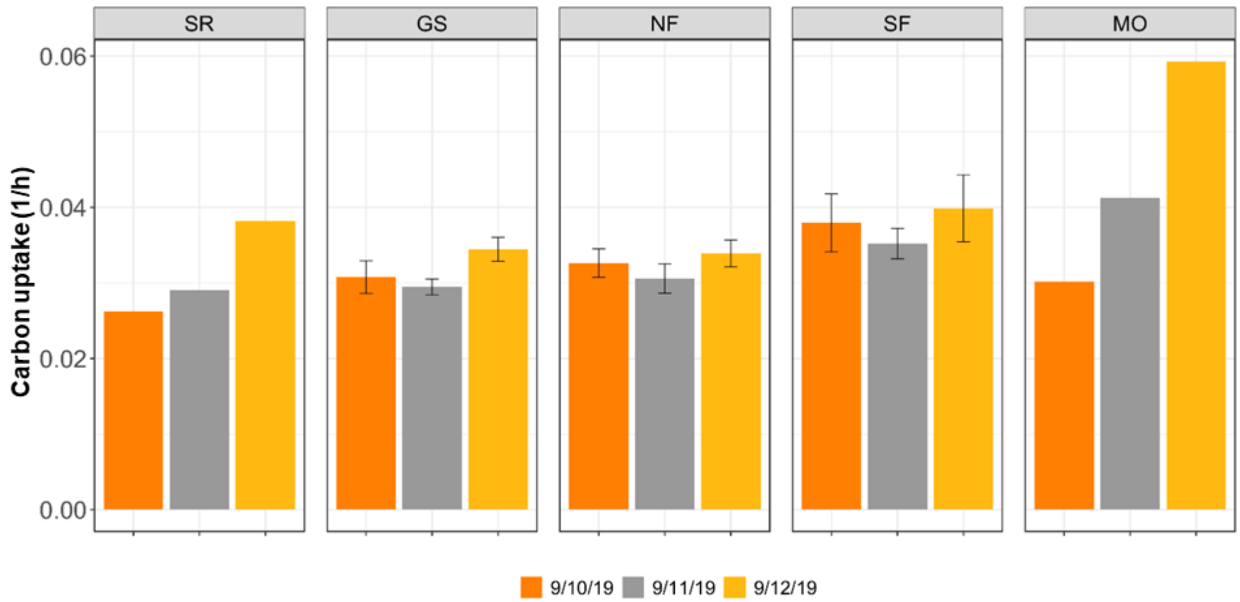


Figure 58. Mean channel-specific carbon uptake (1/h) between 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. The Sacramento River and Mokelumne River were only sampled at a single station. Channel name abbreviations: SR=Sacramento River, GS=Georgiana Slough, NF=North Fork Mokelumne River, SF=South Fork Mokelumne River, and MO=Mokelumne River.

Fixation of carbon dioxide into organic matter by the enzyme Rubisco tends to lower the $\delta^{13}C$ content of particulate matter due to the strong discrimination by the Rubisco enzyme against the ^{13}C isotope in favor of the ^{12}C isotope (Roeske and O'Leary 1984, Guy et al. 1989). Increased productivity resulting in an increase in Rubisco activity is expected to lead to a decrease in $\delta^{13}C$-POC as long as there is no appreciable depletion of the DIC pool or increase in the $\delta^{13}C$ of the DIC. Consistent with increases in carbon uptake, the $\delta^{13}C$ content of POC decreased by day over the course of the three-day sampling period (Figure 59, Figure 60). Values of $\delta^{13}C$-POC ranged from -30.00 – -27.30 ‰, with a mean of -28.41 ± 0.08 ‰ (SE) and median of -28.40 ‰ (Figure 59). Values of $\delta^{13}C$-POC tended to be more negative at the MOKEM and South Fork Mokelumne River stations than at other locations, particularly on 9/12/19 relative to the first two days of sampling. The largest decrease in the $\delta^{13}C$-POC occurred in the MOKEM station (Figure 60).

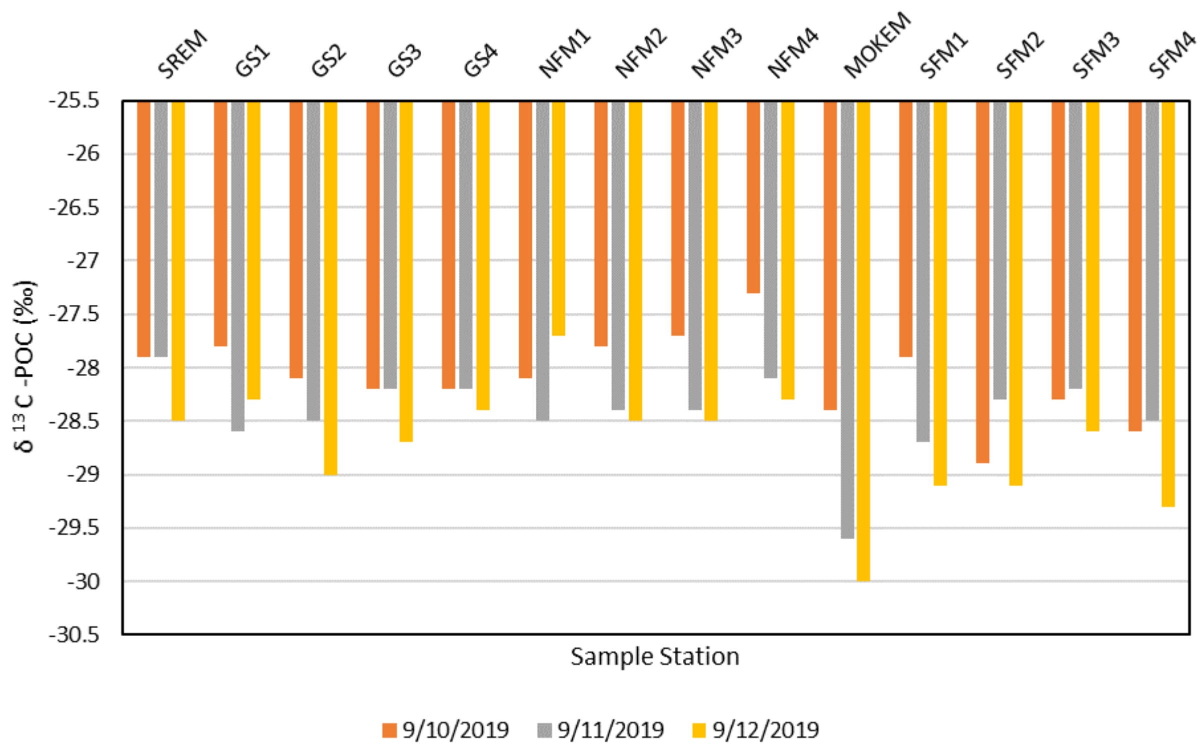


Figure 59. Values of δ¹³C-POC at discrete water sample stations, on 9/10/19–9/12/19. Station name abbreviations are defined in Table 6.

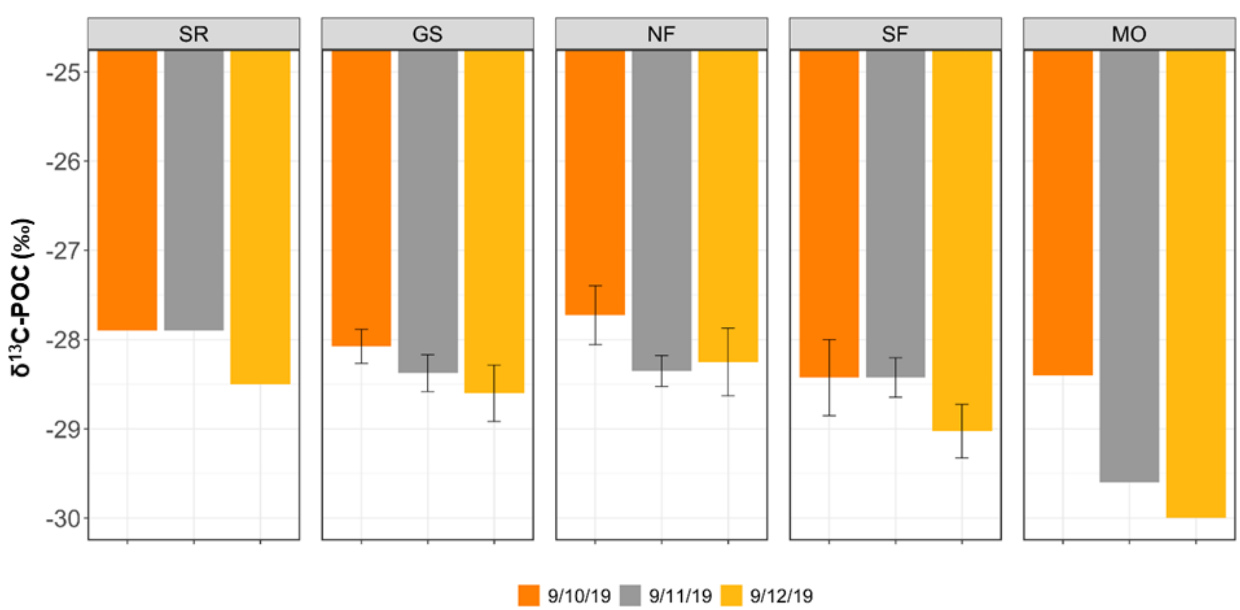


Figure 60. Mean δ¹³C-POC with day for each channel from 9/10/19–9/12/19. Error bars represent standard deviation of the mean of four sample stations along each channel. The Sacramento River (SR) and Mokelumne River (MO) were only sampled at a single station. Channel name abbreviations: SR=Sacramento River, GS=Georgiana Slough, NF=North Fork Mokelumne River, SF=South Fork Mokelumne River, and MO=Mokelumne River.

Over the course of the three sampling days, concentrations of POC ranged from 162.8–372.0 µg/L, with a mean of 250.6 µg/L ± 7.7 µg/L (SE) and median of 244.2 µg/L (Figure 61). When averaged by slough, it was evident that POC concentrations decreased in all sloughs by the end of the three-day sampling period (Figure 62). This decrease is counterintuitive as POC concentrations would be expected to increase with increased carbon uptake and fixation. However, this may be a matter of timescales with increases in productivity initially leading to a depletion of cellular carbon stores followed by increases in POC as abundance and biomass of phytoplankton increase over time. Decreases in POC over the three-day sampling period were smallest in the Mokelumne River endmember compared with the other sites potentially suggesting that phytoplankton cells were more acclimated to changing irradiance conditions than the other sites.

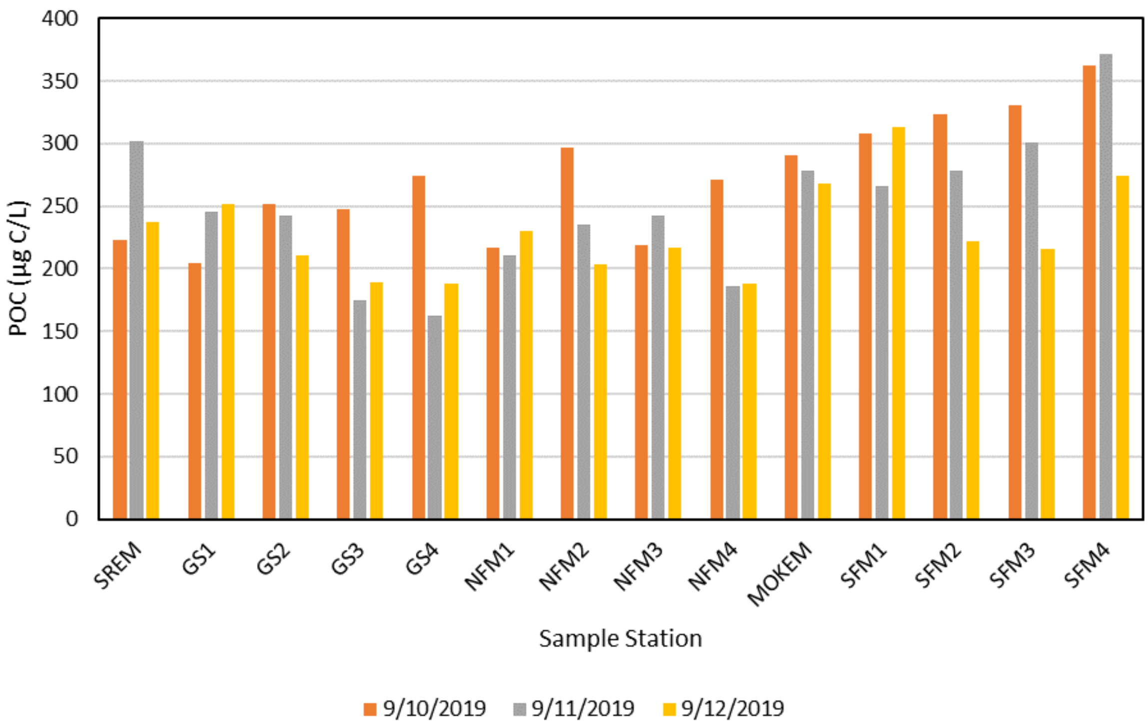


Figure 61. Concentration of POC at discrete water sample stations, on 9/10/19–9/12/19. Station name abbreviations are defined in Table 6.

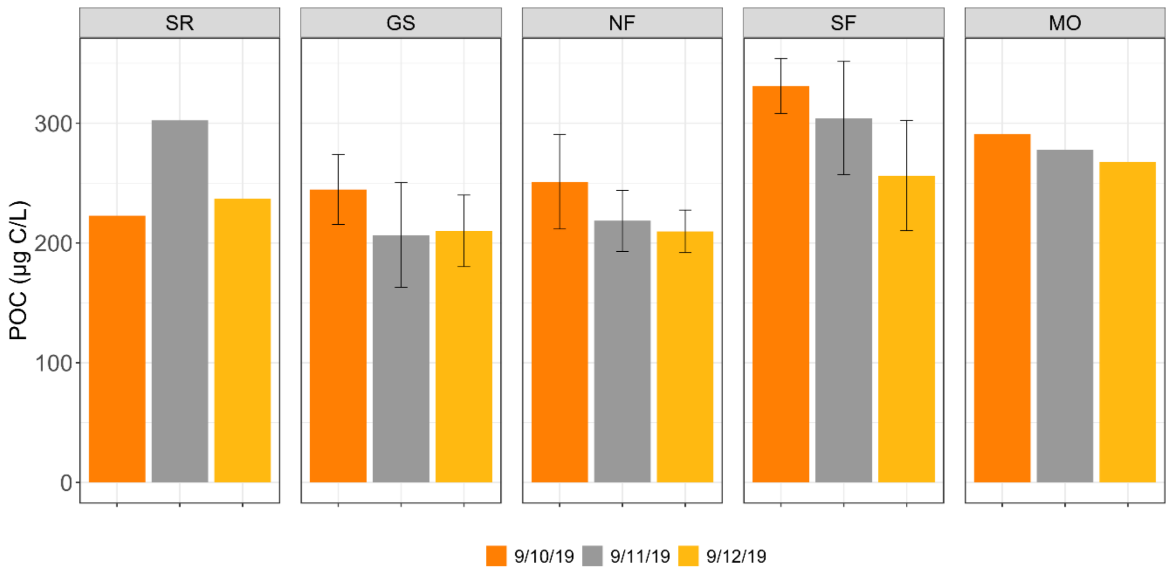


Figure 62. Mean POC concentration with day for each channel from 9/10/19–9/12/19. Error bars represent standard deviation of the mean of four sample stations along each channel. The Sacramento River and Mokelumne River were only sampled at a single station. Channel name abbreviations: SR=Sacramento River, GS=Georgiana Slough, NF=North Fork Mokelumne River, SF=South Fork Mokelumne River, and MO=Mokelumne River.

The changes in water clarity with day of the SRiNCS likely confounded the changes in ammonium concentrations with the EVR hold. To tease apart the impact of changes in irradiance (as measured by changes in light attenuation or Secchi disk depth) from changes in ammonium concentrations would not be easy when both differed by day. Because photosynthetically active radiation and Secchi disk depth were not measured in all channels, it was not possible to measure how differently irradiance changes were manifested in the channels, although the difference between Georgiana Slough and the Sacramento River would somewhat capture this variation (i.e., Figure 59). However, light attenuation could be calculated from turbidity measurements and used as a factor in statistical analyses. Using the approach of examining day and channel as factors in a 2-way ANOVA, where positive changes with day could be indicative of the impact of irradiance, significant positive differences in carbon uptake and $\delta^{13}C$-POC with day were observed (Table 9). Significant differences in carbon uptake and $\delta^{13}C$-POC with channel were also observed (Table 9).

Table 9. P-values and F-values (in parentheses) resulting from 2-way ANOVAs of phytoplankton indices including carbon uptake (1/h), δ13C-POC (‰), and POC (µg C/L) using day and channel as factors. Significant p-values (< 0.05) in bold. Factor 1, Day = 9/10/19, 9/11/19, 9/12/19 (df=2). Factor 2, Channel = SREM, Georgiana Slough, North Fork Mokelumne River, South Fork Mokelumne River, MOKEM (df=4).

Index	***Day (Factor 1) df=2***	***Channel (Factor 2) df=4***	***Interaction (Factor 1 x 2) df=8***	***Residuals***
Carbon uptake	**8.15E-06** (19.4)	**1.48E-07** (20.3)	**8.16E-05** (6.9)	25
δ^{13}C-POC	**2.62E-05** (16.0)	**4.84E-06** (13.0)	0.12 (1.8)	27
POC	0.010 (5.4)	**6.58E-05** (9.4)	0.49 (0.9)	27

Zooplankton Density and Biomass

Zooplankton raw data are presented in Appendix 8.

Total zooplankton density ranged from 0.403–37.498 individuals/L, with a mean of 5.197 ± 0.976 individuals/L (SE) and median of 3.474 individuals/L (Figure 63). Zooplankton density was dominated by Copepoda, followed by Rotifera, with much smaller contributions (an order of magnitude lower) from the other divisions. Using day and channel as factors in a 2-way ANOVA, total zooplankton density was significantly different with day and channel, and the interaction term was also significant (Figure 64, Table 10). Significant negative differences in total zooplankton density with day were observed, with densities on 9/10/19 exceeding densities on 9/12/19. Tukey pairwise comparison indicated the following: 9/10/19 > 9/12/19 (p-value = 0.042). Georgiana Slough and the North Fork Mokelumne River had lower total zooplankton densities than the South Fork Mokelumne River. Tukey pairwise comparisons indicated the following: Georgiana Slough < South Fork Mokelumne River (p-value = 0.012); North Fork Mokelumne River < South Fork Mokelumne River (p-value = 0.031).

Using the same test, no significant differences in Bivalvia density were observed (Table 10).

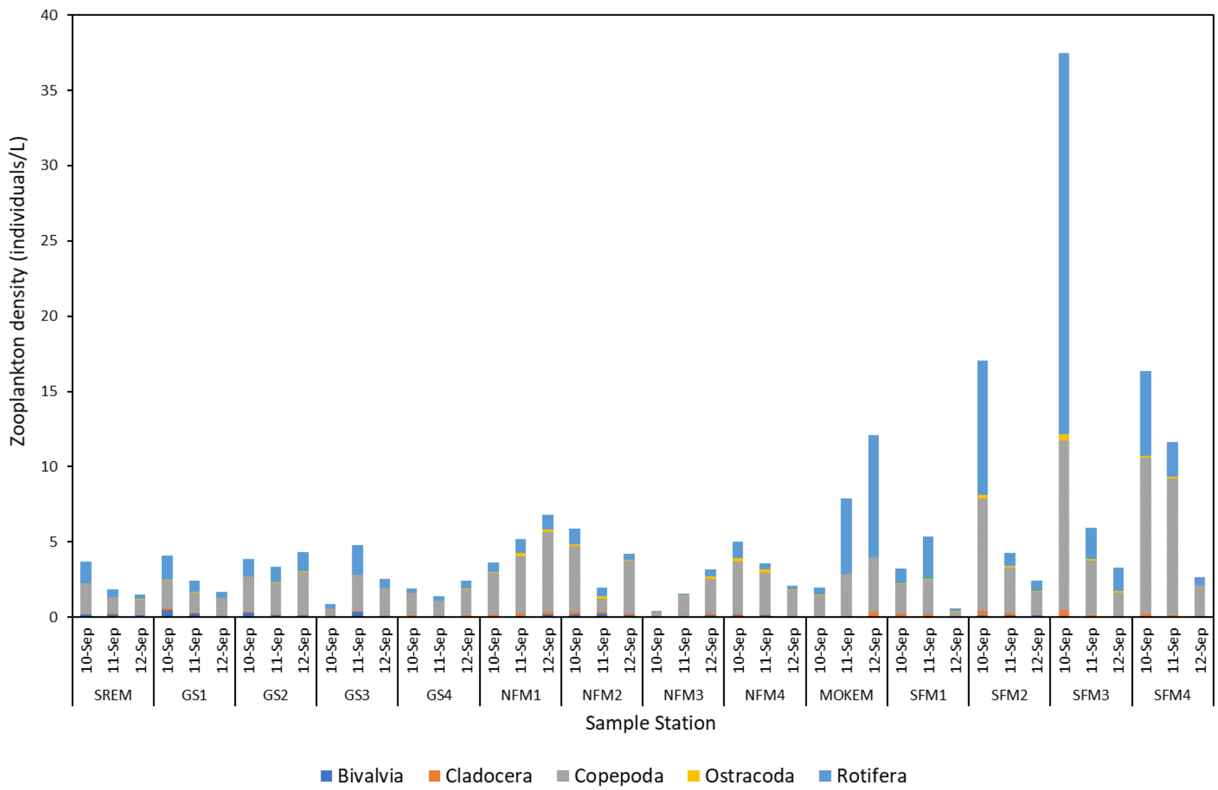


Figure 63. Density of zooplankton by division at discrete water sample stations, on 9/10/19–9/12/19. Station name abbreviations are defined in Table 6.

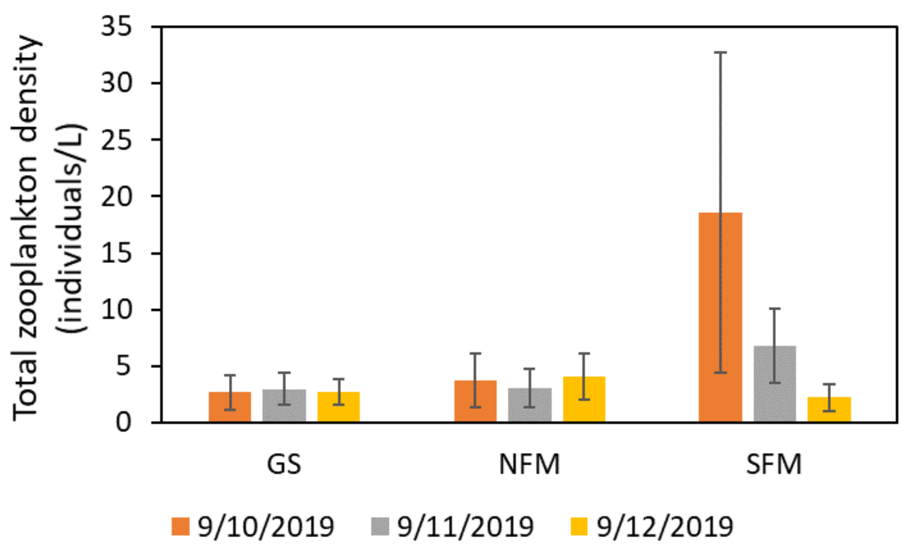


Figure 64. Mean density of total zooplankton from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Table 10. P-values and F-values (in parentheses) resulting from 2-way ANOVAs of zooplankton density and biovolume constituents using day and channel as factors. Significant p-values (< 0.05) in bold. Factor 1, Day = 9/10/19, 9/11/19, 9/12/19 (df=2). Factor 2, Channel = Georgiana Slough, North Fork Mokelumne River, South Fork Mokelumne River (df=2). Residuals df = 27 for all constituents.

Constituent	Day (Factor 1) df=2	Channel (Factor 2) df=4	Interaction (Factor 1 x 2) df=8
Total zooplankton density	**0.04** (3.6)	**8.92E-03** (5.7)	**0.02** (3.7)
Bivalvia density	0.47 (0.8)	0.10 (2.5)	0.73 (0.5)
Cladocera density	**0.01** (5.3)	**3.06E-04** (11.1)	**7.60E-04** (6.6)
Copepoda density	0.09 (2.6)	**7.1E-03** (6.0)	**0.01** (3.8)
Ostracoda density	0.48 (0.7)	**3.65E-03** (7.0)	0.21 (1.6)
Rotifera density	0.07 (2.9)	**0.03** (4.1)	0.05 (2.7)
Total zooplankton biomass	0.07 (3.0)	**0.01** (5.3)	**4.49E-03** (4.8)
Bivalvia biomass	0.42 (0.9)	**4.54E-02** (3.5)	0.77 (0.5)
Cladocera biomass	0.07 (2.9)	**5.65E-04** (10.0)	**2.19E-03** (5.5)
Copepoda biomass	0.42 (0.9)	0.07 (3.0)	0.06 (2.6)
Ostracoda biomass	0.35 (1.1)	0.17 (1.9)	0.60 (0.7)
Rotifera biomass	0.20 (1.7)	0.20 (1.7)	0.12 (2.0)

Using day and channel as factors in a 2-way ANOVA, Cladocera density was significantly different with day and channel, and the interaction term was also significant (Figure 65, Table 10). Significant negative differences in Cladocera density with day were observed, with densities on 9/10/19 exceeding densities on 9/12/19. Tukey pairwise comparison indicated the following: 9/10/19 > 9/12/19 (p-value = 0.009).

Georgiana Slough had lower Cladocera density than the South Fork Mokelumne River. Tukey pairwise comparison indicated the following: Georgiana Slough < South Fork Mokelumne River (p-value = 0.000).

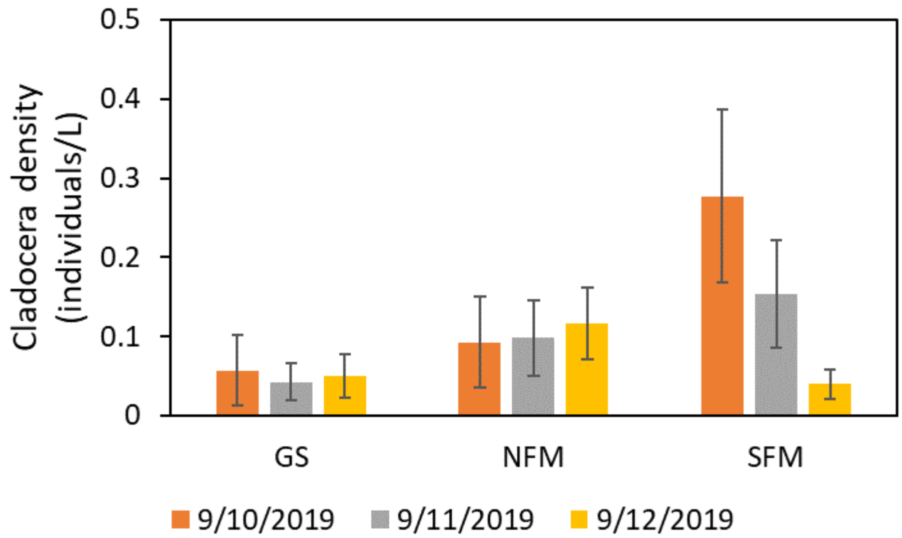


Figure 65. Mean density of Cladocera from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Using day and channel as factors in a 2-way ANOVA, Copepoda density was significantly different with channel, and the interaction term was also significant (Figure 66, Table 10). Georgiana Slough had lower Copepoda density than the South Fork Mokelumne River. Tukey pairwise comparison indicated the following: Georgiana Slough < South Fork Mokelumne River (p-value = 0.006).

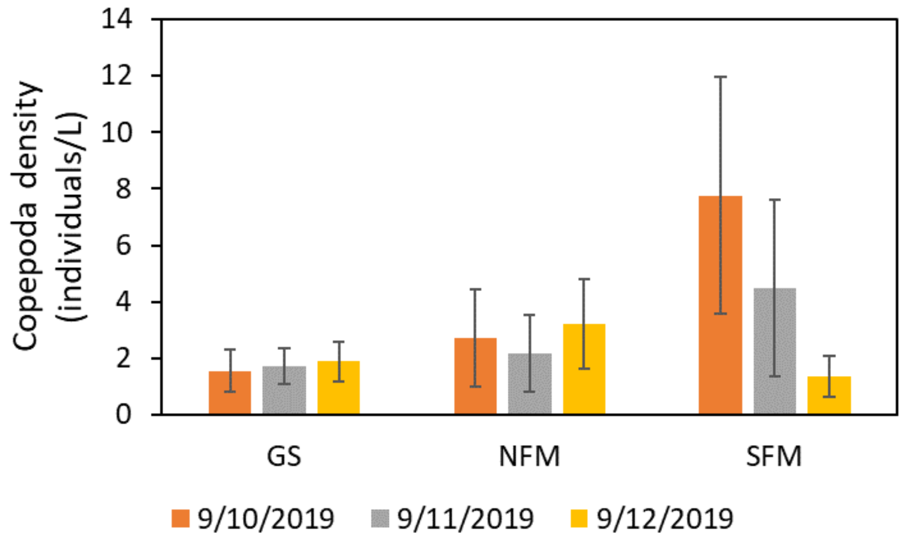


Figure 66. Mean density of Copepoda from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Using day and channel as factors in a 2-way ANOVA, Ostracoda density was significantly different with channel, with Georgiana Slough having lower Ostracoda density than the North Fork Mokelumne River or South Fork Mokelumne River (Figure 67, Table 10). Tukey pairwise comparisons indicated the following: Georgiana Slough < North Fork Mokelumne River (p-value = 0.007); Georgiana Slough < South Fork Mokelumne River (p-value = 0.012).

Using the same test, Rotifera density was significantly different with channel, with the North Fork Mokelumne River having lower Ostracoda density than the South Fork Mokelumne River (Figure 68, Table 10). Tukey pairwise comparison indicated the following: North Fork Mokelumne River < South Fork Mokelumne River (p-value = 0.041).

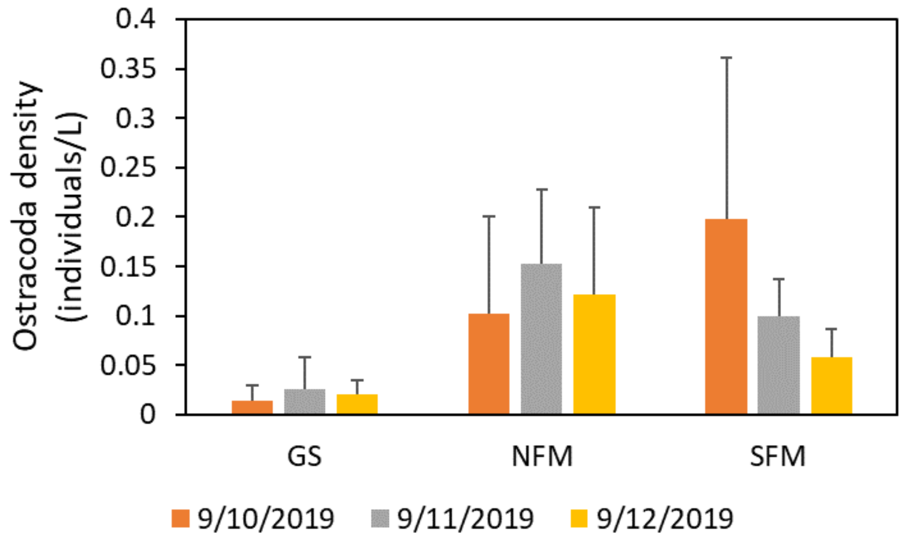


Figure 67. Mean density of Ostracoda from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

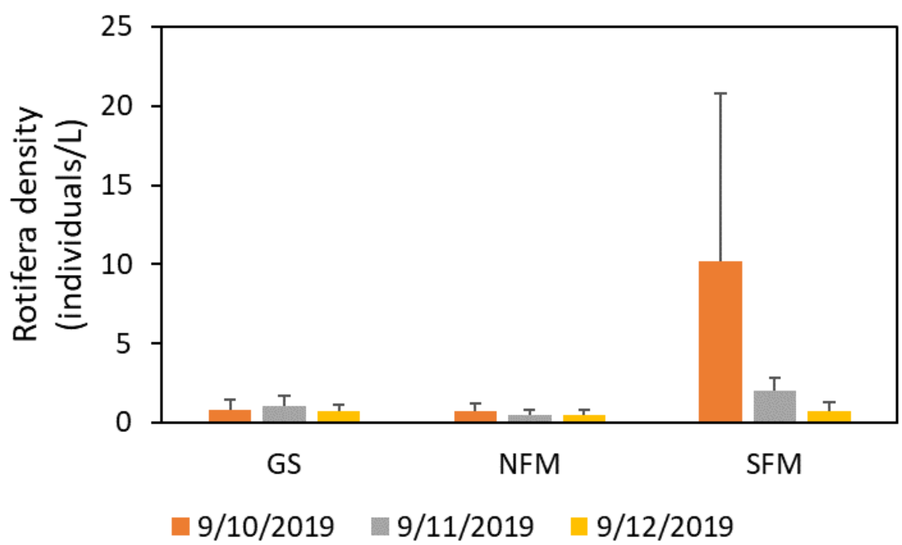


Figure 68. Mean density of Rotifera from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Total zooplankton biomass ranged from 0.042–2.126 µg dry weight/L, with a mean of 0.471 ± 0.061 µg dry weight/L (SE) and median of 0.328 µg dry weight/L (Figure 69). Zooplankton biomass was dominated by Copepoda, followed by Cladocera, and more distantly by Rotifera, Ostracoda, and Bivalvia. Using day and channel as factors in a 2-way ANOVA, total zooplankton biomass was significantly different with channel, and the interaction term was also significant (Figure 70, Table 10). Georgiana Slough had lower total zooplankton biomass than the South Fork Mokelumne River. Tukey pairwise comparison indicated the following: Georgiana Slough < South Fork Mokelumne River (p-value = 0.009).

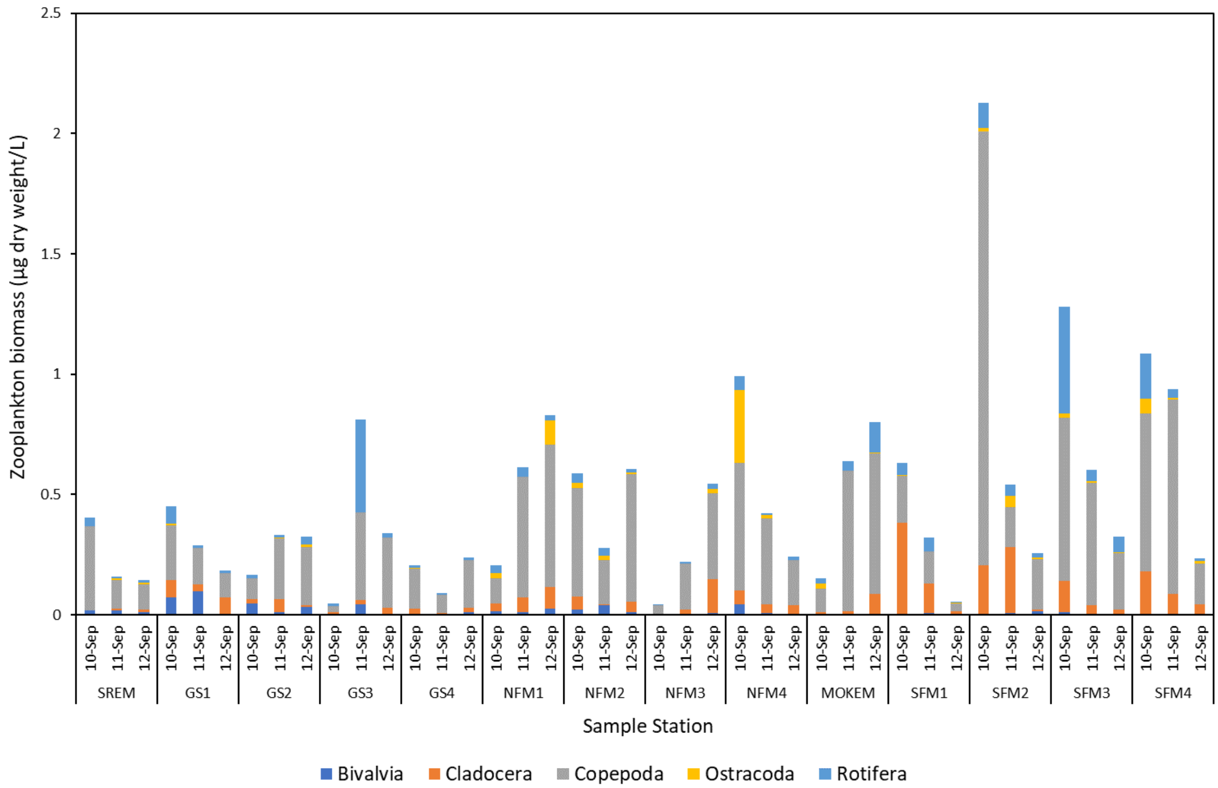


Figure 69. Biomass of zooplankton by division at discrete water sample stations, on 9/10/2019–9/12/2019. Station name abbreviations are defined in Table 6.

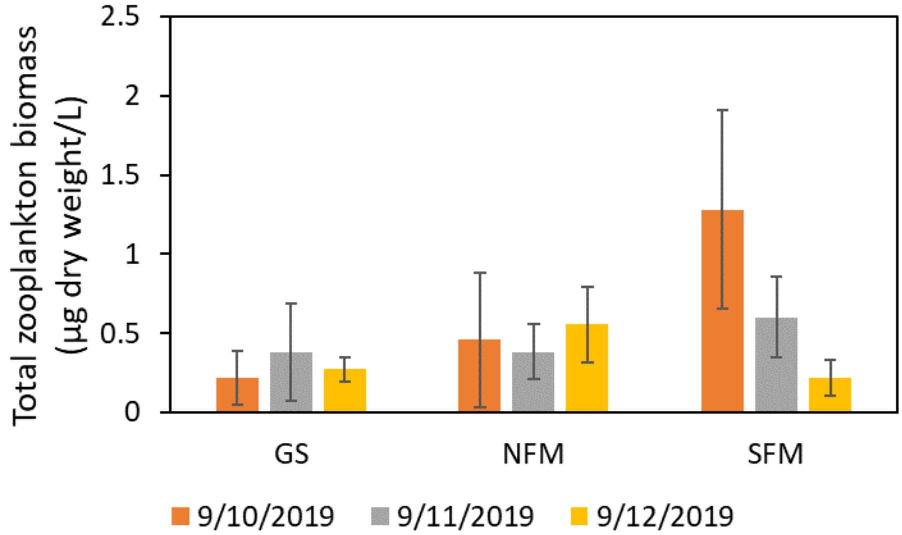


Figure 70. Mean biomass of total zooplankton from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Using day and channel as factors in a 2-way ANOVA, Bivalvia biomass was significantly different with channel, with Georgiana Slough having higher Bivalvia biomass than the South Fork Mokelumne River (Figure 71, Table 10). Tukey pairwise comparison indicated the following: Georgiana Slough > South Fork Mokelumne River (p-value = 0.036).

Using the same ANOVA test, Cladocera biomass was significantly different with channel, and the interaction term was also significant (Figure 72, Table 10). Georgiana Slough and the North Fork Mokelumne River had lower Cladocera biomass than the South Fork Mokelumne River. Tukey pairwise comparisons indicated the following: Georgiana Slough < South Fork Mokelumne River (p-value = 0.001); North Fork Mokelumne River < South Fork Mokelumne River (p-value = 0.006).

Again, using the same ANOVA test, no significant differences in the biomass of Copepoda, Ostracoda, or Rotifera were observed (Table 10).

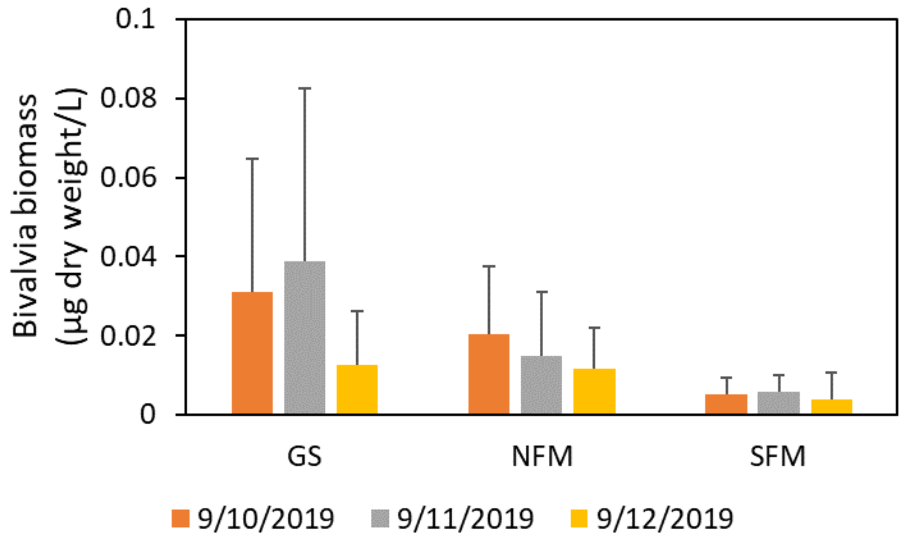


Figure 71. Mean biomass of total zooplankton from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

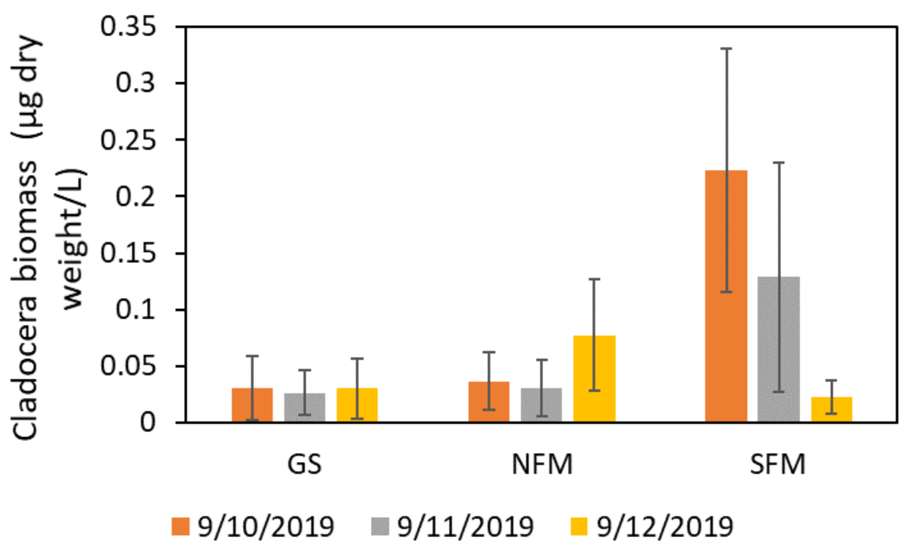


Figure 72. Mean biomass of Cladocera from 9/10/19–9/12/19. Black error bars represent standard deviation of the mean of four sample stations along each channel for each day. Channel name abbreviations: GS=Georgiana Slough, NFM=North Fork Mokelumne River, and SFM=South Fork Mokelumne River.

Zooplankton (*P. forbesi*) Growth

Figure 73 shows the time course and spatial variation of zooplankton abundance (EOS enumerations) and growth, alongside other key variables used in the zooplankton growth analysis, including ammonium (Figure 73A), chl-*a* concentration (Figure 73B), and phytoplankton biovolume (Figure 73C). Total zooplankton abundance was highly variable within days with no consistent spatial pattern (Figure 73D), although the four highest values were from the southerly stations 3 and 4 in the South Fork of the Mokelumne River (SFM3 and SFM4, respectively). Zooplankton (*P. forbesi*) growth rates were generally low, with the values from 9/11/19 being the highest (Figure 73E).

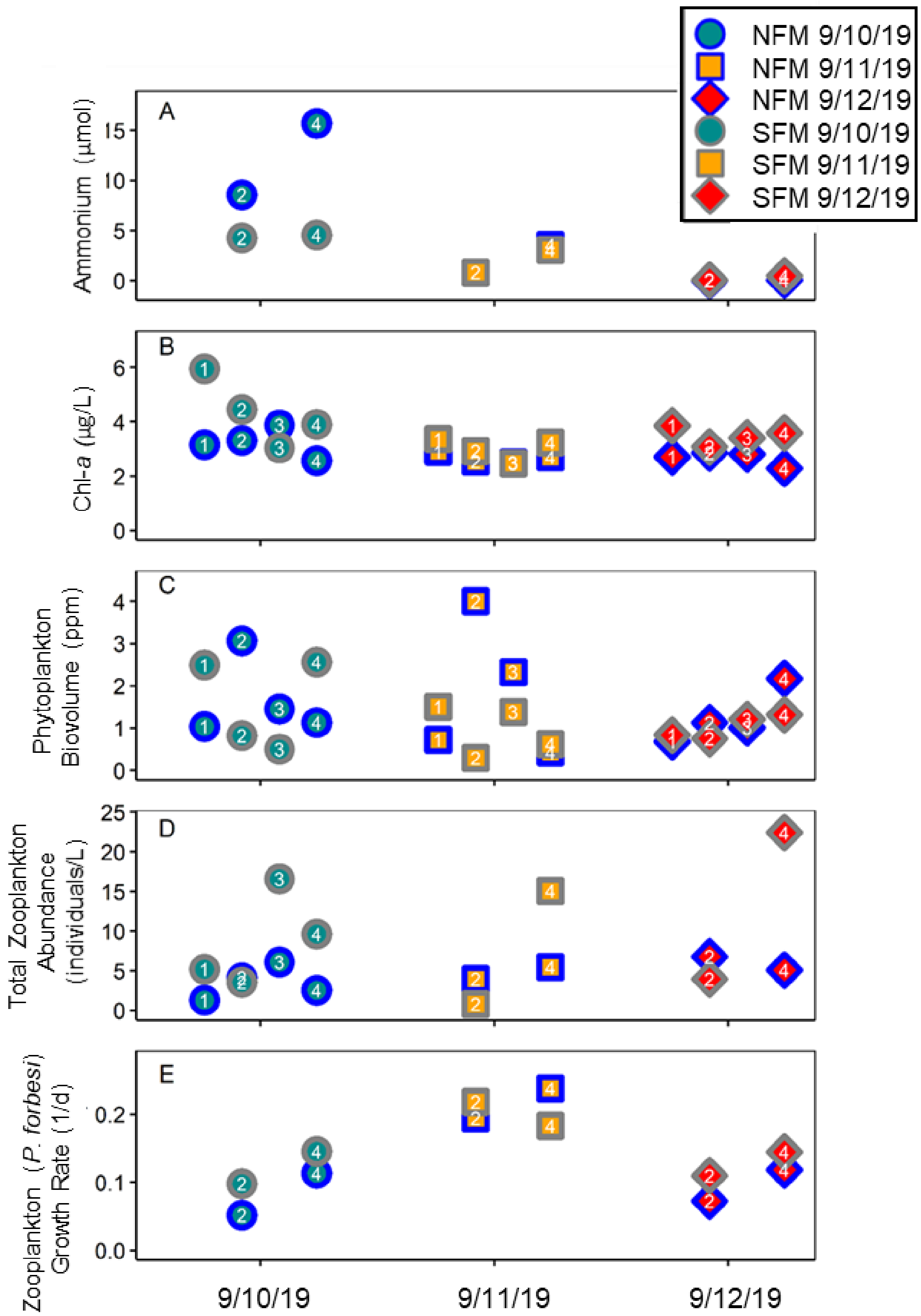


Figure 73. Measured variables by day of sampling with points shifted in x direction to reduce overlap. Symbol shape and fill indicates day of sampling, edge color indicates North Fork Mokelumne River or South Fork Mokelumne River (see legend), and numbers indicate station (Figure 1). A, ammonium concentration (1 µmol = 0.014 mg/L); B, chl-a concentration; C, phytoplankton biovolume; D, total zooplankton abundance; E, zooplankton (P. forbesi) growth rate. Data have been shifted laterally to avoid overlaps.

Zooplankton abundance was variable and dominated by copepod nauplius larvae (Figure 74). These larvae were either *P. forbesi* or unidentified cyclopoid copepods, probably *Acanthocyclops* and close relatives. Adult and juvenile copepods were much less abundant than nauplii in most samples. Note that the high zooplankton abundance values from the southerly stations 3 and 4 in the South Fork Mokelumne River (SFM3 and SFM4, respectively) were 65–77% *P. forbesi* nauplii. Figure 75 shows how anomalous these are: the abundance of nauplii at these stations is about 450 times that of adult females.

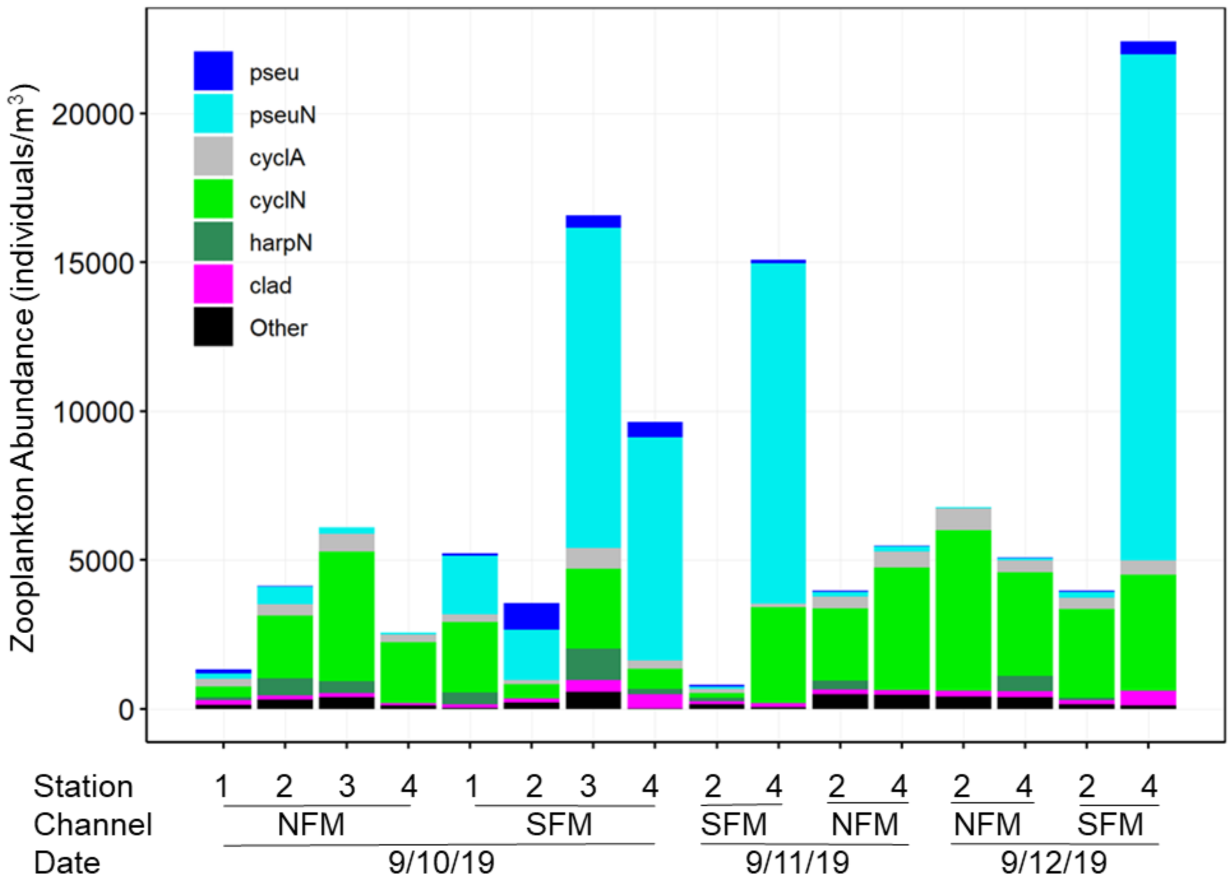


Figure 74. Zooplankton abundance by major taxonomic groups for each sample. Samples are identified by day in September, North Fork Mokelumne River (NFM) or South Fork Mokelumne River (SFM), and sample station (1–4). Taxa are (top to bottom) copepods including *P. forbesi* adults plus juveniles (pseu), and nauplius larvae (pseuN), cyclopoid copepods including adults plus juveniles (cyclA), and nauplii (cyclN), harpacticoid nauplii (harpN), cladocerans (clad), and Other.

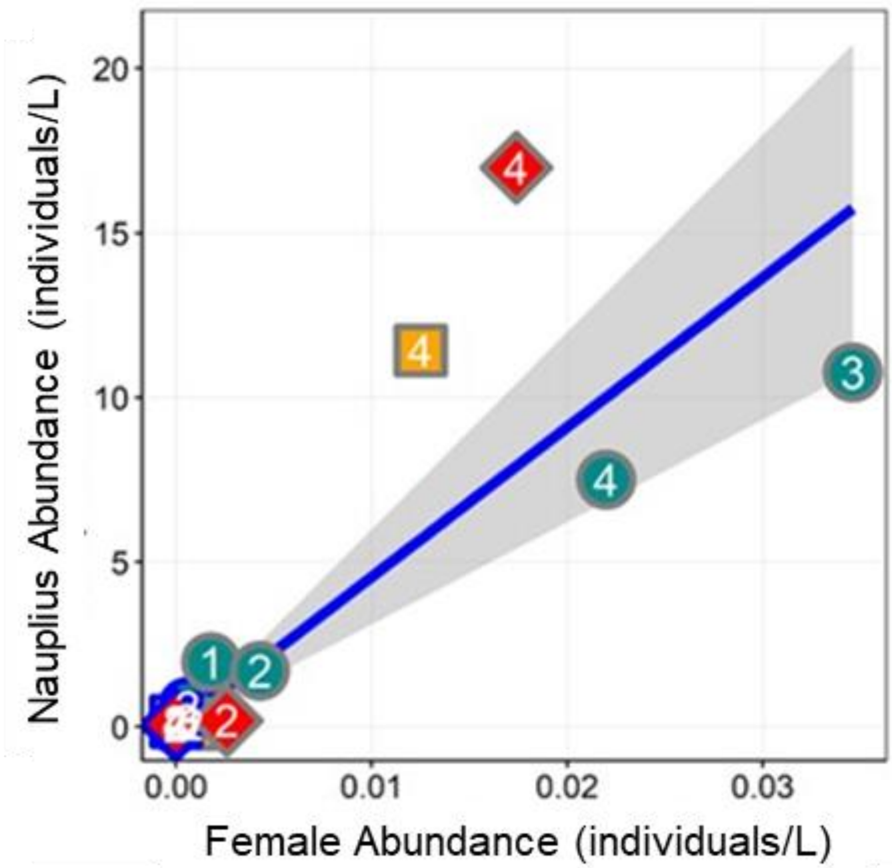


Figure 75. P. forbesi. Abundance of nauplii vs. abundance of adult females. Symbols as in Figure46. Line with 95% confidence bands is a linear regression line with fixed 0 intercept and a slope of 450 ± 300.

Comparing abundance of common zooplankton taxa between the EOS data and the data generated by BSA Environmental Services, Inc., shows some broad similarities and some differences. Total copepods (Figure 76A) were by far the dominant taxa in both data sets, and abundances were very roughly similar except that estimates of nauplius abundance were much greater in the EOS data in several samples. Abundance of cladocerans (Figure 76B) were generally congruent except for higher values in the EOS Center samples from 9/12/19. Ostracods, by contrast, were almost always more abundant in the BSA Environmental Services, Inc., samples (Figure 76C).

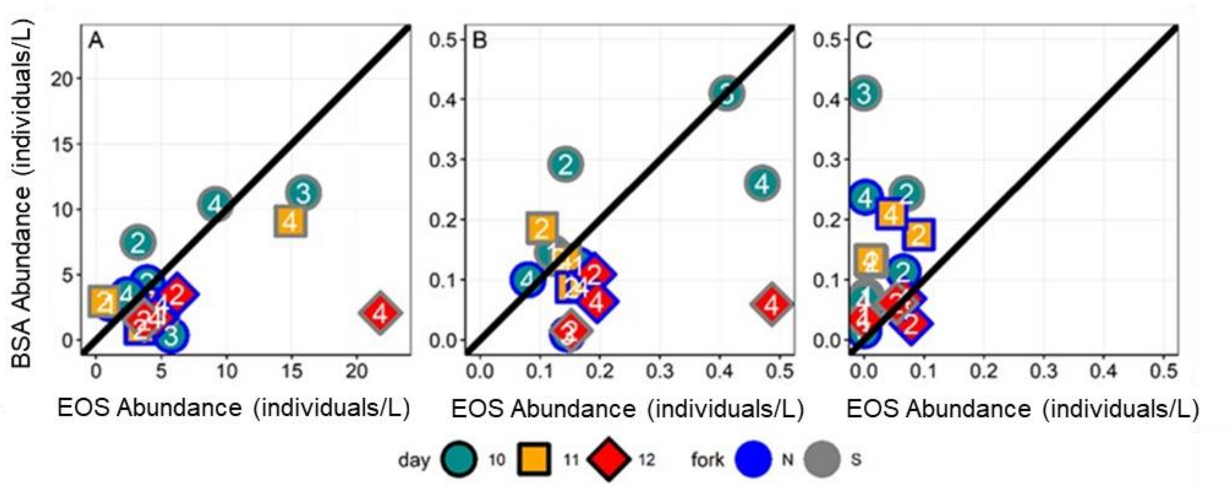


Figure 76. Abundance of common zooplankton taxa collected by EOS group vs. that collected by Regional San group and analyzed by BSA Environmental Services, Inc. (BSA), Shapes show day of September 2019, colors of edges show North Fork Mokelumne River vs. South Fork Mokelumne River, and numbers in symbols give sample station numbers. Lines are 1:1. A, total copepods including nauplii; B, total cladocerans; C, total ostracods.

Egg production and growth rates generally can be highly variable and are related to chlorophyll concentration and other measures of food availability, though with considerable scatter. To place the rates obtained here in context, we plotted these rate measurements against chlorophyll together with all other measurements the EOS laboratory has done (Figure 77, Gearty et al. 2021). Both rates were at the low end of the previously measured rates but were commensurate with the low chlorophyll concentrations.

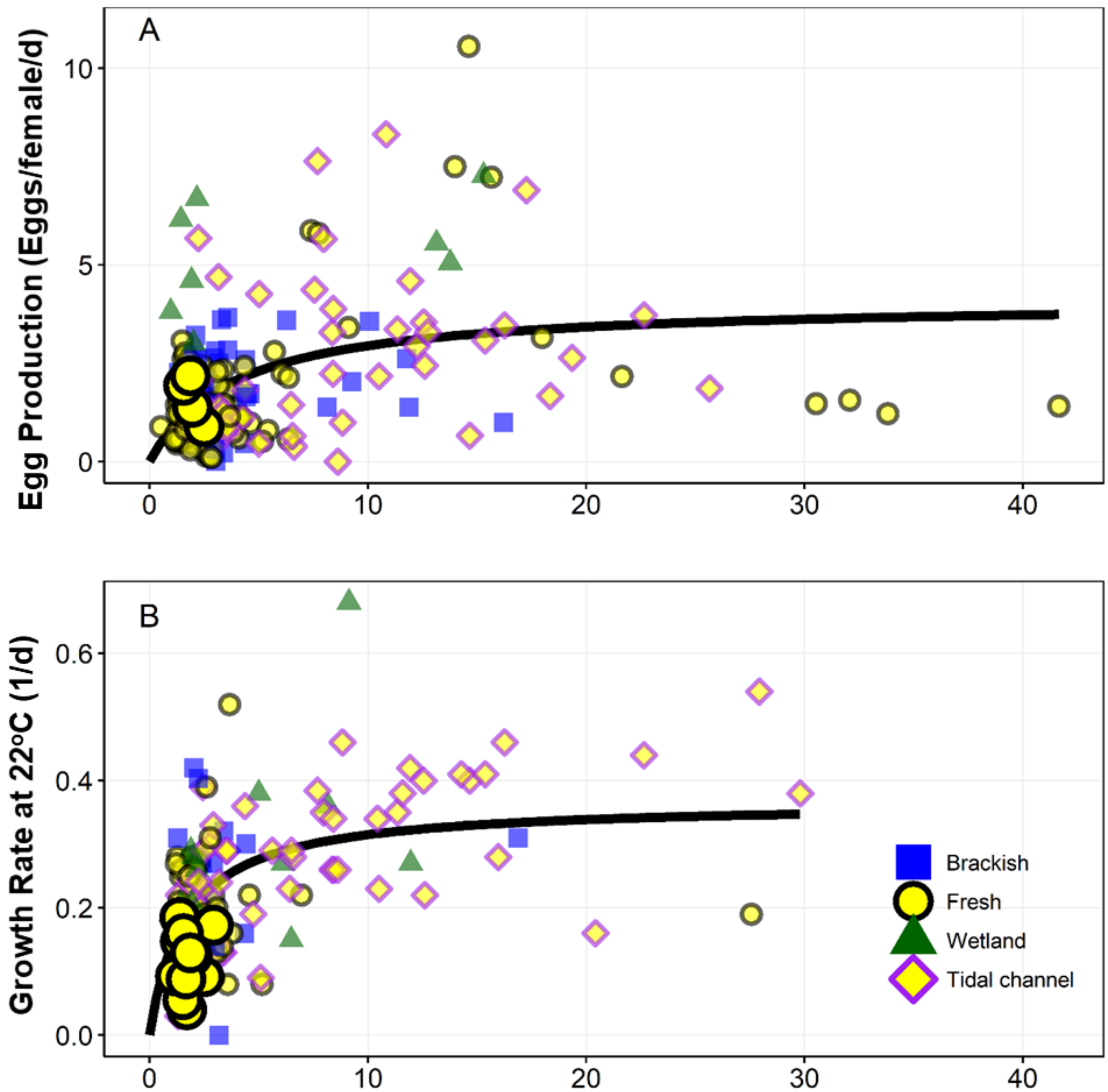


Figure 77. Egg production (A) and growth (B) rates of *P. forbesi* vs. chlorophyll concentration, including all measurements made to date. Large symbols are from the current study. Lines are fitted to all the data (Gearty 2021). Growth rates have been adjusted from incubation temperatures to 22 °C for comparison.

Clam Biomass and Grazing

Clam biomass ranged from 0.090–7.265 g/m^2, with a mean of 1.773 ± 0.436 g/m^2 (SE) and median of 1.327 g/m^2 (Figure 78). Biomass was highest at the SR1 and SFM4 stations. Clam grazing, as a percentage of the water column grazed per day, ranged from 0.2–8.4%, with a mean of 2.4 ± 0.5% (SE) and median of 2.0% (Figure 79). Similar to biomass, grazing was highest at the SR1 and SFM4 stations.

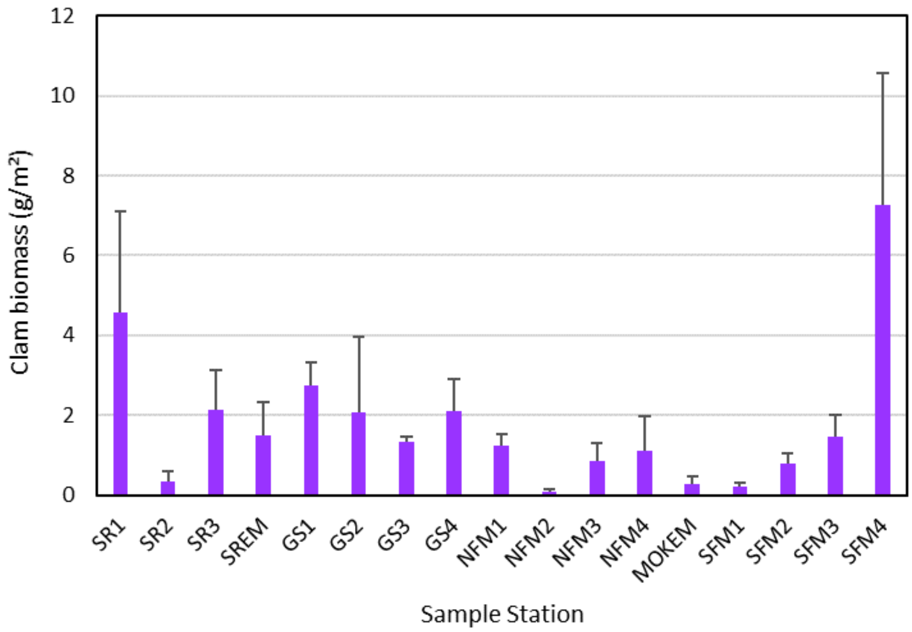


Figure 78. Biomass of clams at discrete water sample stations, on 9/24/19–9/25/19 (sampling was conducted over two days). Station name abbreviations are defined in Table 6. Error bars represent the standard error of the mean.

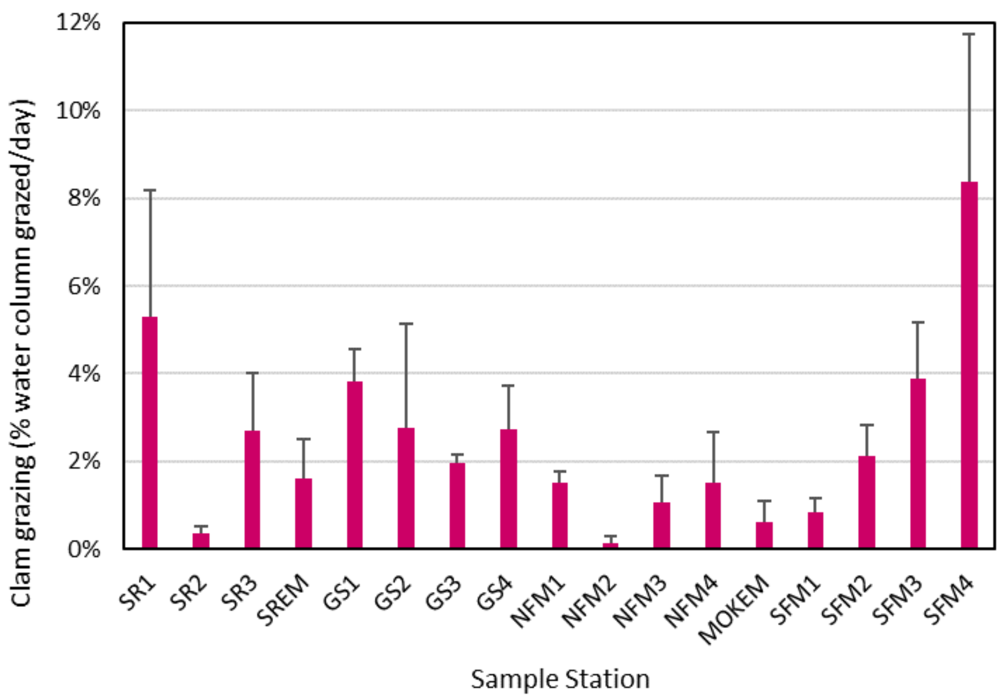


Figure 79. Estimated grazing by clams (percentage of the water column grazed per day) at discrete water sample stations, on 9/24/19–9/25/19 (sampling was conducted over two days). Station name abbreviations are defined in Table 6. Error bars represent the standard error of the mean.

We compared the clam biomass and turnover observed in the current study with previous observations from October 2013, June 2014, and May and October 2016. Biomass at Freeport (SR1) and Hood (SR3) in the current study was well within the range of previous observations, while biomass at RM44 (SR2) was lower (Figure 80). Likewise, grazing rates at Freeport (SR1) and Hood (SR3) in the current study were well within the range of previous observations, while the grazing rate at RM44 (SR2) was lower than in previous studies (Figure 81).

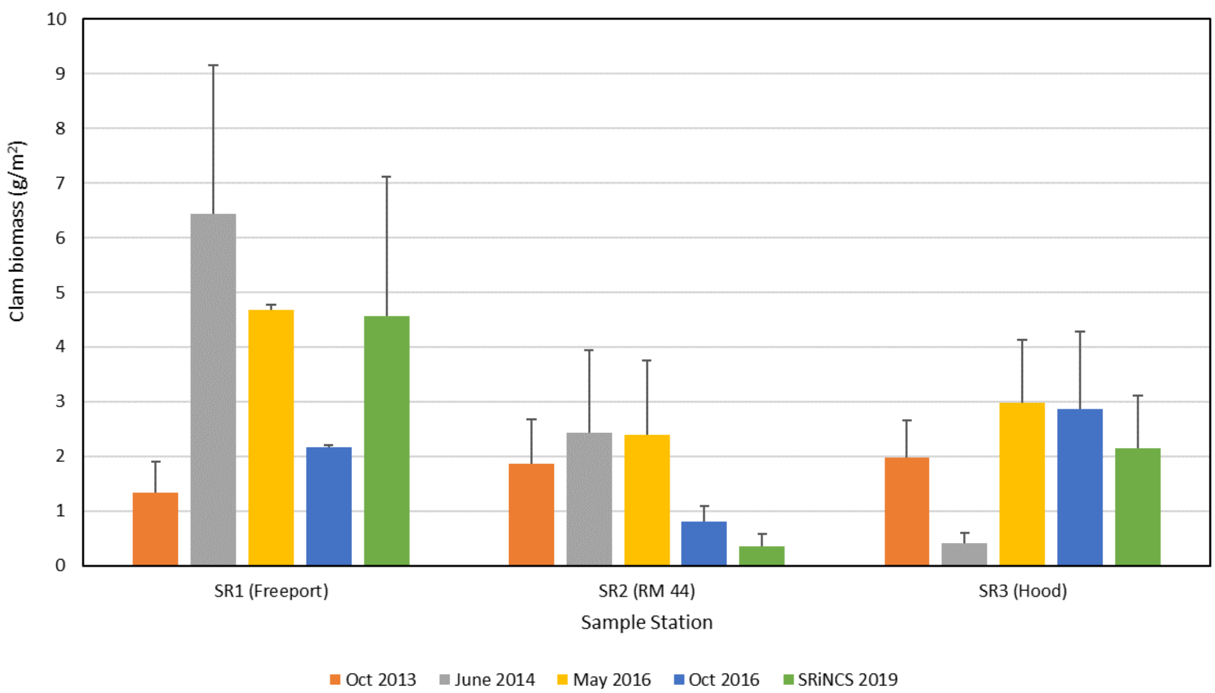


Figure 80. Comparison of the biomass of clams in this study at three sample stations on 9/24/19, with biomass observed at these stations in previous studies in 2013, 2014, and 2016. Station name abbreviations are defined in Table 6.

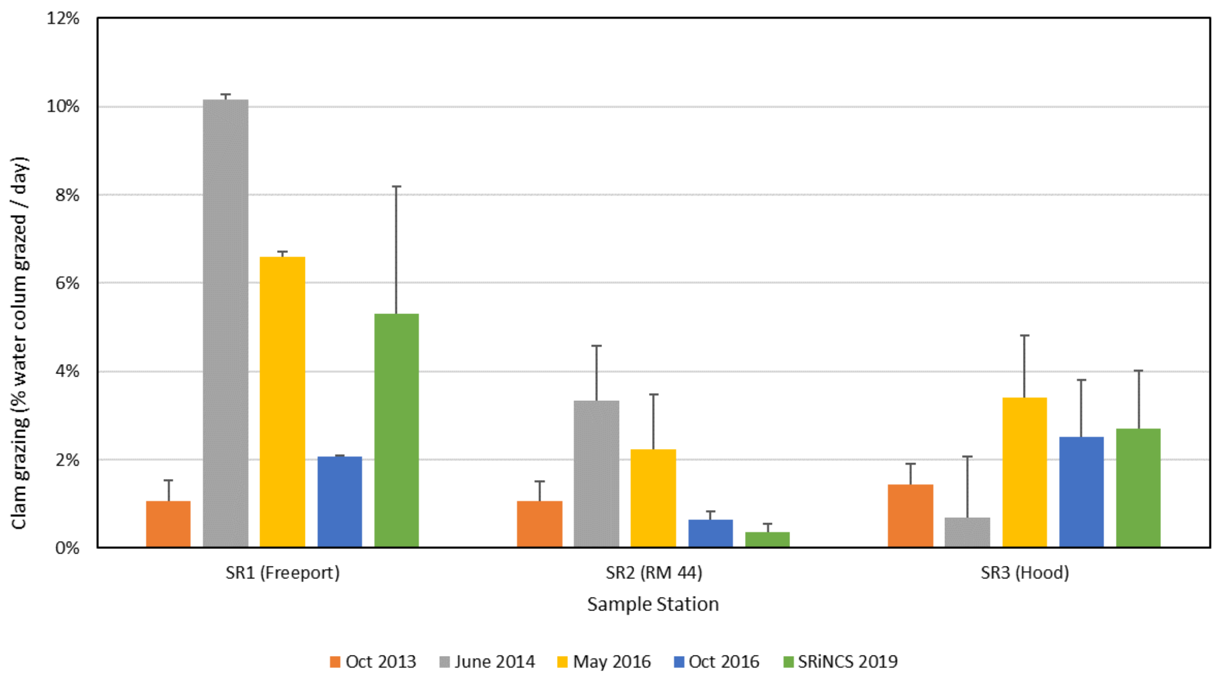


Figure 81. Comparison of the estimated grazing by clams (percent turnover of water column per day) in this study at three sample stations on 9/24/19, with grazing observed at these stations in previous studies in 2013, 2014, and 2016. Freeport is station SR1, RM44 is station SR2, Hood is station SR3. Station name abbreviations are defined in Table 6.

Summary and Discussion

Observed Changes in Environmental Factors and Phytoplankton Responses

Both the flow modeling and the high-resolution boat-based monitoring suggested that a well-defined without-wastewater treatment was produced in Georgiana Slough and North Fork Mokelumne River, while the pattern in the South Fork Mokelumne River was slower to develop and complicated by variable mixing of Sacramento and Mokelumne River inputs, and presumably also water from the three dead-end sloughs. The high-resolution transects showed distinctly lower concentrations of ammonium, nitrate, and DIN in the absence of wastewater. Measured fluorescent chlorophyll concentrations were generally low throughout the study region (<10 µg/L). Data from the bbe Fluoroprobe, which attributes the total measured chlorophyll fluorescence to four different classes of phytoplankton, suggested that blue-green algae were more abundant in the South Fork of the Mokelumne River, potentially due to inputs from the three higher residence time dead-end side sloughs. Chlorophyll fluorescence attributed to diatoms decreased in association with the decrease in wastewater nutrient loading from 9/10/19 (WW+) – 9/11/19 (WW-), but only in the North Fork Mokelumne River. Chlorophyll fluorescence attributed to blue-green algae showed a slight decrease from 9/10/19 (WW+) – 9/12/19 (two days of WW- conditions) across the study area.

Based on discrete water sample measurements from boats sampling in each channel, turbidity decreased significantly with day, as wastewater loading decreased (tests on data from four sample stations in each of the three channels on each of the three days, 9/10/19, 9/11/19, and 9/12/19). Due to the decreased turbidity, light availability increased across the three days of the experiment. The turbidity change seemed to be related to changes in the Sacramento River upstream of the SRWTP discharge point, rather than resulting from the without-wastewater condition. Data from the USGS continuous monitoring station at Freeport show that the turbidity reduction occurred upstream of the outfall and was not due to the EVR diversion (Figure 82). It took over a day for the reduced turbidity concentrations observed at Freeport on 9/ 9/19 to travel downstream into the sampling locations within Georgiana Slough, North Fork Mokelumne River, and South Fork Mokelumne River, as indicated by the RMA hydraulic modeling (see Appendix 2). These changes in water clarity with day of the study confounded our ability to interpret the potential differences in phytoplankton abundance and productivity in relation to the changes in nutrient concentrations associated with the EVR diversion.

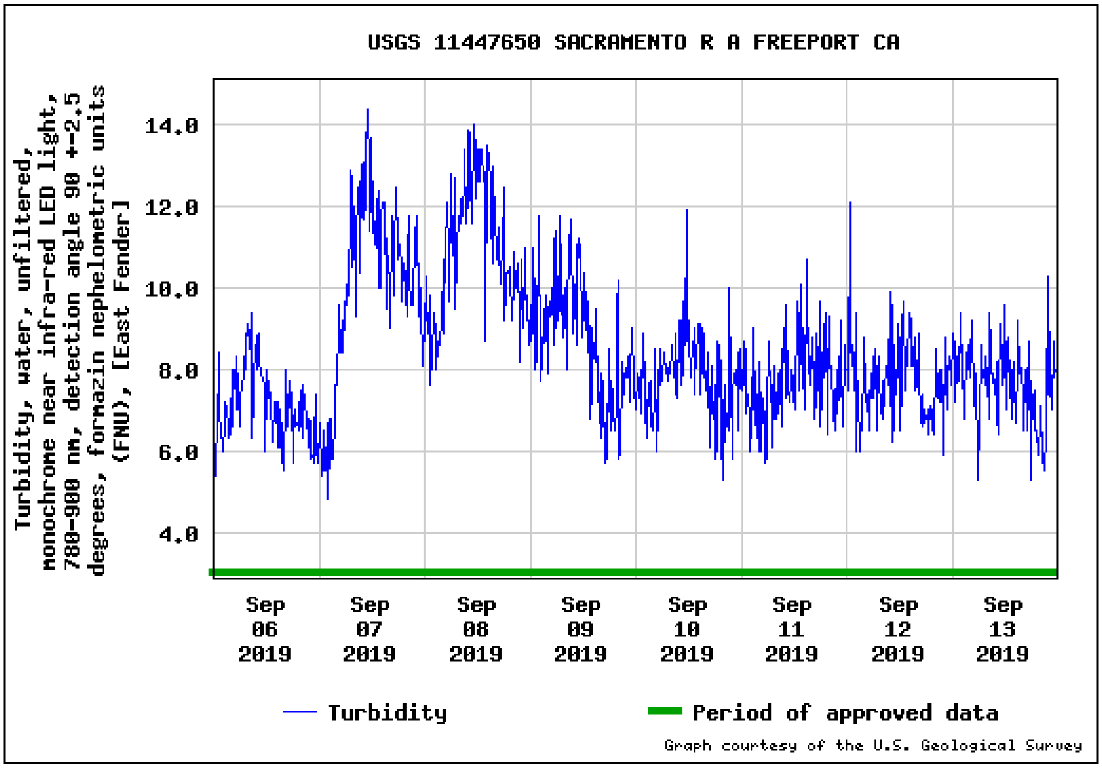


Figure 82. Turbidity recorded at the USGS continuous monitoring station at Freeport, from 9/6/19–9/13/19. Figure from U.S. Geological Survey (2022).

There was a roughly 1,400 cfs reduction in river discharge in the four days before the experiment, which might be related to the lowered turbidity (Figure 83).

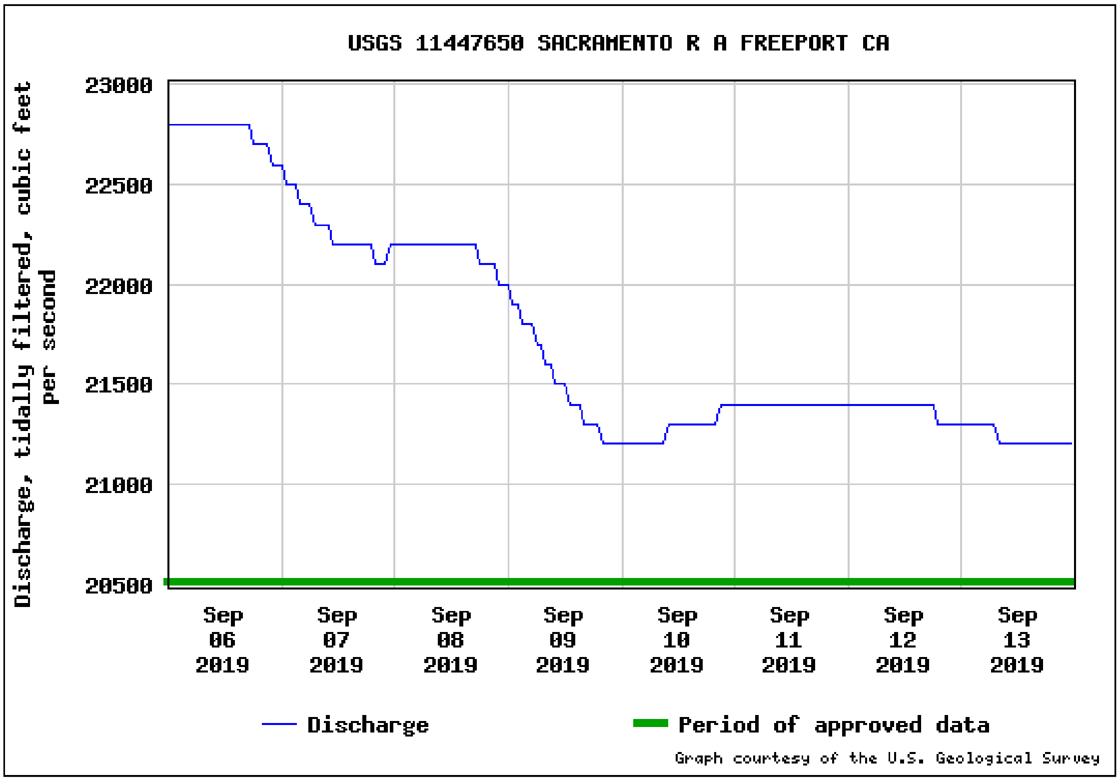


Figure 83. Discharge recorded at the USGS continuous monitoring station at Freeport, from 9/6/19–9/13/19. Figure from U.S. Geological Survey (2022).

In the discrete water samples, values of dissolved nitrogen, dissolved TKN, nitrate, and ammonium on 9/11/19 and 9/12/19 were lower than on 9/10/19, in association with the decrease in wastewater nutrient loading. For nitrate, values on 9/12/19 were lower than on 9/10/19. However, dissolved total phosphorus, DIC, DOC, and silica did not differ with day of the experiment. Likewise, sonde measurements of temperature, dissolved oxygen, specific conductance, and pH did not differ with day. As was the case with the high-resolution mapping, chl-*a* in the discrete water sampling did not differ with day, with a median concentration of approximately 3 µg/L chl-*a* throughout the three-day time course in all three channels. However, at the SREM station and three stations in Georgiana Slough the chl-*a* concentrations increased from approximately 3 µg/L to 5 µg/L by 9/12/19. Cyanobacteria density in the discrete water samples decreased significantly with day, as did total phytoplankton density. The biovolume of all forms of phytoplankton did not differ significantly with day. Although changes in phytoplankton cell densities with day were statistically significant, they were not enough to impact chl-*a* concentrations, which remained low throughout the three-day time course. Because cell densities are determined on relatively few cells (i.e., 400 cells or less) compared with the total number of phytoplankton cells in a liter of water (i.e., close to 1 million cells), they are not a robust measurement in terms of determining total phytoplankton biovolume. Rather, cell densities can be used for determining relative contributions of different phytoplankton taxa to the phytoplankton community.

Carbon uptake increased significantly with day, while the enrichment of δ^{13}C-POC became significantly more negative with day. Meanwhile, POC did not differ significantly with day. Productivity increased on day 3, presumably following a day of acclimation to the higher water column light intensities (i.e., photoacclimation) observed on day 2 (9/11/19; Geider et al. 1998). When phytoplankton cells are acclimated to low light, an increase in light intensity will typically lead to photoinhibition resulting in a depression of productivity before cells acclimate to the higher light intensities and increase their productivity (Long et al. 1994, Geider et al. 1998, Behrenfeld et al. 1998). This pattern of depression in productivity following an increase in light was evident in all three channels on day 2 (9/11/19) when carbon uptake was depressed relative to day 1, followed by an increase in carbon uptake on day 3 (Figure 58). This was not the case in the MOKEM sample station where increases in carbon uptake occurred on day 2 as well as day 3, suggesting that the phytoplankton community in this channel was already acclimated to higher irradiances and could increase its rate of carbon uptake in response to the change in irradiance without having to go through a period of photoacclimation. Following increases in carbon uptake, increases in phytoplankton biomass will occur according to the growth rate of the phytoplankton. During the current experiment, phytoplankton were growing at a rate of 80–90 µg C/L/d, and the doubling time for phytoplankton biomass of 250–300 µg C/L would be approximately 3 days. This suggests that an increase in carbon uptake rate would take three days to manifest as an increase in phytoplankton biomass. As such, the time frame of the current experiment was likely too short to observe differences in phytoplankton biomass related to changes in “bottom-up” parameters such as irradiance.

Total zooplankton density and Cladocera density decreased significantly with day, but this appeared to be driven by changes in a single channel, the South Fork Mokelumne River. The biomass of total zooplankton, Cladocera, and all other forms of zooplankton biomass did not differ significantly with day. Furthermore, zooplankton growth metrics appeared to show little or no effect of wastewater or the lack thereof. Clam abundance was not anticipated to change during the short timeframe of the halt in wastewater nutrient loading. Clam biomass was assessed on one occasion, two weeks subsequent to the other sampling, in order to provide estimates of grazing, which ranged from 0.2–8.4%, as a percentage of the water column grazed per day.

Observed Food Web Changes

Our observed food web diagram confirms some of our predictions, but some remain unclear. Nitrogen forms decreased with day, but the effects on phytoplankton are uncertain, as relative changes in community composition did not contribute to overall changes in phytoplankton biomass as measured by fCHL or chl-*a* concentrations in discrete water samples. As we have discussed in the previous section, non-limiting concentrations of nutrients would not necessarily be expected to have an impact on phytoplankton biomass, while increased irradiance may have impacted carbon uptake, but may not have induced a measurable change in biomass over the short timeframe of this experiment. Notably:

1. Measured fluorescent chlorophyll-*a* concentrations were generally low throughout the study region (<10 µg/L). High-resolution mapping detected higher fCHL concentrations in the North Fork Mokelumne River on 9/10/19 when nitrogen concentrations were high compared to 9/11/19 or 9/12/19. Meanwhile, chl-*a* discrete water samples indicated that the average chl-*a* concentrations within the three channels did not change significantly with day of the experiment. In the enumeration discrete samples, total phytoplankton density, but not biovolume, decreased with day, with densities on 9/10/19 exceeding densities on 9/12/19.

2. Chlorophyll fluorescence attributed to diatoms decreased in association with the decrease in wastewater nutrient loading from 9/10/19–9/11/19, but only in the North Fork Mokelumne River. Meanwhile, Bacillariophyta (diatom) density and biovolume in the phytoplankton enumeration discrete water samples did not differ with day.

3. Chlorophyll fluorescence attributed to blue-green algae showed a slight decrease from 9/10/19–9/12/19. Meanwhile, the phytoplankton enumeration discrete water samples showed that average Cyanobacteria density, but not biovolume, decreased with day, with densities on 9/10/19 exceeding densities on 9/12/19.

Based on the results from the bbe Fluoroprobe fluorescence for diatoms and blue-green algae, and also the discrete sample enumeration densities for total phytoplankton and Cyanobacteria, we have shown observed phytoplankton abundance as "decreased" in the observed food web below (Figure 84). Note that if we had used the total fCHL or chl-*a* discrete sample results, or discrete sample biovolume results, the size of the "Observed" Phytoplankton box would have been the same with or without wastewater effluent loading. Changes in zooplankton abundance were inconclusive (no differences in biomass with day but decreases in density of total zooplankton and Cladocera that were presumably driven by changes in the South Fork Mokelumne River only), so we have shown zooplankton abundance as unchanged. We continue to assume that clam biomass was unchanged during the course of the experiment.

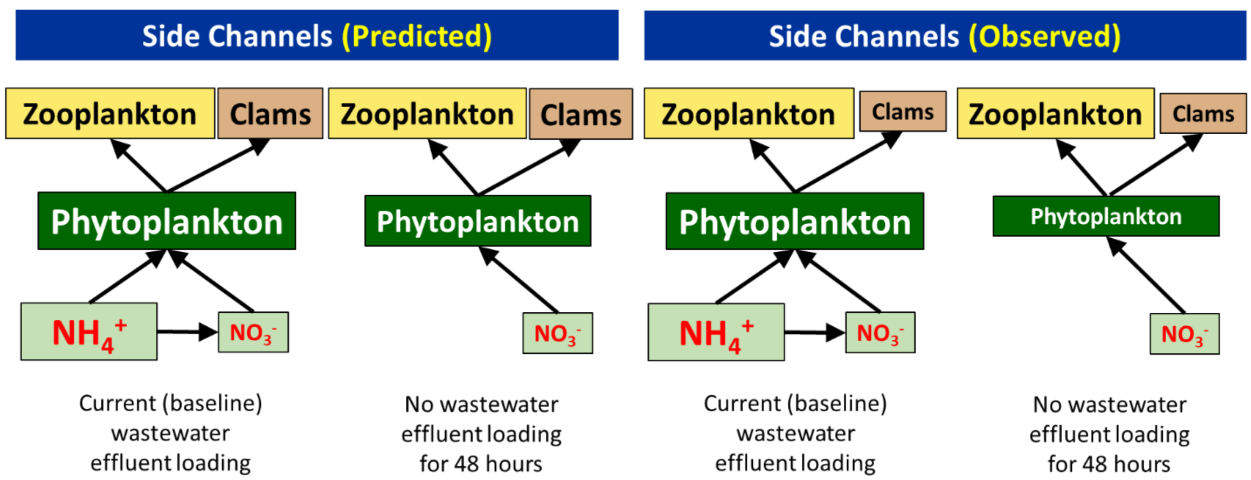


Figure 84. Simplified food web diagrams for the channel area showing predicted and observed (discrete water sample) wastewater nutrient load (focusing on ammonium and nitrate) and standing stock biomass under two scenarios: (1) Current effluent nutrient loading, (2) No effluent loading, as occurred during the 48-hour EVR diversion on 9/10/19–9/11/19. The box size shows biomass at each trophic level relative to the other situations.

