Maryland Chesapeake Bay Tributary Water Quality Monitoring Program - 2011

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Maryland Department of Natural Resources, Resource Assessment Service
Publication_Date: 20120427
Title: Md DNR Chesapeake Bay Tributary Water Quality Monitoring Program 2011
Geospatial_Data_Presentation_Form: Spatial dataset
Online_Linkage: [http://www.chesapeakebay.net/data/index.htm]

Description:
Abstract:
The physical/chemical component of the Maryland Chesapeake Bay Water Quality Monitoring Program consists of water quality monitoring data collected at seventy tributary stations. Samples at all tributary stations are collected monthly.

This program assesses the water quality by evaluating the levels of nutrients and closely related habitat impacts such as dissolved oxygen and water clarity. One of the main goals of the Chesapeake Bay restoration is to reduce the impacts of excess nutrients on the Bay and its tributaries and these measurements provide some of the most direct linkages to management programs that are achieving this goal. The Chesapeake Bay Program jurisdictions have agreed to reduce nitrogen, phosphorus and sediment pollution to the Bay.

Purpose:
The Maryland Department of Natural Resources Chesapeake Bay Water Quality Monitoring Program is part of a cooperative effort between the Federal government and State and local governments in the Chesapeake Bay watershed to assess the status and trends of nutrient and sediment concentrations in Maryland's Chesapeake Bay mainstem and its tidal tributaries.

The information is integrated with data from other Bay water quality stations and living resources monitoring projects and used to understand linkages, temporal variation and long-term trends.

Water quality data are used to refine, calibrate and validate Chesapeake Bay ecological models. The models are used to develop and assess water quality criteria with the goal of removing the Chesapeake Bay and its tidal rivers from the list of impaired waters.

Supplemental_Information:
The target audiences for this information include Resource Managers, Technical/Scientific Users, Government, Educators, Students and General Public.

Data users who desire very detailed information about Water Quality Monitoring data-definition, sampling-procedures and data-processing are encouraged to refer to the two documents listed below. The documents may be obtained from The Chesapeake Bay Program Office.

Water Quality Database - Database Design and Data Dictionary, Prepared For: U.S. Environmental Protection Agency, Region III, Chesapeake Bay Program Office, January 2004. [http://archive.chesapeakebay.net/pubs/cbwqdb2004_RB.PDF].

The most current version of the Water Quality Data Dictionary - Online may be found at: [http://archive.chesapeakebay.net/data/data_dict.cfm?DB_CODE=CBP_WQDB].

The Quality Assurance Project Plan for the Maryland Department of Natural Resources Chesapeake Bay Water Quality Monitoring Program - Chemical and Physical Properties Component for the period July 1, 2011 - June 30, 2012
[http://mddnr.chesapeakebay.net/eyesonthebay/documents/MTQAPP2011_draft1v1.pdf]

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 20110101
Ending_Date: 20111231
Currentness_Reference: Ground Condition
Status:
Progress: Complete
Maintenance_and_Update_Frequency: As needed
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -79.4938
East_Bounding_Coordinate: -75.0405
North_Bounding_Coordinate: 39.7425
South_Bounding_Coordinate: 37.8713
Keywords:
Theme:
Theme_Keyword_Thesaurus: Olsen, L.M., G. Major, K. Shein, J. Scialdone, R. Vogel, S. Leicester, H. Weir, S. Ritz, T. Stevens, M. Meaux, C.Solomon, R. Bilodeau, M. Holland, T. Northcutt, R. A. Restrepo, 2007. NASA/Global Change Master Directory (GCMD) Earth Science Keywords. Version 6.0.0.0.0 Online: [http://gcmd.nasa.gov/Resources/valids//gcmd_parameters.html]
Theme_Keyword: Biosphere > Aquatic Ecosystems > Estuarine Habitat
Theme_Keyword: Biosphere > Aquatic Ecosystems > Rivers/Stream Habitat

