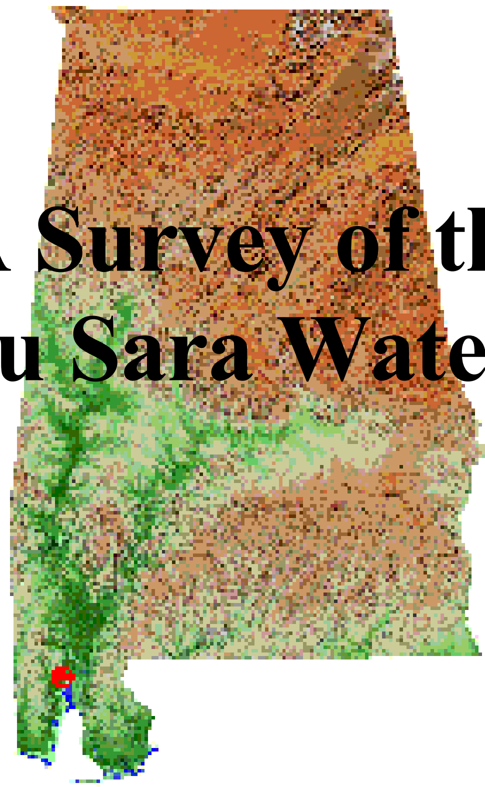
TECHNICAL REPORT

A Survey of the Bayou Sara Watershed



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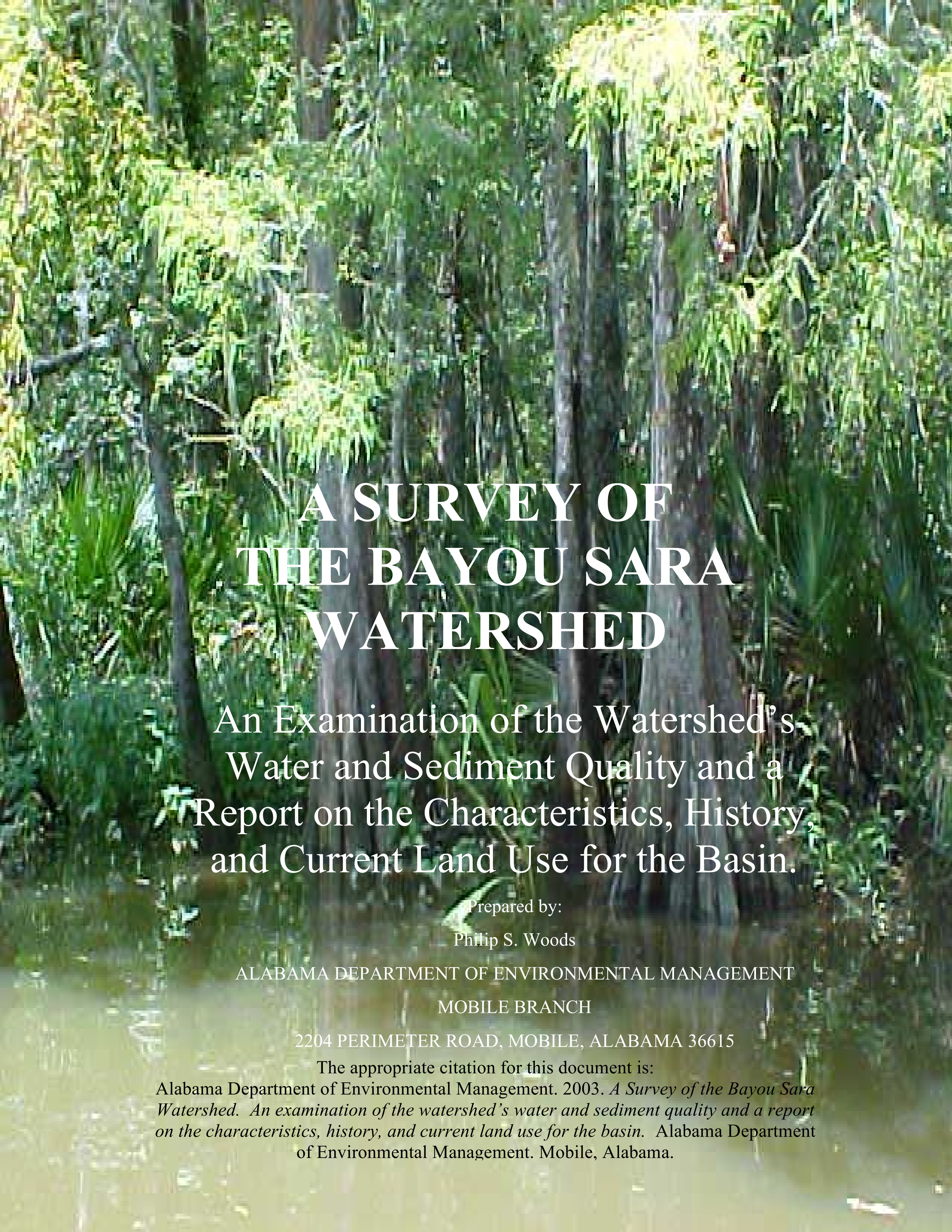
Mobile Branch
2204 Perimeter Road, Mobile, Alabama 36615



A SURVEY OF THE BAYOU SARA WATERSHED

An Examination of the Watershed's Water and Sediment Quality and a Report on the Characteristics, History, and Current Land Use for the Basin.

Prepared by:

Philip S. Woods

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

MOBILE BRANCH

2204 PERIMETER ROAD, MOBILE, ALABAMA 36615

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BAYOU SARA WATERSHED
HUC 03160204 030

EXECUTIVE SUMMARY

Starting in May, 2001, and continuing through September, 2002, the Mobile Branch of the Department's Field Operations Division conducted a survey of the Bayou Sara subwatershed. The Bayou Sara subwatershed, located in eastern Mobile County, is a contributor to the Mobile-Tensaw Delta watershed. The survey endeavored to assess water quality within the subwatershed, to identify stream segments impaired by pollution, to identify any potential sources of impairment, and, ultimately, to provide support and information for more effective implementation of pollution control strategies and NPS management practices. Analyses of the data collected in the field were coupled with the information garnered on established land use and demographic characteristics of the study area to target the specified objectives of the study.

The Bayou Sara subwatershed may be considered predominantly rural with centralized urban/industrial concentration. Those industries operating in the area either discharged their wastewaters outside the subwatershed, or discharged them to the sanitary sewer and, ultimately to the Saraland wastewater treatment plant, the subwatershed's largest NPDES discharger. Apart from litter and solid waste scattered about, field observations did not reveal any substantial impairment from pollution as might be anticipated in a more heavily populated, more industrialized area. A number of study stations did, on occasion, exhibit dissolved oxygen concentrations below the minimum required to maintain their respective water use classifications. Further, three of the study stations, on one occasion, exhibited fecal coliform bacteria concentrations in excess of the maximum allowed. And one station had, on one occasion, a water temperature in excess of the maximum allowed. Bayou Sara and Norton Creek appear on the Department's 2000 303(d) list of impaired streams because of excessive nutrient concentrations. Elevated concentrations of nutrients (ammonia, nitrates, nitrites, etc.) were not observed during this study. The majority of negative water quality indicators that were observed were encountered during and following rain events. These data may be attributed to non point source discharge via runoff, during and immediately following rain events. Continuous deployment of monitoring equipment revealed a diurnal cycle for dissolved oxygen levels, with the highest values occurring in the afternoon, and the lowest occurring in the predawn hours. These concentrations were found to be regularly deficient at some stations, especially deep in the water column of the tidally influenced stations at the easternmost edge of the subwatershed. Such low dissolved oxygen counts are not uncommon in larger water bodies, especially in those water bodies experiencing tidal influence. The depressed dissolved oxygen levels encountered near the source of Bayou Sara were observed at the study's first station, at the mouth of a swamp. Surface water within the subwatershed does not travel a significant vertical distance from origin to sea level. The subwatershed's highest elevation is less than three hundred feet above mean sea level. The average elevation for the study area was far less than one hundred feet above mean sea level. As a result of the topography, streams within the subwatershed generally moved far too slowly to facilitate the introduction of oxygen into the water through surface interaction. Apart from elevated levels of aluminum and iron at a handful of stations, no

substantial concentrations of metals were observed in either water or sediment. No pesticides were detected at any of the selected stations.

Apart from depressed dissolved oxygen concentrations along segments of the subwatershed, overall water quality may, from the results of this study, be characterized as satisfactory. Such a conclusion is based on average values for collected data acquired over a period when the area was experiencing less than normal rainfall amounts. Further, it must be observed that the study area's population is expected to increase. New construction of housing continues, especially along Celeste Road in the western portion of the subwatershed. Such growth will, most likely, contribute to habitat loss, stream modification, and water quality degradation as a result of increased pollutant pressure from impervious surface runoff, septic systems, and additional, miscellaneous stressors of residential congestion.

INTRODUCTION

The Bayou Sara subwatershed facing southeast from the Orvin fire tower south of Turnerville

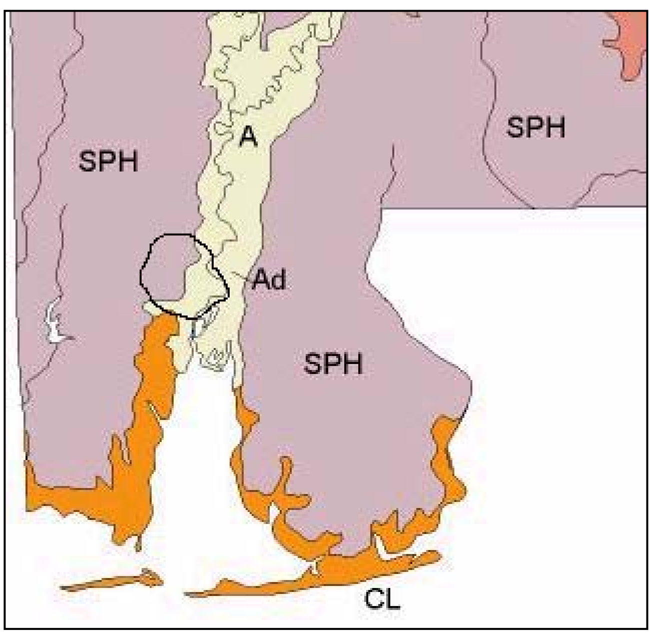
As water drains off the land, it can introduce an array of pollutants into the receiving stream. Recognizing this is important to effectively monitor and protect water resources. The Alabama Department of Environmental Management (ADEM) adopted the watershed assessment strategy in 1996 as an integrated, holistic strategy for more effectively restoring and protecting aquatic ecosystems by examining water resources and the land from which water drains to those resources (ADEM. 2000). By defining a geographical region's drainage pathways and focusing on the individual basins, the ADEM is provided an objective, targeted approach toward meaningful water quality monitoring, assessment, and implementation of control activities. Over the past decade, the ADEM has conducted watershed surveys in the coastal areas of Mobile and Baldwin counties as part of its "Water Quality and Natural Resource Monitoring Strategy for Coastal Alabama." These studies have included Dog River, Bon Secour River, Chickasaw Creek, and Little Lagoon. Each of the watershed studies attempts to define potential pollutant sources and explore potential avenues toward improving the water quality.

In 2001, the Mobile Soil and Water Conservation District identified the Bayou Sara subwatershed as a priority watershed for investigative study. The Bayou Sara subwatershed (HUC 03160204 030) is a subwatershed of the Mobile-Tensaw River Delta watershed (HUC 03160204). Beginning in May, 2001, and lasting through September, 2002, personnel from the Alabama Department of Environmental Management monitored the water quality of surface water within the Bayou Sara subwatershed and assessed the entire subwatershed in accordance with the protocols outlined in the ADEM Technical Report, *Methodology For Coastal Watershed Assessments* (2001).

Sampling stations within the subwatershed were chosen through topographic map review and field observation to represent a randomized cross section of the drainage area based upon the predominate land uses in the subwatershed. Initially, 15 stations were selected and named BSW 1 through BSW 15. BSW 1, and BSW 6 - BSW 8 were chosen to represent rural/agricultural land use segments. BSW 9 and BSW 2 - BSW 4 represented urban/industrial land use segments. BSW 10 through BSW 15 constituted the tidally influenced stations at the easternmost portion of the subwatershed. BSW 5 and BSW 9 proved to be intermittent streams and were omitted. Later in the study, as a result of the Department's investigation of the total maximum daily load estimates, four more stations were added. BSW 16, BSW 18 and BSW 19 were added as tidally influenced stations. BSW 21 was added as a flow measuring station. Of the tidally influenced stations, BSW 3, BSW 10, and BSW 19 represented urban/industrial land use. With the exception of BSW 21 (flow station), all the selected stations were monitored, at least monthly for dissolved oxygen, pH, salinity, conductivity, temperature, total suspended solids, total dissolved solids, turbidity, fecal coliform bacteria, ammonia, nitrates/nitrites, total Kjehldahl nitrogen, total phosphorous, and ortho phosphate. Selected stations were also sampled for metals concentrations in the water column and sediment, as well as oil and grease concentrations, PCB concentrations, and pesticide concentrations.

In presenting the water quality data derived from the study, stations are represented in groups and by individual station. Charts are used to facilitate comparison between stations. Average values recorded are an arithmetic mean of the total determinations made throughout the study period. These average values are, unless otherwise specified, inclusive of all monitored levels along the water column.

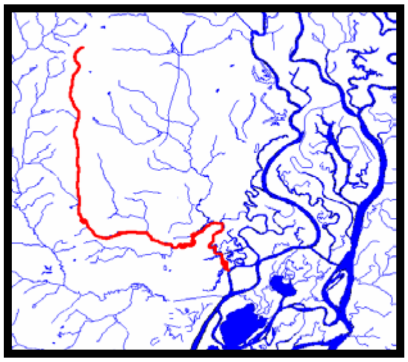
PHYSICAL CHARACTERISTICS



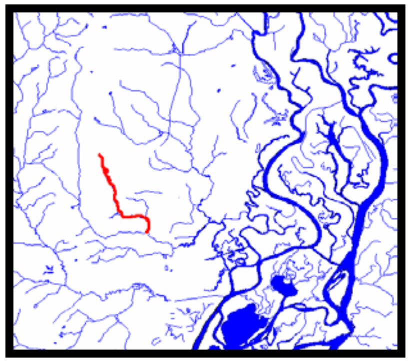
Mobile County is situated in the southwest corner of Alabama. The Bayou Sara subwatershed lies entirely within and along the eastern edge of Mobile County and comprises a total land area of greater than 65,000 acres. The physiographic regions represented in the Bayou Sara Subwatershed are the Southern Pine Hills (SPH), the Coastal Lowlands (CL), and the Alluvial-Deltic Plain (A, Ad). The Southern Pine Hills, located in the northwest portion of the subwatershed, are underlain by terrigenous sediments. The Coastal Lowlands run north to south through the central portion of the study area and are characterized by flat to gently undulating, locally swampy plains underlain by terrigenous deposits of Holocene and late Pleistocene age. The Alluvial-Deltic Plain demonstrates very little topographic relief and consists of alluvial and terrace deposits from rivers. It is located along the eastern edge of the subwatershed.

Originating in Turnerville, in the northwest corner of the subwatershed, west of Celeste Road, Bayou Sara flows due south and, in the lower reaches of the subwatershed, turns more easterly, winding its way to the Mobile River along the southeastern edge of the subwatershed. From its origin to its confluence with the Mobile River, Bayou Sara falls less than three hundred feet while traveling approximately 20 miles. This represents a vertical fall of about fifteen feet for every mile traveled.

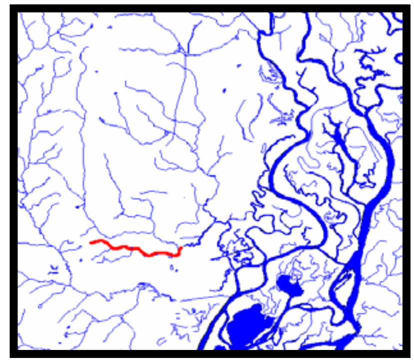
BAYOU SARA



HELLS SWAMP BRANCH

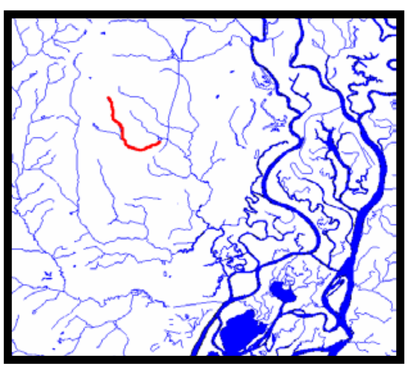


NORTON CREEK

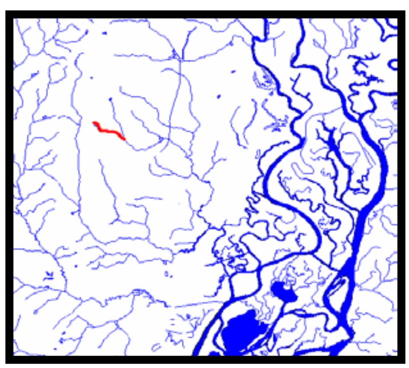


In the south central portion of the subwatershed, Bayou Sara is joined by the tributaries, Hells Swamp Branch and Norton Creek. Hells Swamp Branch originates in the western central portion of the subwatershed, east of Celeste Road, and flows south and east for approximately seven miles before joining with Bayou Sara, west of the Mackies community, in the south central portion of the subwatershed. Norton Creek originates in the southwestern portion of the subwatershed, south and west of Celeste Road, and, after flowing east for approximately four miles, empties into Bayou Sara, east of Saraland.

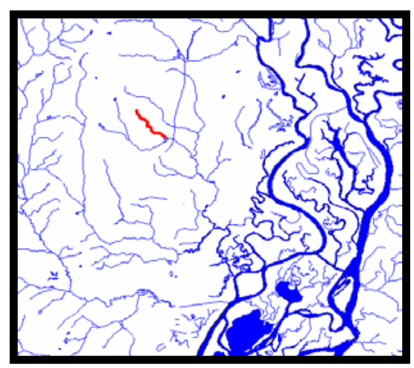
SAWMILL CREEK



ROCKY BRANCH



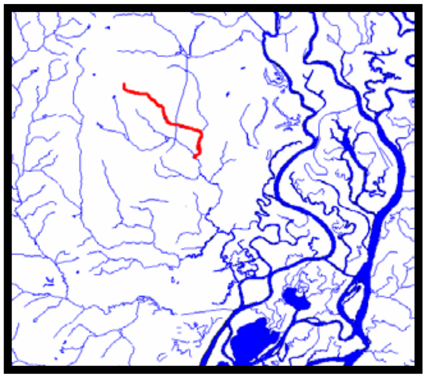
REEDY BRANCH



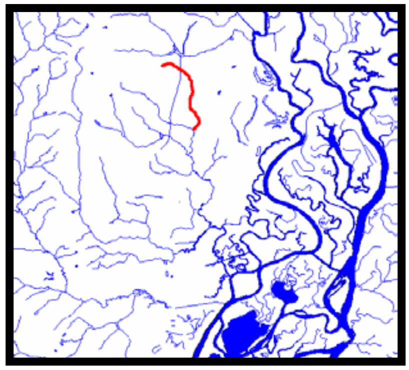
From the northern portion of the subwatershed flow a number of small tributaries, Sawmill Creek, Rocky Branch, Reedy Branch, Seymore Branch, and Turtle Branch. Sawmill Creek originates southeast of Turnerville, east of Celeste Road, and flows south and east for approximately six and a half miles before emptying into Hatters Pond. At about the three and a half mile mark from its origin, Sawmill Branch is joined by Rocky Branch. Rocky Branch originates in the northwestern portion of the subwatershed, also east of Celeste Road, and flows south and west for about two miles and empties into Sawmill Branch. Reedy Branch originates in the north central portion of the subwatershed and flows south and east to Hatters Pond, a distance of approximately two miles.

Seymore Branch originates north of the Reedy Branch origin and flows south and east for approximately five miles before being joined by Turtle Branch. After the confluence with Turtle Branch, Seymore Branch travels for a little more than one mile and empties into Gunnison Creek. Turtle Branch originates at the extreme north central edge of the subwatershed and flows south for approximately four miles to its confluence with Seymore Branch.

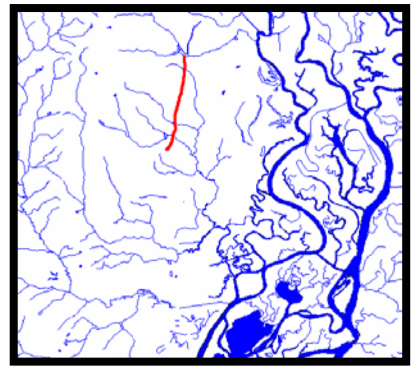
SEYMORE BRANCH



TURTLE BRANCH

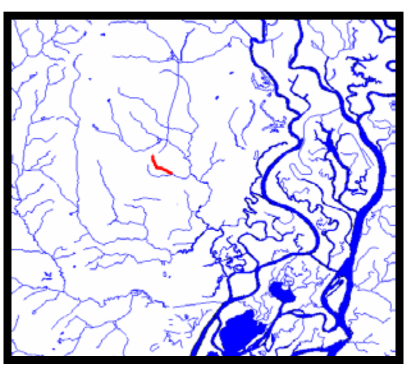


PIPELINE CANAL

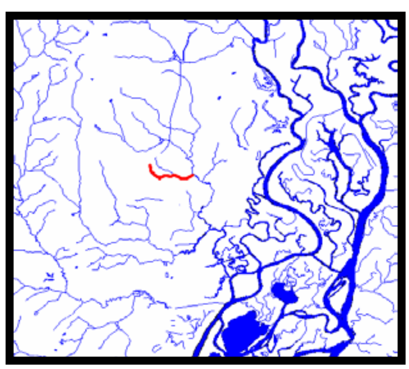


The Mobile County industrial pipeline entered the subwatershed in the north, central portion. It is a channelized stream running south to southwest for approximately eight miles. At its terminus, the canal empties into an underground pipe and travels southeast for approximately two miles to a 60 acre reservoir in Saraland. In the west central portion of the subwatershed, Indian Fork Branch originates and travels south and east approximately one mile before joining Hall Branch. From its confluence with Indian Fork Branch, Hall Branch travels north and east for about three miles and empties into Gunnison Creek. Gunnison Creek originates at Hatters Pond, in the north central portion of the subwatershed, and flows south and east for about a mile and a half before being joined by Seymore Branch. Less than a mile further downstream, Gunnison Creek is joined by Hall Branch. About two and a half miles further downstream, Gunnison Creek is fed by Steele Creek, which originates in the central portion of the subwatershed and flows south and east for about three miles before emptying into Gunnison Creek.

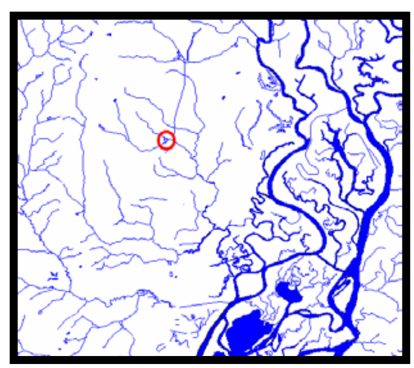
INDIAN FORK BRANCH



HALL BRANCH



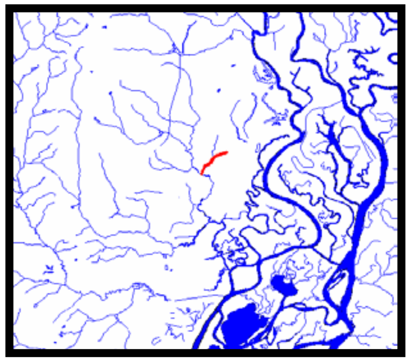
HATTERS POND



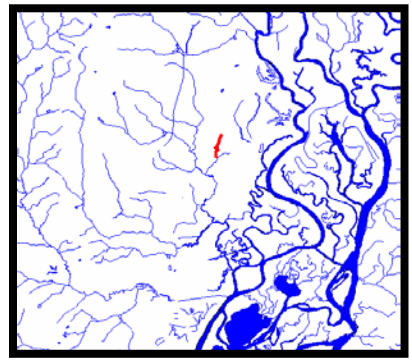
Cypress Pond Branch originates in the northeast central portion of the subwatershed, east of U.S. Highway 43 and travels a little over a mile south and empties into Harpers Branch. Harpers Branch originates about a half a mile east of its confluence with Cypress Pond Branch. From its confluence with Cypress Pond Branch, Harpers Branch flows approximately one mile southwest and empties into Gunnison Creek. From its origin at Hatters Pond to its confluence with Bayou Sara, Gunnison Creek travels approximately six miles and is the major surficial tributary to Bayou Sara.

GUNNISON CREEK

HARPERS BRANCH

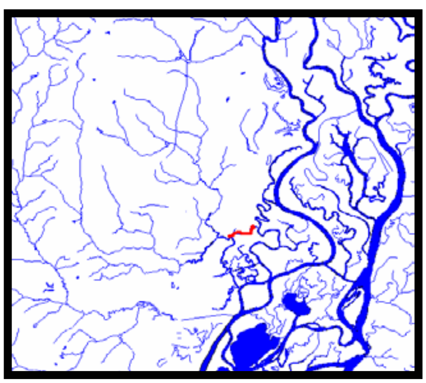


CYPRESS POND BRANCH

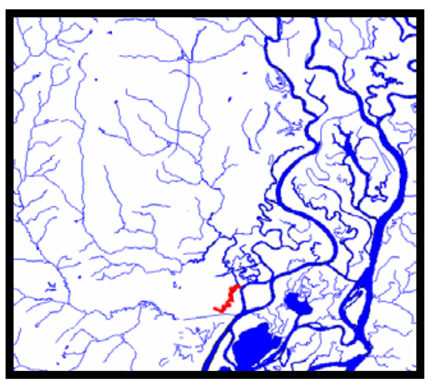


Approximately one half mile further downstream from its confluence with Gunnison Creek, Bayou Sara is joined by Little Catfish Bayou. This tributary originates in the coastal marshes lying between Bayou Sara and Big Bayou Canot, and travels a little over a mile from its origin to Bayou Sara. A little less than four miles further downstream, immediately before it empties into the Mobile River, Bayou Sara is joined by its final tributary, Black Creek. Black Creek originates in the extreme southwestern corner of the subwatershed and winds about a mile and a half to its confluence with Bayou Sara, less than one hundred feet upstream of the confluence of Bayou Sara and the Mobile River.

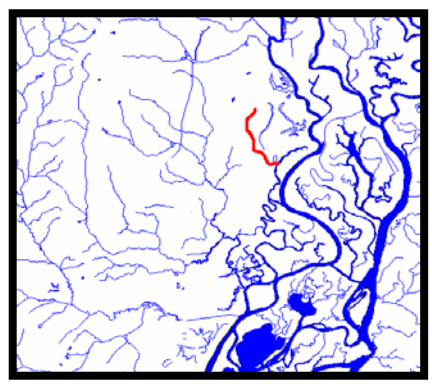
LITTLE CATFISH BAYOU



BLACK CREEK

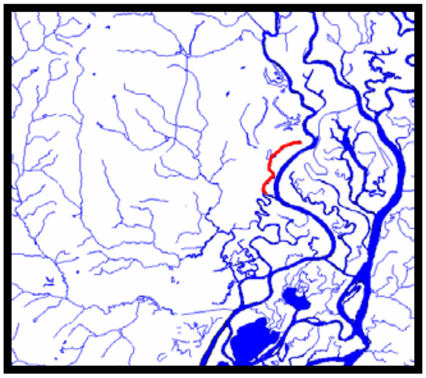


JIM BELL BRANCH

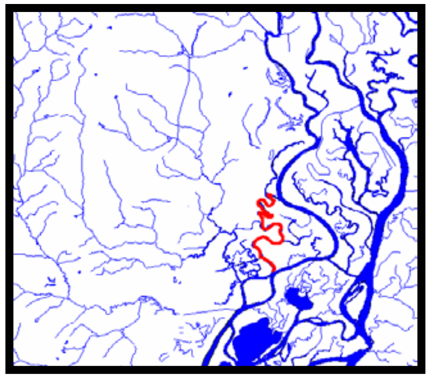


In the extreme northeastern portion of the subwatershed, Jim Bell Branch flows south and east for approximately two miles and empties into the coastal marshes surrounding Dead Lake. Dead Lake consists of a narrow body of water that runs south and west along an old river channel for approximately four miles before joining Big Bayou Canot and the Mobile River.

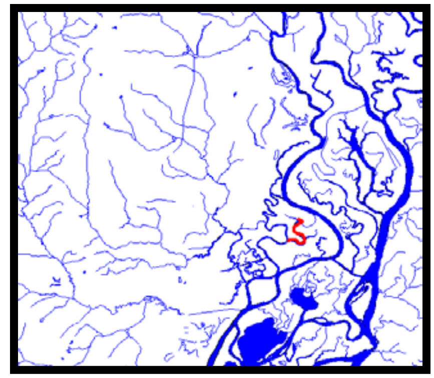
DEAD LAKE



BIG BAYOU CANOT

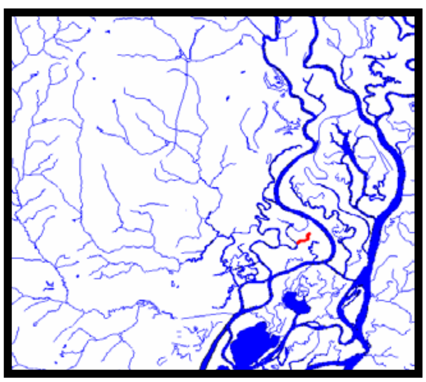


LITTLE BAYOU CANOT

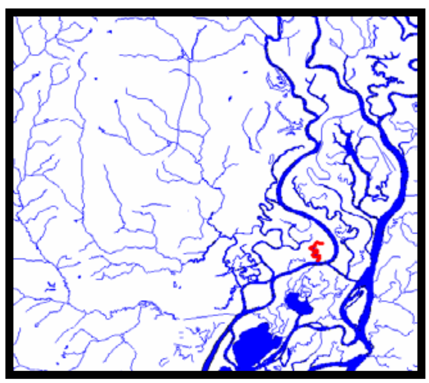


Big Bayou Canot originates along the eastern edge of the subwatershed and travels south and west for approximately four miles and empties into the Mobile River. From the island created by Big Bayou Canot and the Mobile River, Big Bayou Canot receives drainage from Franklin Bayou, Little Catfish Bayou, and Alligator Bayou. Catfish Bayou originates along the eastern edge of the subwatershed between Bayou Sara and Big Bayou Canot and travels approximately two miles south and empties into the Mobile River.

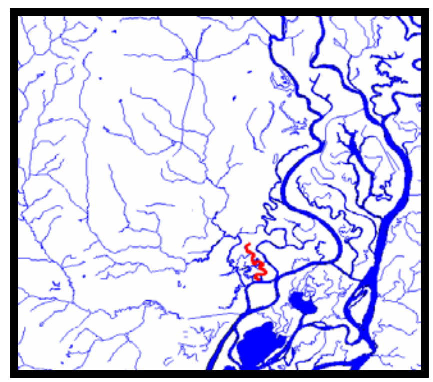
FRANKLIN BAYOU



ALLIGATOR BAYOU

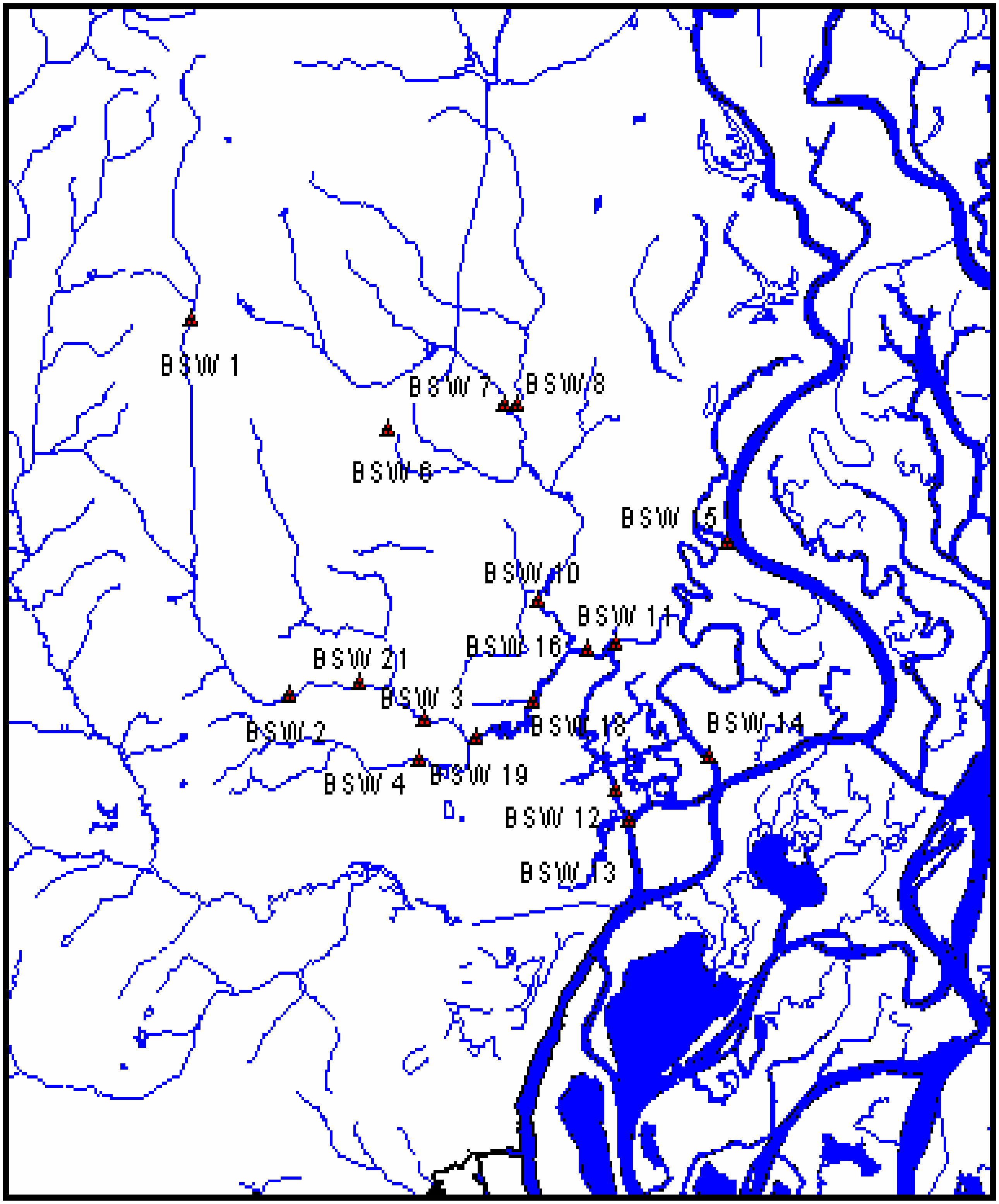


CATFISH BAYOU

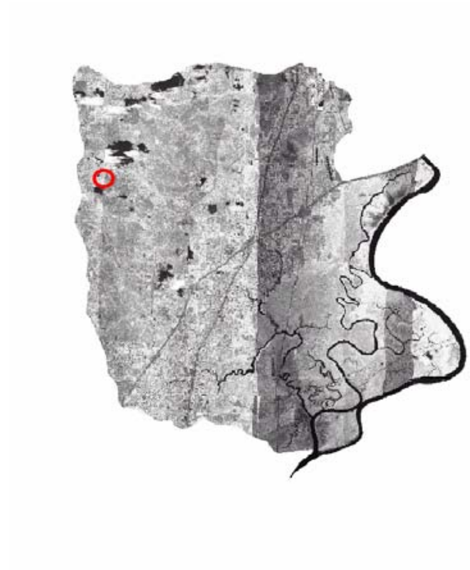


Though infrequent during the interim of this study, runoff during and immediately following significant rain events quickly impacted the drainage paths for the subwatershed. Stations typically exhibiting flows too small for practical measurement were transformed into swollen streams too deep and/or swift for safe flow measurement. Laboratory analyses of samples collected at such periods appear to demonstrate the introduction of pollutants by non point source runoff.

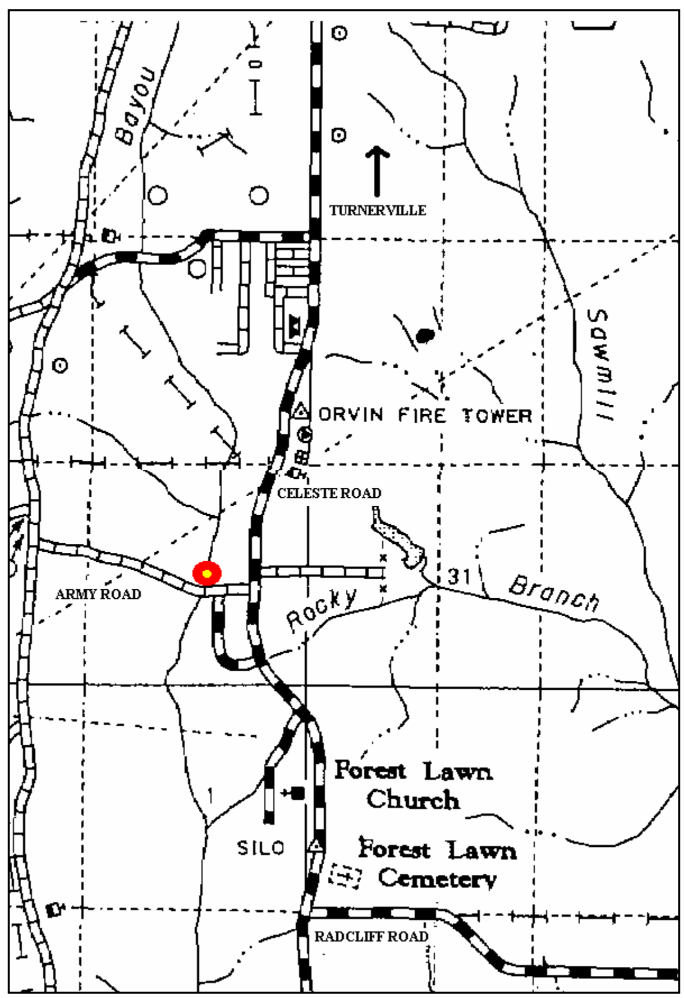
Sample Stations



BSW 1 - Upper Bayou Sara at Army Road **30^0 54’ 58” 88^0 07’ 56”**

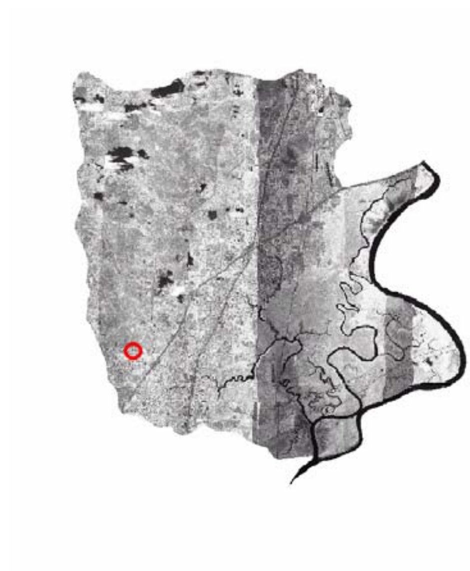


BSW 1 was a freshwater station located at the upper reaches of Bayou Sara, near its source, in the northwestern corner of the subwatershed, west of Celeste Road, on Army Road, approximately four miles south of the Town of Turnerville. It was selected as a study station to represent rural and forested land use. It was also selected as the most accessible station nearest Bayou Sara’s source. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Bayou Sara carries a classification of Fish and Wildlife. Impervious surface was estimated to be 30% because of the paved roadway and drainage ditches adjacent the station. Immediately north of BSW 1, Bayou Sara consisted of wetlands, broad expanses of mostly shallow swamp and swamp forest. The stream flowing south from BSW 1 was braided and shallow with scattered deep pools, abundant vegetation, both aquatic and emerging, and numerous Beaver dams. The stream’s path downstream of BSW 1 was sinuous. The bottom substrate of BSW 1 consisted of fine organic muck, silt, sand, and detritus. Macrophytes and fish were common and abundant. The entire stretch of the BSW 1

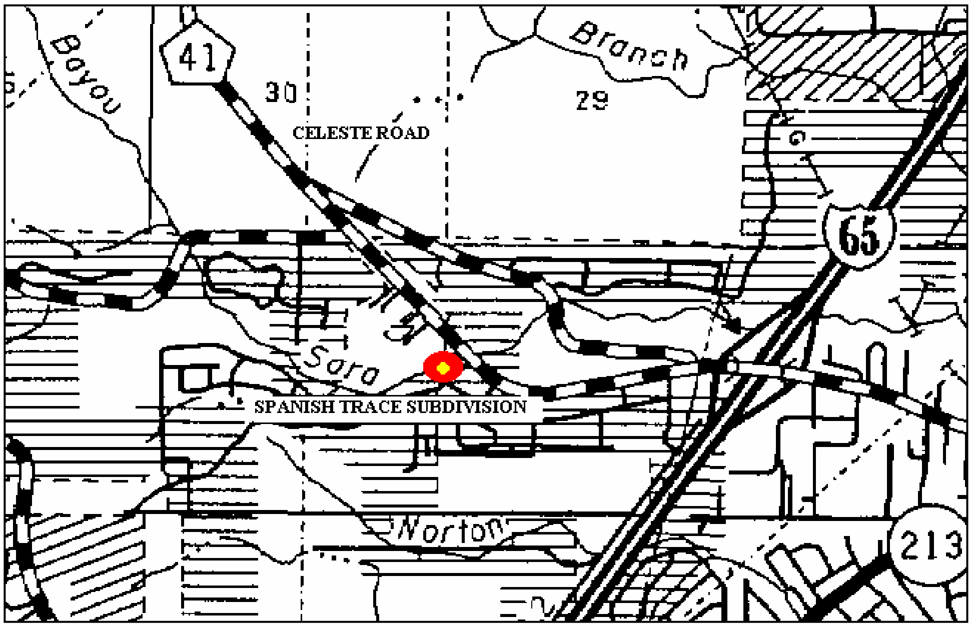


station could be classified as swamp forest. Land use was, primarily forest, although there were some residences within a half mile southeast of the station. Erosion of banks was observed, but, over the course of the study, silt fences were erected and vegetative cover established serving to abate the loss of surface soils. The stream's bank height was less than one foot and the stream's width was about six feet for that section immediately below the BSW 1 station. Above the station, the stream widened considerably into a swamp. Very little shade was provided by the widely separated trees, resulting in very little canopy cover. Throughout the study, the waters present at BSW 1 were moderately to darkly stained. This was, most likely, a result of tannic staining occurring in the wetlands immediately upstream of the station. Sediment odor was not uncommon, most likely the result of anaerobic decomposition. Trash discarded by passing motorists was a normal observation at the station. In February of 2002, beavers constructed a dam along the northern face of the Army Road bridge downstream of BSW 1. This dam remained in place until the end of the study.

BSW 2 - Bayou Sara at Celeste Road **30^0 49' 49"**
88^0 06' 21"

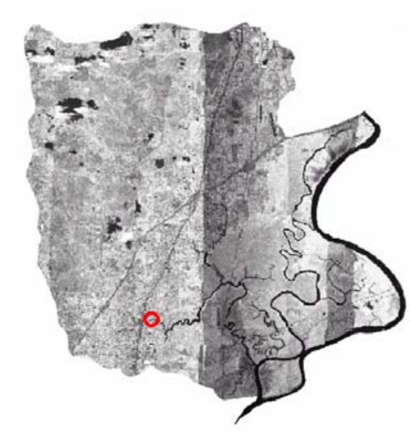


BSW 2 was a freshwater station located on Bayou Sara, approximately one mile west of Interstate 65, off Celeste Road, in the lower, western portion of the subwatershed. It was selected to represent urban/industrial land use. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Bayou Sara carries a classification of Fish and Wildlife. Impervious surface was estimated to be 20% at this station. Flow was generally moderate throughout the study period (about 18.5 cfs). BSW 2 was an urban stream with residential and commercial land use on either side. A buffer of forest existed between the stream and residences. No substantial erosion was observed at the station during the study. The stream's width was, generally, around fifteen feet. In this section of Bayou Sara, the water body was sinuous with deep and shallow pools with short stretches of depositional channels. Trees along the stream's banks provided for about an eighty percent canopy cover. Both banks were generally low, about one and a half feet, and steep. The stream bottom substrate

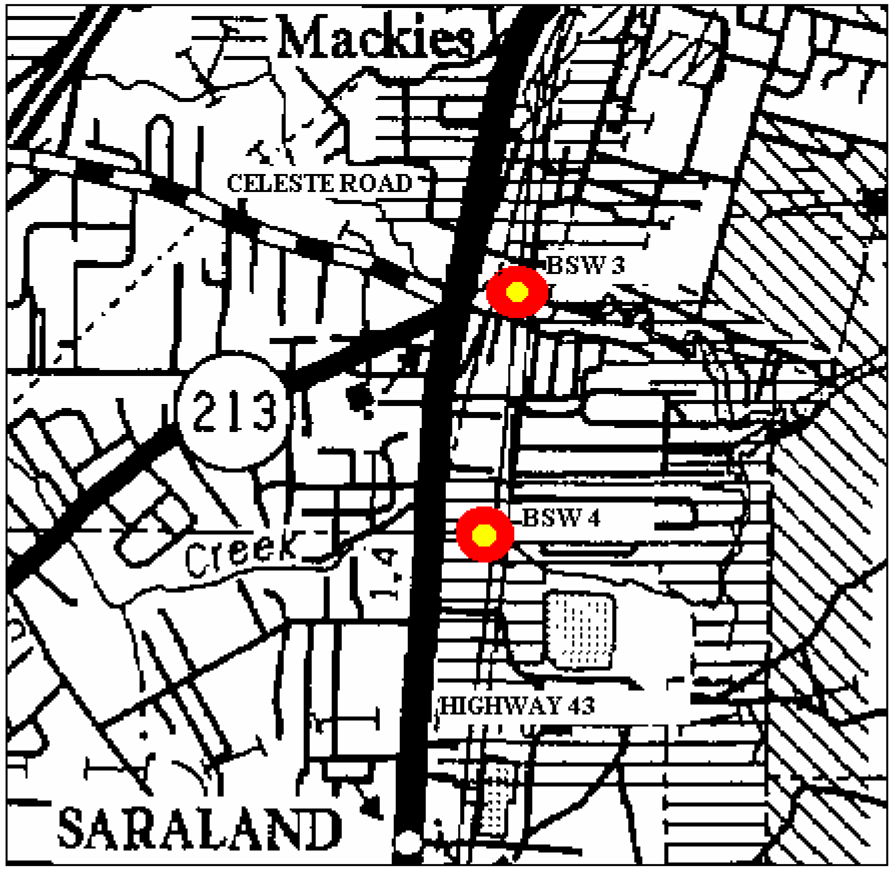


consisted of, chiefly, sand, mud, and detritus. Macrophytes, submerged vegetation, and fish were common and abundant. No water odor, or sediment odor was encountered during the course of the study. Pollution from non point sources, apart from trash discharged from passing vehicles, was not apparent. During substantial rain events, however, this section of Bayou Sara quickly left its banks and experienced significant flow increase as a result of localized rainwater runoff. In May of 2002, beavers constructed a dam immediately upstream of the sample station. This dam remained in place for the duration of the study.

BSW 3 - Bayou Sara at Hwy. 43 **30^0 49' 30"** **88^0 04' 10"**

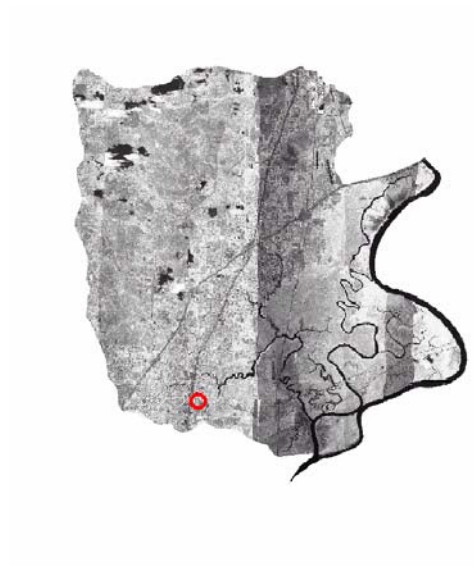


BSW 3 was a tidally influenced station located on Bayou Sara at U.S. Highway 43 in Saraland, Alabama, in the southern, central portion of the subwatershed. This station was selected as an urban/industrial land use station because it was urban stream with residential and commercial land use on either side. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Bayou



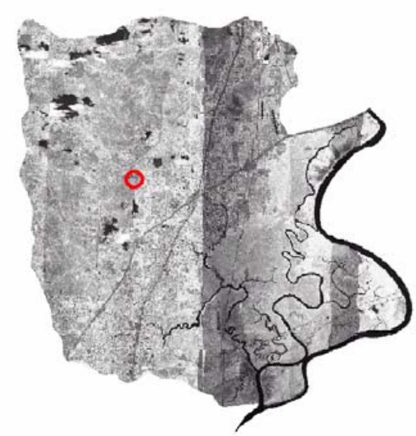
Sara carries a classification of Fish and Wildlife and Swimming and other full body contact water sports. Impervious surface was estimated to be greater than 30% coverage at this station. At BSW 3, Bayou Sara widened considerably from the narrow, faster moving water body upstream, to a deeper and slower moving water body. Very little erosion was observed along the banks. The stream was, typically, in excess of thirty feet in width and slightly to moderately stained. Domestic trash was not uncommon at the station, floating down from upstream and deposited by passing motorists. Stream flow, although not measured because of the water's depth, was often very slow or not observed at all. The stream's bank height averaged about one and a half feet high. Along one stretch of the station, the right bank was substantially higher (about ten feet) where the land had been built up artificially. The stream's bottom was, largely, sand, mud, and detritus. Macrophytes and fish were common. Abundant trees along both banks provided for a greater than sixty percent shading cover for the stream. No significant water odors were encountered during the study.

BSW 4 - Norton Creek at Hwy. 43 **30^0 48' 59"**
88^0 04' 14"

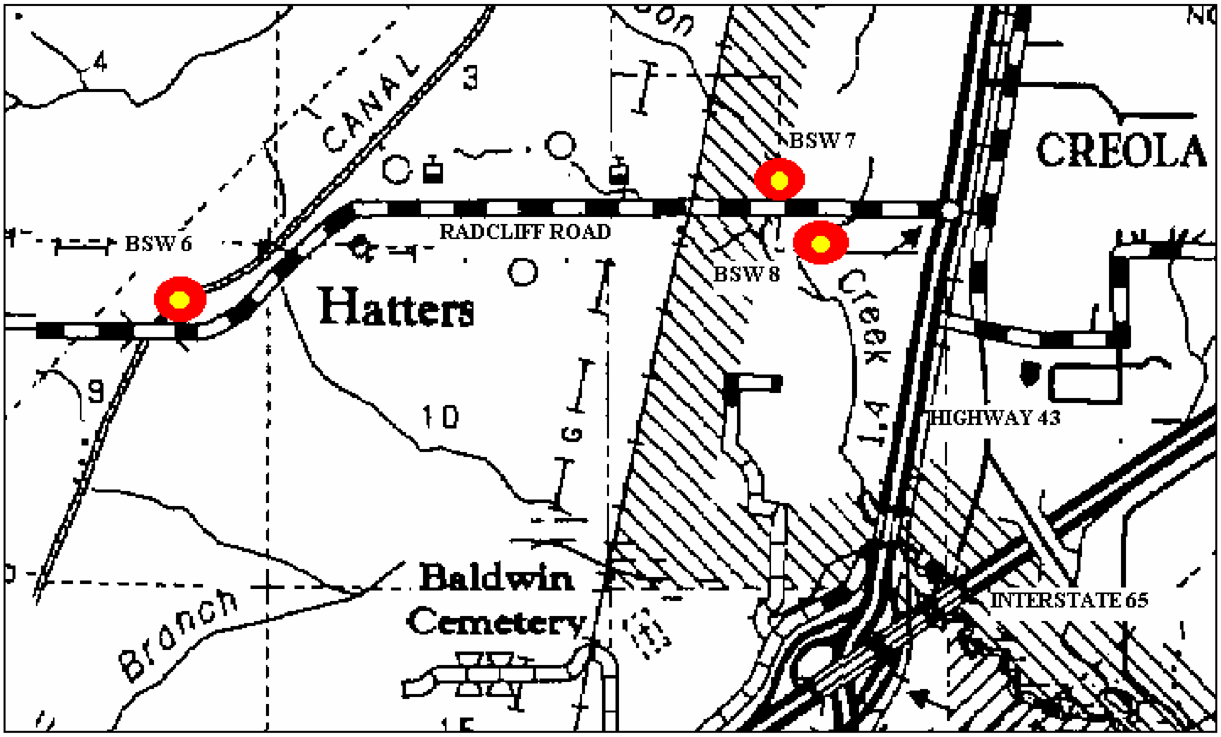


Also located in the southern, central portion of the subwatershed, along U.S. Highway 43 in Saraland, Alabama, on Norton Creek, was BSW 4, a freshwater station. Station BSW 4 was chosen to represent urban/industrial land use. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Norton Creek was not listed and, therefore, carries a classification of Fish and Wildlife. The impervious surface area was estimated to be greater than 30% for this station. The stream above BSW 4 was winding with deep and shallow pools, while the stream below the sample station was, generally, straight and uniform in depth, with a width of about eight feet. Flow at this station was generally low. Land use on both banks was commercial. Domestic trash was often observed at the station, floating down from upstream and deposited by passing motorists. No substantial erosion was observed during the study. Very little shade was available to the stream as the vegetation of both banks was, periodically, cut back. Aquatic vegetation, both submerged and emerging, was present, as was filamentous algae. The banks at BSW 4 were about fifteen feet high with moderately sloping sides and covered in grasses, some shrubs and a few small trees. The stream's bottom consisted of sand, silt, and mud. Macrophytes and fish were common and abundant. Water odors were encountered occasionally, as were sediment odors indicative of organic decomposition.

BSW 6 - Pipeline Canal at Radcliff Road **30^0 53' 30" 88^0 04' 44"**



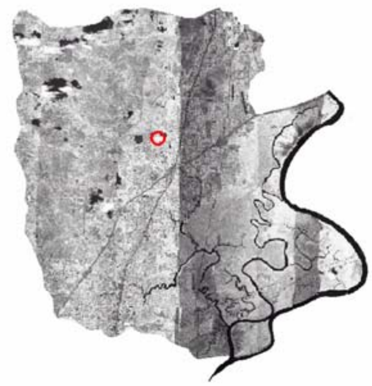
BSW 6 was a freshwater station located on the Mobile Area Water and Sewer System's Pipeline canal at its junction with Radcliff Road, near the center of the subwatershed. It was selected as a station representing forested land use. Impervious surface was estimated to be 20% at this station. The pipeline canal was constructed in 1968 to supplement the Big Creek Lake water supply to industry. The Mobile Area Water and Sewer System (MAWSS) pumps water from the Mobile River at Bucks, Alabama, just above Barry Steam Plant into a one hundred acre lake north of the Bayou Sara subwatershed. This lake was formed by damming Cold Creek. The pipeline canal exits the lake and carries water, by force of gravity, approximately eight miles south and west. At the canal's terminus, the water goes underground in a seventy-eight inch pipe, through which it is transported, also by gravity, to a 60 acre reservoir in Saraland. As the number of industries has



declined dramatically since the canal's construction, the demand for industrial water has fallen substantially and, consequently, the canal is routinely shut down. In the event of emergency, water from the pipeline canal could be diverted to a water treatment plant for public consumption. In that event, the estimated capacity of the system would be 25 mgd (personal conversation with MAWSS personnel).

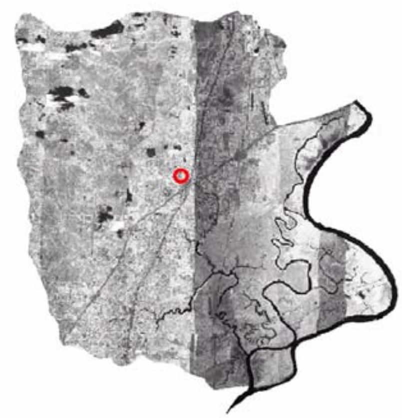
For its entire length, the pipeline canal is a grassed corridor, mostly cleared, with some shrubs and small trees. No evidence of substantial erosion was observed at BSW 6 during the course of the study. Both right and left banks of the canal were moderately sloped and were about ten feet high. No canopy cover existed for the entire length of the canal. The stream itself was, generally, about ten feet wide during periods of low flow. The stream's bed consisted of sand, silt and mud. Macrophytes and fish were common and abundant in the stream. No significant odors were encountered during the study. The stream's bottom was, largely, uniform and flat with very few pools observed. Except for during the coldest seasons of the study, both banks were thick with Elephant Ears (***Bergenia** cordifolia*). Beyond the stream bank's slopes, the grass was regularly mowed. Within the stream itself, very little submerged vegetation was observed, apart from scattered strands of coontail, aka hornwort (*Ceratphyyllum demersum*).

BSW 7 - Gunnison Creek at Radcliff Road **30^0 53' 50"**
88^0 02' 53"



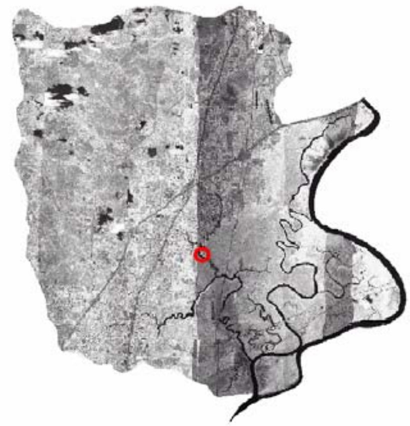
BSW 7 was a freshwater station located in the central portion of the subwatershed at the intersection of Radcliff Road and Gunnison Creek. It was selected to represent forested land use. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Gunnison Creek carries a classification of Fish and Wildlife and Swimming and other full body contact water sports. Impervious surface for this station was estimated to be 20%. The reach of the station was swamp forest. Land use on both banks was forest. Erosion for the reach of the station was slight, with few well-defined runoff pathways. The stream width for the station was approximately ten feet. This width widened to about twenty-five feet near the Radcliff Road Bridge as a result of construction. The stream consisted of numerous shallow and deep pools of water winding south and east. The water was typically lightly to moderately tannic stained. Of all stations sampled, BSW 7 stood alone as consistently having water moving in sufficient volumes to obtain measurable flow. Flows for this station were typically moderate (14.7 cfs). The bottom substrate consisted mainly of sand and detritus. Banks were about three feet high and steep within the natural stream channel, but lower and more gently sloped near the bridge. The dense forest on both banks provided for almost complete canopy cover for the entire stretch of the station. Macrophytes, fish, and submerged aquatic vegetation were common. Slimes appeared seasonally and appeared to thrive, especially in the shallower water near the bridge. Decomposing leaves and wood were present in substantial quantities upstream of the Radcliff Road bridge. As could be predicted from the presence of so much detritus, the sediment in this area exhibited characteristic odors consistent with anaerobic decomposition.

BSW 8 - **Seymore Branch at Radcliff Road** **30^0 53’ 49”**
88^0 02’ 39”

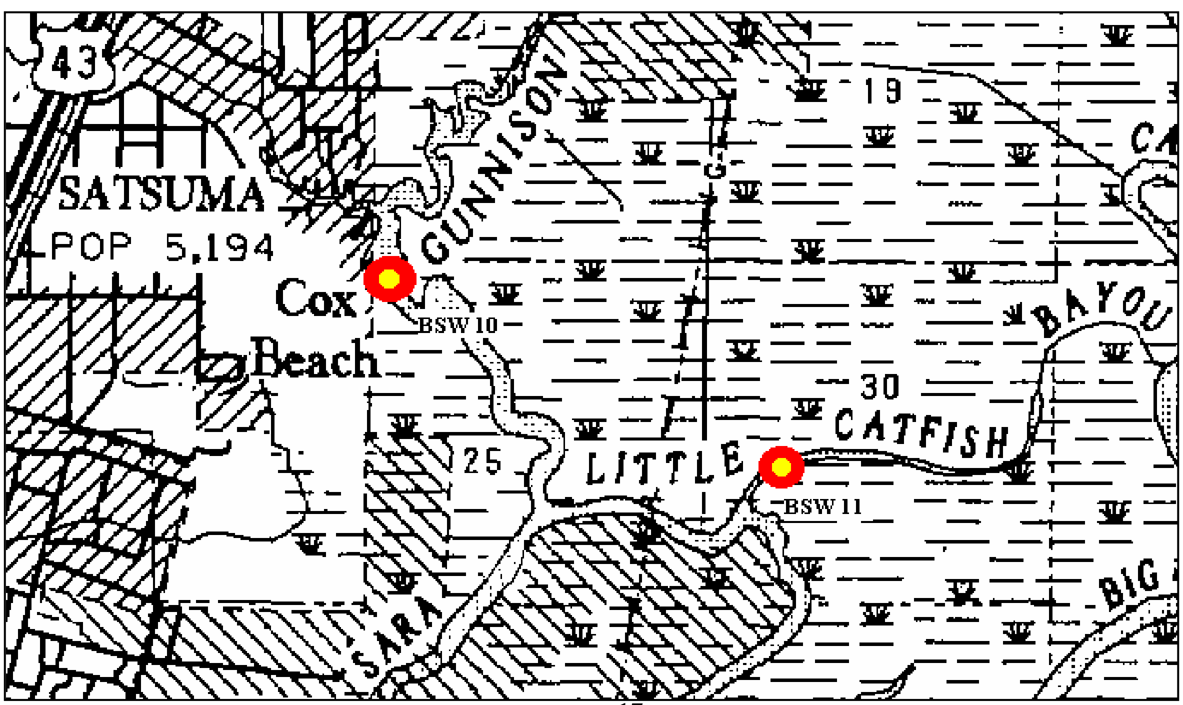


BSW 8 was a freshwater station located in the central portion of the subwatershed, within a half mile east of station BSW 7. This station was located on Seymore Branch at Radcliff Road. The station was chosen to represent forested land use. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Seymore Branch was not listed and, therefore, carries a classification of Fish and Wildlife. Impervious surface was estimated to be 20% for this station. Like BSW 7, BSW 8 was largely swamp forest for the reach of the station. The stream’s width was ten feet with steep banks about one foot high, and a high water mark about two feet higher than the banks. The water was normally slightly tannic stained and flowed moderately to slowly, south and east in a series of deep and shallow pools. The stream bottom was composed of sand and silt with a mixture of mud, muck, and detritus. The sediment exhibited characteristic anaerobic odors. Macrophytes and fish were abundant, as were submerged and emerging vegetation and filamentous algae. The dense forest along both banks provided for almost complete canopy cover. Erosion was moderate. Well defined erosion gullies were observed. Domestic trash was observed for the duration of the study, deposited by passing motorists.

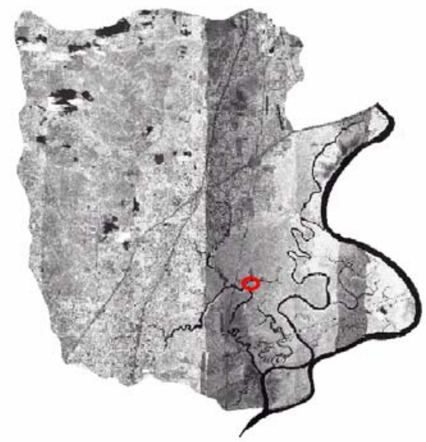
BSW 10 - **Gunnison Creek downstream of Cox Beach** **30^0 51' 06"**
88^0 02' 21"



BSW 10 was a tidally influenced station located on Gunnison Creek, downstream from its confluence with Steele Creek, near Cox Beach. The station was chosen to represent Gunnison Creek's loading to Bayou Sara. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Bayou Sara carries a classification of Fish and Wildlife and Swimming and other full body contact water sports. Impervious surface was estimated to be 15% at this station. The right bank was commercial/residential. A marina was located immediately upstream of this station on the right bank. Numerous live-aboard vessels were docked at this marina suggesting the potential for the unauthorized discharge of sewage. The left bank was forest. The water at this station was, typically, lightly to moderately stained. The maximum depth at the station, as recorded during normal tide conditions, was twenty feet.

