

Tijuana River (TJR) NERR Water Quality Metadata
January to December 2004
Last Revised: August 13, 2020

I. Data Set and Research Descriptors

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2) Entry Verification

Deployment data are uploaded from the YSI data logger to a Personal Computer (IBM compatible). Data plots are produced and examined and erroneous data are detected using the PC6000 or EcoWatch software from YSI. Notes are made of any unusual data during that deployment. Files are exported from EcoWatch in a comma-delimited format (.CSV) and opened in Microsoft Excel for pre-processing with the EQWin format macro that was developed by the CDMO to reformat the header columns, insert station codes, insert a corrected time column and allow the technician to remove any pre- and post-deployment data from the file. Where deployment overlap occurs between files, the data produced by the newly calibrated sonde is accepted as being the most accurate. The pre-processed file is then ready to be copied into the EQWin water.eqi file where the data are QA/QC checked and archived in a database. EQWin queries, reports and graphs are used to discover data set outliers (values which fall outside the range that the instrument is designed to measure) and large changes in the data. EQWin is also used to generate statistics, view graphs, create customized queries and reports of the data, cross query the water, weather and nutrient data and finally export the data to the CDMO. All data is archived on a fileserver which is backed up to a remote location daily. The person responsible for the data management is Michelle Cordrey.

3) Research Objectives

The Tijuana Estuarine Research Reserve is impacted heavily by both periodic raw sewage outflows and urban development. Only about a quarter of the reserve's 2,531 acres are tidally influenced, with few channels deep enough for datalogger deployment. Two stations were originally set up: a treatment station was set

up close to the mouth on the Southern end of the Oneonta Slough, while a control station was set up on the northern end of Oneonta Slough. The treatment station location was chosen because it would be the site most affected by sewage outflow. Deployment at the treatment station, however, was continually halted by both shifting sediment and massive wracks of kelp (*Macrocystis pyrifera*), which would often bury the deployment set-up on incoming tides. After a number of different deployment equipment designs were implemented, with no success, logging at this site was terminated.

We currently have four YSI datalogger stations installed at the reserve. The siting of the stations is designed to investigate spatial gradients of water quality parameters across the reserve as well as document the water quality changes over time to areas in the reserve which have been restored to increase tidal flushing. The original control station in the northern end of Oneonta Slough is still in place. The second station, Tidal Linkage, is located in the North arm of the reserve in a constructed channel designed to increase tidal exchange in that portion of the reserve. Data logging at the Tidal Linkage station began in May 1997 but has not been continuous due to episodic sedimentation events. A third datalogger station is located at the inlet to the Model Marsh, a recently constructed 20-acre restoration site in the southern arm of the estuary. The Model Marsh was opened to tidal flushing in February 2000 and data logging at the station began in October 2000. The River Channel station is located on a tidally influenced section of the Tijuana River, the largest source of freshwater to the reserve. Data logging at the River Channel station began in August 2002. Due to unusually heavy sedimentation resulting from heavy rainfall, the site was discontinued in November 2004. A new site called Boca Rio was established in December 2004 and is located near the mouth of the river.

4) Research Methods (Dataloggers)

Dataloggers at the Model Marsh, Oneonta Slough, Boca Rio, and River Channel stations are deployed using a 4-inch diameter PVC pipe that is strapped vertically to two "rail" style fence posts driven into the sediment. Multiple 1.5 inch holes have been drilled around the bottom of the tube to permit unrestricted water flow to the sensors. During deployment the datalogger units are then placed into and rest on a bolt fixed across the bottom of the tubes. Dataloggers deployed at the Tidal Linkage station are deployed horizontally, in a 4-inch diameter pvc pipe that is fastened to 4 copper pipes that have been driven into the sediment until refusal.

The sampling period is two weeks for non-EDS loggers and between three and four weeks when using EDS loggers, with measurements taken every 30 minutes. Measurements for specific conductivity, salinity, dissolved oxygen (percent saturation), dissolved oxygen (mg/l), temperature, turbidity and water level are recorded. At the end of each two week period, the YSI data logger units are brought back to the laboratory for downloading, cleaning and recalibration and are usually redeployed in the field within 24 to 48 hours. These procedures are carried out according to the methods described in the YSI Operations Manual (see sections 3 and 7). Calibration standards for specific conductivity and turbidity are purchased from YSI and pH standards are purchased pre-made from VWR scientific. The QA/QC procedures for the collected data are followed as given in the CDMO Operations Manual version 4.0.

5) Site location and character

General site Characteristics (TJE)

- a) Tidal exchange (extremes): approx. -2 +7 MLLW,
- b) Salinity: 4 ppt (extreme rain events) to 38 ppt
- c) Latitude and longitude: 32 deg. 34 min. N, 117 deg. 07 min. W
- d) Potential impacts: storm drain runoff from military airfield and adjacent residential areas, occasional sewage spills (10-15 MGD) into the Tijuana River from Mexico. The area surrounding the estuary is heavily developed by residential housing as is the watershed which drains into the estuary. Approximately 2/3 of the watershed is in Mexico. The North Eastern section of the reserve is bordered by a military helicopter training base. Vegetation in the area is dominated by common pickleweed (*Spartina virginica*) and Pacific cordgrass (*Spartina foliosa*).
- e) The dominant freshwater source to the estuary is the Tijuana River, which drains a 4,483 sq. km watershed. Stream flows in the river vary considerably from season to season and year to year with no flow during many months with a mean annual discharge of .82 cubic meters per second (cms). Additional freshwater sources are storm drains located mostly in the northern arm of the estuary. The entire estuary is shallow and has a relatively small tidal prism (0.36 Mm³) so even low freshwater flows result in reduced salinity throughout the reserve. Estimated residence times for freshwater entering the estuary vary from 7 hours to a few days depending on the tidal and mouth conditions. Rainfall within the watershed accounts for most of the freshwater entering the reserve with 90 percent of the mean annual rainfall falling between November and April. Discharges of freshwater with untreated sewage occur year round although these have decreased with the construction of binational water treatment plant.

Specific Site characteristics: Oneonta Slough (OS)

- a) Orientation of site: The Datalogger station is located on the upper portion of Oneonta Slough. The channel runs North to South and is located on the northwestern edge of the reserve. Latitude is 32 deg 34 min 04.8 sec N, longitude is 117 deg 07 min 52.3 sec W.
- b) The elevation of the channel bottom directly below the datalogger is approx. 0.55 meters NGVD (date of last survey was 2001).
- c) Channel width is approx. 20 meters. Datalogger site is located 1km from mouth
- d) Bottom type: sand and sediment
- e) Area adjacent to west side of channel is developed. There is a 50 meter buffer of natural vegetation between development and the channel. Area adjacent to east side of channel is relatively natural.
- f) Direct impacts are estimated to be runoff from streets into channel during rain events.

Specific Site Characteristics: Model Marsh (MM)

- a) Orientation of site: The datalogger station is located in the middle of a natural channel which runs north to south. The channel is approximately 20 meters north of a newly constructed 20 acre mudflat restoration area in the southern section of the reserve. Latitude is 32deg 32min 52.1sec longitude: 117deg 7min 22.5sec due to heavy sedimentation.
- b) The elevation of the channel bottom: -.39 meters NGVD (date of last survey was 2001)
- c) Channel width: 5 meters
- d) Bottom type: Mostly mud with some sand

Specific Site Characteristics: Tidal Linkage (TL)

- a) Orientation of site: Datalogger station is located in the middle of the constructed channel known as the Tidal Linkage. The channel runs northwest to southwest and is located adjacent to the visitor's center in the

northeastern section of the reserve. Latitude is 32 deg 34 min 27.9 sec N, longitude is 117 deg 07 min 37.8 sec W.

b) The elevation of the channel bottom: No current survey data available.

c) Channel width: Approximately 5 meters at both the old and new sites

d) Bottom type: very fine mud.

Specific Site Characteristics: River Channel (RC)

a) Orientation of site: Datalogger station is located in the main channel of the Tijuana River, the main drainage of the watershed. The channel runs East to West. Latitude is 32 deg 33 min 28.4 sec N and longitude is 117 deg 06 min 21.8 sec W. On November 11, 2004 the site was relocated 10 meters due west of the given coordinates due to increased sedimentation at the previous location.

b) The elevation of the channel bottom: No current survey data available.

c) Channel width: Approximately 10 meters

d) Bottom type: mostly sand, some mud.

