Chesapeake Bay Virginia (CBV) NERR Water Quality Metadata
January - December 2000
Latest update: June 30, 2021

I. Data Set and Research Descriptors

1. Principal investigators and contact persons

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2. Entry verification

The data were uploaded to the PC from the YSI 6000 data loggers and reviewed using PC6000 software from YSI. Graphs were produced and examined using the PC6000 software then printed out and filed in order to aid in reviewing data to correlate any anomalous and outlying data. Next, files were uploaded in comma-delimited format, which were opened in Excel 5.0 software and edited to remove extraneous information (headers, footers, spaces, and pre- and post-deployment data). Monthly templates were used to form complete sets of monthly data sets. Macros supplied by NERRS/CDMO were used to help with editing, formatting and identifying outliers in the database. Suspect data (as in data believed to result from a damaged or biofouled probe) were evaluated according to Appendix B of the CDMO manual, edited and documented. Missing data due to YSI maintenance (downtime) was inserted into the spreadsheet and was denoted by periods (.).
Data that was not within calibration range of the instrument were evaluated and removed from the record and denoted by periods (.). Edited and raw data files were copied and archived in the CBNERRVA file server and uploaded to the CDMO FTP site. All Taskinas Creek and Goodwin Islands files from 2000 have been

verified using the latest update of the CDMO Microsoft Excel 5.0 macro programs, which identified outliers (values that fall outside of the calibration - see section II.8 of this document) and other erroneous data. Outliers were determined according to the instruments' manufacturers manual. Janet Nestlerode collected 2000 Goodwin Island data from 01/00 to 12/00. Robert Carrol collected the 2000 Taskinas Creek data. Eric Wooden processed the 2000 data from both sites through the latest update of the CDMO macro and conducted final editing of the data. Following final editing, Eric Wooden uploaded the database to the CBNERRVA server and to CDMO.

3. Research Objectives

Taskinas Creek (TC) Component:

The Taskinas Creek watershed is representative of an inner coastal plain rural watershed within the southern Chesapeake Bay system. This watershed is dominated by forested and agricultural land uses with an increasing urban land use component. The drainage basin is suited for investigating hydrologic and non-point source water quality issues associated with changing land use patterns; these issues are of prime importance to the U.S. EPA Chesapeake Bay Program. Continuously monitored physical water quality parameters (dissolved oxygen, pH, specific conductance, turbidity, and temperature) provide long-term measurements which can be supplemented with shorter-term monitoring and process-oriented studies. Measurements were taken every 15 minutes at the Taskinas Creek site and the YSI dataloggers were maintained, downloaded, cleaned, and calibrated at two-week intervals from early October to the end of May. The two-week intervals of YSI dataloggers deployments are increased to one-week intervals from beginning of June to late September. This may vary from year to year and site to site depending on the amount of fouling on the instruments.

Goodwin Islands (GI) Component:

The Goodwin Islands represent marsh islands surrounded by intertidal flats, submerged aquatic vegetation (SAV) beds, oyster reefs, and shallow open estuarine waters. Because minimal human activities occur within upland portions, the Goodwin Islands are suitable as a reference or control site for

non-point source water quality issues. Furthermore, due to extensive wetlands, intertidal, and submerged habitats, the Goodwin Islands are used extensively for SAV, material flux, and trophic interaction research activities. Measurements were taken every 15 minutes at the Goodwin Islands site and the YSI dataloggers were maintained, downloaded, cleaned, and calibrated at two-week intervals from early October to the end of May. The two-week intervals of YSI dataloggers deployments are increased to one-week intervals from beginning of June to late September. This may vary from year to year and site to site depending on the amount of fouling on the instruments.

4. Research methods

Taskinas Creek (TC) Component:

The Chesapeake Bay NERRS of Virginia maintains a long-term water quality-monitoring program, which consists of two stations. The Taskinas Creek station is located in the transitional zone of the York River tributary in the York River State Park. A simple deployment was arranged with the State Park in September 1995, where the secured unit hung at a fixed depth (0.5 m above the creek bed) from an overhanging tree approximately six meters upstream from the parks canoe landing. In September 1997, the deployment was modified so that the datalogger remained secure at all times within a 4-inch PVC housing 0.5 m above the bottom. Three wood pilings were driven into the sediment in an equilateral triangle arrangement and the PVC pipe bolted to one piling. Specific conductivity, pH, depth, dissolved oxygen, temperature, and turbidity are recorded at 15-minute intervals. Salinity and DO saturation are determined from temperature and specific conductivity readings. At approximately two-week intervals or one-week intervals depending on the time of year, the data logger is returned to the lab for downloading, cleaning, membrane replacement and recalibration. Maintenance intervals are determined according to the amount of biofouling that occurs and to accommodate battery life. A second YSI 6000 datalogger is deployed following retrieval of the original YSI datasonde in

order to maintain a continuous record. Field verification of pH, dissolved oxygen, salinity, and temperature are taken during the deployment/retrieval procedure. PH is tested in the lab with a Fisher Accumet pH Meter Model 600. Dissolved Oxygen was determined by a Winkler titration. Salinity was determined by using a Rosemount Analytical Induction Salinometer. Temperature was measured with a Hanna Instrument HI 9063 microcomputer K-thermocouple thermometer. All YSI procedures are in accordance with the YSI operating manual methods, sections 3 and 7. Standards for pH, and conductivity were purchased from YSI. Turbidity standards were purchased from Advanced Polymer Systems.
Data are reviewed and edited according to the YSI Data Review and Editing Protocol in Appendix B of the CDMO manual.