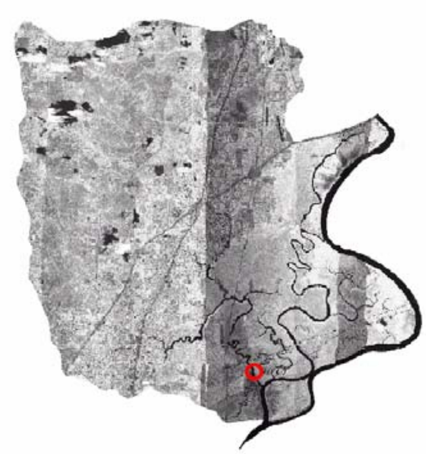


BSW 11 - Little Catfish Bayou **30^0 50' 33"**
88^0 01' 05"

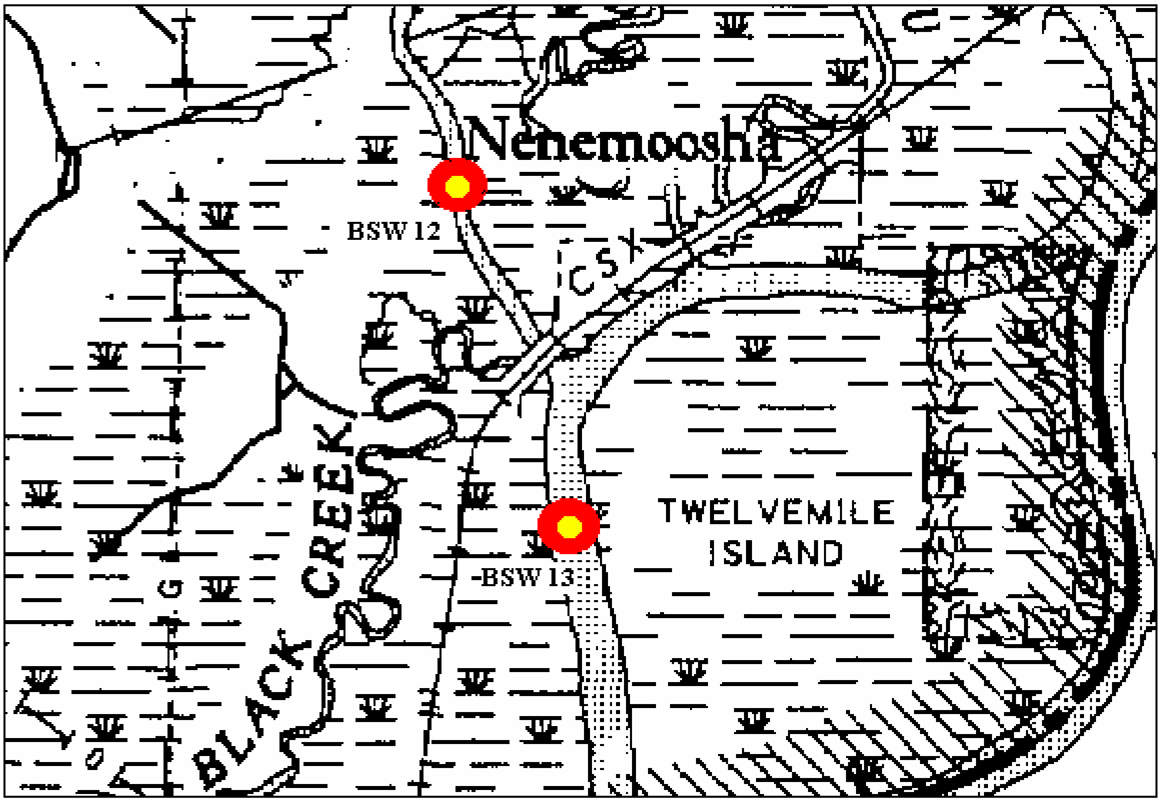


BSW 11 was a tidally influenced station located on Little Catfish Bayou immediately upstream of that water body's confluence with Bayou Sara. It was chosen to represent forested land use. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Little Catfish Bayou was not listed and, therefore, carries a classification of Fish and Wildlife. No impervious surface was observed at this station. The station was located about 3 miles upstream of the Saraland WWTP discharge to Bayou Sara. Land use on both banks of Little Catfish Bayou was forest/coastal marsh. The water at this station was, typically, moderately stained. The maximum depth at the station, as recorded during normal tide conditions, was thirteen feet.

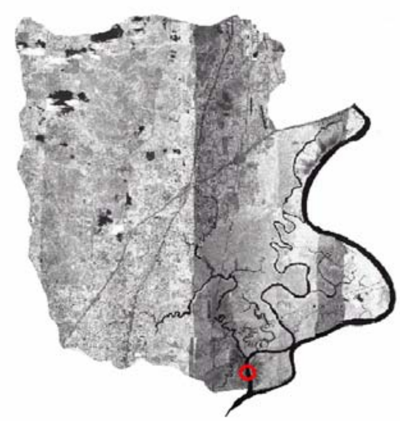
BSW 12 - Bayou Sara upstream of Mobile River **30^0 48' 32"**
88^0 01' 06"



BSW 12 was a tidally influenced station located on Bayou Sara, upstream of its confluence with the Mobile River, and was chosen as a station representing forested land use. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Bayou Sara carries a classification of Fish and Wildlife and Swimming and other full body contact water sports. No impervious surface was observed. Land use on both banks of BSW 12 was forest/coastal marsh. The water at this station was typically muddy. The maximum depth at the station, as recorded during normal tide conditions, was nineteen feet.

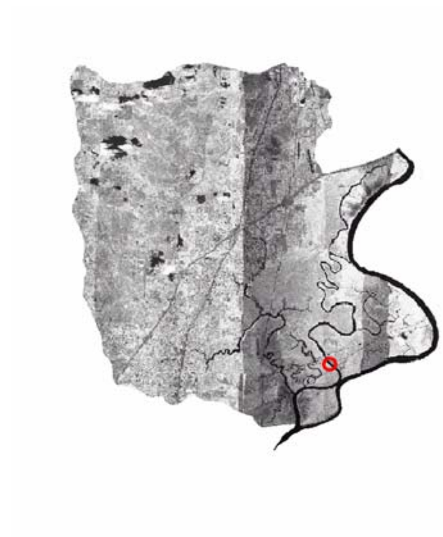


BSW 13 - Mobile River downstream of Bayou Sara **30^0 48' 09"**
88^0 00' 52"



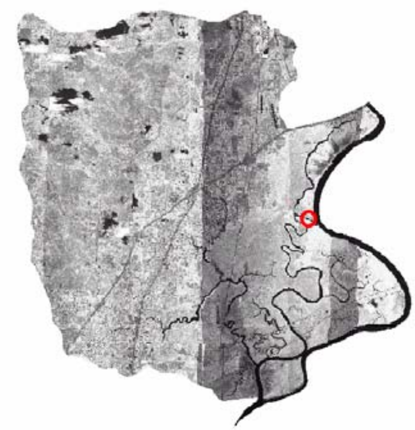
BSW 13 was a tidally influenced station located on the Mobile River, downstream of its confluence with Bayou Sara. It was selected as a forested land use station. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of the Mobile River carries a classification of Fish and Wildlife and Swimming and other full body contact water sports. Impervious surface was estimated to be less than 1%. Land use on both banks of this station was forest/coastal marsh, although a railroad track ran parallel to the right bank. The water at this station was typically muddy.

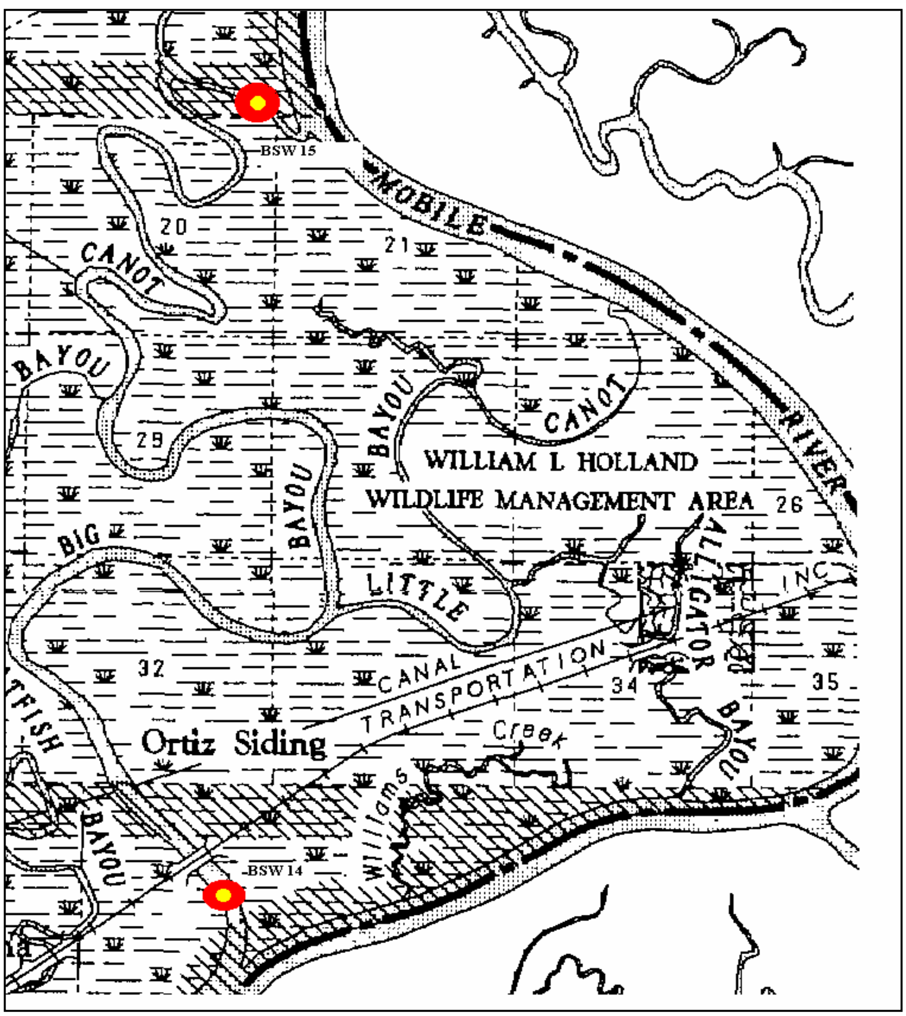
BSW 14 - Lower Big Bayou Canot **30^0 49' 01"**
87^0 59' 34"



BSW 14 was a tidally influenced station located on Big Bayou Canot, just upstream of its confluence with the Mobile River. It was selected as a forested land use station. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Big Bayou Canot was not listed and, therefore, carries a classification of Fish and Wildlife. Impervious surface was estimated to be less than 1%. Land use on both banks of this station was forest/coastal marsh. A railroad track crossed the Bayou upstream of the station, running perpendicular to both banks. The water at this station was typically muddy. The maximum depth at the station, as recorded during normal tide conditions, was forty feet.

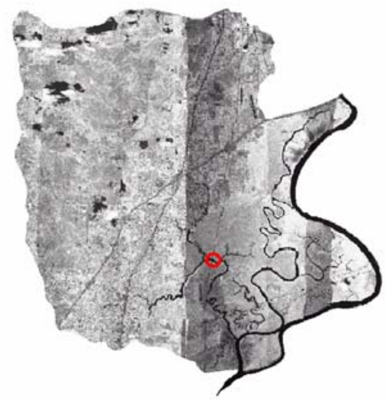
BSW 15 - Upper Big Bayou Canot **30^0 51' 55"**
87^0 59' 15"



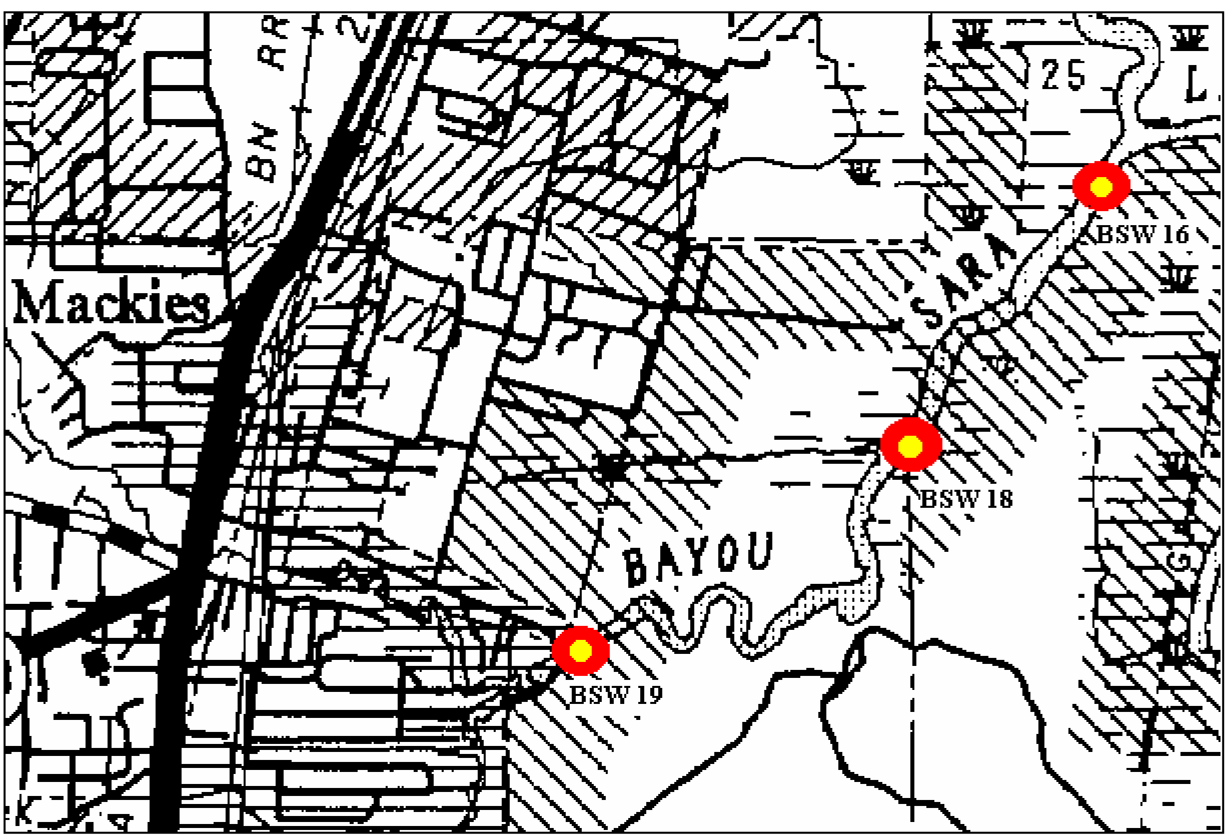


BSW 15 was a tidally influenced station located on Big Bayou Canot, just upstream of its upper confluence with the Mobile River. It was selected as a forested land use station. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Big Bayou Canot was not listed and, therefore, carries a classification of Fish and Wildlife. Impervious surface was estimated to be less than 1%. Land use on both banks of this station was forest/coastal marsh. Several fish camps were located in the vicinity of this station. The water at this station was typically muddy. The maximum depth at the station, as recorded during normal tide conditions, was twenty feet.

BSW 16 - Bayou Sara downstream of Gunnison Creek **30^0 50' 27"** **88^0 01' 32"**

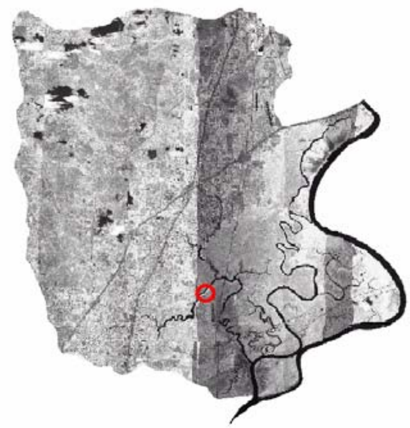


BSW 16 was a tidally influenced station located on Bayou Sara, just downstream of its confluence with Gunnison Creek. It was selected as a forested land use station. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Bayou Sara carries a classification of Fish and Wildlife and Swimming and other full body contact water sports. Impervious surface was estimated to be



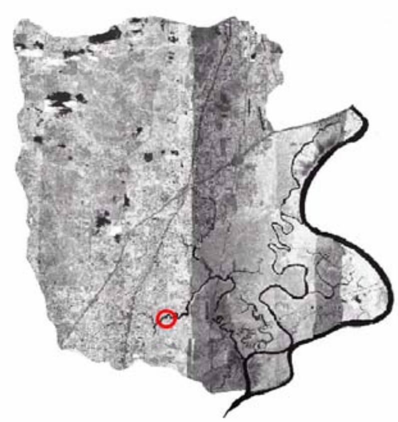
less than 1%. Land use on both banks of this station was forest/coastal marsh. It was located adjacent to a cleared corridor for power transmission lines which ran perpendicular to the stream at both banks. The water at this station was typically muddy. The maximum depth at the station, as recorded during normal tide conditions, was nineteen feet.

BSW 18 - Bayou Sara upstream of Gunnison Creek **30^0 49' 44" 88^0 02' 25"**



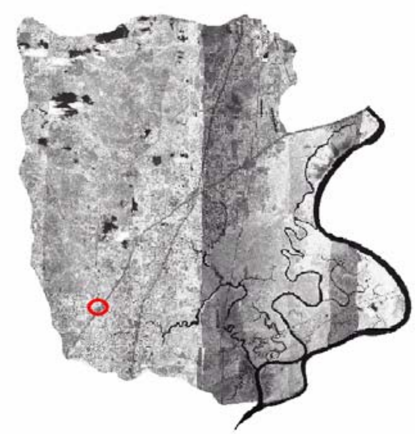
BSW 18 was a tidally influenced station located on Bayou Sara, just upstream of its confluence with Gunnison Creek. It was selected as a forested land use station. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Bayou Sara carries a classification of Fish and Wildlife and Swimming and other full body contact water sports. Impervious surface was estimated to be less than 1%. Land use on the left bank was forest/residential and, on the right bank, forest/coastal marsh. The water at this station was typically moderately stained. The maximum depth at the station, as recorded during normal tide conditions, was fifteen feet.

BSW 19 - Bayou Sara downstream of Norton Creek **30^0 49' 12" 88^0 03' 20"**



BSW 19 was a tidally influenced station located on Bayou Sara, just downstream of its confluence with Norton Creek. It was selected as a residential land use station. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Bayou Sara carries a classification of Fish and Wildlife and Swimming and other full body contact water sports. Impervious surface was estimated to be 10%. Land use on the left bank was residential and, on the right bank, forest/coastal marsh. The water at this station was typically moderately stained. The maximum depth at the station, as recorded during normal tide conditions, was nineteen feet.

BSW 21 - Bayou Sara at I-65 **30^0 49' 58"**
88^0 05' 12"



BSW 21 was located in the lower portion of the subwatershed, at the junction of U.S. Interstate 65 and Bayou Sara. In Rule 335-6-11-.02 of the ADEM Administrative Code, this section of Bayou Sara carries a classification of Fish and Wildlife. This station was a flow station, exclusively, per arrangement with those Department personnel undertaking the Total Maximum Daily Load study for Bayou Sara. Land use on both banks was forest. The water was typically clear with moderate flow. Macrophytes and fish were abundant, as were submerged and emerging vegetation and filamentous algae. The forest along both banks provided for substantial canopy cover. The maximum depth at the station, as recorded during normal flow conditions, was two feet.

GENERAL DESCRIPTION

The greater portion of the area contained within the Bayou Sara subwatershed is rural. Apart from the occasional fish camp, the entire easternmost portion of the subwatershed was uninhabited. From Dead Lake in the north to Twelve Mile Island in the south, this portion of the study area consisted, for the most part, of waterways and wetlands. Urbanized areas were concentrated in the southern central portion of the subwatershed, along U.S. Highway 43. This highway also bordered the majority of the subwatershed's industries, which were situated in the northeast section of the subwatershed. The western portion of the subwatershed was rural, but developing. Many of the homes in that section were less than three years old and many more were being built, especially along Celeste Road (Mobile County Highway 41), which, roughly, parallels Bayou Sara on its north-south trek. Apart from the elevated topography present along the study area's western portion, the majority of the Bayou Sara subwatershed exhibits little topographic relief. Streams within the BSW wind slowly along their paths to discharge.

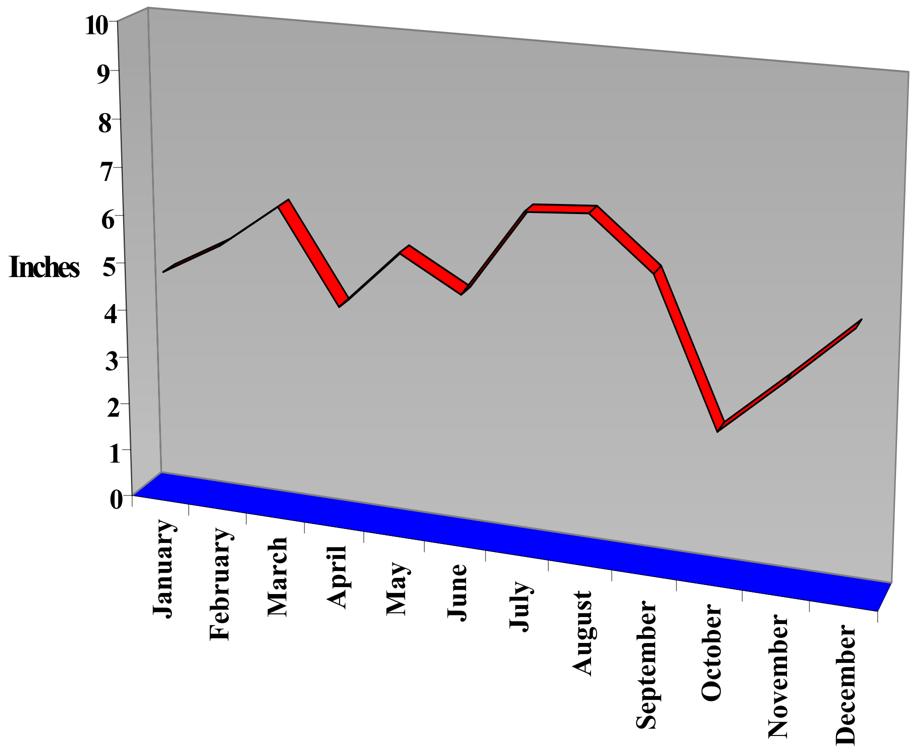
Climate

Summers in the Bayou Sara subwatershed are, typically, hot and humid with an average temperature of 81^0 F, and an average daily maximum temperature of 91^0 F. Winters are mild, with an average temperature of 53^0 F, and an average daily minimum temperature of 43^0 F. The lowest temperature on record, 7^0 F, occurred on January 1, 1963. The highest temperature, 104^0 F, was recorded on July 25, 1952. Rain occurs year round, with the heaviest rainfall occurring in April through September. Total average yearly rainfall is approximately 64 inches. Relative humidity is high in the area, averaging about 60 percent in mid afternoon. The highest relative humidity readings are, typically, at night, with measurements of about 90 percent not uncommon in the dawn hours (U.S. Geological Survey).

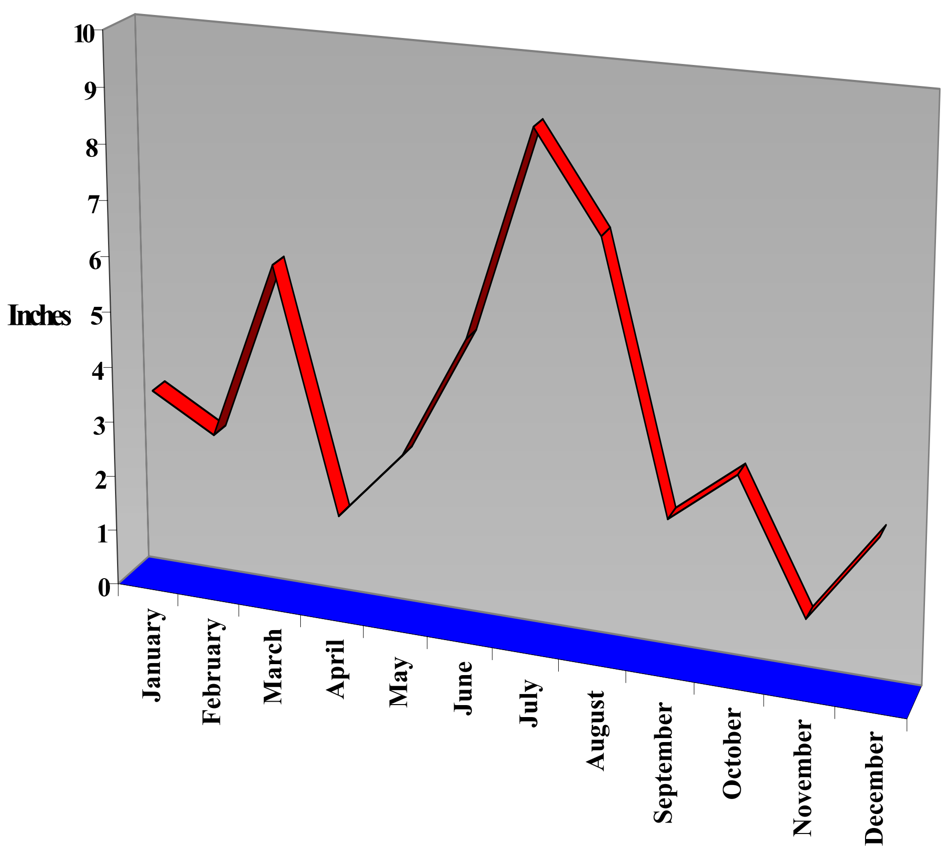
The area in which the Bayou Sara subwatershed is located experiences a normal annual rainfall that is among the highest in the United States. This may be attributed to the area's close proximity to the Gulf of Mexico. Rainfall in the area is usually of the shower type with long periods of continuous rain being rare. Precipitation is usually greatest in the summer and least in the fall. Thunderstorms may occur at any time of the year, regardless of season. Over the past several years, as in other parts of the state and nation, rainfall averages have been lower than usual. Nearly all of the easternmost portions of the Bayou Sara subwatershed lie within the 100 year flood plain. In addition, all of the major streams and most of the minor streams lie within the 100 year flood plain for a distance of about five hundred feet from both banks.

The inserted charts illustrate the normal average rainfall by month for the Mobile area and the recorded amounts of rainfall for the Bayou Sara subwatershed during the study period. The average rainfall during the summer months was higher than the historical average, while the precipitation in the other months of the study appeared to be slightly less than the historical average. The general trend in rainfall averages appeared to follow that of the historical data with the summer months experiencing the greatest amount of rainfall and the fall months experiencing the least. Increased rainfall amounts during the early spring were observed in both the historical record and in the record produced during the study period.

Average Mobile County Rainfall - 1961-1990



Average Rainfall During Study Period



Hydrogeology

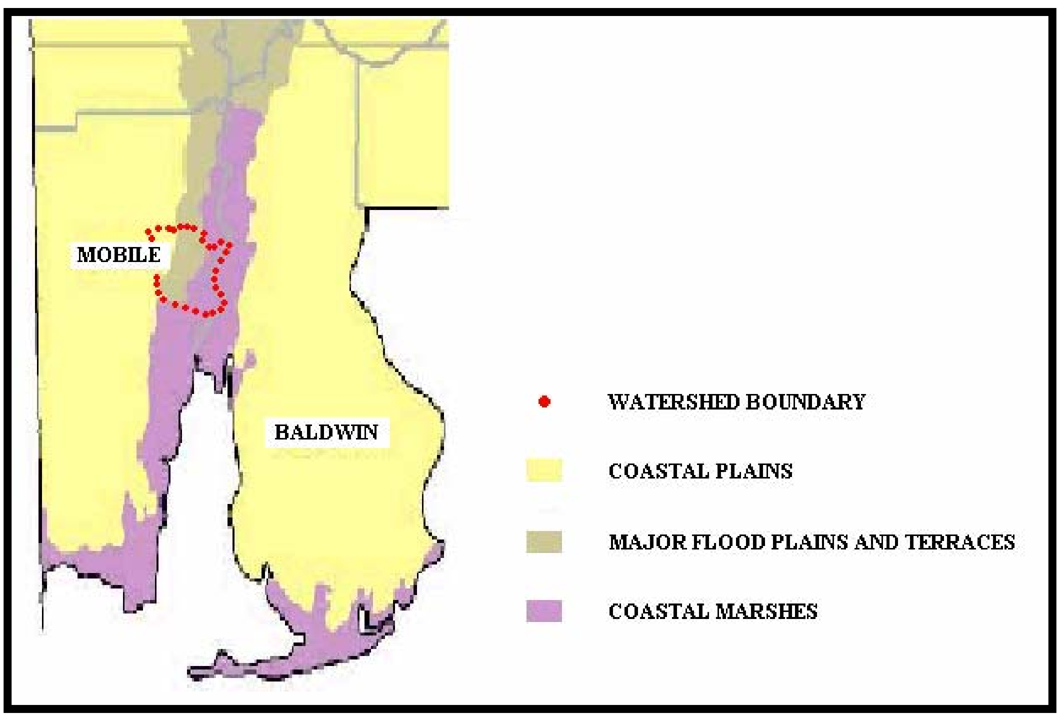
The Bayou Sara subwatershed is underlain, for the most part, by the alluvial-coastal aquifer. The northwestern portion of the subwatershed, however, is underlain by the Pliocene-Miocene aquifer. The Pliocene-Miocene aquifer consists of the Citronelle Formation and undifferentiated deposits of the Miocene Series. The Miocene Series undifferentiated consists of sedimentary deposits of marine and estuarine origin which, in turn, consist of laminated to thinly-bedded clays, sands, and sandy clays. The Citronelle Formation, which overlies the Miocene Series undifferentiated, consists of sediments of gravelly sands and sandy clays. As no continuous confining units appear to exist between the Citronelle Formation and the undifferentiated deposits of the Miocene Series, these two units act as a single hydraulic unit. Ground water in the Pliocene-Miocene aquifer occurs in beds of gravel and sand. These beds in the Citronelle Formation and those in the shallower portions of the Miocene Series undifferentiated are hydraulically connected to the land surface thus making the Pliocene-Miocene aquifer and unconfined aquifer. There are discontinuous lenses of clay in the aquifer which retard the vertical movement of water, but do not separate the aquifer's components. In the deeper portions of the undifferentiated sediments of the Miocene Series, clayey sediments are semi-confining and reduce the vertical infiltration of water which causes this aquifer to respond to short-term pumping as a confined aquifer day (U.S. Geological Survey).

The alluvial-coastal aquifer is composed of channels of sand and gravel arising from coastal deposits and buried river sediments. These channels are surrounded by silty and clayey sediments that allow slow infiltration of water to the sand and gravel beds. Some of these channels may be directly connected to the present channels of the Mobile River. The alluvial-coastal aquifer is hydraulically connected to the Pliocene-Miocene aquifer. As a result of this interconnection, the aquifers often respond to stress as one aquifer. This is significant owing to the relative permeability of the underlying sediments in the Bayou Sara subwatershed, which allows for the rapid infiltration of surface water. The stresses are increased in those portions of the subwatershed that are characterized by flat terrain. The areas around large pumping centers are also considered to be highly susceptible to contamination because of the permeability of the sediments, the slope of the land surface, and the depressions created in the potentiometric surface created by large withdrawals of water from the aquifer. By acting as funnels directing ground water flow, these depressions increase the rate at which a contaminant might potentially migrate into the ground water system. Wells constructed in the Pliocene-Miocene aquifer typically yield 0.5 to 2.0 million gallons per day. Wells constructed in the alluvial-coastal aquifer yield from 0.5 to 1.0 million gallons per day (U.S. Geological Survey).

Recharge to the aquifers underlying the Bayou Sara subwatershed is, primarily, accomplished through rainfall. Of the average 64 inches of rain that fall annually, about 28 of those inches run off during and immediately after rain events. The remainder either enters the underlying aquifers as recharge, or is returned to the atmosphere via evaporation and transpiration of trees and other plants. Another source of recharge for the subject aquifers is through hydraulic connection with the Mobile River. This is of significance when related to withdrawal effects from pumping stations. The close proximity of the Mobile River tends to confine the effects of excessive pumping, i.e. depressions in the potentiometric surface, to a localized area. Another element of significance lies in the fact that, in those areas of tidal influence, the hydraulic connection existing between the Mobile River and the BSW aquifers could introduce saltwater into the ground water (U.S. Geological Survey).

Soil Associations

The soils of the entire easternmost reaches of the Bayou Sara subwatershed are, principally, of the Dorovan-Johnston-Levy classifications and are characterized as nearly level, very poorly drained, mucky and loamy soils formed in thick deposits of organic residues and alluvial sediments on bottomlands. Soils within the eastern central portion of the subwatershed and running north and south are of the Izagora-Bethera-Suffolk classifications and are characterized as nearly level to undulating, well to poorly drained soils with loamy and clayey subsoils. The Izagora-Bethera-Suffolk soils are formed in loamy and clayey marine and alluvial sediments on terraces. The soils in the western central portion of the subwatershed and running north and south are, generally, Troup-Benndale-Smithton soils that are described as nearly level to hilly, well and poorly drained soils with loamy subsoils that are formed in loamy marine and fluvial sediments on uplands. A small portion of the extreme northwest corner of the subwatershed consists of Troup-Heidel-Bama soils. The Troup series soils are characterized as nearly level to undulating, well drained soils with loamy subsoils. These type soils are formed in loamy marine sediments on uplands (U.S. Dept. of Agriculture).



It has been demonstrated that a subwatershed's physical characteristics, among them soil types, are, often, primary factors in influencing the effects that land-use practices have upon a subwatershed, particularly upon that subwatershed's water quality and aquatic habitats (ADEM, 1997). The Bayou Sara subwatershed lies completely within the Southern Coastal Plain and has soils typical of the coastal plain, the coastal marshes, and the coastal flood plains and terraces. The predominant soil types in the Bayou Sara subwatershed are of the Dorovan-Johnston-Levy and Izagora-Bethera-Suffolk classifications and comprise about two-thirds of the subwatershed's area. This two-thirds is located in the relatively level and low lying west central to extreme eastern edge of the subwatershed. These soil types are, typically, poorly drained. The remaining third of the subwatershed, that area demonstrating significant topographic relief, in the western portion of the subwatershed, consists of, primarily, soils of the Troup-Benndale-Smithton classification. A limited area, in the extreme northwestern corner of the subwatershed, had soils of the Troup-Heidel-Bama classification. These soil types are characterized as, generally, well drained. A list of the soil types by station is provided below. The information concerning soil classifications was obtained from the U.S. Department of Agriculture Soil Conservation Service's 1979 publication, *Soil Survey of Mobile County, Alabama*.

SAMPLING STATION	SOIL ASSOCIATION
BSW 1 -	Pactolus Loamy Sand, 0 to 2% slopes*, & Troup-Benndale Association, undulating
BSW 2, 3 -	Johnston-Pamlico Association, 0 to 1% slopes
BSW 4 -	Axis Mucky Sandy Clay Loam, 0 to 1% slopes, Izagora-Berthera Association, gently undulating
BSW 6, 7, 8 & 21 -	Alaga-Harleston Association, undulating, Izagora-Berthera Association, gently undulating
BSW 10 -	Dorovan-Levy Association, 0 to 1% slopes, Izagora-Berthera Association, gently undulating
BSW 11, 12, 13, 15, 16, 18 & 19 -	Dorovan-Levy Association, 0 to 1% slopes
BSW 14 -	Dorovan-Levy Association, 0 to 1% slopes, Bama Sandy Loam, 0 to 2% slopes

*slope is a measure of the inclination of the land surface from the horizontal. The percentage of slope is the vertical distance divided by the horizontal distance – then multiplied by 100, e.g. a drop of 20 feet in a 100 foot run is a 20% slope.

Pactolus Series: moderately well drained to somewhat poorly drained, rapidly permeable soils that are formed in sandy marine sediments. They have a water table about 1.5 to 2.5 feet below the surface, mostly, during the winter. The Pactolus soils are geographically associated with Harleston, Osier, Smithton, and Troup soils.

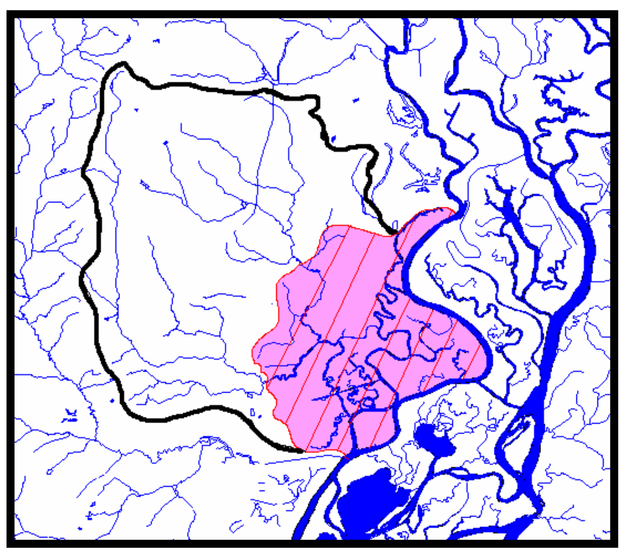
Benndale Series: well drained, moderately permeable soils that are formed in loamy marine sediments. Slope ranges from 0 to 12 percent. They are geographically associated with Bama, Harleston, Heidel, Malbis, Poarch, Shubuta, Suffolk, Smithton, and Troup Soils.

Troup Series: well drained, moderately permeable soils that are formed in sandy and loamy marine sediments. Slope ranges from 0 to 17 percent. They are geographically associated with Bama, Benndale, Heidel, Pactolus, Shubuta, and Susquehanna Soils.

Johnston Series: very poorly drained, moderately rapidly permeable soils are formed in sandy and loamy sediments. Water is near or above the surface most of the year. Slope ranges from 0 to 1 percent. They are geographically associated with Axis, Bayou, Dorovan, Osier, Pamlico, and Smithton Soils.

Dorovon-Levy Series: nearly level, very poorly drained, mucky and loamy soils that are formed in thick deposits of organic residues and alluvial sediments on bottom lands.

Tidal Influence



Shaded Area Represents Tidally Influenced Zone

As a consequence of its proximity to the Gulf of Mexico, the easternmost portions of the Bayou Sara subwatershed experience tidal influence. It should be observed that tidal influence is a dynamic process. Periods of very low tides and prevailing southerly winds will decrease the stretch of tidal influence within the subwatershed. Conversely, periods of abnormally high tides, prevailing northerly winds, or storm surges will expand the stretch of tidal influence. ISCO 4230® flow meters were deployed along Bayou Sara, Norton Creek, Seymore Branch, and Gunnison Creek to record the rise and fall of those water bodies' surfaces in attempts to determine the normal reach of tidal influence. The stream surface data indicate that Bayou Sara experiences tidal influence to a point about one half mile south and east of Interstate 65. Norton Creek is tidally influenced to a point approximately one quarter of a mile downstream of BSW 4. Gunnison Creek appears to be tidally influenced to a point just downstream of that Creek's confluence with Seymore Branch. Salinity level data supported that obtained by use of the ISCO meters. Stations BSW 3, BSW 10, BSW 11, BSW 12, BSW 13, BSW 14, BSW 15, BSW 16, BSW 18, and BSW 19 were determined to be tidally influenced streams. Station BSW 4 could be expected to be tidally influenced in extreme conditions. Stations BSW 1, BSW 2, BSW 6, BSW 7, and BSW 8 were determined to be non tidally influenced streams. Field parameters collected at the respective stations reinforced the findings. Specific conductivity values for the tidally influenced streams were substantially higher than those observed at the other stations.

Water Use Classifications

Rule 335-6-10-.09 of the Alabama Department of Environmental Management Administrative Code contains the water use classifications for interstate and intrastate waters. Of the water bodies within the Bayou Sara watershed, only Bayou Sara, Gunnison Creek, and Steele Creek contain specific listings. Bayou Sara, from U.S. Highway 43 to its source, carries a use classification of fish and wildlife. From the Mobile River to U.S. Highway 43, Bayou Sara has a use classification of fish and wildlife, and swimming and other whole body water-contact sports. Gunnison Creek, from Bayou Sara to its source, has a use classification of fish and wildlife, and swimming and other whole body water-contact sports. Steele Creek, from Gunnison Creek to its source, has a use classification of fish and wildlife, and swimming and other whole body water-contact sports. The remainder of the water bodies within the watershed, by omission from Division Six, carry a water use classification of fish and wildlife (ADEM Admin. Code R. 335-6-11-.01).

For those water bodies with a use classification of swimming and other whole body water contact sports, the following water quality criteria apply:

Criteria	**Limit**
pH	6.0 to 8.5 s.u.
Water Temperature	$\geq 90^0$ F
Dissolved Oxygen	≤ 5.0 mg/l
Fecal Coliform Bacteria	$\geq$ 100 colonies/100 ml (geometric mean)
Turbidity	> 50 ntu above background

For those water bodies with a use classification fish and wildlife, the following water quality criteria apply:

Criteria		**Limit**
pH		6.0 to 8.5 s.u.
Water Temperature		$\geq 90^0$ F
Dissolved Oxygen		≤ 5.0 mg/l
Fecal Coliform Bacteria	June – September	$\geq$ 100 colonies/100 ml (geometric mean)
	October - May	$\geq$ 1000 colonies/100 ml (geometric mean)
		$\geq$ 2000 colonies/100 ml (single sample)
Turbidity		> 50 ntu above background

(ADEM Admin. Code R. 335-6-10-.09).

Threatened and Endangered Species

The Bayou Sara subwatershed exhibited a diverse and prolific array of flora and fauna. Habitat, especially in the easternmost reaches of the subwatershed, was ideal for a great array of plants and animals. It has been generally accepted that the presence or absence of wading birds is indicative of environmental trends within an area (Geological Survey of Alabama. 1983). Wading birds such as the Great Blue Heron, *Ardea herodias*, Great Egret, *Casmerodius albus*, Green Heron, *Butorides virescens*, American Bittern, *Botaurus lentiginosus*, and others were ubiquitous during field patrols. Also prevalent were varying Hawk species, the Osprey, *Pandion haliaetus*, Kingfisher, *Ceryle alcyon*, and Turkey Vulture, *Cathartes aura*. All of which are indicators of ample food supply and acceptable habitat. It may also be observed that two species that formally were considered threatened or endangered were present in significant numbers throughout the study. These were the American Alligator, *Alligator mississippiensis*, removed from listing on June 4, 1987, and the Brown Pelican, *Pelecanus occidentalis*, removed from listing on February 4, 1985.

Below is a current Federal listing of threatened and endangered species for the study area.

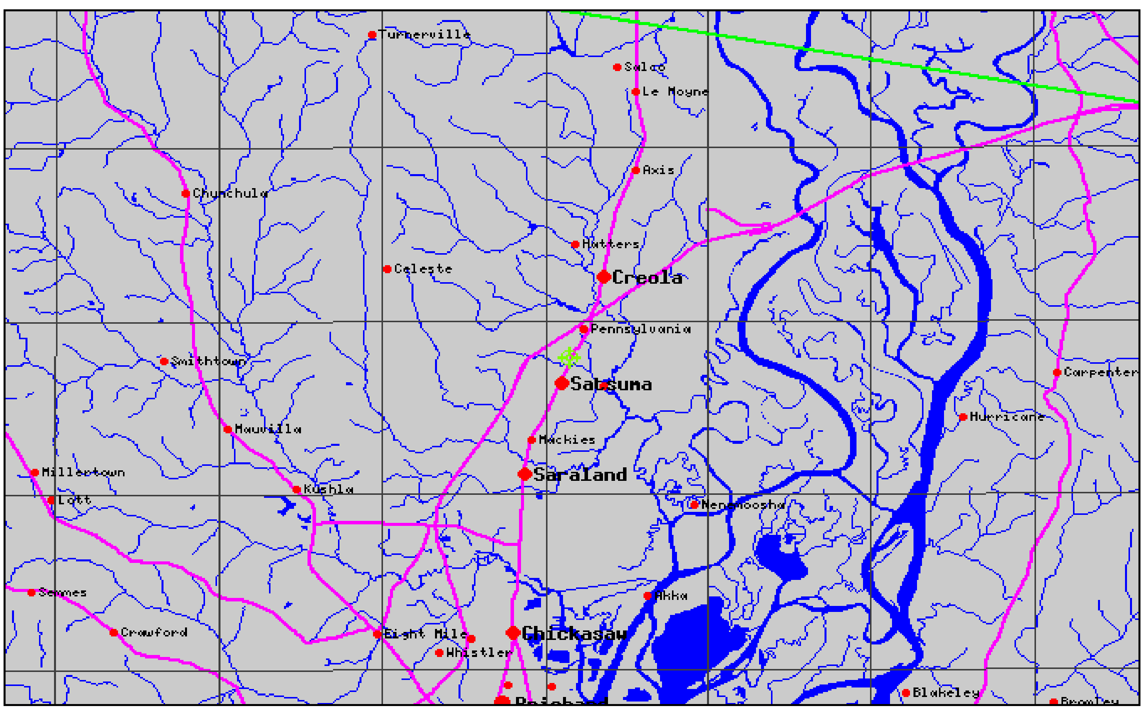
THREATENED -	Piping plover *Charadrius melodus*
THREATENED -	Eastern indigo snake *Drymarchon corais couperi*
THREATENED -	Gopher tortoise *Gopherus polyphemus*
THREATENED -	Loggerhead sea turtle *Caretta caretta*
THREATENED -	Green sea turtle *Chelonia mydas*
THREATENED -	Gulf sturgeon *Acipenser oxyrinchus desotoi*
THREATENED -	Flatwoods salamander *Ambystoma cingulatum*
ENDANGERED -	Louisiana quillwort *Isoetes louisianensis*
ENDANGERED -	Red-cockaded woodpecker *Picoides borealis*
ENDANGERED -	Least tern *Sterna antillarum*
ENDANGERED -	Alabama red-bellied turtle *Pseudemys alabamensis*
ENDANGERED -	Kemp's ridley sea turtle *Lepidochelys kempii*
CANDIDATE SPECIES -	Black pine snake *Pituophis melanoleucus lodingi*

(Daphne Ecological Services Field Office. 2002.)

ECONOMIC DEVELOPMENT AND LAND USE

History

The first European explorers probably set eyes on the area covered in this study around 1519, but it was not until the early 18th century that Europeans began to set up residence on the lands surrounding what is now Bayou Sara. French, Spanish, English, Swedish, and Russian immigrants built homes in the woods and along creek banks. Native Americans had, of course, been established in the area for centuries, but these, as those elsewhere in the nation, were driven away by the arrival of settlers. Mobile, Alabama, located just south of the Bayou Sara subwatershed, was founded in 1711, and is the oldest of all Alabama cities. Until the final years of the 19th century, Mobile was the largest population center in the state, and that population reached well into the Bayou Sara subwatershed. The majority of the area's industry, however, remained in Mobile. Apart from the occasional fish camp, timber, and turpentine extraction, a small scale ship building operation, and numerous grist mills and saw mills, there was very little industry in the Bayou Sara area until well into the 20th century. Until the mid 1880's, Bayou Sara was known as Saw Mill Creek, from its junction with Gunnison Creek to Twelve Mile Island. The land on which the principal metropolitan area, Saraland, is situated was, prior to the 1800's, part of a Spanish land grant to Don Diago



Alvarez. The city's earliest name was, therefore, Alvarez Station. Settlement began in earnest in the early years of the nineteenth century and the name was changed to Cleveland Station. It was not until the end of the nineteenth century that the name was changed to Saraland. That name is reported to have been given by C.J. DeWitt, a retired minister/ editor who moved south in 1890 for health reasons. He opened the first post office on the Southern Railroad in 1895. The Community is purported to be the namesake of his wife, Sara. At the time of its incorporation, 1957, Saraland had approximately one hundred and twenty-five residents. By 1960, that number had risen to four thousand five hundred and ninety five, largely as a result of annexations (Loveman. 1976). As settlers moved in and cleared the land, population centers gradually built into communities and, eventually, towns and cities. Today, these population centers are known as Turnerville, Celeste, Axis, Le Moyne, Creola, Pennsylvania, Saraland, and Satsuma. Saraland and Satsuma are the most heavily populated urbanized areas, followed by Creola, and, then, the others, by varying degrees.

By the year 1820, 2,672 people had settled in the area now known as Mobile County. In 1900, that number had grown to 62,740. In the year 2000, the population of Mobile County was 399,843. Saraland had 12,288 of that number, Satsuma had 5,687, and Creola had a population of 2,002 (U.S. Census Bureau. 2002).

Land Use

The Bayou Sara subwatershed has a total land area of greater than 65,000 acres. Of this area, less than 700 acres is in crops and only around 1,300 acres is used as pasture. There were no significant concentrations of livestock observed in the study area. The number of cattle in the area was estimated to be 235. The number of hogs was estimated to be 50. The greater majority of the study area, over 49,000 acres of it, was forested. About 500 acres per year of the forested land was being harvested. Of these 500 acres, approximately 300 acres of the forested land were clear cut. The urbanized areas comprised less than 14,000 acres. Ponds and lakes took up less than 150 acres (Alabama State Soil and Water Conservation District. 1999).

Impervious Surface Cover

In the course of the last several years, more and more attention has been paid to the effects of non-point source pollution as a significant contributor to water quality degradation in receiving streams. The term 'non-point source' covers a broad spectrum of pollutants present in runoff from a myriad of sources ranging from unauthorized solid waste dumps, to animal waste, to paved surfaces. Of particular import is the attention given to impervious surfaces. Runoff quantities and velocities are increased over impervious surfaces thus facilitating a greater likelihood for pollutant transport. Of equal concern are the associated physical changes increased runoff might cause in the land's surface as well as the stream's morphology that may lead to habitat destruction. Imperviousness can be defined as the sum of roads, parking lots, sidewalks, rooftops and other impermeable surfaces of the urban landscape or, simply, any material that prevents the infiltration of water into the soil (Methodology for Coastal Watershed Assessments, 2001). As the population continues to increase and more and more impervious surfaces are constructed, the potential for impairment to water quality from non-point surfaces also increases. The significance of such impact is reflected in assessing population effects upon water quality. Compared to population density, dwelling units, or other factors, impervious cover is a superior measure to gauge the impacts of growth (Watershed Protection Techniques, 1994).

Arriving at the estimated impervious surface cover area for the Bayou Sara subwatershed involved acquisition of aerial photographs for the area. A standard size English area grid was placed over the aerial photos and a manual count of impervious surface areas was performed. Rooftops, roadways, driveways, parking lots, and any other impervious surface were identified and roughly measured.

The total area arrived at by this method was then compared to the total surface area for the subwatershed to arrive at a percent coverage for impervious surfaces. By use of this method, impervious surface coverage for the Bayou Sara subwatershed was determined to be approximately 7,400 acres, or, approximately, an 11% impervious surface cover. The most substantial concentrations of impervious surfaces were observed in the urban areas along State Highway 43 in the east central portion of the subwatershed. As Celeste Road continues to grow with new residential construction, increasing impervious surface cover is developing in the western portion of the subwatershed.

Sanitary Sewer and Septic Systems

At the time of the study, it was estimated that there were 7,278 septic tanks within the Bayou Sara subwatershed (Alabama State Soil and Water Conservation District. 1999). Demographic data from the most recent national census was not available at the time of this report. For this reason, data gathered in the 1990 census was used for the following information. The Town of Creola had 743 housing units. Of this number, 29 were connected with the public sewer system and 714 were on septic systems. The Town of Saraland had 4,494-four housing units. 3,681 were connected with the public sewer system and 813 were on septic systems. The Town of Satsuma had 1,815 housing units. Of this number, 183 were connected with the public sewer system and 1,632 were on septic systems (ADECA. 1993). No data was available for the smaller communities within the subwatershed.

EXISTING DATA

The ADEM conducted two water quality studies of Bayou Sara and Norton Creek in 1992. These studies were conducted in attempts to better define the water quality conditions in Bayou Sara and obtain necessary data to perform a waste load allocation study for a proposed wastewater treatment facility in Satsuma. The results, contained in the *Norton Creek/Bayou Sara Waste Load Allocation Study*, were based on data generated in field studies at twelve sampling stations along the Norton Creek/Bayou Sara interface. The first of these studies ran from July 20–22, 1992, and the second from September 23–25, 1992. Parameters collected included pH, temperature, dissolved oxygen, conductivity, and salinity. In addition, the first of the studies included slug-injection of rhodamine WT dye into Bayou Sara for a time of travel study, as well as flow measurements for the study stations. The report pointed out that water quality data collected by the ADEM in 1988 indicated marginal dissolved oxygen resources in Bayou Sara. Dissolved oxygen concentrations averaged 5.57 ppm for the July study and 4.15 ppm for the September study. The lowest dissolved oxygen concentration (0.19 ppm) encountered was in Norton Creek, upstream of that creek's confluence with Bayou Sara. The reading was taken from the creek's bottom (3.3 meters). The highest dissolved oxygen concentration (11.15 ppm) encountered was at the same station. This reading, however, was taken at the surface. The highest salinity concentration (3.1 ppt) was found at the confluence of Norton Creek and Bayou Sara, at the bottom (5.0 meters). The dye trace study, performed upstream of the confluence of Bayou Sara and Gunnison Creek, demonstrated a movement of the cloud peak a distance of 0.692 miles downstream in a period of 48 hours. Flow measurements taken during the 1992 study indicated the greatest flow at Bayou Sara at Interstate 65 (30.6 cfs) and the lowest flow at Norton Creek at U.S. Highway 43 (0.41 cfs).

Bayou Sara Intensive Survey

In June, 2002, an intensive survey of the Bayou Sara Watershed was conducted by the ADEM. Nine stations were selected for the survey. Six of the stations were on Bayou Sara, one was on Norton Creek, one was on Gunnison Creek, and the remaining station was at the outfall for the Saraland wastewater treatment plant. For three days, the stations were sampled and field parameters were collected. In addition, multi meter probes were deployed at selected stations for the duration of the study. Field data collected at five of the stations (BYSM 1 through BYSM 5) is presented below. BYSM 1 was located on Bayou Sara upstream of the Saraland WWTP outfall. BYSM 3 was located on Bayou Sara upstream of the confluence with Gunnison Creek. BYSM 2 corresponds with BSW 16. BYSM 4 corresponds with BSW 18. BYSM 5 corresponds with BSW 19.

The following are tables presenting average values for the data collected during the intensive survey. These data were incorporated into the overall averages presented in this report.

Field Parameters

Station	H_20 Temp. ^{0}Celsius	D.O. ppm	Conductivity umhos/cm	Salinity ppm	pH s.u.	Turbidity n.t.u.	Secchi Depth feet
BYSM 1	29.0	2.94	19578	11.6	7.18	10.7	2.3
BYSM 2	29.5	4.58	6626	4.0	6.85	8.7	2.3
BYSM 3	29.3	4.31	5475	3.1	6.75	7.9	2.6
BYSM 4	29.0	4.09	3911	2.1	6.64	5.9	3.6
BYSM 5	26.3	1.46	2410	1.3	6.41	5.2	4.4

Data Sonde Continuous Deployment

Station	H_20 Temp. ^{0}Celsius	D.O. ppm	Specific Conductivity mS/cm	pH s.u.
BYSM 1	29.9	4.77	8.21	6.81
BYSM 2	29.4	4.65	3.43	6.71
BYSM 4	28.6	4.24	2.35	6.41
BYSM 5	26.8	0.84	1.52	6.27

Non Point Source Watershed Targeting

In April of 2001, the Department conducted a non point source survey of nps permitted sites within the Bayou Sara subwatershed. At the time of the survey, there were nine permitted sites. Of these nine, three were issued termination letters as a permit was no longer required. One site, Highland subdivision on Celeste Road, had several best management practices violations and was issued a warning letter. The violations were corrected and the site returned to compliance. No substantial water quality violations were observed during this study.

Permitted Facilities

At the time of this study, Bayou Sara had a single NPDES permitted facility; Saraland wastewater treatment plant, located at 104 Station Street, Saraland, Alabama. Saraland WWTP had 4,119 customers. 3,621 of these were residential customers, and the remaining 498 customers were non-residential. The facility's discharge permit, AL0055786, issued May 20, 1998, and modified March 6, 2001, allowed for the discharge of up to 2.6 million gallons of effluent per day to Bayou Sara. The discharge limitations established by the permit were seasonal. The Saraland WWTP discharge outfall was located approximately 2 miles downstream of station BSW 11 and about ¾ mile upstream of station BSW 12.

Saraland WWTP Permit Limits

May through November

	Monthly Average	Daily Minimum	Daily Maximum
CBOD	12.0 ppm		
TSS	30.0 ppm		
NH_3-N	1.0 ppm		
Fecal Coliform	500 colonies/100 ml		4000 colonies/100 ml
pH		6.0 s.u.	9.0 s.u.
DO		5.0 ppm	
TRC (after chlorination)		0.5 ppm	
TRC (after dechlorination)			0.03 ppm

December through April

	Monthly Average	Daily Minimum	Daily Maximum
CBOD	25.0 ppm		
TSS	30.0 ppm		
NH_3-N	8.0 ppm		
Fecal Coliform	2700 colonies/100 ml		4000 colonies/100 ml
pH		6.0 s.u.	9.0 s.u.
DO		5.0 ppm	
TRC (after chlorination)		0.5 ppm	
TRC (after dechlorination)			0.03 ppm

A Compliance Sampling Inspection conducted by the ADEM in April, 2002 incorporated three days of continuous sampling of the Saraland WWTP's effluent. The results are as follow:

Parameter	3-Day Average
CBOD	15.4 ppm
TSS	23.3 ppm
NH_3-N	9.4 ppm
Fecal Coliform	1803 colonies/100 ml
pH	6.88 s.u.
DO	2.88 ppm
TRC (after chlorination)	1.17 ppm
TRC (after dechlorination)	< 0.3 ppm
Flow	0.98 mgd

At the time of this writing, the Saraland WWTP was undergoing a substantial upgrade to facilitate effective treatment of wastewater and bring their discharges into compliance with permit requirements.

MATERIALS AND METHODS

This study was conducted in accordance with the ADEM *Methodology for Coastal Subwatershed Assessments, 2001* and executed under the requirements established in the ADEM *Standard Operating Procedures and Quality Control Assurance Manual*.

The Bayou Sara subwatershed was delineated using U.S. Department of the Interior Geological Survey 7.5 Minute Series topographic maps. The quadrangles: The Basin, Chunchula, Creola, Hurricane, Kushla, Mobile, and Saraland were used in mapping the contour lines to determine the extent of the basin. Pre-existing boundaries for the Bayou Sara subwatershed bisected Dead Lake along that water body's east-west axis. As all of Dead Lake appears to drain at its terminus, a more accurate description of the subwatershed boundary would be one that included all of Dead Lake. Interstate 65 appears to form a barrier between the Bayou Sara subwatershed and the Cedar Creek subwatershed (another sub-subwatershed of the Mobile-Tensaw River Delta) just north of Dead Lake. Using the mapped topographic relief lines provides for a new easternmost boundary of the Bayou Sara subwatershed. The new boundary lies approximately one and a half miles east of the previously established boundary, in an area formerly designated as part of the Cedar Creek subwatershed.

As discussed in the introduction, sampling stations were selected to represent the land use within the study area. Land use determinations were obtained from the Alabama Soil and Water Conservation needs Assessment Unit. Station accessibility was a significant factor in the final designation of stations. The northern portion of the subwatershed's land use was predominately rural/agricultural. Four stations were selected to represent rural/agricultural land use. Urban/industrial land use was prevalent in the south central portion of the subwatershed. Five stations were selected to represent urban/industrial land use. The easternmost segment of the subwatershed was riverine with multiple islands. Seven stations were located in this segment. One station was established solely for flow determination. Each station was given the designation BSW (Bayou Sara subwatershed) and a number. BSW 1 – BSW 8 and BSW 21 were accessible by public roadway. BSW 10 – BSW 19 were only accessible by boat. With the exception of BSW 3, BSW 1 – BSW 8 were wadeable stations. At these stations, field parameters were recovered from mid depth and samples were retrieved from the surface. At those stations accessible only by boat, field parameters were taken at the surface, mid depth, and bottom. For stations BSW 16 – BSW 19, field parameters were taken at 1 foot increments from the surface to bottom. The additional measurements were in support of the Department's TMDL assessment program. All samples were retrieved at a depth of 15 to 30 cm below the water's surface.

Each of the stations were visited, at least monthly, and monitored for; dissolved oxygen, pH, salinity, conductivity, flow, and temperature, as well as sampled for total suspended solids, total dissolved solids, turbidity, fecal coliform bacteria, ammonia, nitrates/nitrites, total Kjehldahl nitrogen, total phosphorous, and ortho phosphate. Stations were also sampled, on a one time basis, for metals concentrations in the water column and sediment, as well as oil and grease concentrations, PCB concentrations, and pesticide concentrations. Field parameters for those stations located in the central and western portions of the subwatershed (BSW 1 – BSW 8) were taken *in-situ* using the YSI 600XLM® and the YSI 610-D®. The Hydrolab H20® and the Hydrolab Scout® were used to record *in-situ* field parameters for those stations in the easternmost portion of the subwatershed (BSW 10–19). When deployed for continuous monitoring, probes were affixed at mid-depth.

Flow measurements were obtained using the Pygmy Flow Meter. The Department's Microsoft Excel Stream Flow Calculation Worksheet was used to calculate flow based on measurements obtained using a Price vertical axis current meter, pygmy type, mounted on a top setting rod.

Ortho-phosphate samples were field filtered through a 0.45 micrometer cellulose filter using a hand operated vacuum. Samples were transported to the laboratory for analysis on the same day as the sampling event. In some instances, the samples were transported to the ADEM central laboratory in Montgomery, Alabama. Chain of custody records were maintained for each sampling event. The majority of samples were analyzed at the ADEM Mobile Field Operations laboratory, while volatile and pesticide samples were analyzed at the ADEM Montgomery Field Operations laboratory.

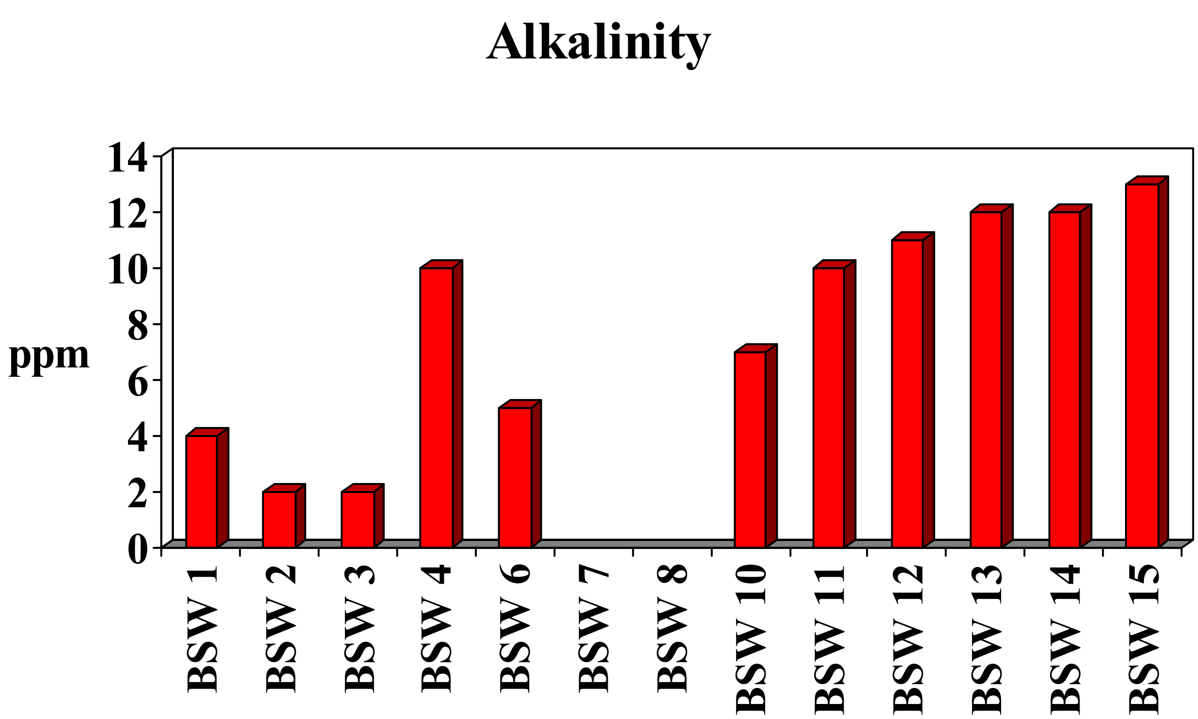
Habitat assessments were performed by two field personnel according to ADEM Field Operations standard procedure using standardized Glide/Pool Habitat Assessment Field Data Sheets. Observations of the two individual assessments were combined to present the habitat assessments contained in this report.

For purposes of description in the Sampling Results and Discussion section of this report, study stations not tidally influenced are referred to as freshwater stations and those stations that are tidally influenced stations are identified as tidally influenced.

SAMPLING RESULTS AND DISCUSSION

Alkalinity

Alkalinity, sometimes referred to as "carbonate hardness", is a measure of a water body's buffering capacity, or ability to neutralize acid or hydrogen ions. It is often an indicator of the presence of the bicarbonate ion, other carbonates, or hydroxide ions. Alkalinity, generally, arises from leachate from soil and minerals. Alkalinity is important for aquatic life because it protects against rapid pH changes. Living organisms, especially aquatic life, function best in a pH range of 6.0 to 9.0. Higher alkalinity levels in surface waters will buffer acid rain and other acid wastes that would otherwise



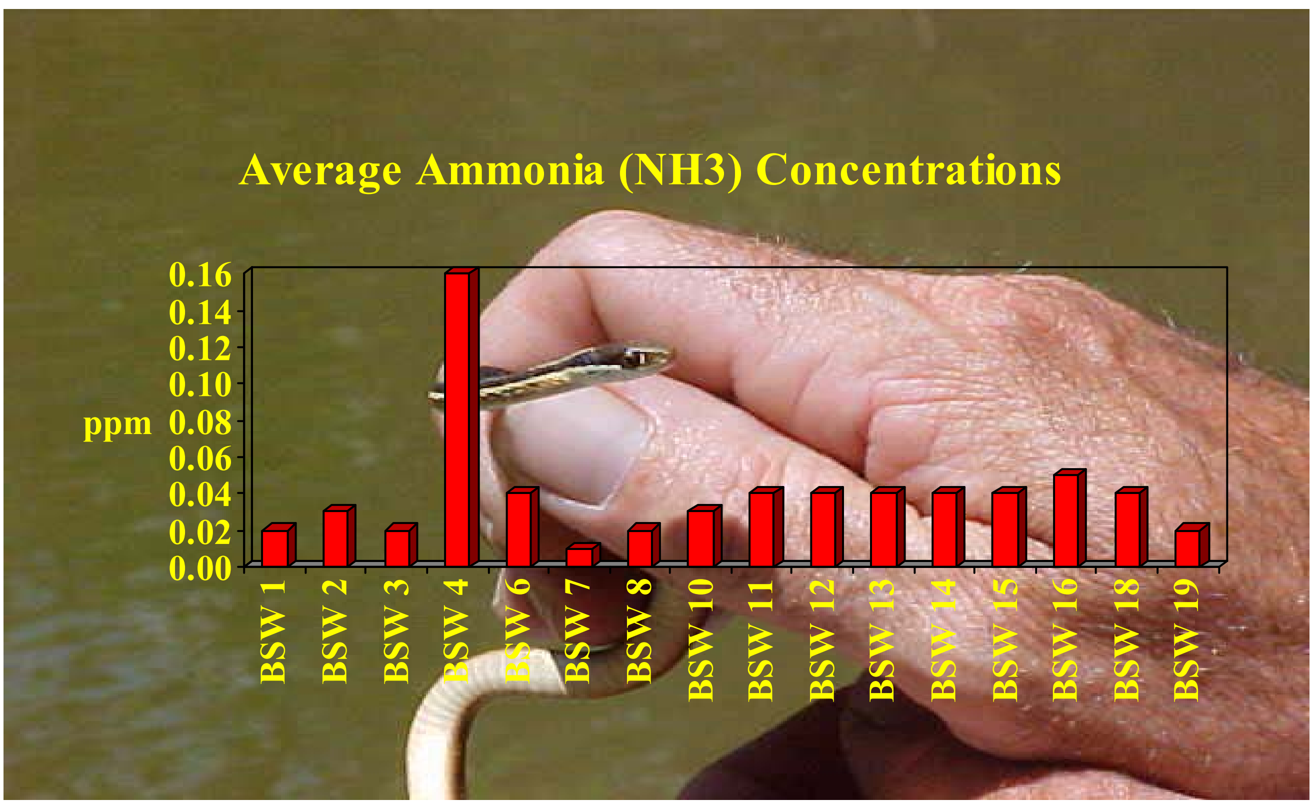
cause pH changes that are harmful to aquatic life. If the alkalinity is too high, however, the pH rises above optimum levels, thus increasing the potential for harm to fish and other aquatic organisms (Grimwood, M.J. & Dixon, E. 1997).