Specific Site characteristics: Boca Rio (BR)

a) Orientation of site: Datalogger station is located approximately 300 meters north of the Tijuana River in the middle of a channel which runs north to south. Latitude is 32 33 34.3 N and Longitude is 117 deg 07 min 43.7 sec W.

b) The elevation of channel bottom: No current survey data available

c) Channel width: Approximately 10 meters

d) Bottom type: mostly sand, very little mud

6) Data Collection period

Unless otherwise noted, YSI model 6600 EDS dataloggers were used to collect data for the following dates and times.

Oneonta Slough

Deploy Date	Time	Retrieve Date	Time
12/19/2003	15:30	01/14/2004	12:00
01/15/2004	15:30	02/11/2004	10:00
02/12/2004	15:30	03/10/2004	15:30 *
03/11/2004	11:00	04/12/2004	11:00 **
04/15/2004	14:30	04/24/2004	13:00 600xlm used
04/24/2004	12:30	05/18/2004	13:30
05/19/2004	15:30	06/23/2004	11:30
06/24/2004	12:30	07/26/2004	10:00
07/27/2004	13:00	08/23/2004	08:00
08/24/2004	11:00	09/24/2004	14:30
09/26/2004	14:00	10/26/2004	16:30
10/26/2004	16:30	11/23/2004	14:00
11/24/2004	17:00	12/30/2004	16:00
12/31/2004	16:30	01/19/2005	16:00

* no deployment due to broken holder

** no deployment due to failure of YSI mainboard

Tidal Linkage

Deploy Date	Time	Retrieve Date	Time
12/19/2003	15:00	01/14/2004	12:00
01/15/2004	15:00	02/11/2004	10:00
02/13/2004	15:00	03/10/2004	14:30
03/12/2004	10:30	04/12/2004	11:00
04/13/2004	13:30	05/18/2004	13:00
05/19/2004	15:30	06/23/2004	11:00

06/24/2004	13:30	07/26/2004	09:30
07/27/2004	12:00	08/23/2004	07:30
08/24/2004	10:00	09/24/2004	13:30
09/26/2004	17:00	10/26/2004	15:30
10/27/2004	15:00	11/23/2004	13:30
11/24/2004	15:30	12/11/2004	14:30
12/11/2004	15:00	12/30/2004	15:30
12/31/2004	16:00	02/16/2005	15:30

Model Marsh

Deploy Date	Time	Retrieve Date	Time
12/19/2004	16:30	01/14/2008	13:00
01/15/2004	17:00	02/11/2004	11:00
02/13/2004	17:00	02/20/2004	17:00
02/20/2004	17:30	02/25/2004	10:30
03/11/2004	18:30	04/12/2004	12:30
04/14/2004	10:00	04/29/2004	13:00
04/30/2004	13:00	05/18/2004	15:30
05/19/2004	17:30	06/23/2004	09:00
06/25/2004	11:30	07/28/2004	11:00
07/29/2004	13:30	08/23/2004	09:00
08/24/2004	14:00	09/24/2004	10:30
09/26/2004	15:00	10/25/2004	14:00
10/26/2004	14:00	11/23/2004	15:00
11/24/2004	16:30	01/19/2005	14:30

River Channel

Deploy Date	Time	Retrieve Date	Time
12/19/2003	16:00	01/14/2004	12:30
01/15/2004	16:00	02/11/2004	10:30
02/12/2004	14:30	03/10/2004	16:00
03/11/2004	18:00	04/12/2004	12:00
04/13/2004	14:30	05/18/2004	14:00
05/19/2004	16:30	06/23/2004	10:30
06/25/2004	15:00	07/26/2004	11:30
07/28/2004	10:30	08/23/2004	09:30
08/24/2004	14:30	09/24/2004	10:00
09/26/2004	16:00	10/25/2004	13:00
11/02/2004	10:30	11/11/2004	14:00

Boca Rio

Deploy Date	Time	Retrieve Date	Time
12/23/2004	15:30	01/19/2005	15:30

7) Distribution

NOAA/ERD retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The PI retains the right to be fully credited for having collected and processed the data. Following academic courtesy standards, the PI and NERR site where the data were collected will be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. Manuscripts resulting from this NOAA/OCRM supported research that are produced for publication in open literature, including refereed scientific journals, will acknowledge that the research was conducted under an award from the Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric

Administration. The data set enclosed within this package/transmission is only as good as the quality assurance and quality control procedures outlined by the enclosed metadata reporting statement. The user bears all responsibility for its subsequent use/misuse in any further analyses or comparisons. The Federal government does not assume liability to the Recipient or third persons, nor will the Federal government reimburse or indemnify the Recipient for its liability due to any losses resulting in any way from the use of this data.

NERR water quality data and metadata can be obtained from the Research Coordinator at the individual NERR site (please see Principal investigators and contact persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under the general information link on the CDMO home page) and online at the CDMO home page <http://cdmo.baruch.sc.edu/>. Data are available in text tab-delimited format.

8) Associated researchers and projects

NERR SWMP tier 1 nutrient sampling is being conducted at all water quality datalogger stations. NERR SWMP meteorological sampling is being conducted at 1 station which is located near the Tidal Linkage water quality station. Within the watershed, above the River Channel site, nutrient sampling and flow studies are being conducted by Dr. Richard Gersberg of the San Diego State University Department of Public Health. The Model Marsh is the ongoing site of research being conducted by PERL which focuses on methods for increasing the success of saltmarsh revegetation projects.

II. Physical Structure Descriptors

9) Sensor Specifications

YSI 6600/YSI 6600EDS datalogger

Parameter: Temperature
Units: Celsius (C)
Sensor Type: Thermistor
Model #: 6560
Range: -5 to 45 °C
Accuracy: +/-0.15 °C
Resolution: 0.01 °C

Parameter: Conductivity
Units: milli-Siemens per cm (mS/cm)
Sensor Type: 4-electrode cell with autoranging
Model #: 6560
Range: 0 to 100 mS/cm
Accuracy: +/-0.5% of reading + 0.001 mS/cm
Resolution: 0.001 mS/cm to 0.1 mS/cm (range dependent)

Parameter: Salinity
Units: parts per thousand (ppt)
Sensor Type: Calculated from conductivity and temperature
Range: 0 to 70 ppt
Accuracy: +/- 1.0% of reading or 0.1 ppt, whichever is greater
Resolution: 0.01 ppt

Parameter: Dissolved Oxygen % saturation
Units: percent air saturation (%)

Sensor Type: Rapid Pulse - Clark type, polarographic
Model #: 6562
Range: 0 to 500 % air saturation
Accuracy: 0-200 % air saturation, +/- 2 % of the reading or 2 % air saturation, whichever is greater; 200-500 % air saturation, +/- 6 % of the reading
Resolution: 0.1 % air saturation

Parameter: Dissolved Oxygen mg/L (Calculated from % air saturation, temperature and salinity)
Units: milligrams per Liter (mg/L)
Sensor Type: Rapid Pulse - Clark type, polarographic
Model #: 6562
Range: 0 to 50 mg/L
Accuracy: 0 to 20 mg/L, +/- 2 % of the reading or 0.2 mg/L, whichever is greater; 20 to 50 mg/L, +/- 6 % of the reading
Resolution: 0.01 mg/L

Parameter: Non-Vented Level - Shallow (Depth)
Units: feet or meters (ft or m)
Sensor Type: Stainless steel strain gauge
Range: 0 to 30 ft (9.1 m)
Accuracy: +/- 0.06 ft (0.018 m)
Resolution: 0.001 ft (0.001 m)

Parameter: Vented Level - Deep (Depth)
Units: feet or meters (ft or m)
Sensor Type: Stainless steel strain gauge
Range: 0 to 656 ft (200 m)
Accuracy: +/- 1 ft (0.3 m)
Resolution: 0.001 ft (0.001 m)