Theme_Keyword: Biosphere > Ecological Dynamics > Ecosystem Functions > Nutrient Cycling
Theme_Keyword: Biosphere > Ecological Dynamics > Ecosystem Functions > Primary Production
Theme_Keyword: Terrestrial Hydrosphere > Surface Water > Rivers/Streams
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Chlorophyll
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Conductivity
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Light Transmission
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Nitrogen Compounds
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Nutrients
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Oxygen
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > pH
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Phosphorous Compounds
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Suspended Solids
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Turbidity
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Temperature
Place:
Place_Keyword_Thesaurus: Producer Defined
Place_Keyword: Chesapeake Bay
Place_Keyword: Maryland
Place_Keyword: Monitoring Segment
Place_Keyword: Tidal Tributaries
Place_Keyword: Back Creek
Place_Keyword: Back River
Place_Keyword: Big Annemessex River
Place_Keyword: Bohemia River
Place_Keyword: Bush River
Place_Keyword: Chester River
Place_Keyword: Chicamacomico River
Place_Keyword: Choptank River
Place_Keyword: Corsica River
Place_Keyword: Eastern Bay
Place_Keyword: Elk River
Place_Keyword: Fishing Bay
Place_Keyword: Gunpowder River
Place_Keyword: Little Choptank River
Place_Keyword: Magothy River
Place_Keyword: Middle River
Place_Keyword: Manokin River
Place_Keyword: Nanticoke River

Place_Keyword: Northeast River
Place_Keyword: Patapsco River
Place_Keyword: Patuxent River
Place_Keyword: Pocomoke River
Place_Keyword: Potomac River
Place_Keyword: Rhode River
Place_Keyword: Sassafras River
Place_Keyword: Severn River
Place_Keyword: South River
Place_Keyword: Transquaking River
Place_Keyword: Wicomico River

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Renee Karrh
Contact_Position: Program Manager
Contact_Address:
Address_Type: Mailing and physical
Address: 580 Taylor Avenue, D2
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21401
Contact_Voice_Telephone: 410-260-8630
Contact_Electronic_Mail_Address: rkarrh_No_Spam_@dnr.state.md.us [Remove _No_Spam_ for valid email address]
Browse_Graphic:
Browse_Graphic_File_Name:
[http://mddnr.chesapeakebay.net/eyesonthebay/documents/metadata/TribsStns2011.pdf]
Browse_Graphic_File_Description: Map of seventy 2009-2010 Maryland Chesapeake Bay Tributary Water Quality Monitoring Sites.
Browse_Graphic_File_Type: PDF
Data_Set_Credit:
Maryland Department of Natural Resources (MDDNR) Resource Assessment Service (RAS) staff collected the majority of samples and processed the data. The Nutrient Analytical Services Laboratory (NASL) at the Chesapeake Biological Laboratory (Univ. of MD) analyzed chlorophyll, nutrient and suspended solids samples.

The project was made possible with funding provided by The State of Maryland.

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:

Quality Assurance/Quality Control. Maryland Department of Natural Resources followed specific procedures to ensure that the Tributary component of the Chesapeake Bay Water Quality Monitoring Program design was properly implemented and managed with sufficient accuracy, precision and detection limits. Accuracy (closeness to the true value) of collected data was controlled and assured by proper use, calibration and maintenance of both field and laboratory equipment for the measurement of physical and chemical parameters.

The procedures to control and assure the accuracy of field measurements involved the calibration of field instruments, the verification of calibrations, and equipment maintenance. Most of the details of how data acquired with YSI sondes and Hydrolab sondes were quality assured and quality controlled are described in the process description elements in the Lineage portion of this metadata record.

Daily quality control checks which included the running of blanks and standards were used to control and assure laboratory accuracy.

