

Chesapeake Bay Virginia (CBV) NERR Water Quality Metadata
September - December 1995
Latest update: November 1, 2002

I. Data Set and Research Descriptors

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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 (down time) were inserted into the spreadsheet and denoted by periods (.). Data that were 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 Chesapeake Bay National Estuarine Research Reserve

Virginia (CBNERRVA) file server and uploaded to the CDMO FTP site. All Taskinas Creek files from 1995 have been verified using the latest update of the Microsoft Excel 5.0 macro programs which identified outliers (values that fall outside of the calibration range- see section II.8 of this document) and other erroneous data. Outliers were determined according to the instruments' manufacturers manual. Rob Breeding edited data from 9/95-12/95. Bill Seufzer updated and corrected the Rob Breeding edited data. Tammy Dorman processed the data through the latest update of the CDMO macro and conducted final editing of the data. Following final editing, Tammy Dorman uploaded the database to the CBNERRVA server and to CDMO.

3. Research Objectives

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. 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 data loggers were maintained, downloaded, cleaned, and calibrated at two-week intervals.

4. Research methods

The CBNERRVA maintains a long-term water quality-monitoring program, which consists of a single station located in the transitional zone of the York River tributary. A simple deployment was arranged with the State Park where a secured YSI 6000 unit hangs at a fixed depth (0.5m above the creek bed) from an overhanging tree approximately six meters upstream from the parks canoe landing. Specific conductance, pH, depth, temperature, dissolved oxygen, and turbidity

are recorded at 15-minute intervals. Salinity and DO saturation are calculated as a function of temperature and specific conductivity readings. Turbidity data was not collected until 1/96. At approximately two-week intervals, the data logger was returned to the lab for downloading, cleaning, membrane replacement and recalibration. Maintenance intervals were determined according to the amount of biofouling that occurred and to accommodate battery life. A second YSI 6000 data logger was deployed following retrieval of the original YSI data logger 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. Data is 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: (Latitude 37 deg 24' 54.04617" N, Longitude 76 deg 42' 51.75733" W). The Taskinas Creek Component of the CBNERRVA 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 approximately 10 kilometers north of Williamsburg. The creek flows in a northeasterly direction covering a distance of about 5.5 kilometers eventually feeding into the York River. The sampling station is located on the second bend from the mouth of Taskinas Creek within York River State Park, about 6 meters upstream from the parks canoe landing. The sediment type at this station consists of 42% fine sand, 30% clay, and 28% silt. The creek is tidal for approximately half of its length with a tidal range of 0.00-1.3m. 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 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.

6. Data collection period

Ongoing sampling at Taskinas Creek (TC) began September 12, 1995.

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 since its inception January 10, 1990. This project samples some overlapping parameters including dissolved oxygen and salinity on a two-week basis.

II. Physical Structure Descriptors

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

Variable	Range of Measurements (units)	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 sec	NA
Temp	-5.0 to 45.0 (°C)	0.01 °C	+/-
0.15 °C			
SpConductance	0-100 (mS/cm)	0.01 mS/cm	+/-
0.5%			
reading + 0.001 mS/cm			
Salinity	0-70 Parts per thousand (ppt)	0.01ppt	+/-
1.0%			
reading or 0.1ppt, (whichever is greater)			
DO	0-200 (% air saturation)	0.1% @ air sat	+/-
2.0% @ air sat			
DO	200-500 (% air saturation)	0.1% @ air sat	+/-
6.0% @ air sat			
DO	0-20 (mg/L)	0.01 mg/L	+/-
0.2 mg/L			
DO	20-50 (mg/L)	0.01 mg/L	+/-
0.6 mg/L			
Depth	0-9.1 (m)	0.001 m	+/-
0.018 m			
PH	2-14 units	0.01 units	+/-
0.2 units			

9. Coded variable indicator and variable code definitions

Site definitions: TC = Taskinas Creek.

File definitions: YSI deployment site/month/year (ex.: TC0995 = Taskinas Creek data from September 1995).

10. Data anomalies (suspect data)

Infrequent 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 a non-vented level probe can be influenced by as much as

0.39m (1.3 feet) during a severe low-pressure hurricane event. Specific dates

and time ranges of potentially influenced data are listed with each respective

month.

