Chesapeake Bay Virginia (CBV) NERR Water Quality Metadata January - December 1998

Latest update: November 1, 2002

- 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 $% \left(1\right) =\left(1\right) +\left(1\right) +\left($

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 $\ensuremath{\mathtt{B}}$

of the CDMO manual, edited and documented. Missing data due to ${\tt YSI}$ maintenance

(down time) 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 $\ensuremath{\mathtt{CDMO}}$

FTP site. All Taskinas Creek and Goodwin Islands files from 1998 have been

verified using the latest update of the Microsoft Excel 5.0 macro programs which

formatted the data, verified dates and times and 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. Tammy Dorman collected and edited data from 01/98 to

04/98. Eric Wooden edited the data from 4/98 to 12/98. Tammy Dorman and Eric

Wooden processed the data through the latest update of the CDMO macro and ${\tt Eric}$

Wooden 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

nonpoint source water quality issues associated with changing land use patterns;

these issues are of prime importance to the U.S. $\ensuremath{\mathtt{EPA}}$ 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 $\ensuremath{\mathsf{S}}$

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, except during the summer when the instruments were calibrated weekly.

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

nonpoint 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,

except during the summer when the instruments were calibrated weekly.

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 $\ensuremath{\mathsf{S}}$

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-

intervals, the data logger is returned to the lab for downloading, cleaning,

membrane replacement and recalibration, except during the summer when the instruments were calibrated weekly. 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. All procedures

are in accordance with the YSI operating manual methods, sections $\boldsymbol{3}$ and $\boldsymbol{7}$.

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 $% \left(1\right) =\left(1\right) +\left(1\right) +\left$

 $0.5\ \mathrm{m}$ 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, 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. All 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

Taskinas Creek (TC) Component: (37 deg 24' 54.04617"; 76 deg 42' 51.75733").

The Taskinas Creek Component of the CBNERR-VA is on the south shore of the York River in James City County near Williamsburg. The site is approximately 44 kilometers upstream from the river's mouth and 15 kilometers

downstream from West Point. Headwaters of Taskinas Creek are near the town of

Croaker, which is located 10 kilometers north of Williamsburg. Fed by numerous

perennial streams, Taskinas Creek is approximately 3 kilometers in length and

flows in a northeasterly direction eventually emptying into the York River.

Tidal range within the creek is $0.0-1.3~\mathrm{m}$. The salinity range for Taskinas Creek

.7-20 ppt. The sampling station is located on the second bend from the mouth of

Taskinas Creek within the York River State Park, about 6 meters upstream from

the park's canoe landing. The sediment type at this station consists of approximately 42% fine sand, 30% clay, and 28% silt. The non-tidal portion

contains feeder streams, which drain oak-hickory forests, maple-gum-oak-ash

swamps and freshwater marshes. The marshes near the creek mouth are brackish

with a salinity range from $3-13~\mathrm{ppt}$. The shoreline is moderately low with

fringing marsh and tidal flats. Taskinas Creek mainly drains the undeveloped

York River State Park watershed, however the watershed is lightly impacted above

the State Park by residential development and selective hardwood logging. Wildlife populations have been shown to influence microbiological water quality

within the watershed.

Goodwin Islands (GI) Component: (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. This site is approximately 22 kilometers

downstream from the Virginia Institute of Marine Science. Circulation patterns

at the Goodwin Islands are influenced by York River discharge and the wind

patterns of the Chesapeake Bay. The sampling station is located in a shallow

embayment on the southeastern side of the main island amongst submerged aquatic

vegetation beds dominated by Zostera marina and Ruppia maritima. The Goodwin

Islands represents a pristine, well-flushed polyhaline system with salinity

ranges from $13-24~\mathrm{ppt}$ and tidal ranges from $0.5-1.0~\mathrm{m}$. The salinity range for

Goodwin Island $10-25~\mathrm{ppt}$. Spartina alterniflora dominates the low marsh, which

covers 70% of the emergent marsh area. Estuarine scrub/shrub vegetation dominates the forested ridges, with the dominant shrub Myrica cerifera (wax

myrtle). The Goodwin Islands are undeveloped and only accessible by boat. This

site is used extensively by VIMS for SAV research.

6. Data collection period:

Ongoing sampling at Taskinas Creek (TC) began September 1995. Ongoing sampling at Goodwin Islands (GI) began mid October 1997.

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. The VIMS Virginia Nearshore $\,$

Water Quality Monitoring Program has collected biweekly samples at Goodwin

Islands since August 1994. Measure parameters include dissolved inorganic

nitrogen and phosphorus, chlorophyll a, total suspended solids, photosynthetic $% \left(1\right) =\left(1\right) +\left(1\right) +\left($

active radiation, temperature, salinity, and water color.

II. Physical Structure Descriptors

8. Variable sequence, range of measurements, units resolution and accuracy (for YSI):

Variable	Range of Measurements (units)	Resolution	
Accuracy Date NA	1-12,1-31,00-99 (Mo,Day,Yr)	1 mo, 1 day, 1 yr	
Time NA	0-24,0-60,0-60 (Hr,Min,Sec)	1 hr, 1 min, 1 sec	
	-5.0 to 45.0 (C)	0.01 C	+/-
	0-100 (mS/cm)	0.01 mS/cm	+/-
reading + 0.	001 mS/cm		
	0-70 Parts per thousand (ppt)	0.01 ppt	+/-
DO 2.0% @	.1ppt, (whichever is greater) 0-200 (% air saturation)	0.1% @ air sat	+/-
air sat DO 6.0% @	200-500 (% air saturation)	0.1% @ air sat	+/-
air sat DO 0.2 mg/L	0-20 (mg/L)	0.01 mg/L	+/-
DO 0.6 mg/L	20-50 (mg/L)	0.01 mg/L	+/-
Depth 0.018 m	0-9.1 (m)	0.001 m	+/-

PH 2-14 units 0.01 units +/0.2 units
Turbidity 0-1000 NTU 0.1 NTU +/5% of
reading or 2 NTU (whichever is greater)

9. Coded variable indicator and variable code definitions

Site definitions: TC = Taskinas Creek, GI= Goodwin Islands File definitions: YSI deployment site/month/year (ex.: 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 $\frac{1}{2}$

 $0.39~\mathrm{m}$ (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 July, data were extracted in accordance with Version 3.0 of the CDMO Manual.

January 1998:

TC:

01/10/98 11:00:00 to 14:15:00 Missing data due to time skip 01/16/98 22:30:00 to 22:45:00 Missing data due to time skip 01/20/98 14:15:00 Replacement sonde deployed

*Note: The following rain events occurred in January, causing turbidity spikes

and depressed DO levels: 01/08/98 = 0.20", 01/23/98 = 0.45", and a Nor'easter

on 01/27/98 - 01/28/98 = 2.13" causing very high tides, and very high turbidity

levels, in part due to the continued construction at the York River State Park.