Goodwin Islands (GI) Component:
The Chesapeake Bay NERRS of Virginia maintains a second long-term water quality-monitoring program at Goodwin Islands, located at the mouth of the York River. This station is located on the southeastern side of the main island in a shallow embayment, approximately 400 meters from shore. A stable and permanent structure was built in October 1997 where 4-inch PVC pipe is housed inside of a commercially available galvanized steel communications tower with the datalogger 0.5 m from the bottom. Specific conductivity, pH, depth, dissolved oxygen, temperature, and turbidity are recorded at 15-minute intervals. Salinity and DO saturation are determined from temperature and specific conductivity readings.
At approximately two-week intervals or one-week intervals depending on the time of year, the datalogger is returned to the lab for downloading, cleaning, membrane replacement and recalibration. Maintenance intervals are determined according to the amount of biofouling that occurs and to accommodate battery life. A second YSI 6000 datalogger is deployed following retrieval of the original YSI datasonde in order to maintain a continuous record. Field verification of pH, dissolved oxygen, salinity, and temperature are taken during the deployment/retrieval procedure. PH is tested in the lab with a Fisher Accumet pH Meter Model 600. Dissolved Oxygen was determined by a Winkler

titration. Salinity was determined by using a Rosemount Analytical Induction Salinometer. Temperature was measured with a Hanna Instrument HI 9063 microcomputer K-thermocouple thermometer. All YSI procedures are in accordance with the YSI operating manual methods, sections 3 and 7. Standards for pH, and conductivity were purchased from YSI. Turbidity standards were purchased from Advanced Polymer Systems. Data are reviewed and edited according to the YSI Data Review and Editing Protocol in Appendix B of the CDMO manual.

5. Site location and character

(1) Goodwin Islands (37 deg 13' 02.65093"; 76 deg 23' 32.75799")

The Goodwin Islands component of the CBNERR-VA is on the mouth of the York River at the northeastern tip of York County. Circulation patterns at the Goodwin Islands are influenced by York River discharge and the wind patterns of the Chesapeake Bay. The Goodwin Islands represent relatively pristine marsh islands surrounded by intertidal flats, submerged aquatic vegetation (SAV) beds, oyster reefs, and shallow open estuarine waters. Dominant marsh species include Saltmarsh Cordgrass (Spartina alterniflora), Salt Grass (Distichlis spicata), and Saltmeadow Hay (Spartina patens). Estuarine scrub/shrub vegetation dominates the forested ridges. The sampling station is located in a shallow embayment on the southeastern side of the main island. The station is located approximately 400 meters from shore, average water depth on the order of 1m, amongst submerged aquatic vegetation beds dominated by eelgrass (Zostera marina) and Widgeon grass (Ruppia maritima). Salinity at this site ranges from 9.9-27.5 ppt and a multi-year average salinity is 19.3 ppt. Tides are semi-diurnal and range from 0.4-1.1 m. The data logger probes are located 0.5 m above the sandy substrate bottom. Potential activities that could impact the site include light recreational and commercial boating activity.

(2) Taskinas Creek (37 deg 24' 54.04617"; 76 deg 42' 51.75733")

The Taskinas Creek watershed is representative of an inner coastal plain rural

watershed within the southern Chesapeake Bay system. Taskinas Creek is a third order stream approximately 3 km in length and flows in a northeasterly direction eventually emptying into the York River. This watershed is dominated by forested and agricultural land uses with an increasing urban land use component. The non-tidal portion of Taskinas Creek contains feeder streams, which drain oak-hickory forests, maple-gum-oak-ash swamps and freshwater marshes. Dominant low tidal creek marsh species include Saltmarsh cordgrass (Spartina alterniflora), Salt Grass (Distichlis spicata), and Saltmeadow Hay (Spartina patens) at the creek mouth, three-square (Scirpus americanus and S. olneyi) and Big Cordgrass (Spartina cynosauroides) in the middle marsh reaches, and freshwater mixed (no single species covers more than 50%) wetlands in the upstream reaches. The data logger station is located near the mouth of Taskinas Creek in the lower tidal creekbank region. Water depth and width are approximately 2 and 20m, respectively. Salinity at this site ranges from 0.2-20.3 ppt and a multi-year average salinity is 9.6 ppt. Tides are semi-diurnal and range from 0.4-1.2 m. The data logger probes are located 0.5 m above the mixed substrate (42% fine sand, 30% clay, and 28% silt) bottom. Potential activities that could impact the site include residential development, selective hardwood logging, and light recreational boating activity. Wildlife populations have been shown to influence microbiological water quality within the watershed.

6. Data collection period:
Sampling at Taskinas Creek (TC) and Goodwin Islands (GI) began January 2000.
Sampling was continuous at both sites through December 2000.

7. Associated researchers and projects:
A volunteer water quality monitoring program sponsored by the Alliance for the Chesapeake Bay has been ongoing at Taskinas Creek for several years, beginning January 10, 1990. This project samples some overlapping parameters including dissolved oxygen and salinity on a two-week basis.

II. Physical Structure Descriptors

8. Sensor specifications, range of measurements, units, resolution, and accuracy:

YSI 6000 datalogger

Variable	Range of Measurements	Resolution	Accuracy
Date	1-12, 1-31, 00-99 (Mo,Day,Yr)	1 mo, 1 day, 1 yr	NA
Time	0-24, 0-60, 0-60 (Hr,Min,Sec)	1 hr, 1 min, 1 s	NA
Temp	-5 to 45 (c)	0.01 C	+/- 0.15C
Sp COND	0-100(mS/cm)	0.01mS/cm	+/-0.5% of reading + 0.001mS/Cm
Salinity	0-70 Parts per thousand (ppt)	0.01 ppt	+/- 1% of Reading or 0.1 ppt, (whichever is greater)
DO	0-200 (% air saturation)	0.1% @air sat	+/-2% @air Saturation
DO	200-500 (% air saturation	0.1% @ air sat	+/- 6% @ Saturation
DO	0-20 (mg/l)	0.01 mg/l	+/- 0.2mg/l
DO	20-50 (mg/l)	0.01 mg/l	+/- 0.6mg/l
Depth (shallow)	0-9.1 (m)	0.001m	+/- 0.018m
PH	2-14 units	0.01 units	+/- 0.2units
Turb	0-1000 NTU	0.1 NTU	+/- 5% of Reading or 2 NTU (whichever is greater)

Data columns are separated by tabs. Each file contains a two-line column header at the top of the page which identifies measurements and units for each column.

9. Coded variable indicator and variable code definitions

Site definitions: TC = Taskinas Creek, GI= Goodwin Islands
File definitions: YSI deployment site/month/year (example: TC0995 = Taskinas Creek data from September 1995).

