Jobos Bay (JOB) NERR WATER QUALITY METADATA
JANUARY 1997 TO DECEMBER 1997
Latest Update: July 16, 2002

I. Data Set & Research Descriptors

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2. Entry verification:

After retrieving and carefully cleaning the dataloggers, they are examined to detect any structural damage to the body or to the probes. The DO membrane is checked for ruptures and then replaced if needed. The turbidity probe is

examined to assure that no obstruction affects the wiper and that the sensor is clean. Manipulation and observation are registered in the field log for each deployment respectively.

The YSI is connected to a Pentium II 400 MHz IBM compatible computer and the data are reviewed using the YSI computer program PC6000 that accompanies the YSI 6000 datalogger. The file is uploaded in two formats, one in YSI PC6000 format and the other in Comma and "" Delimited format then the file is renamed to have a ".txt" extension. The YSI Ecowatch for Windows program is used to plot the data and delete the pre- and post deployment data that are not in range of the other readings. The program is used to perform basic statistical analysis (i,e., min., max., mean, std. dev.). This information is printed out with a list of data and filed for each station.

The information obtained from this printout is used during file review to detect any gross outliers such as data taken when the datalogger was removed from the water or those caused by instrument failure. The data are imported into a Microsoft Excel file that contains the current month's cumulative recordings. When a complete month of data has been recorded the file is ready for review.

The data review includes several steps. The first step is to format the data so that the parameter columns are in the correct order. Secondly, a modified Excel 97 version of the CDMO Excel 5.0 macro is used to check and determine if there are any dates and times that were not recorded due to maintenance, battery failure, or other cause. Missing dates and times are inserted into the file and a period is inserted into the cells where data would normally be. The reason for the missing data is recorded onto the Missing data Log. The data are then formatted so that the parameter columns are in the correct size and the data have the correct number of decimal place holders as specified by the NERR CDMO. Next, the data are filtered using the CDMO Excel 97 macro to find readings outside the instrument measurement range and the "normal" range for the site in question.

Data outside the instrument range is/are removed from the file and a

period is inserted to the cell(s). An explanation for the missing dates and time are recorded onto the Missing data Log. Data that were outside the "normal" range of water quality for a particular site is investigated for validity based on field observation, QC check, PC6000 printouts, and instrument diagnostics. If the datum is/are rejected from the file a period is inserted to the cell(s) and an explanation for the missing date and time is recorded onto the Missing data Log. The information recorded on the Missing data Log is transferred to the metadata form. The metadata form is then submitted with the data to the CDMO. Data is stores in zip disks. Dr. Pedro Robles, Research Coordinator is responsible for the data management.

3. Research Objectives:

The four dataloggers are deployed at Mar Negro area, major component of Jobos Bay Estuarine Research Reserve, and are suspended from a pole at one foot from the bottom of the selected site. Measurements are taken at thirty (30) minute intervals for approximately two-week periods. The sites are identified as representative of areas within the reserve and comparable to the sites that may be receiving impact from human activities in the surroundings areas.

Station number six (6), is located in the proximity of Punta Colchones, close to the thermal discharge pipeline, which can be affected by high temperatures and sediment resuspension.

Station number nine (9), the impacted site, collects water quality data in a site associated with runoff from littoral and basin mangroves areas. This sampling station is closer to the Electric Power Thermoelectric Plant, which makes it subject to runoff and potential spills contamination from this industrial facility. Information compiled from historical environmental documents indicate that station nine (9) was used as a disposal site for the residues of the previously operating sugar mill operation, which might have been a high organic input to the sediments.

Station number ten (10) located in the mangrove lagoon area is the reference or unimpacted site.

Station number eleven (11) is another possible impacted site. Housing development that is not provided with sewage treatment facilities are the potential source of contaminants for this Station. Septic tanks and possible

direct disposal constitute the potential contamination sources. Runoffs from agricultural land and other contaminant transport through a drainage channel are possible hazards at station nine (9) and eleven (11).

4. Research methods:

The Estuarine Water Quality Monitoring began on December 20, 1995 at Station nine (9), February 1, 1996 at Station ten (10), March 15, 1996 at Station eleven (11), and at Station six (6) on December 06, 1996. At this time we are only performing long term water quality monitoring.

Before each YSI 6000 datalogger is deployed, calibration and maintenance is performed following the manufacturer's instruction (YSI Manual addendum 7/94, sections 3,4 and 7). Calibration standards are only required for pH, salinity, and turbidity, all other parameters are done as described in the manual. Buffer solutions for two-point calibration (pH 7 and pH 10) are purchased from a scientific supply house. Salinity is calibrated via a specific conductance standard 1000 µs/cm and are purchased from a scientific supply house. This solution is also prepared in the laboratory of Department of Natural and Environmental Resources (DNER) utilizing KCl following specification of EPA methods.