Parameter: pH
Units: units
Sensor Type: Glass combination electrode
Model #: 6561
Range: 0 to 14 units
Accuracy: +/- 0.2 units
Resolution: 0.01 units

Parameter: Turbidity
Units: nephelometric turbidity units (NTU)
Sensor Type: Optical, 90 ° scatter, with mechanical cleaning
Model #: 6136
Range: 0 to 1000 NTU
Accuracy: +/- 5 % reading or 2 NTU (whichever is greater)
Resolution: 0.1 NTU

The reliability of the dissolved oxygen (DO) data after 96 hours post-deployment for non-EDS (Extended Deployment System) data sondes may be problematic due to fouling which forms on the DO probe membrane during some deployments (Wenner et al. 200*). Many reserves have upgraded to YSI 6600 EDS data sondes, which increase DO accuracy and longevity by reducing the environmental effects of fouling. The user is therefore advised to consult the metadata and to exercise caution when utilizing the DO data beyond the initial 96-hour time period. However, this potential drift is not always problematic for some uses of the data, ie. periodicity analysis. It should be noted that the amount of fouling is site specific and that not all data are affected. The Research Coordinator at

the specific NERR site should be contacted concerning the reliability of the DO data because of the site and seasonal variation in the fouling of the DO sensor. All data sondes used at DNERR sites in 2002 were non-EDS models.

The NERRS System-Wide Monitoring Program utilizes YSI data sondes that can be equipped with either depth or water level sensors. Both sensors measure water depth, but by convention, level sensors refer to atmospherically vented measurements and depth refers to non-vented measurements. Standard calibration protocols for the non-vented sensor use the atmosphere pressure at the time of calibration. Therefore, changes in atmospheric pressure between calibrations appear as changes in water depth. The error is equal to approximately 1.03 cm for every 1millibar change in atmospheric pressure. This error is eliminated for level sensors because they are vented to the atmosphere throughout the deployment time interval. If proper atmospheric pressure data is available, non-vented sensor depth measurements can be corrected for deployments between calibrations. Readings for both vented and non-vented sensors are automatically compensated for water density changes due to variations in temperature and salinity. The Research Coordinator at the specific NERR site should be contacted in order to obtain information regarding atmospheric pressure data availability. All data sondes used at the DNERR sites in 2002 were non-vented models.

10) Coded variable definitions

Site definitions:

OS = Oneonta Slough, MM = Model Marsh, TL = Tidal Linkage, RC = River Channel, BR = Boca Rio

Station codes:

tjroswq = Tijuana River Oneonta Slough Water Quality
tjrmmwq = Tijuana River Model Marsh Water Quality
tjrtlwq = Tijuana River Tidal Linkage Water Quality
tjrrcwq = Tijuana River River Channel Water Quality
tjrbrwq = Tijuana River Boca Rio Water Quality

11) Data anomalies (suspect data)

January 2004

OS

a) 01/01/2004 00:00:00 - 01/14/2004 12:00:00, Lower than average turbidity values. Reason not known. Data were not removed.

b) Negative or 0 depth values were recorded on the following dates and times. Sensors were not out of the water so data were not removed:

01/02/2004 14:00:00 - 15:30:00

01/05/2004 14:00:00

01/06/2004 14:30:00 - 18:30:00

01/10/2004 16:30:00 - 20:30:00

01/11/2004 17:30:00 - 20:30:00

MM

a) 01/25/2004 20:30:00 - 02/03/2004 04:00:00, specific conductivity and salinity values were higher than average. These values are inconsistent with lower than average values related to rainfall recorded at other stations during the same period. Reason not known so data were not deleted.

RC

a) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Data were not removed.

Date	Time	Turb
01/03/2004	03:30:00	1446
01/03/2004	04:00:00	1708
01/03/2004	04:30:00	1709
01/03/2004	05:00:00	1708
01/03/2004	05:30:00	1127

February 2004

TL

a) Slightly negative turbidity values were recorded on the following dates and times. Likely caused by sensor being too close to bottom of calibration cup during calibration. Data were not removed:

02/07/2004 17:30:00
02/08/2004 12:00:00 - 13:00:00
02/08/2004 14:00:00
02/08/2004 17:00:00
02/09/2004 13:30:00
02/09/2004 15:00:00
02/09/2004 16:30:00 - 17:30:00
02/10/2004 02:30:00 - 03:30:00
02/10/2004 15:00:00

RC

a) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Data were not removed.

Date	Time	Turb
02/03/2004	02:30:00	1952
02/03/2004	03:00:00	1953
02/03/2004	03:30:00	1952
02/03/2004	04:00:00	1949
02/03/2004	04:30:00	1947
02/03/2004	05:00:00	1946
02/03/2004	05:30:00	1896
02/03/2004	06:00:00	1482
02/03/2004	06:30:00	1380
02/03/2004	07:00:00	1499
02/03/2004	07:30:00	1886
02/03/2004	08:00:00	1899
02/03/2004	08:30:00	1561
02/03/2004	09:00:00	1302
02/03/2004	09:30:00	1099
02/03/2004	10:00:00	1069
02/18/2004	22:00:00	1266
02/18/2004	22:30:00	1298
02/22/2004	11:30:00	1345

02/22/2004	12:00:00	1976
02/22/2004	12:30:00	1978
02/22/2004	13:00:00	1979
02/22/2004	13:30:00	1964
02/22/2004	14:00:00	1951
02/22/2004	14:30:00	1962
02/22/2004	15:00:00	1961
02/22/2004	15:30:00	1964
02/22/2004	16:00:00	1965
02/22/2004	17:00:00	1971
02/22/2004	18:00:00	1966
02/22/2004	18:30:00	1966
02/22/2004	19:30:00	1966
02/22/2004	20:00:00	1966
02/22/2004	20:30:00	1966
02/22/2004	21:00:00	1966
02/22/2004	21:30:00	1966
02/22/2004	22:00:00	1967
02/22/2004	23:00:00	1966
02/22/2004	23:30:00	1966
02/23/2004	00:00:00	1965
02/23/2004	01:00:00	1961
02/23/2004	02:00:00	1959
02/23/2004	02:30:00	1959
02/23/2004	03:00:00	1958
02/23/2004	04:00:00	1943
02/23/2004	05:00:00	1533
02/23/2004	06:00:00	1575
02/23/2004	06:30:00	1444
02/23/2004	07:00:00	1480
02/23/2004	07:30:00	1488
02/23/2004	08:00:00	1945
02/23/2004	08:30:00	1746
02/23/2004	09:00:00	1947
02/23/2004	09:30:00	1824
02/23/2004	10:00:00	1930
02/23/2004	11:00:00	1906
02/23/2004	11:30:00	1935
02/23/2004	12:30:00	1828
02/23/2004	13:00:00	1669
02/23/2004	14:00:00	1351
02/23/2004	14:30:00	1211
02/23/2004	15:30:00	1243
02/23/2004	16:00:00	1251
02/23/2004	16:30:00	1228
02/23/2004	17:00:00	1978
02/23/2004	17:30:00	1498
02/23/2004	18:00:00	1252
02/23/2004	18:30:00	1236
02/23/2004	19:30:00	1279
02/23/2004	20:00:00	1111
02/23/2004	20:30:00	1208
02/23/2004	21:00:00	1093
02/24/2004	09:00:00	1551
02/24/2004	09:30:00	1013
02/26/2004	11:00:00	1981
02/26/2004	11:30:00	1985

02/26/2004	12:00:00	1986
02/26/2004	13:00:00	1942
02/26/2004	14:00:00	1179

March 2004

TL

a) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Data were not removed.

Date	Time	Turb
03/06/2004	14:00:00	1133
03/10/2004	10:00:00	1151

RC

a) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Data were not removed.