Observed Conceptual Model Diagram

Based on our results, some parts of our conceptual model have become clearer, while others are still uncertain. During the without-wastewater treatment ammonium concentrations nearly disappeared, and nitrate concentrations decreased (Figure 85). As we had anticipated, depths in the three channels were somewhat shallower than in the Sacramento River, allowing for a greater proportion of the water column to be in the euphotic zone for a given level of turbidity. However, light increased throughout the study area across the three days of the study, not just in the channels, apparently due to lower turbidity water entering the system from upstream of Freeport. Based on the RMA particle tracking model, particle transport speeds were similar in Georgiana Slough and the North Fork Mokelumne River and were less than half of those occurring in the Sacramento River.[3] The slowest particle transport speed occurred in the South Fork Mokelumne River. The time needed for 50% of particles to travel from Station 1 to Station 4 in each channel (Figure 1) was 10.75 h in Georgiana Slough (9.41 km), 11.75 h in the North Fork Mokelumne River (9.00 km), and 25 h in the South Fork Mokelumne River (10.82 km). Uncertainty remains regarding the response of phytoplankton to the change in wastewater nutrient loading, since fCHL and chl-*a* in discrete water samples did not show consistent differences across the study period and study area, whereas chlorophyll fluorescence attributed to blue-green algae and their density in discrete samples showed decreases. As noted above for the food web diagrams, changes in zooplankton density and biomass were inconclusive, while zooplankton growth did not change significantly. We assume that clam abundance did not change over the short time frame of this experiment. As for the food web diagram above, phytoplankton in our conceptual model below are illustrated with the changes we observed in blue-green algae abundance, as well as the discrete sample enumeration densities for total phytoplankton and cyanobacteria.

[3] Freeport to SREM: 19 RM/13.5 h = 1.4 mph; SREM to GS4: 8.9 RM/17.25 h = 0.52 mph; SREM to NFM: 8.6 RM/16.25 h = 0.53 mph; SREM to SFM: 9.2 RM/30.75h = 0.30 mph. River mile distances were estimated from Google Earth. Estimated water velocities are from the RMA particle tracking results, for the 9/10/19, release at 00:00 at Freeport.

Figure 85. Observed conceptual model showing changes in the food web in the three downstream channels - Georgiana Slough, the North Fork Mokelumne River, and South Fork Mokelumne River during the cessation of nutrient loading from the wastewater treatment plant. The Delta Cross Channel gates, indicated by a gray bar between the Sacramento River and Mokelumne River, were open for the duration of the study.

Adaptive Management Approach

Adaptive management research experiments, such as the study we have described here, could be used to better understand the potential effects of future nutrient management actions, and to inform future nutrient policy development. Adaptive management has evolved since it was first envisioned in the early 1970s (Holling 1978, Walters 1986, Lee 1993, Westgate et al. 2013). Early proponents sought to design adaptive management experiments, often at pilot or temporary scale, and usually incorporating computer modeling techniques, to test the outcomes of potential full-scale management actions (Holling 1978). Collaboration with managers, and with those who are managed or regulated (e.g., commercial fishermen, foresters, public utilities) was found to be essential to having managers actually proceed with the management experiment in order to decrease uncertainty about the mechanisms governing a particular ecosystem (Walters 1986). More recently, adaptive management research includes collaboration with a broad group of stakeholders, to develop solutions that consider many perspectives and have a good chance of achieving wide buy-in (Lee 1993). In spite of advances in adaptive management processes, these types of projects are rarely truly successful (Westgate et al. 2013), often because of a lack of collaboration between scientists and representatives from resource managing entities, a lack of awareness of the risks of not doing adaptive management, and because adaptive management projects fail to "pass the test of management relevance." We believe our completed project is a successful example of adaptive management for several reasons: (1) our project team included scientists drawn from respected universities, scientific agencies, and consulting firms, in collaboration with scientists at Regional San, the regional wastewater treatment utility; (2) utility managers were already on board with the experiment and were interested in learning how the aquatic community responded to the wastewater loading change; and (3) our project is highly management-relevant to efforts such as the Delta Nutrient Research Plan (Central Valley Regional Water Control Board 2018). We studied the outcome of a temporary, major nutrient reduction that was already taking place—a complete cessation of discharge of effluent from the SRWTP to the Sacramento River—to gain information about potential future changes to SRWTP effluent loading. In addition, our study may help advance adaptive management practices and inform future nutrient policy developments in the Delta, because it addressed key scientific uncertainties and information gaps identified in the Delta Nutrient Research Plan (Central Valley Regional Water Quality Control Board 2018) as described in detail in Appendix 1.

Implications for Future Delta Nutrient Management

The SRiNCS examined the effects of a complete cessation of nutrient loading from SRWTP, but this was possible only for a timeframe of 48 hours. It is possible that certain parts of the habitat and food web were able to buffer the effects of decreased nutrient loading during this relatively short timeframe. For example, nutrient flux out of the sediment may have added to the nutrient pool in the water column and compensated to some degree for the decreased loading from SRWTP, as has been observed in previous nutrient studies in this section of the Sacramento River (Kraus et al. 2017a, Kraus et al. 2017c). Submerged aquatic vegetation was prevalent along the shoreline in all study channels except the Sacramento River. Sediment captured within the foliage of this vegetation would presumably contain nutrients and these could have been released to the mid-channel areas, also compensating for the decreased nutrient loading. Measurement of these potential fluxes was beyond the scope of the current study but could be addressed in future research (Christman et al. In press).

Given a longer period of decreased loading, different responses could have been observed in the food web in our study area. Our project was only a 3-day experiment, with two days of no wastewater nutrient loading. As such, our observations were easily influenced by short-term fluctuations in upstream water sources, particularly in terms of turbidity, but also phytoplankton community composition. It remains to be seen what will be observed in longer experiments to study the effects of a permanent decrease in nitrogen loading, as is occurring with the EchoWater Project, because these studies will be able to look at longer-term average conditions. Following the completion of the EchoWater Project biological nutrient removal upgrade in spring 2021, loading of ammonium from SRWTP has decreased by >95%. Since the ammonium has been converted to nitrate (nitrification), followed by partial denitrification, loading of nitrate in the effluent has increased, but the overall loading of DIN (mainly as ammonium and nitrate) from SRWTP has decreased by approximately 75% (Figure 86). While this decrease in nutrient loading from SRWTP is not as dramatic as that conducted for the SRiNCS in 2019, the decrease will be sustained. Monitoring the river after this permanent transition may reveal ecological changes that occur due to a long-term nutrient reduction. Following the treatment plant upgrade, effluent nutrients stored in the sediment may gradually be released to the water column through time, until the sediment nutrient store reaches a new equilibrium with the water column. In the future, more than half of the total nitrogen in the Sacramento River may be bound within organic material in September (Figure 86, post-EchoWater Project), and potentially in other months as well, which can be less available for uptake by phytoplankton and vascular plants, compared with the previous ammonium loads. Submerged aquatic vegetation may be broken down and flushed out of the channels during high winter flow events, thus transporting nutrients out of the system that are stored within the above-root part of the plants, or in the sediment trapped within the foliage. It would also be interesting to study the change in submerged and floating aquatic vegetation biomass under the new regime of lower SRWTP nutrient loading.

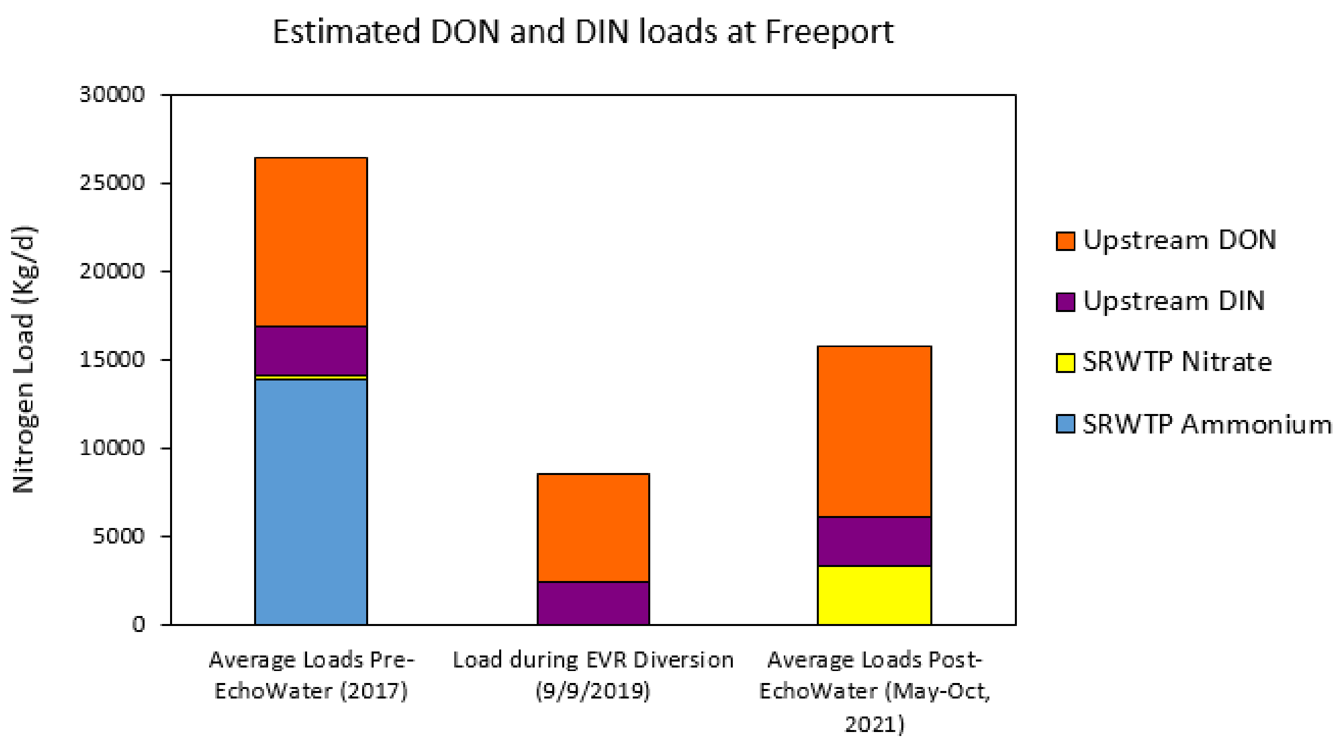


Figure 86. Estimated changes in Sacramento River nutrient loads related to the EVR diversion and the EchoWater Project. The pre-EchoWater loading estimate is based on average nitrogen concentrations and corresponding river discharges in Sacramento River at Freeport during the month of September from 2013–2020 as well as the average wastewater effluent nitrogen concentrations and corresponding daily effluent flows in 2017. The EVR load estimate is based on discrete water samples collected from the Sacramento River at Freeport on 9/9/19, combined with the corresponding river discharge at Freeport. The post-EchoWater data are based on average nitrogen concentrations and corresponding river discharges in Sacramento River at Freeport during the month of September from 2013–2020 as well as the average wastewater effluent nitrogen concentrations and effluent flows from May–October in 2021. Following nitrification and denitrification from the EchoWater Project, ammonium concentrations in SRWTP effluent are below the reporting limit of 0.1 mg/L but may provide a minor contribution to the total nitrogen load in the Sacramento River (not shown in figure).

Seasonal and inter-annual effects on the Sacramento River watershed may also influence future nutrient loads and transport. Nutrient concentrations in the Sacramento River upstream of the Delta may vary between winter and summer (Saleh and Domagalski 2021), whereas the nutrient loading from SRWTP is relatively consistent throughout the year. In addition, there may be effects of water year type. Wet years may involve increased flow volume, which would cause nutrients loaded from SRWTP to be transported downstream faster with less time for biogeochemical transformations and would also dilute these nutrient loads to lower concentrations (White et al. 2021). River flows during the SRiNCS were relatively high (the study occurred near the end of water year 2019, which in the Sacramento Valley was classified as a Wet year), but the 2020 and 2021 water years have been dry, which may make before and after comparisons of river conditions before and after the SRWTP EchoWater Project upgrade more challenging.

Finally, because our study took place during a short timeframe, other factors that may control phytoplankton growth, such as temperature and irradiance, were measured within relatively narrow ranges, which may have in turn affected the range of response of phytoplankton to altered nutrient concentrations. Our finding that plankton abundance and composition in a parcel of WW- water, after a period of 48 hours, did not differ appreciably from the wastewater-enriched water traveling in front of it may seem to imply that further reductions (or increases) in nutrient loading to the Delta would have no appreciable effect on Delta phytoplankton production. This is of interest in the context of increasing cyanobacterial harmful algal blooms in the Delta. The Delta is generally considered to be nutrient-enriched, so that other factors, including flow, temperature, and irradiance control cyanobacterial harmful algal blooms (Kudela et al. In press). However, when other factors such as temperature are favorable to the growth of harmful algae, the concentration of nutrients still sets an upper boundary on the harmful algae biomass that develops during a cyanobacterial harmful algal bloom event (Berg and Sutula 2015). Conversely, to completely suppress harmful algae, when other factors favor their growth, nutrient concentrations may need to be reduced to levels that would also preclude the growth of beneficial phytoplankton necessary to support higher trophic levels of the Delta food web.

In summary, it is unclear whether the short-term (48-hour) removal of wastewater effluent and its nutrient load from these Delta river channels led to a change in the abundance of some forms of phytoplankton, because fCHL and chl-*a* concentrations did not show clear differences while chlorophyll fluorescence attributed to blue-green algae and their abundance in discrete samples showed decreases. Some of our results suggest that, given the observed growth rate of phytoplankton in our study area, the time frame of the current experiment was likely too short to observe differences in phytoplankton biomass related to changes in “bottom-up” parameters such as irradiance. It will be interesting and informative to see the potential effects of longer-term nutrient loading reductions. Such effects remain to be studied now that the SRWTP biological nutrient removal upgrade is in operation. The potential effects of buffering factors, including nutrients that may be stored in river sediment or within beds of aquatic vegetation (macrophytes), could also be examined in future studies. Additional research focused on the longer-term responses of nutrient cycling, and the abundance and growth of phytoplankton and zooplankton at lower nutrient concentrations, could inform future Delta ecosystem management.

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Appendix 1. Relevance of SRiNCS to Management Drivers

Relevance to Delta Regional Monitoring Program Management and Assessment Questions

This study directly addressed the following Delta Regional Monitoring Program Management and Assessment Questions:

Status and Trends–Questions 1 and 1C
1. How do concentrations of nutrients (and nutrient-associated parameters) vary spatially and temporally?
C. Are there important data gaps associated with particular water bodies within the Delta subregions?
Explanation: Previous study of a wastewater diversion did not investigate effects in channels other than the Sacramento River.

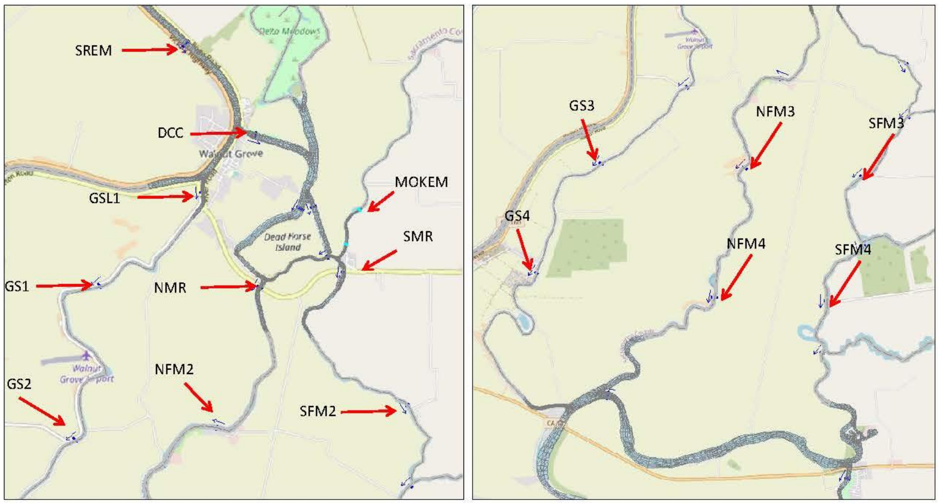
Sources, Pathways, Loadings and Processes–Questions 1, 1A, and 2A
1. Which sources, pathways, and processes contribute most to observed levels of nutrients?
A. How have nutrient or nutrient-related source controls and water management actions changed ambient levels of nutrients and nutrient-associated parameters?
2. How are nutrients linked to water-quality concerns such as harmful algal blooms, low dissolved oxygen, invasive aquatic macrophytes, low phytoplankton productivity, and drinking-water issues?
A. Which factors in the Delta influence the effects of nutrients on the water-quality concerns listed above?
Explanation: The project will track the effects of a significant change in nutrient loading from wastewater. Comparisons among channels and with/without SRWTP effluent will allow examination of factors of light availability and water residence time.

Forecasting Scenarios
How will nutrient loads, concentrations, and water-quality concerns from Sources, Pathways, Loadings & Processes Question 2 respond to potential or planned future source control actions, restoration projects, water resource management changes, and climate change?
Explanation: The project is an opportunity to examine effects of a major change in nutrient loads. On an annual average basis, current nitrogen loads from Regional San and the Sacramento River upstream of Regional San are 14,000 and 18,500 kg N/day, respectively.
In fall, when the project monitoring will occur, the difference will be more marked as Sacramento River upstream nitrogen loads are lower than the yearly average.

Effectiveness Tracking
How did nutrient loads, concentrations, and water-quality concerns from Sources, Pathways, Loadings & Processes Question 2 respond to source control actions, restoration projects, and water resource management changes?
Explanation: The project is a preview of nutrient changes expected due to the Regional San EchoWater upgrade. The project uses an adaptive management approach to monitoring by utilizing pre-planned infrastructure changes to field-test hypotheses of effects of the upgrade.

Appendix 2. RMA Modeling of Sacramento River Nutrient Study (Flow and Transport) Final Report

RMA Modeling of Sacramento River Nutrient Change Study



Particle Capture Locations and Nomenclature

Presented to:

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Introduction

This report includes documentation on numerical modeling tasks prepared by Resource Management Associates (RMA) for the Sacramento Regional County Sanitation District's (Regional San) Sacramento River Nutrient Change (SRiNCS) project. Documentation on model development and results from the primary tasks is included. One task specified refinement of the RMA Delta model grid for enhancing spatial resolution in the area of interest of the project as well as a check on the flow and stage calibration in this area of interest in a historical time frame. Sections 1 and 2 document the results of this work. In addition, a flow simulation covering the project time span was developed and its accuracy checked against measured data – this is documented in Section 3. In order to calculate volumetric percentages using a tracer modeling approach, a project specific transport model was developed covering the data acquisition period for the project. An EC model was developed as a template for the volumetric transport model to modify transport dispersion parameters reflecting changes to the modified grid. This is documented in Section 4. Section 5 documents the development, background and results from a particle tracking model. Section 6 summarizes Findings from the modeling tasks.

Section 1 RMA Delta Model Grid Development

A particular focus of the Sacramento River Nutrient Change study was the Mokelumne River system east of the Delta Cross Channel. The area is a complex system of interconnected channels and sloughs. River inflow is from the east from the upstream Mokelumne and Cosumnes Rivers. When the Delta Cross Channel gates are open, the flow regime is dominated by transfer flow from the Sacramento River, which varies widely in magnitude over the tidal cycle.

Specific conductance (EC) measurements performed during the field survey showed EC could vary significantly over a short distance near the channel junctions. To capture the detail of the source water mixing and attribution, the RMA Delta model grid was enhanced from 1-D elements to 2-D detailed elements in those areas (Figure 1 and Figure 2). Figure 3 shows the model bathymetry and grid detail near the Delta Cross Channel. Figure 4 the bathymetry and grid detail on the downstream North Fork and South Fork Mokelumne River.

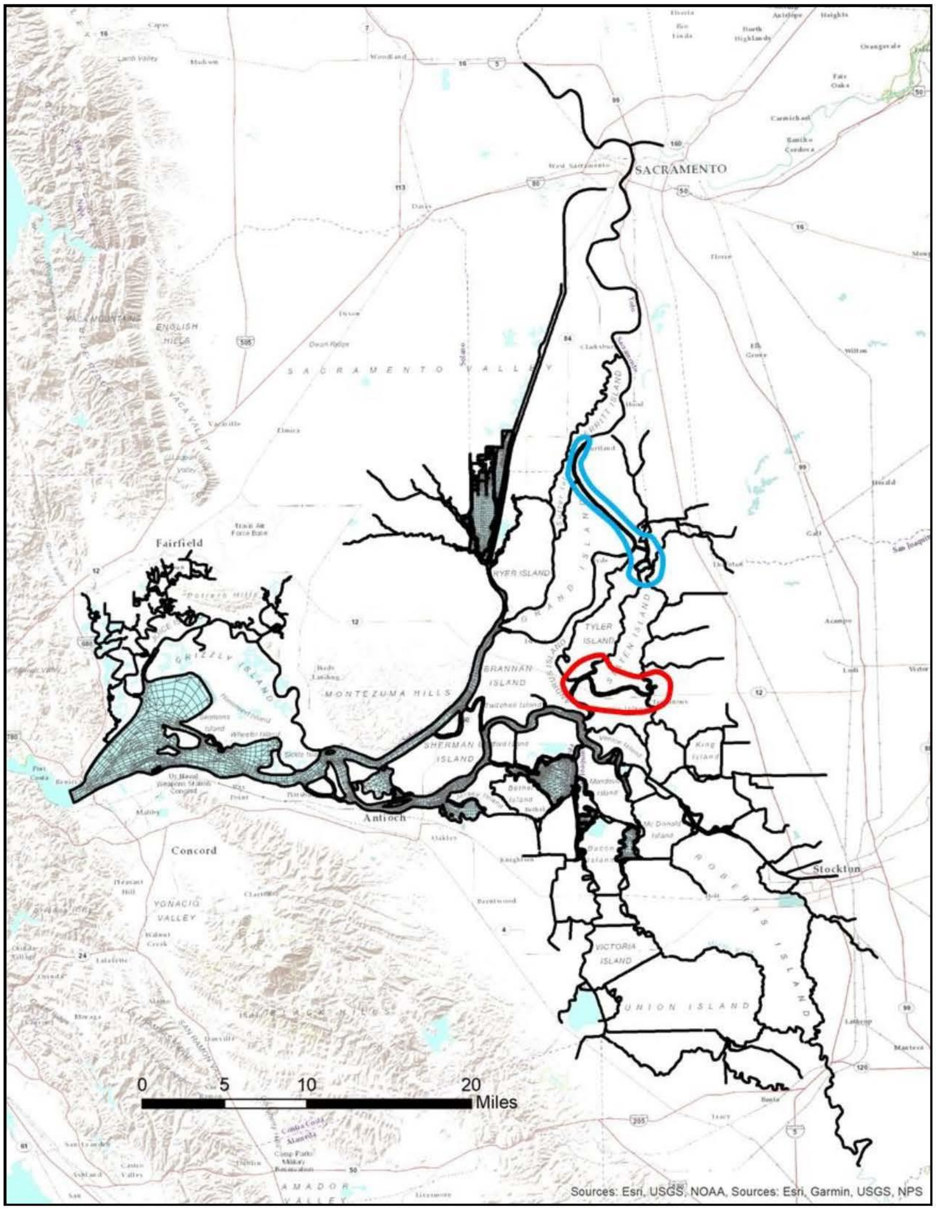

Figure 1 Coverage of the RMA Delta model, with locations of the new or refined 2-D grid development; near the Delta Cross Channel (blue) and the downstream sections of the North Fork and South Fork Mokelumne River (red).

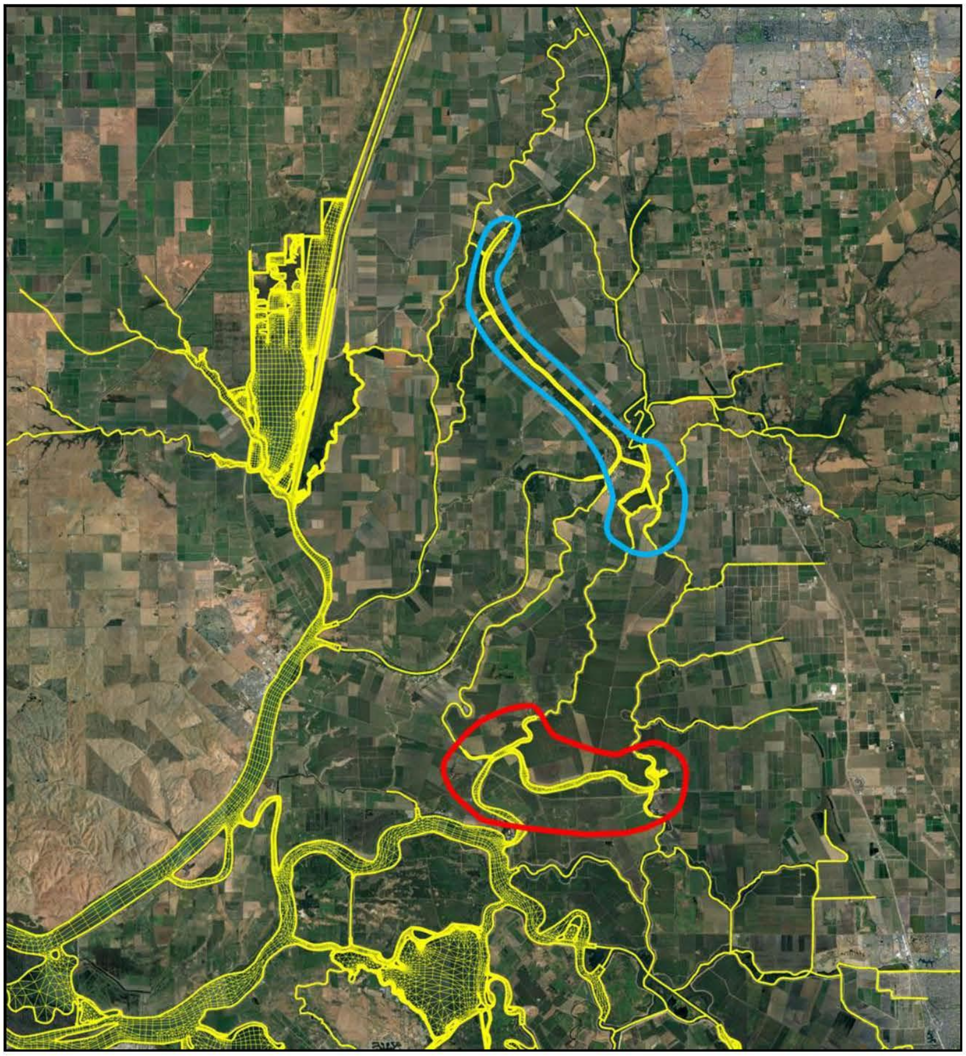

Figure 2 Additional detail for locations of new or refined 2-D grid development in the RMA model; near the Delta Cross Channel (blue) and the downstream sections of the North and South Mokelumne River (red).

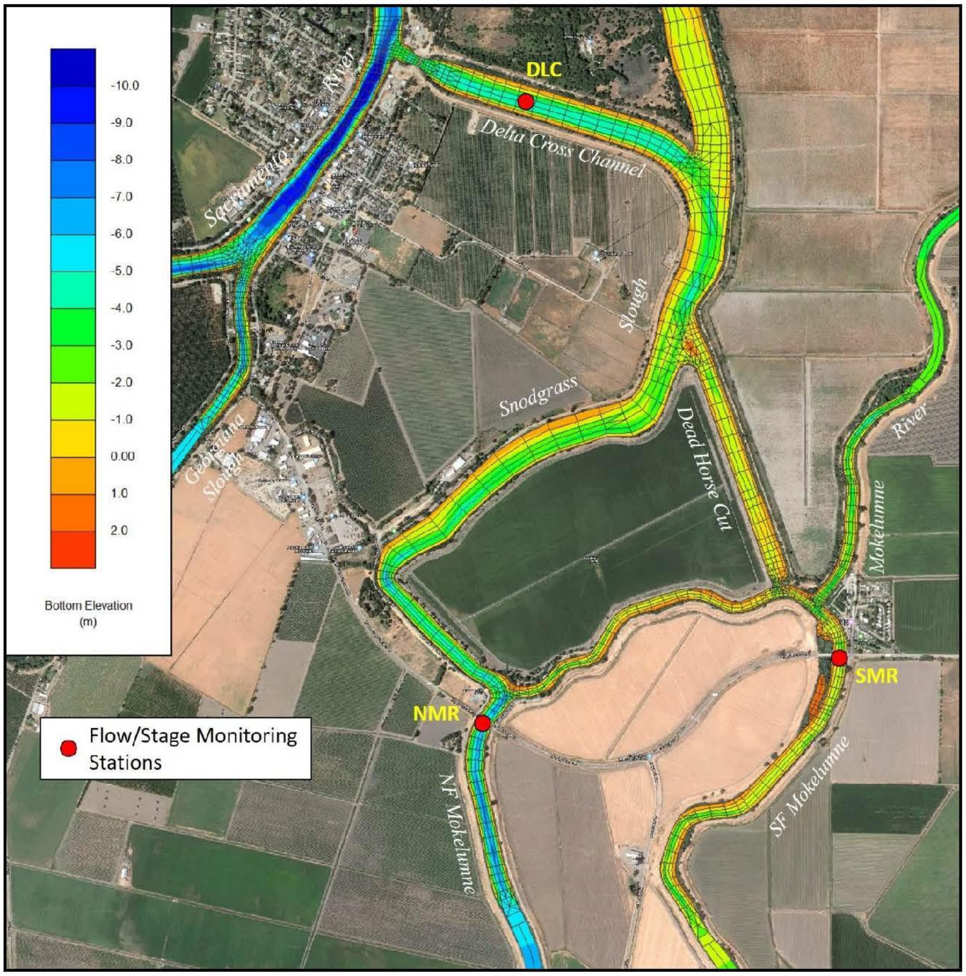

Figure 3 Detail of the model 2-D grid and bathymetry near the Delta Cross Channel.

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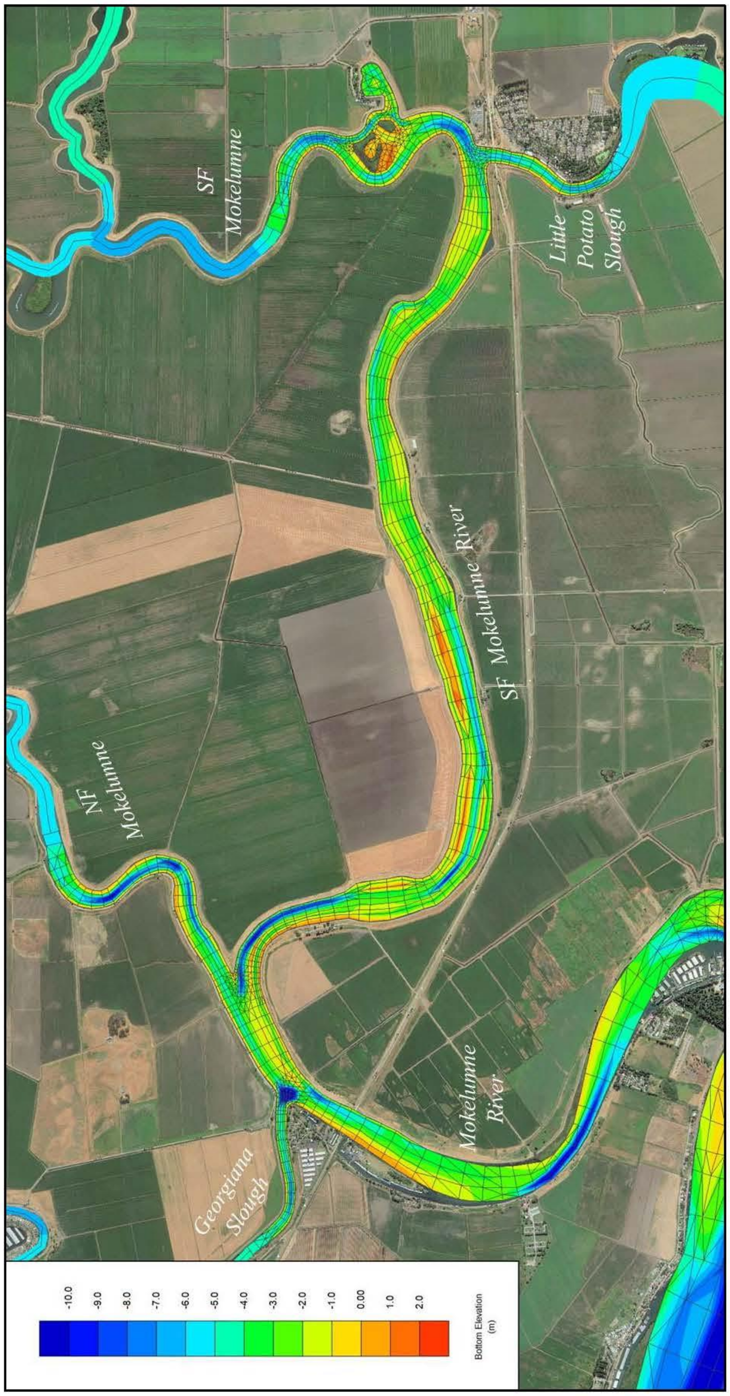

Figure 4 Detail of the model 2-D grid and bathymetry near the downstream North Fork and South Fork Mokelumne River.

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Section 2 RMA2 Flow and Stage Model Calibration

The revised RMA Delta model grid developed and documented in Section 1 was calibrated/validated for flow and stage in the north Delta, with special interest to the Delta Cross Channel and the north and south forks of the Mokelumne River system.

The North Fork and South Fork Mokelumne River flow monitoring stations east of the Delta Cross Channel were lost during the 2017 winter season. As these locations are of particular interest, the calibration run was performed over the June 1 to July 31, 2016 period when the flow gauges were still functioning. Figure 5 shows the flow for the Sacramento River at Freeport, and the Mokelumne and Cosumnes Rivers for the calibration period. Also presented is the Delta Cross Channel (DCC) gates operation. Note that the DCC gates were open and closed twice in early June before permanently open for the summer season on June 18, 2016. In comparison to the 2019 field season, the 2016 June-July Sacramento River flow was somewhat lower, but higher than that for the previous three years of drought. The Mokelumne River flow was about 200 cfs in June 2016, similar to the flow in the first half of September 2019 during the field study. However, the early 2019 summertime Mokelumne River flow was much higher at 680 to 1500 cfs.

The observed and model stage/flow at selected Delta monitoring stations are compared in 3-panel plots as illustrated in Figure 7.

- The top panel provides a visual comparison of the 15-minute interval observed and computed stage/flow to illustrate how well the model reproduces the inter-tidal dynamics of the system.
- The lower-left panel provides a visual comparison of the tidally-averaged (two passes of 24.75 hour moving average window) observed and computed stage/flow time series to illustrate how well the model reproduces the net flow or average stage over the simulation period.
- The lower-right panel presents a linear regression analysis of 15-minute computed and model stage or flow to provide statistical values of the model performance.

Calibration Statistics

Mean value and linear regression statistics were computed from 15-minute interval values of the model and observed time series over the June 1 to July 31 period (Figure 7) and provide an overall measure of the model bias. Model values were excluded from the mean value computation for the times when observed values were missing.

A cross-correlation analysis was first performed to determine the phase lag between the model and observed data time series. The phase difference was removed from the model time series and a linear regression perform for the shifted model time series versus the observed data time series. The regression metrics are described below.

Lag – The time offset for which the best correlation between model and observed data is obtained. Positive time lags indicate delayed model response relative to observed data. Negative time lags indicate model response in advance of observed data.

Tidal Amp Ratio – The slope of the best linear regression line between the tidal components of the modeled and observed data. This is calculated after the tidally-averaged signal has been removed from both data sets and the model data has been shifted to account for any time lag from the observed data. Amplitude ratios greater than 1.0 indicate an amplification of the tidal signal in the model relative to observed data. Amplitude ratios less than 1.0 indicate a dampening of the tidal signal.

R^2 – The square of the correlation coefficient for a linear regression between modeled and observed data. The better the model is at reproducing detailed variations and trends of the observed values, the smaller the scatter will be and the closer R^2 will be to 1. Additionally, the slope of the regression line should be close to 1 to indicate a good fit.

Calibration plots of stage and flow for the Delta Cross Channel and the north and south fork Mokelumne River stations (Figure 6) are presented in Figure 7 to Figure 10. The figures show the model reproduces the observed stage and flow in the area for both the case with the DCC gates open and closed. Of note are the intricate peaks and troughs of the South Fork Mokelumne (SMR) inter-tidal flow, of which the model reproduces fairly well. All three flow station plots show the model phase is in advance of the observed flow phase. This is partly due to the observed flow being averaged over a 15-minute period which should contribute to a 7.5 minute phase lag in the observed data. Still the modeled phase remains several minutes advanced of the field measured flow and should be considered when comparing field and model water quality data. The calibration results for flow are shown at two additional stations, in Little Potato Slough and in the Mokelumne River at the San Joaquin River, in the Appendix (page 62, Appendix)

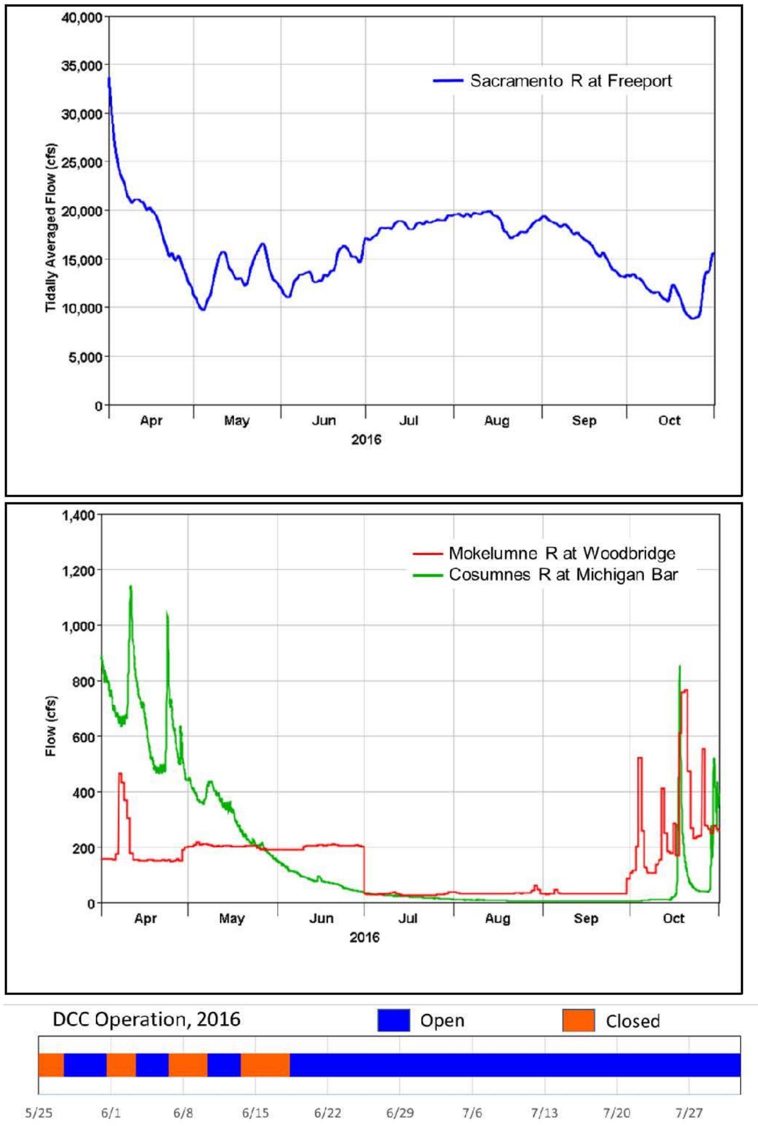

Figure 5 Inflow for the Sacramento River (top) and the Mokelumne River and the Cosumnes River (middle) for 2016 calibration. Delta Cross Channel Gate operation for 2016 calibration period (bottom).

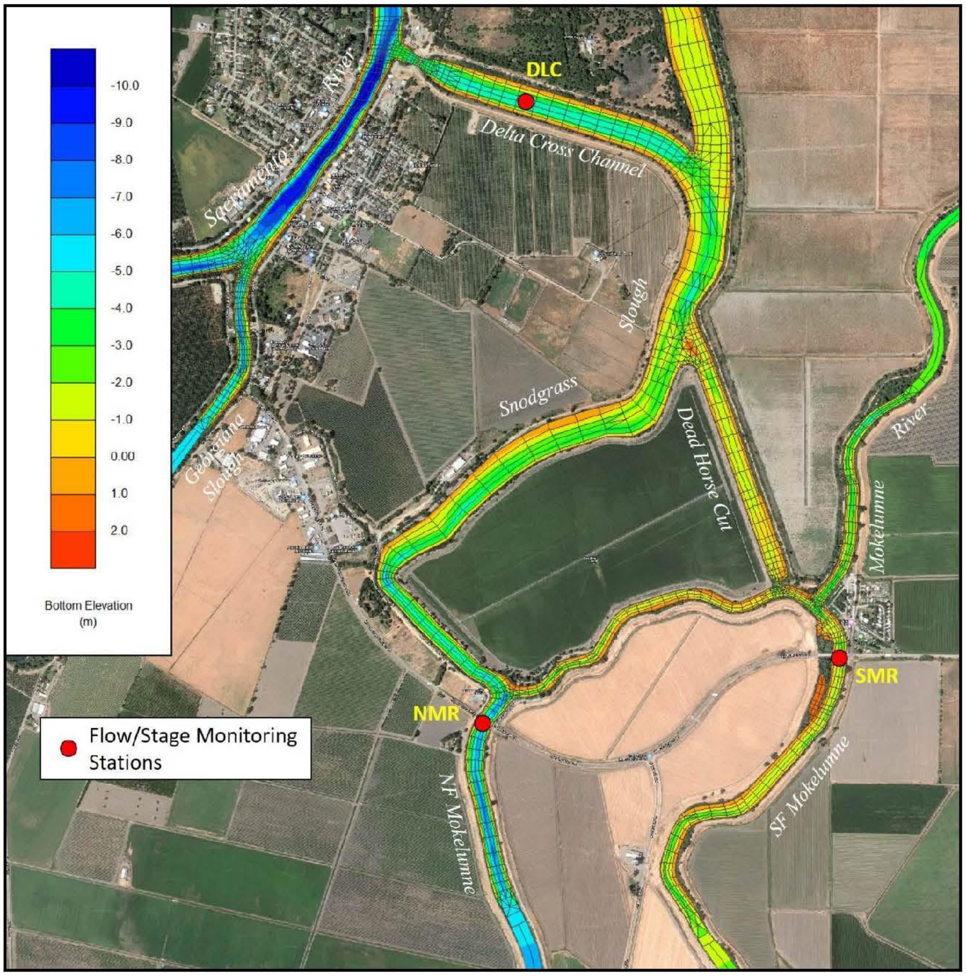

Figure 6 Detail of the model 2-D grid and bathymetry near the Delta Cross Channel.

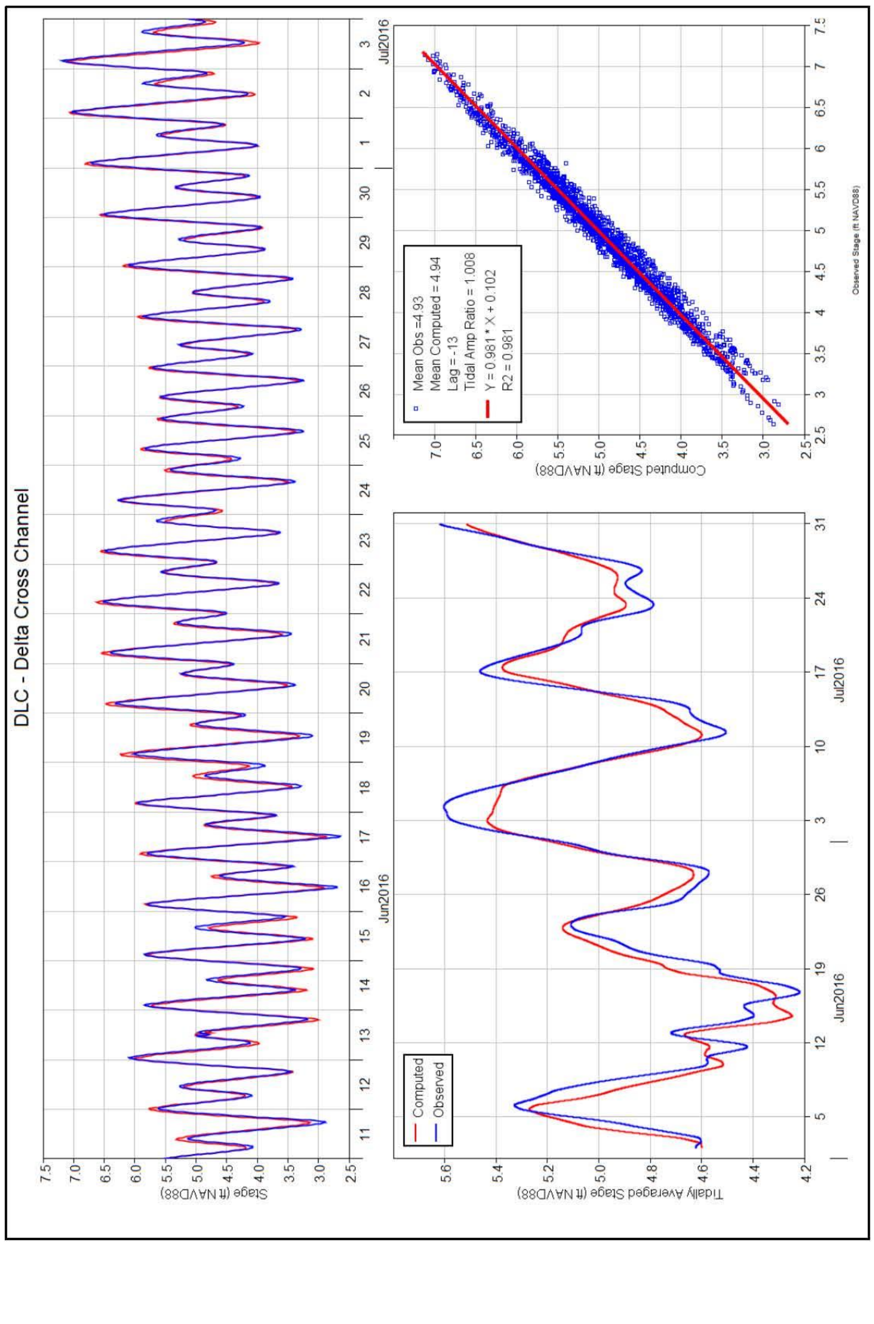

Figure 7 Model and observed stage at the Delta Cross Channel station DLC.

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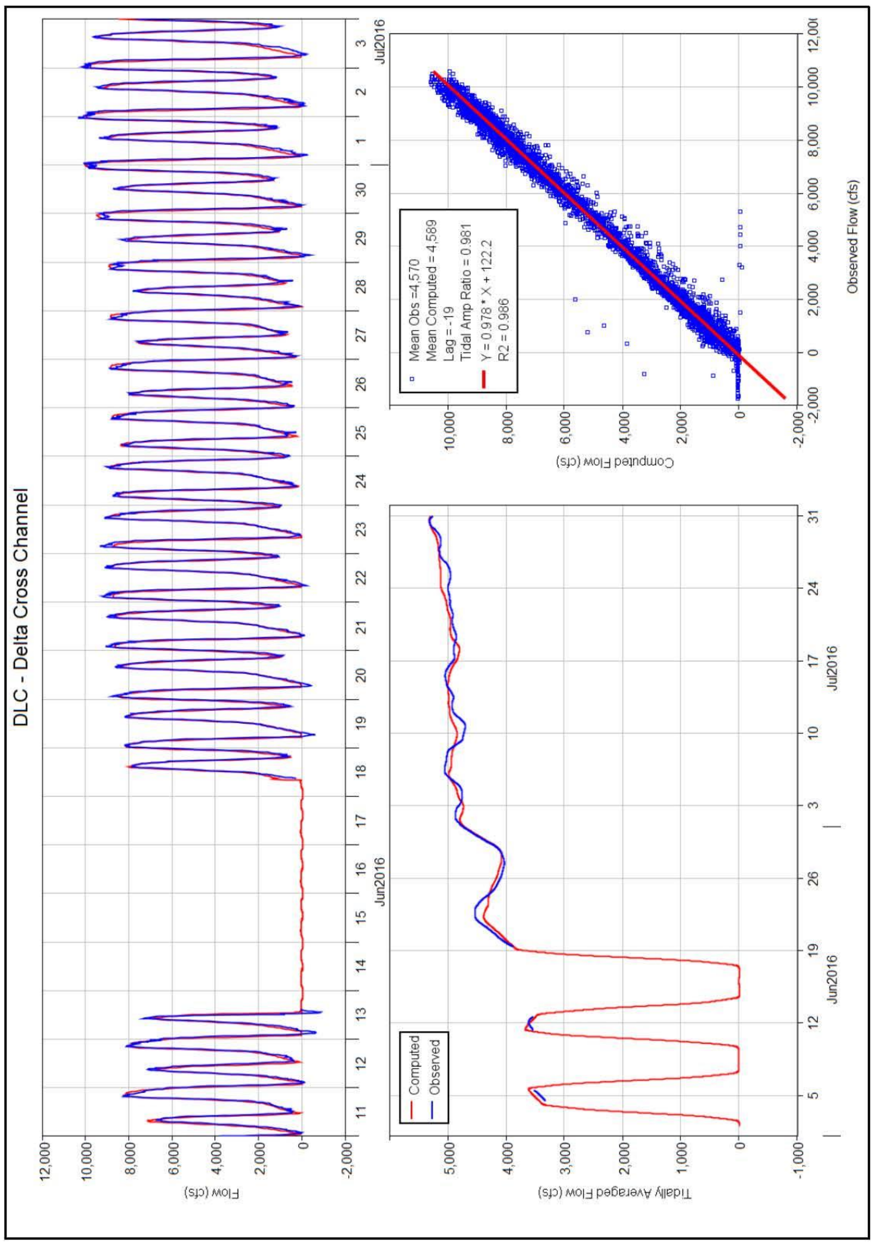

Figure 8 Model and observed flow at the Delta Cross Channel station DLC.

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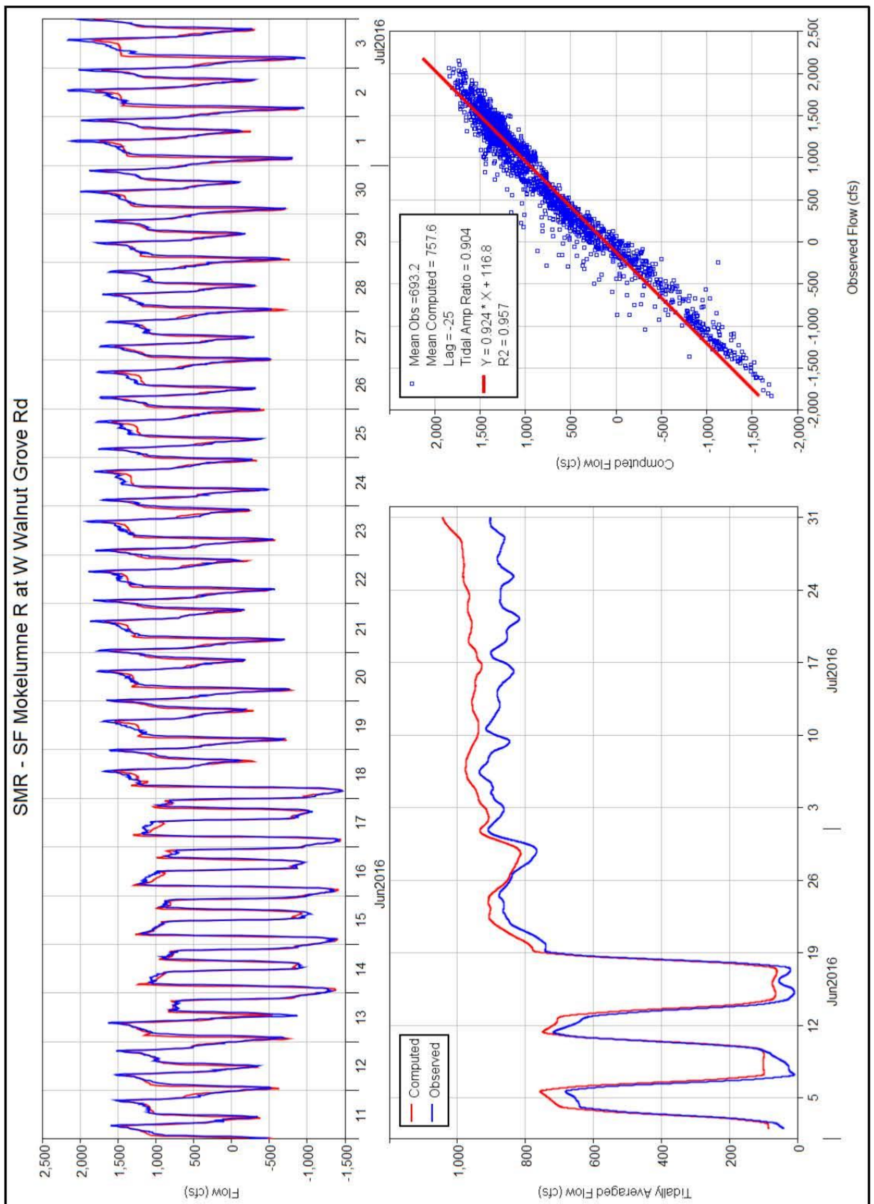

Figure 9 Model and observed flow at the South Fork Mokelumne River station SMF.

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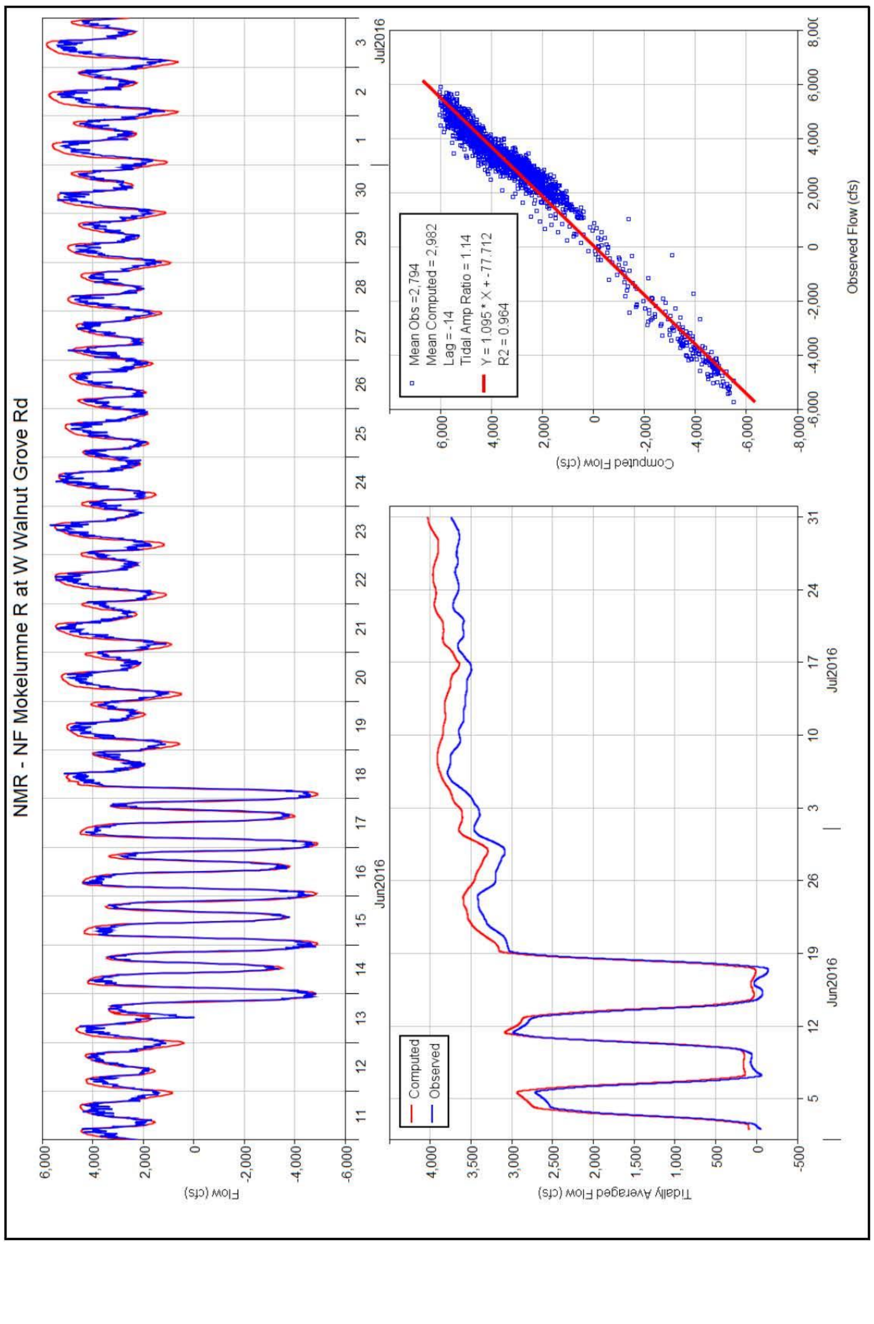

Figure 10 Model and observed flow at the North Fork Mokelumne River station NMF.

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Section 3 Development of Flow/Stage Modeling for the Project

Starting from the calibrated RMA2 model with the updated grid developed for this project (see: Sections 1 and 2), project-specific inflow boundary conditions and comparison data were obtained for the relevant time span from standard data sources (CDEC, USGS, NOAA) as well as flow data for the Mokelumne River sourced from personal communications with staff at the East Bay Municipal Utility District, EBMUD. Regional San effluent flow and EC data was requested for the period July 01 through September 13, 2019 and obtained from Regional San staff (Timothy Mussen).[1] Figure captions indicate the data source for each relevant boundary condition.

Figure 11 shows the RMA Delta Model domain with inflow and outflow boundary locations in pink (circles) and cyan blue (bars), DICU (Delta Island Consumptive Use) locations in yellow and gates and barriers in red. As indicated in Figure 3 and Figure 4, the focus of modeling concerned the section of the Sacramento River through Georgiana Slough and the eastern section of the Delta focusing on the DCC and the Mokelumne River. Inflow locations for the Sacramento, American, Cosumnes and Mokelumne Rivers are indicated in Figure 12 – these rivers plus the effluent flow from Regional San form the most relevant inflow locations for this project. Boundary condition data for other locations was collected from standard RMA sources (CDEC and USGS for flow, NOAA for Martinez stage).

The RMA2 flow model was prepared for the period July 4, 2019 through September 19, 2019. Simulated flow and stage output were compared with data, and minor modifications made to correct timing or level of flow. After a modification to Cosumnes River inflow described in Section 4, the final flow simulation was used for all RMA11 transport simulations as well as particle tracking simulations. Note that DICU boundary conditions (inflows and outflows) were NOT included as these values are not available in real-time. Instead, they are calculated post-fact by staff at the Department of Water Resources' Delta Modeling Section using in-house modeling software. To compensate for this missing data, the Sacramento River inflow was set so as to obtain acceptable fits to flow, net flow and stage measurements at RSAC155 (Freeport) and at a few other standard measurement locations downstream on the Sacramento River. As mentioned below, while Regional San effluent flow was available as requested, effluent EC measurements were only available on a sparse, irregular data set which necessitated some fine-tuning of flow and EC boundary conditions as modeling progressed.

Figure 13 through Figure 16 show the inflow boundary conditions for the important locations. The Freeport location, Figure 13, had relevant data at downstream locations available for comparison during the development of the boundary conditions. The inflow location for Regional San effluent is near (downstream) the Freeport location in the model domain. As discussed in the next section on Volumetric modeling, the Cosumnes River boundary condition was altered by adding 50 cfs to the data. The timing and magnitude of the Regional San effluent flow was fine-tuned during periods without data measurements to improve results during the

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[1] Data was available from July 01, 2019 through September 13th 2019, but the July data was not requested.

calibration of the dispersion coefficients of the RMA11 model. Figure 17 and Figure 18 show the comparison between data (blue lines) and model output (red lines) at the Delta Cross Channel and Georgiana Slough locations, respectively. The flow results before and during the project period are shown at two additional stations, Little Potato Slough and in the Mokelumne River at the San Joaquin River in the Appendix (page 62).

The DCC was the most important location with data to compare to modeled flow as this location captured Sacramento River inflow to the project region - there was no timeseries data internal to the project region for comparison. The mean percent difference between modeled tidally-averaged flow and data in the DCC was -3.2% with a standard deviation of 1.4 cfs, using 2824 data points from July 04 through August 20, 2019 (data not shown). This was deemed an acceptable difference for project purposes.

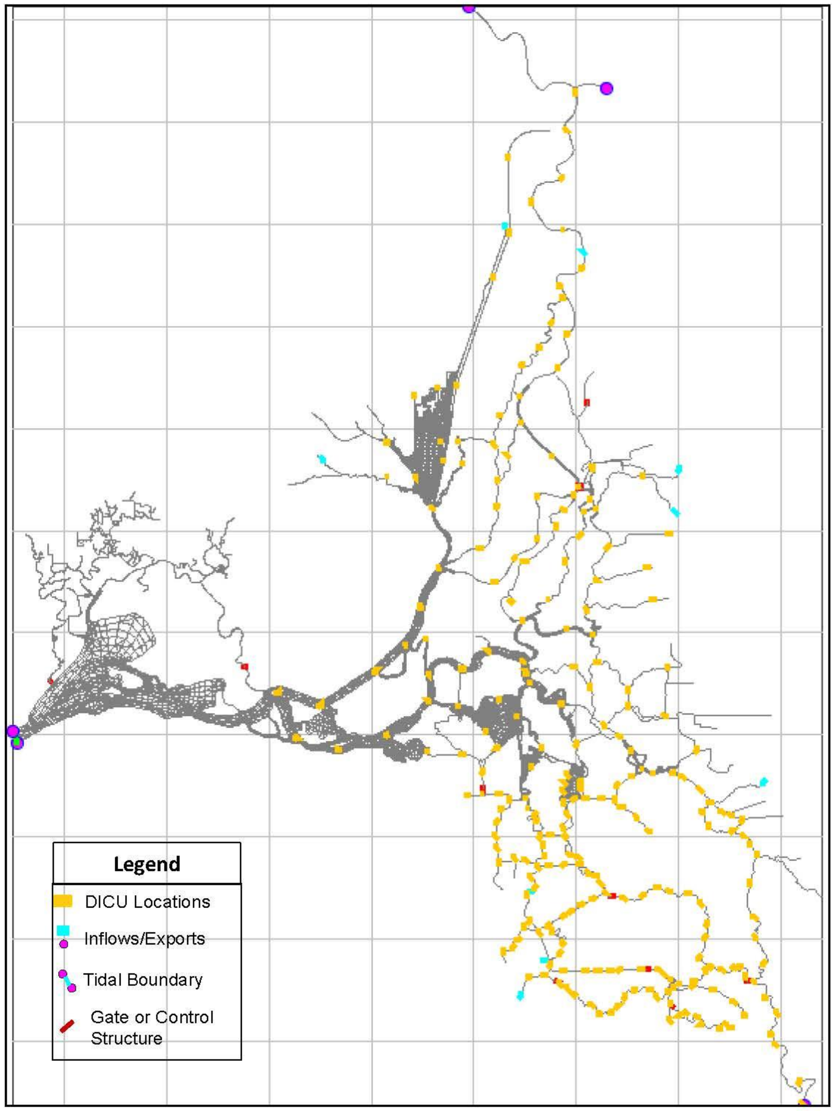

Figure 11 Model domain for the RMA Delta Model.

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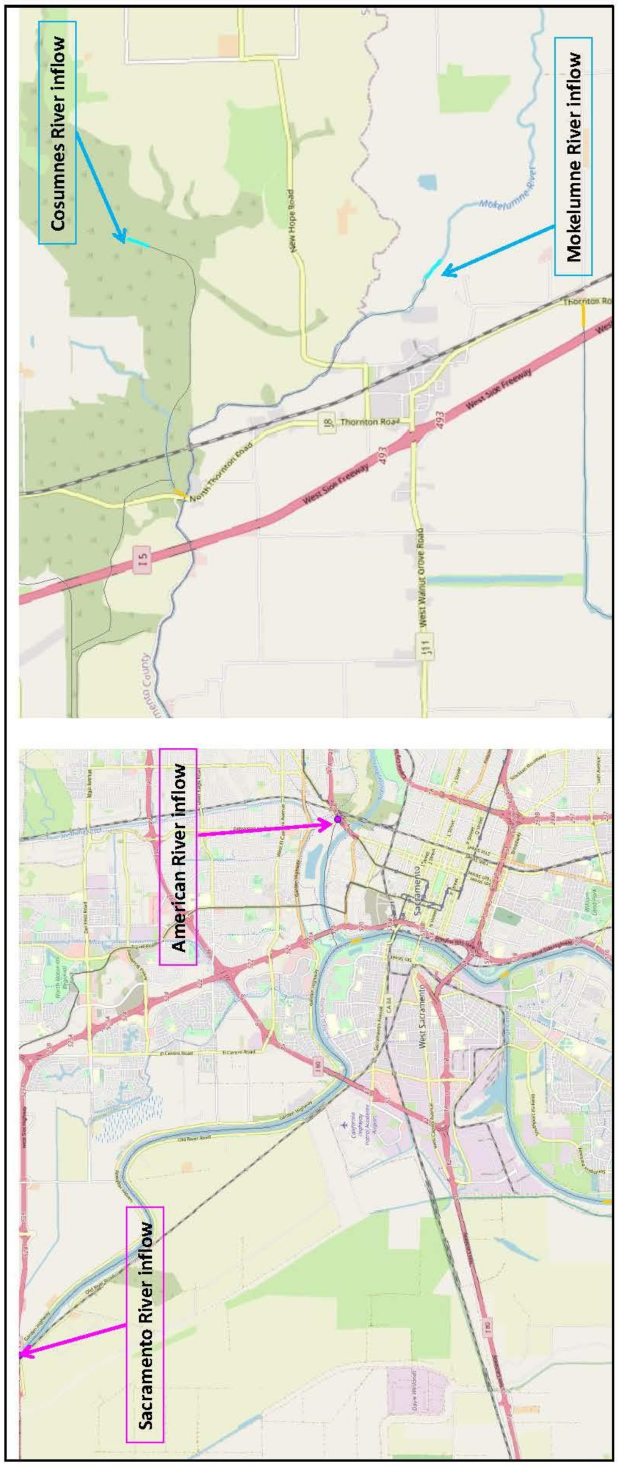

Figure 12 Inflow locations for the four relevant rivers in the RMA model grid.

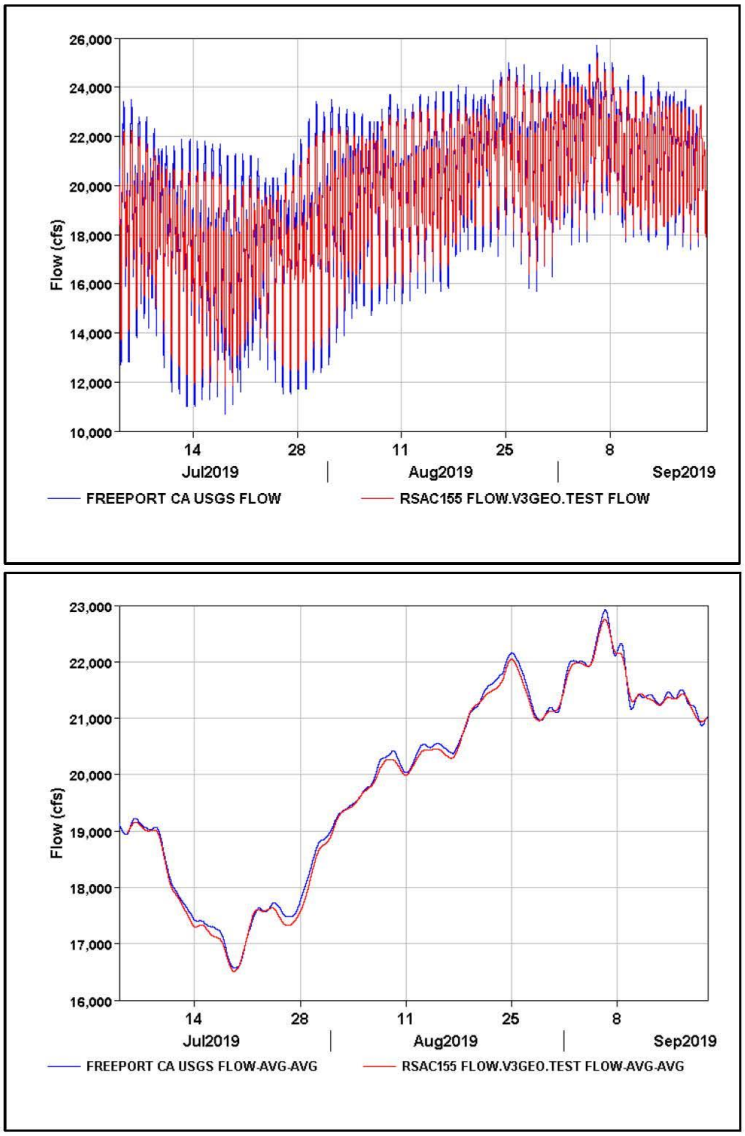

Figure 13 Comparison model RMA model flow (upper) and tidally-averaged flow (lower) output with data at the Freeport data location (blue lines) which is denoted RSAC155 in the model output (redlines).

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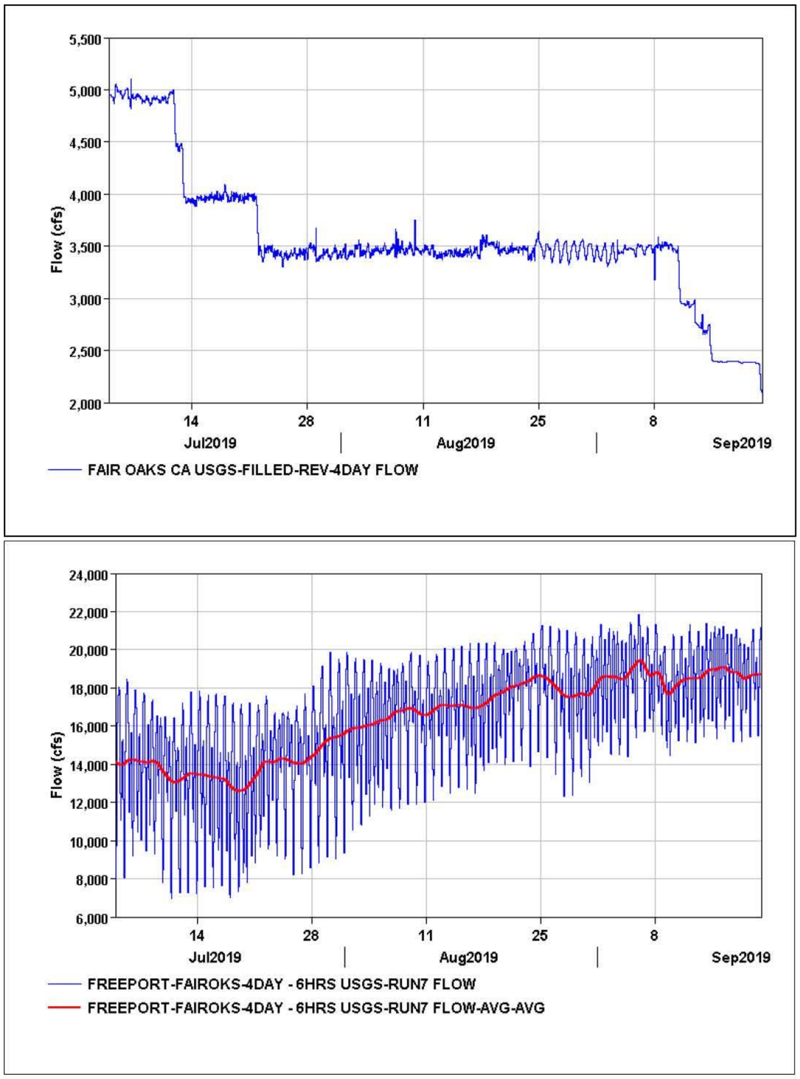

Figure 14 The upper figure shows the boundary inflow used for the American River. Because the Sacramento River inflow boundary is upstream of the American River, the American River flow was subtracted from the Freeport flow, which was time-shifted (blue line) and then tidally averaged (red line) for use at the inflow boundary (lower figure).

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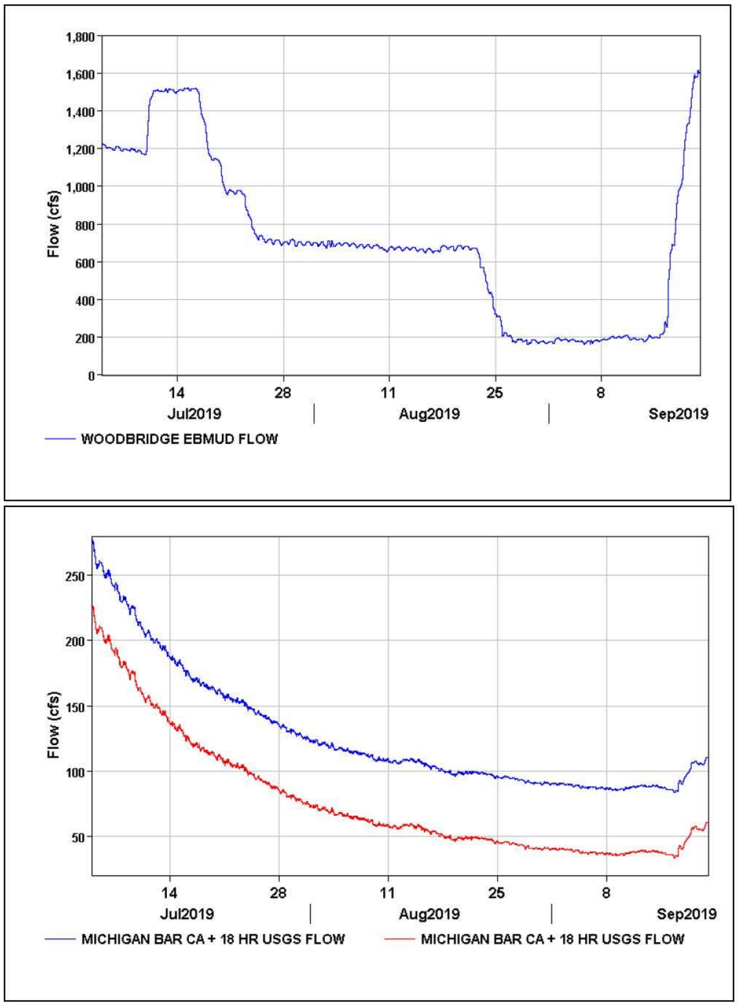

Figure 15 Data used as boundary inflow at the Mokelumne River boundary (upper figure) and at the Cosumnes River boundary. The boundary flow used for the Cosumnes River (blue line) was advanced 18 hours from the data at Michigan Bar and 50 cfs was added to the downloaded data to improve EC model results downstream on the Mokelumne River.

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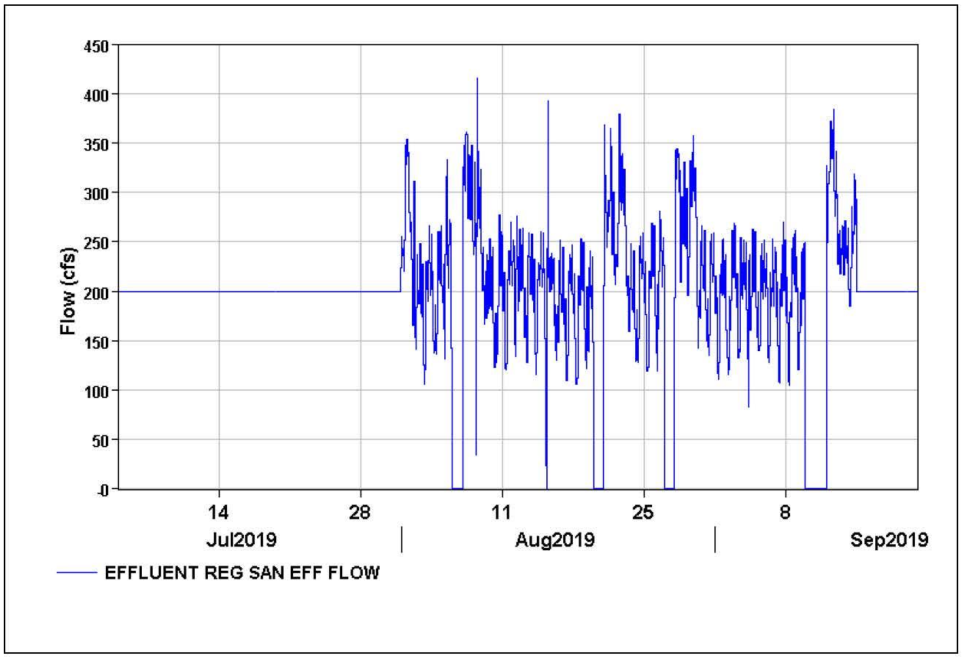
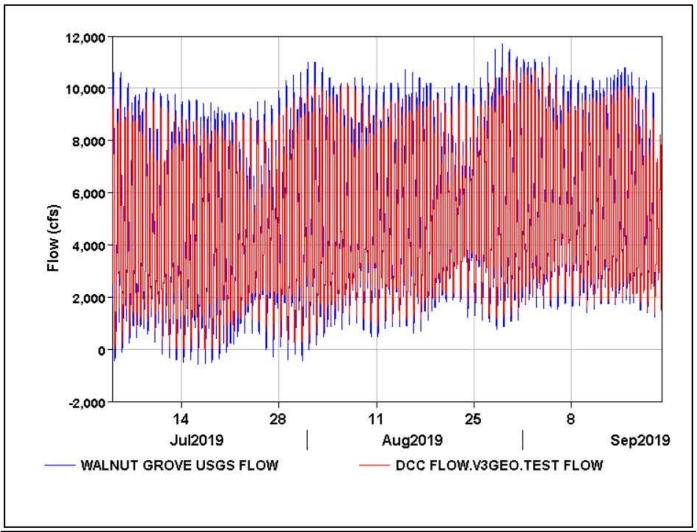


Figure 16 Effluent outflow from Regional San – where data was not requested, flow was set 200 cfs. Sections of zero flow indicate time frames when effluent flow was briefly ceased. The final section of flow cessation occurred September 9 – 11, 2019, which encompassed the project experiment.



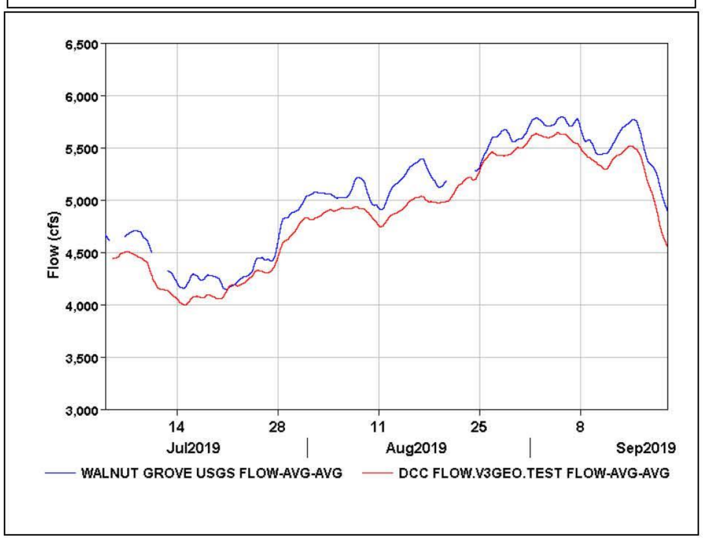


Figure 17 Data (blue lines) and model output red lines) at the Delta Cross Channel location for flow (upper figure) and tidally averaged flow (lower figure).

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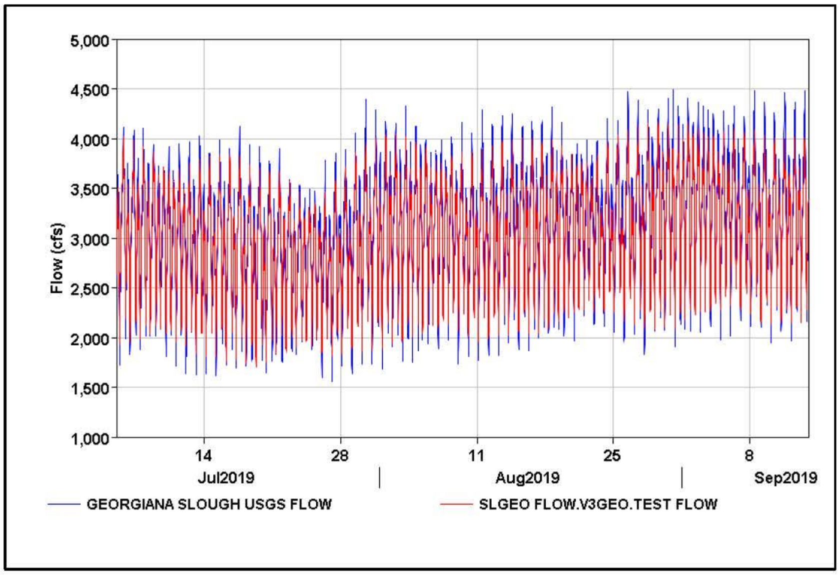

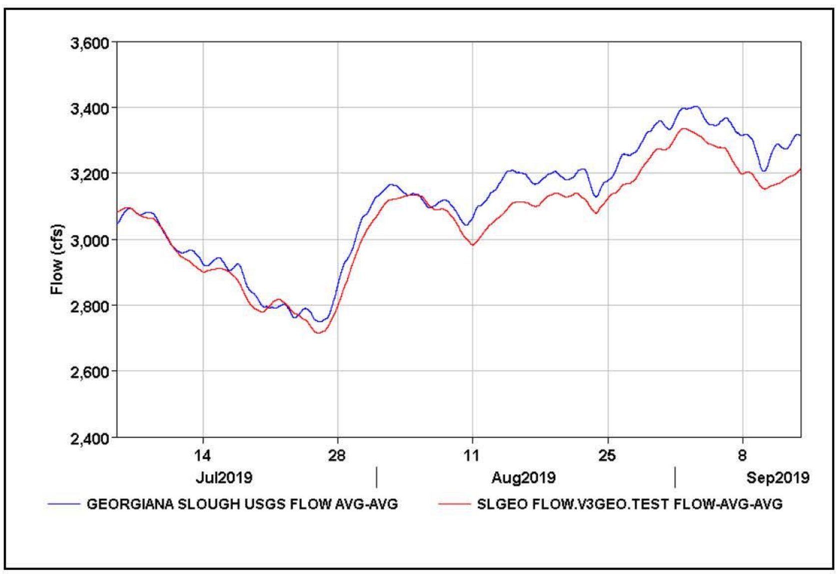

Figure 18 Data (blue lines) and model output red lines) at the Georgiana Slough location for flow (upper figure) and tidally averaged flow (lower figure).

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Section 4 Development of Volumetric Simulations

RMA11 Dispersion Parameter Calibration Using Electrical Conductivity (EC)

The RMA11 EC model was used to provide the template for calibrating the dispersion parameters used in transport model volumetric simulations. EC behaves like a conservative tracer so this strategy produced an appropriate result for setting dispersion parameters for application in volumetric simulation. EC data availability from standard sources for boundary conditions and at several downstream locations was acceptable in the time frame of interest.

EC data to check the accuracy of the model was obtained from USGS project measurements, other project data and from standard online data sources (CDEC, USGS). The RMA11 model dispersion parameters were fine-tuned to closely match EC measurements for the period August through September 2019, focusing on the days when measurements were being collected for the project, September 09 – 12, 2019. Input of EC from DICU sources was not included as DICU flows were not included in the flow model. This omission required a 12 mS/cm (equivalent to UMHOS/CM shown in some figures) increase in the Sacramento River EC inflow. The EC of effluent from Regional San was requested for the period August 01 – September 13, 2019[2]. During this period, the data consisted of a sparse data set which formed an additional source of uncertainty in the development of EC boundary conditions and therefore in the values set for dispersion parameters.

Refinement of the EC model boundary conditions and parameters began once the RMA2 flow model for the period July-September, 2019 was judged sufficient (i.e., when flow and stage output compared well to data). Regional EC calibration consisted mainly of refining the dispersion parameters values and spatial distribution, as well as changes in Regional San effluent flow and EC timing and magnitude during periods without data or with sparse data. Figure 19 documents the EC boundary condition for the Sacramento River – as implemented for the flow boundary, the EC time series was shifted in time. The EC at the Sacramento River inflow boundary was uniformly increased by 12 mS/cm to better match the data at Freeport – as mentioned above DICU flow or EC contributions were not included in the model setup. Figure 20 documents the EC boundary condition for Regional San effluent – the times where data was missing were estimated – effluent flow was ceased September 9-11, 2019 so there was no EC applied. EC at the American, Mokelumne and Cosumnes Rivers was set at a constant 40 mS/cm.

Figure 21 illustrates that cessation of effluent flow results in a measurable decrease of EC at downstream locations, although delayed in time due to transport in the river flow. Figure 22 shows model results in comparison with data at three locations within and just downstream of the project area. Figure 23 shows a shorter time frame comparison view in September 2019 at the most upstream location with available data at Freeport and at DCC, the downstream location that most affected the study area. Note the dispersion parameter calibration shows the transport

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[2] Although EC data was requested during this period, it was available starting July 01, 2019.

model was very good for timing and for magnitude at these locations, although low by a couple of mS/cm at the peaks.

The most difficult region for setting dispersion parameters consisted of the channels and rivers downstream of the Delta Cross Channel and especially at the split of the Mokelumne River into North and South branches. Except for USGS project measurements, no time series were available for comparing model output to measured data. Through multiple iterations of changes to dispersion parametrization, the output from these simulations was compared to project measurement data from the USGS and Regional San to test model consistency in timing and magnitude. As a final step to improve this consistency in the region of the Mokelumne River split, the Cosumnes River inflow was increased by 50 cfs (see Figure 5) – this change was felt reasonable as a reliable downstream measurement of Cosumnes River flow was not available.

Modeled EC for the final RMA11 simulation (Name: ECTest.M5V3F2) was compared to measured EC data in several ways. In addition to the downloaded EC timeseries data shown in shown in Figure 21 through Figure 23, USGS point EC data measurements from their high frequency data acquisition on September 09, 10 and 11, 2019 were used to compare named model output locations to these GPS data locations. USGS data was plotted in Google Earth, and the data measurement times and locations were compared to the corresponding model output locations. These results are compiled in an EXCEL file (USGS.highfreqEC.vs.modelEC.xlsx). For each day, an example figure is included to illustrate the methodology.

Data from Regional San's transect data acquisition on September 11th 2019 was analyzed at named locations (see Figure 24) and EC data plotted (file MG.Transect.regsan.analysis.xlsx). This data was used in two ways to "ground truth" the calibrated RMA11 EC model. For selected locations, the difference between the modeled EC at the EC measurement time was calculated. In these 20 locations, the difference between the values ranged between -5.8 and 4.2 mS/cm (file Compare.rmamodelEC.regsan.transect.xls). Also, the volumetric percentages by source at selected named locations was multiplied by the boundary condition ECs to check the reliability of the volumetric measurements (File: RMA.ECandVolume.regsan.data.Calculations.xlsx).

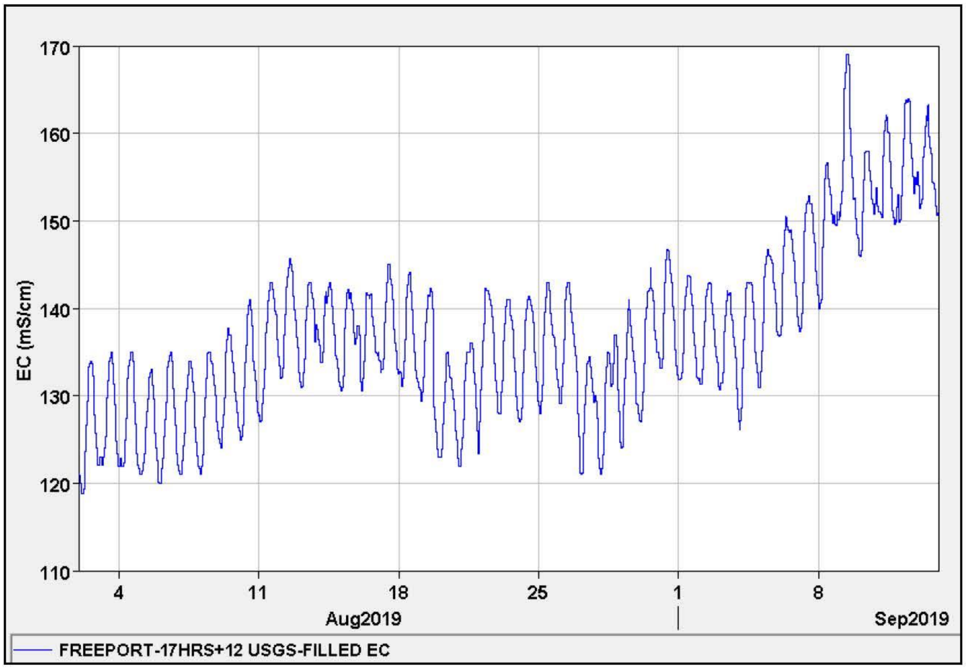

Figure 19 Sacramento River EC boundary condition.

31

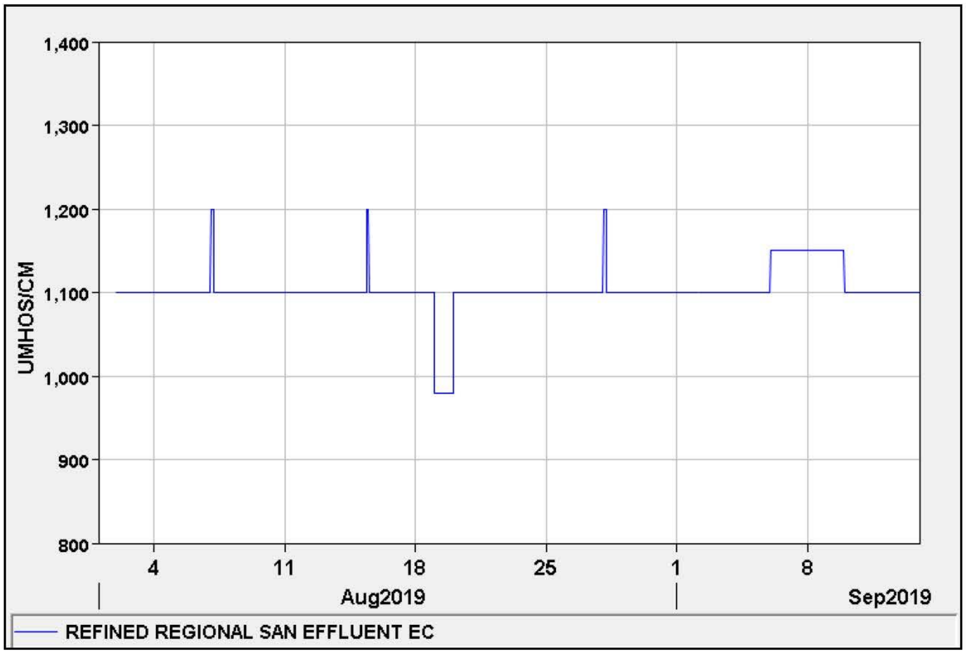

Figure 20 Regional San effluent EC boundary condition.