A general correlation appears to exist between alkalinity and hardness. Hard water, water containing metal carbonates (mostly $CaCO_3$), usually has a high alkalinity, while soft water has a lower alkalinity. Low alkalinity suggests that the water body is more susceptible to fluctuations in pH. Low alkalinity may cause the pH of water to be very acidic and can negatively affect hatching and development of aquatic animals and adult fish. High levels of precipitation tend to lower a water body's alkalinity (Kentucky Natural Resources and Environmental Protection Cabinet. 2001).

Alkalinity was, generally, observed to be higher at the tidally influenced stations than at the freshwater stations. The lowest alkalinity values were less than two parts per million and were recorded at stations BSW 7 and BSW 8. Among the freshwater stations, stations BSW 4 had the greatest alkalinity values, followed by station BSW 6. Station BSW 10 recorded the lowest alkalinity values among the tidally influenced stations.

Ammonia

Ammonia is a colorless gas with a very sharp odor. It is a very important source of nitrogen for plants and animals and may be found in water, soil, and air, but does not last very long in the environment. Ammonia is suspected to remain in the atmosphere less than two weeks, depending on weather and other factors, before being deposited or chemically altered. It is recycled naturally by a substantial number of plants and microscopic organisms that rapidly take up ammonia. Most of the ammonia in the environment comes from the natural breakdown of organic matter, like feces, and dead plants and animals. The amount of ammonia produced by man is very small compared to that produced by nature every year. The majority of man-made ammonia goes toward the manufacture of fertilizer. Ammonia is also used to manufacture synthetic fibers, plastics, and explosives (Microsoft® Encarta® Online Encyclopedia 2002). It may be introduced to a watershed through surface water runoff, direct discharge, or directly from the atmosphere.



Ammonia readily dissolves in water, disassociating to ammonium ion (NH_{4+}) and hydroxide ion (OH-). Although ammonia and ammonium can change back and forth in water with ease, the ammonium ion is the most common form in aquatic environments. The ammonium ion is considered non-toxic and of little concern to organisms.

Problems occur when too much ammonia becomes available and the free ammonia accumulates in the body tissues. Such accumulation can lead to metabolism alterations or increases in internal pH. Generally, the total percentage of ammonia in water is expected to increase with temperature and pH. Concentrations of the principal form of toxic ammonia (NH_3) of less than half a part per million may be toxic to some aquatic organisms. Such toxicity is directly correlated with both temperature and pH (Grimwood, M.J. & Dixon, E. 1997). Existing data seem to indicate that pH plays a larger role than does temperature. Above a pH of 9, un-ionized ammonia (NH_3) replaces ammonium ion as the predominant species. This fact, coupled with the knowledge that un-ionized ammonia may cross cell membranes more readily at higher pH values, demonstrates how water conditions may heighten the toxic effects of ammonia on aquatic organisms.

Other factors influencing the toxicity of ammonia in an aquatic environment are dissolved oxygen concentrations, historical ammonia loading, CO_2 concentrations, and the presence of other toxic compounds. Plants appear to be more tolerant of ammonia than are animals. Invertebrates also appear to demonstrate a greater ammonia tolerance than do higher life forms (NCSU Water Quality Group. August 1994).

The station exhibiting the greatest average concentration of ammonia during the study was BSW 4. As BSW 4 was the most urbanized/industrialized stations of them all, this was not unanticipated. A channelized ditch passing through industry, housing, and major thoroughfares, stresses from pollutants were expected to be greatest at this station. The lowest average ammonia concentrations were observed at station BSW 7. Among the tidally influenced stations, BSW 19 had the lowest average ammonia concentrations and station BSW 16 had the highest average concentrations.

The following table provides the maximum, minimum, and average mean values for ammonia concentrations observed during the study period.

Ammonia (NH_3) in parts per million

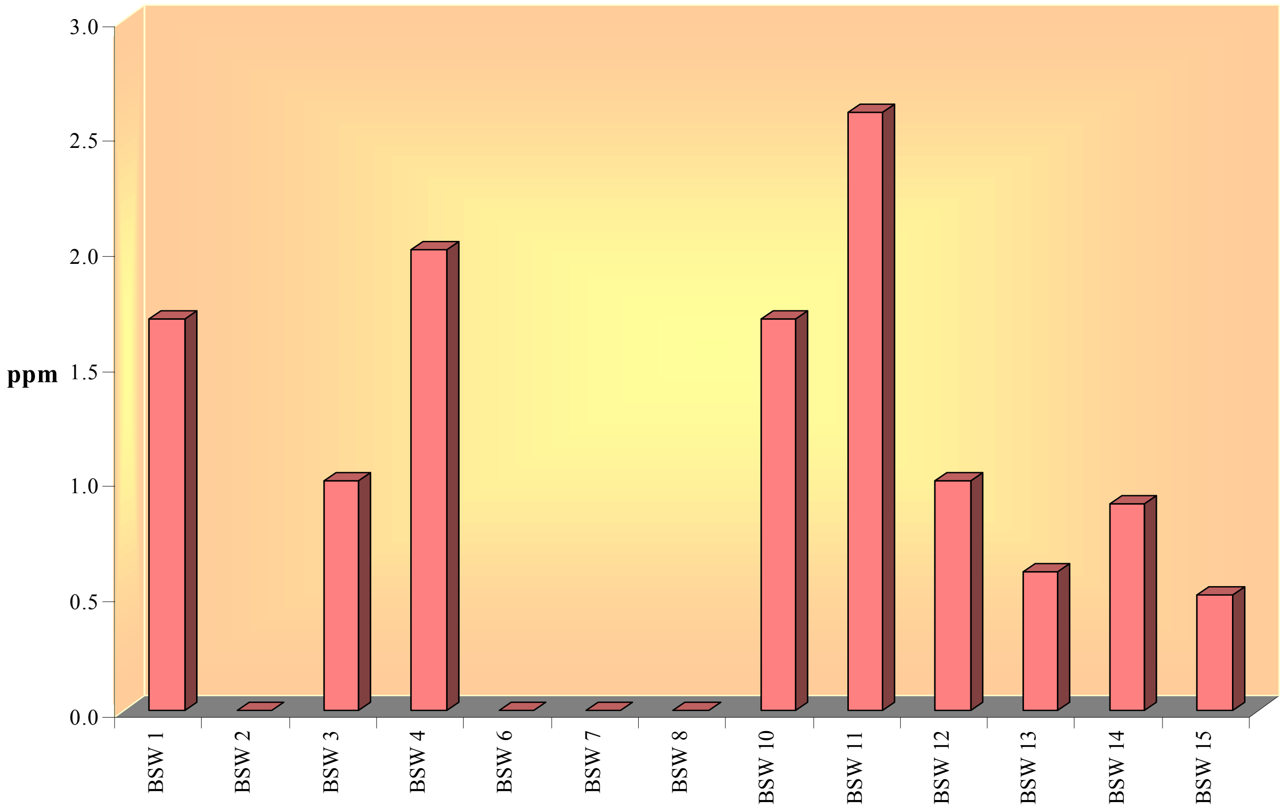
	BSW 1	BSW 2	BSW 3	BSW 4	BSW 6	BSW 7	BSW 8	BSW 10
Average	0.03	0.03	0.02	0.16	0.04	0.01	0.02	0.03
Maximum	0.04	0.11	0.04	1.9	0.17	0.02	0.04	0.05
Minimum	0.01	0.01	0.01	0.01	< 0.01	0.01	0.01	0.01

	BSW 11	BSW 12	BSW 13	BSW 14	BSW 15	BSW 16	BSW 18	BSW 19
Average	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.02
Maximum	0.1	0.11	0.08	0.09	0.09	0.1	0.1	0.04
Minimum	0.01	0.01	0.01	0.01	0.02	< 0.01	0.01	< 0.01

BOD_5

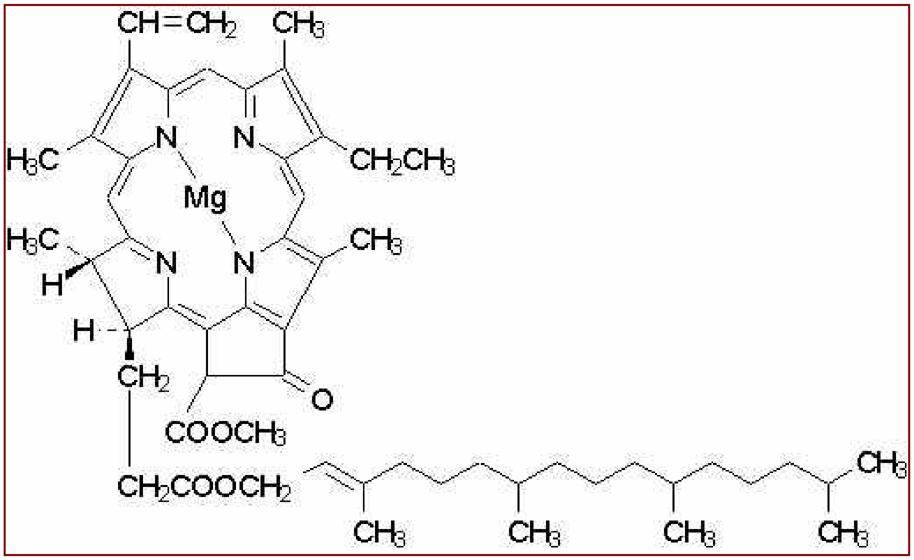
Oxygen is required not only for the survival of aquatic organisms, but also for the decomposition of organic material, including pollutants, in the system. When organic material within an aquatic system decomposes, it is broken down and oxidized by aerobic bacteria. Biochemical oxygen demand is a measure of the quantity of oxygen used by microorganisms in this process. The chemical oxidation of other materials such as ferrous iron, sulfides, and ammonia also consume oxygen in the water. Oxygen consumed in these processes ultimately deplete the available oxygen for the entire system. The test for determining biochemical oxygen demand takes five days, hence the name BOD_5.

Average BOD_5 Values

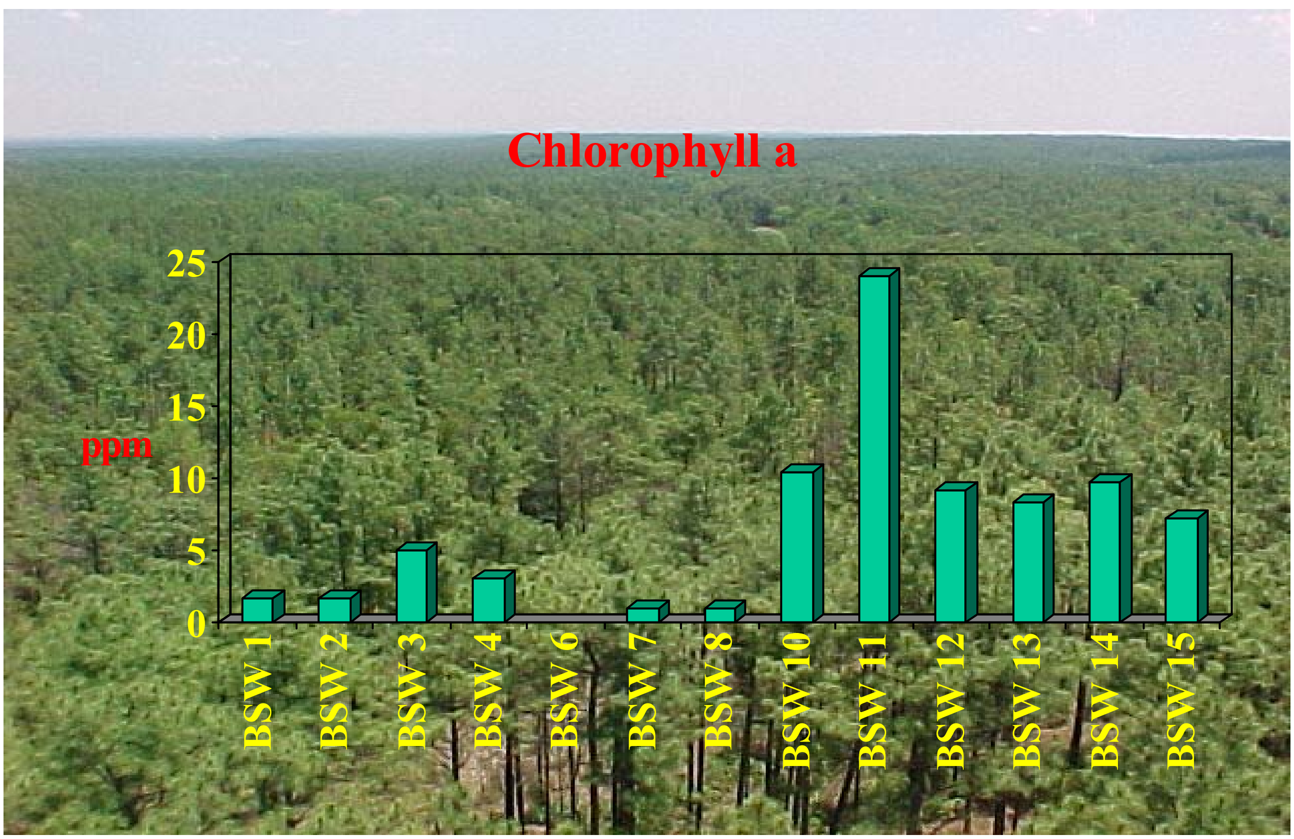


As illustrated in the graph, the highest average biochemical oxygen demand was at station BSW 11. Station BSW 4 had the next highest demand levels, followed by stations BSW 1 and BSW 10. Stations BSW 2, BSW 6, BSW 7, and BSW 8 had the lowest average biochemical oxygen demands. Among the tidally influenced stations, BSW 15 had the lowest average BOD_5 levels.

Chlorophyll a



Chlorophyll is the green colored material found in the chloroplasts of plants, algae, and some bacteria. It is one of the most important chelates (molecules with ring structures that usually contain a metal ion) in the environment. It is a large molecule composed mostly of carbon and hydrogen. At the center of the molecule is a single atom of magnesium surrounded by a porphyrin ring (a nitrogen-containing group of atoms). A long chain of carbon and hydrogen atoms proceeds from this central core. This chain couples the chlorophyll molecule to the inner membrane of the chloroplast (the cell organelle in which photosynthesis takes place. By use of chlorophyll, organisms are able to convert light energy



into chemical energy. In photosynthesis, the energy absorbed by chlorophyll transforms carbon dioxide and water into carbohydrates and oxygen. In the process, a molecule of chlorophyll absorbs a photon of light. Having done so, the chlorophyll's electrons are excited and move to higher energy levels, which in turn initiates a series of chemical reactions that enable the resulting energy to be stored in chemical bonds (Microsoft® Encarta® Online Encyclopedia. 2002).

There are several known forms of chlorophyll. The varying forms differ from each other in molecular structure and absorb slightly different wavelengths of light. The most common form is chlorophyll a, which comprises about seventy-five percent of the chlorophyll in green plants. It is also found in cyanobacteria and other complex photosynthetic cells (NCSU. 1984). Measuring chlorophyll a concentrations in water is an inexpensive means of measuring algae biomass. Substantial concentrations of chlorophyll a might indicate the presence of algae blooms. It is generally accepted that chlorophyll a concentrations in excess of 20 ppm promote eutrophication and facilitate severe diurnal dissolved oxygen fluctuations.

At 24 ppm, station BSW 11 exhibited the greatest average concentration of chlorophyll a. It is generally accepted over the study period , none of the stations exhibited excessive chlorophyll a concentrations. All of the average values for chlorophyll a recorded at the tidally influenced stations were greater than those recorded for the freshwater stations. Station BSW 15 recorded the lowest average concentrations among the tidally influenced stations. Stations BSW 3 and BSW 4 had the greatest chlorophyll a concentrations among the freshwater stations, and stations BSW 6, BSW 7, and BSW 8 exhibited the lowest average concentrations.

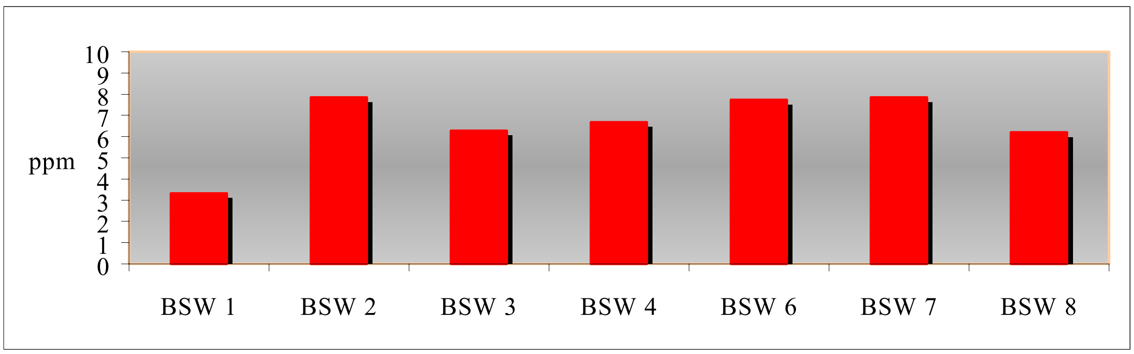
Dissolved Oxygen

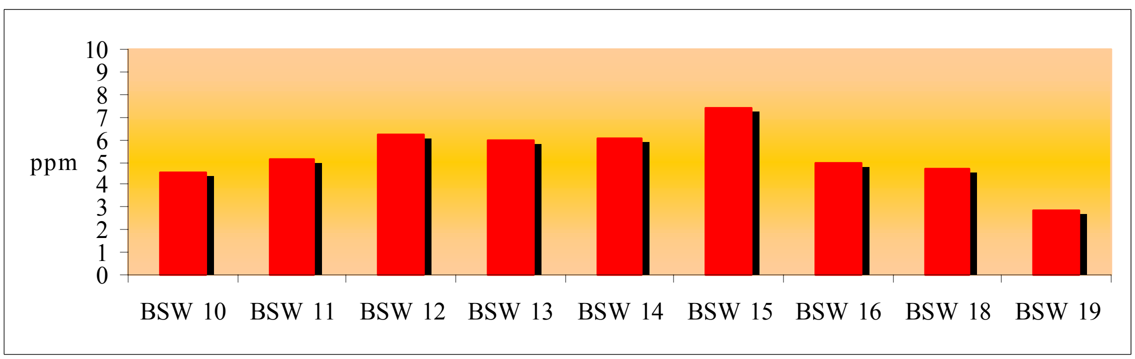
Dissolved oxygen is defined as the amount of free molecular oxygen, O_2, dissolved in an aqueous solution. Oxygen gets into water by diffusion from the surrounding air, by aeration (rapid movement), and as a waste product of photosynthesis. Regardless of its vehicle of introduction, the dissolved oxygen content in a water body may be considered one of the most important and principal measurements of water quality and indicator of a water body's ability to support aquatic life. Dissolved oxygen levels in aquatic systems can range from 0-18 parts per million, but most natural water systems require 5-6 parts per million to support a diverse population (NCSU. 1994). Adequate dissolved oxygen is essential in aquatic systems for the growth and survival of biota. Dissolved oxygen levels above 5 milligrams per liter (mg O_2/L) are considered optimal. Levels below 1 milligrams per liter are considered *hypoxic* (oxygen deficient). When O_2 is totally absent, the system is considered *anoxic*. Dissolved oxygen in aquatic systems is necessary for plants and animals to carry on respiration. Some bacteria consume oxygen during the process of decomposition. Decreases in the dissolved oxygen levels can cause changes in the types and numbers of aquatic macroinvertebrates, which live in a water ecosystem. Some organisms, like mayflies, stone flies, caddis flies, and aquatic beetles, require high dissolved oxygen levels to survive. Worms and fly larvae, which can survive in low dissolved oxygen environments, can be indicators of an unhealthy water body (NCSU. 1994).

Dissolved oxygen levels change and vary according to the time of day, the weather, the temperature, applied stress, and any number of other variables. The lowest dissolved oxygen values observed during this study corresponded to the slower moving waters where there was very little air/water mixing. As has been previously discussed, the Bayou Sara watershed exhibits little topographic relief, resulting in slow, meandering streams free from waterfalls and significant stretches of rapids. Dissolved oxygen values for all stations were consistently lower during the summer months than recorded values for the remainder of the seasons. The highest dissolved oxygen concentrations were observed during the winter months. During the summer months, measured dissolved oxygen concentrations at mid depth frequently fell below 5.0 ppm. Further, dissolved oxygen concentrations less than 1.0 ppm were not uncommon along the bottom.

Division 6 of the ADEM Administrative Code provides a water quality criteria for dissolved oxygen of at least 5.0 parts per million in those waters with a use classification of fish and wildlife, and swimming and other whole body contact water sports. Station BSW 1 which carried a use classification of fish and wildlife, consistently demonstrated dissolved oxygen levels below 5 parts per million. The low values for station BSW 1 can, most likely, be attributed to the swampy nature

Average Dissolved Oxygen Concentrations for Entire Study Period





of the station and the associated oxygen demand. Very little water movement coupled with substantial organic decay often results in associated low dissolved oxygen levels (NCSU. 1994). As discussed previously, station BSW 11 exhibited elevated chlorophyll a concentrations. Dissolved oxygen values observed at this station were not substantially depressed to be consistent with the anticipated effects of excessive chlorophyll a concentrations. Stations BSW 10, BSW 18, and BSW 19, all classified for use as swimming and other whole body contact water sports, in addition to their fish and wildlife use classification, also exhibited depressed average dissolved oxygen levels. Apart from impervious surface coverage and the presence of live aboard vessels at station BSW 10, there were no obvious sources of impairment observed. No apparent source of impairment was observed around station BSW 18. The sediment at station BSW 19 had a distinctive hydrogen sulfide odor.

As this odor is typically indicative of anaerobic decomposition, depressed dissolved oxygen levels could be predicted. BSW 15 exhibited the highest average dissolved oxygen concentrations. Among the freshwater stations, BSW 2, BSW 6, and BSW 7 recorded the highest concentrations. Stations BSW 1 and BSW 19 typically demonstrated the lowest average dissolved oxygen content for all stations. It should be observed that fish, birds, and other biota were observed in similar number and frequency at all stations, particularly at those tidally influenced stations reached by boat. Station BSW 19, though exhibiting the lowest dissolved oxygen levels among all stations, appeared to support a greater population of turtles than were observed in any other portion of the watershed. Ducks were common, as were Great Blue Herons, and Kingfishers. Station BSW 1, despite the depressed dissolved oxygen concentrations, also demonstrated a prolific abundance of flora and fauna. Minnows were a common sight along the streams' edge, as were bream and small largemouth bass.

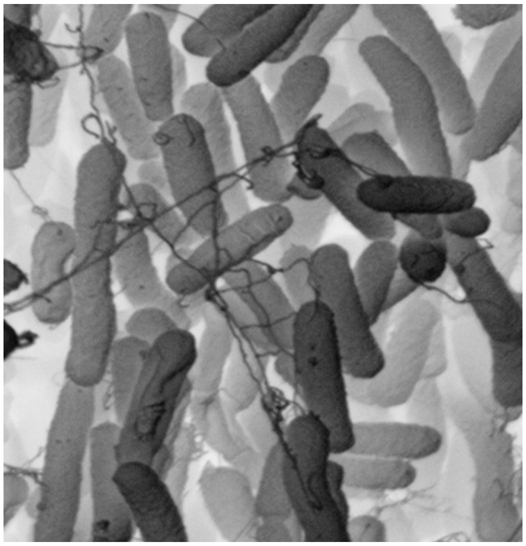
The following table provides the maximum, minimum, and average mean values for dissolved oxygen concentrations observed during the study period.

Dissolved Oxygen Concentrations in parts per million

	BSW 1	**BSW 2**	**BSW 3**	**BSW 4**	**BSW 6**	**BSW 7**	**BSW 8**	**BSW 10**
Average	3.33	7.85	6.28	6.68	7.74	7.85	6.21	4.5
Maximum	8.93	11.6	11	11.7	11.6	11.5	10.7	10.01
Minimum	0.58	5.72	4.1	3.8	4.57	5.82	4.63	0.66

	BSW 11	**BSW 12**	**BSW 13**	**BSW 14**	**BSW 15**	**BSW 16**	**BSW 18**	**BSW 19**
Average	5.17	6.18	5.88	6.02	7.25	5	4.71	2.89
Maximum	9.61	9.61	11.24	11.3	11.6	9.62	9.62	10.2
Minimum	1.41	0.46	0.17	0.28	1.38	0.63	0.18	0.08

Fecal Coliform Bacteria

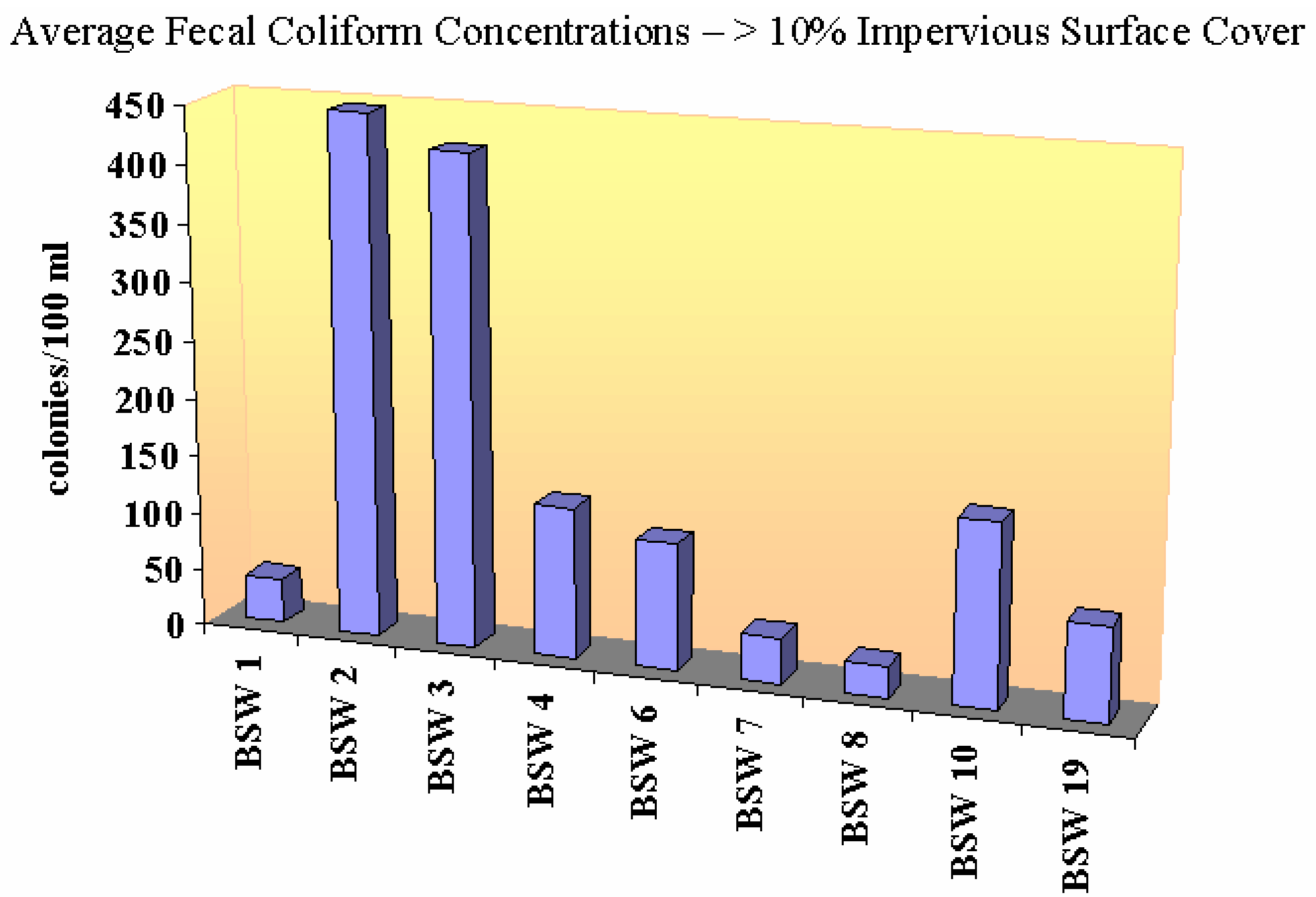


Bacteria are prokaryotes of the Kingdom Monera. Monerans are the most numerous and the most ubiquitous organisms in the environment. Total coliform bacteria are a collection of relatively harmless microorganisms that live in large numbers in the intestines of man and warm and cold-blooded animals. These bacteria are essential for the digestion of certain foods. One of the total coliform bacteria subgroups is the fecal coliform bacteria. Of this subgroup, the most common member is *Escherichia coli*. The inset photo, at the left, is an electron micrograph of *E. coli*. Coliform bacteria are not considered to be pathogenic organisms, having been demonstrated to be only mildly infectious. Fecal coliform bacteria serve as a group of indicator organisms, i.e., their presence indicates recent fecal pollution by animals or man, and the possible presence of other disease causing organisms that may potentially infect those that come into contact with the water. It is generally accepted that the presence of fecal coliform bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of man or other animals. Substantial numbers of these organisms in an aquatic environment gives rise to concern that pathogenic organisms, also present in fecal matter, may be present. As such, the presence of fecal coliform bacteria is an indicator that a potential health risk exists for individuals exposed to this water. Such health risks include ear infections, dysentery, typhoid fever, viral and bacterial gastroenteritis and hepatitis A. It should also be noted that the presence of fecal coliform tends to affect humans more than it does aquatic creatures.

Fecal coliform bacteria can enter surface water through direct discharge of waste from mammals and birds, from agricultural and storm runoff, and from untreated human sewage. Individual home septic systems can become overloaded during rain events and allow untreated human wastes to flow into drainage ditches and nearby waters. Agricultural practices also may contribute to bacterial contamination through such practices as allowing animal wastes to wash into nearby streams, spreading manure and fertilizer on fields during rainy periods, and allowing livestock to water in streams.

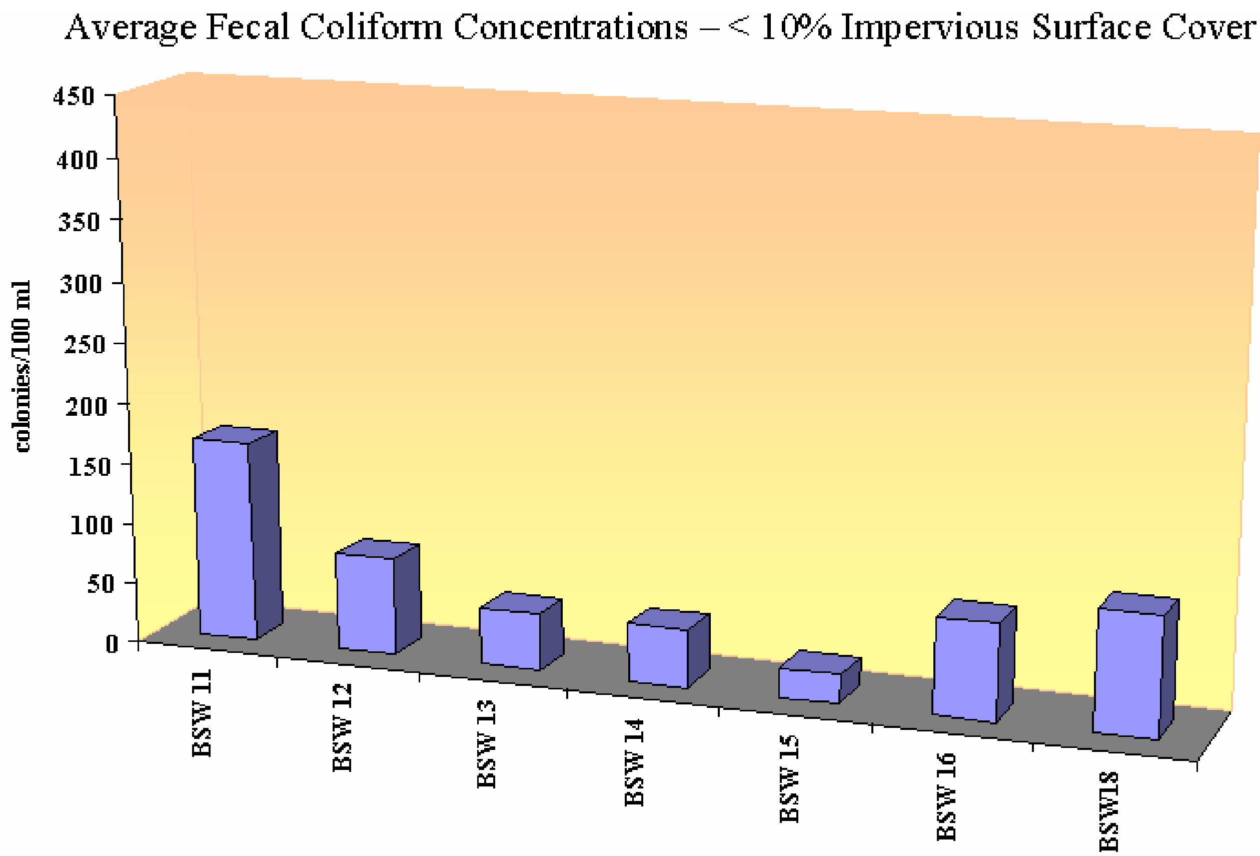
On average, fecal coliform bacteria concentrations were not encountered in alarming numbers at any of the Bayou Sara watershed study stations. Elevated concentrations were observed, however, at several of the stations following substantial rain events. This may be attributed to surface water runoff washing fecal contamination from the surface and into the watershed's streams. The highest concentrations encountered were from samples retrieved during a substantial rain event, at a time when tremendous volumes of runoff were being introduced.

As indicated by the inserted charts, the average fecal coliform bacteria concentrations were highest at those stations located nearest the most urbanized areas of the watershed (BSW 2 – BSW 4). Such elevated concentrations at these stations may be attributed to greater runoff volumes resulting from increased impervious surface cover. The elevated bacteria concentrations observed at BSW 10 might arise from the large number of live-aboard vessels docked upstream of that station. The higher values observed at station BSW 11 may be attributed to runoff containing wildlife fecal



matter, as there was no observable human activity in the area. The lowest average fecal coliform bacteria concentrations were observed at station BSW 15 among the tidally influenced stations and station BSW 1 among the fresh water based stations.

On three occasions, in sections of stream with a water use classification of Fish and Wildlife, fecal coliform concentrations exceeded the established ADEM water use criteria of 2,000 colonies/100ml. On August 28, 2001 station BSW 3 exhibited a fecal count greater than 4,000 colonies/100 ml and station BSW 4 exhibited a fecal count greater than 2,500 colonies/100 ml. BSW 2 exhibited a fecal count greater than 3,000 colonies/100 ml on March 12, 2002. These samples were retrieved either during (3/12/2002) or following (8/28/2001) rain events. As no geometric mean sampling was included in this study, the water quality criteria established for those waters carrying a use classification of swimming and other whole body water contact sports is not applicable in terms of comparison to the data presented.



The following table provides the maximum, minimum, and average mean values for fecal coliform bacteria concentrations observed during the study period.

Fecal Coliform Bacteria Colonies per 100 ml

	BSW 1	BSW 2	BSW 3	BSW 4	BSW 6	BSW 7	BSW 8	BSW 10
Average	39	448	420	289	116	100	51	157
Maximum	160	3200	> 4000	2600	960	420	290	840
Minimum	4	84	54	12	10	6	8	10

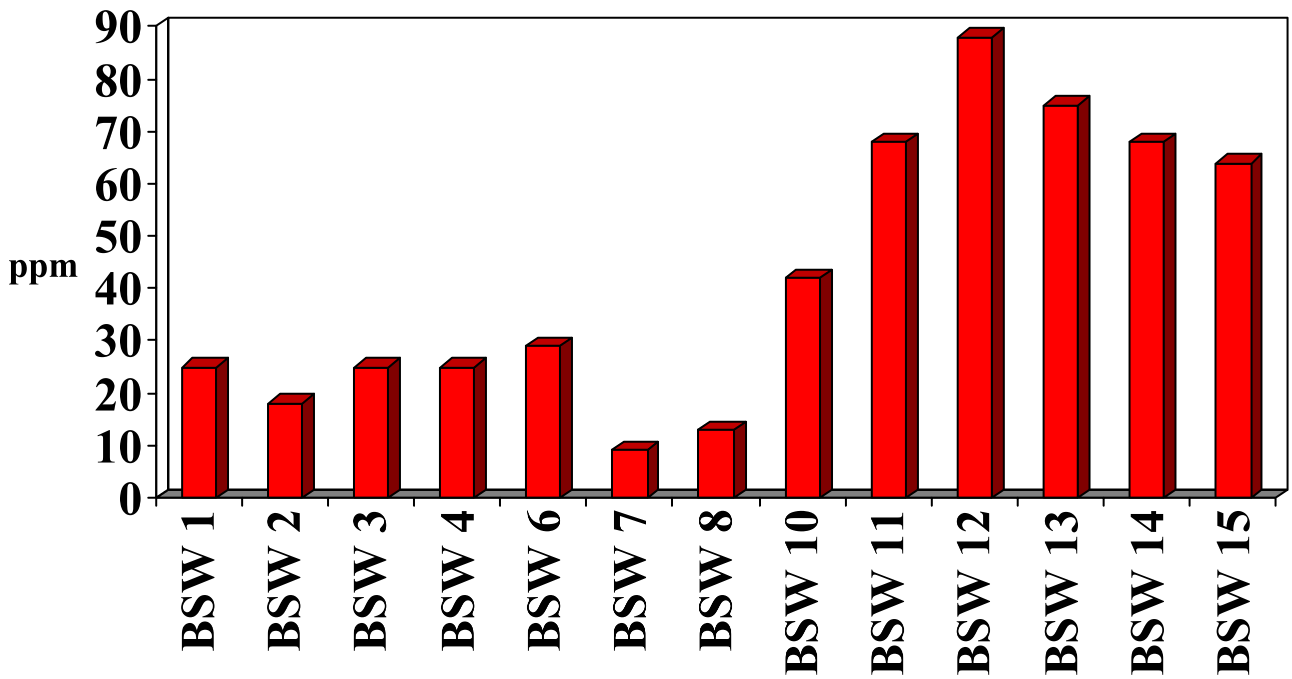
	BSW 11	BSW 12	BSW 13	BSW 14	BSW 15	BSW 16	BSW 18	BSW 19
Average	165	80	47	47	24	79	82	81
Maximum	540	220	210	120	61	320	420	130
Minimum	11	4	2	6	2	8	2	12

Hardness

Hardness is a measure of polyvalent cations dissolved in water. The most common of these cations are calcium (Ca^{2+}) and magnesium (Mg^{2+}). Other contributing cations may include iron, strontium, and manganese. Total hardness, for the purposes of this study, is a measure of the total concentration of calcium and magnesium. The total hardness of water may range from trace amounts to hundreds of milligrams per liter. It is an indicator of water quality primarily as a result of its effect upon other metals that may be present in the water body. Specifically, hardness may tend to interact with the other metals in such a way as to form insoluble precipitates that fall out of solution, thereby removing them as a threat to ingestion for some aquatic organisms (NCSU. 1984).

A water body's hardness is a function of the geology of the area in which that water body is

Hardness Values



situated, more than anything else. A pronounced lack of limestone and other minerals within the Bayou Sara watershed results in low values for water hardness. This was not unanticipated as, typically, water hardness values in the southeastern United States are among the lowest in the nation (NCSU. 1984).

Samples retrieved from the tidally influenced stations produced the highest average values for water hardness. This can probably be attributed to the proximity and hydraulic connectivity to the Mobile River. Station BSW 12 had the highest average hardness values among all stations and station BSW 7 had the lowest average values, followed by station BSW 8. Station BSW 10 had the lowest average hardness values among the tidally influenced stations.

Nitrate/Nitrite

Nitrogen (N_2) is one of the planet's most abundant elements. It is a principal component of our atmosphere. The air we breath is composed of approximately eighty percent nitrogen. It is found in the cells of all living things and is an essential component of proteins. Inorganic nitrogen exists in nature in the free state as a gas (N_2), or as nitrate (NO_3-), nitrite (NO_2-), or ammonia (NH_3+). Nitrogen enters the water body via runoff (animal wastes and septic tanks), municipal and industrial wastewater, and even discharges from car exhausts. In aquatic environments, nitrogen-containing compounds act as nutrients. Aquatic plants and animals continually recycle the available nitrogen. Depending on the predominant form, too much or too little nitrogen in the system may have deleterious effects. Too little nitrogen and the biota experience deprivation, too much and the algae, plants that are fed by nutrients, thrive and rapidly overpopulate. Such algae blooms pose a number of problems to an aquatic system. They contribute to turbidity and substantially reduce the amount of light penetrating the water. And, though they produce oxygen as a by product of photosynthetic activity, the amount of dissolved oxygen they contribute to the aquatic system is not sufficient to overcome the oxygen demand created by their subsequent decay. Further, the bacteria feeding upon the decaying algae quickly convert nitrites to nitrates. Nitrate reactions in aquatic environments can cause oxygen depletion. The sum effect of eutrophication on aquatic systems is decreased dissolved oxygen levels. Decreased dissolved oxygen levels, in turn, leads to hypoxic or even anoxic conditions (NCSU. 1984).

Not surprisingly, the highest nitrate/nitrite values encountered were at one of the most urbanized/industrialized stations, BSW 4, on Norton Creek. At no station could the observed nitrate/nitrite levels be interpreted as excessive. The lowest average nitrate/nitrite concentrations were observed at station BSW 1, followed by BSW 7. Among the tidally influenced stations, BSW 11 had the lowest average concentrations.

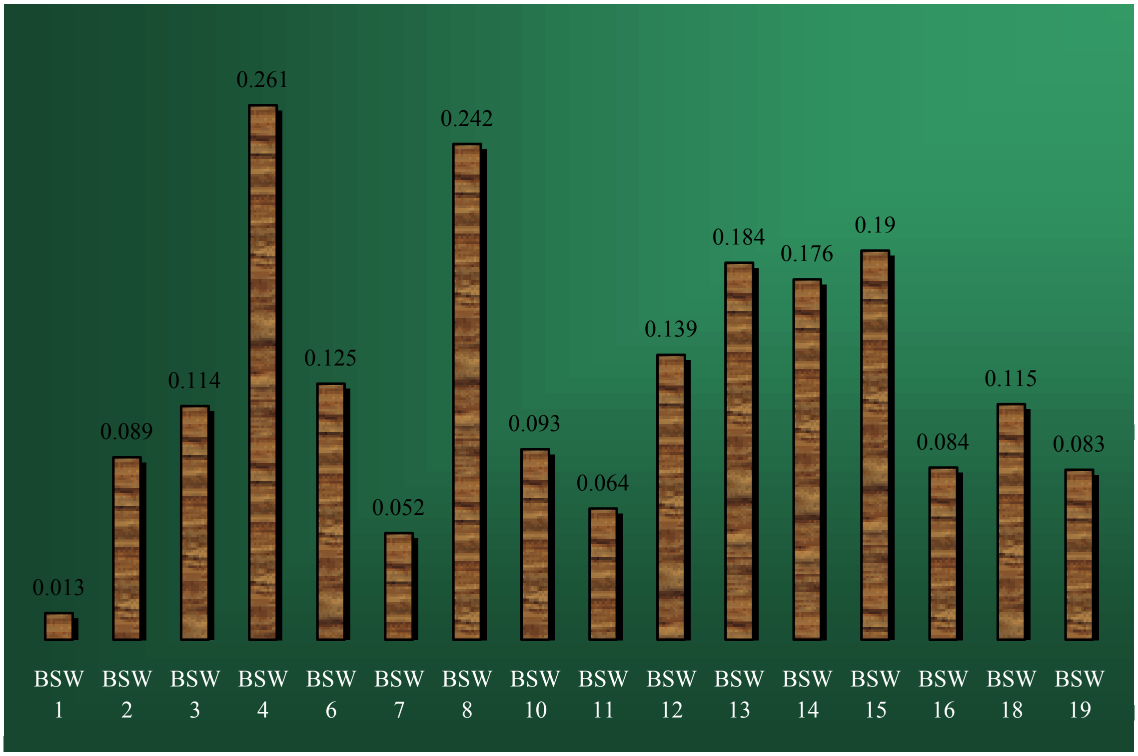
The following table provides the maximum, minimum, and average mean values for Nitrate/Nitrite concentrations observed during the study period.

Nitrate/Nitrite Concentrations in parts per million

	BSW 1	BSW 2	BSW 3	BSW 4	BSW 6	BSW 7	BSW 8	BSW 10
Average	0.011	0.089	0.112	0.263	0.125	0.054	0.232	0.086
Maximum	0.016	0.207	0.189	0.506	0.614	0.281	0.458	0.171
Minimum	< 0.005	0.027	0.029	0.045	< 0.005	< 0.005	0.021	0.008

	BSW 11	BSW 12	BSW 13	BSW 14	BSW 15	BSW 16	BSW 18	BSW 19
Average	0.064	0.139	0.184	0.176	0.184	0.084	0.115	0.083
Maximum	0.2	0.331	0.382	0.413	0.317	0.15	0.253	0.179
Minimum	0.007	0.008	0.016	0.012	0.018	<0.005	0.024	0.023

Average Nitrate/Nitrite Concentrations in Parts Per Million



Total Kjehldahl Nitrogen

It has already been demonstrated that Nitrogen is a very important nutrient to a stream ecology and that, while some nitrogen is necessary as a nutrient for aquatic plant growth, too much nitrogen adversely affects that ecology. Since the nitrogen cycle is very complex, and nitrogen can exist in so many forms simultaneously, the Total Kjehldahl Nitrogen (TKN) test was developed using digestion and distillation to determine the sum concentration of the various nitrogen compounds. Kjehldahl nitrogen, therefore, refers to the total of organically bound nitrogen and ammonia nitrogen. Typically, high Total Kjehldahl Nitrogen values are indicative of pollution in an aquatic system.

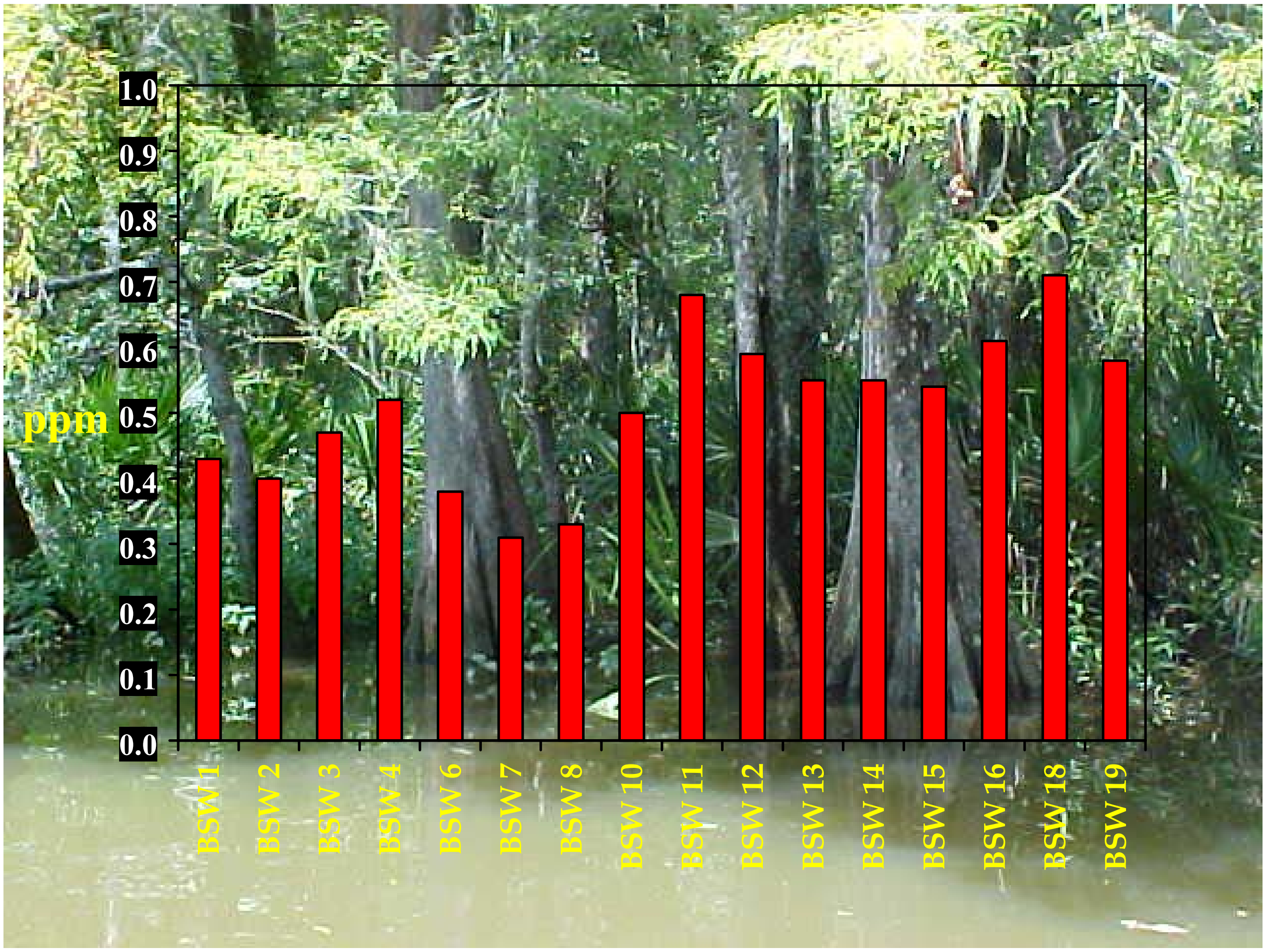
The table that follows provides the maximum, minimum, and average mean values for Total Kjehldahl Nitrogen concentrations observed during the study period.

TKN Concentrations in parts per million

	BSW 1	BSW 2	BSW 3	BSW 4	BSW 6	BSW 7	BSW 8	BSW 10
Average	0.44	0.4	0.47	0.53	0.38	0.31	0.34	0.51
Maximum	0.68	1	0.82	2.6	0.92	0.63	0.55	0.79
Minimum	0.2	0.23	0.3	0.23	0.2	0.2	0.1	0.31

	BSW 11	BSW 12	BSW 13	BSW 14	BSW 15	BSW 16	BSW 18	BSW 19
Average	0.68	0.59	0.55	0.55	0.55	0.61	0.71	0.58
Maximum	1.4	1	0.77	0.8	0.75	1	1.1	0.77
Minimum	0.38	0.45	0.41	0.42	0.4	0.45	0.52	0.41

Average TKN Concentrations

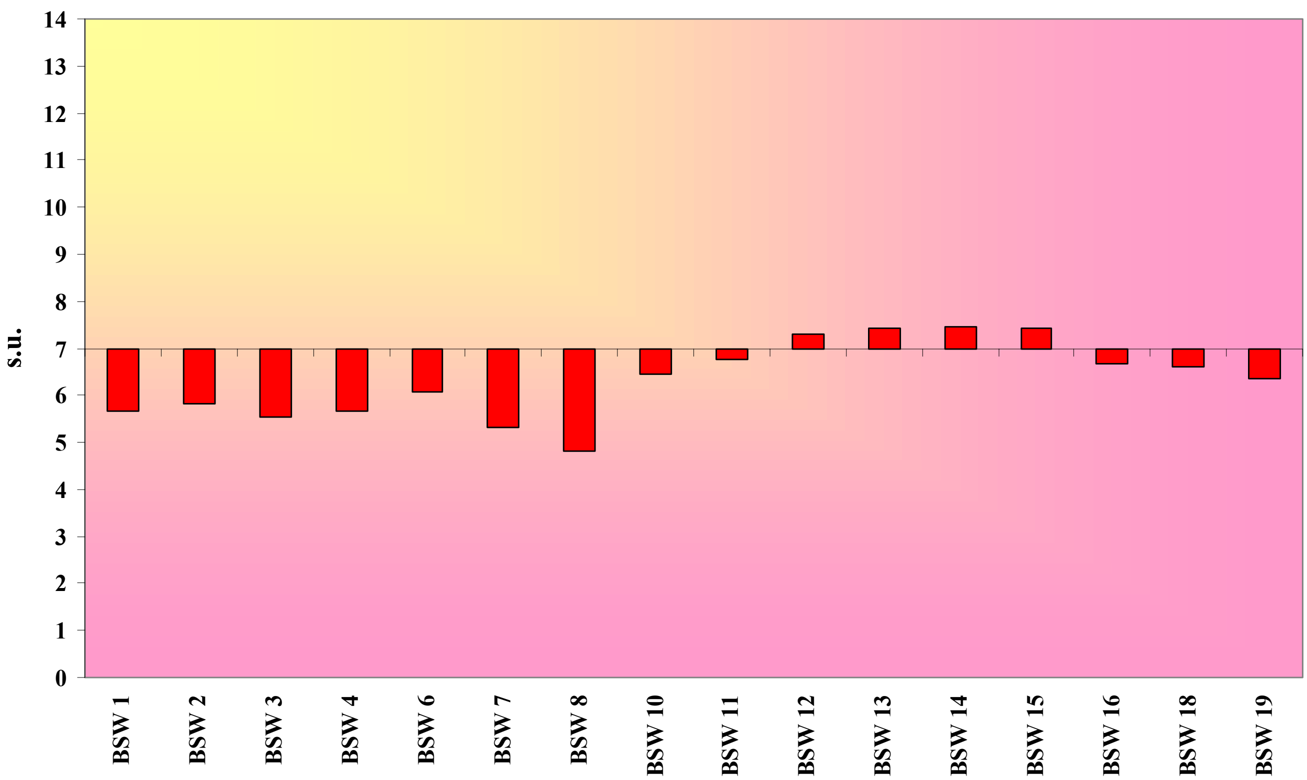


On average, the TKN values observed during this study were not excessive. Values observed for the tidally influenced stations were generally higher than those observed for the freshwater stations. Station BSW 7 had the lowest average TKN values among the freshwater stations. BSW 10 recorded the lowest average values among the tidally influenced stations. Station BSW 4 had the greatest average TKN concentrations among the freshwater stations. And BSW 18 recorded the largest TKN concentrations among all stations sampled.

pH

A measure of a solution's acidity is termed pH. This measure is based upon the concentration of positively charged hydrogen atoms (hydrogen ions) in a solution. For the purposes of this study, pH may be defined as the negative logarithm of the concentration of hydronium ions in solution. Hydronium ions are chosen because hydrogen ions readily associate with water molecules to form hydronium ions. In pure water, hydronium and hydroxyl ions exist in equal quantities which results in a neutral solution. Neutral solutions have a pH of 7. When hydronium ion concentrations exceed the concentration of hydroxyl ions, the solution becomes acidic. As a result, pH values falling below 7 are considered acidic solutions. Conversely, when hydroxyl ion concentrations are greater than hydronium ion concentrations, the solution is considered basic and the pH values range from greater than 7 to 14 (NCSU. 1994).

Average pH Values



On average, the pH values for the tidally influenced stations were greater than those exhibited at the fresh water stations. Those stations situated in closest proximity to the Mobile River exhibited the greatest pH values. Station BSW 14 had the highest average pH values of all stations monitored. Among the freshwater stations, BSW 6 had the highest average pH values. Station BSW 8 had the lowest average pH values of all stations monitored. Among the tidally influenced stations, BSW 19 had the lowest average pH values. The collected data indicate that the upper portions (the fresh water stations) of the Bayou Sara subwatershed are slightly acidic and the lower portions (tidally influenced stations) are closer to neutral in acidity.

The following table provides the maximum, minimum, and average mean values for pH observed during the study period.

pH in Standard Units

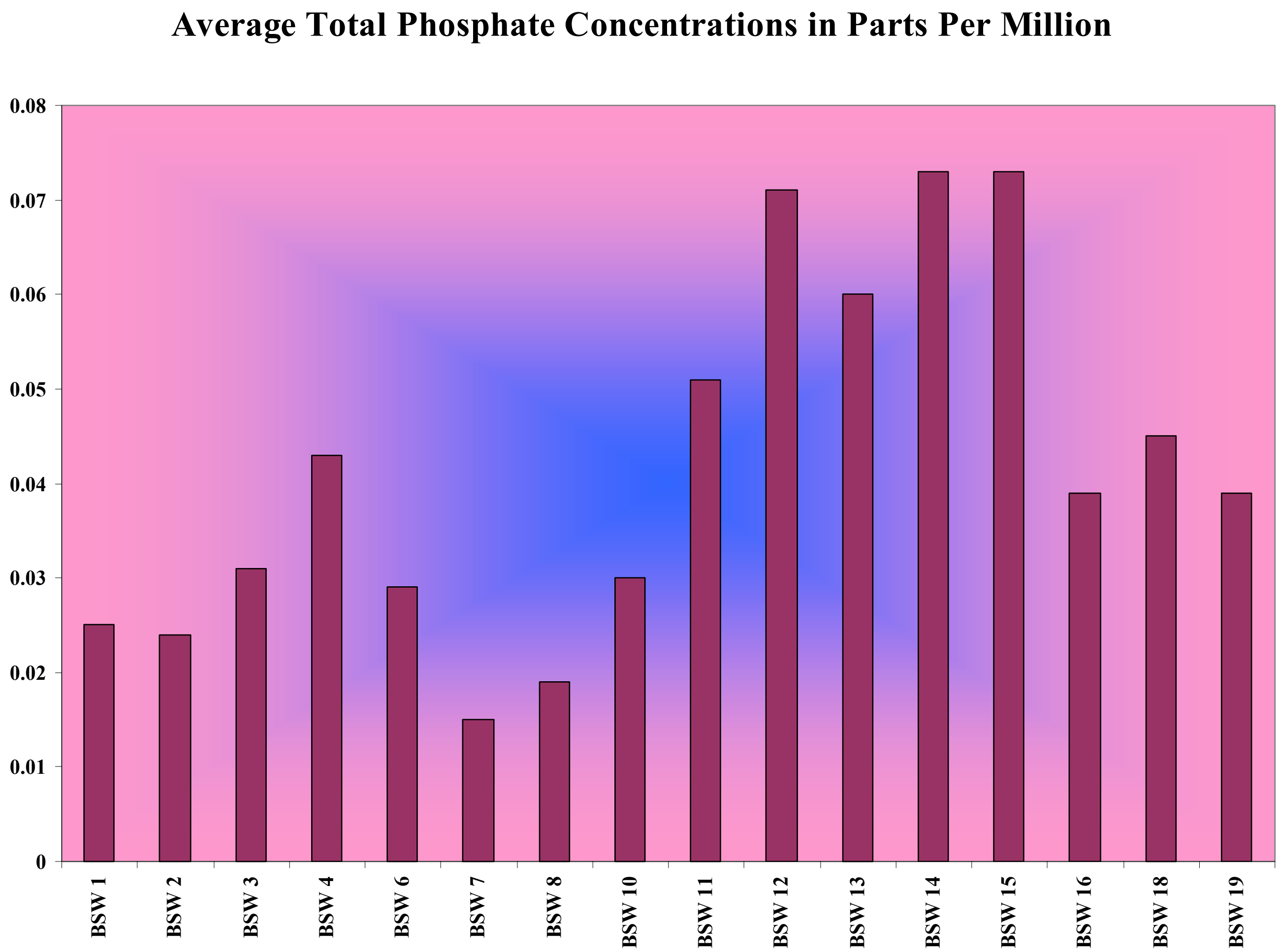
	BSW 1	BSW 2	BSW 3	BSW 4	BSW 6	BSW 7	BSW 8	BSW 10
Average	5.67	5.82	5.53	5.66	6.07	5.31	4.81	6.44
Maximum	6.23	8.21	6.1	6.8	7.55	6.46	6.1	8.43
Minimum	5.09	4.88	4.73	4.71	4.96	4.4	4.15	5.54

	BSW 11	BSW 12	BSW 13	BSW 14	BSW 15	BSW 16	BSW 18	BSW 19
Average	6.75	7.31	7.44	7.45	7.41	6.67	6.6	6.36
Maximum	8.41	8.41	8.05	8.64	8.6	7.34	7.34	6.99
Minimum	6.22	6.52	6.76	6.42	6.68	6.01	5.88	5.73

Phosphate

Total phosphate is a measure of both suspended and dissolved phosphates. Of high nutritive value to plants and animals, phosphates are used in fertilizers and as animal feed supplements. They are also used in the manufacture of numerous industrial chemicals. Phosphorous is a major nutritional and structural component of biota. It is also the least abundant of biota's required components. It occurs in aquatic systems almost exclusively as phosphates. There are several classifications of phosphates: ortho phosphates, condensed phosphates, and organically bound phosphates. Phosphates occur in solution, in detritus, or in the bodies of aquatic organisms. The forms of phosphate are introduced via a variety of sources including wastewater discharge, fertilizer runoff, and runoff from sewage. Phosphorus is found in the Earth's rocks primarily as the ion ortho phosphate (PO_4^{3-}), which is the most significant form of inorganic phosphorus in aquatic systems.

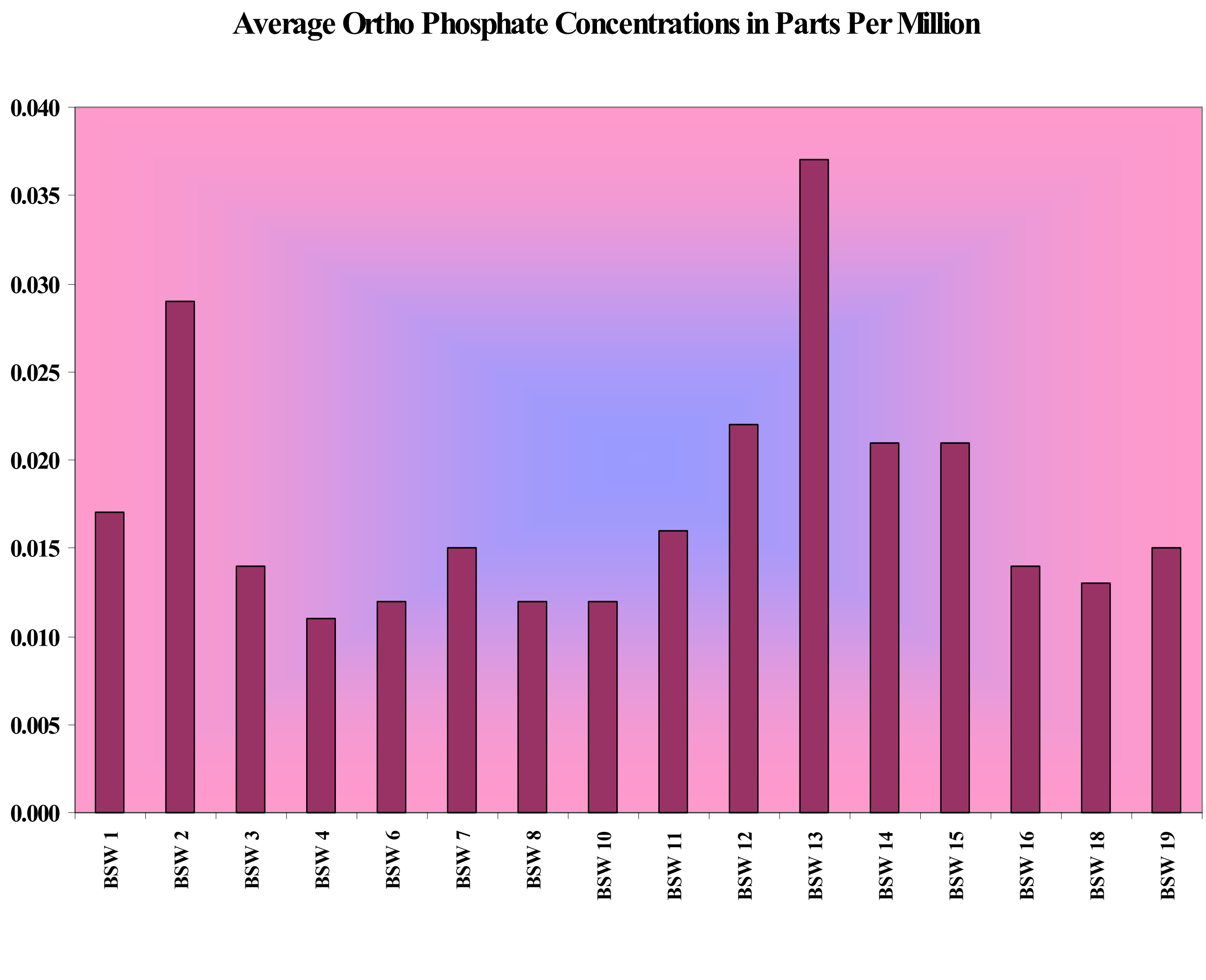
The phosphorous cycle is very complex, but the majority of phosphate in aquatic systems is bound up in the particulate phase as living biota such as bacteria and plants, effectively removing it from



the primary productive zone. With the algae/bacteria interaction comes a colloidal substance, through which some phosphorous is lost to the sediment, while still more is lost through hydrolyzation and conversion to ortho phosphate. Ortho phosphate, since it is soluble, is quickly taken up by macrophytes and algae. The colloidal and particulate forms of phosphorus must be replaced by regeneration of solubilized phosphorus from decomposition, precipitation, and runoff (NCSU. 1984). Given that the primary source of phosphorous in the environment is igneous rocks and that there are a pronounced lack of rocks of any description in the Bayou Sara watershed, it is easy to see how phosphorous may be considered a major limiting nutrient in the aquatic systems of the watershed.