10. Data anomalies (suspect data):
Frequent data anomalies were recorded in depth levels for several months potentially due to low-pressure weather fronts. This data remained in the database. According to the CDMO Operations Manual Version 3.0, depth measurements taken with the non-vented level probe can be influenced by up to 0.39 m (1.3 ft) during some low-pressure hurricane events. Specific dates and

time ranges of potentially influenced data are listed with each respective
month. Starting with January, data were extracted in accordance with Version
3.0 of the CDMO Manual.

January 2000:

TC:
01/21/00 22:15:00 Spike >1000 NTU in turbidity due to low water. Data were
deleted.
01/21/00 03:00:00 Spike >1000 NTU in turbidity due to low water. Data were
deleted.

January 2000:

GI:
01/04/00 13:15:00 Datalogger out of the water. Data were deleted.
01/06/00 03:00:00 Datalogger out of the water. Data were deleted.
01/11/00 12:00:00 Depth data deleted due to deployment
01/11/00 12:00:00 Decrease in pH due to difference in calibration of exchanged
YSI (calibration matches verification sample)
01/12/00 17:15:00 - 01/12/00 20:45:00 Datalogger out of the water. Data deleted.
01/13/00 06:15:00 - 01/13/00 09:30:00 Datalogger out of the water. Data deleted.
01/14/00 19:45:00 - 01/14/00 22:15:00 Datalogger out of the water. Data deleted.
01/15/00 20:45:00 - 01/15/00 22:45:00 Datalogger out of the water. Data deleted.
01/17/00 22:45:00 - 01/18/00 01:00:00 Time skip resulted in no data collection.
01/18/00 01:30:00 - 01/18/00 01:45:00 Time skip resulted in no data collection
01/18/00 02:15:00 Time skip resulted in no data collection
01/18/00 12:45:00 Time skip resulted in no data collection
01/22/00 03:45:00 - 01/22/00 04:00:00 Time skip resulted in no data collection
01/22/00 05:30:00 - 01/22/00 05:45:00 Time skip resulted in no data collection
01/22/00 15:45:00 - 01/22/00 17:00:00 Datalogger out of the water. Data deleted.
01/23/00 03:00:00 - 01/23/00 05:45:00 Datalogger out of the water. Data deleted.
01/23/00 16:45:00 - 01/23/00 17:15:00 Datalogger out of the water. Data deleted.
01/27/00 21:15:00 - 01/27/00 23:30:00 Time skip resulted in no data collection
01/28/00 07:15:00 - 01/28/00 12:30:00 Time skip resulted in no data collection

01/28/00 19:45:00 - 01/28/00 23:00:00 Datalogger out of the water. Data deleted.
01/31/00 15:00:00 - 01/31/00 23:45:00 Error in datalogger sampling interval
resulted in 15 hour intervals

February 2000:

TC:
02/10/00 14:15:00 Spike >1000 NTU in turbidity due to low water. Data were
deleted.
02/11/00 03:30:00 Spike >1000 NTU in turbidity due to low water. Data were
deleted.

February 2000:

GI:
02/01/00 00:00:00 - 02/15/00 11:30:00 Error in datalogger sampling
interval resulted in 15 hour intervals
02/15/00 22:45:00 - 23:45:00 Datalogger out of water
02/16/00 10:30:00 Turbidity spike deleted due to low water
02/16/00 12:30:00 Datalogger out of the water
02/16/00 12:45:00 Datalogger out of the water
02/18/00 00:00:00 - 02/18/00 02:45:00 Datalogger out of the water
02/19/00 02:00:00 - 02/19/00 03:15:00 Datalogger out of the water

March 2000:

TC:
03/18/00 17:30:00 - 03/19/00 14:45:00 Datalogger flooded resulting in
no data collected

March 2000:

GI:
03/03/00 13:15:00 - 03/03/00 14:15:00 Zero/negative depths due to low
tides or low-pressure system
03/04/00 00:30:00 - 03/04/00 02:45:00 Zero/negative depths due to low
tides or low-pressure system
03/05/00 01:45:00 - 03/05/00 03:00:00 Zero/negative depths due to low
tides or low-pressure system
03/05/00 14:00:00 - 03/05/00 15:15:00 Zero/negative depths due to low
tides or low-pressure system
03/5/00 16:30:00 Turbidity spike due to low water. Data deleted.

03/08/00 03:30:00 - 03/08/00 04:45:00 Zero/negative depths due to low
tides or low-pressure system
03/08/00 15:45:00 - 03/08/00 17:15:00 Zero/negative depths due to low
tides or low-pressure system
03/09/00 04:15:00 - 03/09/00 05:30:00 Zero/negative depths due to low
tides or low-pressure system
03/09/00 16:15:00 - 03/09/00 18:00:00 Zero/negative depths due to low
tides or low-pressure system
03/9/00 17:30:00 Turbidity spike due to low water. Data deleted.
03/15/00 23:00:00 - 03/15/00 23:30:00 Zero/negative depths due to low
tides or low-pressure system
03/16/00 11:45:00 - 03/16/00 12:45:00 Zero/negative depths due to low
tides or low-pressure system
03/16/00 22:15:00 - 03/17/00 02:30:00 Zero/negative depths due to low
tides or low-pressure system
03/25/00 17:45:00 - 03/25/00 19:00:00 Zero/negative depths due to low
tides or low-pressure system
03/29/00 22:00:00 - 03/29/00 23:15:00 Zero/negative depths due to low
tides or low-pressure system

April 2000:

TC:
04/08/00 21:15:00 Spike >1000 NTU in turbidity due to low water. Data deleted.
04/08/00 21:30:00 Spike >1000 NTU in turbidity due to low water. Data deleted.
04/09/00 11:15:00 Spike >1000 NTU in turbidity due to low water. Data deleted.
04/09/00 11:30:00 Spike >1000 NTU in turbidity due to low water. Data deleted.
04/17/00 19:15:00 Spike >1000 NTU in turbidity due to low water. Data deleted.