January 1998:

GI:

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01/03/98 03:15:00 to 09:00:00
                                  Instrument out of water due to
extremely low tide
01/03/98 16:15:00 to 21:15:00
                                  Instrument out of water due to
extremely low tide
01/04/98 05:15:00 to 08:45:00
                                  Instrument out of water due to
extremely low tide
01/04/98 18:30:00 to 21:00:00
                                  Instrument out of water due to
extremely low tide
01/06/98 10:45:00
                     Replacement sonde deployed; notice fouling of
pH probe on previously deployed unit
01/07/98 22:00:00 to 23:30:00
                                  Negative depths due to low tides or
low-pressure
system
01/08/98 11:30:00
                      Negative depths due to low tides or low-pressure
system
01/08/98 23:00:00 to 01/09/98 00:00:00 Negative depths due to low tides
low-pressure system
01/09/98 11:30:00 to 13:30:00
                                  Negative depths due to low tides or
low-pressure
system
01/20/98 11:15:00
                      Replacement sonde deployed
*Note: The following rain events occurred in January, causing turbidity
spikes
and depressed DO levels:
01/08/98 = 0.20", 01/23/98 = 0.45", and a Nor'easter on 01/27/98 -
2.13" causing very high tides, depressed DO levels, and very high
turbidity levels.
February 1998:
     TC:
02/02/98 13:45:00
                            Turbidity spike > 1000 NTU
02/03/98 15:00:00
                            Replacement sonde deployed
02/18/98 13:15:00
                            Replacement sonde deployed
02/06/98 15:30:00
                            Missing data due to time skip
02/13/98 03:15:00
                            Missing data due to time skip
02/15/98 21:45:00 to 22:00:00
                                       Missing data due to time skip
02/17/98 14:30:00
                            Turbidity spike > 1000 NTU
*Note: The following rain events occurred in February, causing turbidity
spikes
and depressed DO levels:
a Nor'easter on 02/03/98 - 02/04/98 = 4.73" causing very high turbidity,
high
tides and depressed salinity, 02/11/98 = 0.32", 02/16/98 - 02/17/98 =
0.93", and
02/23/98 = 1.25".
February 1998:
     GI:
02/03/98 10:30:00
                            Replacement sonde deployed
02/19/98 10:30:00
                            Replacement sonde deployed
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02/12/98 02:30:00 to 04:00:00
                              Negative depths due to low tides or
low-pressure
system
02/12/98 15:00:00 to 16:15:00
                                  Negative depths due to low tides or
low-pressure
system
02/13/98 15:45:00 to 17:15:00
                                  Negative depths due to low tides or
low-pressure
system
02/19/98 10:30:00 to 02/28/98 23:45:00 Time clock was off +27
seconds; was corrected
02/25/98 00:45:00
                            Negative depths due to low tides or low-
pressure
system
02/25/98 01:15:00 to 01:45:00 Negative depths due to low tides or
low-pressure
system
*Note: The following rain events occurred in February, causing turbidity
spikes
and depressed DO levels:
a Nor'easter on 02/03/98 - 02/04/98 = 4.73" causing very high turbidity,
high
tides and depressed salinity, 02/11/98 = 0.32", 02/16/98 - 02/17/98 =
0.93", and
02/23/98 = 1.25".
March 1998:
TC:
03/03/98 06:45:00
                            Turbidity spike > 1000 NTU
03/06/98 14:30:00
                            Replacement sonde deployed
                            Turbidity spike > 900 NTU
03/18/98 05:30:00
03/22/98 17:15:00 to 03/23/98 11:00:00 Battery died
03/23/98 11:15:00
                            Replacement sonde deployed
03/25/98 15:45:00 to 03/31/98 23:45:00 It appears as if the motor broke
on the turbidity probe causing unusually high readings; all data rejected
after
discontinuity.
*Note: The following rain events occurred in March, causing turbidity
spikes
and depressed DO levels:
03/07/98 - 03/09/98 = 1.31", 03/17/98 - 03/21/98 = 2.97".
March 1998:
GI:
03/01/98 00:00:00 to 03/03/98 10:00:00 Time clock was off +27 seconds;
was corrected
03/03/98 10:15:00
                                  Replacement sonde deployed
03/12/98 14:30:00 to 15:00:00
                                        Instrument out of water due to
extremely low
tide
03/13/98 14:30:00 to 14:45:00
                                       Spcond drops suddenly due to low
tides
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03/13/98 15:00:00 extremely low tide	to	15:45:00	Instrument out of water due to
03/14/98 02:45:00 extremely low tide	to	05:00:00	Instrument out of water due to
03/18/98 12:00:00 03/21/98 14:45:00 03/22/98 13:15:00	to	-	sonde deployed Missing data due to time skip Ta due to time skip
03/26/98 12:30:00 or low-			Negative depths due to low tides
pressure system 03/27/98 00:00:00 or low	to	00:30:00	Negative depths due to low tides
pressure system 03/27/98 00:45:00 extremely low	to	03:15:00	Instrument out of water due to
tide 03/27/98 03:30:00 or low-	to	04:00:00	Negative depths due to low tides
pressure system 03/27/98 12:00:00 or low-	to	12:30:00	Negative depths due to low tides
pressure system 03/27/98 12:45:00 extremely low	to	15:45:00	Instrument out of water due to
tide 03/27/98 16:00:00 or low-	to	16:45:00	Negative depths due to low tides
pressure system 03/28/98 00:00:00 or low	to	00:45:00	Negative depths due to low tides
pressure system 03/28/98 01:00:00 extremely low	to	04:45:00	Instrument out of water due to
tide 03/28/98 05:00:00 or low-	to	05:30:00	Negative depths due to low tides
pressure system 03/28/98 12:15:00 or low-	to	13:00:00	Negative depths due to low tides
pressure system 03/28/98 13:15:00 extremely low	to	16:45:00	Instrument out of water due to
tide 03/28/98 17:00:00 or low-	to	17:45:00	Negative depths due to low tides
pressure system 03/29/98 00:45:00 or low-	to	01:30:00	Negative depths due to low tides
pressure system 03/29/98 01:45:00 extremely low tide	to	05:30:00	Instrument out of water due to

03/29/98 05:45:00 or low-	to 06:30:0	Negative depths due to low tides
pressure system 03/29/98 13:15:00 or low-	to 14:15:0	Negative depths due to low tides
pressure system 03/29/98 14:30:00 extremely low	to 17:15:0	O Instrument out of water due to
tide 03/29/98 17:30:00 or low-	to 18:15:0	Negative depths due to low tides
pressure system 03/30/98 02:15:00 or low-	to 03:15:0	Negative depths due to low tides
pressure system 03/30/98 03:30:00 extremely low	to 05:45:0	O Instrument out of water due to
tide 03/30/98 06:00:00 or low-	to 06:45:0	Negative depths due to low tides
pressure system 03/30/98 14:15:00 or low-	to 15:30:0	Negative depths due to low tides
pressure system 03/30/98 15:45:00 extremely low	to 17:30:0	O Instrument out of water due to
tide 03/30/98 17:45:00 or low-	to 18:45:0	Negative depths due to low tides
pressure system 03/31/98 03:15:00 or low-	to 07:30:0	Negative depths due to low tides
pressure system 03/31/98 15:15:00 or low-	to 19:45:0	Negative depths due to low tides
pressure system 03/31/98 17:15:00 extremely low tide	to 18:00:0	O Instrument out of water due to
*Note: The follow spikes	ing rain e	vents occurred in March, causing turbidity
and depressed DO 1 03/07/98 - 03/09/9		03/17/98 -03/21/98 =2.97".
April 1998: TC:		
04/06/98 10:30:00 04/06/98 10:45:00 04/16/98 10:45:00 04/16/98 11:30:00		Low depth due to low tide, data was removed Replacement sonde deployed Replacement sonde deployed Drop in depth
April 1998:		

April 1998:

GI:

04/01/98 04:00:00 to 08:45:00 Negative depths due to low tides or lowpressure system 04/01/98 15:45:00 to 21:00:00 Negative depths due to low tides or lowpressure system 04/01/98 18:15:00 Instrument was out of water 04/02/98 05:45:00 to 09:15:00 Negative depths due to low tides or lowpressure system 04/02/98 17:45:00 to 20:30:00 Negative depths due to low tides or lowpressure system 04/03/98 13:45:00 Replacement sonde deployed; slight drop in DO but recovers quickly 04/15/98 11:15:00 Replacement sonde deployed 04/19/98 18:30:00 Turbidity spike > 400 NTU 04/20/98 12:15:00 to 12:45:00 Turbidity spike > 100 NTU 04/26/98 02:30:00 to 02:45:00 Low depths due to low tides or low-pressure system 04/26/98 14:00:00 to 15:45:00 Negative depths due to low tides or lowpressure system 04/30/98 18:15:00 to 18:30:00 Negative depths due to low tides Note: 04/04/98 there was 1.84" of rain that fell, causing depressed DO and inflated turbidity levels. 04/17/98 - 04/22/98 0.82" of rain fell also causing depressed DO levels inflated turbidity levels. May 1998: TC: 05/09/98 20:30:00 to 05/15/98 08:30:00 All DO data was suspect and deleted

The use of the netting around the YSI probe guard to reduce crab colonization around the probes may have reduced the DO reading. The netting was deployed from 4-29-98 10:15:00 to 5-15-98 8:30:00. After the test, the netting was not used again.