The two-point turbidity calibration (as of January 01, 1997) was performed using a 0 NTU standard using lab grade DI water made at the DNER laboratory and 40 NTU standard purchased from a scientific supply house. We are now using (since Jan 01, 1997) a 200 NTU standard purchased from a scientific company. The dissolved oxygen membranes are replaced before deployment and are allowed to sit at least 24 hours prior to deployment.

The weather conditions and tide stage during deployment are recorded in the field observation log. Measurements of DO, pH, salinity, specific conductance, temperature, turbidity (secchi) are taken with other calibrated field instruments to check the accuracy of the instrumentation. Each YSI datalogger is tied with steel cable to a wrought iron galvanized pole, which is plunged into the sediments of each sampling area. Dataloggers are deployed at a depth of 0.3 m. Every 30 minutes during the sampling period measurements are

taken for date, time, temperature, specific conductance, salinity, dissolved oxygen saturation, dissolved oxygen concentration, depth, pH, and turbidity.
Every two weeks the dataloggers are retrieved, uploaded, cleaned, inspected, and calibrated as noted previously. The datalogger is then ready to be deployed.

5. Site location and character:

The Jobos Bay National Estuarine Research Reserve (JOBNERR) is located on the southern coastal plain of the island of Puerto Rico, a reserve within the West Indies geographical area. JOBNERR is composed of two major areas: (1) Mar Negro, located on the western margin of the Bay, and (2) Cayos Caribe, a chain of 15 tear-shaped islets located to the southeast. The Mar Negro area comprises the bulk of the Reserve, and consists of mangrove forests and a complex system of lagoons and channels interspersed with salt and mud flats. Coral reefs and seagrass beds, with small beach deposits and upland areas fringe Cayos Caribe mangrove islands.

Station 6 is located in the bay close to the peninsular drape area in Mar Negro knows as Punta Colchones. The datalogger is deployed at about five meters from the emergence of the fallout pipe cooling water from the Thermoelectric Power Plant. This station is subject to high temperatures and sediment resuspension. The tidal range varies from 12 in. to 14 in. in the vicinity of the monitoring station. No fresh water input in the vicinity of the station is probable. The salinity at the vicinity of the monitoring station varies from 34.0 ppt to 35.7 ppt. The station pole is located at 17° 56' 6.5"N and 66° 13' 43.6"W.

Station 9 is an impacted site and is located at the northeastern part of the Mar Negro unit. The sampling station is associated with the mangrove lagoon area and received the Thermoelectric Power Plant runoff through mudflats and areas adjacent. The tidal range varies from 12 in. to 14 in. in the vicinity of the monitoring station. No fresh water input in the vicinity of the station is

probable. The salinity at the vicinity of the monitoring station varies from 0.0 ppt to 41.1 ppt. The station pole is located at 17° 56' 36.8" N and 66° 14' 18.5" W.

Station 10 is located in a mangrove lagoon not impacted from upland or marine activities. It provided a reference for comparison of the data obtained in other stations, especially to the stations in Mar Negro lagoon environment. The tidal range varies from 12 in. to 14 in. in the vicinity of the monitoring station. No fresh water input in the vicinity of the station is probable. The salinity at the vicinity of the monitoring station varies from 0.0 ppt to 41.7 ppt. The pole is located at 17° 56' 20.3" N and 66° 45' 26.7" W.

Station 11 datalogger is tied to a small pier stand in the westernmost lagoon in the Mar Negro unit. Although a chain from a small pier suspends this datalogger, and it has been deployed at the same depth of the other dataloggers. Non point sources of contaminants from residences and boating activities in the vicinity are probable. The lagoon is characterized by dark bottom, tidal range from 12 in. to 14 in., allegedly related to long term deposition of organic wastes from the sugar mill operation when the mill was operating. No fresh water input in the vicinity of the station is probable. The salinity at the vicinity of the monitoring station varies from 0.0 ppt to 36.7 ppt. The datalogger is suspended by a chain and localized at 17° 56' 41.8" N and 66° 15' 46.0" W.

All monitoring is considered long term.

6. Data collection period:

Station nine (9) sampling with the YSI began on December 20, 1995.
Station ten (10) sampling with the YSI began on February 1, 1996.
Station eleven (11) sampling with the YSI began on March 15, 1996.
Station six (6) sampling with the YSI began on December 06, 1996. No sampling after February 1997 for remainder of year.

7. Associated researchers and projects:

A water quality and plankton monitoring scheme was initiated in 1995, to monitor 12 stations in the Jobos Bay system. This effort, conducted by the

Department of Natural and Environmental Resources Laboratory began in March
1995, using a Hydrolab Data sonde 3 with a Surveyor 3 readout system, monitoring
the water column on a bimonthly time basis for abiotic parameter similar to the
YSI. Monthly samples for nutrients, plankton and chlorophyll were conducted from
March to October (Water Quality Monitoring-Spatial and temporal variations of
main abiotic and plankton components in JOBNERR, 1996). Samplings were resumed
in January 1996 and will be conducted until March 1997).

