

ACE Basin National Estuarine Research Reserve

March - December 1995 Metadata Report

edited: 9/19/97

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 a comma delimited

file. It is imported into Excel 5.0 and edited according to the CDMO guidelines. The file is

exported as a tab-delimited file to the CDMO. Saundra Upchurch and

Christopher Graffeo are

responsible for these tasks.

3. Experimental design:

Agriculture and silviculture are not major industries within the Reserve boundaries but

impacts due to development on Edisto Island may be a problem. EPA-EMAP sampling in the

South Edisto River indicated that contaminant levels were higher than expected. Based on

discussions with local CZM personnel and our knowledge of land use within the Reserve, the

South Edisto River drainage basin appears to be best suited for studying contrasting hydrographic

conditions and land use patterns. One station is located by Edisto Island, within a tributary off Big

Bay Creek. Surrounded by residential and commercial development and likely subject to nonpoint

source pollution, this station is designated as the "treatment" site. The second station is located

by Bailey Island, within a tributary off St. Pierre Creek. No urban development occurs in this area

surrounding the second station; thereby this station will serve as our "control" site.

4. Research methods:

The YSI monitoring program in the ACE Basin NERR was started in March 1995 at two

tributaries off Big Bay and St. Pierre creeks. Prior to the YSI deployment, a 12 foot galvanized

pole was driven two feet into the mud, and a 4 inch diameter PVC pipe, with pre-cut holes, was

bolted onto the pole, approximately 0.1 m (1 ft) above the creek bottom. The holes, or windows,

were cut out at the bottom of the pipes for the probes to have direct contact with the water column.

Sampling periods vary from one to three weeks, and measurements of specific conductance, dissolved oxygen, pH, water temperature and water level are recorded every 15 minutes. At the end of the sampling period, the YSI data loggers are brought back into the laboratory for downloading, cleaning and calibration. These procedures are carried out according to the methods outlined in the YSI Operating and Service Manual. Down time for cleaning, calibrating, and servicing range from 24 to 48 hours.

At the April 28 datalogger redeployment, the data loggers at both sites were moved to deeper sections of the two tributaries because the probes of the data loggers were not submerged continuously at their former locations. The new locations are within one meter of the former locations. Starting August 11, the logging interval was changed from 15 minutes to 30 minutes.

5. Site location and character:

The two sampling sites are located in two tributaries off South Edisto River. The descriptions of the sites are as follows:

Station A--this site is located in a tidal marsh creek off Big Bay Creek (GPS coordinates: 32 29.662N and 80 19.427W). Surrounded by residential and commercial development and likely subject to nonpoint source pollution, this station is designated as the "treatment" site. Pollution sources include houses bordering the creek, many with little setback from the bordering *Spartina* marsh; 20 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 indicating a high concentration of fecal coliforms. 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%.

Station B--this site is located in a tidal creek off St. Pierre Creek (GPS coordinates: 32 31.724N and 80 21.573W). It is surrounded by a wide expanse of *Spartina alterniflora* marsh. Extensive mud flats and oyster reefs fringe the banks. Upland areas are dominated by maritime forest with wax myrtles, live oaks, and palmettos. No development and no agriculture occur in this portion of the reserve. This creek is subject to little boat traffic. At the time of reconnaissance, depth at low tide was 2.5 feet and salinity was 21%.

6. Data collection period:

BEGAN

ENDED

Big Bay

03/03/95, 18:00:00	03/13/93, 12:30:00
03/14/95, 18:00:00	03/31/95, 23:45:00
04/01/95, 00:00:00	04/10/95, 11:00:00
04/11/95, 18:15:00	04/24/95, 11:45:00
04/28/95, 18:15:00	04/30/95, 23:45:00
05/01/95, 00:00:00	05/08/95, 11:30:00
05/11/95, 11:15:00	05/15/95, 06:30:00
06/02/95, 12:00:00	06/19/95, 12:00:00
07/21/95, 12:00:00	07/26/95, 12:00:00
07/28/95, 12:00:00	07/31/95, 23:45:00
08/01/95, 00:00:00	08/02/95, 08:15:00
08/04/95, 12:00:00	08/09/95, 12:00:00
08/11/95, 18:00:00	08/25/95, 12:30:00
09/01/95, 00:00:00	09/15/95, 00:00:00
09/18/95, 13:00:00	09/30/95, 23:30:00
10/01/95, 00:00:00	10/02/95, 13:00:00
10/09/95, 18:00:00	10/31/95, 23:30:00
11/01/95, 00:00:00	11/01/95, 10:30:00
11/03/95, 14:00:00	11/30/95, 23:30:00
12/01/95, 00:00:00	12/01/95, 10:30:00
12/13/95, 18:00:00	12/31/95, 23:30:00