Although phosphates in the aquatic environment are usually poly-phosphates or organically bound, all will degrade to ortho phosphates (reactive) with time. Overloading of phosphate concentrations may result in the proliferation of algae or other aquatic plant life. As previously discussed, such eutrophication causes decreased dissolved oxygen levels in the water due to the accelerated decay of organic matter. Excessive ortho phosphate concentrations are an indicator of such overloading (NCSU. 1984).

The greatest average total phosphate concentrations were encountered at stations BSW 14 and BSW 15, followed by BSW 12. Among the freshwater stations, BSW 4 had the greatest average total phosphate concentrations. Station BSW 7 had the lowest average concentrations for total phosphate. BSW 10 had the lowest value among the tidally influenced stations. For ortho phosphate, station BSW 13 had the highest average value. Station BSW 2 had the highest average concentration among the freshwater stations. Station BSW 4 had the lowest average ortho phosphate concentrations among all stations. Station BSW 10 had the lowest average concentrations among the tidally influenced stations.



The following tables provide the maximum, minimum, and average mean values for total phosphate and ortho phosphate concentrations observed during the study period.

Total Phosphate Concentrations in parts per million

	BSW 1	BSW 2	BSW 3	BSW 4	BSW 6	BSW 7	BSW 8	BSW 10
Average	0.025	0.024	0.031	0.044	0.029	0.015	0.018	0.031
Maximum	0.042	0.074	0.048	0.178	0.079	0.023	0.033	0.053
Minimum	< 0.005	0.014	0.015	0.015	< 0.005	< 0.005	0.005	0.011

	BSW 11	BSW 12	BSW 13	BSW 14	BSW 15	BSW 16	BSW 18	BSW 19
Average	0.051	0.071	0.06	0.073	0.072	0.039	0.045	0.039
Maximum	0.084	0.109	0.111	0.124	0.103	0.048	0.058	0.047
Minimum	0.028	0.036	0.011	0.036	0.035	0.02	0.023	0.032

Ortho Phosphate Concentrations in parts per million

	BSW 1	BSW 2	BSW 3	BSW 4	BSW 6	BSW 7	BSW 8	BSW 10
Average	0.018	0.029	0.014	0.011	0.012	0.016	0.013	0.012
Maximum	0.04	0.1	0.032	0.018	0.024	0.041	0.026	0.021
Minimum	< 0.006	0.006	0.006	0.006	< 0.006	0.006	< 0.005	0.005

	BSW 11	BSW 12	BSW 13	BSW 14	BSW 15	BSW 16	BSW 18	BSW 19
Average	0.016	0.022	0.037	0.021	0.021	0.014	0.013	0.015
Maximum	0.032	0.033	0.097	0.034	0.046	0.023	0.031	0.036
Minimum	0.005	0.008	0.009	0.005	0.007	0.005	0.005	0.009

Nutrient Loading

Nitrogen and phosphorus compounds (nutrients) are important to many of the life forms present in an aquatic environment. Excessive concentrations of nutrients, however, can result in conditions conducive to eutrophication, the process wherein a water body becomes overly rich in nutrients. This, in turn, can lead to phytoplankton proliferation and algal blooms. Such effects place an increased demand on the available oxygen within the aquatic system and may lead to hypoxic or anoxic conditions.

Load, for purposes of this study, refers to the amount of material, nutrients in the current application, transported within a specific stream segment across a vertical cross section in a given unit of time. The values for loading presented in this section's data table represent rough estimates of nutrient loads for selected stations within the Bayou Sara watershed. Although nutrient concentrations were analyzed for each sample event conducted during the study and are presented elsewhere within this report, only those data collected at times when actual stream flow could be measured were used in the calculation of daily nutrient loading. Event specific loading calculations for total suspended solids are included as Appendix D of this report. Data were broken down by season for analysis and the individual measured flows and concentrations within the seasonal period were averaged to provide variables for the estimation equation. Loads, given in pounds per day units, were estimated using the following equation:

W = C * Q * 8.345 lbs

where: **W = load in pounds per day**

C = measured concentration in parts per million

Q = flow in millions of gallons per day (MGD)*

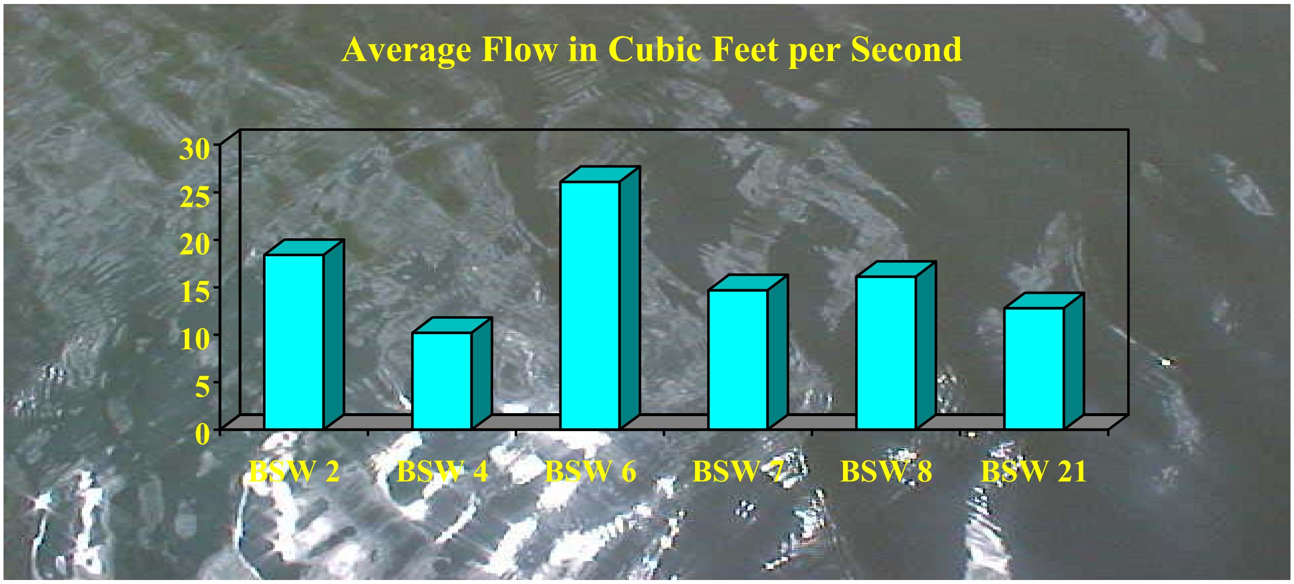
8.345 lbs = weight of 1 gallon of water

*Flow was converted to MGD by multiplying the value in cubic feet per second by a factor of 0.6463169 (the dimensional equivalent in gallons per day of cubic feet per second divided by a factor of $1.0 * 10^6$).

Nutrient loading in the Bayou Sara watershed was, by far, greatest in the winter and spring of 2002. Not surprisingly, increased flow values were also evident in the winter and spring of 2002. Of particular note is one of the sampling events accomplished in the spring of 2002 during a period of heavy rain and flooding. The measured stream flow rate during this event was nearly three times greater than the next highest flow value recorded for the entire study period. Naturally, an increased flow value significantly impacts the given equation, especially when being multiplied by elevated concentrations of analyzed constituents, particularly ammonia and total Kjehldahl nitrogen. It should also be observed that, during this event, fecal coliform levels, turbidity, and total suspended solids values were also significantly higher than previous or subsequent sampling events.

As can be seen by referring to the rainfall data discussed earlier, the elevated values for nutrient loads occurring in the winter and spring of 2002 do not correspond to the periods of highest precipitation during the study. This apparent non sequitur is most easily explained by concluding that nutrient loading is more a function of how much precipitation occurs within a brief span of time rather than the average of precipitation over an extended period.

Nutrient loads during the summer and fall periods were comparatively lower throughout both years of the study.



Seasonal Nutrient Loading in Pounds Per Day

Spring 2001

Station	NH3	TKN	Nitrate/Nitrite	Total P	Ortho P
BSW 6	< 3.07	41.48	8.19	5.38	
BSW 7	< 1.1	15.4	1.38	0.94	

Summer 2001

Station	NH3	TKN	Nitrate/Nitrite	Total P	Ortho P
BSW 2	< 0.52	19.81	4.43	1.2	
BSW 4	0.82	39.35	13.77	4.59	
BSW 6	< 1.66	48.60	6.36	3.86	
BSW 7	< 0.94	< 18.09	< 2.05	0.79	

Fall 2001

Station	NH3	TKN	Nitrate/Nitrite	Total P	Ortho P
BSW 2	< 0.74	19.72	4.54	1.14	0.78
BSW 7	< 0.49	17.20	2.25	0.70	1.70

Winter 2002

Station	NH3	TKN	Nitrate/Nitrite	Total P	Ortho P
BSW 2	4.35	56.25	18.71	2.35	2.50
BSW 4	9.33	50.21	19.58	4.66	1.00
BSW 7	< 1.04	32.56	< 9.97	< 1.23	1.65
BSW 8	< 2.17	46.65	7.12	3.12	2.79

Spring 2002

Station	NH3	TKN	Nitrate/Nitrite	Total P	Ortho P
BSW 2	18.28	178.18	21.32	12.54	4.62
BSW 4	2.27	27.94	12.31	1.66	
BSW 6	2.94	58.90	7.51	3.98	
BSW 7	1.14	29.67	2.12	1.21	0.32
BSW 8	1.23	50.42	4.55	2.09	

Summer 2002

Station	NH3	TKN	Nitrate/Nitrite	Total P	Ortho P
BSW 2	< 0.16	5.63	1.25	0.30	0.09
BSW 7	< 0.47	12.52	1.72	0.28	< 0.23

The following table provides the maximum, minimum, and average flows for stations where flow was measured.

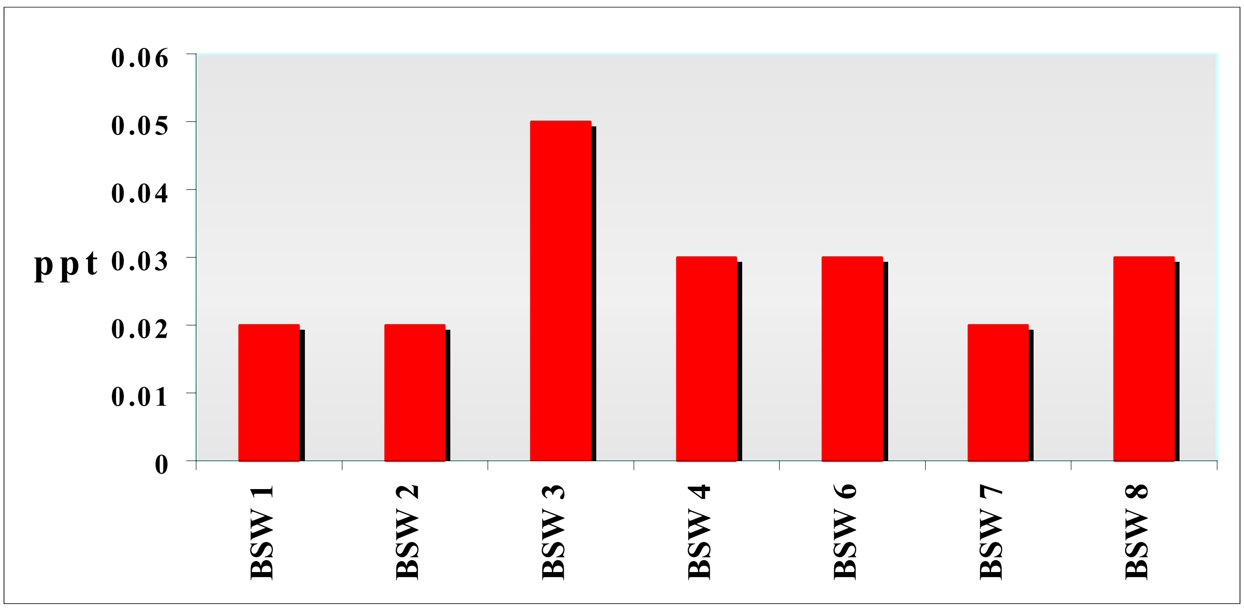
Stream Flow in cubic feet per second

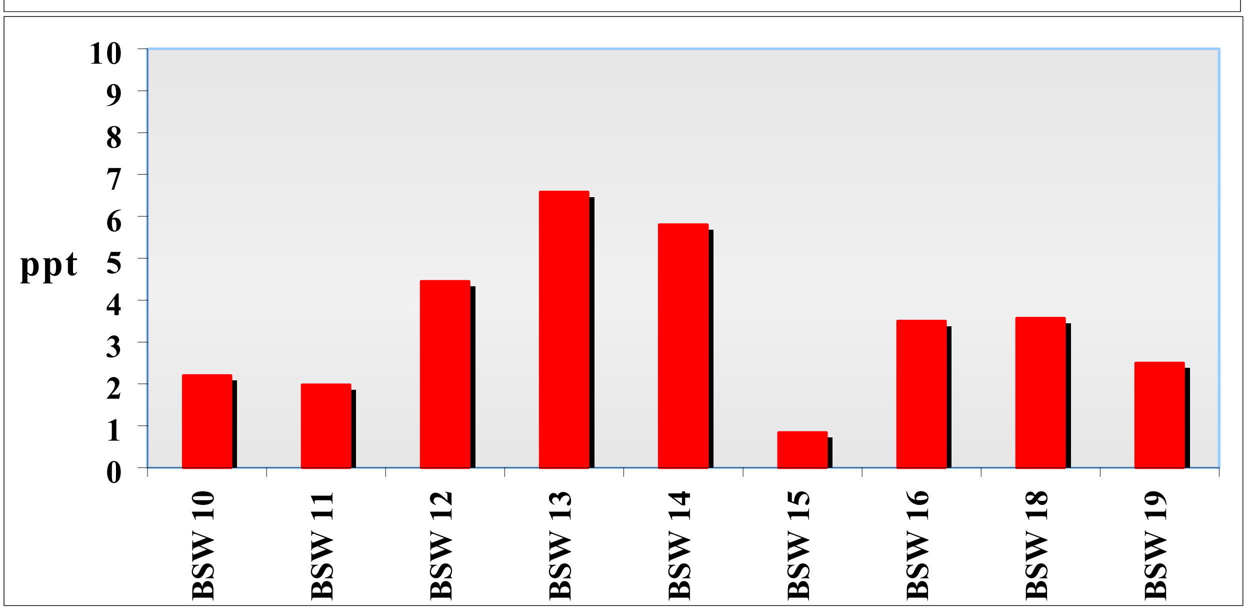
	BSW 2	BSW 4	BSW 6	BSW 7	BSW 8	BSW 21
Average	20.7	10.2	28.2	12.2	16.1	12.8
Maximum	87	14	58	30.1	35.5	20.2
Minimum	2.5	3.2	1.2	7.7	3.5	3.3

Salinity

Salinity is the total amount of dissolved salts present in water. Salt concentrations play a significant role in plant and animal habitat and water quality. Salinity effects dissolved oxygen concentrations, pH, and conductivity. The average salinity of world oceans is around 35 ppt. Freshwater, conversely, is expected to have a salinity approaching zero ppt (NOAA 2001).

Average Salinity for All Stations





Those stations in the easternmost portion of the subwatershed exhibited the highest average salinity values, as would be anticipated with tidally influenced water bodies. Those stations in the upper reaches of the subwatershed all demonstrated average salinity concentrations less than 0.05 ppt.

The following table provides the maximum, minimum, and average mean values for salinity observed during the study period.

Salinity in parts per million

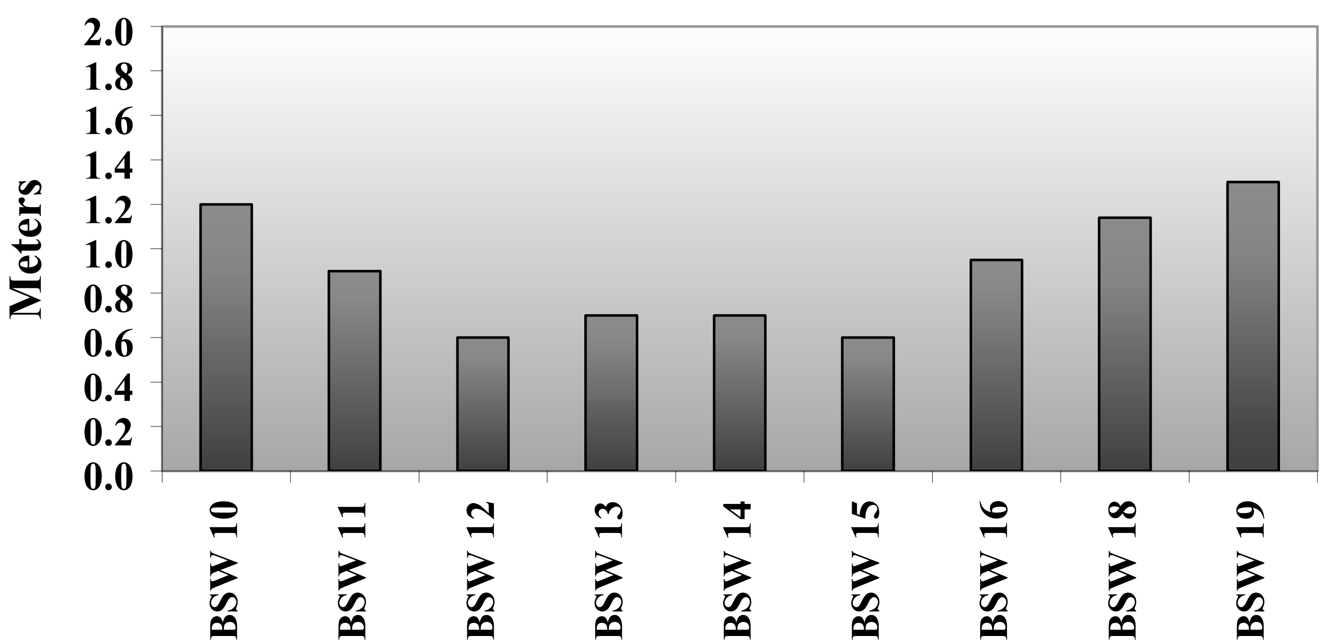
	BSW 1	BSW 2	BSW 3	BSW 4	BSW 6	BSW 7	BSW 8	BSW 10
Average	0.02	0.02	0.05	0.03	0.03	0.02	0.03	2.46
Maximum	0.1	0.1	0.54	0.1	0.1	0.1	0.1	17.3
Minimum	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.07

	BSW 11	BSW 12	BSW 13	BSW 14	BSW 15	BSW 16	BSW 18	BSW 19
Average	2.2	4.74	6.96	6.12	0.94	3.5	3.57	2.5
Maximum	16.6	16.6	27.7	30	17.3	19.7	19.7	16.8
Minimum	0.1	0.1	0.1	0.09	0.08	0.1	0	0

Secchi Disk Depth

Clear water allows light to penetrate more deeply than does murky water. This light allows photosynthesis to occur and oxygen to be produced. Secchi disk depth is a measure of water clarity. A Secchi disk is a circular plate divided into quarters painted alternately black and white. The disk is employed by lowering it into the water until it is no longer visible. Higher Secchi readings

Average Secchi Disk Depth



indicate clearer water. Lower readings indicate turbid or colored water (The American Heritage® Dictionary of the English Language. 2000. Washington State Department of Ecology. 2000). Those stations in closest proximity to the Mobile River exhibited the lowest average Secchi Disk depths. This indicates that the available light at depth for these stations was less than that available at those stations further upstream. A distinct correlation between Secchi disk depth and turbidity values may be inferred from the data gathered during this study. Rising turbidity values corresponded with lower Secchi disk depths.

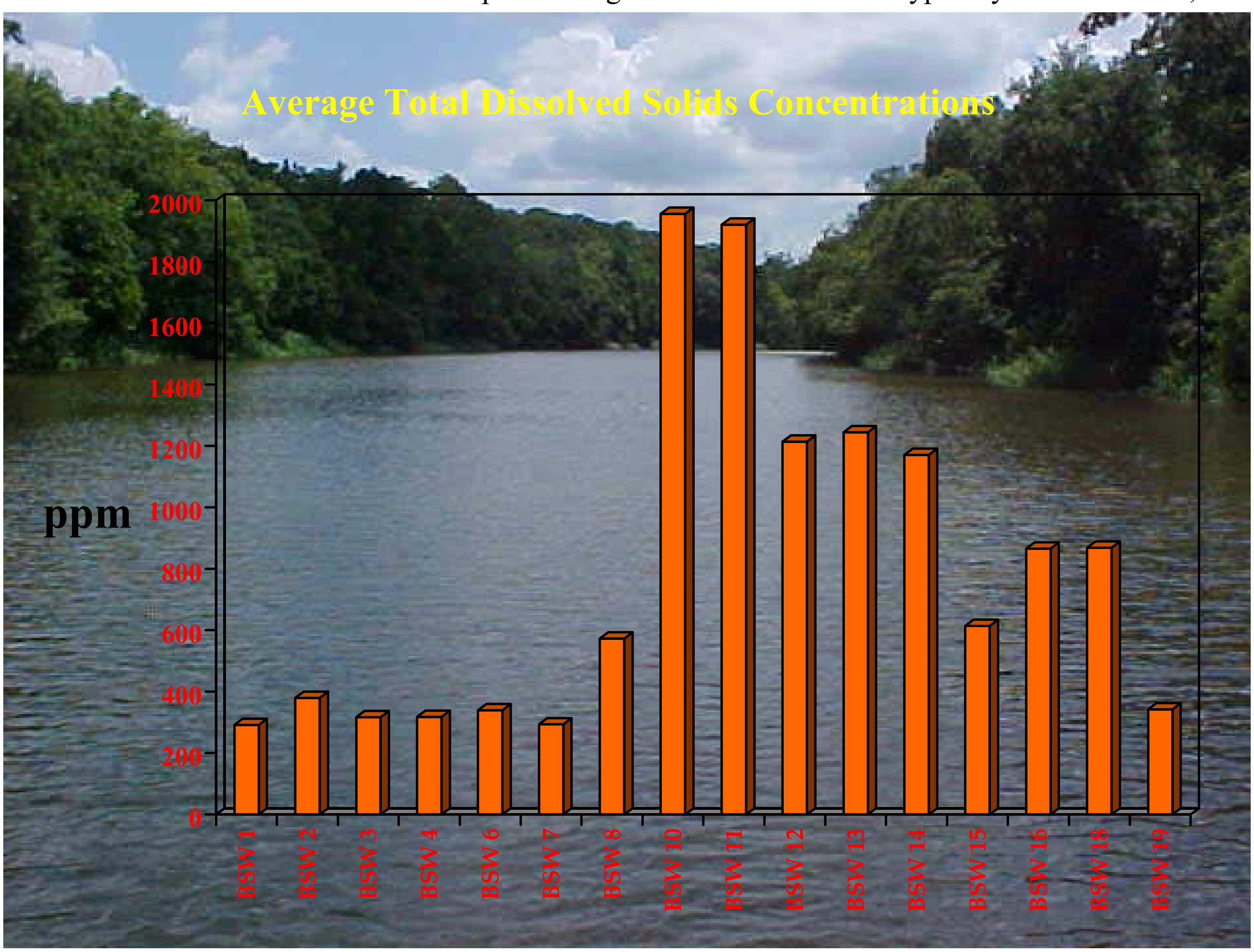
The following table provides the maximum, minimum, and average mean values for Secchi Disk depths observed during the study period.

Secchi Disk Depths in meters

	BSW 10	BSW 11	BSW 12	BSW 13	BSW 14	BSW 15	BSW 16	BSW 18	BSW 19
Average	1.2	0.9	0.6	0.7	0.7	0.6	0.95	1.14	1.3
Maximum	2.4	1.5	1.5	0.9	1	1	1.5	1.7	1.8
Minimum	0.6	0.5	0.4	0.5	0.5	0.3	0.5	0.7	0.7

Total Dissolved Solids

Total Dissolved Solids is a measure of the amount of material dissolved in water, or the concentration of solids in water that can pass through a filter. These solids typically include nitrate,



calcium, magnesium, sodium, carbonate, bicarbonate, chloride, sulfate, phosphate, organic ions, and other ions. A certain level of these ions in water is necessary for aquatic life. Their presence effects the density of the surrounding solution. And, since density is directly correlated to the osmotic potential of water with relation to the metabolic processes of aquatic organisms, changes in total dissolved solids concentrations may have a profound effect upon those organisms. Excessively high or low total dissolved solids concentrations may even lead to impaired growth or death. High concentrations of total dissolved solids may also reduce water clarity, contribute to a decrease in photosynthesis, and serve to increase the water's temperature, thereby depleting the available dissolved oxygen (NCSU. 1994).

With the exceptions of BSW 3 and BSW 19, the average values for total dissolved solids were significantly greater at the tidally influenced stations than at the fresh water stations. This was probably a result of the proximity of the Mobile River. Station BSW 10 exhibited the greatest average total dissolved solids concentrations. Among the tidally influenced stations, BSW 3 had the lowest average concentration. The lowest average total dissolved solids concentration among all the stations was at BSW 1 and BSW 7. Station BSW 8 had the highest average concentration among the freshwater stations.

The following table provides the maximum, minimum, and average mean values for total dissolved solids concentrations observed during the study period.

Total Dissolved Solids Concentrations in parts per million

	BSW 1	BSW 2	BSW 3	BSW 4	BSW 6	BSW 7	BSW 8	BSW 10
Average	0.02	0.02	0.05	0.03	0.03	0.02	0.03	2.46
Maximum	0.1	0.1	0.54	0.1	0.1	0.1	0.1	17.3
Minimum	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.07

	BSW 11	BSW 12	BSW 13	BSW 14	BSW 15	BSW 16	BSW 18	BSW 19
Average	2.2	4.74	6.96	6.12	0.94	3.5	3.57	2.5
Maximum	16.6	16.6	27.7	30	17.3	19.7	19.7	16.8
Minimum	0.1	0.1	0.1	0.09	0.08	0.1	0	0

Total Suspended Solids

Total suspended solids (TSS) concentration is a measure of suspended solids per volume of water. The measured solids are those that can be captured by a filter. These solids include a varied assortment of materials, either mineral or organic, including, but not limited to, sand and silt, decaying plant and animal matter, and waste particulates. High concentrations of suspended solids may cause many problems for water quality. Apart from diminishing the available light, increased siltation may alter a stream's dynamics as well as destroy existing habitat. Suspended particles also serve as substrates for other pollutants such as pathogens and some heavy metals. Suspended solids, therefore, effect the aquatic system both physically and biochemically. Geology and land use are the primary factors influencing suspended solids concentrations. As watersheds develop, there is an increase in disturbed areas, a decrease in vegetation, and an increase in impervious surface area, all of which reduce the watershed's ability to filter runoff. This contributes to increases in erosion, loading of particulate matter, nutrients, and pollutants. Such overloading leads to increased algal growth among other complications, which ultimately leads to decreased dissolved oxygen levels. Further, suspended solids can also clog fish gills, reduce growth rates, decrease resistance to disease, and prevent egg and larval development (NCSU. 1994).

The values for loading presented in this section's data table represent rough estimates of total suspended solids loads for selected stations within the Bayou Sara watershed. Although total suspended solids concentrations were analyzed for each sample event conducted during the study and are presented elsewhere within this report, only those data collected at times when actual stream flow could be measured were used in the calculation of daily of total suspended solids loading. Data were broken down by season for analysis and the individual measured flows and concentrations within the seasonal period were averaged to provide variables for the estimation equation. Loads, given in pounds per day units, were estimated using the following equation:

W = C * Q * 8.345 lbs

where: **W = load in pounds per day**

C = measured concentration in parts per million

Q = flow in millions of gallons per day (MGD)*

8.345 lbs = weight of 1 gallon of water

*Flow was converted to MGD by multiplying the value in cubic feet per second by a factor of 0.6463169 (the dimensional equivalent in gallons per day of cubic feet per second divided by a factor of $1.0 * 10^6$).

For the greater part of the study, total suspended solids concentrations were less than five parts per million at all stations. For this reason, the recorded values appearing in the table are preceded by the ‘ < ’ symbol. Only during six sampling events did concentrations equal or exceed five parts per million. These higher values were recorded in the summers of 2001 and 2002, the winter of 2002, and the spring of 2002. The greatest value for total suspended solids occurred in the spring of 2002 at station BSW 2 during a heavy rain event. Correspondingly, the lowest averaged value recorded also occurred at station BSW 2. Typically, streams in the upper portions of the Bayou Sara watershed ran clear to slightly turbid. Rain events quickly transformed these streams into very turbid water bodies.

Event specific loading calculations for total suspended solids are included as Appendix D of this report.

Total Suspended Solids Loading in Pounds Per Day

Spring 2001

Station	TSS
BSW 6	< 850.18
BSW 7	< 275.39

Summer 2001

Station	TSS
BSW 2	< 259.73
BSW 4	901.80
BSW 6	< 735.75
BSW 7	< 289.92

Fall 2001

Station	TSS
BSW 2	< 367.18
BSW 7	< 175.82

Winter 2002

Station	TSS
BSW 2	< 1050.48
BSW 4	2869.35
BSW 7	< 517.40
BSW 8	< 719.38

Spring 2002

Station	TSS
BSW 2	< 6353.19
BSW 4	< 375.53
BSW 6	< 734.36
BSW 7	< 454.81
BSW 8	< 613.36

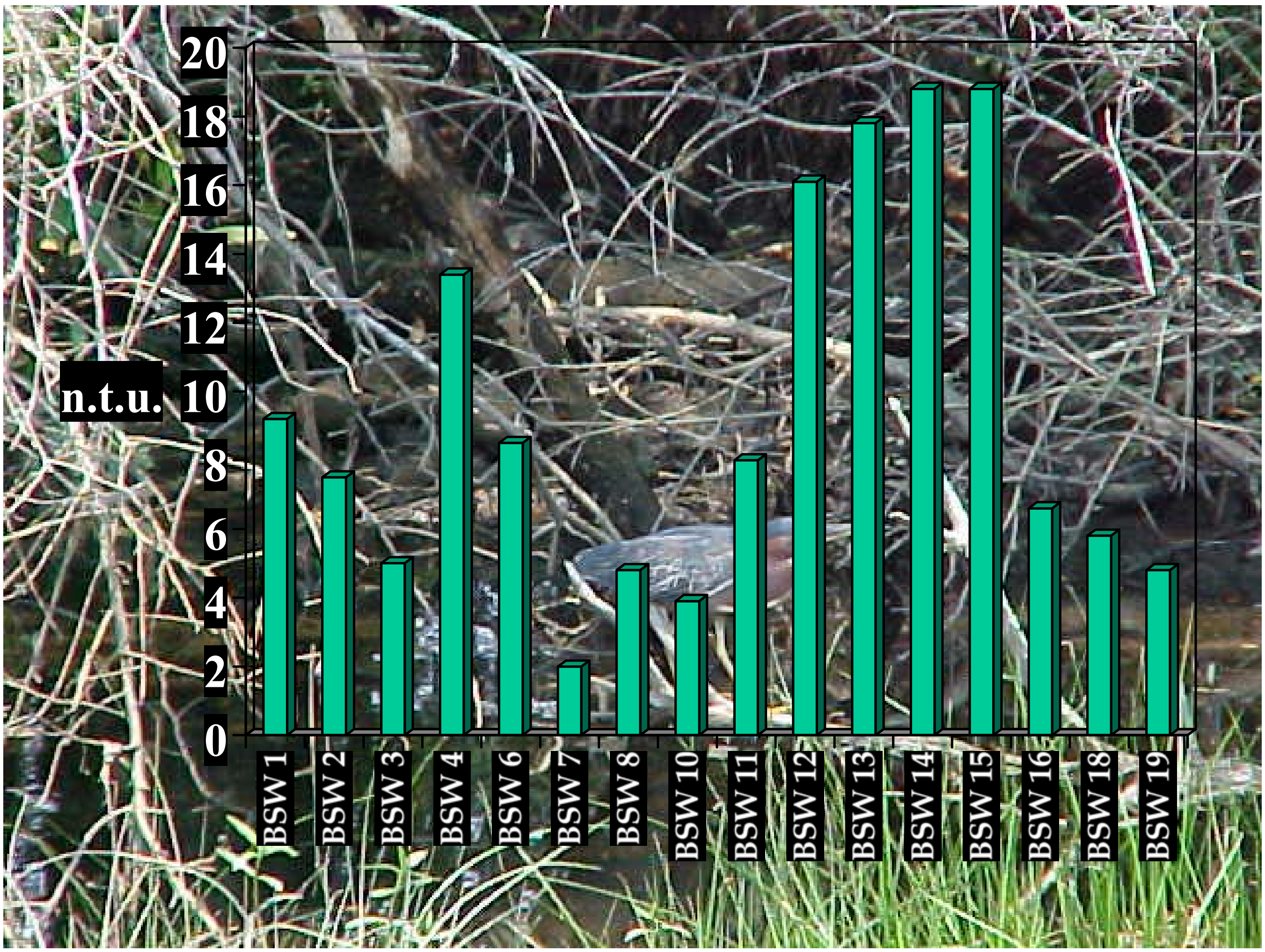
Summer 2002

Station	TSS
BSW 2	78.21
BSW 7	< 233.66

Turbidity

Turbidity may be described as a function of total suspended solids. But, whereas, total suspended solids are determined by weight per unit volume, turbidity is measured as the amount of light scattered from a sample, making it a measure of cloudiness or murkiness in water. Turbidity reduces the amount of light that penetrates the water. Since aquatic plants require light for growth, a

Average Turbidity Values



reduction in the amount of available light may impair plant growth. Fish or other aquatic organisms that depend on such plants for survival, be it for food or shelter, are also impacted. Further, since aquatic plants also provide oxygen to the water body, a reduction in the number of plants results in less oxygen being introduced to the aquatic system. Compounding this problem, turbid waters are generally warmer than non-turbid waters as a result of the suspended particles absorbing the sun's electromagnetic radiation. Increases in the water's temperature decreases the amount of available dissolved oxygen. Depleted oxygen, in turn, results in fewer aquatic invertebrates and fish (NCSU. 1994).

Apart from its impact on light penetration, turbidity offers other complications in the aquatic environment. The suspended particles that contribute to the turbidity can affect the way aquatic invertebrates and fish feed and breathe. Filter feeders are particularly impacted as their feeding mechanisms become choked by increased amounts of suspended particles. Likewise, fish can also experience clogging and damage of gills. Excessive suspended particles may also decrease aquatic organisms' disease resistance, reduce growth rates, interfere with reproductive development, or, simply, smother eggs and larvae. Turbidity can be caused by any number of sources. The most common causes are erosion, runoff, waste discharges, algal activity, and stirring of the bottom sediments (NCSU. 1994).

The average turbidity values for the tidally influenced stations exceeded those values experienced at the fresh water stations. Stations BSW 14 and BSW 15 exhibited the greatest average turbidity values. Station BSW 3 had the lowest average turbidity value among the tidally influenced stations. Station BSW 7 had the lowest average turbidity value among the fresh water stations. Conversely, station BSW 4 had the greatest average value among the fresh water stations.

Water Temperature

In an aquatic ecosystem, water temperature can influence dissolved oxygen concentrations, photosynthesis rates, and the metabolic processes of aquatic organisms. A number of factors contribute to the warming of a water body. These factors include, but are not limited to, ambient air temperature, runoff, man made discharges, and suspended solids concentrations. Elevated water temperatures generally result in decreased dissolved oxygen concentrations (NCSU. 1994). As discussed previously, Division 6 of the Department's Administrative Code provides that no state water with the use designation of Fish and Wildlife, or Swimming and other Whole Body Water Contact Sports shall have a temperature exceeding 90^0 F. In the course of this study, one station, BSW 15, exhibited a water temperature of 91.4^0 F. Stations BSW 13, BSW 14, and BSW 18 recorded maximum water temperatures of 89.6^0 F.

The following table provides the maximum, minimum, and average mean values for water temperatures observed during the study period.

Water Temperature in degrees Celsius

	BSW 1	BSW 2	BSW 3	BSW 4	BSW 6	BSW 7	BSW 8	BSW 10
Average	21	19	20	21	23	21	20	24
Maximum	29	24	26	28	29	26	25	30
Minimum	6	7	7	7	7	8	6	9

	BSW 11	BSW 12	BSW 13	BSW 14	BSW 15	BSW 16	BSW 18	BSW 19
Average	24	25	25	24	26	25	25	24
Maximum	30	31	32	32	33	31	32	30
Minimum	7	8	9	9	9	8	8	8

Note: 90^0 F corresponds to 32.2^0 C

Sediment Metals

Since many contaminants entering a watershed become sequestered in the sediment, sediments represent a temporally integrated record of chemical conditions in a watershed. By examining sediment metal concentrations, insight is gained into past conditions as well as current conditions (ADEM, 1997). The objective of the sediment metal study was to determine the concentrations of metals and the presence of excessive metal enrichment. The data gathered were compared to "Ecological Response" levels developed by Long et al., 1995. These response levels establish three ranges in a given contaminant's concentration where detrimental effects are rare, occasional, and frequent. The three ranges are defined by two threshold concentrations known as Effects Range – Low (ER-L) and Effects Range – Moderate (ER-M). Values below ER-L rarely result in detrimental effects. Values exceeding ER-L, but below ER-M result in occasional detrimental effects. Values exceeding ER-M are likely to result in detrimental effects (ADEM, 2000). Observed metals concentrations in the Bayou Sara subwatershed were also examined in relation to corresponding aluminum concentrations and compared to predicted concentrations using the Schropp and Windom (1988) statistical method. Such comparison was made with the understanding that the Schropp and Windom protocol requires data from replicate samples within an estuarine system to be statistically significant. Regardless, a constant relationship existing between aluminum and other metals in the earth's crust, soils, and sediments allows aluminum to be used as a reference element or "normalizing factor" for identification of sediments enriched by anthropogenic activities (ADEM, 1997).

Threshold in Parts Per Million

Metal	ER – L	ER – M
Arsenic	8.2	70.0
Cadmium	1.2	9.6
Chromium	81.0	370.0
Copper	34.0	270.0
Lead	46.7	218.0
Mercury	0.15	0.71
Nickel	20.9	51.6
Zinc	150.0	410.0

(Long, 1995)

Arsenic is an intermediate between metals and nonmetals. In significant concentrations, it is a potent poison. Excessive levels in surface water may have devastating effects upon aquatic life. Low levels of arsenic were detected in sediment samples at Stations BSW 1 and BSW 3. None of the sampled stations exhibited arsenic concentrations in excess of the ER – L. When corrected to the Base 10 logarithm, arsenic concentrations were below the Schropp and Windom normalized regression line for all stations sampled.

Cadmium is not usually found in its free elemental state, but rather combined with other elements. It is, however, a common substance suspected to be present in all soils and rocks. It is also a persistent element that does not break down readily in the environment. It has been recognized as a probable carcinogen, especially when inhaled. Cadmium was not detected in the sediment of any of the stations sampled.

Chromium occurs naturally in rocks, soil, air, and water. It normally appears in either trivalent or hexavalent form, depending on pH. It is a necessary trace element for the support of life functions, but, as is the case with many substances, excessive concentrations may lead to complications, i.e. acute toxicity to plants and animals. This is especially true with the hexavalent species of the element. Apart from stations BSW 1 and BSW 3, chromium was not detected in the sediment of any station sampled. None of the sampled stations exhibited chromium concentrations in excess of the ER – L. All of the stations sampled exhibited chromium concentrations that fell within the Schropp and Windom lower 95% predicted limits.

Copper is a metal that is often found in its elemental form. It was likely the first metal ever used in production by mankind. It is an essential element for normal growth and reproduction in higher plants and animals, as well as being a primary factor in the development of collagen and protective nerve coatings. Although excessive levels of copper may produce nausea and other adverse effects, deficiencies in copper are believed to be more calamitous than excess concentrations. The greatest concentrations of copper in sediment were observed at station BSW 3. The lowest concentrations of copper in sediment were observed at stations BSW 2, BSW 6, and BSW 7. None of the sampled stations exhibited copper concentrations in excess of the ER – L. All of the stations sampled exhibited copper concentrations that fell within or just below the Schropp and Windom lower 95% predicted limits.

By weight, iron is the fourth most abundant element in the earth's crust. It is a trace element required by both plants and animals. It is a vital component of the oxygen transport system in many organisms. Elevated levels of iron in surface waters generally have little effect upon the aquatic life. The greatest concentrations of iron in sediment were detected at stations BSW 1 and BSW 3. The lowest concentrations in sediment were observed at stations BSW 2 and BSW 7. In solution, the greatest concentrations of iron were observed at station BSW 14. Stations BSW 3 and BSW 4 exhibited the lowest concentrations of iron in solution. All of the sampled stations exhibited lead concentrations that fell within the Schropp and Windom normalized regression line.

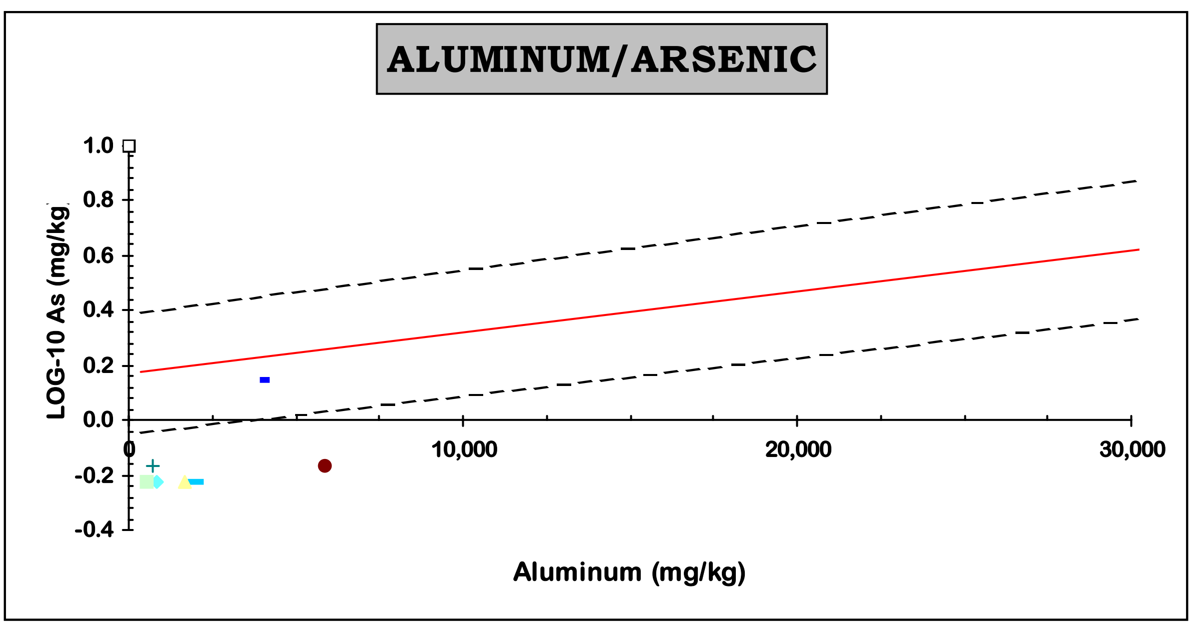
Lead, in sufficient concentrations, is a toxic metal to both plant and animals. This toxicity is correlated to the lead's solubility, which depends on pH and water hardness. Lead finds its way to water bodies through runoff, industrial discharge, or, even through precipitation. Stations BSW 3 and BSW 8 exhibited the highest concentrations of lead in sediment. Stations BSW 2, BSW 6, and BSW 7 had the lowest observed sediment concentrations. None of the sampled stations exhibited lead concentrations in excess of the ER – L. Of the sampled stations, only BSW 3 and BSW 8 exhibited lead levels above the Schropp and Windom 95% prediction limit.

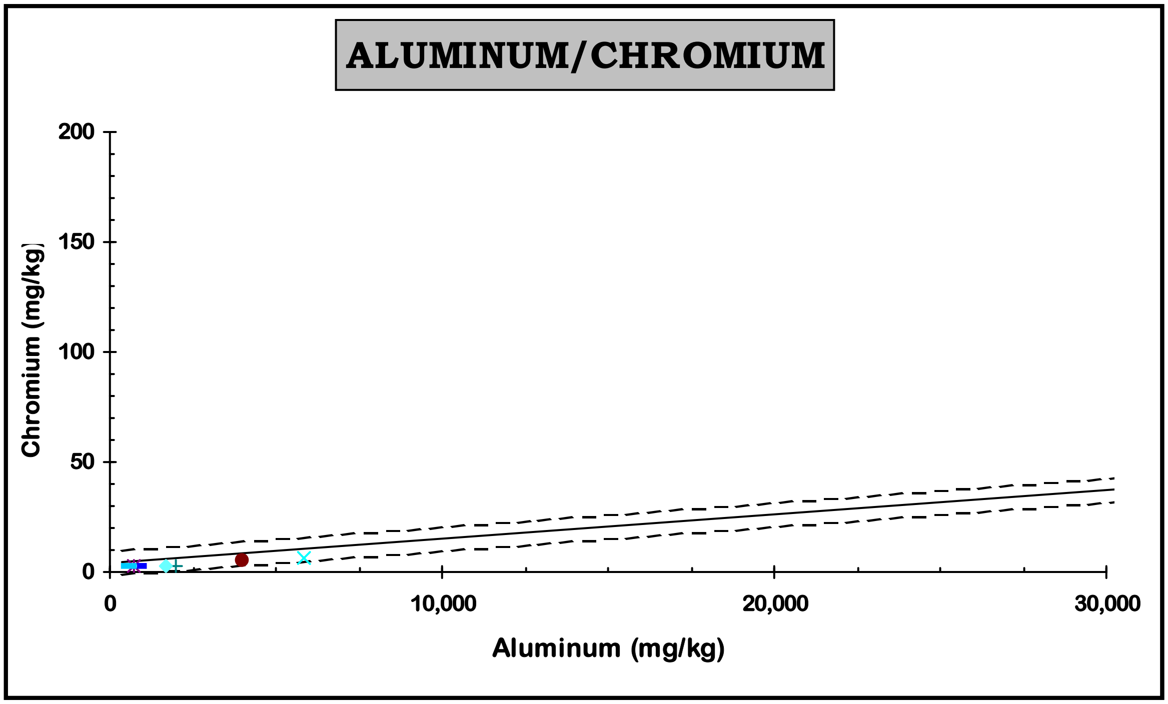
Mercury is a toxic metal. It is not usually found in its free elemental state, but rather combined with other elements. Many of these mercury combinations are beneficial, but benefits aside, mercury has been identified as a bioaccumulative poison. Mercury's toxicity is dependent on its chemical form and the route of exposure. It is particularly pernicious in its methylated form. It is suspected that atmospheric deposition of mercury is the major route of that substance into the water. Mercury was not detected in the sediment of any of the stations sampled.

Nickel is a hard, corrosion resistant metal that shares many properties in common with iron and cobalt. It occurs naturally in the earth's crust, generally coupled with other elements. It is also present in meteorites. Certain nickel species produce deleterious health effects in living organisms and some of the nickel forms are suspected carcinogens. The greatest concentrations of nickel observed in sediment samples were at stations BSW 1 and BSW 3. Stations BSW 2, BSW 6, and BSW 7 exhibited the lowest concentrations of nickel in sediment. None of the sampled stations exhibited nickel concentrations in excess of the ER – L. All of the stations sampled exhibited nickel concentrations that fell below the Schropp and Windom normalized regression line.

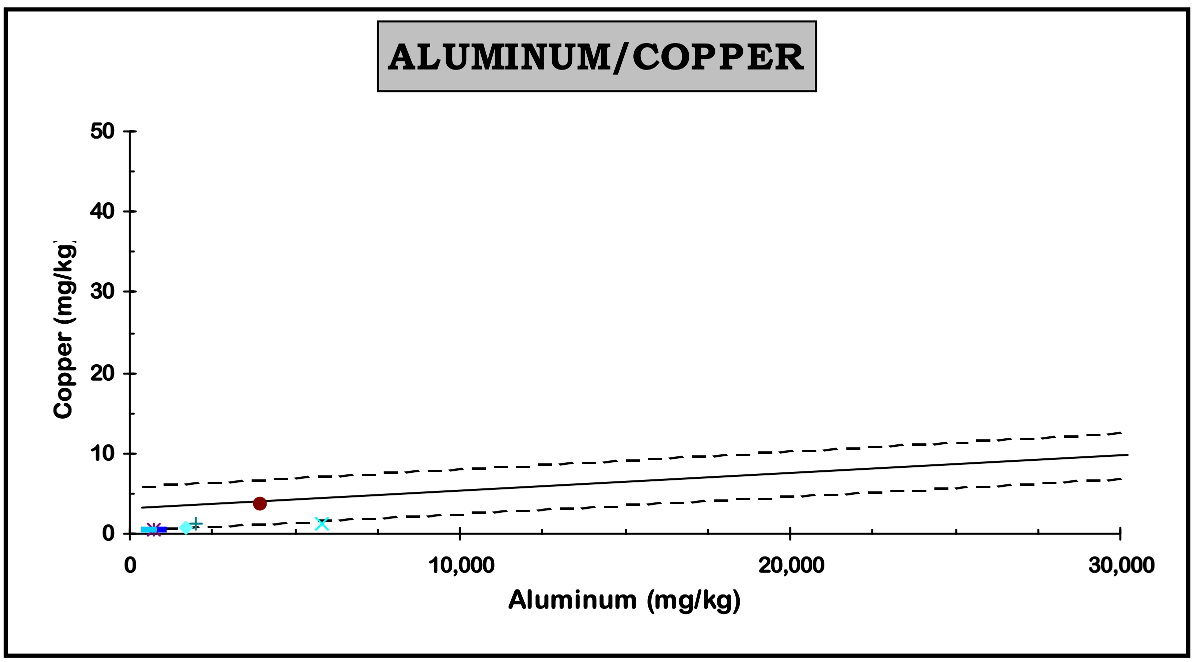
Zinc is a metal used in the production of a number of useful alloys. It is found in many minerals. It is an essential element for many organisms. Zinc is not considered very toxic to humans or other organisms. It may be present in a water body naturally or through deposition from discharge or runoff. Since it is used in the vulcanization of rubber, high concentrations of zinc are not uncommon around roadways. The greatest concentrations of zinc in sediment were observed at stations BSW 3 and BSW 4. The lowest concentrations of zinc in sediment were observed at stations BSW 2 and BSW 7. None of the sampled stations exhibited zinc concentrations in excess of the ER – L. All of the sampled stations, with the exception of BSW 3, exhibited zinc concentrations that fell within the Schropp and Windom normalized regression line. Station BSW 3 exhibited zinc concentrations greater than would be predicted using the Schropp and Windom method. The elevated zinc concentrations at this station may be attributed to the heavy traffic which passes along Highway 43.

The following charts present the measured metals concentrations as compared to aluminum using the Schropp and Windom method.

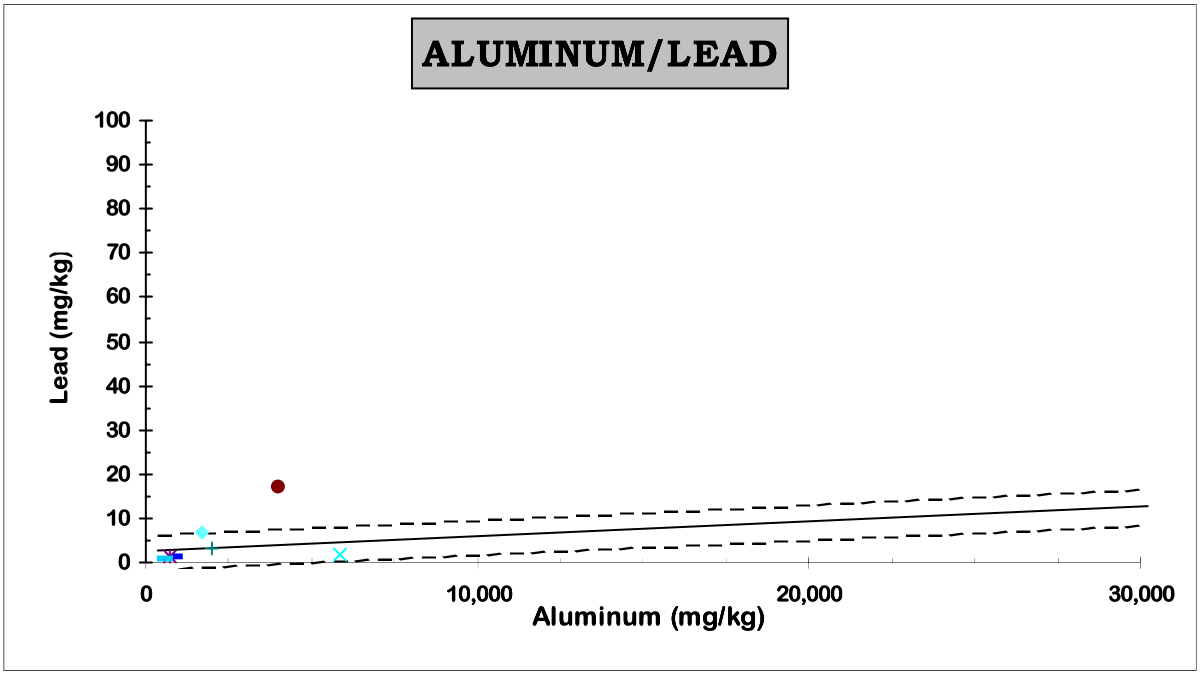


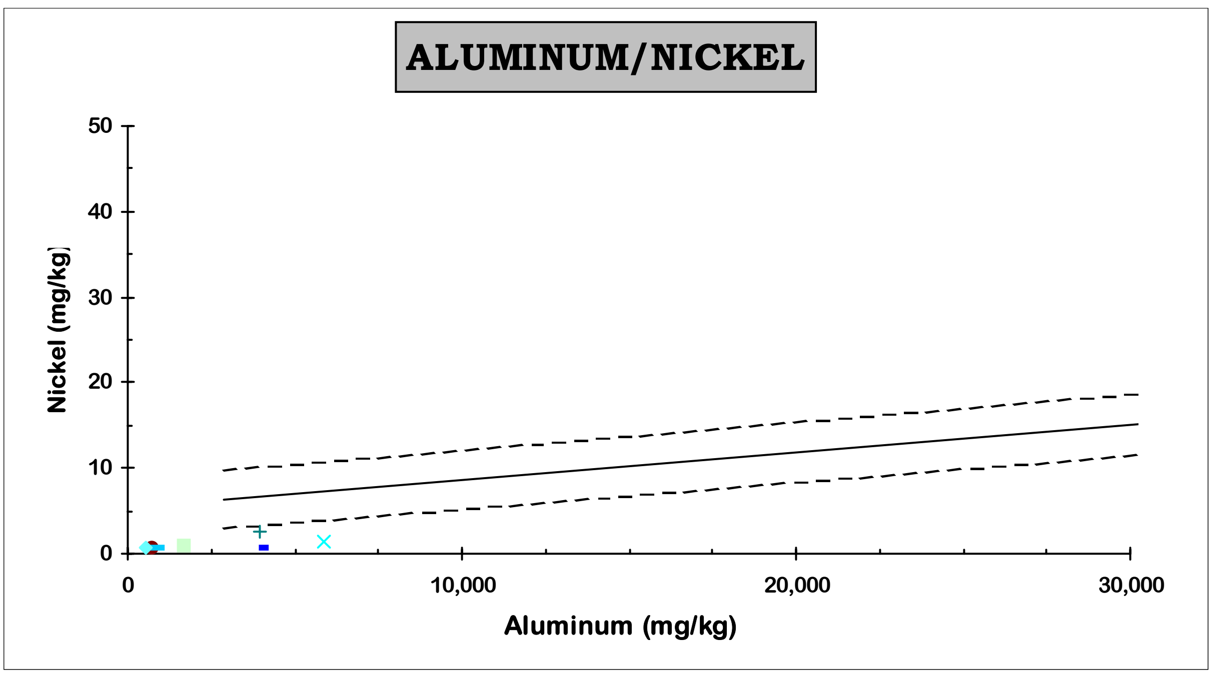


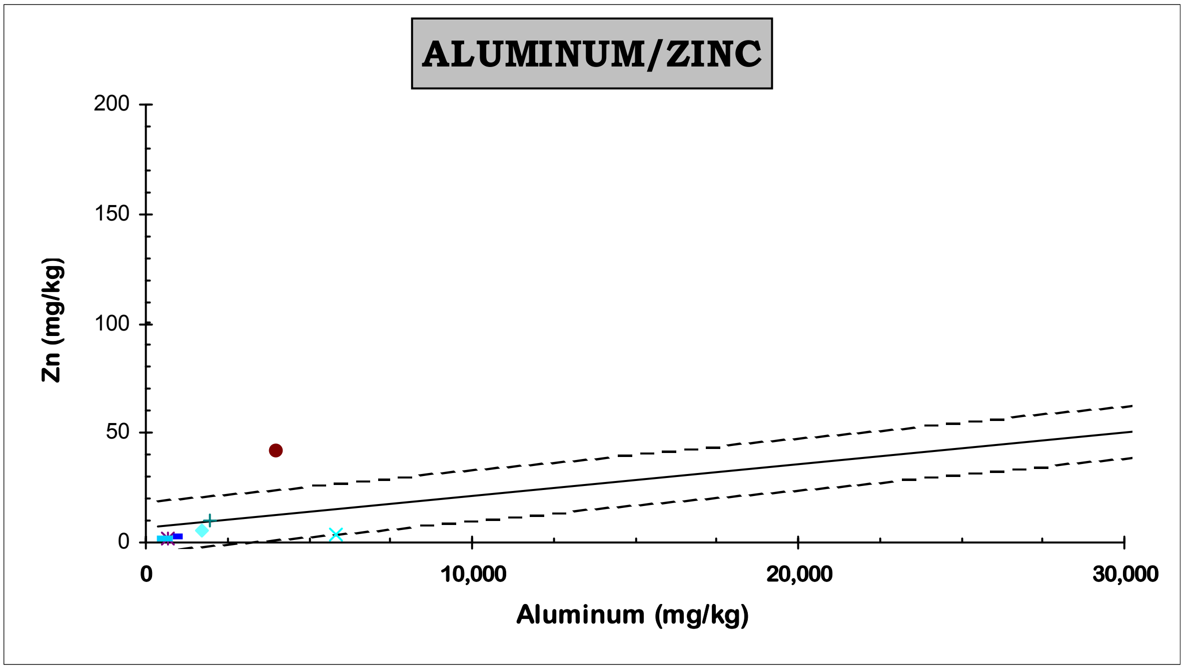
ALUMINUM/CHROMIUM
200
150
100
50
0
Chromium (mg/kg)
0
10,000
20,000
30,000
Aluminum (mg/kg)

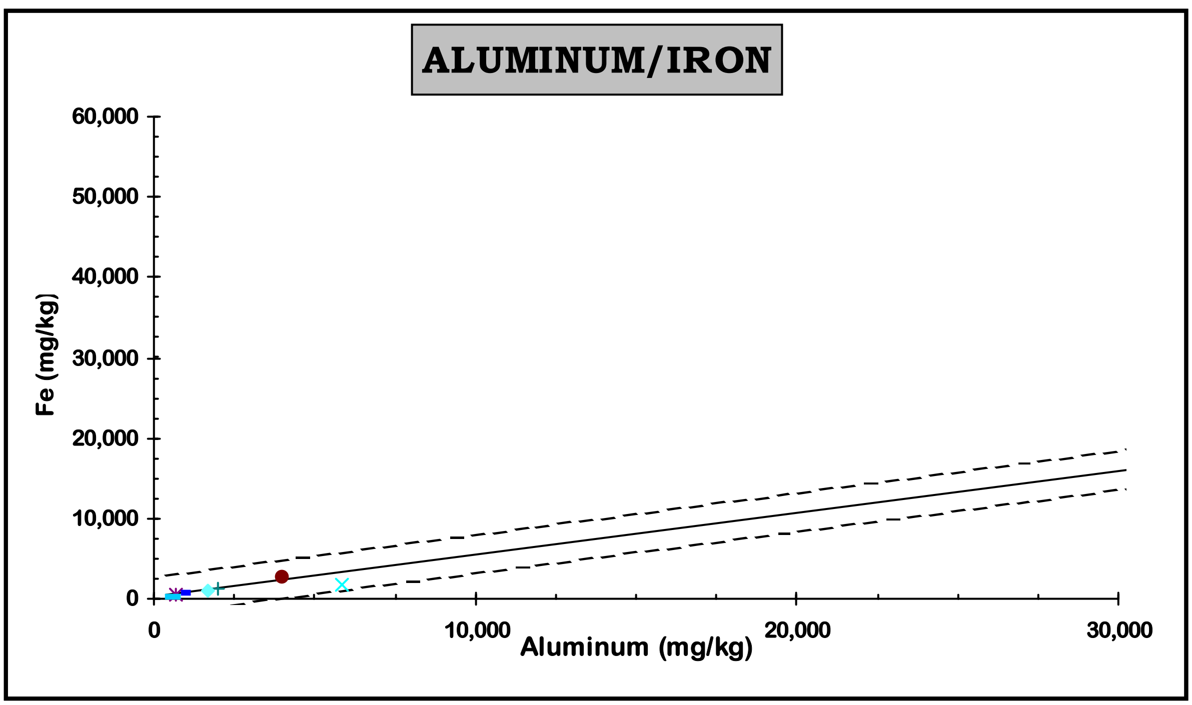


ALUMINUM/COPPER
50
40
30
20
10
0
Copper (mg/kg)
0
10,000
20,000
30,000
Aluminum (mg/kg)


ALUMINUM/LEAD
Lead (mg/kg)
100
90
80
70
60
50
40
30
20
10
0
0
10,000
20,000
30,000
Aluminum (mg/kg)

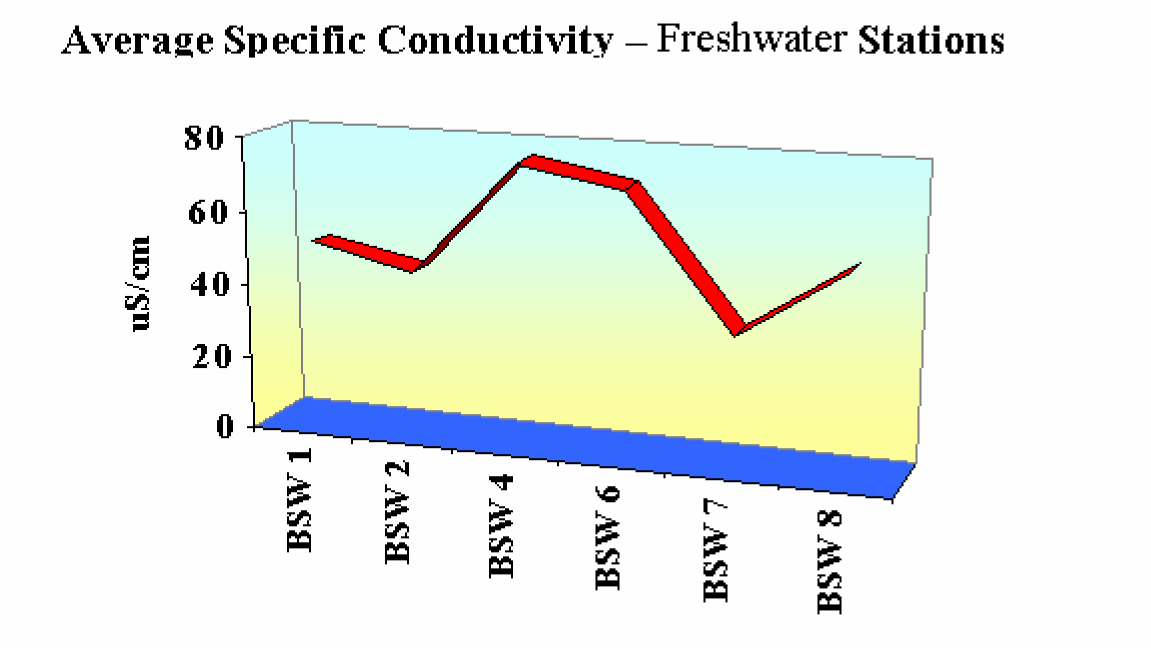

ALUMINUM/NICKEL
Nickel (mg/kg)
50
40
30
20
10
0
0
10,000
20,000
30,000
Aluminum (mg/kg)


ALUMINUM/ZINC
Zn (mg/kg)
200
150
100
50
0
0
10,000
20,000
30,000
Aluminum (mg/kg)


ALUMINUM/IRON
Fe (mg/kg)
60,000
50,000
40,000
30,000
20,000
10,000
0
0
10,000
20,000
30,000
Aluminum (mg/kg)

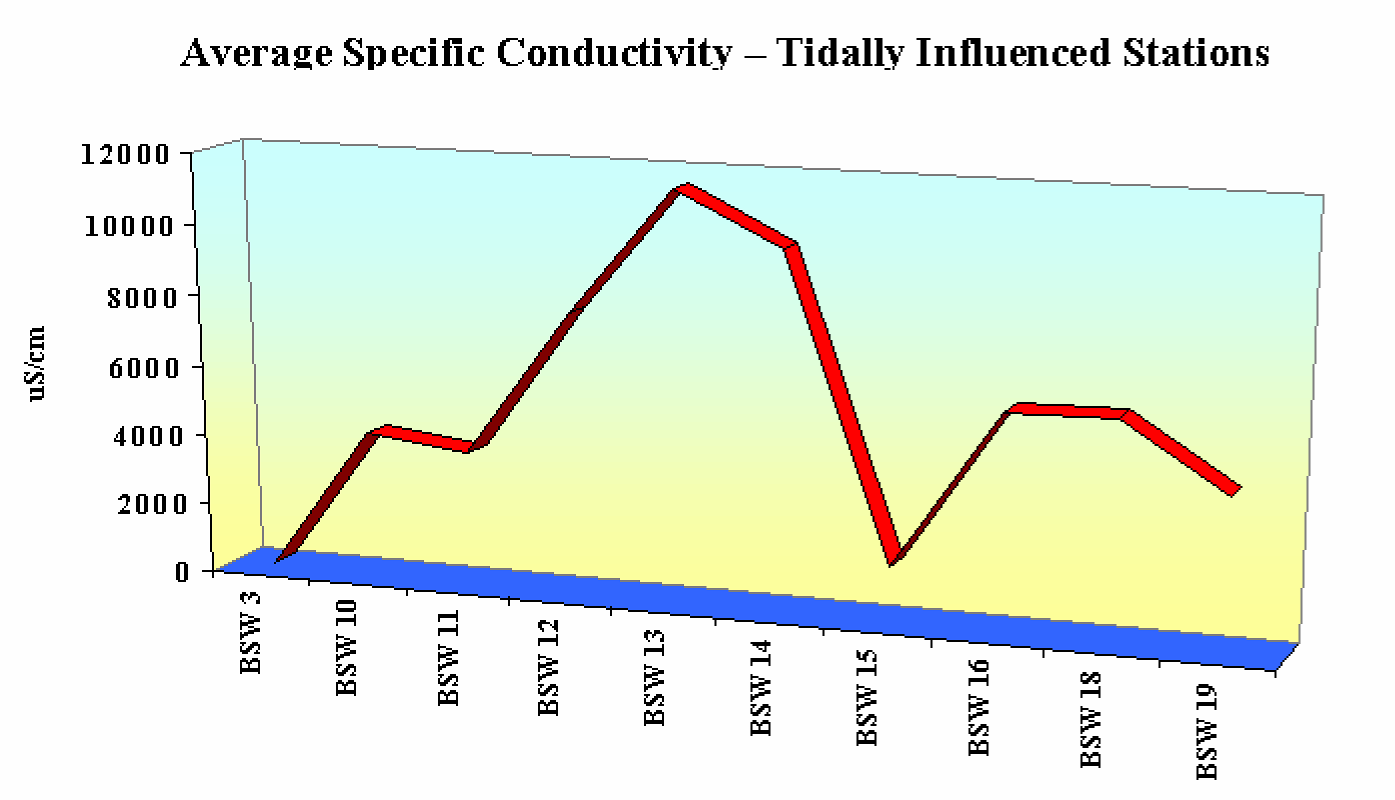
Specific Conductivity

Conductivity is a measure of water's ability to conduct electricity. More specifically, it is a measure of the ionic activity and content within water. Generally, the higher the ionic concentration within water, the higher the conductivity. Temperature, however, has a pronounced effect upon conductivity values. For this reason, specific conductivity (conductivity normalized to a temperature of 25^0 C) is often used in comparative water quality studies. Specific conductivity can be a good measure of total dissolved solids and salinity. It can not, however, provide information on the type of or individual concentrations of ions present. The list of ionic forms that may be present



in water and which effect water's conductivity is a long one. The list includes such ions as calcium, magnesium, sodium, potassium, sulfate, chloride, bicarbonate, nitrogen, phosphorous, iron and others. Specific conductivity values are useful as indicators of potential water quality problems. Low values generally indicate low nutrient, high quality waters, while high values suggest nutrient rich waters. Also, sudden changes in specific conductance values may be an indicator of a pollutant discharge. It should be observed, however, that higher specific conductance values are the norm in tidally influenced waters and are not, necessarily, indicators of pollutant stress, but, rather, reflect the increased ionic activity associated with saline inflow.

