ACE Basin (ACE) NERR Water Quality Metadata
January-December 1999 Metadata Report
Latest update: September 19, 2001

I. Data Set & Research Descriptors
1. Principal investigator & contact persons:
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2. Entry verification:
The data are directly downloaded from the YSI Model 6000 sonde to comma-delimited files (*.csv) and PC6000 files (*.dat). The comma-delimited files are imported into Excel 97 where they are formatted and processed by macros that are supplied by the CDMO. Various macros are designed to: 1) check data files for missing data points, 2) fill all cells that do not contain data with periods (.), 3) convert the data columns to the CDMO-approved formats for time, date and numeric variables, 4) find all data that are out of acceptable range for the sensors and out the anomalous data to an output file (*.dat), and 5) save the files as Excel worksheets (*.xls). The anomalous data are evaluated to determine whether to flag or delete the suspect data. Data are flagged if the values are: 1) outside the range expected for the site (see Site Location and Character section), 2) outside the range of measurements and accuracy established for the sensors (see Variable Sequence, Range of Measurements, Units, Resolution, and Accuracy section), or 3) outside the range established for good water quality conditions (i.e., dissolved oxygen <28%). Data are deleted if the anomalies are attributed to: 1) a sensor malfunction, 2) exposure of sensors during low tide, or 3) fouling of sensors by aquatic organisms, debris, or sediment. Sensor malfunctions are detected if the voltage reading of

the sensor is outside the range established for the sensor or the sensor will not calibrate. Fouling of sensors is detected by comparing in-situ sensor readings with measurements (see Research Methods section). In addition, sensor readings that differ significantly (>10%) from standard solution (i.e., conductivity) suggest that the sensor was fouled during deployment. After corrections are made to the Excel worksheet (*.xls), the files are exported as tab-delimited files (*.txt) to the CDMO. Christopher Graffeo, Mark Thompson, and Saundra Upchurch are responsible for these tasks.

3. Research Objectives:

Based on discussions with local CZM personnel and our knowledge of land use within the Reserve, the South Edisto River drainage basin appears well suited for studying contrasting hydrographic conditions and land use patterns. One NERR water quality monitoring station has been established near Edisto Beach within a tributary of Big Bay Creek. Surrounded by residential and commercial development and subject to nonpoint source pollution, this station is designated as the "treatment" site. The second NERR water quality monitoring station has been situated near Bailey Island, within a tributary of St. Pierre Creek. Urban development in the immediate area of this station has been sparse to date so this station will serve as our "control" site. The ACE Basin water quality monitoring program began on March 3, 1995 at two tributaries off Big Bay and St. Pierre creeks (see Site Location and Character section for description of sites). YSI electronic data loggers were deployed to measure the water temperature, specific conductance, dissolved oxygen, pH, and turbidity conditions, approximately 0.1 meters above the creek bottom, at 30-minute intervals. Change in water level was also recorded.

4. Research Methods

One data logger is deployed at each permanent monitoring station in the South Edisto River watershed. The monitoring station at Big Bay Creek was constructed in 1995, and it consists of a PVC pipe mounted vertically on 12-foot galvanized pole. To facilitate water flow across the sensors, approximately two-inch

diameter holes are drilled into the PVC pipes. The pipes are also positioned to ensure that the sensors are approximately 0.1 meters from the creek bottom. In 1997, the St. Pierre Creek station was modified: the PVC pipe is now mounted horizontally in a pyramid-shaped cage (2.5 ft long by 1.5 ft high) tethered to the original 12-foot galvanized pole. Later that year, we began to put the data loggers in 1/8-inch mesh net bags before placing them in the PVC pipe to reduce damage by crabs and fish. During the summer, the data loggers are left at the sites for one week, and the sampling period is extended to one month during the cooler months. At the end of the sampling period, the data loggers are brought back to the laboratory for cleaning, calibration, and servicing, by methods outlined in the YSI Operating and Service Manual. Downtime for doing these procedures normally ranges from 24 to 48 hours. After cleaning the data loggers, the pH, conductivity, depth, and turbidity sensors are calibrated, using the following standards: pH 7 and 10, conductivity standard of 58.64mS/cm, depth in the air, and turbidity standards of 0 and 100 NTU, respectively. The dissolved oxygen (DO) membrane is replaced and is allowed to stretch for 24 hours before the DO sensor is calibrated in air-saturated water. In addition to the procedures outlined in the manual, we conduct a DO membrane integrity test to determine if the membrane was punctured during deployment.

Several quality assurance checks are used to determine if the sensor readings drifted significantly during deployment. In-situ measurements of dissolved oxygen, expressed in mg/L, salinity, and water temperature are taken during the first and last sampling interval. Water samples are collected at the same depth as the sensors. Water temperature and salinity are measured directly with a thermistor and refractometer, respectively, and dissolved oxygen level is determined by the Winkler procedure. Post-deployment measurements of all the parameters are taken before cleaning the data loggers. Sensors are immersed in the appropriate standard solutions (i.e., pH) and readings are recorded. The

results of these checks are used to evaluate the validity of the data (see Entry
Verification section).

5. Site Location and Character:
The two sampling sites are in separate tributaries of the South Edisto River.
The descriptions of the sites are as follows:
Station A--this site is in a tidal marsh creek off Big Bay Creek (GPS coordinates: 32 29 38.72125N and 80 19 21.69864W). Surrounded by residential
and commercial development and subject to nonpoint source pollution, this station is designated as the "treatment" site. Pollution sources include houses
bordering the creek, many of them with little setbacks from the bordering Spartina marsh; forty docks in the area constructed of creosote, concrete and
Wolmanized pilings; boat dockage and heavy boat traffic through the creek; a
paved road and three boat ramps off the creek; a marina with 75 slips, CCA
treated bulkheads and fueling areas located about 0.5 miles downstream; two
commercial seafood docks with 8-10 commercial shrimp boats; and three restaurants. The creek is closed to shellfish harvesting because of the human
development in the vicinity. Vegetation in the area includes salt marsh dominated by Spartina alterniflora with isolated areas of Salicornia. Upland
fringe areas consist of cabbage palmetto, live oak and cedars. Reefs of American
oyster (Crassostrea virginica) fringe the creek banks. At the time of reconnaissance, depth of the creek midway through ebb tide was 5 feet and salinity was 23 parts per thousand (ppt).

Station B--this site is in a tidal creek off St. Pierre Creek (GPS coordinates:
32 31 40.59518N and 80 21 41.25481W). It is surrounded by a wide expanse of
Spartina alterniflora marsh. Extensive mud flats and oyster reefs fringe the
banks. Maritime forest communities comprised of species such as wax myrtles,
live oaks, and palmettos dominate the upland areas. Development in the immediate area is sparse. This creek is subject to relatively light boat traffic. At the time of reconnaissance, depth at low tide was 2.5 feet and
salinity was 21 ppt.

The following discussions of trends in water quality at the monitoring stations
are based on data collected from March 1995 through December 1997. During this

period, water temperature at both monitoring sites exhibited a seasonal pattern with lowest values occurring in December-January. The lowest monthly water temperature observed was 8.9 oC, which occurred in February 1996 at St. Pierre Creek. Temperature maxima occurred in July and August with the highest monthly water temperature (38.9 oC) occurring in July 1995 at Big Bay Creek. Diurnal variation in temperature was evident with warmest temperatures occurring from 1300 hr to 1800 hr at both sites. Salinity also exhibited seasonal variability during the same period, with lowest values occurring in March at Big Bay and St. Pierre creeks. Another period of low average monthly salinity occurred at Big Bay Creek in December 1997. Average annual salinity for both sites was in the polyhaline regime, with a mean of 29.4 ppt at Big Bay Creek and 26.3 ppt at St. Pierre Creek; however, for all years, salinity ranged from 0.3-41.7 ppt at Big Bay and from 0-41.7 ppt at St. Pierre Creek. Local precipitation and evaporation conditions are most likely the major contributors to monthly variability in salinity. Analysis of the data indicates that tidal stage strongly influences salinity. As expected, highest values of salinity occurred on the flood tide.

It appears that tidal stage also influences pH. Spectral analysis revealed a periodicity for pH and water depth with a sinusoidal period at ~ 12 hrs, representing tidal periodicity. Time series plots of pH indicated variability of ~1 standard unit (su) on a daily basis. The pH at both sites was very similar, ranging from 5.3-8.4; however, the preponderance of measurements were >7 at both sites. The pH observed at the two monitoring sites appears to be attributable to natural conditions. Marked variations in pH can also occur diurnally due to changes in primary production and respiration. Dissolved oxygen concentrations appear to track depth for part of the cycle, with lowest values occurring on low tides. Afternoon and evening values were not as low as early morning values, suggesting a diurnal component. Dissolved oxygen values at the two monitoring sites were generally high throughout the year with averages of 83.6% saturation and 6.6 mg/l for Big Bay Creek and 78.5% saturation

and 6.3 mg/l for St. Pierre Creek, with highest values in winter and lowest in summer. Hypoxic events (<28% air saturation) were observed in every season but summer was clearly the season with the greatest percent of time that DO was > 28%. Whereas, supersaturation (>100% air saturation) occurred primarily in the winter, with values exceeding 120% at both creeks. There are a few differences among the sites such as, hypoxic conditions occur more frequently at St. Pierre Creek. Unlike the other parameters monitored at Big Bay and St. Pierre creeks, there appears to be no distinct seasonal trend in turbidity; however, monthly variability appeared greater at the St. Pierre site. This may be due to fluctuations in the amount of detritus being washed form the extensive salt marsh and upland sites that surround St. Pierre Creek.