St. Pierre

03/03/95, 18:00:00	03/13/95, 13:00:00
03/14/95, 18:00:00	03/31/95, 23:45:00
04/01/95, 00:00:00	04/10/95, 11:45:00
04/11/95, 18:15:00	04/15/95, 18:00:00
04/28/95, 18:15:00	04/30/95, 23:45:00
05/01/95, 00:00:00	05/08/95, 10:45:00
05/11/95, 11:45:00	05/25/95, 11:30:00
06/02/95, 12:00:00	06/19/95, 12:00:00
06/26/95, 15:00:00	06/30/95, 23:45:00
07/01/95, 00:00:00	07/01/95, 12:45:00
07/07/95, 12:00:00	07/13/95, 12:00:00
07/21/95, 12:00:00	07/26/95, 12:00:00
07/28/95, 12:00:00	07/31/95, 23:45:00
08/01/95, 00:00:00	08/02/95, 07:45:00
08/04/95, 12:00:00	08/09/95, 12:00:00
08/11/95, 18:00:00	08/25/95, 13:00:00
09/01/95, 00:00:00	09/15/95, 00:00:00

09/18/95, 13:00:00 09/30/95, 23:30:00
10/01/95, 00:00:00 10/02/95, 13:00:00
10/09/95, 18:00:00 10/31/95, 23:30:00
11/01/95, 00:00:00 11/01/95, 10:00:00
11/03/95, 14:00:00 11/30/95, 23:30:00
12/01/95, 00:00:00 12/01/95, 10:00:00
12/13/95, 18:00:00 12/31/95, 23:30:00

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. Judith and Peddrick Weis are studying the impacts of Chromated Copper Arsenate (CCA)-treated wood on the surrounding benthic communities at several Reserve sites, including the ACE Basin and North Inlet-Winyah Bay. The objective of their study is to determine to what degree and over what distances benthic fauna may be adversely affected by the contaminants. In our Reserve, surface sediment grabs were collected near CCA-treated wood and concrete marine structures in Big Bay Creek and near an undisturbed salt marsh along St. Pierre Creek. The sediment samples will be analyzed for particle size distribution, organic carbon, copper, chromium and arsenic, and the benthic biota will be identified and analyzed for copper, chromium and arsenic as well for species richness, abundance, and biomass. Motile consumers such as crabs and fish will be analyzed for metals to investigate trophic transfer of wood-derived contaminants. The Weis' are in the process of analyzing the data.

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 1994 from each site, and the samples will be analyzed for trace metals (Al, As, Cd, Cr, Cu, Pb, Zn, etc.), PAHs and pesticides. Results will be available by September 1995.

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, 1 d, 1 yr	N/A
HOURL	0-24, 0-60, 0-60 (hr,min,sec)	1 h, 1 m, 1 s	N/A
TEMP	-5 to +45oC	0.01oC	0.1 C+/- 0.4 C
SPCOND	0-100 mS/cm	0.01 mS/cm	+/- % reading +0.001 mS/cm
SALINITY	0-70 parts per thousand (ppt)	0.01 ppt	+/-1% or 0.1 ppt(whichever is greater)
DO	0-200 % air saturation (air sat)	0.1 % air sat	+/-2 %
DO	200-500 % air saturation (air sat)	0.1 % air sat	+/-6 %
DO	0-20 mg/L	0.1 mg/L	+/-0.2 mg/L
DO	20-50 mg/L	0.1 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(whichever is greater)

9. Coded variable indicator and variable code definitions:

SP=St. Pierre BB=Big Bay

10. Data anomalies:

March 1-31, 1995 Sampling Period

Big Bay

a) Between March 14- 31, specific conductance, salinity, and dissolved oxygen, expressed in

mg/L, data were deleted because the specific conductance readings exceeded the normal range

of values for estuarine waters (>50.0 mS/cm) (see Missing Data section).The salinity and

dissolved oxygen data were deleted because these values are calculated from specific

conductance readings.

b) The following records include negative depth readings but the data were not deleted because

specific conductance and dissolved oxygen readings indicated that the sonde was submerged.