May 1998:

GI:

05/09/98 09:45:00 Turbidity spike >1000 NTU

05/11/98 01:45:00 to 05/19/98 10:15:00 Missing data due to instrument

lodged in sediment

05/19/98 20:15:00 Turbidity spike >1000 NTU due to low tide 05/28/98 20:00:00 Spcond drops suddenly due to instrument out

of the water

05/28/98 20:15:00 Turbidity spike >500 NTU due to low tide

Note: 05/11/98 01:30:00 to 05/19/98 10:15:00 missing data due to failure

in logger cable clip which caused the datalogger to drop to the bottom until it was recovered at 05/19/98 10:15:00.

June 1998: TC: June 1998: GI: 06/03/98 23:15:00 to 06/04/98 11:45:00 Missing data due to low battery 06/08/98 14:30:00 Turbidity spike >300 due to low tide 06/18/98 09:00:00 Turbidity probe wiper parking on optics 06/18/98 09:30:00 Turbidity probe wiper parking on optics 06/18/98 10:00:00 to 06/18/98 13:00:00 Turbidity wiper parking on optics 06/18/98 13:30:00 to 06/18/98 18:45:00 Turbidity wiper parking on optics 19:15:00 to 06/18/98 19:45:00 06/18/98 Turbidity wiper parking on optics 06/18/98 20:15:00 to 06/18/98 20:45:00 Turbidity wiper parking on optics 06/18/98 21:15:00 to 06/19/98 22:30:00 Turbidity wiper parking on optics 06/18/98 23:00:00 to 06/19/98 00:30:00 Turbidity wiper parking on optics 06/19/98 01:15:00 Turbidity wiper parking on optics 06/19/98 01:30:00 Turbidity wiper parking on optics 06/19/98 02:00:00 wiper parking on optics Turbidity 06/19/98 03:00:00 to 06/19/98 04:00:00 Turbidity wiper parking on optics 04:30:00 to 06/19/98 05:00:00 06/19/98 Turbidity wiper parking on optics 06/19/98 05:30:00 Turbidity wiper parking on optics 06/19/98 06:30:00 Turbidity wiper parking on optics 07:00:00 to 06/19/98 09:30:00 Turbidity wiper parking on 06/19/98 optics 10:00:00 to 06/19/98 10:45:00 Turbidity wiper parking on 06/19/98 optics 06/19/98 11:15:00 to 06/19/98 12:00:00 Turbidity wiper parking on optics 12:45:00 to 06/19/98 13:15:00 Turbidity wiper parking on 06/19/98 optics 06/19/98 13:45:00 Turbidity wiper parking on optics 06/19/98 14:15:00 to 06/19/98 16:15:00 Turbidity wiper parking on optics 16:45:00 to 06/19/98 17:45:00 Turbidity wiper parking on 06/19/98 optics 18:15:00 to 06/19/98 18:45:00 Turbidity wiper parking on 06/19/98 optics

06/19/98	19:15:00	to 06/19/98	20:30:00 Turbidity	wiper parking on
optics				
06/19/98	21:00:00		Turbidity wiper	parking on optics
06/19/98	21:30:00	to 06/19/98	22:45:00 Turbidity	wiper parking on
optics			_	
06/19/98	23:15:00		Turbidity wiper	parking on optics
06/19/98		to 06/20/98	00:30:00 Turbidity	
optics	23.43.00	00/20/30	00.30.00 larbrarey	wiper parking on
06/20/98	01:00:00		Mushiditu uinas	parking on optics
		06/00/00		1 2 1
06/20/98	01:30:00	to 06/20/98	02:15:00 Turbidity	wiper parking on
optics				
06/20/98	02:45:00			parking on optics
06/20/98	03:15:00		Turbidity wiper	parking on optics
06/20/98	03:45:00	to 06/20/98	04:30:00 Turbidity	wiper parking on
optics			_	
06/20/98	05:00:00		Turbidity wiper	parking on optics
06/20/98		to 06/20/98	06:45:00 Turbidity	
optics	00.00.00	00, 20, 50	11710.00 Talestates	
06/20/98	07.30.00	+0 06/20/00	09:00:00 Turbidity	winer narking on
	07.30.00	00/20/90	os.oo.oo furbially	wiper parking on
optics	00 45 00	1 - 10 00 00	m 1 1 1 1 1 1	
06/20/98	09:45:00	to 10:00:00	Turbidity	wiper parking on
optics				
06/20/98	10:30:00	to 06/20/98	12:30:00 Turbidity	wiper parking on
optics				
06/20/98	13:00:00	to 06/20/98	15:15:00 Turbidity	wiper parking on
optics				
06/20/98	15:45:00		Turbidity wiper	parking on optics
06/20/98	16:15:00			parking on optics
06/20/98		+0 06/20/98	19:15:00 Turbidity	
	10.43.00	00/20/90	19.13.00 fulblatey	wiper parking on
optics 06/20/98	20:00:00		mhidit	
				parking on optics
06/20/98	20:30:00	/ /		parking on optics
06/20/98	21:00:00	to 06/20/98	22:30:00 Turbidity	wiper parking on
optics				
06/20/98	23:00:00	to 06/20/98	23:30:00 Turbidity	wiper parking on
optics				
06/21/98	00:15:00		Turbidity wiper	parking on optics
06/21/98		to 06/21/98	02:45:00 Turbidity	
optic		, ==, 30		1 - 1 9
06/21/98	03.15.00	to 06/21/98	04:30:00 Turbidity	winer narking on
optics	00.10.00	00/21/90	04.50.00 Turbraity	wiper parking on
_	05.15.00	+- 06/01/00	06.00.00	reiman marririana
06/21/98	02:12:00	10 06/21/98	06:00:00 Turbidity	wiper parking on
optics	0000			
06/21/98	06:30:00			parking on optics
06/21/98	06:45:00		Turbidity wiper	parking on optics
06/21/98	07:45:00	to 06/21/98	08:30:00 Turbidity	wiper parking on
optics			-	-
06/21/98	09:00:00	to 06/21/98	10:30:00 Turbidity	wiper parking on
optics	00.00.00			por parating on
06/21/98	11:00:00		Turbidity winer	parking on optics
06/21/98	12:00:00	1 - 06/01/00		parking on optics
06/21/98	13:00:00	to U6/21/98	13:30:00 Turbidity	wiper parking on
optics				