Accuracy of Chesapeake Biological Laboratory, Nutrient Analytical Services Laboratory (CBL NASL) results was also assessed through DNR's participation in the Chesapeake Bay Coordinated Split Sample Program (CSSP) a split sampling program in which five laboratories involved in Chesapeake Bay monitoring analyze the coordinated split samples. CSSP was established in June 1989 to establish a measure of comparability between sampling and analytical operations for water quality monitoring throughout the Chesapeake Bay and its tributaries. DNR followed the protocols in the Chesapeake Bay Coordinated Split Sample Program Implementation Guidelines (EPA 1991) and its revisions. Split samples were collected quarterly. Results were analyzed by appropriate statistical methods to determine if results differed significantly among labs. If a difference occurred, discussions began regarding techniques and potential methods changes to resolve discrepancies.

January 2011- The data sonde hit the bottom at station LE1.2 and a field sheet comment indicated depth readings were off a bit. Another field sheet comment made at station NBP0461 noted that bridge construction was still ongoing and that the water was tinted orange. At station XGG8251it was noted that the Secchi disk depth was greater than the water depth at dock and that the Secchi measurement was not made from the bridge. Bottom and below-pycnocline water samples at station EE2.1were collected out of the same bottle.

February 2011- No known issues.

March 2011 - Orange colored filtration pads were noted at station NBP0689.

April 2011 - No known issues.

May 2011 - A field sheet comment at station NBP0689 noted that the filter pads were orange. At station ET4.1 it was stated that water column readings were taken from the water samples because the sonde cable was too short.

June 2011 - At station CCR0001 field sheet comments noted that the lake was backed up into the creek and that the water was orange colored. At station ET10.1, lack of rain for the previous two months and that a second sonde also read 1.6 PPT was noted. Dead fish were seen in the river near station ET4.1.

July 2011 - At station XFB1986 a comment observed that the surface water column readings were double checked using Hydrolab meter B. At station CCR0001 field sheet comments noted that the lake was backed up into the creek and that the water was orange colored. Very orange murky water was notated at station GEO0009. An algae scum on the water was noted at station ET3.1 and dissolved oxygen and pH readings were double checked using a second data sonde.

August 2011 - A comment at station ET6.1 indicted that the alpha bottle had broken from the cable and that a weighted bottle was used when the bottom sample was collected. At station ANA0082 it was noted that the water contained either an algal bloom or a sediment load. At station WT1.1 it was noted that the surface pH was questionable. Meter scoping due to current was noted at station ET10.1.

September 2011 - Notes about Tropical Storm Lee were made at stations: BDK0000, CAS0479, CCR0001, GEO0009, LYO0004, NBP0103, NBP0326, NBP0461, NBP0534, NBP0534, NBP0689, POT2766, SAV0000, TOW0030, YOU0925 and YOU1139. Heavy rain during the week befor sampling was noted at stations MAT0016, RET2.1, RET2.4, TF2.1, TF2.2, TF2.4 and XFB1986. Construction on the bridge was noted at station ET4.1 and construction on the shoreline was noted at station MAT0016. The 7.0m dissolved oxygen reading was double checked at station WT7.1.

October 2011 - At station MAT0078 it was observed that dissolved oxygen readings using meter Q were unstable and that the value of a reading taken with meter T was 8.9 mg/l. A very high water level due to high winds was noted at station ET3.1. Stations NBP0326 and NBP0461 both had comments about rain preceding sampling and felled trees on the stream bank.

November 2011 - At station CCR0001 it was remarked that pH readings dropped very slowly and that fifteen minutes elapsed before the reading was recorded. Dark orange water color and discharge from a reservoir pipe was noted at station GEO0009. Light, chalky colored run off from a drain pipe just downstream from the bridge was noted at station LYO0004. It was remarked at station NBP0461 that a large area of the river was filled in by gravel and fill upstream of the sampling area.

December 2011 - A field sheet comment made at station CCR0001 noted that pH started at 8.2 and slowly dropped to 7.5. Bridge work on the downstream side of the bridge was noted at station MAT0078. Current at station EE2.2 caused the data sonde meter to scope. An oily sheen was observed on the water at station XDJ9007.