The negative depth values were probably due to low barometric pressure weather systems.

3/21/95 15:45:00-18:30:00

3/22/95 05:30:00-07:15:00

16:45:00-19:30:00

3/23/95	05:45:00-08:15:00	17:45:00-20:15:00
3/26/95	23:00:00	
3/27/95	11:30:00-12:00:00	22:30:00-23:45:00
3/28/95	00:00:00-00:45:00	11:15:00-13:00:00
3/29/95	01:00:00 13:15:00-13:30:00	
3/30/95	13:30:00-14:15:00	
3/31/95	02:15:00-02:45:00	13:45:00-14:30:00

St. Pierre

a) The following records include negative depth readings but the data were not deleted because specific conductance and dissolved oxygen readings indicated that the sonde was submerged.

The negative depth values were due to low barometric pressure weather systems.

3/04/95	04:45:00		
3/07/95	04:45:00	06:30:00	16:15:00 18:45:00
3/08/95	05:45:00-06:45:00		17:15:00-18:15:00
20:00:00-20:30:00			
3/09/95	08:00:00		
3/16/95	00:00:00	02:15:00	12:30:00 14:30:00
3/17/95	13:00:00	15:15:00	
3/18/95	01:45:00	03:45:00-04:00:00	14:00:00-
14:15:00 15:45:00-16:00:00			
3/19/95	03:30:00-04:00:00		15:15:00 16:15:00-
16:30:00			
3/20/95	03:45:00-04:00:00		05:00:00-05:15:00
15:30:00 17:30:00			
3/21/95	04:30:00-04:45:00		06:30:00 15:45:00-
16:00:00 18:45:00			
3/22/95	05:00:00-05:15:00		07:15:00-07:30:00
16:45:00-17:00:00			
19:30:00-19:45:00			
3/23/95	05:45:00-06:00:00		08:15:00-08:30:00
17:30:00-18:00:00		20:00:00-20:30:00	
3/25/95	09:00:00-09:30:00		21:15:00-22:00:00
3/26/95	10:15:00-10:45:00		22:00:00
3/27/95	10:15:00	12:15:00-12:30:00	22:15:00
3/28/95	01:00:00-01:15:00		10:30:00 13:15:00
23:30:00-23:45:00			
3/29/95	01:15:00-01:30:00		12:00:00 13:45:00-
14:00:00			
3/30/95	00:30:00-00:45:00		02:00:00-02:15:00
12:15:00 14:45:00			
3/31/95	00:45:00	03:15:00	13:00:00-13:15:00
15:00:00			

b) The following records include specific conductance values below level expected for

mesohaline/polyhaline waters (<18 mS/cm), but the data were not deleted. Spikes in

dissolved oxygen also occurred during these periods. Extremely low tides or heavy rainfall

may have caused the unusual readings.

3/03/95	18:00:00-18:30:00
3/04/95	03:00:00 15:00:00-17:00:00

3/05/95	16:00:00-17:00:00	
3/06/95	15:45:00-18:00:00	
3/11/95	20:30:00-22:00:00	
3/12/95	09:30:00-10:30:00	21:15:00-23:45:00
3/13/95	10:00:00-12:00:00	
3/14/95	23:30:00	
3/15/95	12:00:00-13:30:00	
3/26/95	10:00:00-10:45:00	

c) At various times during low tides, data were deleted because the data logger went dry (see

Missing Data section).

April 1-30, 1995 Sampling Period

Big Bay

a) Between April 1 and 10, specific conductance, salinity, and dissolved oxygen, expressed in

mg/L, data were deleted because the specific conductance readings exceeded the normal range

of values for estuarine waters (>50.0 mS/cm) (see Missing Data section). The salinity and

dissolved oxygen data were deleted because these values are calculated from specific

conductance readings.

b) The following records include negative depth readings but the data were not deleted because

specific conductance and dissolved oxygen readings indicated that the sonde was submerged.

The negative depth values were due to low barometric pressure weather systems.