April 2000:

GI:
Throughout the month, the datalogger recorded many instances of zero/negative
depth data. These data should be viewed with caution. See Section 12 Remarks for
further details.
04/02/00 14:45:00 turbidity spike suspect due to low water
04/02/00 15:00:00 Turbidity spike due to low water
04/02/00 16:30:00 - 04/03/00 19:15:00 Datalogger flooded. Data deleted.

04/02/00 00:30:00 - 04/02/00 02:00:00 Zero/negative depths due to low tides
or low-pressure system
04/02/00 12:00:00 - 04/02/00 15:00:00 Zero/negative depths due to low tides
or low-pressure system
04/03/00 13:00:00 - 04/03/00 14:45:00 Datalogger out of the water. Data deleted.
04/04/00 01:15:00 - 04/04/00 03:45:00 Datalogger out of the water. Data deleted.
04/04/00 13:45:00 - 04/04/00 15:45:00 Datalogger out of the water. Data deleted.
04/05/00 03:30:00 - 04/05/00 04:00:00 Datalogger out of the water. Data deleted.
04/05/00 14:15:00 - 04/05/00 16:45:00 Datalogger out of the water. Data deleted.
04/06/00 02:00:00 - 04/06/00 06:00:00 Datalogger out of the water. Data deleted.
04/06/00 14:15:00 - 04/06/00 18:00:00 Datalogger out of the water. Data deleted.
04/07/00 03:45:00 - 04/07/00 05:30:00 Datalogger out of the water. Data deleted.
04/07/00 17:30:00 - turbidity spike suspect due to low water
04/07/00 15:30:00 - 04/07/00 18:00:00 Zero/negative depths due to low tides
or low-pressure system. Data retained.
04/08/00 03:45:00 - 04:30:00 Zero/negative depths due to low tides or low-
pressure system. Data retained.
04/08/00 04:45:00 Datalogger out of the water. Data deleted.
04/08/00 05:30:00 salinity suspect due to low water
04/08/00 16:00:00 - 04/08/00 19:15:00 Zero/negative depths due to low tides
or low-pressure system
04/09/00 06:00:00 - 04/09/00 08:45:00 Datalogger out of the water. Data deleted.
04/09/00 16:45:00 - 04/09/00 20:15:00 Datalogger out of the water. Data deleted.
04/10/00 05:30:00 - 04/10/00 09:15:00 Datalogger out of the water. Data deleted.
04/10/00 18:00:00 - 04/10/00 21:15:00 Datalogger out of the water. Data deleted.
04/11/00 07:30:00 - 04/11/00 09:45:00 Datalogger out of the water. Data deleted.
04/15/00 06:15:00 - 04/15/00 14:15:00 Zero/negative turbidity due to low
water. Data retained.
04/15/00 23:15:00 - 04/16/00 03:45:00 Zero/negative turbidity due to low
water. Data retained.
04/16/00 04:15:00 Zero/negative turbidity due to low water
04/16/00 04:45:00 Zero/negative turbidity due to low water
04/16/00 07:30:00 - 04/16/00 07:45:00 Zero/negative turbidity due to low

water. Data retained.
04/16/00 08:30:00 - 04/17/00 06:15:00 Zero/negative turbidity due to low
water. Data retained.
04/17/00 00:45:00 - 04/17/00 03:00:00 Zero/negative depths due to low tides
or low-pressure system. Data retained.
04/17/00 08:45:00 - 04/17/00 10:15:00 Zero/negative turbidity due to low
water. Data retained.
04/24/00 12:00:00 Datalogger out of the water. Data deleted.
04/24/00 12:15:00 - 04/30/00 23:45:00 Salinity values were corrected based
on field verification samples and no specific conductance were calculated or
recorded.

May 2000

TC:
No missing/anomalous data for this month.

May 2000:

GI:
05/01/00 00:00:00 - 05/02/00 09:30:00 Salinity values were corrected
based on field verification samples and no specific conductance were calculated.
05/02/00 01:30:00 - 05/02/00 02:30:00 Zero/negative depths due to low
tides or low-pressure system
05/03/00 13:30:00 - 05/03/00 14:45:00 Datalogger out of the water. Data
deleted.
05/04/00 03:00:00 Datalogger out of the water. Data deleted.
05/04/00 14:45:00 Datalogger out of the water. Data deleted.
05/05/00 03:30:00 - 05/05/00 04:30:00 Datalogger out of the water. Data
deleted.
05/05/00 15:00:00 - 05/05/00 16:15:00 Datalogger out of the water. Data
deleted.
05/06/00 03:45:00 - 05/06/00 05:15:00 Datalogger out of the water. Data
deleted.
05/06/00 15:30:00 - 05/06/00 17:15:00 Datalogger out of the water. Data
deleted.
05/07/00 05:30:00 Datalogger out of the water. Data deleted.
05/09/00 06:30:00 - 08:15:00 Zero/negative depths due to low tides or low-
pressure system

05/09/00 18:00:00 - 05/09/00 20:45:00 Zero/negative depths due to low
tides or low-pressure system
05/10/00 06:45:00 - 05/10/00 09:45:00 Zero/negative depths due to low
tides or low-pressure system
05/10/00 19:45:00 - 05/10/00 20:15:00 Zero/negative depths due to low
tides or low-pressure system
05/15/00 03:15:00 - 05/15/00 03:30:00 Datalogger out of the water.
Data deleted.
05/18/00 14:15:00 - 05/18/00 16:00:00 Zero/negative depths due to low
tides or low-pressure system
05/19/00 03:15:00 - 05/19/00 03:30:00 Datalogger out of the water.
Data deleted.
05/19/00 02:15:00 - 03:00:00 Zero/negative depths due to low tides or
low-pressure system
05/19/00 03:45:00 - 05:15:00 Zero/negative depths due to low tides or
low-pressure system
05/19/00 14:30:00 - 05/19/00 15:00:00 Zero/negative depths due to low
tides or low-pressure system
05/21/00 10:15:00 Spike >1000 NTU in turbidity due to high water. Data
deleted.
05/26/00 05:15:00 - 05/26/00 11:45:00 Zero/negative turbidity due to
low water
05/26/00 14:30:00 - 16:00:00 Zero/negative turbidity due to low water
05/26/00 16:45:00 - 17:30:00 Zero/negative turbidity due to low water
05/27/00 05:45:00 - 05/27/00 06:30:00 Zero/negative turbidity due to
low water
05/27/00 05:15:00 - 05/27/00 11:45:00 Zero/negative turbidity due to
low water
05/27/00 20:15:00 - 05/27/00 22:15:00 Zero/negative turbidity due to
low water
05/27/00 22:45:00 - 23:15:00 Zero/negative turbidity due to low water
05/27/00 23:30:00 - 05/31/00 23:45:00 DO probe malfunction. Data
deleted.
05/31/00 22:15:00 Zero/negative turbidity due to low water
05/31/00 23:45:00 Zero/negative turbidity due to low water

June 2000:

TC:
06/18/00 18:30:00 Suspect turbidity due to low water. Data retained.
06/30/00 20:00:00 Spike >1000 NTU in turbidity due to low water. Data
deleted.