The inserted tables present the average values for specific conductivity for all stations. For the deeper, tidally influenced stations, the values represent the average of all specific conductivity readings taken along the water column from top to bottom. Throughout the study, the highest specific conductivity values were found, predictably, at the boat stations. Tidal influence had a measurable effect upon these values. Rising specific conductivity values correlated positively with salinity values, with the highest values for both salinity and specific conductance occurring nearer the bottom than the surface.



Station BSW 3 exhibited the highest average specific conductivity values among the land based stations. This may be attributed to tidal influence. Station BSW 7 had the lowest average specific conductivity values among all stations. Among the boat stations, BSW 13 had the largest average specific conductivity values and BSW 15 had the lowest. Those stations nearest the mouth of the Mobile River (BSW 12, BSW 13, and BSW 14) exhibited the highest specific conductivity values.

Additional Analytes

Oil and grease concentrations in a water body are indicators of pollutant discharge. Non-point sources, especially during rain events, are suspected to be the primary contributors of these pollutants to a water system. Oil and grease concentrations were not detected at any of the stations sampled.

No pesticides, volatile organic compounds, or polychlorinated biphenyls were detected at any of the stations during this study.

REVIEW AND CONCLUSIONS

A review of the data collected during the interval of this study indicates that the Bayou Sara subwatershed is not severely impacted by any of the monitored pollutants. The subwatershed appears to be free from the stress of multiple point source discharges. Wildlife, both plant and animal, thrive in the subwatershed, especially in the easternmost segments. Wading birds are a common sight within the subwatershed and are indicators of a healthy ecosystem. Apart from depressed dissolved oxygen levels along certain segments, general water quality within the subwatershed may be considered acceptable to good. The low dissolved oxygen levels observed during the study may, reasonably, be attributed to retarded flow and anaerobic bacteria activity. No obvious point or non-point source influences were detected at the stations exhibiting low dissolved oxygen concentrations. It may be concluded that rainfall has a substantial influence on the water quality within the subwatershed, particularly those rain events discharging significant volumes of precipitation over short periods. Fecal coliform bacteria concentrations tend to elevate during and following rain events, as do suspended solids. It is expected that increasing the amount of impervious surface cover within the subwatershed will only exacerbate these effects. Trash deposited by passing motorists was a problem within the subwatershed, if only for aesthetic reasons. It is certain, however, that such trash was no benefit to the water quality. An enhanced awareness of environmental concerns and civic duty might reasonably be expected to deter individuals from depositing their trash in such a manner. It is hoped that, with the passage of time, such activities will decline and, ultimately cease. As the volume and frequency of traffic within the subwatershed will only increase with time, continued littering will, most certainly, have a negative impact on the water quality.

Bayou Sara/Norton Creek have been on the Department's §303(d) list since 1994 for nutrient impairments. The Department is scheduled to either complete a nutrient TMDL or a delisting of the waterbodies by November 5, 2003. Data acquired from this watershed survey will play a major role in the performance of the TMDL evaluation.

LIST OF ACRONYMS AND ABBREVIATIONS

ADEM -	Alabama Department of Environmental Management
BOD_5 -	5 day biochemical oxygen demand
BSW –	Bayou Sara Watershed
^0C –	degrees Celsius/centigrade
CBOD -	carbonaceous biochemical oxygen demand
cfs –	cubic feet per second
DO –	dissolved oxygen
EPA -	Environmental Protection Agency
^0F -	degrees Fahrenheit
mgd/MGD –	million gallons per day

mg/l –	milligrams per liter
NPDES -	National Pollutant Discharge Elimination System
NPS -	non point source
NTU -	Nephelometric turbidity unit
P -	phosphate
ppb -	parts per billion
ppm -	parts per million
ppt -	parts per thousand
s.u. –	standard units
TKN -	total Kjehldahl nitrogen
TRC -	total residual chlorine
USEPA –	United States Environmental Protection Agency
USGS –	United States Geological Survey
uS/cm -	micro Siemens per centimeter

DEFINITIONS OF TERMINOLOGY

Aquifer -	a water bearing stratum of sand, gravel, or permeable rock
Impervious surface -	any material that prevents the infiltration of water into the soil
Non-point source -	pollutant introduction from spatially separate origins such as pollution arising from runoff during rain events
Point source -	pollutant introduction from a specific outlet
Potentiometric surface -	a surface of potential, or hydraulic head, for an aquifer
Sample –	physical evidence collected from a facility, site, or from the environment

Terrigenous - relating to ocean sediment derived directly from the destruction of rocks on the earth's surface

Watershed - a geographical area from which water drains along common paths. The area is bounded by topographical or other features that contain or otherwise direct the flow of water falling within the watershed.

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APPENDIX A

STATION BSW 2 FLOW DATA

Stream Flow Calculation Worksheet

Station# BSW 2
Date 6/13/2001
meter type Pygmy
meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.1					
	0.6	0.5	20	60	0.351	0.167
	2	0.7	62	60	1.024	1.075
	3.6	1	86	60	1.408	2.252
	5.2	1.7	90	60	1.472	4.003
	6.8	1.7	54	60	0.896	2.436
	8.4	2.2	86	60	1.408	4.955
	10	2.2	50	60	0.832	2.927
	11.6	2.4	66	60	1.088	4.177
	13.2	2.1	68	60	1.120	3.762
	14.8	1.5	54	60	0.896	2.149
	16.4	1.2	70	60	1.152	2.211
	18	0.8	46	60	0.768	0.982
	19.6	0.8	64	60	1.056	1.267
	21	1	42	60	0.703	0.844
	22					

flow Q = 33.2 cfs

Stream Flow Calculation Worksheet

Station# BSW 2
Date 6/26/2001
meter type Pygmy
meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	1	0.4	40	60	0.671	0.201
	2	0.4	42	60	0.703	0.281
	3	0.5	20	60	0.351	0.176
	4	0.9	20	60	0.351	0.316
	5	1	24	60	0.415	0.415
	6	0.9	20	60	0.351	0.474
	8	1	28	60	0.479	0.719
	9	1.4	40	60	0.671	0.940
	10	0.5	28	60	0.479	0.240
	11	0.5	26	60	0.447	0.224
	12	0.5	24	60	0.415	0.156
	12.5					

flow Q = 4.1 cfs

Stream Flow Calculation Worksheet

Station# BSW 2 | meter type Pygmy
Date 7/17/2001 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	2	0.8	34	60	0.575	0.691
	3.5	0.8	34	60	0.575	0.552
	4.4	0.8	44	60	0.735	0.618
	5.6	1	44	60	0.735	0.883
	6.8	0.7	54	60	0.896	1.128
	9.2	1.2	66	60	1.088	2.349
	10.4	1.5	70	60	1.152	2.073
	11.6	1.2	58	60	0.960	1.382
	12.8	0.9	82	60	1.344	1.451
	14	0.4	50	60	0.832	0.532
	16	0.1	0	60	0.031	-0.022

flow Q = 11.6 cfs

Stream Flow Calculation Worksheet

Station# BSW 2 | meter type Pygmy
Date 7/25/2001 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	1.5	1.7	8	60	0.159	0.338
	3	0.8	46	60	0.768	0.921
	4.5	0.8	44	60	0.735	0.883
	6	1.1	38	60	0.639	1.055
	7.5	1.1	48	60	0.800	1.319
	9	1.2	38	60	0.639	1.151
	10.5	1.3	70	60	1.152	2.246
	12	0.9	62	60	1.024	1.382
	13.5	0.2	26	60	0.447	0.215
	16.8					

flow Q = 9.5 cfs

Stream Flow Calculation Worksheet

Station# BSW 2 meter type Pygmy
Date 8/15/2001 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	0.5						flow Q =
	1	0.5	24	60	0.415	0.260	31.1 cfs
	3	1	38	60	0.639	1.279	
	5	2	84	60	1.376	5.503	
	7	1.8	82	60	1.344	4.837	
	9	1.8	60	60	0.992	3.570	
	11	1.5	52	60	0.864	2.591	
	13	1.4	86	60	1.408	3.942	
	15	1.2	76	60	1.248	2.994	
	17	0.9	94	60	1.536	2.764	
	19	0.8	86	60	1.408	2.252	
	21	0.9	49	60	0.816	1.138	
	22.1						

Stream Flow Calculation Worksheet

Station# BSW 2 meter type Pygmy
Date 8/28/2001 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	0.5						flow Q =
	1	0.6	24	60	0.415	0.187	13.5 cfs
	2	1.3	24	60	0.415	0.810	
	4	1.2	54	60	0.896	1.881	
	5.5	1	46	60	0.768	1.151	
	7	0.8	68	60	1.120	1.344	
	8.5	1	82	60	1.344	2.016	
	10	1.5	58	60	0.960	2.159	
	11.5	1.2	48	60	0.800	1.439	
	13	1	94	60	1.536	2.381	
	14.6	0.1	22	60	0.383	0.105	
	18.5						

Stream Flow Calculation Worksheet

Station# BSW 2 meter type Pygmy
Date 9/27/2001 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	1.5	1.8	10	60	0.191	0.430
	3	0.9	42	60	0.703	0.950
	4.5	0.9	44	60	0.735	0.993
	6	1.1	40	60	0.671	1.108
	7.5	1.1	48	60	0.800	1.319
	9	1.2	34	60	0.575	1.036
	10.5	4	68	60	1.120	6.718
	12	1	64	60	1.056	1.583
	13.5	0.4	24	60	0.415	0.249
	15	0.2	6	60	0.127	0.025
	15.5					

flow Q = 14.4 cfs

Stream Flow Calculation Worksheet

Station# BSW 2 meter type Pygmy
Date ######## meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	1.5	1.8	18	60	0.319	0.718
	3	1.7	36	60	0.607	1.549
	4.5	0.9	40	60	0.671	0.906
	6	0.9	52	60	0.864	1.166
	7.5	0.6	78	60	1.280	1.152
	9	1	90	60	1.472	2.208
	10.5	1.8	62	60	1.024	2.764
	12	1.4	26	60	0.447	0.939
	13.5	1	38	60	0.639	0.959
	15	1.3	64	60	1.056	2.058
	16.5	0.1	0	60	0.031	0.005
	18					

flow Q = 14.4 cfs

Stream Flow Calculation Worksheet

Station#	BSW 2	meter type	Pygmy
Date	11/6/2001	meter #	

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	1	0.6	36	60	0.607	0.273
	2	1.2	20	60	0.351	0.422
	3	1	26	60	0.447	0.447
	4	1	34	60	0.575	0.575
	5	1.3	54	60	0.896	1.164
	6	1.1	48	60	0.800	0.879
	7	0.9	56	60	0.928	0.835
	8	0.9	66	60	1.088	0.979
	9	1.5	52	60	0.864	1.295
	10	1.5	70	60	1.152	1.728
	11	1.5	64	60	1.056	1.583
	12	1.4	34	60	0.575	0.806
	13	1	24	60	0.415	0.415
	14					

flow Q = 11.4 cfs

Stream Flow Calculation Worksheet

Station#	BSW 2	meter type	Pygmy
Date	########	meter #	

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	1	0.9	26	60	0.447	0.302
	2	1.2	22	60	0.383	0.460
	3	1.1	28	60	0.479	0.527
	4	0.8	40	60	0.671	0.537
	5	1.1	46	60	0.768	0.844
	6	1	54	60	0.896	0.896
	7	0.9	64	60	1.056	0.950
	8	0.9	72	60	1.184	1.065
	9	1.2	62	60	1.024	1.228
	10	1.5	52	60	0.864	1.295
	11	1.7	64	60	1.056	1.795
	12	1.4	38	60	0.639	0.895
	13	1.4	54	60	0.896	1.254
	14					

flow Q = 12.0 cfs

Stream Flow Calculation Worksheet

Station#	BSW 2		meter type	Pygmy		
Date	########		meter #			

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	0.5						flow Q =
	1.5	1.4	36	60	0.607	1.063	15.6 cfs
	3	1.2	38	60	0.639	1.151	
	4.5	1.2	30	60	0.511	0.921	
	6	1.1	44	60	0.735	1.214	
	7.5	0.9	56	60	0.928	1.252	
	9	1.2	60	60	0.992	1.785	
	10.5	1.9	78	60	1.280	3.647	
	12	1.9	56	60	0.928	2.644	
	13.5	1.7	36	60	0.607	1.549	
	15	0.4	18	60	0.319	0.192	
	16.5	0.4	10	60	0.191	0.115	
	18	0.4	10	60	0.191	0.096	
	19						

Stream Flow Calculation Worksheet

Station#	BSW 2		meter type	Pygmy		
Date	1/8/2002		meter #			

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	0.1						flow Q =
	1.5	0.3	48	60	0.800	0.348	17.8 cfs
	3	1.9	52	60	0.864	2.461	
	4.5	1.6	30	60	0.511	1.227	
	6	1.4	48	60	0.800	1.679	
	7.5	1.1	44	60	0.735	1.214	
	9	1	40	60	0.671	1.007	
	10.5	1.1	52	60	0.864	1.425	
	12	2.2	84	60	1.376	4.540	
	13.5	1.5	28	60	0.479	1.079	
	15	0.3	84	60	1.376	0.619	
	16.5	0.6	76	60	1.248	1.123	
	18	0.7	56	60	0.928	0.974	
	19.5	0.5	12	60	0.223	0.151	
	20.7						

Stream Flow Calculation Worksheet

Station#	BSW 2		meter type	Pygmy		
Date	2/20/2002		meter #			

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	0.1						flow Q =
	2	0.3	56	60	0.928	0.543	29.8 cfs
	4	1.9	72	60	1.184	4.498	
	6	1.6	54	60	0.896	2.866	
	8	1.2	52	60	0.864	2.073	
	10	1	44	60	0.735	1.471	
	12	2.2	86	60	1.408	6.194	
	14	2.3	60	60	0.992	4.561	
	16	1.7	60	60	0.992	3.371	
	18	0.7	80	60	1.312	1.836	
	20	0.8	90	60	1.472	2.355	
	22						

Stream Flow Calculation Worksheet

Station#	BSW 2		meter type	Pygmy		
Date	3/12/2002		meter #			

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	0.1						flow Q =
	3	1.5	60	60	0.992	4.388	87.0 cfs
	6	2.8	100	60	1.632	13.708	
	9	2.5	78	60	1.280	9.598	
	12	2.5	92	60	1.504	11.279	
	15	2.5	80	60	1.312	9.838	
	18	3.4	72	60	1.184	12.074	
	21	3.1	76	60	1.248	11.604	
	24	1.7	72	60	1.184	6.037	
	27	1.9	48	60	0.800	4.557	
	30	1.9	36	60	0.607	3.462	
	33	0.7	16	60	0.287	0.503	
	35						

Stream Flow Calculation Worksheet

Station#	BSW 2		meter type	Pygmy		
Date	4/2/2002		meter #			

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	1						flow Q =
	2	0.9	64	60	1.056	1.425	24.9 cfs
	4	1.6	82	60	1.344	4.300	
	6	1	84	60	1.376	2.752	
	8	0.8	84	60	1.376	2.201	
	10	1	64	60	1.056	2.111	
	12	1.6	124	60	2.016	6.451	
	14	0.9	60	60	0.992	1.785	
	16	0.7	18	60	0.319	0.447	
	18	0.8	92	60	1.504	2.406	
	20	0.7	60	60	0.992	1.041	
	21						

Stream Flow Calculation Worksheet

Station#	BSW 2	meter type	Pygmy
Date	4/16/2002	meter #	

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	1						flow Q =
	2	1.5	88	60	1.440	3.240	21.5 cfs
	4	1.3	104	60	1.696	4.409	
	6	1	40	60	0.671	1.343	
	8	0.5	60	60	0.992	0.992	
	10	0.9	36	60	0.607	1.093	
	12	1.6	104	60	1.696	5.427	
	14	1	60	60	0.992	1.983	
	16	0.5	26	60	0.447	0.447	
	18	0.6	74	60	1.216	1.459	
	20	0.6	72	60	1.184	1.065	
	21						

Stream Flow Calculation Worksheet

Station#	BSW 2	meter type	Pygmy
Date	5/16/2002	meter #	

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	1	0.8	12	60	0.223	0.134
	2	0.9	68	60	1.120	1.008
	3	0.8	52	60	0.864	0.691
	4	0.6	34	60	0.575	0.345
	5	0.5	20	60	0.351	0.176
	6	0.2	22	60	0.383	0.077
	7	0.2	6	60	0.127	0.025
	8	0.2	28	60	0.479	0.096
	9	0.2	38	60	0.639	0.128
	10	0.1	28	60	0.479	0.036
	10.5					

flow Q = 2.7 cfs

Stream Flow Calculation Worksheet

Station# BSW 2
Date 5/21/2002
meter type Pygmy
meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	1	1	38	60	0.639	0.480
	2	1	66	60	1.088	1.088
	3	0.7	54	60	0.896	0.627
	4	0.4	24	60	0.415	0.166
	5	0.4	34	60	0.575	0.230
	6	0.3	42	60	0.703	0.211
	7	0.2	8	60	0.159	0.032
	8	0.3	14	60	0.255	0.077
	9	0.4	34	60	0.575	0.230
	10	0.2	40	60	0.671	0.101
	10.5					

flow Q = 3.2 cfs

Stream Flow Calculation Worksheet

Station# BSW 2
Date 7/17/2002
meter type Pygmy
meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	0.5						flow Q =
	1	0.4	30	60	0.511	0.153	2.9 cfs
	2	0.3	34	60	0.575	0.173	
	3	0.4	54	60	0.896	0.358	
	4	0.4	46	60	0.768	0.307	
	5	0.5	60	60	0.992	0.496	
	6	0.6	50	60	0.832	0.499	
	7	0.6	30	60	0.511	0.307	
	8	0.5	46	60	0.768	0.384	
	9	0.3	18	60	0.319	0.096	
	10	0.3	22	60	0.383	0.173	
	12						

Stream Flow Calculation Worksheet

Station# BSW 2 meter type Pygmy
Date 8/26/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	0.5						flow Q =
	1	1.4	16	60	0.287	0.302	11.7 cfs
	2	2.3	140	60	2.272	5.226	
	3	3	26	60	0.447	1.342	
	4	3.5	16	60	0.287	1.006	
	5	0.6	38	60	0.639	0.384	
	6	0.5	36	60	0.607	0.304	
	7	0.5	28	60	0.479	0.240	
	8	0.7	68	60	1.120	0.784	
	9	0.6	120	60	1.952	1.171	
	10	0.5	72	60	1.184	0.592	
	11	0.4	48	60	0.800	0.320	
	12	0.2	16	60	0.287	0.057	
	13						

Stream Flow Calculation Worksheet

Station# BSW 2 meter type Pygmy
Date 9/11/2002 meter #

TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW

bank	0.5						flow Q =
	1	0.3	28	60	0.479	0.108	2.5 cfs
	2	0.4	40	60	0.671	0.269	
	3	0.4	60	60	0.992	0.397	
	4	0.4	56	60	0.928	0.371	
	5	0.5	48	60	0.800	0.400	
	6	0.3	36	60	0.607	0.182	
	7	0.5	44	60	0.735	0.368	
	8	0.2	40	60	0.671	0.134	
	9	0.2	32	60	0.543	0.109	
	10	0.3	40	60	0.671	0.201	
	11						

STATION BSW 4 FLOW DATA

Stream Flow Calculation Worksheet

Station# BSW 4 | meter type Pygmy
Date 6/13/2001 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	2	12	60	0.223	0.357
	2.6	2.1	16	60	0.287	0.362
	3.2	2.2	18	60	0.319	0.422
	3.8	2.2	18	60	0.319	0.422
	4.4	2.1	16	60	0.287	0.362
	5	2.1	16	60	0.287	0.362
	5.6	2	14	60	0.255	0.306
	6.2	1.8	16	60	0.287	0.362
	7	1.5	8	60	0.159	0.167
	7.6	1.2	6	60	0.127	0.076
	8					

flow Q = 3.2 cfs

Stream Flow Calculation Worksheet

Station# BSW 4 | meter type Pygmy
Date 7/25/2001 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	6.5	3	22	60	0.383	3.738
	7.5	3.1	40	60	0.671	2.082
	8.5	3	48	60	0.800	2.399
	9.5	3	46	60	0.768	2.303
	10.5	3.1	38	60	0.639	1.982
	11.5	3.1	14	60	0.255	0.791
	12.5	3	14	60	0.255	0.766
	13.5	2.4	6	60	0.127	1.145
	20					

flow Q = 15.2 cfs

Stream Flow Calculation Worksheet

Station# BSW 4 meter type Pygmy
Date 2/20/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.6	10	60	0.191	0.172
	4	1.5	12	60	0.223	0.670
	6	2.7	14	60	0.255	1.379
	8	3.4	14	60	0.255	1.736
	10	3.5	32	60	0.543	3.804
	12	3.3	26	60	0.447	2.953
	14	2.8	14	60	0.255	1.430
	16	1.5	10	60	0.191	0.574
	18	1.2	6	60	0.127	0.534
	23					

flow Q = 13.3 cfs

Stream Flow Calculation Worksheet

Station# BSW 4 meter type Pygmy
Date 4/2/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.8	0	60	0.031	0.031
	3.5	1	0	60	0.031	0.047
	5	2.2	6	60	0.127	0.420
	6.5	2.8	16	60	0.287	1.207
	8	3.5	16	60	0.287	1.508
	9.5	3.8	14	60	0.255	1.455
	11	3.8	32	60	0.543	3.097
	12.5	3.7	30	60	0.511	2.838
	14	3.7	22	60	0.383	2.128
	15.5	2.7	10	60	0.191	0.775
	17	1.3	6	60	0.127	0.455
	21					

flow Q = 14.0 cfs

STATION BSW 6 FLOW DATA

Stream Flow Calculation Worksheet

Station# BSW 6 meter type Pygmy
Date 5/9/2001 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	0.5						flow Q =
	1	0.5	22	60	0.383	0.192	18.3 cfs
	2.5	0.83	36	60	0.607	1.008	
	5	1	66	60	1.088	2.627	
	7.33	1	66	60	1.088	2.540	
	9.67	1	80	60	1.312	3.063	
	12	1	62	60	1.024	2.385	
	14.33	1	59	60	0.976	2.278	
	16.67	1	60	60	0.992	2.315	
	19	1	37	60	0.623	1.453	
	21.33	0.5	26	60	0.447	0.391	
	22.5	0.17	20	60	0.351	0.050	
	23						

Stream Flow Calculation Worksheet

Station# BSW 6 meter type Pygmy
Date 5/22/2001 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	6.5						flow Q =
	9.67	2.5	34	60	0.575	4.553	46.0 cfs
	12.83	2.1	56	60	0.928	6.165	
	16	2.1	82	60	1.344	8.945	
	19.17	2.1	102	60	1.664	11.059	
	22.33	2.1	78	60	1.280	8.506	
	25.5	2.2	58	60	0.960	6.682	
	28.66	1.2	0	60	0.031	0.103	
	31						

Stream Flow Calculation Worksheet

Station# BSW 6 | meter type Pygmy
Date 5/31/2001 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	8					
	9.2	1.5	10	60	0.191	0.373
	10.6	1.7	20	60	0.351	0.836
	12	1.7	44	60	0.735	1.876
	13.6	1.6	66	60	1.088	2.610
	15	1.7	80	60	1.312	3.233
	16.5	1.5	78	60	1.280	2.879
	18	1.5	90	60	1.472	3.312
	19.5	1.6	78	60	1.280	3.071
	21	1.6	80	60	1.312	3.148
	22.5	1.6	76	60	1.248	2.994
	24	1.6	50	60	0.832	1.996
	25.5	1.6	50	60	0.832	1.996
	27	1.5	42	60	0.703	1.583
	28.5	0.66	18	60	0.319	0.316
	30	0.5	10	60	0.191	0.143
	31.5					

flow Q = 30.4 cfs

Stream Flow Calculation Worksheet

Station# BSW 6 | meter type Pygmy
Date 6/8/2001 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.4	16	60	0.287	0.172
	4	0.3	20	60	0.351	0.211
	6	0.4	14	60	0.255	0.204
	8	0.3	22	60	0.383	0.230
	10	0.3	24	60	0.415	0.249
	12	0.3	26	60	0.447	0.268
	14	0.3	30	60	0.511	0.307
	16	0.4	28	60	0.479	0.384
	18	0.4	22	60	0.383	0.307
	20	0.3	22	60	0.383	0.144
	20.5					

flow Q = 2.5 cfs

Stream Flow Calculation Worksheet

Station# BSW 6
Date 6/13/2001

meter type Pygmy
meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	6					
	7.5	1.9	12	60	0.223	0.636
	9	2.2	22	60	0.383	1.265
	10.5	2.2	44	60	0.735	2.427
	12	2.1	56	60	0.928	2.922
	13.5	2	74	60	1.216	3.647
	15	2.2	88	60	1.440	4.751
	16.5	2.5	92	60	1.504	5.639
	18	2.6	102	60	1.664	6.489
	19.5	2.8	96	60	1.568	6.585
	21	2.6	96	60	1.568	6.115
	22.5	2.5	84	60	1.376	5.159
	24	2.4	78	60	1.280	4.607
	25.5	2.4	60	60	0.992	3.570
	27	2.4	48	60	0.800	2.878
	28.5	1.6	24	60	0.415	0.997
	30	1.6	8	60	0.159	0.319
	31					

flow Q = 58.0 cfs

Stream Flow Calculation Worksheet

Station# BSW 6
Date 6/26/2001

meter type Pygmy
meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	8					
	10	1.8	14	60	0.255	0.919
	12	1.9	22	60	0.383	1.457
	14	2	44	60	0.735	2.942
	16	2.3	60	60	0.992	4.561
	18	2.5	74	60	1.216	6.078
	20	2.5	94	60	1.536	7.679
	22	2.5	94	60	1.536	7.679
	24	2.3	68	60	1.120	5.150
	26	2	44	60	0.735	2.942
	28	1.4	26	60	0.447	1.253
	30					

flow Q = 40.7 cfs

Stream Flow Calculation Worksheet

Station# BSW 6 meter type Pygmy
Date 7/17/2001 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	6					
	9	1.5	8	60	0.159	0.597
	11	1.5	10	60	0.191	0.574
	13	1.9	12	60	0.223	0.848
	15	1.9	44	60	0.735	2.795
	17	2.2	68	60	1.120	4.926
	19	2.4	80	60	1.312	6.296
	21	1.8	76	60	1.248	4.492
	23	2.3	62	60	1.024	4.709
	25	2.2	48	60	0.800	3.518
	27	1.8	22	60	0.383	1.380
	29	0.9	8	60	0.159	0.430
	33					

flow Q = 30.6 cfs

Stream Flow Calculation Worksheet

Station# BSW 6 meter type Pygmy
Date 7/25/2001 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	6					
	9.5	1.6	6	60	0.127	0.509
	11	1.6	10	60	0.191	0.459
	12.5	1.9	20	60	0.351	1.001
	14	2.1	41	60	0.687	2.166
	15.5	2.1	58	60	0.960	3.023
	17	2.4	74	60	1.216	4.376
	18.5	2.5	80	60	1.312	4.919
	20	2.6	80	60	1.312	5.116
	21.5	2.5	74	60	1.216	4.559
	23	2.4	66	60	1.088	3.916
	24.5	2	56	60	0.928	2.783
	26	2	36	60	0.607	1.822
	27.5	1.8	14	60	0.255	0.689
	29	0.9	8	60	0.159	0.466
	34					

flow Q = 35.8 cfs

Stream Flow Calculation Worksheet

Station# BSW 6 | meter type Pygmy
Date 8/28/2001 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.4	0	60	0.031	0.019
	4	0.4	0	60	0.031	0.025
	6	0.6	20	60	0.351	0.422
	8	1.2	24	60	0.415	0.997
	10	1.2	30	60	0.511	1.227
	12	1.2	42	60	0.703	1.688
	14	1.2	36	60	0.607	1.458
	16	1.1	38	60	0.639	1.407
	18	1.1	34	60	0.575	1.266
	20	1.3	30	60	0.511	1.330
	22	0.9	14	60	0.255	0.460
	24	0.6	8	60	0.159	0.191
	26	0.2	0	60	0.031	0.012
	28					

flow Q = 10.5 cfs

Stream Flow Calculation Worksheet

Station# BSW 6 | meter type Pygmy
Date 4/2/2002 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	3	0.9	14	60	0.255	0.574
	6	1.9	10	60	0.191	1.090
	9	2.2	14	60	0.255	1.685
	12	2.8	28	60	0.479	4.027
	15	2.6	44	60	0.735	5.737
	18	2.4	44	60	0.735	5.296
	21	2.6	24	60	0.415	3.240
	24	2.8	16	60	0.287	5.631
	35					

flow Q = 27.3 cfs

STATION BSW 7 FLOW DATA

Stream Flow Calculation Worksheet

Station# BSW 7 | meter type Pygmy
Date 5/22/2001 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1.5					
	3	0.6	40	60	0.671	0.906
	6	0.6	52	60	0.864	1.554
	9	0.6	48	60	0.800	1.439
	12	0.6	44	60	0.735	1.324
	15	0.6	40	60	0.671	1.209
	18	0.6	30	60	0.511	0.921
	21	1.1	26	60	0.447	1.476
	24	0.8	26	60	0.447	1.074
	27	0.8	6	60	0.127	0.305
	30					

flow Q = 10.2 cfs

Stream Flow Calculation Worksheet

Station# BSW 7 | meter type Pygmy
Date 6/8/2001 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	2					
	3	0.4	14	60	0.255	0.204
	6	0.6	42	60	0.703	1.266
	9	0.7	46	60	0.768	1.612
	12	0.7	44	60	0.735	1.545
	15	0.7	40	60	0.671	1.410
	18	0.6	34	60	0.575	1.036
	21	0.9	32	60	0.543	1.467
	24	1.2	26	60	0.447	1.611
	27	0.9	8	60	0.159	0.430
	30					

flow Q = 10.6 cfs

Stream Flow Calculation Worksheet

Station# BSW 7
Date 6/13/2001

meter type Pygmy
meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.1					
	0.5	0.2	16	60	0.287	0.098
	3.5	1.5	26	60	0.447	2.181
	7	1.6	38	60	0.639	3.581
	10.5	1.9	44	60	0.735	4.891
	14	2	42	60	0.703	4.924
	17.5	2	36	60	0.607	4.252
	21	1.9	34	60	0.575	3.827
	24.5	2.1	28	60	0.479	3.523
	28	2.5	20	60	0.351	2.855
	31					

flow Q = 30.1 cfs

Stream Flow Calculation Worksheet

Station# BSW 7
Date 6/26/2001

meter type Pygmy
meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.2	32	60	0.543	0.163
	4	0.5	48	60	0.800	0.800
	6	0.5	56	60	0.928	0.928
	8	0.6	52	60	0.864	1.036
	10	0.6	48	60	0.800	0.959
	12	0.6	44	60	0.735	0.883
	14	0.5	42	60	0.703	0.703
	16	0.5	36	60	0.607	0.607
	18	0.7	28	60	0.479	0.671
	20	0.9	36	60	0.607	1.093
	22	0.9	30	60	0.511	0.921
	24	0.8	24	60	0.415	0.665
	26					

flow Q = 9.4 cfs

Stream Flow Calculation Worksheet

Station# BSW 7 meter type Pygmy

Date 7/25/2001 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	4.5	0.4	42	60	0.703	0.774
	6.5	0.6	42	60	0.703	0.844
	8.5	0.6	24	60	0.415	0.498
	10.5	0.7	54	60	0.896	1.254
	12.5	0.7	50	60	0.832	1.164
	14.5	0.7	46	60	0.768	1.075
	16.5	0.5	46	60	0.768	0.768
	18.5	0.6	34	60	0.575	0.691
	20.5	0.9	34	60	0.575	1.036
	22.5	1.2	24	60	0.415	0.997
	24.5	1.6	10	60	0.191	0.612
	26.5	1	16	60	0.287	1.149
	32.5					

flow Q = 10.9 cfs

Stream Flow Calculation Worksheet

Station# BSW 7 meter type Pygmy

Date 8/28/2001 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.5	6	60	0.127	0.095
	4	0.5	40	60	0.671	0.671
	6	0.7	48	60	0.800	1.119
	8	0.5	36	60	0.607	0.607
	10	0.8	52	60	0.864	1.382
	12	0.8	48	60	0.800	1.279
	14	0.8	46	60	0.768	1.228
	16	0.7	40	60	0.671	0.940
	18	0.8	34	60	0.575	0.921
	20	0.9	32	60	0.543	0.978
	22	1	28	60	0.479	0.959
	24	1	24	60	0.415	0.831
	26	1	12	60	0.223	0.893
	32					

flow Q = 11.9 cfs

Stream Flow Calculation Worksheet

Station# BSW 7 meter type Pygmy
Date 9/27/2001 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.2	30	60	0.511	0.153
	4	0.5	44	60	0.735	0.735
	6	0.5	58	60	0.960	0.960
	8	0.6	50	60	0.832	0.998
	10	0.6	48	60	0.800	0.959
	12	0.6	42	60	0.703	0.844
	14	0.5	40	60	0.671	0.671
	16	0.5	38	60	0.639	0.639
	18	0.6	30	60	0.511	0.614
	20	0.9	34	60	0.575	1.036
	22	1.1	38	60	0.639	1.407
	24	0.8	22	60	0.383	0.613
	26	0.4	0	60	0.000	0.000
	28					

flow Q = 9.6 cfs

Stream Flow Calculation Worksheet

Station# BSW 7 meter type Pygmy
Date ######## meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.2	30	60	0.511	0.153
	4	0.6	38	60	0.639	0.767
	6	0.8	34	60	0.575	0.921
	8	0.9	36	60	0.607	1.093
	10	0.9	36	60	0.607	1.093
	12	0.9	32	60	0.543	0.978
	14	1	36	60	0.607	1.215
	16	1.1	20	60	0.351	0.773
	18	0.9	30	60	0.511	0.921
	20	1	32	60	0.543	1.087
	22	0.8	12	60	0.223	0.357
	24	0.8	20	60	0.351	0.562
	26	0.6	0		0.000	0.000
	28.5					

flow Q = 9.9 cfs

Stream Flow Calculation Worksheet

Station# BSW 7 | meter type Pygmy
Date 11/6/2001 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.4	26	60	0.447	0.268
	4	0.6	32	60	0.543	0.652
	6	0.7	30	60	0.511	0.716
	8	0.8	32	60	0.543	0.869
	10	0.8	28	60	0.479	0.767
	12	0.8	28	60	0.479	0.767
	14	1	14	60	0.255	0.511
	16	0.7	22	60	0.383	0.537
	18	0.8	28	60	0.479	0.767
	20	0.8	30	60	0.511	0.818
	22	0.8	30	60	0.511	1.330
	26.5					

flow Q = 8.0 cfs

Stream Flow Calculation Worksheet

Station# BSW 7 | meter type Pygmy
Date ######## | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.4	26	60	0.447	0.268
	4	0.6	32	60	0.543	0.652
	6	0.7	20	60	0.351	0.492
	8	0.8	32	60	0.543	0.869
	10	0.8	28	60	0.479	0.767
	12	0.8	28	60	0.479	0.767
	14	1	26	60	0.447	0.895
	16	0.8	28	60	0.479	0.767
	18	0.8	28	60	0.479	0.767
	20	0.9	22	60	0.383	0.690
	22	0.8	14	60	0.255	0.766
	27.5					

flow Q = 7.7 cfs

Stream Flow Calculation Worksheet

Station#	BSW 7		meter type	Pygmy		
Date	########		meter #			

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	1						flow Q =
	2	0.3	22	60	0.383	0.173	11.5 cfs
	4	0.7	30	60	0.511	0.716	
	6	1	34	60	0.575	1.151	
	8	1.1	36	60	0.607	1.336	
	10	1.2	34	60	0.575	1.381	
	12	1.2	36	60	0.607	1.458	
	14	1.3	28	60	0.479	1.246	
	16	1.1	28	60	0.479	1.055	
	18	1.1	34	60	0.575	1.266	
	20	1	22	60	0.383	0.767	
	22	1	12	60	0.223	0.447	
	24	0.9	8	60	0.159	0.466	
	28.5						

Stream Flow Calculation Worksheet

Station#	BSW 7		meter type	Pygmy		
Date	1/8/2002		meter #			

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	0.5						flow Q =
	2	0.5	24	60	0.415	0.363	17.6 cfs
	4	0.7	36	60	0.607	0.850	
	6	1.1	38	60	0.639	1.407	
	8	1.1	34	60	0.575	1.266	
	10	1.4	40	60	0.671	1.880	
	12	1.4	44	60	0.735	2.059	
	14	1.5	46	60	0.768	2.303	
	16	1.5	36	60	0.607	1.822	
	18	1.5	34	60	0.575	1.726	
	20	1.4	36	60	0.607	1.701	
	22	1.5	18	60	0.319	0.958	
	24	1.5	10	60	0.191	1.291	
	31						

Stream Flow Calculation Worksheet

Station# BSW 7 meter type Pygmy
Date 2/20/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	2.5	0.9	40	60	0.671	1.360
	5	1.4	50	60	0.832	2.910
	7.5	1.5	52	60	0.864	3.238
	10	1.7	48	60	0.800	3.398
	12.5	1.8	36	60	0.607	2.733
	15	1.9	48	60	0.800	3.798
	17.5	1.8	24	60	0.415	1.869
	20	1.8	28	60	0.479	2.157
	22.5	1.9	18	60	0.319	1.517
	25	1.8	32	60	0.543	2.445
	27.5	1.9	16	60	0.287	1.365
	30	1.5	24	60	0.415	1.713
	33					

flow Q = 28.5 cfs

Stream Flow Calculation Worksheet

Station# BSW 7 meter type Pygmy
Date 4/2/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	3	0.6	42	60	0.703	1.055
	6	1	60	60	0.992	2.975
	9	1.5	44	60	0.735	3.310
	12	1.6	46	60	0.768	3.684
	15	1.6	40	60	0.671	3.223
	18	1.6	48	60	0.800	3.838
	21	1.4	34	60	0.575	2.417
	24	1.6	20	60	0.351	1.686
	27	1.5	24	60	0.415	1.869
	30	1.5	8	60	0.159	0.956
	35					

flow Q = 25.0 cfs

Stream Flow Calculation Worksheet

Station# BSW 7 meter type Pygmy

Date 4/16/2002 meter #

TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank 1					
3	0.6	54	60	0.896	1.343
6	0.9	34	60	0.575	1.554
9	1.3	38	60	0.639	2.494
12	1.3	44	60	0.735	2.868
15	1.5	38	60	0.639	2.878
18	1.4	44	60	0.735	3.089
21	1.3	28	60	0.479	1.870
24	1.4	23	60	0.399	1.677
27	1.3	38	60	0.639	2.494
30	1.4	10	60	0.191	1.071
35					

flow Q = 21.3 cfs

Stream Flow Calculation Worksheet

Station# BSW 7 meter type Pygmy
Date 5/16/2002 meter #

TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank 1					
2	0.5	20	60	0.351	0.264
4	0.8	26	60	0.447	0.716
6	0.8	28	60	0.479	0.767
8	0.8	32	60	0.543	0.869
10	0.8	46	60	0.768	1.228
12	0.8	30	60	0.511	0.818
14	0.7	34	60	0.575	0.806
16	0.8	24	60	0.415	0.665
18	0.6	20	60	0.351	0.422
20	0.5	6	60	0.127	0.095
21					

flow Q = 6.6 cfs

Stream Flow Calculation Worksheet

Station# BSW 7 meter type Pygmy
Date 5/21/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	1						flow Q =
	2.5	0.4	12	60	0.223	0.179	8.6 cfs
	5	0.7	24	60	0.415	0.727	
	7.5	0.8	28	60	0.479	0.959	
	10	0.8	36	60	0.607	1.215	
	12.5	0.9	44	60	0.735	1.655	
	15	0.8	26	60	0.447	0.895	
	17.5	0.9	30	60	0.511	0.921	
	19	0.7	14	60	0.255	0.357	
	21.5	0.8	30	60	0.511	1.023	
	24	0.7	22	60	0.383	0.671	
	26.5	0.6	0	60	0.031	0.028	
	27						

Stream Flow Calculation Worksheet

Station#	BSW 7	meter type	Pygmy
Date	7/17/2002	meter #	

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	1						flow Q =
	2	0.7	24	60	0.415	0.436	8.6 cfs
	4	0.8	26	60	0.447	0.716	
	6	0.9	32	60	0.543	0.978	
	8	0.9	22	60	0.383	0.690	
	10	1	36	60	0.607	1.215	
	12	1	52	60	0.864	1.727	
	14	0.8	40	60	0.671	1.074	
	16	0.6	14	60	0.255	0.306	
	18	0.6	42	60	0.703	0.844	
	20	0.6	38	60	0.639	0.576	
	21						

Stream Flow Calculation Worksheet

Station#	BSW 7	meter type	Pygmy
Date	8/26/2002	meter #	

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	1						flow Q =
	2	0.6	40	60	0.671	0.604	20.8 cfs
	4	0.9	64	60	1.056	1.900	
	6	1	48	60	0.800	1.599	
	8	0.9	60	60	0.992	1.785	
	10	0.9	40	60	0.671	1.209	
	12	1.2	64	60	1.056	2.534	
	14	1.5	80	60	1.312	3.935	
	16	1.2	52	60	0.864	2.073	
	18	1	34	60	0.575	1.151	
	20	1.1	36	60	0.607	1.336	
	22	1	36	60	0.607	1.215	
	24	0.8	36	60	0.607	0.972	
	26	0.8	16	60	0.287	0.460	
	28						

Stream Flow Calculation Worksheet

Station#	BSW 7	meter type	Pygmy
Date	9/11/2002	meter #	

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	1						flow Q =
	2	0.5	44	60	0.735	0.552	10.5 cfs
	4	0.6	36	60	0.607	0.729	
	6	0.7	68	60	1.120	1.568	
	8	0.9	60	60	0.992	1.785	
	10	1.2	64	60	1.056	2.534	
	12	1	28	60	0.479	0.959	
	14	0.8	24	60	0.415	0.665	
	16	0.7	8	60	0.159	0.223	
	18	0.7	44	60	0.735	1.030	
	20	0.6	32	60	0.543	0.489	
	21						

STATION BSW 8 FLOW DATA

Stream Flow Calculation Worksheet

Station# BSW 8 meter type Pygmy
Date 1/8/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	2	0.6	10	60	0.191	0.201
	4	1	38	60	0.639	1.279
	6	1.7	56	60	0.928	3.154
	8	2.6	34	60	0.575	2.992
	10	2.7	72	60	1.184	6.392
	12	3.2	60	60	0.992	6.346
	14	2.8	70	60	1.152	6.449
	16	2.1	70	60	1.152	4.837
	18	1.6	34	60	0.575	1.841
	20	1.4	58	60	0.960	2.015
	21					

flow Q = 35.5 cfs

Stream Flow Calculation Worksheet

Station# BSW 8 meter type Pygmy
Date 2/20/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	1.5	0.2	0	60	0.031	0.008
	3	0.4	22	60	0.383	0.230
	4.5	1.3	14	60	0.255	0.498
	6	1.9	24	60	0.415	1.184
	7.5	2.3	42	60	0.703	2.427
	9	2.6	38	60	0.639	2.494
	10.5	2.7	20	60	0.351	1.423
	12	1.8	28	60	0.479	1.294
	13.5	1.3	30	60	0.511	0.997
	15	1.2	18	60	0.319	0.671
	17					

flow Q = 11.2 cfs

Stream Flow Calculation Worksheet

Station# BSW 8 meter type Pygmy
Date 4/2/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	1	0.2	0	60	0.031	0.006
	2.5	0.6	34	60	0.575	0.518
	4	1	24	60	0.415	0.623
	5.5	1.7	24	60	0.415	1.059
	7	2.4	54	60	0.896	3.224
	8.5	2.3	52	60	0.864	2.979
	10	2.4	42	60	0.703	2.533
	11.5	2.8	54	60	0.896	3.761
	13	2.6	82	60	1.344	5.241
	14.5	1.8	34	60	0.575	1.554
	16	1.4	16	60	0.287	0.603
	17.5	1	42	60	0.703	0.703
	18					

flow Q = 22.8 cfs

Stream Flow Calculation Worksheet

Station# BSW 8 meter type Pygmy
Date 4/16/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	1	0.6	14	60	0.255	0.115
	2	0.9	28	60	0.479	0.431
	3	1.6	16	60	0.287	0.460
	4	1.9	38	60	0.639	1.215
	5	1.8	18	60	0.319	0.575
	6	2.2	28	60	0.479	1.055
	7	2.2	28	60	0.479	1.055
	8	1.5	14	60	0.255	0.383
	9	1.7	20	60	0.351	0.597
	10	1.1	10	60	0.191	0.210
	11	0.9	8	60	0.159	0.143
	12	0.6	18	60	0.319	0.192
	13	0.5	14	60	0.255	0.128
	14	0.6	46	60	0.768	0.461
	15					

flow Q = 7.0 cfs

Stream Flow Calculation Worksheet

Station#	BSW 8		meter type	Pygmy
Date	8/26/2002		meter #	

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW	
bank	0.5						flow Q =
	1.3	1.2	16	60	0.287	0.362	16.5 cfs
	2.6	1.4	14	60	0.255	0.465	
	3.9	2.2	20	60	0.351	1.005	
	5.2	2.5	20	60	0.351	1.142	
	6.5	2.5	14	60	0.255	0.830	
	7.8	2.7	10	60	0.191	0.671	
	9.1	3	38	60	0.639	2.494	
	10.4	3.4	54	60	0.896	3.958	
	11.7	2.9	42	60	0.703	2.652	
	13	2.4	34	60	0.575	1.795	
	14.3	2.7	14	60	0.255	0.896	
	15.6	1.2	10	60	0.191	0.195	
	16						

STATION BSW 21 FLOW DATA

Stream Flow Calculation Worksheet

Station# BSW 21 meter type Pygmy
Date 1/31/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	4	1.2	20	60	0.351	1.054
	5.5	1.6	18	60	0.319	0.766
	7	1.7	12	60	0.223	0.569
	8.5	1.6	30	60	0.511	1.227
	10	1.8	12	60	0.223	0.603
	11.5	1.6	38	60	0.639	1.023
	12	1.6	32	60	0.543	0.869
	13.5	1.6	22	60	0.383	0.920
	15	1.4	18	60	0.319	0.671
	16.5	1.1	34	60	0.575	0.949
	18	0.9	30	60	0.511	0.690
	19.5	0.9	30	60	0.511	0.690
	21	0.6	28	60	0.479	0.503
	23					

flow Q = 10.5 cfs

Stream Flow Calculation Worksheet

Station# BSW 21 meter type Pygmy
Date 2/22/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	2	0.5	0	60	0.031	0.027
	4	0.7	0	60	0.031	0.044
	6	0.9	10	60	0.191	0.344
	8	1.3	18	60	0.319	0.830
	10	2	26	60	0.447	1.789
	12	2.3	22	60	0.383	1.763
	14	2.1	34	60	0.575	2.417
	16	1.9	32	60	0.543	2.065
	18	2	34	60	0.575	2.302
	20	1.9	18	60	0.319	1.213
	22	1.2	36	60	0.607	1.458
	24	0.7	10	60	0.191	0.201
	25					

flow Q = 14.5 cfs

Stream Flow Calculation Worksheet

Station# BSW 21 | meter type Pygmy
Date 3/20/2002 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	2	1.1	14	60	0.255	0.491
	4	1.4	14	60	0.255	0.715
	6	1.6	18	60	0.319	1.022
	8	1.8	32	60	0.543	1.956
	10	1.9	20	60	0.351	1.335
	12	1.8	46	60	0.768	2.763
	14	1.8	40	60	0.671	2.417
	16	1.3	28	60	0.479	1.246
	18	1	22	60	0.383	0.767
	20	1	28	60	0.479	0.959
	22	0.4	14	60	0.255	0.153
	23					

flow Q = 13.8 cfs

Stream Flow Calculation Worksheet

Station# BSW 21 | meter type Pygmy
Date 4/16/2002 | meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	0.5					
	2	0.9	26	60	0.447	0.705
	4	1.4	16	60	0.287	0.804
	6	1.6	20	60	0.351	1.124
	8	1.8	20	60	0.351	1.265
	10	1.8	30	60	0.511	1.841
	12	1.7	40	60	0.671	2.283
	14	1.8	34	60	0.575	2.072
	16	2	24	60	0.415	1.661
	18	1.7	38	60	0.639	2.174
	20	1.4	36	60	0.607	1.701
	22	1	38	60	0.639	0.959
	23					

flow Q = 16.6 cfs

Stream Flow Calculation Worksheet

Station# BSW 21
Date 5/16/2002

meter type Pygmy
meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.6	6	60	0.127	0.115
	4	0.9	6	60	0.127	0.229
	6	1.1	8	60	0.159	0.350
	8	1.1	12	60	0.223	0.491
	10	1.2	16	60	0.287	0.690
	12	1.1	10	60	0.191	0.421
	14	1.3	10	60	0.191	0.497
	16	0.8	10	60	0.191	0.306
	18	0.5	6	60	0.127	0.127
	20	0.3	10	60	0.191	0.100
	21.5					

flow Q = 3.3 cfs

Stream Flow Calculation Worksheet

Station# BSW 21
Date 7/30/2002

meter type Pygmy
meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	1	24	60	0.415	0.623
	4	1.4	14	60	0.255	0.715
	6	1.6	24	60	0.415	1.329
	8	1.7	24	60	0.415	1.412
	10	1.7	44	60	0.735	2.501
	12	1.8	66	60	1.088	3.916
	14	1.7	96	60	1.568	5.331
	16	1.5	32	60	0.543	1.630
	18	1	40	60	0.671	1.343
	20	0.8	38	60	0.639	1.023
	22	0.5	26	60	0.447	0.336
	23					

flow Q = 20.2 cfs

Stream Flow Calculation Worksheet

Station# BSW 21 meter type Pygmy
Date 8/26/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.7	8	60	0.159	0.167
	4	1.2	8	60	0.159	0.382
	6	1.3	12	60	0.223	0.581
	8	1.4	24	60	0.415	1.163
	10	1.4	32	60	0.543	1.522
	12	1.6	56	60	0.928	2.968
	14	1.4	56	60	0.928	2.597
	16	1.4	52	60	0.864	2.418
	18	1.2	28	60	0.479	1.151
	20	0.8	32	60	0.543	0.869
	22	0.4	20	60	0.351	0.211
	23					

flow Q = 14.0 cfs

Stream Flow Calculation Worksheet

Station# BSW 21 meter type Pygmy
Date 9/17/2002 meter #

	TAPE (FT)	DEPTH (FT)	REV	SEC	VELOCITY	FLOW
bank	1					
	2	0.7	6	60	0.127	0.134
	4	0.8	6	60	0.127	0.204
	6	1.1	28	60	0.479	1.055
	8	1.3	32	60	0.543	1.413
	10	1.5	36	60	0.607	1.822
	12	1.3	48	60	0.800	2.079
	14	1.3	16	60	0.287	0.747
	16	0.9	40	60	0.671	1.209
	18	0.7	24	60	0.415	0.582
	20	0.5	12	60	0.223	0.167
	21					

flow Q = 9.4 cfs

APPENDIX B

Station BSW 1 - March 20-21, 2002
Continuous Sonde Deployment

	DateTime M/D/Y	Temp ^0C	SpCond mS/cm	DO Conc mg/L	pH s.u.	Salinity ppt	DO%	Cond mS/cm
0	3/20/2002 10:00	22.67	0.045	3.2	5.83	0.02	37.1	0.043
1	3/20/2002 10:15	22.66	0.043	2.72	5.81	0.02	31.4	0.041
2	3/20/2002 10:30	22.74	0.044	2.55	5.86	0.02	29.6	0.042
3	3/20/2002 10:45	22.87	0.045	2.56	5.85	0.02	29.7	0.043
4	3/20/2002 11:00	22.86	0.044	2.52	5.85	0.02	29.3	0.043
5	3/20/2002 11:15	22.9	0.044	2.57	5.86	0.02	29.9	0.042
6	3/20/2002 11:30	23.07	0.044	2.75	5.86	0.02	32.1	0.042
7	3/20/2002 11:45	23.08	0.045	2.66	5.88	0.02	31.1	0.043
8	3/20/2002 12:00	23.02	0.044	2.73	5.82	0.02	31.8	0.042
9	3/20/2002 12:15	23.26	0.044	2.82	5.84	0.02	33.1	0.042
10	3/20/2002 12:30	22.94	0.045	2.67	5.83	0.02	31.1	0.044
11	3/20/2002 12:45	23.22	0.044	2.78	5.83	0.02	32.5	0.043
12	3/20/2002 13:00	23.62	0.044	2.88	5.86	0.02	34	0.043
13	3/20/2002 13:15	23.61	0.043	2.98	5.85	0.02	35.1	0.042
14	3/20/2002 13:30	23.4	0.044	2.81	5.82	0.02	33	0.042
15	3/20/2002 13:45	23.55	0.05	2.95	5.87	0.02	34.8	0.049
16	3/20/2002 14:00	23.7	0.046	3.1	5.84	0.02	36.6	0.045
17	3/20/2002 14:15	23.71	0.044	2.99	5.82	0.02	35.3	0.043
18	3/20/2002 14:30	23.65	0.044	2.97	5.82	0.02	35	0.043
19	3/20/2002 14:45	23.64	0.045	2.9	5.84	0.02	34.3	0.044
20	3/20/2002 15:00	23.78	0.044	3.02	5.84	0.02	35.8	0.043
21	3/20/2002 15:15	24	0.044	3.12	5.82	0.02	37.1	0.043
22	3/20/2002 15:30	23.89	0.044	3.08	5.83	0.02	36.6	0.043
23	3/20/2002 15:45	23.99	0.044	3.1	5.82	0.02	36.8	0.043
24	3/20/2002 16:00	24.21	0.044	3.31	5.84	0.02	39.4	0.043
25	3/20/2002 16:15	24.2	0.044	3.22	5.85	0.02	38.3	0.043
26	3/20/2002 16:30	24.27	0.045	3.27	5.89	0.02	39	0.044
27	3/20/2002 16:45	24.24	0.046	3.42	5.97	0.02	40.8	0.046
28	3/20/2002 17:00	24.04	0.048	3.05	5.89	0.02	36.2	0.047
29	3/20/2002 17:15	24.2	0.048	3.16	6.01	0.02	37.6	0.048
30	3/20/2002 17:30	24.19	0.044	3.31	5.84	0.02	39.5	0.043
31	3/20/2002 17:45	24.14	0.055	2.97	6.03	0.02	35.4	0.055
32	3/20/2002 18:00	24.16	0.051	3.3	6.03	0.02	39.3	0.05
33	3/20/2002 18:15	24.12	0.051	3.69	6.05	0.02	43.9	0.05
34	3/20/2002 18:30	24.04	0.049	3.97	6	0.02	47.2	0.048
35	3/20/2002 18:45	24	0.047	4	5.98	0.02	47.5	0.046
36	3/20/2002 19:00	23.84	0.047	4.11	5.97	0.02	48.6	0.046
37	3/20/2002 19:15	23.76	0.045	3.32	5.89	0.02	39.3	0.044
38	3/20/2002 19:30	23.77	0.047	3.43	5.97	0.02	40.6	0.046
39	3/20/2002 19:45	23.69	0.049	3.21	5.97	0.02	38	0.048
40	3/20/2002 20:00	23.66	0.048	3.12	5.97	0.02	36.9	0.046
41	3/20/2002 20:15	23.55	0.047	3.01	5.91	0.02	35.5	0.046
42	3/20/2002 20:30	23.45	0.045	2.84	5.87	0.02	33.4	0.043
43	3/20/2002 20:45	23.44	0.045	2.81	5.91	0.02	33.1	0.044
44	3/20/2002 21:00	23.36	0.044	3.04	5.86	0.02	35.7	0.042
45	3/20/2002 21:15	23.2	0.047	2.72	5.88	0.02	31.8	0.045
46	3/20/2002 21:30	23.25	0.046	2.86	5.9	0.02	33.5	0.045

	DateTime	Temp	SpCond	DO Conc	pH	Salinity	DO%	Cond

Station BSW 1 - March 20-21, 2002
Continuous Sonde Deployment

	DateTime M/D/Y	Temp ^{0}C	SpCond mS/cm	DO Conc mg/L	pH s.u.	Salinity ppt	DO%	Cond mS/cm
47	3/20/2002 21:45	23.21	0.046	2.88	5.89	0.02	33.7	0.044
48	3/20/2002 22:00	22.57	0.047	4.41	5.97	0.02	51	0.045
49	3/20/2002 22:15	22.51	0.047	4.52	6.1	0.02	52.2	0.045
50	3/20/2002 22:30	21.81	0.043	5.39	6.14	0.02	61.4	0.04
51	3/20/2002 22:45	21.43	0.038	5.68	6.02	0.02	64.2	0.036
52	3/20/2002 23:00	21.83	0.041	5.19	6.17	0.02	59.2	0.039
53	3/20/2002 23:15	22.24	0.045	4.04	6.02	0.02	46.4	0.042
54	3/20/2002 23:30	22.17	0.045	3.82	5.94	0.02	43.8	0.042
55	3/20/2002 23:45	22.02	0.045	3.82	5.93	0.02	43.7	0.042
56	3/21/2002 0:00	21.93	0.045	3.92	5.93	0.02	44.8	0.042
57	3/21/2002 0:15	21.71	0.045	3.98	5.95	0.02	45.3	0.042
58	3/21/2002 0:30	21.63	0.044	3.97	5.94	0.02	45	0.042
59	3/21/2002 0:45	21.57	0.044	3.87	5.93	0.02	43.9	0.041
60	3/21/2002 1:00	21.47	0.044	3.85	5.91	0.02	43.5	0.041
61	3/21/2002 1:15	21.38	0.044	3.84	5.92	0.02	43.4	0.041
62	3/21/2002 1:30	21.3	0.043	3.89	5.92	0.02	43.9	0.04
63	3/21/2002 1:45	21.24	0.043	3.88	5.9	0.02	43.8	0.04
64	3/21/2002 2:00	21.18	0.043	3.85	5.9	0.02	43.4	0.04
65	3/21/2002 2:15	21.13	0.043	3.76	5.9	0.02	42.2	0.04
66	3/21/2002 2:30	21.12	0.042	3.63	5.9	0.02	40.8	0.039
67	3/21/2002 2:45	21.06	0.043	3.48	5.88	0.02	39.1	0.039
68	3/21/2002 3:00	21.02	0.043	3.34	5.87	0.02	37.5	0.039
69	3/21/2002 3:15	21.01	0.043	3.18	5.85	0.02	35.6	0.04
70	3/21/2002 3:30	20.93	0.043	3.05	5.84	0.02	34.2	0.04
71	3/21/2002 3:45	20.85	0.043	2.92	5.83	0.02	32.7	0.04
72	3/21/2002 4:00	20.78	0.043	2.83	5.82	0.02	31.6	0.04
73	3/21/2002 4:15	20.76	0.043	2.73	5.8	0.02	30.5	0.04
74	3/21/2002 4:30	20.66	0.043	2.67	5.82	0.02	29.8	0.04
75	3/21/2002 4:45	20.57	0.043	2.6	5.81	0.02	28.9	0.04
76	3/21/2002 5:00	20.48	0.043	2.54	5.8	0.02	28.2	0.039
77	3/21/2002 5:15	20.38	0.043	2.49	5.8	0.02	27.6	0.039
78	3/21/2002 5:30	20.32	0.043	2.44	5.79	0.02	26.9	0.039
79	3/21/2002 5:45	20.26	0.043	2.36	5.79	0.02	26.1	0.039
80	3/21/2002 6:00	20.2	0.043	2.32	5.8	0.02	25.6	0.039
81	3/21/2002 6:15	20.09	0.043	2.29	5.79	0.02	25.2	0.039
82	3/21/2002 6:30	20.05	0.043	2.24	5.78	0.02	24.6	0.039
83	3/21/2002 6:45	20	0.043	2.2	5.78	0.02	24.2	0.038
84	3/21/2002 7:00	19.93	0.043	2.17	5.78	0.02	23.8	0.038
85	3/21/2002 7:15	19.9	0.042	2.14	5.78	0.02	23.5	0.038
86	3/21/2002 7:30	19.87	0.042	2.14	5.78	0.02	23.5	0.038
87	3/21/2002 7:45	19.82	0.043	2.16	5.78	0.02	23.7	0.038
88	3/21/2002 8:00	19.8	0.042	2.16	5.77	0.02	23.7	0.038
89	3/21/2002 8:15	19.75	0.042	2.19	5.78	0.02	24	0.038
90	3/21/2002 8:30	19.68	0.042	2.22	5.78	0.02	24.3	0.038
91	3/21/2002 8:45	19.64	0.042	2.24	5.77	0.02	24.5	0.038
92	3/21/2002 9:00	19.6	0.042	2.29	5.77	0.02	24.9	0.038
93	3/21/2002 9:15	19.62	0.042	2.31	5.78	0.02	25.2	0.038

	DateTime M/D/Y	Temp ^{0}C	SpCond mS/cm	DO Conc mg/L	pH s.u.	Salinity ppt	DO%	Cond mS/cm

Station BSW 1 - March 20-21, 2002
Continuous Sonde Deployment

94	3/21/2002 9:30	19.57	0.042	2.46	5.78	0.02	26.9	0.037
95	3/21/2002 9:45	19.56	0.042	2.4	5.78	0.02	26.2	0.038
96	3/21/2002 10:00	19.55	0.041	2.56	5.78	0.02	28	0.037
	Average	22.16	0.044	3.10	5.87	0.02	35.7	0.042
	Maximum Value	24.27	0.055	5.68	6.17	0.02	64.2	0.055
	Minimum Value	19.55	0.038	2.14	5.77	0.02	23.5	0.036