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,l day,1 yr)	NA
Time	0-24,0-60,0-60 (Hr,Min,Sec)	(1 hr, 1min, 1s)	NA
Temp	-5 to 45 (C)	0.01 C	+/- 0.15 C
SpCond	0-100 (mS/cm)	0.01mS/cm	+/- 0.5% of reading + 0.001 ms/cm
Salinity	0-70 Parts per Thousand(ppt)	0.01ppt	+/- 1.0% of reading or 0.1ppt, whichever is greater
Dosat @air sat	0-200 (% saturation)	0.1% @air sat	+/- 2%
Dosat @air sat	200-500 (% saturation)	0.1% @air sat	+/- 6%
Domg	0-20 (mg/1)	0.01 mg/L	+/- 0.2 mg/L
Domg	20-50 (mg/1)	0.01 mg/L	+/- 0.6 mg/L
Depth	0-9.1 (meters)	0.00l meters	+/- 0.018 m
pH	2-14	0.01 units	+/- 0.2 units
Turbidity	0-1000 NTU	0.1 NTU	+/- 5% of reading 2 NTU, whichever is greater

9. Coded variable indicator and variable code definitions:

Site definitions: S9 = Station 9
Site definitions: S10 = Station 10
Site definitions: S11 = Station 11
Site definitions: S6 = Station 6
File definitions: site/month/year (ex: XXaug95 = Station data from August
of 1995).

10. Data anomalies:

January, 1997:

Station 09:

Turbidity deleted from 1/1/97 0000 – 1/31/97 2330 – erratic throughout entire month.
No DO% and DO mg/L data from 1/01/97 00:00:00 through 1/14/97 11:00:00. YSI datalogger
or DO sensor was damaged causing very erratic DO readings.
All data was deleted because instrument was out of water from 1/14/97 1130 – 1/15/97 0930.
Depth, DO and pH data deleted from 1/17 1200 – 2/4 0830 due to erratic readings,
probably due to instrument.

Station11:
Possible small turbidity calibration error from 1/17 1200 – 1/31 2330.
Low DO Outliers were deleted:
1/17/97 17:00:00 through 1/17/97 20:00:00
1/18/97 3:30:00 through 1/18/97 8:00:00
1/18/97 14:30:00 through 1/19/97 8:00:00
1/19/97 14:30:00 through 1/19/97 15:00:00
1/19/97 16:00:00 through 1/20/97 8:00:00
1/20/97 14:00:00
1/20/97 15:00:00 through 1/21/97 8:30:00
1/21/97 13:00:00 through 1/21/97 13:30:00
1/21/97 14:30:00 through 1/22/97 9:30:00
1/22/97 15:00:00 through 1/23/97 8:00:00
1/23/97 14:00:00 through 1/24/97 8:00:00
1/24/97 15:00:00 through 1/25/97 8:00:00
1/25/97 14:30:00 through 1/26/97 8:00:00
1/26/97 14:00:00 through 1/27/97 8:30:00
1/27/97 14:00:00 through 1/28/97 8:30:00
1/28/97 13:00:00 through 1/29/97 9:00:00
1/29/97 13:00:00 through 1/30/97 11:00:00
1/30/97 13:00:00 through 1/31/97 9:00:00
1/31/97 13:00:00 through 1/31/97 22:30:00
High Temp Outliers:
1/20/97 14:30:00 through 1/31/97 21:00:00, 23:00:00 through 23:30:00
SpCond values deleted due to errors in temperature:
1/20/97 14:30:00 through 1/31/97 21:00:00, 23:00:00 through 23:30:00
Salinity values deleted due to errors in temperature:
1/20/97 14:30:00 through 1/31/97 21:00:00, 23:00:00 through 23:30:00
DO values deleted due to errors in temperature:
1/20/97 14:30:00 through 1/31/97 21:00:00, 23:00:00 through 23:30:00
pH values deleted due to errors in temperature:
1/20/97 14:30:00 through 1/31/97 21:00:00, 23:00:00 through 23:30:00

February, 1997:
Station 06:
No Data due to internal error:
2/1/97 6:00:00
2/1/97 7:00:00
2/1/97 10:30:00
2/1/97 23:00:00
2/2/97 0:30:00
2/2/97 2:00:00
2/3/97 3:00:00