6. Data collection period:

BEGAN	ENDED
Big Bay Site	
12/21/98, 11:00:00	01/20/99, 10:00:00
01/22/99, 09:30:00	02/10/99, 10:00:00
02/10/99, 11:00:00	03/08/99, 08:30:00
03/08/99, 09:00:00	03/10/99, 13:30:00
04/05/99, 09:00:00	05/02/99, 11:00:00
05/03/99, 08:30:00	05/30/99, 13:00:00
05/30/99, 15:00:00	06/21/99, 11:00:00
06/24/99, 12:30:00	07/09/99, 09:00:00
07/09/99, 10:00:00	08/02/99, 08:00:00
08/05/99, 11:00:00	08/13/99, 06:30:00
08/13/99, 12:00:00	09/03/99, 11:00:00
09/10/99, 12:30:00	10/01/99, 09:30:00
10/01/99, 10:30:00	10/27/99, 12:30:00
10/27/99, 13:00:00	11/23/99, 10:00:00
11/23/99, 10:30:00	12/10/99, 11:00:00
12/16/99, 11:00:00	01/14/00, 11:30:00
St. Pierre Site	
12/21/99, 10:30:00	01/20/99, 11:00:00
01/22/99, 09:30:00	02/10/99, 09:30:00
02/10/99, 10:00:00	03/08/99, 10:00:00
03/08/99, 11:00:00	04/03/99, 03:00:00
04/05/99, 11:00:00	05/02/99, 11:00:00
05/03/99, 11:30:00	05/30/99, 14:00:00
05/30/99, 15:00:00	06/21/99, 12:00:00
06/24/99, 13:30:00	07/09/99, 10:00:00
07/09/99, 10:30:00	08/02/99, 09:30:00
08/05/99, 11:30:00	08/13/99, 11:00:00
08/13/99, 11:30:00	09/03/99, 11:00:00

09/10/99, 17:00:00 10/01/99, 10:30:00
10/01/99, 11:00:00 10/27/99, 13:00:00
10/27/99, 14:00:00 11/23/99, 11:00:00
11/23/99, 11:30:00 12/10/99, 11:30:00
12/16/99, 10:30:00 01/14/00, 11:30:00

7. Associated researchers and projects:
In 1993, the Reserve staff initiated a long-term survey of the decapod crustaceans and juvenile fish that utilize the estuarine waters of the Reserve as a nursery ground. There are four sampling stations in each of the three major rivers (Ashepoo, Combahee and South Edisto) of the Reserve. Stations are located along a salinity gradient, ranging from polyhaline to oligohaline or limnetic. Sampling is done each month during daylight flood tide. Trawls are 10 minutes long and tows are made against the tide. Several physical parameters are measured at each station: air and water temperature, salinity, wind speed and direction, water depth and tidal stage. Cloud cover and rainfall conditions are also recorded at each station. To date, we have caught seventy-one species of fish and twenty-eight species of decapod crustacean species.Drs. Geoff Scott and Tom Mathews are assessing the distribution of contaminants (i.e., trace metals, PAHs, pesticides) in sediments within the rivers of the Reserve. Surface sediment grabs were collected from twelve sites in the Reserve. Ten sites are located along a salinity gradient in Ashepoo, Combahee and South Edisto rivers, and two sites are located in the vicinity of our data logger sites. Surface sediment grabs were collected in 1996 from each site, and the samples will be analyzed for trace metals (i.e., Al, As, Cd, Cr, Cu, Pb, and Zn), PAHs and pesticides.

II. Physical Structure Descriptors
8. Variable sequence, range of measurements, units, resolution, and accuracy:

Variable Name	Range of Measurements(Units)	Resolution	Accuracy
DATE	1-12, 1-31, 00-99 (mo,day,yr)	1 mo, 1d, 1 y	N/A
HOUR	0-24, 0-60, 0-60 (hr,min,sec)	1 hr, 1 min, 1 s	N/A
TEMP	-5 to +45oC	0.01oC	+/- 0.15oC
SPCOND	0-100 mS/cm	0.01 mS/cm	+/- 0.5% of reading + 0.001 mS/cm
SALINITY	0-70 parts per thousand (ppt)	0.01 ppt	+/-1% or reading or 0.1 ppt or whichever is greater

DO 0-200 % air saturation (air sat) 0.1 % air sat +/-2% air sat
DO 200-500 % air saturation (air sat) 0.1 % air sat +/-6% air sat
DO 0-20 mg/L 0.01 mg/L +/-0.2 mg/L
DO 20-50 mg/L 0.01 mg/L +/-0.6 mg/L
DEPTH 0-9.1 meters 0.001 m +/-0.018 m
pH 2-14 units 0.01 units +/-0.2 units
@TURBIDITY 0-1000 NTU 0.1 NTU +/-5% of reading or 2 NTU or whichever is greater
@As of March 16, the data loggers have the capability to record turbidity readings greater than 1000 NTU.

9. Coded variable indicator and variable code definitions:
SP=St. Pierre BB=Big Bay

10. Data anomalies:
January 1-31, 1999 Sampling Period
Big Bay
a) During the following periods, pH data were deleted because the sensor malfunctioned during the December 21, 1998-January 20, 1999 deployment.
01/01/99 00:00 THRU 01/20/99 10:00:00
b) During the following periods, turbidity data were deleted because the sensor wiper malfunctioned during the December 21, 1998-January 20, 1999 deployment. Wiper pad was replaced before next deployment
01/01/99 00:00:00 THRU 01/20/99 10:00:00
01/22/99 09:30:00 THRU 01/31/99 23:30:00

St. Pierre
a) The following records include pH readings that are higher than observed at this site (pH 5.3-8.4). However, the data were not deleted because the pH calibration held through the December 21, 1998-January 20, 1999 deployment. The cause of the high readings is not known at this time.
01/01/99 00:00:00 THRU 01/02/99 12:00:00
b) During the following periods, temperature, specific conductivity, salinity, dissolved oxygen, pH, and turbidity data were deleted because the sensors were fouled by mud from nearby creek bank.
01/02/99 12:00:00 THRU 01/20/99 11:00:00
c) During the following periods, pH data were deleted because the sensor malfunctioned during the deployment.
01/22/99 09:30:00 THRU 01/31/99 23:30:00
d) The following records include salinity readings that are less than 18 ppt.
These readings are not within normal mesohaline/polyhaline salinity range (18 and 35 ppt) for this site. The heavy rainfall events may have caused the low

salinity conditions.
01/24/99 06:00:00-07:00:00

February 1-28, 1999 Sampling Period
Big Bay

a) During the following periods, turbidity data were deleted because the
wiper malfunctioned during the December 21, 1998-January 20, 1999 deployment. A
new unit (datalogger and sensors) was deployed at the next deployment.
02/01/99 00:00:00 THRU 02/10/99 10:00:00
b) During the following periods, dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during deployment.
02/03/99 03:00:00 THRU 02/10/99 10:00:00
c) Prior to 11:00 on February 10, the data logger was replaced with a recently calibrated, new unit (datalogger and sensors).
d) At 06:30 on February 20, the turbidity spiked (601 NTU). The high spike
was probably caused by a clump of plant matter or sediment or an animal that
passed by the sensor optics during the sampling interval.

St. Pierre
a) During the following periods, pH data were deleted because the sensor
malfunctioned during the deployment.
02/01/99 00:00:00 THRU 02/10/99 09:30:00
b) The following record includes a turbidity reading that is greater than
1000 NTU. The high value reflects the very turbid conditions that occur during
heavy rainfall and high wind events.
02/01/99 02:30:00
c) Prior to 10:00 on February 10, the data logger was replaced with a recently calibrated unit.
d) During the following periods, the specific conductivity and salinity
readings drifted downward as a result of fouling. The in-situ readings taken
with a refractometer was used to correct for the drift. No in-situ specific
conductivity readings are available, so we used a value observed at the same
temperature during the next deployment to correct for the drift.
We did not correct the dissolved oxygen readings, expressed as mg/L, because the
last in-situ reading of the deployment (February 10-March 8) was similar to the
Winkler check (9.1 and 8.5 mg/L, respectively).
02/10/99 11:00:00 THRU 02/28/99 23:30:00

March 1-31, 1999 Sampling Period

Big Bay

Prior to 09:00 on March 8, the data logger was replaced with a recently calibrated unit.

St. Pierre

a) During the following periods, the specific conductivity and salinity readings drifted downward as a result of fouling. The in-situ readings taken with a refractometer was used to correct for the drift. No in-situ specific conductivity readings are available, so we used a value observed at the same temperature during the next deployment to correct for the drift. We did not correct the dissolved oxygen readings, expressed as mg/L, because the last in-situ reading of the deployment (February 10-March 8) was similar to the Winkler check (9.1 and 8.5 mg/L, respectively).

03/01/99 00:00:00 THRU 03/08/99 10:00:00

b) Prior to 11:00 on March 8, the data logger was replaced with a recently calibrated unit.

April 1-30, 1999 Sampling

Big Bay

a) Prior to 09:00 on April 5, the data logger was replaced with a recently calibrated unit.

b) The following records include dissolved oxygen readings that are less than 28% air saturation. The low readings occurred during early flood tides.

04/07/99 07:30:00
04/09/99 09:00:00
04/11/99 23:30:00
04/14/99 02:00:00
04/22/99 21:00:00
04/27/99 01:00:00
04/28/99 02:00:00

c) During the following periods, the data were deleted because the data logger went dry.

04/16/99 13:00:00-14:30:00
04/17/99 03:30:00 14:00:00-16:00:00
04/18/99 04:00:00-04:30:0014:30:00-16:30:00
04/19/99 04:30:00-05:00:0015:30:00-17:30:00
04/20/99 05:00:00-06:00:0016:30:00-18:30:00
04/21/99 05:30:00-06:30:0018:00:00
04/24/99 08:30:00-09:30:00

St. Pierre

a) The following record includes a turbidity reading that is greater than 1000 NTU. The high value reflects the very turbid conditions that occur during heavy rainfall and high wind events.

04/05/99 17:00:00
04/06/99 20:30:00
04/07/99 12:00:00 20:00:00
04/09/99 10:30:00
04/10/99 22:00:00
04/11/99 09:00:00
04/12/99 13:00:00
04/14/99 04:30:00
04/16/99 08:00:00-08:30:0018:30:00
04/22/99 22:30:00
04/23/99 13:30:00-14:00:00

b) During the following periods, temperature, specific conductivity, salinity, dissolved oxygen and pH data were deleted. Prolonged periods of readings that are less than 28% air saturation followed by spikes indicate that the sensor was fouled by mud from nearby creek bank.

04/13/99 09:30:00 THRU 04/16/99 02:00:00

c) During the following periods, the turbidity data were deleted. The sensor was fouled by mud from nearby creek bank, but no anomalies were evident. However, the operation of the wiper was probably hindered by the mud.

04/13/99 09:30:00 THRU 04/16/99 02:00:00

May 1-30, 1999 Sampling Period
Big Bay

a) The following records include zero or negative depth readings. The depth data were not deleted because the salinity and dissolved oxygen readings indicate the data logger was submerged during these periods.

05/09/99 08:00:00-08:30:00
05/10/99 08:30:00 09:30:00
05/12/99 10:30:00 12:00:00 23:00:00
05/13/99 00:30:00
05/14/99 00:30:00 02:00:00 12:00:00
05/15/99 02:00:00-02:30:0015:00:00
05/16/99 15:30:00
05/18/99 16:00:00 17:00:00
05/19/99 16:30:00 18:00:00
05/23/99 08:30:00-09:00:00
05/24/99 09:00:00-10:30:0022:00:00-23:00:00
05/25/99 10:00:00-11:00:0023:00:00
05/26/99 11:00:00-11:30:0023:30:00
05/27/99 00:30:00

05/28/99 12:30:00

b) During the following periods, the data were deleted because the data logger went dry.