4/01/95	15:00:00	
4/02/95	15:00:00-15:30:00	
4/04/95	16:00:00-17:15:00	
4/05/95	04:45:00-05:00:00	
4/13/95	11:30:00-13:00:00	
4/14/95	01:00:00-02:00:00	
4/15/95	14:30:00-14:45:00	
4/16/95	15:00:00-15:45:00	
4/17/95	14:30:00-16:45:00	
4/18/95	05:00:00-05:15:00	15:30:00-17:15:00
4/19/95	16:15:00-18:00:00	
4/20/95	06:30:00-06:45:00	17:00:00-19:00:00
4/21/95	06:45:00-07:45:00	18:15:00-20:15:00
4/22/95	06:45:00-08:45:00	19:15:00-21:00:00
4/23/95	08:00:00-09:30:00	
4/24/95	10:00:00-10:30:00	
4/30/95	14:15:00	

c) Between April 28-30, pH data were deleted because the sensor cracked during deployment

(see Missing Data section).

St. Pierre

a) At various times during low tides, data were deleted because the data logger went dry (see

Missing Data section).

b) The following records include negative depth readings but the data were not deleted because

specific conductance and dissolved oxygen readings indicated that the sonde was submerged.

The negative depth values were due to low barometric pressure weather systems.

4/01/95	02:00:00-03:30:00	14:15:00-15:30:00
4/02/95	02:30:00-02:45:00	04:30:00 14:30:00-16:00:00
4/04/95	04:30:00 15:30:00-15:45:00	17:30:00-17:45:00
4/05/95	04:15:00-04:30:00	05:30:00-06:00:00
4/12/95	11:15:00-11:45:00	23:00:00-23:15:00
4/13/95	00:45:00 10:45:00	13:30:00 23:15:00-23:30:00
4/14/95	02:15:00 12:15:00-12:30:00	13:45:00-14:00:00
4/15/95	00:45:00 02:30:00-02:45:00	12:30:00

c) The following records include specific conductance values below level expected for

mesohaline/polyhaline waters (<18 mS/cm), but the data were not deleted. Extremely low

tides or heavy rainfall may have caused the low readings.

4/01/95	14:45:00
4/03/95	15:30:00-16:15:00

d) Between April 11-15, pH data were deleted because the sensor cracked during deployment.

May 1-31, 1995 Sampling Period

Big Bay

a) Between May 1-8, pH data were deleted because the sensor cracked during deployment.

b) The following records include negative depth readings but the data were not deleted because

specific conductance and dissolved oxygen readings indicated that the sonde was submerged.

The negative depth values were due to low barometric pressure weather systems.

5/01/95	14:30:00-15:00:00
5/02/95	14:45:00-16:00:00

St. Pierre

a) Between May 2-8, dissolved oxygen (DO) data were deleted because the DO membrane was

damaged during deployment (see Missing Data section).

b) Between May 11-25, pH data were deleted because pH sensor cracked during deployment

(see Missing Data section).

June 1-30, 1995 Sampling Period

Big Bay

Between June 2-19, dissolved oxygen (DO) data were deleted because the DO membrane was

damaged during deployment (see Missing Data section).

St. Pierre

a) The following records include negative depth readings but the data were not deleted because

specific conductance and dissolved oxygen readings indicated that the sonde was submerged.

The negative depth values were due to low barometric pressure weather systems.

06/12/95

13:00:00

06/13/95

01:45:00-02:30:00

b) Between June 15-19, dissolved oxygen data were deleted due to downward drifts in the

readings (see Missing Data section). The downward drifts were due to the fouling of the

membrane by algae and tunicates.

c) Between June 26-30, pH data were deleted because the sensor cracked during deployment

(see Missing Data section).

July 1-31, 1995 Sampling Period

St. Pierre

a) On July 1, pH data were deleted because the sensor cracked during deployment (see Missing

Data section).

b) Between July 21-26, pH data were deleted because the sensor cracked during deployment (see

Missing Data section).

c) At 16:15 on July 29, dissolved oxygen datum was deleted because the reading was negative.

August 1-31, 1995 Sampling Period

Big Bay

Between August 1-2, dissolved oxygen (DO) data were deleted because the DO membrane

was damaged during deployment (see Missing Data section).

St. Pierre

Between August 22-25, dissolved oxygen data (DO) were deleted because the DO membrane

was damaged during deployment (see Missing Data section).

September 1-30, 1995 Sampling Period

Big Bay

Between September 18-30, dissolved oxygen (DO) data were deleted because the DO

membrane was damaged during deployment (see Missing Data section).

St. Pierre

Between September 13-15 and 19-30, dissolved oxygen (DO) data were deleted because the

DO membrane was damaged during deployment (see Missing Data section).