2/2/97 6:00:00
2/2/97 7:00:00
2/2/97 8:00:00
2/2/97 10:30:00
2/2/97 11:00:00
2/2/97 14:00:00
2/2/97 15:00:00
2/2/97 17:30:00
2/2/97 19:00:00
2/2/97 20:30:00
2/2/97 22:00:00
2/2/97 22:30:00
2/2/97 23:00:00
2/3/97 3:30:00
2/3/97 5:00:00 through 2/3/97 5:30:00
2/3/97 6:00:00 through 2/3/97 6:30:00
2/3/97 7:30:00 through 2/3/97 8:00:00
2/3/97 9:30:00 through 2/3/97 13:00:00
2/3/97 14:00:00
2/3/97 15:00:00
2/3/97 16:00:00
2/3/97 17:00:00
2/3/97 17:30:00 through 2/3/97 18:30:00
2/3/97 23:30:00
2/4/97 1:30:00
2/4/97 3:30:00
2/4/97 5:00:00
2/4/97 6:30:00
2/4/97 8:00:00 through 2/28/97 23:30:00

Station09:
Turbidity deleted from 2/1/97 0000 – 2/28/97 2330 – erratic throughout entire month.
Depth, DO and pH data deleted from 1/17 1200 – 2/4 0830 due to erratic readings,
probably due to instrument.
Instrument was out of water from 2/4 0900 – 0930.
No data due to maintenance-there were problems with the probes from 02/04/97 10:00:00
through 02/28/97 23:30:00.

Station11:
High Temp Outliers:
2/1/97 0:00:00 through 2/4/97 9:00:00
SpCond values deleted due to errors in temperature:
2/1/97 0:00:00 through 2/4/97 9:00:00
Salinity values deleted due to errors in temperature:
2/1/97 0:00:00 through 2/4/97 9:00:00
DO values deleted due to errors in temperature:
2/1/97 0:00:00 through 2/4/97 9:00:00
pH values deleted due to errors in temperature:
2/1/97 0:00:00 through 2/4/97 9:00:00

March, 1997:

Station09:
DO deleted – very erratic from 3/1 0000 – 3/31 2330.
Anomalous Low Turbidity:
3/8/97 15:30:00
3/8/97 17:30:00
3/9/97 18:30:00
3/11/97 20:00:00
3/15/97 13:30:00
pH suspect from 3/5/97 1600 through 4/4/97 1600 and deleted.
Anomalously low turbidity spike (-785) deleted on 3/11/97 8:30:00.

April, 1997:
Station09:
pH suspect from 3/5/97 1600 through 4/4/97 1600 and deleted.
DO deleted – very erratic/bad data from 4/1 0000 – 4/4 1600.
Anomalous Low Turbidity:
4/4/97 11:30:00
4/23/97 23:30:00
DOmg/L data – not set up to record from 04/18/97 12:00:00 through 04/30/97 23:30:00.
DO% data deleted from 04/18/97 12:00:00 through 04/30/97 23:30:00-appears to be a
membrane puncture since values jump from the 70s to the 200s in half an hour.

Station10:
No Domg data - negative data was deleted from 04/01/97 0:00:00 through 04/30/97 23:30:00.
No Salinity data - data was deleted from 04/01/97 0:00:00 through 04/30/97 23:30:00.
High SpCond Outliers were deleted from 4/18/97 12:00:00 through 4/30/97 23:30:00.

May, 1997:
Station09:
DO% data deleted from 5/1/97 0:00:00 through 5/5/97 09:30:00-appears to be a
membrane puncture since values jump from the 70s to the 200s in half an hour.
No Salinity data from 05/01/97 00:00:00 through 05/05/97 09:30:00.
No Domg data from 05/01/97 00:00:00 through 05/05/97 09:30:00.

Station10:
Depth deleted – bad data from 5/01 0000 – 5/05 0930.
No Domg data from 05/01/97 0:00:00 through 05/05/97 09:00:00.
High SpCond and Salinity Outliers were deleted from 05/01/97 0:00:00 through
05/05/97 09:00:00.
Instrument out of water on 5/5 0930.
Instrument out of water from 5/6 1100 - 1400.
No pH data - bad probe from 05/06/97 14:30:00 through 05/31/97 23:30:00.
High Salinity and SpCond Outliers were deleted from 5/6/97 14:30:00 through 5/31/97 23:30:00.

DOmg/L values were also deleted from 5/6/97 14:30:00 through 5/31/97 23:30:00.
DO deleted due to possible bad calibration from 5/22 2330 – 5/31 2330.