June 2000:

GI:
Several zero and/or negative turbidity data points were recorded throughout the
entire month due to low tides or low-pressure system. . All data were retained.

06/01/00 06:45:00 Turbidity data suspect due to moderate fouling.
06/03/00 12:00:00 - 06/08/00 10:15:00 Turbidity data suspect due to moderate fouling. Data were retained.
06/27/00 13:15:00 Drop in Specific Conductivity and salinity due to possible rain event. Data were retained.

July 2000:

TC:
07/12/00 07:30:00 Spike >1000 NTU in turbidity due to low water. Data
deleted.
07/12/00 14:30:00 Datalogger out of the water. Data deleted.
07/19/00 17:30:00 Spike >1000 NTU in turbidity due to low water
07/19/00 17:45:00 - 07/19/00 22:45:00 Data suspect. All data were deleted.
07/19/00 23:00:00 - 07/20/00 13:00:00 Suspect DO data. Data retained.

July 2000:

GI:
07/02/00 00:30:00 - 02:30:00 Zero/negative turbidity due to low water
07/02/00 03:00:00 - 05:00:00 Zero/negative turbidity due to low water
07/04/00 16:30:00 - 07/04/00 17:45:00 Zero/negative depths due to low
tides or low-pressure system
07/05/00 05:45:00 - 07:30:00 Zero/negative turbidity due to low water
07/06/00 04:15:00 - 06:45:00 Zero/negative turbidity due to low water
07/14/00 10:15:00 - 07/14/00 14:45:00 Zero/negative turbidity due to

low water
07/17/00 12:30:00 - 17:00:00 Zero/negative turbidity due to low water
07/18/00 00:00:00 - 06:30:00 Zero/negative turbidity due to low water
07/18/00 14:00:00 - 07/18/00 16:30:00 Zero/negative turbidity due to
low water
07/19/00 02:45:00 - 07/19/00 06:15:00 Zero/negative turbidity due to
low water
07/21/00 03:45:00 - 07/21/00 06:15:00 Zero/negative turbidity due to
low water
07/21/00 06:45:00 - 07/21/00 07:15:00 Zero/negative turbidity due to
low water
07/22/00 04:30:00 - 08:15:00 Zero/negative turbidity due to low water
07/22/00 16:00:00 - 17:45:00 Zero/negative turbidity due to low water
07/23/00 04:15:00 - 06:00:00 Zero/negative turbidity due to low water
07/30/00 16:00:00 Turbidity spike suspect due to low water.
Data deleted.

August 2000:

TC:
08/04/00 18:00:00 - 08/31/00 06:45:00 DO data deleted due to puncture
in membrane.
08/18/00 17:00:00 Spike >1000 NTU in turbidity due to low water. Data deleted.

August 2000:

GI:
08/06/00 00:00:00 Spike >1000 NTU in turbidity due to high turbidity.
Data deleted.
08/08/00 10:15:00 - 13:45:00 Datalogger out of the water. Data deleted.
08/15/00 15:15:00 Data missing due to deployment of datalogger
08/15/00 15:30:00 Salinity increase due to error in calibration (field
verification samples indicate deployed datalogger correct. Previous deployment
.7 ppt below recordings).
08/15/00 15:30:00 Turbidity spike (25 NTU) due to deployment
08/20/00 04:15:00 - 07:30:00 Zero/negative turbidity due to low water

08/20/00 04:15:00 - 07:30:00 Zero/negative turbidity due to low water
08/24/00 09:00:00 - 10:15:00 Zero/negative depths due to low tides or
low-pressure system
08/27/00 12:15:00 - 13:45:00 Zero/negative depths due to low tides or
low-pressure system
08/29/00 15:00:00 - 08/31/00 23:45:00 Malfunction of DO probe. Data
deleted.

September 2000:

TC:
09/07/00 13:00:00 - 09/14/00 15:15:00 Data deleted due to datalogger malfunction.
09/21/00 15:30:00 - 09/29/00 11:15:00 Data deleted due to datalogger malfunction.
09/24/00 13:30:00 Spike >1000 NTU in turbidity due to low water. Data
deleted.

September 2000:

GI:
09/01/00 00:00 - 09/08/00 10:30:00 Malfunction of DO probe. Data deleted.
09/08/00 11:00:00 Turbidity spike due to deployment. (20 NTU)
09/08/00 08:45:00 - 09:15:00 Zero/negative turbidity due to low turbidity
09/08/00 09:45:00 - 09/08/00 10:00:00 Zero/negative turbidity due to
low turbidity
09/13/00 12:00:00 - 09/13/00 15:30:00 Zero/negative turbidity due to
low turbidity
09/13/00 23:00:00 Zero/negative turbidity due to low turbidity
09/13/00 23:30:00 - 09/14/00 01:30:00 Zero/negative turbidity due to
low turbidity
09/16/00 04:15:00 - 09/16/00 05:30:00 Zero/negative turbidity due to
low turbidity
09/16/00 14:15:00 - 09/16/00 14:45:00 Zero/negative turbidity due to
low turbidity
09/16/00 15:15:00 - 09/16/00 16:15:00 Zero/negative turbidity due to
low turbidity
09/16/00 16:45:00 - 09/16/00 21:00:00 Zero/negative turbidity due to