05/10/99 09:00:00
05/12/99 11:00:00-11:30:0023:30:00
05/13/99 00:00:00 11:00:00-13:00:00
05/14/99 01:00:00-01:30:0012:30:00-14:00:00
05/15/99 13:30:00-14:30:00
05/16/99 15:00:00
05/17/99 15:30:00-16:00:00
05/18/99 16:30:00
05/19/99 17:00:00-17:30:00
05/27/99 00:00:00

c) During the following periods, the dissolved oxygen (DO) data were deleted because the DO membrane was fouled.

05/21/99 07:30:00 THRU 05/30/99 13:00:00

d) Prior to 15:00 on May 30, the data logger was replaced with a recently calibrated unit.

e) The following records include dissolved oxygen reading that are less than 28% air saturation. The low readings occurred during an early flood tide.

05/31/99 04:00:00-04:30:00

St. Pierre

a) During the following periods, dissolved oxygen (DO) data were deleted because the DO membrane was damaged during deployment.

05/03/99 10:30:00 THRU 05/30/99 14:00:00

b) The following records include pH readings that are greater than 8.4, outside the range normally observed at this site (pH 5.3-8.4). However, the data were not deleted because the final in-situ reading was similar to the end-of-deployment field check (pH 8.2 and 7.5, respectively). In addition, the pH calibration held through the deployment. The cause of the high readings is not known at this time.

05/04/99 19:00:00 THRU 05/06/99 14:30:00

c) The following record includes a turbidity reading that is greater than 1000 NTU. The high value reflects the very turbid conditions that occur during heavy rainfall and high wind events.

05/07/99 23:00:00
05/19/99 15:00:00
05/21/99 13:00:00

d) Prior to 15:00 on May 30, the data logger was replaced with a recently calibrated unit.

June 1-30, 1999 Sampling Period
Big Bay

a) The following records include dissolved oxygen reading that are less than
28% air saturation. The low readings occurred during late ebb tides and early
flood tides.
06/01/99 05:00:00
06/02/99 05:00:00-05:30:00
06/03/99 05:30:00-07:00:00

06/04/99 04:00:00-04:30:0005:30:00-06:30:00
06/05/99 06:00:00-08:00:00
06/06/99 06:30:00-08:30:0020:00:00-20:30:00
06/07/99 07:00:00 08:30:00-09:30:0021:00:00-21:30:00
06/08/99 10:00:00 22:30:00
06/09/99 21:30:00 23:00:00-23:30:00
06/10/99 00:00:00-00:30:0023:30:00
06/11/99 00:30:00-02:00:00
06/12/99 01:30:00-03:00:0011:00:00-12:00:0013:00:00
b) During the following periods, the data were deleted because the data
logger went dry.
06/04/99 05:00:00
06/09/99 09:00:00-10:00:00
06/10/99 10:00:00-11:30:00
06/11/99 11:00:00-11:30:00
06/13/99 13:30:00-14:00:00
06/14/99 14:00:00-15:00:00
06/15/99 14:30:00-16:00:00
06/16/99 15:30:00-16:30:00
c) During the following periods, the pH data were deleted because the sensor
was fouled during deployment.
06/12/99 13:30:00 THRU 06/21/99 11:00:00
d) During the following periods, dissolved oxygen (DO) data were deleted.
Prolonged periods of extremely low DO readings (<8% and <1 mg/l) indicated that
the sensor was not working properly.
06/12/99 13:30:00 THRU 06/21/99 11:00:00
e) The following records include turbidity readings greater than 1000 NTU.
The high values reflect the very turbid conditions that occur during heavy
rainfall and high wind events.
06/14/99 00:30:00-05:00:0006:00:00 11:00:00-12:00:0013:00:00-
13:30:00
06/15/99 15:00:00
06/16/99 15:00:00 21:30:00
06/18/99 06:30:00 09:00:00 10:00:00 16:30:00
19:00:00 21:30:00
06/19/99 17:30:00 19:00:00-20:30:00
06/28/99 12:00:00-13:00:00
f) During the following periods, dissolved oxygen (DO) data were deleted

because the DO membrane was punctured during deployment.
06/27/99 13:00:00 THRU 06/30/99 23:30:00
g) The following records include salinity readings that are less than 18 ppt.
These readings are not within normal mesohaline/polyhaline salinity range (18
and 35 ppt) for this site. Heavy rainfall events may have caused the low salinity conditions.
06/28/99 12:30:00-14:30:00
06/29/99 10:30:00-15:30:00

St. Pierre
a) The following records include turbidity readings greater than 1000 NTU.
The high values reflect the very turbid conditions that occur during heavy
rainfall and high wind events.
06/03/99 17:00:00-23:00:00
06/04/99 01:00:00 04:00:00-04:30:0012:00:00-12:30:0019:00:00
20:00:00 21:00:00
06/05/99 01:30:00
06/06/99 22:00:00-22:30:00
06/08/99 12:30:00-13:00:00
06/11/99 07:00:00 08:00:00-08:30:0009:30:00-10:00:0011:00:00-
15:00:00
06/12/99 02:30:00 05:00:00-10:30:0014:00:00 21:30:00-22:00:00
23:30:00
06/13/99 00:00:00-02:30:0004:00:00 05:30:00 07:30:00-08:30:00
10:30:00 22:00:00-23:30:00
06/14/99 00:00:00-01:00:0002:00:00-02:30:0003:30:00 05:00:00
08:30:00 10:30:00-12:00:0015:30:00 17:00:00
19:00:00 22:30:00 23:30:00
06/15/99 00:00:00-02:30:0003:30:00-04:00:0005:30:00
08:00:00-09:00:0010:00:00 14:00:00-14:30:0018:00:00
06/16/99 08:00:00-09:00:0012:30:00 13:30:00-15:00:0016:30:00
20:00:00
06/17/99 00:00:00
b) During the following periods, the dissolved oxygen (DO) are suspect, but
the data were not deleted. The DO readings drop suddenly to extremely low
levels and many are below 10% air sat. The low readings occurred during a flood
tide. However, all quality assurance checks indicate that DO sensor was not
fouled or punctured during the deployment, and the last in-situ DO reading was
7.9 mg/L, and the DO field check reading was 6.2 mg/L. The data will be re-
evaluated, and the data may be deleted at a later date.
06/03/99 20:30:00-23:30:00
06/12/99 15:00:00-16:00:00
06/13/99 02:30:00-03:30:0005:30:00-11:30:0015:00:00-17:00:00

06/14/99 05:00:00-10:00:0018:30:00 23:00:00
c) During the following periods, the dissolved oxygen (DO) readings are less
than 28% air saturation. The low readings occurred during late ebb tides and
early flood tides. A few readings represent dips in the DO during mid-flood
tide; the sudden drop in DO was probably caused by the ambient environmental
conditions.
06/12/99 02:00:00
06/13/99 00:00:00 12:30:00 14:00:00
06/14/99 03:00:00 18:30:00 23:00:00
06/15/99 10:00:00

d) During the following periods, the dissolved oxygen (DO) readings are
suspect, but data were not deleted. The initial rapid increase in dissolved
oxygen (35.7% to 174.9%) concentration suggests that the membrane was punctured
at during that period. However, all quality assurance checks indicate that DO
sensor was not fouled or punctured during the deployment, and the last in-situ
DO reading was 7.9 mg/L, and the DO field check reading was 6.2 mg/L. The rise
in temperature and dampening of the salinity diurnal pattern during this period
suggest that environmental conditions may be a factor. Further examination is
required to determine the cause of the high readings.
06/15/99 16:30 THRU 06/21/99 12:00:00
e) At 00:30 on June 29, salinity reading is less than 18 ppt. The reading is
not within normal mesohaline/polyhaline salinity range (18 and 35 ppt) for this
site. Heavy rainfall events may have caused the low salinity conditions.

July 1-31, 1999 Sampling Period
Big Bay
a) During the following periods, the dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during the June 24-July 9 deployment.
07/01/99 00:00:00 THRU 07/09/99 09:00:00
b) Prior to 10:00 on July 9, the data logger was replaced with a recently
calibrated unit.
c) During the following periods, the depth readings are either zero or
negative. The depth data were not deleted because the salinity and dissolved
oxygen readings indicate the data logger was submerged.
07/10/99 10:30:00-11:30:00

07/11/99 11:00:00-13:00:00
d) During the following periods, dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during the deployment.
07/11/99 18:30:00 THRU 07/31/99 23:30:00

St. Pierre
a) Prior to 10:30 on July 9, the data logger was replaced with a recently
calibrated unit.
b) During the following periods, dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during the deployment.
07/09/99 10:30:00 THRU 07/31/99 23:30:00
c) During the following periods, the salinity data are suspect because the
readings decreased during flood tides; however, the data were not deleted. In
addition, the readings were less than 18 ppt, not within the normal
mesohaline/polyhaline salinity range (18 and 35 ppt) for this site. Reason for
the anomalous readings is not known at this time.
07/15/99 14:30:00 THRU 07/15/99 20:00:00
d) During the following periods, the turbidity readings are greater than 1000
NTU. The high values reflect the very turbid conditions that occur during heavy
rainfall and high wind events.
07/11/99 04:00:00 15:30:00 16:30:00
07/13/99 00:00:00 01:00:00 23:30:00
07/14/99 00:00:00 01:30:00
07/15/99 01:30:00 13:30:00-14:00:00
07/16/99 00:00:00 02:30:00 14:30:00
07/17/99 03:30:00 14:00:00
07/29/99 02:00:00

07/31/99 00:30:00
e) During the following periods, temperature, specific conductivity, and
salinity data were deleted because the sensor was fouled by mud from nearby
creek bank.
07/18/99 06:30:00 THRU 07/25/99 12:00:00
f) During the following periods, the pH data were deleted because the sensor
was fouled by mud from nearby creek bank.
07/18/99 18:30:00 THRU 07/27/99 16:00:00
g) The following records include small negative turbidity readings (-1 NTU).
The negative readings are due to normal sensor drift.
07/12/99 14:00:00 22:30:00-23:00:00
07/14/99 11:30:00 14:30:00 17:00:00
18:30:00-19:00:00
07/15/99 08:30:00