October 1-31, 1995 Sampling Period

Big Bay

a) Between October 1-2, dissolved oxygen (DO) data were deleted because the DO membrane

was damaged during deployment (see Missing Data section).

b) Between October 27-31, DO data were deleted because of downward drifts in the readings

(see Missing Data section).

St. Pierre

Between October 1-2, dissolved oxygen (DO) data were deleted because the DO membrane

was damaged during deployment (see Missing Data section).

November 1-30, 1995 Sampling Period

Big Bay

a) On November 1, dissolved oxygen data were deleted because of a downward drift in the readings (see Missing Data section).

b) On November 3, dissolved oxygen data were deleted because the readings, expressed as % air sat., were negative (see Missing Data section).

December 1-31, 1995 Sampling Period

Big Bay

The following records include negative depth readings but the data were not deleted because

specific conductance and dissolved oxygen readings indicated that the sonde was submerged.

The negative depth values were due to low barometric pressure weather systems.

12/19/95 23:00:00-23:30:00

12/20/95 00:00:00-01:00:00

St. Pierre

At 00:00 on December 20, the negative depth datum was not deleted because specific

conductance and dissolved oxygen readings indicated that the sonde was submerged. The

negative depth values were due to low barometric pressure weather systems.

11. Missing data:

March 1-31, 1995 Sampling Period

Big Bay

a) Between 00:00 on March 1 and 17:45 on March 3, no data are available because the loggers were not yet deployed.

b) Between 12:45 on March 13 and 18:00 on March 14, no data are available due to downtime for cleaning, calibrating, and servicing of data loggers.

c) Between 18:15 on March 14 and 23:45 on March 31, salinity, specific conductance, and dissolved oxygen (mg/L) data were deleted because the values were out of range for estuarine waters (>50 mS/cm).

St. Pierre

a) Between 00:00 on March 1 and 17:45 on March 3, no data are available because the data loggers were not yet deployed.

b) Between 13:15 on March 13 and 18:00 on March 14, no data are available due to downtime for cleaning, calibrating, and servicing of data loggers.

c) The data in the following records were deleted because the data logger went dry.

3/04/95 03:15:00-04:30:00

3/07/95 05:00:00-06:15:00 16:30:00-18:30:00

3/08/95 18:30:00-19:45:00

3/09/95 05:45:00-07:45:00

3/14/95 23:45:00

3/15/95 00:00:00-01:00:00

3/16/95 00:15:00-02:00:00 12:45:00-14:15:00

3/17/95	01:00:00-03:00:00	13:15:00-15:00:00
3/18/95	02:00:00-03:30:00	14:30:00-15:30:00
3/19/95	15:30:00-16:00:00	
3/20/95	04:15:00-04:45:00	15:45:00-17:15:00
3/21/95	05:00:00-06:15:00	16:15:00-18:30:00
3/22/95	05:30:00-07:00:00	17:15:00-19:15:00
3/23/95	06:15:00-08:00:00	18:15:00-19:45:00
3/26/95	22:15:00-23:00:00	
3/27/95	10:30:00-12:00:00	22:30:00-23:45:00
3/28/95	00:00:00-00:45:00	10:45:00-13:00:00
3/29/95	00:00:00-01:00:00	12:15:00-13:30:00
3/30/95	01:00:00-01:45:00	12:30:00-14:30:00
3/31/95	01:00:00-03:00:00	13:30:00-14:45:00

April 1-30, 1995 Sampling Period

Big Bay

- a) Between 00:00 on April 1 and 11:00 on April 10, specific conductance (mS/cm), salinity and dissolved oxygen (expressed as mg/L) data collected were deleted because the values were out of range for estuarine waters (>50 mS/cm).
- c) Between 11:15 on April 10 and 18:00 on April 11, no data are available due to downtime for cleaning, calibrating, and servicing of data loggers.
- d) Between 12:00 on April 24 and 18:00 on April 28, no data are available due to downtime for cleaning, calibrating, and servicing of data loggers.
- e) Between 18:15 on April 28 and 23:45 on April 30, pH data were deleted because the sensor cracked during deployment.

St. Pierre

- a) The data in the following records were deleted because the data logger went dry.