June, 1997:
Station09:
High SpCond Outliers were deleted due to bad conductivity from 6/3/97 16:00:00
through 6/19/97 7:00:00.
High Salinity Outliers were deleted due to bad conductivity from 6/3/97 16:00:00
through 6/19/97 7:00:00.
DO mg/L data were also deleted from 6/3/97 16:00:00 through 6/19/97 7:00:00.
Anomalous Low Turbidity:

6/3/97	22:00:00			
6/5/97	0:00:00	through	6/5/97	0:30:00
6/6/97	2:00:00	through	6/6/97	2:30:00
6/7/97	22:00:00			
6/11/97	2:00:00			
6/11/97	4:00:00	through	6/11/97	5:00:00
6/11/97	6:30:00			
6/11/97	7:30:00			
6/11/97	9:30:00			
6/11/97	10:30:00	through	6/11/97	11:00:00
6/11/97	13:30:00			
6/11/97	23:00:00	through	6/12/97	0:00:00
6/12/97	1:00:00			
6/12/97	2:00:00	through	6/12/97	4:00:00
6/18/97	15:30:00			
6/24/97	17:00:00			
6/24/97	22:00:00			
6/25/97	10:30:00	through	6/25/97	11:30:00
6/25/97	13:00:00	through	6/25/97	14:30:00
6/25/97	15:30:00	through	6/25/97	19:30:00
6/26/97	13:00:00	through	6/26/97	13:30:00
6/26/97	15:00:00	through	6/26/97	16:30:00
6/26/97	17:30:00			
6/26/97	18:30:00			
6/27/97	12:30:00	through	6/27/97	15:30:00
6/27/97	17:00:00			
6/27/97	18:00:00	through	6/27/97	19:00:00
6/28/97	11:00:00	through	6/28/97	12:00:00
6/28/97	13:30:00			
6/28/97	14:30:00	through	6/28/97	15:00:00
6/28/97	16:00:00	through	6/28/97	18:00:00
6/28/97	21:00:00			
6/29/97	6:30:00	through	6/29/97	7:00:00
6/29/97	8:30:00	through	6/29/97	9:00:00
6/29/97	10:00:00			
6/29/97	13:00:00	through	6/29/97	14:00:00
6/29/97	15:00:00	through	6/29/97	16:00:00
6/29/97	17:00:00			
6/29/97	18:00:00			

6/29/97 19:00:00
6/29/97 21:00:00 through 6/29/97 22:30:00
pH data suspect and deleted from 6/10/97 1000 through 6/19/97 0700.
Suspect salinity/specific conductivity data from 06/24/97 17:00:00 through 06/30/97 04:30:00 deleted.
No Domg - suspect data deleted from 06/24/97 17:00:00 through 06/30/97 04:30:00.

Station10:
DO data deleted due to possible bad calibration from 6/1/97 0000 – 6/2/97 10:00.
No pH data - bad probe from 06/01/97 0:00:00 through 06/02/97 14:30:00.
High SpCond Outliers were deleted from 6/1/97 0:00:00 through 6/2/97 10:00:00.
High Salin Outliers were deleted from 6/1/97 0:00:00 through 6/2/97 10:00:00.
Instrument out of water from 6/2 1030 - 1430.
Anomalous Low Depth was deleted from 6/2/97 13:00:00 through 6/2/97 14:30:00.

November, 1997:
Station09:
pH data deleted due to bad probe from 11/14 1000 – 11/30 2330.
Low DO Outliers were deleted on 11/14/97 14:30:00.
DO data deleted from 11/19/97 16:00:00 through 11/30 2330 due to membrane puncture.
Anomalous Low Turbidity:
11/21/97 16:00:00
11/30/97 0:00:00, 23:00:00

Station11:
Anomalous Low Depth from 11/14/97 12:00:00 through 11/14/97 12:30:00.

December, 1997:
Station09:
DO data deleted from 12/01 0000-12/10 0900 due to membrane puncture.
Values jump
from 90 to >500 in half an hour and remain >500.
pH deleted due to bad probe from 12/01 0000 – 12/10 0900.
Anomalous Low Turbidity:
12/1/97 0:30:00
12/2/97 22:00:00
12/2/97 23:00:00
12/3/97 0:00:00

Station10:
No Salinity data from 12/23/97 16:00:00 through 12/31/97 23:30:00.
DO data deleted from 12/23 1600-1830 because membrane had not settled yet.
DO deleted due to possible tear in membrane from 12/30 0800 – 12/31 1900.

Station11:
Instrument out of water from 12/10 1230 – 12/12 1300.

11. Missing data:

January, 1997:
Station06:
No Data due to Internal Error on 1/1/97 0:00:00, 1/1/97 11:30:00.
No turbidity data – not set up to record on 01/01/97 00:00:00 through 01/31/97 23:30:00.
Sonde not deployed from 1/2/97 5:30:00 through 1/2/97 05:00:00.

Station 09:
Turbidity deleted – erratic throughout entire month from 1/1 0000 – 1/31 2330.
No DO% and DO mg/L data from 1/01/97 00:00:00 through 1/14/97 11:00:00.
YSI datalogger
or DO sensor was damaged causing very erratic DO readings.
All data was deleted because instrument was out of water from 1/14/97 1130 – 1/15/97 0930.
No Data due to maintenance from 1/15/97 10:00:00 through 1/17/97 11:30:00.
Depth, DO and pH data deleted from 1/17 1200 – 2/4 0830 due to erratic readings,
probably due to instrument.