03/02/2004	05:30	1242
03/02/2004	08:00	1520

April 2004

OS

a) Negative or 0 depth values were recorded on the following dates and times. Sensors were not out of the water so data were not removed:

04/15/2004	15:00:40 - 15:30:40
04/16/2004	02:30:40
04/16/2004	13:30:40 - 16:00:40
04/17/2004	02:30:40 - 04:00:40
04/17/2004	15:00:40 - 16:00:40
04/18/2004	03:30:40 - 05:00:40
04/18/2004	15:00:40 - 16:30:40
04/19/2004	04:00:40 - 06:00:40
04/19/2004	15:30:40 - 16:30:40
04/20/2004	04:00:40 - 07:00:40
04/20/2004	15:30:40 - 16:00:40
04/21/2004	04:00:40 - 07:30:40
04/22/2004	06:00:40 - 07:30:40
04/23/2004	07:00:40 - 09:00:40
04/24/2004	07:00:40 - 10:30:40

MM

a) Negative or 0 depth values were recorded on the following dates and times. Sensors were not out of the water so data were not removed:

04/14/2004	13:00:00 - 16:00:00
04/15/2004	14:00:00 - 16:00:00
04/16/2004	14:30:00 - 16:30:00
04/20/2004	16:00:00 - 17:00:00
04/28/2004	14:00:00 - 14:30:00

RC

a) Negative or 0 depth values were recorded on the following dates and times. Sensors were not out of the water so data were not removed:

04/28/2004	13:30:00 - 16:30:00
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b) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Data were not removed.

04/02/2004 02:00 2017
 04/02/2004 02:30 1985
 04/02/2004 03:00 1977
 04/02/2004 03:30 1973
 04/02/2004 04:00 1970
 04/02/2004 04:30 1968
 04/02/2004 05:00 1972
 04/02/2004 05:30 1981
 04/02/2004 06:00 1986
 04/02/2004 07:00 1976
 04/02/2004 07:30 1946
 04/02/2004 08:30 1741
 04/02/2004 09:30 1946
 04/02/2004 10:00 1785
 04/02/2004 10:30 1704
 04/02/2004 11:00 1394
 04/02/2004 11:30 1994
 04/02/2004 12:00 1270
 04/02/2004 12:30 1059
 04/02/2004 13:00 1019
 04/02/2004 13:30 1374
 04/17/2004 17:00 1032

c) Drop in dissolved Oxygen towards end of 03/11/04 deployment possibly due to fouling. Dissolved oxygen suspect for the following dates/times:

04/02/2004 01:30:00 - 04/12/2004 12:00:00

May 2004

OS

a) Negative or 0 depth values were recorded on the following dates and times. Sensors were not out of the water so data were not removed:

05/09/2004 07:00:00 - 10:30:00
 05/10/2004 08:30:00 - 11:30:00
 05/11/2004 09:30:00 - 12:30:00
 05/12/2004 11:00:00 - 13:30:00
 05/13/2004 13:30:00 - 14:00:00
 05/14/2004 12:30:00 - 14:30:00
 05/15/2004 02:00:00 - 03:00:00
 05/15/2004 13:30:00 - 14:00:00
 05/16/2004 03:30:00 - 04:00:00
 05/23/2004 07:30:00 - 09:30:00
 05/28/2004 13:00:00

TL

a) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Data were not removed.

Date	Time	Turb
05/21/2004	03:30:00	1535
05/21/2004	04:00:00	1437

June 2004

OS

a) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Reason Not known. Data were not removed.

Date	Time	Turb
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06/13/2004 22:00:00 1562
06/13/2004 23:00:00 1571
06/14/2004 18:00:00 1567

b) Negative or 0 depth values were recorded on the following dates and times.
Sensors were not out of the water so data were not removed:

06/02/2004 04:00:00 - 06:00:00
06/03/2004 05:30:00 - 06:30:00
06/04/2004 06:00:00 - 07:30:00
06/05/2004 06:00:00 - 08:30:00
06/06/2004 06:30:00 - 09:30:00
06/07/2004 06:30:00 - 10:00:00
06/08/2004 07:00:00 - 11:00:00
06/13/2004 02:00:00 - 03:00:00
06/14/2004 03:00:00 - 04:30:00
06/15/2004 03:30:00 - 05:00:00
06/16/2004 04:00:00 - 05:30:00
06/17/2004 04:00:00 - 06:30:00
06/18/2004 04:30:00
06/21/2004 06:00:00 - 09:00:00
06/22/2004 06:30:00 - 09:30:00
06/25/2004 08:00:00 - 10:30:00
06/26/2004 10:00:00
06/29/2004 02:30:00 - 03:30:00
06/30/2004 02:30:00 - 05:00:00

TL

a) 06/24/2004, 13:30:00 - 06/30/2004, 23:30:00; Turbidity values higher than average. No reason known. Data were not removed.

MM

a) Turbidity spikes:

Date	Time	Turb
06/28/2004	21:31:00	1178

July 2004

OS

a) 07/11/2004 17:00:00 - 07/16/2004 23:30:00, pH values higher than average.
reason unknown. Data were not removed.

b) 07/14/2004 - 07/17/2004, Higher than average turbidity values were recorded.
No reason known. Data were not removed.

c) Negative or 0 depth values were recorded on the following dates and times.
Sensors were not out of the water so data were not removed:

07/02/2004 05:00:00 - 06:00:00
07/03/2004 05:00:00 - 07:30:00
07/04/2004 05:30:00 - 08:30:00
07/05/2004 05:30:00 - 09:00:00
07/06/2004 05:30:00
07/07/2004 05:30:00 - 10:00:00
07/08/2004 06:30:00 - 10:00:00
07/09/2004 08:00:00 - 10:00:00
07/10/2004 23:00:00 - 23:30:00
07/11/2004 00:00:00 - 02:00:00
07/11/2004 23:30:00 - 07/12/2004 03:30:00
07/13/2004 00:00:00 - 04:30:00
07/14/2004 01:00:00 - 05:30:00
07/15/2004 01:30:00 - 06:00:00

07/16/2004 02:30:00 - 06:30:00
07/17/2004 03:00:00 - 07:00:00
07/30/2004 03:00:00 - 05:30:00
07/31/2004 04:00:00 - 06:30:00

TL

a) 07/01/2004, 00:00:00 - 07/26/2004, 09:30:00; Turbidity values higher than average. No reason known. Data were not removed.

MM

a) Turbidity spikes:

Date	Time	Turb
07/05/2004	23:31:00	1109
07/06/2004	01:31:00	1188
07/06/2004	04:31:00	1191
07/06/2004	06:01:00	1188
07/06/2004	07:31:00	1187
07/06/2004	09:01:00	1189
07/06/2004	13:31:00	1210
07/06/2004	22:01:00	1137
07/10/2004	13:31:00	1232
07/10/2004	15:31:00	1166
07/10/2004	17:01:00	1193
07/10/2004	18:31:00	1196
07/10/2004	21:31:00	1049
07/10/2004	23:01:00	1204
07/11/2004	00:31:00	1194
07/11/2004	02:01:00	1187
07/11/2004	04:01:00	1182
07/11/2004	05:31:00	1184
07/11/2004	07:01:00	1185
07/11/2004	08:31:00	1186
07/11/2004	10:31:00	1190
07/11/2004	18:01:00	1156
07/12/2004	01:31:00	1126
07/12/2004	04:31:00	1150
07/12/2004	06:01:00	1193
07/12/2004	07:31:00	1194
07/12/2004	09:01:00	1196
07/12/2004	10:31:00	1032
07/12/2004	12:01:00	1175
07/12/2004	21:31:00	1216
07/13/2004	17:01:00	1160
07/13/2004	17:31:00	1052
07/13/2004	18:31:00	1183
07/31/2004	18:31:00	1198

August 2004

OS

a) 08/08/2004 - 08/17/2004, Higher than average turbidity values were recorded. No reason known. Data were not removed.

b) 08/28/2004 02:31:00 - 08/28/2004 06:31:00, pH values lower than average. reason unknown.

c) Negative or 0 depth values were recorded on the following dates and times. Sensors were not out of the water so data were not removed:

08/01/2004 04:30:00 - 07:00:00

08/04/2004 04:30:00 - 07:00:00
08/05/2004 05:00:00
08/07/2004 23:00:00
08/09/2004 00:30:00 - 02:00:00
08/10/2004 02:00:00 - 03:30:00
08/11/2004 02:30:00 - 04:00:00
08/12/2004 03:30:00 - 04:30:00
08/16/2004 03:30:00 - 04:30:00
08/18/2004 04:30:00 - 06:00:00
08/25/2004 01:01:00 - 03:01:00
08/26/2004 02:01:00 - 03:31:00
08/27/2004 03:01:00 - 04:31:00
08/28/2004 04:31:00
08/29/2004 04:01:00 - 05:31:00
08/30/2004 04:31:00 - 06:01:00
08/30/2004 15:31:00
08/31/2004 04:31:00 - 06:31:00
08/31/2004 16:31:00 - 17:01:00