STATION BSW 1 FIELD PARAMETERS

Date dd/mm/yy	Time	H_2O Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth feet
5/8/2001	1050	21	21	32	2.71	0.01	5.35	1.7
5/17/2001	1250	23	33	39	3.02	0.02	5.61	1.5
5/22/2001	1100	24	21	61	2.20	0.03	5.93	1.5
5/29/2001	1035	24	35	54	3.03	0.02	6.09	1.5
6/13/2001	1325	28	27	35	4.21	0.01	5.41	1.5
6/26/2001	1020	24	32	62	1.26	0.03	5.76	1.5
7/6/2001	1300	28	30	45	0.58	0.02	5.34	1.5
7/12/2001	1255	29	34	35	2.89	0.01	5.31	1.5
7/17/2001	1020	26	30	53	1.29	0.02	5.87	1.5
8/15/2001	1120	26	29	37	2.36	0.02	5.62	1.5
8/28/2001	1220	26	30	66	0.92	0.03	5.83	1.8
9/27/2001	1240	19	22	48	1.37	0.02	6.02	2.0
10/11/2001	1155	21	27	43	5.48	0.02	6.23	1.8
10/22/2001	1005	18	24	35	3.65	0.02	5.09	2.0
11/6/2001	1150	16	25	36	3.91	0.02	5.23	2.1
11/13/2001	1205	15	19	36	4.60	0.02	5.47	2.1
12/7/2001	1050	16	20	45	3.89	0.02	5.46	2.0
12/10/2001	1145	15	14	34	5.63	0.01	5.67	2.0
1/8/2002	1110	6	9	129	8.93	0.1	5.47	1.8
2/20/2002	1130	15	22	32	8.26	0.01	5.82	2.8
3/12/2002	1120	15	18	38	6.96	0.02	5.86	3.1
4/2/2002	1020	19	25	36	3.98	0.02	5.69	3.1
4/16/2002	1015	23	28	43	4.11	0.02	5.9	
5/16/2002	1010	20	30	59	0.73	0.03	5.9	3.1
5/21/2002	940	18	21	57	2.10	0.03	5.99	
7/3/2002	940	26	30	60	3.15	0.03	5.8	3.1
7/17/2002	910	27	32	62	1.12	0.03	5.52	3.1
7/25/2002	1000	24	26	40	3.66	0.02	5.4	5.2
8/26/2002	1045	26	31	93	1.71	0.04	5.77	
9/11/2002	945	25	28	78	2.16	0.04	5.72	
	Average	21	26	51	3.33	0.02	5.67	2.2
	Maximum	29	35	129	8.93	0.1	6.23	5.2
	Minimum	6	9	32	0.58	0.01	5.09	1.5

Station BSW 2 - February 21-22, 2002, and June 26-27, 2002
Continuous Sonde Deployment

	DateTime M/D/Y	Temp ^0C	DO Conc mg/L	SpCond mS/cm	pH s.u.	Salinity ppt	DO% %	Cond mS/cm
0	2/21/2002 12:45	13.79	9.4	0.041	5.71	0.02	90.8	0.032
1	2/21/2002 13:00	13.83	9.37	0.041	5.81	0.02	90.6	0.032
2	2/21/2002 13:15	13.89	9.35	0.041	5.83	0.02	90.5	0.032
3	2/21/2002 13:30	13.94	9.34	0.041	5.84	0.02	90.5	0.032
4	2/21/2002 13:45	14	9.32	0.041	5.86	0.02	90.5	0.032
5	2/21/2002 14:00	14.05	9.31	0.041	5.86	0.02	90.4	0.032
6	2/21/2002 14:15	14.1	9.3	0.041	5.86	0.02	90.5	0.032
7	2/21/2002 14:30	14.16	9.29	0.041	5.87	0.02	90.5	0.032
8	2/21/2002 14:45	14.2	9.3	0.041	5.87	0.02	90.6	0.032
9	2/21/2002 15:00	14.24	9.28	0.041	5.87	0.02	90.6	0.032
10	2/21/2002 15:15	14.28	9.28	0.041	5.88	0.02	90.7	0.032
11	2/21/2002 15:30	14.32	9.28	0.041	5.88	0.02	90.6	0.032
12	2/21/2002 15:45	14.35	9.26	0.041	5.87	0.02	90.6	0.032
13	2/21/2002 16:00	14.38	9.25	0.041	5.88	0.02	90.5	0.032
14	2/21/2002 16:15	14.41	9.24	0.041	5.88	0.02	90.5	0.032
15	2/21/2002 16:30	14.44	9.23	0.041	5.87	0.02	90.4	0.032
16	2/21/2002 16:45	14.46	9.22	0.041	5.88	0.02	90.4	0.032
17	2/21/2002 17:00	14.49	9.21	0.041	5.88	0.02	90.3	0.032
18	2/21/2002 17:15	14.51	9.2	0.041	5.89	0.02	90.2	0.032
19	2/21/2002 17:30	14.54	9.18	0.041	5.88	0.02	90.2	0.032
20	2/21/2002 17:45	14.55	9.18	0.041	5.88	0.02	90.1	0.033
21	2/21/2002 18:00	14.57	9.17	0.041	5.89	0.02	90.1	0.033
22	2/21/2002 18:15	14.58	9.16	0.041	5.88	0.02	90	0.033
23	2/21/2002 18:30	14.6	9.15	0.041	5.89	0.02	89.9	0.033
24	2/21/2002 18:45	14.61	9.14	0.041	5.9	0.02	89.9	0.033
25	2/21/2002 19:00	14.62	9.14	0.041	5.89	0.02	89.8	0.033
26	2/21/2002 19:15	14.62	9.13	0.041	5.9	0.02	89.8	0.033
27	2/21/2002 19:30	14.62	9.13	0.041	5.9	0.02	89.7	0.033
28	2/21/2002 19:45	14.61	9.12	0.041	5.89	0.02	89.7	0.033
29	2/21/2002 20:00	14.59	9.12	0.041	5.9	0.02	89.6	0.033
30	2/21/2002 20:15	14.57	9.12	0.041	5.9	0.02	89.6	0.033
31	2/21/2002 20:30	14.55	9.11	0.041	5.9	0.02	89.5	0.033
32	2/21/2002 20:45	14.52	9.11	0.041	5.9	0.02	89.4	0.033
33	2/21/2002 21:00	14.5	9.12	0.041	5.89	0.02	89.4	0.033
34	2/21/2002 21:15	14.48	9.11	0.041	5.9	0.02	89.3	0.033
35	2/21/2002 21:30	14.46	9.11	0.041	5.89	0.02	89.3	0.032
36	2/21/2002 21:45	14.43	9.11	0.041	5.9	0.02	89.2	0.033
37	2/21/2002 22:00	14.41	9.11	0.041	5.9	0.02	89.2	0.033
38	2/21/2002 22:15	14.39	9.11	0.041	5.9	0.02	89.1	0.033
39	2/21/2002 22:30	14.36	9.11	0.041	5.9	0.02	89.1	0.033
40	2/21/2002 22:45	14.33	9.11	0.041	5.91	0.02	89	0.033
41	2/21/2002 23:00	14.3	9.11	0.041	5.91	0.02	89	0.033
42	2/21/2002 23:15	14.27	9.11	0.041	5.92	0.02	89	0.033
43	2/21/2002 23:30	14.24	9.12	0.041	5.91	0.02	88.9	0.033
44	2/21/2002 23:45	14.2	9.12	0.041	5.91	0.02	88.9	0.032
45	2/22/2002 0:00	14.17	9.13	0.041	5.91	0.02	88.9	0.032
46	2/22/2002 0:15	14.13	9.13	0.041	5.91	0.02	88.9	0.032

	DateTime	Temp	DO Conc	SpCond	pH	Salinity	DO%	Cond

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	M/D/Y	^{0}C	mg/L	mS/cm	s.u.	ppt	%	mS/cm
47	2/22/2002 0:30	14.09	9.14	0.041	5.91	0.02	88.9	0.032
48	2/22/2002 0:45	14.05	9.14	0.041	5.91	0.02	88.8	0.032
49	2/22/2002 1:00	14.02	9.15	0.041	5.92	0.02	88.8	0.032
50	2/22/2002 1:15	13.98	9.15	0.041	5.92	0.02	88.8	0.032
51	2/22/2002 1:30	13.94	9.16	0.041	5.92	0.02	88.8	0.032
52	2/22/2002 1:45	13.9	9.17	0.041	5.92	0.02	88.7	0.032
53	2/22/2002 2:00	13.86	9.17	0.041	5.93	0.02	88.7	0.032
54	2/22/2002 2:15	13.82	9.18	0.041	5.92	0.02	88.7	0.032
55	2/22/2002 2:30	13.78	9.19	0.041	5.92	0.02	88.7	0.032
56	2/22/2002 2:45	13.74	9.19	0.041	5.93	0.02	88.7	0.032
57	2/22/2002 3:00	13.7	9.2	0.041	5.92	0.02	88.7	0.032
58	2/22/2002 3:15	13.66	9.21	0.041	5.93	0.02	88.7	0.032
59	2/22/2002 3:30	13.62	9.21	0.041	5.93	0.02	88.7	0.032
60	2/22/2002 3:45	13.57	9.22	0.041	5.93	0.02	88.6	0.032
61	2/22/2002 4:00	13.53	9.24	0.041	5.92	0.02	88.7	0.032
62	2/22/2002 4:15	13.5	9.24	0.041	5.93	0.02	88.6	0.032
63	2/22/2002 4:30	13.46	9.24	0.041	5.93	0.02	88.6	0.032
64	2/22/2002 4:45	13.43	9.25	0.041	5.94	0.02	88.6	0.032
65	2/22/2002 5:00	13.39	9.26	0.041	5.94	0.02	88.6	0.032
66	2/22/2002 5:15	13.36	9.26	0.041	5.94	0.02	88.6	0.032
67	2/22/2002 5:30	13.33	9.27	0.041	5.94	0.02	88.6	0.032
68	2/22/2002 5:45	13.3	9.28	0.041	5.94	0.02	88.6	0.032
69	2/22/2002 6:00	13.27	9.28	0.041	5.95	0.02	88.6	0.032
70	2/22/2002 6:15	13.24	9.29	0.041	5.94	0.02	88.7	0.032
71	2/22/2002 6:30	13.21	9.3	0.041	5.94	0.02	88.6	0.032
72	2/22/2002 6:45	13.18	9.3	0.041	5.94	0.02	88.6	0.032
73	2/22/2002 7:00	13.15	9.3	0.041	5.95	0.02	88.6	0.032
74	2/22/2002 7:15	13.13	9.31	0.041	5.95	0.02	88.6	0.032
75	2/22/2002 7:30	13.1	9.31	0.041	5.95	0.02	88.5	0.032
76	2/22/2002 7:45	13.08	9.31	0.041	5.95	0.02	88.5	0.032
77	2/22/2002 8:00	13.06	9.32	0.041	5.95	0.02	88.5	0.032
78	2/22/2002 8:15	13.04	9.32	0.041	5.95	0.02	88.5	0.032
79	2/22/2002 8:30	13.03	9.33	0.041	5.95	0.02	88.6	0.032
80	2/22/2002 8:45	13.01	9.33	0.041	5.96	0.02	88.5	0.032
81	2/22/2002 9:00	13	9.33	0.041	5.96	0.02	88.6	0.032
82	2/22/2002 9:15	12.99	9.34	0.041	5.95	0.02	88.6	0.032
83	2/22/2002 9:30	12.99	9.34	0.041	5.96	0.02	88.6	0.032
84	2/22/2002 9:45	12.98	9.35	0.041	5.96	0.02	88.7	0.032
85	2/22/2002 10:00	12.98	9.35	0.041	5.96	0.02	88.7	0.032
86	2/22/2002 10:15	12.98	9.36	0.041	5.96	0.02	88.8	0.032
87	2/22/2002 10:30	12.99	9.36	0.041	5.96	0.02	88.8	0.032
88	2/22/2002 10:45	13	9.36	0.041	5.96	0.02	88.8	0.032
89	2/22/2002 11:00	13.02	9.36	0.041	5.97	0.02	88.9	0.032
90	2/22/2002 11:15	13.04	9.37	0.041	5.96	0.02	89	0.032
91	2/22/2002 11:30	13.05	9.38	0.041	5.97	0.02	89.1	0.032
92	2/22/2002 11:45	13.07	9.38	0.041	5.96	0.02	89.2	0.032
93	2/22/2002 12:00	13.08	9.39	0.041	5.96	0.02	89.3	0.032

	DateTime	Temp	DO Conc	SpCond	pH	Salinity	DO%	Cond
	M/D/Y	^{0}C	mg/L	mS/cm	s.u.	ppt	%	mS/cm

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94	2/22/2002 12:15	13.09	9.4	0.041	5.97	0.02	89.4	0.032
95	2/22/2002 12:30	13.11	9.4	0.041	5.96	0.02	89.4	0.032
96	2/22/2002 12:45	13.14	9.41	0.041	5.97	0.02	89.5	0.032
97	2/22/2002 13:00	13.16	9.41	0.041	5.97	0.02	89.7	0.032
98	2/22/2002 13:15	13.17	9.43	0.041	5.97	0.02	89.8	0.032
99	2/22/2002 13:30	13.21	9.43	0.041	5.98	0.02	90	0.032
100	2/22/2002 13:45	13.23	9.44	0.041	5.98	0.02	90.1	0.032
	Average	13.81	9.25	0.041	5.92	0.02	89.32	0.032
	Maximum Value	14.62	9.44	0.041	5.98	0.02	90.8	0.033
	Minimum Value	12.98	9.11	0.041	5.71	0.02	88.5	0.032

	DateTime M/D/Y	Temp ^{0}C	DO Conc mg/L	SpCond mS/cm	pH s.u.	Salinity ppt
1	6/26/2002 13:00	22.89	7.12	0.058	5.27	0.03
2	6/26/2002 13:15	22.94	7.01	0.058	5.3	0.03
3	6/26/2002 13:30	22.99	6.97	0.058	5.3	0.03
4	6/26/2002 13:45	23.05	6.94	0.058	5.3	0.03
5	6/26/2002 14:00	23.09	6.91	0.058	5.29	0.03
6	6/26/2002 14:15	23.15	6.9	0.058	5.27	0.03
7	6/26/2002 14:30	23.19	6.89	0.058	5.28	0.03
8	6/26/2002 14:45	23.24	6.88	0.058	5.27	0.03
9	6/26/2002 15:00	23.28	6.86	0.058	5.26	0.03
10	6/26/2002 15:15	23.32	6.84	0.058	5.27	0.03
11	6/26/2002 15:30	23.34	6.84	0.058	5.25	0.03
12	6/26/2002 15:45	23.35	6.83	0.058	5.25	0.03
13	6/26/2002 16:00	23.35	6.83	0.059	5.24	0.03
14	6/26/2002 16:15	23.34	6.81	0.059	5.24	0.03
15	6/26/2002 16:30	23.34	6.81	0.059	5.23	0.03
16	6/26/2002 16:45	23.33	6.84	0.059	5.22	0.03
17	6/26/2002 17:00	23.79	6.99	0.055	5.45	0.02
18	6/26/2002 17:15	23.45	6.95	0.058	5.28	0.03
19	6/26/2002 17:30	23.38	6.91	0.058	5.24	0.03
20	6/26/2002 17:45	23.37	6.91	0.058	5.22	0.03
21	6/26/2002 18:00	23.35	6.93	0.057	5.23	0.03
22	6/26/2002 18:15	23.3	6.91	0.058	5.22	0.03
23	6/26/2002 18:30	23.25	6.91	0.058	5.2	0.03
24	6/26/2002 18:45	23.26	6.89	0.057	5.22	0.03
25	6/26/2002 19:00	23.43	6.85	0.056	5.31	0.02
26	6/26/2002 19:15	23.52	6.84	0.055	5.34	0.02
27	6/26/2002 19:30	23.53	6.83	0.055	5.32	0.02
28	6/26/2002 19:45	23.52	6.83	0.055	5.3	0.02
29	6/26/2002 20:00	23.52	6.78	0.054	5.31	0.02
30	6/26/2002 20:15	23.45	6.74	0.055	5.31	0.02
31	6/26/2002 20:30	23.36	6.75	0.056	5.29	0.03
32	6/26/2002 20:45	23.3	6.78	0.057	5.28	0.03
33	6/26/2002 21:00	23.24	6.8	0.057	5.27	0.03

	DateTime M/D/Y	Temp ^{0}C	DO Conc mg/L	SpCond mS/cm	pH s.u.	Salinity ppt
34	6/26/2002 21:15	23.2	6.81	0.056	5.26	0.03

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35	6/26/2002 21:30	23.16	6.81	0.056	5.23	0.03
36	6/26/2002 21:45	23.12	6.82	0.056	5.22	0.02
37	6/26/2002 22:00	23.08	6.84	0.056	5.22	0.02
38	6/26/2002 22:15	23.05	6.83	0.056	5.22	0.02
39	6/26/2002 22:30	23.02	6.85	0.056	5.21	0.02
40	6/26/2002 22:45	22.99	6.86	0.056	5.22	0.02
41	6/26/2002 23:00	22.97	6.86	0.056	5.21	0.02
42	6/26/2002 23:15	22.95	6.87	0.056	5.22	0.02
43	6/26/2002 23:30	22.93	6.87	0.056	5.22	0.02
44	6/26/2002 23:45	22.91	6.88	0.055	5.22	0.02
45	6/27/2002 0:00	22.9	6.89	0.055	5.22	0.02
46	6/27/2002 0:15	22.88	6.91	0.055	5.22	0.02
47	6/27/2002 0:30	22.87	6.91	0.055	5.22	0.02
48	6/27/2002 0:45	22.85	6.92	0.055	5.23	0.02
49	6/27/2002 1:00	22.84	6.92	0.055	5.25	0.02
50	6/27/2002 1:15	22.83	6.93	0.055	5.23	0.02
51	6/27/2002 1:30	22.82	6.94	0.055	5.24	0.02
52	6/27/2002 1:45	22.81	6.94	0.055	5.23	0.02
53	6/27/2002 2:00	22.8	6.96	0.055	5.24	0.02
54	6/27/2002 2:15	22.78	6.97	0.055	5.24	0.02
55	6/27/2002 2:30	22.77	6.97	0.055	5.24	0.02
56	6/27/2002 2:45	22.76	6.98	0.055	5.24	0.02
57	6/27/2002 3:00	22.75	6.98	0.055	5.24	0.02
58	6/27/2002 3:15	22.74	6.99	0.055	5.25	0.02
59	6/27/2002 3:30	22.73	7	0.055	5.25	0.02
60	6/27/2002 3:45	22.73	7	0.054	5.24	0.02
61	6/27/2002 4:00	22.72	7.01	0.054	5.24	0.02
62	6/27/2002 4:15	22.72	7.02	0.055	5.26	0.02
63	6/27/2002 4:30	22.72	7.02	0.054	5.26	0.02
64	6/27/2002 4:45	22.72	7.03	0.054	5.27	0.02
65	6/27/2002 5:00	22.71	7.04	0.054	5.26	0.02
66	6/27/2002 5:15	22.7	7.04	0.054	5.27	0.02
67	6/27/2002 5:30	22.69	7.05	0.054	5.27	0.02
68	6/27/2002 5:45	22.68	7.06	0.053	5.27	0.02
69	6/27/2002 6:00	22.66	7.06	0.053	5.26	0.02
70	6/27/2002 6:15	22.64	7.07	0.053	5.26	0.02
71	6/27/2002 6:30	22.62	7.08	0.053	5.27	0.02
72	6/27/2002 6:45	22.6	7.09	0.053	5.27	0.02
73	6/27/2002 7:00	22.58	7.1	0.052	5.27	0.02
74	6/27/2002 7:15	22.57	7.1	0.052	5.28	0.02
75	6/27/2002 7:30	22.55	7.11	0.052	5.29	0.02
76	6/27/2002 7:45	22.54	7.12	0.052	5.27	0.02
77	6/27/2002 8:00	22.53	7.13	0.052	5.28	0.02
78	6/27/2002 8:15	22.52	7.13	0.051	5.28	0.02
79	6/27/2002 8:30	22.51	7.13	0.051	5.29	0.02
80	6/27/2002 8:45	22.52	7.13	0.051	5.3	0.02

	DateTime M/D/Y	Temp ^{0}C	DO Conc mg/L	SpCond mS/cm	pH s.u.	Salinity ppt
81	6/27/2002 9:00	22.52	7.13	0.051	5.29	0.02
82	6/27/2002 9:15	22.53	7.13	0.052	5.3	0.02

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83	6/27/2002 9:30	22.54	7.13	0.052	5.3	0.02
84	6/27/2002 9:45	22.55	7.13	0.052	5.3	0.02
85	6/27/2002 10:00	22.57	7.13	0.052	5.3	0.02
86	6/27/2002 10:15	22.6	7.13	0.052	5.3	0.02
87	6/27/2002 10:30	22.62	7.14	0.052	5.31	0.02
88	6/27/2002 10:45	22.66	7.14	0.052	5.33	0.02
89	6/27/2002 11:00	22.69	7.13	0.052	5.33	0.02
90	6/27/2002 11:15	22.73	7.14	0.053	5.33	0.02
91	6/27/2002 11:30	22.76	7.13	0.052	5.33	0.02
92	6/27/2002 11:45	22.8	7.13	0.053	5.34	0.02
93	6/27/2002 12:00	22.83	7.13	0.052	5.35	0.02
94	6/27/2002 12:15	22.86	7.14	0.052	5.33	0.02
	Average	22.95	6.97	0.06	5.27	0.02
	Maximum	23.79	7.14	0.059	5.45	0.03
	Minimum	22.51	6.74	0.05	5.20	0.02

STATION BSW 2 FIELD PARAMETERS

Date	Time	H_20 Temp.	Air Temp.	Sp. Cond.	D.O.	Salinity	pH	Depth
dd/mm/yy		^0C	^0C	uS/cm	ppm	ppt	s.u.	feet
5/8/2001	1135	19	21	35	7.76	0.02	5.55	1.33
5/17/2001	1330	21	36	36	7.18	0.02	5.89	1.5
5/22/2001	1025	22	21	37	6.52	0.02	6.22	1.25
5/29/2001	1020	21	30	54	7.59	0.02	5.6	1.25
6/13/2001	1015	23	24	44	6.83	0.02	5.34	
6/26/2001	940	21	30	39	7.4	0.02	5.9	1.4
7/3/2001	1245	24	31	45	6.62	0.02	6.15	1.25
7/12/2001	1240	24	33	42	5.87	0.02	5.73	
7/17/2001	935	23	30	37	7.95	0.02	5.86	1.5
8/15/2001	1140	24	29	45	6.5	0.02	4.88	2
8/28/2001	1050	24	28	32	6.69	0.01	6.07	1.5
9/27/2001	1400	17	23	50	8.53	0.02	6.08	1.5
10/11/2001	1215	19	27	34	8.33	0.01	6.1	1.67
10/22/2001	920	17	23	39	8.42	0.02	5.22	1.8
11/6/2001	1210	16	24	37	8.3	0.02	5.49	surface
		16	24	37	8.31	0.02	5.47	1
		16	24	37	8.33	0.02	5.43	2
11/13/2001	1230	15	20	37	9.41	0.02	5.67	1.7
12/7/2001	1105	16	18	43	10.3	0.02	5.39	1.9
12/10/2001	1210	15	15	41	9.1	0.02	5.66	1.9
1/8/2002	1015	7	8	141	11.6	0.1	5.5	2.2
2/20/2002	1045	14	21	50	9.44	0.02	5.96	2.3
3/12/2002	1205	14	18	52	9.12	0.02	6.28	3.4
4/2/2002	920	17	22	45	8.42	0.02	5.94	1.6
4/16/2002	945	20	25	47	8.55	0.02	5.92	1.6
5/16/2002	935	19	26	37	6.57	0.02	6.31	0.9
5/21/2002	900	17	20	44	8.39	0.02	8.21	1
7/3/2002	930	24	27	46	7.32	0.02	5.84	0.8
7/17/2002	830	24	29	46	5.72	0.02	5.81	0.6
7/25/2002	920	23	26	49	7.27	0.02	5.42	
8/26/2002	1105	24	31	35	6.97	0.01	5.83	3.5
9/11/2002	905	24	26	51	6.02	0.02	5.49	2.4
	Average	19	25	45	7.85	0.02	5.82	1.7
	Maximum	24	36	141	11.60	0.1	8.21	3.5
	Minimum	7	8	32	5.72	0.01	4.88	0.6

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	DateTime M/D/Y	Temp ^0C	SpCond mS/cm	DO Conc mg/L	pH s.u.	Salinity ppt	DO%	Cond mS/cm
0	4/3/2002 12:30	19.96	0.04	6.94	5.5	0.02	76.3	0.036
1	4/3/2002 12:45	19.97	0.04	6.9	5.54	0.02	75.9	0.036
2	4/3/2002 13:00	20.04	0.04	6.89	5.55	0.02	75.9	0.036
3	4/3/2002 13:15	20.05	0.04	6.89	5.55	0.02	75.8	0.036
4	4/3/2002 13:30	20.11	0.04	6.91	5.56	0.02	76.2	0.036
5	4/3/2002 13:45	20.08	0.04	6.89	5.57	0.02	75.9	0.036
6	4/3/2002 14:00	20.16	0.04	6.91	5.57	0.02	76.2	0.036
7	4/3/2002 14:15	20.17	0.04	6.91	5.57	0.02	76.3	0.036
8	4/3/2002 14:30	20.17	0.04	6.91	5.58	0.02	76.2	0.036
9	4/3/2002 14:45	20.27	0.04	6.96	5.58	0.02	76.9	0.036
10	4/3/2002 15:00	20.27	0.04	6.94	5.58	0.02	76.8	0.036
11	4/3/2002 15:15	20.27	0.04	6.94	5.59	0.02	76.7	0.036
12	4/3/2002 15:30	20.31	0.04	6.95	5.6	0.02	76.9	0.036
13	4/3/2002 15:45	20.33	0.04	6.96	5.6	0.02	77	0.036
14	4/3/2002 16:00	20.35	0.04	7	5.61	0.02	77.5	0.036
15	4/3/2002 16:15	20.37	0.04	7.02	5.61	0.02	77.8	0.036
16	4/3/2002 16:30	20.39	0.04	7.04	5.61	0.02	78	0.036
17	4/3/2002 16:45	20.43	0.039	7.07	5.61	0.02	78.5	0.036
18	4/3/2002 17:00	20.44	0.039	7.1	5.62	0.02	78.8	0.036
19	4/3/2002 17:15	20.46	0.039	7.12	5.62	0.02	79	0.036
20	4/3/2002 17:30	20.47	0.039	7.15	5.62	0.02	79.4	0.036
21	4/3/2002 17:45	20.49	0.039	7.22	5.63	0.02	80.1	0.036
22	4/3/2002 18:00	20.49	0.039	7.26	5.63	0.02	80.6	0.036
23	4/3/2002 18:15	20.49	0.039	7.28	5.64	0.02	80.8	0.036
24	4/3/2002 18:30	20.5	0.039	7.32	5.64	0.02	81.3	0.036
25	4/3/2002 18:45	20.51	0.039	7.34	5.64	0.02	81.6	0.036
26	4/3/2002 19:00	20.52	0.039	7.35	5.65	0.02	81.7	0.036
27	4/3/2002 19:15	20.54	0.039	7.37	5.65	0.02	81.9	0.036
28	4/3/2002 19:30	20.55	0.039	7.37	5.65	0.02	81.9	0.036
29	4/3/2002 19:45	20.56	0.039	7.37	5.66	0.02	82	0.036
30	4/3/2002 20:00	20.57	0.039	7.36	5.65	0.02	81.9	0.036
31	4/3/2002 20:15	20.57	0.039	7.36	5.66	0.02	81.9	0.036
32	4/3/2002 20:30	20.57	0.039	7.32	5.66	0.02	81.5	0.036
33	4/3/2002 20:45	20.56	0.039	7.29	5.66	0.02	81.1	0.036
34	4/3/2002 21:00	20.56	0.039	7.25	5.66	0.02	80.6	0.036
35	4/3/2002 21:15	20.55	0.039	7.22	5.66	0.02	80.3	0.036
36	4/3/2002 21:30	20.52	0.039	7.18	5.65	0.02	79.7	0.036
37	4/3/2002 21:45	20.5	0.039	7.13	5.65	0.02	79.2	0.036
38	4/3/2002 22:00	20.47	0.039	7.09	5.64	0.02	78.7	0.036
39	4/3/2002 22:15	20.46	0.039	7.04	5.65	0.02	78.1	0.036
40	4/3/2002 22:30	20.42	0.039	6.98	5.65	0.02	77.4	0.036
41	4/3/2002 22:45	20.38	0.04	6.67	5.65	0.02	74	0.036
42	4/3/2002 23:00	20.35	0.04	6.92	5.65	0.02	76.6	0.036
43	4/3/2002 23:15	20.3	0.04	6.52	5.65	0.02	72.1	0.036
44	4/3/2002 23:30	20.28	0.04	6.61	5.65	0.02	73.1	0.036
45	4/3/2002 23:45	20.23	0.04	6.57	5.65	0.02	72.6	0.037
46	4/4/2002 0:00	20.18	0.041	6.54	5.64	0.02	72.2	0.037

	DateTime	Temp	SpCond	DO Conc	pH	Salinity	DO%	Cond

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	DateTime	Temp	SpCond	DO Conc	pH	Salinity	DO%	Cond
	M/D/Y	^{0}C	mS/cm	mg/L	s.u.	ppt		mS/cm
47	4/4/2002 0:15	20.15	0.04	6.83	5.64	0.02	75.4	0.037
48	4/4/2002 0:30	20.08	0.041	6.83	5.65	0.02	75.3	0.037
49	4/4/2002 0:45	20.06	0.041	6.8	5.65	0.02	74.9	0.037
50	4/4/2002 1:00	19.99	0.041	6.81	5.64	0.02	74.9	0.037
51	4/4/2002 1:15	19.98	0.041	6.76	5.64	0.02	74.3	0.037
52	4/4/2002 1:30	19.92	0.041	6.75	5.64	0.02	74.2	0.037
53	4/4/2002 1:45	19.88	0.041	6.76	5.64	0.02	74.2	0.037
54	4/4/2002 2:00	19.82	0.041	6.78	5.64	0.02	74.3	0.037
55	4/4/2002 2:15	19.78	0.041	6.76	5.64	0.02	74	0.037
56	4/4/2002 2:30	19.71	0.041	6.76	5.63	0.02	73.9	0.037
57	4/4/2002 2:45	19.65	0.041	6.77	5.63	0.02	74	0.037
58	4/4/2002 3:00	19.56	0.041	6.77	5.63	0.02	73.8	0.037
59	4/4/2002 3:15	19.41	0.042	6.77	5.63	0.02	73.6	0.038
60	4/4/2002 3:30	19.35	0.042	9.4	5.64	0.02	102	0.038
61	4/4/2002 3:45	19.21	0.043	9.22	5.86	0.02	99.8	0.038
62	4/4/2002 4:00	17.74	0.044	9.19	5.64	0.02	96.6	0.038
63	4/4/2002 4:15	17.38	0.036	9.17	5.53	0.02	95.7	0.031
64	4/4/2002 4:30	16.86	0.024	9.24	5.54	0.01	95.3	0.02
65	4/4/2002 4:45	15.62	0.001	9.57	5.44	0	96.2	0.001
66	4/4/2002 5:00	14.74	0	9.77	5.32	0	96.3	0
67	4/4/2002 5:15	14.04	0	9.92	5.32	0	96.3	0
68	4/4/2002 5:30	13.61	0	10.02	5.27	0	96.4	0
69	4/4/2002 5:45	13.6	0	10.03	5.28	0	96.4	0
70	4/4/2002 6:00	13.57	0	10.04	5.27	0	96.5	0
71	4/4/2002 6:15	13.47	0	10.07	5.26	0	96.6	0
72	4/4/2002 6:30	13.62	0	10.05	5.25	0	96.7	0
73	4/4/2002 6:45	14.47	0.022	9.81	5.2	0.01	96.2	0.018
74	4/4/2002 7:00	15.44	0.027	9.57	5.1	0.01	95.9	0.022
75	4/4/2002 7:15	16.26	0.04	9.37	4.96	0.02	95.5	0.033
76	4/4/2002 7:30	17.47	0.043	9.11	4.8	0.02	95.2	0.036
77	4/4/2002 7:45	18.07	0.041	9.04	4.64	0.02	95.6	0.036
78	4/4/2002 8:00	17.3	0.043	9.33	4.95	0.02	97.1	0.037
79	4/4/2002 8:15	16.71	0.038	9.49	4.85	0.02	97.6	0.032
80	4/4/2002 8:30	16.75	0.029	9.49	4.65	0.01	97.7	0.024
81	4/4/2002 8:45	16.38	0.033	9.56	4.55	0.01	97.7	0.028
82	4/4/2002 9:00	18.21	0.042	9.2	4.59	0.02	97.6	0.036
83	4/4/2002 9:15	18.36	0.041	9.16	5.71	0.02	97.4	0.036
84	4/4/2002 9:30	18.45	0.041	7.09	5.66	0.02	75.6	0.036
85	4/4/2002 9:45	18.43	0.041	7.05	5.66	0.02	75.1	0.036
86	4/4/2002 10:00	18.43	0.04	7.09	5.66	0.02	75.5	0.035
87	4/4/2002 10:15	18.49	0.04	7.06	5.66	0.02	75.4	0.035
88	4/4/2002 10:30	18.4	0.04	7.1	5.66	0.02	75.7	0.035
89	4/4/2002 10:45	18.47	0.041	7.09	5.66	0.02	75.6	0.035
90	4/4/2002 11:00	18.57	0.041	7.16	5.68	0.02	76.5	0.036
91	4/4/2002 11:15	18.45	0.04	7.12	5.66	0.02	75.9	0.035
92	4/4/2002 11:30	18.49	0.04	7.17	5.67	0.02	76.5	0.035
93	4/4/2002 11:45	18.5	0.041	7.17	5.66	0.02	76.5	0.036

94	4/4/2002 12:00	18.5	0.041	7.19	5.66	0.02	76.7	0.036
95	4/4/2002 12:15	18.48	0.041	7.21	5.66	0.02	77	0.036
96	4/4/2002 12:30	18.52	0.041	7.21	5.66	0.02	77	0.036
97	4/4/2002 12:45	18.56	0.041	7.22	5.67	0.02	77.2	0.036
	Average	19.00	0.036	7.64	5.52	0.02	81.9	0.032
	Maximum	20.57	0.044	10.07	5.86	0.02	102	0.038
	Minimum	13.47	0	6.52	4.55	0	72.1	0

	DateTime M/D/Y	Temp ^{0}C	DO Conc mg/L	SpCond mS/cm	pH s.u.	Salinity ppt
1	6/27/2002 12:45	23.11	6.03	0.06	5.35	0.03
2	6/27/2002 13:00	23.11	5.97	0.059	5.27	0.03
3	6/27/2002 13:15	23.15	5.8	0.06	5.33	0.03
4	6/27/2002 13:30	23.13	5.76	0.06	5.35	0.03
5	6/27/2002 13:45	23.17	5.72	0.06	5.37	0.03
6	6/27/2002 14:00	23.31	5.74	0.06	5.35	0.03
7	6/27/2002 14:15	23.32	5.8	0.059	5.4	0.03
8	6/27/2002 14:30	23.39	5.74	0.059	5.37	0.03
9	6/27/2002 14:45	23.25	5.77	0.059	5.34	0.03
10	6/27/2002 15:00	23.41	5.9	0.058	5.38	0.03
11	6/27/2002 15:15	23.34	5.84	0.059	5.38	0.03
12	6/27/2002 15:30	23.34	5.9	0.059	5.39	0.03
13	6/27/2002 15:45	23.26	5.85	0.059	5.35	0.03
14	6/27/2002 16:00	23.18	5.82	0.059	5.34	0.03
15	6/27/2002 16:15	23.35	5.99	0.059	5.41	0.03
16	6/27/2002 16:30	23.2	5.86	0.059	5.35	0.03
17	6/27/2002 16:45	23.16	5.83	0.059	5.33	0.03
18	6/27/2002 17:00	23.2	5.87	0.059	5.39	0.03
19	6/27/2002 17:15	23.29	6.05	0.058	5.4	0.03
20	6/27/2002 17:30	23.52	6.2	0.058	5.44	0.03
21	6/27/2002 17:45	23.26	6.02	0.059	5.38	0.03
22	6/27/2002 18:00	23.26	5.99	0.059	5.35	0.03
23	6/27/2002 18:15	23.28	5.99	0.059	5.38	0.03
24	6/27/2002 18:30	23.35	6.07	0.058	5.4	0.03
25	6/27/2002 18:45	23.39	6.12	0.058	5.41	0.03
26	6/27/2002 19:00	23.5	6.21	0.058	5.43	0.03
27	6/27/2002 19:15	23.59	6.26	0.058	5.45	0.03
28	6/27/2002 19:30	23.63	6.31	0.058	5.44	0.03
29	6/27/2002 19:45	23.62	6.37	0.057	5.45	0.03
30	6/27/2002 20:00	23.64	6.42	0.057	5.45	0.03
31	6/27/2002 20:15	23.64	6.51	0.057	5.44	0.03
32	6/27/2002 20:30	23.64	6.53	0.057	5.42	0.03
33	6/27/2002 20:45	23.63	6.55	0.056	5.47	0.03
34	6/27/2002 21:00	23.72	6.57	0.056	5.56	0.03
35	6/27/2002 21:15	23.79	6.59	0.055	5.63	0.02

	DateTime M/D/Y	Temp ^{0}C	DO Conc mg/L	SpCond mS/cm	pH s.u.	Salinity ppt
36	6/27/2002 21:30	23.74	6.58	0.056	5.63	0.02

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	DateTime M/D/Y	Temp ^{0}C	DO Conc mg/L	SpCond mS/cm	pH s.u.	Salinity ppt
37	6/27/2002 21:45	23.68	6.54	0.056	5.61	0.02
38	6/27/2002 22:00	23.65	6.52	0.055	5.6	0.02
39	6/27/2002 22:15	23.64	6.53	0.055	5.58	0.02
40	6/27/2002 22:30	23.6	6.51	0.055	5.59	0.02
41	6/27/2002 22:45	23.56	6.49	0.055	5.56	0.02
42	6/27/2002 23:00	23.52	6.49	0.055	5.56	0.02
43	6/27/2002 23:15	23.48	6.45	0.055	5.54	0.02
44	6/27/2002 23:30	23.44	6.39	0.055	5.53	0.02
45	6/27/2002 23:45	23.41	6.43	0.055	5.52	0.02
46	6/28/2002 0:00	23.37	6.37	0.055	5.51	0.02
47	6/28/2002 0:15	23.34	6.36	0.055	5.5	0.02
48	6/28/2002 0:30	23.31	6.38	0.055	5.49	0.02
49	6/28/2002 0:45	23.29	6.31	0.055	5.5	0.02
50	6/28/2002 1:00	23.27	6.34	0.055	5.5	0.02
51	6/28/2002 1:15	23.27	6.37	0.055	5.51	0.02
52	6/28/2002 1:30	23.27	6.33	0.056	5.52	0.02
53	6/28/2002 1:45	23.26	6.32	0.055	5.52	0.02
54	6/28/2002 2:00	23.23	6.3	0.055	5.51	0.02
55	6/28/2002 2:15	23.22	6.23	0.055	5.51	0.02
56	6/28/2002 2:30	23.21	5.99	0.056	5.49	0.02
57	6/28/2002 2:45	23.21	5.97	0.056	5.46	0.02
58	6/28/2002 3:00	23.19	5.95	0.056	5.44	0.02
59	6/28/2002 3:15	23.18	6.08	0.056	5.45	0.02
60	6/28/2002 3:30	23.16	5.71	0.056	5.43	0.02
61	6/28/2002 3:45	23.15	6.04	0.056	5.42	0.02
62	6/28/2002 4:00	23.13	6.01	0.056	5.41	0.02
63	6/28/2002 4:15	23.11	6.1	0.056	5.41	0.02
64	6/28/2002 4:30	23.1	6.03	0.056	5.41	0.02
65	6/28/2002 4:45	23.09	6.18	0.056	5.41	0.02
66	6/28/2002 5:00	23.08	6	0.056	5.42	0.02
67	6/28/2002 5:15	23.07	6	0.056	5.42	0.02
68	6/28/2002 5:30	23.06	5.94	0.056	5.42	0.03
69	6/28/2002 5:45	23.05	6.09	0.056	5.44	0.03
70	6/28/2002 6:00	23.04	6.02	0.056	5.43	0.03
71	6/28/2002 6:15	23.04	6.18	0.056	5.46	0.03
72	6/28/2002 6:30	23.03	6.09	0.056	5.46	0.03
73	6/28/2002 6:45	23.03	6.02	0.056	5.46	0.03
74	6/28/2002 7:00	23.02	5.96	0.056	5.46	0.03
75	6/28/2002 7:15	23.02	5.88	0.056	5.47	0.03
76	6/28/2002 7:30	23.02	5.98	0.056	5.47	0.03
77	6/28/2002 7:45	23.02	6.12	0.056	5.48	0.02
78	6/28/2002 8:00	23.02	6.15	0.057	5.45	0.03
79	6/28/2002 8:15	23.02	6.23	0.056	5.49	0.03
80	6/28/2002 8:30	23.03	6.2	0.056	5.44	0.02
81	6/28/2002 8:45	23.01	6.16	0.056	5.44	0.02
82	6/28/2002 9:00	23	6.19	0.056	5.45	0.02
83	6/28/2002 9:15	23	6.17	0.056	5.45	0.02
84	6/28/2002 9:30	23.01	6.16	0.055	5.45	0.02

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85	6/28/2002 9:45	23	6.2	0.055	5.44	0.02
86	6/28/2002 10:00	23.02	6.31	0.055	5.46	0.02
87	6/28/2002 10:15	23.02	6.31	0.055	5.47	0.02
88	6/28/2002 10:30	23.02	6.36	0.055	5.44	0.02
89	6/28/2002 10:45	23.03	6.41	0.054	5.46	0.02
90	6/28/2002 11:00	23.05	6.48	0.054	5.45	0.02
91	6/28/2002 11:15	23.1	6.5	0.054	5.47	0.02
92	6/28/2002 11:30	23.28	6.36	0.054	5.54	0.02
93	6/28/2002 11:45	23.27	6.39	0.055	5.57	0.02
94	6/28/2002 12:00	23.31	6.43	0.054	5.59	0.02
95	6/28/2002 12:15	23.28	6.4	0.055	5.59	0.02
96	6/28/2002 12:30	23.49	6.37	0.056	5.67	0.02
97	6/28/2002 12:45	23.36	6.33	0.055	5.63	0.02
98	6/28/2002 13:00	23.34	6.41	0.054	5.61	0.02
	Average	23.27	6.17	0.06	5.46	0.02
	Maximum	23.79	6.59	0.06	5.67	0.03
	Minimum	23.00	5.71	0.05	5.27	0.02

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STATION BSW 3 FIELD PARAMETERS

Date dd/mm/yy	Time	H_20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth feet
5/8/2001	1220	21	23	51	5.64	0.02	5.83	
5/17/2001	1150	21	34	51	4.53	0.02	5.14	
5/22/2001	1015	25	21	197	5.02	0.09	5.93	
5/29/2001	1010	22	30	48	6.23	0.02	5.81	
6/13/2001	1005	23	24	49	5.88	0.02	4.86	
6/26/2001	925	23	29	79	6.09	0.04	5.61	
7/3/2001	1235	25	30	107	4.1	0.05	5.84	
7/12/2001	1215	25	32	42	5.69	0.02	5.95	
7/17/2001	925	25	29	113	6.18	0.05	5.86	
8/15/2001	1030	25	28	43	5.27	0.02	4.73	
8/28/2001	1030	25	28	65	5.24	0.03	5.79	
9/27/2001	1335	19	23	59	6.48	0.03	5.69	
10/11/2001	1225	20	28	265	6.44	0.13	5.68	
10/22/2001	1135	18	28	47	7.19	0.02	5.61	
11/6/2001	1245	17	26	77	6.5	0.04	5.21	surface
		17	26	78	5.74	0.04	5.22	1.5
		17	26	76	5.69	0.03	5.25	2.5
		17	26	74	5.37	0.03	5.25	3.5
		17	26	82	4.57	0.04	5.36	4.5
11/13/2001	1315	16	21	287	7.54	0.12	5.57	
12/7/2001	1005	16	20	65	9.24	0.03	5.02	
12/10/2001	945	16	13	74	8.26	0.03	5.01	
1/8/2002	950	7	6	150	11	0.1	5.1	
2/20/2002	1300	14	22	45	9.71	0.02	5.98	
3/12/2002	940	13	18	47	9.6	0.02	5.89	
4/2/2002	1250	18		43	5.58	0.02	5.57	
5/16/2002	925	22	23	87	4.11	0.04	6.1	
5/21/2002	1130	19	22	53	6.76	0.02	5.86	
7/3/2002	920	26	27	176	5.62	0.08	5.81	
7/17/2002	1020	25	33	59	4.31	0.03	5.47	
Duplicate (7/17)		25	33	59	4.38	0.03	5.48	
7/25/2002	930	23	25	32	7.33	0.01	5.54	
8/26/2002	900	25	25	59	5.75	0.03	5.63	
9/11/2002	1050	25	30	1101	6.32	0.54	5.52	
	Average	20	25	116	6.28	0.05	5.53	
	Maximum	26	34	1101	11	0.54	6.1	
	Minimum	7	6	32	4.1	0.01	4.73	

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	DateTime M/D/Y	Temp ^0C	SpCond mS/cm	DO Conc mg/L	pH s.u.	Salinity ppt	DO%	Cond mS/cm
0	4/17/2002 13:15	23.52	0.069	7.36	6.07	0.03	86.6	0.067
1	4/17/2002 13:30	23.65	0.07	7.28	6.08	0.03	85.9	0.068
2	4/17/2002 13:45	23.79	0.07	7.31	6.09	0.03	86.5	0.068
3	4/17/2002 14:00	23.9	0.069	7.37	6.1	0.03	87.4	0.068
4	4/17/2002 14:15	24.01	0.069	7.47	6.1	0.03	88.7	0.068
5	4/17/2002 14:30	24.07	0.069	7.54	6.11	0.03	89.7	0.068
6	4/17/2002 14:45	24.11	0.069	7.4	6.11	0.03	88	0.068
7	4/17/2002 15:00	24.11	0.069	7.43	6.1	0.03	88.4	0.068
8	4/17/2002 15:15	24.1	0.07	7.45	6.11	0.03	88.7	0.069
9	4/17/2002 15:30	24.12	0.07	7.4	6.1	0.03	88.1	0.069
10	4/17/2002 15:45	24.08	0.072	7.47	6.1	0.03	88.9	0.071
11	4/17/2002 16:00	24.02	0.072	7.36	6.09	0.03	87.4	0.071
12	4/17/2002 16:15	23.97	0.073	7.3	6.09	0.03	86.7	0.071
13	4/17/2002 16:30	23.85	0.073	7.33	6.08	0.03	86.8	0.071
14	4/17/2002 16:45	23.8	0.072	7.21	6.1	0.03	85.4	0.071
15	4/17/2002 17:00	23.78	0.072	7.15	6.11	0.03	84.6	0.07
16	4/17/2002 17:15	23.77	0.072	7.05	6.11	0.03	83.4	0.071
17	4/17/2002 17:30	23.73	0.072	7	6.11	0.03	82.8	0.071
18	4/17/2002 17:45	23.72	0.073	7.01	6.12	0.03	82.8	0.071
19	4/17/2002 18:00	23.7	0.072	6.96	6.12	0.03	82.2	0.071
20	4/17/2002 18:15	23.74	0.072	6.88	6.12	0.03	81.3	0.071
21	4/17/2002 18:30	23.77	0.072	6.86	6.12	0.03	81.1	0.071
22	4/17/2002 18:45	23.82	0.072	6.81	6.12	0.03	80.6	0.071
23	4/17/2002 19:00	23.84	0.072	6.78	6.12	0.03	80.3	0.071
24	4/17/2002 19:15	23.83	0.072	6.74	6.11	0.03	79.8	0.071
25	4/17/2002 19:30	23.8	0.072	6.71	6.12	0.03	79.4	0.071
26	4/17/2002 19:45	23.77	0.072	6.67	6.11	0.03	78.9	0.071
27	4/17/2002 20:00	23.73	0.072	6.61	6.11	0.03	78.2	0.071
28	4/17/2002 20:15	23.67	0.073	6.54	6.11	0.03	77.3	0.071
29	4/17/2002 20:30	23.61	0.073	6.46	6.11	0.03	76.2	0.071
30	4/17/2002 20:45	23.54	0.073	6.43	6.11	0.03	75.8	0.071
31	4/17/2002 21:00	23.5	0.073	6.39	6.11	0.03	75.2	0.071
32	4/17/2002 21:15	23.43	0.073	6.34	6.11	0.03	74.6	0.071
33	4/17/2002 21:30	23.36	0.073	6.31	6.11	0.03	74.1	0.071
34	4/17/2002 21:45	23.33	0.073	6.22	6.11	0.03	73	0.071
35	4/17/2002 22:00	23.27	0.073	6.29	6.1	0.03	73.7	0.071
36	4/17/2002 22:15	23.22	0.073	6.28	6.09	0.03	73.5	0.07
37	4/17/2002 22:30	23.2	0.073	6.22	6.09	0.03	72.8	0.07
38	4/17/2002 22:45	23.16	0.072	6.19	6.09	0.03	72.3	0.07
39	4/17/2002 23:00	23.12	0.072	6.14	6.09	0.03	71.7	0.07
40	4/17/2002 23:15	23.08	0.072	6.09	6.09	0.03	71.1	0.07
41	4/17/2002 23:30	23.04	0.072	6.02	6.09	0.03	70.3	0.07
42	4/17/2002 23:45	22.99	0.072	5.99	6.08	0.03	69.8	0.07
43	4/18/2002 0:00	22.94	0.072	5.9	6.08	0.03	68.7	0.07
44	4/18/2002 0:15	22.91	0.072	5.87	6.08	0.03	68.4	0.069
45	4/18/2002 0:30	22.86	0.072	5.84	6.08	0.03	67.9	0.069
46	4/18/2002 0:45	22.81	0.072	5.78	6.08	0.03	67.2	0.069

	DateTime	Temp	SpCond	DO Conc	pH	Salinity	DO%	Cond

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	DateTime M/D/Y	Temp ^{0}C	SpCond mS/cm	DO Conc mg/L	pH s.u.	Salinity ppt	DO%	Cond mS/cm
47	4/18/2002 1:00	22.75	0.073	5.75	6.07	0.03	66.7	0.069
48	4/18/2002 1:15	22.73	0.073	5.69	6.07	0.03	66	0.069
49	4/18/2002 1:30	22.69	0.073	5.59	6.07	0.03	64.7	0.069
50	4/18/2002 1:45	22.66	0.073	5.55	6.08	0.03	64.3	0.069
51	4/18/2002 2:00	22.6	0.073	5.44	6.07	0.03	63	0.069
52	4/18/2002 2:15	22.55	0.073	5.44	6.07	0.03	62.9	0.069
53	4/18/2002 2:30	22.5	0.073	5.36	6.07	0.03	62	0.069
54	4/18/2002 2:45	22.49	0.073	5.28	6.07	0.03	61	0.069
55	4/18/2002 3:00	22.43	0.073	5.27	6.07	0.03	60.7	0.069
56	4/18/2002 3:15	22.4	0.073	5.19	6.07	0.03	59.8	0.069
57	4/18/2002 3:30	22.35	0.073	5.16	6.07	0.03	59.4	0.069
58	4/18/2002 3:45	22.31	0.073	5.1	6.06	0.03	58.7	0.069
59	4/18/2002 4:00	22.26	0.073	5.01	6.06	0.03	57.6	0.069
60	4/18/2002 4:15	22.21	0.073	4.97	6.04	0.03	57.1	0.069
61	4/18/2002 4:30	22.16	0.073	4.92	6.04	0.03	56.5	0.069
62	4/18/2002 4:45	22.14	0.073	4.92	6.05	0.03	56.4	0.069
63	4/18/2002 5:00	22.11	0.073	4.89	6.05	0.03	56.1	0.069
64	4/18/2002 5:15	22.07	0.073	4.89	6.05	0.03	56.1	0.069
65	4/18/2002 5:30	22.03	0.073	4.8	6.05	0.03	54.9	0.069
66	4/18/2002 5:45	21.98	0.073	4.8	6.05	0.03	54.9	0.069
67	4/18/2002 6:00	21.92	0.073	4.79	6.05	0.03	54.7	0.069
68	4/18/2002 6:15	21.89	0.073	4.78	6.05	0.03	54.5	0.069
69	4/18/2002 6:30	21.9	0.073	4.73	6.05	0.03	54	0.069
70	4/18/2002 6:45	21.91	0.073	4.74	6.05	0.03	54.1	0.069
71	4/18/2002 7:00	21.95	0.073	4.72	6.05	0.03	53.9	0.069
72	4/18/2002 7:15	21.96	0.073	4.8	6.05	0.03	54.9	0.069
73	4/18/2002 7:30	22.04	0.073	4.68	6.05	0.03	53.6	0.069
74	4/18/2002 7:45	22.08	0.073	4.74	6.05	0.03	54.3	0.069
75	4/18/2002 8:00	22.13	0.073	4.71	6.05	0.03	54	0.069
76	4/18/2002 8:15	22.2	0.073	4.85	6.05	0.03	55.7	0.069
77	4/18/2002 8:30	22.3	0.073	4.89	6.05	0.03	56.2	0.069
78	4/18/2002 8:45	22.36	0.073	4.9	6.05	0.03	56.4	0.069
79	4/18/2002 9:00	22.43	0.073	5.14	6.05	0.03	59.3	0.069
80	4/18/2002 9:15	22.54	0.072	5.23	6.05	0.03	60.4	0.069
81	4/18/2002 9:30	22.61	0.072	5.31	6.05	0.03	61.4	0.069
82	4/18/2002 9:45	22.73	0.072	5.39	6.05	0.03	62.5	0.069
83	4/18/2002 10:00	22.87	0.072	5.52	6.05	0.03	64.2	0.069
84	4/18/2002 10:15	22.99	0.072	5.51	6.06	0.03	64.2	0.069
85	4/18/2002 10:30	23.11	0.072	5.7	6.06	0.03	66.6	0.069
86	4/18/2002 10:45	23.17	0.072	5.87	6.06	0.03	68.7	0.069
87	4/18/2002 11:00	23.19	0.072	5.7	6.04	0.03	66.7	0.07
88	4/18/2002 11:15	23.23	0.073	5.8	6.05	0.03	67.9	0.07
89	4/18/2002 11:30	23.22	0.074	5.77	6.02	0.03	67.5	0.071
90	4/18/2002 11:45	23.19	0.074	5.98	6.02	0.03	69.9	0.071
91	4/18/2002 12:00	23.16	0.074	6.13	6.03	0.03	71.7	0.071
92	4/18/2002 12:15	23.17	0.074	6.25	6.02	0.03	73.1	0.072
93	4/18/2002 12:30	23.28	0.074	6.29	6.03	0.03	73.7	0.072

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94	4/18/2002 12:45	23.36	0.074	6.42	6.04	0.03	75.4	0.072
95	4/18/2002 13:00	23.52	0.073	6.63	6.07	0.03	78	0.071
	Average	23.05	0.072	6.01	6.08	0.03	70.3	0.070
	Maximum	24.12	0.074	7.54	6.12	0.03	89.7	0.072
	Minimum	21.89	0.069	4.68	6.02	0.03	53.6	0.067

STATION BSW 4 FIELD PARAMETERS

Date dd/mm/yy	Time	H_20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth feet
5/8/2001	1245	23	23	104	6.27	0.05	6	1.7
5/17/2001	1225	25	35	97	6.97	0.04	5.65	1.9
5/22/2001	950	25	22	77	6.28	0.03	5.5	1.8
5/29/2001	950	24	30	73	3.8	0.03	5.67	2
6/13/2001	930	24	24	67	5.95	0.03	5.48	2.2
6/26/2001	905	24	29	76	7.81	0.03	5.73	2
7/3/2001	1220	26	32	73	5.05	0.03	5.79	2.1
7/12/2001	1225	26	33	76	5.11	0.03	5.86	2.2
7/17/2001	905	26	28	75	5.99	0.03	5.64	2.8
8/15/2001	1020	24	28	40	7.36	0.02	4.99	3.5
8/28/2001	1010	25	28	64	6.69	0.03	5.77	4
9/27/2001	1345	19	23	84	6.4	0.04	5.7	2.6
10/11/2001	1240	22	28	76	8.21	0.03	5.84	3
10/22/2001	1150	20	28	78	7.92	0.03	5.36	3.2
11/6/2001	1305	17	27	74	7.06	0.03	5.45	4
		17	27	75	6.91	0.03	5.43	3
		17	27	74	6.97	0.03	5.45	2
		18	27	73	7.07	0.03	5.43	1
		19	27	73	7.69	0.03	5.5	surface
11/13/2001	1330	17	22	78	8.56	0.04	5.88	3
12/7/2001	955	17	20	83	6.68	0.04	5.19	2.8
12/10/2001	925	16	13	87	5.38	0.04	4.71	3.1
1/8/2002	905	7	5	174	11.7	0.1	5.06	2.3
2/20/2002	1315	17	22	61	9.21	0.03	6.41	3.5
3/12/2002	915	15	18	62	8.15	0.03	5.94	4
4/2/2002	1310	19		50	8.45	0.02	5.89	3.8
4/16/2002	840	22	24	67	7.18	0.03	5.69	
5/16/2002	910	22	23	74	5.17	0.03	6.8	
5/21/2002	1150	20	22	80	5.78	0.04	6.11	
7/3/2002	905	28	27	63	4.41	0.03	6.13	3
7/17/2002	1035	27	33	98	4.02	0.04	5.83	2.8
7/25/2002	920	23	25	40	7.64	0.02	5.31	
8/26/2002	845	24	25	73	5.42	0.03	5.4	2.8
9/11/2002	1105	26	32	78	4.02	0.04	5.98	
	Average	21	25	76	6.68	0.03	5.66	2.7
	Maximum	28	35	174	11.7	0.1	6.8	4
	Minimum	7	5	40	3.8	0.02	4.71	1

STATION BSW 6 FIELD PARAMETERS

Date dd/mm/yy	Time	H_20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth feet
5/9/2001	940	22	23	79	8.62	0.04	5.65	2.3
5/17/2001	955	24	30	89	8.09	0.04	6.05	2
5/22/2001	1115	26	20	108	6.6	0.05	7.55	2.4
5/29/2001	1050	26	33	115	8.41	0.05	6.27	2.3
6/13/2001	1150	26	26	44	6.93	0.02	5.92	2.6
6/26/2001	1040	26	29	94	8.02	0.04	6.44	2.5
7/3/2001	1315	28	30	62	9.08	0.03	6.53	2.1
7/12/2001	1310	29	33	83	7.43	0.04	6.65	2
7/17/2001	1035	27	30	48	7.01	0.02	6.22	2.4
8/15/2001	1105	25	28	49	6.88	0.02	5.53	2
8/28/2001	1235	28	30	74	8.02	0.03	6.33	1
9/27/2001	1300	21	22	21	8.08	0.01	6.51	0.75
10/11/2001	1140	23	26	113	7.22	0.05	6.06	0.75
10/22/2001	1025	20	27	93	6.45	0.04	5.62	0.75
11/6/2001	1110	18	24	84	8.87	0.04	5.22	0.7
11/13/2001	1135	18	18	90	9.61	0.04	5.86	0.7
12/7/2001	1035	18	19	78	9.21	0.04	5.17	0.8
12/10/2001	1125	15	14	76	9.11	0.03	4.96	0.8
1/8/2002	1130	7	10	187	11.6	0.1	6.18	0.75
2/20/2002	1150	18	22	63	10.2	0.03	6.19	0.6
3/12/2002	1055	15	18	63	8.84	0.03	6.14	0.9
4/2/2002	1110	26	20	33	8.03	0.01	6.13	2.8
4/16/2002	1035	23	27	51	7.78	0.02	6.13	
5/16/2002	1025	23	25	30	7.85	0.01	6.46	
5/21/2002	1000	20	20	28	7.95	0.01	6.52	1.3
7/3/2002	1000	29	29	59	5.77	0.03	6.13	0.8
7/17/2002	930	29	32	54	4.58	0.02	5.88	0.6
7/25/2002	1015	25	25	58	5.94	0.03	5.93	
8/26/2002	1030	27	29	59	5.34	0.03	5.92	0.6
9/11/2002	1000	27	28	59	4.57	0.03	6.03	
	Average	23	25	71	7.74	0.03	6.07	1.4
	Maximum	29	33	187	11.6	0.1	7.55	2.8
	Minimum	7	10	21	4.57	0.01	4.96	0.6

Station BSW 7 - November 29-30, 2001
Continuous Sonde Deployment

	DateTime M/D/Y	Temp ^{0}C	SpCond mS/cm	DO Conc mg/L	pH s.u.	Salinity ppt	DO%	Cond mS/cm
0	11/29/2001 12:00	20.06	0.035	8.23	4.56	0.02	90.6	0.032
1	11/29/2001 12:15	20.07	0.035	8.27	4.59	0.01	91.0	0.032
2	11/29/2001 12:30	20.08	0.035	8.28	4.61	0.01	91.2	0.031
3	11/29/2001 12:45	20.09	0.034	8.25	4.62	0.01	90.9	0.031
4	11/29/2001 13:00	20.12	0.034	8.28	4.62	0.01	91.3	0.031
5	11/29/2001 13:15	20.15	0.034	8.26	4.63	0.01	91.1	0.031
6	11/29/2001 13:30	20.17	0.034	8.26	4.64	0.01	91.1	0.031
7	11/29/2001 13:45	20.21	0.034	8.25	4.64	0.01	91.1	0.031
8	11/29/2001 14:00	20.26	0.035	8.22	4.66	0.01	90.9	0.032
9	11/29/2001 14:15	20.30	0.035	8.21	4.66	0.01	90.8	0.032
10	11/29/2001 14:30	20.33	0.035	8.19	4.66	0.02	90.6	0.032
11	11/29/2001 14:45	20.34	0.035	8.18	4.67	0.02	90.6	0.032
12	11/29/2001 15:00	20.35	0.036	8.16	4.69	0.02	90.3	0.033
13	11/29/2001 15:15	20.34	0.036	8.14	4.68	0.02	90.2	0.033
14	11/29/2001 15:30	20.34	0.036	8.18	4.71	0.02	90.6	0.033
15	11/29/2001 15:45	20.32	0.036	8.17	4.70	0.02	90.4	0.033
16	11/29/2001 16:00	20.31	0.036	8.18	4.69	0.02	90.5	0.033
17	11/29/2001 16:15	20.30	0.036	8.16	4.72	0.02	90.3	0.033
18	11/29/2001 16:30	20.29	0.037	8.17	4.72	0.02	90.3	0.033
19	11/29/2001 16:45	20.28	0.037	8.16	4.72	0.02	90.2	0.034
20	11/29/2001 17:00	20.26	0.037	8.17	4.72	0.02	90.3	0.034
21	11/29/2001 17:15	20.25	0.037	8.17	4.73	0.02	90.3	0.034
22	11/29/2001 17:30	20.22	0.037	8.17	4.74	0.02	90.3	0.034
23	11/29/2001 17:45	20.20	0.037	8.17	4.75	0.02	90.2	0.034
24	11/29/2001 18:00	20.17	0.037	8.17	4.77	0.02	90.2	0.034
25	11/29/2001 18:15	20.14	0.037	8.18	4.81	0.02	90.2	0.034
26	11/29/2001 18:30	20.11	0.037	8.19	4.82	0.02	90.3	0.034
27	11/29/2001 18:45	20.08	0.037	8.19	4.82	0.02	90.2	0.033
28	11/29/2001 19:00	20.03	0.037	8.20	4.81	0.02	90.2	0.033
29	11/29/2001 19:15	19.98	0.037	8.21	4.81	0.02	90.3	0.033
30	11/29/2001 19:30	19.93	0.036	8.23	4.82	0.02	90.3	0.033
31	11/29/2001 19:45	19.87	0.036	8.25	4.80	0.02	90.5	0.033
32	11/29/2001 20:00	19.83	0.036	8.23	4.82	0.02	90.2	0.033
33	11/29/2001 20:15	19.79	0.036	8.24	4.81	0.02	90.2	0.033
34	11/29/2001 20:30	19.75	0.036	8.26	4.81	0.02	90.4	0.033
35	11/29/2001 20:45	19.72	0.036	8.28	4.80	0.02	90.6	0.033
36	11/29/2001 21:00	19.69	0.036	8.28	4.82	0.02	90.5	0.033
37	11/29/2001 21:15	19.66	0.036	8.28	4.82	0.02	90.4	0.033
38	11/29/2001 21:30	19.63	0.036	8.29	4.82	0.02	90.5	0.033
39	11/29/2001 21:45	19.60	0.037	8.30	4.82	0.02	90.6	0.033
40	11/29/2001 22:00	19.58	0.037	8.30	4.83	0.02	90.5	0.033
41	11/29/2001 22:15	19.55	0.037	8.29	4.83	0.02	90.4	0.033
42	11/29/2001 22:30	19.53	0.037	8.31	4.85	0.02	90.5	0.033
43	11/29/2001 22:45	19.50	0.037	8.32	4.86	0.02	90.5	0.033
44	11/29/2001 23:00	19.46	0.037	8.33	4.87	0.02	90.6	0.033
45	11/29/2001 23:15	19.43	0.037	8.31	4.87	0.02	90.4	0.033
46	11/29/2001 23:30	19.39	0.037	8.34	4.86	0.02	90.6	0.033