32

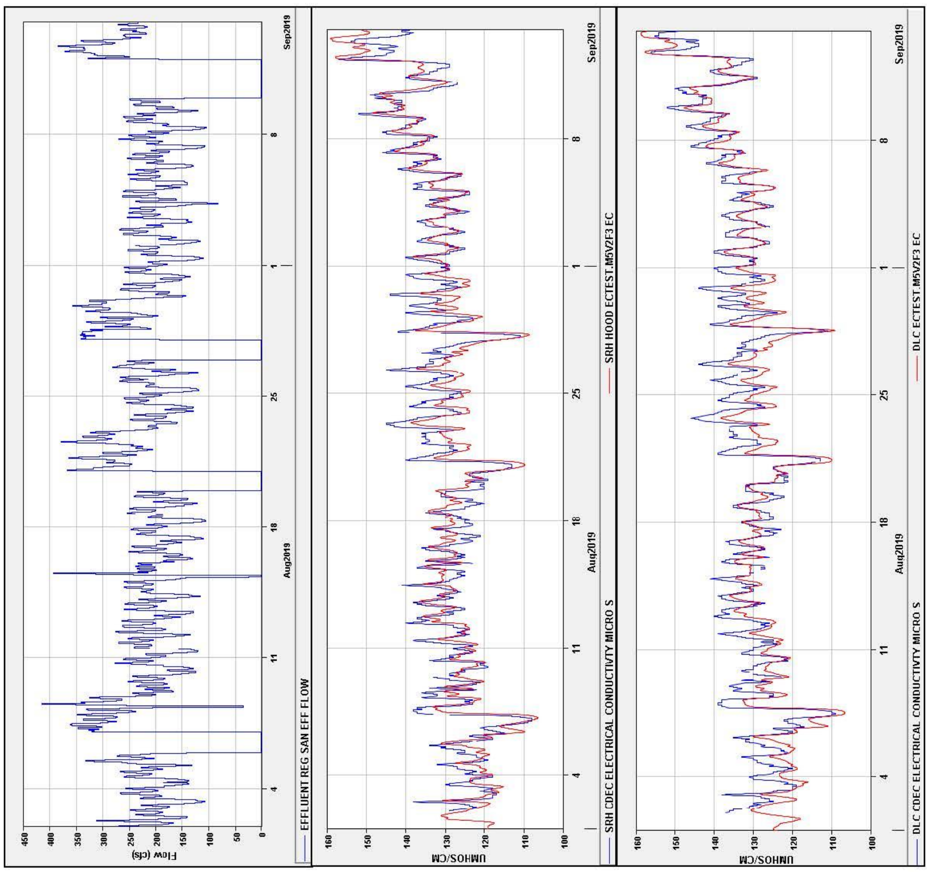

Figure 21 Effect of ceasing Regional San effluent flow (top panel) on EC at Hood (center panel) and in the DCC (bottom panel) for data (blue line) and model output (red line).

33

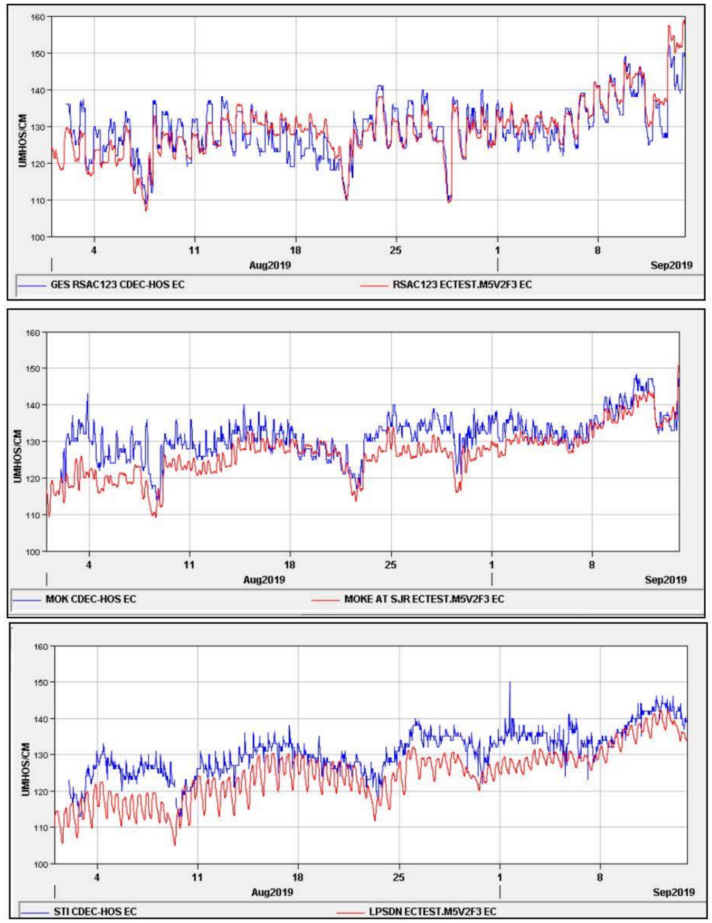

Figure 22 EC on the Sacramento River at RSAC123 (top panel), downstream on the Mokelumne River near the San Joaquin River(center panel), and at the southern end of Staten Island on the South Fork of the Mokelumne River (bottom panel) for data (blue line) and model output (red line).

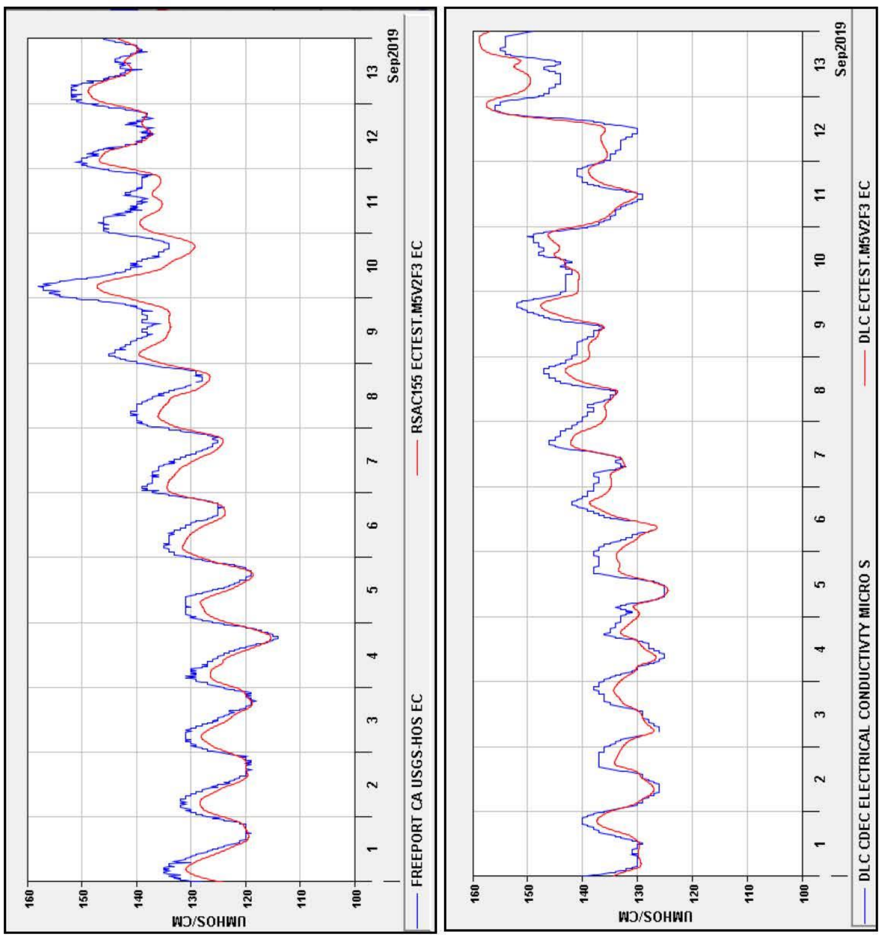

Figure 23 Detail view of EC at Freeport (top panel) and in the DCC (bottom pane) at model output location DLC for data (blue line) and model output (red line) in September, 2019.

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Volumetric Simulation Results

Volumetric modeling output was calculated using the RMA11 transport application with updated dispersion parameters described in the previous section on RMA11 dispersion calibration. The volumetric simulations were set as follows:

1. The boundary conditions for the American and Sacramento Rivers were combined and set to 100.
2. The boundary conditions for the Mokelumne and Cosumnes Rivers were combined and set to 100.
3. The boundary condition for Regional San was set to 100 – note that Regional San inflow was stopped for 2 days during the experiment, so there was no contribution during this period.

Model output from each of these three simulations gives the volumetric percentage, which is also interpreted as the mixing percentage, of each of the combined sources at downstream locations. Time series of the numerical output is provided at selected project measurement locations is include in figures below. Figure 24 shows the locations specified by Regional San, while Figure 25 and Figure 26 show these output locations in screen captures of the RMA grid. A separate EXCEL file with model output time series results at all locations is included with project documentation (Name: VOLUMETRIC.OUTPUT.xls). A portion of the model output for a single source is shown in the Appendix (page 66).

Figure 27 shows the downstream location MOKEM is tidally influenced in the model, with the majority source alternating between the combined Mokelumne-Cosumnes source and the combined Sacramento-American source. Figure 28 shows that a small percentage of Regional San effluent tidally mixes with Sacramento-American source at the RSAC155/Freeport location, while a somewhat larger percentage is present at the SREM location in Figure 29.

Mixing on the South Fork Mokelumne was complicated and heavily influenced by tidal period as shown in Figure 30 and Figure 31. In Figure 30. The mixture at the SMR location on the south fork of the Mokelumne is dominated by alternating between the Sacramento-American or Mokelumne-Cosumnes sources with a minor contribution from Regional San effluent. Three locations (left, center and right) across the river at this location with a two-dimensional grid are shown to have variable mixing percentages from the three sources in Figure 31.

Figure 32 shows the variation in the three separate inflow sources at NMR on the north fork of the Mokelumne River. Figure 33 shows the change in tidal signature for the three sources at SMR and SFM4, from north to south along the south fork of the Mokelumne River. Figure 34 shows the shift from north to south along Georgiana Slough, from GS1 to GS4, presents primarily as a shift in timing.

The volumetric output from the three-combined-source volumetric transport model was used to perform an inter-model compression of the two RMA11 transport models EC model boundary condition EC to test the validity of the source percentages calculated in the volumetric models. Using model output at six named locations (see Figure 24), the three modeled percent volumes at that location and time were used along with the associated boundary condition EC to calculate the corresponding EC to compare with the measured data. In each case, the modeled EC and the EC calculated with volumetric percentage and boundary condition EC matched within 2 mS/cm, as expected.

NOTE: Three animations were prepared showing modeled volumetric percentages for each combined source during the study period – a color scale is used to visualize the percentage spatially and time-specific values are shown at selected locations. These animations were used to QA/QC the volumetric models and used during project meetings to assist in the interpretation of tidal influences on source mixtures during the study period. The animations are included separately as deliverables. Images of the initial time stamp for the three animations are illustrated in the Appendix (page 67, Figure 48 through Figure 50).

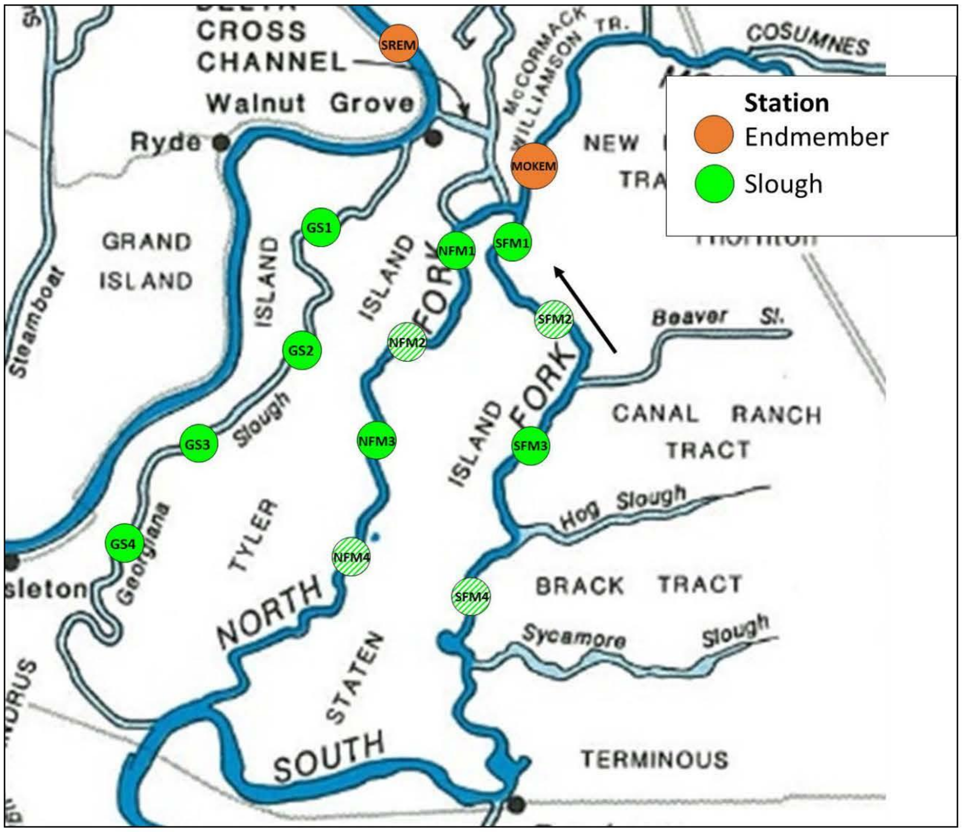

Figure 24 Model output locations for volumetric time series – figure supplied by staff at Regional San.

38

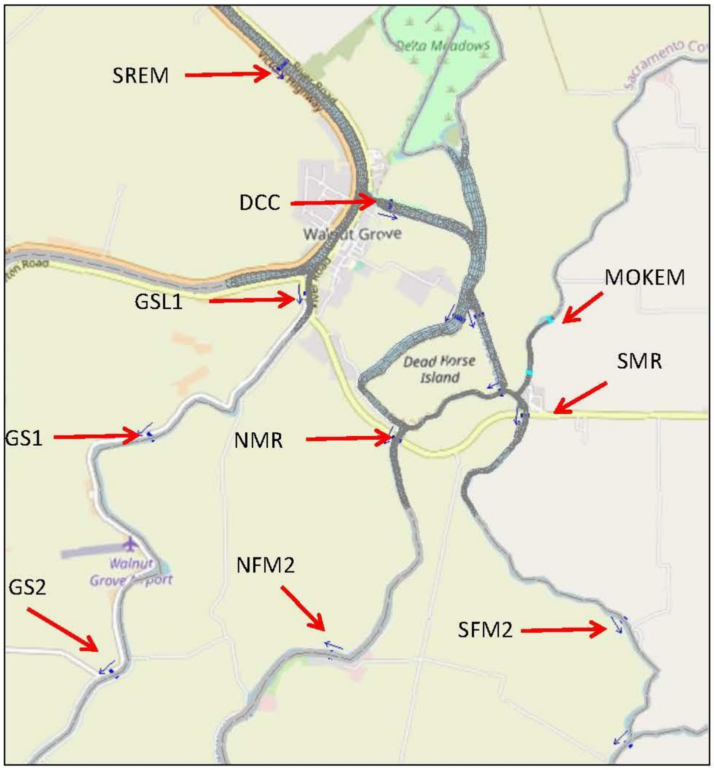

Figure 25 Nomenclature and location for particle tracking and volumetric output in upper portion of study area.

39

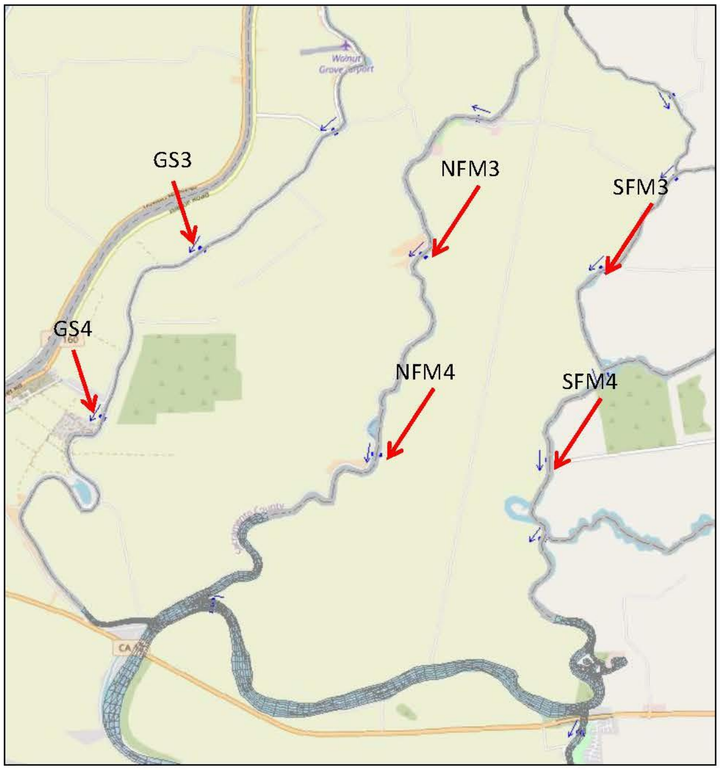

Figure 26 Nomenclature and location for particle tracking and volumetric output in lower portion of study area.

40

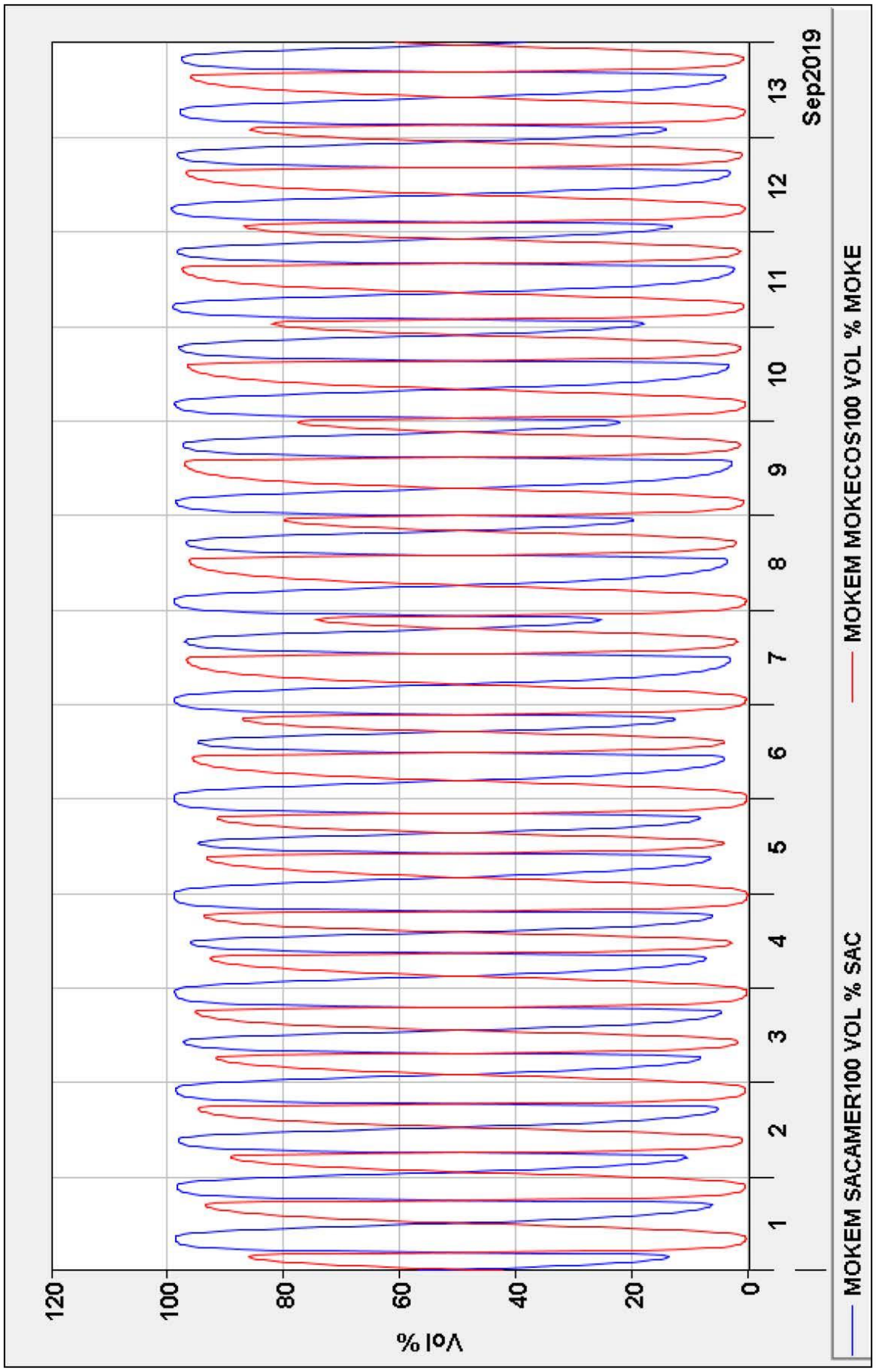

Figure 27 Volumetric percentages by source at the boundary location on the Mokelumne River

41

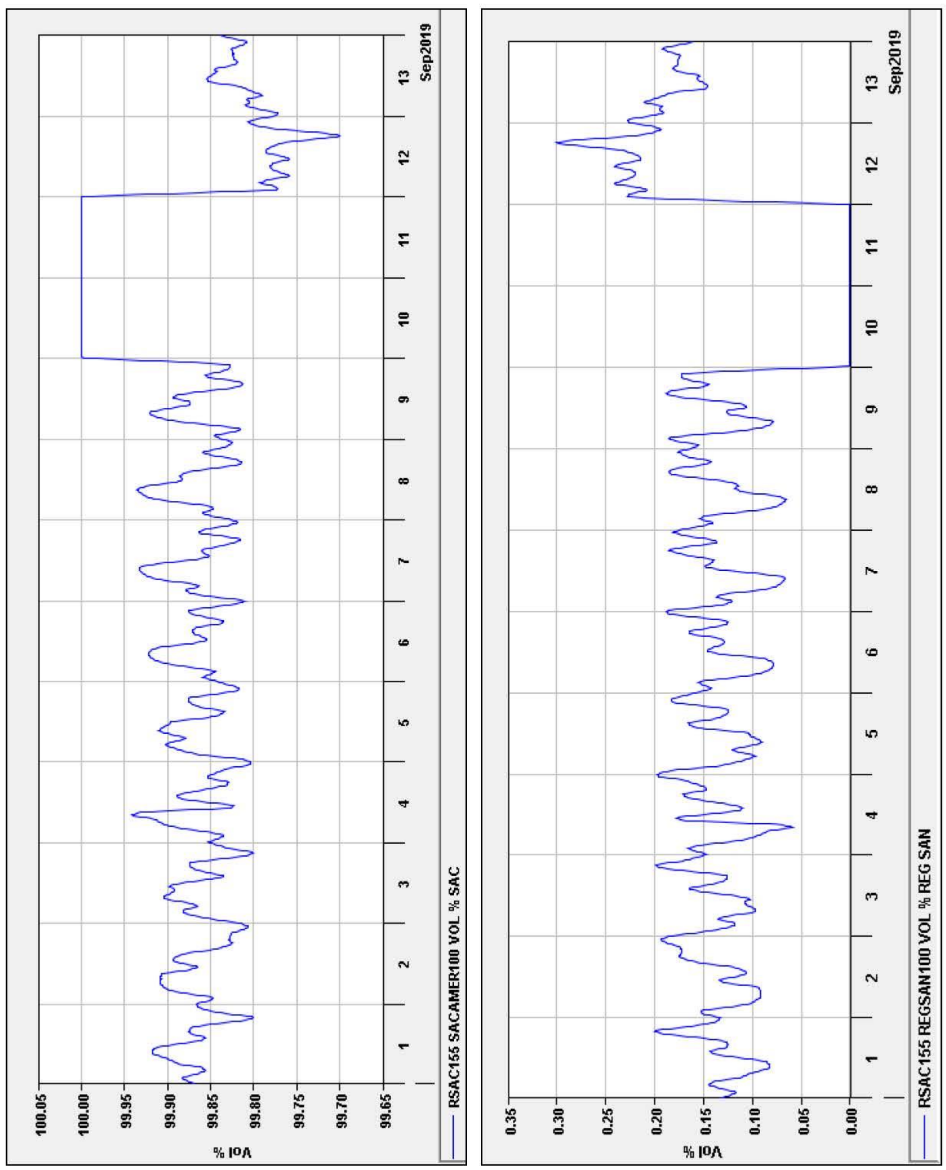

Figure 28 Volumetric percentages by source at RSAC155 on the Sacramento River.

42

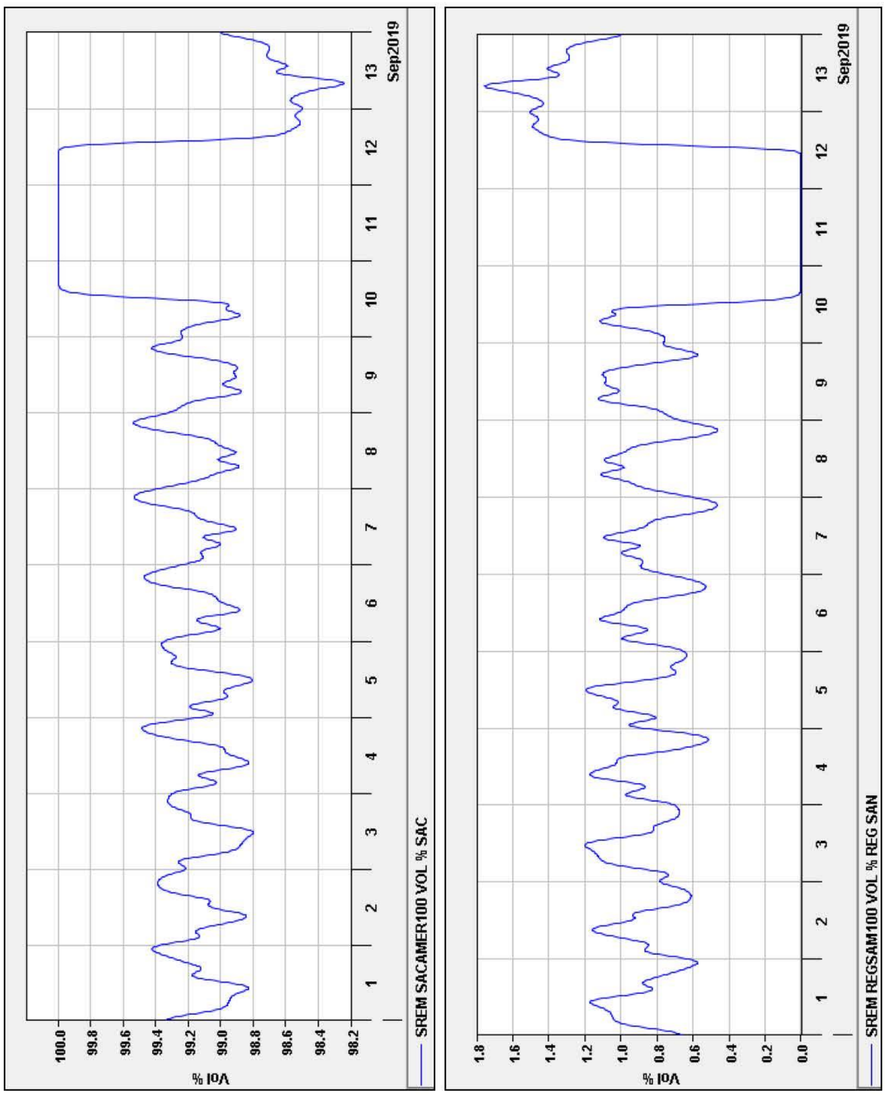

Figure 29 Volumetric percentages by source at model output location SREM on the Sacramento River.

43

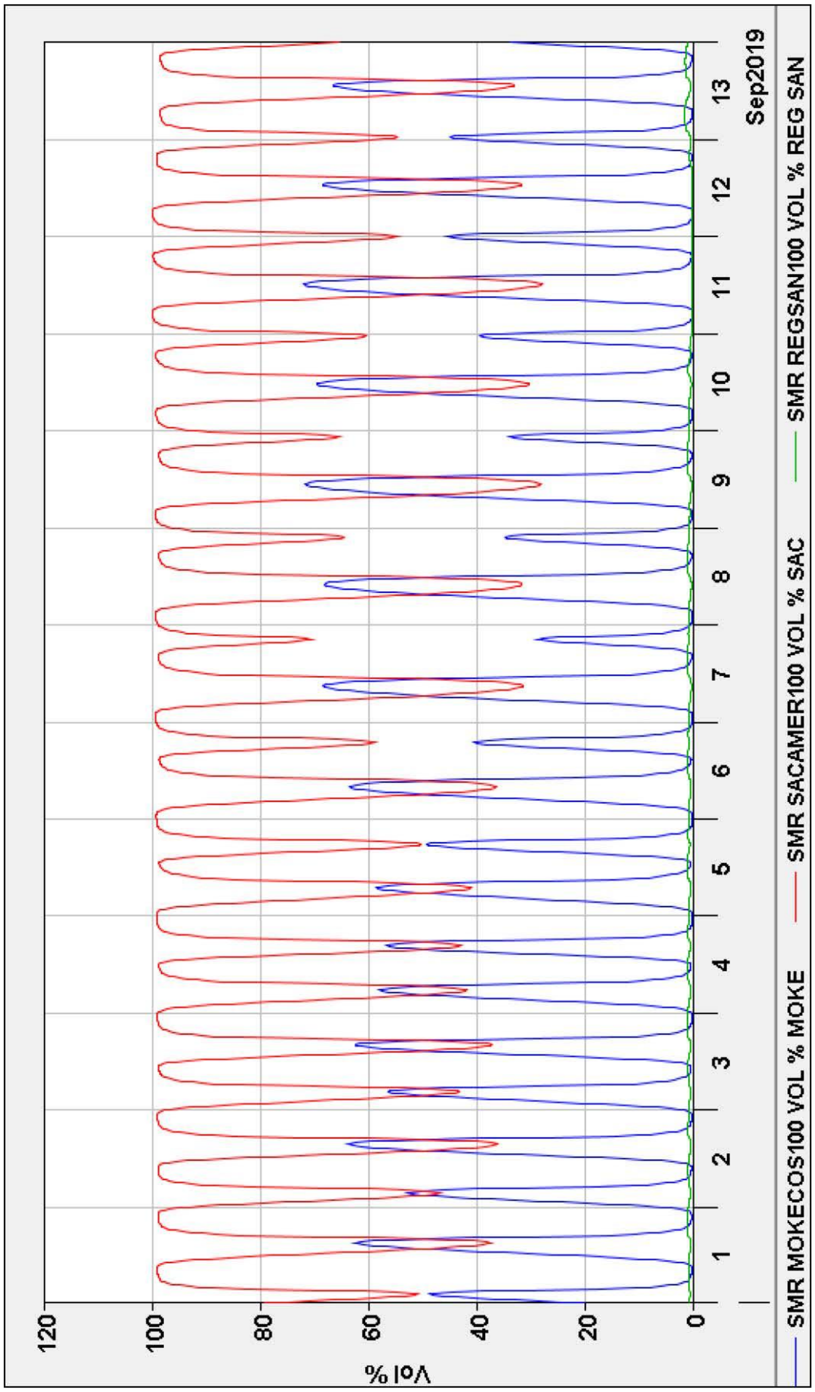

Figure 30 Volumetric percentages by source at model output location SMR on the South Fork of the Mokelumne River.

44

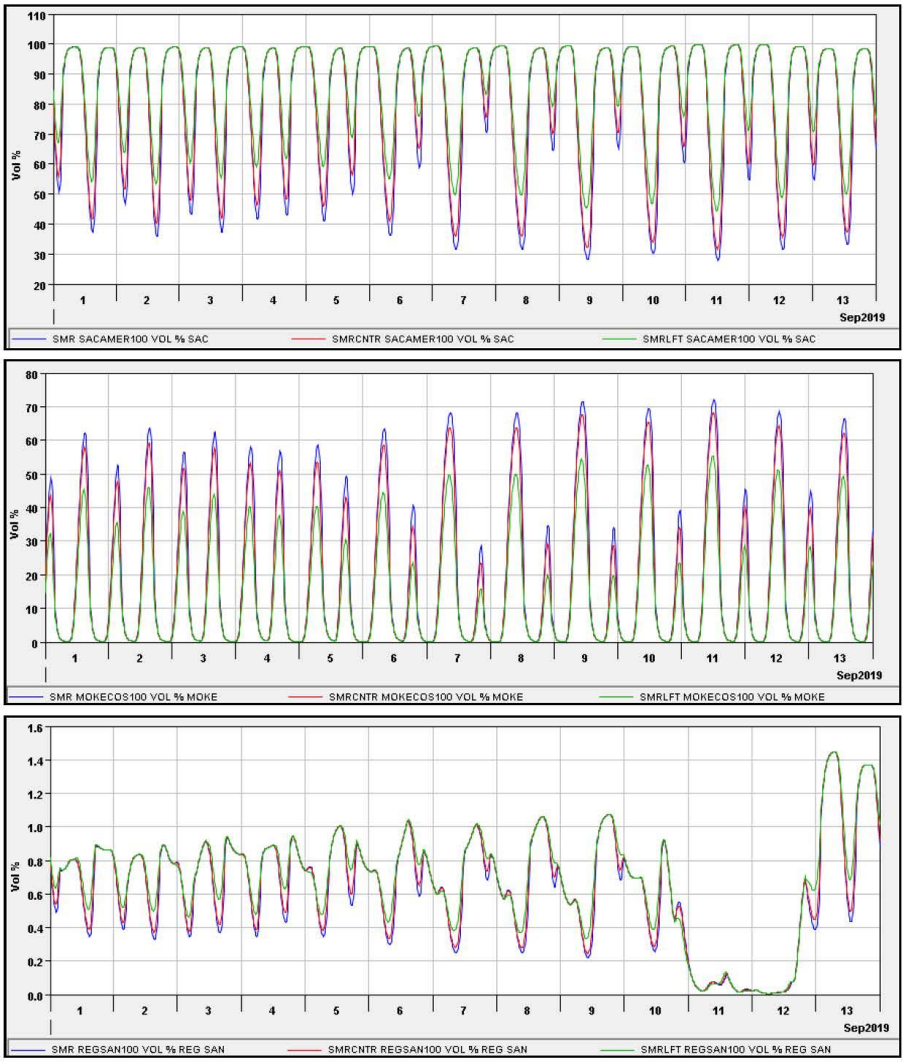

Figure 31 Volumetric percentages of the three sources at model output location SMR on the South Fork of the Mokelumne River illustrating variation across the river in transect.

45

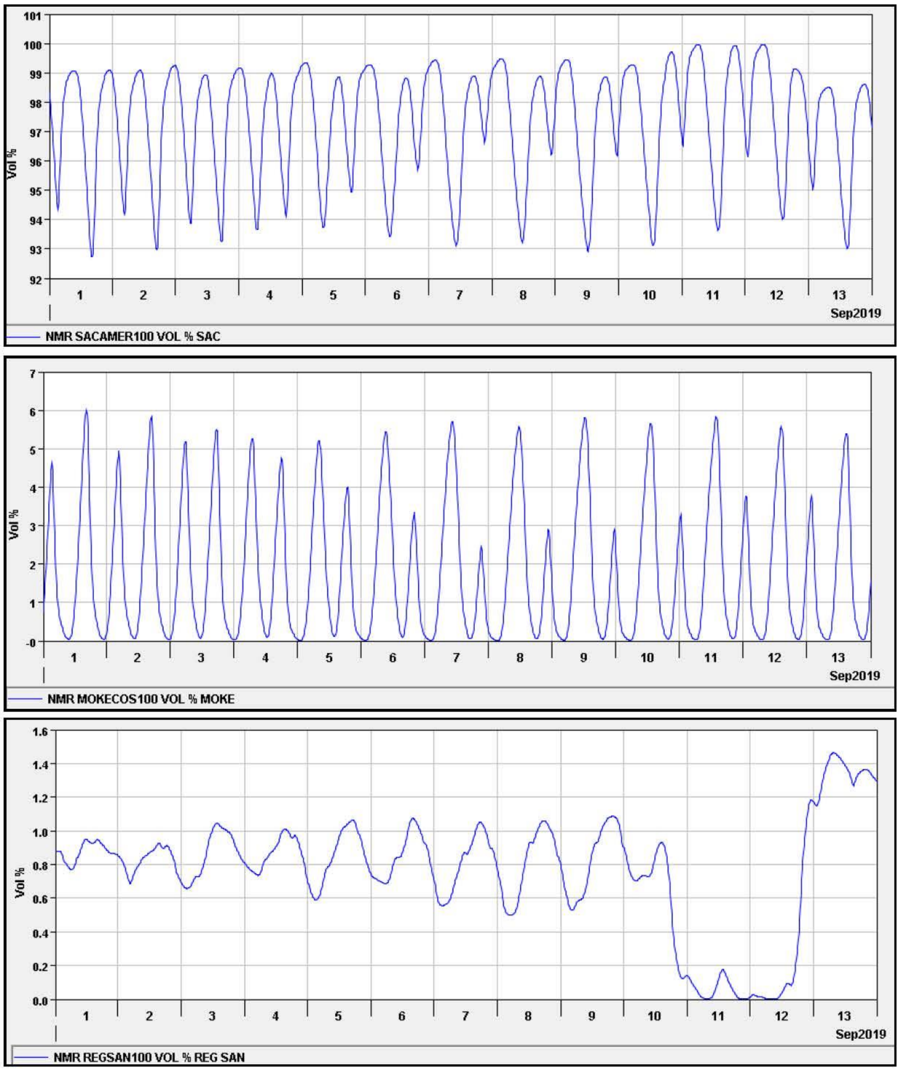

Figure 32 Volumetric percentages of the three sources at model output location NMR on the North Fork of the Mokelumne River illustrating variation across the river in transect.

46

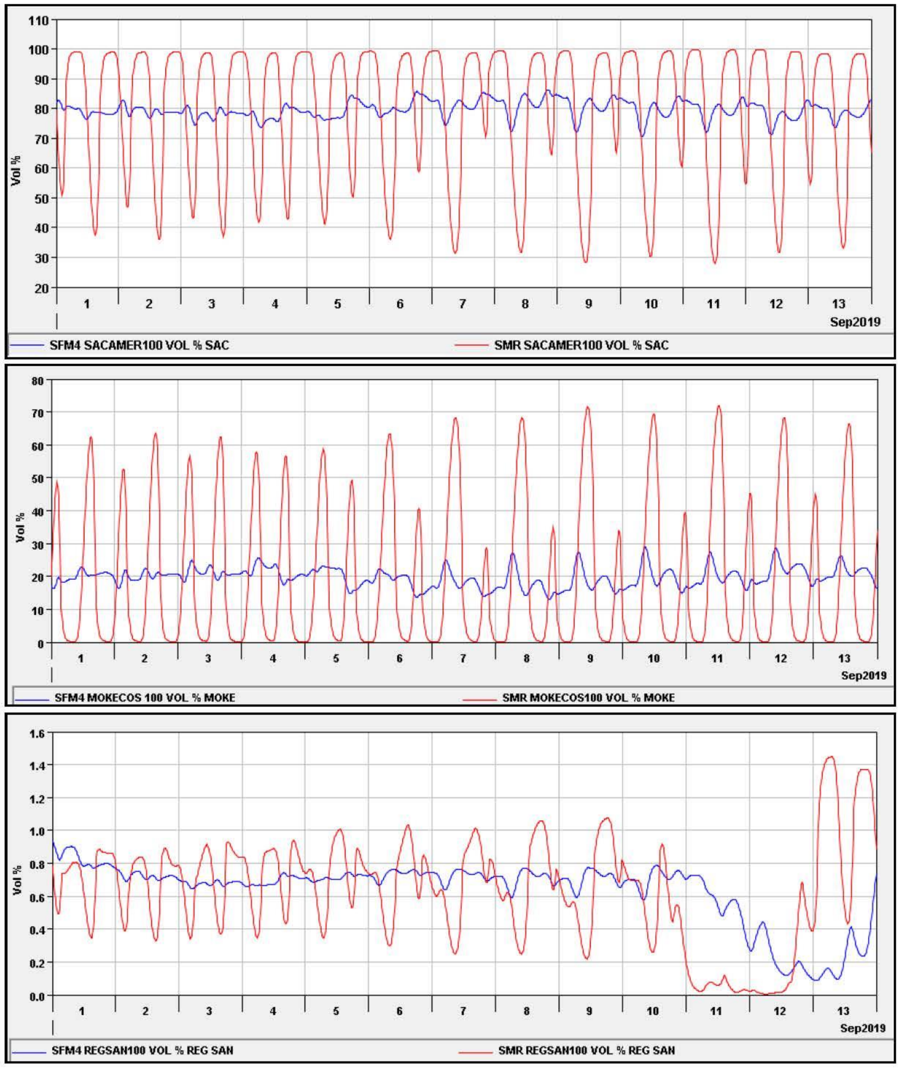

Figure 33 Volumetric percentages of the three sources at model output locations SMR and downstream at SFM4 on the South Fork of the Mokelumne River illustrating variation from north to south down the river.

47

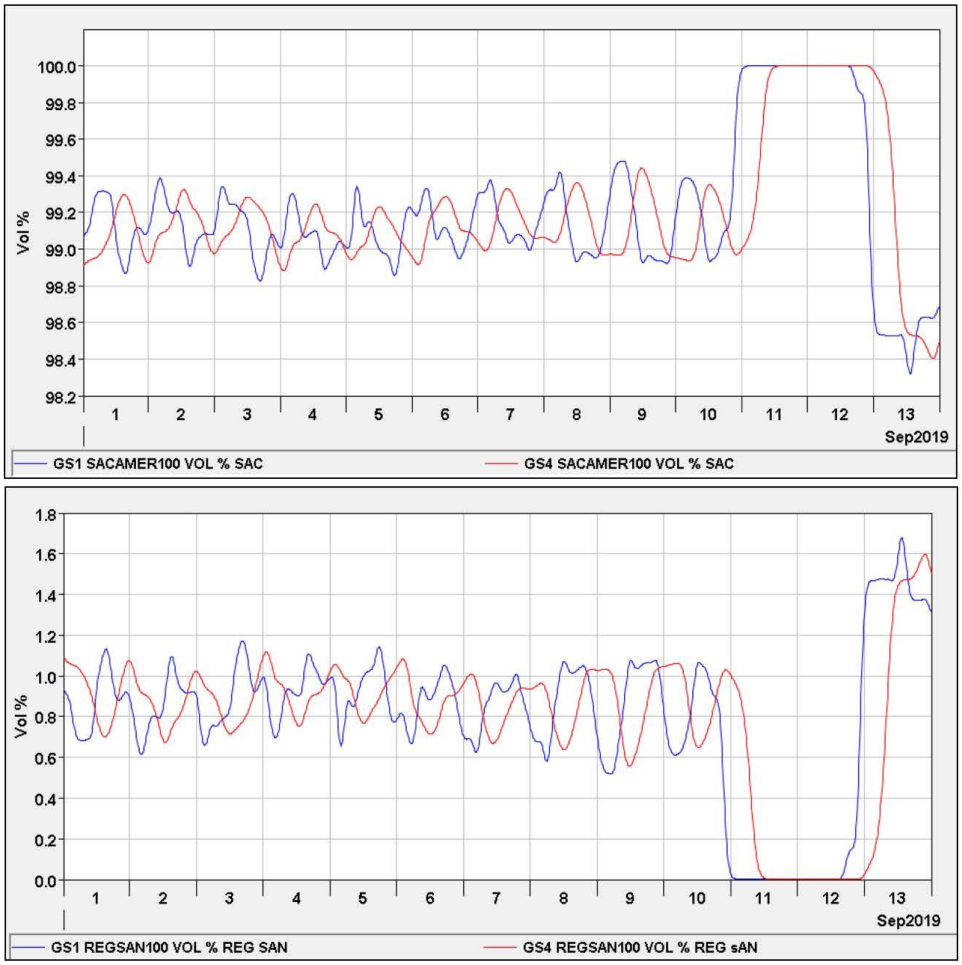

Figure 34 Volumetric percentages of two sources at model output locations GS1 and downstream at GS4 on Georgiana Slough illustrating variation from north (GS1) to south (GS4) down the slough.

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Section 5 Particle Tracking Simulations

Using the flow model developed for the study period described above (Section 3), particle tracking simulations and animations were developed to help characterize the movement and mixing of water parcels during the study. The RMA particle tracking code used the output of the RMA2 flow model in its calculations. In general, dispersion values for the particle tracking simulations are set by the user. For this study, no dispersion values were set for the particle tracking as dispersion settings developed during the EC calibration indicated a level of complexity beyond any attempt for justification in particle tracking. Output from particle tracking simulations is used by the project participants to assist in the interpretations of sample measurements. Two animations were prepared emphasizing aspects of the flow dynamics using the procedure described below. These animations are included in a separate PowerPoint file as part of RMA's project deliverables. Images of the initial time stamp for the two animations are illustrated in the Appendix (page 70, Figure 51 and Figure 52). Additional documentation for the particle tracking and animation setups are also found in the Appendix (page 72, Figure 53 and Figure 54).

Three particle sources of different colors were inserted in the model grid near the location of the Regional San effluent outflow location (Figure 35, right hand figure), each of which inserted 100 particles/minute during portions of the simulation period (02 – 13 September, 2019). Particles numbers do NOT represent any flow or load criterion – instead these values were selected to make visualizations understandable/comprehensible and so have no physical significance. Bright red particles represent Sacramento River water parcels which include Regional San effluent before the shutdown (i.e., insertion stopped when the effluent flow stopped), bright blue particles represent Sacramento River water parcels without Regional San effluent ONLY during the effluent flow shutdown, and darker red particles represent Sacramento River water parcels which include Regional San effluent ONLY after the shutdown.

Cyan particles represent water parcels originating from the Mokelumne River – they were inserted at a rate of 4 particles/minute at the downstream insertion location and 1 particle/minute at an upstream location on the Mokelumne River (Figure 35, left hand figure). Using two locations improved the quality of the visualizations but had no other significance.

Figure 25 and Figure 26 identify the locations where particle arrivals for each of the four sources were counted. Note that in all of the following figures documenting particle travel through the model grid (Figure 36 through Figure 42), particle counts have no physical meaning – they simply represent timing of water parcels originating at one of the three Sacramento River sources. Figure 36 documents that water parcels originating in the Mokelumne River do not reach Georgiana Slough or the North Fork of the Mokelumne River. Figure 37 documents Sacramento River water parcels from the three sources arriving at location SREM on the Sacramento River above the DCC. Figure 38 documents these parcels arriving at the upstream and downstream locations on Georgiana Slough; Figure 39 and Figure 40 documents these parcels arriving at four locations on the North Fork Mokelumne River; and, Figure 41and Figure 42 documents these parcels arriving at four locations on the South Fork Mokelumne River.

Table 1 provides documentation of the arrival time of particles released into the Sacramento River near the Regional San effluent outflow location for particles representing water parcels without effluent and parcels when effluent flow restarts.

Table 1 Arrival Time for Two Particle Release Locations near Regional San Effluent Outflow Location

Release Location	No Reg San	Reg San Late
Release Time	10 Sep. 00:00	9/12/2020 1:00
Arrival Location	Arrival Time	Arrival Time
SREM	10 Sep 19, 13:30	12 Sep 19, 14:15
GS1	10 Sep 19, 19:45	12 Sep 19, 19:30
GS4	11 Sep 19, 06:45	13 Sep 19, 06:30
NFM1	10 Sep 19, 18:00	12 Sep 19, 18:00
NFM2	10 Sep 19, 20:30	12 Sep 19, 21:30
NFM3	10 Sep 19, 23:00	12 Sep 19, 24:00
NFM4	11 Sep 19, 05:45	13 Sep 19, 06:30
SFM1	10 Sep 19, 19:15	12 Sep 19, 20:30
SFM2	10 Sep 19, 22:45	13 Sep 19, 00:15
SFM3	11 Sep 19, 07:30	13 Sep 19, 09:00
SFM4	11 Sep 19, 20:15	13 Sep 19, 13:30

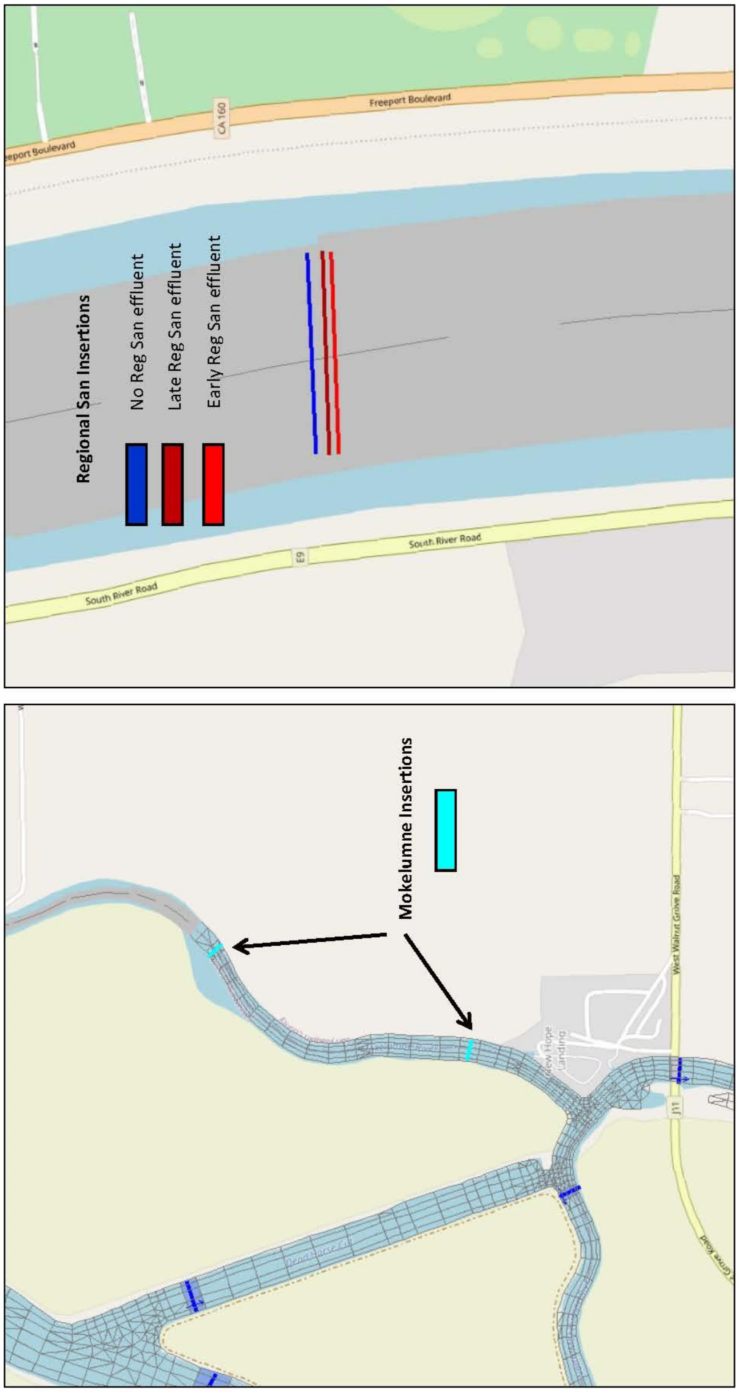

Figure 35 Location of particle insertion lines – cyan blue in left hand figure are the locations of Mokelumne particle insertion, and the right hand figure shows the locations of Regional San particle insertions.

52

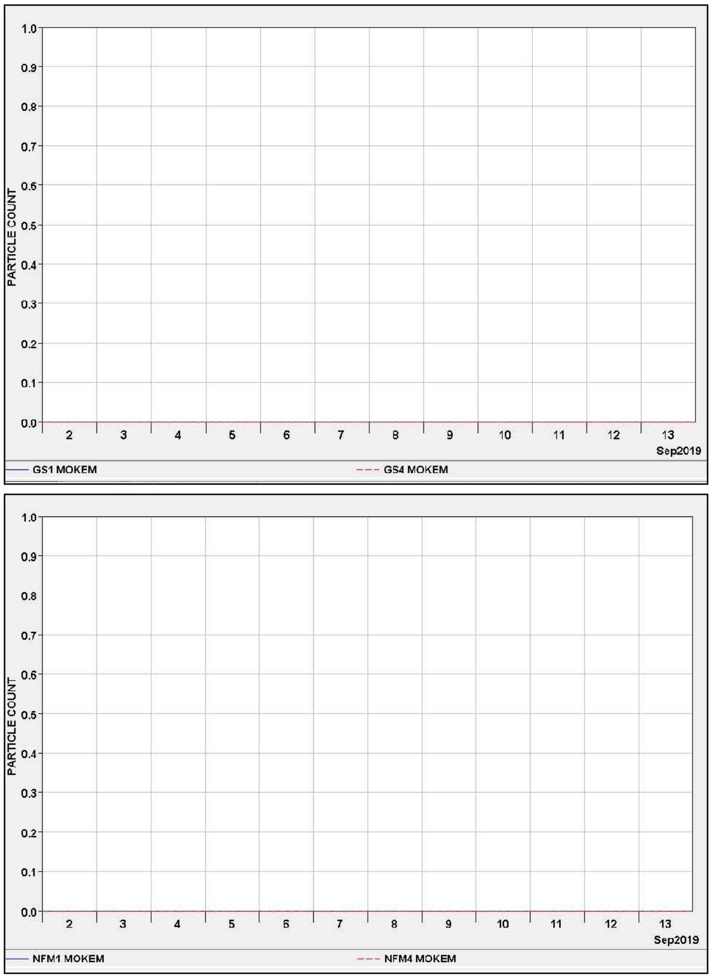

Figure 36 Particles originating at the MOKEM source do not reach either Georgiana Slough (top figure) of the North Forth of the Mokelumne River (lower figure).

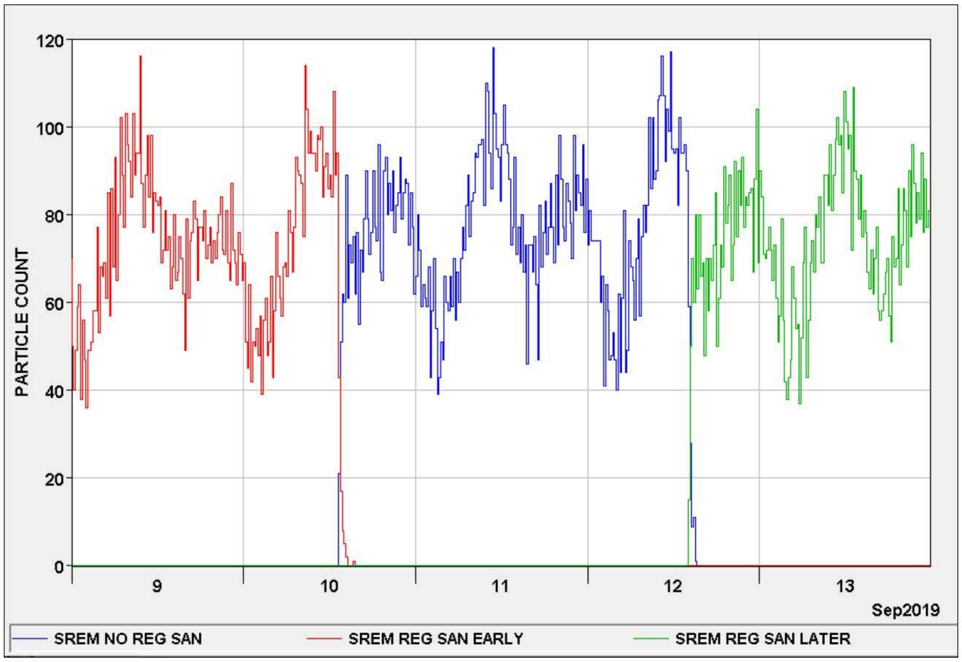

Figure 37 Particle arrival timing for particles representing Sacramento River water parcels arriving at the SREM location. Particle counts have no physical meaning as particle insertion values were designed for ease of visual interpretation.

54

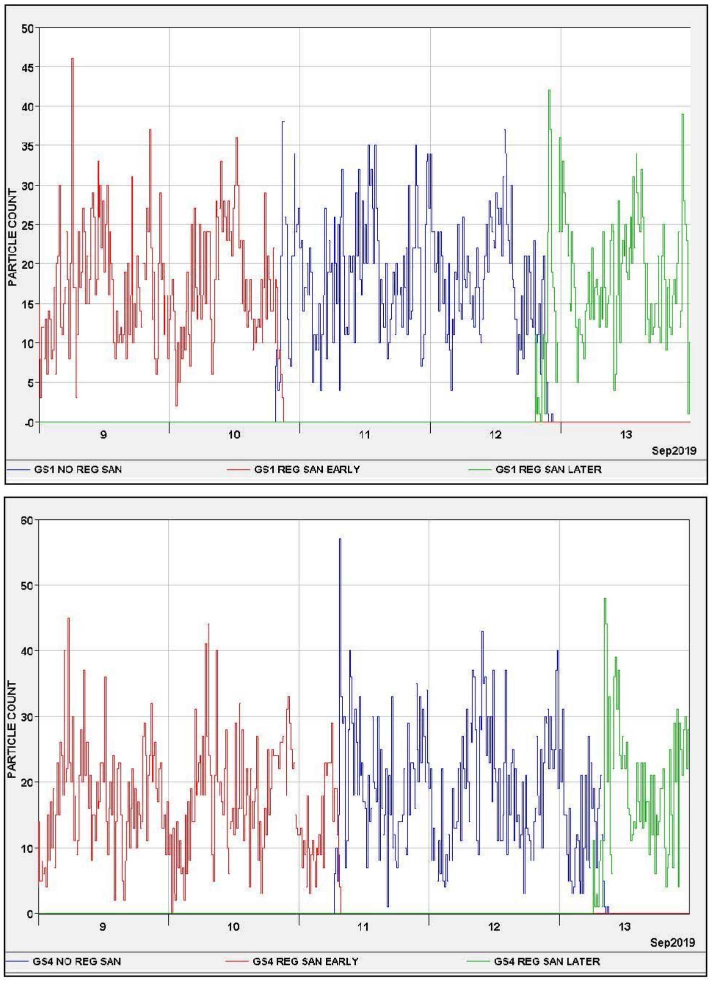

Figure 38 Particle arrival timing for particles representing Sacramento River water parcels arriving at the GS1 (upper figure) and GS4 (lower figure) locations. Particle counts have no physical meaning as particle insertion values were designed for ease of visual interpretation.

55

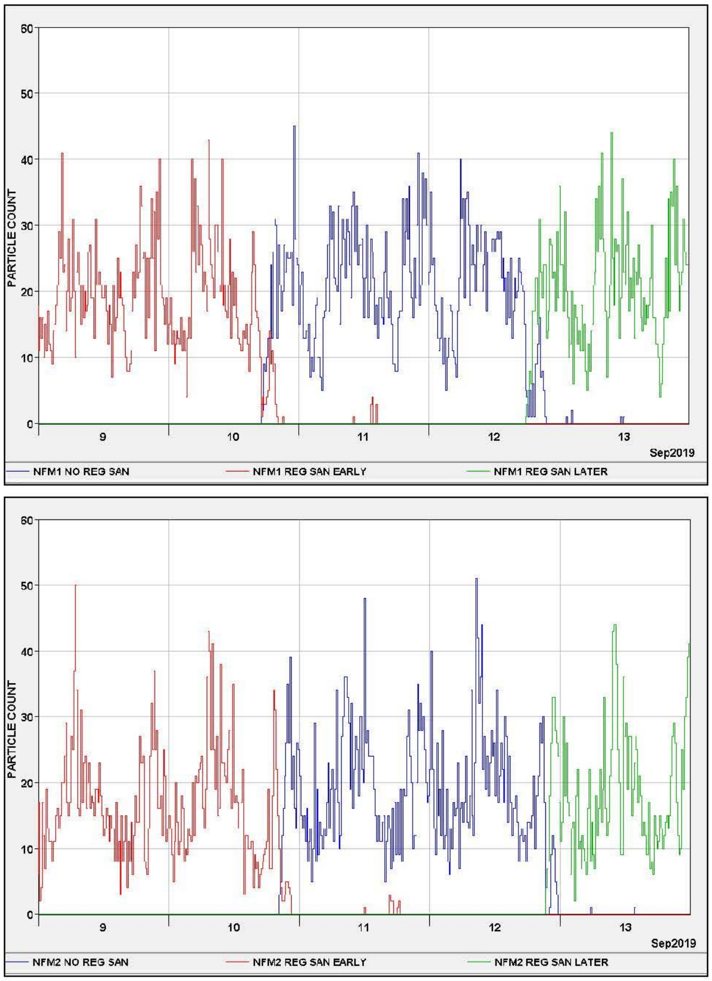

Figure 39 Particle arrival timing for particles representing Sacramento River water parcels arriving at the NFM1 (upper figure) and NFM2 (lower figure) locations. Particle counts have no physical meaning as particle insertion values were designed for ease of visual interpretation.

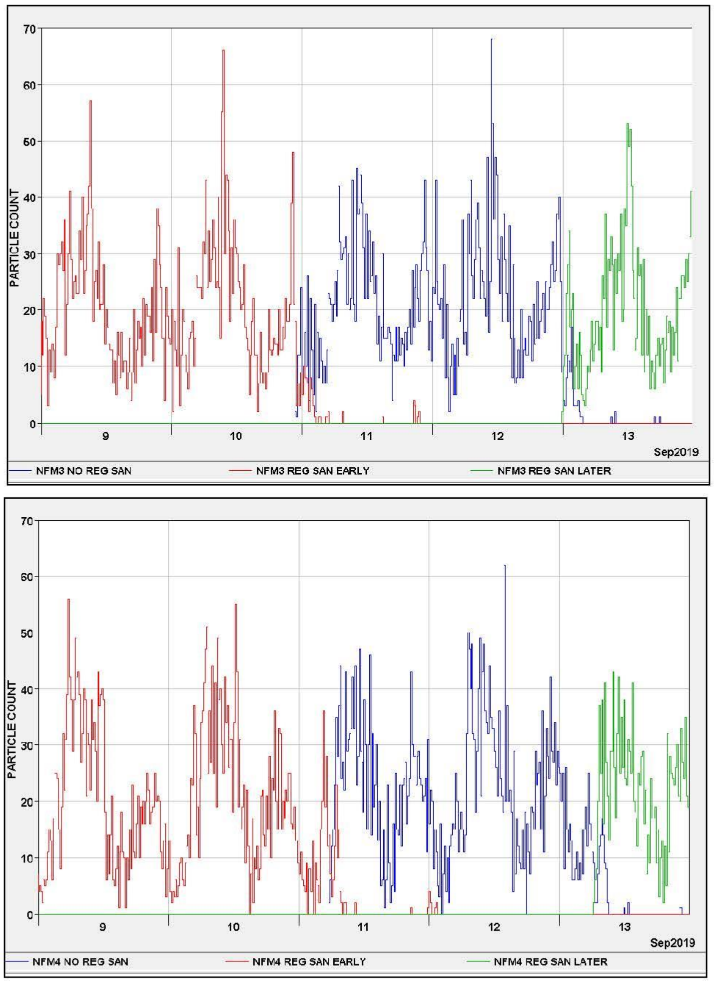

Figure 40 Particle arrival timing for particles representing Sacramento River water parcels arriving at the NFM3 (upper figure) and NFM4 (lower figure) locations. Particle counts have no physical meaning as particle insertion values were designed for ease of visual interpretation.

57

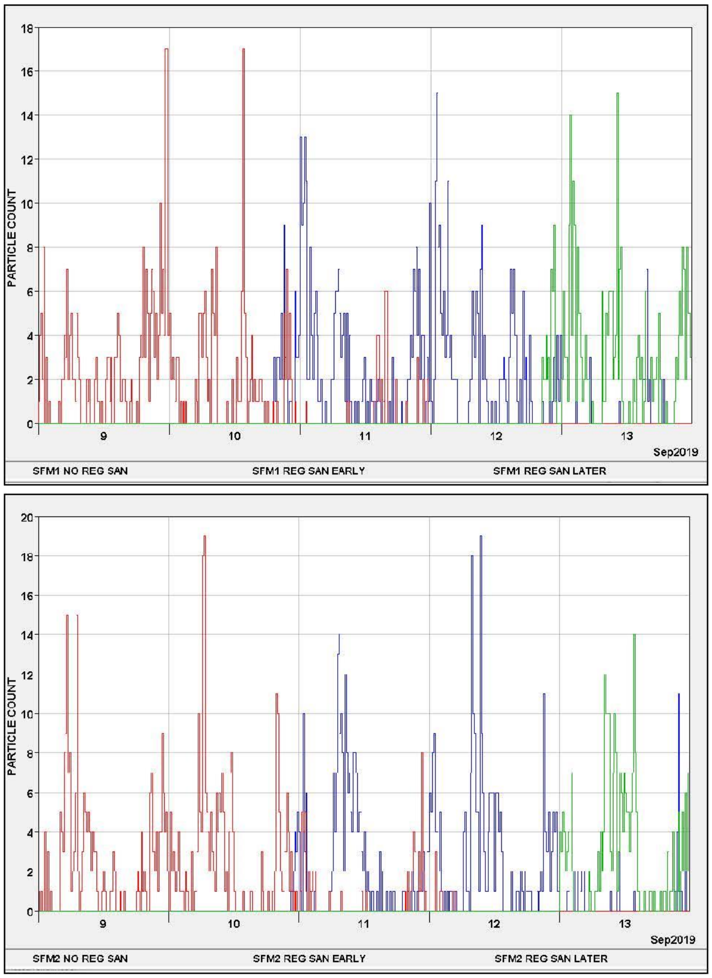

Figure 41 Particle arrival timing for particles representing Sacramento River water parcels arriving at the SFM1 (upper figure) and SFM2 (lower figure) locations. Particle counts have no physical meaning as particle insertion values were designed for ease of visual interpretation.

58

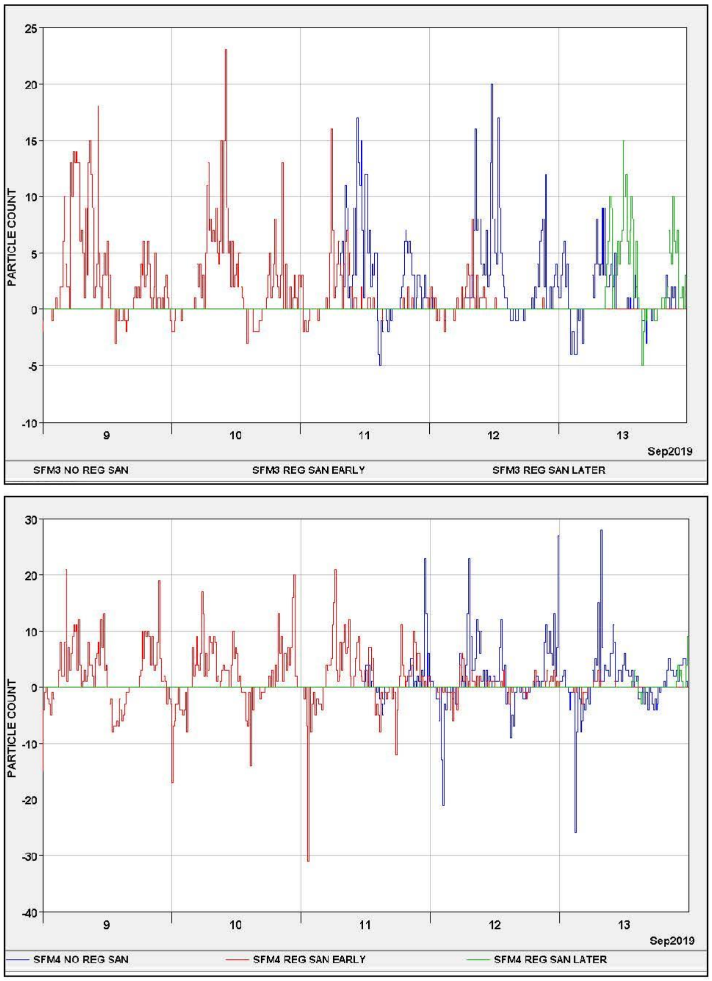

Figure 42 Particle arrival timing for particles representing Sacramento River water parcels arriving at the SFM3 (upper figure) and SFM4 (lower figure) locations. Particle counts have no physical meaning as particle insertion values were designed for ease of visual interpretation.

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Section 6 Summary of Results

Sources of Uncertainty in the Transport Model Simulations

Challenges encountered during the calibration of the RMA11 EC model dispersion parameters highlighted the unfortunate loss of the North Fork and South Fork Mokelumne River flow, stage and EC monitoring stations east of the Delta Cross Channel during the 2017 winter season. Without the 15-minute time series for flow, stage and EC data from these stations, the July-September 2019 project simulations are at a loss to estimate the accuracy of the tidal timing, flow magnitude or EC along the two forks of the Mokelumne River. As noted in Section 2, the dynamics of the South Fork Mokelumne (SMF) inter-tidal flow are characterized by intricate peaks and troughs during the 2016 calibration period. During this initial calibration period, flow station plots show the model phase is in advance of the observed flow phase, with the modeled phase several minutes advanced with respect to the field measured flow.

Because of this missing data during the 2019 study period, our expectation that the timing difference between model and project EC data measurements would be offset, in our case, by an unknown quantity on the order of minutes to hours was in fact observed. The timing difference of modeled EC in RMA11 in comparison with USGS high frequency field data was generally observed to be at most several hours, and on the order of an hour or less when comparing model output to the Regional San transect EC measurements.

At the split of the Mokelumne into North and South forks, the USGS data measurements were not accurately resolved in the model grid. However, assuming the two-dimensional grid only partially captured the physical detail, the model output was sensible if the simplified resolution represented partial mixing of the sources. At the downstream end of the South Fork of the Mokelumne, it appeared that Little Potato Slough influenced the modeled EC to a greater extent than expressed by the USGS data measurements.

Analysis and Findings

Analysis of the Volumetric and Particle Tracking simulations yielded similar results. The modeling clearly captured that the North Fork of the Mokelumne River was sourced from a tidally influenced mixture of the Sacramento River, Regional San effluent and the Mokelumne River under the flow conditions during the project period September 09 -12, 2019. Georgiana Slough didn't experience any inflow from the Mokelumne source as expected, so mixing was relatively simple and travel times of the water parcels were short.

Unlike the North Fork, the South Fork of the Mokelumne was a complex mixture of the three sources with long travel times for water parcels as compared to the North Fork. Tidal influences along the South Fork became muted as water parcels progressed downstream. The effect of the three side sloughs was complex, with water parcels from the sources mixing in the sloughs. The plus and minus wastewater parcels moved in and out of the sloughs, mixing together during the study period. Model output along with the USGS data suggests the side sloughs are potential sources of constituents including EC.

Regional San implemented a data acquisition scheme that included the needs of the transport model calibration – this joint approach clearly improved the accuracy of the transport modeling during the project period in 2019. Data from the USGS high frequency sampling September 09 – 12, 2019 proved to be very important in setting and calibrating dispersion parameters in the study area, while the Regional San grab sample measurements provided invaluable validation data for the calibration.

Appendix

Additional Flow Locations for the Calibration and Project Periods

In Figure 43, the flow calibration results are shown at CDEC station LPS in Little Potato Slough. For comparison, the results for flow and tidally averaged flow at this station before and during the project period in 2019 are shown in Figure 44. Similarly, the calibration results and results before and during the project period at CDEC location MOK in the Mokelumne River at the San Joaquin River, are shown in Figure 45 and Figure 46, respectively.

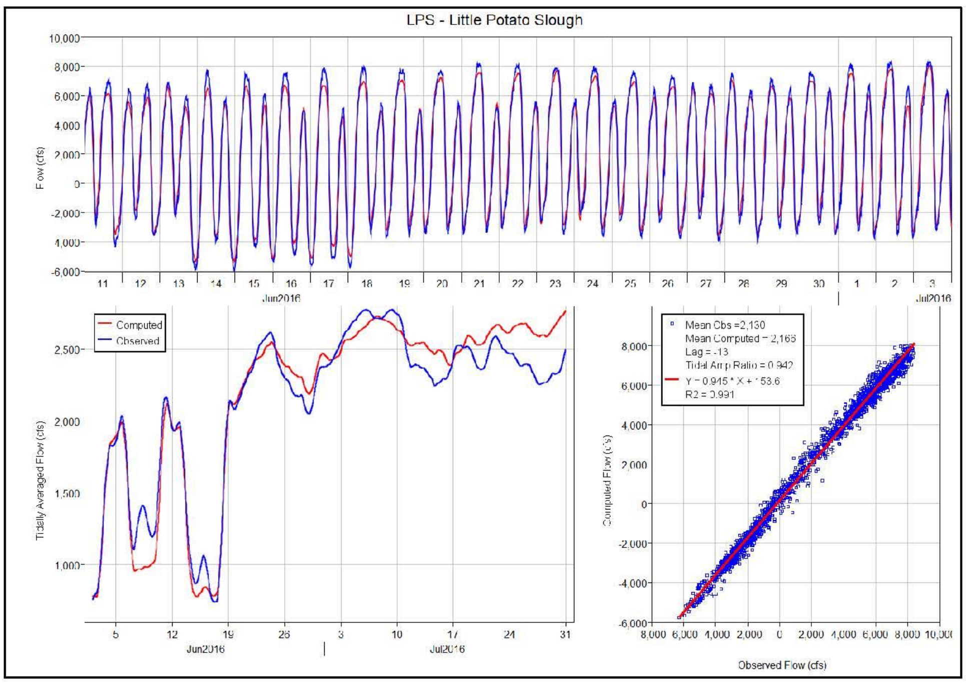

Figure 43 Flow calibration results in Little Potato Slough, CDEC location LPS.

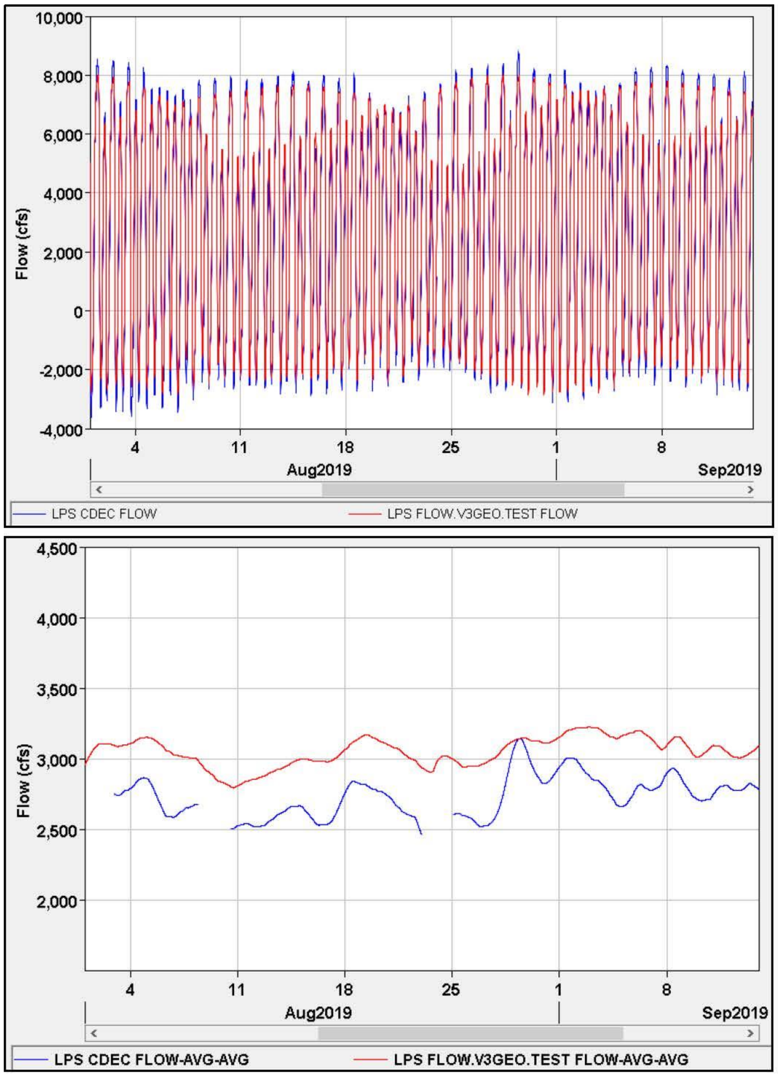

Figure 44 Flow (upper) and tidally averaged flow (lower) results of the project period model at Little Potato Slough.

63

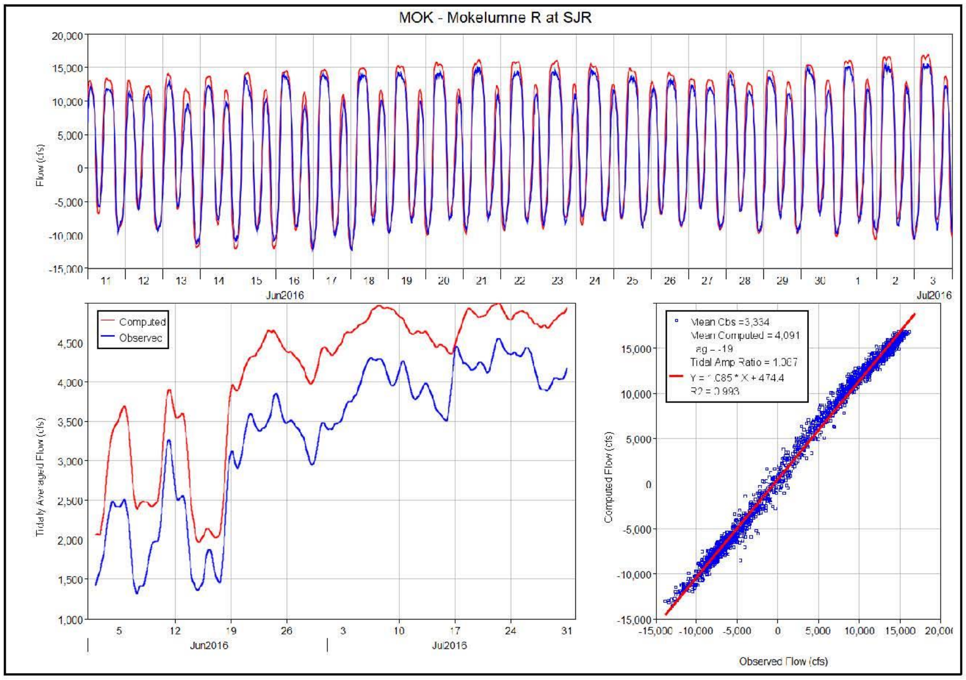

Figure 45 Flow calibration results in the Mokelumne River at the San Joaquin River, CDEC location MOK.

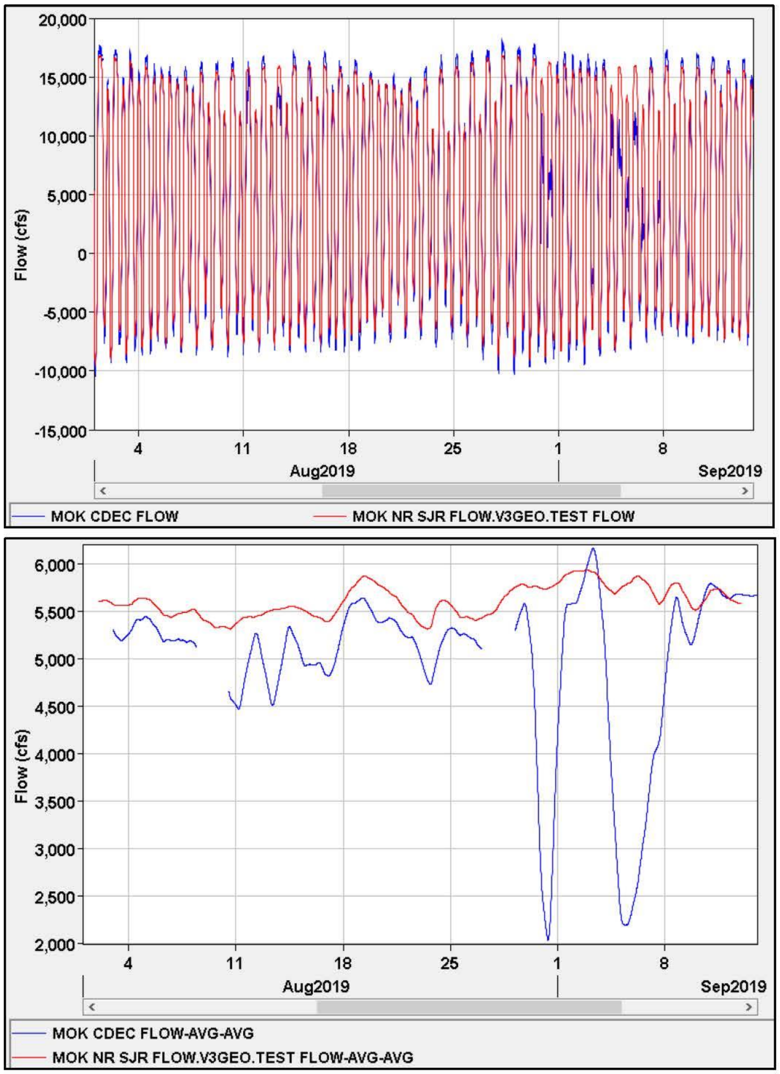

Figure 46 Flow (upper) and tidally averaged flow (lower) results of the project period model in the Mokelumne River at the San Joaquin River. Unexplained data departures in the flow data resulted in large deviations in the tidally averaged flow.

65

Volumetric Output Example

Volumetric percentage output for the three sources was compiled into an EXCEL file for each of the stations identified by the project in the model domain. Figure 47 shows several lines of this output for the Mokelumne source at several locations. The Mokelumne source was composed of the combined flow from the Mokelumne and Cosumnes Rivers.

	RMA11	RMA11	RMA11	RMA11	RMA11	RMA11	RMA11	RMA11	RMA11
	GS1	GS2	GS3	GS4	NFM3	NFM4	NFM2	NMR	SREM
	VOL % MOKE	VOL % MOKE	VOL % MOKE	VOL % MOKE	VOL % MOKE	VOL % MOKE	VOL % MOKE	VOL % MOKE	VOL % MOKE
	MOKECOS100	MOKECOS100	MOKECOS100	MOKECOS100	MOKECOS100	MOKECOS100	MOKECOS100	MOKECOS100	MOKECOS100
	Vol %	Vol %	Vol %	Vol %	Vol %	Vol %	Vol %	Vol %	Vol %
	INST-VAL	INST-VAL	INST-VAL	INST-VAL	INST-VAL	INST-VAL	INST-VAL	INST-VAL	INST-VAL
01Sep2019 0015	0.000	0.000	0.000	0.000	1.205	1.515	0.133	0.754	0.000
01Sep2019 0030	0.000	0.000	0.000	0.000	1.048	1.595	0.105	0.982	0.000
01Sep2019 0045	0.000	0.000	0.000	0.000	0.896	1.648	0.083	1.237	0.000
01Sep2019 0100	0.000	0.000	0.000	0.000	0.756	1.672	0.066	1.516	0.000
01Sep2019 0115	0.000	0.000	0.000	0.000	0.630	1.664	0.055	1.815	0.000
01Sep2019 0130	0.000	0.000	0.000	0.000	0.520	1.627	0.049	2.133	0.000
01Sep2019 0145	0.000	0.000	0.000	0.000	0.426	1.564	0.050	2.463	0.000
01Sep2019 0200	0.000	0.000	0.000	0.000	0.348	1.482	0.057	2.807	0.000
01Sep2019 0215	0.000	0.000	0.000	0.000	0.283	1.386	0.071	3.163	0.000
01Sep2019 0230	0.000	0.000	0.000	0.000	0.232	1.287	0.094	3.530	0.000
01Sep2019 0245	0.000	0.000	0.000	0.000	0.192	1.193	0.125	3.893	0.000
01Sep2019 0300	0.000	0.000	0.000	0.000	0.162	1.110	0.164	4.212	0.000
01Sep2019 0315	0.000	0.000	0.000	0.000	0.141	1.038	0.209	4.439	0.000
01Sep2019 0330	0.000	0.000	0.000	0.000	0.125	0.974	0.257	4.635	0.000
01Sep2019 0345	0.000	0.000	0.000	0.000	0.113	0.918	0.306	4.423	0.000

Figure 47 Example of EXCEL file timeseries output for Mokelumne volumetric percent results for several stations in the model domain.

Animations of Volumetric Percentages

Three animations were prepared to visualize the volumetric percentages in RMA grid for a portion of the study period – the initial frame of each of the animations is shown in Figure 48 through Figure 50. The area covers the DCC, the two branches of the Mokelumne River, portion of the side sloughs to the South Fork Mokelumne, and a portion of Georgiana Slough. Numerical values illustrating the changes in volumetric percentage as the animations progress were included.

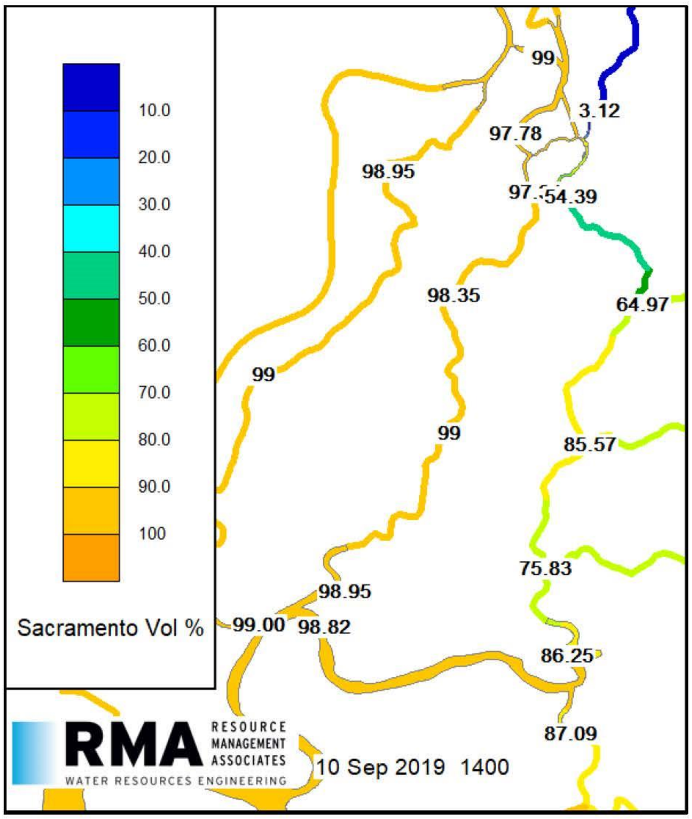

Figure 48 Initial frame of the Sacramento Volume % animation (File: SRiNCS.RMA.Sac.Volume.animation.pptx).

67

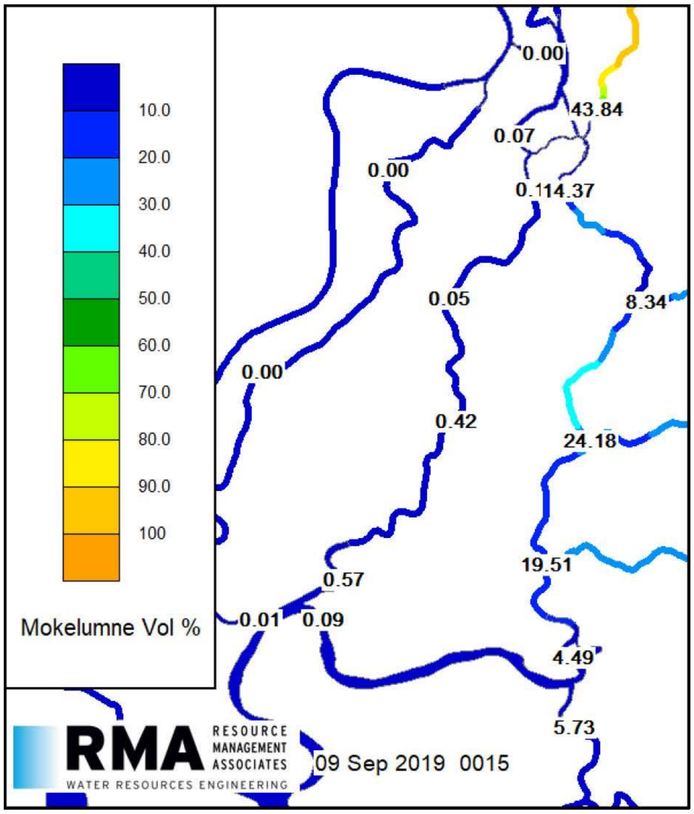

Figure 49 Initial frame of the Mokelumne Volume % animation (File: SRiNCS.RMA.Moke.Volume.animation.pptx.