low turbidity
09/17/00 00:00:00 - 09/17/00 07:00:00 Zero/negative turbidity due to
low turbidity
09/17/00 12:30:00 - 09/17/00 19:30:00 Zero/negative turbidity due to
low turbidity
09/17/00 20:00:00 - 09/17/00 21:45:00 Zero/negative turbidity due to
low turbidity
09/18/00 01:15:00 - 09/18/00 09:15:00 Zero/negative turbidity due to
low turbidity
09/18/00 14:00:00 Zero/negative turbidity due to low turbidity
09/20/00 23:15:00 Turbidity spike due to deployment (81 NTU)
09/20/00 06:45:00 - 09/20/00 08:45:00 Zero/negative turbidity due to
low turbidity
09/20/00 09:45:00 Zero/negative turbidity due to low turbidity
09/20/00 20:30:00 - 09/20/00 20:45:00 Zero/negative turbidity due to
low turbidity
09/21/00 9:15:00 Turbidity spike due to deployment (63 NTU)
09/21/00 06:45:00 - 09/21/00 09:00:00 Zero/negative depths due to low
tides or low-pressure system

October 2000:

TC:
10/10/00 12:15:00Spike >1000 NTU in turbidity due to low water. Data deleted.
10/12/00 15:45:00Spike >1000 NTU in turbidity due to low water. Data deleted.

October 2000:

GI:
10/03/00 10:45:00 - 10/03/00 13:00:00 Datalogger out of the water.
Data deleted.
10/10/00 13:45:00 - 10/24/00 12:15:00 Salinity values were corrected
based on field verification samples and no specific conductance were calculated.
Therefore, sp. cond. data were deleted from the file.
10/14/00 15:15:00 - 10/14/00 16:15:00 Zero/negative depths due to low
tides or low-pressure system
10/15/00 03:15:00 - 10/15/00 04:00:00 Zero/negative depths due to low
tides or low-pressure system
10/16/00 16:00:00 Turbidity spike due to low water (47 NTU)
10/16/00 04:30:00 Zero/negative turbidity due to low water

10/24/00 19:00:00 - 10/25/00 18:45:00 Zero/negative turbidity due to
low water
10/25/00 - 10/31/00 numerous zero turbidity values were recorded sporadically
throughout these dates due to low turbidity

November 2000:

TC:
11/02/00 13:45:00 Datalogger out of the water. Data deleted.
11/29/00 11:00:00 Spike >1000 NTU in turbidity due to low water. Data
deleted.

November 2000:

GI:
11/01/00 03:45:00 - 11/23/00 15:00:00 Numerous zero/negative turbidity
due to low turbidity during this period
11/04/00 12:45:00 - 11/08/00 11:00:00 Battery compartment flooded. Data were
deleted for this time period
11/16/00 18:00:00 - 11/16/00 21:00:00 Zero/negative depths due to low
tides or low-pressure system
11/17/00 05:30:00 - 11/17/00 08:30:00 Zero/negative depths due to low
tides or low-pressure system
11/17/00 18:45:00 - 11/17/00 19:15:00 Zero/negative depths due to low
tides or low-pressure system
11/21/00 14:30:00 - 11/21/00 14:45:00 Datalogger out of the water.
Data deleted.
11/21/00 23:30:00 - 11/22/00 00:30:00 Datalogger out of the water.
Data deleted.
11/21/00 15:15:00 - 11/31/00 23:45:00 Bad DO data due to possible
puncture of DO membrane. DO data deleted.
11/22/00 11:00:00 - 11/22/00 14:15:00 Datalogger out of the water.
Data deleted.
11/22/00 22:15:00 - 11/23/00 02:15:00 Datalogger out of the water.
Data deleted.
11/23/00 12:45:00 - 11/23/00 14:30:00 Datalogger out of the water.
Data deleted.

11/24/00 01:15:00 - 11/24/00 01:45:00 Datalogger out of the water.
Data deleted.
11/29/00 17:30:00 Zero/negative depths due to low tides or low-pressure
system.

December 2000:

TC: 12/17/00 17:15:00 - 12/19/00 12:45:00 Low Do during this time period due to
low tides. All data were retained.

December 2000:
GI:
12/01/00 00:00:00 - 12/05/00 16:15 DO data suspect, however DO readings were ok at post-deployment.
12/01/00 03:00:00 - 12/16/00 20:45:00 Numerous zero/negative turbidity
due to low turbidity during this period
12/06/00 21:45:00 - 12/12/00 05:00:00 Numerous zero/negative depths
due to low tides or low-pressure system
12/13/00 15:30:00 - 12/13/00 17:45:00 Datalogger out of the water.
Data deleted.
12/14/00 04:00:00 - 12/14/00 05:45:00 Datalogger out of the water.
Data deleted.
12/17/00 18:30:00 - 12/19/00 23:45:00 Numerous zero/negative depths
due to low tides or low-pressure system
12/17/00 21:00:00 - 12/17/00 22:15:00 Datalogger out of the water.
Data deleted.
12/18/00 20:30:00 - 12/18/00 23:00:00 Datalogger out of the water.
Data deleted.
12/19/00 09:00:00 - 12/19/00 10:45:00 Datalogger out of the water.
Data deleted.
12/19/00 11:00:00 - 12/31/00 23:45:00 Bad DO data due to possible puncture of DO membrane. Data deleted.
12/20/00 22:45:00 - 12/20/00 23:45:00 Datalogger out of the water.
Data deleted.
12/21/00 23:30:00 - 12/22/00 00:30:00 Datalogger out of the water.
Data deleted.
12/22/00 12:45:00 - 12/22/00 13:30:00 Datalogger out of the water.
Data deleted.

12/23/00 13:00:00 - 12/23/00 15:15:00 Datalogger out of the water.
Data deleted.
12/24/00 00:30:00 - 12/24/00 02:45:00 Datalogger out of the water.
Data deleted.
12/24/00 13:30:00 - 12/24/00 16:00:00 Datalogger out of the water.
Data deleted.
12/25/00 14:30:00 - 12/25/00 17:00:00 Datalogger out of the water.
Data deleted.
12/26/00 01:30:00 - 12/26/00 05:00:00 Datalogger out of the water.
Data deleted.
12/26/00 05:15:00 - 12/26/00 06:00:00 Turbidity spikes due to low water. Data deleted.
12/26/00 14:15:00 - 12/26/00 17:45:00 Datalogger out of the water
Data deleted.
12/27/00 02:00:00 - 12/27/00 05:15:00 Datalogger out of the water.
Data deleted.
12/27/00 14:45:00 - 12/27/00 18:00:00 Datalogger out of the water.
Data deleted.