MM

a) Turbidity spikes:

Date	Time	Turb
08/01/2004	19:01:00	1208
08/03/2004	22:01:00	1161
08/10/2004	18:01:00	1199
08/11/2004	17:01:00	1177
08/11/2004	17:31:00	1205
08/12/2004	18:01:00	1198
08/13/2004	19:31:00	1193
08/16/2004	21:01:00	1162
08/17/2004	01:01:00	1183
08/17/2004	20:31:00	1198
08/27/2004	23:31:00	1185
08/30/2004	08:31:00	1186

September 2004

OS

a) Negative or 0 depth values were recorded on the following dates and times.
Sensors were not out of the water so data were not removed:

09/01/2004 04:31:00 - 06:31:00
09/01/2004 17:01:00 - 17:31:00
09/02/2004 05:01:00 - 06:01:00
09/11/2004 04:01:00
09/12/2004 03:01:00 - 04:31:00
09/13/2004 03:31:00 - 04:31:00
09/14/2004 04:31:00

MM

a) Turbidity spikes:

Date	Time	Turb
09/04/2004	11:01:00	1202
09/14/2004	10:31:00	1196
09/14/2004	11:01:00	1199
09/14/2004	13:01:00	1234
09/14/2004	14:01:00	1244
09/14/2004	15:31:00	1258

09/23/2004	23:01:00	1187
09/24/2004	10:31:00	1174

October 2004

OS

a) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Data were not removed.

Date	Time	Turb
10/11/2004	05:30:00	1441
10/11/2004	07:00:00	1435
10/11/2004	18:30:00	1452
10/12/2004	06:30:00	1332
10/12/2004	08:30:00	1448
10/12/2004	20:00:00	1284
10/13/2004	05:00:00	1389
10/19/2004	16:30:00	1362
10/20/2004	03:30:00	1450
10/20/2004	09:00:00	1396
10/20/2004	09:30:00	1415
10/20/2004	11:30:00	1458
10/20/2004	13:30:00	1457
10/20/2004	15:00:00	1457
10/20/2004	17:00:00	1457
10/20/2004	18:00:00	1368
10/20/2004	18:30:00	1229
10/21/2004	02:30:00	1449
10/21/2004	08:00:00	1433
10/21/2004	08:30:00	1256
10/21/2004	10:00:00	1437
10/21/2004	10:30:00	1384
10/21/2004	12:00:00	1440
10/21/2004	12:30:00	1302
10/21/2004	15:00:00	1264
10/21/2004	15:30:00	1091
10/21/2004	16:00:00	1444
10/22/2004	00:00:00	1224
10/22/2004	00:30:00	1207
10/22/2004	02:00:00	1295
10/22/2004	02:30:00	1172
10/22/2004	04:00:00	1348
10/22/2004	06:00:00	1359
10/22/2004	08:00:00	1209
10/22/2004	10:00:00	1439
10/22/2004	10:30:00	1069
10/22/2004	12:00:00	1225
10/22/2004	14:00:00	1444
10/22/2004	17:30:00	1459
10/22/2004	18:30:00	1462
10/22/2004	19:30:00	1404
10/22/2004	20:00:00	1263
10/22/2004	21:30:00	1396
10/22/2004	22:00:00	1260
10/22/2004	23:30:00	1371
10/23/2004	00:00:00	1233

10/23/2004	03:30:00	1430
10/23/2004	06:30:00	1213
10/23/2004	09:30:00	1209
10/23/2004	13:00:00	1462
10/23/2004	14:00:00	1476
10/23/2004	15:30:00	1476
10/23/2004	17:00:00	1167
10/23/2004	19:00:00	1117
10/23/2004	20:00:00	1277
10/23/2004	21:00:00	1454
10/23/2004	22:00:00	1426
10/23/2004	23:00:00	1449
10/24/2004	01:00:00	1446
10/24/2004	03:00:00	1439
10/24/2004	05:00:00	1449
10/24/2004	07:00:00	1449
10/24/2004	09:00:00	1444
10/24/2004	11:00:00	1452
10/24/2004	12:00:00	1436
10/24/2004	12:30:00	1060
10/24/2004	13:00:00	1476
10/24/2004	13:30:00	1481
10/24/2004	14:30:00	1343
10/24/2004	16:00:00	1479
10/24/2004	19:00:00	1405
10/24/2004	19:30:00	1370
10/24/2004	22:00:00	1451
10/24/2004	23:30:00	1397
10/25/2004	00:30:00	1230
10/25/2004	01:30:00	1442
10/25/2004	02:30:00	1396
10/25/2004	03:00:00	1307
10/25/2004	04:30:00	1045
10/25/2004	05:30:00	1451
10/25/2004	08:00:00	1451
10/25/2004	09:00:00	1449
10/25/2004	10:00:00	1082
10/25/2004	11:00:00	1445
10/25/2004	12:00:00	1431
10/25/2004	12:30:00	1355
10/25/2004	14:30:00	1476
10/25/2004	16:00:00	1303
10/25/2004	18:00:00	1301
10/25/2004	19:00:00	1455
10/25/2004	19:30:00	1355
10/25/2004	20:30:00	1168
10/25/2004	21:00:00	1418
10/25/2004	22:00:00	1445
10/25/2004	23:30:00	1324
10/26/2004	00:00:00	1060
10/26/2004	00:30:00	1439
10/26/2004	01:30:00	1232
10/26/2004	02:30:00	1399
10/26/2004	03:30:00	1419
10/26/2004	05:30:00	1429
10/26/2004	06:00:00	1075
10/26/2004	06:30:00	1448

10/26/2004	07:30:00	1388
10/26/2004	08:30:00	1448
10/26/2004	10:30:00	1453
10/26/2004	12:00:00	1150
10/26/2004	12:30:00	1468
10/26/2004	13:30:00	1298
10/26/2004	14:30:00	1370
10/26/2004	15:00:00	1465
10/27/2004	19:00:00	1303
10/27/2004	19:30:00	1552
10/27/2004	20:00:00	1551
10/27/2004	20:30:00	1552
10/27/2004	21:00:00	1554
10/27/2004	21:30:00	1554
10/27/2004	22:30:00	1415
10/28/2004	06:00:00	1546
10/28/2004	06:30:00	1466
10/29/2004	07:00:00	1019

d) Negative or 0 depth values were recorded on the following dates and times.
Sensors were not out of the water so data were not removed:

10/26/2004 16:00:00

TL

a) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Data were not removed.

Date	Time	Turb
10/28/2004	09:30:00	1464
10/28/2004	16:30:00	1031
10/29/2004	15:00:00	1505
10/29/2004	18:30:00	1506

MM

a) Turbidity spikes:

Date	Time	Turb
10/13/2004	12:30:00	1176
10/16/2004	13:00:00	1037
10/17/2004	14:30:00	1161
10/17/2004	15:00:00	1155
10/18/2004	14:00:00	1149
10/18/2004	15:00:00	1156
10/19/2004	17:30:00	1138
10/19/2004	18:00:00	1136
10/19/2004	18:30:00	1134
10/19/2004	19:00:00	1083
10/19/2004	19:30:00	1133
10/19/2004	20:00:00	1132
10/19/2004	20:30:00	1132
10/19/2004	21:00:00	1131
10/19/2004	21:30:00	1131
10/19/2004	22:00:00	1130
10/19/2004	22:30:00	1129
10/19/2004	23:00:00	1129
10/19/2004	23:30:00	1128
10/20/2004	00:00:00	1128
10/20/2004	00:30:00	1128
10/20/2004	01:00:00	1127