68

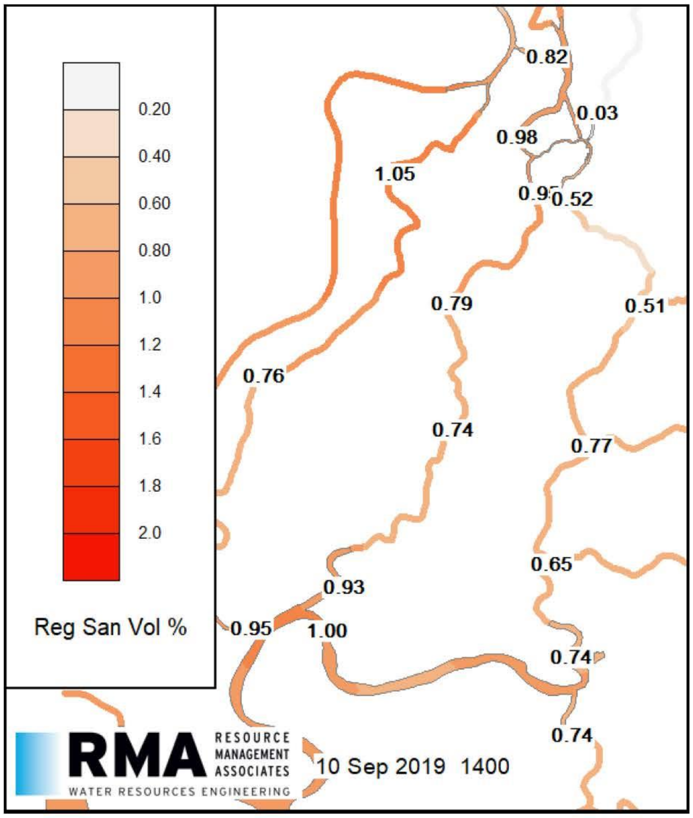

Figure 50 Initial frame of the Regional San Volume % animation (File: SRiNCS.RMA.RegSan.Volume.animation.pptx.

69

Particle Tracking Output and Animations

In addition to an EXCEL file with time series output sent to Regional San (PTM.NoRegSanEffluentParticleCount.xlsx) and an explanatory file with images (PTM.Images.NoEffluent.PDF), two animations at different spatial scales were prepared to illustrate the movement of water parcels conceptualized as particles in the RMA particle tracking model. The initial time stamp of these animations are shown in Figure 51 and Figure 52. Explanatory information is included in Figure 53and Figure 54.

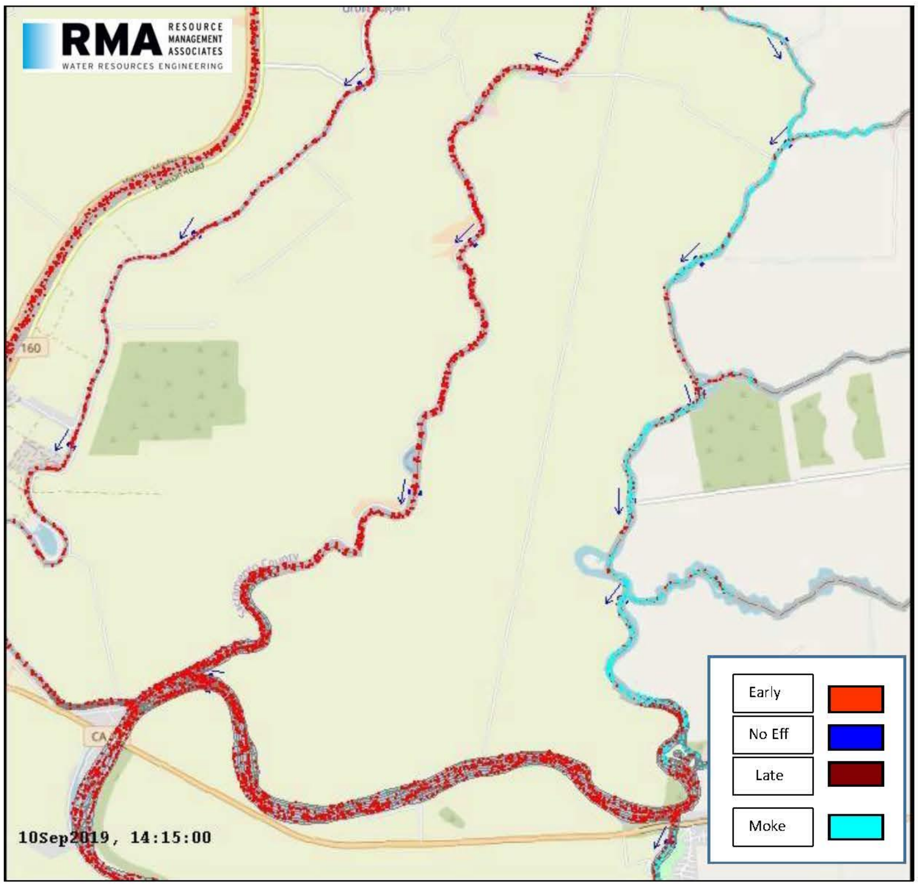

Figure 51 Initial frame of the larger scale particle tracking animation (File: SRiNCS.PTM.LrgScale.RegSanFinal.pptx).

70

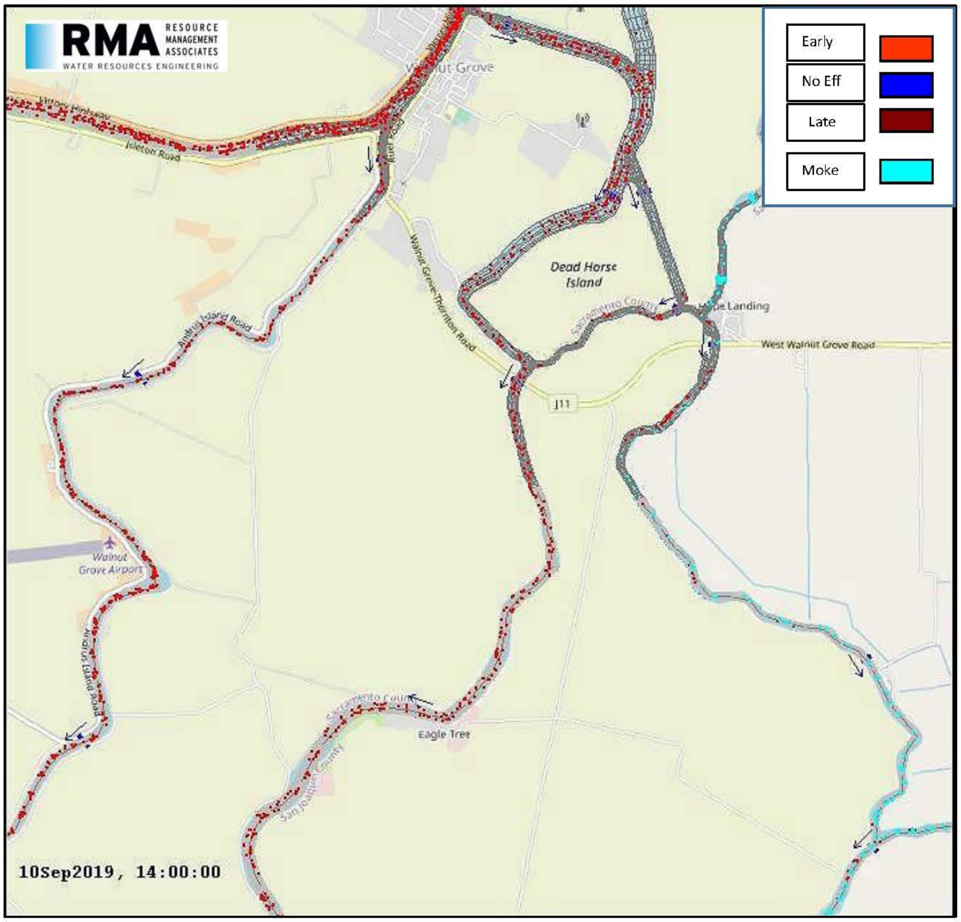

Figure 52 Initial frame of the smaller scale particle tracking animation (File: SRiNCS.PTM.SmlScale.RegSanFinal.pptx).

71

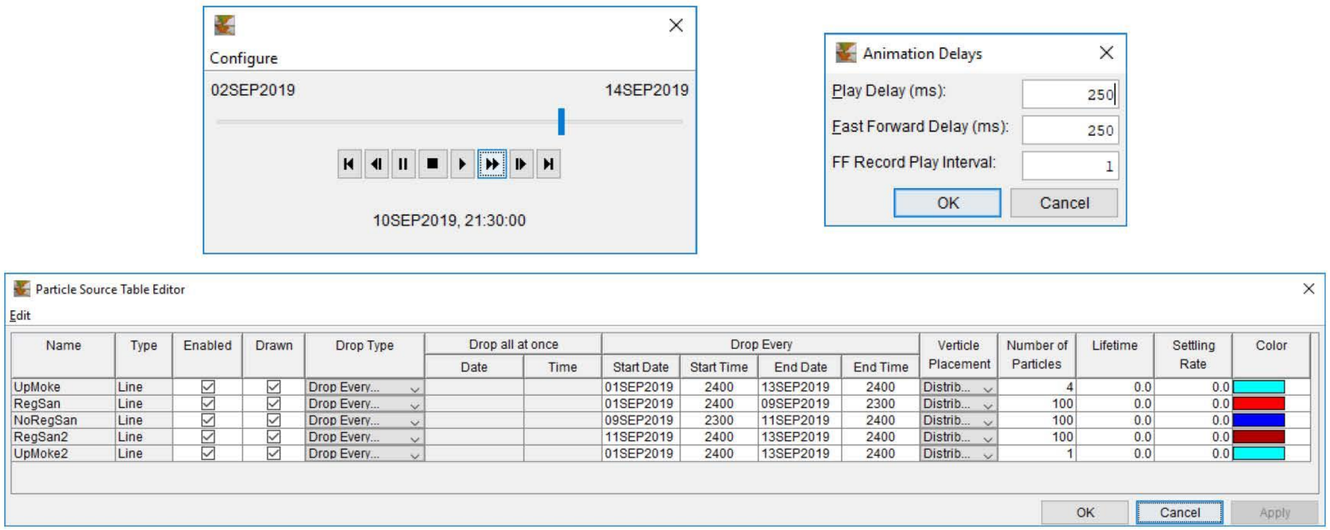

Figure 53 Setup for the particle tracking models used as input to the animations in the RMA software.

72

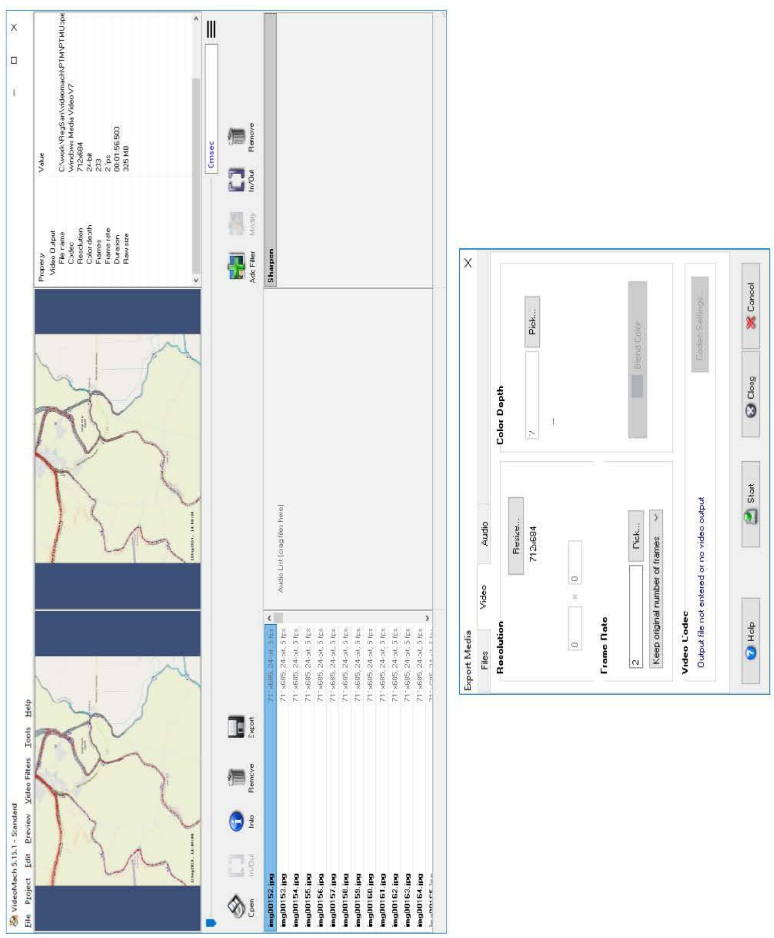

Figure 54 Documentation on the animation setup in the commercial software package VideoMach.

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Appendix 3. RMA Depth Analysis Final Report and Bathymetric Maps

RMA RESOURCE MANAGEMENT ASSOCIATES
WATER RESOURCES ENGINEERING

River Depth Analysis in Support of the Sacramento River Nutrient Change Study

DRAFT

November 11, 2020

Prepared By:
Resource Management Associates
1756 Picasso Avenue, Suite G
Davis, CA 95618
Contact:
Richard Rachiele
925-949-8960

INTRODUCTION

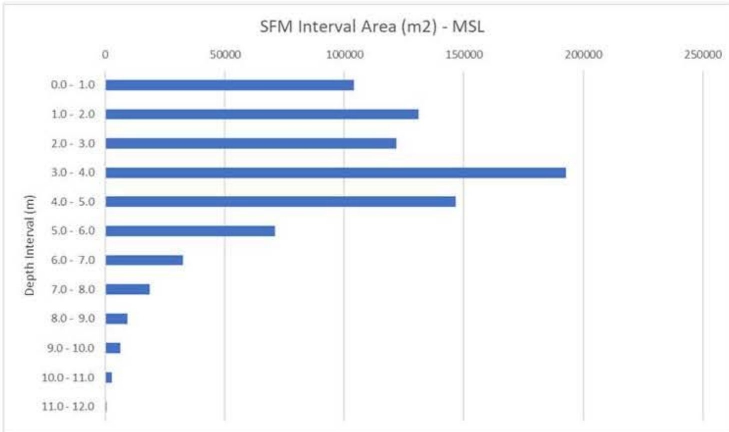
Depth histograms were developed for the four study reaches of the 2019 Sacramento River Nutrient Change Study. The depths were derived using the 2-meter DEM of the north Delta bathymetry developed by the California Dept. of Water Resources (DWR) (Figure 1). The RMA hydrodynamic model results performed for the September 2019 field study were processed to develop elevation surfaces of Mean Sea Level (MSL), MHHW and MLLW. The gridded bathymetry was subtracted from the model water surface elevations to produce 2m x 2m grids of water depth for the four study reaches (Figure 2 and Figure 3).

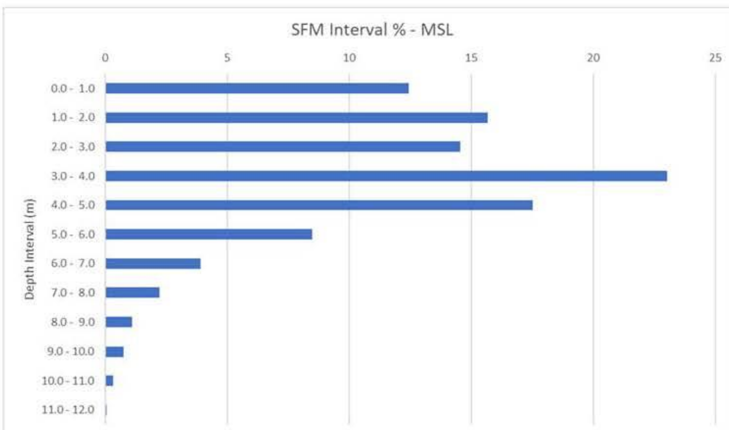
RESULTS

For each reach, the grid cells of depth were binned for 1 meter intervals of depth and tabulated. Below is an example of the table of areas for the depth intervals from the SFM and the histogram plots. The tables and plots are provided in Excel spreadsheet files.

DEM File	SFM_MSL_depth_dem.flt	
NCOUNT	209187	
Depth Interval	Area (m2)	% Fraction
0.0 - 1.0	103976	12.4
1.0 - 2.0	131080	15.7
2.0 - 3.0	121808	14.6
3.0 - 4.0	192676	23.0
4.0 - 5.0	146628	17.5
5.0 - 6.0	70956	8.5
6.0 - 7.0	32572	3.9
7.0 - 8.0	18508	2.2
8.0 - 9.0	9140	1.1
9.0 - 10.0	6204	0.7
10.0 - 11.0	2712	0.3
11.0 - 12.0	488	0.1

River Depth Analysis in Support of the Sacramento River Nutrient Change Study





In addition to the tables and histogram plots, the depth raster image files were exported to geotiff format:

Coordinate System: UTM meters zone 10.

Depth units: meters.

The geotiff files may be imported into GIS programs for display and analysis. An examples of the display are presented in Figure 4.

River Depth Analysis in Support of the Sacramento River Nutrient Change Study

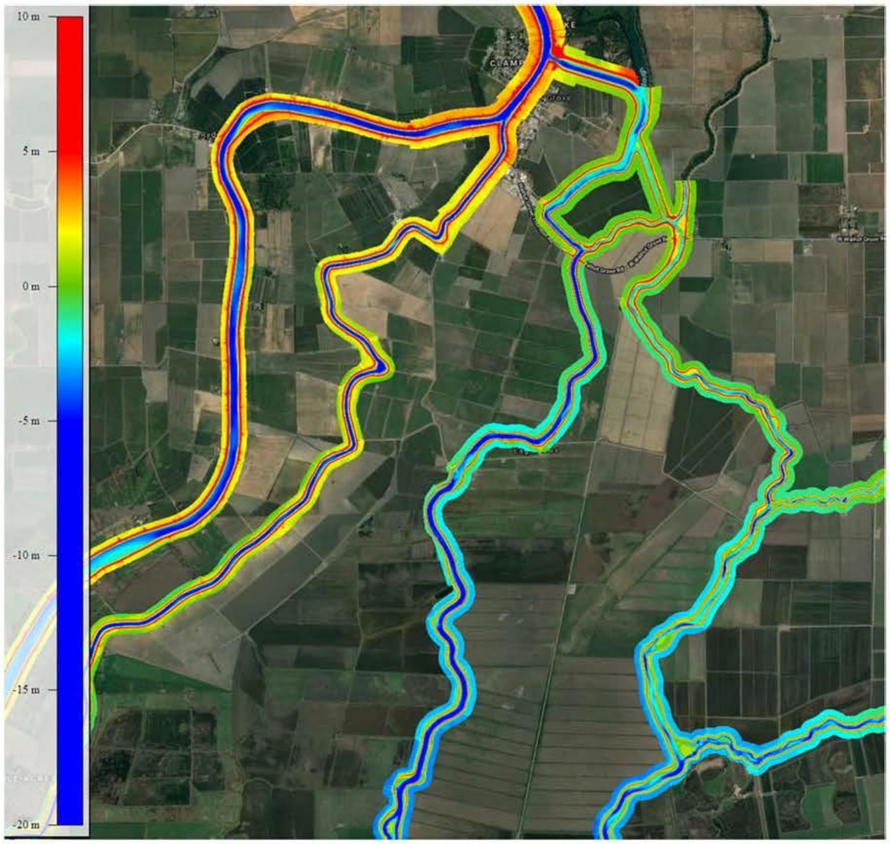


Figure 1 DWR 2-meter bathymetry DEM for the north Delta.

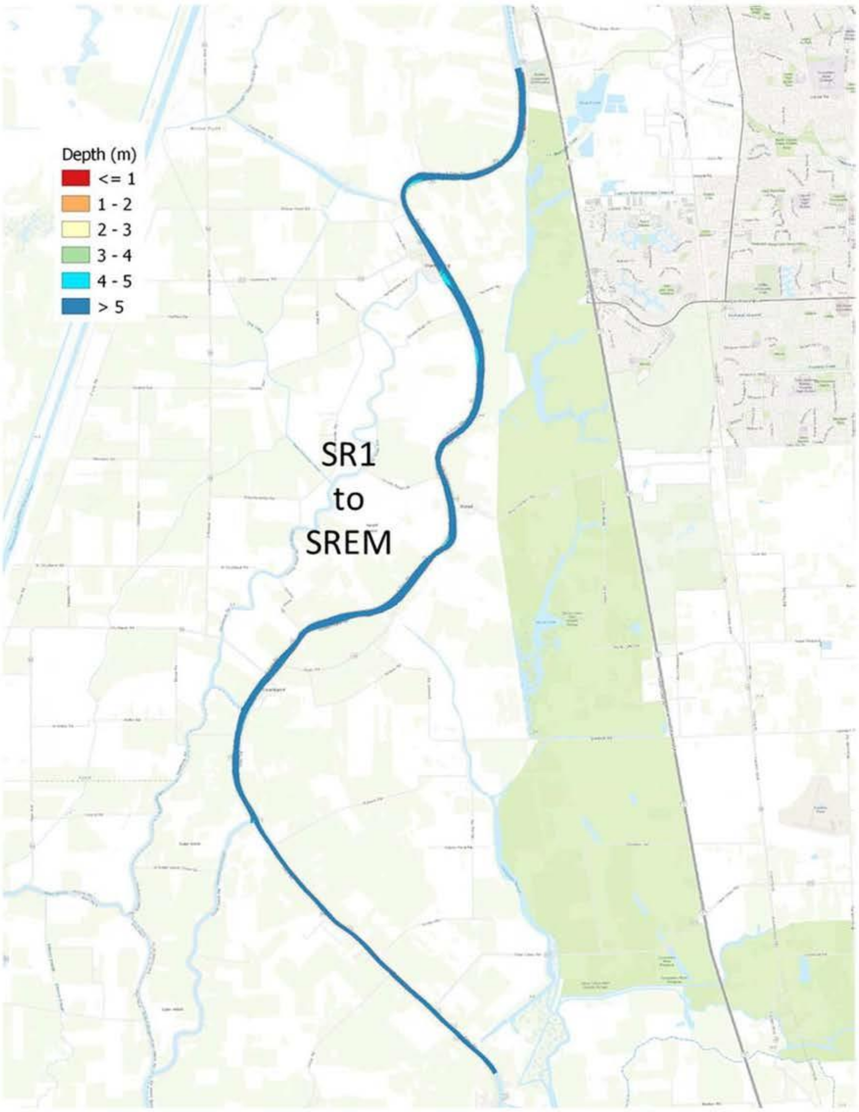


Figure 2 Depth coverage for the SR1 to SREM

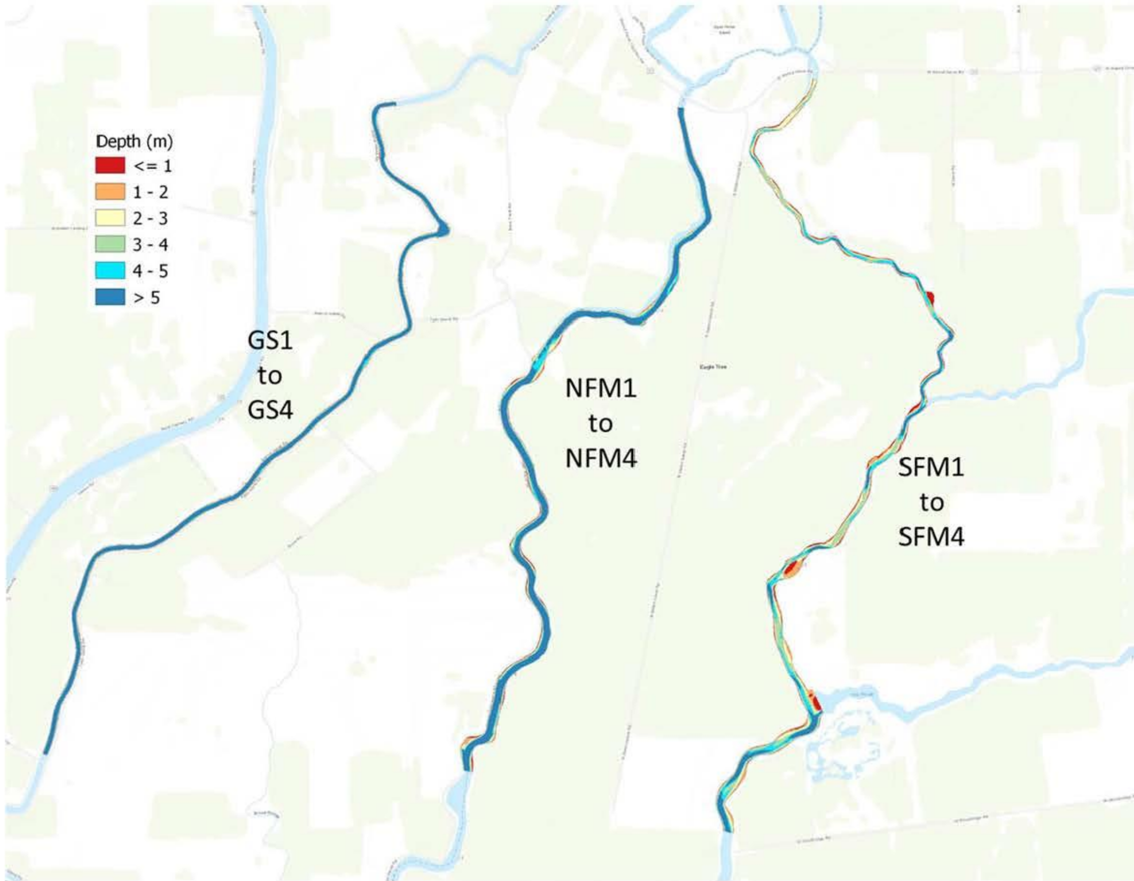


Figure 3 Depth coverage for the GS1-GS4, NFM1-NFM4, and SFM1-SFM4

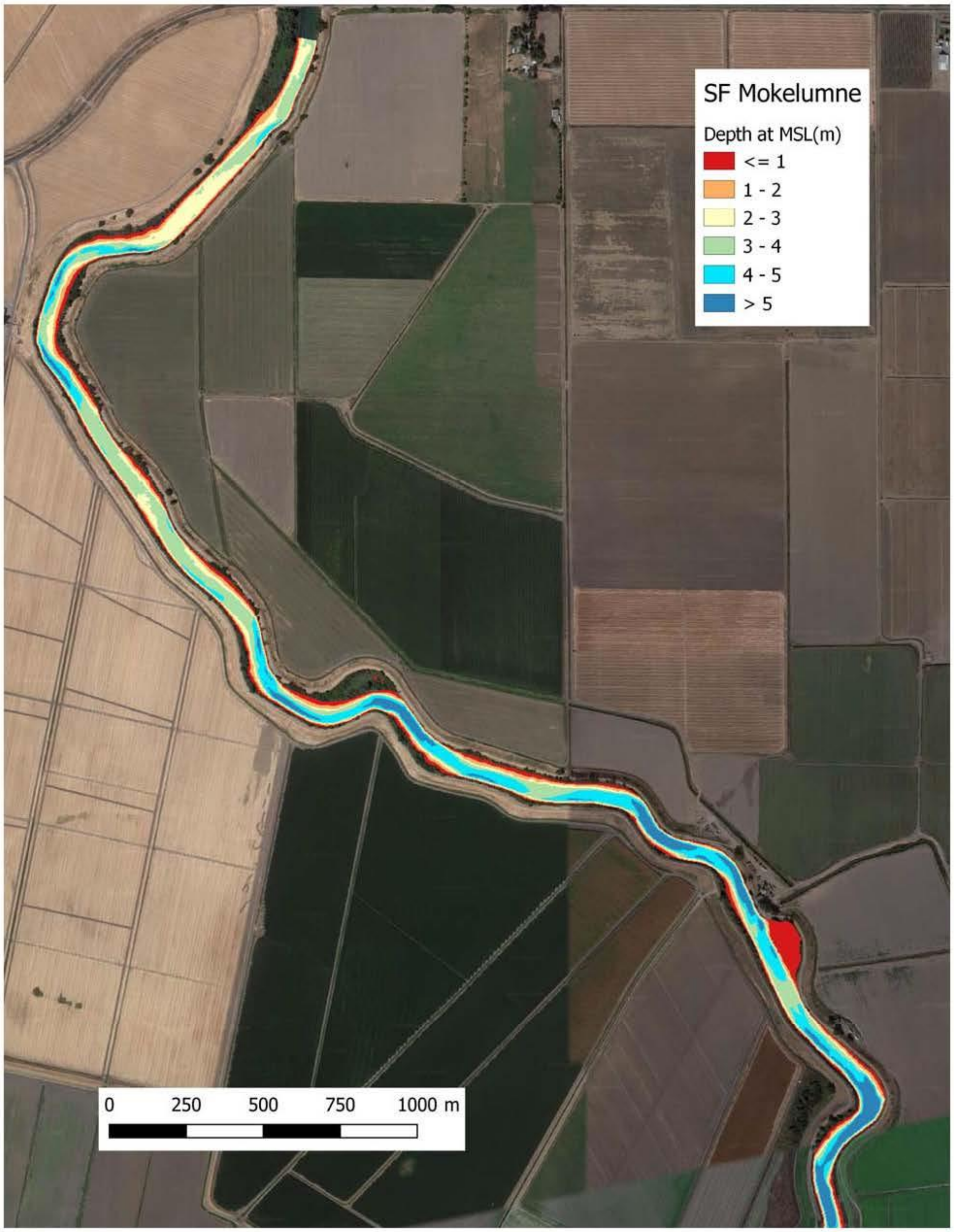
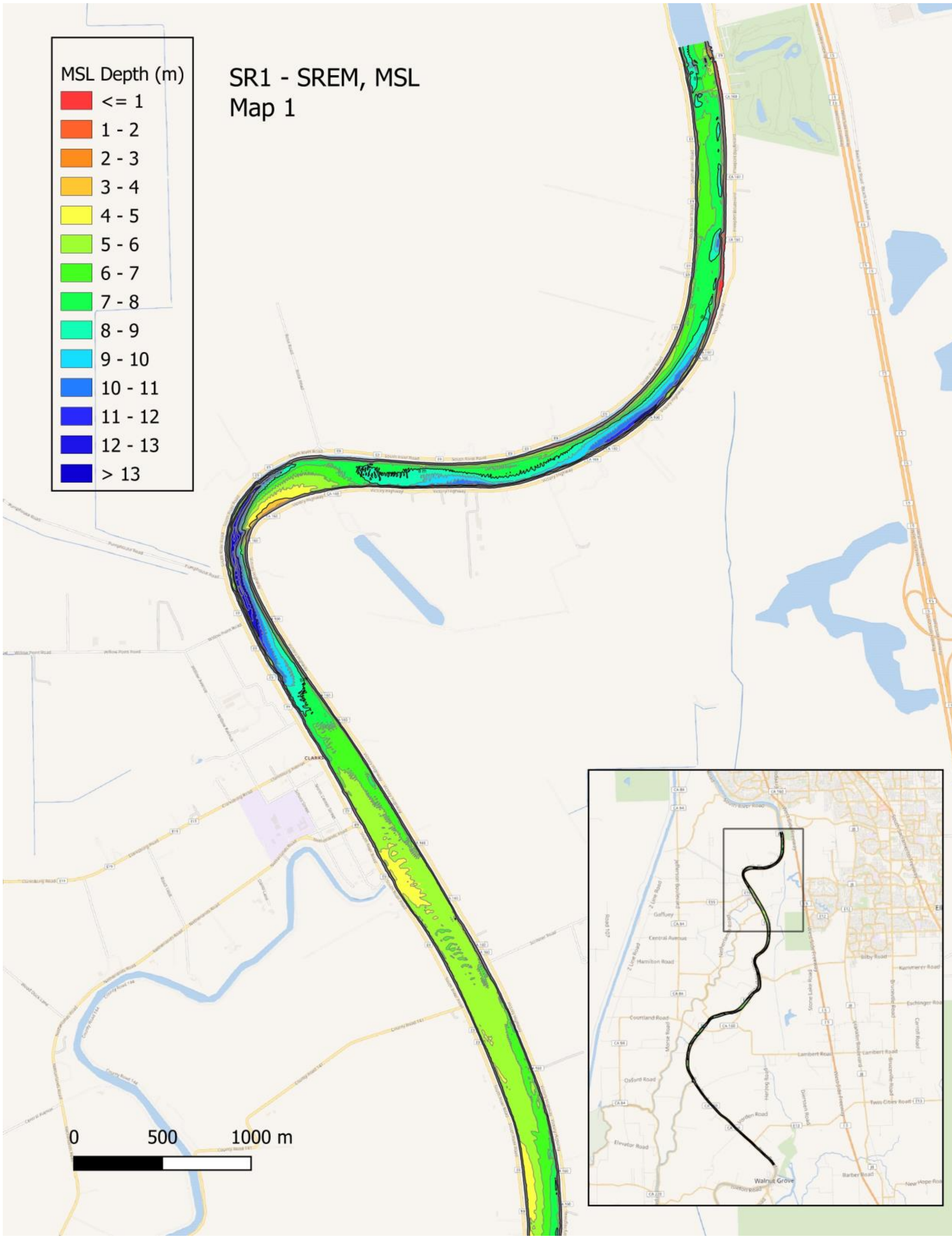
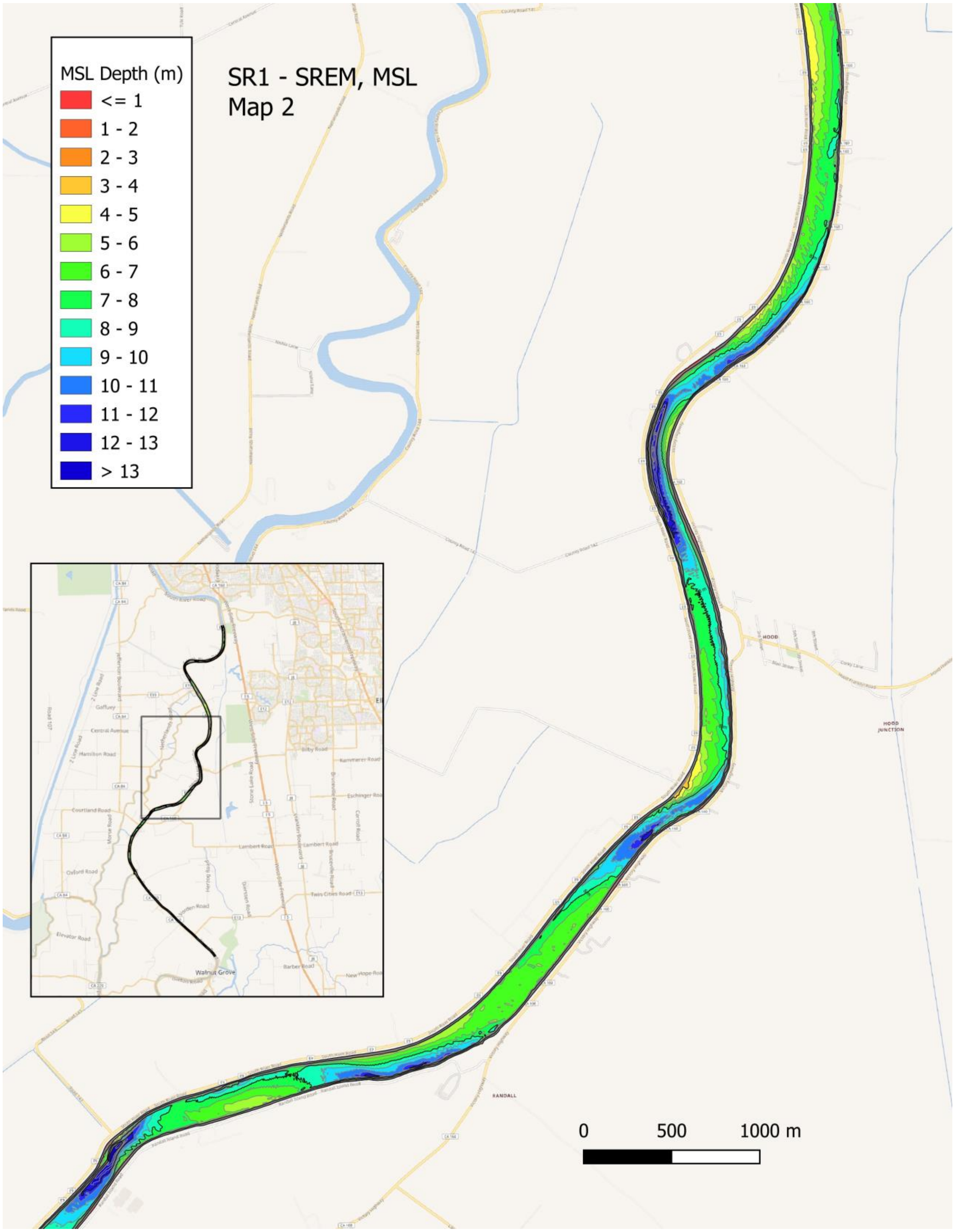
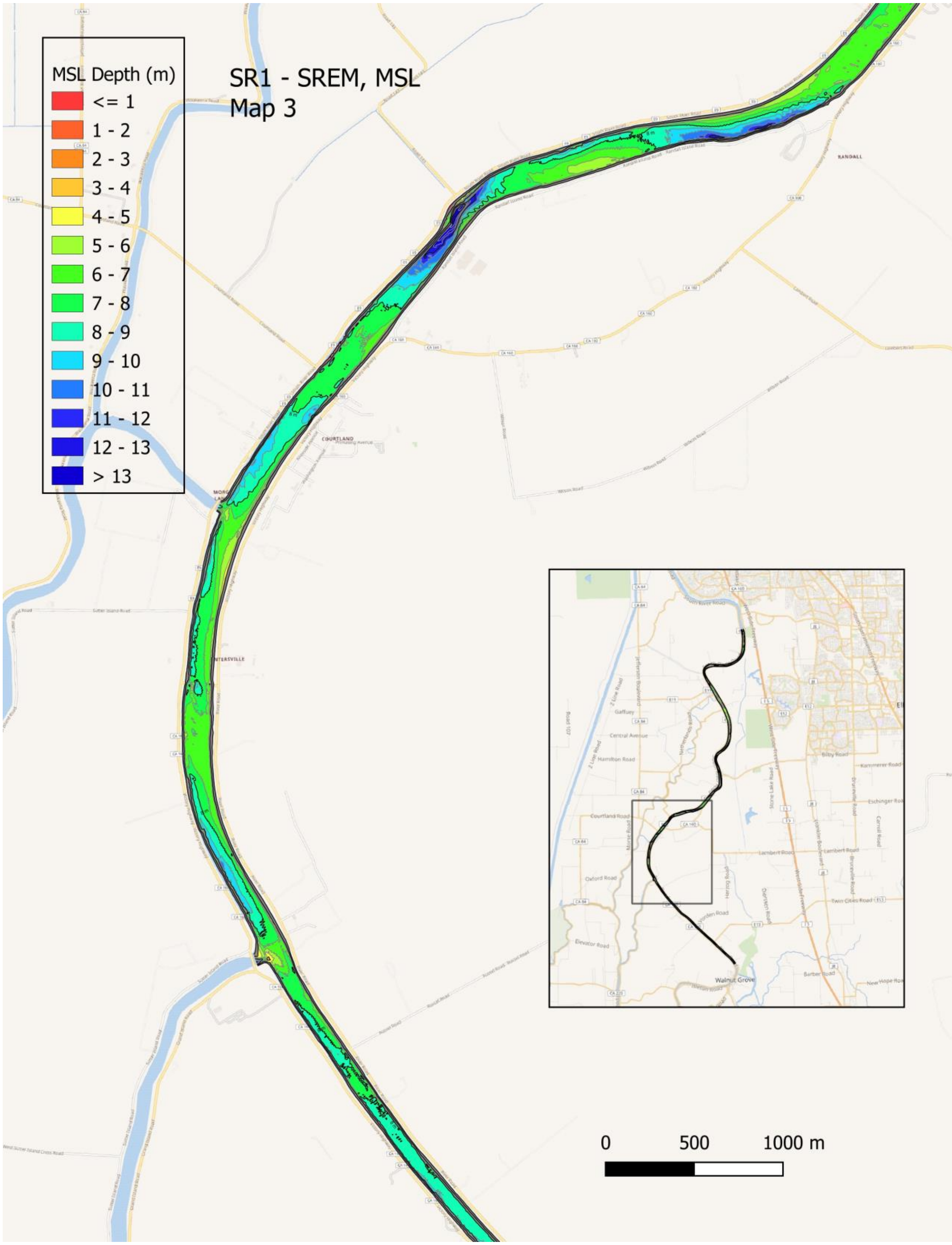


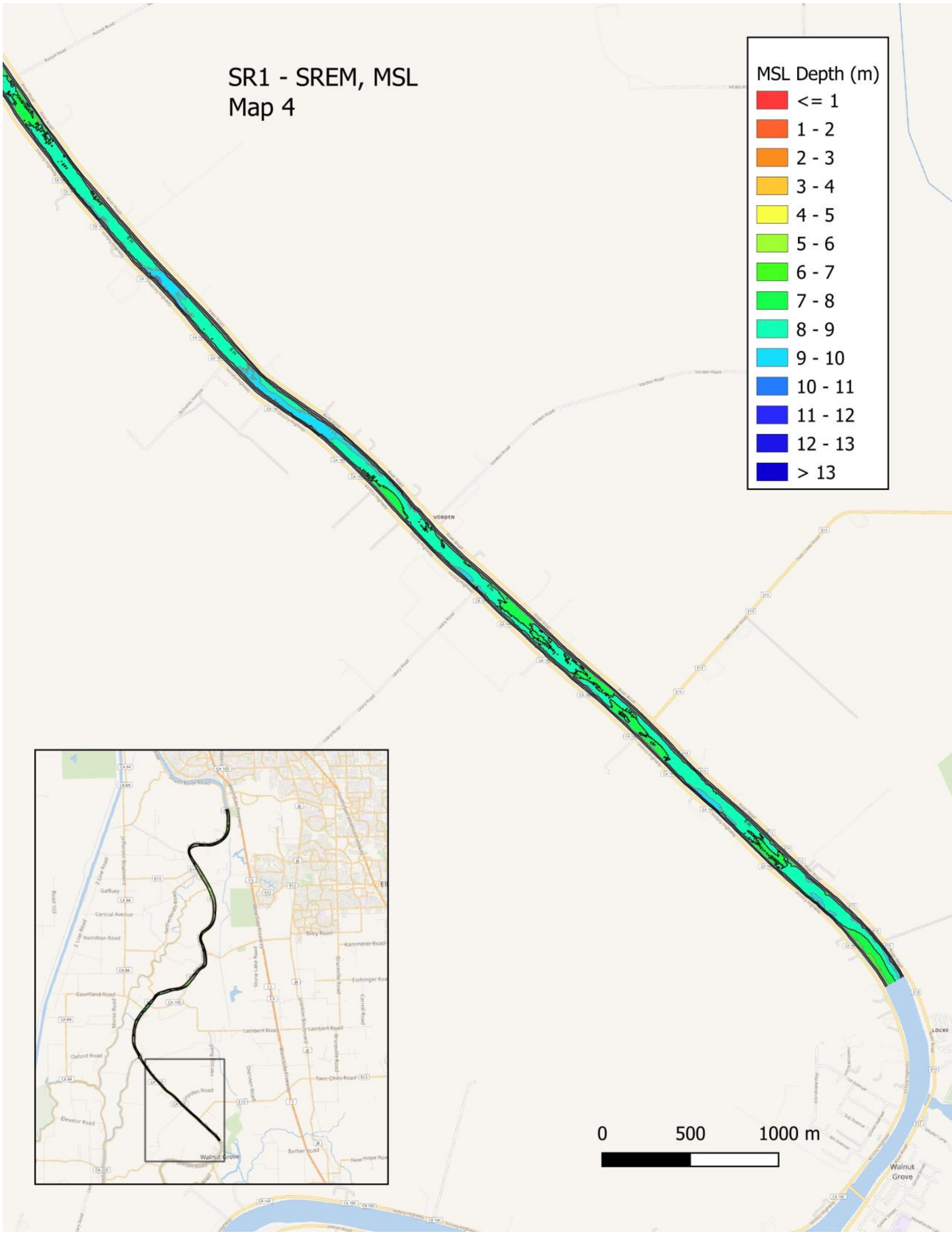
Figure 4 Display of the geotiff depth file for the upper portion of the SFM.

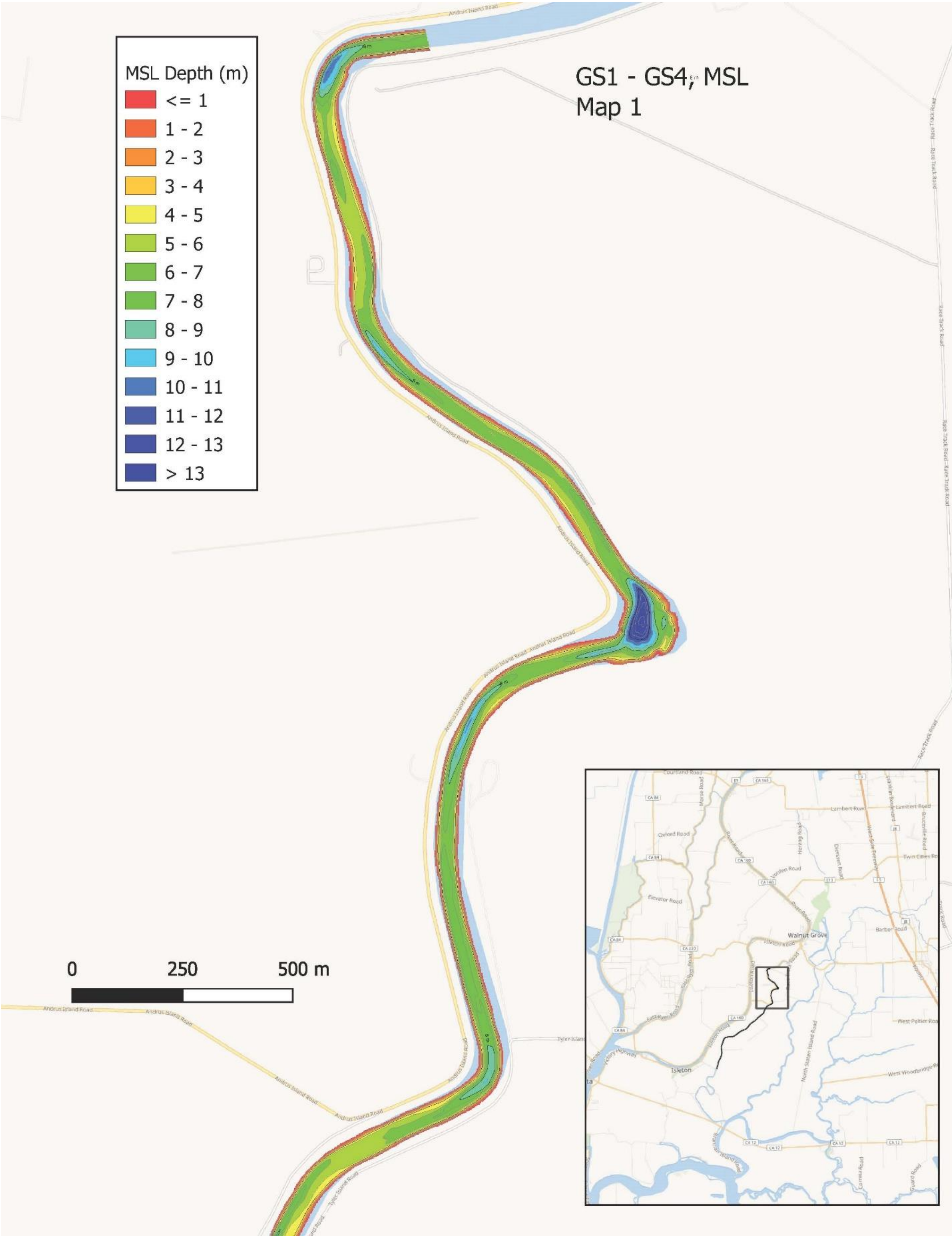
Figure 87. This page and twelve subsequent maps: Elevation surfaces at Mean Sea Level for our study area, divided into segments for the Sacramento River (SR), Georgiana Slough (GS), North Fork Mokelumne River (NFM), and South Fork Mokelumne River (SFM).

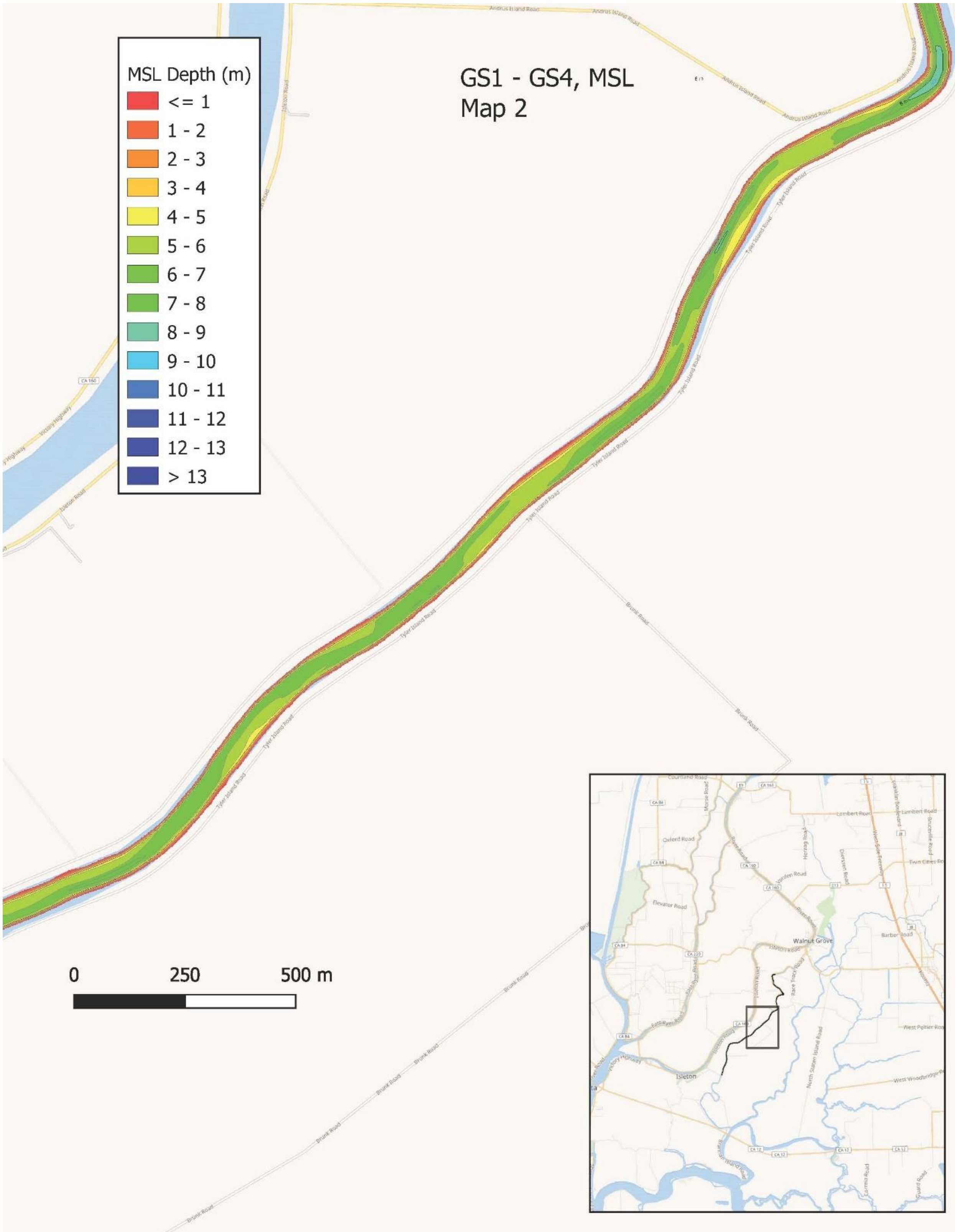


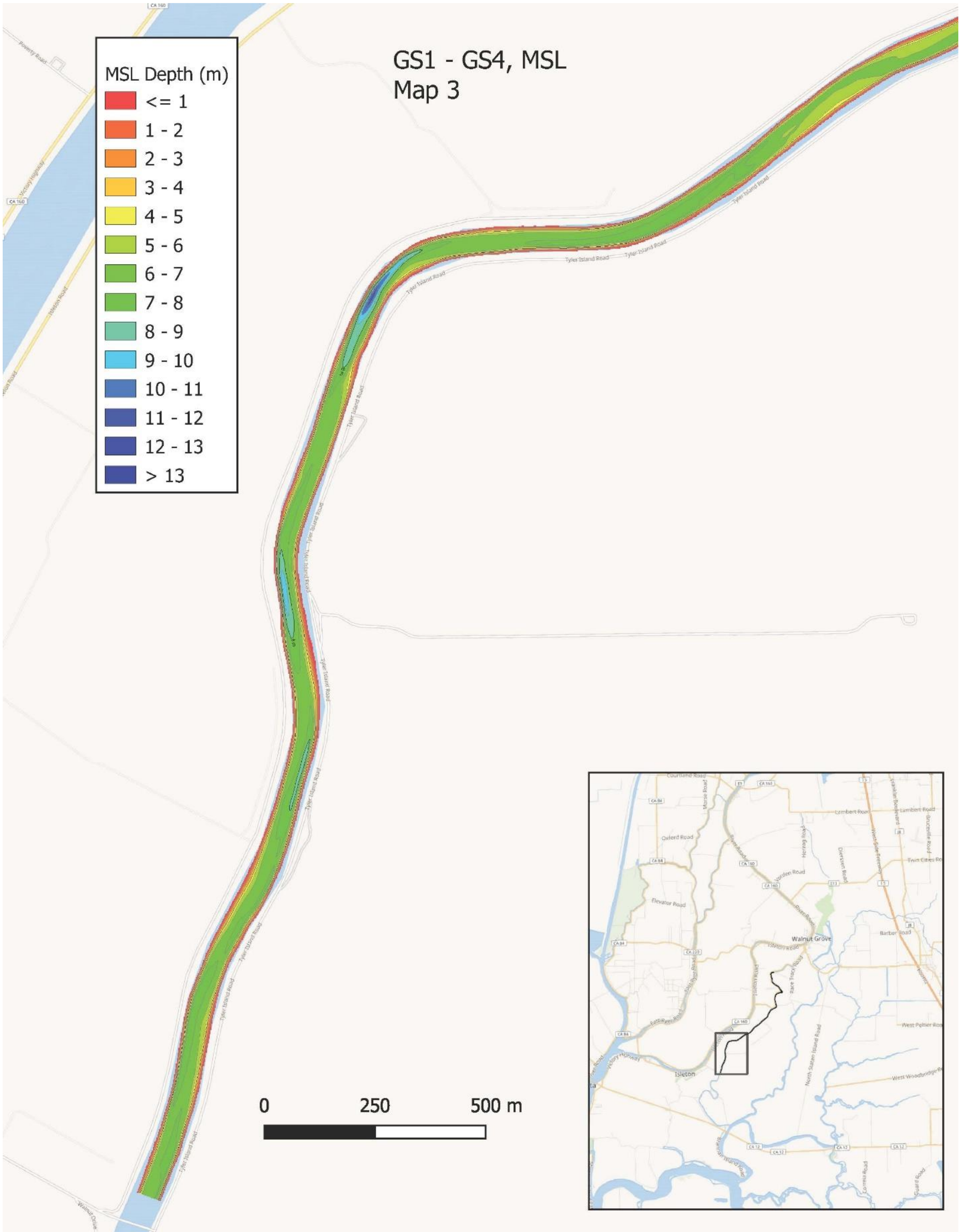

MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
SR1 - SREM, MSL
Map 2
0
500
1000 m

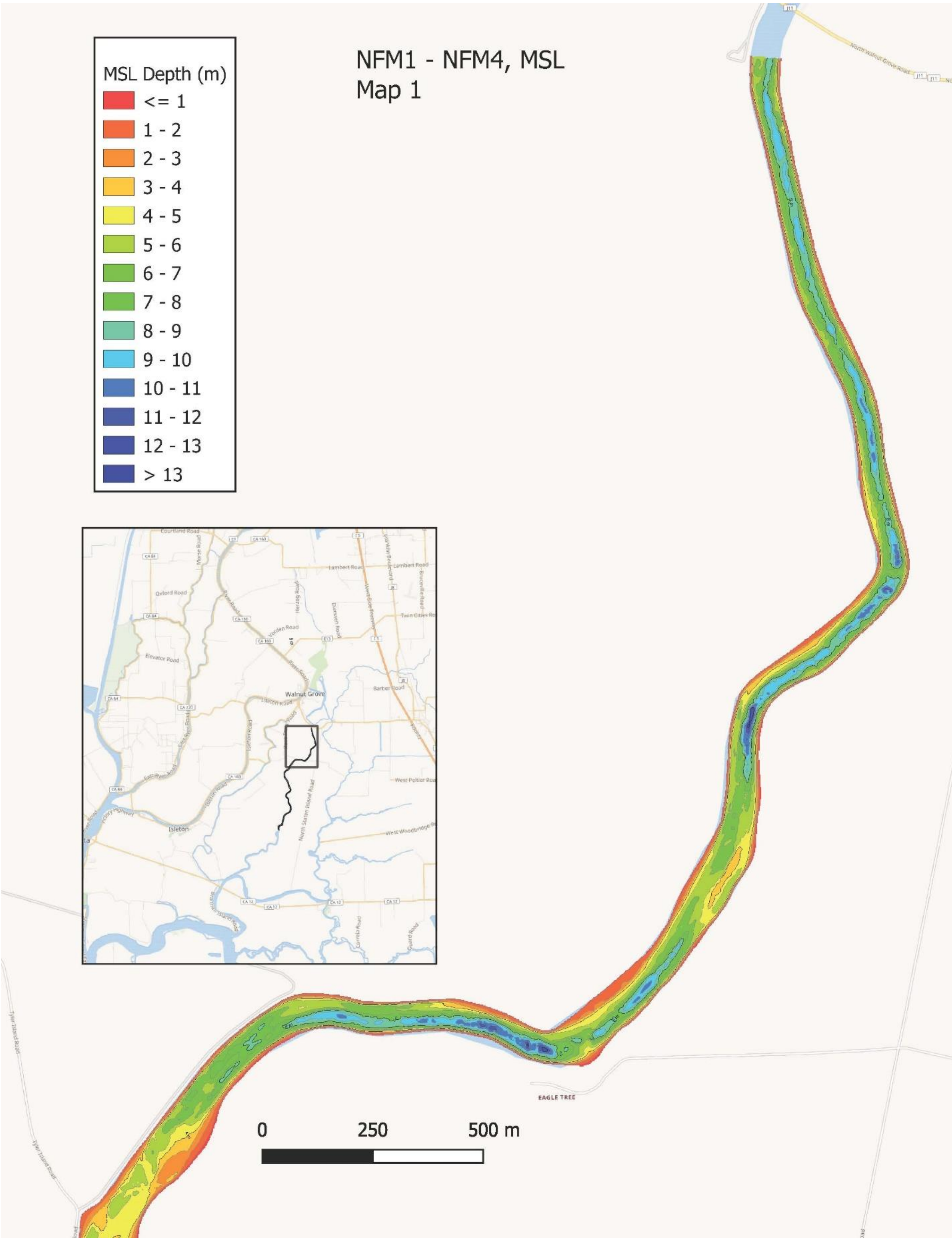

MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
SR1 - SREM, MSL
Map 3
COURTLAND
RANDALL
Walnut Grove
0
500
1000 m

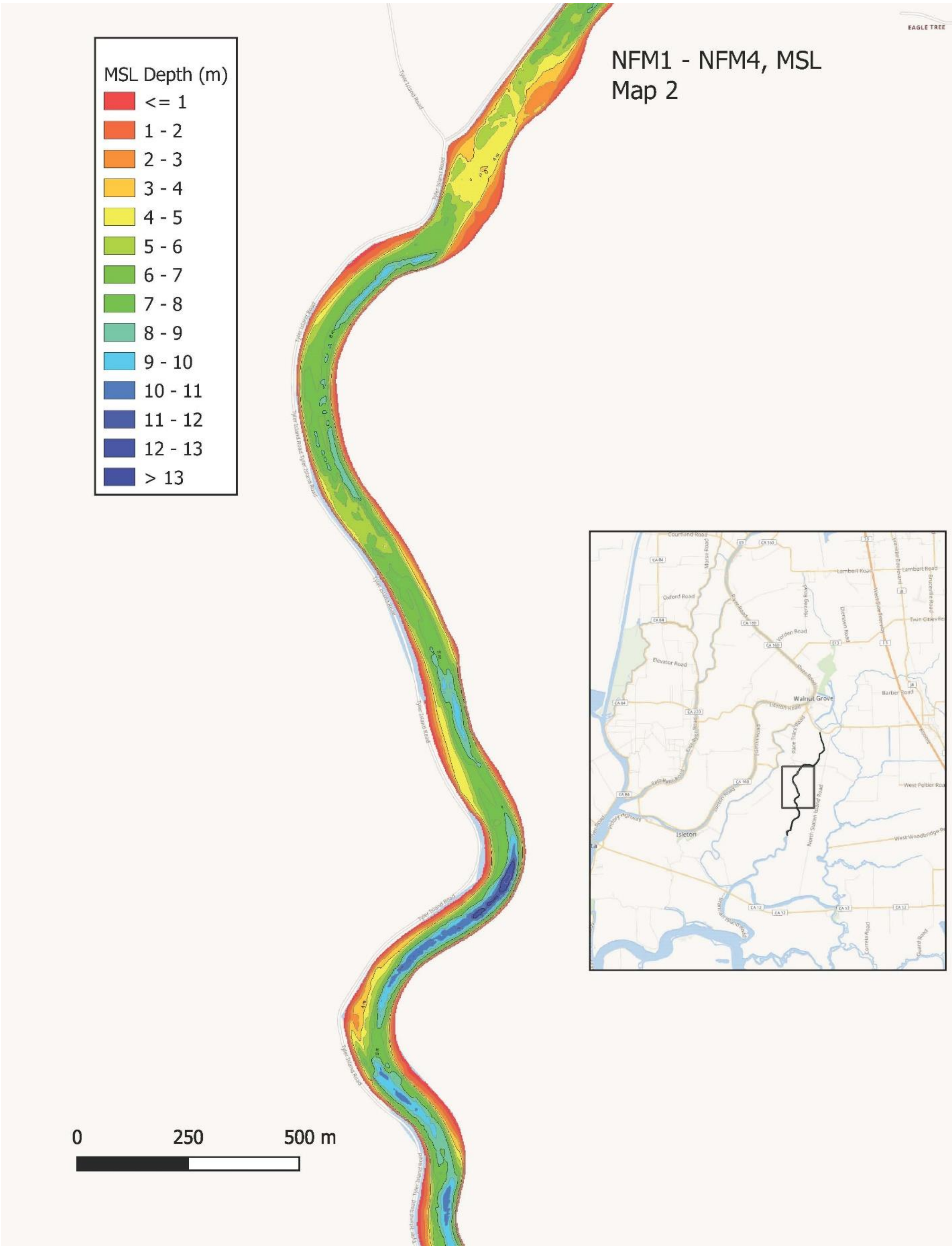

SR1 - SREM, MSL
Map 4
MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
0
500
1000 m


MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
GS1 - GS4, MSL
Map 1
0
250
500 m

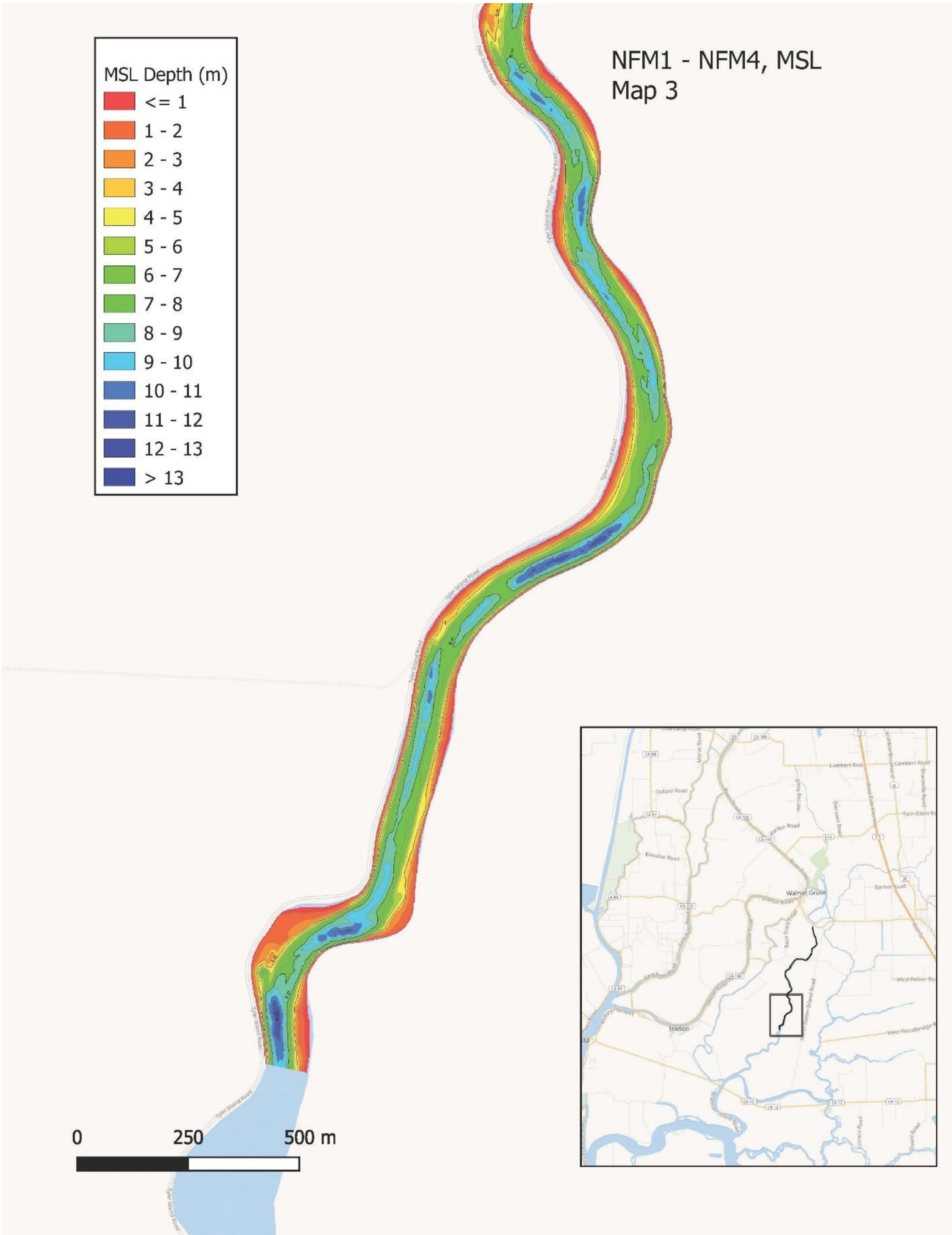

MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
GS1 - GS4, MSL
Map 2
0
250
500 m
Walnut Grove
Isleton

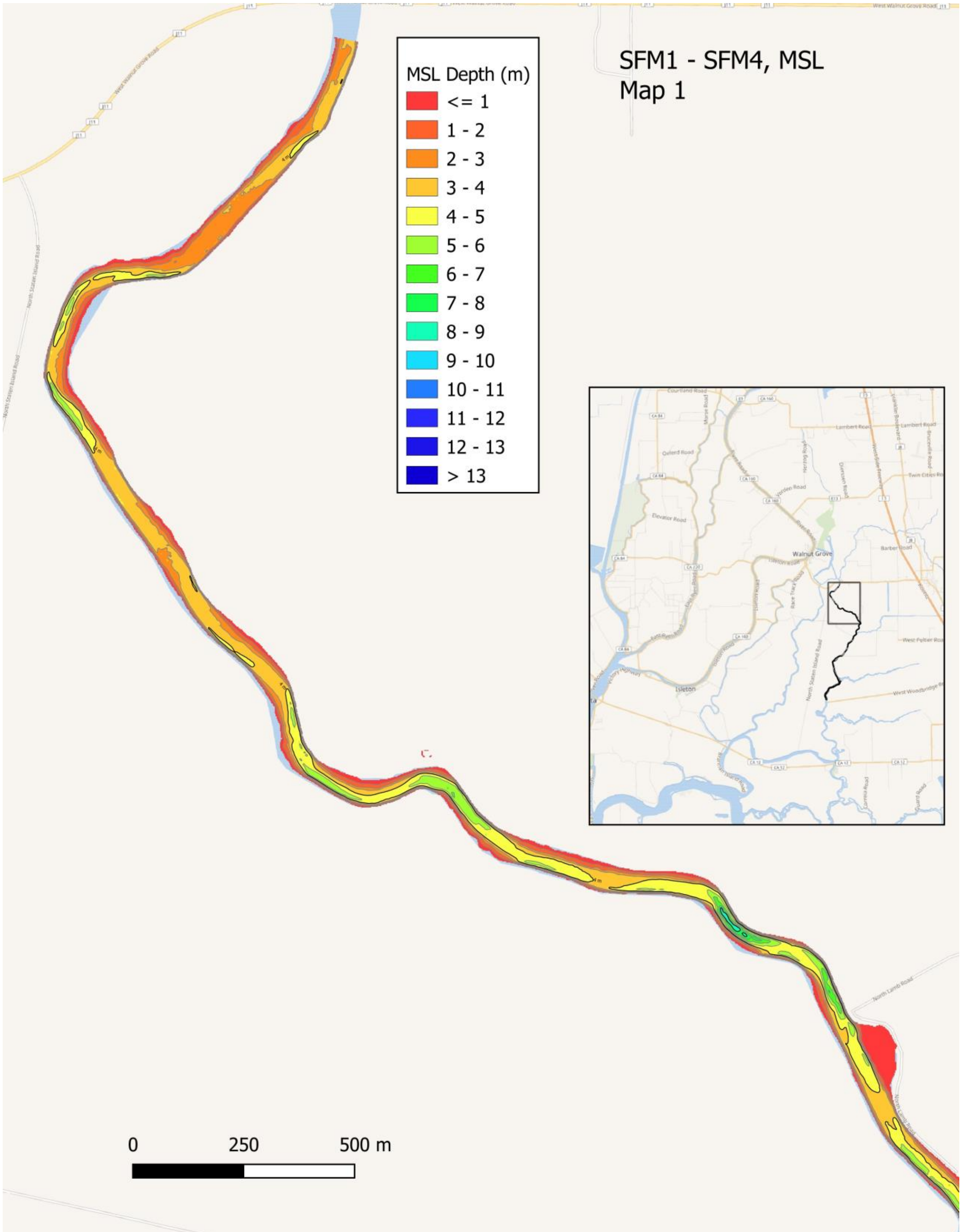

GS1 - GS4, MSL
Map 3
MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
0
250
500 m
Walnut Grove
Isleton

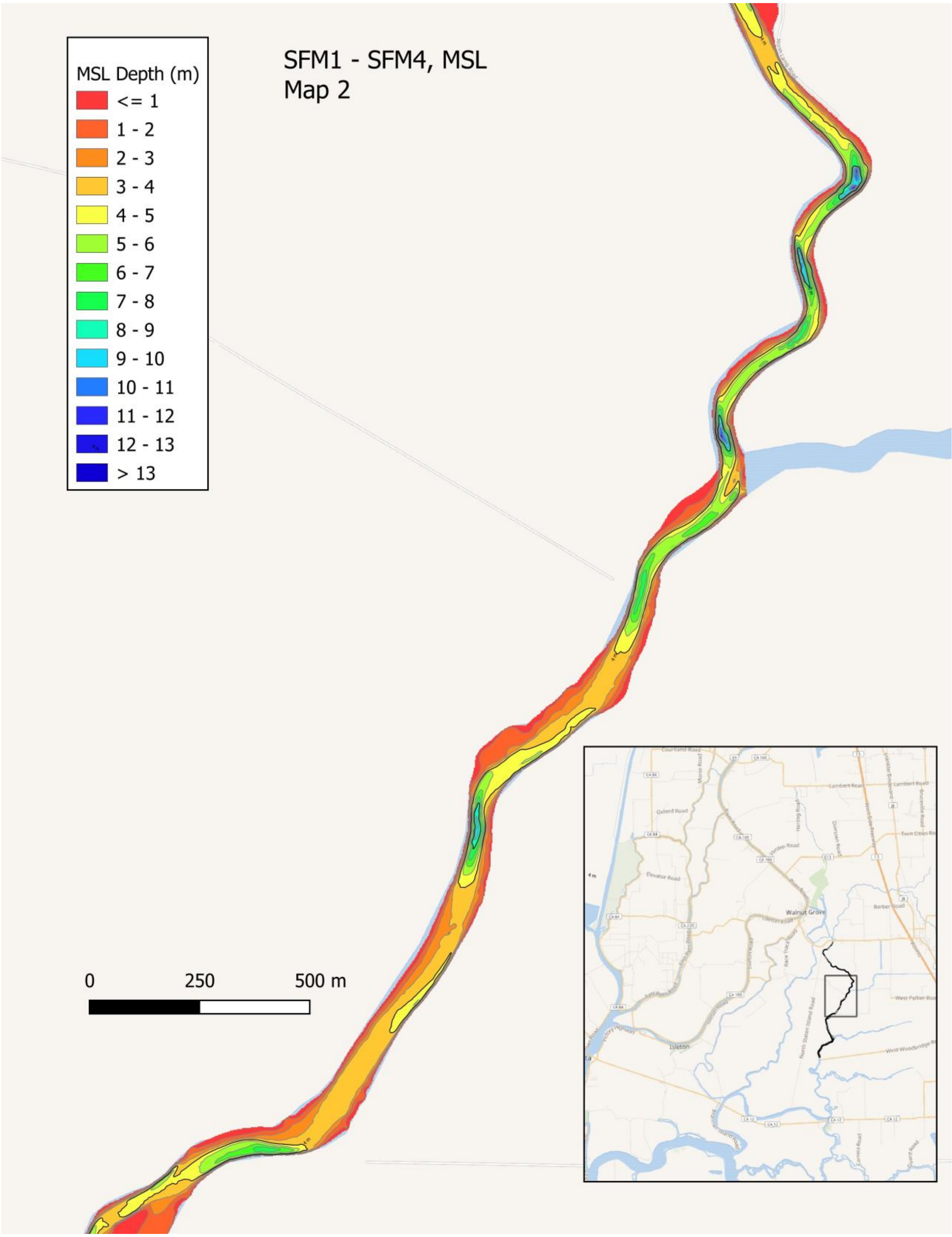

NFM1 - NFM4, MSL
Map 1
MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
Walnut Grove
Isleton
EAGLE TREE
0
250
500 m

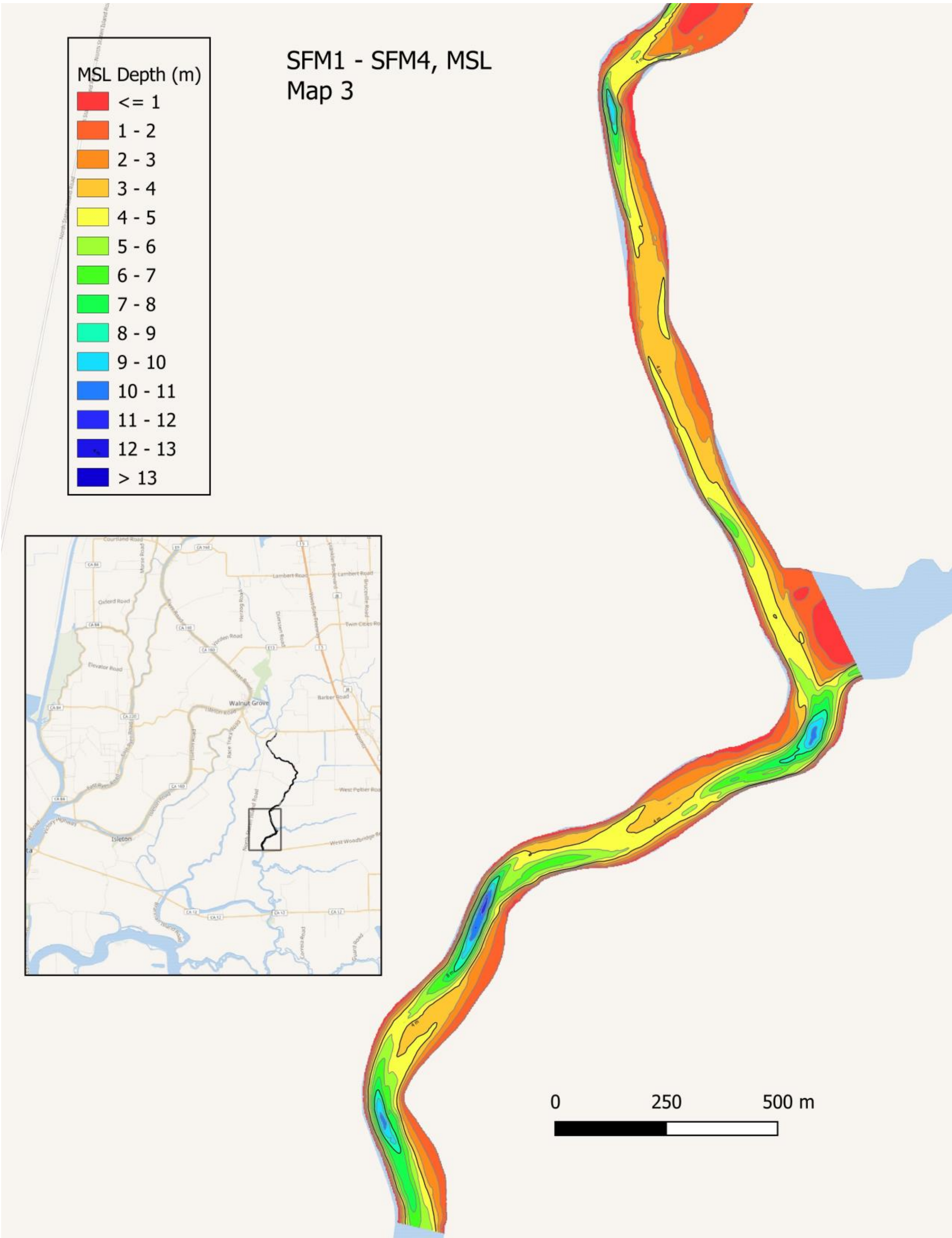


MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
NFM1 - NFM4, MSL
Map 2
0
250
500 m
Walnut Grove
Isleton

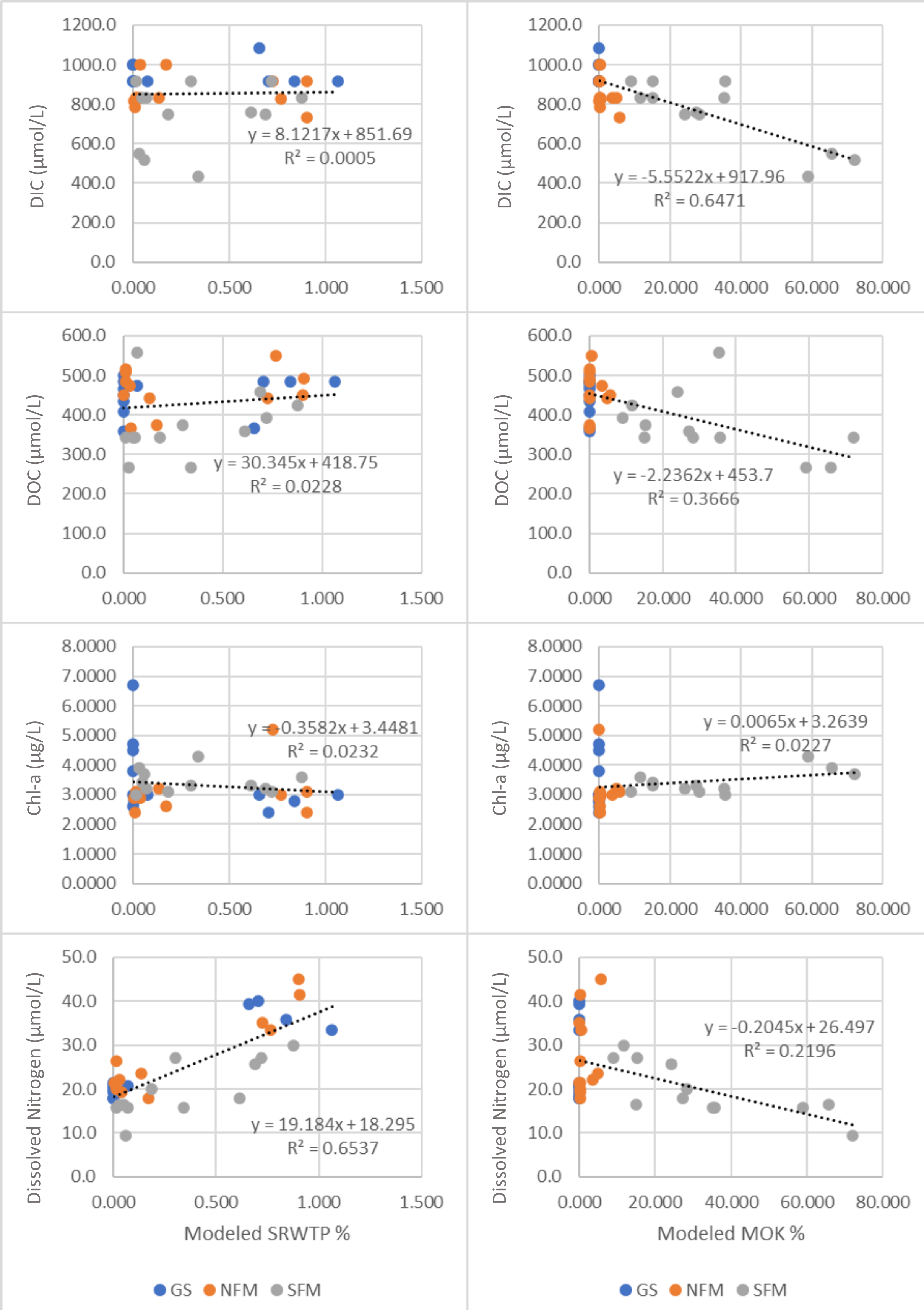

MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
NFM1 - NFM4, MSL
Map 3
0
250
500 m
Walnut Grove
Isleton

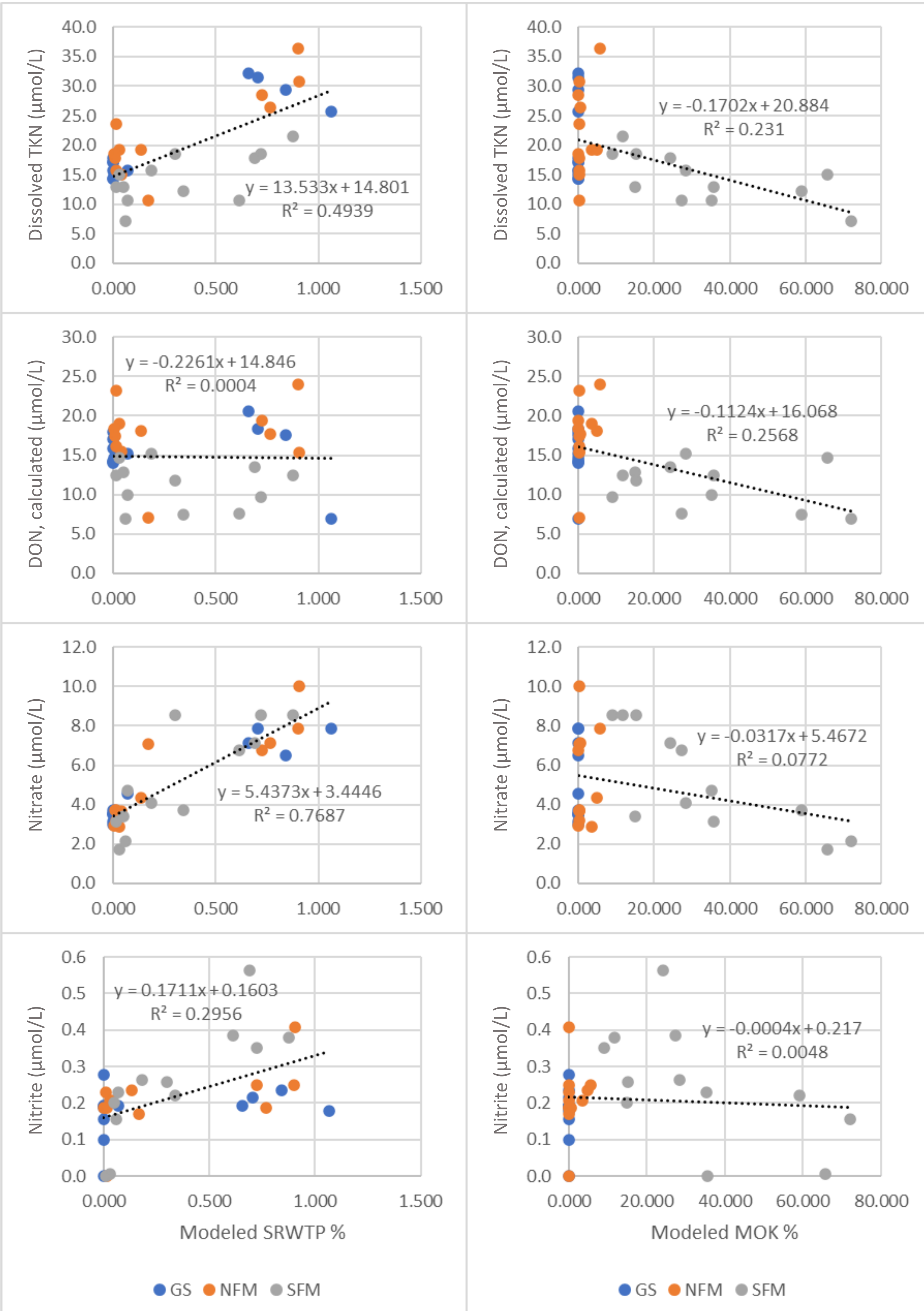

SFM1 - SFM4, MSL
Map 1
MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
0
250
500 m
Walnut Grove

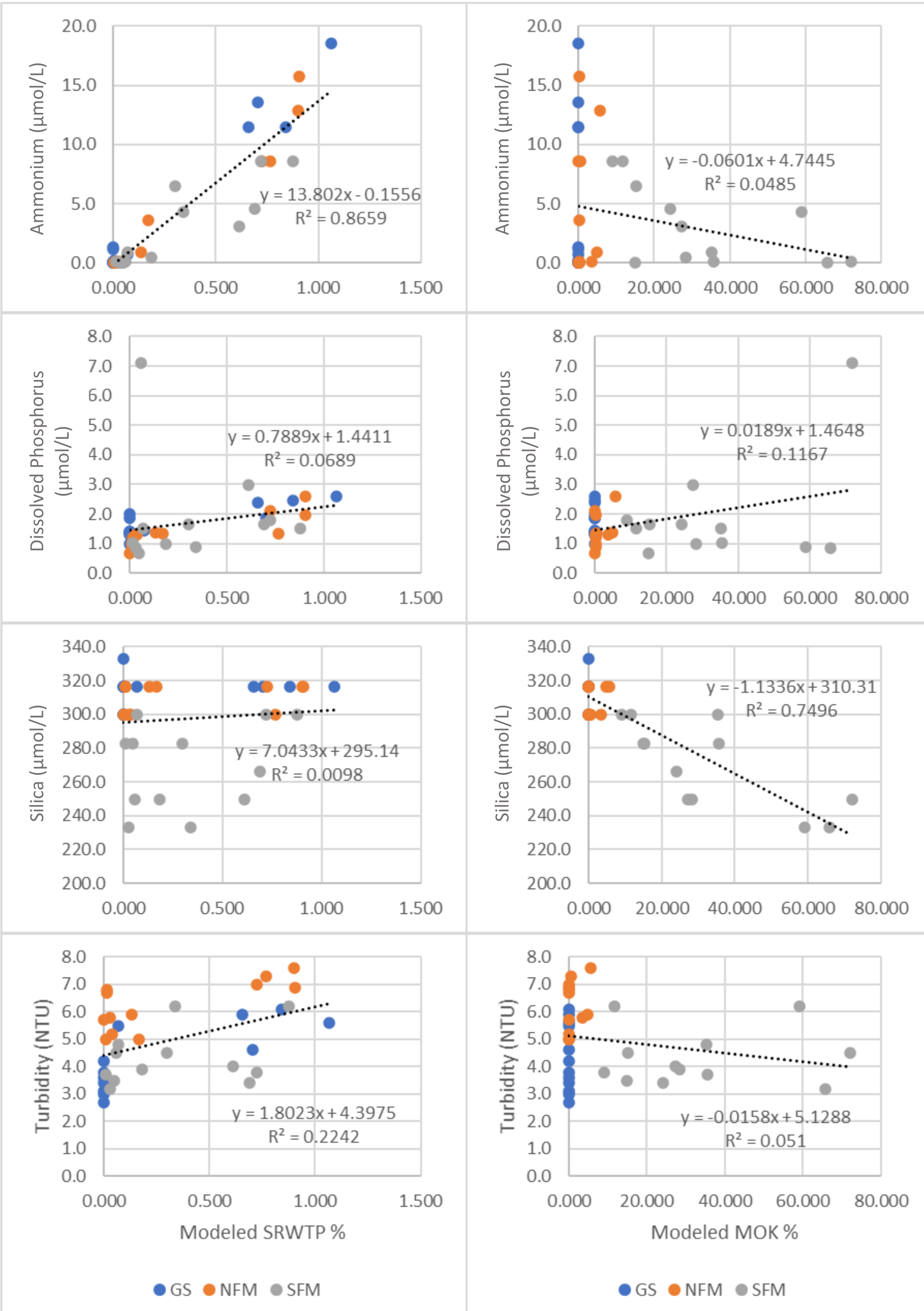

SFM1 - SFM4, MSL
Map 2
MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
0
250
500 m
Walnut Grove
Isleton


SFM1 - SFM4, MSL
Map 3
MSL Depth (m)
<= 1
1 - 2
2 - 3
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 11
11 - 12
12 - 13
> 13
Walnut Grove
Isleton
0
250
500 m

Appendix 4. Relationship of Modeled Water Fractions to Measured Water Quality Characteristics and Constituents


DIC (µmol/L)
y = 8.1217x + 851.69
R² = 0.0005
y = -5.5522x + 917.96
R² = 0.6471
DOC (µmol/L)
y = 30.345x + 418.75
R² = 0.0228
y = -2.2362x + 453.7
R² = 0.3666
Chl-a (µg/L)
y = 0.3582x + 3.4481
R² = 0.0232
y = 0.0065x + 3.2639
R² = 0.0227
Dissolved Nitrogen (µmol/L)
y = 19.184x + 18.295
R² = 0.6537
y = -0.2045x + 26.497
R² = 0.2196
Modeled SRWTP %
Modeled MOK %
GS
NFM
SFM


Dissolved TKN (µmol/L)
y = 13.533x + 14.801
R² = 0.4939
y = -0.1702x + 20.884
R² = 0.231
DON, calculated (µmol/L)
y = -0.2261x + 14.846
R² = 0.0004
y = -0.1124x + 16.068
R² = 0.2568
Nitrate (µmol/L)
y = 5.4373x + 3.4446
R² = 0.7687
y = -0.0317x + 5.4672
R² = 0.0772
Nitrite (µmol/L)
y = 0.1711x + 0.1603
R² = 0.2956
y = -0.0004x + 0.217
R² = 0.0048
Modeled SRWTP %
Modeled MOK %
GS NFM SFM
GS NFM SFM


Ammonium (µmol/L)
y = 13.802x - 0.1556
R² = 0.8659
Ammonium (µmol/L)
y = -0.0601x + 4.7445
R² = 0.0485
Dissolved Phosphorus (µmol/L)
y = 0.7889x + 1.4411
R² = 0.0689
Dissolved Phosphorus (µmol/L)
y = 0.0189x + 1.4648
R² = 0.1167
Silica (µmol/L)
y = 7.0433x + 295.14
R² = 0.0098
Silica (µmol/L)
y = -1.1336x + 310.31
R² = 0.7496
Turbidity (NTU)
y = 1.8023x + 4.3975
R² = 0.2242
Turbidity (NTU)
y = -0.0158x + 5.1288
R² = 0.051
Modeled SRWTP %
Modeled MOK %
GS NFM SFM
GS NFM SFM

Appendix 5. Water-Quality Report of Laboratory Analysis

Sacramento Regional County Sanitation District
Regional San Environmental Laboratory
8521 Laguna Station Road
Elk Grove, CA 95758
Phone: (916) 875-9000 Fax: (916) 875-9069

March 05, 2020

Lisa Thompson
Regional San - Policy and Planning
10060 Goethe Road
Sacramento, CA 95827

RE: Work Order No: 72538
Project ID: SRiNCS Study

Dear Lisa Thompson:

Enclosed are the analytical results for sample(s) received by the laboratory between Monday, September 09, 2019 and Thursday, September 12, 2019. Results reported herein conform to the most current ELAP standards, where applicable, unless otherwise noted in the body of the report.