Station10:
Sonde not deployed from 01/01/97 00:00:00 through 01/31/97 23:30:00.

Station11:
Sonde not deployed from 01/01/97 0:00:00 through 01/17/97 11:30:00.
Low DO Outliers were deleted:
1/17/97 17:00:00 through 1/17/97 20:00:00
1/18/97 3:30:00 through 1/18/97 8:00:00
1/18/97 14:30:00 through 1/19/97 8:00:00
1/19/97 14:30:00 through 1/19/97 15:00:00
1/19/97 16:00:00 through 1/20/97 8:00:00
1/20/97 14:00:00
1/20/97 15:00:00 through 1/21/97 8:30:00
1/21/97 13:00:00 through 1/21/97 13:30:00
1/21/97 14:30:00 through 1/22/97 9:30:00
1/22/97 15:00:00 through 1/23/97 8:00:00
1/23/97 14:00:00 through 1/24/97 8:00:00
1/24/97 15:00:00 through 1/25/97 8:00:00
1/25/97 14:30:00 through 1/26/97 8:00:00
1/26/97 14:00:00 through 1/27/97 8:30:00
1/27/97 14:00:00 through 1/28/97 8:30:00
1/28/97 13:00:00 through 1/29/97 9:00:00
1/29/97 13:00:00 through 1/30/97 11:00:00
1/30/97 13:00:00 through 1/31/97 9:00:00
1/31/97 13:00:00 through 1/31/97 23:30:00
High Temp Outliers were deleted due to probe malfunction:
1/20/97 14:30:00 through 1/31/97 21:00:00, 23:00:00 through 23:30:00
SpCond values deleted due to errors in temperature:
1/20/97 14:30:00 through 1/31/97 21:00:00, 23:00:00 through 23:30:00

Salinity values deleted due to errors in temperature:
1/20/97 14:30:00 through 1/31/97 21:00:00, 23:00:00 through 23:30:00
DO values deleted due to errors in temperature:
1/20/97 14:30:00 through 1/31/97 21:00:00, 23:00:00 through 23:30:00
pH values deleted due to errors in temperature:
1/20/97 14:30:00 through 1/31/97 21:00:00, 23:00:00 through 23:30:00

February, 1997:
Station06:
No Data due to internal error:

2/1/97	6:00:00			
2/1/97	7:00:00			
2/1/97	10:30:00			
2/1/97	23:00:00			
2/2/97	0:30:00			
2/2/97	2:00:00			
2/3/97	3:00:00			
2/2/97	6:00:00			
2/2/97	7:00:00			
2/2/97	8:00:00			
2/2/97	10:30:00			
2/2/97	11:00:00			
2/2/97	14:00:00			
2/2/97	15:00:00			
2/2/97	17:30:00			
2/2/97	19:00:00			
2/2/97	20:30:00			
2/2/97	22:00:00			
2/2/97	22:30:00			
2/2/97	23:00:00			
2/3/97	3:30:00			
2/3/97	5:00:00	through	2/3/97	5:30:00
2/3/97	6:00:00	through	2/3/97	6:30:00
2/3/97	7:30:00	through	2/3/97	8:00:00
2/3/97	9:30:00	through	2/3/97	13:00:00
2/3/97	14:00:00			
2/3/97	15:00:00			
2/3/97	16:00:00			
2/3/97	17:00:00			
2/3/97	17:30:00	through	2/3/97	18:30:00
2/3/97	23:30:00			
2/4/97	1:30:00			
2/4/97	3:30:00			
2/4/97	5:00:00			
2/4/97	6:30:00			
2/4/97	8:00:00	through	2/28/97	23:30:00

No turbidity data – not set up to record from 02/01/97 00:00:00 through 02/28/97 23:30:00.

Station 09:
Turbidity deleted from 2/1/97 0000 – 2/28/97 2330 – erratic throughout entire month.
Depth, DO and pH data deleted from 1/17 1200 – 2/4 0830 due to erratic readings,

probably due to instrument.
Instrument was out of water on 2/4 0900 – 0930.
No data due to maintenance-there were problems with the probes from
02/04/97 10:00:00
through 02/28/97 23:30:00.

Station10:
Sonde not deployed due to problems with probes from last deployment from
02/01/97 00:00:00
through 02/28/97 23:30:00.

Station11:
High Temp Outliers:
2/1/97 0:00:00 through 2/4/97 9:00:00
SpCond values deleted due to errors in temperature:
2/1/97 0:00:00 through 2/4/97 9:00:00
Salinity values deleted due to errors in temperature:
2/1/97 0:00:00 through 2/4/97 9:00:00
DO values deleted due to errors in temperature:
2/1/97 0:00:00 through 2/4/97 9:00:00
pH values deleted due to errors in temperature:
2/1/97 0:00:00 through 2/4/97 9:00:00
No data due to maintenance from 02/04/97 9:30:00 through 02/28/97
23:30:00.