10/20/2004	01:30:00	1127
10/20/2004	02:00:00	1127
10/20/2004	02:30:00	1126
10/20/2004	03:00:00	1126
10/20/2004	04:00:00	1125
10/20/2004	04:30:00	1125
10/20/2004	05:00:00	1125
10/20/2004	05:30:00	1124
10/20/2004	06:00:00	1123
10/20/2004	10:00:00	1128
10/20/2004	10:30:00	1128
10/20/2004	11:00:00	1129
10/20/2004	11:30:00	1129
10/20/2004	12:30:00	1132
10/20/2004	13:00:00	1133
10/20/2004	14:30:00	1134
10/20/2004	15:00:00	1134
10/20/2004	15:30:00	1128
10/20/2004	18:00:00	1125
10/21/2004	02:00:00	1116
10/21/2004	04:00:00	1114
10/21/2004	05:30:00	1111
10/21/2004	06:30:00	1101
10/21/2004	07:00:00	1102
10/21/2004	08:30:00	1112
10/21/2004	09:00:00	1114
10/27/2004	04:00:00	1101
10/27/2004	04:30:00	1101
10/27/2004	05:00:00	1101
10/27/2004	08:30:00	1089
10/27/2004	09:00:00	1089
10/27/2004	09:30:00	1090
10/27/2004	10:00:00	1091
10/27/2004	10:30:00	1093
10/27/2004	11:00:00	1094
10/27/2004	11:30:00	1097
10/27/2004	12:00:00	1099
10/27/2004	12:30:00	1103
10/27/2004	13:00:00	1106
10/27/2004	13:30:00	1110
10/27/2004	14:00:00	1112
10/27/2004	14:30:00	1112
10/27/2004	15:00:00	1113
10/27/2004	15:30:00	1114
10/27/2004	16:00:00	1114
10/27/2004	16:30:00	1114
10/27/2004	17:00:00	1113
10/27/2004	17:30:00	1111
10/27/2004	18:00:00	1109
10/27/2004	18:30:00	1107
10/27/2004	19:00:00	1106
10/27/2004	19:30:00	1105
10/27/2004	20:00:00	1104
10/27/2004	20:30:00	1104
10/27/2004	21:00:00	1102
10/27/2004	21:30:00	1100
10/27/2004	22:00:00	1099

10/27/2004	23:00:00	1096
10/27/2004	23:30:00	1095
10/28/2004	00:00:00	1096
10/28/2004	00:30:00	1095
10/28/2004	01:00:00	1094
10/28/2004	01:30:00	1094
10/28/2004	02:00:00	1093
10/28/2004	02:30:00	1092
10/28/2004	03:00:00	1092
10/28/2004	03:30:00	1091
10/28/2004	04:00:00	1090
10/28/2004	04:30:00	1089
10/28/2004	05:00:00	1089
10/28/2004	05:30:00	1089
10/28/2004	06:00:00	1090
10/28/2004	12:00:00	1118
10/28/2004	12:30:00	1126
10/28/2004	13:00:00	1132
10/28/2004	13:30:00	1137
10/28/2004	14:00:00	1141
10/28/2004	14:30:00	1145
10/28/2004	15:00:00	1146
10/28/2004	15:30:00	1146
10/28/2004	16:00:00	1143
10/28/2004	16:30:00	1139
10/28/2004	17:00:00	1134
10/28/2004	17:30:00	1128
10/28/2004	18:00:00	1124
10/28/2004	18:30:00	1120
10/28/2004	19:00:00	1117
10/28/2004	19:30:00	1114
10/28/2004	20:00:00	1112
10/28/2004	20:30:00	1110
10/28/2004	21:00:00	1109
10/28/2004	21:30:00	1107
10/28/2004	22:00:00	1098
10/28/2004	22:30:00	1052
10/29/2004	01:30:00	1029
10/29/2004	13:00:00	1126
10/29/2004	13:30:00	1131
10/29/2004	14:00:00	1135

November 2004

OS

a) Negative or 0 depth values were recorded on the following dates and times.
Sensors were not out of the water so data were not removed:

11/25/2004	15:00:00 - 18:00:00
11/26/2004	15:30:00 - 18:30:00
11/27/2004	16:00:00 - 19:30:00
11/28/2004	17:00:00 - 19:30:00

MM

a) Turbidity spikes:

Date	Time	Turb
11/05/2004	12:30:00	1093

11/06/2004	16:30:00	1118
11/07/2004	10:30:00	1085
11/07/2004	11:00:00	1074
11/07/2004	18:00:00	1093
11/07/2004	18:30:00	1107
11/08/2004	05:00:00	1102
11/14/2004	15:00:00	1125
11/21/2004	09:00:00	1090
11/23/2004	10:00:00	1083

Decemember 2004

OS

a) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Data were not removed.

Date	Time	Turb
12/29/2004	07:30:00	1294
12/29/2004	08:00:00	1342
12/29/2004	08:30:00	1343
12/29/2004	09:00:00	1343
12/29/2004	09:30:00	1343
12/29/2004	10:00:00	1343
12/29/2004	10:30:00	1343
12/29/2004	11:00:00	1339
12/30/2004	10:00:00	1267

b) Negative or 0 depth values were recorded on the following dates and times. Sensors were not out of the water so data were not removed:

12/02/2004	19:00:00 - 22:30:00
12/03/2004	19:30:00 - 23:00:00
12/04/2004	20:30:00 - 23:30:00
12/10/2004	15:30:00 - 17:30:00
12/11/2004	16:00:00 - 18:30:00
12/12/2004	16:30:00 - 18:00:00
12/19/2004	22:00:00 - 23:00:00
12/20/2004	12:00:00 - 13:00:00
12/21/2004	12:00:00 - 15:00:00
12/22/2004	12:30:00 - 16:00:00
12/23/2004	13:30:00 - 15:00:00
12/25/2004	14:30:00 - 18:30:00
12/26/2004	15:00:00 - 19:00:00
12/27/2004	16:00:00 - 19:30:00
12/28/2004	17:00:00 - 18:00:00

TL

a) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Data were not removed.

Date	Time	Turb
12/01/2004	14:30:00	1418
12/05/2004	02:30:00	1367
12/25/2004	01:30:00	1201

BR

a) Highly positive turbidity values (>1000 NTU) were recorded on the following dates and times which were not consistent with the overall data set. Data were not removed.

12/29/2004	06:00	1298
12/29/2004	06:30	1298
12/29/2004	07:00	1297
12/29/2004	07:30	1297
12/29/2004	08:00	1298
12/29/2004	08:30	1298
12/29/2004	09:00	1298
12/29/2004	09:30	1297
12/29/2004	10:00	1297
12/29/2004	10:30	1297
12/29/2004	11:00	1297
12/29/2004	11:30	1089
12/29/2004	20:30	1302
12/29/2004	21:00	1298
12/29/2004	21:30	1298
12/29/2004	22:00	1239
12/29/2004	22:30	1234
12/29/2004	23:00	1222
12/30/2004	09:30	1284
12/30/2004	11:30	1288
12/30/2004	12:00	1271
12/30/2004	12:30	1269
12/30/2004	13:00	1260

MM

a) Turbidity spikes:

Date	Time	Turb
12/06/2004	13:30:00	1106
12/06/2004	14:00:00	1109
12/06/2004	14:30:00	1110
12/06/2004	15:00:00	1110
12/06/2004	15:30:00	1109
12/06/2004	16:00:00	1108
12/06/2004	16:30:00	1108
12/06/2004	17:00:00	1107
12/06/2004	17:30:00	1102
12/06/2004	18:00:00	1101
12/06/2004	18:30:00	1092
12/06/2004	19:00:00	1087
12/06/2004	19:30:00	1087
12/06/2004	20:00:00	1084
12/06/2004	20:30:00	1081
12/06/2004	21:00:00	1077
12/06/2004	21:30:00	1074
12/06/2004	22:00:00	1072
12/06/2004	22:30:00	1071
12/06/2004	23:00:00	1070
12/06/2004	23:30:00	1069
12/07/2004	00:00:00	1068
12/07/2004	01:00:00	1067
12/07/2004	03:00:00	1072
12/07/2004	04:00:00	1078
12/11/2004	03:30:00	1091
12/11/2004	17:00:00	1107