07/18/99 07:30:00 17:30:00
07/19/99 07:00:00-07:30:0011:30:00 13:30:00 14:30:00
18:00:00-18:30:0019:30:00-20:00:0021:00:00 23:00:00-
23:30:00
07/20/99 02:00:00 03:30:00-04:00:0005:00:00 07:30:00
10:00:00-10:30:0012:30:00 16:00:00-17:30:0018:30:00
19:30:00 23:00:00-23:30:00
07/21/99 00:00:00-00:30:0002:00:00-03:30:0005:30:00-10:00:00
12:00:00-13:30:00
15:00:00-16:00:0017:30:00-22:30:00
07/22/99 00:00:00-04:30:0006:00:00-11:00:0012:30:00-16:30:00
17:30:00-21:00:00
22:00:00 23:00:00
07/23/99 00:30:00-09:00:0010:00:00 11:00:00-23:30:00
07/24/99 00:00:00-01:30:0002:30:00-23:30:00
07/25/99 00:00:00-17:00:0018:30:00 21:30:00-23:00:00
07/26/99 00:00:00-02:00:0003:00:00-03:30:0004:30:00-07:30:00
08:30:00-14:00:00
15:00:00-18:30:0021:00:00
22:00:00-22:30:00
07/27/99 00:00:00 01:30:00-06:00:0007:00:00-18:00:0022:00:00-
23:00:00
07/28/99 00:00:00 02:00:00 04:30:00-06:00:0009:30:00-
10:00:00
11:00:00 17:30:00-18:00:00
07/29/99 02:30:00 04:00:00
07/31/99 03:30:00 14:00:00

August 1-31, 1999 Sampling Period
Big Bay
a) During the following periods, dissolved oxygen (DO) data were
deleted
because the DO membrane was punctured during the deployment.
08/01/99 00:00:00 THRU 08/02/99 08:00:00
b) During the following periods, the water temperature readings
exceeded
38oC, which are above the range expected at this site (8 to 38 oC).
08/01/99 15:00:00-17:00:00
c) During the following periods, no data are available due to a unit
malfunction caused by water seepage into the bulkhead. The water entered
through a fracture in the battery chamber. The unit was sent to YSI for
a
replacement bulkhead.
08/11/99 13:30:00-14:30:0016:30:00
08/12/99 00:00:00-03:00:0004:00:00-05:30:0007:00:00 12:00:00-
13:30:00
14:30:00-17:30:0020:00:00
08/13/99 00:30:00 01:30:00-03:30:0004:30:00-06:00:00
d) Prior to 12:00 on August 13, the data logger was replaced with a
recently
calibrated unit.
e) During the following periods, the dissolved oxygen (DO) data were
deleted
because the DO membrane was damaged prior to the deployment.

08/13/99 11:00:00 THRU 08/31/99 23:30:00

St. Pierre
a) During the following periods, the dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during the deployment.
08/01/99 00:00:00 THRU 08/02/99 09:30:00
b) During the following periods, the turbidity readings are greater than 1000
NTU. The high values reflect the very turbid conditions that occur during heavy
rainfall and high wind events.
08/01/99 02:30:00 14:30:00
08/02/99 02:30:00 08:00:00
08/06/99 01:30:00 02:30:00 03:30:00-04:00:0005:00:00-06:00:00
07:00:00-08:30:0009:30:00 10:30:00 12:30:00-13:00:00
17:30:00

08/07/99 02:30:00 03:30:00 05:00:00 17:30:00-18:30:00
08/08/99 04:00:00 05:00:00-06:00:0008:30:00 14:30:00-15:00:00
08/09/99 16:30:00 20:00:00-20:30:00
08/10/99 08:00:00-09:00:0017:00:00 21:00:00-21:30:0022:30:00-23:30:00
08/11/99 00:00:00-01:00:0003:30:00-04:00:0006:30:00-07:30:0012:30:00
21:30:00
08/12/99 03:30:00-4:00:00 05:00:00-06:00:0007:00:00 09:00:00-10:00:00
12:00:00 13:30:00-15:00:0016:00:00-16:30:0019:00:00
22:30:00-23:00:00
c) The following records include small negative turbidity readings (-1 NTU).
The negative readings are due to normal sensor drift.
08/01/99 03:30:00-04:00:0005:30:00 06:30:00 15:00:00
16:30:00 17:00:00
08/02/99 07:30:00
08/15/99 05:00:00 09:00:00 15:30:00
08/16/99 15:00:00-15:30:0018:30:00 23:30:00
08/17/99 00:00:00 03:00:00-03:30:0009:00:00-09:30:0016:00:00-16:30:00
22:00:00-23:30:00
08/18/99 01:00:00 03:30:00-04:00:0005:00:00 06:00:00
07:00:00 09:30:00 15:30:00 17:30:00
20:30:00 22:00:00 23:00:00
08/19/99 01:00:00 03:00:00 04:00:00 06:30:00
08:00:00 09:30:00 12:00:00 17:00:00
19:30:00 20:30:00-21:00:0023:00:00
08/20/99 00:00:00 01:30:00 03:00:00 04:00:00
05:30:00 08:30:00 09:30:00-10:30:0013:00:00
18:30:00 20:00:00 22:00:00 23:00:00-23:30:00
08/21/99 11:30:00 17:30:00 23:30:00
08/22/99 02:00:00 07:00:00-08:30:0010:30:00 12:00:00
15:30:00 23:00:00-23:30:00
08/23/99 12:00:00 13:30:00-14:00:0015:00:00-16:00:0017:30:00
19:30:00 20:30:00 23:00:00-23:30:00

08/24/99 01:00:00 06:00:00-06:30:0007:30:00 12:00:00
14:00:00 16:00:00
08/25/99 04:00:00 15:00:00-16:00:00
08/26/99 02:30:00 06:30:00 08:00:00 15:30:00
16:30:00 17:30:00 20:00:00-20:30:00
08/27/99 01:30:00-02:00:0007:30:00 08:30:00 18:30:00
21:00:00
08/28/99 09:30:00 10:30:00 15:30:00 18:30:00
21:00:00
08/29/99 01:00:00 02:30:00 04:30:00 05:30:00-07:00:00
09:00:00 10:00:00 11:00:00 12:00:00-13:00:0015:00:00-
15:30:00
19:00:00-19:30:0021:00:00 22:30:00
08/30/99 00:00:00 02:00:00-03:00:0007:30:00 09:00:00-
10:00:00
11:00:00 12:30:00-14:00:0015:00:00 16:30:00-17:30:00
19:30:00 20:30:00-23:30:00
08/31/99 00:30:00-01:30:0003:00:00 04:00:00-06:00:0007:00:00
08:00:00-09:30:0010:30:00 11:30:00 13:00:00
14:00:00-15:30:0016:30:00-18:30:0020:00:00 21:00:00-
22:00:00
23:00:00

d) During the following periods, dissolved oxygen (DO) does not exhibit a normal diurnal pattern. Although DO readings are low, DO remain above 28% air saturation. The anomalous readings was probably caused by environmental conditions during this period, as indicated by the unusually high salinity and low pH readings that occurred during the same time period.

08/10/99 02:00:00 THRU 08/12/99 19:00:00

e) Prior to 11:30 on August 13, the data logger was replaced with a recently calibrated unit.

f) The following records include dissolved oxygen (DO) readings that are less than 28% air saturation. The low readings occurred during late ebb or early flood tides.

08/12/99 22:30:00
08/22/99 22:30:00-23:30:00
08/23/99 00:00:00-01:30:00
08/23/99 04:00:00-05:30:00
08/29/99 04:30:00 22:00:00 23:00:00
8/30/99 21:00:00 22:00:00-23:00:00
8/31/99 08:00:00-09:30:0023:00:00

g) The following records include large negative turbidity readings (> -10 NTU). The negative readings were caused by debris on the lens, a wiper malfunction, or animal interference. The post-deployment calibration check indicated that the sensor worked properly during deployment.

08/14/99 09:00:00 11:30:00 22:30:00
08/15/99 17:00:00 18:00:00-20:00:00

08/16/99 01:30:00 03:00:00 04:30:00 06:00:00-07:00:00
08:00:00 13:00:00
08/21/99 01:00:00 02:30:00 03:30:00 06:30:00
08:30:00-09:00:0013:30:00 15:30:00-17:00:00
08/22/99 06:30:00 14:00:00 16:00:00
08/24/99 08:00:00 17:30:00 23:00:00-23:30:00
08/25/99 00:30:00 01:30:00-03:30:0004:30:00 05:30:00
06:30:00 07:30:00-08:00:0010:30:00 13:00:00
16:30:00-17:00:0018:30:00 20:00:00 23:30:00
08/26/99 01:00:00-02:00:0004:00:00 12:30:00-13:30:0019:30:00
21:30:00
08/27/99 02:30:00 03:30:00 04:30:00 06:00:00
09:30:00 14:30:00-17:00:0018:00:00 20:30:00
08/28/99 04:30:00 07:30:00 08:30:00 13:00:00
14:00:00 15:00:00 22:00:00
08/29/99 02:00:00

h) During the following periods, temperature, specific conductivity, salinity, dissolved oxygen (DO), and pH readings were deleted. The dampened or absent diurnal fluctuations indicated that the sensors were fouled by mud from the nearby creek.

08/23/99 00:00:00-11:00:00

i) During the following periods, the turbidity readings were deleted. The sensor was fouled by mud from nearby creek bank, but no anomalies were evident. However, the operation of the wiper was probably hindered by the mud.

08/23/99 00:00:00-11:00:00

j) The following record includes a negative turbidity reading (-2 to -10 NTU). The negative reading is probably due to calibration error. The post-deployment calibration check indicated that the sensor worked properly during deployment.

08/24/99 05:30:00

k) During the following periods, the dissolved oxygen (DO) does not exhibit a normal diurnal patter. The readings decreased during a flood tide and in some instances did not increase again until the next flood tide. However, all quality assurance checks indicate that DO sensor was not fouled or punctured during the deployment, and the last in-situ DO reading was 7.9 mg/L, and the DO field check reading was 6.2 mg/L. The reason for the anomalous readings is not known at this time.

08/29/99 09:00:00 21:30:00-23:30:00
08/30/99 20:00:00-23:00:00
08/31/99 05:30:00-09:30:0023:00:00

September 1-30, 1999 Sampling Period
Big Bay
a) During the following periods, the dissolved oxygen (DO) data were deleted
because the DO membrane was damaged prior to the deployment.
09/01/99 00:00:00 THRU 09/03/99 10:00:00
b) The following records include salinity readings that are greater than 40
ppt. These readings are not within normal mesohaline/polyhaline salinity range
(18 and 35 ppt) for this site.
Reason for high readings is not known at this time.
09/10/99 THRU 09/14/99 11:30:00-23:30:00
09/15/99 00:00:00-04:30:0007:30:00-14:00:00
09/16/99 12:30:00-13:00:00
09/17/99 12:30:00-16:00:00
09/18/99 01:00:00-02:00:0012:30:00-17:00:00
09/19/99 01:00:00-04:00:0013:30:00-17:30:00
09/20/99 02:30:00-05:00:0014:30:00-19:00:00
09/21/99 04:00:00-06:00:0015:00:00-21:00:00
09/22/99 05:00:00-08:00:0017:30:00 21:30:00-22:00:00
09/23/99 07:30:00
c) During the following periods, the dissolved oxygen (DO) data were deleted
because the readings were negative.
09/19/99 20:00:00-22:00:00
d) During the following periods, the dissolved oxygen (DO) data were deleted
because the DO membrane was fouled.
09/23/99 12:30:00 THRU 09/30/99 23:30:00

e) During the following periods, the temperatures readings were deleted. The
readings exceeded 50 oC, which are well above the range expected at this site (8
to 38 oC).
Subsequently, salinity and dissolved oxygen (mg/L) readings, all of which are
calculated from temperature readings, were deleted.
09/24/99 14:30:00-20:00:00
f) During the following periods, the specific conductivity readings are
suspect. At 14:30, specific conductivity readings is 50% lower than preceding
time period, and readings remain at this level during all but the 1530 h when
reading spike by 50%. However, the post-deployment checks did not indicate any
sensor problem. Reason for the anomalous readings are not known at this time.
09/24/99 14:30:00-20:00:00

St. Pierre

a) The dissolved oxygen (DO) readings are suspect. The readings decreased during a flood tide and in some instances did not increase again until the next flood tide. However, all quality assurance checks indicate that DO sensor was not fouled or punctured during the deployment, and the last in-situ DO reading was 7.9 mg/L, and the DO field check reading was 6.2 mg/L. Based on our knowledge of this site, the anomalous readings may be due to high sediment loading from nearby creek bank and creeklet. Further investigation of this problem is needed.