11. Missing data

Missing data is either the result of
1) The YSI not deployed
2) YSI out of the water (negative depth with salinity of zero)
3) A probe not attached
4) A probe malfunction

January 2000:
TC:
01/21/00 03:00:00 Spike >1000 NTU in turbidity due to low water
01/21/00 22:15:00 Spike >1000 NTU in turbidity due to low water

January 2000:
GI:
01/04/00 13:15:00 Datalogger out of the water
01/06/00 03:00:00 Datalogger out of the water
01/11/00 12:00:00 Depth data deleted due to deployment
01/12/00 17:15:00 - 01/12/00 20:45:00 Datalogger out of the water
01/13/00 06:15:00 - 01/13/00 09:30:00 Datalogger out of the water
01/14/00 19:45:00 - 01/14/00 22:15:00 Datalogger out of the water
01/15/00 20:45:00 - 01/15/00 22:45:00 Datalogger out of the water
01/17/00 22:45:00 - 01/18/00 01:00:00 Time skip resulted in no data collection

01/18/00 01:30:00 - 01/18/00 01:45:00 Time skip resulted in no data collection
01/18/00 02:15:00 Time skip resulted in no data collection
01/18/00 12:45:00 Time skip resulted in no data collection
01/22/00 03:45:00 - 01/22/00 04:00:00 Time skip resulted in no data collection
01/22/00 05:30:00 - 01/22/00 05:45:00 Time skip resulted in no data collection
01/22/00 15:45:00 - 01/22/00 17:00:00 Datalogger out of the water
01/23/00 03:00:00 - 01/23/00 05:45:00 Datalogger out of the water
01/23/00 16:45:00 - 01/23/00 17:15:00 Datalogger out of the water
01/27/00 21:15:00 - 01/27/00 23:30:00 Time skip resulted in no data collection
01/28/00 07:15:00 - 01/28/00 12:30:00 Time skip resulted in no data collection
01/28/00 19:45:00 - 01/28/00 23:00:00 Datalogger out of the water
01/31/00 15:00:00 - 01/31/00 23:45:00 Error in datalogger sampling interval
resulted in 15 hour intervals

February 2000:
TC:
02/10/00 14:15:00 Spike >1000 NTU in turbidity due to low water
02/11/00 03:30:00 Spike >1000 NTU in turbidity due to low water

February 2000:
GI:
02/01/00 00:00:00 - 02/15/00 11:30:00 Error in datalogger sampling interval
resulted in 15 hour intervals
02/15/00 22:45:00 - 23:45:00 Datalogger out of water
02/16/00 10:30:00 Turbidity spike deleted due to low water
02/16/00 12:30:00 Datalogger out of the water
02/16/00 12:45:00 Datalogger out of the water
02/18/00 00:00:00 - 02/18/00 02:45:00 Datalogger out of the water
02/19/00 02:00:00 - 02/19/00 03:15:00 Datalogger out of the water

March 2000:
TC:
03/18/00 17:30:00 - 03/19/00 14:45:00 Datalogger flooded resulting in no data
collected

March 2000:
GI:
03/05/00 16:30:00 Turbidity spike due to low water
03/09/00 17:30:00 Turbidity spike due to low water

April 2000:
TC:
04/08/00 21:15:00 Spike >1000 NTU in turbidity due to low water
04/08/00 21:30:00 Spike >1000 NTU in turbidity due to low water
04/09/00 11:15:00 Spike >1000 NTU in turbidity due to low water

04/09/00 11:30:00 Spike >1000 NTU in turbidity due to low water
04/17/00 19:15:00 Spike >1000 NTU in turbidity due to low water

April 2000:
GI:
04/02/00 16:30:00 - 04/03/00 09:15:00 Datalogger flooded
04/03/00 13:00:00 - 04/03/00 14:45:00 Datalogger out of the water
04/04/00 01:15:00 - 04/04/00 03:45:00 Datalogger out of the water
04/04/00 13:45:00 - 04/04/00 15:45:00 Datalogger out of the water
04/05/00 03:30:00 - 04/05/00 04:00:00 Datalogger out of the water
04/05/00 14:15:00 - 04/05/00 16:45:00 Datalogger out of the water
04/06/00 02:00:00 - 04/06/00 06:00:00 Datalogger out of the water
04/06/00 14:15:00 - 04/06/00 18:00:00 Datalogger out of the water
04/07/00 03:45:00 - 04/07/00 05:30:00 Datalogger out of the water
04/08/00 04:45:00 Datalogger out of the water
04/09/00 06:00:00 - 04/09/00 08:45:00 Datalogger out of the water
04/09/00 16:45:00 - 04/09/00 20:15:00 Datalogger out of the water
04/10/00 05:30:00 - 04/10/00 09:15:00 Datalogger out of the water
04/10/00 18:00:00 - 04/10/00 21:15:00 Datalogger out of the water
04/11/00 07:30:00 - 04/11/00 09:45:00 Datalogger out of the water
04/24/00 12:00:00 Datalogger out of the water
04/24/00 12:15:00 - 04/30/00 23:45:00 Salinity values were corrected
based on
field verification samples and no specific conductance were calculated or
recorded.

May 2000:
TC: No missing data.