September 1995:

TC:

9/13/95 06:00:00 to 08:00:00 Negative depth values
due to low

tides or low-pressure system

9/13/95 18:15:00 to 20:45:00 Negative depth values
due to low

tides or low-pressure system

9/14/95 05:45:00 to 07:00:00 Negative depth values
due to low

tides or low-pressure system

9/14/95 07:15:00 to 08:00:00 All sensors were out
of water

due to low tide

9/14/95 08:15:00 to 09:45:00 Negative depth values
due to low

tides or low-pressure

9/14/95 18:30:00 to 22:00:00 Negative depth values
due to low

tides or low-pressure system

9/14/95 23:00:00 to 9/27/95 09:00:00 DO data (%Sat and
mg/l) have

been deleted. It appears that during a low tide the sensors were out of
the water.

It is possible that the DO membrane dried out causing readings after this
event

to drift towards zero.

9/22/95 14:00:00 to 15:15:00 Negative depth values
due to low

tides or low-pressure system.

October 1995:

TC:

10/21/95 09:45:00 to 10/31/95 23:45:00 Suspect DO probe is bad; low pre- DO% and high post- DO% usually indicates a problem with the membrane integrity or the probe itself.

10/21/95 09:45:00 to 10/31/95 23:45:00 pH readings drifted possibly due to a bad probe. The graph of the data indicates a probe malfunction.

10/24/95 04:00:00 to 04:30:00 Negative depth values due to low tides or low-pressure system

10/30/95 08:45:00 to 09:30:00, 10/30/95 21:30:00, and 10/31/95 09:45:00 to 11:15:00 Three low salinity records occurred due to freshwater movement downstream on very low tides, or the probes were out of the water. If the probes were out of the water and atmospheric pressure was great enough, the depth data could still show a slightly positive number. Close examination of the data shows a sharp drop of salinity and conductivity with a later sharp increase. This adds weight to the argument of probes being out of the water. Data from these events have been left intact, but should be treated as suspect.

10/30/95 21:45:00 to 10/30/95 23:15:00 All sensors were out of the water due to a low tide

November 1995:

TC:

11/01/95 00:00:00 to 11/03/95 16:30:00 Suspect DO probe is bad -

low pre- DO% and high post- DO% usually indicates a problem with the membrane integrity or the probe itself.

11/01/95 00:00:00 to 11/03/95 16:30:00 pH readings drifted possibly due

to a bad probe. The graph of the data clearly indicates that there was something wrong with this probe.

11/05/95 03:00:00 to 03:45:00 Low DO spikes occurred during low tide conditions

11/07/95 16:00:00 to 17:45:00 Negative depths due to low

tides or low-pressure systems

11/07/95 17:00:00 to 20:45:00 Low DO spikes occurred during low tide conditions

11/09/95 18:30:00 to 20:00:00 occurred during low tide conditions	Low DO spikes
11/12/95 07:00:00 to 11:30:00 occurred during low tide conditions	Low DO spikes
11/17/95 14:30:00 to 11/30/95 23:45:00 it appears that the depth port may have been plugged resulting in many periods of negative data and peak depths much lower than normal.	Depth data removed;
December 1995:	
TC:	
12/01/95 00:00:00 to 10:30:00 depth port may have been plugged resulting in many periods of negative data and peak depths much lower than normal.	It appears that the
12/01/95 23:00:00 to 23:30:00 to low tides or low-pressure	Negative depths due
12/02/95 01:45:00 to 02:00:00 to low tides or low-pressure	Negative depths due
12/01/95 23:45:00 to 12/02/95 01:30:00 of water due to low tide	All sensors were out
12/02/95 23:45:00 to 12/03/95 03:00:00 of water due to low tide	All sensors were out
12/03/95 13:15:00 to 15:30:00 of water due to low tide	All sensors were out
12/04/95 01:30:00 to 03:00:00 of water due to low tide	All sensors were out
12/10/95 18:00:00 to 20:45:00 of water due to low tide	All sensors were out
12/11/95 04:45:00 to 09:30:00 of water due to low tide	All sensors were out
12/11/95 16:45:00 to 22:30:00 of water due to low tide	All sensors were out
12/12/95 05:00:00 to 09:30:00 of water due to low tide	All sensors were out
12/12/95 18:15:00 to 21:45:00 of water due to low tide	All sensors were out
12/21/95 15:15:00 to 17:00:00 of	All sensors were out