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06/21/98
          14:45:00 to 06/21/98 16:30:00 Turbidity wiper parking on
optics
06/21/98
          18:00:00 to 06/21/98 19:15:00 Turbidity wiper parking on
optics
06/21/98
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          20:15:00 to 06/21/98 22:00:00 Turbidity wiper parking on
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          22:30:00 to 06/21/98 23:45:00 Turbidity wiper parking on
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          14:15:00 to 06/22/98 14:45:00 Turbidity wiper parking on
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          21:15:00 to 06/22/98 23:00:00
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06/23/98 00:00:00 to 00:15:00
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optics
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          00:45:00 to 01:00:00
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06/23/98
          01:30:00
                                Turbidity wiper parking on optics
06/23/98 02:00:00
                                Turbidity wiper parking on optics
06/23/98
          02:30:00
                                Turbidity wiper parking on optics
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06/23/98 optics	03:00:00	to 06/23/98	06:15:00 Turbidity wiper parking on
06/23/98 optics	06:45:00	to 06/23/98	08:30:00 Turbidity wiper parking on
06/23/98	09:00:00	to 09:15:00	Turbidity wiper parking on
optics 06/23/98	09:45:00	to 06/23/98	13:30:00 Turbidity wiper parking on
optics 06/23/98	14:00:00		Turbidity wiper parking on optics
06/23/98 optics	14:30:00	to 06/23/98	15:30:00 Turbidity wiper parking on
06/23/98	16:00:00		Turbidity wiper parking on optics
06/23/98		to 06/23/98	17:45:00 Turbidity wiper parking on
optics			
06/23/98 optics	18:30:00	to 06/23/98	19:30:00 Turbidity wiper parking on
06/23/98 optics	20:00:00	to 06/23/98	22:30:00 Turbidity wiper parking on
06/23/98	23:00:00	to 06/24/98	00:15:00 Turbidity wiper parking on
optics			
06/24/98	00:45:00		Turbidity wiper parking on optics
06/24/98	01:15:00		Turbidity wiper parking on optics
06/24/98 optics	01:45:00	to 06/24/98	02:15:00 Turbidity wiper parking on
06/24/98	02.45.00	-0 06/24/98	03:15:00 Turbidity wiper parking on
optics	02.45.00	00/24/30	03.13.00 fulbidity wiper parking on
06/24/98	03:45:00	to 06/24/98	04:15:00 Turbidity wiper parking on
optics 06/24/98	04:45:00	to 05:00:00	Turbidity wiper parking on
optics			
06/24/98 optics	05:30:00	to 06/24/98	06:00:00 Turbidity wiper parking on
06/24/98	06:30:00	to 06:45:00	Turbidity wiper parking on
optics	07 15 00	07 20 00	m 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
06/24/98 optics	0/:15:00 1	to 07:30:00	Turbidity wiper parking on
06/24/98	08:15:00	to 06/24/98	08:45:00 Turbidity wiper parking on
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06/24/98	09:30:00	06/04/00	Turbidity wiper parking on optics
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optics			
06/24/98	14:00:00		Turbidity wiper parking on optics
06/24/98	15:00:00	to 06/24/98	15:45:00 Turbidity wiper parking on
optics			
06/24/98	16:15:00	to 06/24/98	17:15:00 Turbidity wiper parking on
optics			
06/24/98	18:15:00	to 18:30:00	Turbidity wiper parking on
optics	10 45 00	06/04/00	01 15 00 m 3-1-1-1
06/24/98 optics	19:45:00	to U6/24/98	21:15:00 Turbidity wiper parking on
06/24/98	22:00:00		Turbidity wiper parking on optics

06/24/98	22:30:00	to 06/24/98	22:45:00 Turbidity wiper parking on
optics	00 15 00	. 06/05/00	01 45 00 5 1111
06/24/98 optics	23:15:00	to U6/25/98	01:45:00 Turbidity wiper parking on
06/25/98	02:15:00	to 06/25/98	04:15:00 Turbidity wiper parking on
optics		,,	critical reservation and reservations con
06/25/98	04:45:00	to 06/25/98	07:00:00 Turbidity wiper parking on
optics			
06/25/98	07:30:00	to 06/25/98	08:00:00 Turbidity wiper parking on
optics	00 15 00	1 - 06/05/00	00 00 00
06/25/98 optics	09:15:00	to 06/25/98	09:30:00 Turbidity wiper parking on
operes			
06/26/98	16:15:00		Negative depths due to low tides
06/26/98	16:30:00		Negative depths due to low tides
06/26/98	16:45:00		Negative depths due to low tides
06/27/98	04:00:00		Negative depths due to low tides
06/27/98	04:15:00		Negative depths due to low tides
06/27/98	04:30:00		Negative depths due to low tides
06/27/98	04:45:00		Negative depths due to low tides
06/27/98	05:00:00		Negative depths due to low tides
06/27/98	05:15:00		Negative depths due to low tides
06/27/98	05:30:00		Negative depths due to low tides
06/27/98	05:45:00		Negative depths due to low tides
July 1998:			
TC:			
07/01/98	15:15:00		Turbidity spike >1000
07/15/98	08:30:00		Turbidity spike >1000 due to low tide
07/15/98	22:00:00	1597.1	Turbidity spike >1000 due to low
tide	00 00 00		7 1 11
07/17/98	09:00:00	1016	Low depth reading
07/22/98 07/23/98	03:45:00 17:15:00	1216 1397.6	Turbidity spike >1000 due to low tide Turbidity spike >1000 due to low
07/23/90 tide	17.13.00	1397.0	rurbraity spike >1000 due to 10w
07/26/98	04:15:00	1111.7	Turbidity spike >1000
0., 20, 30	01110100	,	randara, spine / root
July 1998:			
GI: 07/02/98 0	00 00		Deviler words also devile and also the DO
07/02/98 C high	19:30:00		Replacement sonde deployed, depth, DO
07/07/98 1	0.00.00		Sonde out of the water
07/12/98 0			Turbidity spike >200
07/19/98 0			Turbidity spike >100
07/22/98 1			Turbidity spike >100
07/23/98 1			Sonde out of the water
07/24/98 1			Spcond drops but recovers
August 199	98:		
	17:45:00		Turbidity spike >1000 due to low tide
		08/21/98 08	
08/23/98		50, 21, 50 00	Turbidity spike >1000
		08/31/98 11	1:15:00 DO membrane torn
-, -,		-, - ,	

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Note: August 27, 1998, Hurricane Bonnie:
August 1998:
     GI:
8/13/98 09:15:00
                               Missing data due to time skip
8/13/98 09:45:00
                               Missing data due to time skip
                               Missing data due to time skip
8/13/98 10:00:00
September 1998:
     TC:
          00:15:00 to 9/14/98 16:15:00 Missing data due to
09/10/98
flooded battery compartment
September 1998:
     GI:
09/05/98
          13:15:00
                                Turbidity >300 NTU
09/07/98
          15:00:00
                                Negative depths due to low tide
09/07/98 15:15:00
                               Negative depths due to low tide
09/07/98 15:30:00
                               Negative depths due to low tide
09/07/98 15:45:00
                                Negative depths due to low tide
                                Negative depths due to low tide
09/07/98 16:00:00
09/07/98 16:15:00
                                Negative depths due to low tide
09/11/98 14:00:00
                         Replacement sonde deployed, jump in Sp.
Cond.
09/12/98
          10:15:00
                           Sudden DO increase due to possible membrane
damage
09/12/98
        10:30:00 to 09/18/98 13:30:00
                                                DO eventually
decrease due
to negative DO due to possible membrane damage
                                Turbidity wiper parking on optics
09/23/98 11:15:00
09/23/98 12:30:00 to 09/23/98 12:45:00 Turbidity wiper parking on
optics
          13:30:00 to 09/23/98 13:45:00
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parking on
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optics 09/27/98 1	1:00:00 to	09/27/98	11:30:00	Turbiditv	wiper parking	on
optics		, 03,21,30	11.00.00	rarerarey	"iper parming	011
·	.2:00:00 to	09/27/98	12:15:00	Turbidity	wiper parking	on
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optics		, 03,21,30	13.33.30	rarerarey	"iper parming	011
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optics						
·	6:15:00	00/07/00		wiper parkin		
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	7:30:00 to	09/27/98	17:45:00	Turbidity	wiper parking	on
optics				_		
·	8:15:00			wiper parking		
09/27/98 1 optics	.9:00:00 to	09/27/98	19:15:00	Turbidity	wiper parking	on
_	21:15:00		Turbiditv	wiper parkin	ng on optics	
	21:45:00		-	wiper parking	-	
09/27/98 22	2:30:00				parking on op	tics
October 1998	:					
TC:						
10/14/98 22 affecting	2:45:00 to	10/28/98	09:30:00	Temperatur	e probe failur	ce
Sp. Cond., sa	alinitv. D	O data and	Ha l			
-	_		- 1			
October 1998	:					
GI: 10/07/98 1	3:00:00	ron	lacomont son	do doplovod	jump in Sp. C	Cond
10/07/98 1		reb		crease in DO	jump in Sp. C	Jona
November 1998	8:					
TC: 11/10/98 10:0	00.00		Instrumen	t out of the	water due to	low
tide	00.00		TIIS CT amen	c out of the	water due to	10W
November 1998	8:					
GI: 11/04/98 0	9.45.00		Renlaceme	nt of sonde	SpCond increa	S
turbidity de		se	vebraceme.	ic of sonde,	Specific Increa	,
11/17/98 1	_		Replacemen	nt of sonde,	SpCond increa	se
Danish - 100	0 -					
December 1998	ѷ:					
10.						
December 1998	8:					