12/11/2004	17:30:00	1104
12/11/2004	18:00:00	1105
12/11/2004	18:30:00	1108
12/11/2004	21:00:00	1040
12/11/2004	21:30:00	1103
12/11/2004	22:00:00	1103
12/11/2004	22:30:00	1103
12/12/2004	01:00:00	1100
12/12/2004	01:30:00	1101
12/12/2004	02:00:00	1101
12/12/2004	04:00:00	1098
12/12/2004	04:30:00	1099
12/12/2004	05:00:00	1099
12/12/2004	15:00:00	1113
12/12/2004	15:30:00	1113
12/12/2004	16:00:00	1113
12/12/2004	19:30:00	1108
12/12/2004	20:00:00	1108
12/12/2004	20:30:00	1107
12/12/2004	23:00:00	1104
12/13/2004	01:00:00	1104
12/13/2004	01:30:00	1104
12/13/2004	04:00:00	1104
12/13/2004	04:30:00	1103
12/13/2004	05:00:00	1036
12/13/2004	07:00:00	1099
12/28/2004	16:00:00	1021
12/28/2004	16:30:00	1102
12/28/2004	17:30:00	1047
12/28/2004	18:00:00	1099
12/28/2004	19:30:00	1099
12/28/2004	22:30:00	1098
12/28/2004	23:30:00	1098
12/29/2004	00:30:00	1098
12/29/2004	01:30:00	1098
12/29/2004	02:00:00	1097
12/29/2004	02:30:00	1097
12/29/2004	03:00:00	1097
12/29/2004	03:30:00	1095
12/29/2004	04:00:00	1094
12/29/2004	04:30:00	1094
12/29/2004	05:00:00	1093
12/29/2004	05:30:00	1092
12/29/2004	06:00:00	1092
12/29/2004	06:30:00	1091
12/29/2004	07:00:00	1090
12/29/2004	07:30:00	1054
12/29/2004	12:00:00	1100
12/29/2004	12:30:00	1104
12/29/2004	13:00:00	1107
12/29/2004	13:30:00	1109
12/29/2004	14:00:00	1111
12/29/2004	14:30:00	1112
12/29/2004	15:00:00	1113
12/29/2004	15:30:00	1112
12/29/2004	16:00:00	1111
12/29/2004	16:30:00	1108

12/29/2004	17:00:00	1105
12/29/2004	17:30:00	1101
12/29/2004	18:00:00	1098
12/29/2004	20:30:00	1036
12/29/2004	21:00:00	1084
12/30/2004	09:30:00	1085
12/30/2004	11:00:00	1088
12/30/2004	11:30:00	1089
12/30/2004	14:30:00	1119
12/30/2004	17:00:00	1115
12/30/2004	17:30:00	1112
12/30/2004	18:30:00	1071
12/30/2004	19:00:00	1105
12/30/2004	19:30:00	1102
12/30/2004	20:00:00	1099
12/30/2004	20:30:00	1096
12/30/2004	21:00:00	1094
12/30/2004	22:30:00	1092
12/30/2004	23:00:00	1092
12/30/2004	23:30:00	1008
12/31/2004	03:30:00	1076
12/31/2004	04:00:00	1076
12/31/2004	04:30:00	1074
12/31/2004	05:00:00	1074
12/31/2004	05:30:00	1072
12/31/2004	07:00:00	1072
12/31/2004	08:00:00	1078
12/31/2004	08:30:00	1077
12/31/2004	09:00:00	1077
12/31/2004	09:30:00	1078
12/31/2004	11:30:00	1095
12/31/2004	12:00:00	1095
12/31/2004	12:30:00	1099
12/31/2004	14:00:00	1103
12/31/2004	14:30:00	1102
12/31/2004	15:00:00	1102
12/31/2004	16:00:00	1101
12/31/2004	17:00:00	1091
12/31/2004	19:00:00	1087
12/31/2004	19:30:00	1080
12/31/2004	20:00:00	1087
12/31/2004	20:30:00	1085
12/31/2004	21:00:00	1081
12/31/2004	21:30:00	1078
12/31/2004	22:00:00	1063
12/31/2004	22:30:00	1076

12) Deleted Data

January 2004

MM

a) 01/15/2004 17:00:00 - 02/20/2004 17:00:00, pH values were deleted due to probe failure.

February 2004

MM

a) 02/22/2004 12:00:00 - 02/25/2004 10:30:00, all parameters were deleted. Sonde was buried in sediment.

March 2004

TL

a) 03/08/2004 07:00:00 - 03/10/2004 14:30:00, pH values were deleted. Probe failure during deployment.

MM

a) 03/21/2004 19:00:00 - 04/12/2004 12:30:00, all parameters were deleted. Sonde buried by sediment.

April 2004

MM

a) 04/30/2004 13:00:00 - 05/18/2004 15:30:00, depth values were deleted. Sonde with vented sensor used without venting - readings inaccurate and inconsistent over time.

May 2004

TL

a) 05/29/2004 13:00:00 - 06/23/2004 11:00:00, turbidity values were deleted. Sensor wiper was parking on optics, may have been caused by excessive sediment in deployment holder, probe guard and mesh.

June 2004

OS

a) 06/15/2004 18:30:00 - 06/23/2004 11:30:00, Turbidity values higher than average. Likely caused by wiper parking over optics. Data were deleted.

July 2004

TL

a) 07/12/2004 12:00:00; all parameters were deleted. Probes were out of water.

RC

a) 07/28/2004 10:30:00 - 08/23/2004 09:30:00, DO% and DO mg/l deleted. values at beginning of deployment below manufactures stated range of probe. Readings unstable and too low at end of deployment as indicated by post calibration data.

August 2004

OS

a) 08/22/2004 14:30:00 - 08/23/2004 08:00:00, turbidity values were deleted. wiper parking on optics.

TL

a) 08/22/2004 18:30:00 - 08/23/2004 07:30:00, DO% & DO mg/l values were deleted. Negative values were recorded towards end of deployment. Contamination of probe suspected.

September 2004

TL

a) 09/01/2004 23:00:00, DO% and DO mg/l values were deleted. Values were below manufacturer's specified range of measurement.
b) 09/04/2004 09:30:00 - 09/24/2004 13:30:00, DO% and DO mg/l values deleted. Contamination of probe suspected.

October 2004

TL

a) 10/01/2004 19:00:00 - 10/26/2004 15:30:00, DO% and DO mg/l values were deleted. Probe contamination suspected. DO charge data during deployment was used to determine period where suspect data began.

RC

a) 10/17/2004 12:30:00 - 10/25/2004 13:00:00, all parameters were deleted. sonde buried in sediment deposited by heavy than average rainfall.

November 2004

TL

a) 11/03/2004 19:30:00 - 11/04/2004 01:00:00, DO% and DO mg/l values were deleted as values were below manufacturer's specified range of operation.

b) 11/05/2004 02:00:00, DO% and DO mg/l values were deleted as values were below manufacturer's specified range of operation.

c) 11/09/2004 07:00:00 - 11/23/2004 13:30:00, turbidity values were deleted. Rain events deposited sediment in the deployment holder resulting in erroneously high readings.

RC

a) 11/03/2004 16:30:00 - 11/11/2004 14:00:00, all parameters were deleted. Sonde was buried in sediment deposited by above average rainfall.

December 2004

TL

a) 12/09/2004 14:30:00 - 12/11/2004 14:30:00, all parameters were deleted due to temperature probe failure.

13) Missing Data

Data are missing due to equipment failure, specific probes not being deployed, and time of maintenance or calibration of equipment. For more details on deleted data, see Deleted Data Section (12.). If additional information on missing data are needed, contact the Research Coordinator at the reserve submitting the data.

14) Post deployment information

np = no probe installed

nc = no calibration done

numbers in parentheses are used if standard differs from those stated.