March, 1997:
Station06:
Sonde not deployed from 03/01/97 00:00:00 through 03/31/97 23:30:00.

Station 09:
No data due to maintenance from 03/01/97 00:00:00 through 03/05/97
15:30:00.
DO deleted – very erratic from 3/1 0000 – 3/31 2330.
pH suspect from 3/5/97 1600 through 4/4/97 1600 and deleted.
Anomalously low turbidity spike (-785) deleted on 3/11/97 8:30:00.

Station10:
Sonde not deployed due to problems with sonde from 03/01/97 00:00:00
through
03/31/97 23:30:00.

Station11:
Sonde not deployed due to problems with sonde from 03/01/97 00:00:00
through
03/31/97 23:30:00.

April, 1997:
Station06:
Sonde not deployed from 04/01/97 00:00:00 through 04/30/97 23:30:00.

Station 09:
DO deleted – very erratic/bad data from 4/1 0000 – 4/4 1600.
pH suspect from 3/5/97 1600 through 4/4/97 1600 and deleted.

No data due to maintenance from 04/04/97 16:30:00 through 04/18/97 11:30:00.
No salinity data - conductivity was programmed to record instead from 04/18/97 12:00:00
through 04/30/97 23:30:00.
DOmg/L data – not set up to record from 04/18/97 12:00:00 through 04/30/97 23:30:00.
DO% data deleted from 04/18/97 12:00:00 through 04/30/97 23:30:00-appears to be a
membrane puncture since values jump from the 70s to the 200s in half an hour.

Station10:
No data due to maintenance from 04/01/97 0:00:00 through 04/18/97 11:30:00.
No Domg data - not set up to record from 04/01/97 0:00:00 through 04/30/97 23:30:00.
No Salinity data - not set up to record from 04/01/97 0:00:00 through 04/30/97 23:30:00.
High SpCond Outliers were deleted from 4/18/97 12:00:00 through 4/30/97 23:30:00.

Station11:
Sonde not deployed from 04/01/97 00:00:00 through 04/30/97 23:30:00.

May, 1997:
Station06:
Sonde not deployed from 05/01/97 00:00:00 through 05/31/97 23:30:00.

Station 09:
No Salinity data - not set up to record from 05/01/97 00:00:00 through 05/05/97 09:30:00.
DOmg/L data - not set up to record from 05/01/97 00:00:00 through 05/05/97 09:30:00.
DO% data deleted from 5/1/97 0:00:00 through 5/5/97 09:30:00-appears to be a
membrane puncture since values jump from the 70s to the 200s in half an hour.
No data due to maintenance from 05/05/97 10:00:00 through 05/31/97 23:30:00.

Station10:
Depth deleted – bad data from 5/01 0000 – 5/05 0930.
No Domg data - not set up to record from 05/01/97 0:00:00 through 05/05/97 09:00:00.
High SpCond Outliers were deleted from 05/01/97 0:00:00 through 05/05/97 09:00:00.
No Salinity data – not set up to record from 05/01/97 0:00:00 through 05/05/97 09:00:00.
Instrument out of water on 5/5 0930.
No data due to maintenance from 05/05/97 10:00:00 through 05/06/97 10:30:00.
Instrument out of water on 5/6 1100 - 1400.
No pH data - bad probe from 05/06/97 14:30:00 through 05/31/97 23:30:00.

High Salinity and SpCond Outliers were deleted from 5/6/97 14:30:00 through 5/31/97 23:30:00.
DOmg/L values were also deleted from 5/6/97 14:30:00 through 5/31/97 23:30:00.
DO deleted due to possible bad calibration from 5/22 2330 – 5/31 2330.

Station11:
Sonde not deployed from 05/01/97 00:00:00 through 05/31/97 23:30:00.

June, 1997:
Station06:
Sonde not deployed from 06/01/97 00:00:00 through 06/31/97 23:30:00.

Station 09:
No Data due to maintenance from:
6/1/97 0:00:00 through 6/3/97 15:30:00.
6/19/97 7:30:00 through 6/24/97 16:30:00.
6/30/97 5:00:00 through 6/30/97 23:30:00.
High SpCond Outliers were deleted from 6/3/97 16:00:00 through 6/19/97 7:00:00.
High Salinity Outliers were deleted from 6/3/97 16:00:00 through 6/19/97 7:00:00.
DO mg/L data were also deleted from 6/3/97 16:00:00 through 6/19/97 7:00:00.
pH data suspect and deleted from 6/10/97 1000 through 6/19/97 0700.
Suspect salinity/specific conductivity data from 06/24/97 17:00:00 through 06/30/97 04:30:00 deleted.
No Domg - suspect data deleted from 06/24/97 17:00:00 through 06/30/97 04:30:00.