Logical_Consistency_Report:

January 2011 - Station TF1.3 samples were collected from a fishing pier next to the bridge and the Secchi disk depth exceeded the total depth. The samples at station CCR0001 were collected at the edge of the creek because there was ice under the bridge. Station ET5.1 was sampled from the dock at the boat ramp. Station ET5.2 was led from the fishing pier. Station NBP0689 was sampled from the bridge. Station WIW0141 was sampled from the bulkhead. The Secchi disk depth measurement at station XGG8251 was not made from the bridge.

February 2011 - Stations NBP0689 and XGG8251 were sampled from the bridge. Samples for station WT4.1 were collected one half mile upstream from the station at the West Shore Yacht Center.

March 2011 - The station TF1.3 samples were collected from the route 4 bridge.

April 2011 - Station TF1.3 was sampled from the bridge. At station CCM0069, the initial readings were recorded from meter Q and replicate readings were recorded from meter O which was configured with a Clark cell. At station PXT0809, the battery of data sonde R was dead at the site. Temperature was measured with a glass thermometer on site and dissolved oxygen, pH, conductivity and salinity measurements were obtained at the field office, half an hour later, using another meter.

May 2011 - Station NBP0326 was sampled from the bank. Station TF1.3 was sampled from the bridge.

June 2011 - Station NBP0326 was sampled upstream of the bridge. Station TF1.3 was sampled from the bridge.

July 2011 - Station NBP0326 was sampled from the bank, upstream of the bridge.

August 2011 - Station NBP0326 was sampled from the bank, upstream of the bridge. Station SAV0000 was sampled from the bank at the bottom of the bridge.

September 2011 - Water samples were collected by a Chesapeake Bay Laboratory graduate student, on a special sampling run, 1-Sep-2011 at stations MAT0016, RET2.1, RET2.2, RET2.4, TF2.1, TF2.2, TF2.3, TF2.4 and XFB1986. Station SAV0000 was sampled from the bank below the bridge. The depth data at station TF1.3 was measured using a Hydrolab data sonde. At station BXX0031, the dissolved oxygen reading was unstable and a switch was made to meter L. The salinity measurement was 0.1 PPT different. The location where station TRQ0088 is normally collected was under water and the samples were collected from the boat ramp downstream. The station WIW0141 samples were collected aboard the ferry. A duplicate bottom sample was collected at station ET2.1.

October 2011 - The station TF1.3 samples were collected from the Park dock. Station SAV0000 samples were taken from the bank below the bridge. And stations NBP0326 and NBP0461 were sampled from the bank.

November 2011 - Due to a broken sampling bucket, station TF1.3 samples were collected from the bank. Station NBP0326 samples were collected just upstream of the bridge. Station SAV0000 samples were collected from the bank below the bridge.

December 2011 - Station SAV0000 samples were collected from the bank below the bridge. The WIW0141 samples were collected from the ferry.

Completeness_Report:

January 2011 - Total depth was not recorded at station WIW0141. A bottom sample was not collected at station ET5.1. Only surface and bottom samples were collected at station ET5.2 and Secchi disk depth was not recorded. Secchi depth was not recorded at station ET4.1 either. Ice conditions resulted in no sample collection at stations: MAT0016, MAT0078, PIS0033, TF2.1, TF2.2, TF2.3, XFB1986, ET1.1, ET2.1, ET2.2, ET2.3, MNK0146, WT1.1, WT2.1, WT3.1, WT4.1, WT6.1, WT7.1, WT8.1, WT8.2, WT8.3 and XHH4742.

February 2011 - Stations EE3.3 and MNK0146 are not sampled during the winter. Station XHH4742 was not sampled for an unspecified reason. LICOR measurements were not made at stations CB5.1W, LE1.1, LE1.2, LE1.3 and LE1.4 due to rough water conditions. Secchi disk depth and total depth were not recorded at station TF1.3. Station TF1.5 was not sampled due to extreme low water conditions. A bottom sample was not collected at station ET7.1. Total depth was not recorded at station WIW0141.