09/01/99 00:00:00-01:30:0012:30:00-13:00:00
09/02/99 00:00:00-00:30:0013:30:00-14:30:00
09/03/99 08:00:00-08:30:0009:30:00

b) The following records include small negative turbidity readings (-1 NTU). The negative readings are the result of normal sensor drift.

09/01/99 00:00:00-00:30:0002:00:00 03:00:00-03:30:0005:30:00
07:00:00-08:30:0009:30:00 10:30:00-11:00:0012:00:00-13:00:00
14:00:00-15:30:0017:00:00-20:30:0022:00:00-23:30:00

09/02/99 00:00:00-00:30:0001:30:00-04:00:0005:00:00-07:30:00 08:30:00-12:30:00
13:30:00-14:30:0015:30:00-16:00:0018:00:00 20:30:00-21:00:00
22:00:00-23:30:00

09/03/99 00:00:00 01:00:00-03:00:0004:00:00-06:00:0007:30:00-10:00:00
11:00:00

09/11/99 05:30:00 07:00:00-07:30:0008:30:00-09:00:0010:00:00-11:00:00
12:00:00 13:00:00-14:00:0015:00:00 16:00:00
17:00:00-17:30:0018:30:00 19:30:00-20:00:00

09/12/99 05:30:00 07:30:00 17:00:00 19:30:00-20:00:00
22:30:00

09/13/99 01:30:00 05:30:00 06:30:00-07:00:0009:00:00
10:00:00-10:30:0012:00:00-13:30:0015:00:00 16:30:00-17:00:00
18:00:00 19:00:00-19:30:0021:00:00-21:30:0023:30:00

09/14/99 01:00:00 02:30:00-03:00:0004:30:00 06:00:00-06:30:00
07:30:00 10:00:00 11:00:00-11:30:0013:30:00-15:00:00
16:30:00

09/21/99 16:30:00

09/22/99 00:00:00 01:00:00 03:30:00 05:00:00
06:00:00-07:00:0008:30:00-09:00:0013:30:00-14:00:0015:00:00
16:00:00

09/23/99 01:00:00-01:30:0002:30:00-03:00:0004:00:00 06:00:00
07:00:00 08:00:00 11:30:00 14:00:00
15:00:00 16:00:00 22:30:00

09/24/99 01:00:00 09:30:00-10:00:0012:00:00 16:00:00

17:30:00 23:30:00
09/25/99 00:00:00 05:00:00 06:00:00 16:00:00
17:30:00 18:30:00
09/26/99 02:00:00 03:00:00 04:00:00-05:00:0007:00:00
08:00:00 09:00:00 10:30:00 14:00:00
15:30:00 16:30:00 20:00:00 22:00:00-22:30:00
09/27/99 01:00:00-02:00:0004:30:00-06:00:0007:00:00-07:30:00
08:30:00
14:00:00-14:30:0016:00:00 21:00:00
09/28/99 06:30:00 09:00:00 14:30:00 15:30:00-16:00:00
17:30:00-18:00:0021:00:00
09/29/99 00:00:00 01:00:00 02:30:00 06:00:00-06:30:00
10:00:00 16:00:00 23:00:00
09/30/99 02:00:00 05:30:00 09:00:00 12:30:00
23:30:00

c) The following records include large negative turbidity readings (> -10
NTU). The negative readings are caused by debris on the lens, a wiper malfunction, or animal interference during deployment. The post-deployment
calibration check indicated that the sensor worked properly during deployment.
Based on our knowledge of this site, the anomalous readings may be due to high
sediment loading from nearby creek bank and creeklet.
Further investigation of this problem is needed.
09/10/99 23:30:00
09/11/99 00:00:00 01:00:00
09/12/99 00:30:000-05:00:00 12:30:00-14:30:00
09/21/99 17:30:00 19:00:00-21:30:0022:30:00
09/22/99 02:00:00-02:30:0004:30:00 05:30:00 07:30:00
11:00:00 14:30:00 20:30:00-22:00:0023:00:00-23:30:00
09/23/99 03:30:00 09:30:00 10:30:00-11:00:0023:30:00
09/24/99 00:00:00-00:30:0001:30:00 05:30:00 11:00:00
18:00:00-18:30:00
09/25/99 10:30:00-11:30:0013:00:00
09/26/99 00:00:00-01:00:00
09/27/99 09:00:00-09:30:0010:30:00-11:00:0012:00:00 13:00:00
22:00:00
09/28/99 00:00:00-00:30:0002:00:00-03:30:0004:30:00 13:00:00-13:30:00
22:00:00-23:00:00
09/29/99 00:30:00 10:30:00-12:00:0013:00:00 14:00:00-14:30:00
d) During the following periods, the dissolved oxygen readings are suspect.
The readings rapidly decreased to low levels (<28%) at the onset of an ebb tide
and remained low throughout the low tide, and then readings suddenly increased
at the onset of a flood tide.
Based on our knowledge of this site, the anomalous readings may be due to high

sediment loading from nearby creek bank and creeklet. Further investigation of
this problem is needed.
09/11/99 01:30:00-06:00:0013:00:00-19:30:00
09/12/99 14:30:00-19:30:0020:30:00
09/13/99 02:00:00-08:30:0012:00:00 14:30:00-20:30:0023:30:00
09/14/99 00:00:00-09:00:0013:00:00 14:30:00-23:30:00
09/21/99 21:30:00-23:30:00
09/22/99 00:00:00-04:30:0006:30:00-16:00:0022:30:00-23:30:00
09/23/99 00:00:00-03:00:0004:00:00-04:30:00
09/24/99 23:00:00-23:30:00
09/25/99 00:00:00-05:30:0012:30:00-17:30:00
09/26/99 01:30:00-04:00:0005:00:00 13:30:00-14:00:0015:00:00-19:30:00
09/27/99 00:30:00-07:30:0014:00:00-19:00:0020:00:00
09/28/99 01:30:00-07:30:0014:30:00-19:30:00
09/29/99 03:30:00-08:00:0009:00:00 16:30:00-17:30:0019:00:00
09/30/99 02:00:00-09:00:0013:30:00 16:30:00-22:30:00
e) During the following periods, temperature, specific conductivity, salinity, dissolved oxygen (DO), and pH readings were deleted. The dampened or
no diurnal fluctuations and significantly lower readings than expected indicated
that the sensors were fouled by mud from nearby creek bank.
09/14/99 17:30:00 THRU 09/21/99 16:00:00
f) During the following periods, the turbidity readings were deleted. The
sensor was fouled by mud from nearby creek bank, but no anomalies were evident.
However, the operation of the wiper was probably hindered by the mud.
09/14/99 17:30:00 THRU 09/21/99 16:00:00
g) The following records include small negative turbidity readings (-1 NTU).
The negative readings are probably due to a calibration error. The post-deployment calibration check indicated that the sensor worked properly during
deployment. Based on our knowledge of this site, the anomalous readings may be
due to high sediment loading from nearby creek bank and creeklet. Further
investigation of this problem is needed.
09/25/99 19:00:00

October 1-31, 1999 Sampling Period
Big Bay
a) During the following periods, the dissolved oxygen (DO) data were deleted
because the DO membrane was fouled.
10/01/99 00:00:00 THRU 10/01/99 08:30:00
b) Prior to 10:30 on October 1, the data logger was replaced with a recently
calibrated unit.
c) During the following periods, dissolved oxygen (DO) data were deleted

because the DO membrane was punctured during the deployment.
10/11/99 03:30:00 THRU 10/27/99 12:30:00
d) The following records include salinity readings that less than 18 ppt.
These readings are not within normal mesohaline/polyhaline salinity range (18
and 35 ppt) for this site.
10/17/99 19:00:00-20:30:00
e) Prior to 13:00 on October 27, the data logger was replaced with a recently
calibrated unit.

St. Pierre
a) The following records include negative turbidity readings (-1 to -10 NTU).
The negative readings are probably due to a calibration error. The post-deployment calibration check indicated that the sensor worked properly during
deployment.
10/01/99 01:00:00 02:00:00-02:30:0005:30:00-06:00:0007:00:00-07:30:00
b) Prior to 11:00 on October 1, the data logger was replaced with a recently
calibrated unit.
c) During the following periods, the dissolved oxygen readings are low (<28%
air sat.). The low dissolved oxygen (DO) readings occurred during high tides,
not a low tide when the lowest DO readings usually occur. Reason for the low
readings during high tide is not known at this time.
10/01/99 01:00:00-09:30:0017:30:00-23:30:00

10/02/99 02:30:00-12:30:0020:00:00-23:30:00
10/03/99 00:00:00-13:30:0019:00:00-23:30:00
10/04/99 00:00:00-02:30:0006:00:00 07:00:00-14:30:0023:00:00-23:30:00
10/05/99 00:00:00-05:30:0009:30:00-10:00:0011:00:00-16:00:00
18:30:00
23:00:00-23:30:00
10/06/99 00:00:00-06:30:0007:00:00 09:30:00-17:00:00
10/07/99 00:00:00-03:00:0012:00:00-17:30:00
10/08/99 00:30:00-04:00:0006:00:00 12:30:00 14:00:00-17:00:00
10/09/99 01:30:00-05:30:0013:00:00-19:00:0023:00:00-23:30:00
10/10/99 00:30:00-07:30:0012:30:00-19:00:0022:00:00-22:30:00
23:30:00
10/11/99 01:00:00 02:00:00-08:00:0009:00:00 10:30:00-11:00:00
12:00:00 13:30:00
10/29/99 08:30:00
d) During the following periods, dissolved oxygen (DO) are suspect. The

readings were low during high tides and high during low tides. However, all
quality assurance checks indicate that DO sensor was not fouled or punctured
during the deployment. Reason for anomalous diurnal pattern is unknown at this
time.