As requested, this report has been revised to include values that fall below the calculated MDL's. The results for those analyses are not legally defensible and are only estimates.

As discussed, nitrite and nitrate analyses were performed outside of the holding times for regulatory samples, but were performed within the agreed upon holding time for this study. Results cannot be used for regulatory purposes.

This report is late. We apologize for any inconvenience this may have caused.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

James Noss — Digitally signed by James Noss Date: 2020.03.10 14:55:10 -07'00'
James Noss
Program Coordinator
nossj@sacsewer.com

Justin Nordin — Digitally signed by Justin Nordin Date: 2020.03.11 09:57:20 -07'00'
Justin Nordin
QA Officer

Srividhya Ramamoorthy — Digitally signed by Srividhya Ramamoorthy Date: 2020.03.13 08:54:57 -07'00'
Srividhya Ramamoorthy
Lab Manager

cc: Timothy Mussen

REPORT OF LABORATORY ANALYSIS

Sacramento Regional County Sanitation District
Regional San Environmental Laboratory
8521 Laguna Station Road
Elk Grove, CA 95758
Phone: (916) 875-9000 Fax: (916) 875-9069

SAMPLE SUMMARY

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1909100066	**GS2**	Surface Water	09/10/2019 11:52	09/10/2019 19:40
1909090046	**SR1**	Surface Water	09/09/2019 11:20	09/09/2019 17:10
1909100065	**GS1**	Surface Water	09/10/2019 12:48	09/10/2019 19:40
1909100067	**GS3**	Surface Water	09/10/2019 11:12	09/10/2019 19:40
1909100068	**GS4**	Surface Water	09/10/2019 10:30	09/10/2019 19:40
1909100069	**SREM**	Surface Water	09/10/2019 14:14	09/10/2019 19:40
1909100070	**NFM1**	Surface Water	09/10/2019 13:06	09/10/2019 19:40
1909100071	**NFM2**	Surface Water	09/10/2019 12:05	09/10/2019 19:40
1909100072	**NFM3**	Surface Water	09/10/2019 11:06	09/10/2019 19:40
1909100073	**NFM4**	Surface Water	09/10/2019 09:45	09/10/2019 19:40
1909100074	**SFM1**	Surface Water	09/10/2019 14:18	09/10/2019 19:40
1909100075	**SFM2**	Surface Water	09/10/2019 13:00	09/10/2019 19:40
1909100076	**SFM3**	Surface Water	09/10/2019 11:45	09/10/2019 19:40
1909100077	**SFM4**	Surface Water	09/10/2019 10:00	09/10/2019 19:40
1909100078	**MOKEM**	Surface Water	09/10/2019 15:02	09/10/2019 19:40
1909100079	**GS2**	Surface Water	09/10/2019 11:52	09/10/2019 19:40
1909090005	**SR1**	Surface Water	09/09/2019 11:20	09/09/2019 17:10
1909090006	**SR2**	Surface Water	09/09/2019 12:16	09/09/2019 17:10
1909090007	**SR3**	Surface Water	09/09/2019 12:54	09/09/2019 17:10
1909090008	**SREM**	Surface Water	09/09/2019 13:42	09/09/2019 17:10
1909110059	**GS1**	Surface Water	09/11/2019 11:35	09/11/2019 15:30
1909110060	**GS2**	Surface Water	09/11/2019 11:00	09/11/2019 15:30
1909110061	**GS3**	Surface Water	09/11/2019 10:24	09/11/2019 15:30
1909110062	**GS4**	Surface Water	09/11/2019 09:49	09/11/2019 15:30
1909110063	**SREM**	Surface Water	09/11/2019 12:44	09/11/2019 15:30
1909110064	**NFM1**	Surface Water	09/11/2019 12:10	09/11/2019 15:30
1909110065	**NFM2**	Surface Water	09/11/2019 11:14	09/11/2019 15:30
1909110066	**NFM3**	Surface Water	09/11/2019 10:05	09/11/2019 15:30
1909110067	**NFM4**	Surface Water	09/11/2019 09:05	09/11/2019 15:30
1909110068	**SFM1**	Surface Water	09/11/2019 12:13	09/11/2019 15:30
1909110069	**SFM2**	Surface Water	09/11/2019 11:18	09/11/2019 15:30
1909110070	**SFM3**	Surface Water	09/11/2019 10:08	09/11/2019 15:30
1909110071	**SFM4**	Surface Water	09/11/2019 09:07	09/11/2019 15:30
1909110072	**MOKEM**	Surface Water	09/11/2019 12:58	09/11/2019 15:30
1909110073	**NFM3**	Surface Water	09/11/2019 10:05	09/11/2019 15:30

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SAMPLE SUMMARY

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1909120033	**GS2**	Surface Water	09/12/2019 10:38	09/12/2019 15:36
1909120034	**GS3**	Surface Water	09/12/2019 10:05	09/12/2019 15:36
1909120035	**GS4**	Surface Water	09/12/2019 09:30	09/12/2019 15:36
1909120036	**SREM**	Surface Water	09/12/2019 12:37	09/12/2019 15:36
1909120037	**NFM1**	Surface Water	09/12/2019 11:45	09/12/2019 15:36
1909120038	**NFM2**	Surface Water	09/12/2019 10:50	09/12/2019 15:36
1909120039	**NFM3**	Surface Water	09/12/2019 10:05	09/12/2019 15:36
1909120040	**NFM4**	Surface Water	09/12/2019 09:10	09/12/2019 15:36
1909120041	**SFM1**	Surface Water	09/12/2019 13:30	09/12/2019 15:36
1909120042	**SFM2**	Surface Water	09/12/2019 12:14	09/12/2019 15:36
1909120043	**SFM3**	Surface Water	09/12/2019 11:27	09/12/2019 15:36
1909120044	**SFM4**	Surface Water	09/12/2019 10:03	09/12/2019 15:36
1909120045	**MOKEM**	Surface Water	09/12/2019 13:20	09/12/2019 15:36
1909120032	**GS1**	Surface Water	09/12/2019 11:15	09/12/2019 15:36
1909120046	**SFM4**	Surface Water	09/12/2019 10:03	09/12/2019 15:36

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909090005** Date Collected: 9/9/2019 11:20 Matrix: Surface Water
Sample ID: **SR1** Date Received: 9/9/2019 17:10

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0044	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0044	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	11	NTU	1	1.0	NA	09/09/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	ND	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.12J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.047J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	ND	mg/L	1	0.10	0.000010	10/01/2019	KDN	
Phosphorus,Diss(as P)	EPA 365.4	0.061J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2],[1]
Dissolved Nitrogen as N	SM 4500-N	0.17	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	8.6	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.9	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	20,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909090006** Date Collected: 9/9/2019 12:16 Matrix: Surface Water
Sample ID: **SR2** Date Received: 9/9/2019 17:10

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By
BIOLOGICAL								
chlorophyll 'a'	SM 10200 H	0.0042	mg/L	1	0.00073	NA	09/12/2019	JTA
chlorophyll 'a'	SM 10200 H	0.0041	mg/L	1	0.00073	NA	09/12/2019	JTA
FIELD ANALYSIS								

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909090006** Date Collected: 9/9/2019 12:16 Matrix: Surface Water
Sample ID: **SR2** Date Received: 9/9/2019 17:10

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	9.1	NTU	1	1.0	NA	09/09/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.24J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.42	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.066J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	ND	mg/L	1	0.10	0.000010	10/01/2019	KDN	
Phosphorus,Diss(as P)	EPA 365.4	0.045J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2],[1]
Dissolved Nitrogen as N	SM 4500-N	0.48	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	9.8	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	6.1	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	20,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909090007** Date Collected: 9/9/2019 12:54 Matrix: Surface Water
Sample ID: **SR3** Date Received: 9/9/2019 17:10

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0039	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0043	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	8.6	NTU	1	1.0	NA	09/09/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.12J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909090007** Date Collected: 9/9/2019 12:54 Matrix: Surface Water
Sample ID: **SR3** Date Received: 9/9/2019 17:10

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.24	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.062J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0025J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.084J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2]
Dissolved Nitrogen as N	SM 4500-N	0.31	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	12	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	6.0	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	21,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909090008** Date Collected: 9/9/2019 13:42 Matrix: Surface Water
Sample ID: **SREM** Date Received: 9/9/2019 17:10

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0037	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0036	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	12	NTU	1	1.0	NA	09/09/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.27J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.48	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.11	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0035J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909090008** Date Collected: 9/9/2019 13:42 Matrix: Surface Water
Sample ID: **SREM** Date Received: 9/9/2019 17:10

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Phosphorus,Diss(as P)	EPA 365.4	0.086J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2]
Dissolved Nitrogen as N	SM 4500-N	0.59	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	9.9	mg/L	1	1.0	NA	09/25/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	6.6	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	21,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909090046** Date Collected: 9/9/2019 11:20 Matrix: Surface Water
Sample ID: **SR1** Date Received: 9/9/2019 17:10

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.047J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.13J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.048J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	ND	mg/L	1	0.10	0.000010	10/01/2019	KDN	
Phosphorus,Diss(as P)	EPA 365.4	0.031J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2],[1]
Dissolved Nitrogen as N	SM 4500-N	0.18	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	9.0	mg/L	1	1.0	NA	09/25/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	7.6	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	20,000	ug/L	1	120	54	10/23/2019	NCH	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100065** Date Collected: 9/10/2019 12:48 Matrix: Surface Water
Sample ID: **GS1** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	5.6	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.26J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.36	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.11	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0025J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.080J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2]
Dissolved Nitrogen as N	SM 4500-N	0.47	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/25/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.8	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909100066** Date Collected: 9/10/2019 11:52 Matrix: Surface Water
Sample ID: **GS2** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By
BIOLOGICAL								
chlorophyll 'a'	SM 10200 H	0.0028	mg/L	1	0.00073	NA	09/12/2019	JTA
chlorophyll 'a'	SM 10200 H	0.0029	mg/L	1	0.00073	NA	09/12/2019	JTA
FIELD ANALYSIS								

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100066** Date Collected: 9/10/2019 11:52 Matrix: Surface Water
Sample ID: **GS2** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	6.1	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.16J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.41	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.091J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0033J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.076J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2]
Dissolved Nitrogen as N	SM 4500-N	0.50	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/25/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.8	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909100067** Date Collected: 9/10/2019 11:12 Matrix: Surface Water
Sample ID: **GS3** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	5.9	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.16J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100067** Date Collected: 9/10/2019 11:12 Matrix: Surface Water
Sample ID: **GS3** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.45	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.10	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0027J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.074J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2]
Dissolved Nitrogen as N	SM 4500-N	0.55	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	13	mg/L	1	1.0	NA	09/16/2019	SHA	[8]
Carbon,Organic,Dissolved	SM 5310 B	4.4	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909100068** Date Collected: 9/10/2019 10:30 Matrix: Surface Water
Sample ID: **GS4** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0024	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0023	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	4.6	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.19J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.44	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.11	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0030J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100068** Date Collected: 9/10/2019 10:30 Matrix: Surface Water
Sample ID: **GS4** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Phosphorus,Diss(as P)	EPA 365.4	0.058J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2],[1]
Dissolved Nitrogen as N	SM 4500-N	0.56	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/25/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.8	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909100069** Date Collected: 9/10/2019 14:14 Matrix: Surface Water
Sample ID: **SREM** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	4.4	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.13J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.35	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.089J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0033J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.063J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2],[1]
Dissolved Nitrogen as N	SM 4500-N	0.44	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	12	mg/L	1	1.0	NA	09/25/2019	SHA	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100069** Date Collected: 9/10/2019 14:14 Matrix: Surface Water
Sample ID: **SREM** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Carbon,Organic,Dissolved	SM 5310 B	5.0	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909100070** Date Collected: 9/10/2019 13:06 Matrix: Surface Water
Sample ID: **NFM1** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0031	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0033	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	7.6	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.18J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.51	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.11	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0035J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.080J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2]
Dissolved Nitrogen as N	SM 4500-N	0.63	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	8.8	mg/L	1	1.0	NA	09/25/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.4	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100070** Date Collected: 9/10/2019 13:06 Matrix: Surface Water
Sample ID: **NFM1** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	

Lab ID: **1909100071** Date Collected: 9/10/2019 12:05 Matrix: Surface Water
Sample ID: **NFM2** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0033	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	7.3	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.12J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.37	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.10	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0026J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.041J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.47	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	9.9	mg/L	1	1.0	NA	09/25/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	6.6	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909100072** Date Collected: 9/10/2019 11:06 Matrix: Surface Water
Sample ID: **NFM3** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100072** Date Collected: 9/10/2019 11:06 Matrix: Surface Water
Sample ID: **NFM3** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00073	NA	09/12/2019	JTA	[3]
chlorophyll 'a'	SM 10200 H	0.0052	mg/L	1	0.00073	NA	09/12/2019	JTA	[3]
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	7.0	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.12J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.40	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.095J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0035J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.065J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.49	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/25/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.3	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909100073** Date Collected: 9/10/2019 09:45 Matrix: Surface Water
Sample ID: **NFM4** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By
BIOLOGICAL								
chlorophyll 'a'	SM 10200 H	0.0026	mg/L	1	0.00073	NA	09/12/2019	JTA
chlorophyll 'a'	SM 10200 H	0.0024	mg/L	1	0.00073	NA	09/12/2019	JTA
FIELD ANALYSIS								

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ANALYTICAL RESULTS

Work Order No: 72538
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Lab ID: **1909100073** Date Collected: 9/10/2019 09:45 Matrix: Surface Water
Sample ID: **NFM4** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	6.9	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.22J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.43	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.14	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0057J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.061J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.58	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/25/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.9	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909100074** Date Collected: 9/10/2019 14:18 Matrix: Surface Water
Sample ID: **SFM1** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0034	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0036	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	6.2	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.12J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100074** Date Collected: 9/10/2019 14:18 Matrix: Surface Water
Sample ID: **SFM1** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.30	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.12	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0053J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.047J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.42	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	10	mg/L	1	1.0	NA	09/25/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.1	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909100075** Date Collected: 9/10/2019 13:00 Matrix: Surface Water
Sample ID: **SFM2** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0044	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0043	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	6.2	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.060J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.17J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.052J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0031J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100075** Date Collected: 9/10/2019 13:00 Matrix: Surface Water
Sample ID: **SFM2** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Phosphorus,Diss(as P)	EPA 365.4	0.027J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.22	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	5.2	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	3.2	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	14,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909100076** Date Collected: 9/10/2019 11:45 Matrix: Surface Water
Sample ID: **SFM3** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0031	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0034	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	3.8	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.12J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.26	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.12	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0049J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.055J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.38	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/23/2019	SHA	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100076** Date Collected: 9/10/2019 11:45 Matrix: Surface Water
Sample ID: **SFM3** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Carbon,Organic,Dissolved	SM 5310 B	4.7	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909100077** Date Collected: 9/10/2019 10:00 Matrix: Surface Water
Sample ID: **SFM4** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0031	mg/L	1	0.00073	NA	09/12/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00073	NA	09/12/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	3.4	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.064J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.25	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.10	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0079J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.051J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2],[1]
Dissolved Nitrogen as N	SM 4500-N	0.36	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	9.0	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.5	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	16,000	ug/L	1	120	54	10/23/2019	NCH	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100077** Date Collected: 9/10/2019 10:00 Matrix: Surface Water
Sample ID: **SFM4** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	

Lab ID: **1909100078** Date Collected: 9/10/2019 15:02 Matrix: Surface Water
Sample ID: **MOKEM** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0040	mg/L	1	0.00073	NA	09/12/2019	JTA	[3]
chlorophyll 'a'	SM 10200 H	0.0051	mg/L	1	0.00073	NA	09/12/2019	JTA	[3]
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	4.6	NTU	1	1.0	NA	09/10/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.10J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.35	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.11	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0041J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.070J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2]
Dissolved Nitrogen as N	SM 4500-N	0.46	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	9.1	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	4.2	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	17,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909100079** Date Collected: 9/10/2019 11:52 Matrix: Surface Water
Sample ID: **GS2** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By

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Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909100079** Date Collected: 9/10/2019 11:52 Matrix: Surface Water
Sample ID: **GS2** Date Received: 9/10/2019 19:40

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.16J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.35	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.091J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0027J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.12J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[2]
Dissolved Nitrogen as N	SM 4500-N	0.44	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	4.2	mg/L	1	1.0	0.35	09/16/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909110059** Date Collected: 9/11/2019 11:35 Matrix: Surface Water
Sample ID: **GS1** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By
BIOLOGICAL								
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00073	NA	09/24/2019	JTA
chlorophyll 'a'	SM 10200 H	0.0031	mg/L	1	0.00073	NA	09/24/2019	JTA
FIELD ANALYSIS								
Turbidity(Field)	EPA 180.1	3.8	NTU	1	1.0	NA	09/11/2019	JKN
GENERAL WET CHEMISTRY								
Nitrogen,Ammonia(as N)	EPA 350.1	ND	mg/L	1	0.50	0.0000010	09/18/2019	KDN
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.20	mg/L	1	0.20	0.070	10/03/2019	KDN
Nitrate(as N)	EPA 353.2	0.049J	mg/L	1	0.10	0.000010	10/02/2019	KDN

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110059** Date Collected: 9/11/2019 11:35 Matrix: Surface Water
Sample ID: **GS1** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Nitrite(as N)	EPA 353.2	0.0014J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.031J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.25	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	12	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	4.3	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110060** Date Collected: 9/11/2019 11:00 Matrix: Surface Water
Sample ID: **GS2** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0038	mg/L	1	0.00073	NA	09/24/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0036	mg/L	1	0.00073	NA	09/24/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	2.7	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	ND	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.20	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.049J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0039J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.040J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.25	mg/L	1	0.01	NA	10/23/2019	UFB	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110060** Date Collected: 9/11/2019 11:00 Matrix: Surface Water
Sample ID: **GS2** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.4	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110061** Date Collected: 9/11/2019 10:24 Matrix: Surface Water
Sample ID: **GS3** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0028	mg/L	1	0.00073	NA	09/24/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0029	mg/L	1	0.00073	NA	09/24/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	3.0	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.0031J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.21	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.049J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0026J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.041J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.26	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.8	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110061** Date Collected: 9/11/2019 10:24 Matrix: Surface Water
Sample ID: **GS3** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110062** Date Collected: 9/11/2019 09:49 Matrix: Surface Water
Sample ID: **GS4** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00073	NA	09/24/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0031	mg/L	1	0.00073	NA	09/24/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	5.5	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.010J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.22	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.064J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0027J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.045J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.29	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.7	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110063** Date Collected: 9/11/2019 12:44 Matrix: Surface Water
Sample ID: **SREM** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0034	mg/L	1	0.00073	NA	09/24/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00073	NA	09/24/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	5.0	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.0010J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.10J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.046J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0034J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.029J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.15	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.3	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110064** Date Collected: 9/11/2019 12:10 Matrix: Surface Water
Sample ID: **NFM1** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By
BIOLOGICAL								
chlorophyll 'a'	SM 10200 H	0.0031	mg/L	1	0.00071	NA	09/24/2019	JTA
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00071	NA	09/24/2019	JTA
FIELD ANALYSIS								

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110064** Date Collected: 9/11/2019 12:10 Matrix: Surface Water
Sample ID: **NFM1** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	5.9	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.013J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.27	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.061J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0033J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.042J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.33	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	10	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.3	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110065** Date Collected: 9/11/2019 11:14 Matrix: Surface Water
Sample ID: **NFM2** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By
BIOLOGICAL								
chlorophyll 'a'	SM 10200 H	0.0031	mg/L	1	0.00071	NA	09/24/2019	JTA
chlorophyll 'a'	SM 10200 H	0.0035	mg/L	1	0.00071	NA	09/24/2019	JTA
FIELD ANALYSIS								
Turbidity(Field)	EPA 180.1	6.7	NTU	1	1.0	NA	09/11/2019	JKN
GENERAL WET CHEMISTRY								
Nitrogen,Ammonia(as N)	EPA 350.1	ND	mg/L	1	0.50	0.0000010	09/18/2019	KDN

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ANALYTICAL RESULTS

Work Order No: 72538
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Lab ID: **1909110065** Date Collected: 9/11/2019 11:14 Matrix: Surface Water
Sample ID: **NFM2** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.22	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.052J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0026J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.037J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.28	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	10	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	6.1	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110066** Date Collected: 9/11/2019 10:05 Matrix: Surface Water
Sample ID: **NFM3** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0029	mg/L	1	0.00073	NA	09/24/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00073	NA	09/24/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	5.2	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	ND	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.21	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.051J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0029J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110066** Date Collected: 9/11/2019 10:05 Matrix: Surface Water
Sample ID: **NFM3** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Phosphorus,Diss(as P)	EPA 365.4	0.040J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.27	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	12	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	4.4	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110067** Date Collected: 9/11/2019 09:05 Matrix: Surface Water
Sample ID: **NFM4** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0024	mg/L	1	0.00073	NA	09/24/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0026	mg/L	1	0.00073	NA	09/24/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	5.0	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.050J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.15J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.099J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0024J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.041J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.25	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	12	mg/L	1	1.0	NA	09/18/2019	SHA	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110067** Date Collected: 9/11/2019 09:05 Matrix: Surface Water
Sample ID: **NFM4** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Carbon,Organic,Dissolved	SM 5310 B	4.5	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110068** Date Collected: 9/11/2019 12:13 Matrix: Surface Water
Sample ID: **SFM1** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0038	mg/L	1	0.00071	NA	09/24/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0037	mg/L	1	0.00071	NA	09/24/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	4.5	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.0010J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.10J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.030J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0022J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.22	mg/L	1	0.20	0.000010	10/03/2019	KDN	
Dissolved Nitrogen as N	SM 4500-N	0.13	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	6.2	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	4.1	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	15,000	ug/L	1	120	54	10/23/2019	NCH	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110068** Date Collected: 9/11/2019 12:13 Matrix: Surface Water
Sample ID: **SFM1** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	

Lab ID: **1909110069** Date Collected: 9/11/2019 11:18 Matrix: Surface Water
Sample ID: **SFM2** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00071	NA	09/24/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0034	mg/L	1	0.00071	NA	09/24/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	4.8	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.012J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.15J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.066J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0032J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.047J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.22	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	10	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	6.7	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110070** Date Collected: 9/11/2019 10:08 Matrix: Surface Water
Sample ID: **SFM3** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110070** Date Collected: 9/11/2019 10:08 Matrix: Surface Water
Sample ID: **SFM3** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00071	NA	09/24/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0033	mg/L	1	0.00071	NA	09/24/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	4.5	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.091J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.26	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.12	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0036J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.051J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.38	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	4.5	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	17,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110071** Date Collected: 9/11/2019 09:07 Matrix: Surface Water
Sample ID: **SFM4** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By
BIOLOGICAL								
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00071	NA	09/24/2019	JTA
chlorophyll 'a'	SM 10200 H	0.0033	mg/L	1	0.00071	NA	09/24/2019	JTA
FIELD ANALYSIS								

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110071** Date Collected: 9/11/2019 09:07 Matrix: Surface Water
Sample ID: **SFM4** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	4.0	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.043J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.15J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.095J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0054J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.092J	mg/L	1	0.20	0.000010	10/09/2019	KDN	
Dissolved Nitrogen as N	SM 4500-N	0.25	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	9.1	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	4.3	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	15,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110072** Date Collected: 9/11/2019 12:58 Matrix: Surface Water
Sample ID: **MOKEM** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0034	mg/L	1	0.00071	NA	09/24/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00071	NA	09/24/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	5.2	NTU	1	1.0	NA	09/11/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.027J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110072** Date Collected: 9/11/2019 12:58 Matrix: Surface Water
Sample ID: **MOKEM** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.31	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.011J	mg/L	1	0.10	0.000010	10/02/2019	KDN	[1]
Nitrite(as N)	EPA 353.2	ND	mg/L	1	0.10	0.000010	10/01/2019	KDN	
Phosphorus,Diss(as P)	EPA 365.4	0.0051J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.32	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	3.3	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	2.9	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	13,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909110073** Date Collected: 9/11/2019 10:05 Matrix: Surface Water
Sample ID: **NFM3** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.0078J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.24	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.051J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0033J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.049J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.30	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	12	mg/L	1	1.0	NA	09/18/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	4.7	mg/L	1	1.0	0.35	09/18/2019	SHA	
METALS									

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909110073** Date Collected: 9/11/2019 10:05 Matrix: Surface Water
Sample ID: **NFM3** Date Received: 9/11/2019 15:30

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/23/2019	NCH	

Lab ID: **1909120032** Date Collected: 9/12/2019 11:15 Matrix: Surface Water
Sample ID: **GS1** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0048	mg/L	1	0.00071	NA	09/26/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0045	mg/L	1	0.00071	NA	09/26/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	4.2	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	ND	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.24	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.042J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	ND	mg/L	1	0.10	0.000010	10/01/2019	KDN	
Phosphorus,Diss(as P)	EPA 365.4	0.043J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.28	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	4.9	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/24/2019	NCH	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120033** Date Collected: 9/12/2019 10:38 Matrix: Surface Water
Sample ID: **GS2** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0067	mg/L	1	0.00071	NA	09/26/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0065	mg/L	1	0.00071	NA	09/26/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	3.1	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.0017J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.25	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.044J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0027J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.062J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.30	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	12	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.2	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909120034** Date Collected: 9/12/2019 10:05 Matrix: Surface Water
Sample ID: **GS3** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By
BIOLOGICAL								
chlorophyll 'a'	SM 10200 H	0.0047	mg/L	1	0.00071	NA	09/26/2019	JTA
chlorophyll 'a'	SM 10200 H	0.0051	mg/L	1	0.00071	NA	09/26/2019	JTA
FIELD ANALYSIS								

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120034** Date Collected: 9/12/2019 10:05 Matrix: Surface Water
Sample ID: **GS3** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	3.6	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.018J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.22	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.052J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0022J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.043J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.27	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	6.0	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	20,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909120035** Date Collected: 9/12/2019 09:30 Matrix: Surface Water
Sample ID: **GS4** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0026	mg/L	1	0.00071	NA	09/26/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0027	mg/L	1	0.00071	NA	09/26/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	3.4	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.016J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120035** Date Collected: 9/12/2019 09:30 Matrix: Surface Water
Sample ID: **GS4** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.24	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.050J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0027J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.058J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.29	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	12	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.6	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909120036** Date Collected: 9/12/2019 12:37 Matrix: Surface Water
Sample ID: **SREM** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By
BIOLOGICAL								
chlorophyll 'a'	SM 10200 H	0.0041	mg/L	1	0.00071	NA	09/26/2019	JTA
chlorophyll 'a'	SM 10200 H	0.0047	mg/L	1	0.00071	NA	09/26/2019	JTA
FIELD ANALYSIS								
Turbidity(Field)	EPA 180.1	5.6	NTU	1	1.0	NA	09/12/2019	JKN
GENERAL WET CHEMISTRY								
Nitrogen,Ammonia(as N)	EPA 350.1	ND	mg/L	1	0.50	0.0000010	09/18/2019	KDN
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.091J	mg/L	1	0.20	0.070	10/03/2019	KDN
Nitrate(as N)	EPA 353.2	0.040J	mg/L	1	0.10	0.000010	10/02/2019	KDN
Nitrite(as N)	EPA 353.2	ND	mg/L	1	0.10	0.000010	10/01/2019	KDN

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120036** Date Collected: 9/12/2019 12:37 Matrix: Surface Water
Sample ID: **SREM** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Phosphorus,Diss(as P)	EPA 365.4	0.031J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.13	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.3	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909120037** Date Collected: 9/12/2019 11:45 Matrix: Surface Water
Sample ID: **NFM1** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0029	mg/L	1	0.00071	NA	09/26/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00071	NA	09/26/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	5.8	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.0013J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.27	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.040J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0029J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.040J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.31	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	10	mg/L	1	1.0	NA	09/23/2019	SHA	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120037** Date Collected: 9/12/2019 11:45 Matrix: Surface Water
Sample ID: **NFM1** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Carbon,Organic,Dissolved	SM 5310 B	5.7	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909120038** Date Collected: 9/12/2019 10:50 Matrix: Surface Water
Sample ID: **NFM2** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00071	NA	09/26/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0029	mg/L	1	0.00071	NA	09/26/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	5.7	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.00019J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.26	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.041J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0026J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.021J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.30	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	9.8	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.4	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120038** Date Collected: 9/12/2019 10:50 Matrix: Surface Water
Sample ID: **NFM2** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909120039** Date Collected: 9/12/2019 10:05 Matrix: Surface Water
Sample ID: **NFM3** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00072	NA	09/26/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0029	mg/L	1	0.00072	NA	09/26/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	6.8	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	ND	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.33	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.045J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	ND	mg/L	1	0.10	0.000010	10/01/2019	KDN	
Phosphorus,Diss(as P)	EPA 365.4	0.027J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.37	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	10	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	6.2	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	19,000	ug/L	1	120	54	10/24/2019	NCH	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120040** Date Collected: 9/12/2019 09:10 Matrix: Surface Water
Sample ID: **NFM4** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0024	mg/L	1	0.00072	NA	09/26/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0024	mg/L	1	0.00072	NA	09/26/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	5.0	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.0011J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.25	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.052J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0032J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.030J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.30	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	9.4	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.8	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	18,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909120041** Date Collected: 9/12/2019 13:30 Matrix: Surface Water
Sample ID: **SFM1** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By
BIOLOGICAL								
chlorophyll 'a'	SM 10200 H	0.0039	mg/L	1	0.00072	NA	09/26/2019	JTA
chlorophyll 'a'	SM 10200 H	0.0040	mg/L	1	0.00072	NA	09/26/2019	JTA
FIELD ANALYSIS								

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120041** Date Collected: 9/12/2019 13:30 Matrix: Surface Water
Sample ID: **SFM1** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	3.2	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	ND	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.21	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.024J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.000070J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.026J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.23	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	6.6	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	3.2	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	14,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909120042** Date Collected: 9/12/2019 12:14 Matrix: Surface Water
Sample ID: **SFM2** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00072	NA	09/26/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0030	mg/L	1	0.00072	NA	09/26/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	3.7	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.0012J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120042** Date Collected: 9/12/2019 12:14 Matrix: Surface Water
Sample ID: **SFM2** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.18J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.044J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	ND	mg/L	1	0.10	0.000010	10/01/2019	KDN	
Phosphorus,Diss(as P)	EPA 365.4	0.032J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.22	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	11	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	4.1	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	17,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909120043** Date Collected: 9/12/2019 11:27 Matrix: Surface Water
Sample ID: **SFM3** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0034	mg/L	1	0.00072	NA	09/26/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00072	NA	09/26/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	3.5	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	ND	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.18J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.048J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0028J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120043** Date Collected: 9/12/2019 11:27 Matrix: Surface Water
Sample ID: **SFM3** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Phosphorus,Diss(as P)	EPA 365.4	0.021J	mg/L	1	0.20	0.000010	10/03/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.23	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	10	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	4.1	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	17,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909120044** Date Collected: 9/12/2019 10:03 Matrix: Surface Water
Sample ID: **SFM4** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0031	mg/L	1	0.00072	NA	09/26/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0032	mg/L	1	0.00072	NA	09/26/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	3.9	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.0068J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.22	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.057J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0037J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.030J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.28	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	9.0	mg/L	1	1.0	NA	09/23/2019	SHA	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120044** Date Collected: 9/12/2019 10:03 Matrix: Surface Water
Sample ID: **SFM4** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Carbon,Organic,Dissolved	SM 5310 B	4.1	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	15,000	ug/L	1	120	54	10/24/2019	NCH	

Lab ID: **1909120045** Date Collected: 9/12/2019 13:20 Matrix: Surface Water
Sample ID: **MOKEM** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
BIOLOGICAL									
chlorophyll 'a'	SM 10200 H	0.0036	mg/L	1	0.00072	NA	09/26/2019	JTA	
chlorophyll 'a'	SM 10200 H	0.0035	mg/L	1	0.00072	NA	09/26/2019	JTA	
FIELD ANALYSIS									
Turbidity(Field)	EPA 180.1	3.9	NTU	1	1.0	NA	09/12/2019	JKN	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	ND	mg/L	1	0.50	0.0000010	09/18/2019	KDN	
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.18J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.010J	mg/L	1	0.10	0.000010	10/02/2019	KDN	[1]
Nitrite(as N)	EPA 353.2	ND	mg/L	1	0.10	0.000010	10/01/2019	KDN	
Phosphorus,Diss(as P)	EPA 365.4	0.030J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.19	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	3.1	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	3.0	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	12,000	ug/L	1	120	54	10/24/2019	NCH	

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ANALYTICAL RESULTS

Work Order No: 72538
Project ID: SRiNCS Study

Lab ID: **1909120045** Date Collected: 9/12/2019 13:20 Matrix: Surface Water
Sample ID: **MOKEM** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	

Lab ID: **1909120046** Date Collected: 9/12/2019 10:03 Matrix: Surface Water
Sample ID: **SFM4** Date Received: 9/12/2019 15:36

Parameter	Method	Results	Units	DF	RL	MDL	Analyzed	By	
GENERAL WET CHEMISTRY									
Nitrogen,Ammonia(as N)	EPA 350.1	0.033J	mg/L	1	0.50	0.0000010	09/18/2019	KDN	[1]
TKN(as N)DISSOLVED	EPA 351.2 (LowLevel)	0.17J	mg/L	1	0.20	0.070	10/03/2019	KDN	
Nitrate(as N)	EPA 353.2	0.074J	mg/L	1	0.10	0.000010	10/02/2019	KDN	
Nitrite(as N)	EPA 353.2	0.0034J	mg/L	1	0.10	0.000010	10/01/2019	KDN	[1]
Phosphorus,Diss(as P)	EPA 365.4	0.035J	mg/L	1	0.20	0.000010	10/09/2019	KDN	[1]
Dissolved Nitrogen as N	SM 4500-N	0.25	mg/L	1	0.01	NA	10/23/2019	UFB	
Carbon,Inorganic,Dissolved	SM 5310 B	7.8	mg/L	1	1.0	NA	09/23/2019	SHA	
Carbon,Organic,Dissolved	SM 5310 B	5.3	mg/L	1	1.0	0.35	09/23/2019	SHA	
METALS									
Silica(SiO2)	EPA 200.8	15,000	ug/L	1	120	54	10/24/2019	NCH	

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ANALYTICAL RESULTS QUALIFIERS

Work Order No: 72538
Project ID: SRiNCS Study

PARAMETER QUALIFIERS

J - The analytical result is below RL but above MDL.

MDL - Method Detection Limit defined in 40 CFR, Sect. 136, Appendix B.

ND - Non Detect - Analyte not detected above the MDL or, in the absence of a MDL, above the RL

RL - Reporting limit is the quantitation limit at which the laboratory is able to detect an analyte with a certain degree of confidence. Generally, this represents the parameter's lowest calibration point. This can also define the customer's requirement.

(S) - Surrogates.

DF - Dilution Factor.

NA - Not Applicable.

VS and VSS results reported as percentages of TS and TSS.

MBAS, calculated as LAS, mol wt 340.

Total Alkalinity is titrated to pH 4.5 per the method. This may not correspond to an inflection point where the slope changes rapidly.

[1] The reported value is an estimation.

[2] This sample was analyzed outside of the EPA recommended holding time of 28 days.

[3] Result confirmed by second analysis of original extract.

[8] The batch QC for this sample failed, but there was insufficient volume to reanalyze. The result is an estimation only.

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: METP/6036 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: Total Recoverable Metals Prep

Associated Lab Samples: 1909090005 1909090006 1909090007 1909090008 1909090046 1909100065
Associated Lab Samples: 1909100066 1909100067 1909100068 1909100069 1909100070 1909100071
1909100072 1909100073 1909100074 1909100075 1909100076

METHOD BLANK: 323642

Associated Lab Samples: 1909090006 1909100067 1909100073 1909090046 1909100075 1909090005
1909100068 1909100071 1909090007 1909090008 1909100065 1909100070
1909100069 1909100072 1909100074 1909100076 1909100066

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Silica(SiO2)	ND	50	ug/L	21	

LABORATORY CONTROL SAMPLE & LCSD: LCS-323643 LCSD-323644

Parameter	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD
Silica(SiO2)	104	103	85-115	0.78	20.7

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-323645 MSD-323646
Associated Lab Sample: 1909090005

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Silica(SiO2)	117	118	70-130	0.22	20.7	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324664 MSD-324665
Associated Lab Sample: 1909090006

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324664 MSD-324665
Associated Lab Sample: 1909090006

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Silica(SiO2)	117	117	70-130	0.069	20.7	

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Work Order No: 72538
Project ID: SRINCS Study

QC Batch: METP/6037
Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8
Analysis Description: Total Recoverable Metals Prep

Associated Lab Samples: 1909100077 1909100097 1909110059 1909110060 1909110061 1909110062
Associated Lab Samples: 1909110063 1909110064 1909110065 1909110066 1909110067 1909110068
1909110069 1909110070 1909110071 1909110072 1909110073

METHOD BLANK: 323647

Associated Lab Samples: 1909110071 1909100077 1909110059 1909110061 1909110066 1909110060
1909110062 1909110063 1909110065 1909110073 1909110068 1909110067
1909110069 1909110064 1909110070 1909110072

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Silica(SiO2)	ND	50	ug/L	21	

LABORATORY CONTROL SAMPLE & LCSD: LCS-323648 LCSD-323649

Parameter	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD
Silica(SiO2)	106	104	85-115	1.1	20.7

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-323650 MSD-323651
Associated Lab Sample: 1909110059

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Silica(SiO2)	100	108	70-130	1.6	20.7	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324666 MSD-324667
Associated Lab Sample: 1909110060

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324666 MSD-324667
Associated Lab Sample: 1909110060

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Silica(SiO2)	109	107	70-130	0.34	20.7	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRiNCS Study

QC Batch: BIOL/66179 | Analysis Method: SM 10200 H
QC Batch Method: SM 10200 H | Analysis Description: Chlorophyll 'a'

Associated Lab Samples: 1909110064 1909110065 1909110068 1909110069 1909110070 1909110071
Associated Lab Samples: 1909110072

METHOD BLANK: 323689

Associated Lab Samples: 1909110071 1909110065 1909110068 1909110069 1909110070 1909110064
1909110072

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
chlorophyll 'a'	ND	0.00071	mg/L	NA	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: BIOL/66180 Analysis Method: SM 10200 H
QC Batch Method: SM 10200 H Analysis Description: Chlorophyll 'a'

Associated Lab Samples: 1909110059 1909110060 1909110061 1909110062 1909110063 1909110066
Associated Lab Samples: 1909110067

METHOD BLANK: 323690

Associated Lab Samples: 1909110066 1909110059 1909110061 1909110063 1909110060 1909110062 1909110067

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
chlorophyll 'a'	ND	0.00073	mg/L	NA	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: TOC/1553 Analysis Method: SM 5310 B
QC Batch Method: SM 5310 B Analysis Description: Carbon,Organic by Combustion,Oxidation

Associated Lab Samples: 1909090005 1909090006 1909090007 1909090008 1909090046 1909100065
Associated Lab Samples: 1909100066 1909100067 1909100068 1909100069 1909100070 1909100071
1909100072 1909100073 1909100074 1909100075 1909100076 1909100077
1909100078 1909100079

METHOD BLANK: 324019

Associated Lab Samples: 1909090006 1909100073 1909100067 1909090046 1909100075 1909100077
1909090005 1909100068 1909100071 1909090007 1909090008 1909100065
1909100070 1909100069 1909100072 1909100074 1909100076 1909100079
1909100078 1909100066

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Organic,Dissolved	ND	1.0	mg/L	0.35	

METHOD BLANK: 324021

Associated Lab Samples: 1909090006 1909100073 1909100067 1909090046 1909100075 1909100077
1909090005 1909100068 1909100071 1909090007 1909090008 1909100065
1909100070 1909100069 1909100072 1909100074 1909100076 1909100079
1909100078 1909100066

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Organic,Dissolved	ND	1.0	mg/L	0.35	

LABORATORY CONTROL SAMPLE: LCS-324014

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Organic,Dissolved	94	90-110	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

LABORATORY CONTROL SAMPLE: LCS-324022

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Organic,Dissolved	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324017 MSD-324018
Associated Lab Sample: 1909100067

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Carbon,Organic,Dissolved	85	96	66-127	4.1	13.4	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: TOC/1554
QC Batch Method: SM 5310 B
Analysis Method: SM 5310 B
Analysis Description: Carbon,Organic by Combustion,Oxidation
Associated Lab Samples: 1909100067

METHOD BLANK: 324023

Associated Lab Samples: 1909100067

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

METHOD BLANK: 324032

Associated Lab Samples: 1909100067

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

METHOD BLANK: 324035

Associated Lab Samples: 1909100067

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

LABORATORY CONTROL SAMPLE: LCS-324027

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Inorganic,Dissolved	83	80-120	

LABORATORY CONTROL SAMPLE: LCS-324033

Parameter	LCS % Rec	% Rec Limits	Qualifier

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

LABORATORY CONTROL SAMPLE: LCS-324033

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Inorganic,Dissolved	75	80-120	[7]

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324030 MSD-324031
Associated Lab Sample: 1909100067

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Carbon,Inorganic,Dissolved	47	64	66-127	3	11.5	[6]

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: BIOL/66213 Analysis Method: SM 10200 H
QC Batch Method: SM 10200 H Analysis Description: Chlorophyll 'a'

Associated Lab Samples: 1909120032 1909120033 1909120034 1909120035 1909120036 1909120037
Associated Lab Samples: 1909120038

METHOD BLANK: 324107

Associated Lab Samples: 1909120033 1909120034 1909120035 1909120038 1909120032 1909120037
1909120036

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
chlorophyll 'a'	ND	0.00071	mg/L	NA	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: FLD/41390 Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1 Analysis Description: Turbidity by Turbidimeter
Associated Lab Samples: 1909090005 1909090006 1909090007 1909090008

METHOD BLANK: 324109
Associated Lab Samples: 1909090006 1909090005 1909090007 1909090008

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Turbidity(Field)	ND	1.0	NTU	NA	

LABORATORY CONTROL SAMPLE: LCS-324110

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	105	90-111	

LABORATORY CONTROL SAMPLE: LCS-324111

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	104	90-111	

LABORATORY CONTROL SAMPLE: LCS_RL-324112

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	112	80-133	

SAMPLE DUPLICATE: 324113
Associated Lab Sample: 1909090005

Parameter	RPD	Max RPD	Qualifier
Turbidity(Field)	4.6	9.5	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: BIOL/66214 Analysis Method: SM 10200 H
QC Batch Method: SM 10200 H Analysis Description: Chlorophyll 'a'

Associated Lab Samples: 1909120039 1909120040 1909120041 1909120042 1909120043 1909120044
Associated Lab Samples: 1909120045

METHOD BLANK: 324119

Associated Lab Samples: 1909120040 1909120041 1909120042 1909120045 1909120039 1909120044
1909120043

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
chlorophyll 'a'	ND	0.00072	mg/L	NA	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10071 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: Ammonia by Automated Colorimetry

Associated Lab Samples: 1909100065 1909100066 1909100067 1909100068 1909100070 1909100078
Associated Lab Samples: 1909100079 1909110059 1909110060 1909110061 1909110062 1909110064
1909110072 1909120032 1909120033 1909120034 1909120035 1909120037
1909120045

METHOD BLANK: 324129

Associated Lab Samples: 1909100067 1909110059 1909120033 1909110061 1909100068 1909100065
1909110060 1909110062 1909120045 1909100070 1909120034 1909120035
1909120032 1909100079 1909120037 1909100078 1909110064 1909100066
1909110072

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Nitrogen,Ammonia(as N)	0.0068J	0.50	mg/L	0.0000010	

LABORATORY CONTROL SAMPLE: LCS-324130

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrogen,Ammonia(as N)	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324131 MSD-324132
Associated Lab Sample: 1909100065

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Nitrogen,Ammonia(as N)	117	121	70-130	0.6	10	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10072 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: Ammonia by Automated Colorimetry

Associated Lab Samples:	1909100071	1909100072	1909100073	1909100074	1909100075	1909100076
Associated Lab Samples:	1909110065	1909110066	1909110067	1909110068	1909110069	1909110070
	1909110073	1909120038	1909120039	1909120040	1909120041	1909120042
	1909120043					

METHOD BLANK: 324134

Associated Lab Samples:	1909120040	1909100073	1909120041	1909100075	1909100071	1909110066
	1909120042	1909110065	1909110073	1909120038	1909100072	1909110068
	1909100074	1909100076	1909110067	1909110069	1909120039	1909110070
	1909120043					

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Nitrogen,Ammonia(as N)	0.0016J	0.50	mg/L	0.0000010	

LABORATORY CONTROL SAMPLE: LCS-324135

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrogen,Ammonia(as N)	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324136 MSD-324137
Associated Lab Sample: 1909120038

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Nitrogen,Ammonia(as N)	108	108	70-130	0.31	10	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10073 — Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 — Analysis Description: Ammonia by Automated Colorimetry

Associated Lab Samples: 1909090005 1909090006 1909090007 1909090008 1909090046 1909100069
Associated Lab Samples: 1909100077 1909110063 1909110071 1909120036 1909120044 1909120046

METHOD BLANK: 324139

Associated Lab Samples: 1909110071 1909090006 1909100077 1909090046 1909090005 1909090008
1909110063 1909090007 1909100069 1909120046 1909120044 1909120036

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Nitrogen,Ammonia(as N)	0.0047J	0.50	mg/L	0.0000010	

LABORATORY CONTROL SAMPLE: LCS-324140

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrogen,Ammonia(as N)	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324141 MSD-324142
Associated Lab Sample: 1909110071

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Nitrogen,Ammonia(as N)	108	120	70-130	5.9	10	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch:	TOC/1555	Analysis Method:	SM 5310 B
QC Batch Method:	SM 5310 B	Analysis Description:	Carbon,Organic by Combustion,Oxidation

Associated Lab Samples:	1909110059	1909110060	1909110061	1909110062	1909110063	1909110064
Associated Lab Samples:	1909110065	1909110066	1909110067	1909110068	1909110069	1909110070
	1909110071	1909110072	1909110073	1909160014		

METHOD BLANK: 324155

Associated Lab Samples:	1909110071	1909110059	1909110061	1909110066	1909110060	1909110062
	1909110063	1909110073	1909110065	1909110068	1909110067	1909110069
	1909110064	1909110070	1909110072			

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Organic,Dissolved	ND	1.0	mg/L	0.35	

METHOD BLANK: 324164

Associated Lab Samples:	1909110071	1909110059	1909110061	1909110066	1909110060	1909110062
	1909110073	1909110063	1909110065	1909110068	1909110067	1909110069
	1909110064	1909110070	1909110072			

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Organic,Dissolved	0.38J	1.0	mg/L	0.35	

METHOD BLANK: 324166

Associated Lab Samples:	1909110071	1909110059	1909110061	1909110066	1909110060	1909110062
	1909110063	1909110073	1909110065	1909110068	1909110067	1909110069
	1909110064	1909110070	1909110072			

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Organic,Dissolved	ND	1.0	mg/L	0.35	

METHOD BLANK: 324609

Associated Lab Samples:	1909110071	1909110059	1909110061	1909110066	1909110060	1909110062

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

1909110063 1909110073 1909110065 1909110068 1909110067 1909110069
1909110064 1909110070 1909110072

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Organic,Dissolved	ND	1.0	mg/L	0.35	

LABORATORY CONTROL SAMPLE: LCS-324159

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Organic,Dissolved	92	90-110	

LABORATORY CONTROL SAMPLE: LCS-324165

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Organic,Dissolved	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324162 MSD-324163
Associated Lab Sample: 1909110072

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Carbon,Organic,Dissolved	80	86	66-127	3	13.4	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: FLD/41395 Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1 Analysis Description: Turbidity by Turbidimeter

Associated Lab Samples: 1909100065 1909100066 1909100067 1909100068 1909100069 1909100070
Associated Lab Samples: 1909100071 1909100072 1909100073 1909100074 1909100075 1909100076 1909100077 1909100078

METHOD BLANK: 324200

Associated Lab Samples: 1909100067 1909100073 1909100075 1909100077 1909100068 1909100071 1909100065 1909100070 1909100069 1909100072 1909100074 1909100076 1909100078 1909100066

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Turbidity(Field)	ND	1.0	NTU	NA	

LABORATORY CONTROL SAMPLE: LCS-324201

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	99	90-111	

LABORATORY CONTROL SAMPLE: LCS-324202

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	100	90-111	

LABORATORY CONTROL SAMPLE: LCS_RL-324203

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	92	80-133	

LABORATORY CONTROL SAMPLE: LCS-324206

Parameter	LCS % Rec	% Rec Limits	Qualifier

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRiNCS Study

LABORATORY CONTROL SAMPLE: LCS-324206

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	100	90-111	

SAMPLE DUPLICATE: 324204
Associated Lab Sample: 1909100070

Parameter	RPD	Max RPD	Qualifier
Turbidity(Field)	0.79	9.5	

SAMPLE DUPLICATE: 324205
Associated Lab Sample: 1909100068

Parameter	RPD	Max RPD	Qualifier
Turbidity(Field)	2.6	9.5	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: FLD/41397 | Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1 | Analysis Description: Turbidity by Turbidimeter

Associated Lab Samples: 1909110059 1909110060 1909110061 1909110062 1909110063 1909110064
Associated Lab Samples: 1909110065 1909110066 1909110067 1909110068 1909110069 1909110070 1909110071 1909110072

METHOD BLANK: 324207

Associated Lab Samples: 1909110071 1909110059 1909110061 1909110066 1909110060 1909110062 1909110063 1909110065 1909110068 1909110067 1909110069 1909110064 1909110070 1909110072

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Turbidity(Field)	ND	1.0	NTU	NA	

LABORATORY CONTROL SAMPLE: LCS-324208

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	97	90-111	

LABORATORY CONTROL SAMPLE: LCS-324209

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	93	90-111	

LABORATORY CONTROL SAMPLE: LCS_RL-324210

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	91	80-133	

LABORATORY CONTROL SAMPLE: LCS-324213

Parameter	LCS % Rec	% Rec Limits	Qualifier

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

LABORATORY CONTROL SAMPLE: LCS-324213

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	92	90-111	

SAMPLE DUPLICATE: 324211
Associated Lab Sample: 1909110066

Parameter	RPD	Max RPD	Qualifier
Turbidity(Field)	0.77	9.5	

SAMPLE DUPLICATE: 324212
Associated Lab Sample: 1909110072

Parameter	RPD	Max RPD	Qualifier
Turbidity(Field)	5.6	9.5	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: FLD/41401 | Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1 | Analysis Description: Turbidity by Turbidimeter

Associated Lab Samples: 1909120032 1909120033 1909120034 1909120035 1909120036 1909120037
Associated Lab Samples: 1909120038 1909120039 1909120040 1909120041 1909120042 1909120043
1909120044 1909120045

METHOD BLANK: 324264

Associated Lab Samples: 1909120040 1909120041 1909120033 1909120042 1909120045 1909120034
1909120035 1909120038 1909120032 1909120037 1909120039 1909120044
1909120036 1909120043

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Turbidity(Field)	ND	1.0	NTU	NA	

LABORATORY CONTROL SAMPLE: LCS-324265

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	98	90-111	

LABORATORY CONTROL SAMPLE: LCS-324266

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	102	90-111	

LABORATORY CONTROL SAMPLE: LCS_RL-324267

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	97	80-133	

LABORATORY CONTROL SAMPLE: LCS-324270

Parameter	LCS % Rec	% Rec Limits	Qualifier

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

LABORATORY CONTROL SAMPLE: LCS-324270

Parameter	LCS % Rec	% Rec Limits	Qualifier
Turbidity(Field)	100	90-111	

SAMPLE DUPLICATE: 324268
Associated Lab Sample: 1909120036

Parameter	RPD	Max RPD	Qualifier
Turbidity(Field)	4	9.5	

SAMPLE DUPLICATE: 324269
Associated Lab Sample: 1909120040

Parameter	RPD	Max RPD	Qualifier
Turbidity(Field)	3	9.5	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: TOC/1556 Analysis Method: SM 5310 B
QC Batch Method: SM 5310 B Analysis Description: Carbon,Organic by Combustion,Oxidation

Associated Lab Samples:	1909090005	1909090006	1909090007	1909110059	1909110060	1909110061
Associated Lab Samples:	1909110062	1909110063	1909110064	1909110065	1909110066	1909110067
	1909110068	1909110069	1909110070	1909110071	1909110072	1909110073

METHOD BLANK: 324488

Associated Lab Samples:	1909090006	1909110071	1909090005	1909110059	1909110061	1909110066
	1909090007	1909110060	1909110062	1909110063	1909110065	1909110073
	1909110068	1909110067	1909110069	1909110064	1909110070	1909110072

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

METHOD BLANK: 324497

Associated Lab Samples:	1909090006	1909110071	1909090005	1909110059	1909110061	1909110066
	1909110073	1909090007	1909110060	1909110062	1909110063	1909110065
	1909110068	1909110067	1909110069	1909110064	1909110070	1909110072

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

METHOD BLANK: 324499

Associated Lab Samples:	1909090006	1909110071	1909090005	1909110059	1909110061	1909110066
	1909090007	1909110060	1909110062	1909110063	1909110065	1909110073
	1909110068	1909110067	1909110069	1909110064	1909110070	1909110072

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

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QUALITY CONTROL DATA

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LABORATORY CONTROL SAMPLE: LCS-324492

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Inorganic,Dissolved	88	80-120	

LABORATORY CONTROL SAMPLE: LCS-324498

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Inorganic,Dissolved	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324495 MSD-324496
Associated Lab Sample: 1909110072

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Carbon,Inorganic,Dissolved	76	89	66-127	6.3	11.5	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: TOC/1557
Analysis Method: SM 5310 B
QC Batch Method: SM 5310 B
Analysis Description: Carbon,Organic by Combustion,Oxidation

Associated Lab Samples: 1909120032 1909120033 1909120034 1909120035 1909120036 1909120037
Associated Lab Samples: 1909120038 1909120039 1909120040 1909120041 1909120042 1909120043
1909120044 1909120045 1909120046

METHOD BLANK: 324505

Associated Lab Samples: 1909120040 1909120041 1909120033 1909120042 1909120045 1909120034
1909120035 1909120038 1909120032 1909120037 1909120046 1909120039
1909120044 1909120036 1909120043

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Organic,Dissolved	ND	1.0	mg/L	0.35	

METHOD BLANK: 324514

Associated Lab Samples: 1909120040 1909120041 1909120033 1909120042 1909120045 1909120034
1909120035 1909120038 1909120032 1909120037 1909120046 1909120039
1909120044 1909120036 1909120043

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Organic,Dissolved	ND	1.0	mg/L	0.35	

METHOD BLANK: 324515

Associated Lab Samples: 1909120040 1909120041 1909120033 1909120042 1909120045 1909120034
1909120035 1909120038 1909120032 1909120037 1909120046 1909120039
1909120044 1909120036 1909120043

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Organic,Dissolved	ND	1.0	mg/L	0.35	

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LABORATORY CONTROL SAMPLE: LCS-324509

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Organic,Dissolved	97	90-110	

LABORATORY CONTROL SAMPLE: LCS-324516

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Organic,Dissolved	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324512 MSD-324513
Associated Lab Sample: 1909120038

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Carbon,Organic,Dissolved	100	101	66-127	0.33	13.4	

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Work Order No: 72538
Project ID: SRINCS Study

QC Batch: TOC/1558 | Analysis Method: SM 5310 B
QC Batch Method: SM 5310 B | Analysis Description: Carbon,Organic by Combustion,Oxidation

Associated Lab Samples:	1909100075	1909100076	1909100077	1909100078	1909100079	1909120032
Associated Lab Samples:	1909120033	1909120034	1909120035	1909120036	1909120037	1909120038
	1909120039	1909120040	1909120041	1909120042	1909120043	1909120044
	1909120045	1909120046				

METHOD BLANK: 324517

Associated Lab Samples:	1909120040	1909100075	1909100077	1909120041	1909120033	1909120042
	1909120045	1909100076	1909120034	1909120035	1909120038	1909120032
	1909100079	1909120037	1909120046	1909100078	1909120039	1909120044
	1909120036	1909120043				

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

METHOD BLANK: 324526

Associated Lab Samples:	1909120040	1909100075	1909100077	1909120041	1909120033	1909120042
	1909120045	1909100076	1909120034	1909120035	1909120038	1909120032
	1909120046	1909100079	1909120037	1909100078	1909120039	1909120044
	1909120036	1909120043				

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

METHOD BLANK: 324528

Associated Lab Samples:	1909120040	1909100075	1909100077	1909120041	1909120033	1909120042
	1909120045	1909100076	1909120034	1909120035	1909120038	1909120032
	1909100079	1909120037	1909120046	1909100078	1909120039	1909120044
	1909120036	1909120043				

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

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LABORATORY CONTROL SAMPLE: LCS-324521

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Inorganic,Dissolved	95	80-120	

LABORATORY CONTROL SAMPLE: LCS-324527

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Inorganic,Dissolved	84	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324524 MSD-324525
Associated Lab Sample: 1909120038

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Carbon,Inorganic,Dissolved	49	67	66-127	4	11.5	[5]

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QC Batch: METP/6047 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: Total Recoverable Metals Prep

Associated Lab Samples:	1909100078	1909100079	1909120032	1909120033	1909120034	1909120035
Associated Lab Samples:	1909120036	1909120037	1909120038	1909120039	1909120040	1909120041
	1909120042	1909120043	1909120044	1909120045	1909120046	

METHOD BLANK: 324668

Associated Lab Samples:	1909120040	1909120041	1909120033	1909120042	1909120045	1909120034
	1909120035	1909120038	1909120032	1909120037	1909120046	1909100079
	1909120039	1909120044	1909100078	1909120036	1909120043	

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Silica(SiO2)	ND	50	ug/L	21	

LABORATORY CONTROL SAMPLE & LCSD: LCS-324669 LCSD-324670

Parameter	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD
Silica(SiO2)	103	103	85-115	0.28	20.7

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324671 MSD-324672
Associated Lab Sample: 1909120032

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Silica(SiO2)	120	113	70-130	1.2	20.7	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324673 MSD-324674
Associated Lab Sample: 1909120033

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier

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MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324673 MSD-324674
Associated Lab Sample: 1909120033

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Silica(SiO2)	105	108	70-130	0.64	20.7	

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Work Order No: 72538
Project ID: SRINCS Study

QC Batch: TOC/1559 — Analysis Method: SM 5310 B
QC Batch Method: SM 5310 B — Analysis Description: Carbon,Organic by Combustion,Oxidation

Associated Lab Samples: 1909090008 1909090046 1909100065 1909100066 1909100068 1909100069
Associated Lab Samples: 1909100070 1909100071 1909100072 1909100073 1909100074 1909120038

METHOD BLANK: 324742

Associated Lab Samples: 1909100073 1909090046 1909100068 1909100071 1909090008 1909100065
1909100070 1909100069 1909100072 1909100074 1909120038 1909100066

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

METHOD BLANK: 324852

Associated Lab Samples: 1909100073 1909090046 1909100068 1909100071 1909090008 1909100065
1909100070 1909100069 1909100072 1909100074 1909120038 1909100066

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

METHOD BLANK: 324853

Associated Lab Samples: 1909100073 1909090046 1909100068 1909100071 1909090008 1909100065
1909100070 1909100069 1909100072 1909100074 1909120038 1909100066

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Carbon,Inorganic,Dissolved	ND	1.0	mg/L	NA	

LABORATORY CONTROL SAMPLE: LCS-324746

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Inorganic,Dissolved	81	80-120	

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LABORATORY CONTROL SAMPLE: LCS-324854

Parameter	LCS % Rec	% Rec Limits	Qualifier
Carbon,Inorganic,Dissolved	80	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-324749 MSD-324750
Associated Lab Sample: 1909120038

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Carbon,Inorganic,Dissolved	118	131	66-127	2.8	11.5	[5]

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10100 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: Nitrite Nitrogen by Colorimetry

Associated Lab Samples: 1909100065 1909100066 1909100067 1909100068 1909100070 1909100078
Associated Lab Samples: 1909100079 1909110059 1909110060 1909110061 1909110062 1909110064
1909110072 1909120032 1909120033 1909120034 1909120035 1909120037
1909120045

METHOD BLANK: 325136

Associated Lab Samples: 1909100067 1909110059 1909120033 1909110061 1909100068 1909100065
1909110060 1909110062 1909120045 1909100070 1909120034 1909120035
1909120032 1909100079 1909120037 1909100078 1909110064 1909100066
1909110072

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Nitrite(as N)	0.0022J	0.10	mg/L	0.000010	

LABORATORY CONTROL SAMPLE: LCS-325137

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrite(as N)	106	90-110	

LABORATORY CONTROL SAMPLE: LCS-325140

Parameter	LCS % Rec	% Rec Limits	Qualifier	
Nitrite(as N)	111	90-110		[4]

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS_WN2-325138 MSD_W2-325139
Associated Lab Sample: 1909120032

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Nitrite(as N)	107	106	90-110	1	10	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10101 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: Nitrite Nitrogen by Colorimetry

Associated Lab Samples: 1909100071 1909100072 1909100073 1909100074 1909100075 1909100076
Associated Lab Samples: 1909110065 1909110066 1909110067 1909110068 1909110069 1909110070
1909110073 1909120038 1909120039 1909120040 1909120041 1909120042
1909120043

METHOD BLANK: 325142

Associated Lab Samples: 1909100073 1909120040 1909100075 1909120041 1909100071 1909110066
1909120042 1909110065 1909110073 1909100072 1909100074 1909100076
1909110068 1909120038 1909110067 1909110069 1909110070 1909120039
1909120043

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Nitrite(as N)	0.0018J	0.10	mg/L	0.000010	

LABORATORY CONTROL SAMPLE: LCS-325143

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrite(as N)	105	90-110	

LABORATORY CONTROL SAMPLE: LCS-325146

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrite(as N)	110	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS_WN2-325144 MSD_W2-325145
Associated Lab Sample: 1909100071

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Nitrite(as N)	105	99	90-110	5.4	10	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10102 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: Nitrite Nitrogen by Colorimetry

Associated Lab Samples: 1909090005 1909090006 1909090007 1909090008 1909090046 1909100069
Associated Lab Samples: 1909100077 1909110063 1909110071 1909120036 1909120044 1909120046

METHOD BLANK: 325148

Associated Lab Samples: 1909110071 1909090006 1909100077 1909090046 1909090005 1909090007
1909110063 1909090008 1909100069 1909120046 1909120044 1909120036

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Nitrite(as N)	0.0022J	0.10	mg/L	0.000010	

LABORATORY CONTROL SAMPLE: LCS-325149

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrite(as N)	107	90-110	

LABORATORY CONTROL SAMPLE: LCS-325171

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrite(as N)	112	90-110	[4]

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS_WN2-325150 MSD_W2-325151
Associated Lab Sample: 1909100077

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Nitrite(as N)	104	105	90-110	1	10	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10103
Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2
Analysis Description: Nitrate-Nitrite Nitrogen by Colorimetry

Associated Lab Samples:	1909100065	1909100066	1909100067	1909100068	1909100070	1909100078
Associated Lab Samples:	1909100079	1909110059	1909110060	1909110061	1909110062	1909110064
	1909110072	1909120032	1909120033	1909120034	1909120035	1909120037
	1909120045					

METHOD BLANK: 325174

Associated Lab Samples:	1909100067	1909110059	1909120033	1909110061	1909100068	1909100070
	1909100065	1909110060	1909110062	1909120045	1909120034	1909120035
	1909120037	1909120032	1909100079	1909100078	1909110064	1909100066
	1909110072					

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Nitrate(as N)	ND	0.10	mg/L	0.000010	

LABORATORY CONTROL SAMPLE: LCS-325175

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrate(as N)	106	90-110	

LABORATORY CONTROL SAMPLE: LCS-325264

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrate(as N)	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS_WN3-325176 MSD_W3-325177
Associated Lab Sample: 1909120032

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Nitrate(as N)	105	103	90-110	1.7	10	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10104 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: Nitrate-Nitrite Nitrogen by Colorimetry

Associated Lab Samples: 1909100071 1909100072 1909100073 1909100074 1909100075 1909100076
Associated Lab Samples: 1909110065 1909110066 1909110067 1909110068 1909110069 1909110070 1909110073 1909120038 1909120039 1909120040 1909120041 1909120042 1909120043

METHOD BLANK: 325180

Associated Lab Samples: 1909100073 1909120040 1909120041 1909100075 1909100071 1909110066 1909120042 1909110065 1909110073 1909120038 1909100072 1909110068 1909100074 1909100076 1909110067 1909110069 1909120039 1909110070 1909120043

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Nitrate(as N)	ND	0.10	mg/L	0.000010	

LABORATORY CONTROL SAMPLE: LCS-325181

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrate(as N)	101	90-110	

LABORATORY CONTROL SAMPLE: LCS-325265

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrate(as N)	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS_WN3-325182 MSD_W3-325183
Associated Lab Sample: 1909100071

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Nitrate(as N)	100	100	90-110	0.32	10	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10105 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: Nitrate-Nitrite Nitrogen by Colorimetry

Associated Lab Samples: 1909090005 1909090006 1909090007 1909090008 1909090046 1909100069
Associated Lab Samples: 1909100077 1909110063 1909110071 1909120036 1909120044 1909120046

METHOD BLANK: 325186

Associated Lab Samples: 1909110071 1909090006 1909100077 1909090046 1909090005 1909090007
1909110063 1909090008 1909100069 1909120046 1909120044 1909120036

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Nitrate(as N)	ND	0.10	mg/L	0.000010	

LABORATORY CONTROL SAMPLE: LCS-325187

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrate(as N)	102	90-110	

LABORATORY CONTROL SAMPLE: LCS-325266

Parameter	LCS % Rec	% Rec Limits	Qualifier
Nitrate(as N)	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS_WN3-325188 MSD_W3-325189
Associated Lab Sample: 1909100077

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Nitrate(as N)	100	100	90-110	0	10	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10108 | Analysis Method: EPA 351.2 (LowLevel)
QC Batch Method: EPA 351.2 (LowLevel) | Analysis Description: TKN by Block Digestion & Colorimetry

Associated Lab Samples:	1909100065	1909100066	1909100067	1909100068	1909100070	1909100078
Associated Lab Samples:	1909100079	1909110059	1909110060	1909110061	1909110062	1909110064
	1909110072	1909120032	1909120033	1909120034	1909120035	1909120037
	1909120045					

METHOD BLANK: 325316

Associated Lab Samples:	1909100067	1909110059	1909120033	1909110061	1909100068	1909100065
	1909110060	1909110062	1909120045	1909100070	1909120034	1909120035
	1909120032	1909100079	1909120037	1909100078	1909110064	1909100066
	1909110072					

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
TKN(as N)DISSOLVED	ND	0.20	mg/L	0.070	

LABORATORY CONTROL SAMPLE: LCS-325317

Parameter	LCS % Rec	% Rec Limits	Qualifier
TKN(as N)DISSOLVED	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-325318 MSD-325319
Associated Lab Sample: 1909100065

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
TKN(as N)DISSOLVED	102	96	90-110	5.1	10	

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Sacramento Regional County Sanitation District
Regional San Environmental Laboratory
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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10109 Analysis Method: EPA 351.2 (LowLevel)
QC Batch Method: EPA 351.2 (LowLevel) Analysis Description: TKN by Block Digestion & Colorimetry

Associated Lab Samples: 1909100071 1909100072 1909100073 1909100074 1909100075 1909100076
Associated Lab Samples: 1909110065 1909110066 1909110067 1909110068 1909110069 1909110070
1909110073 1909120038 1909120039 1909120040 1909120041 1909120042
1909120043

METHOD BLANK: 325326

Associated Lab Samples: 1909120040 1909100073 1909120041 1909100075 1909100071 1909110066
1909120042 1909110065 1909110073 1909120038 1909100072 1909110068
1909100074 1909100076 1909110067 1909110069 1909120039 1909110070
1909120043

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
TKN(as N)DISSOLVED	ND	0.20	mg/L	0.070	

LABORATORY CONTROL SAMPLE: LCS-325327

Parameter	LCS % Rec	% Rec Limits	Qualifier
TKN(as N)DISSOLVED	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-325328 MSD-325329
Associated Lab Sample: 1909100071

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
TKN(as N)DISSOLVED	90	94	90-110	3.8	10	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10110 Analysis Method: EPA 351.2 (LowLevel)
QC Batch Method: EPA 351.2 (LowLevel) Analysis Description: TKN by Block Digestion & Colorimetry

Associated Lab Samples: 1909090005 1909090006 1909090007 1909090008 1909090046 1909100069
Associated Lab Samples: 1909100077 1909110063 1909110071 1909120036 1909120044 1909120046

METHOD BLANK: 325331

Associated Lab Samples: 1909110071 1909090006 1909100077 1909090046 1909090005 1909090007
1909110063 1909090008 1909100069 1909120046 1909120044 1909120036

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
TKN(as N)DISSOLVED	ND	0.20	mg/L	0.070	

LABORATORY CONTROL SAMPLE: LCS-325332

Parameter	LCS % Rec	% Rec Limits	Qualifier
TKN(as N)DISSOLVED	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS-325333 MSD-325334
Associated Lab Sample: 1909120044

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
TKN(as N)DISSOLVED	91	94	90-110	3	10	

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10111 Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4 Analysis Description: Phosphorus by Automated Colorimetry

Associated Lab Samples: 1909100065 1909100066 1909100067 1909100068 1909100070 1909100078
Associated Lab Samples: 1909100079 1909110059 1909110060 1909110061 1909110062 1909110064
1909110072 1909120032 1909120033 1909120034 1909120035 1909120037
1909120045

METHOD BLANK: 325336

Associated Lab Samples: 1909100067 1909110059 1909120033 1909110061 1909100068 1909100065
1909110060 1909110062 1909120045 1909100070 1909120034 1909120035
1909120032 1909100079 1909120037 1909100078 1909110064 1909100066
1909110072

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Phosphorus,Diss(as P)	0.0023J	0.20	mg/L	0.000010	

LABORATORY CONTROL SAMPLE: LCS-325337

Parameter	LCS % Rec	% Rec Limits	Qualifier
Phosphorus,Diss(as P)	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS_D-325343 MSD_D-325344
Associated Lab Sample: 1909100065

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Phosphorus,Diss(as P)	103	100	90-110	2.8	10	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10112
Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4
Analysis Description: Phosphorus by Automated Colorimetry

Associated Lab Samples: 1909100071 1909100072 1909100073 1909100074 1909100075 1909100076
Associated Lab Samples: 1909110065 1909110066 1909110067 1909110068 1909110069 1909110070
1909110073 1909120038 1909120039 1909120040 1909120041 1909120042
1909120043

METHOD BLANK: 325339

Associated Lab Samples: 1909120040 1909100073 1909120041 1909100075 1909100071 1909110066
1909120042 1909110073 1909110065 1909120038 1909100072 1909110068
1909100074 1909100076 1909110067 1909110069 1909120039 1909110070
1909120043

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Phosphorus,Diss(as P)	ND	0.20	mg/L	0.000010	

LABORATORY CONTROL SAMPLE: LCS-325340

Parameter	LCS % Rec	% Rec Limits	Qualifier
Phosphorus,Diss(as P)	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS_D-325341 MSD_D-325342
Associated Lab Sample: 1909100071

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Phosphorus,Diss(as P)	102	102	90-110	0.19	10	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Work Order No: 72538
Project ID: SRINCS Study

QC Batch: LACH/10113 | Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4 | Analysis Description: Phosphorus by Automated Colorimetry

Associated Lab Samples: 1909090005 1909090006 1909090007 1909090008 1909090046 1909100069
Associated Lab Samples: 1909100077 1909110063 1909110071 1909120036 1909120044 1909120046

METHOD BLANK: 325346

Associated Lab Samples: 1909110071 1909090006 1909100077 1909090046 1909090005 1909090007
1909110063 1909090008 1909100069 1909120046 1909120044 1909120036

Parameter	Blank Result	Reporting Limit	Units	MDL	Qualifier
Phosphorus,Diss(as P)	0.018J	0.20	mg/L	0.000010	

LABORATORY CONTROL SAMPLE: LCS-325347

Parameter	LCS % Rec	% Rec Limits	Qualifier
Phosphorus,Diss(as P)	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: MS_D-325348 MSD_D-325349
Associated Lab Sample: 1909120044

Parameter	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qualifier
Phosphorus,Diss(as P)	102	102	90-110	0.63	10	

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QUALITY CONTROL DATA QUALIFIERS

Work Order No: 72538
Project ID: SRiNCS Study

QUALITY CONTROL PARAMETER QUALIFIERS

Result Qualifiers:These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank.

LCS - Laboratory Control Standard.

DUP - Duplicate of Original Sample Matrix.

MS/MSD - Matrix Spike/Matrix Spike Duplicate.

RPD -Relative Percent Difference.

% Rec - Spike Recovery stated as a percentage.

QC - Total QC applies to total recoverable.

[4] The low level LCS is outside of control limits due to increased variability near the reporting limit

[5] The matrix spike recovery was outside of control limits, possibly due to matrix interference. The batch was accepted based on other QC data.

[6] Matrix spike and matrix spike duplicate are outside of control limits.

[7] Low LCS recovery due to increased variability near the reporting limit.

Appendix 6. Phytoplankton Enumeration Data Table

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
SR1	1909090046-E	9/9/2019	11:20	Achnanthidium sp.	Bacillariophyta	2	2.38E+05	1.23E+07	
SR1	1909090046-E	9/9/2019	11:20	Aulacoseira sp.	Bacillariophyta	5	5.94E+05	2.92E+08	
SR1	1909090046-E	9/9/2019	11:20	Cocconeis placentula	Bacillariophyta	2	2.38E+05	1.53E+08	
SR1	1909090046-E	9/9/2019	11:20	Craticula sp.	Bacillariophyta	1	1.19E+05	4.93E+07	
SR1	1909090046-E	9/9/2019	11:20	Cyclotella meneghiniana	Bacillariophyta	2	3.63E+04	2.07E+07	
SR1	1909090046-E	9/9/2019	11:20	Cyclotella sp.	Bacillariophyta	2	2.38E+05	5.97E+07	
SR1	1909090046-E	9/9/2019	11:20	Cymatopleura solea	Bacillariophyta	1	1.82E+04	1.44E+08	Fragment.
SR1	1909090046-E	9/9/2019	11:20	Cymbella affinis	Bacillariophyta	1	1.19E+05	1.24E+08	
SR1	1909090046-E	9/9/2019	11:20	Diatoma sp.	Bacillariophyta	1	1.19E+05	1.79E+07	
SR1	1909090046-E	9/9/2019	11:20	Epithemia sorex	Bacillariophyta	1	1.82E+04	8.48E+06	
SR1	1909090046-E	9/9/2019	11:20	Fragilaria crotonensis	Bacillariophyta	1	1.19E+05	5.67E+07	
SR1	1909090046-E	9/9/2019	11:20	Gomphonema sp.	Bacillariophyta	1	1.82E+04	5.34E+07	Fragment.
SR1	1909090046-E	9/9/2019	11:20	Melosira sp.	Bacillariophyta	1	1.82E+04	1.51E+08	
SR1	1909090046-E	9/9/2019	11:20	Navicula spp.	Bacillariophyta	2	2.38E+05	3.45E+08	
SR1	1909090046-E	9/9/2019	11:20	Nitzschia inconspicua	Bacillariophyta	2	2.38E+05	5.35E+06	
SR1	1909090046-E	9/9/2019	11:20	Nitzschia linearis	Bacillariophyta	1	1.82E+04	1.32E+07	
SR1	1909090046-E	9/9/2019	11:20	Nitzschia sp.	Bacillariophyta	1	1.19E+05	5.70E+06	Fragment.
SR1	1909090046-E	9/9/2019	11:20	Nitzschia spp.	Bacillariophyta	2	3.63E+04	5.15E+06	
SR1	1909090046-E	9/9/2019	11:20	Synedra ulna	Bacillariophyta	1	1.19E+05	4.54E+08	
SR1	1909090046-E	9/9/2019	11:20	Synedra ulna	Bacillariophyta	1	1.19E+05	7.39E+07	Fragment.
SR1	1909090046-E	9/9/2019	11:20	cf. Thalassiosira sp.	Bacillariophyta	10	1.19E+06	4.48E+07	
SR1	1909090046-E	9/9/2019	11:20	Ankistrodesmus nannoselene	Chlorophyta	1	1.19E+05	3.27E+05	
SR1	1909090046-E	9/9/2019	11:20	Chlamydomonas spp.	Chlorophyta	3	3.56E+05	3.36E+07	
SR1	1909090046-E	9/9/2019	11:20	Chlorella spp.	Chlorophyta	53	6.30E+06	8.90E+07	
SR1	1909090046-E	9/9/2019	11:20	Dictyosphaerium sp.	Chlorophyta	16	2.91E+05	6.85E+06	
SR1	1909090046-E	9/9/2019	11:20	Kirchneriella sp.	Chlorophyta	1	1.19E+05	1.49E+06	
SR1	1909090046-E	9/9/2019	11:20	Monoraphidium minutum	Chlorophyta	4	7.26E+04	1.52E+06	
SR1	1909090046-E	9/9/2019	11:20	Cryptomonas sp.	Cryptophyta	1	1.19E+05	1.18E+08	
SR1	1909090046-E	9/9/2019	11:20	Plagioselmis nannoplanctica	Cryptophyta	35	4.16E+06	5.87E+08	
SR1	1909090046-E	9/9/2019	11:20	Rhodomonas sp.	Cryptophyta	1	1.19E+05	1.05E+08	
SR1	1909090046-E	9/9/2019	11:20	Chroococcus microscopicus	Cyanobacteria	396	4.71E+07	1.26E+07	
				TOTAL		552	6.27E+07	3.04E+09	
SR2	1909090006-F	9/9/2019	12:16	Achnanthidium minutissimum	Bacillariophyta	6	4.01E+05	1.26E+07	
SR2	1909090006-F	9/9/2019	12:16	Cocconeis placentula	Bacillariophyta	7	4.68E+05	2.50E+08	
SR2	1909090006-F	9/9/2019	12:16	Cyclotella sp.	Bacillariophyta	13	8.69E+05	2.76E+08	
SR2	1909090006-F	9/9/2019	12:16	Cymbella sp.	Bacillariophyta	1	1.82E+04	1.45E+07	
SR2	1909090006-F	9/9/2019	12:16	Encyonema sp.	Bacillariophyta	1	1.82E+04	3.73E+06	
SR2	1909090006-F	9/9/2019	12:16	Gyrosigma sp.	Bacillariophyta	1	6.68E+04	1.68E+08	
SR2	1909090006-F	9/9/2019	12:16	Navicula sp.	Bacillariophyta	1	6.68E+04	1.89E+07	
SR2	1909090006-F	9/9/2019	12:16	Nitzschia spp.	Bacillariophyta	4	2.67E+05	2.65E+07	
SR2	1909090006-F	9/9/2019	12:16	Synedra sp.	Bacillariophyta	4	2.67E+05	1.25E+08	Fragment.
SR2	1909090006-F	9/9/2019	12:16	Synedra sp.	Bacillariophyta	1	6.68E+04	1.70E+08	
SR2	1909090006-F	9/9/2019	12:16	cf. Thalassiosira sp.	Bacillariophyta	4	2.67E+05	1.57E+07	
SR2	1909090006-F	9/9/2019	12:16	Ankistrodesmus nannoselene	Chlorophyta	6	4.01E+05	1.06E+06	
SR2	1909090006-F	9/9/2019	12:16	Chlorella sp.	Chlorophyta	17	1.14E+06	4.76E+06	
SR2	1909090006-F	9/9/2019	12:16	Scenedesmus sp.	Chlorophyta	4	2.67E+05	7.56E+06	
SR2	1909090006-F	9/9/2019	12:16	Cryptomonas sp.	Cryptophyta	2	3.63E+04	3.39E+07	
SR2	1909090006-F	9/9/2019	12:16	Plagioselmis nannoplanctica	Cryptophyta	12	8.02E+05	1.03E+08	
SR2	1909090006-F	9/9/2019	12:16	Chroococcus microscopicus	Cyanobacteria	524	3.50E+07	9.39E+06	
				TOTAL		608	4.04E+07	1.24E+09	
SR3	1909090007-F	9/9/2019	12:54	Achnanthidium minutissimum	Bacillariophyta	1	7.64E+04	3.00E+06	
SR3	1909090007-F	9/9/2019	12:54	Cocconeis placentula	Bacillariophyta	2	3.63E+04	9.58E+06	
SR3	1909090007-F	9/9/2019	12:54	Cocconeis sp.	Bacillariophyta	1	7.64E+04	2.02E+07	Fragment.
SR3	1909090007-F	9/9/2019	12:54	Cyclotella sp.	Bacillariophyta	2	1.53E+05	1.02E+08	
SR3	1909090007-F	9/9/2019	12:54	Cymbella sp.	Bacillariophyta	1	1.82E+04	5.30E+06	Fragment.
SR3	1909090007-F	9/9/2019	12:54	cf. Diadesmis sp.	Bacillariophyta	1	7.64E+04	2.74E+07	
SR3	1909090007-F	9/9/2019	12:54	Diatoma vulgare	Bacillariophyta	1	7.64E+04	2.11E+08	
SR3	1909090007-F	9/9/2019	12:54	Encyonema sp.	Bacillariophyta	2	1.53E+05	5.91E+07	
SR3	1909090007-F	9/9/2019	12:54	Fragilaria spp.	Bacillariophyta	3	2.29E+05	3.02E+07	
SR3	1909090007-F	9/9/2019	12:54	Gyrosigma sp.	Bacillariophyta	1	1.82E+04	2.76E+07	Fragment.
SR3	1909090007-F	9/9/2019	12:54	Melosira sp.	Bacillariophyta	1	1.82E+04	2.22E+08	
SR3	1909090007-F	9/9/2019	12:54	Navicula spp.	Bacillariophyta	2	1.53E+05	2.30E+08	
SR3	1909090007-F	9/9/2019	12:54	Nitzschia inconspicua	Bacillariophyta	4	7.26E+04	1.82E+06	
SR3	1909090007-F	9/9/2019	12:54	Nitzschia spp.	Bacillariophyta	3	2.29E+05	2.48E+07	
SR3	1909090007-F	9/9/2019	12:54	Sellaphora pupula	Bacillariophyta	1	1.82E+04	1.74E+07	
SR3	1909090007-F	9/9/2019	12:54	Staurosira sp.	Bacillariophyta	7	1.27E+05	9.58E+06	
SR3	1909090007-F	9/9/2019	12:54	Staurosirella leptostauron	Bacillariophyta	1	7.64E+04	5.04E+07	
SR3	1909090007-F	9/9/2019	12:54	Surirella sp.	Bacillariophyta	2	1.53E+05	2.23E+08	
SR3	1909090007-F	9/9/2019	12:54	Synedra ulna	Bacillariophyta	1	7.64E+04	2.97E+08	
SR3	1909090007-F	9/9/2019	12:54	cf. Thalassiosira sp.	Bacillariophyta	9	6.88E+05	2.59E+07	
SR3	1909090007-F	9/9/2019	12:54	Chlamydomonas sp.	Chlorophyta	2	1.53E+05	1.20E+07	
SR3	1909090007-F	9/9/2019	12:54	Chlorella sp.	Chlorophyta	70	5.35E+06	2.24E+07	
SR3	1909090007-F	9/9/2019	12:54	Dictyosphaerium sp.	Chlorophyta	16	2.91E+05	1.22E+07	
SR3	1909090007-F	9/9/2019	12:54	Kirchneriella sp.	Chlorophyta	1	7.64E+04	8.00E+05	
SR3	1909090007-F	9/9/2019	12:54	Monoraphidium sp.	Chlorophyta	1	7.64E+04	1.76E+06	
SR3	1909090007-F	9/9/2019	12:54	Scenedesmus sp.	Chlorophyta	6	1.09E+05	3.08E+06	
SR3	1909090007-F	9/9/2019	12:54	Cryptomonas sp.	Cryptophyta	2	3.63E+04	5.06E+07	
SR3	1909090007-F	9/9/2019	12:54	Plagioselmis nannoplanctica	Cryptophyta	26	1.99E+06	2.55E+08	
SR3	1909090007-F	9/9/2019	12:54	Rhodomonas sp.	Cryptophyta	1	7.64E+04	6.76E+07	
SR3	1909090007-F	9/9/2019	12:54	Chroococcus microscopicus	Cyanobacteria	358	2.73E+07	7.33E+06	
SR3	1909090007-F	9/9/2019	12:54	cf. Peridinium sp.	Pyrrophyta	1	7.64E+04	6.27E+07	
				TOTAL		530	3.81E+07	2.09E+09	
SREM	1909090008-F	9/9/2019	13:42	Achnanthidium minutissimum	Bacillariophyta	1	1.82E+04	4.56E+05	
SREM	1909090008-F	9/9/2019	13:42	Amphora sp.	Bacillariophyta	4	3.56E+05	4.46E+07	
SREM	1909090008-F	9/9/2019	13:42	Cocconeis placentula	Bacillariophyta	1	8.91E+04	5.04E+07	
SREM	1909090008-F	9/9/2019	13:42	Cyclotella sp.	Bacillariophyta	17	1.52E+06	3.05E+08	