March 2011 - LICOR measurements were not made, due to rough conditions, at stations: CB5.1W, LE1.1, LE1.2, LE1.3, LE1.4, RET1.1, TF1.6 and TF1.7. Secchi disk depth and total depth were not measured at station TF1.5. No samples were collected at station TF1.5 due to an extremely low tide.

April 2011 - Samples were not collected at station PMS 10. LICOR measurements were not made, due to rough conditions, at stations: CB5.1W, LE1.1, LE1.2, LE1.3, LE1.4, RET1.1 and TF1.7. LICOR deck cell malfunction precluded samples at stations: ET3.1, TF1.5 and TF1.6. Secchi disk depth and total depth were not measured at station TF1.3.

May 2011 - No LICOR measurement was made, due to rough conditions, at station CB5.1W. LICOR deck cell malfunction precluded samples at stations: LE1.1, LE1.2, LE1.3, LE1.4, RET1.1, TF1.3, TF1.5 andTF1.6. Secchi disk depth and total depth were not measured at station TF1.3.

June 2011 - No LICOR measurement was made, due to rough conditions, at station CB5.1W. Secchi disk depth and total depth were not measured at station TF1.3. Station TF1.5 was not sampled.

July 2011 - Secchi disk depth was not recorded at stations TF1.3, TF1.4 and WXT0001. Station WT6.1 was not sampled.

August 2011 - Total depth was not measured at station TF1.3 due to a short measurement line. No LICOR measurement was made at station CB5.1W due to rough conditions. Bottom dissolved oxygen data at station ET8.1 were considered questionable and deleted.

September 1, 2011 - A note on the field data sheet for station CAS0479 remarked the passage of Tropical Storm Lee 6-Sep-2012. The bridge where station NBP0023 samples were normally collected was under water and samples were not collected. LICOR measurements were not made, due instrument malfunction, at stations: CB5.1W, LE1.1, LE1.2, LE1.3, LE1.4, RET1.1, TF1.5, TF1.6 and TF1.7.

October 2011 - No LICOR measurement was made, due to rough conditions, at station CB5.1W. Secchi disk depth was not measured at station TRQ0146.

November 2011 - Secchi disk depth and total depth were not measured at station TF1.3. Secchi depth was not recorded at station CCM0069. Tide stage was not recorded at station TRQ0088. Station ET4.1 was not sampled because water access was not possible due to bridge construction.

December 2011 - Total depth was not measured at station WIW0141.

Lineage:
Process_Step:
Process_Description:
SONDE CALIBRATION and POST-CALIBRATION

The Yellow Springs Instrument (YSI) 6000 data sondes and HydroLabs were maintained and calibrated before and after each cruise in accordance with manufacturer's recommendations.

HYDROLAB PROFILE SAMPLING PROTOCOLS:

A profile of temperature, specific conductance, dissolved oxygen, and pH was obtained from the water column at 0.5 m, 1.0 m, 2.0 m and 3.0 m depth intervals below the surface. Thereafter readings were taken at 2.0 m intervals and at the bottom. Tributary bottom equals total depth minus one meter (not rounded). If the change in dissolved oxygen exceeded 1.0 mg/L or if the change in specific conductance equaled or exceeded 1,000 micromhos/cm over any 2.0 m interval, readings were taken at 1.0 m intervals between these two readings. For total depths less than or equal to 10.0 m, readings were taken at 1.0 m intervals.

GRAB SAMPLING DEPTH PROTOCOLS:

At stations where two depths were sampled, collections were taken at 0.5 m below the surface, and 1.0 m above the bottom. If the station total depth was equal to 1.5 m, the bottom sample was also collected at 0.5 m. Great caution was exercised when taking bottom samples; if the bottom was disturbed and bottom sediments appeared to have been included, the sample

was dumped out and collected after the sediments had settled. Alternately, the sample was collected slightly higher in the water column and the new bottom sample depth was noted.