10/01/99 00:00:00 THRU 10/11/99 14:00:00

e) During the following periods, temperature, specific conductivity, and
salinity readings were deleted. The dampened or no diurnal fluctuations and
significantly lower readings than expected indicated that the sensors were
fouled by mud from nearby creek bank.

10/10/99 16:30:00 THRU 10/27/99 13:00:00

f) During the following periods, the pH readings were deleted. The dampened
or no diurnal fluctuations and significantly lower readings than expected
indicated that the sensors were fouled by mud from nearby creek bank.

10/11/99 04:30:00 THRU 10/27/99 13:00:00

g) During the following periods, dissolved oxygen (DO) readings were deleted.
The dampened or no diurnal fluctuations and significantly lower readings than
expected indicated that the sensors were fouled by mud from nearby creek bank.

10/11/99 14:30:00 THRU 10/27/99 13:00:00

h) Prior to 14:00 on October 27, the data logger was replaced with a recently
calibrated unit.

i) At 21:00 on October 27, the turbidity rose to 628 NTU. The reason for the
spike in the dataset is not known at this time.

November 1-30, 1999 Sampling Period
Big Bay

a) During the following periods, data were deleted because the sonde went
dry.

11/02/99 23:00:00-23:30:00
11/03/99 00:00:00
11/21/99 00:30:00
11/22/99 02:00:00
11/23/99 14:30:00-15:00:00
11/24/99 01:30:00-03:30:0015:30:00-16:00:00
11/25/99 02:00:00-04:00:0016:00:00-17:00:00
11/26/99 03:00:00-05:00:0017:00:00-17:30:00
11/27/99 03:30:00-06:00:0017:00:00-18:30:00
11/28/99 05:00:00-06:30:0018:00:00-19:00:00
11/29/99 06:30:00-07:00:00
11/30/99 20:30:00-21:00:00

b) The following records include zero or negative depth readings. The depth
data were not deleted because the salinity and dissolved oxygen readings indicate the data logger was submerged.
11/02/99 11:00:00 22:30:00
11/03/99 00:30:00
11/21/99 00:00:00 01:00:00
11/22/99 01:00:00-01:30:00
11/23/99 02:30:00
c) At 11:30 on November 22, the turbidity rose to 710 NTU. The reason for the
spike in the dataset is not known at this time.
d) Prior to 10:30 on November 23, the data logger was replaced with a recently calibrated unit.
e) During the following periods, the specific conductivity and salinity
readings are suspect. The low reading are probably due to improper calibration
procedures are contaminated standard. Adjusted readings with correction factors
as follows.
The correction factors for the specific conductivity and salinity data were
calculated as follows. First, a new conductivity standard was prepared. Then
the conductivity sensor was fully immersed in the standard and the specific
conductivity and salinity readings were recorded. Next, the sensor was calibrated, and the new specific conductivity and salinity readings were recorded. The correction factor for the two parameters was calculated by dividing the reading taken after calibration by the reading taken prior to the
calibration. The specific conductivity and salinity data were multiplied by the
correction factors (1.67 and 1.77, respectively).
In addition, the dissolved oxygen (mg/L) readings were reduced by 10%, in accordance with the oxygen solubility table.
11/23/99 10:30:00 THRU 11/30/99 23:30:00

St. Pierre
a) During the following periods, the dissolved oxygen (DO) readings are
suspect. The readings are lower than expected during low tides in November.
The data were not deleted because the water was very turbid, as indicated by the
turbidity readings. In addition, the post deployment checks indicated that the
membrane was not damaged or fouled, and the last YSI reading was similar to the
DO check reading.
11/01/99 21:30:00-23:30:00
11/02/99 00:00:00-09:00:0012:00:00-23:30:00
11/03/99 00:30:00-23:30:00

11/04/99 00:00:00-12:30:0014:00:00-23:30:00
11/05/99 00:00:00-00:30:0003:30:00-23:30:00
11/06/99 00:00:00-01:00:0004:30:00-11:00:0017:00:00-23:30:00
11/07/99 00:00:00-04:00:0005:00:00-23:30:00
11/08/99 00:00:00-01:30:0006:00:00-16:00:0019:30:00-23:00:00
11/09/99 07:30:00-17:00:0018:00:00-23:30:00
11/10/99 00:00:00-02:00:0007:00:00-16:00:00

b) During the following periods, negative and zero dissolved oxygen (DO) readings were deleted.

11/02/99 09:30:00-11:30:00
11/03/99 00:00:00
11/04/99 13:00:00-13:30:00
11/05/99 01:00:00-03:00:00
11/06/99 01:30:00-04:00:0011:30:00-16:30:00
11/07/99 04:30:00
11/08/99 02:00:00-05:30:0016:30:00-19:00:0023:30:00
11/09/99 00:00:00-07:00:0017:30:00
11/10/99 02:30:00-06:30:00
11/10/99 16:30:00 THRU 11/23/99 11:00:00
11/27/99 11:30:00-12:00:00
11/28/99 04:30:00-05:00:00
11/29/99 19:30:00-22:00:00
11/30/99 08:00:00-10:00:00

c) The following record includes a turbidity reading that is greater than 1000 NTU. The high value reflects the very turbid conditions that occur during heavy rainfall and high wind events.

11/02/99 05:30:00 21:00:00
11/05/99 08:00:00
11/07/99 20:00:00-20:30:00
11/09/99 21:30:00
11/10/99 09:30:00
11/15/99 08:00:00
11/23/99 00:00:00-00:30:0001:30:00-02:30:0003:30:00-04:00:00 05:30:00-07:00:00

d) The following records include salinity readings that are greater than 40 ppt. These readings are not within normal mesohaline/polyhaline salinity range (18 and 35 ppt) for this site. Reason for the high salinity readings is not known at this time.

11/23/99 11:30:00-13:30:0018:30:00-23:00:00
11/24/99 06:30:00-11:30:0013:00:00 20:00:00-22:30:00
11/25/99 08:30:00-10:00:0011:00:00 12:00:00-12:30:0019:00:00-20:30:00
11/27/99 10:00:00-12:30:0013:30:00
11/28/99 14:30:00-17:00:0023:30:00
11/29/99 00:00:00-03:00:0012:00:00 13:00:00-14:00:00

e) Prior to 11:30 on November 23, the data logger was replaced with a recently calibrated unit.

December 1-31, 1999 Sampling Period
Big Bay

a) During the following periods, data were deleted because the sonde went dry.

12/01/99 21:00:00-21:30:00
12/02/99 22:30:00
12/03/99 22:30:00-23:30:00
12/04/99 11:30:00-12:00:0023:00:00-23:30:00
12/05/99 00:00:00-00:30:0012:30:00
12/06/99 00:00:00-01:00:0012:30:00-14:00:0023:30:00
12/07/99 00:00:00-02:00:00
12/08/99 01:00:00-02:00:0014:00:00-14:30:00
12/09/99 14:30:00-15:30:00
12/10/99 02:30:00-03:00:00
12/20/99 23:30:00
12/21/99 00:00:00-00:30:00
12/22/99 02:00:00
12/23/99 02:00:00-02:30:00
12/24/99 03:00:00-03:30:00
12/25/99 03:00:00-04:00:00
12/27/99 05:00:00-05:30:00

b) During the following periods, the specific conductivity and salinity readings are suspect. The low reading are probably due to improper calibration procedures are contaminated standard. Adjusted readings with correction factors as follows. The correction factors for the specific conductivity and salinity data were calculated as follows. First, a new conductivity standard was prepared. Then the conductivity sensor was fully immersed in the standard and the specific conductivity and salinity readings were recorded. Next, the sensor was calibrated, and the new specific conductivity and salinity readings were recorded. The correction factor for the two parameters was calculated by dividing the reading taken after calibration by the reading taken prior to the calibration. The specific conductivity and salinity data were multiplied by the correction factors (1.67 and 1.77, respectively).

In addition, the dissolved oxygen (mg/L) readings were reduced by 10%, in accordance with the oxygen solubility table.

12/01/99 00:00:00 THRU 12/10/99 11:00:00
12/16/99 11:00:00 THRU 12/31/99 23:30:00

c)At 13:30 on December 7, the specific conductivity and salinity are lower than expected during this deployment period. However, the data were not deleted. Reason for the low readings are not known.

St. Pierre
a) During the following periods, the dissolved oxygen (DO) readings are suspect. The readings are lower than those in the previous and subsequent deployment, indicating that the sensor was either improperly calibrated or the membrane or electrolyte was faulty. The first DO reading (6.8 mg/L) and the last DO reading (5.6 mg/L) during the November 23-December 10 deployment are lower than Winkler checks (8.6 and 7.1 mg/L, respectively). We may be able to adjust the values because the calculated ratios of the YSI readings to the Winkler readings are similar.

12/01/99 00:00:00 THRU 12/10/99 11:30:00

b) During the following periods, the negative dissolved oxygen (DO) readings were deleted.

12/01/99 08:00:00-08:30:00
12/03/99 11:30:00-13:30:0017:30:00 23:30:00
12/04/99 00:30:00-01:00:0023:00:00-23:30:00
12/05/99 00:00:00-01:30:0019:30:00 23:00:00-23:30:00
12/06/99 00:00:00-01:30:00
12/07/99 12:00:00-15:30:0017:00:00 21:00:00 23:30:00
12/08/99 00:00:00-04:30:0009:00:00 11:00:00 12:30:00
14:00:00-16:30:00
12/09/99 01:00:00-04:30:00

c) During the following periods, the pH readings did not exhibit a diurnal pattern; however, the data were not deleted. Based on our knowledge of this site, the anomalous readings may be due to high sediment loading from nearby creek bank and creeklet. Further investigation of this problem is needed.

12/03/99 11:30:00 THRU 12/10/99 11:30:00

d) During the following periods, the specific conductivity readings are lower than expected at the site. The low reading are probably due to improper calibration procedures are contaminated standard. Adjusted readings with correction factors as follows.