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
SREM	1909090008-F	9/9/2019	13:42	Encyonema sp.	Bacillariophyta	1	8.91E+04	2.75E+07	
SREM	1909090008-F	9/9/2019	13:42	Fragilaria sp.	Bacillariophyta	1	8.91E+04	8.82E+06	
SREM	1909090008-F	9/9/2019	13:42	Gomphonema sp.	Bacillariophyta	1	1.82E+04	6.40E+06	
SREM	1909090008-F	9/9/2019	13:42	Melosira varians	Bacillariophyta	4	3.56E+05	1.07E+09	
SREM	1909090008-F	9/9/2019	13:42	Navicula sp.	Bacillariophyta	1	1.82E+04	4.28E+06	
SREM	1909090008-F	9/9/2019	13:42	Pseudostaurosira brevistriata	Bacillariophyta	25	2.23E+06	3.36E+08	
SREM	1909090008-F	9/9/2019	13:42	Surirella sp.	Bacillariophyta	1	8.91E+04	6.01E+09	
SREM	1909090008-F	9/9/2019	13:42	Synedra ulna	Bacillariophyta	1	8.91E+04	4.04E+08	
SREM	1909090008-F	9/9/2019	13:42	Ankistrodesmus nannoselene	Chlorophyta	1	8.91E+04	2.35E+05	
SREM	1909090008-F	9/9/2019	13:42	Chlorella sp.	Chlorophyta	22	1.96E+06	8.21E+06	
SREM	1909090008-F	9/9/2019	13:42	Tetraedron minimum	Chlorophyta	1	8.91E+04	6.68E+06	
SREM	1909090008-F	9/9/2019	13:42	Cryptomonas sp.	Cryptophyta	1	8.91E+04	5.08E+07	
SREM	1909090008-F	9/9/2019	13:42	Plagioselmis nannoplanctica	Cryptophyta	6	5.35E+05	6.86E+07	
SREM	1909090008-F	9/9/2019	13:42	Chroococcus microscopicus	Cyanobacteria	508	4.53E+07	1.21E+07	
SREM	1909090008-F	9/9/2019	13:42	Pseudanabaena sp.	Cyanobacteria	12	2.18E+05	2.74E+06	
				TOTAL		609	5.32E+07	8.42E+09	
NFM4	1909100073-B	9/10/2019	9:45	Achnanthidium sp.	Bacillariophyta	1	5.94E+04	2.52E+06	
NFM4	1909100073-B	9/10/2019	9:45	Aulacoseira sp.	Bacillariophyta	8	1.45E+05	5.75E+07	
NFM4	1909100073-B	9/10/2019	9:45	Cocconeis placentula	Bacillariophyta	11	6.54E+05	4.31E+08	
NFM4	1909100073-B	9/10/2019	9:45	Cyclotella sp.	Bacillariophyta	14	8.32E+05	7.06E+07	
NFM4	1909100073-B	9/10/2019	9:45	Epithemia sorex	Bacillariophyta	1	1.82E+04	7.85E+06	
NFM4	1909100073-B	9/10/2019	9:45	Fragilaria sp.	Bacillariophyta	4	2.38E+05	9.74E+07	
NFM4	1909100073-B	9/10/2019	9:45	Navicula spp.	Bacillariophyta	4	2.38E+05	1.83E+08	
NFM4	1909100073-B	9/10/2019	9:45	Nitzschia sp.	Bacillariophyta	1	5.94E+04	2.32E+06	Fragment.
NFM4	1909100073-B	9/10/2019	9:45	Pseudostaurosira brevistriata	Bacillariophyta	10	5.94E+05	9.10E+07	
NFM4	1909100073-B	9/10/2019	9:45	Reimeria sinuata	Bacillariophyta	1	1.82E+04	1.03E+06	
NFM4	1909100073-B	9/10/2019	9:45	Rhoicosphenia curvata	Bacillariophyta	1	5.94E+04	1.85E+07	
NFM4	1909100073-B	9/10/2019	9:45	Synedra sp.	Bacillariophyta	1	1.82E+04	1.13E+07	Fragment.
NFM4	1909100073-B	9/10/2019	9:45	Ankistrodesmus nannoselene	Chlorophyta	1	5.94E+04	1.63E+05	
NFM4	1909100073-B	9/10/2019	9:45	Chlorella sp.	Chlorophyta	26	1.54E+06	6.47E+06	
NFM4	1909100073-B	9/10/2019	9:45	Monoraphidium sp.	Chlorophyta	1	1.82E+04	8.37E+05	
NFM4	1909100073-B	9/10/2019	9:45	Scenedesmus sp.	Chlorophyta	8	4.75E+05	5.97E+06	
NFM4	1909100073-B	9/10/2019	9:45	Plagioselmis nannoplanctica	Cryptophyta	17	1.01E+06	1.30E+08	
NFM4	1909100073-B	9/10/2019	9:45	Chroococcus microscopicus	Cyanobacteria	444	2.64E+07	7.07E+06	
NFM4	1909100073-B	9/10/2019	9:45	Trachelomonas sp.	Euglenophyta	1	1.82E+04	1.27E+07	
				TOTAL		555	3.24E+07	1.14E+09	
SFM4	1909100077-F	9/10/2019	10:00	Cocconeis placentula	Bacillariophyta	5	3.96E+05	2.55E+08	
SFM4	1909100077-F	9/10/2019	10:00	Cyclotella sp.	Bacillariophyta	1	3.63E+04	2.07E+07	
SFM4	1909100077-F	9/10/2019	10:00	Melosira sp.	Bacillariophyta	2	1.58E+05	1.94E+09	
SFM4	1909100077-F	9/10/2019	10:00	Nitzschia inconspicua	Bacillariophyta	2	1.58E+05	2.54E+06	
SFM4	1909100077-F	9/10/2019	10:00	Nitzschia sp.	Bacillariophyta	1	3.63E+04	2.32E+06	
SFM4	1909100077-F	9/10/2019	10:00	cf. Thalassiosira sp.	Bacillariophyta	8	6.34E+05	2.39E+07	
SFM4	1909100077-F	9/10/2019	10:00	Ankistrodesmus nannoselene	Chlorophyta	5	3.96E+05	1.09E+06	
SFM4	1909100077-F	9/10/2019	10:00	Chlamydomonas sp.	Chlorophyta	1	3.63E+04	2.85E+06	
SFM4	1909100077-F	9/10/2019	10:00	Chlorella spp.	Chlorophyta	67	5.31E+06	2.22E+07	
SFM4	1909100077-F	9/10/2019	10:00	Plagioselmis nannoplanctica	Cryptophyta	22	1.74E+06	2.24E+08	
SFM4	1909100077-F	9/10/2019	10:00	Rhodomonas sp.	Cryptophyta	1	7.92E+04	4.27E+07	
SFM4	1909100077-F	9/10/2019	10:00	cf. Aphanizomenon sp.	Cyanobacteria	31	1.13E+06	2.49E+07	
SFM4	1909100077-F	9/10/2019	10:00	Chroococcus microscopicus	Cyanobacteria	412	3.26E+07	8.75E+06	
				TOTAL		558	4.27E+07	2.57E+09	
NFM3	1909100072-F	9/10/2019	11:06	Achnanthidium sp.	Bacillariophyta	4	5.35E+05	1.51E+07	
NFM3	1909100072-F	9/10/2019	11:06	Cocconeis placentula	Bacillariophyta	2	2.67E+05	1.32E+08	
NFM3	1909100072-F	9/10/2019	11:06	Cyclotella sp.	Bacillariophyta	9	1.20E+06	2.42E+08	
NFM3	1909100072-F	9/10/2019	11:06	Cymbella sp.	Bacillariophyta	1	3.63E+04	2.02E+07	
NFM3	1909100072-F	9/10/2019	11:06	Diatoma vulgare	Bacillariophyta	2	7.26E+04	9.13E+07	
NFM3	1909100072-F	9/10/2019	11:06	Encyonema sp.	Bacillariophyta	3	4.01E+05	1.44E+08	
NFM3	1909100072-F	9/10/2019	11:06	Epithemia sp.	Bacillariophyta	1	1.34E+05	2.03E+07	Fragment.
NFM3	1909100072-F	9/10/2019	11:06	Nitzschia sp.	Bacillariophyta	8	1.07E+06	2.99E+07	
NFM3	1909100072-F	9/10/2019	11:06	Pseudostaurosira brevistriata	Bacillariophyta	24	3.21E+06	4.23E+08	
NFM3	1909100072-F	9/10/2019	11:06	Rhoicosphenia curvata	Bacillariophyta	1	1.34E+05	2.22E+07	
NFM3	1909100072-F	9/10/2019	11:06	Synedra sp.	Bacillariophyta	3	4.01E+05	1.23E+08	Fragment.
NFM3	1909100072-F	9/10/2019	11:06	Ankistrodesmus nannoselene	Chlorophyta	5	6.68E+05	1.84E+06	
NFM3	1909100072-F	9/10/2019	11:06	Chlorella sp.	Chlorophyta	21	2.81E+06	1.18E+07	
NFM3	1909100072-F	9/10/2019	11:06	Scenedesmus sp.	Chlorophyta	12	1.60E+06	5.29E+07	
NFM3	1909100072-F	9/10/2019	11:06	Cryptomonas sp.	Cryptophyta	1	3.63E+04	2.07E+07	
NFM3	1909100072-F	9/10/2019	11:06	Plagioselmis nannoplanctica	Cryptophyta	4	5.35E+05	6.86E+07	
NFM3	1909100072-F	9/10/2019	11:06	Chroococcus microscopicus	Cyanobacteria	448	5.99E+07	1.61E+07	
NFM3	1909100072-F	9/10/2019	11:06	Pseudanabaena sp.	Cyanobacteria	13	1.74E+06	2.18E+07	
				TOTAL		562	7.47E+07	1.46E+09	
GS3	1909100067-F	9/10/2019	11:12	Achnanthidium minutissimum	Bacillariophyta	1	3.63E+04	1.57E+06	
GS3	1909100067-F	9/10/2019	11:12	Cocconeis placentula	Bacillariophyta	2	1.65E+05	4.96E+07	
GS3	1909100067-F	9/10/2019	11:12	Cyclotella sp.	Bacillariophyta	2	7.26E+04	1.83E+07	
GS3	1909100067-F	9/10/2019	11:12	Diatoma sp.	Bacillariophyta	1	8.23E+04	1.84E+07	
GS3	1909100067-F	9/10/2019	11:12	Fragilaria sp.	Bacillariophyta	23	8.35E+05	1.26E+08	
GS3	1909100067-F	9/10/2019	11:12	Gyrosigma sp.	Bacillariophyta	1	3.63E+04	2.65E+07	Fragment.
GS3	1909100067-F	9/10/2019	11:12	Nitzschia inconspicua	Bacillariophyta	5	4.11E+05	1.11E+07	
GS3	1909100067-F	9/10/2019	11:12	Nitzschia sp.	Bacillariophyta	1	8.23E+04	5.18E+06	Fragment.
GS3	1909100067-F	9/10/2019	11:12	Nitzschia spp.	Bacillariophyta	3	2.47E+05	1.78E+07	
GS3	1909100067-F	9/10/2019	11:12	Rhoicosphenia curvata	Bacillariophyta	1	3.63E+04	3.48E+07	
GS3	1909100067-F	9/10/2019	11:12	Synedra ulna	Bacillariophyta	1	3.63E+04	9.70E+06	Fragment.
GS3	1909100067-F	9/10/2019	11:12	Synedra ulna	Bacillariophyta	1	3.63E+04	3.48E+08	
GS3	1909100067-F	9/10/2019	11:12	cf. Thalassiosira sp.	Bacillariophyta	8	6.58E+05	2.48E+07	
GS3	1909100067-F	9/10/2019	11:12	Ankistrodesmus nannoselene	Chlorophyta	1	8.23E+04	2.26E+05	
GS3	1909100067-F	9/10/2019	11:12	Chlorella sp.	Chlorophyta	62	5.10E+06	2.14E+07	
GS3	1909100067-F	9/10/2019	11:12	Monoraphidium arcuatum	Chlorophyta	1	3.63E+04	1.90E+06	

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
GS3	1909100067-F	9/10/2019	11:12	Plagioselmis nannoplanctica	Cryptophyta	17	1.40E+06	1.79E+08	
GS3	1909100067-F	9/10/2019	11:12	Rhodomonas sp.	Cryptophyta	1	3.63E+04	3.21E+07	
GS3	1909100067-F	9/10/2019	11:12	Chroococcus microscopicus	Cyanobacteria	422	3.47E+07	9.31E+06	
				TOTAL		554	4.41E+07	9.36E+08	
SFM3	1909100076-F	9/10/2019	11:45	Cocconeis placentula	Bacillariophyta	1	3.63E+04	2.77E+07	
SFM3	1909100076-F	9/10/2019	11:45	Cyclotella sp.	Bacillariophyta	20	1.53E+06	1.76E+08	
SFM3	1909100076-F	9/10/2019	11:45	Fragilaria sp.	Bacillariophyta	1	3.63E+04	5.31E+06	
SFM3	1909100076-F	9/10/2019	11:45	Gomphonema sp.	Bacillariophyta	1	3.63E+04	1.44E+07	
SFM3	1909100076-F	9/10/2019	11:45	Nitzschia spp.	Bacillariophyta	4	3.06E+05	1.56E+07	
SFM3	1909100076-F	9/10/2019	11:45	Reimeria sinuata	Bacillariophyta	1	7.64E+04	3.96E+06	
SFM3	1909100076-F	9/10/2019	11:45	Rhopalodia sp.	Bacillariophyta	1	7.64E+04	1.57E+07	Fragment.
SFM3	1909100076-F	9/10/2019	11:45	Staurosirella pinnata	Bacillariophyta	3	2.29E+05	2.88E+06	
SFM3	1909100076-F	9/10/2019	11:45	Synedra sp.	Bacillariophyta	2	7.26E+04	1.75E+07	Fragment.
SFM3	1909100076-F	9/10/2019	11:45	Ankistrodesmus nannoselene	Chlorophyta	3	2.29E+05	6.30E+05	
SFM3	1909100076-F	9/10/2019	11:45	cf. Chlamydomonas sp.	Chlorophyta	1	7.64E+04	4.00E+07	
SFM3	1909100076-F	9/10/2019	11:45	Chlorella sp.	Chlorophyta	31	2.37E+06	9.92E+06	
SFM3	1909100076-F	9/10/2019	11:45	Dictyosphaerium sp.	Chlorophyta	4	3.06E+05	4.32E+06	
SFM3	1909100076-F	9/10/2019	11:45	Monoraphidium sp.	Chlorophyta	1	7.64E+04	2.72E+06	
SFM3	1909100076-F	9/10/2019	11:45	Scenedesmus sp.	Chlorophyta	8	6.11E+05	6.40E+06	
SFM3	1909100076-F	9/10/2019	11:45	Tetrastrum sp.	Chlorophyta	8	6.11E+05	2.05E+07	
SFM3	1909100076-F	9/10/2019	11:45	Cryptomonas sp.	Cryptophyta	1	3.63E+04	3.70E+07	
SFM3	1909100076-F	9/10/2019	11:45	Plagioselmis nannoplanctica	Cryptophyta	10	7.64E+05	9.80E+07	
SFM3	1909100076-F	9/10/2019	11:45	Chroococcus microscopicus	Cyanobacteria	448	3.42E+07	9.17E+06	
				TOTAL		549	4.17E+07	5.08E+08	
GS4	1909100068-F	9/10/2019	10:30	Achnanthidium minutissimum	Bacillariophyta	7	4.99E+05	2.12E+07	
GS4	1909100068-F	9/10/2019	10:30	Cyclotella sp.	Bacillariophyta	4	2.85E+05	5.73E+07	
GS4	1909100068-F	9/10/2019	10:30	Encyonema sp.	Bacillariophyta	1	3.63E+04	8.05E+06	
GS4	1909100068-F	9/10/2019	10:30	Epithemia sorex	Bacillariophyta	3	2.14E+05	7.84E+07	
GS4	1909100068-F	9/10/2019	10:30	Gomphonema sp.	Bacillariophyta	4	2.85E+05	5.60E+07	
GS4	1909100068-F	9/10/2019	10:30	Navicula spp.	Bacillariophyta	4	2.85E+05	6.05E+07	
GS4	1909100068-F	9/10/2019	10:30	Nitzschia spp.	Bacillariophyta	3	2.14E+05	1.54E+07	
GS4	1909100068-F	9/10/2019	10:30	Pseudostaurosira sp.	Bacillariophyta	6	4.28E+05	4.84E+07	
GS4	1909100068-F	9/10/2019	10:30	Synedra sp.	Bacillariophyta	1	3.63E+04	2.77E+07	Fragment.
GS4	1909100068-F	9/10/2019	10:30	Ankistrodesmus nannoselene	Chlorophyta	10	7.13E+05	1.96E+06	
GS4	1909100068-F	9/10/2019	10:30	Chlorella sp.	Chlorophyta	19	1.35E+06	5.67E+06	
GS4	1909100068-F	9/10/2019	10:30	Monoraphidium sp.	Chlorophyta	1	7.13E+04	3.29E+06	
GS4	1909100068-F	9/10/2019	10:30	Scenedesmus sp.	Chlorophyta	8	5.70E+05	5.97E+06	
GS4	1909100068-F	9/10/2019	10:30	Chrysococcus sp.	Chrysophyta	1	3.63E+04	2.38E+06	
GS4	1909100068-F	9/10/2019	10:30	Plagioselmis nannoplanctica	Cryptophyta	1	7.13E+04	9.15E+06	
GS4	1909100068-F	9/10/2019	10:30	Chroococcus microscopicus	Cyanobacteria	470	3.35E+07	8.98E+06	
GS4	1909100068-F	9/10/2019	10:30	cf. Planktothrix sp.	Cyanobacteria	51	3.64E+06	7.71E+07	
				TOTAL		594	4.22E+07	4.87E+08	
NFM2	1909100071-F	9/10/2019	12:05	Achnanthidium minutissimum	Bacillariophyta	5	4.86E+05	1.22E+07	
NFM2	1909100071-F	9/10/2019	12:05	Amphora sp.	Bacillariophyta	1	3.63E+04	2.03E+06	
NFM2	1909100071-F	9/10/2019	12:05	Cocconeis placentula	Bacillariophyta	7	6.81E+05	4.28E+08	
NFM2	1909100071-F	9/10/2019	12:05	Cyclotella sp.	Bacillariophyta	9	8.75E+05	7.42E+07	
NFM2	1909100071-F	9/10/2019	12:05	Cymbella sp.	Bacillariophyta	1	3.63E+04	5.59E+07	
NFM2	1909100071-F	9/10/2019	12:05	Diatoma sp.	Bacillariophyta	2	1.94E+05	4.81E+07	
NFM2	1909100071-F	9/10/2019	12:05	Encyonema sp.	Bacillariophyta	4	3.89E+05	8.82E+07	
NFM2	1909100071-F	9/10/2019	12:05	Epithemia sp.	Bacillariophyta	1	3.63E+04	1.63E+07	
NFM2	1909100071-F	9/10/2019	12:05	Fragilaria crotonensis	Bacillariophyta	5	4.86E+05	1.12E+08	
NFM2	1909100071-F	9/10/2019	12:05	Melosira sp.	Bacillariophyta	4	3.89E+05	1.32E+09	
NFM2	1909100071-F	9/10/2019	12:05	Navicula spp.	Bacillariophyta	5	4.86E+05	9.62E+07	
NFM2	1909100071-F	9/10/2019	12:05	Nitzschia inconspicua	Bacillariophyta	1	9.72E+04	1.17E+06	
NFM2	1909100071-F	9/10/2019	12:05	Nitzschia spp.	Bacillariophyta	4	3.89E+05	1.01E+07	
NFM2	1909100071-F	9/10/2019	12:05	Planothidium sp.	Bacillariophyta	2	1.94E+05	2.98E+07	
NFM2	1909100071-F	9/10/2019	12:05	Synedra sp.	Bacillariophyta	8	7.78E+05	1.47E+08	Fragment.
NFM2	1909100071-F	9/10/2019	12:05	Ulnaria ulna	Bacillariophyta	1	9.72E+04	3.59E+08	
NFM2	1909100071-F	9/10/2019	12:05	Ankistrodesmus nannoselene	Chlorophyta	4	3.89E+05	1.07E+06	
NFM2	1909100071-F	9/10/2019	12:05	Chlorella sp.	Chlorophyta	24	2.33E+06	9.77E+06	
NFM2	1909100071-F	9/10/2019	12:05	Monoraphidium sp.	Chlorophyta	1	3.63E+04	2.28E+06	
NFM2	1909100071-F	9/10/2019	12:05	Scenedesmus sp.	Chlorophyta	4	1.45E+05	8.90E+06	
NFM2	1909100071-F	9/10/2019	12:05	Plagioselmis nannoplanctica	Cryptophyta	13	1.26E+06	2.33E+08	
NFM2	1909100071-F	9/10/2019	12:05	Chroococcus microscopicus	Cyanobacteria	438	4.26E+07	1.14E+07	
				TOTAL		544	5.24E+07	3.07E+09	
GS2	1909100079-E	9/10/2019	11:52	Achnanthidium minutissimum	Bacillariophyta	3	1.28E+05	8.47E+06	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Cocconeis placentula	Bacillariophyta	1	4.28E+04	2.88E+07	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Cyclotella cf. meneghiniana	Bacillariophyta	1	4.28E+04	2.44E+07	Fragment. Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Navicula sp.	Bacillariophyta	1	4.28E+04	1.37E+07	Fragment. Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Nitzschia acicularis	Bacillariophyta	1	4.28E+04	1.21E+07	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Nitzschia inconspicua	Bacillariophyta	3	1.28E+05	2.89E+06	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Nitzschia sigma	Bacillariophyta	1	4.28E+04	8.16E+07	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Nitzschia sp.	Bacillariophyta	3	1.28E+05	1.85E+07	Fragment. Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Reimeria sinuata	Bacillariophyta	1	4.28E+04	6.55E+06	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Synedra ulna	Bacillariophyta	1	4.28E+04	6.92E+07	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	cf. Thalassiosira sp.	Bacillariophyta	9	3.85E+05	9.68E+06	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Ankistrodesmus nannoselene	Chlorophyta	3	1.28E+05	3.53E+05	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Chlorella sp.	Chlorophyta	21	8.98E+05	3.76E+06	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Scenedesmus sp.	Chlorophyta	2	7.26E+04	9.13E+05	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Plagioselmis nannoplanctica	Cryptophyta	6	2.57E+05	3.29E+07	Cannot meet tally in 50 fields.
GS2	1909100079-E	9/10/2019	11:52	Chroococcus microscopicus	Cyanobacteria	174	7.44E+06	2.00E+06	Cannot meet tally in 50 fields.
				TOTAL		231	9.87E+06	3.16E+08	
GS1	1909100065-F	9/10/2019	12:48	Achnanthidium sp.	Bacillariophyta	4	4.28E+05	1.21E+07	
GS1	1909100065-F	9/10/2019	12:48	Aulacoseira granulata var. angustissima	Bacillariophyta	6	2.18E+05	4.66E+07	

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
GS1	1909100065-F	9/10/2019	12:48	Cocconeis placentula	Bacillariophyta	2	2.14E+05	1.29E+08	
GS1	1909100065-F	9/10/2019	12:48	Cyclotella sp.	Bacillariophyta	12	1.28E+06	7.56E+07	
GS1	1909100065-F	9/10/2019	12:48	Cymbella sp.	Bacillariophyta	1	3.63E+04	1.80E+07	
GS1	1909100065-F	9/10/2019	12:48	Gomphonema sp.	Bacillariophyta	3	3.21E+05	5.98E+07	
GS1	1909100065-F	9/10/2019	12:48	Navicula spp.	Bacillariophyta	4	4.28E+05	6.05E+07	
GS1	1909100065-F	9/10/2019	12:48	Nitzschia sp.	Bacillariophyta	1	1.07E+05	8.34E+06	Fragment.
GS1	1909100065-F	9/10/2019	12:48	Nitzschia sp.	Bacillariophyta	1	1.07E+05	5.78E+06	
GS1	1909100065-F	9/10/2019	12:48	Synedra sp.	Bacillariophyta	5	5.35E+05	1.29E+08	Fragment.
GS1	1909100065-F	9/10/2019	12:48	Ankistrodesmus nannoselene	Chlorophyta	11	1.18E+06	3.23E+06	
GS1	1909100065-F	9/10/2019	12:48	cf. Chlorella sp.	Chlorophyta	15	1.60E+06	6.72E+06	
GS1	1909100065-F	9/10/2019	12:48	Monoraphidium sp.	Chlorophyta	1	3.63E+04	1.67E+06	
GS1	1909100065-F	9/10/2019	12:48	Cryptomonas sp.	Cryptophyta	1	3.63E+04	2.31E+07	
GS1	1909100065-F	9/10/2019	12:48	Plagioselmis nannoplanctica	Cryptophyta	4	4.28E+05	6.81E+07	
GS1	1909100065-F	9/10/2019	12:48	Chroococcus microscopicus	Cyanobacteria	504	5.39E+07	1.45E+07	
				TOTAL		575	6.09E+07	6.61E+08	
GS2	1909100066-F	9/10/2019	11:52	Achnanthidium sp.	Bacillariophyta	4	3.29E+05	9.30E+06	
GS2	1909100066-F	9/10/2019	11:52	Cocconeis placentula	Bacillariophyta	10	8.23E+05	4.39E+08	
GS2	1909100066-F	9/10/2019	11:52	Cyclotella sp.	Bacillariophyta	9	7.40E+05	6.28E+07	
GS2	1909100066-F	9/10/2019	11:52	Epithemia sp.	Bacillariophyta	1	3.63E+04	2.88E+07	
GS2	1909100066-F	9/10/2019	11:52	Fragilaria crotonensis	Bacillariophyta	8	2.91E+05	1.14E+08	
GS2	1909100066-F	9/10/2019	11:52	Navicula sp.	Bacillariophyta	1	8.23E+04	1.71E+07	
GS2	1909100066-F	9/10/2019	11:52	Nitzschia spp.	Bacillariophyta	7	5.76E+05	3.63E+07	
GS2	1909100066-F	9/10/2019	11:52	Synedra sp.	Bacillariophyta	2	7.26E+04	1.33E+07	Fragment.
GS2	1909100066-F	9/10/2019	11:52	Synedra ulna	Bacillariophyta	4	3.29E+05	8.79E+08	
GS2	1909100066-F	9/10/2019	11:52	Tryblionella sp.	Bacillariophyta	1	8.23E+04	6.46E+07	
GS2	1909100066-F	9/10/2019	11:52	Ankistrodesmus nannoselene	Chlorophyta	1	8.23E+04	2.26E+05	
GS2	1909100066-F	9/10/2019	11:52	Chlorella sp.	Chlorophyta	36	2.96E+06	1.24E+07	
GS2	1909100066-F	9/10/2019	11:52	Tetraedron minimum	Chlorophyta	1	8.23E+04	8.88E+06	
GS2	1909100066-F	9/10/2019	11:52	Cryptomonas sp.	Cryptophyta	1	8.23E+04	7.68E+07	
GS2	1909100066-F	9/10/2019	11:52	Plagioselmis nannoplanctica	Cryptophyta	7	5.76E+05	7.39E+07	
GS2	1909100066-F	9/10/2019	11:52	Chroococcus microscopicus	Cyanobacteria	452	3.72E+07	9.97E+06	
				TOTAL		545	4.43E+07	1.85E+09	
SFM2	1909100075-F	9/10/2019	13:00	Achnanthidium minutissimum	Bacillariophyta	4	1.71E+05	1.05E+07	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Aulacoseira sp.	Bacillariophyta	2	8.56E+04	1.40E+07	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Cocconeis sp.	Bacillariophyta	2	7.26E+04	2.74E+07	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Cymbella sp.	Bacillariophyta	1	3.63E+04	1.51E+07	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Fragilaria sp.	Bacillariophyta	1	3.63E+04	4.79E+06	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Melosira sp.	Bacillariophyta	2	8.56E+04	4.64E+08	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Nitzschia sp.	Bacillariophyta	1	4.28E+04	2.70E+06	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Pinnularia sp.	Bacillariophyta	1	3.63E+04	6.02E+07	Fragment. Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Planothidium sp.	Bacillariophyta	1	4.28E+04	8.06E+06	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Synedra ulna	Bacillariophyta	1	3.63E+04	1.04E+08	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	cf. Thalassiosira spp.	Bacillariophyta	17	7.27E+05	3.47E+07	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Ankistrodesmus nannoselene	Chlorophyta	2	8.56E+04	2.35E+05	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Chlorella spp.	Chlorophyta	33	1.41E+06	5.91E+06	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Dictyosphaerium sp.	Chlorophyta	9	3.27E+05	6.16E+06	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Plagioselmis nannoplanctica	Cryptophyta	12	5.13E+05	6.59E+07	Cannot meet tally in 50 fields.
SFM2	1909100075-F	9/10/2019	13:00	Chroococcus microscopicus	Cyanobacteria	246	1.05E+07	2.82E+06	Cannot meet tally in 50 fields.
				TOTAL		335	1.42E+07	8.27E+08	
NFM1	1909100070-F	9/10/2019	13:06	Cocconeis placentula	Bacillariophyta	7	4.16E+05	2.22E+08	
NFM1	1909100070-F	9/10/2019	13:06	cf. Cyclotella sp.	Bacillariophyta	4	2.38E+05	1.40E+07	
NFM1	1909100070-F	9/10/2019	13:06	Cyclotella sp.	Bacillariophyta	5	2.97E+05	1.17E+08	
NFM1	1909100070-F	9/10/2019	13:06	Melosira varians	Bacillariophyta	2	7.26E+04	2.96E+08	
NFM1	1909100070-F	9/10/2019	13:06	Navicula sp.	Bacillariophyta	1	5.94E+04	9.80E+06	Fragment.
NFM1	1909100070-F	9/10/2019	13:06	Nitzschia sp.	Bacillariophyta	1	5.94E+04	3.92E+06	Fragment.
NFM1	1909100070-F	9/10/2019	13:06	Nitzschia spp.	Bacillariophyta	6	3.56E+05	2.25E+07	Fragment.
NFM1	1909100070-F	9/10/2019	13:06	Staurosirella pinnata	Bacillariophyta	3	1.78E+05	4.20E+06	
NFM1	1909100070-F	9/10/2019	13:06	Synedra sp.	Bacillariophyta	7	4.16E+05	1.76E+08	Fragment.
NFM1	1909100070-F	9/10/2019	13:06	Tryblionella sp.	Bacillariophyta	1	3.63E+04	3.23E+07	
NFM1	1909100070-F	9/10/2019	13:06	Ankistrodesmus nannoselene	Chlorophyta	3	1.78E+05	4.90E+05	
NFM1	1909100070-F	9/10/2019	13:06	Chlorella sp.	Chlorophyta	21	1.25E+06	5.23E+06	
NFM1	1909100070-F	9/10/2019	13:06	Monoraphidium sp.	Chlorophyta	1	5.94E+04	5.60E+05	
NFM1	1909100070-F	9/10/2019	13:06	Tetrastrum sp.	Chlorophyta	4	1.45E+05	4.87E+06	
NFM1	1909100070-F	9/10/2019	13:06	Chrysococcus sp.	Chrysophyta	1	3.63E+04	2.38E+06	
NFM1	1909100070-F	9/10/2019	13:06	Plagioselmis nannoplanctica	Cryptophyta	13	7.72E+05	1.23E+08	
NFM1	1909100070-F	9/10/2019	13:06	Chroococcus microscopicus	Cyanobacteria	474	2.82E+07	7.55E+06	
				TOTAL		554	3.27E+07	1.04E+09	
SFM1	1909100074-F	9/10/2019	14:18	Achnanthidium minutissimum	Bacillariophyta	1	1.07E+05	3.02E+06	
SFM1	1909100074-F	9/10/2019	14:18	Amphora sp.	Bacillariophyta	4	4.28E+05	3.25E+07	
SFM1	1909100074-F	9/10/2019	14:18	Cocconeis placentula	Bacillariophyta	1	3.63E+04	3.23E+07	
SFM1	1909100074-F	9/10/2019	14:18	Cyclotella sp.	Bacillariophyta	12	1.28E+06	7.56E+07	
SFM1	1909100074-F	9/10/2019	14:18	Gomphonema sp.	Bacillariophyta	4	4.28E+05	1.21E+08	
SFM1	1909100074-F	9/10/2019	14:18	Navicula sp.	Bacillariophyta	1	1.07E+05	3.18E+07	Fragment.
SFM1	1909100074-F	9/10/2019	14:18	Navicula sp.	Bacillariophyta	1	1.07E+05	8.40E+07	
SFM1	1909100074-F	9/10/2019	14:18	Nitzschia spp.	Bacillariophyta	9	9.63E+05	3.12E+08	
SFM1	1909100074-F	9/10/2019	14:18	Reimeria sinuata	Bacillariophyta	1	1.07E+05	1.21E+07	
SFM1	1909100074-F	9/10/2019	14:18	Rhoicosphenia curvata	Bacillariophyta	1	3.63E+04	7.86E+06	
SFM1	1909100074-F	9/10/2019	14:18	Stephanodiscus sp.	Bacillariophyta	1	1.07E+05	3.03E+08	
SFM1	1909100074-F	9/10/2019	14:18	Synedra sp.	Bacillariophyta	3	3.21E+05	1.68E+08	Fragment.
SFM1	1909100074-F	9/10/2019	14:18	Synedra ulna	Bacillariophyta	4	4.28E+05	1.18E+09	
SFM1	1909100074-F	9/10/2019	14:18	Ankistrodesmus nannoselene	Chlorophyta	4	4.28E+05	1.18E+06	
SFM1	1909100074-F	9/10/2019	14:18	Chlorella sp.	Chlorophyta	16	1.71E+06	7.17E+06	
SFM1	1909100074-F	9/10/2019	14:18	Scenedesmus sp.	Chlorophyta	12	4.36E+05	1.23E+07	
SFM1	1909100074-F	9/10/2019	14:18	Plagioselmis nannoplanctica	Cryptophyta	7	7.49E+05	9.60E+07	
SFM1	1909100074-F	9/10/2019	14:18	Chroococcus microscopicus	Cyanobacteria	532	5.69E+07	1.53E+07	

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
				TOTAL		614	6.47E+07	2.49E+09	
SREM	1909100069-F	9/10/2019	14:14	Achnanthidium minutissimum	Bacillariophyta	6	3.77E+05	1.96E+07	
SREM	1909100069-F	9/10/2019	14:14	Aulacoseira sp.	Bacillariophyta	3	1.89E+05	3.79E+07	
SREM	1909100069-F	9/10/2019	14:14	Cocconeis placentula	Bacillariophyta	1	3.63E+04	1.10E+07	Fragment.
SREM	1909100069-F	9/10/2019	14:14	Cocconeis sp.	Bacillariophyta	1	3.63E+04	9.58E+06	
SREM	1909100069-F	9/10/2019	14:14	Craticula sp.	Bacillariophyta	1	3.63E+04	3.99E+07	
SREM	1909100069-F	9/10/2019	14:14	Cyclotella sp.	Bacillariophyta	1	6.29E+04	1.58E+07	
SREM	1909100069-F	9/10/2019	14:14	Diatoma vulgare	Bacillariophyta	2	1.26E+05	4.55E+08	
SREM	1909100069-F	9/10/2019	14:14	Gyrosigma sp.	Bacillariophyta	1	3.63E+04	4.00E+07	Fragment.
SREM	1909100069-F	9/10/2019	14:14	cf. Navicula sp.	Bacillariophyta	1	6.29E+04	8.30E+06	
SREM	1909100069-F	9/10/2019	14:14	Nitzschia inconspicua	Bacillariophyta	3	1.89E+05	4.53E+06	
SREM	1909100069-F	9/10/2019	14:14	Nitzschia sp.	Bacillariophyta	1	3.63E+04	2.67E+06	
SREM	1909100069-F	9/10/2019	14:14	Pseudostaurosira brevistriata	Bacillariophyta	4	2.52E+05	4.98E+07	
SREM	1909100069-F	9/10/2019	14:14	Sellaphora pupula	Bacillariophyta	1	6.29E+04	4.42E+07	
SREM	1909100069-F	9/10/2019	14:14	Synedra ulna	Bacillariophyta	1	3.63E+04	1.25E+08	
SREM	1909100069-F	9/10/2019	14:14	cf. Thalassiosira sp.	Bacillariophyta	10	6.29E+05	3.71E+07	
SREM	1909100069-F	9/10/2019	14:14	Ankistrodesmus nannoselene	Chlorophyta	7	4.40E+05	1.21E+06	
SREM	1909100069-F	9/10/2019	14:14	cf. Chlamydomonas sp.	Chlorophyta	2	1.26E+05	2.53E+07	
SREM	1909100069-F	9/10/2019	14:14	Chlorella spp.	Chlorophyta	40	2.52E+06	1.05E+07	
SREM	1909100069-F	9/10/2019	14:14	Kirchneriella sp.	Chlorophyta	1	6.29E+04	1.65E+06	
SREM	1909100069-F	9/10/2019	14:14	Monoraphidium sp.	Chlorophyta	1	3.63E+04	5.96E+05	
SREM	1909100069-F	9/10/2019	14:14	Plagioselmis nannoplanctica	Cryptophyta	8	5.03E+05	9.28E+07	
SREM	1909100069-F	9/10/2019	14:14	Chroococcus microscopicus	Cyanobacteria	462	2.91E+07	7.79E+06	
				TOTAL		558	3.49E+07	1.04E+09	
MOKEM	1909100078-F	9/10/2019	15:02	Achnanthidium minutissimum	Bacillariophyta	7	2.30E+05	7.24E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Aulacoseira alpigena	Bacillariophyta	4	1.32E+05	4.19E+07	
MOKEM	1909100078-F	9/10/2019	15:02	Aulacoseira sp.	Bacillariophyta	21	6.91E+05	2.17E+08	
MOKEM	1909100078-F	9/10/2019	15:02	Cocconeis placentula	Bacillariophyta	7	2.30E+05	1.37E+08	
MOKEM	1909100078-F	9/10/2019	15:02	Cyclotella sp.	Bacillariophyta	6	1.97E+05	1.16E+07	
MOKEM	1909100078-F	9/10/2019	15:02	Cymbella spp.	Bacillariophyta	6	1.97E+05	6.22E+07	
MOKEM	1909100078-F	9/10/2019	15:02	Encyonema sp.	Bacillariophyta	1	7.26E+03	7.41E+05	
MOKEM	1909100078-F	9/10/2019	15:02	Fragilaria sp.	Bacillariophyta	2	1.45E+04	4.52E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Gomphonema sp.	Bacillariophyta	1	3.29E+04	4.39E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Gyrosigma sp.	Bacillariophyta	1	7.26E+03	4.20E+07	
MOKEM	1909100078-F	9/10/2019	15:02	Melosira varians	Bacillariophyta	4	1.32E+05	4.48E+08	
MOKEM	1909100078-F	9/10/2019	15:02	Navicula capitatoradiata	Bacillariophyta	1	7.26E+03	5.43E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Navicula sp.	Bacillariophyta	2	6.58E+04	2.09E+07	
MOKEM	1909100078-F	9/10/2019	15:02	Nitzschia inconspicua	Bacillariophyta	4	1.32E+05	1.58E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Nitzschia sigma	Bacillariophyta	1	7.26E+03	3.18E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Pseudostaurosira brevistriata	Bacillariophyta	4	2.91E+04	3.56E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Rhoicosphenia curvata	Bacillariophyta	1	7.26E+03	7.60E+05	
MOKEM	1909100078-F	9/10/2019	15:02	Staurosira construens	Bacillariophyta	2	1.45E+04	1.78E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Stephanodiscus sp.	Bacillariophyta	1	3.29E+04	2.62E+07	Fragment.
MOKEM	1909100078-F	9/10/2019	15:02	Synedra sp.	Bacillariophyta	8	2.63E+05	3.28E+08	Fragment.
MOKEM	1909100078-F	9/10/2019	15:02	Synedra ulna	Bacillariophyta	2	1.45E+04	1.11E+08	
MOKEM	1909100078-F	9/10/2019	15:02	cf. Thalassiosira sp.	Bacillariophyta	1	3.29E+04	1.24E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Ankistrodesmus nannoselene	Chlorophyta	12	3.95E+05	1.09E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Chlorella sp.	Chlorophyta	26	8.56E+05	3.58E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Monoraphidium sp.	Chlorophyta	5	1.65E+05	6.20E+06	
MOKEM	1909100078-F	9/10/2019	15:02	cf. Oocystis sp.	Chlorophyta	4	2.91E+04	1.46E+06	
MOKEM	1909100078-F	9/10/2019	15:02	Tetrastrum sp.	Chlorophyta	4	2.91E+04	9.74E+05	
MOKEM	1909100078-F	9/10/2019	15:02	Plagioselmis sp.	Cryptophyta	10	3.29E+05	2.79E+07	
MOKEM	1909100078-F	9/10/2019	15:02	Chroococcus microscopicus	Cyanobacteria	442	1.45E+07	3.90E+06	
				TOTAL		590	1.88E+07	1.53E+09	
SFM4	1909110071-F	9/11/2019	9:07	Aulacoseira sp.	Bacillariophyta	4	1.34E+05	4.20E+07	
SFM4	1909110071-F	9/11/2019	9:07	Bacillaria paxillifer	Bacillariophyta	1	9.08E+03	1.06E+07	
SFM4	1909110071-F	9/11/2019	9:07	Cocconeis placentula	Bacillariophyta	7	2.34E+05	1.54E+08	
SFM4	1909110071-F	9/11/2019	9:07	Cyclotella sp.	Bacillariophyta	1	3.34E+04	1.97E+06	
SFM4	1909110071-F	9/11/2019	9:07	Encyonema sp.	Bacillariophyta	1	9.08E+03	1.70E+06	
SFM4	1909110071-F	9/11/2019	9:07	Fragilaria spp.	Bacillariophyta	1	3.34E+04	7.03E+06	
SFM4	1909110071-F	9/11/2019	9:07	Gomphonema sp.	Bacillariophyta	1	3.34E+04	3.16E+06	
SFM4	1909110071-F	9/11/2019	9:07	Melosira varians	Bacillariophyta	2	1.82E+04	7.39E+07	
SFM4	1909110071-F	9/11/2019	9:07	Navicula spp.	Bacillariophyta	3	1.00E+05	3.54E+07	
SFM4	1909110071-F	9/11/2019	9:07	Nitzschia inconspicua	Bacillariophyta	1	3.34E+04	4.01E+05	
SFM4	1909110071-F	9/11/2019	9:07	Nitzschia spp.	Bacillariophyta	4	1.34E+05	6.02E+06	
SFM4	1909110071-F	9/11/2019	9:07	Staurosira sp.	Bacillariophyta	2	1.82E+04	9.41E+05	
SFM4	1909110071-F	9/11/2019	9:07	Stephanodiscus sp.	Bacillariophyta	1	9.08E+03	1.28E+07	Fragment.
SFM4	1909110071-F	9/11/2019	9:07	Surirella sp.	Bacillariophyta	1	3.34E+04	7.17E+07	
SFM4	1909110071-F	9/11/2019	9:07	Synedra sp.	Bacillariophyta	6	2.01E+05	4.25E+07	Fragment.
SFM4	1909110071-F	9/11/2019	9:07	Ankistrodesmus nannoselene	Chlorophyta	21	7.02E+05	1.93E+06	
SFM4	1909110071-F	9/11/2019	9:07	Chlorella sp.	Chlorophyta	40	1.34E+06	5.60E+06	
SFM4	1909110071-F	9/11/2019	9:07	Scenedesmus sp.	Chlorophyta	8	2.67E+05	2.80E+06	
SFM4	1909110071-F	9/11/2019	9:07	Cryptomonas sp.	Cryptophyta	5	1.67E+05	8.96E+07	
SFM4	1909110071-F	9/11/2019	9:07	Plagioselmis sp.	Cryptophyta	13	4.34E+05	5.57E+07	
SFM4	1909110071-F	9/11/2019	9:07	Chroococcus microscopicus	Cyanobacteria	378	1.26E+07	3.39E+06	
				TOTAL		501	1.66E+07	6.24E+08	
NFM4	1909110067-F	9/11/2019	9:05	Achnanthidium minutissimum	Bacillariophyta	8	3.42E+05	1.48E+07	
NFM4	1909110067-F	9/11/2019	9:05	Cocconeis sp.	Bacillariophyta	2	8.56E+04	2.58E+07	
NFM4	1909110067-F	9/11/2019	9:05	Cyclotella sp.	Bacillariophyta	2	8.56E+04	4.88E+07	Fragment.
NFM4	1909110067-F	9/11/2019	9:05	cf. Navicula sp.	Bacillariophyta	2	8.56E+04	7.74E+07	
NFM4	1909110067-F	9/11/2019	9:05	Nitzschia inconspicua	Bacillariophyta	2	8.56E+04	1.71E+06	
NFM4	1909110067-F	9/11/2019	9:05	Nitzschia spp.	Bacillariophyta	3	1.28E+05	1.23E+07	
NFM4	1909110067-F	9/11/2019	9:05	Planothidium sp.	Bacillariophyta	1	3.63E+04	1.16E+07	
NFM4	1909110067-F	9/11/2019	9:05	Synedra ulna	Bacillariophyta	2	7.26E+04	3.97E+07	Fragment.
NFM4	1909110067-F	9/11/2019	9:05	cf. Thalassiosira sp.	Bacillariophyta	24	1.03E+06	3.87E+07	

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
NFM4	1909110067-F	9/11/2019	9:05	Ankistrodesmus nannoselene	Chlorophyta	2	8.56E+04	2.35E+05	
NFM4	1909110067-F	9/11/2019	9:05	Chlorella sp.	Chlorophyta	71	3.04E+06	1.27E+07	
NFM4	1909110067-F	9/11/2019	9:05	Scenedesmus sp.	Chlorophyta	4	1.71E+05	1.79E+06	
NFM4	1909110067-F	9/11/2019	9:05	Tetraedron caudatum	Chlorophyta	2	8.56E+04	6.42E+06	
NFM4	1909110067-F	9/11/2019	9:05	Plagioselmis nannoplanctica	Cryptophyta	24	1.03E+06	1.32E+08	
NFM4	1909110067-F	9/11/2019	9:05	Chroococcus microscopicus	Cyanobacteria	584	2.50E+07	6.70E+06	
				TOTAL		733	3.13E+07	4.30E+08	
GS4	1909110062-F	9/11/2019	9:49	Achnanthidium sp.	Bacillariophyta	7	3.56E+05	8.96E+06	
GS4	1909110062-F	9/11/2019	9:49	Cocconeis placentula	Bacillariophyta	1	3.63E+04	1.94E+07	
GS4	1909110062-F	9/11/2019	9:49	Cyclotella sp.	Bacillariophyta	11	5.60E+05	3.30E+07	
GS4	1909110062-F	9/11/2019	9:49	cf. Navicula sp.	Bacillariophyta	1	5.09E+04	1.01E+07	
GS4	1909110062-F	9/11/2019	9:49	Nitzschia sp.	Bacillariophyta	1	3.63E+04	1.70E+07	
GS4	1909110062-F	9/11/2019	9:49	Synedra ulna	Bacillariophyta	4	2.04E+05	1.14E+09	
GS4	1909110062-F	9/11/2019	9:49	Ankistrodesmus nannoselene	Chlorophyta	9	4.58E+05	1.26E+06	
GS4	1909110062-F	9/11/2019	9:49	Chlorella sp.	Chlorophyta	24	1.22E+06	5.12E+06	
GS4	1909110062-F	9/11/2019	9:49	Plagioselmis sp.	Cryptophyta	10	5.09E+05	4.32E+07	
GS4	1909110062-F	9/11/2019	9:49	Chroococcus microscopicus	Cyanobacteria	476	2.42E+07	6.50E+06	
				TOTAL		544	2.77E+07	1.29E+09	
NFM3	1909110066-F	9/11/2019	10:05	Achnanthidium sp.	Bacillariophyta	7	2.99E+05	1.81E+07	
NFM3	1909110066-F	9/11/2019	10:05	Cocconeis placentula	Bacillariophyta	2	8.56E+04	6.29E+07	
NFM3	1909110066-F	9/11/2019	10:05	Cyclotella sp.	Bacillariophyta	2	8.56E+04	1.32E+07	
NFM3	1909110066-F	9/11/2019	10:05	Encyonema sp.	Bacillariophyta	1	3.63E+04	1.07E+07	
NFM3	1909110066-F	9/11/2019	10:05	Gomphoneis sp.	Bacillariophyta	1	3.63E+04	1.35E+08	Fragment.
NFM3	1909110066-F	9/11/2019	10:05	Gyrosigma sp.	Bacillariophyta	1	3.63E+04	1.61E+08	
NFM3	1909110066-F	9/11/2019	10:05	Nitzschia inconspicua	Bacillariophyta	6	2.57E+05	5.13E+06	
NFM3	1909110066-F	9/11/2019	10:05	Nitzschia spp.	Bacillariophyta	11	4.71E+05	1.98E+07	
NFM3	1909110066-F	9/11/2019	10:05	Synedra ulna	Bacillariophyta	10	4.28E+05	1.29E+08	Fragment.
NFM3	1909110066-F	9/11/2019	10:05	cf. Thalassiosira sp.	Bacillariophyta	12	5.13E+05	3.02E+07	
NFM3	1909110066-F	9/11/2019	10:05	Actinastrum hantzschii	Chlorophyta	8	2.91E+05	2.42E+07	
NFM3	1909110066-F	9/11/2019	10:05	Chlorella sp.	Chlorophyta	62	2.65E+06	1.11E+07	
NFM3	1909110066-F	9/11/2019	10:05	Plagioselmis nannoplanctica	Cryptophyta	27	1.16E+06	1.48E+08	
NFM3	1909110066-F	9/11/2019	10:05	Chroococcus microscopicus	Cyanobacteria	528	2.26E+07	6.06E+06	
NFM3	1909110066-F	9/11/2019	10:05	cf. Gymnodinium sp.	Pyrrophyta	1	3.63E+04	1.22E+07	
				TOTAL		679	2.90E+07	7.86E+08	
NFM3	1909110073-F	9/11/2019	10:05	Achnanthidium sp.	Bacillariophyta	5	4.86E+05	1.07E+07	
NFM3	1909110073-F	9/11/2019	10:05	Cocconeis placentula	Bacillariophyta	10	9.72E+05	5.19E+08	
NFM3	1909110073-F	9/11/2019	10:05	Cyclotella sp.	Bacillariophyta	18	1.75E+06	1.48E+08	
NFM3	1909110073-F	9/11/2019	10:05	Cymbella sp.	Bacillariophyta	1	9.72E+04	4.81E+07	
NFM3	1909110073-F	9/11/2019	10:05	Diatoma sp.	Bacillariophyta	1	9.72E+04	1.56E+07	
NFM3	1909110073-F	9/11/2019	10:05	Nitzschia dissipata	Bacillariophyta	1	3.63E+04	3.49E+06	
NFM3	1909110073-F	9/11/2019	10:05	Nitzschia spp.	Bacillariophyta	7	6.81E+05	1.67E+08	
NFM3	1909110073-F	9/11/2019	10:05	Pseudostaurosira brevistriata	Bacillariophyta	24	2.33E+06	3.08E+08	
NFM3	1909110073-F	9/11/2019	10:05	Rhoicosphenia curvata	Bacillariophyta	4	3.89E+05	5.37E+07	
NFM3	1909110073-F	9/11/2019	10:05	Staurosirella pinnata	Bacillariophyta	9	8.75E+05	3.09E+07	
NFM3	1909110073-F	9/11/2019	10:05	Synedra sp.	Bacillariophyta	4	3.89E+05	7.15E+07	Fragment.
NFM3	1909110073-F	9/11/2019	10:05	cf. Thalassiosira sp.	Bacillariophyta	1	9.72E+04	1.50E+07	
NFM3	1909110073-F	9/11/2019	10:05	Tryblionella sp.	Bacillariophyta	1	3.63E+04	5.28E+07	
NFM3	1909110073-F	9/11/2019	10:05	Chlorella sp.	Chlorophyta	23	2.24E+06	9.37E+06	
NFM3	1909110073-F	9/11/2019	10:05	Monoraphidium sp.	Chlorophyta	1	9.72E+04	6.31E+06	
NFM3	1909110073-F	9/11/2019	10:05	Plagioselmis sp.	Cryptophyta	3	2.92E+05	3.74E+07	
NFM3	1909110073-F	9/11/2019	10:05	Teleaulax sp.	Cryptophyta	1	3.63E+04	1.73E+07	
NFM3	1909110073-F	9/11/2019	10:05	Chroococcus microscopicus	Cyanobacteria	406	3.95E+07	1.06E+07	
NFM3	1909110073-F	9/11/2019	10:05	Trachelomonas sp.	Euglenophyta	1	3.63E+04	1.69E+07	
				TOTAL		521	5.04E+07	1.54E+09	
SFM3	1909110070-F	9/11/2019	10:08	Achnanthidium sp.	Bacillariophyta	7	6.24E+05	1.76E+07	
SFM3	1909110070-F	9/11/2019	10:08	Aulacoseira alpigena	Bacillariophyta	6	5.35E+05	1.34E+08	
SFM3	1909110070-F	9/11/2019	10:08	Cocconeis placentula	Bacillariophyta	2	7.26E+04	4.11E+07	
SFM3	1909110070-F	9/11/2019	10:08	Cyclotella sp.	Bacillariophyta	9	8.02E+05	4.72E+07	
SFM3	1909110070-F	9/11/2019	10:08	Diatoma vulgare	Bacillariophyta	1	8.91E+04	1.50E+08	
SFM3	1909110070-F	9/11/2019	10:08	Gomphonema sp.	Bacillariophyta	1	3.63E+04	5.70E+06	
SFM3	1909110070-F	9/11/2019	10:08	Navicula sp.	Bacillariophyta	1	8.91E+04	4.85E+07	
SFM3	1909110070-F	9/11/2019	10:08	Nitzschia inconspicua	Bacillariophyta	2	1.78E+05	2.14E+06	
SFM3	1909110070-F	9/11/2019	10:08	Nitzschia sp.	Bacillariophyta	1	8.91E+04	6.68E+06	
SFM3	1909110070-F	9/11/2019	10:08	Pseudostaurosira brevistriata	Bacillariophyta	18	1.60E+06	1.97E+08	
SFM3	1909110070-F	9/11/2019	10:08	Rhoicosphenia curvata	Bacillariophyta	1	3.63E+04	4.23E+06	
SFM3	1909110070-F	9/11/2019	10:08	Stauroneis sp.	Bacillariophyta	1	3.63E+04	4.55E+08	Fragment.
SFM3	1909110070-F	9/11/2019	10:08	Staurosirella pinnata	Bacillariophyta	4	3.56E+05	1.26E+07	
SFM3	1909110070-F	9/11/2019	10:08	Synedra sp.	Bacillariophyta	3	2.67E+05	6.43E+07	Fragment.
SFM3	1909110070-F	9/11/2019	10:08	Ankistrodesmus nannoselene	Chlorophyta	7	6.24E+05	1.71E+06	
SFM3	1909110070-F	9/11/2019	10:08	Chlorella sp.	Chlorophyta	38	3.39E+06	1.42E+07	
SFM3	1909110070-F	9/11/2019	10:08	Cryptomonas sp.	Cryptophyta	1	8.91E+04	9.80E+07	
SFM3	1909110070-F	9/11/2019	10:08	Plagioselmis sp.	Cryptophyta	10	8.91E+05	7.56E+07	
SFM3	1909110070-F	9/11/2019	10:08	Chroococcus microscopicus	Cyanobacteria	448	3.99E+07	1.07E+07	
				TOTAL		561	4.97E+07	1.39E+09	
GS2	1909110060-F	9/11/2019	11:00	Achnanthidium sp.	Bacillariophyta	2	9.72E+04	4.12E+06	
GS2	1909110060-F	9/11/2019	11:00	Cyclotella sp.	Bacillariophyta	4	1.94E+05	1.15E+07	
GS2	1909110060-F	9/11/2019	11:00	Encyonema sp.	Bacillariophyta	1	4.86E+04	1.43E+07	
GS2	1909110060-F	9/11/2019	11:00	Nitzschia dissipata	Bacillariophyta	1	3.63E+04	5.88E+06	
GS2	1909110060-F	9/11/2019	11:00	Nitzschia inconspicua	Bacillariophyta	2	9.72E+04	1.17E+06	
GS2	1909110060-F	9/11/2019	11:00	Nitzschia sp.	Bacillariophyta	1	4.86E+04	1.90E+06	Fragment.
GS2	1909110060-F	9/11/2019	11:00	Nitzschia spp.	Bacillariophyta	3	1.46E+05	1.05E+07	
GS2	1909110060-F	9/11/2019	11:00	Pinnularia sp.	Bacillariophyta	1	4.86E+04	9.93E+07	
GS2	1909110060-F	9/11/2019	11:00	Synedra sp.	Bacillariophyta	1	4.86E+04	8.93E+06	Fragment.
GS2	1909110060-F	9/11/2019	11:00	Ankistrodesmus nannoselene	Chlorophyta	5	2.43E+05	6.68E+05	

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
GS2	1909110060-F	9/11/2019	11:00	Chlorella sp.	Chlorophyta	67	3.26E+06	1.36E+07	
GS2	1909110060-F	9/11/2019	11:00	Monoraphidium sp.	Chlorophyta	3	1.46E+05	4.89E+06	
GS2	1909110060-F	9/11/2019	11:00	Scenedesmus sp.	Chlorophyta	4	1.94E+05	2.04E+06	
GS2	1909110060-F	9/11/2019	11:00	Tetraedron minimum	Chlorophyta	1	3.63E+04	2.72E+06	
GS2	1909110060-F	9/11/2019	11:00	Cryptomonas sp.	Cryptophyta	1	3.63E+04	2.07E+07	
GS2	1909110060-F	9/11/2019	11:00	Plagioselmis nannoplanctica	Cryptophyta	15	7.29E+05	9.35E+07	
GS2	1909110060-F	9/11/2019	11:00	Teleaulax sp.	Cryptophyta	1	3.63E+04	1.73E+07	
GS2	1909110060-F	9/11/2019	11:00	Chroococcus microscopicus	Cyanobacteria	408	1.98E+07	5.32E+06	
GS2	1909110060-F	9/11/2019	11:00	cf. Limnothrix sp.	Cyanobacteria	17	8.26E+05	1.30E+07	
				TOTAL		538	2.61E+07	3.31E+08	
NFM2	1909110065-F	9/11/2019	11:14	Achnanthidium sp.	Bacillariophyta	1	7.92E+04	2.99E+06	
NFM2	1909110065-F	9/11/2019	11:14	Cyclotella sp.	Bacillariophyta	7	5.55E+05	3.27E+07	
NFM2	1909110065-F	9/11/2019	11:14	Diatoma sp.	Bacillariophyta	4	3.17E+05	6.97E+07	Fragment.
NFM2	1909110065-F	9/11/2019	11:14	Gyrosigma sp.	Bacillariophyta	7	5.55E+05	3.10E+09	
NFM2	1909110065-F	9/11/2019	11:14	Nitzschia acicularis	Bacillariophyta	1	7.92E+04	5.39E+06	
NFM2	1909110065-F	9/11/2019	11:14	Nitzschia spp.	Bacillariophyta	5	3.96E+05	2.97E+07	
NFM2	1909110065-F	9/11/2019	11:14	Pseudostaurosira brevistriata	Bacillariophyta	8	6.34E+05	8.36E+07	
NFM2	1909110065-F	9/11/2019	11:14	Synedra sp.	Bacillariophyta	24	1.90E+06	6.45E+08	Fragment.
NFM2	1909110065-F	9/11/2019	11:14	Ankistrodesmus nannoselene	Chlorophyta	4	3.17E+05	8.71E+05	
NFM2	1909110065-F	9/11/2019	11:14	Chlorella sp.	Chlorophyta	31	2.46E+06	1.03E+07	
NFM2	1909110065-F	9/11/2019	11:14	Plagioselmis nannoplanctica	Cryptophyta	1	7.92E+04	1.12E+07	
NFM2	1909110065-F	9/11/2019	11:14	Chroococcus microscopicus	Cyanobacteria	492	3.90E+07	1.04E+07	
				TOTAL		585	4.63E+07	4.00E+09	
SFM2	1909110069-F	9/11/2019	11:18	Amphora sp.	Bacillariophyta	4	1.71E+05	7.53E+06	Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Cyclotella sp.	Bacillariophyta	10	4.28E+05	2.52E+07	Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Navicula spp.	Bacillariophyta	4	1.71E+05	6.65E+07	Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Nitzschia spp.	Bacillariophyta	6	2.57E+05	3.39E+07	Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Staurosirella pinnata	Bacillariophyta	1	4.28E+04	1.51E+06	Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Synedra sp.	Bacillariophyta	1	4.28E+04	2.86E+07	Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Synedra sp.	Bacillariophyta	1	4.28E+04	9.68E+06	Fragment. Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Chlorella sp.	Chlorophyta	42	1.80E+06	7.53E+06	Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Crucigenia sp.	Chlorophyta	4	1.45E+05	6.54E+06	Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Scenedesmus sp.	Chlorophyta	4	1.45E+05	1.83E+06	Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Cryptomonas sp.	Cryptophyta	1	3.63E+04	2.07E+07	Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Plagioselmis nannoplanctica	Cryptophyta	16	6.84E+05	8.78E+07	Cannot meet tally in 50 fields.
SFM2	1909110069-F	9/11/2019	11:18	Chroococcus microscopicus	Cyanobacteria	264	1.13E+07	3.03E+06	Cannot meet tally in 50 fields.
				TOTAL		358	1.53E+07	3.00E+08	
GS3	1909110061-F	9/11/2019	10:24	Achnanthidium sp.	Bacillariophyta	1	6.11E+04	2.40E+06	
GS3	1909110061-F	9/11/2019	10:24	Cymbella sp.	Bacillariophyta	1	3.63E+04	1.02E+07	
GS3	1909110061-F	9/11/2019	10:24	Diatoma vulgare	Bacillariophyta	3	1.83E+05	2.30E+08	
GS3	1909110061-F	9/11/2019	10:24	cf. Navicula sp.	Bacillariophyta	1	6.11E+04	2.69E+07	
GS3	1909110061-F	9/11/2019	10:24	Nitzschia inconspicua	Bacillariophyta	1	6.11E+04	1.65E+06	
GS3	1909110061-F	9/11/2019	10:24	Nitzschia spp.	Bacillariophyta	5	3.06E+05	1.95E+07	
GS3	1909110061-F	9/11/2019	10:24	Staurosira sp.	Bacillariophyta	6	2.18E+05	1.64E+07	
GS3	1909110061-F	9/11/2019	10:24	Synedra ulna	Bacillariophyta	1	3.63E+04	1.09E+08	
GS3	1909110061-F	9/11/2019	10:24	Synedra ulna	Bacillariophyta	1	6.11E+04	5.53E+07	Fragment.
GS3	1909110061-F	9/11/2019	10:24	cf. Thalassiosira sp.	Bacillariophyta	8	4.89E+05	1.84E+07	
GS3	1909110061-F	9/11/2019	10:24	Chlorella spp.	Chlorophyta	49	2.99E+06	1.25E+07	
GS3	1909110061-F	9/11/2019	10:24	Plagioselmis nannoplanctica	Cryptophyta	17	1.04E+06	1.33E+08	
GS3	1909110061-F	9/11/2019	10:24	Chroococcus microscopicus	Cyanobacteria	462	2.82E+07	7.57E+06	
				TOTAL		556	3.38E+07	6.43E+08	
NFM1	1909110064-F	9/11/2019	12:12	Achnanthidium sp.	Bacillariophyta	7	3.25E+05	1.53E+07	
NFM1	1909110064-F	9/11/2019	12:12	Cocconeis placentula	Bacillariophyta	13	6.04E+05	3.04E+08	
NFM1	1909110064-F	9/11/2019	12:12	Cyclotella sp.	Bacillariophyta	10	4.65E+05	2.74E+07	
NFM1	1909110064-F	9/11/2019	12:12	Encyonema sp.	Bacillariophyta	1	4.65E+04	1.46E+07	
NFM1	1909110064-F	9/11/2019	12:12	Fragilaria crotonensis	Bacillariophyta	6	2.79E+05	9.33E+07	
NFM1	1909110064-F	9/11/2019	12:12	Gomphonema sp.	Bacillariophyta	1	3.63E+04	3.62E+06	
NFM1	1909110064-F	9/11/2019	12:12	Navicula sp.	Bacillariophyta	1	4.65E+04	3.29E+06	
NFM1	1909110064-F	9/11/2019	12:12	Nitzschia inconspicua	Bacillariophyta	1	4.65E+04	9.76E+05	
NFM1	1909110064-F	9/11/2019	12:12	Nitzschia sp.	Bacillariophyta	5	2.32E+05	1.53E+07	
NFM1	1909110064-F	9/11/2019	12:12	Pseudostaurosira brevistriata	Bacillariophyta	3	1.09E+05	1.67E+07	
NFM1	1909110064-F	9/11/2019	12:12	Reimeria sinuata	Bacillariophyta	1	4.65E+04	2.41E+06	
NFM1	1909110064-F	9/11/2019	12:12	Rhoicosphenia curvata	Bacillariophyta	1	3.63E+04	4.90E+06	
NFM1	1909110064-F	9/11/2019	12:12	Synedra sp.	Bacillariophyta	4	1.86E+05	4.21E+07	Fragment.
NFM1	1909110064-F	9/11/2019	12:12	Ankistrodesmus nannoselene	Chlorophyta	10	4.65E+05	1.28E+06	
NFM1	1909110064-F	9/11/2019	12:12	Chlorella sp.	Chlorophyta	38	1.77E+06	7.40E+06	
NFM1	1909110064-F	9/11/2019	12:12	Scenedesmus sp.	Chlorophyta	10	4.65E+05	4.87E+06	
NFM1	1909110064-F	9/11/2019	12:12	Cryptomonas sp.	Cryptophyta	4	1.86E+05	1.42E+08	
NFM1	1909110064-F	9/11/2019	12:12	Teleaulax sp.	Cryptophyta	1	4.65E+04	2.36E+07	
NFM1	1909110064-F	9/11/2019	12:12	Chroococcus microscopicus	Cyanobacteria	420	1.95E+07	5.24E+06	
				TOTAL		537	2.49E+07	7.28E+08	
GS1	1909110059-F	9/11/2019	11:35	Achnanthidium minutissimum	Bacillariophyta	3	1.69E+05	1.27E+07	
GS1	1909110059-F	9/11/2019	11:35	Cocconeis placentula	Bacillariophyta	2	7.26E+04	2.91E+07	
GS1	1909110059-F	9/11/2019	11:35	Cyclotella sp.	Bacillariophyta	2	1.13E+05	6.42E+07	
GS1	1909110059-F	9/11/2019	11:35	Epithemia sorex	Bacillariophyta	1	3.63E+04	2.96E+07	
GS1	1909110059-F	9/11/2019	11:35	Nitzschia inconspicua	Bacillariophyta	2	1.13E+05	1.80E+06	
GS1	1909110059-F	9/11/2019	11:35	Nitzschia spp.	Bacillariophyta	3	1.69E+05	8.36E+06	
GS1	1909110059-F	9/11/2019	11:35	Reimeria sinuata	Bacillariophyta	1	5.63E+04	4.02E+06	
GS1	1909110059-F	9/11/2019	11:35	cf. Thalassiosira sp.	Bacillariophyta	6	3.38E+05	1.27E+07	
GS1	1909110059-F	9/11/2019	11:35	Chlamydomonas sp.	Chlorophyta	1	3.63E+04	2.85E+06	
GS1	1909110059-F	9/11/2019	11:35	Chlorella spp.	Chlorophyta	58	3.26E+06	1.37E+07	
GS1	1909110059-F	9/11/2019	11:35	Tetraedron minimum	Chlorophyta	1	5.63E+04	4.22E+06	
GS1	1909110059-F	9/11/2019	11:35	Cryptomonas sp.	Cryptophyta	1	3.63E+04	5.06E+07	
GS1	1909110059-F	9/11/2019	11:35	Plagioselmis nannoplanctica	Cryptophyta	21	1.18E+06	1.52E+08	

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
GS1	1909110059-F	9/11/2019	11:35	Chroococcus microscopicus	Cyanobacteria	430	2.42E+07	6.49E+06	
GS1	1909110059-F	9/11/2019	11:35	Peridinium sp.	Pyrrophyta	1	5.63E+04	5.28E+07	
				TOTAL		533	2.99E+07	4.45E+08	
SFM1	1909110068-F	9/11/2019	12:13	Achnanthidium sp.	Bacillariophyta	5	3.82E+05	1.44E+07	
SFM1	1909110068-F	9/11/2019	12:13	Aulacoseira sp.	Bacillariophyta	8	6.11E+05	1.92E+08	
SFM1	1909110068-F	9/11/2019	12:13	Cocconeis placentula	Bacillariophyta	3	2.29E+05	1.15E+08	
SFM1	1909110068-F	9/11/2019	12:13	Cyclotella sp.	Bacillariophyta	13	9.93E+05	5.85E+07	
SFM1	1909110068-F	9/11/2019	12:13	Cymbella sp.	Bacillariophyta	1	7.64E+04	1.07E+08	
SFM1	1909110068-F	9/11/2019	12:13	Diatoma sp.	Bacillariophyta	1	7.64E+04	1.26E+07	Fragment.
SFM1	1909110068-F	9/11/2019	12:13	Gomphonema sp.	Bacillariophyta	1	3.63E+04	7.56E+06	
SFM1	1909110068-F	9/11/2019	12:13	Gyrosigma sp.	Bacillariophyta	2	1.53E+05	4.49E+08	
SFM1	1909110068-F	9/11/2019	12:13	Navicula sp.	Bacillariophyta	1	7.64E+04	1.98E+07	
SFM1	1909110068-F	9/11/2019	12:13	Nitzschia palea	Bacillariophyta	1	7.64E+04	7.33E+06	
SFM1	1909110068-F	9/11/2019	12:13	Nitzschia sp.	Bacillariophyta	1	7.64E+04	4.13E+06	
SFM1	1909110068-F	9/11/2019	12:13	Rhoicosphenia curvata	Bacillariophyta	1	3.63E+04	3.98E+06	
SFM1	1909110068-F	9/11/2019	12:13	Synedra sp.	Bacillariophyta	10	7.64E+05	1.89E+08	Fragment.
SFM1	1909110068-F	9/11/2019	12:13	Ankistrodesmus nannoselene	Chlorophyta	9	6.88E+05	1.89E+06	
SFM1	1909110068-F	9/11/2019	12:13	Chlorella sp.	Chlorophyta	52	3.97E+06	1.66E+07	
SFM1	1909110068-F	9/11/2019	12:13	Crucigenia tetrapedia	Chlorophyta	4	1.45E+05	1.09E+07	
SFM1	1909110068-F	9/11/2019	12:13	Monoraphidium sp.	Chlorophyta	2	1.53E+05	6.72E+06	
SFM1	1909110068-F	9/11/2019	12:13	Scenedesmus sp.	Chlorophyta	4	1.45E+05	1.52E+06	
SFM1	1909110068-F	9/11/2019	12:13	Cryptomonas sp.	Cryptophyta	1	7.64E+04	4.35E+07	
SFM1	1909110068-F	9/11/2019	12:13	Plagioselmis nannoplanctica	Cryptophyta	24	1.83E+06	2.35E+08	
SFM1	1909110068-F	9/11/2019	12:13	Chroococcus microscopicus	Cyanobacteria	356	2.72E+07	7.29E+06	
SFM1	1909110068-F	9/11/2019	12:13	Merismopedia tenuissima	Cyanobacteria	16	1.22E+06	1.22E+06	
				TOTAL		516	3.90E+07	1.50E+09	
MOKEM	1909110072-F	9/11/2019	12:58	Amphora sp.	Bacillariophyta	1	9.72E+04	1.22E+07	
MOKEM	1909110072-F	9/11/2019	12:58	Aulacoseira granulata var. angustissima	Bacillariophyta	9	8.75E+05	9.90E+07	
MOKEM	1909110072-F	9/11/2019	12:58	Cocconeis placentula	Bacillariophyta	4	3.89E+05	2.47E+08	
MOKEM	1909110072-F	9/11/2019	12:58	Cyclotella sp.	Bacillariophyta	12	1.17E+06	1.80E+08	
MOKEM	1909110072-F	9/11/2019	12:58	Melosira varians	Bacillariophyta	4	3.89E+05	2.08E+09	
MOKEM	1909110072-F	9/11/2019	12:58	Navicula sp.	Bacillariophyta	1	9.72E+04	2.29E+07	
MOKEM	1909110072-F	9/11/2019	12:58	Nitzschia inconspicua	Bacillariophyta	1	9.72E+04	1.36E+06	
MOKEM	1909110072-F	9/11/2019	12:58	Nitzschia spp.	Bacillariophyta	3	2.92E+05	1.49E+07	
MOKEM	1909110072-F	9/11/2019	12:58	Planothidium sp.	Bacillariophyta	1	3.63E+04	5.56E+06	
MOKEM	1909110072-F	9/11/2019	12:58	Pseudostaurosira brevistriata	Bacillariophyta	5	1.82E+05	2.22E+07	
MOKEM	1909110072-F	9/11/2019	12:58	Staurosirella pinnata	Bacillariophyta	1	3.63E+04	1.28E+06	
MOKEM	1909110072-F	9/11/2019	12:58	Tryblionella sp.	Bacillariophyta	1	9.72E+04	5.88E+07	
MOKEM	1909110072-F	9/11/2019	12:58	Ankistrodesmus nannoselene	Chlorophyta	3	2.92E+05	8.02E+05	
MOKEM	1909110072-F	9/11/2019	12:58	Chlorella sp.	Chlorophyta	38	3.69E+06	1.55E+07	
MOKEM	1909110072-F	9/11/2019	12:58	Monoraphidium sp.	Chlorophyta	1	3.63E+04	1.83E+06	
MOKEM	1909110072-F	9/11/2019	12:58	Scenedesmus sp.	Chlorophyta	4	1.45E+05	2.13E+06	
MOKEM	1909110072-F	9/11/2019	12:58	Cryptomonas sp.	Cryptophyta	1	9.72E+04	5.21E+07	
MOKEM	1909110072-F	9/11/2019	12:58	Plagioselmis nannoplanctica	Cryptophyta	22	2.14E+06	2.74E+08	
MOKEM	1909110072-F	9/11/2019	12:58	Chroococcus microscopicus	Cyanobacteria	476	4.63E+07	1.24E+07	
				TOTAL		588	5.64E+07	3.10E+09	
SREM	1909110063-F	9/11/2019	12:44	Achnanthidium minutissimum	Bacillariophyta	2	8.56E+04	3.36E+06	
SREM	1909110063-F	9/11/2019	12:44	Aulacoseira granulata var. angustissima	Bacillariophyta	9	3.85E+05	1.12E+08	
SREM	1909110063-F	9/11/2019	12:44	Cocconeis placentula	Bacillariophyta	5	2.14E+05	1.05E+08	
SREM	1909110063-F	9/11/2019	12:44	Craticula sp.	Bacillariophyta	1	7.26E+03	2.85E+06	
SREM	1909110063-F	9/11/2019	12:44	Cyclotella sp.	Bacillariophyta	11	4.71E+05	1.18E+08	
SREM	1909110063-F	9/11/2019	12:44	Cymbella sp.	Bacillariophyta	2	1.45E+04	1.90E+07	
SREM	1909110063-F	9/11/2019	12:44	Encyonema minutum	Bacillariophyta	2	8.56E+04	1.10E+07	
SREM	1909110063-F	9/11/2019	12:44	Fragilaria crotonensis	Bacillariophyta	14	5.99E+05	4.68E+08	
SREM	1909110063-F	9/11/2019	12:44	Melosira sp.	Bacillariophyta	3	2.18E+04	2.66E+08	
SREM	1909110063-F	9/11/2019	12:44	Navicula sp.	Bacillariophyta	1	7.26E+03	2.17E+06	
SREM	1909110063-F	9/11/2019	12:44	Nitzschia spp.	Bacillariophyta	9	3.85E+05	1.85E+07	
SREM	1909110063-F	9/11/2019	12:44	Planothidium sp.	Bacillariophyta	1	4.28E+04	7.41E+06	Fragment.
SREM	1909110063-F	9/11/2019	12:44	Rhoicosphenia curvata	Bacillariophyta	1	4.28E+04	9.22E+06	
SREM	1909110063-F	9/11/2019	12:44	Sellaphora pupula	Bacillariophyta	1	4.28E+04	3.23E+07	
SREM	1909110063-F	9/11/2019	12:44	Staurosira sp.	Bacillariophyta	8	3.42E+05	1.61E+07	
SREM	1909110063-F	9/11/2019	12:44	Synedra ulna	Bacillariophyta	1	4.28E+04	1.16E+08	
SREM	1909110063-F	9/11/2019	12:44	Synedra ulna	Bacillariophyta	1	4.28E+04	2.34E+07	Fragment.
SREM	1909110063-F	9/11/2019	12:44	cf. Thalassiosira sp.	Bacillariophyta	12	5.13E+05	3.02E+07	
SREM	1909110063-F	9/11/2019	12:44	Ankistrodesmus nannoselene	Chlorophyta	1	4.28E+04	1.18E+05	
SREM	1909110063-F	9/11/2019	12:44	Chlamydomonas sp.	Chlorophyta	4	1.71E+05	1.34E+07	
SREM	1909110063-F	9/11/2019	12:44	Chlorella spp.	Chlorophyta	55	2.35E+06	9.86E+06	
SREM	1909110063-F	9/11/2019	12:44	Closteriopsis cf. acicularis	Chlorophyta	1	7.26E+03	9.06E+06	
SREM	1909110063-F	9/11/2019	12:44	Kirchneriella sp.	Chlorophyta	1	7.26E+03	1.71E+05	
SREM	1909110063-F	9/11/2019	12:44	Monoraphidium sp.	Chlorophyta	1	7.26E+03	3.80E+05	
SREM	1909110063-F	9/11/2019	12:44	Cryptomonas sp.	Cryptophyta	1	7.26E+03	1.15E+07	
SREM	1909110063-F	9/11/2019	12:44	Plagioselmis nannoplanctica	Cryptophyta	17	7.27E+05	9.33E+07	
SREM	1909110063-F	9/11/2019	12:44	Chroococcus microscopicus	Cyanobacteria	308	1.32E+07	3.53E+06	
SREM	1909110063-F	9/11/2019	12:44	Peridinium sp.	Pyrrophyta	2	1.45E+04	4.51E+07	
				TOTAL		475	1.99E+07	1.55E+09	
NFM4	1909120040-F	9/12/2019	9:10	Achnanthidium minutissimum	Bacillariophyta	7	6.81E+05	2.14E+07	
NFM4	1909120040-F	9/12/2019	9:10	Amphora sp.	Bacillariophyta	2	1.94E+05	1.71E+07	
NFM4	1909120040-F	9/12/2019	9:10	Cocconeis placentula	Bacillariophyta	1	3.63E+04	2.57E+07	
NFM4	1909120040-F	9/12/2019	9:10	Cyclotella sp.	Bacillariophyta	16	1.56E+06	9.16E+07	
NFM4	1909120040-F	9/12/2019	9:10	Diatoma sp.	Bacillariophyta	2	1.94E+05	2.75E+07	Fragment.
NFM4	1909120040-F	9/12/2019	9:10	Navicula sp.	Bacillariophyta	1	9.72E+04	3.44E+07	Fragment.
NFM4	1909120040-F	9/12/2019	9:10	Nitzschia dissipata	Bacillariophyta	1	9.72E+04	1.58E+07	
NFM4	1909120040-F	9/12/2019	9:10	Nitzschia inconspicua	Bacillariophyta	4	3.89E+05	4.67E+06	
NFM4	1909120040-F	9/12/2019	9:10	Planothidium sp.	Bacillariophyta	3	2.92E+05	5.50E+07	
NFM4	1909120040-F	9/12/2019	9:10	Stephanodiscus sp.	Bacillariophyta	5	4.86E+05	3.74E+08	Fragment.