4/02/95	03:00:00-04:15:00	14:45:00-15:45:00
4/03/95	16:30:00	
4/04/95	16:00:00-17:15:00	
4/05/95	04:45:00-05:15:00	
4/12/95	23:30:00-23:45:00	
4/13/95	00:00:00-00:30:00	11:00:00-13:15:00
23:45:00		
4/14/95	00:00:00-02:00:00	12:45:00-13:30:00
4/15/95	01:00:00-02:15:00	12:45:00-15:00:00

- b) Between 12:00 on April 10 and 18:00 on April 11, no data are available due to downtime for calibrating and servicing of loggers.
- c) Between April 11-15, pH data were deleted.
- d) Between 18:15 on April 15 and 13:00 on April 24, no data are available due to insufficient battery voltage to operate data logger.
- e) Between 13:15 on April 24 and 18:00 on April 28, no data are available due to downtime for cleaning, calibrating, and servicing of data loggers.
- f) Between April 28-30, no pH data are available because there was no sensor on the data logger.

May 1-31, 1995 Sampling Period

Big Bay

- a) Between May 1-8, pH data were deleted because the sensor cracked during deployment.
- b) Between May 11-15, no pH data are available because there was no sensor on the data logger.
- c) Between 11:45 on May 8 and 11:00 on May 11, no data are available due to downtime for cleaning, calibrating, and servicing of data loggers and for boat repairs.
- d) Between 06:45 on May 15 and 23:45 on May 31, no data are available due to battery failure; to conflicts with regular monthly trawl sampling; and to downtime for cleaning, calibrating, and servicing of data loggers.

St. Pierre

- a) Between 09:00 on May 2 and 10:45 on May 8, dissolved oxygen (DO) data were deleted because DO membrane was damaged during deployment.
- b) Between May 1-8, no pH data are available because there was no sensor on the data logger.
- c) Between 11:00 on May 8 and 11:30 on May 11, no data are available due to downtime for cleaning, calibrating, and servicing of data loggers and for boat repairs.
- d) Between May 11-25, pH data were deleted because the sensor cracked during deployment.
- e) Between 11:45 on May 25 and 23:45 on May 31, no data are available due to conflicts with regular monthly trawl sampling and to downtime for cleaning, calibrating, and servicing.

June 1-30, 1995 Sampling Period

Big Bay

- a) Between 00:00 on June 1 and 11:45 on June 2, no data are available due to conflicts with regular monthly trawl sampling and to downtime for cleaning, calibrating, and servicing.
- b) Between 12:00 on June 2 and 12:00 on June 19, dissolved oxygen (DO) data were deleted because DO membrane was damaged during deployment.
- c) Between June 2-19, no pH data are available because there was no sensor on the data logger.
- d) Between 12:15 on June 19 and 23:45 on June 30, no data are available because the logger was sent to YSI for repairs. The data logger did not recognize the sensors during calibration because the PC600 board is not working properly.

St. Pierre

- a) Between 00:00 on June 1 and 11:45 on June 2, no data are available due to conflicts with regular monthly trawl sampling and to downtime for cleaning, calibrating, and servicing.

- b) Between 12:00 on June 2 and 12:00 on June 19, no pH data are available because there was
no sensor on the data logger.
- c) Between 00:00 on June 15 and 12:00 on June 19, dissolved oxygen (DO) data were deleted
because of DO membrane fouling.
- d) Between 12:15 on June 19 and 14:45 hr on June 26, no data are available due to conflicts
with regular monthly trawl sampling and to downtime for cleaning, calibrating, and servicing
of data loggers.
- e) Between 15:00 on June 26 and 23:45 on June 30, pH data were deleted because the sensor
cracked during deployment.

July 1-31, 1995 Sampling Period

Big Bay

- a) Between 00:00 on July 1 and 11:45 on July 21, no data are available for the period because
data logger was sent to YSI for repairs.
 - b) Between 12:15 on July 26 and 11:45 on July 28, no data are available due to downtime for
servicing and calibrating of data loggers.
- St. Pierre
- a) Between 13:00 on July 1 and 12:30 on July 5, no data are available due to low battery
voltage.
 - b) Between 12:45 on July 5 and 11:45 on July 7, no data are available due to downtime for
servicing and calibrating of data loggers.
 - c) During July 1 and 21-26, pH data were deleted because the sensor cracked during
deployment.
 - d) Between July 7-13 and 26-31, no pH data are available because there was no sensor on the
data logger.
 - e) Between 12:15 on July 13 and 11:45 on July 21, no data are available due to downtime for
servicing and calibrating of data loggers and to operator error.
 - f) Between 12:15 on July 26 and 11:45 on July 28, no data are available for the period due to
downtime for servicing and calibrating of data loggers.
 - g) At 16:15 on July 29, dissolved oxygen datum was deleted because the reading was negative.