water due to low tide	
12/22/95 03:00:00 to 06:00:00	All sensors were out
of	
water due to low tide	
12/22/95 15:00:00 to 19:00:00	All sensors were out
of	
water due to low tide	
12/23/95 02:45:00 to 07:00:00	All sensors were out
of	
water due to low tide	
12/23/95 16:45:00 to 19:00:00	All sensors were out
of	
water due to low tide	
12/24/95 05:15:00 to 06:45:00	All sensors were out
of	
water due to low tide	
12/27/95 07:30:00 to 10:00:00	All sensors were out
of	
water due to low tide	
12/27/95 19:15:00 to 22:45:00	All sensors were out
of	
water due to low tide	

Note: The original *.dat and *.csv files were not found for data collected between 12/15/95 17:15:00 to 12/31/95 23:45:00. The data presented here is from a *.xls file that was found in the archives. Missing or anomalous data may be the result of the old the old formatting standard.

12/15/95 17:15:00 to 18:45:00	Negative depth values
due	
to low tides or low-pressure system	
12/19/95 00:00:00 to 02:30:00	Negative depth values
due	
to low tides or low-pressure system	
12/19/95 13:00:00 to 15:45:00	Negative depth values
due	
to low tides or low-pressure system	
12/20/95 01:45:00 to 03:15:00	Negative depth values
due	
to low tides or low-pressure system	
12/20/95 13:45:00 to 16:45:00	Negative depth values
due	
to low tides or low-pressure system	
12/21/95 01:45:00 to 04:45:00	Negative depth values
due	
to low tides or low-pressure system	
12/21/95 14:15:00 to 15:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/21/95 17:15:00 to 18:00:00	Negative depth values
due	

to low tides or low-pressure system 12/22/95 01:30:00 to 02:45:00 due	Negative depth values
to low tides or low-pressure system 12/22/95 06:15:00 to 07:30:00 due	Negative depth values
to low tides or low-pressure system 12/22/95 14:15:00 to 14:45:00 due	Negative depth values
to low tides or low-pressure system 12/22/95 19:15:00 to 19:30:00 due	Negative depth values
to low tides or low-pressure system 12/23/95 02:00:00 to 02:30:00 due	Negative depth values
to low tides or low-pressure system 12/23/95 07:15:00 to 08:00:00 due	Negative depth values
to low tides or low-pressure system 12/23/95 15:45:00 to 16:30:00 due	Negative depth values
to low tides or low-pressure system 12/23/95 19:15:00 to 20:00:00 due	Negative depth values
to low tides or low-pressure system 12/24/95 04:00:00 to 05:00:00 due	Negative depth values
to low tides or low-pressure system 12/24/95 07:00:00 to 08:00:00 due	Negative depth values
to low tides or low-pressure system 12/24/95 17:00:00 to 19:45:00 due	Negative depth values
to low tides or low-pressure system 12/25/95 05:15:00 to 09:00:00 due	Negative depth values
to low tides or low-pressure system 12/25/95 17:45:00 to 21:15:00 due	Negative depth values
to low tides or low-pressure system 12/26/95 05:45:00 to 10:00:00 due	Negative depth values
to low tides or low-pressure system 12/26/95 18:00:00 to 22:30:00 due	Negative depth values
to low tides or low-pressure system 12/27/95 06:30:00 to 07:15:00 due	Negative depth values
to low tides or low-pressure system 12/27/95 10:15:00 to 11:00:00 due	Negative depth values
to low tides or low-pressure system 12/27/95 18:00:00 to 19:00:00 due	Negative depth values

to low tides or low-pressure system	
12/27/95 23:00:00 to 12/28/95 01:15:00	Negative depth values
due	
to low tides or low-pressure system	
12/28/95 07:30:00 to 10:15:00	Negative depth values
due	
to low tides or low-pressure system	
12/28/95 20:45:00 to 23:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/29/95 22:30:00 to 22:45:00	Negative depth values
due	
to low tides or low-pressure system	
12/29/95 23:45:00 to 12/30/95 00:45:00	Negative depth values
due	
to low tides or low-pressure system	

11. Missing data

Missing data is either the result of

- 1) the YSI not deployed (exact reason unknown**)
- 2) a probe not attached
- 3) a probe malfunction
- 4) probe exposure to the atmosphere

** Exact reasons are unknown due to change in staffing.

September 1995:

TC:

09/01/95 00:00:00 to 09/12/95 10:30:00	YSI not deployed
09/12/95 10:30:00 to 09/30/95 23:45:00	Turbidity probes not
yet available.	