The correction factors for the specific conductivity and salinity data were calculated as follows. First, a new conductivity standard was prepared. Then the conductivity sensor was fully immersed in the standard and the specific conductivity and salinity readings were recorded. Next, the sensor was calibrated, and the new specific conductivity and salinity readings were recorded. The correction factor for the two parameters was calculated by dividing the reading taken after calibration by the reading taken prior to the

calibration. The specific conductivity and salinity data were multiplied by the
correction factors (1.67 and 1.77, respectively).
      In addition, the dissolved oxygen (mg/L) readings were reduced by 10%, in
accordance with the oxygen solubility table.
      12/16/99   10:30:00   THRU 12/31/99   23:30:00
e)   The following record includes a turbidity reading that is greater than
1000 NTU. The high value reflects the very turbid conditions that occur during
heavy rainfall and high wind events.
12/16/99   10:30:00   THRU 12/31/99   23:30:00
12/19/99   07:30:00   08:30:00-12:00:0015:30:00   20:30:00-23:30:00
12/20/99   01:00:00-01:30:0002:30:00   09:00:00   10:00:00
            11:00:00-12:00:0013:30:00-14:00:0015:00:00   16:30:00
            17:00:00   20:00:00
      12/21/99   07:30:00   10:00:00-10:30:0012:00:00   13:00:00
            21:00:00-21:30:0022:30:00
      12/22/99   00:00:00   01:00:00-02:00:0003:00:00   04:00:00
            05:30:00   09:00:00   10:00:00   12:00:00-12:30:00
            14:00:00   15:00:00   16:00:00   17:00:00-18:00:00
            19:00:00   20:00:00-20:30:00
      12/23/99   11:30:00   12:30:00-13:00:0014:00:00
      12/24/99   12:00:00-13:00:0015:00:00   17:30:00-18:00:00
      12/25/99   14:30:00   17:30:00-18:00:00

11.   Missing data
January 1-31, 1999 Sampling Period
Big Bay
a)   During the following periods, pH data were deleted because the sensor
malfunctioned during the December 21, 1998-January 20, 1999 deployment, as
determined by post-deployment check. The probe read pH 7 while immersed in the
pH 10 standard solution.
      01/01/99   00:00:00   THRU 01/20/99   10:00:00

b)   During the following periods, turbidity data were deleted because the
sensor?s wiper malfunctioned during the December 21, 1998-January 20, 1999
deployment. It was discovered during the post-deployment check that the wiper
was jammed. The wiper pad was replaced prior to next deployment.
      01/01/99   00:00:00   THRU 01/20/99   10:00:00
      01/22/99   09:30:00   THRU 01/31/99   23:30:00
c)   During the following periods, no data are available due to downtime for
servicing and calibrating of data loggers.
      01/20/99   10:30:00   THRU 01/22/99   09:00:00

St. Pierre

a) During the following periods, temperature, specific conductivity, salinity, dissolved oxygen, pH, and turbidity data were deleted because the sensors were fouled by sediment.
The lack of a cyclic fluctuation and significant decrease in the readings indicated that the sensors were fouled by mud from the nearby riverbank.
01/02/99 12:00:00 THRU 01/20/99 11:00:00
b) During the following periods, no data are available due to downtime for servicing and calibrating of data loggers.
01/20/99 11:30:00 THRU 01/22/99 09:00:00
c) During the following periods, pH data were deleted because the sensor malfunctioned during the deployment. The last in-situ reading was significantly higher than the end-of-deployment field check (10.1 and 7.2, respectively). In addition, the readings are significantly higher than previously observed at this site (pH 5.3-8.4).
Although the pH calibration held through the deployment, the millivolt output from the sensors was outside the normal range while sensor was submersed in pH 7 buffer and in pH 10 buffer. The pH sensor was re-conditioned prior to the next deployment.
01/22/99 09:30:00 THRU 01/31/99 23:30:00

February 1-28, 1999 Sampling Period
Big Bay
a) During the following periods, turbidity data were deleted because the wiper malfunctioned during the December 21, 1998-January 20, 1999 deployment. A new unit (datalogger and sensors) was deployed at the next deployment
02/01/99 00:00:00 THRU 02/10/99 10:00:00
b) During the following periods, dissolved oxygen (DO) data were deleted because the DO membrane was punctured during deployment, as indicated by the post-deployment checks. DO readings increased from 88.3% to 250.6% during a half hour period, and the final YSI?s DO reading was significantly lower than a in-situ Winkler DO check (53.33 and 6.2 mg/L, respectively). The membrane integrity test confirmed that the DO membrane was punctured during deployment.
02/03/99 03:00:00 THRU 02/10/99 10:00:00
c) At 10:30 on February 10, no data are available due to downtime for servicing the deployment site.

St. Pierre

a) During the following periods, pH data were deleted because the sensor malfunctioned during the deployment. The last in-situ reading was significantly higher than the end-of-deployment field check (10.1 and 7.2, respectively). In addition, the readings are significantly higher than previously observed at this site (pH 5.3-8.4). Although the pH calibration held through the deployment, the millivolt output from the sensors was outside the normal range while sensor was submersed in pH 7 buffer and in pH 10 buffer. The pH sensor was re-conditioned prior to the next deployment.

02/01/99 00:00:00 THRU 02/10/99 09:30:00

b) During the following periods, the turbidity sensor was not installed.

02/10/99 10:00:00 THRU 02/28/99 23:30:00

March 1-31, 1999 Sampling Period

Big Bay

a) During the following periods, the turbidity sensor was not installed.

03/08/99 09:00:00 THRU 03/31/99 23:30:00

b) During the following periods, no data are available because data logger stopped working after water seeped into the battery chamber, shorting out the batteries.

03/10/99 14:00:00 THRU 03/31/99 23:30:00

St. Pierre

a) During the following periods, the turbidity sensor was not installed.

03/01/99 00:00:00 THRU 03/08/99 10:00:00

b) At 10:30 on March 8, no data are available due to downtime for servicing of the deployment site.

April 1-30, 1999 Sampling

Big Bay

a) During the following periods, no data are available because data logger stopped working after water seeped into the battery chamber, shorting out the batteries.

04/01/99 00:00:00 THRU 04/05/99 08:30:00

b) During the following periods, the data were deleted because the data logger went dry.

04/16/99 13:00:00-14:30:00
04/17/99 03:30:00 14:00:00-16:00:00

04/18/99 04:00:00-04:30:0014:30:00-16:30:00
04/19/99 04:30:00-05:00:0015:30:00-17:30:00
04/20/99 05:00:00-06:00:0016:30:00-18:30:00
04/21/99 05:30:00-06:30:0018:00:00
04/24/99 08:30:00-09:30:00

St. Pierre
a) During the following periods, no data are available because the unit
stopped working when battery voltage dropped below 10 volts; however, reason for
premature drain on battery is
not known.
    04/03/99 03:30:00 THRU 04/04/99 10:30:00
b) During the following periods, no data are available due to downtime for
servicing and calibrating of data loggers.
    04/04/99 11:00:00 THRU 04/05/99 10:30:00
c) During the following periods, the temperature, specific conductivity,
salinity, dissolved oxygen, and pH data were deleted. Prolonged periods of
readings that are less than 28% air saturation followed by spikes, and dampened
diurnal fluctuations indicated that the sensors was buried under mud.
04/13/99 09:30:00 THRU 04/16/99 02:00:00
d) During the following periods, the turbidity data were deleted. The sensor
was buried under mud, but no anomalies were evident. However, the operation of
the wiper was probably hindered by the mud.
04/13/99 09:30:00 THRU 04/16/99 02:00:00

May 1-30, 1999 Sampling Period
Big Bay

a) During the following periods, no data are available due to downtime for
servicing and calibrating of data loggers.
    05/02/99 11:30:00 THRU 05/03/00 08:00:00
b) During the following periods, turbidity sensor was not installed.
    05/03/99 08:30:00 THRU 05/30/99 14:00:00
c) During the following periods, the data were deleted because the data
logger went dry.
05/10/99 09:00:00
05/12/99 11:00:00-11:30:0023:30:00
05/13/99 00:00:00 11:00:00-13:00:00
05/14/99 01:00:00-01:30:0012:30:00-14:00:00
05/15/99 13:30:00-14:30:00
05/16/99 15:00:00
05/17/99 15:30:00-16:00:00
05/18/99 16:30:00
05/19/99 17:00:00-17:30:00

05/27/99 00:00:00
d) During the following periods, the dissolved oxygen (DO) data were deleted
because the DO membrane was fouled, as indicated by end of deployment quality
checks. The last in-situ reading was significantly lower than the field DO check
(1.8 and 5.8 mg/l, respectively), and the post deployment calibration check was
88.6% air saturation.
05/21/99 07:30:00 THRU 05/30/99 13:00:00
e) During the following periods, no data are available due to downtime for
servicing of deployment of site.
05/30/99 13:30:00-14:30:00

St. Pierre
a) During the following periods, no data are available due to downtime for
servicing and calibrating of data loggers.
05/02/99 11:30:00 THRU 05/03/99 10:00:00
b) During the following periods, dissolved oxygen (DO) data were deleted
because the DO membrane was damaged during deployment, as indicated by the post-
deployment checks.
The membrane integrity test confirmed that the DO membrane was punctured during
deployment. The rapid increase in DO upon submersion in water indicated that
either the sensor was damaged in transit or the membrane was improperly installed.
05/03/99 10:30:00 THRU 05/30/99 14:00:00
c) At 14:30 on May 30, no data are available due to downtime for servicing
deployment site.

June 1-30, 1999 Sampling Period
Big Bay
a) During the following periods, the data were deleted because the data
logger went dry.
06/04/99 05:00:00
06/09/99 09:00:00-10:00:00
06/10/99 10:00:00-11:30:00
06/11/99 11:00:00-11:30:00
06/13/99 13:30:00-14:00:00
06/14/99 14:00:00-15:00:00
06/15/99 14:30:00-16:00:00

06/16/99 15:30:00-16:30:00
b) During the following periods, the pH data were deleted because the sensor
was fouled during deployment.