May 2000:

GI:
05/01/00 00:00:00 - 05/02/00 09:30:00 Salinity values were corrected
based on
field verification samples and no specific conductance were calculated or
recorded.
05/03/00 13:30:00 - 05/03/00 14:45:00 Datalogger out of the water
05/04/00 03:00:00 Datalogger out of the water
05/04/00 14:45:00 Datalogger out of the water
05/05/00 03:30:00 - 05/05/00 04:30:00 Datalogger out of the water
05/05/00 15:00:00 - 05/05/00 16:15:00 Datalogger out of the water
05/06/00 03:45:00 - 05/06/00 05:15:00 Datalogger out of the water
05/06/00 15:30:00 - 05/06/00 17:15:00 Datalogger out of the water
05/07/00 05:30:00 Datalogger out of the water
05/19/00 03:15:00 - 05/19/00 03:30:00 Datalogger out of the water
05/21/00 10:15:00 Spike >1000 NTU in turbidity due to high water
05/27/00 23:30:00 - 05/31/00 23:45:00 DO probe malfunction

June 2000:
TC:
06/30/00 20:00:00 Spike >1000 NTU in turbidity due to low water

June 2000:

GI: No missing data.

July 2000:
TC:
07/12/00 07:30:00 Spike >1000 NTU in turbidity due to low water
07/12/00 14:30:00 Datalogger out of the water
07/19/00 17:30:00 Spike >1000 NTU in turbidity due to low water
07/19/00 17:45:00 - 07/19/00 22:45:00 Data suspect. All data were deleted.

July 2000:
GI:
07/30/00 16:00:00 Turbidity spike suspect due to low water

August 2000:
TC:
08/04/00 18:00:00 - 08/31/00 06:45:00 DO data deleted due to puncture in membrane
08/18/00 17:00:00 Spike >1000 NTU in turbidity due to low water

August 2000:
GI:
08/06/00 00:00:00 Spike >1000 NTU in turbidity due to high turbidity
08/08/00 10:15:00 - 08/08/00 13:45:00 Datalogger out of the water
08/15/00 15:15:00 Data missing due to deployment of datalogger
08/29/00 15:00:00 - 08/31/00 23:45:00 Malfunction of DO probe

September 2000:
TC:
09/07/00 13:00:00 - 09/14/00 15:15:00 Data deleted due to datalogger malfunction.
09/21/00 15:30:00 - 09/29/00 11:15:00 Data deleted due to datalogger malfunction.
09/24/00 13:30:00 Spike >1000 NTU in turbidity due to low water

September 2000:
GI:
09/01/00 00:00:00 - 09/08/00 10:30:00 Malfunction of DO probe

October 2000:
TC:
10/10/00 12:15:00 Spike >1000 NTU in turbidity due to low water
10/12/00 15:45:00 Spike >1000 NTU in turbidity due to low water

October 2000:
GI:
10/03/00 10:45:00 - 10/03/00 13:00:00 Datalogger out of the water
10/10/00 13:45:00 - 10/24/00 12:15:00 Salinity values were corrected based on
field verification samples and no specific conductance were calculated or recorded.

November 2000:

TC:
11/02/00 13:45:00 Datalogger out of the water
11/29/00 11:00:00 Spike >1000 NTU in turbidity due to low water

November 2000:
GI:
11/04/00 12:45:00 - 11/08/00 11:00:00 Battery compartment flooded. Data were
deleted for this time period.
11/21/00 14:30:00 - 11/21/00 14:45:00 Datalogger out of the water
11/21/00 23:30:00 - 11/22/00 00:30:00 Datalogger out of the water
11/21/00 15:15:00 - 11/31/00 23:45:00 Bad DO data due to possible puncture of
DO membrane
11/22/00 11:00:00 - 11/22/00 14:15:00 Datalogger out of the water
11/22/00 22:15:00 - 11/23/00 02:15:00 Datalogger out of the water
11/23/00 12:45:00 - 11/23/00 14:30:00 Datalogger out of the water
11/24/00 01:15:00 - 11/24/00 01:45:00 Datalogger out of the water

December 2000:
TC: No missing data.

December 2000:
GI:
12/13/00 15:30:00 - 12/13/00 17:45:00 Datalogger out of the water.
12/14/00 04:00:00 - 12/14/00 05:45:00 Datalogger out of the water.
12/17/00 21:00:00 - 12/17/00 22:15:00 Datalogger out of the water.
12/18/00 20:30:00 - 12/18/00 23:00:00 Datalogger out of the water.
12/19/00 09:00:00 - 12/19/00 10:45:00 Datalogger out of the water.
12/19/00 11:00:00 - 12/31/00 23:45:00 Bad DO data due to possible puncture of DO membrane.
12/20/00 22:45:00 - 12/20/00 23:45:00 Datalogger out of the water.
12/21/00 23:30:00 - 12/22/00 00:30:00 Datalogger out of the water.
12/22/00 12:45:00 - 12/22/00 13:30:00 Datalogger out of the water.
12/23/00 13:00:00 - 12/23/00 15:15:00 Datalogger out of the water.
12/24/00 00:30:00 - 12/24/00 02:45:00 Datalogger out of the water.
12/24/00 13:30:00 - 12/24/00 16:00:00 Datalogger out of the water.
12/25/00 14:30:00 - 12/25/00 17:00:00 Datalogger out of the water.
12/26/00 01:30:00 - 12/26/00 05:00:00 Datalogger out of the water.
12/26/00 05:15:00 - 12/26/00 06:00:00 Turbidity spikes due to low water.

12/26/00 14:15:00 - 12/26/00 17:45:00 Datalogger out of the water
12/27/00 02:00:00 - 12/27/00 05:15:00 Datalogger out of the water.
12/27/00 14:45:00 - 12/27/00 18:00:00 Datalogger out of the water.

12. Remarks

On 06/30/2021 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) Any regions of data with negative depth values due to low tides or low-pressure systems should be viewed with caution. In some instances the probes are clearly out of water and have been noted. Depth data should be considered relative depth.

B) Due to conductance calibration error, salinity values were adjusted based on field verification samples taken at each datasonde deployment and retrieval. Datasonde specific conductance data were deleted and replaced with periods. Corrected salinity values are presented in edited and raw data files. Percent dissolved oxygen saturation values were computed based on equations provided by APHA Standard Methods 1989. No changes were made to raw dissolved oxygen concentration data.

C) Any time a reference is made to turbidity data being negative and/or zero, it was recorded as a negative in the raw data file and a zero in the edited data

file due to the formatting of Excel. The technician edited none of these data
points by hand nor did he/she delete any of them.