GI:

12/01/98	11:00:00	to	12/01/98	14:15:0	0 ou	t of	the	wate	due	to	low
tide											
12/03/98	01:00:00	to	12/03/98	03:00:0	0 ou	t of	the	wate	due	to	low
tide											
12/03/98	14:45:00	to	12/03/98	15:00:0	0 ou	t of	the	wate	due	to	low
tide											
12/04/98	02:15:00	to	12/04/98	03:00:0	0 ou	t of	the	wate	due	to	low
tide											
12/14/98	06:00:00				Sudden i	ncre	ase	in de	pth		
12/26/98	01:00:00	to	12/26/98	01:15:0	0	S	Sudde	en dec	rease	in	DO DO
12/30/98	20:00:00				Sudden d	ecre	ase	in DO			
12/31/98	14:15:00				Sudden d	ecre	ase	in DO			
12/31/98	13:00:00				Negative	dep	ths	due t	o low	ti	de
12/31/98	13:15:00				Negative	dep	ths	due t	o low	ti	de
12/31/98	13:30:00				Negative	dep	ths	due t	o low	ti	de
12/31/98	13:45:00				Negative	dep	ths	due t	o low	ti	de
12/31/98	14:00:00				Negative	dep	ths	due t	o low	ti	de
12/31/98	14:15:00				Negative	dep	ths	due t	o low	ti	de
12/31/98	14:30:00				Negative	dep	ths	due t	o low	ti	de

12. 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 1998: TC: 01/07/98 12:15:00

Maintenance 01/10/98 11:00:00 to 14:15:00 Missing data due to time skip 01/16/98 22:30:00 to 22:45:00 Missing data due to time skip

January 1998: GI: 01/01/98 02:15:00 to 07:00:00 Instrument out of water due to extremely low 01/01/98 14:30:00 to 20:00:00 Instrument out of water due to extremely low tide 01/02/98 01:45:00 to 09:00:00 Instrument out of water due to extremely low tide 01/02/98 15:15:00 to 21:00:00 Instrument out of water due to extremely low tide 01/03/98 03:15:00 to 09:00:00 Instrument out of water due to extremely low tide 01/03/98 16:15:00 to 21:15:00 Instrument out of water due to

extremely low

tide

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01/04/98 05:15:00 to 08:45:00
                              Instrument out of water due to
extremely low
tide
01/04/98 18:30:00 to 21:00:00
                               Instrument out of water due to
extremely low
tide
February 1998:
TC:
02/02/98 13:45:00
                           Turbidity spike >1000 NTU
02/06/98 15:30:00 Missing data due to time skip 02/13/98 03:15:00 Missing data due to time skip
02/15/98 21:45:00 to 22:00:00
                                      Missing data due to time skip
02/17/98 14:30:00
                           Turbidity spike >1000 NTU
February 1998:
     GI:
March 1998:
TC:
03/22/98 17:15:00 to 03/23/98 11:00:00
                                        Battery died
03/25/98 15:45:00 to 03/31/98 23:45:00
                                           It appears as if the motor
on the turbidity probe causing unusually high readings; all data rejected
after
discontinuity.
March 1998:
GT:
03/12/98 14:30:00 to 15:00:00
                                      Instrument out of water due to
extremely low
tide
03/13/98 15:00:00 to 15:45:00
                                       Instrument out of water due to
extremely low
03/14/98 02:45:00 to 05:00:00
                                      Instrument out of water due to
extremely low
tide
03/21/98 14:45:00 to 15:00:00
                                      Missing data due to time skip
03/22/98 13:15:00 Missing data due to time skip
03/27/98 00:45:00 to 03:15:00
                                       Instrument out of water due to
extremely low
tide
03/27/98 12:45:00 to 15:45:00
                                      Instrument out of water due to
extremely low
tide
03/28/98 01:00:00 to 04:45:00
                                       Instrument out of water due to
extremely low
03/28/98 13:15:00 to 16:45:00
                                       Instrument out of water due to
extremely low
tide
03/29/98 01:45:00 to 05:30:00
                                      Instrument out of water due to
```

extremely low