Station BSW 7 - November 29-30, 2001
Continuous Sonde Deployment

	M/D/Y	^0C	mS/cm	mg/L	s.u.	ppt		mS/cm
47	11/29/2001 23:45	19.36	0.037	8.33	4.87	0.02	90.4	0.033
48	11/30/2001 0:00	19.32	0.037	8.33	4.87	0.02	90.4	0.033
49	11/30/2001 0:15	19.28	0.037	8.34	4.87	0.02	90.4	0.033
50	11/30/2001 0:30	19.25	0.037	8.36	4.86	0.02	90.5	0.033
51	11/30/2001 0:45	19.22	0.037	8.36	4.86	0.02	90.5	0.033
52	11/30/2001 1:00	19.17	0.037	8.36	4.86	0.02	90.4	0.033
53	11/30/2001 1:15	19.13	0.037	8.37	4.85	0.02	90.5	0.033
54	11/30/2001 1:30	19.09	0.037	8.35	4.83	0.02	90.2	0.033
55	11/30/2001 1:45	19.05	0.037	8.38	4.83	0.02	90.4	0.033
56	11/30/2001 2:00	19.00	0.037	8.38	4.83	0.02	90.4	0.033
57	11/30/2001 2:15	18.96	0.037	8.38	4.83	0.02	90.3	0.033
58	11/30/2001 2:30	18.91	0.037	8.39	4.82	0.02	90.3	0.033
59	11/30/2001 2:45	18.85	0.037	8.38	4.82	0.02	90.1	0.033
60	11/30/2001 3:00	18.81	0.037	8.39	4.81	0.02	90.1	0.033
61	11/30/2001 3:15	18.75	0.037	8.42	4.80	0.02	90.3	0.033
62	11/30/2001 3:30	18.70	0.037	8.42	4.80	0.02	90.2	0.033
63	11/30/2001 3:45	18.66	0.037	8.42	4.80	0.02	90.2	0.033
64	11/30/2001 4:00	18.62	0.037	8.41	4.80	0.02	90.0	0.033
65	11/30/2001 4:15	18.58	0.037	8.44	4.79	0.02	90.2	0.033
66	11/30/2001 4:30	18.53	0.037	8.43	4.80	0.02	90.1	0.033
67	11/30/2001 4:45	18.48	0.037	8.44	4.80	0.02	90.0	0.033
68	11/30/2001 5:00	18.44	0.037	8.44	4.79	0.02	90.0	0.033
69	11/30/2001 5:15	18.40	0.037	8.44	4.80	0.02	89.8	0.033
70	11/30/2001 5:30	18.35	0.037	8.45	4.79	0.02	89.9	0.033
71	11/30/2001 5:45	18.30	0.037	8.46	4.79	0.02	89.9	0.033
72	11/30/2001 6:00	18.25	0.037	8.45	4.78	0.02	89.7	0.033
73	11/30/2001 6:15	18.21	0.038	8.45	4.79	0.02	89.6	0.033
74	11/30/2001 6:30	18.17	0.038	8.44	4.79	0.02	89.5	0.033
75	11/30/2001 6:45	18.12	0.038	8.46	4.79	0.02	89.6	0.033
76	11/30/2001 7:00	18.08	0.038	8.45	4.79	0.02	89.4	0.033
77	11/30/2001 7:15	18.05	0.038	8.47	4.79	0.02	89.6	0.033
78	11/30/2001 7:30	18.01	0.038	8.47	4.80	0.02	89.5	0.033
79	11/30/2001 7:45	17.98	0.038	8.47	4.80	0.02	89.5	0.033
80	11/30/2001 8:00	17.95	0.038	8.46	4.80	0.02	89.2	0.033
81	11/30/2001 8:15	17.91	0.038	8.50	4.79	0.02	89.6	0.033
82	11/30/2001 8:30	17.88	0.038	8.47	4.80	0.02	89.2	0.033
83	11/30/2001 8:45	17.85	0.038	8.47	4.81	0.02	89.2	0.033
84	11/30/2001 9:00	17.81	0.038	8.49	4.81	0.02	89.3	0.033
85	11/30/2001 9:15	17.78	0.038	8.48	4.81	0.02	89.1	0.033
86	11/30/2001 9:30	17.76	0.038	8.47	4.82	0.02	89.0	0.033
87	11/30/2001 9:45	17.74	0.038	8.45	4.82	0.02	88.8	0.033
88	11/30/2001 10:00	17.71	0.039	8.48	4.82	0.02	89.0	0.033
89	11/30/2001 10:15	17.69	0.039	8.48	4.82	0.02	89.1	0.033
90	11/30/2001 10:30	17.68	0.039	8.48	4.83	0.02	89.0	0.033
91	11/30/2001 10:45	17.67	0.039	8.48	4.84	0.02	89.0	0.033
92	11/30/2001 11:00	17.66	0.039	8.48	4.84	0.02	89.0	0.033
93	11/30/2001 11:15	17.66	0.039	8.50	4.85	0.02	89.1	0.033

	DateTime	Temp	SpCond	DO Conc	pH	Salinity	DO%	Cond
	M/D/Y	^0C	mS/cm	mg/L	s.u.	ppt		mS/cm

Station BSW 7 - November 29-30, 2001
Continuous Sonde Deployment

94	11/30/2001 11:30	17.66	0.039	8.47	4.84	0.02	88.8	0.033
95	11/30/2001 11:45	17.66	0.039	8.48	4.85	0.02	89.0	0.034
96	11/30/2001 12:00	17.67	0.039	8.49	4.85	0.02	89.1	0.034
	Average	19.15	0.037	8.34	4.78	0.02	90.11	0.033
	Maximum	20.35	0.04	8.50	4.87	0.02	91.30	0.034
	Minimum	17.66	0.03	8.14	4.56	0.01	88.80	0.031

STATION BSW 7 FIELD PARAMETERS

Date dd/mm/yy	Time	H_20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth feet
5/9/2001	1005	22	24	29	7.94	0.01	5.44	1
5/17/2001	940	23	30	25	7.34	0.01	4.85	1
5/22/2001	1220	24	22	30	7.2	0.01	6.2	1.1
5/29/2001	1100	24	30	29	7.64	0.01	6.18	1
6/8/2001	1155	26	26	23	6.94	0.01	5.02	1
6/13/2001	1230	24	26	44	8.01	0.02	4.63	2.5
6/26/2001	1120	24	30	31	7.59	0.01	5.29	0.9
7/3/2001	1325	25	30	30	7.12	0.01	5.25	0.9
7/12/2001	1320	25	33	36	6.27	0.02	5.24	1.1
7/17/2001	1110	26	30	31	7.3	0.01	5.18	0.8
8/15/2001	1055	24	29	39	6.97	0.02	4.4	1.2
8/28/2001	1300	26	30	29	7.15	0.01	5.87	1
9/27/2001	1315	19	22	38	8.13	0.02	6.46	1
10/11/2001	1125	21	26	27	8.13	0.01	4.8	1
10/22/2001	1045	19	26	28	8.16	0.01	5.87	1.1
11/6/2001	1035	16	21	29	8.7	0.01	4.73	1
11/13/2001	1100	16	18	31	9.18	0.01	4.74	1
12/7/2001	1025	17	18	34	9.67	0.01	4.71	1
12/10/2001	1040	16	13	31	9.52	0.01	4.82	1.3
1/8/2002	1150	8	10	138	11.5	0.1	4.69	1.5
2/20/2002	1205	15	22	35	10.3	0.02	5.62	1.9
3/12/2002	1030	14	17	35	9.75	0.02	5.23	
4/2/2002	1130	19	25	34	8.16	0.01	5.17	1.6
4/16/2002	1045	22	27	35	7.18	0.01	6.26	1.5
5/16/2002	1040	21	27	28	7.18	0.01	5.88	0.8
5/21/2002	1030	19	21	32	7.41	0.01	5.87	0.9
7/3/2002	1010	21	27	30	6.95	0.01	5.34	
d Duplicate (7/3)		21	27	30	6.93	0.01	5.38	
7/17/2002	945	21	31	33	5.82	0.01	5.19	1
7/25/2002	1025	24	25	38	6.96	0.02	4.98	
8/26/2002	950	25	28	33	7.25	0.01	5.19	1.5
9/11/2002	1005	26	26	33	6.7	0.01	5.41	1.2
	Average	21	25	35	7.85	0.02	5.31	1.2
	Maximum	26	33	138	11.5	0.1	6.46	2.5
	Minimum	8	10	23	5.82	0.01	4.4	0.8

Station BSW 8 - December 3-4, 2001
Continuous Sonde Deployment

	DateTime M/D/Y	Temp ^0C	SpCond mS/cm	DO Conc mg/L	pH s.u.	Salinity ppt	DO%	Cond mS/cm
0	12/3/2001 10:00	13.71	0.054	6.43	3.95	0.02	62.0	0.042
1	12/3/2001 10:15	13.82	0.054	6.49	3.97	0.02	62.7	0.042
2	12/3/2001 10:30	13.84	0.054	6.48	4.00	0.02	62.6	0.042
3	12/3/2001 10:45	14.04	0.054	6.46	4.00	0.02	62.8	0.042
4	12/3/2001 11:00	13.88	0.054	6.46	4.00	0.02	62.5	0.042
5	12/3/2001 11:15	13.94	0.054	6.46	3.99	0.02	62.6	0.042
6	12/3/2001 11:30	14.00	0.054	6.46	3.99	0.02	62.7	0.042
7	12/3/2001 11:45	14.05	0.054	6.47	4.00	0.02	62.8	0.043
8	12/3/2001 12:00	14.07	0.054	6.52	3.99	0.02	63.4	0.043
9	12/3/2001 12:15	14.12	0.054	6.51	4.00	0.02	63.3	0.043
10	12/3/2001 12:30	14.15	0.054	6.50	3.98	0.02	63.3	0.043
11	12/3/2001 12:45	14.19	0.054	6.50	3.99	0.02	63.3	0.043
12	12/3/2001 13:00	14.27	0.054	6.51	4.00	0.02	63.6	0.043
13	12/3/2001 13:15	14.28	0.054	6.51	4.02	0.02	63.6	0.043
14	12/3/2001 13:30	14.29	0.054	6.51	4.02	0.02	63.6	0.043
15	12/3/2001 13:45	14.29	0.054	6.49	4.02	0.02	63.4	0.043
16	12/3/2001 14:00	14.31	0.054	6.49	4.02	0.02	63.4	0.043
17	12/3/2001 14:15	14.33	0.054	6.47	4.03	0.02	63.2	0.043
18	12/3/2001 14:30	14.36	0.054	6.49	4.04	0.02	63.4	0.043
19	12/3/2001 14:45	14.36	0.054	6.45	4.05	0.02	63.1	0.043
20	12/3/2001 15:00	14.37	0.054	6.43	4.05	0.02	62.9	0.043
21	12/3/2001 15:15	14.38	0.054	6.43	4.06	0.02	62.9	0.043
22	12/3/2001 15:30	14.38	0.054	6.43	4.06	0.02	62.9	0.043
23	12/3/2001 15:45	14.38	0.054	6.40	4.06	0.02	62.7	0.043
24	12/3/2001 16:00	14.40	0.054	6.45	4.06	0.02	63.2	0.043
25	12/3/2001 16:15	14.42	0.054	6.47	4.06	0.02	63.3	0.043
26	12/3/2001 16:30	14.43	0.054	6.45	4.06	0.02	63.2	0.043
27	12/3/2001 16:45	14.46	0.054	6.45	4.07	0.02	63.2	0.043
28	12/3/2001 17:00	14.51	0.054	6.45	4.05	0.02	63.3	0.043
29	12/3/2001 17:15	14.55	0.054	6.49	4.05	0.02	63.8	0.043
30	12/3/2001 17:30	14.60	0.054	6.51	4.06	0.02	64.0	0.044
31	12/3/2001 17:45	14.62	0.054	6.51	4.08	0.02	64.1	0.044
32	12/3/2001 18:00	14.69	0.055	6.53	4.09	0.02	64.3	0.044
33	12/3/2001 18:15	14.74	0.055	6.55	4.09	0.02	64.6	0.044
34	12/3/2001 18:30	14.79	0.054	6.55	4.10	0.02	64.7	0.044
35	12/3/2001 18:45	14.86	0.055	6.53	4.09	0.02	64.5	0.044
36	12/3/2001 19:00	14.90	0.055	6.57	4.11	0.02	65.0	0.044
37	12/3/2001 19:15	14.96	0.055	6.55	4.12	0.02	64.9	0.044
38	12/3/2001 19:30	14.98	0.055	6.53	4.12	0.02	64.8	0.044
39	12/3/2001 19:45	15.01	0.055	6.53	4.14	0.02	64.8	0.044
40	12/3/2001 20:00	15.03	0.055	6.53	4.14	0.02	64.8	0.044
41	12/3/2001 20:15	15.06	0.055	6.52	4.14	0.02	64.8	0.044
42	12/3/2001 20:30	15.09	0.055	6.49	4.14	0.02	64.5	0.044
43	12/3/2001 20:45	15.07	0.055	6.49	4.16	0.02	64.4	0.044
44	12/3/2001 21:00	15.09	0.055	6.50	4.15	0.02	64.6	0.044
45	12/3/2001 21:15	15.08	0.055	6.47	4.15	0.02	64.3	0.044
46	12/3/2001 21:30	15.07	0.055	6.48	4.15	0.02	64.3	0.044

	DateTime	Temp	SpCond	DO Conc	pH	Salinity	DO%	Cond

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Continuous Sonde Deployment

	M/D/Y	^{0}C	mS/cm	mg/L	s.u.	ppt		mS/cm
47	12/3/2001 21:45	15.07	0.055	6.45	4.15	0.02	64.1	0.044
48	12/3/2001 22:00	15.06	0.055	6.42	4.15	0.02	63.7	0.044
49	12/3/2001 22:15	15.03	0.055	6.39	4.15	0.02	63.4	0.044
50	12/3/2001 22:30	15.02	0.055	6.37	4.15	0.02	63.2	0.044
51	12/3/2001 22:45	14.99	0.055	6.35	4.16	0.02	63.0	0.044
52	12/3/2001 23:00	14.93	0.055	6.32	4.15	0.02	62.6	0.044
53	12/3/2001 23:15	14.93	0.055	6.30	4.16	0.02	62.4	0.044
54	12/3/2001 23:30	14.91	0.055	6.28	4.16	0.02	62.1	0.044
55	12/3/2001 23:45	14.86	0.055	6.26	4.16	0.02	61.9	0.044
56	12/4/2001 0:00	14.73	0.055	6.23	4.16	0.02	61.5	0.044
57	12/4/2001 0:15	14.80	0.055	6.22	4.17	0.02	61.4	0.044
58	12/4/2001 0:30	14.78	0.055	6.18	4.17	0.02	61.0	0.044
59	12/4/2001 0:45	14.74	0.054	6.16	4.17	0.02	60.8	0.044
60	12/4/2001 1:00	14.70	0.055	6.13	4.17	0.02	60.4	0.044
61	12/4/2001 1:15	14.68	0.055	6.15	4.17	0.02	60.6	0.044
62	12/4/2001 1:30	14.63	0.054	6.12	4.17	0.02	60.2	0.044
63	12/4/2001 1:45	14.57	0.054	6.11	4.17	0.02	60.1	0.044
64	12/4/2001 2:00	14.53	0.054	6.10	4.18	0.02	59.9	0.044
65	12/4/2001 2:15	14.54	0.054	6.08	4.18	0.02	59.7	0.043
66	12/4/2001 2:30	14.49	0.054	6.08	4.18	0.02	59.7	0.043
67	12/4/2001 2:45	14.45	0.054	6.08	4.19	0.02	59.6	0.043
68	12/4/2001 3:00	14.42	0.054	6.09	4.19	0.02	59.6	0.043
69	12/4/2001 3:15	14.38	0.054	6.06	4.19	0.02	59.3	0.043
70	12/4/2001 3:30	14.35	0.054	6.05	4.20	0.02	59.1	0.043
71	12/4/2001 3:45	14.33	0.054	6.05	4.20	0.02	59.1	0.043
72	12/4/2001 4:00	14.31	0.054	6.02	4.20	0.02	58.8	0.043
73	12/4/2001 4:15	14.26	0.054	6.03	4.20	0.02	58.8	0.043
74	12/4/2001 4:30	14.24	0.054	6.02	4.21	0.02	58.7	0.043
75	12/4/2001 4:45	14.19	0.054	6.00	4.21	0.02	58.5	0.043
76	12/4/2001 5:00	14.18	0.054	5.97	4.21	0.02	58.2	0.043
77	12/4/2001 5:15	14.12	0.054	6.03	4.22	0.02	58.6	0.043
78	12/4/2001 5:30	14.11	0.054	5.97	4.22	0.02	58.1	0.043
79	12/4/2001 5:45	14.05	0.054	6.02	4.23	0.02	58.4	0.043
80	12/4/2001 6:00	14.07	0.054	5.99	4.23	0.02	58.2	0.043
81	12/4/2001 6:15	14.05	0.054	5.98	4.23	0.02	58.1	0.043
82	12/4/2001 6:30	14.02	0.054	5.98	4.23	0.02	58.1	0.043
83	12/4/2001 6:45	14.00	0.054	5.97	4.23	0.02	57.9	0.043
84	12/4/2001 7:00	13.98	0.054	5.94	4.24	0.02	57.6	0.043
85	12/4/2001 7:15	13.94	0.054	5.98	4.24	0.02	58.0	0.043
86	12/4/2001 7:30	13.95	0.054	5.94	4.24	0.02	57.6	0.043
87	12/4/2001 7:45	13.93	0.054	5.95	4.25	0.02	57.7	0.043
88	12/4/2001 8:00	13.90	0.054	5.97	4.24	0.02	57.8	0.043
89	12/4/2001 8:15	13.89	0.054	5.98	4.25	0.02	57.9	0.043
90	12/4/2001 8:30	13.89	0.054	5.99	4.25	0.02	57.9	0.043
91	12/4/2001 8:45	13.95	0.054	5.98	4.26	0.02	57.9	0.043
92	12/4/2001 9:00	13.94	0.054	5.92	4.27	0.02	57.3	0.043
93	12/4/2001 9:15	13.95	0.054	5.96	4.28	0.02	57.8	0.043

	DateTime	Temp	SpCond	DO Conc	pH	Salinity	DO%	Cond
	M/D/Y	^{0}C	mS/cm	mg/L	s.u.	ppt		mS/cm

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94	12/4/2001 9:30	14.02	0.054	5.95	4.29	0.02	57.8	0.043
95	12/4/2001 9:45	13.96	0.054	5.96	4.29	0.02	57.8	0.043
96	12/4/2001 10:00	13.99	0.054	5.97	4.29	0.02	58.0	0.043
97	12/4/2001 10:15	14.14	0.054	5.98	4.30	0.02	58.20	0.043
98	12/4/2001 10:30	14.09	0.054	5.90	4.32	0.02	57.30	0.043
99	12/4/2001 10:45	14.12	0.054	6.02	4.32	0.02	58.60	0.043
	Average	14.41	0.054	6.27	4.14	0.02	61.44	0.043
	Maximum	15.09	0.055	6.57	4.32	0.02	65.00	0.044
	Minimum	13.71	0.054	5.90	3.95	0.02	57.30	0.042

	DateTime M/D/Y	Temp ^0C	SpCond mS/cm	DO Conc mg/L	pH s.u.	Salinity ppt	DO%	Cond mS/cm
1	7/25/2002 12:00	23.36	0.043	6.21	4.80	0.02	0.0	96.7
2	7/25/2002 12:15	23.39	0.043	6.04	4.81	0.02	0.0	72.8
3	7/25/2002 12:30	23.43	0.043	5.97	4.78	0.02	0.0	71
4	7/25/2002 12:45	23.47	0.043	5.92	4.79	0.02	0.0	70.2
5	7/25/2002 13:00	23.51	0.043	5.87	4.78	0.02	0.0	69.6
6	7/25/2002 13:15	23.56	0.043	5.83	4.78	0.02	0.0	69.1
7	7/25/2002 13:30	23.58	0.044	5.8	4.77	0.02	0.0	68.7
8	7/25/2002 13:45	23.63	0.044	5.78	4.78	0.02	0.0	68.4
9	7/25/2002 14:00	23.68	0.044	5.76	4.79	0.02	0.0	68.2
10	7/25/2002 14:15	23.68	0.045	5.74	4.78	0.02	0.0	68
11	7/25/2002 14:30	23.70	0.045	5.72	4.77	0.02	0.0	67.8
12	7/25/2002 14:45	23.71	0.045	5.71	4.75	0.02	0.0	67.5
13	7/25/2002 15:00	23.72	0.045	5.7	4.74	0.02	0.044	67.5
14	7/25/2002 15:15	23.73	0.046	5.69	4.71	0.02	0.044	67.3
15	7/25/2002 15:30	23.75	0.046	5.67	4.7	0.02	0.044	67.2
16	7/25/2002 15:45	23.76	0.046	5.65	4.67	0.02	0.045	67
17	7/25/2002 16:00	23.76	0.046	5.61	4.68	0.02	0.045	66.8
18	7/25/2002 16:15	23.77	0.045	5.58	4.68	0.02	0.045	66.4
19	7/25/2002 16:30	23.77	0.045	5.55	4.68	0.02	0.044	66
20	7/25/2002 16:45	23.78	0.045	5.52	4.67	0.02	0.044	65.7
21	7/25/2002 17:00	23.79	0.045	5.5	4.66	0.02	0.044	65.3
22	7/25/2002 17:15	23.79	0.045	5.48	4.66	0.02	0.044	65.1
23	7/25/2002 17:30	23.80	0.045	5.46	4.63	0.02	0.044	64.8
24	7/25/2002 17:45	23.80	0.045	5.43	4.64	0.02	0.044	64.6
25	7/25/2002 18:00	23.80	0.045	5.41	4.59	0.02	0.044	64.3
26	7/25/2002 18:15	23.80	0.045	5.38	4.58	0.02	0.044	64.1
27	7/25/2002 18:30	23.81	0.045	5.35	4.57	0.02	0.044	63.7
28	7/25/2002 18:45	23.81	0.045	5.34	4.56	0.02	0.044	63.4
29	7/25/2002 19:00	23.82	0.046	5.32	4.56	0.02	0.044	63.2
30	7/25/2002 19:15	23.82	0.046	5.3	4.54	0.02	0.045	62.9
31	7/25/2002 19:30	23.83	0.046	5.28	4.54	0.02	0.045	62.7
32	7/25/2002 19:45	23.83	0.046	5.24	4.53	0.02	0.045	62.6
33	7/25/2002 20:00	23.84	0.046	5.21	4.52	0.02	0.045	62.1

	DateTime M/D/Y	Temp ^0C	SpCond mS/cm	DO Conc mg/L	pH s.u.	Salinity ppt	DO%	Cond mS/cm
34	7/25/2002 20:15	23.85	0.046	5.16	4.53	0.02	0.045	61.7

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	DateTime M/D/Y	Temp ^{0}C	SpCond mS/cm	DO Conc mg/L	pH s.u.	Salinity ppt	DO%	Cond mS/cm
35	7/25/2002 20:30	23.86	0.046	5.12	4.52	0.02	0.045	61.2
36	7/25/2002 20:45	23.86	0.046	5.09	4.52	0.02	0.045	60.7
37	7/25/2002 21:00	23.87	0.046	5.05	4.5	0.02	0.045	60.3
38	7/25/2002 21:15	23.88	0.046	5.02	4.5	0.02	0.045	59.9
39	7/25/2002 21:30	23.89	0.046	5	4.49	0.02	0.045	59.6
40	7/25/2002 21:45	23.9	0.046	4.97	4.48	0.02	0.045	59.2
41	7/25/2002 22:00	23.91	0.046	4.93	4.49	0.02	0.045	58.9
42	7/25/2002 22:15	23.92	0.046	4.91	4.49	0.02	0.045	58.5
43	7/25/2002 22:30	23.93	0.046	4.88	4.49	0.02	0.045	58.2
44	7/25/2002 22:45	23.95	0.046	4.84	4.48	0.02	0.045	57.8
45	7/25/2002 23:00	23.96	0.046	4.83	4.49	0.02	0.045	57.5
46	7/25/2002 23:15	23.97	0.045	4.81	4.47	0.02	0.045	57.3
47	7/25/2002 23:30	23.98	0.045	4.77	4.48	0.02	0.045	57.1
48	7/25/2002 23:45	23.99	0.045	4.74	4.48	0.02	0.045	56.6
49	7/26/2002 0:00	24	0.045	4.72	4.47	0.02	0.044	56.3
50	7/26/2002 0:15	24.01	0.045	4.69	4.47	0.02	0.044	56.1
51	7/26/2002 0:30	24.02	0.045	4.67	4.48	0.02	0.044	55.7
52	7/26/2002 0:45	24.03	0.045	4.66	4.47	0.02	0.044	55.5
53	7/26/2002 1:00	24.04	0.045	4.63	4.47	0.02	0.044	55.4
54	7/26/2002 1:15	24.05	0.045	4.62	4.47	0.02	0.044	55.1
55	7/26/2002 1:30	24.05	0.044	4.61	4.47	0.02	0.044	55
56	7/26/2002 1:45	24.06	0.044	4.59	4.49	0.02	0.044	54.8
57	7/26/2002 2:00	24.06	0.044	4.57	4.48	0.02	0.044	54.6
58	7/26/2002 2:15	24.07	0.044	4.57	4.48	0.02	0.043	54.3
59	7/26/2002 2:30	24.07	0.044	4.55	4.48	0.02	0.043	54.3
60	7/26/2002 2:45	24.08	0.044	4.53	4.47	0.02	0.043	54.1
61	7/26/2002 3:00	24.08	0.044	4.52	4.47	0.02	0.043	53.9
62	7/26/2002 3:15	24.08	0.044	4.51	4.47	0.02	0.043	53.8
63	7/26/2002 3:30	24.08	0.044	4.48	4.47	0.02	0.043	53.6
64	7/26/2002 3:45	24.08	0.044	4.48	4.47	0.02	0.043	53.4
65	7/26/2002 4:00	24.08	0.044	4.4	4.46	0.02	0.043	53.3
66	7/26/2002 4:15	24.08	0.044	4.34	4.46	0.02	0.043	52.4
67	7/26/2002 4:30	24.08	0.044	4.3	4.46	0.02	0.043	51.6
68	7/26/2002 4:45	24.08	0.044	4.28	4.46	0.02	0.043	51.2
69	7/26/2002 5:00	24.08	0.044	4.26	4.45	0.02	0.043	51
70	7/26/2002 5:15	24.08	0.044	4.25	4.45	0.02	0.043	50.7
71	7/26/2002 5:30	24.08	0.044	4.23	4.46	0.02	0.043	50.5
72	7/26/2002 5:45	24.08	0.044	4.21	4.45	0.02	0.043	50.3
73	7/26/2002 6:00	24.08	0.044	4.2	4.46	0.02	0.043	50.1
74	7/26/2002 6:15	24.08	0.044	4.2	4.44	0.02	0.043	50
75	7/26/2002 6:30	24.08	0.044	4.19	4.46	0.02	0.043	50
76	7/26/2002 6:45	24.08	0.044	4.18	4.46	0.02	0.043	49.8
77	7/26/2002 7:00	24.07	0.044	4.17	4.46	0.02	0.043	49.7
78	7/26/2002 7:15	24.08	0.044	4.16	4.45	0.02	0.043	49.6
79	7/26/2002 7:30	24.08	0.044	4.16	4.45	0.02	0.043	49.5
80	7/26/2002 7:45	24.08	0.044	4.15	4.46	0.02	0.043	49.5
81	7/26/2002 8:00	24.09	0.044	4.15	4.45	0.02	0.043	49.4
82	7/26/2002 8:15	24.09	0.044	4.14	4.45	0.02	0.043	49.3

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83	7/26/2002 8:30	24.1	0.044	4.12	4.45	0.02	0.043	49.2
84	7/26/2002 8:45	24.12	0.044	4.12	4.45	0.02	0.043	49.1
85	7/26/2002 9:00	24.13	0.044	4.11	4.45	0.02	0.043	49.1
86	7/26/2002 9:15	24.15	0.044	4.11	4.45	0.02	0.043	49
87	7/26/2002 9:30	24.17	0.044	4.1	4.45	0.02	0.043	49
88	7/26/2002 9:45	24.19	0.044	4.1	4.45	0.02	0.043	48.9
89	7/26/2002 10:00	24.22	0.044	4.09	4.46	0.02	0.043	48.9
90	7/26/2002 10:15	24.24	0.044	4.08	4.45	0.02	0.044	48.8
91	7/26/2002 10:30	24.26	0.044	4.08	4.45	0.02	0.044	48.7
92	7/26/2002 10:45	24.3	0.044	4.08	4.45	0.02	0.044	48.7
93	7/26/2002 11:00	24.32	0.044	4.07	4.44	0.02	0.044	48.7
94	7/26/2002 11:15	24.36	0.045	4.07	4.44	0.02	0.044	48.7
95	7/26/2002 11:30	24.4	0.044	4.06	4.44	0.02	0.044	48.7
96	7/26/2002 11:45	24.43	0.045	4.06	4.45	0.02	0.044	48.6
97	7/26/2002 12:00	24.46	0.045	4.06	4.44	0.02	0.044	48.7
	Average	23.95	0.045	4.84	4.54	0.02	0.043	58
	Maximum	24.46	0.046	6.21	4.81	0.02	0.045	96.7
	Minimum	23.36	0.043	4.06	4.44	0.02	0.004	48.6

STATION BSW 8 FIELD PARAMETERS

Date dd/mm/yy	Time	H_20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth feet
5/9/2001	1025	20	24	54	5.7	0.02	4.78	1.25
5/17/2001	920	20	30	56	5.49	0.03	4.44	1.8
5/22/2001	1240	20	23	61	6.4	0.03	6.1	1.8
5/29/2001	1115	21	33	64	5.5	0.03	4.99	1.8
6/8/2001	1140	21	24	56	5.95	0.03	4.42	1.8
6/13/2001	1300	24	25	46	5.65	0.02	4.52	4
6/26/2001	1150	21	31	59	4.76	0.03	4.65	3
7/6/2001	1340	24	30	41	5.5	0.02	4.43	>4
7/12/2001	1330	25	33	41	4.82	0.02	4.45	>4
7/17/2001	1120	24	30	38	6.25	0.02	4.51	>4
8/15/2001	1045	24	29	37	4.63	0.02	4.28	>4
8/28/2001	1325	22	29	50	5.2	0.02	5.17	3
9/27/2001	1325	18	22	57	6.44	0.03	5.41	3
10/11/2001	1115	20	26	58	5.75	0.03	4.75	3
10/22/2001	1115	19	27	47	6.04	0.02	5.33	3
11/6/2001	950	17	18	54	5.05	0.02	5.2	2.5
11/13/2001	1030	17	16	56	6.3	0.03	5.28	2.5
12/3-4/01		14		54	6.26	0.02	4.15	
12/7/2001	1020	16	19	51	7.02	0.02	4.45	2.5
12/10/2001	1020	16	13	49	5.74	0.02	4.61	3
1/8/2002	1220	6	10	151	10.7	0.1	4.5	3.2
2/20/2002	1230	15	22	48	9.32	0.02	5.3	2.7
3/12/2002	1000	13	18	44	9.38	0.02	4.99	
4/2/2002	1210	18		41	7.55	0.02	4.9	2.8
4/16/2002	1105	20	26	47	7.31	0.02	4.94	2.2
5/16/2002	1055	19	30	50	6.52	0.02	5.19	
5/21/2002	1105	18	22	57	6.70	0.03	5.19	
7/3/2002	1030	23	30	51	6.3	0.02	4.6	2.1
7/17/2002	1005	23	33	59	4.85	0.03	4.75	2
7/25-26/02		24	45	37	4.84	0.02	4.54	
8/26/2002	915	24	28	50	6.23	0.02	4.21	3.4
9/11/2002	1030	23	28	62	4.67	0.03	4.81	
	Average	20	26	54	6.21	0.03	4.81	2.6
	Maximum	25	45	151	10.7	0.1	6.1	4
	Minimum	6	10	37	4.63	0.02	4.15	1.3

STATION BSW 10 FIELD PARAMETERS

Date dd/mm/yy	Time	H_20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth feet
5/30/2001	905	27	29	827	5.82	0.1	6.6	surface
		27	29	768	5.22	0.4	6.55	0.5
		27	29	780	5.15	0.4	6.54	1
		27	29	747	4.97	0.4	6.53	1.5
		26	29	818	4.52	0.4	6.52	2
		26	29	770	3.89	0.4	6.46	2.5
		26	29	734	3.65	0.4	6.42	3
		26	29	664	3.37	0.3	6.37	4.2
6/19/2001	1210	30	27	240	6.13	0.1	6.54	surface
		28	27	229	4.31	0.1	6.34	1
		27	27	184	2.11	0.1	6.16	2.3
		25	27	127	0.66	0.1	6.16	4.6
7/3/2001	910	29	27	518	4.96	0.3	6.43	surface
		28	27	503	4.85	0.3	6.42	1
		28	27	575	4.35	0.3	6.34	2.3
		27	27	394	1.97	0.2	6.24	4.6
7/16/2001	1130	30	31	403	6.26	0.2	6.52	surface
		29	31	415	5.96	0.2	6.45	1
		28	31	310	3.11	0.1	6.32	2.4
		26	31	130	4.43	0.1	6.82	4.8
8/2/2001	1230	30	31	816	5.95	0.4	6.46	surface
		28	31	1174	2.94	0.7	6.56	2.7
		28	31	7040	1.03	4	6.51	5.5
8/16/2001	1005	28	28	564	4.54	0.3	6.11	surface
		27	28	619	4.27	0.3	6.15	1
		26	28	758	3.92	0.4	6.24	2.5
		26	28	1288	3.84	0.7	6.55	5
8/21/2001	950	26	27	376	3.49	0.2	5.95	surface
		26	27	381	3.49	0.2	5.97	1
		26	27	420	3.45	0.2	6.04	2.7
		26	27	426	3.69	0.2	6.17	4.3
9/28/2001	910	23	16	1115	4.51	0.6	6.25	surface
		23	16	1118	4.46	0.6	6.32	1
		24	16	3550	3.03	2.2	6.42	2.1
		27	16	19220	1.09	11.1	6.67	4.2
10/15/2001	1140	23	25	5020	4.58	2.8	6.12	surface
		22	25	6600	3.75	3.8	6.4	1
		24	25	14280	2.34	8.7	6.6	2.7
		25	25	21010	1.72	15.1	6.73	4.3
10/23/2001	1000					3.2		surface
11/7/2001	1145	20	27	5960	7.22	3.4	6.71	surface
		20	27	8070	4.96	4.4	6.86	1.2
		21	27	15920	2.66	8.9	6.88	2.4
		21	27	26040	4.05	15.9	6.92	4.8

STATION BSW 10 FIELD PARAMETERS

Date dd/mm/yy	Time	H_20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth feet
11/14/2001	1035	19	16	5570	6.73	3.1	6.68	surface
		20	16	9250	4.96	5	6.72	1.2
		22	16	15910	0.77	9.3	6.74	2.4
		21	16	27520	1.67	17.3	6.91	4.7
12/17/2001	1230	18	20	4580	5.58	2.5	6.57	surface
		18	20	4600	5.34	2.5	6.62	1.5
		18	20	4630	5.34	2.6	6.59	2.9
		18	20	4970	5.25	2.8	6.65	4.9
1/9/2002	1030	9	17	810	9.63	0.4	5.73	surface
		9	17	1870	8.01	1	5.98	2.5
		10	17	2390	6.82	1.3	5.87	5
2/26/2002	1210	15	12	310	7.63	0.2	6.18	surface
		15	12	290	7.61	0.1	6.15	1.7
		14	12	290	10.01	0.1	6.33	3.4
3/13/2002	1000	14	14	154	9.49	0.07	8.43	surface
		14	14	151	7.21	0.07	6.51	2
4/11/2002	1010	20	20	230	5.28	0.1	6.26	surface
		19	20	240	4.3	0.1	6.19	2.3
		19	20	220	4.2	0.1	6.16	4.6
5/7/2002	1050	29	31	1820	7.62	1	6.68	surface
		29	31	2010	7.37	1.1	6.68	1.5
		28	31	2020	5.79	1.1	6.57	2.5
		26	31	2830	0.76	1.5	6.35	5.1
7/31/2002	1025	28	31	484	4.61	0.1	5.94	surface
		26	31	212	2.68	0.1	5.54	2.5
		25	31	276	2.83	0.1	5.94	4.9
8/15/2002	1010	30	30	4610	7.4	2.5	6.64	surface
		29	30	7960	1.11	4.5	6.45	2.9
		28	30	18220	1.36	10.9	6.67	5.8
9/19/2002	1055	29	31	4160	7.18	1.9	6.69	surface
		29	31	14680	0.94	8.5	6.56	2.6
		29	31	20180	1.07	12.3	6.77	4.3
	Average	24	25	4205	4.5	2.46	6.44	
	Maximum	30	31	27520	10.01	17.3	8.43	
	Minimum	9	12	127	0.66	0.07	5.54	

STATION BSW 11 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
5/30/2001	940	27	30	1084	5.49	0.6	6.75	surface
		27	30	1084	4.85	0.6	6.71	0.5
		27	30	1115	4.5	0.6	6.68	1
		26	30	1116	4.49	0.6	6.68	1.5
		26	30	1115	4.49	0.6	6.68	2
		26	30	1114	4.47	0.6	6.68	2.5
		26	30	1116	4.47	0.6	6.68	3
6/19/2001	1150	29	27	273	7.2	0.1	6.77	surface
		28	27	291	4.2	0.1	6.61	2.3
		27	27	289	3.93	0.1	6.68	4.6
7/3/2001	925	29	28	2360	5.36	1.3	6.82	surface
		29	28	2520	5.07	1.3	6.81	1.4
		29	28	2630	5.14	1.4	6.8	2.8
7/16/2001	1145	30	31	575	5.98	0.3	6.67	surface
		29	31	792	4.2	0.4	6.62	1
		29	31	982	4.06	0.5	6.6	1.4
		29	31	1325	3.08	0.7	6.54	2.8
8/2/2001	1220	30	31	1870	6.1	1	6.81	surface
		29	31	2910	4.15	1.6	6.87	1.9
		29	31	3020	4.29	1.6	6.88	3.9
8/16/2001	1015	29	28	2060	5.09	1.1	6.93	surface
		29	28	2140	5.13	1.1	6.95	1.7
		29	28	2120	5.23	1.1	6.99	3.3
8/21/2001	1000	27	27	632	3.54	0.3	6.22	surface
		26	27	622	3.17	0.3	6.29	1.4
		26	27	762	2.77	0.6	6.47	2.7
9/20/2001	1155	27	28	1660	4.81	0.8	6.82	surface
9/28/2001	925	22	16	2200	4.84	1.2	6.57	surface
		23	16	2240	4.66	1.3	6.6	1.2
		25	16	7400	4.66	2.5	6.87	2.5
10/15/2001	1150	23	25	9380	4.31	5.4	6.42	surface
		23	25	11170	3.39	6.4	6.55	1.8
		24	25	17850	1.41	10.7	6.63	3.7
11/7/2001	1215	20	27	7230	8.52	4.1	7.02	surface
		18	27	8780	6.19	4.9	6.92	1.6
		21	27	21000	3.16	13.6	6.96	3.1
11/14/2001	1050	19	17	8400	7.49	4.9	6.98	surface
		19	17	11110	3.87	6.4	6.88	1.9
		21	17	26750	2.02	16.6	6.83	3.7
12/17/2001	1220	19	21	3030	5.23	1.6	6.82	surface
		19	21	3080	5.08	1.7	6.81	1.5
		18	21	3270	5.49	1.8	6.83	3
1/9/2002	1050	8	16	1440	9.61	0.8	6.38	surface
		8	16	1650	8.87	0.8	6.36	1.3
		7	16	2090	8.38	1.1	6.33	2.6

STATION BSW 11 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^{0}C	Air Temp. ^{0}C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
2/26/2002	1145	15	12	740	7.34	0.4	6.65	surface
		14	12	720	7.1	0.4	6.67	1
		14	12	720	7.49	0.4	6.77	2
3/13/2002	1020	15	14	631	9.47	0.31	8.41	surface
		15	14	598	7.6	0.29	7.44	1
		15	14	849	6.55	0.42	6.95	2
		15	14	946	6.21	0.47	6.9	4
4/11/2002	1045	21	22	290	5.71	0.1	6.42	surface
		20	22	350	4.8	0.2	6.52	1.9
		19	22	550	2.26	0.3	6.66	3.9
5/7/2002	1120	29	32	2260	7.12	1.2	7	surface
		29	32	2240	6.68	1.2	6.95	1.6
		29	32	2520	3.52	1.4	6.63	3.3
7/31/2002	1100	28	31	817	6.17	0.4	6.36	surface
		28	31	837	4.03	0.4	6.32	1.5
		27	31	877	2.58	0.5	6.41	2.9
8/15/2002	1025	30	30	6910	7.28	3.8	7.12	surface
		30	30	7120	6.22	4	6.99	1.7
		30	30	7740	2.82	4.3	6.63	3.5
9/19/2002	1105	30	31	10610	6.34	6	7.21	surface
		29	31	12060	5.79	6.9	7.04	1.9
		29	31	13320	3.92	7.7	6.73	2.9
	Average	24	25	3871	5.17	2.2	6.75	
	Maximum	30	32	26750	9.61	16.6	8.41	
	Minimum	7	12	273	1.41	0.1	6.22	

STATION BSW 12 FIELD PARAMETERS

Date	Time	H20 Temp.	Air Temp.	Sp. Cond.	D.O.	Salinity	pH	Depth
dd/mm/yy		^{0}C	^{0}C	uS/cm	ppm	ppt	s.u.	m
5/30/2001	1015	28	30	125	7.74	0.1	6.52	surface
		28	30	333	7.26	0.2	7.45	0.5
		28	30	335	7.09	0.2	7.4	1
		28	30	368	6.92	0.2	7.37	1.5
		28	30	360	6.89	0.2	7.36	2
		28	30	437	6.83	0.2	7.35	2.5
		28	30	412	6.78	0.2	7.35	3
		28	30	477	6.72	0.2	7.33	4
		28	30	480	6.72	0.2	7.33	5
		28	30	492	6.58	0.2	7.33	6.1
6/19/2001	1140	28	27	511	6.1	0.3	7.04	surface
		28	27	529	5.71	0.3	7.01	1
		28	27	685	5.37	0.4	6.99	3
		27	27	1349	5.23	0.7	6.93	6.1
7/3/2001	940	30	28	2890	6.91	1.6	7.33	surface
		30	28	3130	6.68	1.6	7.32	1
		30	28	5050	5.97	2.6	7.25	2.2
		29	28	19840	3.36	12.1	7.1	4.4
7/16/2001	1155	31	32	3140	7.82	1.7	7.74	surface
				3270	7.64	1.8	7.7	1
				5950	6.1	3.8	7.57	2.5
				23920	2.33	14.4	7.33	4.9
8/2/2001	1210	31	31	5760	7.22	3.3	7.81	surface
		30	31	22680	2.06	14	7.47	2.8
		29	31	32430	0.59	20.2	7.45	5.7
8/16/2001	1030	30	29	3730	6.4	2	7.41	surface
		30	29	4930	5.92	2.6	7.42	1
		30	29	14360	4.1	8.4	7.39	2.7
		29	29	31150	1.98	19.3	7.43	4.5
8/21/2001	1015	29	28	2300	5.73	1.2	7.05	surface
		29	28	2810	5.15	1.5	7.04	1.9
		30	28	13630	3.53	11.4	7.08	3.7
9/20/2001	1140	28	27	2045	5.81	1.1	7.17	surface
9/28/2001	940	24	17	6370	6.5	3.5	7.53	surface
		25	17	6940	6.17	3.8	7.54	1
		27	17	26820	2.85	16.1	7.63	2.2
		27	17	36360	0.89	23.1	7.59	4.4
10/15/2001	1205	25	25	1840	6.86	1.1	7.28	surface
		24	25	2350	6.25	1.3	7.17	1.5
		24	25	3640	5.42	1.8	7.02	3
		24	25	12740	2.25	7.3	6.57	6.1
11/7/2001	1230	21	26	10250	7.53	5.9	7.34	surface
		20	26	11880	7.47	6.8	7.34	1.4
		20	26	15370	6.74	9	7.41	2.7
		21	26	43500	4.18	27.9	7.78	5.3

STATION BSW 12 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
11/14/2001	1105	21	17	2930	8.68	1.6	7.49	surface
		20	17	8490	7.79	4.8	7.4	1.4
		19	17	12560	6.96	7.1	7.38	2.8
		21	17	36290	3.33	23.2	7.51	5.6
12/17/2001	1020	17	21	419	8.28	0.2	7.44	surface
		17	21	433	8.37	0.2	7.45	2.1
		17	21	465	8.64	0.2	7.48	4.1
1/9/2002	1105	9	16	838	10.8	0.4	6.85	surface
		8	16	1195	10.24	0.7	6.83	2.6
		9	16	2150	9.97	1.2	6.74	5.3
2/26/2002	1015	14	10	340	9.36	0.2	7.02	surface
		14	10	330	9.5	0.2	7.03	2.7
		14	10	320	9.92	0.2	7.04	5.4
3/13/2002	1040	14	14	378	9.88	0.18	8.58	surface
		14	14	377	9.03	0.18	7.75	1
		14	14	377	9.01	0.18	7.53	2
4/11/2002	1105	20	22	310	6.63	0.2	6.88	surface
		20	22	310	6.5	0.2	6.84	1
		20	22	310	6.34	0.2	6.85	2
5/7/2002	1150	27	31	280	7.5	0.1	7.44	surface
		27	31	280	7.42	0.1	7.42	1.6
		27	31	300	7.21	0.1	7.4	3.2
7/31/2002	1115	30	31	2040	7.71	1.1	7.48	surface
		31	31	15840	2.9	8.8	7.29	2.8
		30	31	34890	0.46	21.9	7.29	5.6
8/15/2002	1040	31	31	7370	6.14	4.1	7.49	surface
		31	31	10210	5.26	5.7	7.4	2
		31	31	23550	2.21	13	7.15	4.1
9/19/2002	1320	31	32	9580	8.77	5.4	7.99	surface
		30	32	18170	3.1	10.8	7.17	2.8
		29	32	31540	1.05	19.4	7.21	5.5
	Average	25	25	8037	6.18	4.74	7.31	
	Maximum	31	31	26750	9.61	16.6	8.41	
	Minimum	8	10	125	0.46	0.1	6.52	

STATION BSW 13 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^{0}C	Air Temp. ^{0}C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
5/30/2001	1040	28	30	98	8.05	0.1	7.1	surface
		28	30	272	7.03	0.1	7.46	0.5
		28	30	281	7.01	0.1	7.43	1
		28	30	292	6.98	0.1	7.42	1.5
		28	30	360	6.76	0.2	7.37	2
		28	30	371	6.73	0.2	7.37	2.5
		28	30	387	6.71	0.2	7.36	3
		28	30	412	6.67	0.2	7.35	4
		28	30	522	6.61	0.3	7.33	5
		27	30	1301	6.24	0.7	7.24	6
		27	30	5720	4.72	3.1	7.23	7.9
		25	30	33240	0.17	20.8	7.13	15.8
6/19/2001	1125	28	27	235	5.72	0.1	7.04	surface
		28	27	283	5.69	0.1	7.04	1
		28	27	464	5.47	0.2	7.12	3.3
		27	27	9790	4.45	5.7	6.82	6.6
7/3/2001	950	30	28	1660	7.07	0.8	7.43	surface
		30	28	1680	7.01	0.9	7.48	1
		29	28	10790	4.56	5.8	7.27	2.9
		28	28	29250	2.01	18.6	7.24	5.9
7/16/2001	1210	31	32	2140	8.33	1.3	8.01	surface
		31	32	2710	8.15	1.4	7.97	1
		30	32	16440	4.01	10.6	7.51	3.5
		28	32	39270	0.77	25	7.6	7
8/2/2001	1205	31	31	5200	7.24	2.9	7.86	surface
		29	31	32630	0.52	20.6	7.53	4.2
		29	31	35130	0.57	22.1	7.55	8.4
8/16/2001	1035	31	29	1630	6.83	1	7.5	surface
		30	29	2420	6.46	1.2	7.49	1
		30	29	2890	6.24	1.4	7.66	2.3
		29	29	34440	0.97	21.4	7.61	4.6
		29	29	38180	0.78	24.3	7.64	9.1
8/21/2001	1025	30	28	2940	7.2	1.7	7.51	surface
		30	28	3710	6	2	7.4	1
		30	28	8520	5.31	4.7	7.44	3
		29	28	33100	1.22	21.1	7.41	6.1
9/20/2001	1130	28	27	2212	5.72	1.1	7.02	surface
9/28/2001	955	26	17	6290	6.69	3.5	7.69	surface
		27	17	22840	3.86	13.4	7.69	1.8
		27	17	35400	1.34	22.5	7.71	3.6
		27	17	37400	1.08	23.7	7.72	7.1
10/15/2001	1215	24	26	720	7.03	0.4	7.42	surface
		24	26	871	7	0.5	7.42	1.7
		24	26	901	6.94	0.5	7.44	3.4
		24	26	14490	3.28	7.7	6.76	6.9

STATION BSW 13 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
11/7/2001	1240	21	27	8570	7.25	4.9	7.45	surface
		21	27	9920	7.14	5.6	7.49	1.7
		21	27	19010	6.24	11.5	7.58	3.4
		21	27	42920	4.91	27.7	7.87	6.8
11/14/2001	1115	20	18	2450	8.17	1.3	7.42	surface
		21	18	7170	7.31	3.9	7.48	1.5
		21	18	12430	6.65	7.4	7.51	2.9
		21	18	39690	5.24	25.5	7.8	5.7
1/9/2002	1110	9	17	424	10.8	0.2	7	surface
		9	17	1870	11.24	0.8	7.42	4.3
		11	17	20210	9.08	11	7.35	8.6
2/26/2002	945	14	11	220	9.98	0.1	7.17	surface
		14	11	240	9.97	0.1	7.17	3.8
		14	11	930	9.71	0.4	7.17	7.6
3/13/2002	1055	14	14	1189	10.78	0.56	8.05	surface
		14	14	1390	10.8	0.71	7.82	1
		13	14	1493	10.74	0.75	7.72	2
		13	14	1493	10.73	0.75	7.61	3
		13	14	1585	10.71	0.8	7.54	4
4/11/2002	1120	19	22	170	7.88	0.1	7.08	surface
		19	22	180	7.78	0.1	7.02	6
		19	22	180	7.82	0.1	7.02	12
5/7/2002	1200	27	31	190	7.55	0.1	7.42	surface
		27	31	190	7.46	0.1	7.57	1.5
		27	31	230	7.4	0.1	7.6	6.5
		24	31	34000	0.37	21.6	7.03	13.1
7/31/2002	1130	32	32	2940	7.05	1.6	7.68	surface
		30	32	34370	0.69	19.2	7.44	4.4
		30	32	40660	0.59	26.1	7.5	8.8
8/15/2002	1045	31	31	5830	6.89	3.2	7.82	surface
		30	31	33930	1.21	20.8	7.45	5.4
		29	31	41940	0.58	26.9	7.53	10.8
9/19/2002	1305	31	32	9640	8.19	5.5	7.86	surface
		28	32	35350	1.06	22.4	7.37	6.5
		28	32	36690	1.18	23.2	7.39	13
	Average	25	26	11620	5.88	6.96	7.44	
	Maximum	32	32	42920	11.24	27.7	8.05	
	Minimum	9	11	98	0.17	0.1	6.76	

STATION BSW 14 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^{0}C	Air Temp. ^{0}C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
5/30/2001	1115	29	30	243	8.36	0.1	7.81	surface
		28	30	227	8.05	0.1	7.75	0.5
		28	30	244	7.44	0.1	7.57	1
		28	30	264	7.09	0.1	7.47	1.5
		27	30	284	7.08	0.1	7.43	2
		27	30	293	6.79	0.1	7.4	2.5
		27	30	285	6.73	0.1	7.37	3
		27	30	327	6.55	0.2	7.34	4
		27	30	359	6.5	0.2	7.31	5
		27	30	380	6.4	0.2	7.31	6
		24	30	33460	0.28	20.9	7.05	10.9
6/19/2001	1115	28	26	177	6.62	0.1	7.13	surface
		28	26	177	6.34	0.1	7.1	1
		28	26	182	5.46	0.1	7.04	5.5
		28	26	192	5.62	0.1	7.1	10.9
7/3/2001	1050	30	28	1028	7.39	0.5	7.55	surface
		30	28	1152	6.97	0.6	7.58	1
		28	28	29560	1.29	17.9	7.24	5.7
		27	28	36890	0.46	23.4	7.31	11.4
7/16/2001	1220	32	32	474	9.18	0.2	8.54	surface
		31	32	652	8.32	0.3	8.21	1
		29	32	37340	0.37	23.7	7.59	5.8
		29	32	37680	0.44	23.9	7.56	11.5
8/2/2001	1155	32	31	2930	7.1	1.7	7.85	surface
		29	31	27550	1.03	16.9	7.42	4.4
		28	31	41300	0.38	26.1	7.36	8.9
8/16/2001	1045	31	29	1480	6.79	1	7.52	surface
		30	29	3230	6.03	1.8	7.47	1.5
		30	29	10890	4.36	5.7	7.45	2.9
		29	29	33850	0.77	21.3	7.48	5.9
8/21/2001	1040	30	28	601	7.49	0.3	7.57	surface
		30	28	717	6.29	0.4	7.56	1
		30	28	12930	3.92	7.9	7.38	4.9
		28	28	40710	0.34	26.4	7.2	9.7
9/20/2001	1025	28	26	748	6.31	0.4	6.42	surface
9/28/2001	1005	25	17	3930	7.46	2.3	7.75	surface
		27	17	8010	5.64	4.4	7.57	1
		27	17	28680	2.56	15.7	7.76	2.8
		28	17	35880	0.71	22.6	7.68	5.6
		28	17	36450	0.63	23.1	7.66	11.2
10/15/2001	1230	25	26	2650	5.97	1.4	7.01	surface
		24	26	2750	5.41	1.5	6.98	1
		24	26	3270	5.06	1.7	6.93	2.3
		24	26	5020	4.22	2.7	6.81	4.6
		24	26	6450	4.08	3.6	6.73	9.1

STATION BSW 14 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
11/7/2001	1250	21	27	8370	7.13	4.6	7.35	surface
		21	27	8740	7.09	4.9	7.4	1
		21	27	8840	7.03	5.1	7.49	2
		21	27	30380	5.09	19.5	7.73	4.1
		21	27	46090	4.31	30	7.82	8.2
11/14/2001	1130	21	19	5820	7.93	3.2	7.42	surface
		20	19	6730	7.39	3.7	7.39	1.6
		20	19	8530	6.62	4.6	7.47	3.2
		21	19	35850	5.11	22.8	7.66	6.3
12/17/2001	1110	17	22	228	8.24	0.1	7.37	surface
		17	22	228	8.26	0.1	7.37	1.5
		17	22	226	8.27	0.1	7.37	2.9
		17	22	227	8.32	0.1	7.38	5.9
		17	22	238	8.35	0.1	7.35	11.9
1/9/2002	1125	9	18	275	11.3	0.1	7.12	surface
		9	18	291	11.2	0.1	7.65	5
		9	18	1970	6.28	0.9	6.92	10
2/26/2002	1030	14	10	170	10.04	0.1	7.21	surface
		14	10	180	10.14	0.1	7.21	2.4
		14	10	180	10.6	0.1	7.23	4.8
3/13/2002	1115	14	14	190	10.78	0.09	8.64	surface
		14	14	189	10.77	0.09	8.31	1
		14	14	188	10.73	0.09	8.14	2
		14	14	189	10.67	0.09	8.01	3
		14	14	197	10.65	0.09	7.91	4
4/11/2002	1135	19	22	180	7.62	0.1	7.05	surface
		19	22	170	7.6	0.1	7.04	3
		19	22	170	7.6	0.1	7.05	6.1
5/7/2002	1225	28	32	190	7.4	0.1	7.48	surface
		27	32	190	7.17	0.1	7.41	1.5
		27	32	200	7.08	0.1	7.4	2.9
		27	32	200	7.07	0.1	7.4	5.8
7/31/2002	1150	31	31	1085	7.62	0.6	7.84	surface
		30	31	29340	0.91	17.6	7.32	3.7
		30	31	42080	0.89	27	7.38	7.4
8/15/2002	1100	31	31	3430	7.63	1.9	7.68	surface
		31	31	24680	1.68	14.9	7.26	4.3
		29	31	41480	0.83	26.9	7.34	8.6
9/19/2002	1245	31	32	6530	8.59	3.7	8.06	surface
		29	32	33130	0.86	20.7	7.22	5.2
		28	32	34330	2.22	21.6	7.24	10.4
	Average	24	25	10160	6.02	6.12	7.45	
	Maximum	32	32	46090	11.3	30	8.64	
	Minimum	9	10	170	0.28	0.09	6.42	

STATION BSW 15 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^{0}C	Air Temp. ^{0}C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
5/30/2001	1155	29	30	242	7.55	0.1	7.61	surface
		29	30	226	7.42	0.1	7.58	0.5
		28	30	223	7.31	0.1	7.55	1
		28	30	220	7.22	0.1	7.53	1.5
		28	30	220	7.19	0.1	7.52	2
		28	30	219	7.14	0.1	7.51	2.5
		28	30	219	7.12	0.1	7.5	3
		28	30	218	7.12	0.1	7.5	4
		28	30	218	7.09	0.1	7.5	5.3
6/19/2001	1035	28	27	167	5.93	0.1	7.1	surface
		28	27	168	5.83	0.1	7.09	1
		28	27	169	5.82	0.1	7.09	3.2
		28	27	171	5.84	0.1	7.07	6.4
7/3/2001	1015	30	28	244	7.19	0.1	7.41	surface
		30	28	239	6.99	0.1	7.38	1
		30	28	239	6.96	0.1	7.37	2.8
		30	28	235	6.99	0.1	7.35	5.7
7/16/2001	1250	33	32	270	8.24	0.1	8.01	surface
		32	32	258	8.21	0.1	7.98	1
		32	32	262	7.68	0.1	7.8	2.7
		31	32	255	6.83	0.1	7.65	5.4
8/2/2001	1135	32	30	211	7.66	0.1	7.72	surface
		32	30	212	6.2	0.1	7.44	2.9
		32	30	216	6.14	0.1	7.4	5.8
8/16/2001	1110	31	28	362	6.63	0.2	7.43	surface
		31	28	366	6.61	0.2	7.43	1.5
		31	28	373	6.63	0.2	7.43	2.9
		31	28	377	6.72	0.2	7.43	5.9
8/21/2001	1115	31	28	313	7.4	0.2	7.57	surface
		31	28	309	7.37	0.2	7.57	1
		31	28	311	7.23	0.2	7.54	2.7
		31	28	318	7.36	0.2	7.55	5.5
9/20/2001	1105	29	26	246	6.23	0.11	6.97	surface
9/28/2001	1040	27	19	655	7.44	0.3	7.65	surface
		27	19	633	7.05	0.3	7.57	1.0
		26	19	667	6.74	0.3	7.55	3.0
		27	19	6320	4.52	3.6	7.11	6.0
10/15/2001	1330	24	27	312	7.16	0.2	7.49	surface
		24	27	305	7.15	0.2	7.5	1.4
		24	27	310	7.19	0.2	7.5	2.8
		24	27	319	7.88	0.2	7.51	5.6
11/7/2001	1320	23	26	2450	7.51	1.3	7.38	surface
		23	26	2790	7.31	1.5	7.37	1.3
		22	26	3580	7.06	2	7.35	2.6
		22	26	23940	3.52	15.1	6.91	5.1

STATION BSW 15 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^{0}C	Air Temp. ^{0}C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
11/14/2001	1200	21	20	4160	7.76	2.3	7.39	surface
		21	20	4240	7.73	2.3	7.4	1.4
		21	20	4490	7.39	2.4	7.4	2.8
		21	20	27400	2.67	17.3	6.9	5.5
12/17/2001	1140	16	22	172	8.58	0.1	7.49	surface
		16	22	174	8.58	0.1	7.49	1.5
		16	22	172	8.65	0.1	7.49	2.9
		16	22	173	8.97	0.1	7.47	5.9
1/9/2002	1155	9	17	229	11.6	0.1	7.16	surface
		9	17	221	11.6	0.1	7.19	2.8
		9	17	230	11.5	0.1	7.19	5.5
2/26/2002	1100	14	12	160	10.46	0.1	7.26	surface
		14	12	160	10.56	0.1	7.28	2.6
		14	12	170	11.03	0.1	7.31	5.2
3/13/2002	1150	14	14	186	10.92	0.09	8.6	surface
		13	14	177	10.86	0.08	8.13	3.0
4/11/2002	1215	19	22	160	8.02	0.1	7.09	surface
		19	22	160	7.92	0.1	7.03	3.0
		19	22	160	7.99	0.1	7.04	6.0
5/7/2002	1300	27	32	180	7.97	0.1	7.45	surface
		27	32	180	7.8	0.1	7.43	1.5
		27	32	180	7.81	0.1	7.42	3.1
		27	32	170	7.84	0.1	7.43	6.2
7/31/2002	1230	33	31	392	6.85	0.2	7.49	surface
		32	31	378	5.82	0.2	7.31	2.5
		32	31	391	6.24	0.2	7.28	5
8/15/2002	1130	33	31	1115	6.24	0.6	7.53	surface
		32	31	1500	5.18	0.8	7.37	2.3
		31	31	10800	1.38	6.2	6.73	4.7
9/19/2002	1150	32	32	907	6.42	0.4	7.52	surface
		30	32	5640	3.72	3.2	6.96	2.7
		30	32	11910	1.64	6.8	6.68	5.4
	Average	26	26	1653	7.25	0.94	7.41	
	Maximum	33	32	27400	11.6	17.3	8.6	
	Minimum	9	12	160	1.38	0.08	6.68	

STATION BSW 16 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
11/7/2001	1155	21	27	6140	8.69	3.4	7.02	surface
		20	27	6510	8.97	3.5	7.06	0.5
		20	27	7330	9.15	3.9	7.1	0.8
		20	27	8120	8.68	4.5	7.09	1.2
		20	27	10010	7.33	5.6	7.06	1.5
		21	27	12200	5.62	7	7.01	1.8
		21	27	13210	5.47	7.6	6.98	2.1
		21	27	15060	3.32	8.7	6.96	2.4
		21	27	19220	3.61	11.1	6.88	2.7
		21	27	20210	3.14	12.1	7.02	3.0
		21	27	22530	3.34	13.6	7.09	3.3
		21	27	24970	3.68	15.1	7.18	3.6
		21	27	26560	3.85	16.6	7.2	3.9
		21	27	28740	3.67	17.4	7.26	4.2
		21	27	29730	3.84	18.3	7.34	4.5
		21	27	29730	5.59	18.5	7.25	4.8
11/14/2001	1250	21	21	8380	8.68	4.7	7.12	surface
		21	21	8450	8.62	4.7	7.11	0.5
		20	21	9330	7.55	5.1	7.09	1.0
		20	21	10600	6.06	6.1	6.95	1.5
		21	21	13090	3.43	7.6	6.81	2.0
		21	21	15900	1.2	9.2	6.75	2.5
		21	21	23810	1.06	14.1	6.83	3.0
		21	21	27700	1.6	17.2	7.03	3.5
		21	21	30150	1.91	18.7	7.16	4.0
		21	21	30970	2.07	19.1	7.21	4.5
		21	21	31590	2.28	19.7	7.26	5.0
		21	21	31590	2.24	19.7	7.29	5.3
12/11/2001	1345	18	14	4660	7.54	2.6	6.6	surface
		18	14	4670	6.95	2.6	6.64	0.5
		18	14	4670	6.73	2.6	6.65	1.0
		18	14	4700	6.65	2.6	6.65	1.5
		18	14	4750	6.29	2.6	6.64	2.0
		18	14	4770	6.23	2.6	6.64	2.5
		18	14	4780	6.2	2.6	6.65	3.0
		18	14	4830	5.7	2.6	6.62	3.5
		18	14	5070	5.54	2.8	6.6	4.0
		18	14	5130	5.19	2.8	6.58	4.5
1/9/2002	1040	9	15	1128	9.62	0.6	6.33	surface
		8	15	1214	9.56	0.6	6.21	0.5
		8	15	1286	9.46	0.7	6.18	1.0
		8	15	1510	9.2	0.8	6.13	1.5
		8	15	1730	9.04	0.9	6.12	2.0
		8	15	1830	8.73	0.9	6.17	2.5
		8	15	1910	8.72	1	6.16	3.0