Site	Date	SpCond Std(50)	DO% std(100)	Depth std(0)	pH std(7)	Turb std(0)
OS	01/15/2004	50.6	98.5	0.097	7.01	0.1
	02/12/2004	49.8	nc	nc	7.06	-0.2
	03/12/2004	nc	101.9	0.028	7.1	nc
	04/24/2004	50.07	102.8	0.027	7.27	-0.4
	05/19/2004	50.13	107	0.006	7.02	0.1
	06/24/2004	49.52	99.8	0.024	7.25	0.4
	07/27/2004	49.2	101.9	0.5	6.96	0.1
	08/24/2004	49.77	114.5	0.025	7.05	0.3
	09/26/2004	50.73	99.8	0.036	6.98	0.2
	10/26/2004	49.92	108.1	0.083	7.02	0.4
	11/24/2004	53.15 (54.4)	109	0.005	7.14	0.2
	12/31/2004	53.74 (54)	100.2	0.03	7	0.6

TL	12/19/2003	49.49	101.4	-0.04	7.05	-0.2
	01/15/2004	50.36	104.1	0.102	7.01	-4.8
	02/13/2004	47.81	113.4	0.003	nc	-0.4
	03/12/2004	50.37	100	0.025	7.17	-0.3
	04/13/2004	49.23	102.5	0.006	7.13	-0.2
	05/19/2004	50.66	102.3	0.002	7.12	0
	06/24/2004	49.66	97	0.017	7.07	0.4
	07/24/2004	49.61	156.4	0.016	7.07	0.4
	08/24/2004	50.07	205	0.025	6.96	0.1
	09/26/2004	49.89	117	0.037	6.98	0.3
	10/27/2004	48.73	98.2	0.093	7.24	0.4
	11/24/2004	nc	nc	0.02	nc	0.2
	12/11/2004	51.84	100.6	0.001	7.01	0.5
	12/31/2004	52.89	nc	-0.019	7.08	0.1
MM	01/15/2004	50.09	90.4	0.098	10.34	0
	02/13/2004	49.66	97.9	-0.069	np	np
	02/20/2004	49.93	101	-0.091	7	10
	03/04/2004	49.75	nc	nc	7.03	nc
	03/11/2004	50.1	99.3	0.149	7.05	0
	04/14/2004	50.39	101	-0.036	7.11	np
	04/30/2004	48.96	99.8	-0.46	5.33	-0.1
	05/19/2004	49.86	110	0.13	7.14	0.4
	06/24/2004	48.94	101.1	0.015	7.07	0.1
	07/29/2004	50.05	100.1	0.022	7.11	0.3
	08/24/2004	49.94	102.3	0.019	7.23	0.2
	09/26/2004	49.99	103	0.012	7.4	0.1
	10/26/2004	49.78	107.5	0.065	7.06	0.6
	11/24/2004	53.22 (54)	111	-0.03	6.96	0.9
RC	01/15/2004	49.25	110	0.101	7.04	-0.1
	02/12/2004	49.07	108	-0.086	7.1	-0.1
	03/11/2004	49.13	112.6	0.046	7.02	0
	04/13/2004	50.56	103.6	0.002	6.99	0.1
	05/19/2004	49.94	120	0.009	7.12	1.5
	06/24/2004	50.05	97.5	0.034	7.02	0
	07/28/2004	50.52	71.5	0.03	7.09	0.3
	08/24/2004	50.83	95.4	0.021	7.01	0.4
	09/26/2004	49.61	110	-0.009	6.99	0.4
	11/01/2004	nc	nc	nc	nc	nc
BR	12/23/2004	52.35 (54)	107	-0.05	nc	nc

15) Other Remarks

On 08/13/2020 this dataset was updated to include embedded QAQC flags for anomalous/suspect data. System-wide monitoring data beginning in 2007 were processed to allow for QAQC flags and codes to be embedded in the data files rather than detailed in the metadata alone (as in the anomalous/suspect, deleted, and missing data sections above). Prior to 2006, rejected data were deleted from the dataset so they are unavailable to be used at all, but suspect data were only noted in the metadata document. Suspect data flags <1> were embedded retroactively in order to allow suspect data to be easily identified and filtered from the dataset if desired for analysis and reporting purposes. No other flags or codes were embedded in the dataset and users should still refer to the detailed explanations above for more information.

a) There were a few instances at this NERR site where turbidity recorded small negative values (-0001 and -0002). Because turbidity has a range of accuracy of +/-2 NTU, the technician did not edit or delete these values in any way.

b) Hypoxic (< 20%, including negative values) and super-saturation (>100%) dissolved oxygen events were recorded at all sites. The events were cyclic (primarily diel) and the duration of each event was less than 24hrs.

c) 2004 Daily Rainfall Totals Recorded at the Tijuana Estuary Meteorological station. Data are preliminary and have not undergone final QA/QC procedures:

Date	ppt_mm
01/02/2004	6.096
01/03/2004	0.254
01/21/2004	0.254
01/24/2004	0.254
01/25/2004	1.524
02/02/2004	2.54
02/03/2004	3.048
02/04/2004	0.254
02/14/2004	1.27
02/18/2004	3.302
02/21/2004	0.762
02/22/2004	19.304
02/23/2004	5.334
04/01/2004	5.842
04/17/2004	6.604
10/17/2004	2.032
10/19/2004	30.734
10/20/2004	29.464
10/21/2004	8.89
10/27/2004	58.928
10/28/2004	8.128
11/07/2004	2.54
11/08/2004	0.254
11/13/2004	0.254
11/21/2004	5.842
11/27/2004	0.762
12/04/2004	3.556
12/05/2004	8.636
12/06/2004	7.112
12/08/2004	0.508
12/14/2004	0.254
12/28/2004	23.114
12/29/2004	18.542
12/31/2004	6.35

d) Meteorological Condition Related Statements:

OS:

a) 01/03/2004 09:00:00 - 01/05/2004 07:00:00, lower than average specific conductivity salinity. Likely related to rain recorded from 1/2/2004 to 1/3/2004.

b) 02/03/2004 - 02/08/2004 lower than average specific conductivity and salinity and higher than average turbidity values were recorded. Likely related to rain. Please refer to section 15. for rainfall details.

c) 01/25/2004 14:00:00 - 02/11/2004 10:00:00, Lower than average specific conductivity and salinity values were recorded. Likely related to rain. Please see section 15d for rainfall details

a) 04/17/2004 13:00:39 - 04/20/2004 08:00:40; lower than average salinity values. Likely related to rain events. Please refer to section 15. for rainfall details.

d) 10/17/2004 09:30:00 - 10/26/2004 16:30:00, lower than average Specific conductivity and salinity, higher than average turbidity. rainfall beginning 10/17/2004 until end of month. Please refer to section 15. for rainfall details.

e) 10/17/2004 16:30:00 - 10/26/2004 16:30:00, recorded pH values were lower than average. Likely related to rainfall which began 10/17/2004 and continued through 10/29/2004.

RC

a) Beginning on 01/25/2004 high pH, low salinity, specific conductivity, DO% and DO mg/l values resulting from rainfall in the watershed were recorded. Please refer to section 15. for rainfall details.

b) Beginning 02/03/2004 through 02/06/2004 Higher than average turbidity and pH, low salinity, specific conductivity, DO% and DO mg/l values resulting from rainfall in the watershed were recorded. Please refer to section 15. for rainfall details.

TL

a) 02/14/2004 - 02/29/2004, Higher than average turbidity values were recorded. Likely related to rain events. Please see section 15. for rainfall details.

b) 03/01/2004 - 03/30/2004 higher than average turbidity values were recorded. Likely caused by rainfall in watershed and freshwater flow in river. Please see section 15. for rainfall details.

c) 04/08/2004 - 04/13/2004 higher than average turbidity values were recorded. Likely related to rain events. Please refer to section 15. for rainfall details.

d) 04/17/2004 - 05/18/2004 Higher than average turbidity values were recorded. Likely related to rain events. Please refer to section 15. for rainfall details.

MM

a) 10/19/2004 - 10/25/2004; DO% and DO mg/l variation low. Likely correlated with heavy rainfall and is consistent with other parameters so was not deleted.

All Sites

a) Higher than average rainfall during the month of October resulted in higher average turbidity and depth and lower than average temperature, salinity and dissolved oxygen values at all datalogger sampling sites.

b) Higher than average rainfall during the month of November resulted in higher average turbidity and depth and lower than average temperature, salinity and dissolved oxygen values at all datalogger sampling sites.

c) Higher than average rainfall during the month of December resulted in higher average turbidity and depth and lower than average temperature, salinity and dissolved oxygen values at all datalogger sampling sites.