```
tide
03/29/98 14:30:00 to 17:15:00 Instrument out of water due to
extremely low
tide
03/30/98 03:30:00 to 05:45:00
                                    Instrument out of water due to
extremely low
tide
                               Instrument out of water due to
03/30/98 15:45:00 to 18:00:00
extremely low
tide
April 1998:
TC:
04/06/98 10:30:00 Low depth due to low tide, data was removed
04/16/98 10:45:00 to 11:15:00
                                    Maintenance
April 1998:
GI:
04/01/98 18:15:00
                         Spcond drops suddenly due to instrument
being out of water
May 1998:
TC:
05/09/98 20:30:00 to 05/15/98 08:30:00 All DO data was suspect and
deleted
May 1998:
GI:
05/09/98 09:45:00
                          Turbidity spike >1000 NTU
05/11/98 01:45:00 to 05/19/98 10:15:00 Missing data due to instrument
lodged
in sediment
05/19/98 20:15:00
                          Turbidity spike >1000 NTU due to
low tide
05/28/98 20:00:00
                          Spcond drops suddenly due to
instrument out of the water
June 1998:
     TC:
06/04/98 14:30:00 Maintenance
June 1998:
    GI:
         23:15:00 to 06/04/98 11:45:00
06/03/98
                                               Missing data due to
low battery
06/08/98 14:30:00
                                     Turbidity spike >300 due to low
tide
06/18/98 09:00:00
                                     Turbidity wiper parking on
optics
06/18/98 09:30:00
                                     Turbidity wiper parking on
optics
06/18/98 10:00:00 to 10:15:00
                                     Turbidity wiper parking on
optics
```

06/18/98	10:45:00		Turbi	dity	wiper	parking	on on	
optics 06/18/98 optics	11:15:00		Turbi	dity	wiper	parking	on on	
06/18/98 optics	12:00:00 to	0 12:15:00	Turbi	dity	wiper	parking	, on	
06/18/98 optics	12:45:00 to	0 13:00:00	Turbi	dity	wiper	parking	, on	
06/18/98 optics	13:30:00 to	0 14:00:00	Turbi	dity	wiper	parking	, on	
06/18/98 optics	14:30:00 to	0 16:15:00	Turbi	dity	wiper	parking	, on	
06/18/98 optics	16:45:00			_	_	parking		
06/18/98 optics	17:15:00 to			_	_	parking		
06/18/98 optics 06/18/98	18:15:00 to			_	_	parking wiper p		on
optics 06/18/98	20:15:00 to				_	wiper p	_	
optics 06/18/98	21:15:00 to				-	wiper p		
optics 06/18/98	23:00:00 to	06/19/98	00:30:00	Turbi	dity	wiper p	arking	on
optics 06/19/98	01:15:00		Turbi	dity	wiper	parking	, on	
optics 06/19/98 optics	01:30:00		Turbi	dity	wiper	parking	, on	
06/19/98 optics	02:00:00		Turbi	dity	wiper	parking	, on	
06/19/98 optics	03:00:00 to	06/19/98	04:00:00 Turk	oidity	wipe	r parki	ng on	
06/19/98 optics		06/19/98	05:00:00 Turk	-	-	-	_	
06/19/98 optics	05:30:00			-	-	parking		
06/19/98 optics 06/19/98	06:30:00 07:00:00 to	06/10/00		_	_	parking		
optics 06/19/98	10:00:00 to				_	wiper p	_	
optics 06/19/98	11:15:00 to				_	wiper p		
optics 06/19/98	12:45:00 to	06/19/98	13:15:00		-	wiper p		
optics 06/19/98 optics	13:45:00		Turbi	dity	wiper	parking	, on	
06/19/98 optics	14:15:00 to	06/19/98	16:15:00 Turk	oidity	wipe	r parki	ng on	

06/19/98 optics	16:45:00 to 06/19/98 17:45:00 Turbidity wiper parking on
06/19/98 optics	18:15:00 to 06/19/98 18:45:00 Turbidity wiper parking on
06/19/98 optics	19:15:00 to 06/19/98 20:30:00 Turbidity wiper parking on
06/19/98 optics	21:00:00 Turbidity wiper parking on
06/19/98 optics	21:30:00 to 06/19/98 22:45:00 Turbidity wiper parking on
06/19/98	23:15:00 Turbidity wiper parking on
optics 06/19/98	23:45:00 to 06/20/98 00:30:00 Turbidity wiper parking on
optics 06/20/98	01:00:00 Turbidity wiper parking on
optics 06/20/98	01:30:00 to 06/20/98 02:15:00 Turbidity wiper parking on
optics 06/20/98	02:45:00 Turbidity wiper parking on
optics 06/20/98	03:15:00 Turbidity wiper parking on
optics 06/20/98	03:45:00 to 06/20/98 04:30:00 Turbidity wiper parking on
optics 06/20/98	05:00:00 Turbidity wiper parking on
optics 06/20/98	05:30:00 to 06/20/98 06:45:00 Turbidity wiper parking on
optics 06/20/98	07:30:00 to 06/20/98 09:00:00 Turbidity wiper parking on
optics 06/20/98	09:45:00 to 10:00:00 Turbidity wiper parking on
optics 06/20/98	10:30:00 to 06/20/98 12:30:00 Turbidity wiper parking on
optics 06/20/98	13:00:00 to 06/20/98 15:15:00 Turbidity wiper parking on
optics 06/20/98	15:45:00 Turbidity wiper parking on
optics 06/20/98	16:15:00 Turbidity wiper parking on
optics 06/20/98	16:45:00 to 06/20/98 19:15:00 Turbidity wiper parking on
optics 06/20/98	20:00:00 Turbidity wiper parking on
optics 06/20/98	20:30:00 Turbidity wiper parking on
optics 06/20/98	21:00:00 to 06/20/98 22:30:00 Turbidity wiper parking on
optics 06/20/98	23:00:00 to 06/20/98 23:30:00 Turbidity wiper parking on
optics 06/21/98	00:15:00 Turbidity wiper parking on
optics 06/21/98	00:45:00 to 06/21/98 02:45:00 Turbidity wiper parking on
optics	

06/21/98 optics	03:15:00	to	06/21/98	04:30:00	Turbidity	wipe	r parking on	
06/21/98 optics	05:15:00	to	06/21/98	06:00:00	Turbidity	wipe	r parking on	
06/21/98 optics	06:30:00			Т	urbidity	wiper	parking on	
06/21/98 optics	06:45:00			T	urbidity	wiper	parking on	
06/21/98 optics	07:45:00	to	06/21/98	08:30:00	Turbidity	wipe	r parking on	
06/21/98 optics	09:00:00	to	06/21/98	10:30:00	Turbidity	wipe	r parking on	
06/21/98 optics	11:00:00			T	urbidity	wiper	parking on	
06/21/98 optics	12:00:00			Т	urbidity	wiper	parking on	
06/21/98 optics	13:00:00	to	06/21/98	13:30:00	Turbidity	wipe	r parking on	
06/21/98 optics	14:45:00	to	06/21/98	16:30:00	Turbidity	wipe	r parking on	
06/21/98 optics	18:00:00	to	06/21/98	19:15:00	Turbi	dity	wiper parking	on
06/21/98 optics	19:45:00			I	urbidity	wiper	parking on	
06/21/98 optics	20:15:00	to	06/21/98	22:00:00	Turbidity	wipe	r parking on	
06/21/98 optics	22:30:00	to	06/21/98	23:45:00	Turbidity	wipe	r parking on	
06/22/98 optics	00:15:00			Т	urbidity	wiper	parking on	
06/22/98 optics	00:30:00			I	urbidity	wiper	parking on	
06/22/98 optics	01:00:00			Т	urbidity	wiper	parking on	
06/22/98 optics	01:30:00	to	06/22/98	03:30:00	Turbidity	wipe	r parking on	
06/22/98 optics	04:00:00			T	urbidity	wiper	parking on	
06/22/98 optics	04:30:00			T	urbidity	wiper	parking on	
06/22/98 optics	04:45:00			T	urbidity	wiper	parking on	
06/22/98 optics	05:15:00			T	urbidity	wiper	parking on	
06/22/98 optics	05:45:00			T	urbidity	wiper	parking on	
06/22/98 optics	06:00:00	to	06/22/98	06:30:00	Turbi	dity	wiper parking	on
06/22/98	07:00:00			I	urbidity	wiper	parking on	
optics 06/22/98	07:30:00			T	urbidity	wiper	parking on	
optics 06/22/98	08:00:00	to	06/22/98	08:45:00	Turbi	dity	wiper parking	on
optics								

06/22/98 optics	09:00:00	to 06/22/98	09:45:00	Turbidity	wiper parking	on
06/22/98 optics	10:15:00		ר	Turbidity	wiper parking on	n
06/22/98 optics	10:45:00	to 06/22/98	12:30:00	Turbidity	wiper parking	on
06/22/98 optics	13:00:00	to 06/22/98	13:45:00	Turbidity	wiper parking	on
06/22/98 optics	14:15:00	to 06/22/98	14:45:00	Turbidity	wiper parking	on
06/22/98 optics	15:15:00		7	Turbidity	wiper parking or	n
06/22/98 optics	15:30:00		ר	Turbidity	wiper parking on	n
06/22/98 optics	16:30:00		ר	Turbidity	wiper parking or	n
06/22/98 optics	17:00:00		7	Turbidity	wiper parking on	n
06/22/98 optics	17:30:00	to 06/22/98	19:00:00	Turbidity	wiper parking	on
06/22/98 optics	19:30:00	to 06/22/98	20:00:00	Turbidity	wiper parking	on
06/22/98 optics	20:30:00			Turbidity		
06/22/98 optics	20:45:00			Turbidity		
06/22/98 optics		to 06/22/98		_	wiper parking	
06/22/98 optics	23:30:00			Turbidity		
06/23/98 optics	00:00:00	to 00:15:		Turbidity	wiper parking or	
06/23/98 optics	00:45:00	to 01:00:		Turbidity	wiper parking on	
06/23/98 optics	01:30:00			Turbidity	wiper parking on	
06/23/98 optics	02:00:00			_	wiper parking on	
06/23/98 optics	02:30:00	/ /		_	wiper parking on	
06/23/98 optics				_	wiper parking	
06/23/98 optics				_	wiper parking	
06/23/98 optics		to 09:15:00		_	wiper parking on	
06/23/98 optics		to 06/23/98		_	wiper parking	
06/23/98 optics	14:00:00	/ /		_	wiper parking on	
06/23/98 optics		to 06/23/98		_	wiper parking	
06/23/98 optics	16:00:00		7	Turbidity	wiper parking or	n

06/23/98 optics	16:45:00 t	06/23/98	17:45:00 Turbidity wiper parking on
06/23/98 optics	18:30:00 t	06/23/98	19:30:00 Turbidity wiper parking on
06/23/98 optics	20:00:00 t	06/23/98	22:30:00 Turbidity wiper parking on
06/23/98 optics	23:00:00 t	06/24/98	00:15:00 Turbidity wiper parking on
06/24/98 optics	00:45:00		Turbidity wiper parking on
06/24/98	01:15:00		Turbidity wiper parking on
optics 06/24/98	01:45:00 t	06/24/98	02:15:00 Turbidity wiper parking on
optics 06/24/98	02:45:00 t	06/24/98	03:15:00 Turbidity wiper parking on
optics 06/24/98	03:45:00 t	06/24/98	04:15:00 Turbidity wiper parking on
optics 06/24/98	04:45:00 t	05:00:00	Turbidity wiper parking on
optics 06/24/98	05:30:00 t	06/24/98	06:00:00 Turbidity wiper parking on
optics 06/24/98 optics	06:30:00 t	0 06:45:00	Turbidity wiper parking on
06/24/98 optics	07:15:00 t	07:30:00	Turbidity wiper parking on
06/24/98 optics	08:15:00 t	06/24/98	08:45:00 Turbidity wiper parking on
06/24/98 optics	09:30:00		Turbidity wiper parking on
06/24/98 optics	10:15:00 t	06/24/98	12:00:00 Turbidity wiper parking on
06/24/98 optics	12:30:00 t	06/24/98	13:15:00 Turbidity wiper parking on
06/24/98	14:00:00		Turbidity wiper parking on optics
06/24/98 optics	15:00:00 t	0 06/24/98	15:45:00 Turbidity wiper parking on
06/24/98	16:15:00 t	06/24/98	17:15:00 Turbidity wiper parking on
optics 06/24/98	18:15:00 t	0 18:30:00	Turbidity wiper parking on optics
06/24/98	19:45:00 t	06/24/98	21:15:00 Turbidity wiper parking on
optics 06/24/98	22:00:00		Turbidity wiper parking on optics
06/24/98	22:30:00 t	06/24/98	22:45:00 Turbidity wiper parking on
optics 06/24/98	23:15:00 t	06/25/98	01:45:00 Turbidity wiper parking on
optics 06/25/98	02:15:00 t	06/25/98	04:15:00 Turbidity wiper parking on
optics 06/25/98 optics	04:45:00 t	06/25/98	07:00:00 Turbidity wiper parking on

06/25/98	07:30:00 to 06/25/98 08:00:0	OO Turbidity wiper parking on
optics 06/25/98	09:15:00 to 06/25/98 09:30:0	OO Turbidity wiper parking on
optics	09.10.00 00 00, 20, 30 09.00.0	idibidie, wiper parking on
T 1 1000		
July 1998: TC:		
07/01/98	15:15:00	Turbidity spike >1000
07/15/98	08:30:00	Turbidity spike >1000 due to low
tide 07/15/98	22:00:00	Turbidity spike >1000 due to low
tide	22.00.00	randiately optime > 1000 date to 10w
07/22/98	03:45:00	Turbidity spike >1000 due to low
tide 07/23/98	17:15:00	Turbidity spike >1000 due to low
tide	17.13.00	rurbrurey spike >1000 due to 10w
07/26/98	04:15:00	Turbidity spike >1000
July 1998:		
GI:		
07/07/98 10		Sonde out of the water
07/23/98 12	2:15:00	Sonde out of the water
August 1998	3:	
TC:		
08/07/98 tide	17:45:00	Turbidity spike >1000 due to low
	3:30:00 to 08/21/98 08:15:00	DO membrane torn
08/23/98		Turbidity spike >1000
08/29/98 10	0:00:00 to 08/31/98 11:15:00	DO membrane torn
August 1998	3:	
GI:		
8/13/98 09:	:15:00 '98 09:45:00	Missing data due to time skip Missing data due to time skip
0/13/	30 03.43.00	MISSING data due to time skip
8/13/	98 10:00:00	Missing data due to time skip
September 1	1008.	
TC:	1990:	
	00:15:00 to 9/14/98 16:15:00	Missing data due to flooded
battery		
compartment		
September 1	1998:	
GI:	10.15.00	
09/12/98 possible	10:15:00	Sudden DO increase due to
membrane da	amage	
		DO eventually decrease due
to negative		
DO due to permembrane da		
09/23/98		Turbidity wiper parking on optics

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09/23/98
           12:30:00 to 09/23/98 12:45:00
                                            Turbidity wiper parking on
optics
09/23/98
           13:30:00 to 09/23/98 13:45:00
                                            Turbidity wiper parking on
optics
09/23/98
           14:30:00
                                       Turbidity wiper parking on optics
09/23/98
           15:15:00
                                       Turbidity wiper parking on optics
09/23/98
           16:15:00 to 09/23/98 16:30:00
                                            Turbidity wiper parking on
optics
09/23/98
           17:00:00 to 09/23/98 17:15:00
                                            Turbidity wiper parking on
optics
09/23/98
          18:00:00 to 09/23/98 18:15:00
                                            Turbidity wiper parking on
optics
09/23/98
           19:00:00
                                       Turbidity wiper parking on optics
09/23/98
           19:45:00
                                       Turbidity wiper parking on optics
09/23/98
          20:15:00
                                       Turbidity wiper parking on optic
09/23/98 20:45:00
                                       Turbidity wiper parking on optics
09/23/98
          21:15:00
                                       Turbidity wiper parking on optics
09/23/98
          22:15:00
                                       Turbidity wiper parking on optics
09/23/98 22:30:00
                                       Turbidity wiper parking on optics
09/23/98 23:00:00
                                       Turbidity wiper parking on optics
09/23/98 23:45:00
                                       Turbidity wiper parking on optics
         00:15:00
09/24/98
                                       Turbidity wiper parking on optics
09/24/98 00:45:00
                                       Turbidity wiper parking on optics
09/24/98 01:15:00
                                       Turbidity wiper parking on optics
09/24/98 01:45:00
                                       Turbidity wiper parking on optics
09/24/98
         02:30:00
                                       Turbidity wiper parking on optics
09/24/98 03:00:00
                                       Turbidity wiper parking on optics
09/24/98 03:30:00
                                       Turbidity wiper parking on optics
09/24/98 04:00:00
                                       Turbidity wiper parking on optics
09/24/98
         04:45:00
                                       Turbidity wiper parking on optics
09/24/98 05:15:00
                                       Turbidity wiper parking on optics
09/24/98 05:45:00
                                       Turbidity wiper parking on optics
09/24/98 06:30:00
                                       Turbidity wiper parking on optics
09/24/98
          07:30:00 to 09/24/98 07:45:00
                                            Turbidity wiper parking on
optics
09/24/98 08:15:00 to 09/24/98 08:30:00
                                            Turbidity wiper parking on
optics
09/24/98
           09:00:00
                                       Turbidity wiper parking on optics
09/24/98 09:45:00
                                       Turbidity wiper parking on optics
09/24/98 10:00:00
                                       Turbidity wiper parking on optics
09/24/98 10:45:00
                                       Turbidity wiper parking on optics
09/24/98
           11:30:00
                                       Turbidity wiper parking on optics
09/24/98
           11:45:00
                                       Turbidity wiper parking on optics
09/24/98
          12:30:00 to 09/24/98 12:45:00
                                            Turbidity wiper parking on
optics
09/24/98
           13:15:00
                                       Turbidity wiper parking on optics
           14:00:00 to 09/24/98 14:15:00
09/24/98
                                            Turbidity wiper parking on
optics
           17:30:00 to 09/24/98 18:00:00 Turbidity wiper parking on
09/24/98
optics
09/24/98
          18:30:00
                                       Turbidity wiper parking on optics
09/24/98 19:45:00
                                       Turbidity wiper parking on optics
09/24/98
          20:45:00
                                       Turbidity wiper parking on optics
```