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
NFM4	1909120040-F	9/12/2019	9:10	Synedra sp.	Bacillariophyta	7	6.81E+05	1.73E+08	Fragment.
NFM4	1909120040-F	9/12/2019	9:10	Synedra ulna	Bacillariophyta	4	3.89E+05	9.35E+08	
NFM4	1909120040-F	9/12/2019	9:10	Ankistrodesmus nannoselene	Chlorophyta	10	9.72E+05	2.67E+06	
NFM4	1909120040-F	9/12/2019	9:10	Chlorella sp.	Chlorophyta	45	4.38E+06	1.83E+07	
NFM4	1909120040-F	9/12/2019	9:10	Cryptomonas sp.	Cryptophyta	3	2.92E+05	1.95E+08	
NFM4	1909120040-F	9/12/2019	9:10	Plagioselmis nannoplanctica	Cryptophyta	9	8.75E+05	1.76E+08	
NFM4	1909120040-F	9/12/2019	9:10	Chroococcus microscopicus	Cyanobacteria	388	3.77E+07	1.01E+07	
				TOTAL		508	4.93E+07	2.18E+09	
SFM4	1909120044-F	9/12/2019	10:03	Aulacoseira sp.	Bacillariophyta	6	1.89E+05	5.93E+07	
SFM4	1909120044-F	9/12/2019	10:03	Cocconeis placentula	Bacillariophyta	1	3.15E+04	1.28E+07	Fragment.
SFM4	1909120044-F	9/12/2019	10:03	Cocconeis placentula	Bacillariophyta	8	2.52E+05	1.92E+08	
SFM4	1909120044-F	9/12/2019	10:03	Cyclotella sp.	Bacillariophyta	16	5.03E+05	2.96E+07	
SFM4	1909120044-F	9/12/2019	10:03	Fragilaria sp.	Bacillariophyta	14	4.40E+05	9.96E+07	
SFM4	1909120044-F	9/12/2019	10:03	Gomphonema sp.	Bacillariophyta	1	9.08E+03	1.73E+06	
SFM4	1909120044-F	9/12/2019	10:03	Navicula sp.	Bacillariophyta	1	3.15E+04	8.89E+06	
SFM4	1909120044-F	9/12/2019	10:03	Nitzschia spp.	Bacillariophyta	13	4.09E+05	4.17E+07	
SFM4	1909120044-F	9/12/2019	10:03	Synedra sp.	Bacillariophyta	3	9.44E+04	7.20E+07	Fragment.
SFM4	1909120044-F	9/12/2019	10:03	Tryblionella sp.	Bacillariophyta	1	3.15E+04	3.46E+07	
SFM4	1909120044-F	9/12/2019	10:03	Ankistrodesmus nannoselene	Chlorophyta	5	1.57E+05	4.32E+05	
SFM4	1909120044-F	9/12/2019	10:03	Chlorella sp.	Chlorophyta	46	1.45E+06	6.06E+06	
SFM4	1909120044-F	9/12/2019	10:03	Monoraphidium sp.	Chlorophyta	3	9.44E+04	4.74E+06	
SFM4	1909120044-F	9/12/2019	10:03	Scenedesmus sp.	Chlorophyta	8	2.52E+05	3.16E+06	
SFM4	1909120044-F	9/12/2019	10:03	Chrysococcus sp.	Chrysophyta	1	3.15E+04	2.06E+06	
SFM4	1909120044-F	9/12/2019	10:03	Cryptomonas sp.	Cryptophyta	1	9.08E+03	6.93E+06	
SFM4	1909120044-F	9/12/2019	10:03	Plagioselmis nannoplanctica	Cryptophyta	13	4.09E+05	5.25E+07	
SFM4	1909120044-F	9/12/2019	10:03	Chroococcus microscopicus	Cyanobacteria	368	1.16E+07	3.10E+06	
				TOTAL		509	1.60E+07	6.31E+08	
GS4	1909120035-F	9/12/2019	9:30	Achnanthidium minutissimum	Bacillariophyta	1	3.63E+04	1.26E+06	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	Cocconeis sp.	Bacillariophyta	1	3.63E+04	1.51E+07	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	Cyclotella sp.	Bacillariophyta	1	4.28E+04	1.08E+07	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	Encyonema minutum	Bacillariophyta	1	4.28E+04	3.14E+06	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	Navicula sp.	Bacillariophyta	1	3.63E+04	2.74E+07	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	Nitzschia sp.	Bacillariophyta	1	4.28E+04	6.93E+06	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	cf. Thalassiosira sp.	Bacillariophyta	4	1.71E+05	1.01E+07	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	Chlorella sp.	Chlorophyta	25	1.07E+06	4.48E+06	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	cf. Scenedesmus sp.	Chlorophyta	1	4.28E+04	1.01E+06	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	Cryptomonas sp.	Cryptophyta	1	3.63E+04	3.61E+07	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	Plagioselmis nannoplanctica	Cryptophyta	4	1.71E+05	2.20E+07	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	Chroococcus microscopicus	Cyanobacteria	62	2.65E+06	7.11E+05	Cannot meet tally in 50 fields.
GS4	1909120035-F	9/12/2019	9:30	Gymnodinium sp.	Pyrrophyta	1	4.28E+04	6.70E+07	Cannot meet tally in 50 fields.
				TOTAL		104	4.42E+06	2.06E+08	
SFM4	1909120046-D	9/12/2019	10:03	Achnanthidium minutissimum	Bacillariophyta	4	1.10E+05	3.10E+06	
SFM4	1909120046-D	9/12/2019	10:03	Aulacoseira sp.	Bacillariophyta	9	2.47E+05	1.74E+08	
SFM4	1909120046-D	9/12/2019	10:03	Cocconeis placentula	Bacillariophyta	8	2.19E+05	1.24E+08	
SFM4	1909120046-D	9/12/2019	10:03	Cyclotella sp.	Bacillariophyta	11	3.02E+05	1.78E+07	
SFM4	1909120046-D	9/12/2019	10:03	Epithemia sp.	Bacillariophyta	1	1.21E+04	2.97E+06	
SFM4	1909120046-D	9/12/2019	10:03	Gyrosigma sp.	Bacillariophyta	1	2.74E+04	5.83E+07	
SFM4	1909120046-D	9/12/2019	10:03	Nitzschia inconspicua	Bacillariophyta	1	2.74E+04	8.23E+05	
SFM4	1909120046-D	9/12/2019	10:03	Nitzschia spp.	Bacillariophyta	6	1.65E+05	1.18E+07	
SFM4	1909120046-D	9/12/2019	10:03	Pinnularia sp.	Bacillariophyta	1	2.74E+04	4.52E+06	Fragment.
SFM4	1909120046-D	9/12/2019	10:03	Planothidium sp.	Bacillariophyta	3	8.23E+04	1.16E+07	
SFM4	1909120046-D	9/12/2019	10:03	Synedra sp.	Bacillariophyta	9	2.47E+05	4.88E+07	Fragment.
SFM4	1909120046-D	9/12/2019	10:03	Synedra ulna	Bacillariophyta	2	5.48E+04	1.05E+08	
SFM4	1909120046-D	9/12/2019	10:03	Ankistrodesmus nannoselene	Chlorophyta	17	4.66E+05	1.28E+06	
SFM4	1909120046-D	9/12/2019	10:03	Chlorella sp.	Chlorophyta	46	1.26E+06	5.28E+06	
SFM4	1909120046-D	9/12/2019	10:03	Monoraphidium sp.	Chlorophyta	1	1.21E+04	8.62E+05	
SFM4	1909120046-D	9/12/2019	10:03	Scenedesmus sp.	Chlorophyta	6	1.65E+05	2.07E+06	
SFM4	1909120046-D	9/12/2019	10:03	Plagioselmis nannoplanctica	Cryptophyta	26	7.13E+05	1.13E+08	
SFM4	1909120046-D	9/12/2019	10:03	Chroococcus microscopicus	Cyanobacteria	344	9.43E+06	2.53E+06	
				TOTAL		496	1.36E+07	6.88E+08	
SR1	1909090005-F	9/9/2019	11:20	cf. Achnanthes sp.	Bacillariophyta	1	1.82E+04	5.82E+06	
SR1	1909090005-F	9/9/2019	11:20	Achnanthidium minutissimum	Bacillariophyta	1	6.68E+04	5.88E+06	
SR1	1909090005-F	9/9/2019	11:20	cf. Amphora sp.	Bacillariophyta	1	6.68E+04	6.68E+06	
SR1	1909090005-F	9/9/2019	11:20	Cocconeis sp.	Bacillariophyta	1	6.68E+04	6.93E+06	
SR1	1909090005-F	9/9/2019	11:20	Cymbella spp.	Bacillariophyta	4	7.26E+04	1.86E+07	
SR1	1909090005-F	9/9/2019	11:20	Diatoma sp.	Bacillariophyta	1	6.68E+04	5.20E+07	
SR1	1909090005-F	9/9/2019	11:20	Fragilaria cf. capucina	Bacillariophyta	77	1.40E+06	7.73E+08	
SR1	1909090005-F	9/9/2019	11:20	Fragilaria sp.	Bacillariophyta	1	6.68E+04	1.55E+07	
SR1	1909090005-F	9/9/2019	11:20	Fragilaria vaucheriae	Bacillariophyta	2	3.63E+04	8.13E+06	
SR1	1909090005-F	9/9/2019	11:20	Gomphonema sp.	Bacillariophyta	1	6.68E+04	2.45E+07	
SR1	1909090005-F	9/9/2019	11:20	Melosira sp.	Bacillariophyta	4	7.26E+04	3.07E+08	
SR1	1909090005-F	9/9/2019	11:20	Navicula sp.	Bacillariophyta	1	1.82E+04	2.98E+07	
SR1	1909090005-F	9/9/2019	11:20	Nitzschia inconspicua	Bacillariophyta	1	6.68E+04	1.67E+06	
SR1	1909090005-F	9/9/2019	11:20	Nitzschia palea	Bacillariophyta	1	6.68E+04	1.60E+07	
SR1	1909090005-F	9/9/2019	11:20	Nitzschia sp.	Bacillariophyta	1	6.68E+04	5.08E+06	
SR1	1909090005-F	9/9/2019	11:20	Pseudostaurosira sp.	Bacillariophyta	1	6.68E+04	1.02E+07	
SR1	1909090005-F	9/9/2019	11:20	Rhoicosphenia curvata	Bacillariophyta	1	6.68E+04	8.65E+06	
SR1	1909090005-F	9/9/2019	11:20	Synedra sp.	Bacillariophyta	1	6.68E+04	1.68E+07	Fragment.
SR1	1909090005-F	9/9/2019	11:20	Synedra ulna	Bacillariophyta	4	2.67E+05	1.09E+09	
SR1	1909090005-F	9/9/2019	11:20	cf. Thalassiosira sp.	Bacillariophyta	2	1.34E+05	1.51E+07	
SR1	1909090005-F	9/9/2019	11:20	Chlorella sp.	Chlorophyta	18	1.20E+06	5.04E+06	
SR1	1909090005-F	9/9/2019	11:20	Elakatothrix sp.	Chlorophyta	2	3.63E+04	7.99E+05	
SR1	1909090005-F	9/9/2019	11:20	Monoraphidium sp.	Chlorophyta	1	1.82E+04	1.22E+06	
SR1	1909090005-F	9/9/2019	11:20	Dinobryon sp.	Chrysophyta	10	1.82E+05	5.48E+07	
SR1	1909090005-F	9/9/2019	11:20	Plagioselmis sp.	Cryptophyta	1	6.68E+04	2.80E+07	

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
SR1	1909090005-F	9/9/2019	11:20	Rhodomonas sp.	Cryptophyta	1	1.82E+04	2.05E+07	
SR1	1909090005-F	9/9/2019	11:20	Chroococcus microscopicus	Cyanobacteria	528	3.53E+07	1.35E+07	
SR1	1909090005-F	9/9/2019	11:20	Merismopedia sp.	Cyanobacteria	24	1.60E+06	1.60E+06	
				TOTAL		692	4.12E+07	2.54E+09	
GS3	1909120034-F	9/12/2019	10:05	Achnanthidium minutissimum	Bacillariophyta	2	8.56E+04	3.36E+06	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Cyclotella sp.	Bacillariophyta	5	2.14E+05	2.42E+07	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Cymbella sp.	Bacillariophyta	1	4.28E+04	3.48E+07	Fragment. Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Epithemia sp.	Bacillariophyta	1	3.63E+04	1.21E+07	Fragment.Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Fragilaria sp.	Bacillariophyta	1	3.63E+04	8.56E+06	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Navicula spp.	Bacillariophyta	3	1.28E+05	2.60E+08	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Nitzschia inconspicua	Bacillariophyta	1	4.28E+04	1.03E+06	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Nitzschia sp.	Bacillariophyta	1	4.28E+04	1.88E+06	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Reimeria sp.	Bacillariophyta	1	4.28E+04	5.54E+06	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Synedra ulna	Bacillariophyta	2	7.26E+04	6.73E+07	Fragment. Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	cf. Thalassiosira sp.	Bacillariophyta	20	8.56E+05	5.04E+07	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Chlorella sp.	Chlorophyta	62	2.65E+06	1.11E+07	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Monoraphidium minutum	Chlorophyta	2	8.56E+04	1.97E+06	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Plagioselmis nannoplanctica	Cryptophyta	23	9.84E+05	1.26E+08	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Rhodomonas sp.	Cryptophyta	1	3.63E+04	2.53E+07	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Chroococcus microscopicus	Cyanobacteria	162	6.93E+06	1.86E+06	Cannot meet tally in 50 fields.
GS3	1909120034-F	9/12/2019	10:05	Peridinium sp.	Pyrrophyta	1	4.28E+04	7.49E+07	Cannot meet tally in 50 fields.
				TOTAL		289	1.23E+07	7.11E+08	
NFM3	1909120039-F	9/12/2019	10:05	Achnanthidium minutissimum	Bacillariophyta	7	5.16E+05	2.68E+07	
NFM3	1909120039-F	9/12/2019	10:05	Aulacoseira sp.	Bacillariophyta	4	2.95E+05	5.93E+07	
NFM3	1909120039-F	9/12/2019	10:05	Cocconeis placentula	Bacillariophyta	1	7.38E+04	2.09E+07	Fragment.
NFM3	1909120039-F	9/12/2019	10:05	Cocconeis placentula	Bacillariophyta	1	3.63E+04	1.94E+07	
NFM3	1909120039-F	9/12/2019	10:05	Cyclotella sp.	Bacillariophyta	9	6.64E+05	3.91E+07	
NFM3	1909120039-F	9/12/2019	10:05	Hippodonta capitata	Bacillariophyta	1	7.38E+04	1.22E+07	
NFM3	1909120039-F	9/12/2019	10:05	Mayamaea sp.	Bacillariophyta	1	7.38E+04	2.09E+06	
NFM3	1909120039-F	9/12/2019	10:05	Nitzschia acicularis	Bacillariophyta	2	1.48E+05	1.90E+07	
NFM3	1909120039-F	9/12/2019	10:05	Nitzschia inconspicua	Bacillariophyta	1	3.63E+04	5.08E+05	
NFM3	1909120039-F	9/12/2019	10:05	Nitzschia palea	Bacillariophyta	1	3.63E+04	2.94E+06	
NFM3	1909120039-F	9/12/2019	10:05	Nitzschia sp.	Bacillariophyta	1	7.38E+04	1.77E+06	Fragment.
NFM3	1909120039-F	9/12/2019	10:05	Pseudostaurosira brevistriata	Bacillariophyta	10	7.38E+05	9.04E+07	
NFM3	1909120039-F	9/12/2019	10:05	Rhopalodia sp.	Bacillariophyta	1	7.38E+04	1.67E+07	
NFM3	1909120039-F	9/12/2019	10:05	Staurosira construens	Bacillariophyta	1	3.63E+04	3.00E+06	
NFM3	1909120039-F	9/12/2019	10:05	Staurosirella pinnata	Bacillariophyta	3	2.21E+05	7.82E+06	
NFM3	1909120039-F	9/12/2019	10:05	Synedra ulna	Bacillariophyta	13	9.59E+05	5.15E+08	Fragment.
NFM3	1909120039-F	9/12/2019	10:05	Ankistrodesmus nannoselene	Chlorophyta	5	3.69E+05	1.01E+06	
NFM3	1909120039-F	9/12/2019	10:05	Chlorella sp.	Chlorophyta	48	3.54E+06	1.48E+07	
NFM3	1909120039-F	9/12/2019	10:05	Monoraphidium sp.	Chlorophyta	1	7.38E+04	3.71E+06	
NFM3	1909120039-F	9/12/2019	10:05	Plagioselmis nannoplanctica	Cryptophyta	10	7.38E+05	1.48E+08	
NFM3	1909120039-F	9/12/2019	10:05	Chroococcus microscopicus	Cyanobacteria	432	3.19E+07	8.54E+06	
				TOTAL		553	4.06E+07	1.01E+09	
GS2	1909120033-F	9/12/2019	10:38	Achnanthidium minutissimum	Bacillariophyta	2	8.56E+04	4.44E+06	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	Cocconeis placentula	Bacillariophyta	3	1.28E+05	2.54E+07	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	Diatoma sp.	Bacillariophyta	1	3.63E+04	4.79E+06	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	Nitzschia acicularis	Bacillariophyta	1	4.28E+04	1.89E+07	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	Nitzschia inconspicua	Bacillariophyta	3	1.28E+05	1.80E+06	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	Nitzschia sp.	Bacillariophyta	2	8.56E+04	5.45E+06	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	Planothidium sp.	Bacillariophyta	1	3.63E+04	1.16E+07	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	Synedra ulna	Bacillariophyta	1	4.28E+04	1.01E+08	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	cf. Thalassiosira sp.	Bacillariophyta	2	8.56E+04	4.08E+06	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	cf. Chlamydomonas sp.	Chlorophyta	4	1.71E+05	2.26E+07	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	Chlorella spp.	Chlorophyta	64	2.74E+06	1.15E+07	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	Scenedesmus sp.	Chlorophyta	8	3.42E+05	3.58E+06	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	Plagioselmis nannoplanctica	Cryptophyta	12	5.13E+05	6.59E+07	Cannot meet tally in 50 fields.
GS2	1909120033-F	9/12/2019	10:38	Chroococcus microscopicus	Cyanobacteria	84	3.59E+06	9.63E+05	Cannot meet tally in 50 fields.
				TOTAL		188	8.03E+06	2.82E+08	
NFM2	1909120038-F	9/12/2019	10:50	Achnanthidium minutissimum	Bacillariophyta	6	3.06E+05	9.60E+06	
NFM2	1909120038-F	9/12/2019	10:50	Aulacoseira sp.	Bacillariophyta	4	2.04E+05	1.64E+08	
NFM2	1909120038-F	9/12/2019	10:50	Cocconeis placentula	Bacillariophyta	1	5.09E+04	1.40E+07	Fragment.
NFM2	1909120038-F	9/12/2019	10:50	Cocconeis placentula	Bacillariophyta	5	2.55E+05	2.50E+08	
NFM2	1909120038-F	9/12/2019	10:50	Cyclotella sp.	Bacillariophyta	16	8.15E+05	4.80E+07	
NFM2	1909120038-F	9/12/2019	10:50	Encyonema sp.	Bacillariophyta	1	5.09E+04	1.31E+07	
NFM2	1909120038-F	9/12/2019	10:50	Epithemia sp.	Bacillariophyta	1	5.09E+04	1.36E+07	
NFM2	1909120038-F	9/12/2019	10:50	Fragilaria sp.	Bacillariophyta	3	1.53E+05	3.31E+07	
NFM2	1909120038-F	9/12/2019	10:50	Melosira varians	Bacillariophyta	4	4.84E+04	1.97E+08	
NFM2	1909120038-F	9/12/2019	10:50	Navicula spp.	Bacillariophyta	6	3.06E+05	8.64E+07	
NFM2	1909120038-F	9/12/2019	10:50	Nitzschia inconspicua	Bacillariophyta	4	2.04E+05	3.26E+06	
NFM2	1909120038-F	9/12/2019	10:50	Nitzschia sp.	Bacillariophyta	1	1.21E+04	5.81E+05	
NFM2	1909120038-F	9/12/2019	10:50	Pinnularia sp.	Bacillariophyta	1	5.09E+04	1.28E+08	Fragment.
NFM2	1909120038-F	9/12/2019	10:50	Pseudostaurosira brevistriata	Bacillariophyta	6	3.06E+05	4.68E+07	
NFM2	1909120038-F	9/12/2019	10:50	Rhoicosphenia curvata	Bacillariophyta	1	1.21E+04	1.27E+06	
NFM2	1909120038-F	9/12/2019	10:50	Staurosira construens	Bacillariophyta	1	1.21E+04	1.14E+06	
NFM2	1909120038-F	9/12/2019	10:50	Synedra sp.	Bacillariophyta	1	1.21E+04	4.62E+06	Fragment.
NFM2	1909120038-F	9/12/2019	10:50	Ankistrodesmus nannoselene	Chlorophyta	8	4.07E+05	1.12E+06	
NFM2	1909120038-F	9/12/2019	10:50	Chlorella sp.	Chlorophyta	57	2.90E+06	1.22E+07	
NFM2	1909120038-F	9/12/2019	10:50	Monoraphidium sp.	Chlorophyta	1	1.21E+04	8.87E+05	
NFM2	1909120038-F	9/12/2019	10:50	Plagioselmis nannoplanctica	Cryptophyta	15	7.64E+05	9.80E+07	
NFM2	1909120038-F	9/12/2019	10:50	Chroococcus microscopicus	Cyanobacteria	420	2.14E+07	5.73E+06	
				TOTAL		563	2.83E+07	1.13E+09	
GS1	1909120032-F	9/12/2019	11:15	Achnanthidium sp.	Bacillariophyta	2	7.26E+04	3.08E+06	
GS1	1909120032-F	9/12/2019	11:15	Amphora sp.	Bacillariophyta	4	3.89E+05	5.25E+07	

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
GS1	1909120032-F	9/12/2019	11:15	Cocconeis placentula	Bacillariophyta	2	1.94E+05	1.16E+08	
GS1	1909120032-F	9/12/2019	11:15	Cyclotella sp.	Bacillariophyta	10	9.72E+05	5.73E+07	
GS1	1909120032-F	9/12/2019	11:15	Encyonema sp.	Bacillariophyta	4	3.89E+05	8.82E+07	
GS1	1909120032-F	9/12/2019	11:15	Fragilaria sp.	Bacillariophyta	1	3.63E+04	8.22E+06	
GS1	1909120032-F	9/12/2019	11:15	Gomphonema sp.	Bacillariophyta	1	9.72E+04	1.25E+07	
GS1	1909120032-F	9/12/2019	11:15	Nitzschia acicularis	Bacillariophyta	1	9.72E+04	8.46E+06	
GS1	1909120032-F	9/12/2019	11:15	Nitzschia spp.	Bacillariophyta	4	3.89E+05	2.57E+07	
GS1	1909120032-F	9/12/2019	11:15	Pleurosigma sp.	Bacillariophyta	1	9.72E+04	8.43E+08	Fragment.
GS1	1909120032-F	9/12/2019	11:15	Staurosirella pinnata	Bacillariophyta	5	4.86E+05	1.15E+07	
GS1	1909120032-F	9/12/2019	11:15	Synedra sp.	Bacillariophyta	5	4.86E+05	9.62E+07	Fragment.
GS1	1909120032-F	9/12/2019	11:15	Synedra sp.	Bacillariophyta	1	9.72E+04	8.52E+07	
GS1	1909120032-F	9/12/2019	11:15	Synedra ulna	Bacillariophyta	1	9.72E+04	2.01E+08	
GS1	1909120032-F	9/12/2019	11:15	Tryblionella sp.	Bacillariophyta	1	3.63E+04	1.08E+07	
GS1	1909120032-F	9/12/2019	11:15	Chlorella sp.	Chlorophyta	30	2.92E+06	1.22E+07	
GS1	1909120032-F	9/12/2019	11:15	Monoraphidium sp.	Chlorophyta	1	9.72E+04	5.50E+06	
GS1	1909120032-F	9/12/2019	11:15	Plagioselmis nannoplanctica	Cryptophyta	19	1.85E+06	2.61E+08	
GS1	1909120032-F	9/12/2019	11:15	Chroococcus microscopicus	Cyanobacteria	496	4.82E+07	1.29E+07	
				TOTAL		589	5.70E+07	1.91E+09	
SFM3	1909120043-F	9/12/2019	11:27	Aulacoseira sp.	Bacillariophyta	1	3.96E+04	1.51E+07	
SFM3	1909120043-F	9/12/2019	11:27	Bacillaria paxillifer	Bacillariophyta	1	1.21E+04	9.06E+06	
SFM3	1909120043-F	9/12/2019	11:27	Cocconeis placentula	Bacillariophyta	6	2.38E+05	2.12E+08	
SFM3	1909120043-F	9/12/2019	11:27	Cyclotella meneghiniana	Bacillariophyta	1	1.21E+04	9.64E+06	
SFM3	1909120043-F	9/12/2019	11:27	Cymbella sp.	Bacillariophyta	1	3.96E+04	1.98E+07	
SFM3	1909120043-F	9/12/2019	11:27	Gomphonema sp.	Bacillariophyta	1	1.21E+04	1.03E+07	
SFM3	1909120043-F	9/12/2019	11:27	Melosira sp.	Bacillariophyta	2	7.92E+04	3.82E+08	
SFM3	1909120043-F	9/12/2019	11:27	Navicula sp.	Bacillariophyta	1	3.96E+04	6.42E+07	
SFM3	1909120043-F	9/12/2019	11:27	Nitzschia spp.	Bacillariophyta	5	1.98E+05	1.90E+07	
SFM3	1909120043-F	9/12/2019	11:27	Sellaphora sp.	Bacillariophyta	1	1.21E+04	2.91E+07	
SFM3	1909120043-F	9/12/2019	11:27	Staurosira construens	Bacillariophyta	8	9.69E+04	1.83E+07	
SFM3	1909120043-F	9/12/2019	11:27	Synedra mazamaensis	Bacillariophyta	1	1.21E+04	3.23E+06	
SFM3	1909120043-F	9/12/2019	11:27	Synedra sp.	Bacillariophyta	5	1.98E+05	1.64E+08	Fragment.
SFM3	1909120043-F	9/12/2019	11:27	cf. Thalassiosira sp.	Bacillariophyta	5	1.98E+05	3.98E+07	
SFM3	1909120043-F	9/12/2019	11:27	Chlorella sp.	Chlorophyta	11	4.36E+05	3.56E+06	
SFM3	1909120043-F	9/12/2019	11:27	Coelastrum sp.	Chlorophyta	8	9.69E+04	1.37E+06	
SFM3	1909120043-F	9/12/2019	11:27	Crucigenia sp.	Chlorophyta	8	9.69E+04	1.16E+06	
SFM3	1909120043-F	9/12/2019	11:27	Monoraphidium spp.	Chlorophyta	3	1.19E+05	4.73E+06	
SFM3	1909120043-F	9/12/2019	11:27	Scenedesmus sp.	Chlorophyta	4	1.58E+05	2.32E+06	
SFM3	1909120043-F	9/12/2019	11:27	Cryptomonas sp.	Cryptophyta	2	7.92E+04	4.25E+07	
SFM3	1909120043-F	9/12/2019	11:27	Plagioselmis sp.	Cryptophyta	13	5.15E+05	1.12E+08	
SFM3	1909120043-F	9/12/2019	11:27	Teleaulax sp.	Cryptophyta	1	3.96E+04	2.69E+07	
SFM3	1909120043-F	9/12/2019	11:27	Chroococcus microscopicus	Cyanobacteria	518	2.05E+07	1.07E+07	
SFM3	1909120043-F	9/12/2019	11:27	cf. Chroococcus sp.	Cyanobacteria	2	7.92E+04	1.12E+06	
SFM3	1909120043-F	9/12/2019	11:27	Microcystis sp.	Cyanobacteria	61	7.38E+05	1.04E+07	
				TOTAL		670	2.41E+07	1.21E+09	
SFM2	1909120042-F	9/12/2019	12:14	Achnanthidium minutissimum	Bacillariophyta	8	2.63E+05	9.10E+06	
SFM2	1909120042-F	9/12/2019	12:14	Achnanthidium sp.	Bacillariophyta	5	1.65E+05	7.75E+06	
SFM2	1909120042-F	9/12/2019	12:14	Aulacoseira sp.	Bacillariophyta	4	1.32E+05	4.84E+07	
SFM2	1909120042-F	9/12/2019	12:14	Cocconeis placentula	Bacillariophyta	3	9.87E+04	5.70E+07	
SFM2	1909120042-F	9/12/2019	12:14	Cyclotella sp.	Bacillariophyta	14	4.61E+05	3.91E+07	
SFM2	1909120042-F	9/12/2019	12:14	Diatoma sp.	Bacillariophyta	1	7.26E+03	4.62E+06	
SFM2	1909120042-F	9/12/2019	12:14	Diatoma vulgare	Bacillariophyta	1	7.26E+03	8.79E+06	
SFM2	1909120042-F	9/12/2019	12:14	Fragilaria sp.	Bacillariophyta	5	1.65E+05	2.40E+07	
SFM2	1909120042-F	9/12/2019	12:14	Navicula sp.	Bacillariophyta	1	3.29E+04	1.12E+07	
SFM2	1909120042-F	9/12/2019	12:14	Nitzschia dissipata	Bacillariophyta	1	7.26E+03	1.09E+06	
SFM2	1909120042-F	9/12/2019	12:14	Nitzschia inconspicua	Bacillariophyta	4	1.32E+05	2.11E+06	
SFM2	1909120042-F	9/12/2019	12:14	Nitzschia spp.	Bacillariophyta	8	2.63E+05	1.74E+07	
SFM2	1909120042-F	9/12/2019	12:14	Planothidium sp.	Bacillariophyta	1	3.29E+04	5.04E+06	
SFM2	1909120042-F	9/12/2019	12:14	Pseudostaurosira brevistriata	Bacillariophyta	19	6.25E+05	9.58E+07	
SFM2	1909120042-F	9/12/2019	12:14	Staurosirella pinnata	Bacillariophyta	2	6.58E+04	1.55E+06	
SFM2	1909120042-F	9/12/2019	12:14	Synedra ulna	Bacillariophyta	1	3.29E+04	6.19E+07	Fragment.
SFM2	1909120042-F	9/12/2019	12:14	Synedra ulna	Bacillariophyta	2	6.58E+04	2.57E+08	
SFM2	1909120042-F	9/12/2019	12:14	Tabellaria flocculosa	Bacillariophyta	2	1.45E+04	6.28E+06	
SFM2	1909120042-F	9/12/2019	12:14	Thalassiosira sp.	Bacillariophyta	1	7.26E+03	4.11E+06	
SFM2	1909120042-F	9/12/2019	12:14	Ankistrodesmus nannoselene	Chlorophyta	6	1.97E+05	5.43E+05	
SFM2	1909120042-F	9/12/2019	12:14	Chlorella sp.	Chlorophyta	31	1.02E+06	4.27E+06	
SFM2	1909120042-F	9/12/2019	12:14	Monoraphidium spp.	Chlorophyta	5	1.65E+05	7.58E+06	
SFM2	1909120042-F	9/12/2019	12:14	Scenedesmus sp.	Chlorophyta	4	2.91E+04	3.65E+05	
SFM2	1909120042-F	9/12/2019	12:14	Tetrastrum sp.	Chlorophyta	4	1.32E+05	1.86E+06	
SFM2	1909120042-F	9/12/2019	12:14	Plagioselmis nannoplanctica	Cryptophyta	11	3.62E+05	7.28E+07	
SFM2	1909120042-F	9/12/2019	12:14	Aphanocapsa sp.	Cyanobacteria	34	1.12E+06	5.86E+05	
SFM2	1909120042-F	9/12/2019	12:14	Chroococcus microscopicus	Cyanobacteria	376	1.24E+07	3.32E+06	
SFM2	1909120042-F	9/12/2019	12:14	Planktolyngbya sp.	Cyanobacteria	46	1.51E+06	2.38E+06	
				TOTAL		600	1.95E+07	7.56E+08	
NFM1	1909120037-F	9/12/2019	11:45	Achnanthidium minutissimum	Bacillariophyta	5	1.82E+05	1.11E+07	Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	Cocconeis placentula	Bacillariophyta	2	8.56E+04	3.23E+07	Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	Melosira sp.	Bacillariophyta	1	4.28E+04	4.84E+08	Fragment. Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	Navicula sp.	Bacillariophyta	2	7.26E+04	7.73E+07	Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	Nitzschia acicularis	Bacillariophyta	1	4.28E+04	6.16E+06	Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	Nitzschia inconspicua	Bacillariophyta	4	1.71E+05	4.28E+06	Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	Nitzschia sp.	Bacillariophyta	1	4.28E+04	2.05E+06	Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	Planothidium sp.	Bacillariophyta	1	3.63E+04	1.10E+07	Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	cf. Thalassiosira sp.	Bacillariophyta	3	1.28E+05	7.56E+06	Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	Chlorella spp.	Chlorophyta	83	3.55E+06	1.49E+07	Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	Tetrastrum sp.	Chlorophyta	4	1.71E+05	5.73E+06	Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	Plagioselmis nannoplanctica	Cryptophyta	4	1.71E+05	2.20E+07	Cannot meet tally in 50 fields.
NFM1	1909120037-F	9/12/2019	11:45	Chroococcus microscopicus	Cyanobacteria	230	9.84E+06	2.64E+06	Cannot meet tally in 50 fields.

SITE	STATION	SAMPLE DATE	SAMPLE TIME	GENUS	DIVISION	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
				TOTAL		341	1.45E+07	6.81E+08	
MOKEM	1909120045-F	9/12/2019	13:20	Achnanthidium sp.	Bacillariophyta	3	2.72E+04	1.28E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Aulacoseira spp.	Bacillariophyta	6	3.21E+05	1.13E+08	
MOKEM	1909120045-F	9/12/2019	13:20	Cyclotella meneghiniana	Bacillariophyta	1	9.08E+03	9.78E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Encyonema sp.	Bacillariophyta	1	5.35E+04	3.30E+07	
MOKEM	1909120045-F	9/12/2019	13:20	Gomphonema sp.	Bacillariophyta	1	9.08E+03	2.01E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Navicula spp.	Bacillariophyta	3	1.60E+05	3.10E+08	
MOKEM	1909120045-F	9/12/2019	13:20	cf. Nupela sp.	Bacillariophyta	1	9.08E+03	1.18E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Pinnularia sp.	Bacillariophyta	1	9.08E+03	3.39E+07	
MOKEM	1909120045-F	9/12/2019	13:20	Planothidium lanceolatum	Bacillariophyta	1	9.08E+03	7.49E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Sellaphora sp.	Bacillariophyta	3	2.72E+04	6.23E+07	
MOKEM	1909120045-F	9/12/2019	13:20	Staurosira construens	Bacillariophyta	1	5.35E+04	2.02E+07	
MOKEM	1909120045-F	9/12/2019	13:20	Staurosira construens var. venter	Bacillariophyta	1	5.35E+04	1.51E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Synedra sp.	Bacillariophyta	1	5.35E+04	3.43E+07	Fragment.
MOKEM	1909120045-F	9/12/2019	13:20	cf. Thalassiosira sp.	Bacillariophyta	2	1.07E+05	2.15E+07	
MOKEM	1909120045-F	9/12/2019	13:20	Thalassiosira sp.	Bacillariophyta	2	1.82E+04	2.34E+08	
MOKEM	1909120045-F	9/12/2019	13:20	Ankistrodesmus nannoselene	Chlorophyta	3	1.60E+05	3.28E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Chlamydomonas sp.	Chlorophyta	1	9.08E+03	3.04E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Chlorella sp.	Chlorophyta	15	8.02E+05	3.36E+06	
MOKEM	1909120045-F	9/12/2019	13:20	cf. Kirchneriella sp.	Chlorophyta	5	2.67E+05	1.79E+07	
MOKEM	1909120045-F	9/12/2019	13:20	Monoraphidium contortum	Chlorophyta	5	2.67E+05	1.40E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Scenedesmus sp.	Chlorophyta	4	2.14E+05	8.06E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Cryptomonas sp.	Cryptophyta	1	9.08E+03	8.08E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Plagioselmis sp.	Cryptophyta	5	2.67E+05	2.27E+07	
MOKEM	1909120045-F	9/12/2019	13:20	Rhodomonas sp.	Cryptophyta	1	9.08E+03	4.89E+06	
MOKEM	1909120045-F	9/12/2019	13:20	Chroococcus microscopicus	Cyanobacteria	552	2.95E+07	1.55E+07	
				TOTAL		620	3.24E+07	9.74E+08	
SFM1	1909120041-C	9/12/2019	13:30	Achnanthidium minutissimum	Bacillariophyta	1	3.56E+04	2.35E+06	
SFM1	1909120041-C	9/12/2019	13:30	Cocconeis placentula	Bacillariophyta	3	1.07E+05	1.79E+08	
SFM1	1909120041-C	9/12/2019	13:30	Cyclotella meneghiniana	Bacillariophyta	1	3.56E+04	7.17E+07	
SFM1	1909120041-C	9/12/2019	13:30	Encyonema sp.	Bacillariophyta	1	3.56E+04	9.98E+06	
SFM1	1909120041-C	9/12/2019	13:30	Eunotia sp.	Bacillariophyta	1	9.08E+03	4.62E+06	
SFM1	1909120041-C	9/12/2019	13:30	Gomphonema sp.	Bacillariophyta	4	3.63E+04	1.88E+07	
SFM1	1909120041-C	9/12/2019	13:30	Melosira sp.	Bacillariophyta	3	2.72E+04	3.33E+08	
SFM1	1909120041-C	9/12/2019	13:30	Navicula spp.	Bacillariophyta	4	3.63E+04	1.25E+07	
SFM1	1909120041-C	9/12/2019	13:30	Nitzschia inconspicua	Bacillariophyta	5	1.78E+05	3.56E+06	
SFM1	1909120041-C	9/12/2019	13:30	Nitzschia spp.	Bacillariophyta	2	7.13E+04	8.02E+06	
SFM1	1909120041-C	9/12/2019	13:30	Rhoicosphenia curvata	Bacillariophyta	1	9.08E+03	1.96E+06	
SFM1	1909120041-C	9/12/2019	13:30	Staurosira sp.	Bacillariophyta	1	9.08E+03	3.21E+05	
SFM1	1909120041-C	9/12/2019	13:30	cf. Thalassiosira sp.	Bacillariophyta	20	7.13E+05	4.20E+07	
SFM1	1909120041-C	9/12/2019	13:30	Ankistrodesmus arcuatus	Chlorophyta	1	3.56E+04	2.80E+06	
SFM1	1909120041-C	9/12/2019	13:30	Ankistrodesmus nannoselene	Chlorophyta	7	2.50E+05	6.86E+05	
SFM1	1909120041-C	9/12/2019	13:30	Chlorella sp.	Chlorophyta	52	1.85E+06	7.77E+06	
SFM1	1909120041-C	9/12/2019	13:30	Cryptomonas sp.	Cryptophyta	1	3.56E+04	3.17E+07	
SFM1	1909120041-C	9/12/2019	13:30	Plagioselmis nannoplanctica	Cryptophyta	23	8.20E+05	1.05E+08	
SFM1	1909120041-C	9/12/2019	13:30	Chroococcus microscopicus	Cyanobacteria	448	1.60E+07	4.28E+06	
				TOTAL		579	2.03E+07	8.40E+08	
SREM	1909120036-F	9/12/2019	12:37	Achnanthidium minutissimum	Bacillariophyta	6	1.83E+05	8.64E+06	
SREM	1909120036-F	9/12/2019	12:37	Bacillaria paxillifer	Bacillariophyta	1	7.26E+03	8.50E+06	
SREM	1909120036-F	9/12/2019	12:37	Cocconeis placentula	Bacillariophyta	1	3.06E+04	1.09E+07	Fragment.
SREM	1909120036-F	9/12/2019	12:37	Cocconeis placentula	Bacillariophyta	6	1.83E+05	1.37E+08	
SREM	1909120036-F	9/12/2019	12:37	Cyclotella sp.	Bacillariophyta	20	6.11E+05	3.60E+07	
SREM	1909120036-F	9/12/2019	12:37	Encyonema sp.	Bacillariophyta	4	1.22E+05	5.32E+07	
SREM	1909120036-F	9/12/2019	12:37	Fragilaria crotonensis	Bacillariophyta	3	2.18E+04	6.57E+06	
SREM	1909120036-F	9/12/2019	12:37	Fragilaria sp.	Bacillariophyta	4	1.22E+05	1.79E+07	
SREM	1909120036-F	9/12/2019	12:37	Navicula spp.	Bacillariophyta	8	2.44E+05	1.61E+08	
SREM	1909120036-F	9/12/2019	12:37	Nitzschia acicularis	Bacillariophyta	1	3.06E+04	2.26E+06	
SREM	1909120036-F	9/12/2019	12:37	Nitzschia dissipata	Bacillariophyta	1	3.06E+04	4.03E+06	
SREM	1909120036-F	9/12/2019	12:37	Nitzschia palea	Bacillariophyta	1	7.26E+03	1.18E+06	
SREM	1909120036-F	9/12/2019	12:37	Nitzschia spp.	Bacillariophyta	9	2.75E+05	1.98E+07	
SREM	1909120036-F	9/12/2019	12:37	Pseudostaurosira brevistriata	Bacillariophyta	15	4.58E+05	7.02E+07	
SREM	1909120036-F	9/12/2019	12:37	Staurosirella pinnata	Bacillariophyta	1	7.26E+03	1.71E+05	
SREM	1909120036-F	9/12/2019	12:37	Synedra sp.	Bacillariophyta	11	3.36E+05	6.65E+07	Fragment.
SREM	1909120036-F	9/12/2019	12:37	Ankistrodesmus nannoselene	Chlorophyta	12	3.67E+05	1.01E+06	
SREM	1909120036-F	9/12/2019	12:37	Chlorella sp.	Chlorophyta	40	1.22E+06	5.12E+06	
SREM	1909120036-F	9/12/2019	12:37	Monoraphidium sp.	Chlorophyta	1	3.06E+04	8.64E+05	
SREM	1909120036-F	9/12/2019	12:37	Plagioselmis nannoplanctica	Cryptophyta	15	4.58E+05	8.45E+07	
SREM	1909120036-F	9/12/2019	12:37	Chroococcus microscopicus	Cyanobacteria	384	1.17E+07	3.15E+06	
				TOTAL		544	1.65E+07	6.99E+08	

Appendix 7. Picoplankton Enumeration Data Table

SITE ID	STATION	SAMPLE DATE	SAMPLE TIME	ANALYSIS	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
1909110062-H	GS4	9/11/2019	9:49	PE - Rich Picocyanobacteria	138	1.11E+07	5.47E+06	Cannot meet tally in 50 fields.
1909110062-H	GS4	9/11/2019	9:49	PC - Rich Picocyanobacteria	10	8.04E+05	2.68E+05	Cannot meet tally in 50 fields.
				TOTAL	148	1.19E+07	5.74E+06	
1909110073-G	NFM3	9/11/2019	10:05	PE - Rich Picocyanobacteria	135	1.09E+07	3.62E+06	Cannot meet tally in 50 fields.
1909110073-G	NFM3	9/11/2019	10:05	PC - Rich Picocyanobacteria	6	4.83E+05	2.05E+05	Cannot meet tally in 50 fields.
				TOTAL	141	1.13E+07	3.82E+06	
1909120036-H	SREM	9/12/2019	12:37	PE - Rich Picocyanobacteria	160	1.29E+07	1.08E+07	Cannot meet tally in 50 fields.
1909120036-H	SREM	9/12/2019	12:37	PC - Rich Picocyanobacteria	17	1.37E+06	4.55E+05	Cannot meet tally in 50 fields.
				TOTAL	177	1.42E+07	1.12E+07	
1909110061-H	GS3	9/11/2019	10:24	PE - Rich Picocyanobacteria	149	1.20E+07	4.28E+06	Cannot meet tally in 50 fields.
1909110061-H	GS3	9/11/2019	10:24	PC - Rich Picocyanobacteria	27	2.17E+06	8.85E+05	Cannot meet tally in 50 fields.
				TOTAL	176	1.42E+07	5.16E+06	
1909110069-H	SFM2	9/11/2019	11:18	PE - Rich Picocyanobacteria	226	1.82E+07	1.27E+07	Cannot meet tally in 50 fields.
1909110069-H	SFM2	9/11/2019	11:18	PC - Rich Picocyanobacteria	51	4.10E+06	1.57E+06	Cannot meet tally in 50 fields.
				TOTAL	277	2.23E+07	1.42E+07	
1909120045-H	MOKEM	9/12/2019	13:20	PE - Rich Picocyanobacteria	94	8.22E+06	3.57E+06	
1909120045-H	MOKEM	9/12/2019	13:20	PC - Rich Picocyanobacteria	326	2.85E+07	3.13E+07	
				TOTAL	420	3.67E+07	3.49E+07	
1909110060-H	GS2	9/11/2019	11:00	PE - Rich Picocyanobacteria	278	2.24E+07	1.73E+07	Cannot meet tally in 50 fields.
1909110060-H	GS2	9/11/2019	11:00	PC - Rich Picocyanobacteria	57	4.58E+06	2.70E+06	Cannot meet tally in 50 fields.
				TOTAL	335	2.69E+07	2.00E+07	
1909120037-H	NFM1	9/12/2019	11:45	PE - Rich Picocyanobacteria	263	2.12E+07	1.64E+07	Cannot meet tally in 50 fields.
1909120037-H	NFM1	9/12/2019	11:45	PC - Rich Picocyanobacteria	59	4.75E+06	2.79E+06	Cannot meet tally in 50 fields.
				TOTAL	322	2.59E+07	1.92E+07	
1909120042-H	SFM2	9/12/2019	12:14	PE - Rich Picocyanobacteria	164	1.32E+07	7.55E+06	Cannot meet tally in 50 fields.
1909120042-H	SFM2	9/12/2019	12:14	PC - Rich Picocyanobacteria	94	7.56E+06	3.84E+06	Cannot meet tally in 50 fields.
				TOTAL	258	2.07E+07	1.14E+07	
1909120041-E	SFM1	9/12/2019	13:30	PE - Rich Picocyanobacteria	89	1.43E+07	5.46E+06	
1909120041-E	SFM1	9/12/2019	13:30	PC - Rich Picocyanobacteria	343	5.52E+07	8.63E+07	
				TOTAL	432	6.95E+07	9.17E+07	
1909110071-H	SFM4	9/11/2019	9:07	PE - Rich Picocyanobacteria	91	1.26E+07	4.50E+06	
1909110071-H	SFM4	9/11/2019	9:07	PC - Rich Picocyanobacteria	335	4.65E+07	6.39E+07	
				TOTAL	426	5.91E+07	6.84E+07	
1909110070-H	SFM3	9/11/2019	10:08	PE - Rich Picocyanobacteria	133	1.07E+07	6.48E+06	Cannot meet tally in 50 fields.
1909110070-H	SFM3	9/11/2019	10:08	PC - Rich Picocyanobacteria	212	1.71E+07	2.10E+07	Cannot meet tally in 50 fields.
				TOTAL	345	2.77E+07	2.75E+07	
1909100075-H	SFM2	9/10/2019	13:00	PE - Rich Picocyanobacteria	57	9.17E+06	3.99E+06	
1909100075-H	SFM2	9/10/2019	13:00	PC - Rich Picocyanobacteria	383	6.16E+07	9.83E+07	
				TOTAL	440	7.08E+07	1.02E+08	
1909100076-H	SFM3	9/10/2019	11:45	PE - Rich Picocyanobacteria	206	1.73E+07	2.37E+07	
1909100076-H	SFM3	9/10/2019	11:45	PC - Rich Picocyanobacteria	227	1.90E+07	1.94E+07	
				TOTAL	433	3.63E+07	4.32E+07	
1909100066-H	GS2	9/10/2019	11:52	PE - Rich Picocyanobacteria	275	2.21E+07	1.38E+07	Cannot meet tally in 50 fields.
1909100066-H	GS2	9/10/2019	11:52	PC - Rich Picocyanobacteria	32	2.57E+06	8.57E+05	Cannot meet tally in 50 fields.
				TOTAL	307	2.47E+07	1.46E+07	
1909100079-G	GS2	9/10/2019	11:52	PE - Rich Picocyanobacteria	185	1.49E+07	1.04E+07	Cannot meet tally in 50 fields.
1909100079-G	GS2	9/10/2019	11:52	PC - Rich Picocyanobacteria	18	1.45E+06	1.34E+06	Cannot meet tally in 50 fields.
				TOTAL	203	1.63E+07	1.17E+07	
1909100071-H	NFM2	9/10/2019	12:05	PE - Rich Picocyanobacteria	152	1.22E+07	8.75E+06	Cannot meet tally in 50 fields.
1909100071-H	NFM2	9/10/2019	12:05	PC - Rich Picocyanobacteria	35	2.81E+06	6.27E+06	Cannot meet tally in 50 fields.
				TOTAL	187	1.50E+07	1.50E+07	
1909100073-C	NFM4	9/10/2019	9:45	PE - Rich Picocyanobacteria	291	2.34E+07	2.63E+07	Cannot meet tally in 50 fields.

SITE ID	STATION	SAMPLE DATE	SAMPLE TIME	ANALYSIS	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
1909100073-C	NFM4	9/10/2019	9:45	PC - Rich Picocyanobacteria	65	5.23E+06	9.24E+06	Cannot meet tally in 50 fields.
				TOTAL	356	2.86E+07	3.55E+07	
1909100077-H	SFM4	9/10/2019	10:00	PE - Rich Picocyanobacteria	148	1.35E+07	5.16E+06	
1909100077-H	SFM4	9/10/2019	10:00	PC - Rich Picocyanobacteria	308	2.81E+07	2.42E+07	
				TOTAL	456	4.17E+07	2.94E+07	
1909100068-H	GS4	9/10/2019	10:30	PE - Rich Picocyanobacteria	297	2.39E+07	2.68E+07	Cannot meet tally in 50 fields.
1909100068-H	GS4	9/10/2019	10:30	PC - Rich Picocyanobacteria	66	5.31E+06	9.38E+06	Cannot meet tally in 50 fields.
				TOTAL	363	2.92E+07	3.62E+07	
1909100072-H	NFM3	9/10/2019	11:06	PE - Rich Picocyanobacteria	278	2.24E+07	1.97E+07	Cannot meet tally in 50 fields.
1909100072-H	NFM3	9/10/2019	11:06	PC - Rich Picocyanobacteria	35	2.81E+06	4.13E+06	Cannot meet tally in 50 fields.
				TOTAL	313	2.52E+07	2.39E+07	
1909100067-H	GS3	9/10/2019	11:12	PE - Rich Picocyanobacteria	217	1.75E+07	1.18E+07	Cannot meet tally in 50 fields.
1909100067-H	GS3	9/10/2019	11:12	PC - Rich Picocyanobacteria	27	2.17E+06	1.82E+06	Cannot meet tally in 50 fields.
				TOTAL	244	1.96E+07	1.37E+07	
1909100065-H	GS1	9/10/2019	12:48	PE - Rich Picocyanobacteria	371	7.46E+07	7.63E+07	
1909100065-H	GS1	9/10/2019	12:48	PC - Rich Picocyanobacteria	46	9.25E+06	3.77E+06	
				TOTAL	417	8.38E+07	8.01E+07	
1909090008-H	SREM	9/9/2019	13:42	PE - Rich Picocyanobacteria	416	3.41E+07	1.48E+07	
1909090008-H	SREM	9/9/2019	13:42	PC - Rich Picocyanobacteria	61	5.01E+06	5.12E+06	
				TOTAL	477	3.91E+07	2.00E+07	
1909090005-H	SR1	9/9/2019	11:20	PE - Rich Picocyanobacteria	373	3.66E+07	3.48E+07	
1909090005-H	SR1	9/9/2019	11:20	PC - Rich Picocyanobacteria	36	3.53E+06	1.54E+06	
				TOTAL	409	4.01E+07	3.63E+07	
1909090006-H	SR2	9/9/2019	12:16	PE - Rich Picocyanobacteria	364	5.63E+07	4.84E+07	
1909090006-H	SR2	9/9/2019	12:16	PC - Rich Picocyanobacteria	46	7.11E+06	3.09E+06	
				TOTAL	410	6.34E+07	5.15E+07	
1909090046-F	SR1	9/9/2019	11:20	PE - Rich Picocyanobacteria	358	3.27E+07	1.93E+07	
1909090046-F	SR1	9/9/2019	11:20	PC - Rich Picocyanobacteria	44	4.02E+06	2.96E+06	
				TOTAL	402	3.67E+07	2.22E+07	
1909090007-H	SR3	9/9/2019	12:54	PE - Rich Picocyanobacteria	345	3.85E+07	2.54E+07	
1909090007-H	SR3	9/9/2019	12:54	PC - Rich Picocyanobacteria	59	6.59E+06	3.45E+06	
				TOTAL	404	4.51E+07	2.89E+07	
1909110067-H	NFM4	9/11/2019	9:05	PE - Rich Picocyanobacteria	201	1.62E+07	6.17E+06	Cannot meet tally in 50 fields.
1909110067-H	NFM4	9/11/2019	9:05	PC - Rich Picocyanobacteria	63	5.07E+06	1.69E+06	Cannot meet tally in 50 fields.
				TOTAL	264	2.12E+07	7.86E+06	
1909110066-H	NFM3	9/11/2019	10:05	PE - Rich Picocyanobacteria	344	4.07E+07	1.88E+07	
1909110066-H	NFM3	9/11/2019	10:05	PC - Rich Picocyanobacteria	64	7.57E+06	2.70E+06	
				TOTAL	408	4.83E+07	2.15E+07	
1909110065-H	NFM2	9/11/2019	11:14	PE - Rich Picocyanobacteria	135	1.09E+07	2.30E+06	Cannot meet tally in 50 fields.
1909110065-H	NFM2	9/11/2019	11:14	PC - Rich Picocyanobacteria	9	7.24E+05	3.57E+05	Cannot meet tally in 50 fields.
				TOTAL	144	1.16E+07	2.66E+06	
1909110059-H	GS1	9/11/2019	11:35	PE - Rich Picocyanobacteria	328	2.64E+07	9.41E+06	Cannot meet tally in 50 fields.
1909110059-H	GS1	9/11/2019	11:35	PC - Rich Picocyanobacteria	14	1.13E+06	7.02E+05	Cannot meet tally in 50 fields.
				TOTAL	342	2.75E+07	1.01E+07	
1909100070-H	NFM1	9/10/2019	13:06	PE - Rich Picocyanobacteria	227	2.23E+07	1.03E+07	
1909100070-H	NFM1	9/10/2019	13:06	PC - Rich Picocyanobacteria	173	1.70E+07	6.05E+06	
				TOTAL	400	3.92E+07	1.64E+07	
1909100069-H	SREM	9/10/2019	14:14	PE - Rich Picocyanobacteria	346	3.86E+07	2.84E+07	
1909100069-H	SREM	9/10/2019	14:14	PC - Rich Picocyanobacteria	61	6.81E+06	2.60E+06	
				TOTAL	407	4.55E+07	3.10E+07	
1909120044-H	SFM4	9/12/2019	10:03	PE - Rich Picocyanobacteria	110	1.64E+07	5.85E+06	
1909120044-H	SFM4	9/12/2019	10:03	PC - Rich Picocyanobacteria	367	5.47E+07	4.24E+07	

SITE ID	STATION	SAMPLE DATE	SAMPLE TIME	ANALYSIS	TALLY	DENSITY (cells/L)	TOTAL BV um^3/L	NOTES
				TOTAL	477	7.10E+07	4.82E+07	
1909100074-H	SFM1	9/10/2019	14:18	PE - Rich Picocyanobacteria	169	1.58E+07	8.28E+06	
1909100074-H	SFM1	9/10/2019	14:18	PC - Rich Picocyanobacteria	254	2.38E+07	2.04E+07	
				TOTAL	423	3.96E+07	2.87E+07	
1909100078-H	MOKEM	9/10/2019	15:02	PE - Rich Picocyanobacteria	128	1.14E+07	4.37E+06	
1909100078-H	MOKEM	9/10/2019	15:02	PC - Rich Picocyanobacteria	284	2.54E+07	1.92E+07	
				TOTAL	412	3.68E+07	2.35E+07	
1909110072-H	MOKEM	9/11/2019	12:58	PE - Rich Picocyanobacteria	119	1.29E+07	4.61E+06	
1909110072-H	MOKEM	9/11/2019	12:58	PC - Rich Picocyanobacteria	323	3.51E+07	2.87E+07	
				TOTAL	442	4.80E+07	3.33E+07	
1909120046-F	SFM4	9/12/2019	10:03	PE - Rich Picocyanobacteria	183	1.89E+07	8.21E+06	
1909120046-F	SFM4	9/12/2019	10:03	PC - Rich Picocyanobacteria	251	2.59E+07	2.12E+07	
				TOTAL	434	4.47E+07	2.94E+07	
1909120032-H	GS1	9/12/2019	11:15	PE - Rich Picocyanobacteria	189	1.52E+07	9.48E+06	Cannot meet tally in 50 fields.
1909120032-H	GS1	9/12/2019	11:15	PC - Rich Picocyanobacteria	27	2.17E+06	1.60E+06	Cannot meet tally in 50 fields.
				TOTAL	216	1.74E+07	1.11E+07	
1909120038-H	NFM2	9/12/2019	10:50	PE - Rich Picocyanobacteria	121	9.73E+06	6.42E+06	Cannot meet tally in 50 fields.
1909120038-H	NFM2	9/12/2019	10:50	PC - Rich Picocyanobacteria	5	4.02E+05	3.29E+05	Cannot meet tally in 50 fields.
				TOTAL	126	1.01E+07	6.75E+06	
1909120043-H	SFM3	9/12/2019	11:27	PE - Rich Picocyanobacteria	198	1.62E+07	5.80E+06	
1909120043-H	SFM3	9/12/2019	11:27	PC - Rich Picocyanobacteria	214	1.76E+07	8.14E+06	
				TOTAL	412	3.38E+07	1.39E+07	
1909110068-H	SFM1	9/11/2019	12:13	PE - Rich Picocyanobacteria	168	1.69E+07	7.34E+06	
1909110068-H	SFM1	9/11/2019	12:13	PC - Rich Picocyanobacteria	232	2.33E+07	1.25E+07	
				TOTAL	400	4.02E+07	1.99E+07	
1909120039-H	NFM3	9/12/2019	10:05	PE - Rich Picocyanobacteria	268	2.16E+07	1.20E+07	Cannot meet tally in 50 fields.
1909120039-H	NFM3	9/12/2019	10:05	PC - Rich Picocyanobacteria	32	2.57E+06	1.43E+06	Cannot meet tally in 50 fields.
				TOTAL	300	2.41E+07	1.34E+07	
1909120033-H	GS2	9/12/2019	10:38	PE - Rich Picocyanobacteria	351	2.82E+07	1.48E+07	Cannot meet tally in 50 fields.
1909120033-H	GS2	9/12/2019	10:38	PC - Rich Picocyanobacteria	34	2.73E+06	1.80E+06	Cannot meet tally in 50 fields.
				TOTAL	385	3.10E+07	1.66E+07	
1909120034-H	GS3	9/12/2019	10:05	PE - Rich Picocyanobacteria	341	2.86E+07	1.50E+07	
1909120034-H	GS3	9/12/2019	10:05	PC - Rich Picocyanobacteria	66	5.53E+06	5.00E+06	
				TOTAL	407	3.41E+07	2.00E+07	
1909110063-H	SREM	9/11/2019	12:13	PE - Rich Picocyanobacteria	227	1.83E+07	6.97E+06	Cannot meet tally in 50 fields.
1909110063-H	SREM	9/11/2019	12:13	PC - Rich Picocyanobacteria	39	3.14E+06	2.56E+06	Cannot meet tally in 50 fields.
				TOTAL	266	2.14E+07	9.53E+06	
1909120035-H	GS4	9/12/2019	9:30	PE - Rich Picocyanobacteria	294	2.46E+07	1.45E+07	
1909120035-H	GS4	9/12/2019	9:30	PC - Rich Picocyanobacteria	108	9.05E+06	5.64E+06	
				TOTAL	402	3.37E+07	2.01E+07	
1909120040-H	NFM4	9/12/2019	9:10	PE - Rich Picocyanobacteria	345	2.77E+07	1.63E+07	
1909120040-H	NFM4	9/12/2019	9:10	PC - Rich Picocyanobacteria	78	6.27E+06	5.68E+06	
				TOTAL	423	3.40E+07	2.20E+07	
1909110064-H	NFM1	9/11/2019	12:12	PE - Rich Picocyanobacteria	218	2.92E+07	1.93E+07	
1909110064-H	NFM1	9/11/2019	12:12	PC - Rich Picocyanobacteria	189	2.53E+07	1.58E+07	
				TOTAL	407	5.46E+07	3.51E+07	

Appendix 8. Zooplankton Enumeration Data Table

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Alona	guttata	Cladocera	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.230	0.003
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Bosmina	longirostris	Cladocera	6.0	25	1178.10	250	17.0	0.01	3	0.037	0.486	0.018
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Chydorus	sphaericus	Cladocera	6.0	25	1178.10	250	17.0	0.01	1	0.012	1.006	0.013
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Diaphanosoma	brachyurum	Cladocera	6.0	25	1178.10	250	17.0	0.01	2	0.025	0.252	0.006
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Kurzia	latissima	Cladocera	6.0	25	1178.10	250	17.0	0.01	1	0.012	1.399	0.017
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	ostracod		Ostracoda	6.0	25	1178.10	250	17.0	0.01	19	0.237	1.278	0.303
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	calanoid	copepodid	Copepoda	6.0	25	1178.10	250	17.0	0.01	18	0.225	1.163	0.261
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	250	17.0	0.01	9	0.112	0.331	0.037
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Ilyocryptus	sp.	Copepoda	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.003	0.000
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Mesocyclops	edax	Copepoda	6.0	25	1178.10	250	17.0	0.01	1	0.012	1.792	0.022
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	nauplii		Copepoda	6.0	25	1178.10	250	17.0	0.01	248	3.096	0.068	0.211
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Asplanchna	sp.	Rotifera	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.431	0.005
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	bdelloid		Rotifera	6.0	25	1178.10	250	17.0	0.01	12	0.150	0.158	0.024
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Brachionus	angularis	Rotifera	6.0	25	1178.10	250	17.0	0.01	3	0.037	0.022	0.001
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Brachionus	bidentata	Rotifera	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.052	0.001
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Brachionus	caudatus	Rotifera	6.0	25	1178.10	250	17.0	0.01	3	0.037	0.013	0.000
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Brachionus	havanaensis	Rotifera	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.022	0.000
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Cephalodella	spp.	Rotifera	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.014	0.000
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Collotheca	spp.	Rotifera	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.041	0.001
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Conochilus	unicornis	Rotifera	6.0	25	1178.10	250	17.0	0.01	2	0.025	0.010	0.000
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	250	17.0	0.01	6	0.075	0.085	0.006
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	250	17.0	0.01	17	0.212	0.003	0.001
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Keratella	crassa	Rotifera	6.0	25	1178.10	250	17.0	0.01	3	0.037	0.010	0.000
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Keratella	tropica	Rotifera	6.0	25	1178.10	250	17.0	0.01	5	0.062	0.064	0.004
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Lepadella	ovalis	Rotifera	6.0	25	1178.10	250	17.0	0.01	2	0.025	0.008	0.000
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Monostyla	bulla	Rotifera	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.018	0.000
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Monostyla	closterocerca	Rotifera	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.018	0.000
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Monostyla	quadridentata	Rotifera	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.029	0.000
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Plationus	patulus	Rotifera	6.0	25	1178.10	250	17.0	0.01	2	0.025	0.063	0.002
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Ploesoma	truncatum	Rotifera	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.023	0.000
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	250	17.0	0.01	12	0.150	0.037	0.005
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Synchaeta	spp.	Rotifera	6.0	25	1178.10	250	17.0	0.01	6	0.075	0.008	0.001
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Trichocerca	multicrinis	Rotifera	6.0	25	1178.10	250	17.0	0.01	1	0.012	0.067	0.001
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Trichocerca	pusilla	Rotifera	6.0	25	1178.10	250	17.0	0.01	3	0.037	0.030	0.001
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Trichocerca	rattus	Rotifera	6.0	25	1178.10	250	17.0	0.01	2	0.025	0.111	0.003
NFM4	1909100073-A	10-Sep-2019	9:45	High detritus and silt.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	250	17.0	0.01	10	0.125	0.341	0.043
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Bosmina	longirostris	Cladocera	6.0	25	1178.10	192	5.0	0.03	3	0.098	0.486	0.048
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Chydorus	sphaericus	Cladocera	6.0	25	1178.10	192	5.0	0.03	1	0.033	1.137	0.037
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Diaphanosoma	brachyurum	Cladocera	6.0	25	1178.10	192	5.0	0.03	4	0.130	0.746	0.097
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	ostracod		Ostracoda	6.0	25	1178.10	192	5.0	0.03	2	0.065	0.900	0.059
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	calanoid	copepodid	Copepoda	6.0	25	1178.10	192	5.0	0.03	1	0.033	1.617	0.053
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	192	5.0	0.03	1	0.033	0.089	0.003
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Microcyclops	rubellus	Copepoda	6.0	25	1178.10	192	5.0	0.03	1	0.033	0.679	0.022
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Pseudodiaptomus	forbesi	Copepoda	6.0	25	1178.10	192	5.0	0.03	1	0.033	3.070	0.100
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	nauplii		Copepoda	6.0	25	1178.10	192	5.0	0.03	314	10.235	0.047	0.479
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Asplanchna	sp.	Rotifera	6.0	25	1178.10	192	5.0	0.03	5	0.163	0.731	0.119
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	bdelloid		Rotifera	6.0	25	1178.10	192	5.0	0.03	5	0.163	0.095	0.016
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Brachionus	angularis	Rotifera	6.0	25	1178.10	192	5.0	0.03	3	0.098	0.013	0.001
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Conochilus	unicornis	Rotifera	6.0	25	1178.10	192	5.0	0.03	64	2.086	0.006	0.012
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	192	5.0	0.03	3	0.098	0.029	0.003
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Filinia	longiseta	Rotifera	6.0	25	1178.10	192	5.0	0.03	1	0.033	0.038	0.001
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Keratella	americana	Rotifera	6.0	25	1178.10	192	5.0	0.03	2	0.065	0.006	0.000
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	192	5.0	0.03	65	2.119	0.005	0.011
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Keratella	crassa	Rotifera	6.0	25	1178.10	192	5.0	0.03	1	0.033	0.009	0.000
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Keratella	earlinae	Rotifera	6.0	25	1178.10	192	5.0	0.03	1	0.033	0.009	0.000
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Keratella	tropica	Rotifera	6.0	25	1178.10	192	5.0	0.03	5	0.163	0.017	0.003
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Plationus	patulus	Rotifera	6.0	25	1178.10	192	5.0	0.03	1	0.033	0.022	0.001
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	192	5.0	0.03	8	0.261	0.030	0.008
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Synchaeta	spp.	Rotifera	6.0	25	1178.10	192	5.0	0.03	9	0.293	0.029	0.009
SFM4	1909100077-G	10-Sep-2019	10:10	High detritus.	Trichocerca	rattus	Rotifera	6.0	25	1178.10	192	5.0	0.03	1	0.033	0.094	0.003
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Alona	spp.	Cladocera	6.0	25	1178.10	270	28.0	0.01	3	0.025	0.230	0.006
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	6.0	25	1178.10	270	28.0	0.01	3	0.025	0.397	0.010
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Macrothrix	spp.	Cladocera	6.0	25	1178.10	270	28.0	0.01	1	0.008	0.002	0.000
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Monospilus	dispar	Cladocera	6.0	25	1178.10	270	28.0	0.01	1	0.008	0.505	0.004

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	ostracod		Ostracoda	6.0	25	1178.10	270	28.0	0.01	4	0.033	0.060	0.002
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	calanoid	copepodid	Copepoda	6.0	25	1178.10	270	28.0	0.01	1	0.008	1.423	0.012
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	270	28.0	0.01	4	0.033	0.302	0.010
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Pseudodiaptomus	forbesi	Copepoda	6.0	25	1178.10	270	28.0	0.01	1	0.008	3.292	0.027
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	270	28.0	0.01	179	1.465	0.082	0.119
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	bdelloid		Rotifera	6.0	25	1178.10	270	28.0	0.01	1	0.008	0.413	0.003
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Brachionus	angularis	Rotifera	6.0	25	1178.10	270	28.0	0.01	2	0.016	0.013	0.000
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Cephalodella	spp.	Rotifera	6.0	25	1178.10	270	28.0	0.01	1	0.008	0.024	0.000
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	270	28.0	0.01	10	0.082	0.003	0.000
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Keratella	crassa	Rotifera	6.0	25	1178.10	270	28.0	0.01	2	0.016	0.010	0.000
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	6.0	25	1178.10	270	28.0	0.01	3	0.025	0.010	0.000
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Keratella	tropica	Rotifera	6.0	25	1178.10	270	28.0	0.01	2	0.016	0.217	0.004
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Lophocharis	spp.	Rotifera	6.0	25	1178.10	270	28.0	0.01	2	0.016	0.005	0.000
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Monostyla	bulla	Rotifera	6.0	25	1178.10	270	28.0	0.01	1	0.008	0.014	0.000
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Monostyla	copeis	Rotifera	6.0	25	1178.10	270	28.0	0.01	1	0.008	0.004	0.000
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Plationus	patulus	Rotifera	6.0	25	1178.10	270	28.0	0.01	1	0.008	0.013	0.000
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Platyias	quadricornis	Rotifera	6.0	25	1178.10	270	28.0	0.01	1	0.008	0.200	0.002
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	270	28.0	0.01	4	0.033	0.022	0.001
GS4	1909100068-G	10-Sep-2019	10:30	High algae and detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	270	28.0	0.01	4	0.033	0.172	0.006
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	Diaphanosoma	brachyurum	Cladocera	10.0	25	1963.50	195	53.0	0.00	1	0.002	0.483	0.001
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	Ilyocryptus	spp.	Cladocera	10.0	25	1963.50	195	53.0	0.00	4	0.007	0.184	0.001
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	ostracod		Ostracoda	10.0	25	1963.50	195	53.0	0.00	8	0.015	0.039	0.001
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	calanoid	copepodid	Copepoda	10.0	25	1963.50	195	53.0	0.00	2	0.004	0.865	0.003
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	10.0	25	1963.50	195	53.0	0.00	14	0.026	0.419	0.011
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	Eucyclops	spp.	Copepoda	10.0	25	1963.50	195	53.0	0.00	1	0.002	1.818	0.003
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	Paracyclops	spp.	Copepoda	10.0	25	1963.50	195	53.0	0.00	1	0.002	1.391	0.003
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	nauplii		Copepoda	10.0	25	1963.50	195	53.0	0.00	165	0.309	0.054	0.017
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	bdelloid		Rotifera	10.0	25	1963.50	195	53.0	0.00	6	0.011	0.148	0.002
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	Brachionus	calyciflorus	Rotifera	10.0	25	1963.50	195	53.0	0.00	1	0.002	0.028	0.000
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	10.0	25	1963.50	195	53.0	0.00	2	0.004	0.062	0.000
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	10.0	25	1963.50	195	53.0	0.00	2	0.004	0.009	0.000
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	Lophocharis	spp.	Rotifera	10.0	25	1963.50	195	53.0	0.00	1	0.002	0.010	0.000
NFM3	1909100072-G	10-Sep-2019	11:06	High algae and detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	10.0	25	1963.50	195	53.0	0.00	7	0.013	0.049	0.001
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	Ceriodaphnia	spp.	Cladocera	6.0	25	1178.10	260	36.0	0.01	1	0.006	1.849	0.011
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	260	36.0	0.01	7	0.043	0.078	0.003
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	260	36.0	0.01	83	0.509	0.043	0.022
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	Asplanchna	spp.	Rotifera	6.0	25	1178.10	260	36.0	0.01	1	0.006	0.539	0.003
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	bdelloid		Rotifera	6.0	25	1178.10	260	36.0	0.01	4	0.025	0.081	0.002
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	Brachionus	calyciflorus	Rotifera	6.0	25	1178.10	260	36.0	0.01	2	0.012	0.063	0.001
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	260	36.0	0.01	29	0.178	0.004	0.001
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	6.0	25	1178.10	260	36.0	0.01	1	0.006	0.012	0.000
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	Keratella	tropica	Rotifera	6.0	25	1178.10	260	36.0	0.01	3	0.018	0.096	0.002
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	Lecane	ungulata	Rotifera	6.0	25	1178.10	260	36.0	0.01	1	0.006	0.029	0.000
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	Lophocharis	spp.	Rotifera	6.0	25	1178.10	260	36.0	0.01	3	0.018	0.017	0.000
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	260	36.0	0.01	6	0.037	0.030	0.001
GS3	1909100067-G	10-Sep-2019	11:12	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	260	36.0	0.01	2	0.012	0.106	0.001
SFM3	1909100076-G	10-Sep-2019	11:45	na	Bosmina	longirostris	Cladocera	6.0	25	1178.10	290	3.0	0.08	5	0.410	0.319	0.131
SFM3	1909100076-G	10-Sep-2019	11:45	na	ostracod		Ostracoda	6.0	25	1178.10	290	3.0	0.08	5	0.410	0.039	0.016
SFM3	1909100076-G	10-Sep-2019	11:45	na	calanoid	copepodid	Copepoda	6.0	25	1178.10	290	3.0	0.08	2	0.164	0.904	0.148
SFM3	1909100076-G	10-Sep-2019	11:45	na	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	290	3.0	0.08	3	0.246	0.302	0.074
SFM3	1909100076-G	10-Sep-2019	11:45	na	harpacticoid		Copepoda	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.674	0.055
SFM3	1909100076-G	10-Sep-2019	11:45	na	nauplii		Copepoda	6.0	25	1178.10	290	3.0	0.08	131	10.749	0.037	0.400
SFM3	1909100076-G	10-Sep-2019	11:45	na	Asplanchna	spp.	Rotifera	6.0	25	1178.10	290	3.0	0.08	6	0.492	0.384	0.189
SFM3	1909100076-G	10-Sep-2019	11:45	na	bdelloid		Rotifera	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.047	0.004
SFM3	1909100076-G	10-Sep-2019	11:45	na	Brachionus	angularis	Rotifera	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.007	0.001
SFM3	1909100076-G	10-Sep-2019	11:45	na	Brachionus	caudatus	Rotifera	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.028	0.002
SFM3	1909100076-G	10-Sep-2019	11:45	na	Brachionus	quadridentatus	Rotifera	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.043	0.004
SFM3	1909100076-G	10-Sep-2019	11:45	na	Collotheca	spp.	Rotifera	6.0	25	1178.10	290	3.0	0.08	3	0.246	0.024	0.006
SFM3	1909100076-G	10-Sep-2019	11:45	na	Conochiloides	dossuarius	Rotifera	6.0	25	1178.10	290	3.0	0.08	12	0.985	0.015	0.015
SFM3	1909100076-G	10-Sep-2019	11:45	na	Conochilus	unicornis	Rotifera	6.0	25	1178.10	290	3.0	0.08	230	18.872	0.007	0.126
SFM3	1909100076-G	10-Sep-2019	11:45	na	Filinia	longiseta	Rotifera	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.014	0.001
SFM3	1909100076-G	10-Sep-2019	11:45	na	Hexarthra	mira	Rotifera	6.0	25	1178.10	290	3.0	0.08	6	0.492	0.024	0.012
SFM3	1909100076-G	10-Sep-2019	11:45	na	Keratella	cochlearis	Rotifera	6.0	25	1178.10	290	3.0	0.08	3	0.246	0.004	0.001

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
SFM3	1909100076-G	10-Sep-2019	11:45	na	Keratella	crassa	Rotifera	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.012	0.001
SFM3	1909100076-G	10-Sep-2019	11:45	na	Keratella	earlinae	Rotifera	6.0	25	1178.10	290	3.0	0.08	2	0.164	0.007	0.001
SFM3	1909100076-G	10-Sep-2019	11:45	na	Keratella	hiemalis	Rotifera	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.031	0.003
SFM3	1909100076-G	10-Sep-2019	11:45	na	Keratella	tropica	Rotifera	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.023	0.002
SFM3	1909100076-G	10-Sep-2019	11:45	na	Plationus	patulus	Rotifera	6.0	25	1178.10	290	3.0	0.08	4	0.328	0.043	0.014
SFM3	1909100076-G	10-Sep-2019	11:45	na	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	290	3.0	0.08	7	0.574	0.030	0.017
SFM3	1909100076-G	10-Sep-2019	11:45	na	Synchaeta	spp.	Rotifera	6.0	25	1178.10	290	3.0	0.08	25	2.051	0.019	0.040
SFM3	1909100076-G	10-Sep-2019	11:45	na	Testudinella	patina	Rotifera	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.035	0.003
SFM3	1909100076-G	10-Sep-2019	11:45	na	Trichocerca	similis	Rotifera	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.013	0.001
SFM3	1909100076-G	10-Sep-2019	11:45	na	Trichotria	spp.	Rotifera	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.062	0.005
SFM3	1909100076-G	10-Sep-2019	11:45	na	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	290	3.0	0.08	1	0.082	0.125	0.010
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Ceriodaphnia	spp.	Cladocera	6.0	25	1178.10	266	5.0	0.05	1	0.045	0.453	0.020
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	266	5.0	0.05	2	0.090	0.226	0.020
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	266	5.0	0.05	50	2.258	0.029	0.065
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	bdelloid		Rotifera	6.0	25	1178.10	266	5.0	0.05	3	0.135	0.014	0.002
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Brachionus	budapestinensis	Rotifera	6.0	25	1178.10	266	5.0	0.05	1	0.045	0.022	0.001
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Brachionus	caudatus	Rotifera	6.0	25	1178.10	266	5.0	0.05	1	0.045	0.022	0.001
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	266	5.0	0.05	1	0.045	0.014	0.001
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Filinia	longiseta	Rotifera	6.0	25	1178.10	266	5.0	0.05	2	0.090	0.024	0.002
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	266	5.0	0.05	10	0.452	0.003	0.001
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Lecane	spp.	Rotifera	6.0	25	1178.10	266	5.0	0.05	2	0.090	0.011	0.001
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Monostyla	bulla	Rotifera	6.0	25	1178.10	266	5.0	0.05	1	0.045	0.018	0.001
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Platyias	quadricornis	Rotifera	6.0	25	1178.10	266	5.0	0.05	1	0.045	0.022	0.001
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	266	5.0	0.05	3	0.135	0.015	0.002
GS2	1909100066-G	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	266	5.0	0.05	7	0.316	0.147	0.047
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	6.0	25	1178.10	265	15.0	0.01	3	0.045	0.641	0.029
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Camptocercus	spp.	Cladocera	6.0	25	1178.10	265	15.0	0.01	1	0.015	2.392	0.036
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Ceriodaphnia	spp.	Cladocera	6.0	25	1178.10	265	15.0	0.01	1	0.015	1.150	0.017
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Monospilus	dispar	Cladocera	6.0	25	1178.10	265	15.0	0.01	3	0.045	3.541	0.159
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	ostracod		Ostracoda	6.0	25	1178.10	265	15.0	0.01	14	0.210	0.077	0.016
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	265	15.0	0.01	10	0.150	0.275	0.041
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	265	15.0	0.01	126	1.889	0.083	0.156
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Asplanchna	spp.	Rotifera	6.0	25	1178.10	265	15.0	0.01	2	0.030	0.663	0.020
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	bdelloid		Rotifera	6.0	25	1178.10	265	15.0	0.01	10	0.150	0.192	0.029
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Brachionus	angularis	Rotifera	6.0	25	1178.10	265	15.0	0.01	1	0.015	0.009	0.000
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	265	15.0	0.01	6	0.090	0.062	0.006
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	265	15.0	0.01	30	0.450	0.008	0.004
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Keratella	cochlearis var. tecta	Rotifera	6.0	25	1178.10	265	15.0	0.01	1	0.015	0.001	0.000
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Keratella	crassa	Rotifera	6.0	25	1178.10	265	15.0	0.01	5	0.075	0.009	0.001
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	6.0	25	1178.10	265	15.0	0.01	2	0.030	0.007	0.000
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Keratella	tropica	Rotifera	6.0	25	1178.10	265	15.0	0.01	1	0.015	0.115	0.002
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Monostyla	bulla	Rotifera	6.0	25	1178.10	265	15.0	0.01	3	0.045	0.018	0.001
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Monostyla	lunaris	Rotifera	6.0	25	1178.10	265	15.0	0.01	1	0.015	0.005	0.000
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Plationus	patulus	Rotifera	6.0	25	1178.10	265	15.0	0.01	2	0.030	0.022	0.001
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	265	15.0	0.01	6	0.090	0.030	0.003
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Trichocerca	bicristata	Rotifera	6.0	25	1178.10	265	15.0	0.01	2	0.030	0.078	0.002
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Trichotria	tetractis	Rotifera	6.0	25	1178.10	265	15.0	0.01	1	0.015	0.029	0.000
GS2	1909100079-F	10-Sep-2019	11:52	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	265	15.0	0.01	20	0.300	0.049	0.015
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Alona	spp.	Cladocera	7.0	25	1374.45	280	9.0	0.02	1	0.023	0.125	0.003
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	7.0	25	1374.45	280	9.0	0.02	2	0.045	0.319	0.014
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Ceriodaphnia	spp.	Cladocera	7.0	25	1374.45	280	9.0	0.02	1	0.023	0.370	0.008
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Ilyocryptus	spp.	Cladocera	7.0	25	1374.45	280	9.0	0.02	1	0.023	0.004	0.000
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Monospilus	dispar	Cladocera	7.0	25	1374.45	280	9.0	0.02	1	0.023	1.281	0.029
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	ostracod		Ostracoda	7.0	25	1374.45	280	9.0	0.02	5	0.113	0.172	0.019
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	calanoid	copepodid	Copepoda	7.0	25	1374.45	280	9.0	0.02	5	0.113	0.904	0.102
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	7.0	25	1374.45	280	9.0	0.02	9	0.204	0.362	0.074
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Eucyclops	elegans	Copepoda	7.0	25	1374.45	280	9.0	0.02	1	0.023	4.021	0.091
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	nauplii		Copepoda	7.0	25	1374.45	280	9.0	0.02	178	4.029	0.046	0.185
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	bdelloid		Rotifera	7.0	25	1374.45	280	9.0	0.02	10	0.226	0.038	0.009
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Brachionus	havanaensis	Rotifera	7.0	25	1374.45	280	9.0	0.02	1	0.023	0.022	0.001
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Cephalodella	spp.	Rotifera	7.0	25	1374.45	280	9.0	0.02	4	0.091	0.007	0.001
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Conochilus	unicornis	Rotifera	7.0	25	1374.45	280	9.0	0.02	1	0.023	0.007	0.000
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	7.0	25	1374.45	280	9.0	0.02	7	0.158	0.130	0.021

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Kellicottia	longispina	Rotifera	7.0	25	1374.45	280	9.0	0.02	1	0.023	0.006	0.000
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	7.0	25	1374.45	280	9.0	0.02	2	0.045	0.009	0.000
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Keratella	crassa	Rotifera	7.0	25	1374.45	280	9.0	0.02	6	0.136	0.010	0.001
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Keratella	tropica	Rotifera	7.0	25	1374.45	280	9.0	0.02	2	0.045	0.096	0.004
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Lophocharis	spp.	Rotifera	7.0	25	1374.45	280	9.0	0.02	2	0.045	0.002	0.000
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Monostyla	lunaris	Rotifera	7.0	25	1374.45	280	9.0	0.02	2	0.045	0.014	0.001
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Plationus	patulus	Rotifera	7.0	25	1374.45	280	9.0	0.02	2	0.045	0.022	0.001
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Platyias	quadricornis	Rotifera	7.0	25	1374.45	280	9.0	0.02	1	0.023	0.013	0.000
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	7.0	25	1374.45	280	9.0	0.02	4	0.091	0.030	0.003
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	7.0	25	1374.45	280	9.0	0.02	3	0.068	0.004	0.000
NFM2	1909100071-G	10-Sep-2019	12:05	High algae and detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	7.0	25	1374.45	280	9.0	0.02	9	0.204	0.106	0.022
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Alona	guttata	Cladocera	6.0	25	1178.10	265	10.0	0.02	2	0.045	0.230	0.010
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Bosmina	longirostris	Cladocera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.486	0.011
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Ceriodaphnia	spp.	Cladocera	6.0	25	1178.10	265	10.0	0.02	2	0.045	1.150	0.052
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	ostracod		Ostracoda	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.385	0.009
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	265	10.0	0.02	3	0.067	1.085	0.073
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Microcyclops	rubellus	Copepoda	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.706	0.016
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	265	10.0	0.02	78	1.755	0.078	0.137
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	bdelloid		Rotifera	6.0	25	1178.10	265	10.0	0.02	18	0.405	0.105	0.042
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Brachionus	angularis	Rotifera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.035	0.001
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Brachionus	calyciflorus	Rotifera	6.0	25	1178.10	265	10.0	0.02	2	0.045	0.119	0.005
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Brachionus	caudatus	Rotifera	6.0	25	1178.10	265	10.0	0.02	2	0.045	0.013	0.001
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Conochilus	unicornis	Rotifera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.007	0.000
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	265	10.0	0.02	3	0.067	0.085	0.006
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Gastropus	stylifer	Rotifera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.037	0.001
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	265	10.0	0.02	22	0.495	0.007	0.004
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Lepadella	spp.	Rotifera	6.0	25	1178.10	265	10.0	0.02	2	0.045	0.011	0.000
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Ploesoma	truncatum	Rotifera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.014	0.000
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	265	10.0	0.02	12	0.270	0.035	0.009
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Synchaeta	spp.	Rotifera	6.0	25	1178.10	265	10.0	0.02	3	0.067	0.005	0.000
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Testudinella	spp.	Rotifera	6.0	25	1178.10	265	10.0	0.02	3	0.067	0.035	0.002
GS1	1909100065-G	10-Sep-2019	12:48	High silt. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	265	10.0	0.02	22	0.495	0.144	0.071
SFM2	1909100075-G	10-Sep-2019	13:00	na	Alona	spp.	Cladocera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.106	0.002
SFM2	1909100075-G	10-Sep-2019	13:00	na	Bosmina	longirostris	Cladocera	5.0	25	981.75	255	16.0	0.02	9	0.146	0.283	0.041
SFM2	1909100075-G	10-Sep-2019	13:00	na	Ceriodaphnia	spp.	Cladocera	5.0	25	981.75	255	16.0	0.02	1	0.016	2.643	0.043
SFM2	1909100075-G	10-Sep-2019	13:00	na	Diaphanosoma	brachyurum	Cladocera	5.0	25	981.75	255	16.0	0.02	3	0.049	0.455	0.022
SFM2	1909100075-G	10-Sep-2019	13:00	na	Monospilus	dispar	Cladocera	5.0	25	981.75	255	16.0	0.02	4	0.065	1.438	0.093
SFM2	1909100075-G	10-Sep-2019	13:00	na	ostracod		Ostracoda	5.0	25	981.75	255	16.0	0.02	15	0.244	0.068	0.017
SFM2	1909100075-G	10-Sep-2019	13:00	na	calanoid	copepodid	Copepoda	5.0	25	981.75	255	16.0	0.02	20	0.325	0.924	0.300
SFM2	1909100075-G	10-Sep-2019	13:00	na	cyclopoid	copepodid	Copepoda	5.0	25	981.75	255	16.0	0.02	16	0.260	0.377	0.098
SFM2	1909100075-G	10-Sep-2019	13:00	na	Microcyclops	spp.	Copepoda	5.0	25	981.75	255	16.0	0.02	1	0.016	0.706	0.011
SFM2	1909100075-G	10-Sep-2019	13:00	na	Pseudodiaptomus	forbesi	Copepoda	5.0	25	981.75	255	16.0	0.02	1	0.016	2.652	0.043
SFM2	1909100075-G	10-Sep-2019	13:00	na	nauplii		Copepoda	5.0	25	981.75	255	16.0	0.02	422	6.851	0.197	1.347
SFM2	1909100075-G	10-Sep-2019	13:00	na	bdelloid		Rotifera	5.0	25	981.75	255	16.0	0.02	3	0.049	0.095	0.005
SFM2	1909100075-G	10-Sep-2019	13:00	na	Brachionus	angularis	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.013	0.000
SFM2	1909100075-G	10-Sep-2019	13:00	na	Brachionus	budapestinensis	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.009	0.000
SFM2	1909100075-G	10-Sep-2019	13:00	na	Cephalodella	spp.	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.010	0.000
SFM2	1909100075-G	10-Sep-2019	13:00	na	Conochiloides	dossuarius	Rotifera	5.0	25	981.75	255	16.0	0.02	6	0.097	0.020	0.002
SFM2	1909100075-G	10-Sep-2019	13:00	na	Conochilus	unicornis	Rotifera	5.0	25	981.75	255	16.0	0.02	417	6.769	0.006	0.044
SFM2	1909100075-G	10-Sep-2019	13:00	na	Euchlanis	spp.	Rotifera	5.0	25	981.75	255	16.0	0.02	14	0.227	0.071	0.016
SFM2	1909100075-G	10-Sep-2019	13:00	na	Filinia	terminalis	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.030	0.000
SFM2	1909100075-G	10-Sep-2019	13:00	na	Keratella	cochlearis	Rotifera	5.0	25	981.75	255	16.0	0.02	37	0.601	0.005	0.003
SFM2	1909100075-G	10-Sep-2019	13:00	na	Keratella	crassa	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.010	0.000
SFM2	1909100075-G	10-Sep-2019	13:00	na	Keratella	earlinae	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.009	0.000
SFM2	1909100075-G	10-Sep-2019	13:00	na	Keratella	tropica	Rotifera	5.0	25	981.75	255	16.0	0.02	3	0.049	0.115	0.006
SFM2	1909100075-G	10-Sep-2019	13:00	na	Lecane	spp.	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.018	0.000
SFM2	1909100075-G	10-Sep-2019	13:00	na	Lepadella	spp.	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.011	0.000
SFM2	1909100075-G	10-Sep-2019	13:00	na	Monostyla	bulla	Rotifera	5.0	25	981.75	255	16.0	0.02	3	0.049	0.018	0.001
SFM2	1909100075-G	10-Sep-2019	13:00	na	Monostyla	lunaris	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.011	0.000
SFM2	1909100075-G	10-Sep-2019	13:00	na	Plationus	patulus	Rotifera	5.0	25	981.75	255	16.0	0.02	6	0.097	0.043	0.004
SFM2	1909100075-G	10-Sep-2019	13:00	na	Platyias	quadricornis	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.028	0.000
SFM2	1909100075-G	10-Sep-2019	13:00	na	Polyarthra	vulgaris	Rotifera	5.0	25	981.75	255	16.0	0.02	40	0.649	0.019	0.012
SFM2	1909100075-G	10-Sep-2019	13:00	na	Sinantherina	semibullata	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.163	0.003
SFM2	1909100075-G	10-Sep-2019	13:00	na	Synchaeta	spp.	Rotifera	5.0	25	981.75	255	16.0	0.02	1	0.016	0.014	0.000

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
SFM2	1909100075-G	10-Sep-2019	13:00	na	Trichocerca	spp.	Rotifera	5.0	25	981.75	255	16.0	0.02	6	0.097	0.056	0.005
SFM2	1909100075-G	10-Sep-2019	13:00	na	Bivalvia	veliger	Bivalvia	5.0	25	981.75	255	16.0	0.02	9	0.146	0.039	0.006
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Alona	spp.	Cladocera	6.5	25	1276.28	265	10.0	0.02	1	0.021	0.264	0.005
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	6.5	25	1276.28	265	10.0	0.02	3	0.062	0.397	0.025
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Diaphanosoma	brachyurum	Cladocera	6.5	25	1276.28	265	10.0	0.02	1	0.021	0.066	0.001
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Ilyocryptus	spp.	Cladocera	6.5	25	1276.28	265	10.0	0.02	1	0.021	0.043	0.001
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	ostracod		Ostracoda	6.5	25	1276.28	265	10.0	0.02	2	0.042	0.543	0.023
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.5	25	1276.28	265	10.0	0.02	2	0.042	0.226	0.009
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	nauplii		Copepoda	6.5	25	1276.28	265	10.0	0.02	132	2.741	0.034	0.094
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	bdelloid		Rotifera	6.5	25	1276.28	265	10.0	0.02	5	0.104	0.192	0.020
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Brachionus	angularis	Rotifera	6.5	25	1276.28	265	10.0	0.02	1	0.021	0.017	0.000
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Conochilus	unicornis	Rotifera	6.5	25	1276.28	265	10.0	0.02	3	0.062	0.009	0.001
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	6.5	25	1276.28	265	10.0	0.02	3	0.062	0.011	0.001
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Kellicottia	longispina	Rotifera	6.5	25	1276.28	265	10.0	0.02	1	0.021	0.007	0.000
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.5	25	1276.28	265	10.0	0.02	1	0.021	0.009	0.000
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Keratella	crassa	Rotifera	6.5	25	1276.28	265	10.0	0.02	1	0.021	0.009	0.000
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Keratella	tropica	Rotifera	6.5	25	1276.28	265	10.0	0.02	4	0.083	0.023	0.002
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Lecane	leontina	Rotifera	6.5	25	1276.28	265	10.0	0.02	1	0.021	0.062	0.001
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Lecane	mira	Rotifera	6.5	25	1276.28	265	10.0	0.02	1	0.021	0.018	0.000
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Plationus	patulus	Rotifera	6.5	25	1276.28	265	10.0	0.02	1	0.021	0.052	0.001
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.5	25	1276.28	265	10.0	0.02	2	0.042	0.022	0.001
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	6.5	25	1276.28	265	10.0	0.02	1	0.021	0.011	0.000
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Trichocerca	rattus	Rotifera	6.5	25	1276.28	265	10.0	0.02	4	0.083	0.046	0.004
NFM1	1909100070-G	10-Sep-2019	13:06	High silt and detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.5	25	1276.28	265	10.0	0.02	3	0.062	0.264	0.016
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	calanoid	copepodid	Copepoda	7.0	25	1374.45	260	3.0	0.06	2	0.126	1.770	0.223
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	cyclopoid	copepodid	Copepoda	7.0	25	1374.45	260	3.0	0.06	1	0.063	0.956	0.060
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	nauplii		Copepoda	7.0	25	1374.45	260	3.0	0.06	30	1.892	0.034	0.064
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	bdelloid		Rotifera	7.0	25	1374.45	260	3.0	0.06	4	0.252	0.047	0.012
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	Euchlanis	spp.	Rotifera	7.0	25	1374.45	260	3.0	0.06	3	0.189	0.044	0.008
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	Keratella	cochlearis	Rotifera	7.0	25	1374.45	260	3.0	0.06	6	0.378	0.007	0.003
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	Keratella	earlinae	Rotifera	7.0	25	1374.45	260	3.0	0.06	2	0.126	0.007	0.001
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	Lecane	leontina	Rotifera	7.0	25	1374.45	260	3.0	0.06	1	0.063	0.085	0.005
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	Lecane	spp.	Rotifera	7.0	25	1374.45	260	3.0	0.06	1	0.063	0.014	0.001
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	Monostyla	closterocerca	Rotifera	7.0	25	1374.45	260	3.0	0.06	1	0.063	0.005	0.000
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	Platyias	quadricornis	Rotifera	7.0	25	1374.45	260	3.0	0.06	1	0.063	0.022	0.001
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	7.0	25	1374.45	260	3.0	0.06	2	0.126	0.022	0.003
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	Synchaeta	spp.	Rotifera	7.0	25	1374.45	260	3.0	0.06	1	0.063	0.018	0.001
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	Testudinella	spp.	Rotifera	7.0	25	1374.45	260	3.0	0.06	1	0.063	0.035	0.002
SREM	1909100069-G	10-Sep-2019	14:14	High algae and silt. Unable to meet tally.	Bivalvia	veliger	Bivalvia	7.0	25	1374.45	260	3.0	0.06	3	0.189	0.106	0.020
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	3.5	25	687.23	250	20.0	0.02	4	0.073	3.863	0.281
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Diaphanosoma	brachyurum	Cladocera	3.5	25	687.23	250	20.0	0.02	3	0.055	0.133	0.007
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Sida	crystallina	Cladocera	3.5	25	687.23	250	20.0	0.02	1	0.018	4.940	0.090
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	ostracod		Ostracoda	3.5	25	687.23	250	20.0	0.02	4	0.073	0.049	0.004
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	calanoid	copepodid	Copepoda	3.5	25	687.23	250	20.0	0.02	2	0.036	1.108	0.040
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	3.5	25	687.23	250	20.0	0.02	6	0.109	0.680	0.074
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	nauplii		Copepoda	3.5	25	687.23	250	20.0	0.02	100	1.819	0.044	0.080
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Asplanchna	spp.	Rotifera	3.5	25	687.23	250	20.0	0.02	1	0.018	0.731	0.013
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	bdelloid		Rotifera	3.5	25	687.23	250	20.0	0.02	3	0.055	0.455	0.025
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Brachionus	angularis	Rotifera	3.5	25	687.23	250	20.0	0.02	1	0.018	0.009	0.000
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Brachionus	havanaensis	Rotifera	3.5	25	687.23	250	20.0	0.02	1	0.018	0.022	0.000
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Conochilus	unicornis	Rotifera	3.5	25	687.23	250	20.0	0.02	15	0.273	0.002	0.001
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	3.5	25	687.23	250	20.0	0.02	2	0.036	0.062	0.002
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Hexarthra	mira	Rotifera	3.5	25	687.23	250	20.0	0.02	1	0.018	0.024	0.000
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	3.5	25	687.23	250	20.0	0.02	9	0.164	0.005	0.001
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	3.5	25	687.23	250	20.0	0.02	4	0.073	0.009	0.001
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Keratella	tropica	Rotifera	3.5	25	687.23	250	20.0	0.02	2	0.036	0.031	0.001
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Lepadella	acuminata	Rotifera	3.5	25	687.23	250	20.0	0.02	1	0.018	0.008	0.000
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	3.5	25	687.23	250	20.0	0.02	10	0.182	0.022	0.004
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	3.5	25	687.23	250	20.0	0.02	2	0.036	0.005	0.000
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Trichocerca	spp.	Rotifera	3.5	25	687.23	250	20.0	0.02	1	0.018	0.028	0.001
SFM1	1909100074-G	10-Sep-2019	14:18	High silt and detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	3.5	25	687.23	250	20.0	0.02	4	0.073	0.073	0.005
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Bosmina	longirostris	Cladocera	6.0	25	1178.10	200	32.0	0.01	3	0.016	0.166	0.003

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Ceriodaphnia	sp.	Cladocera	6.0	25	1178.10	200	32.0	0.01	1	0.005	0.716	0.004
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Diaphanosoma	brachyurum	Cladocera	6.0	25	1178.10	200	32.0	0.01	2	0.011	0.252	0.003
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Ilyocryptus	spp.	Cladocera	6.0	25	1178.10	200	32.0	0.01	3	0.016	0.011	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	ostracod		Ostracoda	6.0	25	1178.10	200	32.0	0.01	8	0.042	0.434	0.018
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	calanoid	copepodid	Copepoda	6.0	25	1178.10	200	32.0	0.01	3	0.016	1.108	0.018
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	200	32.0	0.01	11	0.058	0.232	0.014
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Tropocyclops	prasinus	Copepoda	6.0	25	1178.10	200	32.0	0.01	1	0.005	0.876	0.005
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	nauplii		Copepoda	6.0	25	1178.10	200	32.0	0.01	250	1.326	0.049	0.065
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Asplanchna	spp.	Rotifera	6.0	25	1178.10	200	32.0	0.01	2	0.011	0.663	0.007
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	bdelloid		Rotifera	6.0	25	1178.10	200	32.0	0.01	4	0.021	0.018	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Brachionus	angularis	Rotifera	6.0	25	1178.10	200	32.0	0.01	1	0.005	0.028	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Brachionus	quadridentatus	Rotifera	6.0	25	1178.10	200	32.0	0.01	1	0.005	0.028	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Conochilus	unicornis	Rotifera	6.0	25	1178.10	200	32.0	0.01	13	0.069	0.007	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	200	32.0	0.01	3	0.016	0.085	0.001
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	200	32.0	0.01	21	0.111	0.004	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Keratella	crassa	Rotifera	6.0	25	1178.10	200	32.0	0.01	1	0.005	0.010	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Keratella	earlinae	Rotifera	6.0	25	1178.10	200	32.0	0.01	7	0.037	0.009	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Keratella	tropica	Rotifera	6.0	25	1178.10	200	32.0	0.01	7	0.037	0.188	0.007
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Lecane	crepida	Rotifera	6.0	25	1178.10	200	32.0	0.01	1	0.005	0.014	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Lophocharis	spp.	Rotifera	6.0	25	1178.10	200	32.0	0.01	1	0.005	0.017	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Monostyla	stenroosi	Rotifera	6.0	25	1178.10	200	32.0	0.01	1	0.005	0.014	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	200	32.0	0.01	20	0.106	0.030	0.003
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Testudinella	spp.	Rotifera	6.0	25	1178.10	200	32.0	0.01	1	0.005	0.035	0.000
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Trichocerca	bicristata	Rotifera	6.0	25	1178.10	200	32.0	0.01	2	0.011	0.161	0.002
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Trichocerca	spp.	Rotifera	6.0	25	1178.10	200	32.0	0.01	4	0.021	0.085	0.002
MOKEM	1909100078-G	10-Sep-2019	15:02	High detritus.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	200	32.0	0.01	1	0.005	0.147	0.001
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Alona	spp.	Cladocera	7.0	25	1374.45	255	23.0	0.01	2	0.016	0.172	0.003
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Bosmina	longirostris	Cladocera	7.0	25	1374.45	255	23.0	0.01	6	0.048	0.319	0.015
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Ilyocryptus	spp.	Cladocera	7.0	25	1374.45	255	23.0	0.01	1	0.008	0.003	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Leydigia	spp.	Cladocera	7.0	25	1374.45	255	23.0	0.01	1	0.008	1.778	0.014
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Monospilus	dispar	Cladocera	7.0	25	1374.45	255	23.0	0.01	1	0.008	0.676	0.005
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	ostracod		Ostracoda	7.0	25	1374.45	255	23.0	0.01	26	0.210	0.068	0.014
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	cyclopoid	copepodid	Copepoda	7.0	25	1374.45	255	23.0	0.01	19	0.153	0.355	0.054
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Microcyclops	spp.	Copepoda	7.0	25	1374.45	255	23.0	0.01	1	0.008	0.733	0.006
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	nauplii		Copepoda	7.0	25	1374.45	255	23.0	0.01	322	2.597	0.113	0.295
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Asplanchna	spp.	Rotifera	7.0	25	1374.45	255	23.0	0.01	2	0.016	0.196	0.003
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	bdelloid		Rotifera	7.0	25	1374.45	255	23.0	0.01	5	0.040	0.024	0.001
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Brachionus	angularis	Rotifera	7.0	25	1374.45	255	23.0	0.01	2	0.016	0.022	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Brachionus	caudatus	Rotifera	7.0	25	1374.45	255	23.0	0.01	1	0.008	0.013	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Brachionus	calyciflorus	Rotifera	7.0	25	1374.45	255	23.0	0.01	1	0.008	0.043	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Brachionus	havanaensis	Rotifera	7.0	25	1374.45	255	23.0	0.01	1	0.008	0.022	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Conochilus	unicornis	Rotifera	7.0	25	1374.45	255	23.0	0.01	3	0.024	0.006	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Euchlanis	spp.	Rotifera	7.0	25	1374.45	255	23.0	0.01	5	0.040	0.023	0.001
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Keratella	cochlearis	Rotifera	7.0	25	1374.45	255	23.0	0.01	3	0.024	0.007	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Keratella	crassa	Rotifera	7.0	25	1374.45	255	23.0	0.01	3	0.024	0.009	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Keratella	earlinae	Rotifera	7.0	25	1374.45	255	23.0	0.01	4	0.032	0.009	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Lophocharis	spp.	Rotifera	7.0	25	1374.45	255	23.0	0.01	1	0.008	0.006	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Monostyla	bulla	Rotifera	7.0	25	1374.45	255	23.0	0.01	2	0.016	0.018	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Plationus	patulus	Rotifera	7.0	25	1374.45	255	23.0	0.01	2	0.016	0.013	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Platyias	quadricornis	Rotifera	7.0	25	1374.45	255	23.0	0.01	1	0.008	0.043	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Polyarthra	vulgaris	Rotifera	7.0	25	1374.45	255	23.0	0.01	5	0.040	0.022	0.001
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Synchaeta	spp.	Rotifera	7.0	25	1374.45	255	23.0	0.01	7	0.056	0.018	0.001
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Trichocerca	bicristata	Rotifera	7.0	25	1374.45	255	23.0	0.01	2	0.016	0.046	0.001
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Trichotria	tetractis	Rotifera	7.0	25	1374.45	255	23.0	0.01	1	0.008	0.023	0.000
NFM4	1909110067-G	11-Sep-2019	9:05	High algae and detritus.	Bivalvia	veliger	Bivalvia	7.0	25	1374.45	255	23.0	0.01	13	0.105	0.060	0.006
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	Bosmina	longirostris	Cladocera	6.0	25	1178.10	94	3.0	0.03	1	0.027	1.270	0.034
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	Chydorus	sphaericus	Cladocera	6.0	25	1178.10	94	3.0	0.03	1	0.027	1.137	0.030
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	Diaphanosoma	brachyurum	Cladocera	6.0	25	1178.10	94	3.0	0.03	2	0.053	0.428	0.023
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	Simocephalus	spp.	Cladocera	6.0	25	1178.10	94	3.0	0.03	1	0.027	0.006	0.000
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	ostracod		Ostracoda	6.0	25	1178.10	94	3.0	0.03	5	0.133	0.049	0.006
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	calanoid	copepodid	Copepoda	6.0	25	1178.10	94	3.0	0.03	3	0.080	0.717	0.057
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	94	3.0	0.03	5	0.133	0.302	0.040
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	nauplii		Copepoda	6.0	25	1178.10	94	3.0	0.03	334	8.883	0.080	0.710
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	Brachionus	angularis	Rotifera	6.0	25	1178.10	94	3.0	0.03	1	0.027	0.017	0.000