August 1-31, 1995 Sampling Period

Big Bay

- a) Between 12:30 on August 1 and 08:15 on August 2, dissolved oxygen (DO) data were deleted
because DO membrane was damaged during deployment.
- b) Between 08:30 on August 2 and 11:45 on August 4, no data are available due to downtime
for servicing and calibrating of data loggers.
- c) Between 12:15 on August 9 and 17:45 on August 11, no data are available due to downtime
for servicing and calibrating of data loggers.

d) Between 13:00 on August 25 and 23:30 on August 31, no data are available due to downtime

for servicing and calibrating of data loggers.

St. Pierre

a) During August, no pH data are available because there was no sensor on the data logger.

b) Between 08:00 on August 2 and 11:45 on August 4, no data are available due to downtime

for servicing and calibrating of data loggers.

c) Between 12:15 on August 9 and 17:45 on August 11, no data are available due to downtime

for servicing and calibrating of data loggers.

d) Between 18:30 on August 22 and 13:00 on August 25, dissolved oxygen (DO) data were

deleted because DO membrane was damaged during deployment.

e) Between 13:30 on August 25 and 23:30 on August 31, no data are available due to downtime

for servicing and calibrating of data loggers.

September 1-30, 1995 Sampling Period

Big Bay

a) During September, no pH data are available because there was no sensor on the data logger.

b) Between 00:30 on September 15 and 12:30 on September 18, no data are available due to

downtime for servicing and calibrating of data loggers.

c) Between 13:00 on September 18 and 23:30 on September 30, dissolved oxygen (DO) data

were deleted because DO membrane was damaged during deployment.

St. Pierre

a) During September, no pH data are available because there was no sensor on the data logger.

b) Between 00:30 on September 15 and 12:30 on September 18, no data are available due to

downtime for servicing and calibrating of data loggers.

c) Between 19:00 on September 13 and 00:00 on September 15 and between 02:30 on

September 19 and 23:30 on September 30, dissolved oxygen (DO) data were deleted because

the DO membrane was damaged during deployment.

October 1-31, 1995 Sampling Period

Big Bay

a) During October, no pH data are available because there was no sensor on the data logger.

b) Between 00:00 on October 1 and 13:00 on October 2, dissolved oxygen (DO) data were

deleted because the DO membrane was damaged during deployment.

c) Between 13:30 on October 2 and 17:30 on October 9, no data are available due to downtime

for servicing and calibrating of data loggers.

d) Between 18:00 on October 27 and 23:30 on October 31, dissolved oxygen data were deleted

due to downward drifts in the readings.

St. Pierre

a) During October, no pH data are available because there was no sensor on the data logger.

b) Between 13:30 on October 2 and 17:30 on October 9, no data are available due to downtime

for servicing and calibrating of data loggers.

c) Between 00:00 on October 1 and 13:00 on October 2, dissolved oxygen (DO) data were

deleted because the DO membrane was damaged during deployment.

November 1-30, 1995 Sampling Period

Big Bay

a) On November 1, no pH data are available because there was no sensor on the data logger.

b) Between 00:00 and 10:30 on November 1, dissolved oxygen data were deleted due to

downward drifts in the readings.

c) Between 11:00 on November 1 and 13:30 on November 3, no data are available due to

downtime for servicing and calibrating of data loggers.

d) Between 15:00-15:30 on November 3, dissolved oxygen data were deleted because the

readings were negative.

St. Pierre

a) On November 1, no pH data are available because there was no sensor on the data logger.

b) Between 10:30 on November 1 and 13:30 on November 3, no data are available due to

downtime for servicing and calibrating of data loggers.

December 1-31, 1995 Sampling Period

Big Bay

a) Between 11:00 on December 1 and 17:30 on December 13, no data are available due to

downtime for servicing and calibrating of data loggers and to conflicts with other sampling efforts.

St. Pierre

a) Between 10:30 on December 1 and 17:30 on December 13, no data are available due to

downtime for servicing and calibrating of data loggers and to conflicts with other sampling efforts.