09/24/98 optics	21:15:00	to	09/24/98	21:45:00	Turbidity	wiper parking on
09/24/98	22:30:00					parking on optics
09/24/98	23:30:00					parking on optics
09/25/98	00:15:00	to	09/25/98	00:30:00	Turbidity	wiper parking on
optics						
09/25/98	01:00:00	to	09/25/98	01:45:00	Turbidity	wiper parking on
optics						
09/25/98	02:30:00	to	09/25/98	03:00:00	Turbidity	wiper parking on
optics						
09/25/98	03:30:00	to	09/25/98	03:45:00	Turbidity	wiper parking on
optics						
09/25/98	04:15:00			Tu	rbidity wiper	parking on optics
09/25/98	04:45:00			Τυ	rbidity wiper	parking on optics
09/25/98	05:00:00	to	09/25/98	05:15:00	Turbidity	wiper parking on
optics					_	
09/25/98	05:45:00	to	09/25/98	06:00:00	Turbidity	wiper parking on
optics					_	
09/25/98	07:00:00	to	09/25/98	08:00:00	Turbidity	wiper parking on
optics					-	
09/25/98	08:45:00			Tu	rbidity wiper	parking on optics
09/25/98	09:00:00					parking on optics
09/25/98	09:45:00					parking on optics
09/25/98	10:00:00					parking on optics
09/25/98		t o	09/25/98			wiper parking on
optics	10.10.00		03/20/30	11.00.00	rarerarer	wiper parming on
09/25/98	12:00:00			Т1	ırhidity winer	parking on optics
09/25/98	12:30:00					parking on optics
09/25/98		t 0	09/25/98			wiper parking on
optics	13.30.00	CO	03/23/30	13.43.00	rarbrarcy	wiper parking on
09/25/98	14:45:00			Tu-	ırhidity winer	parking on optics
09/25/98	15:30:00					parking on optics
09/25/98	16:30:00					parking on optics
09/25/98		t 0	09/25/98			wiper parking on
optics	17.00.00	CO	03/23/30	17.13.00	rarbrarcy	wiper parking on
09/25/98	17:45:00			Ψ1	irhidity winer	parking on optics
09/25/98		t 0	09/25/98			wiper parking on
optics	10.00.00	CO	03/23/30	10.13.00	rarbrarcy	wiper parking on
09/25/98	19.30.00	+ 0	09/25/98	20.00.00	Turhidity	wiper parking on
optics	13.30.00	CO	03/23/30	20.00.00	rarbrarcy	wiper parking on
09/25/98	20.30.00	t 0	09/25/98	21.15.00	Turhidity	wiper parking on
optics	20.30.00	CO	03/23/30	21.13.00	rarbrarcy	wiper parking on
09/25/98	21:45:00			Ψ1.	irhidity winer	parking on optics
09/25/98		+ 0	09/25/98			wiper parking on
optics	22.50.00	CO	03/23/30	22.43.00	rarbrarcy	wiper parking on
09/25/98	23:15:00			m,	irhiditu winar	parking on optics
09/25/98	23:15:00					parking on optics
09/25/98		+ ^	09/26/98			wiper parking on
optics	00.40:00	LU	09/40/90	01.30.00	τατριατιγ	wither harvilla ou
09/26/98	02:00:00			т.	irhiditu winan	narking on ontice
09/26/98	02:00:00					parking on optics parking on optics
09/26/98	02:30:00					parking on optics
09/26/98		+ ~	09/26/98			
	03:30:00	LO	09/40/98	04:13:00	ιπτριαττλ	wiper parking on
optics						