09/14/95 07:15:00 to 08:00:00	All sensors were out
of	

water due to low tide

09/14/95 23:00:00 to 09/27/95 09:00:00	DO data (%Sat and
mg/l) have	

been deleted. It appears that during a low tide the sensors were out of the water.

It is possible that the DO membrane dried out causing readings after this event to drift towards zero.

09/27/95 09:15:00 to 09/30/95 23:45:00	Maintenance
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October 1995:

TC:

10/01/95 00:00:00 to 10/21/95 09:30:00	Maintenance
10/21/95 09:45:00 to 10/31/95 23:45:00	Turbidity probes not
yet available.	

10/21/95 09:45:00 to 10/31/95 23:45:00	pH readings drifted
possibly due	

to a bad probe. The graph of the data clearly indicates a probe malfunction.

10/21/95 09:45:00 to 10/31/95 23:45:00	Suspect DO probe is
bad -	

low pre- DO% and high post- DO% usually indicates a problem with the membrane integrity or the probe itself.
10/30/95 21:45:00 to 10/30/95 23:30:00 All sensors were out of the water due to a low tide

November 1995:

Note- * Data not missing

TC:

11/01/95 00:00:00 to 11/03/95 16:30:00 Suspect DO probe is bad - low

pre- DO% and high post- DO% usually indicates probe malfunction.

11/01/95 00:00:00 to 11/03/95 16:30:00 pH readings drifted possibly due to a

bad probe. The graph of the data indicates a probe malfunction.

11/01/95 00:00:00 to 11/30/95 23:45:00 No turbidity, probes not yet available.

*11/03/95 16:45:00

Replacement sonde deployed
pH readings not

11/03/95 16:45:00 to 11/17/95 14:15:00 recorded due to

a broken probe.

11/17/95 14:30:00 to 11/30/95 23:45:00 Depth data removed; it appears that

the depth port may have been plugged resulting in many periods of negative data and peak depths much lower than normal.

*11/17/95 14:30:00

Replacement sonde deployed

December 1995:

Note- * Data not missing

TC:

12/01/95 00:00:00 to 10:30:00 It appears that the depth port may have been

plugged resulting in many periods of negative data and peak depths much lower than normal.

12/01/95 00:00:00 to 12/31/95 23:45:00 No turbidity, probes not yet available.

12/01/95 10:45:00 to 15:00:00

Maintenance

12/01/95 23:45:00 to 12/02/95 01:30:00 All sensors were out of water

due to low tide

12/02/95 23:45:00 to 12/03/95 03:00:00 All sensors were out of water

due to low tide

12/03/95 13:15:00 to 15:30:00 All sensors were out of

water due to low tide

12/04/95 01:30:00 to 03:00:00 All sensors were out of water

due to low tide

12/10/95 18:00:00 to 20:45:00 of water due to low tide	All sensors were out
12/11/95 04:45:00 to 09:30:00 of water due to low tide	All sensors were out
12/11/95 16:45:00 to 22:30:00 of water due to low tide	All sensors were out
12/12/95 05:00:00 to 09:30:00 of water due to low tide	All sensors were out
12/12/95 18:15:00 to 21:45:00 of water due to low tide	All sensors were out
*12/15/95 17:15:00	Replacement sonde deployed
12/21/95 15:15:00 to 17:00:00 of water due to low tide	All sensors were out
12/22/95 03:00:00 to 06:00:00 of water due to low tide	All sensors were out
12/22/95 15:00:00 to 19:00:00 of water due to low tide	All sensors were out
12/23/95 02:45:00 to 07:00:00 of water due to low tide	All sensors were out
12/23/95 16:45:00 to 19:00:00 of water due to low tide	All sensors were out
12/24/95 05:15:00 to 06:45:00 of water due to low tide	All sensors were out
12/27/95 07:30:00 to 10:00:00 of water due to low tide	All sensors were out
12/27/95 19:15:00 to 22:45:00 of water due to low tide	All sensors were out
12/30/95 14:15:00 to 12/31/95 23:45:00	Maintenance

Note: The original *.dat and *.csv files were not found for data collected between 12/15/95 17:15:00 to 12/31/95 23:45:00. The data presented here is from a *.xls file that was found in the archives. Missing or anomalous data may be the result of the old the old formatting standard.