Station10:
DO data deleted due to possible bad calibration from 6/1/97 0000 – 6/2/97 10:00.
No pH data - bad probe from 06/01/97 0:00:00 through 06/02/97 14:30:00.
High SpCond Outliers were deleted from 6/1/97 0:00:00 through 6/2/97 10:00:00.
High Salin Outliers were deleted from 6/1/97 0:00:00 through 6/2/97 10:00:00.
Instrument out of water on 6/2 1030 - 1430.
Anomalous Low Depth was deleted from 6/2/97 13:00:00 through 6/2/97 14:30:00.
No data due to maintenance - problems with sonde from 06/02/97 15:00:00 through
06/30/97 23:30:00.

Station11:
Sonde not deployed from 06/01/97 00:00:00 through 06/30/97 23:30:00.

July, 1997:
Station06:
Sonde not deployed from 07/01/97 00:00:00 through 07/31/97 23:30:00.

Station 09:
Sonde not deployed from 07/01/97 00:00:00 through 07/31/97 23:30:00.

Station10:
Sonde not deployed from 07/01/97 00:00:00 through 07/31/97 23:30:00.

Station11:
Sonde not deployed from 07/01/97 00:00:00 through 07/31/97 23:30:00.

August, 1997:
Station06:
Sonde not deployed from 08/01/97 00:00:00 through 08/31/97 23:30:00.

Station 09:
Sonde not deployed from 08/01/97 00:00:00 through 08/31/97 23:30:00.

Station10:
Sonde not deployed from 08/01/97 00:00:00 through 08/31/97 23:30:00.

Station11:
Sonde not deployed from 08/01/97 00:00:00 through 08/31/97 23:30:00.

September, 1997:
Station06:
Sonde not deployed from 09/01/97 00:00:00 through 09/30/97 23:30:00.

Station 09:
Sonde not deployed from 09/01/97 00:00:00 through 09/30/97 23:30:00.

Station10:
Sonde not deployed from 09/01/97 00:00:00 through 09/30/97 23:30:00.

Station11:
Sonde not deployed from 09/01/97 00:00:00 through 09/30/97 23:30:00.

October, 1997:
Station06:
Sonde not deployed from 10/01/97 00:00:00 through 10/31/97 23:30:00.

Station 09:
Sonde not deployed from 10/01/97 00:00:00 through 10/31/97 23:30:00.

Station10:
Sonde not deployed from 10/01/97 00:00:00 through 10/31/97 23:30:00.

Station11:
Sonde not deployed from 10/01/97 00:00:00 through 10/31/97 23:30:00.

November, 1997:
Station06:
Sonde not deployed from 11/01/97 00:00:00 through 11/31/97 23:30:00.

Station 09:
No data due to maintenance from 11/01/97 00:0:00 through 11/14/97 12:00:00.
pH data deleted due to bad probe from 11/14 1000 – 11/30 2330.

Low DO Outliers were deleted on 11/14/97 14:30:00.
DO data deleted from 11/19/97 16:00:00 through 11/30 2330 due to membrane puncture.

Station10:
No data due to maintenance on:
11/01/97 00:0:00 through 11/14/97 9:30:00
11/16/97 6:00:00 through 11/16/97 6:30:00
11/18/97 2:30:00 through 11/30/97 23:30:00

Station11:
No data – not deployed from 11/01/97 00:0:00 through 11/14/97 9:30:00.

December, 1997:
Station06:
Sonde not deployed from 12/01/97 00:00:00 through 12/31/97 23:30:00.

Station 09:
DO data deleted from 12/01 0000-12/10 0900 due to membrane puncture.
Values jump
from 90 to >500 in half an hour and remain >500.
pH deleted due to bad probe from 12/01 0000 – 12/10 0900.
No data due to sonde problems from 12/10/97 09:30:00 through 12/31/97 23:30:00.

Station10:
Sonde not deployed from 12/01/97 00:00:00 through 12/23/97 15:30:00.
DO data deleted from 12/23 1600-1830 because membrane had not settled yet.
No Salinity data – not set up to record 12/23/97 16:00:00 through 12/31/97 23:30:00.
DO deleted due to possible tear in membrane from 12/30 0800 – 12/31 1900.

Station11:
Instrument out of water from 12/10 1230 – 12/12 1300.
No data due to maintenance from 12/12/97 13:30:00 through 12/31/97 23:30:00.

12. Other remarks
Please Note: These time mismatches were all corrected in the data files.

January, 1997
Station06: Time mismatch 01/26/97 08:20:28 through 01/31/97 23:43:00

February, 1997:
Station06: Time mismatch 02/01/97 00:13:00 through 02/04/97 8:15:41

May, 1997:
Station10: Time mismatch 05/06/97 11:03:15 through 05/31/97 23:33:15

June, 1997:
Station10: Time mismatch 06/01/97 0:03:15 through 06/02/97 14:33:15