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	Conochilus	unicornis	Rotifera	6.0	25	1178.10	94	3.0	0.03	40	1.064	0.008	0.009
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	94	3.0	0.03	35	0.931	0.006	0.006
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	Keratella	tropica	Rotifera	6.0	25	1178.10	94	3.0	0.03	6	0.160	0.115	0.018
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	94	3.0	0.03	2	0.053	0.022	0.001
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	Sinantherina	spp.	Rotifera	6.0	25	1178.10	94	3.0	0.03	1	0.027	0.015	0.000
SFM4	1909110071-G	11-Sep-2019	9:07	High detritus.	Trichocerca	bicristata	Rotifera	6.0	25	1178.10	94	3.0	0.03	1	0.027	0.071	0.002
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Diaphanosoma	brachyurum	Cladocera	6.0	25	1178.10	265	49.0	0.00	2	0.009	0.355	0.003
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Simocephalus	spp.	Cladocera	6.0	25	1178.10	265	49.0	0.00	1	0.005	0.550	0.003
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	265	49.0	0.00	23	0.106	0.304	0.032
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	harpacticoid		Copepoda	6.0	25	1178.10	265	49.0	0.00	1	0.005	0.091	0.000
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	265	49.0	0.00	207	0.950	0.048	0.046
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Brachionus	angularis	Rotifera	6.0	25	1178.10	265	49.0	0.00	3	0.014	0.013	0.000
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	265	49.0	0.00	1	0.005	0.062	0.000
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Kellicottia	longispina	Rotifera	6.0	25	1178.10	265	49.0	0.00	1	0.005	0.007	0.000
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	265	49.0	0.00	25	0.115	0.004	0.000
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Keratella	crassa	Rotifera	6.0	25	1178.10	265	49.0	0.00	4	0.018	0.009	0.000
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	6.0	25	1178.10	265	49.0	0.00	7	0.032	0.010	0.000
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Keratella	tropica	Rotifera	6.0	25	1178.10	265	49.0	0.00	3	0.014	0.052	0.001
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Lophocharis	spp.	Rotifera	6.0	25	1178.10	265	49.0	0.00	1	0.005	0.007	0.000
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Plationus	patulus	Rotifera	6.0	25	1178.10	265	49.0	0.00	1	0.005	0.028	0.000
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	265	49.0	0.00	12	0.055	0.076	0.004
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Sinantherina	semibullata	Rotifera	6.0	25	1178.10	265	49.0	0.00	7	0.032	0.044	0.001
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	6.0	25	1178.10	265	49.0	0.00	1	0.005	0.023	0.000
GS4	190911062-G	11-Sep-2019	10:13	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	265	49.0	0.00	1	0.005	0.060	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Alona	guttata	Cladocera	8.0	25	1570.80	358	50.0	0.00	1	0.005	0.434	0.002
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	8.0	25	1570.80	358	50.0	0.00	3	0.014	0.319	0.004
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Ceriodaphnia	sp.	Cladocera	8.0	25	1570.80	358	50.0	0.00	2	0.009	0.601	0.005
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Chydorus	sphaericus	Cladocera	8.0	25	1570.80	358	50.0	0.00	1	0.005	0.885	0.004
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Diaphanosoma	brachyurum	Cladocera	8.0	25	1570.80	358	50.0	0.00	1	0.005	0.091	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Ilyocryptus	spp.	Cladocera	8.0	25	1570.80	358	50.0	0.00	2	0.009	0.015	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Simocephalus	spp.	Cladocera	8.0	25	1570.80	358	50.0	0.00	1	0.005	0.235	0.001
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	ostracod		Ostracoda	8.0	25	1570.80	358	50.0	0.00	9	0.041	0.060	0.002
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	8.0	25	1570.80	358	50.0	0.00	29	0.132	0.755	0.100
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	harpacticoid		Copepoda	8.0	25	1570.80	358	50.0	0.00	1	0.005	0.567	0.003
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	nauplii		Copepoda	8.0	25	1570.80	358	50.0	0.00	261	1.190	0.073	0.087
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Brachionus	angularis	Rotifera	8.0	25	1570.80	358	50.0	0.00	3	0.014	0.013	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Brachionus	havanaensis	Rotifera	8.0	25	1570.80	358	50.0	0.00	2	0.009	0.022	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	8.0	25	1570.80	358	50.0	0.00	3	0.014	0.085	0.001
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	8.0	25	1570.80	358	50.0	0.00	3	0.014	0.003	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Keratella	crassa	Rotifera	8.0	25	1570.80	358	50.0	0.00	2	0.009	0.010	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	8.0	25	1570.80	358	50.0	0.00	6	0.027	0.009	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Keratella	tropica	Rotifera	8.0	25	1570.80	358	50.0	0.00	2	0.009	0.079	0.001
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Lecane	leontina	Rotifera	8.0	25	1570.80	358	50.0	0.00	2	0.009	0.044	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Lecane	ungulata	Rotifera	8.0	25	1570.80	358	50.0	0.00	1	0.005	0.029	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Monostyla	bulla	Rotifera	8.0	25	1570.80	358	50.0	0.00	1	0.005	0.023	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Trichocerca	multicrinis	Rotifera	8.0	25	1570.80	358	50.0	0.00	1	0.005	0.134	0.001
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Trichotria	spp.	Rotifera	8.0	25	1570.80	358	50.0	0.00	1	0.005	0.036	0.000
NFM3	1909110066-G	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	8.0	25	1570.80	358	50.0	0.00	7	0.032	0.172	0.005
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Alonella	excisa	Cladocera	8.0	25	1570.80	265	11.0	0.02	1	0.015	0.486	0.007
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	8.0	25	1570.80	265	11.0	0.02	1	0.015	0.698	0.011
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Ceriodaphnia	sp.	Cladocera	8.0	25	1570.80	265	11.0	0.02	1	0.015	0.370	0.006
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Chydorus	sphaericus	Cladocera	8.0	25	1570.80	265	11.0	0.02	1	0.015	1.992	0.031
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Ilyocryptus	spp.	Cladocera	8.0	25	1570.80	265	11.0	0.02	2	0.031	0.020	0.001
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Pleuroxus	denticulatus	Cladocera	8.0	25	1570.80	265	11.0	0.02	1	0.015	0.235	0.004
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	ostracod		Ostracoda	8.0	25	1570.80	265	11.0	0.02	10	0.153	0.061	0.009
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	calanoid	copepodid	Copepoda	8.0	25	1570.80	265	11.0	0.02	2	0.031	0.943	0.029
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	8.0	25	1570.80	265	11.0	0.02	15	0.230	0.751	0.173
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	nauplii		Copepoda	8.0	25	1570.80	265	11.0	0.02	172	2.638	0.099	0.261
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	bdelloid		Rotifera	8.0	25	1570.80	265	11.0	0.02	5	0.077	0.018	0.001
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Brachionus	caudatus	Rotifera	8.0	25	1570.80	265	11.0	0.02	2	0.031	0.022	0.001
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Brachionus	havanaensis	Rotifera	8.0	25	1570.80	265	11.0	0.02	1	0.015	0.017	0.000
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	8.0	25	1570.80	265	11.0	0.02	2	0.031	0.099	0.003
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Kellicottia	bostoniensis	Rotifera	8.0	25	1570.80	265	11.0	0.02	2	0.031	0.002	0.000

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	8.0	25	1570.80	265	11.0	0.02	4	0.061	0.009	0.001
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Keratella	crassa	Rotifera	8.0	25	1570.80	265	11.0	0.02	5	0.077	0.009	0.001
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	8.0	25	1570.80	265	11.0	0.02	6	0.092	0.007	0.001
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Plationus	patulus	Rotifera	8.0	25	1570.80	265	11.0	0.02	1	0.015	0.035	0.001
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	8.0	25	1570.80	265	11.0	0.02	2	0.031	0.030	0.001
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	8.0	25	1570.80	265	11.0	0.02	7	0.107	0.011	0.001
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Testudinella	spp.	Rotifera	8.0	25	1570.80	265	11.0	0.02	1	0.015	0.029	0.000
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Trichotria	tetractis	Rotifera	8.0	25	1570.80	265	11.0	0.02	1	0.015	0.036	0.001
NFM3	1909110073-E	11-Sep-2019	10:05	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	8.0	25	1570.80	265	11.0	0.02	21	0.322	0.061	0.020
SFM3	1909110070-G	11-Sep-2019	10:08	na	Bosmina	longirostris	Cladocera	6.0	25	1178.10	82	5.0	0.01	4	0.056	0.586	0.033
SFM3	1909110070-G	11-Sep-2019	10:08	na	Ilyocryptus	spp.	Cladocera	6.0	25	1178.10	82	5.0	0.01	1	0.014	0.255	0.004
SFM3	1909110070-G	11-Sep-2019	10:08	na	ostracod		Ostracoda	6.0	25	1178.10	82	5.0	0.01	5	0.070	0.106	0.007
SFM3	1909110070-G	11-Sep-2019	10:08	na	calanoid	copepodid	Copepoda	6.0	25	1178.10	82	5.0	0.01	4	0.056	4.258	0.237
SFM3	1909110070-G	11-Sep-2019	10:08	na	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	82	5.0	0.01	5	0.070	0.226	0.016
SFM3	1909110070-G	11-Sep-2019	10:08	na	Pseudodiaptomus	forbesi	Copepoda	6.0	25	1178.10	82	5.0	0.01	2	0.028	3.524	0.098
SFM3	1909110070-G	11-Sep-2019	10:08	na	nauplii		Copepoda	6.0	25	1178.10	82	5.0	0.01	251	3.494	0.045	0.157
SFM3	1909110070-G	11-Sep-2019	10:08	na	Asplanchna	spp.	Rotifera	6.0	25	1178.10	82	5.0	0.01	1	0.014	0.483	0.007
SFM3	1909110070-G	11-Sep-2019	10:08	na	bdelloid		Rotifera	6.0	25	1178.10	82	5.0	0.01	4	0.056	0.014	0.001
SFM3	1909110070-G	11-Sep-2019	10:08	na	Brachionus	angularis	Rotifera	6.0	25	1178.10	82	5.0	0.01	4	0.056	0.009	0.001
SFM3	1909110070-G	11-Sep-2019	10:08	na	Brachionus	calyciflorus	Rotifera	6.0	25	1178.10	82	5.0	0.01	1	0.014	0.035	0.000
SFM3	1909110070-G	11-Sep-2019	10:08	na	Conochiloides	dossuarius	Rotifera	6.0	25	1178.10	82	5.0	0.01	6	0.084	0.012	0.001
SFM3	1909110070-G	11-Sep-2019	10:08	na	Conochilus	unicornis	Rotifera	6.0	25	1178.10	82	5.0	0.01	77	1.072	0.007	0.008
SFM3	1909110070-G	11-Sep-2019	10:08	na	Euchlanis	spp.	Rotifera	6.0	25	1178.10	82	5.0	0.01	8	0.111	0.148	0.016
SFM3	1909110070-G	11-Sep-2019	10:08	na	Filinia	longiseta	Rotifera	6.0	25	1178.10	82	5.0	0.01	2	0.028	0.030	0.001
SFM3	1909110070-G	11-Sep-2019	10:08	na	Keratella	cochlearis	Rotifera	6.0	25	1178.10	82	5.0	0.01	17	0.237	0.003	0.001
SFM3	1909110070-G	11-Sep-2019	10:08	na	Keratella	tropica	Rotifera	6.0	25	1178.10	82	5.0	0.01	4	0.056	0.041	0.002
SFM3	1909110070-G	11-Sep-2019	10:08	na	Lecane	curvicornis	Rotifera	6.0	25	1178.10	82	5.0	0.01	3	0.042	0.018	0.001
SFM3	1909110070-G	11-Sep-2019	10:08	na	Lecane	spp.	Rotifera	6.0	25	1178.10	82	5.0	0.01	1	0.014	0.011	0.000
SFM3	1909110070-G	11-Sep-2019	10:08	na	Plationus	patulus	Rotifera	6.0	25	1178.10	82	5.0	0.01	2	0.028	0.063	0.002
SFM3	1909110070-G	11-Sep-2019	10:08	na	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	82	5.0	0.01	5	0.070	0.022	0.002
SFM3	1909110070-G	11-Sep-2019	10:08	na	Synchaeta	spp.	Rotifera	6.0	25	1178.10	82	5.0	0.01	10	0.139	0.011	0.001
SFM3	1909110070-G	11-Sep-2019	10:08	na	Testudinella	spp.	Rotifera	6.0	25	1178.10	82	5.0	0.01	1	0.014	0.019	0.000
SFM3	1909110070-G	11-Sep-2019	10:08	na	Trichocerca	rattus	Rotifera	6.0	25	1178.10	82	5.0	0.01	2	0.028	0.038	0.001
SFM3	1909110070-G	11-Sep-2019	10:08	na	Trichocerca	spp.	Rotifera	6.0	25	1178.10	82	5.0	0.01	1	0.014	0.012	0.000
SFM3	1909110070-G	11-Sep-2019	10:08	na	Trichotria	spp.	Rotifera	6.0	25	1178.10	82	5.0	0.01	1	0.014	0.073	0.001
SFM3	1909110070-G	11-Sep-2019	10:08	na	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	82	5.0	0.01	4	0.056	0.088	0.005
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Diaphanosoma	brachyurum	Cladocera	6.0	25	1178.10	255	6.0	0.04	1	0.036	0.511	0.018
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	255	6.0	0.04	8	0.289	0.838	0.242
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	255	6.0	0.04	60	2.165	0.056	0.121
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Conochilus	unicornis	Rotifera	6.0	25	1178.10	255	6.0	0.04	1	0.036	0.010	0.000
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	255	6.0	0.04	1	0.036	0.130	0.005
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	255	6.0	0.04	15	0.541	0.004	0.002
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Keratella	crassa	Rotifera	6.0	25	1178.10	255	6.0	0.04	1	0.036	0.010	0.000
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Keratella	lenzi	Rotifera	6.0	25	1178.10	255	6.0	0.04	1	0.036	0.041	0.001
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Keratella	tropica	Rotifera	6.0	25	1178.10	255	6.0	0.04	2	0.072	0.052	0.004
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Monostyla	bulla	Rotifera	6.0	25	1178.10	255	6.0	0.04	1	0.036	0.018	0.001
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Monostyla	stenroosi	Rotifera	6.0	25	1178.10	255	6.0	0.04	2	0.072	0.014	0.001
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	255	6.0	0.04	2	0.072	0.052	0.004
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Sinantherina	semibullata	Rotifera	6.0	25	1178.10	255	6.0	0.04	27	0.974	0.375	0.365
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	6.0	25	1178.10	255	6.0	0.04	1	0.036	0.011	0.000
GS3	1909110061-G	11-Sep-2019	10:36	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	255	6.0	0.04	10	0.361	0.125	0.045
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.535	0.012
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Ceriodaphnia	sp.	Cladocera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.500	0.011
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Pleuroxus	spp.	Cladocera	6.0	25	1178.10	265	10.0	0.02	1	0.022	1.283	0.029
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	ostracod		Ostracoda	6.0	25	1178.10	265	10.0	0.02	3	0.067	0.024	0.002
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	265	10.0	0.02	9	0.202	0.731	0.148
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	265	10.0	0.02	83	1.867	0.057	0.107
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Brachionus	calyciflorus	Rotifera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.035	0.001
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Conochilus	unicornis	Rotifera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.004	0.000
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.018	0.000
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Filinia	longiseta	Rotifera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.010	0.000
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Hexarthra	mira	Rotifera	6.0	25	1178.10	265	10.0	0.02	1	0.022	0.030	0.001
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	265	10.0	0.02	22	0.495	0.003	0.001

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	6.0	25	1178.10	265	10.0	0.02	2	0.045	0.005	0.000
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Lecane	spp.	Rotifera	6.0	25	1178.10	265	10.0	0.02	2	0.045	0.014	0.001
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	265	10.0	0.02	12	0.270	0.022	0.006
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	6.0	25	1178.10	265	10.0	0.02	4	0.090	0.004	0.000
GS2	1909110060-G	11-Sep-2019	11:00	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	265	10.0	0.02	5	0.112	0.106	0.012
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Diaphanosoma	brachyurum	Cladocera	6.0	25	1178.10	165	8.0	0.02	1	0.018	0.271	0.005
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Ilyocryptus	spp.	Cladocera	6.0	25	1178.10	165	8.0	0.02	4	0.070	0.002	0.000
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	ostracod		Ostracoda	6.0	25	1178.10	165	8.0	0.02	10	0.175	0.106	0.019
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	calanoid	copepodid	Copepoda	6.0	25	1178.10	165	8.0	0.02	1	0.018	1.108	0.019
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	165	8.0	0.02	7	0.123	1.019	0.125
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	harpacticoid		Copepoda	6.0	25	1178.10	165	8.0	0.02	1	0.018	0.032	0.001
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	165	8.0	0.02	40	0.700	0.054	0.038
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Asplanchna	spp.	Rotifera	6.0	25	1178.10	165	8.0	0.02	1	0.018	0.431	0.008
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	bdelloid		Rotifera	6.0	25	1178.10	165	8.0	0.02	5	0.088	0.057	0.005
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Brachionus	angularis	Rotifera	6.0	25	1178.10	165	8.0	0.02	1	0.018	0.009	0.000
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Brachionus	caudatus	Rotifera	6.0	25	1178.10	165	8.0	0.02	2	0.035	0.013	0.000
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Brachionus	quadridentatus	Rotifera	6.0	25	1178.10	165	8.0	0.02	1	0.018	0.017	0.000
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	165	8.0	0.02	4	0.070	0.073	0.005
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	165	8.0	0.02	2	0.035	0.005	0.000
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Keratella	tropica	Rotifera	6.0	25	1178.10	165	8.0	0.02	2	0.035	0.023	0.001
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Lecane	curvicornis	Rotifera	6.0	25	1178.10	165	8.0	0.02	2	0.035	0.018	0.001
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Plationus	patulus	Rotifera	6.0	25	1178.10	165	8.0	0.02	1	0.018	0.075	0.001
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	165	8.0	0.02	3	0.053	0.052	0.003
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Sinantherina	semibullata	Rotifera	6.0	25	1178.10	165	8.0	0.02	1	0.018	0.060	0.001
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	6.0	25	1178.10	165	8.0	0.02	3	0.053	0.005	0.000
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Trichocerca	rattus	Rotifera	6.0	25	1178.10	165	8.0	0.02	1	0.018	0.043	0.001
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Trichotria	spp.	Rotifera	6.0	25	1178.10	165	8.0	0.02	3	0.053	0.130	0.007
NFM2	1909110065-G	11-Sep-2019	11:14	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	165	8.0	0.02	15	0.263	0.147	0.039
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Alona	guttata	Cladocera	5.0	25	981.75	73	4.0	0.02	2	0.037	0.434	0.016
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	5.0	25	981.75	73	4.0	0.02	2	0.037	0.357	0.013
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Ceriodaphnia	spp.	Cladocera	5.0	25	981.75	73	4.0	0.02	2	0.037	0.916	0.034
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Chydorus	sphaericus	Cladocera	5.0	25	981.75	73	4.0	0.02	1	0.019	0.311	0.006
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Diaphanosoma	brachyurum	Cladocera	5.0	25	981.75	73	4.0	0.02	2	0.037	0.172	0.006
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Kurzia	latissima	Cladocera	5.0	25	981.75	73	4.0	0.02	1	0.019	10.521	0.196
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	ostracod		Ostracoda	5.0	25	981.75	73	4.0	0.02	7	0.130	0.341	0.044
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	calanoid	copepodid	Copepoda	5.0	25	981.75	73	4.0	0.02	1	0.019	0.488	0.009
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	5.0	25	981.75	73	4.0	0.02	8	0.149	0.465	0.069
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	nauplii		Copepoda	5.0	25	981.75	73	4.0	0.02	150	2.788	0.032	0.090
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	bdelloid		Rotifera	5.0	25	981.75	73	4.0	0.02	6	0.112	0.128	0.014
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Brachionus	havanaensis	Rotifera	5.0	25	981.75	73	4.0	0.02	1	0.019	0.013	0.000
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Conochiloides	dossuarius	Rotifera	5.0	25	981.75	73	4.0	0.02	1	0.019	0.022	0.000
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Conochilus	unicornis	Rotifera	5.0	25	981.75	73	4.0	0.02	4	0.074	0.016	0.001
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	5.0	25	981.75	73	4.0	0.02	10	0.186	0.114	0.021
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	5.0	25	981.75	73	4.0	0.02	7	0.130	0.002	0.000
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Keratella	crassa	Rotifera	5.0	25	981.75	73	4.0	0.02	1	0.019	0.004	0.000
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Keratella	tropica	Rotifera	5.0	25	981.75	73	4.0	0.02	2	0.037	0.031	0.001
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Lecane	curvicornis	Rotifera	5.0	25	981.75	73	4.0	0.02	2	0.037	0.029	0.001
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Lepadella	spp.	Rotifera	5.0	25	981.75	73	4.0	0.02	1	0.019	0.018	0.000
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	5.0	25	981.75	73	4.0	0.02	4	0.074	0.030	0.002
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	5.0	25	981.75	73	4.0	0.02	3	0.056	0.018	0.001
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Testudinella	spp.	Rotifera	5.0	25	981.75	73	4.0	0.02	1	0.019	0.035	0.001
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Trichocerca	rattus	Rotifera	5.0	25	981.75	73	4.0	0.02	2	0.037	0.019	0.001
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Trichocerca	similis	Rotifera	5.0	25	981.75	73	4.0	0.02	2	0.037	0.028	0.001
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Trichotria	spp.	Rotifera	5.0	25	981.75	73	4.0	0.02	1	0.019	0.130	0.002
SFM2	1909110069-G	11-Sep-2019	11:18	High algae and detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	5.0	25	981.75	73	4.0	0.02	7	0.130	0.073	0.010
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Alona	guttata	Cladocera	6.0	25	1178.10	255	12.0	0.02	3	0.054	0.543	0.029
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	ostracod		Ostracoda	6.0	25	1178.10	255	12.0	0.02	2	0.036	0.004	0.000
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Acanthocyclops	vernalis	Copepoda	6.0	25	1178.10	255	12.0	0.02	1	0.018	4.190	0.076
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	255	12.0	0.02	1	0.018	0.465	0.008
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	255	12.0	0.02	72	1.299	0.051	0.066
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	bdelloid		Rotifera	6.0	25	1178.10	255	12.0	0.02	3	0.054	0.024	0.001
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Brachionus	angularis	Rotifera	6.0	25	1178.10	255	12.0	0.02	1	0.018	0.017	0.000
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Brachionus	caudatus	Rotifera	6.0	25	1178.10	255	12.0	0.02	1	0.018	0.028	0.001

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Collotheca	spp.	Rotifera	6.0	25	1178.10	255	12.0	0.02	2	0.036	0.024	0.001
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Gastropus	stylifer	Rotifera	6.0	25	1178.10	255	12.0	0.02	1	0.018	0.016	0.000
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	255	12.0	0.02	13	0.234	0.004	0.001
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Keratella	cochlearis var. tecta	Rotifera	6.0	25	1178.10	255	12.0	0.02	1	0.018	0.002	0.000
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Keratella	tropica	Rotifera	6.0	25	1178.10	255	12.0	0.02	1	0.018	0.023	0.000
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Platyias	quadricornis	Rotifera	6.0	25	1178.10	255	12.0	0.02	1	0.018	0.035	0.001
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	255	12.0	0.02	13	0.234	0.028	0.006
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Synchaeta	spp.	Rotifera	6.0	25	1178.10	255	12.0	0.02	6	0.108	0.008	0.001
GS1	1909110059-G	11-Sep-2019	11:52	High detritus and silt. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	255	12.0	0.02	14	0.253	0.387	0.098
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Alona	spp.	Cladocera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.301	0.006
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Bosmina	longirostris	Cladocera	8.0	25	1570.80	260	9.0	0.02	4	0.074	0.220	0.016
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Chydorus	spp.	Cladocera	8.0	25	1570.80	260	9.0	0.02	1	0.018	2.207	0.041
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Ilyocryptus	spp.	Cladocera	8.0	25	1570.80	260	9.0	0.02	2	0.037	0.008	0.000
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Macrothrix	spp.	Cladocera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.002	0.000
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	ostracod		Ostracoda	8.0	25	1570.80	260	9.0	0.02	10	0.184	0.009	0.002
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	calanoid	copepodid	Copepoda	8.0	25	1570.80	260	9.0	0.02	3	0.055	1.194	0.066
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	cyclopoid	copepodid	Copepoda	8.0	25	1570.80	260	9.0	0.02	5	0.092	0.257	0.024
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	nauplii		Copepoda	8.0	25	1570.80	260	9.0	0.02	199	3.660	0.112	0.412
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	bdelloid		Rotifera	8.0	25	1570.80	260	9.0	0.02	4	0.074	0.024	0.002
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Brachionus	angularis	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.022	0.000
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Brachionus	calyciflorus	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.075	0.001
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Brachionus	caudatus	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.022	0.000
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Conochilus	unicornis	Rotifera	8.0	25	1570.80	260	9.0	0.02	11	0.202	0.007	0.001
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Euchlanis	spp.	Rotifera	8.0	25	1570.80	260	9.0	0.02	7	0.129	0.167	0.021
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Keratella	cochlearis	Rotifera	8.0	25	1570.80	260	9.0	0.02	4	0.074	0.038	0.003
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Keratella	crassa	Rotifera	8.0	25	1570.80	260	9.0	0.02	2	0.037	0.009	0.000
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Keratella	earlinae	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.006	0.000
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Keratella	tropica	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.064	0.001
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Lecane	leontina	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.062	0.001
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Lophocharis	spp.	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.004	0.000
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Monostyla	bulla	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.018	0.000
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Monostyla	cornuta	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.014	0.000
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Monostyla	stenroosi	Rotifera	8.0	25	1570.80	260	9.0	0.02	2	0.037	0.014	0.001
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Plationus	patulus	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.017	0.000
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Platyias	quadricornis	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.043	0.001
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Polyarthra	vulgaris	Rotifera	8.0	25	1570.80	260	9.0	0.02	3	0.055	0.015	0.001
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Sinantherina	semibullata	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.088	0.002
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Synchaeta	spp.	Rotifera	8.0	25	1570.80	260	9.0	0.02	5	0.092	0.014	0.001
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Trichocerca	bicristata	Rotifera	8.0	25	1570.80	260	9.0	0.02	1	0.018	0.067	0.001
NFM1	1909110064-G	11-Sep-2019	12:12	High algae and detritus.	Bivalvia	veliger	Bivalvia	8.0	25	1570.80	260	9.0	0.02	5	0.092	0.106	0.010
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Alona	spp.	Cladocera	3.5	25	687.23	62	2.8	0.03	1	0.032	0.147	0.005
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Bosmina	longirostris	Cladocera	3.5	25	687.23	62	2.8	0.03	2	0.064	0.535	0.034
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Chydorus	sphaericus	Cladocera	3.5	25	687.23	62	2.8	0.03	1	0.032	1.609	0.052
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Diaphanosoma	brachyurum	Cladocera	3.5	25	687.23	62	2.8	0.03	2	0.064	0.234	0.015
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Scapholeberis	spp.	Cladocera	3.5	25	687.23	62	2.8	0.03	1	0.032	0.465	0.015
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	ostracod		Ostracoda	3.5	25	687.23	62	2.8	0.03	2	0.064	0.018	0.001
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	calanoid	copepodid	Copepoda	3.5	25	687.23	62	2.8	0.03	3	0.097	0.790	0.076
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	nauplii		Copepoda	3.5	25	687.23	62	2.8	0.03	66	2.127	0.027	0.056
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Conochiloides	spp.	Rotifera	3.5	25	687.23	62	2.8	0.03	6	0.193	0.004	0.001
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Conochilus	unicornis	Rotifera	3.5	25	687.23	62	2.8	0.03	31	0.999	0.003	0.003
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Encentrum	spp.	Rotifera	3.5	25	687.23	62	2.8	0.03	4	0.129	0.081	0.010
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Euchlanis	spp.	Rotifera	3.5	25	687.23	62	2.8	0.03	2	0.064	0.029	0.002
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Filinia	longiseta	Rotifera	3.5	25	687.23	62	2.8	0.03	2	0.064	0.030	0.002
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Keratella	cochlearis	Rotifera	3.5	25	687.23	62	2.8	0.03	10	0.322	0.005	0.002
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Keratella	cochlearis var. tecta	Rotifera	3.5	25	687.23	62	2.8	0.03	1	0.032	0.004	0.000
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Keratella	earlinae	Rotifera	3.5	25	687.23	62	2.8	0.03	1	0.032	0.005	0.000
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Keratella	tropica	Rotifera	3.5	25	687.23	62	2.8	0.03	20	0.644	0.027	0.018
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Monostyla	bulla	Rotifera	3.5	25	687.23	62	2.8	0.03	1	0.032	0.014	0.000
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Monostyla	lunaris	Rotifera	3.5	25	687.23	62	2.8	0.03	1	0.032	0.014	0.000
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Platyias	quadricornis	Rotifera	3.5	25	687.23	62	2.8	0.03	1	0.032	0.063	0.002
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Ploesoma	truncatum	Rotifera	3.5	25	687.23	62	2.8	0.03	1	0.032	0.073	0.002
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	3.5	25	687.23	62	2.8	0.03	2	0.064	0.015	0.001
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Trichocerca	rattus	Rotifera	3.5	25	687.23	62	2.8	0.03	5	0.161	0.100	0.016
SFM1	1909110068-G	11-Sep-2019	12:13	High detritus and silt. Unable to meet tally.	Bivalvia	veliger	Bivalvia	3.5	25	687.23	62	2.8	0.03	1	0.032	0.264	0.008

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	7.0	25	1374.45	270	15.0	0.01	2	0.026	0.397	0.010
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	ostracod		Ostracoda	7.0	25	1374.45	270	15.0	0.01	1	0.013	0.543	0.007
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	calanoid	copepodid	Copepoda	7.0	25	1374.45	270	15.0	0.01	1	0.013	1.329	0.017
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	7.0	25	1374.45	270	15.0	0.01	6	0.079	0.838	0.066
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	nauplii		Copepoda	7.0	25	1374.45	270	15.0	0.01	77	1.008	0.033	0.033
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	bdelloid		Rotifera	7.0	25	1374.45	270	15.0	0.01	5	0.065	0.024	0.002
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	Brachionus	quadridentatus	Rotifera	7.0	25	1374.45	270	15.0	0.01	1	0.013	0.075	0.001
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	Cephalodella	spp.	Rotifera	7.0	25	1374.45	270	15.0	0.01	1	0.013	0.038	0.000
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	7.0	25	1374.45	270	15.0	0.01	18	0.236	0.005	0.001
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	Keratella	crassa	Rotifera	7.0	25	1374.45	270	15.0	0.01	1	0.013	0.006	0.000
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	7.0	25	1374.45	270	15.0	0.01	4	0.052	0.007	0.000
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	Lepadella	spp.	Rotifera	7.0	25	1374.45	270	15.0	0.01	2	0.026	0.008	0.000
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	Monostyla	bulla	Rotifera	7.0	25	1374.45	270	15.0	0.01	1	0.013	0.018	0.000
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	7.0	25	1374.45	270	15.0	0.01	4	0.052	0.030	0.002
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	7.0	25	1374.45	270	15.0	0.01	1	0.013	0.011	0.000
SREM	1909110063-G	11-Sep-2019	1:00	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	7.0	25	1374.45	270	15.0	0.01	16	0.210	0.081	0.017
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Bosmina	longirostris	Cladocera	6.0	25	1178.10	92	4.0	0.02	1	0.020	0.397	0.008
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Diaphanosoma	brachyurum	Cladocera	6.0	25	1178.10	92	4.0	0.02	2	0.039	0.172	0.007
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	calanoid	copepodid	Copepoda	6.0	25	1178.10	92	4.0	0.02	12	0.234	1.066	0.250
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	92	4.0	0.02	4	0.078	2.581	0.202
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	nauplii		Copepoda	6.0	25	1178.10	92	4.0	0.02	128	2.499	0.054	0.134
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Conochiloides	spp.	Rotifera	6.0	25	1178.10	92	4.0	0.02	1	0.020	0.018	0.000
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Conochilus	unicornis	Rotifera	6.0	25	1178.10	92	4.0	0.02	190	3.709	0.004	0.016
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Filinia	longiseta	Rotifera	6.0	25	1178.10	92	4.0	0.02	1	0.020	0.018	0.000
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	92	4.0	0.02	13	0.254	0.003	0.001
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Keratella	crassa	Rotifera	6.0	25	1178.10	92	4.0	0.02	2	0.039	0.009	0.000
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Keratella	earlinae	Rotifera	6.0	25	1178.10	92	4.0	0.02	3	0.059	0.010	0.001
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Keratella	tropica	Rotifera	6.0	25	1178.10	92	4.0	0.02	28	0.547	0.029	0.016
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Monostyla	lunaris	Rotifera	6.0	25	1178.10	92	4.0	0.02	2	0.039	0.011	0.000
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	92	4.0	0.02	15	0.293	0.015	0.004
MOKEM	1909110072-G	11-Sep-2019	12:58	High detritus.	Trichocerca	spp.	Rotifera	6.0	25	1178.10	92	4.0	0.02	1	0.020	0.032	0.001
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Bosmina	longirostris	Cladocera	7.5	25	1472.63	222	33.0	0.00	5	0.023	0.192	0.004
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Ceriodaphnia	sp.	Cladocera	7.5	25	1472.63	222	33.0	0.00	5	0.023	1.327	0.030
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Diaphanosoma	brachyurum	Cladocera	7.5	25	1472.63	222	33.0	0.00	1	0.005	0.511	0.002
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Ilyocryptus	spp.	Cladocera	7.5	25	1472.63	222	33.0	0.00	3	0.014	0.004	0.000
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	ostracod		Ostracoda	7.5	25	1472.63	222	33.0	0.00	15	0.069	0.049	0.003
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	cyclopoid	copepodid	Copepoda	7.5	25	1472.63	222	33.0	0.00	22	0.101	0.642	0.065
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Diacyclops	thomasi	Copepoda	7.5	25	1472.63	222	33.0	0.00	1	0.005	1.242	0.006
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	nauplii		Copepoda	7.5	25	1472.63	222	33.0	0.00	345	1.576	0.074	0.117
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Asplanchna	sp.	Rotifera	7.5	25	1472.63	222	33.0	0.00	1	0.005	0.143	0.001
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	bdelloid		Rotifera	7.5	25	1472.63	222	33.0	0.00	4	0.018	0.081	0.001
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Brachionus	angularis	Rotifera	7.5	25	1472.63	222	33.0	0.00	2	0.009	0.028	0.000
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Brachionus	calyciflorus	Rotifera	7.5	25	1472.63	222	33.0	0.00	2	0.009	0.200	0.002
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Euchlanis	spp.	Rotifera	7.5	25	1472.63	222	33.0	0.00	7	0.032	0.018	0.001
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Keratella	cochlearis	Rotifera	7.5	25	1472.63	222	33.0	0.00	7	0.032	0.007	0.000
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Keratella	crassa	Rotifera	7.5	25	1472.63	222	33.0	0.00	2	0.009	0.007	0.000
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Keratella	earlinae	Rotifera	7.5	25	1472.63	222	33.0	0.00	5	0.023	0.007	0.000
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Keratella	tropica	Rotifera	7.5	25	1472.63	222	33.0	0.00	2	0.009	0.096	0.001
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Lecane	ungulata	Rotifera	7.5	25	1472.63	222	33.0	0.00	2	0.009	0.029	0.000
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Monostyla	bulla	Rotifera	7.5	25	1472.63	222	33.0	0.00	1	0.005	0.023	0.000
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Monostyla	quadridentata	Rotifera	7.5	25	1472.63	222	33.0	0.00	1	0.005	0.036	0.000
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Plationus	patulus	Rotifera	7.5	25	1472.63	222	33.0	0.00	4	0.018	0.043	0.001
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Polyarthra	vulgaris	Rotifera	7.5	25	1472.63	222	33.0	0.00	5	0.023	0.030	0.001
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Synchaeta	spp.	Rotifera	7.5	25	1472.63	222	33.0	0.00	2	0.009	0.011	0.000
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Testudinella	spp.	Rotifera	7.5	25	1472.63	222	33.0	0.00	1	0.005	0.059	0.000
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Trichocerca	bicristata	Rotifera	7.5	25	1472.63	222	33.0	0.00	7	0.032	0.122	0.004
NFM4	1909120040-G	12-Sep-2019	9:10	High detritus.	Bivalvia	veliger	Bivalvia	7.5	25	1472.63	222	33.0	0.00	5	0.023	0.088	0.002
GS4	1909120035-G	12-Sep-2019	9:43	na	Bosmina	longirostris	Cladocera	6.0	25	1178.10	265	43.0	0.01	11	0.058	0.330	0.019
GS4	1909120035-G	12-Sep-2019	9:43	na	Ceriodaphnia	sp.	Cladocera	6.0	25	1178.10	265	43.0	0.01	1	0.005	0.266	0.001
GS4	1909120035-G	12-Sep-2019	9:43	na	Ilyocryptus	spp.	Cladocera	6.0	25	1178.10	265	43.0	0.01	4	0.021	0.006	0.000
GS4	1909120035-G	12-Sep-2019	9:43	na	ostracod		Ostracoda	6.0	25	1178.10	265	43.0	0.01	4	0.021	0.060	0.001
GS4	1909120035-G	12-Sep-2019	9:43	na	calanoid	copepodid	Copepoda	6.0	25	1178.10	265	43.0	0.01	2	0.010	1.108	0.012

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
GS4	1909120035-G	12-Sep-2019	9:43	na	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	265	43.0	0.01	25	0.131	0.549	0.072
GS4	1909120035-G	12-Sep-2019	9:43	na	nauplii		Copepoda	6.0	25	1178.10	265	43.0	0.01	300	1.569	0.072	0.112
GS4	1909120035-G	12-Sep-2019	9:43	na	bdelloid		Rotifera	6.0	25	1178.10	265	43.0	0.01	12	0.063	0.065	0.004
GS4	1909120035-G	12-Sep-2019	9:43	na	Brachionus	angularis	Rotifera	6.0	25	1178.10	265	43.0	0.01	1	0.005	0.013	0.000
GS4	1909120035-G	12-Sep-2019	9:43	na	Brachionus	quadridentatus f. brevispinus	Rotifera	6.0	25	1178.10	265	43.0	0.01	1	0.005	0.052	0.000
GS4	1909120035-G	12-Sep-2019	9:43	na	Euchlanis	spp.	Rotifera	6.0	25	1178.10	265	43.0	0.01	5	0.026	0.044	0.001
GS4	1909120035-G	12-Sep-2019	9:43	na	Filinia	longiseta	Rotifera	6.0	25	1178.10	265	43.0	0.01	1	0.005	0.024	0.000
GS4	1909120035-G	12-Sep-2019	9:43	na	Keratella	cochlearis	Rotifera	6.0	25	1178.10	265	43.0	0.01	35	0.183	0.004	0.001
GS4	1909120035-G	12-Sep-2019	9:43	na	Keratella	crassa	Rotifera	6.0	25	1178.10	265	43.0	0.01	5	0.026	0.007	0.000
GS4	1909120035-G	12-Sep-2019	9:43	na	Keratella	earlinae	Rotifera	6.0	25	1178.10	265	43.0	0.01	12	0.063	0.008	0.001
GS4	1909120035-G	12-Sep-2019	9:43	na	Keratella	tropica	Rotifera	6.0	25	1178.10	265	43.0	0.01	2	0.010	0.064	0.001
GS4	1909120035-G	12-Sep-2019	9:43	na	Lophocharis	spp.	Rotifera	6.0	25	1178.10	265	43.0	0.01	1	0.005	0.005	0.000
GS4	1909120035-G	12-Sep-2019	9:43	na	Monostyla	bulla	Rotifera	6.0	25	1178.10	265	43.0	0.01	1	0.005	0.018	0.000
GS4	1909120035-G	12-Sep-2019	9:43	na	Monostyla	closterocerca	Rotifera	6.0	25	1178.10	265	43.0	0.01	2	0.010	0.004	0.000
GS4	1909120035-G	12-Sep-2019	9:43	na	Monostyla	cornuta	Rotifera	6.0	25	1178.10	265	43.0	0.01	1	0.005	0.014	0.000
GS4	1909120035-G	12-Sep-2019	9:43	na	Platyias	quadricornis	Rotifera	6.0	25	1178.10	265	43.0	0.01	2	0.010	0.052	0.001
GS4	1909120035-G	12-Sep-2019	9:43	na	Ploesoma	truncatum	Rotifera	6.0	25	1178.10	265	43.0	0.01	4	0.021	0.073	0.002
GS4	1909120035-G	12-Sep-2019	9:43	na	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	265	43.0	0.01	7	0.037	0.015	0.001
GS4	1909120035-G	12-Sep-2019	9:43	na	Synchaeta	spp.	Rotifera	6.0	25	1178.10	265	43.0	0.01	13	0.068	0.007	0.000
GS4	1909120035-G	12-Sep-2019	9:43	na	Trichocerca	spp.	Rotifera	6.0	25	1178.10	265	43.0	0.01	3	0.016	0.021	0.000
GS4	1909120035-G	12-Sep-2019	9:43	na	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	265	43.0	0.01	13	0.068	0.152	0.010
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Bosmina	longirostris	Cladocera	7.0	25	1374.45	170	25.0	0.00	5	0.025	1.446	0.036
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Ceriodaphnia	sp.	Cladocera	7.0	25	1374.45	170	25.0	0.00	1	0.005	0.370	0.002
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Chydorus	sphaericus	Cladocera	7.0	25	1374.45	170	25.0	0.00	1	0.005	0.586	0.003
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Diaphanosoma	brachyurum	Cladocera	7.0	25	1374.45	170	25.0	0.00	5	0.025	0.110	0.003
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	ostracod		Ostracoda	7.0	25	1374.45	170	25.0	0.00	7	0.035	0.230	0.008
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	calanoid	copepodid	Copepoda	7.0	25	1374.45	170	25.0	0.00	4	0.020	0.983	0.019
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	cyclopoid	copepodid	Copepoda	7.0	25	1374.45	170	25.0	0.00	4	0.020	0.465	0.009
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	nauplii		Copepoda	7.0	25	1374.45	170	25.0	0.00	409	2.024	0.070	0.142
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Asplanchna	sp.	Rotifera	7.0	25	1374.45	170	25.0	0.00	2	0.010	0.196	0.002
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Brachionus	angularis	Rotifera	7.0	25	1374.45	170	25.0	0.00	4	0.020	0.017	0.000
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Colurella	spp.	Rotifera	7.0	25	1374.45	170	25.0	0.00	1	0.005	0.003	0.000
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Conochilus	unicornis	Rotifera	7.0	25	1374.45	170	25.0	0.00	12	0.059	0.006	0.000
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Euchlanis	spp.	Rotifera	7.0	25	1374.45	170	25.0	0.00	1	0.005	0.073	0.000
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Filinia	longiseta	Rotifera	7.0	25	1374.45	170	25.0	0.00	1	0.005	0.014	0.000
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Hexarthra	mira	Rotifera	7.0	25	1374.45	170	25.0	0.00	1	0.005	0.018	0.000
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Keratella	cochlearis	Rotifera	7.0	25	1374.45	170	25.0	0.00	58	0.287	0.005	0.002
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Keratella	tropica	Rotifera	7.0	25	1374.45	170	25.0	0.00	10	0.049	0.126	0.006
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Lecane	ungulata	Rotifera	7.0	25	1374.45	170	25.0	0.00	1	0.005	0.023	0.000
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Monostyla	bulla	Rotifera	7.0	25	1374.45	170	25.0	0.00	1	0.005	0.018	0.000
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Mytilina	spp.	Rotifera	7.0	25	1374.45	170	25.0	0.00	1	0.005	0.010	0.000
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Plationus	patulus	Rotifera	7.0	25	1374.45	170	25.0	0.00	1	0.005	0.022	0.000
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Polyarthra	vulgaris	Rotifera	7.0	25	1374.45	170	25.0	0.00	6	0.030	0.030	0.001
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Testudinella	spp.	Rotifera	7.0	25	1374.45	170	25.0	0.00	3	0.015	0.091	0.001
SFM4	1909120044-G	12-Sep-2019	10:03	High algae and detritus.	Bivalvia	veliger	Bivalvia	7.0	25	1374.45	170	25.0	0.00	1	0.005	0.147	0.001
SFM4	1909120046-E	12-Sep-2019	10:03	na	Alona	guttata	Cladocera	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.125	0.014
SFM4	1909120046-E	12-Sep-2019	10:03	na	Bosmina	longirostris	Cladocera	6.0	25	1178.10	270	2.0	0.11	2	0.229	0.142	0.033
SFM4	1909120046-E	12-Sep-2019	10:03	na	Chydorus	sphaericus	Cladocera	6.0	25	1178.10	270	2.0	0.11	1	0.115	1.137	0.130
SFM4	1909120046-E	12-Sep-2019	10:03	na	Ilyocryptus	spp.	Cladocera	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.088	0.010
SFM4	1909120046-E	12-Sep-2019	10:03	na	ostracod		Ostracoda	6.0	25	1178.10	270	2.0	0.11	6	0.688	0.106	0.073
SFM4	1909120046-E	12-Sep-2019	10:03	na	calanoid	copepodid	Copepoda	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.904	0.104
SFM4	1909120046-E	12-Sep-2019	10:03	na	nauplii		Copepoda	6.0	25	1178.10	270	2.0	0.11	345	39.534	0.034	1.352
SFM4	1909120046-E	12-Sep-2019	10:03	na	Asplanchna	spp.	Rotifera	6.0	25	1178.10	270	2.0	0.11	2	0.229	0.384	0.088
SFM4	1909120046-E	12-Sep-2019	10:03	na	bdelloid		Rotifera	6.0	25	1178.10	270	2.0	0.11	4	0.458	0.024	0.011
SFM4	1909120046-E	12-Sep-2019	10:03	na	Conochilus	unicornis	Rotifera	6.0	25	1178.10	270	2.0	0.11	59	6.761	0.005	0.034
SFM4	1909120046-E	12-Sep-2019	10:03	na	Euchlanis	spp.	Rotifera	6.0	25	1178.10	270	2.0	0.11	9	1.031	0.036	0.037
SFM4	1909120046-E	12-Sep-2019	10:03	na	Hexarthra	mira	Rotifera	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.024	0.003
SFM4	1909120046-E	12-Sep-2019	10:03	na	Keratella	cochlearis	Rotifera	6.0	25	1178.10	270	2.0	0.11	21	2.406	0.005	0.013
SFM4	1909120046-E	12-Sep-2019	10:03	na	Keratella	crassa	Rotifera	6.0	25	1178.10	270	2.0	0.11	3	0.344	0.007	0.002
SFM4	1909120046-E	12-Sep-2019	10:03	na	Keratella	lenzi	Rotifera	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.012	0.001
SFM4	1909120046-E	12-Sep-2019	10:03	na	Keratella	tropica	Rotifera	6.0	25	1178.10	270	2.0	0.11	4	0.458	0.052	0.024
SFM4	1909120046-E	12-Sep-2019	10:03	na	Lecane	curvicornis	Rotifera	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.036	0.004
SFM4	1909120046-E	12-Sep-2019	10:03	na	Lecane	leontina	Rotifera	6.0	25	1178.10	270	2.0	0.11	2	0.229	0.018	0.004
SFM4	1909120046-E	12-Sep-2019	10:03	na	Lepadella	spp.	Rotifera	6.0	25	1178.10	270	2.0	0.11	2	0.229	0.008	0.002

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
SFM4	1909120046-E	12-Sep-2019	10:03	na	Monostyla	bulla	Rotifera	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.036	0.004
SFM4	1909120046-E	12-Sep-2019	10:03	na	Plationus	patulus	Rotifera	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.052	0.006
SFM4	1909120046-E	12-Sep-2019	10:03	na	Ploesoma	truncatum	Rotifera	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.130	0.015
SFM4	1909120046-E	12-Sep-2019	10:03	na	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	270	2.0	0.11	6	0.688	0.030	0.021
SFM4	1909120046-E	12-Sep-2019	10:03	na	Testudinella	spp.	Rotifera	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.035	0.004
SFM4	1909120046-E	12-Sep-2019	10:03	na	Trichocerca	bicristata	Rotifera	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.022	0.003
SFM4	1909120046-E	12-Sep-2019	10:03	na	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	270	2.0	0.11	1	0.115	0.125	0.014
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Alona	spp.	Cladocera	6.0	25	1178.10	280	38.0	0.01	2	0.013	0.147	0.002
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Bosmina	longirostris	Cladocera	6.0	25	1178.10	280	38.0	0.01	1	0.006	0.698	0.004
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Ceriodaphnia	spp.	Cladocera	6.0	25	1178.10	280	38.0	0.01	1	0.006	1.150	0.007
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Ilyocryptus	spp.	Cladocera	6.0	25	1178.10	280	38.0	0.01	2	0.013	0.026	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Monospilus	dispar	Cladocera	6.0	25	1178.10	280	38.0	0.01	3	0.019	0.586	0.011
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	ostracod		Ostracoda	6.0	25	1178.10	280	38.0	0.01	4	0.025	0.106	0.003
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	calanoid	copepodid	Copepoda	6.0	25	1178.10	280	38.0	0.01	5	0.031	1.108	0.035
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	280	38.0	0.01	15	0.094	2.092	0.196
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Microcyclops	spp.	Copepoda	6.0	25	1178.10	280	38.0	0.01	1	0.006	0.625	0.004
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	nauplii		Copepoda	6.0	25	1178.10	280	38.0	0.01	267	1.670	0.035	0.058
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	bdelloid		Rotifera	6.0	25	1178.10	280	38.0	0.01	13	0.081	0.108	0.009
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Brachionus	quadridentatus f. brevispinus	Rotifera	6.0	25	1178.10	280	38.0	0.01	1	0.006	0.028	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Conochilus	unicornis	Rotifera	6.0	25	1178.10	280	38.0	0.01	1	0.006	0.006	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	280	38.0	0.01	9	0.056	0.085	0.005
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Kellicottia	bostoniensis	Rotifera	6.0	25	1178.10	280	38.0	0.01	1	0.006	0.002	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	280	38.0	0.01	36	0.225	0.003	0.001
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Keratella	crassa	Rotifera	6.0	25	1178.10	280	38.0	0.01	7	0.044	0.009	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Keratella	earlinae	Rotifera	6.0	25	1178.10	280	38.0	0.01	7	0.044	0.007	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Keratella	tropica	Rotifera	6.0	25	1178.10	280	38.0	0.01	2	0.013	0.052	0.001
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Lecane	curvicornis	Rotifera	6.0	25	1178.10	280	38.0	0.01	1	0.006	0.018	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Macrochaetus	spp.	Rotifera	6.0	25	1178.10	280	38.0	0.01	1	0.006	0.014	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Monostyla	bulla	Rotifera	6.0	25	1178.10	280	38.0	0.01	1	0.006	0.014	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Monostyla	closterocerca	Rotifera	6.0	25	1178.10	280	38.0	0.01	1	0.006	0.005	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Plationus	patulus	Rotifera	6.0	25	1178.10	280	38.0	0.01	2	0.013	0.028	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Platyias	quadricornis	Rotifera	6.0	25	1178.10	280	38.0	0.01	1	0.006	0.063	0.000
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	280	38.0	0.01	6	0.038	0.022	0.001
GS3	1909120034-G	12-Sep-2019	10:05	High algae and detritus.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	280	38.0	0.01	13	0.081	0.039	0.003
NFM3	1909120039-G	12-Sep-2019	10:05	na	Bosmina	longirostris	Cladocera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.958	0.011
NFM3	1909120039-G	12-Sep-2019	10:05	na	Ceriodaphnia	sp.	Cladocera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.846	0.010
NFM3	1909120039-G	12-Sep-2019	10:05	na	Diaphanosoma	brachyurum	Cladocera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.333	0.004
NFM3	1909120039-G	12-Sep-2019	10:05	na	Ilyocryptus	spp.	Cladocera	8.0	25	1570.80	130	7.0	0.01	2	0.024	0.006	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Kurzia	spp.	Cladocera	8.0	25	1570.80	130	7.0	0.01	2	0.024	2.749	0.065
NFM3	1909120039-G	12-Sep-2019	10:05	na	Monospilus	dispar	Cladocera	8.0	25	1570.80	130	7.0	0.01	3	0.035	1.438	0.051
NFM3	1909120039-G	12-Sep-2019	10:05	na	ostracod		Ostracoda	8.0	25	1570.80	130	7.0	0.01	16	0.189	0.093	0.018
NFM3	1909120039-G	12-Sep-2019	10:05	na	calanoid	copepodid	Copepoda	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.648	0.008
NFM3	1909120039-G	12-Sep-2019	10:05	na	cyclopoid	copepodid	Copepoda	8.0	25	1570.80	130	7.0	0.01	10	0.118	0.679	0.080
NFM3	1909120039-G	12-Sep-2019	10:05	na	nauplii		Copepoda	8.0	25	1570.80	130	7.0	0.01	185	2.187	0.123	0.269
NFM3	1909120039-G	12-Sep-2019	10:05	na	bdelloid		Rotifera	8.0	25	1570.80	130	7.0	0.01	4	0.047	0.095	0.005
NFM3	1909120039-G	12-Sep-2019	10:05	na	Brachionus	angularis	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.013	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Brachionus	havanaensis	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.017	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Euchlanis	spp.	Rotifera	8.0	25	1570.80	130	7.0	0.01	9	0.106	0.099	0.011
NFM3	1909120039-G	12-Sep-2019	10:05	na	Hexarthra	mira	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.010	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Kellicottia	bostoniensis	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.006	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Keratella	cochlearis	Rotifera	8.0	25	1570.80	130	7.0	0.01	2	0.024	0.009	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Keratella	crassa	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.009	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Keratella	earlinae	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.009	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Lecane	curvicornis	Rotifera	8.0	25	1570.80	130	7.0	0.01	2	0.024	0.023	0.001
NFM3	1909120039-G	12-Sep-2019	10:05	na	Lepadella	spp.	Rotifera	8.0	25	1570.80	130	7.0	0.01	2	0.024	0.008	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Monostyla	bulla	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.014	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Monostyla	stenroosi	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.011	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Plationus	patulus	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.028	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Polyarthra	major	Rotifera	8.0	25	1570.80	130	7.0	0.01	2	0.024	0.040	0.001
NFM3	1909120039-G	12-Sep-2019	10:05	na	Polyarthra	vulgaris	Rotifera	8.0	25	1570.80	130	7.0	0.01	5	0.059	0.022	0.001
NFM3	1909120039-G	12-Sep-2019	10:05	na	Sinantherina	semibullata	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.074	0.001
NFM3	1909120039-G	12-Sep-2019	10:05	na	Sinantherina	spp.	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.077	0.001
NFM3	1909120039-G	12-Sep-2019	10:05	na	Synchaeta	spp.	Rotifera	8.0	25	1570.80	130	7.0	0.01	2	0.024	0.018	0.000
NFM3	1909120039-G	12-Sep-2019	10:05	na	Wolga	spinifera	Rotifera	8.0	25	1570.80	130	7.0	0.01	1	0.012	0.014	0.000

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
NFM3	1909120039-G	12-Sep-2019	10:05	na	Bivalvia	veliger	Bivalvia	8.0	25	1570.80	130	7.0	0.01	9	0.106	0.060	0.006
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Alona	guttata	Cladocera	6.0	25	1178.10	270	13.0	0.02	1	0.018	0.434	0.008
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	ostracod		Ostracoda	6.0	25	1178.10	270	13.0	0.02	2	0.035	0.341	0.012
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	270	13.0	0.02	10	0.176	0.633	0.112
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	270	13.0	0.02	153	2.697	0.048	0.131
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Brachionus	bidentata	Rotifera	6.0	25	1178.10	270	13.0	0.02	1	0.018	0.088	0.002
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Brachionus	quadridentatus f. brevispinus	Rotifera	6.0	25	1178.10	270	13.0	0.02	1	0.018	0.177	0.003
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Conochilus	unicornis	Rotifera	6.0	25	1178.10	270	13.0	0.02	2	0.035	0.006	0.000
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	270	13.0	0.02	1	0.018	0.052	0.001
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Filinia	longiseta	Rotifera	6.0	25	1178.10	270	13.0	0.02	1	0.018	0.047	0.001
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	270	13.0	0.02	32	0.564	0.003	0.001
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Keratella	crassa	Rotifera	6.0	25	1178.10	270	13.0	0.02	2	0.035	0.012	0.000
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Keratella	tropica	Rotifera	6.0	25	1178.10	270	13.0	0.02	3	0.053	0.023	0.001
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Lecane	curvicornis	Rotifera	6.0	25	1178.10	270	13.0	0.02	2	0.035	0.018	0.001
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Lecane	leontina	Rotifera	6.0	25	1178.10	270	13.0	0.02	1	0.018	0.023	0.000
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Lepadella	spp.	Rotifera	6.0	25	1178.10	270	13.0	0.02	2	0.035	0.008	0.000
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Mytilina	spp.	Rotifera	6.0	25	1178.10	270	13.0	0.02	1	0.018	0.006	0.000
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Plationus	patulus	Rotifera	6.0	25	1178.10	270	13.0	0.02	1	0.018	0.052	0.001
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	270	13.0	0.02	16	0.282	0.052	0.015
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	6.0	25	1178.10	270	13.0	0.02	4	0.071	0.004	0.000
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Trichocerca	longiseta	Rotifera	6.0	25	1178.10	270	13.0	0.02	1	0.018	0.044	0.001
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Trichocerca	rattus	Rotifera	6.0	25	1178.10	270	13.0	0.02	3	0.053	0.063	0.003
GS2	1909120033-G	12-Sep-2019	10:55	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	270	13.0	0.02	7	0.123	0.264	0.033
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Alona	guttata	Cladocera	10.5	25	2061.68	225	8.0	0.01	3	0.041	0.172	0.007
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	10.5	25	2061.68	225	8.0	0.01	2	0.027	0.250	0.007
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Kurzia	latissima	Cladocera	10.5	25	2061.68	225	8.0	0.01	1	0.014	0.000	0.000
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Monospilus	dispar	Cladocera	10.5	25	2061.68	225	8.0	0.01	1	0.014	1.609	0.022
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Simocephalus	spp.	Cladocera	10.5	25	2061.68	225	8.0	0.01	1	0.014	0.319	0.004
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	ostracod		Ostracoda	10.5	25	2061.68	225	8.0	0.01	2	0.027	0.230	0.006
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	calanoid	copepodid	Copepoda	10.5	25	2061.68	225	8.0	0.01	1	0.014	1.239	0.017
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	10.5	25	2061.68	225	8.0	0.01	18	0.246	0.991	0.243
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Eucyclops	spp.	Copepoda	10.5	25	2061.68	225	8.0	0.01	1	0.014	2.122	0.029
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Skistodiaptomus	pallidus	Copepoda	10.5	25	2061.68	225	8.0	0.01	1	0.014	6.487	0.088
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	nauplii		Copepoda	10.5	25	2061.68	225	8.0	0.01	236	3.219	0.048	0.155
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Ascomorpha	ovalis	Rotifera	10.5	25	2061.68	225	8.0	0.01	1	0.014	0.013	0.000
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Asplanchna	sp.	Rotifera	10.5	25	2061.68	225	8.0	0.01	1	0.014	0.227	0.003
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	bdelloid		Rotifera	10.5	25	2061.68	225	8.0	0.01	3	0.041	0.038	0.002
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Brachionus	angularis	Rotifera	10.5	25	2061.68	225	8.0	0.01	2	0.027	0.022	0.001
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Brachionus	havanaensis	Rotifera	10.5	25	2061.68	225	8.0	0.01	1	0.014	0.028	0.000
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Conochilus	unicornis	Rotifera	10.5	25	2061.68	225	8.0	0.01	2	0.027	0.004	0.000
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	10.5	25	2061.68	225	8.0	0.01	3	0.041	0.085	0.003
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	10.5	25	2061.68	225	8.0	0.01	8	0.109	0.004	0.000
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Keratella	crassa	Rotifera	10.5	25	2061.68	225	8.0	0.01	3	0.041	0.007	0.000
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Plationus	patulus	Rotifera	10.5	25	2061.68	225	8.0	0.01	2	0.027	0.043	0.001
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	10.5	25	2061.68	225	8.0	0.01	1	0.014	0.015	0.000
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	10.5	25	2061.68	225	8.0	0.01	2	0.027	0.005	0.000
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Testudinella	spp.	Rotifera	10.5	25	2061.68	225	8.0	0.01	1	0.014	0.023	0.000
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Trichocerca	cylindrica	Rotifera	10.5	25	2061.68	225	8.0	0.01	1	0.014	0.036	0.000
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Trichotria	spp.	Rotifera	10.5	25	2061.68	225	8.0	0.01	1	0.014	0.052	0.001
NFM2	1909120038-G	12-Sep-2019	10:50	High algae and detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	10.5	25	2061.68	225	8.0	0.01	11	0.150	0.087	0.013
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Alona	guttata	Cladocera	6.0	25	1178.10	275	41.0	0.01	1	0.006	0.230	0.001
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	6.0	25	1178.10	275	41.0	0.01	2	0.011	0.889	0.010
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Diaphanosoma	brachyurum	Cladocera	6.0	25	1178.10	275	41.0	0.01	3	0.017	0.121	0.002
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Ilyocryptus	spp.	Cladocera	6.0	25	1178.10	275	41.0	0.01	2	0.011	4.880	0.056
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Acanthocyclops	vernalis	Copepoda	6.0	25	1178.10	275	41.0	0.01	1	0.006	3.542	0.020
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	275	41.0	0.01	14	0.080	0.310	0.025
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	nauplii		Copepoda	6.0	25	1178.10	275	41.0	0.01	195	1.110	0.048	0.054
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	bdelloid		Rotifera	6.0	25	1178.10	275	41.0	0.01	2	0.011	0.192	0.002
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Brachionus	angularis	Rotifera	6.0	25	1178.10	275	41.0	0.01	1	0.006	0.009	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Brachionus	calyciflorus	Rotifera	6.0	25	1178.10	275	41.0	0.01	1	0.006	0.052	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Brachionus	havanaensis	Rotifera	6.0	25	1178.10	275	41.0	0.01	1	0.006	0.013	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Conochilus	unicornis	Rotifera	6.0	25	1178.10	275	41.0	0.01	3	0.017	0.010	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	6.0	25	1178.10	275	41.0	0.01	1	0.006	0.062	0.000

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Kellicottia	bostoniensis	Rotifera	6.0	25	1178.10	275	41.0	0.01	1	0.006	0.004	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	6.0	25	1178.10	275	41.0	0.01	18	0.102	0.004	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Keratella	cochlearis var. tecta	Rotifera	6.0	25	1178.10	275	41.0	0.01	1	0.006	0.001	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Keratella	crassa	Rotifera	6.0	25	1178.10	275	41.0	0.01	4	0.023	0.007	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	6.0	25	1178.10	275	41.0	0.01	2	0.011	0.010	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Keratella	tropica	Rotifera	6.0	25	1178.10	275	41.0	0.01	5	0.028	0.064	0.002
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Lecane	papuana	Rotifera	6.0	25	1178.10	275	41.0	0.01	1	0.006	0.052	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Lecane	spp.	Rotifera	6.0	25	1178.10	275	41.0	0.01	2	0.011	0.004	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Monostyla	bulla	Rotifera	6.0	25	1178.10	275	41.0	0.01	2	0.011	0.018	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Platyias	quadricornis	Rotifera	6.0	25	1178.10	275	41.0	0.01	1	0.006	0.052	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	275	41.0	0.01	21	0.120	0.027	0.003
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Pompholyx	sulcata	Rotifera	6.0	25	1178.10	275	41.0	0.01	2	0.011	0.028	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	6.0	25	1178.10	275	41.0	0.01	2	0.011	0.014	0.000
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Trichocerca	bicristata	Rotifera	6.0	25	1178.10	275	41.0	0.01	1	0.006	0.111	0.001
GS1	1909120032-G	12-Sep-2019	11:30	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	275	41.0	0.01	7	0.040	0.125	0.005
SFM3	1909120043-G	12-Sep-2019	11:27	na	Alona	spp.	Cladocera	6.0	25	1178.10	66	8.0	0.01	1	0.007	0.543	0.004
SFM3	1909120043-G	12-Sep-2019	11:27	na	Bosmina	longirostris	Cladocera	6.0	25	1178.10	66	8.0	0.01	4	0.028	0.283	0.008
SFM3	1909120043-G	12-Sep-2019	11:27	na	Ceriodaphnia	spp.	Cladocera	6.0	25	1178.10	66	8.0	0.01	1	0.007	1.236	0.009
SFM3	1909120043-G	12-Sep-2019	11:27	na	Diaphanosoma	brachyurum	Cladocera	6.0	25	1178.10	66	8.0	0.01	1	0.007	0.234	0.002
SFM3	1909120043-G	12-Sep-2019	11:27	na	ostracod		Ostracoda	6.0	25	1178.10	66	8.0	0.01	14	0.098	0.037	0.004
SFM3	1909120043-G	12-Sep-2019	11:27	na	calanoid	copepodid	Copepoda	6.0	25	1178.10	66	8.0	0.01	2	0.014	1.822	0.026
SFM3	1909120043-G	12-Sep-2019	11:27	na	cyclopoid	copepodid	Copepoda	6.0	25	1178.10	66	8.0	0.01	4	0.028	0.067	0.002
SFM3	1909120043-G	12-Sep-2019	11:27	na	nauplii		Copepoda	6.0	25	1178.10	66	8.0	0.01	218	1.527	0.136	0.207
SFM3	1909120043-G	12-Sep-2019	11:27	na	Asplanchna	spp.	Rotifera	6.0	25	1178.10	66	8.0	0.01	11	0.077	0.469	0.036
SFM3	1909120043-G	12-Sep-2019	11:27	na	bdelloid		Rotifera	6.0	25	1178.10	66	8.0	0.01	15	0.105	0.039	0.004
SFM3	1909120043-G	12-Sep-2019	11:27	na	Brachionus	angularis	Rotifera	6.0	25	1178.10	66	8.0	0.01	2	0.014	0.017	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Brachionus	calyciflorus	Rotifera	6.0	25	1178.10	66	8.0	0.01	1	0.007	0.136	0.001
SFM3	1909120043-G	12-Sep-2019	11:27	na	Cephalodella	spp.	Rotifera	6.0	25	1178.10	66	8.0	0.01	1	0.007	0.030	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Collotheca	spp.	Rotifera	6.0	25	1178.10	66	8.0	0.01	1	0.007	0.012	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Conochilus	unicornis	Rotifera	6.0	25	1178.10	66	8.0	0.01	98	0.686	0.007	0.005
SFM3	1909120043-G	12-Sep-2019	11:27	na	Euchlanis	spp.	Rotifera	6.0	25	1178.10	66	8.0	0.01	7	0.049	0.044	0.002
SFM3	1909120043-G	12-Sep-2019	11:27	na	Filinia	longiseta	Rotifera	6.0	25	1178.10	66	8.0	0.01	1	0.007	0.007	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Hexarthra	mira	Rotifera	6.0	25	1178.10	66	8.0	0.01	2	0.014	0.007	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Keratella	cochlearis	Rotifera	6.0	25	1178.10	66	8.0	0.01	28	0.196	0.007	0.001
SFM3	1909120043-G	12-Sep-2019	11:27	na	Keratella	cochlearis var. tecta	Rotifera	6.0	25	1178.10	66	8.0	0.01	2	0.014	0.002	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Keratella	crassa	Rotifera	6.0	25	1178.10	66	8.0	0.01	2	0.014	0.005	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Keratella	earlinae	Rotifera	6.0	25	1178.10	66	8.0	0.01	1	0.007	0.009	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Keratella	tropica	Rotifera	6.0	25	1178.10	66	8.0	0.01	5	0.035	0.115	0.004
SFM3	1909120043-G	12-Sep-2019	11:27	na	Lecane	curvicornis	Rotifera	6.0	25	1178.10	66	8.0	0.01	1	0.007	0.029	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Lepadella	spp.	Rotifera	6.0	25	1178.10	66	8.0	0.01	2	0.014	0.008	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Monostyla	cornuta	Rotifera	6.0	25	1178.10	66	8.0	0.01	3	0.021	0.014	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Monostyla	stenroosi	Rotifera	6.0	25	1178.10	66	8.0	0.01	1	0.007	0.008	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Plationus	patulus	Rotifera	6.0	25	1178.10	66	8.0	0.01	2	0.014	0.052	0.001
SFM3	1909120043-G	12-Sep-2019	11:27	na	Polyarthra	vulgaris	Rotifera	6.0	25	1178.10	66	8.0	0.01	14	0.098	0.013	0.001
SFM3	1909120043-G	12-Sep-2019	11:27	na	Synchaeta	spp.	Rotifera	6.0	25	1178.10	66	8.0	0.01	13	0.091	0.004	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Testudinella	spp.	Rotifera	6.0	25	1178.10	66	8.0	0.01	3	0.021	0.029	0.001
SFM3	1909120043-G	12-Sep-2019	11:27	na	Trichocerca	bicristata	Rotifera	6.0	25	1178.10	66	8.0	0.01	4	0.028	0.139	0.004
SFM3	1909120043-G	12-Sep-2019	11:27	na	Trichocerca	porcellus	Rotifera	6.0	25	1178.10	66	8.0	0.01	3	0.021	0.017	0.000
SFM3	1909120043-G	12-Sep-2019	11:27	na	Bivalvia	veliger	Bivalvia	6.0	25	1178.10	66	8.0	0.01	3	0.021	0.060	0.001
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Alona	guttata	Cladocera	7.0	25	1374.45	200	5.0	0.03	2	0.058	0.385	0.022
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Ilyocryptus	spp.	Cladocera	7.0	25	1374.45	200	5.0	0.03	2	0.058	0.170	0.010
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Pleuroxus	denticulatus	Cladocera	7.0	25	1374.45	200	5.0	0.03	1	0.029	1.655	0.048
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Simocephalus	spp.	Cladocera	7.0	25	1374.45	200	5.0	0.03	1	0.029	0.319	0.009
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	ostracod		Ostracoda	7.0	25	1374.45	200	5.0	0.03	7	0.204	0.486	0.099
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Acanthocyclops	vernalis	Copepoda	7.0	25	1374.45	200	5.0	0.03	1	0.029	1.019	0.030
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	7.0	25	1374.45	200	5.0	0.03	14	0.407	0.839	0.342
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Eucyclops	spp.	Copepoda	7.0	25	1374.45	200	5.0	0.03	1	0.029	1.301	0.038
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	nauplii		Copepoda	7.0	25	1374.45	200	5.0	0.03	166	4.831	0.038	0.183
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	bdelloid		Rotifera	7.0	25	1374.45	200	5.0	0.03	2	0.058	0.014	0.001
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Brachionus	angularis	Rotifera	7.0	25	1374.45	200	5.0	0.03	1	0.029	0.007	0.000
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Brachionus	havanaensis	Rotifera	7.0	25	1374.45	200	5.0	0.03	2	0.058	0.013	0.001
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Conochilus	unicornis	Rotifera	7.0	25	1374.45	200	5.0	0.03	3	0.087	0.004	0.000
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	7.0	25	1374.45	200	5.0	0.03	4	0.116	0.023	0.003
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Kellicottia	bostoniensis	Rotifera	7.0	25	1374.45	200	5.0	0.03	1	0.029	0.003	0.000

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	7.0	25	1374.45	200	5.0	0.03	2	0.058	0.003	0.000
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Keratella	crassa	Rotifera	7.0	25	1374.45	200	5.0	0.03	1	0.029	0.009	0.000
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Keratella	tropica	Rotifera	7.0	25	1374.45	200	5.0	0.03	4	0.116	0.031	0.004
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Monostyla	bulla	Rotifera	7.0	25	1374.45	200	5.0	0.03	3	0.087	0.018	0.002
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Plationus	patulus	Rotifera	7.0	25	1374.45	200	5.0	0.03	2	0.058	0.043	0.003
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	7.0	25	1374.45	200	5.0	0.03	3	0.087	0.030	0.003
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Pompholyx	sulcata	Rotifera	7.0	25	1374.45	200	5.0	0.03	1	0.029	0.008	0.000
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Trichocerca	bicristata	Rotifera	7.0	25	1374.45	200	5.0	0.03	3	0.087	0.057	0.005
NFM1	1909120037-G	12-Sep-2019	11:45	High algae and detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	7.0	25	1374.45	200	5.0	0.03	6	0.175	0.147	0.026
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	5.0	25	981.75	83	11.0	0.01	2	0.015	0.535	0.008
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	ostracod		Ostracoda	5.0	25	981.75	83	11.0	0.01	8	0.061	0.088	0.005
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	5.0	25	981.75	83	11.0	0.01	7	0.054	2.581	0.139
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	nauplii		Copepoda	5.0	25	981.75	83	11.0	0.01	189	1.453	0.048	0.070
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	bdelloid		Rotifera	5.0	25	981.75	83	11.0	0.01	11	0.085	0.028	0.002
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Cephalodella	spp.	Rotifera	5.0	25	981.75	83	11.0	0.01	2	0.015	0.024	0.000
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Collotheca	spp.	Rotifera	5.0	25	981.75	83	11.0	0.01	1	0.008	0.012	0.000
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Conochilus	unicornis	Rotifera	5.0	25	981.75	83	11.0	0.01	21	0.161	0.003	0.000
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Euchlanis	spp.	Rotifera	5.0	25	981.75	83	11.0	0.01	11	0.085	0.077	0.006
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	5.0	25	981.75	83	11.0	0.01	7	0.054	0.004	0.000
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Keratella	crassa	Rotifera	5.0	25	981.75	83	11.0	0.01	5	0.038	0.010	0.000
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	5.0	25	981.75	83	11.0	0.01	7	0.054	0.006	0.000
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Keratella	tropica	Rotifera	5.0	25	981.75	83	11.0	0.01	4	0.031	0.041	0.001
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Lecane	spp.	Rotifera	5.0	25	981.75	83	11.0	0.01	1	0.008	0.023	0.000
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Lepadella	spp.	Rotifera	5.0	25	981.75	83	11.0	0.01	1	0.008	0.011	0.000
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Monostyla	lunaris	Rotifera	5.0	25	981.75	83	11.0	0.01	2	0.015	0.008	0.000
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	5.0	25	981.75	83	11.0	0.01	15	0.115	0.041	0.005
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	5.0	25	981.75	83	11.0	0.01	1	0.008	0.004	0.000
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Testudinella	spp.	Rotifera	5.0	25	981.75	83	11.0	0.01	2	0.015	0.019	0.000
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Trichocerca	bicristata	Rotifera	5.0	25	981.75	83	11.0	0.01	5	0.038	0.040	0.002
SFM2	1909120042-G	12-Sep-2019	12:14	High algae and detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	5.0	25	981.75	83	11.0	0.01	17	0.131	0.106	0.014
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Alona	guttata	Cladocera	7.0	25	1374.45	250	19.0	0.01	1	0.010	0.230	0.002
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Bosmina	longirostris	Cladocera	7.0	25	1374.45	250	19.0	0.01	1	0.010	0.250	0.002
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Ceriodaphnia	sp.	Cladocera	7.0	25	1374.45	250	19.0	0.01	1	0.010	0.601	0.006
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	ostracod		Ostracoda	7.0	25	1374.45	250	19.0	0.01	2	0.019	0.341	0.007
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	calanoid	copepodid	Copepoda	7.0	25	1374.45	250	19.0	0.01	1	0.010	0.904	0.009
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	cyclopoid	copepodid	Copepoda	7.0	25	1374.45	250	19.0	0.01	6	0.057	0.504	0.029
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Tropocyclops	prasinus	Copepoda	7.0	25	1374.45	250	19.0	0.01	1	0.010	0.847	0.008
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	nauplii		Copepoda	7.0	25	1374.45	250	19.0	0.01	100	0.957	0.062	0.059
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	bdelloid		Rotifera	7.0	25	1374.45	250	19.0	0.01	3	0.029	0.148	0.004
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Keratella	cochlearis	Rotifera	7.0	25	1374.45	250	19.0	0.01	14	0.134	0.007	0.001
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Keratella	earlinae	Rotifera	7.0	25	1374.45	250	19.0	0.01	1	0.010	0.010	0.000
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Keratella	tropica	Rotifera	7.0	25	1374.45	250	19.0	0.01	1	0.010	0.031	0.000
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Monommata	spp.	Rotifera	7.0	25	1374.45	250	19.0	0.01	1	0.010	0.014	0.000
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Plationus	patulus	Rotifera	7.0	25	1374.45	250	19.0	0.01	3	0.029	0.022	0.001
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Polyarthra	vulgaris	Rotifera	7.0	25	1374.45	250	19.0	0.01	8	0.077	0.040	0.003
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Synchaeta	spp.	Rotifera	7.0	25	1374.45	250	19.0	0.01	2	0.019	0.029	0.001
SREM	1909120036-G	12-Sep-2019	12:45	High detritus. Unable to meet tally.	Bivalvia	veliger	Bivalvia	7.0	25	1374.45	250	19.0	0.01	12	0.115	0.105	0.012
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Bosmina	longirostris	Cladocera	4.0	25	785.40	235	13.0	0.02	5	0.115	0.250	0.029
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Ceriodaphnia	sp.	Cladocera	4.0	25	785.40	235	13.0	0.02	1	0.023	0.410	0.009
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Chydorus	sphaericus	Cladocera	4.0	25	785.40	235	13.0	0.02	1	0.023	0.586	0.013
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Diaphanosoma	brachyurum	Cladocera	4.0	25	785.40	235	13.0	0.02	6	0.138	0.217	0.030
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Ilyocryptus	spp.	Cladocera	4.0	25	785.40	235	13.0	0.02	1	0.023	0.003	0.000
MOKEM	1909120045-G	12-Sep-2019	13:20	na	ostracod		Ostracoda	4.0	25	785.40	235	13.0	0.02	1	0.023	0.073	0.002
MOKEM	1909120045-G	12-Sep-2019	13:20	na	calanoid	copepodid	Copepoda	4.0	25	785.40	235	13.0	0.02	8	0.184	1.423	0.262
MOKEM	1909120045-G	12-Sep-2019	13:20	na	cyclopoid	copepodid	Copepoda	4.0	25	785.40	235	13.0	0.02	3	0.069	0.204	0.014
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Tropocyclops	prasinus	Copepoda	4.0	25	785.40	235	13.0	0.02	1	0.023	0.761	0.018
MOKEM	1909120045-G	12-Sep-2019	13:20	na	nauplii		Copepoda	4.0	25	785.40	235	13.0	0.02	146	3.360	0.087	0.291
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Conochilus	unicornis	Rotifera	4.0	25	785.40	235	13.0	0.02	286	6.583	0.006	0.040
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Euchlanis	spp.	Rotifera	4.0	25	785.40	235	13.0	0.02	3	0.069	0.036	0.002
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Filinia	longiseta	Rotifera	4.0	25	785.40	235	13.0	0.02	1	0.023	0.024	0.001
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Keratella	cochlearis	Rotifera	4.0	25	785.40	235	13.0	0.02	10	0.230	0.006	0.001
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Keratella	crassa	Rotifera	4.0	25	785.40	235	13.0	0.02	1	0.023	0.010	0.000
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Keratella	tropica	Rotifera	4.0	25	785.40	235	13.0	0.02	27	0.621	0.103	0.064

site	container ID	date	time	notes	genus	species	division	tow length (m)	net radius (cm)	tow volume filtered (L)	total sample volume (ml)	aliquot (ml)	count factor	#individuals counted	# / L	biomass factor	species biomass (µg d.w./L)
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Monostyla	closterocerca	Rotifera	4.0	25	785.40	235	13.0	0.02	1	0.023	0.004	0.000
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Monostyla	lunaris	Rotifera	4.0	25	785.40	235	13.0	0.02	2	0.046	0.014	0.001
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Plationus	patulus	Rotifera	4.0	25	785.40	235	13.0	0.02	2	0.046	0.013	0.001
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Platyias	quadricornis	Rotifera	4.0	25	785.40	235	13.0	0.02	2	0.046	0.052	0.002
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Polyarthra	vulgaris	Rotifera	4.0	25	785.40	235	13.0	0.02	15	0.345	0.035	0.012
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Trichocerca	bicristata	Rotifera	4.0	25	785.40	235	13.0	0.02	1	0.023	0.200	0.005
MOKEM	1909120045-G	12-Sep-2019	13:20	na	Bivalvia	veliger	Bivalvia	4.0	25	785.40	235	13.0	0.02	1	0.023	0.230	0.005
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	Bosmina	longirostris	Cladocera	3.5	25	687.23	64	5.0	0.02	2	0.037	0.440	0.016
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	ostracod		Ostracoda	3.5	25	687.23	64	5.0	0.02	2	0.037	0.039	0.001
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	calanoid	copepodid	Copepoda	3.5	25	687.23	64	5.0	0.02	1	0.019	0.790	0.015
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	cyclopoid	copepodid	Copepoda	3.5	25	687.23	64	5.0	0.02	1	0.019	0.078	0.001
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	nauplii		Copepoda	3.5	25	687.23	64	5.0	0.02	16	0.298	0.054	0.016
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	bdelloid		Rotifera	3.5	25	687.23	64	5.0	0.02	1	0.019	0.024	0.000
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	Keratella	cochlearis	Rotifera	3.5	25	687.23	64	5.0	0.02	1	0.019	0.004	0.000
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	Keratella	crassa	Rotifera	3.5	25	687.23	64	5.0	0.02	2	0.037	0.009	0.000
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	Keratella	earlinae	Rotifera	3.5	25	687.23	64	5.0	0.02	1	0.019	0.009	0.000
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	Keratella	tropica	Rotifera	3.5	25	687.23	64	5.0	0.02	2	0.037	0.079	0.003
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	Monostyla	bulla	Rotifera	3.5	25	687.23	64	5.0	0.02	1	0.019	0.014	0.000
SFM1	1909120041-D	12-Sep-2019	13:30	High detritus. Sample not preserved. Unable to meet tally.	Plationus	patulus	Rotifera	3.5	25	687.23	64	5.0	0.02	1	0.019	0.028	0.001

Appendix 9. Clam Biomass and Grazing Data Table

Mean values for *Corbicula fluminea*

Date	Station	Position	Biomass (g/m^2)	Density ($clams/m^2$)	Shell length (mm)	Grazing Rate (m pumped/day)	Water depth (m)	Turnover rate (water column/day)	Full turnover (days)
9/24/2019	SR1	West	3.829	94.9	14.8	0.331	7.2	0.046	21.7
9/24/2019	SR1	Middle	0.574	13.0	15.4	0.053	7.85	0.007	148.3
9/24/2019	SR1	East	9.297	222.4	14.8	0.760	7.15	0.106	9.4
9/24/2019	SR2	West	0.136	6.5	11.4	0.013	6.35	0.002	497.9
9/24/2019	SR2	Middle	0.102	6.6	10.4	0.010	7.85	0.001	815.1
9/24/2019	SR2	East	0.823	30.7	13.0	0.075	10.35	0.007	137.9
9/24/2019	SR3	West	3.478	169.9	11.3	0.300	6.05	0.050	20.2
9/24/2019	SR3	Middle	0.260	9.2	13.1	0.024	6.55	0.004	270.0
9/24/2019	SR3	East	2.702	65.2	15.2	0.238	8.55	0.028	36.0
9/24/2019	SREM	West	3.142	73.2	15.3	0.275	8.25	0.033	30.0
9/24/2019	SREM	Middle	1.050	31.1	14.2	0.095	7.8	0.012	81.9
9/24/2019	SREM	East	0.254	12.6	11.4	0.024	7.85	0.003	331.7
9/24/2019	GS1	West	2.463	57.1	15.6	0.217	6.2	0.035	28.5
9/24/2019	GS1	Middle	1.892	54.8	14.4	0.168	6.15	0.027	36.5
9/24/2019	GS1	East	3.885	113.6	14.2	0.334	6.4	0.052	19.1
9/24/2019	GS2	West	0.354	16.4	12.5	0.033	4.75	0.007	144.9
9/24/2019	GS2	Middle	5.862	272.8	12.4	0.484	6.45	0.075	13.3
9/24/2019	GS2	East	0.034	1.2	12.0	0.003	5.6	0.001	1758.8
9/24/2019	GS3	West	1.063	37.2	13.3	0.096	5.95	0.016	61.8
9/24/2019	GS3	Middle	1.466	53.6	13.0	0.131	6.1	0.022	46.4
9/24/2019	GS3	East	1.452	33.1	15.1	0.131	6.1	0.021	46.6
9/24/2019	GS4	West	3.308	103.6	13.7	0.287	7.1	0.040	24.7
9/24/2019	GS4	Middle	2.448	79.7	13.7	0.215	6.45	0.033	30.0
9/24/2019	GS4	East	0.554	20.7	13.2	0.051	6	0.008	117.8
9/25/2019	NFM1	West	0.879	10.2	19.1	0.081	5.75	0.014	71.2
9/25/2019	NFM1	Middle	1.050	10.6	20.1	0.096	8.1	0.012	84.1
9/25/2019	NFM1	East	1.824	11.7	23.8	0.165	8.35	0.020	50.5
9/25/2019	NFM2	West	0.236	5.6	15.6	0.022	5.2	0.004	236.1
9/25/2019	NFM2	Middle	0.009	0.2	17.4	0.001	9.6	0.000	11580.5
9/25/2019	NFM2	East	0.025	0.5	16.3	0.002	9.35	0.000	3865.2
9/25/2019	NFM3	West	1.511	11.0	23.3	0.137	6.55	0.021	47.7

Mean values for *Corbicula fluminea*

Date	Station	Position	Biomass (g/m^2)	Density ($clams/m^2$)	Shell length (mm)	Grazing Rate (m pumped/day)	Water depth (m)	Turnover rate (water column/day)	Full turnover (days)
9/25/2019	NFM3	Middle	1.083	9.8	20.9	0.099	8.7	0.011	87.6
9/25/2019	NFM3	East	0	0	NO CLAMS	NO CLAMS	7.2	NO CLAMS	NO CLAMS
9/25/2019	NFM4	West	2.850	35.8	18.9	0.253	6.6	0.038	26.1
9/25/2019	NFM4	Middle	0.377	10.4	14.2	0.035	6	0.006	171.2
9/25/2019	NFM4	East	0.068	1.0	18.6	0.006	4.05	0.002	634.2
9/25/2019	SFM1	West	0.201	7.9	12.4	0.019	2.45	0.008	130.1
9/25/2019	SFM1	Middle	0.372	11.0	12.9	0.035	2.45	0.014	70.8
9/25/2019	SFM1	East	0.086	7.1	9.5	0.008	2.65	0.003	326.2
9/25/2019	SFM2	West	1.277	27.3	14.6	0.116	3.45	0.034	29.7
9/25/2019	SFM2	Middle	0.764	16.8	14.7	0.070	3.45	0.020	49.1
9/25/2019	SFM2	East	0.335	5.5	16.2	0.031	3.1	0.010	99.1
9/25/2019	SFM3	West	0.967	25.5	14.5	0.088	3.5	0.025	39.7
9/25/2019	SFM3	Middle	0.916	14.5	17.0	0.084	3.1	0.027	36.9
9/25/2019	SFM3	East	2.539	39.8	17.0	0.226	3.5	0.065	15.5
9/25/2019	SFM4	West	8.464	70.3	21.3	0.716	5.8	0.123	8.1
9/25/2019	SFM4	Middle	12.289	116.3	20.0	1.011	9.1	0.111	9.0
9/25/2019	SFM4	East	1.041	12.4	18.4	0.095	5.7	0.017	59.7
9/25/2019	MOKEM	West	0.100	3.1	12.9	0.009	4.45	0.002	470.7
9/25/2019	MOKEM	Middle	0.670	10.3	16.1	0.062	3.95	0.016	63.8
9/25/2019	MOKEM	East	0.041	1.8	10.3	0.004	3.75	0.001	954.8