12/15/95 17:15:00 to 18:45:00 due to low tides or low-pressure system	Negative depth values
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12/19/95 00:00:00 to 02:30:00	Negative depth values
due	
to low tides or low-pressure system	
12/19/95 13:00:00 to 15:45:00	Negative depth values
due	
to low tides or low-pressure system	
12/20/95 01:45:00 to 03:15:00	Negative depth values
due	
to low tides or low-pressure system	
12/20/95 13:45:00 to 16:45:00	Negative depth values
due	
to low tides or low-pressure system	
12/21/95 01:45:00 to 04:45:00	Negative depth values
due	
to low tides or low-pressure system	
12/21/95 14:15:00 to 15:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/21/95 17:15:00 to 18:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/22/95 01:30:00 to 02:45:00	Negative depth values
due	
to low tides or low-pressure system	
12/22/95 06:15:00 to 07:30:00	Negative depth values
due	
to low tides or low-pressure system	
12/22/95 14:15:00 to 14:45:00	Negative depth values
due	
to low tides or low-pressure system	
12/22/95 19:15:00 to 19:30:00	Negative depth values
due	
to low tides or low-pressure system	
12/23/95 02:00:00 to 02:30:00	Negative depth values
due	
to low tides or low-pressure system	
12/23/95 07:15:00 to 08:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/23/95 15:45:00 to 16:30:00	Negative depth values
due	
to low tides or low-pressure system	
12/23/95 19:15:00 to 20:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/24/95 04:00:00 to 05:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/24/95 07:00:00 to 08:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/24/95 17:00:00 to 19:45:00	Negative depth values
due	
to low tides or low-pressure system	

12/25/95 05:15:00 to 09:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/25/95 17:45:00 to 21:15:00	Negative depth values
due	
to low tides or low-pressure system	
12/26/95 05:45:00 to 10:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/26/95 18:00:00 to 22:30:00	Negative depth values
due	
to low tides or low-pressure system	
12/27/95 06:30:00 to 07:15:00	Negative depth values
due	
to low tides or low-pressure system	
12/27/95 10:15:00 to 11:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/27/95 18:00:00 to 19:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/27/95 23:00:00 to 12/28/95 01:15:00	Negative depth values
due	
to low tides or low-pressure system	
12/28/95 07:30:00 to 10:15:00	Negative depth values
due	
to low tides or low-pressure system	
12/28/95 20:45:00 to 23:00:00	Negative depth values
due	
to low tides or low-pressure system	
12/29/95 22:30:00 to 22:45:00	Negative depth values
due	
to low tides or low-pressure system	
12/29/95 23:45:00 to 12/30/95 00:45:00	Negative depth values
due	
to low tides or low-pressure system	

12. Remarks:

In 1995, 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.

TC950912.csv was corrected to EST

TC951021.csv was corrected to EST

TC951103.csv was corrected to EST

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.

The instrument was deployed on a rope that was tied to a tree branch and therefore

may have been deployed at a slightly different depth for each deployment.

This

situation was corrected in the fall of 1996 with the use of steel cable and mounting

hardware that keeps the instrument at a fixed elevation above the creek bottom,

however is influenced by the current causing the instrument to sway as the tides change.

Taskinas Creek experiences extremely low tides where it is difficult to determine

times when the probes are out of the water and when they are not. If the YSI would

have been more securely deployed and at a fixed depth from the bottom, the problem

of exposure from low tides might have been lessened. Also there is an ongoing problem

with land subsidence in Taskinas Creek, which at times affects our deployment because

the tree from which our unit is attached, sinks with the land. Current efforts are being

made to construct a more stable and elevation referenced station.