STATION BSW 16 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
1/9/2002		8	15	2020	8.56	1	6.17	3.5
		8	15	1980	8.7	1	6.15	4.0
		8	15	2050	8.38	1	6.18	4.5
		8	15	1990	8.36	1	6.18	5.0
2/26/2002	1155	15	12	410	9.04	0.2	6.72	surface
		15	12	410	8.64	0.2	6.57	0.5
		15	12	420	8.38	0.2	6.51	1.0
		15	12	420	8.24	0.2	6.45	1.5
		15	12	430	8.19	0.2	6.44	2.0
		15	12	420	8.16	0.2	6.42	2.5
		15	12	430	8.15	0.2	6.42	3.0
		15	12	420	8.12	0.2	6.41	3.5
		15	12	420	8.1	0.2	6.41	4.0
4/11/2002	1025	21	21	260	5.64	0.1	6.39	surface
		21	21	270	5.59	0.1	6.24	0.5
		21	21	260	5.58	0.1	6.22	1.0
		20	21	270	5.18	0.1	6.21	1.5
		20	21	280	5.01	0.1	6.2	2.0
		20	21	280	4.71	0.1	6.19	2.5
		20	21	280	4.64	0.1	6.17	3.0
		20	21	270	4.49	0.1	6.15	3.5
		20	21	260	4.5	0.1	6.14	4.0
		20	21	260	4.36	0.1	6.14	4.5
		20	21	270	4.3	0.1	6.13	5.0
5/7/2002	1105	29	31	2350	6.47	1.3	6.88	surface
		29	31	2330	6.03	1.2	6.84	0.5
		28	31	2350	5.53	1.2	6.81	1.0
		28	31	2410	4.94	1.3	6.73	1.5
		28	31	2470	4.59	1.3	6.69	2.0
		28	31	2490	4.41	1.3	6.67	2.5
		28	31	2510	4.34	1.3	6.65	3.0
		28	31	2540	3.51	1.4	6.58	3.5
		27	31	2600	2.22	1.4	6.49	4.0
		27	31	2650	1.88	1.5	6.46	4.5
		27	31	2800	1.54	1.4	6.45	5.0
6/11/2002	1320	31	32	5900	5.92	3.2	7	surface
		30	32	6210	5.62	3.4	6.96	0.6
		29	32	6400	4.85	3.6	6.93	0.9
		29	32	6510	4.8	3.6	6.92	1.2
		29	32	6540	4.84	3.6	6.93	1.5
		29	32	6540	4.81	3.6	6.93	1.8
		29	32	6550	4.82	3.7	6.93	2.1
		29	32	6600	4.56	3.7	6.91	2.4
		29	32	6630	4.46	3.7	6.91	2.7
		29	32	6700	4.35	3.7	6.91	3.0

STATION BSW 16 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
6/11/2002		29	32	6750	4.25	3.8	6.9	3.3
		29	32	6760	4.25	3.8	6.91	3.6
		29	32	6850	4.23	3.8	6.91	4.2
6/12/2002	1050	30	32	4520	7.02	2.5	6.73	surface
		30	32	4490	5.28	2.5	6.73	0.4
		30	32	4550	5.09	2.5	6.72	0.7
		30	32	4580	4.98	2.5	6.72	1.0
		30	32	4590	4.83	2.5	6.72	1.3
		29	32	4710	4.35	2.6	6.69	1.6
		29	32	4710	4.31	2.6	6.69	1.9
		29	32	4770	4.22	2.6	6.7	2.2
		29	32	4850	4.19	2.6	6.7	2.5
		29	32	4820	4.11	2.7	6.7	2.8
		29	32	4810	4.07	2.6	6.69	3.1
		29	32	4870	3.95	2.7	6.68	3.4
		29	32	4750	3.9	2.7	6.68	3.7
		29	32	4840	3.86	2.7	6.67	4.0
		29	32	4860	3.85	2.7	6.68	4.3
		29	32	4910	3.84	2.7	6.68	4.6
		29	32	4850	3.82	2.7	6.68	4.9
6/12/2002	1350	31	34	5900	7.93	3.3	7.1	surface
		31	34	5940	7.57	3.3	7.12	0.4
		31	34	6010	7.4	3.3	7.13	0.7
		31	34	6060	6.81	3.3	7.06	1.0
		30	34	6140	6.05	3.4	6.97	1.3
		30	34	6110	5.82	3.4	6.96	1.6
		30	34	6220	5.32	3.4	6.94	1.9
		30	34	6150	5.17	3.4	6.93	2.2
		30	34	6180	5.23	3.4	6.92	2.5
		30	34	6260	4.97	3.5	6.91	2.8
		30	34	6240	4.77	3.5	6.9	3.1
		30	34	6320	4.75	3.5	6.9	3.4
		30	34	6310	4.63	3.5	6.9	4.6
		30	34	6380	4.64	3.5	6.9	4.9
		30	34	6530	4.58	3.6	6.9	5.2
		29	34	6400	4.28	3.5	6.89	5.5
6/13/2002	1000	30	31	2640	4.76	2.3	6.72	surface
		30	31	4270	4.49	2.3	6.69	0.4
		30	31	4300	4.58	2.3	6.7	0.7
		30	31	4250	4.55	2.4	6.7	1.0
		30	31	4320	4.44	2.3	6.69	1.3
		30	31	4260	4.23	2.3	6.68	1.6
		30	31	4320	4.14	2.4	6.67	1.9
		29	31	4270	4.03	2.4	6.66	2.2
		29	31	4340	4.01	2.4	6.66	2.5

STATION BSW 16 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^{0}C	Air Temp. ^{0}C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
6/13/2002		29	31	4320	3.99	2.4	6.66	2.8
		29	31	4310	3.99	2.4	6.66	3.1
		29	31	4380	3.97	2.4	6.66	3.4
		29	31	4310	3.95	2.4	6.66	4.6
		29	31	4380	3.92	2.4	6.66	4.9
		29	31	4380	3.9	2.4	6.66	5.2
		29	31	4330	3.89	2.4	6.66	5.5
		29	31	4280	3.92	2.3	6.66	5.8
		29	31	4320	3.91	2.4	6.66	6.1
		29	31	4230	3.76	2.3	6.66	6.4
8/15/2002	1220	31	32	5750	7.22	3.2	6.94	surface
		31	32	5750	7.19	3.4	6.95	0.4
		31	32	6160	6.51	3.5	6.88	0.7
		31	32	6180	6.47	3.5	6.87	1.0
		30	32	6540	6.13	3.6	6.81	1.3
		30	32	6670	6.12	4.1	6.79	1.6
		30	32	7360	4.27	4.1	6.76	1.9
		30	32	7260	4.49	4	6.78	2.2
		30	32	7470	3.9	4.1	6.71	2.5
		30	32	7430	4.05	4.2	6.71	2.8
		30	32	7830	2.62	4.3	6.68	3.1
		30	32	8150	1.89	4.6	6.59	3.4
		30	32	8390	1.59	4.7	6.56	3.7
		30	32	8260	1.84	4.6	6.59	4.0
		30	32	8420	1.46	4.7	6.56	4.3
		30	32	8450	1.36	4.7	6.56	4.6
		30	32	8480	1.21	4.8	6.55	4.9
		30	32	8820	0.63	5	6.55	5.2
9/19/2002	1040	30	30	11180	6.39	6.4	7.13	surface
		30	30	11510	5.78	6.6	7.07	0.4
		30	30	11710	5.68	6.7	7.05	0.7
		30	30	11660	5.84	6.7	7.07	1.0
		30	30	11670	5.9	6.7	7.08	1.3
		30	30	12420	5.54	7.1	7.01	1.6
		29	30	12540	5.47	7.2	7	1.9
		29	30	12410	5.3	7.4	7.01	2.2
		29	30	13640	3.88	7.8	6.85	2.5
		29	30	14830	2.17	8.6	6.71	2.8
		29	30	15600	0.96	9.3	6.64	3.1
		29	30	16630	0.69	9.7	6.67	3.7
	Average	25	27	6158	5	3.5	6.67	
	Maximum	31	34	31590	9.62	19.7	7.34	
	Minimum	8	12	260	0.63	0.1	6.01	

STATION BSW 18 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
11/7/2001	1110	20	25	5280	8.36	2.9	6.92	surface
		20	25	5260	8.34	2.9	7	0.5
		20	25	6380	8.5	2.9	7.1	0.8
		20	25	8310	8.78	5	7.09	1.1
		21	25	9860	7.52	5.5	7.05	1.4
		21	25	10700	6.32	6.1	7.01	1.7
		21	25	14270	5.68	7.1	6.98	2
		22	25	16520	0.59	9.6	6.81	2.3
		22	25	18310	0.59	10.8	6.76	2.6
		22	25	19050	0.77	11.2	6.77	2.9
		22	25	20290	2.87	12.1	6.95	3.2
		21	25	22790	3.65	13.6	7.11	3.5
		21	25	25700	3.71	15.9	7.16	3.8
		21	25	26170	3.38	16	7.2	4.1
		21	25	26630	3.55	16.4	7.17	4.4
11/14/2001	1310	20	20	7800	9.26	4.4	7.01	surface
		20	20	7800	8.1	4.4	7.01	0.5
		20	20	8100	7.65	4.6	6.99	1
		20	20	9380	5.88	5.3	6.88	1.5
		21	20	11060	2.72	6.3	6.77	2
		22	20	17360	0.49	11.6	6.7	2.5
		22	20	20430	0.41	12.2	6.79	3
		21	20	23870	1.06	14.5	6.9	3.5
		21	20	27960	0.71	17.3	6.98	3.9
12/11/2001	1210	17	15	4380	8.59	2.4	6.61	surface
		17	15	4400	8.07	2.4	6.69	0.6
		17	15	4420	7.82	2.4	6.72	1
		17	15	4400	7.71	2.4	6.74	1.5
		17	15	4400	7.63	2.4	6.75	2
		17	15	4420	7.47	2.4	6.74	2.5
		18	15	4720	5.01	2.6	6.7	3
		20	15	18890	0.56	12	6.58	3.5
		21	15	20340	0.47	12.2	6.61	3.9
1/9/2002	1015	8	14	725	9.8	0.4	6.26	surface
		10	14	728	9.67	0.4	6.07	0.5
		8	14	733	9.56	0.4	6.03	1
		8	14	950	9.54	0.5	6.05	1.5
		8	14	1820	8.59	0.9	6.04	2
		9	14	2050	8.45	1.1	6.1	2.5
		10	14	3340	5.53	1.7	6.11	2.8
2/26/2002		15	12	440	9.85	0.2	6.6	surface
		15	12	440	9	0.2	6.52	0.5
		15	12	430	8.92	0.2	6.5	1
		15	12	460	8.88	0.2	6.48	1.5
		15	12	480	8.67	0.2	6.48	2

STATION BSW 18 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
		15	12	550	8.11	0.3	6.41	2.5
		14	12	710	7.29	0.4	6.33	3
		14	12	760	6.87	0.4	6.32	3.5
4/11/2002	950	21	20	230	6.25	0.1	6.23	surface
		21	20	230	6.12	0.1	6.21	0.5
		21	20	230	6.03	0.1	6.2	1
		21	20	230	5.71	0.1	6.18	1.5
		20	20	230	4.9	0.1	6.11	2
		19	20	110	5.22	0	6.01	2.5
		19	20	130	4.58	0.1	5.92	3
		19	20	150	4.09	0.1	5.88	3.5
5/7/2002	1030	29	30	2440	7.46	1.3	6.84	surface
		29	30	2440	7.79	1.3	6.9	0.5
		29	30	2440	6.71	1.3	6.8	1
		29	30	2450	6.08	1.3	6.68	1.5
		29	30	2480	6.2	1.3	6.72	2
		29	30	2490	5.44	1.3	6.67	2.5
		28	30	2490	5.1	1.3	6.64	3
		27	30	2910	3.13	1.5	6.44	3.5
		26	30	3700	0.18	2	6.39	4
6/11/2002	1225	30	31	2820	5.82	1.5	6.76	surface
		29	31	2760	6.4	1.5	6.74	0.6
		28	31	2630	5.6	1.4	6.76	0.9
		28	31	3040	5.15	1.6	6.65	1.2
		30	31	3040	5.15	1.6	6.66	1.5
		28	31	3350	5.17	1.8	6.68	1.8
		28	31	3830	4.73	2.1	6.67	2.1
		28	31	4220	4.31	2.3	6.68	2.4
		28	31	4410	3.83	2.4	6.68	2.7
		28	31	4630	3.25	2.6	6.65	3
		28	31	4800	3.08	2.6	6.65	3.3
		28	31	5900	2.37	3.1	6.7	3.6
6/12/2002	950	29	30	2420	4.19	1.3	6.5	surface
		29	30	2370	3.99	1.3	6.49	0.4
		28	30	2330	4.3	1.2	6.48	0.7
		28	30	2550	4.24	1.4	6.51	1
		28	30	2820	4.34	1.5	6.52	1.3
		28	30	3020	4.1	1.7	6.53	1.6
		28	30	3270	3.8	1.8	6.53	1.9
		28	30	3470	3.65	1.9	6.53	2.2
		28	30	3510	3.41	1.9	6.53	2.5
		29	30	4660	2.72	2.5	6.55	2.8
		29	30	4660	2.55	2.6	6.56	3.1
		29	30	4820	2.39	2.6	6.56	3.4
		29	30	4780	2.2	2.6	6.56	3.7

STATION BSW 18 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^{0}C	Air Temp. ^{0}C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
6/12/2002	1430	32	35	3160	7.08	1.7	6.85	surface
		32	35	3150	6.76	1.7	6.83	0.4
		31	35	3460	7.2	2	6.86	0.7
		31	35	3890	6.86	2.1	6.82	1
		30	35	4100	5.5	2.2	6.81	1.3
		29	35	4150	4.54	2.3	6.7	1.6
		29	35	4190	4.05	2.3	6.68	1.9
		29	35	4260	3.79	2.3	6.66	2.2
		29	35	4330	3.42	2.4	6.66	2.5
		29	35	4390	3.47	2.4	6.67	2.8
		29	35	4420	3.42	2.4	6.67	3.1
		29	35	4390	3.3	2.4	6.66	3.4
		29	35	4700	2.47	2.6	6.64	3.7
6/13/2002	925	29	30	2400	6.52	1.3	6.56	surface
		29	30	2410	5.09	1.3	6.53	0.4
		29	30	2300	4.42	1.2	6.52	0.7
		29	30	2310	4.35	1.3	6.5	1
		29	30	2510	4.14	1.5	6.5	1.3
		29	30	2930	3.55	1.6	6.49	1.6
		29	30	3820	2.68	2.2	6.51	1.9
		29	30	4050	2.56	2.2	6.51	2.2
		29	30	4180	2.3	2.3	6.52	2.5
		29	30	4360	1.99	2.4	6.52	2.8
		29	30	4650	1.72	2.5	6.52	3.1
7/31/2002		28	30	616	5.9	0.3	6.59	surface
		28	30	606	5.3	0.3	6.35	0.4
		28	30	593	5.15	0.3	6.31	0.7
		28	30	598	4.82	0.3	6.29	1
		28	30	597	4.41	0.3	6.27	1.3
		28	30	653	3.52	0.3	6.23	1.6
		27	30	683	2.82	0.4	6.16	1.9
		27	30	572	2.14	0.3	6.11	2.2
		26	30	509	2.04	0.3	6.03	2.5
		26	30	459	1.82	0.3	5.98	2.8
		26	30	449	1.68	0.2	5.92	3.1
		25	30	657	0.63	0.3	5.89	3.4
		25	30	1144	0.4	0.5	5.99	3.7
		25	30	2080	0.37	1.1	6.16	4
8/15/2002	1240	31	32	5190	6.64	2.9	6.82	surface
		31	32	5190	6.6	2.9	6.83	0.4
		31	32	5210	6.53	2.9	6.82	0.7
		31	32	5200	6.51	2.9	6.81	1
		30	32	5540	6.11	3.1	6.79	1.3
		30	32	5930	5.8	3.3	6.79	1.6
		30	32	7320	3.67	3.9	6.77	1.9

STATION BSW 18 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
8/15/2002		30	32	7570	2.27	4.2	6.63	2.2
		30	32	7720	2.06	4.3	6.55	2.5
		30	32	7990	0.69	4.4	6.5	2.8
		29	32	8300	0.53	4.8	6.48	3.1
		29	32	10520	0.49	5.8	6.45	3.4
		29	32	16590	0.46	9.4	6.65	3.7
		28	32	17210	0.44	9.9	6.7	4
		28	32	19980	0.48	12	6.8	4.3
		28	32	19980	0.45	11.9	6.8	4.6
9/19/2002	1025	29	30	11600	6.97	6.7	6.82	surface
		29	30	11920	7.18	6.8	6.89	0.4
		29	30	11960	7.05	6.8	6.9	0.7
		29	30	12100	6.72	6.9	6.89	1
		29	30	12410	6.34	7.1	6.89	1.3
		29	30	12480	6.15	7.2	6.89	1.6
		29	30	12760	5.75	7.3	6.85	1.9
		29	30	13010	4.87	7.5	6.78	2.2
		29	30	13730	2.09	7.6	6.7	2.5
		29	30	14710	1.1	8.6	6.57	2.8
		29	30	15960	0.79	9.2	6.58	3.1
								3.2
	Average	25	27	6236	4.71	3.57	6.6	
	Maximum	32	27	31590	9.62	19.7	7.34	
	Minimum	8	12	110	0.18	0	5.88	

STATION BSW 19 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
11/14/2001	1005	17	15	1316	7.82	0.7	6.42	surface
		18	15	3930	6.31	2.1	6.55	0.5
		19	15	7690	2.04	4.3	6.42	1
		21	15	9570	1.35	5.4	6.43	1.5
		22	15	13550	0.64	7.7	6.48	2
		22	15	19440	0.48	11.4	6.67	2.5
		22	15	20180	0.48	12	6.74	3
		22	15	20740	0.47	12.4	6.77	3.5
		22	15	20870	0.46	12.5	6.78	4
		22	15	20990	0.45	12.5	6.78	4.5
		22	15	21000	0.45	12.5	6.79	4.9
12/11/2001	1150	16	15	1339	8.66	0.7	6.42	surface
		16	15	1361	7.74	0.7	6.36	0.5
		17	15	3030	5.91	1.5	6.28	1
		18	15	4120	4.95	2.2	6.3	1.5
		19	15	4420	4.49	2.4	6.34	2
		19	15	4810	3.74	2.7	6.33	2.5
		19	15	6160	1.67	3.2	6.24	3
		20	15	16060	0.57	11.5	6.47	3.5
								3.7
1/9/2002	1000	8	15	276	10.1	0.1	6.21	surface
		8	15	273	10.2	0.1	5.79	0.5
		8	15	272	10.1	0.1	5.73	1
		8	15	284	10.1	0.1	5.74	1.5
		9	15	422	9.4	0.2	5.76	2
		11	15	3100	4.42	1.7	5.84	2.5
		12	15	4570	2.28	2.5	5.94	3
		14	15	5380	1.26	3.7	6.17	3.5
								3.6
2/26/2002	1230	15	13	110	9.04	0	6.49	surface
		15	13	110	9.09	0	6.49	0.5
		15	13	110	9.06	0	6.49	1
		15	13	110	9	0	6.45	1.5
		15	13	120	8.78	0.1	6.38	2
		14	13	130	8.61	0.1	6.31	2.5
		14	13	140	8.31	0.1	6.18	3
		14	13	240	8.59	0.1	6.06	3.5
		14	13	310	7.58	0.1	6.53	3.8
4/11/2002	930	21	20	90	7.45	0	6.24	surface
		21	20	90	7.34	0	6.25	0.5
		21	20	90	7.24	0	6.21	1
		21	20	100	6.93	0	6.2	1.5
		20	20	80	6.35	0	6.15	2
		20	20	80	6.43	0	6.08	2.5
		19	20	70	6.31	0	5.97	3

STATION BSW 19 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^{0}C	Air Temp. ^{0}C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
		19	20	70	6.3	0	5.88	3.5
		18	20	80	6.33	0	5.87	4
		18	20	80	6.3	0	5.85	4.5
		18	20	90	6.29	0	5.84	5
		18	20	90	6.14	0	5.87	5.5
								5.7
5/7/2002	1000	29	31	1860	5.61	1	6.46	surface
		29	31	1840	5.26	1	6.46	0.5
		28	31	1830	5	1	6.43	1
		28	31	1810	4.07	1	6.39	1.5
		28	31	2020	2.8	1	6.32	2
		27	31	2190	0.68	1.1	6.26	2.5
		26	31	2500	0.14	1.3	6.26	3
		25	31	2810	0.13	1.5	6.31	3.5
		24	31	3560	0.13	2	6.38	4
		24	31	4180	0.13	2.3	6.43	4.5
		23	31	4700	0.12	2.6	6.47	5
		23	31	5150	0.12	2.9	6.53	5.5
6/11/2002	1150	28	31	683	4.49	0.3	6.46	surface
		28	31	671	4.2	0.3	6.37	0.4
		27	31	680	3.49	0.3	6.33	0.7
		27	31	763	3.32	0.4	6.31	1
		27	31	771	2.85	0.4	6.29	1.3
		27	31	776	2.13	0.4	6.28	1.6
		27	31	1249	0.89	0.6	6.24	1.9
		26	31	1750	0.23	1	6.24	2.2
		25	31	2030	0.19	1.1	6.3	2.5
		25	31	2200	0.18	1.2	6.32	2.8
		25	31	2270	0.17	1.2	6.34	3.1
		24	31	2490	0.17	1.3	6.36	3.4
		24	31	2570	0.16	1.4	6.38	3.7
		24	31	2710	0.16	1.5	6.4	4
		24	31	2710	0.15	1.5	6.42	4.36
		23	31	2810	0.14	1.5	6.44	5.2
		23	31	2900	0.15	1.5	6.53	5.8
		23	31	2910	0.14	1.6	6.56	6.1
6/12/2002	900	28	28	650	5.83	0.3	6.36	surface
		28	28	640	3.9	0.3	6.33	0.4
		27	28	680	3.53	0.3	6.29	0.7
		27	28	660	2.9	0.3	6.26	1
		27	28	1490	1.8	0.8	6.24	1.3
		27	28	1500	0.32	0.8	6.21	1.6
		27	28	1800	0.14	1	6.27	1.9
		27	28	2780	0.11	1.5	6.34	2.2
		27	28	3090	0.12	1.7	6.36	2.5

STATION BSW 19 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^{0}C	Air Temp. ^{0}C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
		27	28	3310	0.11	1.8	6.38	2.8
		26	28	3220	0.11	1.8	6.39	3.1
		26	28	3070	0.1	1.7	6.41	3.4
		25	28	3090	0.1	1.7	6.42	3.7
		25	28	3050	0.1	1.7	6.43	4
		24	28	3020	0.1	1.6	6.44	4.3
		24	28	2980	0.1	1.6	6.45	4.6
		24	28	3010	0.1	1.7	6.45	4.9
		24	28	3180	0.1	1.7	6.46	5.2
		24	28	3250	0.1	1.8	6.46	5.5
		24	28	3290	0.11	1.7	6.47	5.8
6/12/2002	1440	30	34	840	6.24	0.4	6.56	surface
		30	34	840	5.86	0.4	6.53	0.4
		30	34	880	5.6	0.5	6.53	0.7
		29	34	880	5.52	0.5	6.53	1
		29	34	1050	5.04	0.6	6.44	1.3
		28	34	2000	1.99	1.1	6.41	1.6
		28	34	2100	1.44	1.3	6.4	1.9
		27	34	2680	0.86	1.4	6.41	2.2
		27	34	3100	0.45	1.8	6.42	2.5
		28	34	3670	0.26	2	6.46	2.8
		27	34	3600	0.11	1.9	6.48	3.1
		26	34	3450	0.1	1.9	6.5	3.4
		26	34	3250	0.09	1.7	6.5	3.7
		25	34	3060	0.09	1.7	6.5	4
		25	34	3030	0.09	1.7	6.51	4.3
		24	34	3170	0.09	1.6	6.52	4.6
		24	34	3190	0.08	1.7	6.53	4.9
		24	34	3220	0.08	1.7	6.56	5.2
6/13/2002	845	27	29	700	5.35	0.4	6.19	surface
		28	29	750	4.29	0.4	6.34	0.4
		28	29	730	3.85	0.3	6.33	0.7
		28	29	670	3.73	0.3	6.32	1
		27	29	790	2.52	0.5	6.24	1.3
		27	29	1430	1.78	0.8	6.23	1.6
		27	29	2410	0.24	1.3	6.25	1.9
		27	29	3120	0.18	1.7	6.31	2.2
		26	29	3420	0.17	1.9	6.36	2.5
		26	29	3390	0.15	1.9	6.39	2.8
		26	29	3330	0.14	1.8	6.4	3.1
		26	29	3290	0.13	1.8	6.41	3.4
		25	29	3200	0.13	1.8	6.42	3.7
		25	29	3250	0.12	1.8	6.43	4
		25	29	3350	0.12	1.8	6.44	4.3
		25	29	3490	0.12	1.8	6.44	4.6

STATION BSW 19 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^{0}C	Air Temp. ^{0}C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
6/13/2002		25	29	3400	0.12	1.9	6.46	4.9
		25	29	3540	0.11	1.9	6.46	5.2
		24	29	3500	0.1	1.8	6.48	5.5
7/31/2002	940	28	30	213	6.86	0.1	6.41	surface
		27	30	207	6.36	0.1	6.37	0.4
		27	30	201	6.04	0.1	6.34	0.7
		27	30	187	5.78	0.1	6.33	1
		27	30	188	4.81	0.1	6.29	1.3
		27	30	163	4	0.1	6.15	1.6
		26	30	154	4.32	0.1	5.92	1.9
		26	30	162	3.97	0.1	5.86	2.2
		25	30	191	3.7	0.1	5.83	2.5
		25	30	220	3.52	0.1	5.82	2.8
		25	30	257	2.81	0.1	5.82	3.1
		25	30	513	1.55	0.3	6.01	3.4
		25	30	661	0.98	0.3	5.9	3.7
		25	30	760	0.46	0.4	5.92	4
		25	30	1308	0.41	0.7	6.02	4.3
		25	30	1720	0.39	0.9	6.19	4.6
		25	30	2920	0.39	1.6	6.38	4.9
		25	30	5320	0.38	2.2	6.59	5.2
		25	30	9250	0.37	5.2	6.61	5.5
8/15/2002	1300	30	32	3430	6.51	1.8	6.62	surface
		30	32	3290	6.5	1.8	6.59	0.4
		30	32	3530	5.44	1.9	6.53	0.7
		29	32	3640	5.02	1.9	6.46	1
		29	32	5330	3.56	2.7	6.5	1.3
		30	32	5820	2.53	3.1	6.45	1.6
		30	32	6180	2.07	3.5	6.43	1.9
		29	32	6960	0.82	3.9	6.37	2.2
		29	32	7290	0.56	4	6.37	2.5
		29	32	7470	0.5	4.2	6.37	2.8
		29	32	7750	0.46	4.3	6.39	3.1
		28	32	8160	0.45	4.6	6.41	3.4
		28	32	10940	0.44	6.9	6.51	3.7
		28	32	16790	0.44	9.8	6.64	4
		28	32	17110	0.43	10.1	6.65	4.4
9/19/2002	1005	28	30	7150	7.9	4	6.53	surface
		28	30	7830	6.56	4.7	6.56	0.4
		29	30	10580	5.48	6.1	6.56	0.7
		29	30	12280	4.43	7	6.57	1
		29	30	12660	3.87	7.3	6.57	1.3
		29	30	13140	2.97	7.6	6.54	1.6
		29	30	13640	1.83	7.8	6.49	1.9
		29	30	13750	1.53	8	6.48	2.2

STATION BSW 19 FIELD PARAMETERS

Date dd/mm/yy	Time	H20 Temp. ^0C	Air Temp. ^0C	Sp. Cond. uS/cm	D.O. ppm	Salinity ppt	pH s.u.	Depth m
9/19/2002		29	30	14310	0.89	8.3	6.49	2.5
		29	30	14910	0.86	8.8	6.54	2.8
		29	30	16480	0.83	10	6.64	3.1
		29	30	23160	0.8	14	6.76	3.4
		29	30	26340	0.8	16.2	6.94	3.7
		29	30	27340	0.78	16.7	6.99	4
		29	30	27540	0.76	16.8	6.98	4.4
	Average	24	27	4369	2.89	2.5	6.36	
	Maximum	30	34	27540	10.2	16.8	6.99	
	Minimum	8	13	70	0.08	0	5.73	

APPENDIX C

Station BSW 1 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm	Hardness ppm
5/8/2001	1105	96	< 5		7.6	< 0.01	0.41	< 0.005	0.022		< 1	1.6	4.0	17.0
#######	1105		16		12.4	< 0.02	0.45	< 0.005	0.028					
#######	1055		18		14.2	< 0.02	0.53	< 0.005	0.034		1.7	2.0		
#######	1025	18	23		18.5	< 0.01	0.40	< 0.005	0.027		< 2	1.5		32.0
#######	1025	50	24		11.3	< 0.01	0.51	< 0.005	0.031					
#######	1225	8	21		9.4	< 0.01	0.68	< 0.005	0.022					
#######	1250	22	< 5		7.1	0.02	0.36	< 0.005	0.027					
#######	1005	4	< 5		2.3	0.04	0.48	< 0.005	0.014					
#######	1210	6	< 5	2410	2.2	0.02	0.24	< 0.005	0.018	0.007				
#######	1150	34	12	5	4.8	< 0.01	0.42	< 0.005	0.017	0.036				
1/8/2002	1120	7	< 5	56	2.8	< 0.01	0.35	< 0.005	0.024	0.04				
#######	1135	160	< 5	26	1.7	< 0.01	0.20	0.016	< 0.005	0.009				
#######	1125	12	< 5	19	4.8	0.04	0.35	0.006	0.023	<0.006				8.0
4/2/2002	1025	16	< 5	21	2.1	0.01	0.39	< 0.005	0.013					
#######	945	28	16	16	31	0.02	0.55	< 0.005	0.042	0.011				
#######	920		15	56	18.7	< 0.01	0.66	0.012	0.032	0.006				
#######	840	82												
	Average	39	18	326	9.4	0.03	0.44	0.011	0.025	0.018	1.7	1.7	4.0	19.0
	Maximum	160	24	2410	31.0	0.04	0.68	0.016	0.042	0.040	1.7	2.0	4.0	32.0
	Minimum	4	12	5	1.7	0.01	0.20	< 0.005	< 0.005	< 0.006	< 1	1.5	4.0	8.0

Station BSW 1 Sediment Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/8/2001	1250	5840	0.68	< 0.003	6.4	1.18	1790	1.8	< 0.05	1.34	3.5

Station BSW 2 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm	Hardness ppm
5/8/2001	1142	150	< 5		2.5	0.01	0.36	0.097	0.017		< 1	< 1		12
5/22/2001	1030		< 5		2.3	< 0.02	0.38	0.066	0.025					
5/31/2001	1011		< 5		3.8	< 0.02	0.27	0.059	0.025		< 1	1.6	2.0	
6/26/2001	945	400	< 5		2.4	0.01	0.25	0.080	0.017		< 2	< 1		23
7/17/2001	940	140	< 5		3.9	< 0.01	0.30	0.080	0.022					
7/25/2001	1000		< 5		6.4	0.01	0.39	0.064	0.031					
8/28/2001	1055	660	< 5		4.6	0.01	0.48	0.105	0.020					
9/27/2001	1400	390	< 5		2.2	0.01	0.33	0.080	0.015					
10/22/2001	925	130	< 5		2.5	< 0.01	0.24	0.073	0.014					
11/13/2001	1235	84	< 5	2410	3.2	0.01	0.23	0.027	0.018	0.012				
12/10/2001	1215	220	< 5	< 5	2.5	0.01	0.46	0.057	0.016					
1/8/2002	1020	130	< 5	42	3	0.01	0.35	0.188	0.026	0.022				
2/20/2002	1050	>1600	14	43	36	0.07	0.60	0.207	0.020	0.018				
3/12/2002	1210	3200	39	42	39	0.11	1.00	0.120	0.074	0.016				15
4/2/2002	920	97	< 5	39	6.4	0.02	0.44	0.047	0.018					
5/21/2002	905	100	< 5	38	2.9	0.03	0.36	0.078	0.028	0.100				
7/17/2002	840		5	48	4.2	< 0.01	0.36	0.080	0.019	0.006				
7/18/2002	830	120												
	Average	448	19	380	7.5	0.03	0.40	0.089	0.024	0.029	< 1	1.6	2	17
	Maximum	3200	39	2410	39.0	0.11	1.00	0.207	0.074	0.100	< 2	1.6	2	23
	Minimum	84	5	38	2.2	0.01	0.23	0.027	0.014	0.006	< 1	1.6	2	12

Station BSW 2 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/8/2001	1142	700	< 0.66	< 0.04	< 4	< 0.66	393	1.2	< 0.05	< 0.7	< 2.3

Station BSW 3 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm	Hardness ppm
5/8/2001	1242	180	< 5		3.5	0.04	0.45	0.097	0.040		< 1	8.6	2.0	
5/22/2001	1020		< 5		2.9	< 0.02	0.56	0.047	0.048					
5/31/2001	1000		< 5		5.2	< 0.02	0.41	0.184	0.032		1.2	2.1		
6/26/2001	930		5		3.3	0.01	0.38	0.116	0.033		< 2	4.2		
7/17/2001	930	160	7		4.7	< 0.01	0.48	< 0.005	0.035					
8/28/2001	1035	> 4000	10		8	< 0.01	0.67	0.169	0.035					
9/27/2001	1335	1700	< 5		2.8	0.01	0.35	0.133	0.020					
10/22/2001	1135	320	< 5		3.3	< 0.01	0.51	0.105	0.015					
11/13/2001	1320	129	< 5	2520	3.2	0.02	0.30	0.065	0.022	0.010				
12/10/2001	950	430	7	31	6.7	0.04	0.61	0.155	0.037					
1/8/2002	955	150	22	47	11.7	0.01	0.40	0.124	0.029	0.032				
2/20/2002	1305	1300	< 5	38	4.5	0.02	0.31	0.098	< 0.005	0.018				
3/12/2002	945	54	< 5	31	3.8	0.02	0.32	0.052	0.023	0.008				11
4/2/2002	1255	96	< 5	43	5.7	0.01	0.44	0.029	0.018					
5/21/2002	1135	123	21	43	5.4	0.03	0.53	0.189	0.047	0.009				
7/17/2002	1025		< 5	53	4.3	< 0.01	0.82	0.114	0.032	0.006				
7/18/2002	820	400												
	Average	420	12	351	4.9	0.02	0.47	0.112	0.031	0.014	1	5	2	11
	Maximum	> 4000	22	2520	11.7	0.04	0.82	0.189	0.048	0.032	1.2	8.6	2	11
	Minimum	54	5	31	2.8	0.01	0.30	0.029	0.015	0.006	1	2	2	11

Station BSW 3 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/8/2001	1240	3960	1.41	< 0.04	5.4	3.68	2820	17	< 0.05	2.58	42

Station BSW 3 Water Column Metals and Oil and Grease Analyses

Date dd/mm/yy	Time	Aluminum Total ppm	Arsenic Total ppb	Cadmium Total ppm	Chromium Total ppm	Copper Total ppm	Iron Total ppm	Lead Total ppb	Mercury Total ppb	Nickel Total ppm	Zinc Total ppm	Oil and Grease ppm
5/8/2001	1242	< 2.5	< 0.007	< 0.003	< 0.05	< 0.007	0.98	< 5	< 1	< 0.007	< 0.02	< 5

Station BSW 4 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm	Hardness ppm
5/8/2001	1300	23	31		12.7	1.90	2.60	0.295	0.178		1.2	3.4	10	
5/22/2001	955		< 5		3.8	0.06	0.36	0.154	0.051					
5/31/2001	940		11		16.8	0.10	0.48	0.187	0.081		3.2	3.1		
6/26/2001	915		< 5		3.5	0.01	0.25	0.376	0.022		< 2	< 1		
7/17/2001	915	120	< 5		5.9	0.02	0.26	0.209	0.023					
7/25/2001	1045		11		13.6	0.01	0.48	0.168	0.056					
8/28/2001	1015	2600	8		14.2	0.02	0.56	0.489	0.031					
9/27/2001	1345	12	< 5		3	0.01	0.26	0.506	0.015					
10/22/2001	1150	120	< 5		4.7	< 0.01	0.28	0.397	0.015					
11/13/2001	1335	70	< 5	2430	5.2	0.01	0.23	0.386	0.025	0.009				
12/10/2001	930	74	< 5	51	5.7	0.06	0.48	0.228	0.025					
1/8/2002	920	240	< 5	53	9.7	0.02	0.35	0.222	0.039	0.018				
2/20/2002	1320	> 1600	40	80	95	0.13	0.70	0.273	0.065	0.014				
3/12/2002	920	40	4	37	8.7	0.03	0.33	0.211	0.031	0.01				17
4/2/2002	1315	26	< 5	48	9.4	0.03	0.37	0.163	0.022					
5/21/2002	1155	18	1	57	8.6	0.03	0.45	0.161	0.041	0.007				
7/17/2002	1040		< 5	63	7.2	< 0.01	0.54	0.045	0.03	0.006				
7/18/2002	815	130												
	Average	289	15	352	13.4	0.16	0.53	0.263	0.044	0.011	2	3	10	17
	Maximum	2600	40	2430	95.0	1.90	2.60	0.506	0.178	0.018	3.2	3.4	10	17
	Minimum	12	1	37	3.0	0.01	0.23	0.045	0.015	0.006	1	3	10	17

Station BSW 4 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/8/2001	1305	1980	< 0.66	< 0.04	< 4	1.18	1210	3.2	< 0.05	0.79	10

Station BSW 4 Water Column Metals and Oil and Grease Analyses

Date dd/mm/yy	Time	Aluminum Total ppm	Arsenic Total ppm	Cadmium Total ppm	Chromium Total ppm	Copper Total ppm	Iron Total ppm	Lead Total ppm	Mercury Total ppm	Nickel Total ppm	Zinc Total ppm	Oil and Grease ppm
5/8/2001	1300	< 2.5	< 0.007	< 0.003	< 0.05	< 0.007	0.82	< 5	< 1	< 0.007	< 0.02	< 5

Station BSW 6 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm	Hardness ppm
5/9/2001	956	20	5.0		7.1	0.01	0.30	0.072	0.030		< 1	< 1	5.0	
5/22/2001	1121		< 5		4.5	< 0.02	0.25	0.038	0.034					
5/31/2001	1110		< 5		4.6	< 0.02	0.20	0.049	0.029		< 1	2.0		
6/26/2001	1045	20	< 5		3.8	0.01	0.26	0.040	0.029		< 2	< 1		
7/17/2001	1040	16	< 5		3.1	< 0.01	0.39	0.036	0.026					
8/28/2001	1240	26	< 5		2.9	0.02	0.43	0.077	0.016					
9/27/2001	1300	10	< 5		1.1	0.01	0.36	0.250	0.016					
10/22/2001	1030	34	< 5		< 2.0	< 0.01	0.33	0.091	0.014					
11/13/2001	1140	54	< 5	2430	1.8	0.02	0.29	0.120	0.019	0.008				
12/10/2001	1130	74	5	30	2.9	0.01	0.45	0.124	0.021					
1/8/2002	1140	16	< 5	51	2.9	0.03	0.37	0.169	0.028	0.024				
2/20/2002	1155	62	< 5	45	7.5	0.08	0.39	0.614	0.005	0.012				
3/12/2002	1100	960	44	53	60	0.17	0.92	0.256	0.079	0.013				22
4/2/2002	1110	170	< 5	26	5.3	0.02	0.4	0.051	0.027					
5/21/2002	1005	48	< 5	35	7.2	0.01	0.4	0.008	0.045	0.007				
7/17/2002	935		10	47	13.3	< 0.01	0.4	0.011	0.046	0.007				
7/18/2002	850	110												
	Average	116	16	340	8.5	0.04	0.38	0.125	0.029	0.012	< 1	< 2	5	22
	Maximum	960	44	2430	60.0	0.17	0.92	0.614	0.079	0.024	< 2	2	5	22
	Minimum	10	< 5	26	1.1	< 0.01	0.20	< 0.005	< 0.005	< 0.006	< 1	< 1	5	22

Station BSW 6 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/9/2001	950	842	< 0.66	< 0.04	< 4	< 0.66	708	1.2	< 0.05	< 0.7	2.3

Station BSW 7 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm	Hardness ppm
5/9/2001	1010	24	6.0		2.8						< 1	< 1	< 2	
5/17/2001	945					< 0.02	0.24	0.017	0.015					
5/22/2001	1220		< 5		2.1	< 0.02	0.28	0.025	0.017					
5/31/2001	1200		< 5		2.6	< 0.02	0.30	0.043	0.018		1.1	1.0		
6/26/2001	1125	14	< 5		< 2	0.02	0.25	0.028	0.012		< 2	< 1		
7/17/2001	1115	6	< 5		2.5	< 0.01	0.33	0.033	0.015					
7/25/2001	1150		5.0		2.3	< 0.02	0.26	< 0.005	0.018					
8/28/2001	1305	44	< 5		< 2	0.01	0.41	0.069	0.011					
9/27/2001	1315	42	< 5		1.1	0.01	0.63	0.05	0.018					
10/22/2001	1050	170	< 5		< 2	< 0.01	0.20	0.046	0.011					
11/13/2001	1105	160	< 5	2400	1.3	0.01	0.20	0.041	0.014	0.041				
12/10/2001	1045	420	< 5	27	1.2	0.01	0.41	0.04	0.012					
1/8/2002	1155	42	< 5	37	2.2	< 0.01	0.34	0.281	0.023	0.017				
2/20/2002	1210	290	< 5	33	3.6	< 0.01	0.26	< 0.005	< 0.005	0.011				
3/12/2002	1035	26	1	31	2.1	0.01	0.30	0.052	0.018	0.006				6
4/2/2002	1140	100	< 5	31	1.4	0.01	0.33	0.02	0.011					
5/21/2002	1035	20	< 5	29	< 2	0.02	0.32	0.033	0.02	0.007				
7/17/2002	950		< 5	33	1.2	< 0.01	0.27	0.037	0.006	< 0.005				
7/18/2002	900	40												
	Average	100	4	328	2.0	0.01	0.31	0.054	0.015	0.016	< 2	1	<2	6
	Maximum	420	6	2400	3.6	0.02	0.63	0.281	0.023	0.041	1.1	1	0	6
	Minimum	6	1	27	1.1	0.01	0.20	< 0.005	< 0.005	0.006	< 1	1	0	6

Station BSW 7 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/9/2001	1010	560	< 0.66	< 0.04	< 4	< 0.66	148	1.1	< 0.05	< 0.7	< 2.3

Station BSW 8 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm	Hardness ppm
5/9/2001	1025	8	< 5		1.2	0.01	0.46	0.458	0.011		< 1	1.0	< 2	
5/22/2001	1243		< 5		< 2	< 0.02	0.10	0.276	0.017					
5/31/2001	1235		< 5		< 2	< 0.02	0.11	0.292	0.016		< 1	ND		
6/26/2001	1155	12	6.0		< 2	0.02	0.11	0.318	0.014		< 2	< 1		
7/17/2001	1125	10	< 5		5.3	0.02	0.50	0.050	0.022					
7/25/2001	1210		11.0		12.9	0.03	0.45	0.128	0.033					
8/28/2001	1330	14	< 5		2.4	0.03	0.51	0.314	0.014					
9/27/2001	1325	24	< 5		3.1	0.02	0.55	0.195	0.020					
10/22/2001	1120	20	< 5		< 2	< 0.01	0.29	0.390	0.011					
11/13/2001	1035	30	< 5	2420	1.1	0.01	0.22	0.418	0.022	0.007				
12/10/2001	1025	64	< 5	36	1.5	0.01	0.53	0.276	0.019					
1/8/2002	1230	78	< 5	49	5.5	< 0.01	0.38	0.021	0.031	0.026				
2/20/2002	1235	290	8.0	47	16.9	0.04	0.34	0.169	0.005	0.010				
3/12/2002	1005	40	< 5	43	5.1	0.01	0.39	0.032	0.022	<0.005				10
4/2/2002	1215	82	< 5	44	5.2	0.01	0.41	0.037	0.017					
5/21/2002	1110	10	< 5	47	< 2	0.03	0.19	0.350	0.023	0.010				
7/17/2002	1010		< 5	49	1.6	< 0.01	0.19	0.213	0.007	<0.005				
7/18/2002	910	26												
	Average	51	8	342	5.2	0.02	0.34	0.232	0.018	0.013	< 1	1	< 2	10
	Maximum	290	11	2420	16.9	0.04	0.55	0.458	0.033	0.026	0	1	0	10
	Minimum	8	6	36	1.1	0.01	0.10	0.021	0.005	< 0.005	0	1	0	10

Station BSW 8 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/9/2001	1025	1700	< 0.66	< 0.04	< 4	0.78	965	7	< 0.05	0.84	5.5

Station BSW 10 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm
5/23/2001	1030		5		4.3	< 0.02	0.57	0.03	0.053		1.3	9.1	7.0
5/29/2001	910	36	6		3.4	< 0.02	0.46	< 0.005	0.043			10	
6/19/2001	1215	10	5		6.9	0.02	0.48	0.008	0.047		2.0	12	
7/16/2001	1135	44	5		3.1	< 0.01	0.54	0.026	0.037				
8/21/2001	950	120	6		4.5	0.04	0.46	0.069	0.035				
9/20/2001	1205	46	4		2.2	0.05	0.57	0.057	0.031				
10/23/2001	1000	320	5		3.6	< 0.01	0.46	0.05	0.023				
11/14/2001	1040	110	< 5	8000	1.2	0.03	0.31	0.087	0.020	0.021			
12/11/2001	1230	55	< 5	1610	< 2.0	0.01	0.38	0.077	0.020	0.018			
1/9/2002	1035	240	< 5	403	3.9	0.03	0.36	0.147	0.027	0.013			
2/26/2002	1210	98	1	156	2.1	0.01	0.43	0.147	0.014	0.015			
3/13/2002	1005	840	2	90	7.8	0.02	0.51	0.171	0.034	0.008			
4/11/2002	1015	160	< 5	147	3.5	0.04	0.76	0.094	0.036	0.007			
5/7/2002	1055	48	< 5	971	2	0.03	0.52	< 0.005	0.032	0.009			
7/31/2002	1030	64	< 5	261	4	< 0.01	0.79	0.154	0.011	0.005			
	Average	157	< 5	1455	3.8	0.03	0.51	0.086	0.031	0.012	1.7	10.4	7.0
	Maximum	840	6	8000	7.8	0.05	0.79	0.171	0.053	0.021	2.0	12.0	7.0
	Minimum	10	1	90	1.2	0.01	0.31	0.008	0.011	0.005	1.3	9.1	7.0

Station BSW 10 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
6/19/2001	1215	27400	5.63	0.7	not analyzed	36	28400	38	0.49	24	159

Station BSW 11 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm
5/23/2001	1250		11.0		10.2	0.03	0.5	0.024	0.072		< 1	15	10
5/29/2001	950	34	5.0		3.4	< 0.02	0.46	0.009	0.045			12	
6/19/2001	1155	12	13.0		12.7	0.01	0.89	0.007	0.084		4.6	45	
7/16/2001	1150	60	10.0		6.8	< 0.01	0.66	0.007	0.061				
8/21/2001	1000	100	9.0		8.2	0.09	0.61	0.074	0.063				
9/20/2001	1155	120	6.0		3.8	0.01	0.6	< 0.005	0.040				
10/23/2001	1015	360	13.0		25	0.02	0.61	0.2	0.067				
11/14/2001	1055	130	< 5.0	9490	2.3	0.01	0.38	0.007	0.030	0.020			
12/11/2001	1235	20	6.0	2520	5.5	0.02	0.57	0.056	0.037	0.032			
1/9/2002	1055	320	< 5.0	810	7.4	0.10	0.53	0.09	0.042				
2/26/2002	1150	260	10.0	365	7.8	0.01	0.66	0.038	0.028	0.013			
3/12/2002	1025	540	5.0	340	8.3	0.02	0.86	0.117	0.065	<0.005			
4/11/2002	1050	88	< 5.0	170	5.3	0.07	0.62	0.064	0.053	0.014			
5/7/2002	1125	11	8.0	1220	6.5	0.03	1.4	< 0.005	0.041	0.009			
7/31/2002	1105	250	8.0	451.0	7.3	0.06	0.84	0.13	0.030	0.005			
	Average	165	9	1921	8.0	0.04	0.68	0.064	0.051	0.016		24.0	10.0
	Maximum	540	13	9490	25	0.1	1.4	0.2	0.084	0.032	4.6	45.0	10.0
	Minimum	11	< 5.0	170	2.3	0.01	0.38	0.007	0.028	0.005	< 1	12.0	10.0

Station BSW 11 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/29/2001	950	33000	3.96	0.46	690	29	21900	17.3	0.17	32.6	119

Station BSW 11 Laboratory Analyses

Station BSW 12 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm
5/23/2001	1050		14		11.0	0.04	0.8	0.038	0.065		< 1	7.1	11.0
5/29/2001	1050	4	19		16.8	< 0.02	0.5	0.103	0.076			8.1	
6/19/2001	1215	10	5		6.9	0.02	0.48	0.008	0.047		2.0	12	
7/16/2001	1200	78	16		11.8	< 0.01	0.56	0.018	0.057				
8/21/2001	1013	78	12		11.3	0.05	0.51	0.080	0.072				
9/20/2001	1140	60	12		10.9	0.01	0.65	0.060	0.071				
10/23/2001	1025	160	32		41.0	0.03	0.45	0.247	0.109				
11/14/2001	1110	130	7	6100	13.0	0.04	0.49	0.190	0.073	0.033			
12/11/2001	1245	5	12	1370	24.0	0.05	0.5	0.204	0.082	0.030			
1/9/2002	1105	60	8	420	16.9	0.11	0.52	0.331	0.081	0.028			
2/26/2002	1015	71	14	137	14.5	0.04	0.5	0.283	0.036	0.021			
3/13/2002	1045	220	<5	209	8.9	0.02	0.63	0.159	0.050	0.012			
4/11/2002	1110	200	12	184	16.8	0.07	0.67	0.124	0.080	0.021			
5/7/2002	1155	8	20	153.0	26.0	0.08	0.55	0.223	0.083	0.019			
7/31/2002	1120	32	15	1140.0	11.5	0.02	1.0	0.011	0.079	0.008			
	Average	80	14	1214	16.1	0.04	0.59	0.139	0.071	0.022		9.1	11.0
	Maximum	220	32	6100	41	0.11	1	0.331	0.109	0.033	2.0	12.0	11.0
	Minimum	4	< 5.0	137	6.9	0.01	0.45	0.008	0.036	0.008	< 1	7.1	11.0

Station BSW 12 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/29/2001	1020	50800	11.5	0.26	50	26	21700	10.2	0.08	28.3	87

Station BSW 13 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm
5/23/2001	1100		11		9.8	0.04	0.41	0.027	0.059		< 1	5.1	12.0
5/29/2001	910	36	6		3.4	< 0.02	0.46	< 0.005	0.043			10	
6/19/2001	1130	2	14		16.6	0.01	0.54	0.256	0.075		1.3	10	
7/16/2001	1215	26	15		11.0	< 0.01	0.47	0.02	0.044				
8/21/2001	1025	55	12		11.0	0.05	0.43	0.12	0.069				
9/20/2001	1130	54	10		11.4	0.03	0.58	0.168	0.065				
10/23/2001	1035	210	32		44.0	0.03	0.63	0.248	0.111				
11/14/2001	1120	12	7	6100	13.0	0.04	0.43	0.245	0.067	0.024			
12/11/2001	1250	50	13	939	25.0	0.05	0.66	0.213	0.084	0.032			
1/9/2002	1115	18	14	215	21.0	0.05	0.52	0.221	0.082	0.023			
2/26/2002	950	85	26	149	22.0	0.05	0.49	0.382	0.045	0.027			
3/13/2002	1100	52	6	680	11.7	0.02	0.53	0.219	0.011	0.068			
4/11/2002	1125	20	22	119	25.0	0.05	0.68	0.203	0.083	0.017			
5/7/2002	1205	12	32	124	31.0	0.08	0.77	0.225	0.021	0.097			
7/31/2002	1135	32	7	1630	10.6	0.04	0.64	0.026	0.046	0.009			
	Average	47	15	1245	17.8	0.04	0.55	0.184	0.060	0.037		8.4	12.0
	Maximum	210	32	6100	44	0.08	0.77	0.382	0.111	0.097	1.3	10.0	12.0
	Minimum	2	< 5.0	119	3.4	0.01	0.41	0.016	0.011	0.009	< 1	5.1	12.0

Station BSW 13 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/29/2001	1050	88500	18.2	0.22	75	30	25700	22	0.1	40	110

Station BSW 14 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm
5/23/2001	1115		9		9.7	0.04	0.42	0.035	0.061		< 1	6.3	12.0
5/29/2001	1200	< 2	15		14.0	< 0.02	0.47	0.031	0.077				
6/19/2001	1120	10	15		17.6	0.01	0.55	0.237	0.063		1.8	13	
7/16/2001	1225	6	10		10.8	< 0.01	0.47	< 0.005	0.042				
8/21/2001	1040	20	14		12.2	< 0.01	0.45	0.052	0.072				
9/20/2001	1025	20	10		10.9	0.02	0.59	0.185	0.065				
10/23/2001	1140	120	44		47.0	0.02	0.8	0.248	0.124				
11/14/2001	1135	68	5	8200	12.3	0.03	0.46	0.210	0.066	0.022			
12/11/2001	1335	35	13	190	28.0	0.05	0.57	0.212	0.092	0.034			
1/9/2002	1130	36	13	133	22.0	0.05	0.48	0.196	0.084	0.031			
2/26/2002	1035	89	29	22	24.0	0.05	0.5	0.413	0.047	0.026			
3/13/2002	1120	90	10	119	14.5	0.03	0.59	0.227	0.086	0.01			
4/11/2002	1140	100	20	119	26.0	0.05	0.69	0.196	0.086	0.017			
5/7/2002	1230	8	18	107	25.0	0.09	0.57	0.216	0.087	0.022			
7/31/2002	1155	14	5.0	480	8.0	0.01	0.67	0.012	0.036	0.005			
	Average	47	15	1171	18.8	0.04	0.55	0.176	0.073	0.021		9.7	12.0
	Maximum	120	44	8200	47	0.09	0.8	0.413	0.124	0.034	1.8	13.0	12.0
	Minimum	6	< 5.0	22	8	0.01	0.42	0.012	0.036	0.005	< 1	6.3	12.0

Station BSW 14 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/29/2001	1120	43400	2.81	0.1	38	11	17400	32	< 0.05	15.6	53

Station BSW 15 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	BOD-5 ppm	Chlorophyll a ppb	Alkalinity ppm
5/23/2001	1205		8		8.5	< 0.02	0.44	0.018	0.056		< 1	5.8	13.0
5/29/2001	910	2	14		13.5	< 0.02	0.50	< 0.005	0.068				
6/19/2001	1040	< 5	12		15.6	0.02	0.47	0.244	0.090		1.0	8.5	
7/16/2001	900	4	12		12.2	0.02	0.47	0.040	0.049				
8/21/2001	1115	40	15		14.3	0.02	0.40	0.098	0.064				
9/20/2001	1105	10	11		12.4	0.03	0.56	0.224	0.069				
10/23/2001	1055	18	28		38.0	0.03	0.68	0.230	0.101				
11/14/2001	1205	8	< 5	4610	14.2	0.04	0.45	0.257	0.070	0.024			
12/11/2001	1310	25	14	137	27.0	0.05	0.75	0.214	0.089	0.046			
1/9/2002	1200	38	18	115	23.0	0.05	0.49	0.233	0.082	0.022			
2/26/2002	1105	61	21	64	21	0.0	0.51	0.32	0.045	0.025			
3/13/2002	1155	52	9	111	12.2	0.02	0.63	0.232	0.067	0.010			
4/11/2002	1220	28	31	117	29.0	0.05	0.58	0.203	0.094	0.016			
5/7/2002	1305	14	36	107	31.0	0.09	0.62	0.212	0.103	0.019			
7/31/2002	1235	12	9	149	12.4	0.04	0.65	0.056	0.035	0.007			
	Average	24	17	676	19.0	0.04	0.55	0.184	0.072	0.021		7.2	13.0
	Maximum	61	36	4610	38	0.09	0.75	0.317	0.103	0.046	1.0	8.5	13.0
	Minimum	2	< 5.0	64	8.5	0.02	0.4	0.018	0.035	0.007	< 1	5.8	13.0

Station BSW 15 Sediment Metals Analyses

Date dd/mm/yy	Time	Aluminum Total ppb	Arsenic Total ppb	Cadmium Total ppb	Chromium Total ppb	Copper Total ppb	Iron Total ppb	Lead Total ppb	Mercury Total ppb	Nickel Total ppb	Zinc Total ppb
5/29/2001	1200	5030	1.17	< 0.04	11.0	2.05	3570	2.890	< 0.05	5.270	11

Station BSW 16 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm
12/11/2001	1350	50	11	2600	7.7	0.03	0.51	0.065	0.043	0.021
1/9/2002	1040	320	< 5	572	11.7	0.10	0.52	0.100	0.048	0.023
2/26/2002	1200	36	3	199	3.6	< 0.01	0.45	0.066	0.020	0.007
4/11/2002	1030	46	< 5	154	4.0	0.05	0.61	0.039	0.045	0.020
5/7/2002	1110	8	6	1230	6.0	0.04	0.55	<0.005	0.036	0.008
7/17/2002	1045	14	6	441	6.7	0.01	1.00	0.150	0.043	0.005
	Average	79	6.5	866	6.6	0.05	0.61	0.084	0.039	0.014
	Maximum	320	11	2600	11.7	0.1	1	0.15	0.048	0.023
	Minimum	8	3	154	3.6	< 0.01	0.45	<0.005	0.02	0.005

Station BSW 18 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm
12/11/2001	1215	10	5	2450	4.3	0.01	1.10	0.028	0.039	0.031
1/9/2002	1020	420	< 5	367	15.4	0.10	0.56	0.195	0.047	0.014
2/26/2002	26	26	< 5	211	3.8	0.01	0.52	0.024	0.023	0.011
4/11/2002	955	24	< 5	133	4.0	0.08	0.70	0.076	0.058	0.011
5/7/2002	1035	< 2	< 5	1300	2.9	0.02	0.59	<0.005	0.053	0.008
7/31/2002	1010	10	< 5	321	7.4	0.01	0.89	0.253	0.040	0.005
	Average	82	<5	869	5.8	0.04	0.71	0.115	0.045	0.013
	Maximum	420	5	2450	15.4	0.1	1.1	0.253	0.058	0.031
	Minimum	2	< 5	133	2.9	0.01	0.52	0.024	0.023	0.005

Station BSW 19 Laboratory Analyses

Date dd/mm/yy	Time	F. Coli. colonies/100ml	TSS ppm	TDS ppm	Turbidity NTU	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm
12/11/2001	1200	45	< 5	731	2.3	0.01	0.41	0.059	0.032	0.036
1/9/2002	1010	130	< 5	126	6.6	0.04	0.50	0.179	0.036	0.010
2/26/2002	1235	120	5	55	6.0	0.02	0.46	0.069		
4/11/2002	935	110	< 5	67	4.8	0.02	0.64	0.023	0.047	0.010
5/7/2002	1005	12	< 5	983	2.1	0.03	0.68	0.046	0.041	0.010
7/31/2002	945	70	< 5	95	6.9	< 0.01	0.77	0.120	0.039	0.009
	Average	81	<5	343	4.8	0.02	0.58	0.083	0.039	0.015
	Maximum	130	5	983	6.9	0.04	0.77	0.179	0.047	0.036
	Minimum	12	< 5	55	2.1	< 0.01	0.41	0.023	0.032	0.009

APPENDIX D

BAYOU SARA SUBWATERSHED STUDY

EVENT SPECIFIC LOADING ESTIMATES

											LOADING					
Station	Date dd/mm/yy	Time	TSS ppm	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	FLOW CFS	FLOW MGD	TSS ppd	NH3 ppd	TKN ppd	Nitrate/Nitrite ppd	Total-P ppd	Ortho-P ppd
BSW 2																
	6/26/2001	945	< 5	0.01	0.25	0.08	0.017		4.1	2.6	< 108.5	0.22	5.53	1.77	0.38	
	7/17/2001	940	< 5	< 0.01	0.3	0.08	0.022		11.6	7.5	< 312.9	< 0.63	18.77	5.01	1.38	
	7/25/2001	1000	< 5	0.01	0.39	0.064	0.031		9.5	6.1	< 254.52	0.51	19.98	3.28	1.59	
	8/28/2001	1055	< 5	0.01	0.48	0.105	0.02		13.5	8.7	< 363.0	0.73	34.95	7.65	1.46	
	9/27/2001	1400	< 5	0.01	0.33	0.08	0.015		14.4	9.3	< 388.04	0.78	25.63	6.21	1.16	
	#########	925	< 5	< 0.01	0.24	0.073	0.014		14.4	9.3	< 388.04	< 0.78	18.64	5.67	1.09	
	#########	1235	< 5	0.01	0.23	0.027	0.018	0.012	12	7.8	< 325.46	0.65	14.89	1.75	1.16	0.78
	#########	1215	< 5	0.01	0.46	0.057	0.016		15.6	10.1	< 421.42	0.84	38.7	4.8	1.35	
	1/8/2002	1020	< 5	0.01	0.35	0.188	0.026	0.022	17.8	11.5	< 479.84	0.96	33.6	18.05	2.5	2.11
	2/20/2002	1050	14	0.07	0.6	0.207	0.02	0.018	29.8	19.3	2250.17	11.25	96.44	33.27	3.21	2.89
	3/12/2002	1210	39	0.11	1	0.12	0.074	0.016	87	56.2	18300.19	51.62	469.24	56.31	34.72	7.51
	4/2/2002	920	< 5	0.02	0.44	0.047	0.018		24.9	16.1	< 671.77	2.69	59.09	6.31	2.42	
	5/21/2002	905	< 5	0.03	0.36	0.078	0.028	0.1	3.2	2.1	< 87.62	0.52	6.21	1.35	0.48	1.73
	7/17/2002	840	5	< 0.01	0.36	0.08	0.019	0.006	2.9	1.9	78.21	< 0.16	5.63	1.25	0.3	0.09
BSW 4																
	7/25/2001	1045	11	0.01	0.48	0.168	0.056		15.2	9.8	901.8	0.82	39.35	13.77	4.59	
	2/20/2002	1320	40	0.13	0.7	0.273	0.065	0.014	13.3	8.6	2869.35	9.33	50.21	19.58	4.66	1
	4/2/2002	1315	< 5	0.03	0.37	0.163	0.022		14	9	< 375.53	2.27	27.94	12.31	1.66	
BSW 6																
	5/9/2001	956	5	0.01	0.3	0.072	0.03		18.3	11.8	493.51	0.99	29.61	7.11	2.96	
	5/22/2001	1121	< 5	< 0.02	0.25	0.038	0.034		46	29.7	< 1239.23	< 4.96	62.03	9.43	8.44	
	5/31/2001	1110	< 5	< 0.02	0.2	0.049	0.029		30.4	19.6	< 817.81	< 3.27	32.79	8.03	4.75	
	6/26/2001	1045	< 5	0.01	0.26	0.04	0.029		40.7	26.3	< 1097.37	2.2	57.07	8.78	6.37	
	7/17/2001	1040	< 5	< 0.01	0.39	0.036	0.026		30.6	19.8	< 826.16	< 1.64	64.37	5.94	4.29	
	8/28/2001	1240	< 5	0.02	0.43	0.077	0.016		10.5	6.8	< 283.73	1.13	24.35	4.36	0.91	
	4/2/2002	1110	< 5	0.02	0.4	0.051	0.027		27.3	17.6	< 734.36	2.94	58.9	7.51	3.98	

BAYOU SARA SUBWATERSHED STUDY

EVENT SPECIFIC LOADING ESTIMATES

											LOADING					
Station	Date dd/mm/yy	Time	TSS ppm	NH3 ppm	TKN ppm	Nitrate/Nitrite ppm	Total-P ppm	Ortho-P ppm	FLOW CFS	FLOW MGD	TSS ppd	NH3 ppd	TKN ppd	Nitrate/Nitrite ppd	Total-P ppd	Ortho-P ppd
BSW 7																
	5/22/2001	1220	< 5	< 0.02	0.28	0.025	0.017		10.2	6.6	< 275.39	< 1.10	15.4	1.38	0.94	
	6/26/2001	1125	< 5	0.02	0.25	0.028	0.012		9.4	6.1	< 254.52	1.01	12.67	1.42	0.61	
	7/25/2001	1150	5	< 0.02	0.26	< 0.005	0.018		10.9	7	293.95	< 1.17	15.29	< 0.29	1.06	
	8/28/2001	1305	< 5	0.01	0.41	0.069	0.011		11.9	7.7	< 321.28	0.64	26.31	4.43	0.71	
	9/27/2001	1315	< 5	0.01	0.63	0.05	0.018		9.6	6.2	51.78	0.52	32.62	2.59	0.93	
	#########	1050	< 5	< 0.01	0.2	0.046	0.011		9.9	6.4	< 267.04	< 0.53	10.68	2.46	0.59	
BSW 7																
	#########	1105	< 5	0.01	0.2	0.041	0.014	0.041	7.7	5	< 208.63	0.42	8.31	1.7	0.58	1.7
	#########	1045	< 5	0.01	0.41	0.04	0.012		11.5	7.4	< 308.77	0.62	25.43	2.48	0.74	
	1/8/2002	1155	< 5	< 0.01	0.34	0.281	0.023	0.017	17.6	11.4	< 475.67	< 0.95	32.27	26.67	2.18	1.61
	2/20/2002	1210	< 5	< 0.01	0.26	< 0.005	< 0.005	0.011	28.5	18.4	< 767.74	< 1.54	39.97	< 0.77	< 0.77	1.69
	4/2/2002	1140	< 5	0.01	0.33	0.02	0.011		25	16.2	< 675.95	1.35	44.5	2.7	1.48	
	5/21/2002	1035	< 5	0.02	0.32	0.033	0.02	0.007	8.6	5.6	< 233.66	0.93	14.84	1.53	0.93	0.32
	7/17/2002	950	< 5	< 0.01	0.27	0.037	0.006	< 0.005	8.6	5.6	< 233.66	< 0.47	12.52	1.72	0.28	< 0.23
BSW 8																
	1/8/2002	1230	< 5	< 0.01	0.38	0.021	0.031	0.026	35.5	22.9	< 955.5	< 1.91	72.76	4.02	5.94	4.98
	2/20/2002	1235	8	0.04	0.34	0.169	0.005	0.01	11.2	7.2	483.26	2.42	20.54	10.21	0.3	0.6
	4/2/2002	1215	< 5	0.01	0.41	0.037	0.017		22.8	14.7	< 613.36	1.23	50.42	4.55	2.09	