09/26/98	04:45:00				Turbidity wipe	r parking on optics
09/26/98	05:15:00				Turbidity wipe	r parking on optics
09/26/98	05:45:00					r parking on optics
09/26/98	06:15:00					r parking on optics
09/26/98	06:45:00					r parking on optics
09/26/98	07:15:00					r parking on optics
09/26/98	07:45:00					r parking on optics
09/26/98	07:43:00					r parking on optics
09/26/98	08:45:00					r parking on optics
09/26/98	09:15:00					r parking on optics
09/26/98	09:45:00		00/06/00	10 00 0		r parking on optics
09/26/98	10:15:00	to	09/26/98	10:30:0	U Turbidity	y wiper parking on
optics						
09/26/98	11:00:00					r parking on optics
09/26/98	11:30:00					r parking on optics
09/26/98	12:00:00					r parking on optics
09/26/98	12:30:00	to	09/26/98	13:00:0	0 Turbidity	y wiper parking on
optics						
09/26/98	13:30:00				Turbidity wipe	r parking on optics
09/26/98	14:00:00	to	09/26/98	19:30:0	0 Turbidity	y wiper parking on
optics						
09/26/98	20:00:00	to	09/27/98	08:45:0	0 Turbidit	y wiper parking on
optics					-	
09/27/98	09:15:00	t.o	09/27/98	09:45:0	O Turbidity	y wiper parking on
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optics	10.10.00	00	03/21/30	10.30.0	o rarbrare,	wiper parking on
09/27/98	11.00.00	+ 0	09/27/98	11.30.0	O Turbidit	y wiper parking on
optics	11.00.00	CO	03/21/30	11.50.0	o laibiaic	wiper parking on
09/27/98	12.00.00	+ ~	09/27/98	12.15.0	O Turbidit	y wiper parking on
optics	12.00.00	LO	09/21/90	12.13.0	o lulbiait	y wiper parking on
09/27/98	12:45:00				m	n namina an antica
			00/07/00	12 20 0		r parking on optics
09/27/98	13:15:00	to	09/27/98	13:30:0	U Turbiait	y wiper parking on
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09/27/98	14:00:00	to	09/27/98	14:15:0	U Turbidity	y wiper parking on
optics						
09/27/98	14:45:00					r parking on optics
09/27/98	15:00:00					r parking on optics
09/27/98	15:30:00	to	09/27/98	15:45:0	0 Turbidity	y wiper parking on
optics						
09/27/98	16:15:00				Turbidity wipe	r parking on optics
09/27/98	16:45:00	to	09/27/98	17:00:0	0 Turbidity	y wiper parking on
optics						
09/27/98	17:30:00	to	09/27/98	17:45:0	0 Turbidity	y wiper parking on
optics					•	-
09/27/98	18:15:00				Turbidity wipe	r parking on optics
09/27/98		to	09/27/98	19:15:0		wiper parking on
optics		- 0	= . / 3 3	0 . 0	_ = = = = = = = = = = = = = = = = = = =	. 1 - 1
09/27/98	21:15:00				Turbidity wine	r parking on optics
09/27/98	21:45:00					r parking on optics
09/27/98	22:30:00					r parking on optics
03/21/30	22.50.00				rarbrarcy wibe	r barking on obcics

October 1998:

TC:

10/14/98 22:45:00 to 10/28/98 09:30:00 Temperature probe failure affecting

Sp. Cond., salinity, DO data, and pH

October 1998:

GI:

November 1998:

TC:

11/10/98 10:00:00

Instrument out of the water due to low

tide

November 1998:

GI:

December 1998:

TC:

December 1998:

GI:

12/01/98 11:00:00 to 12/01/98 14:15:00 out of the water due to low tide 12/03/98 01:00:00 to 12/03/98 03:00:00 out of the water due to low tide 12/03/98 14:45:00 to 12/03/98 15:00:00 out of the water due to low tide 12/04/98 02:15:00 to 12/04/98 03:00:00 out of the water due to low tide

12. Remarks

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.

Please note that in December of 1997, construction work began and is ongoing at

the York River State Park in an effort to reduce erosion problems from the steep

banks into the creek. This may be effecting the Taskinas Creek deployment

readings, especially for turbidity. All construction work is taking place about

75 feet upstream from the deployment site.

The Goodwin Islands February file from 02/19/98 10:30:27 to 02/28/98 23:45:27

was off by +27 seconds, but was corrected.

Several files were recorded in Daylight Savings Time instead of Eastern Standard

Time (EST). Tammy Dorman corrected the following files so that they would be in

accordance with the NERR System Wide Monitoring Program by displaying the date

and time in EST.

TC980415.csv was corrected to EST GI980414.csv was corrected to EST