06/12/99 13:30:00 THRU 06/21/99 11:00:00
c) During the following periods, dissolved oxygen (DO) data were deleted.
Prolonged periods of extremely low DO readings (<8% and <1 mg/l) indicated that
the sensor wasn?t working properly.
06/12/99 13:30:00 THRU 06/21/99 11:00:00
d) During the following periods, no data are available due to downtime for
servicing and calibrating of data loggers.
06/21/99 11:30:00 THRU 06/24/99 12:00:00
e) During the following periods, dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during deployment, as indicated by the
post-deployment checks. The membrane integrity test confirmed that the DO membrane was punctured during deployment.
06/27/99 13:00:00 THRU 06/30/99 23:30:00

St. Pierre
During the following periods, no data are available due to downtime for
servicing and calibrating of data loggers.
06/21/99 12:30:00 THRU 06/24/99 13:00:00

July 1-31, 1999 Sampling Period
Big Bay
a) During the following periods, dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during the June 24-July 9 deployment.
07/01/99 00:00:00 THRU 07/09/99 09:00:00
b) During the following periods, turbidity sensor was not installed.
07/09/99 10:00:00 THRU 07/31/99 23:30:00
c) At 09:30 on July 9, no data are available due to downtime for servicing of
the deployment
apparatus.
d) During the following periods, dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during the deployment.
07/11/99 18:30:00 THRU 07/31/99 23:30:00

St. Pierre
a) During the following periods, dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during the deployment.
07/09/99 10:30:00 THRU 07/31/99 23:30:00
b) During the following periods, temperature, specific conductivity, and
salinity data were deleted because the sensor was fouled by mud from nearby
creek bank.
07/18/99 06:30:00 THRU 07/25/99 12:00:00

c) During the following periods, the pH data were deleted because the sensor
was fouled by mud from nearby creek bank.
07/18/99 18:30:00 THRU 07/27/99 16:00:00

August 1-31, 1999 Sampling Period
Big Bay

a) During the following periods, turbidity sensor was not installed.
08/01/99 00:00:00 THRU 08/02/99 08:00:00
b) During the following periods, dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during the deployment.
08/01/99 00:00:00 THRU 08/02/99 08:00:00
c) During the following periods, no data are available due to downtime for
servicing and calibrating of data loggers.
08/02/99 08:30:00 THRU 08/05/99 10:30:00
d) During the following periods, no data are available due to a unit malfunction caused by water seepage into the bulkhead. The water entered through a fracture in the battery chamber. The unit was sent to YSI for a
replacement bulkhead.
08/11/99 13:30:00-14:30:0016:30:00
08/12/99 00:00:00-03:00:0004:00:00-05:30:0007:00:00 12:00:00-13:30:00
14:30:00-17:30:0020:00:00
08/13/99 00:30:00 01:30:00-03:30:0004:30:00-06:00:0007:00:00-10:30:00
e) During the following periods, the dissolved oxygen (DO) data were deleted
because the DO membrane was damaged prior to the deployment. The spike in the
readings at the beginning of the deployment indicated that the membrane was
damaged in transit. However, we could not confirm our hypothesis because the DO
membrane integrity test was not conducted.
08/13/99 11:00:00 THRU 08/31/99 23:30:00
f) During the following periods, turbidity sensor was not installed.
08/13/99 11:00:00 THRU 08/31/99 23:30:00

St. Pierre
a) During the following periods, dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during the deployment.
08/01/99 00:00:00 THRU 08/02/99 09:30:00
b) During the following periods, no data are available due to downtime for
servicing and calibrating of data loggers.
08/02/99 10:00:00 THRU 08/05/99 11:00:00
c) During the following periods, temperature, specific conductivity, salinity, dissolved oxygen (DO), and pH readings were deleted. The dampened or

absent diurnal fluctuations indicated that the sensors were fouled by mud from
the nearby creek.
08/23/99 00:00:00-11:00:00
d) During the following periods, the turbidity readings were deleted. The
sensor was fouled by mud from nearby creek bank, but no anomalies were evident.
However, the operation of the wiper was probably hindered by the mud.
08/23/99 00:00:00-11:00:00

September 1-30, 1999 Sampling Period
Big Bay

a) During the following periods, turbidity sensor was not installed.
09/01/99 00:00:00 THRU 09/03/99 10:00:00
b) During the following periods, the dissolved oxygen (DO) data were deleted
because the DO membrane was damaged prior to the deployment. A DO spike prior to
deployment indicated that the membrane was damaged in transit; however, we could
not confirm our hypothesis because the DO membrane integrity test was not conducted at the end of the deployment.
09/01/99 00:00 THRU 09/03/99 10:00:00
c) During the following periods, no data are available due to downtime for
servicing and calibrating of data loggers.
09/03/99 10:30:00 THRU 09/10/99 11:00:00
d) During the following periods, the dissolved oxygen (DO) data were deleted
because the readings were negative. The negative DO readings were probably due
to reduced flow of oxygen across the membrane caused by sediment, plant or
animal.
09/19/99 20:00:00-22:00:00
e) During the following periods, the dissolved oxygen (DO) data were deleted
because the DO membrane was fouled.
09/23/99 12:30:00 THRU 09/30/99 23:30:00
f) During the following periods, the temperatures readings were deleted. The
readings exceeded 50 oC, which are well above the range expected at this site (8
to 38 oC). In addition, the sudden rise in temperature indicated that the probe
malfunctioned during the below-mentioned periods.
09/24/99 14:30:00-20:00:00
g) During the following periods, salinity and dissolved oxygen (mg/L) data,
all of which calculated from temperature readings, were deleted due to a temperature sensor malfunction (see previous log entry).

Subsequently, salinity and dissolved oxygen (mg/L) readings, all of which are
calculated from temperature readings, were deleted.
09/24/99 14:30:00-20:00:00

St. Pierre
a) During the following periods, no data are available due to downtime for
servicing and calibrating of data loggers.
    09/03/99 11:30:00 THRU 09/10/99 15:30:00
b) During the following periods, temperature, specific conductivity, salinity, dissolved oxygen (DO), and pH readings were deleted. The dampened or
no diurnal fluctuations and significantly lower readings than expected indicated
that the sensors were fouled by mud from nearby creek bank.
09/14/99 17:30:00 THRU 09/21/99 16:00:00
c) During the following periods, the turbidity readings were deleted. The
sensor was fouled by mud from nearby creek bank, but no anomalies were evident.
However, the operation of the wiper was probably hindered by the mud.
09/14/99 17:30:00 THRU 09/21/99 16:00:00

October 1-31, 1999 Sampling Period
Big Bay
a) During the following periods, the dissolved oxygen (DO) data were deleted
because the DO membrane was fouled.
10/01/99 00:00:00 THRU 10/01/99 08:30:00
b) During the following periods, no data are available due to downtime for
servicing and maintenance of deployment site.
    10/01/99 09:00:00-10:00:00
c) During the following periods, dissolved oxygen (DO) data were deleted
because the DO membrane was punctured during the deployment.
10/11/99 03:30:00 THRU 10/27/99 12:30:00

St. Pierre
a) During the following periods, no data are available due to downtime for
servicing and maintenance of deployment site.
    10/01/99 10:00:00-10:30:00
b) During the following periods, the turbidity sensor was not installed.
10/01/99 11:00:00 THRU 10/27/99 13:00:00
c) During the following periods, temperature, specific conductivity, and
salinity readings were deleted. The dampened cyclic fluctuation and little or no
diurnal pattern indicated that the sensors were fouled by mud from nearby creek

bank.
10/10/99 16:30:00 THRU 10/27/99 13:00:00
d) During the following periods, the pH readings were deleted. The dampened
cyclic fluctuation and little or no diurnal pattern indicated that the sensors
were fouled by mud from nearby creek bank.
10/11/99 04:30:00 THRU 10/27/99 13:00:00
e) During the following periods, dissolved oxygen (DO) readings were deleted.
The dampened cyclic fluctuation and little or no diurnal pattern indicated that
the sensors were fouled by mud from nearby creek bank.
10/11/99 14:30:00 THRU 10/27/99 13:00:00
f) At 13:30 on October 27, no data are available due to downtime for servicing of deployment site.

November 1-30, 1999 Sampling Period
Big Bay
a) During the following periods, data were deleted because the sonde went
dry.
11/02/99 23:00:00-23:30:00
11/03/99 00:00:00
11/21/99 00:30:00
11/22/99 02:00:00
11/23/99 14:30:00-15:00:00
11/24/99 01:30:00-03:30:0015:30:00-16:00:00
11/25/99 02:00:00-04:00:0016:00:00-17:00:00
11/26/99 03:00:00-05:00:0017:00:00-17:30:00
11/27/99 03:30:00-06:00:0017:00:00-18:30:00
11/28/99 05:00:00-06:30:0018:00:00-19:00:00
11/29/99 06:30:00-07:00:00
11/30/99 20:30:00-21:00:00

St. Pierre
a) During the following periods, the negative and zero dissolved oxygen (DO)
data were deleted. The lack of a cyclic fluctuation and the prolonged periods
of negative and zero DO readings indicated that the sensor was covered by mud
from the nearby riverbank. Quality assurance checks indicate that DO sensor was
not fouled or punctured during the deployment
11/02/99 09:30:00-11:30:00
11/03/99 00:00:00
11/04/99 13:00:00-13:30:00
11/05/99 01:00:00-03:00:00
11/06/99 01:30:00-04:00:0011:30:00-16:30:00
11/07/99 04:30:00
11/08/99 02:00:00-05:30:0016:30:00-19:00:0023:30:00
11/09/99 00:00:00-07:00:0017:30:00
11/10/99 02:30:00-06:30:00

11/10/99 16:30:00 THRU 11/23/99 11:00:00
11/27/00 11:30:00-12:00:00
11/28/99 04:30:00-05:00:00
11/29/99 19:30:00-22:00:00
11/30/99 08:00:00-10:00:00
b) During the following periods, the turbidity sensor was not installed.
11/23/99 11:30:00 THRU 11/30/99 23:30:00

December 1-31, 1999 Sampling Period
Big Bay
a) During the following periods, data were deleted because the sonde went
dry.
12/01/99 21:00:00-21:30:00
12/02/99 22:30:00
12/03/99 22:30:00-23:30:00
12/04/99 11:30:00-12:00:0023:00:00-23:30:00
12/05/99 00:00:00-00:30:0012:30:00
12/0699 00:00:00-01:00:0012:30:00-14:00:0023:30:00

12/07/99 00:00:00-02:00:00
12/08/99 01:00:00-02:00:0014:00:00-14:30:00
12/09/99 14:30:00-15:30:00
12/10/99 02:30:00-03:00:00
12/20/99 23:30:00
12/21/99 00:00:00-00:30:00
12/22/99 02:00:00
12/23/99 02:00:00-02:30:00
12/24/99 03:00:00-03:30:00
12/25/99 03:00:00-04:00:00
12/27/99 05:00:00-05:30:00
b) During the following periods, no data are available due to downtime for
servicing and calibrating data loggers.
12/10/99 11:30:00 THRU 12/16/99 10:30:00

St. Pierre

a) During the following periods, the turbidity sensor was not installed.
12/01/99 00:00:00 THRU 12/10/99 11:30:00
b) During the following periods, the negative dissolved oxygen (DO) readings
were deleted.
The negative DO readings were probably due to reduced flow of oxygen across the
membrane caused by sediment, plant or animal.
12/01/99 08:00:00-08:30:00
12/03/99 11:30:00-13:30:0017:30:00 23:30:00
12/04/99 00:30:00-01:00:0023:00:00-23:30:00
12/05/99 00:00:00-01:30:0019:30:00 23:00:00-23:30:00
12/06/99 00:00:00-01:30:00
12/07/99 12:00:00-15:30:0017:00:00 21:00:00 23:30:00

12/08/99 00:00:00-04:30:0009:00:00 11:00:00 12:30:00
14:00:00-16:30:00
12/09/99 01:00:00-04:30:00
c) During the following periods, no data are available due to downtime for
servicing and calibrating data loggers.
12/10/99 12:00:00 THRU 12/16/99 10:00:00