At stations where 4 depths were sampled and a pycnocline existed, collections were taken at 0.5 m below the surface, 1.5 m above the upper boundary of the pycnocline, 1.5 m below the lower boundary of the pycnocline, and 1.0 m above the bottom.

At stations where 4 depths were sampled and there was no discernable pycnocline, samples were taken at 0.5 m below the surface, at the closest profile depth one third the distance from the surface to the bottom, at the closest profile depth two thirds the distance from the surface to the bottom, and 1.0 m above the bottom.

SECCHI DEPTH:

Water transparency was determined, to the nearest 0.1 m using a 20-cm standard Secchi disc lowered into the water column with a calibrated rope. Observations were made on the shady side of the sampling location.

Process_Date: Unknown
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Sally Bowen
Contact_Position: Project Chief, Monitoring Field Office, DNR
Contact_Address:
Address_Type: mailing and physical
Address: 1919 Lincoln Drive
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21401
Country: USA
Contact_Voice_Telephone: 410 263-3369
Contact_Electronic_Mail_Address: SBOWEN_nospam_@dnr.state.md.us[Remove _nospam_ for valid email address]

Process_Step:
Process_Description:
LABORATORY ANALYSIS - CBL

University of Maryland's Chesapeake Biological Laboratory (CBL), Nutrient Analytical Services Laboratory (NASL) analyzed total dissolved nitrogen, particulate nitrogen, nitrite, nitrite + nitrate, ammonium, total dissolved phosphorus, particulate phosphorus, particulate inorganic phosphorus, orthophosphate, dissolved organic carbon, particulate carbon, total suspended solids, and volatile suspended solids.

The NASL began performing chlorophyll analyses in the year 2009. Prior to 2009, chlorophyll analyses were performed by the Maryland Department of Health and Mental Hygiene.

Further information about laboratory analytical procedures may be obtained from the "Process_Contact".

Process_Date: Unknown
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Carl Zimmerman
Contact_Position: Director of Chesapeake Biological Laboratory Analytical Services/Quality Assurance Officer

Contact_Address:
Address_Type: mailing and physical
Address: Chesapeake Biological Laboratory, Center for Environmental and Estuarine Studies, The University of Maryland System, 1 Williams St; P.O. Box 38
City: Solomons
State_or_Province: Maryland
Postal_Code: 20688
Country: USA
Contact_Voice_Telephone: 410 326-4281
Contact_Electronic_Mail_Address: carlz _nospam_@cbl.umces.edu[Remove _nospam_ for valid email address]

Process_Step:
Process_Description:
VERIFICATION AND DATA MANAGEMENT:

Each month DNR Tawes Office and Field Office personnel conducted data QA/QC procedures. All of the water quality calibration "grab" sample data were plotted. Outliers and anomalous values were thoroughly researched. Staff compared unusual values to historic values from the site and values from nearby sites. Weather events were considered, event logs were reviewed and CBL analytical laboratory staff and DNR field staff members were consulted regarding possible legitimate causes for outlying values. In cases where values were not considered to be legitimate, they were masked from the published dataset with the approval of the field staff and the Quality Assurance Officer.

Process_Date: Unknown
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Renee Karrh
Contact_Position: Program Manager
Contact_Address:
Address_Type: mailing

Address: 580 Taylor Ave., D2
City: Annapolis
State_or_Province: MD
Postal_Code: 21401
Contact_Voice_Telephone: 410 260-8630
Contact_Electronic_Mail_Address: rkarrh _Nospam_@dnr.state.md.us [Remove _Nospam_ for valid email address]

Spatial_Data_Organization_Information:
Indirect_Spatial_Reference: Back Creek, Back River, Big Annemessex River, Bohemia River, Bush River, C&D Canal, Chesapeake Bay, Chester River, Chicamacomico River, Choptank River, Corsica River, Eastern Bay, Elk River, Fishing Bay, Gunpowder River, Little Choptank River, Magothy River, Manokin River, Middle River, Nanticoke River, Northeast River, Patapsco River, Potomac River, Patuxent River, Pocomoke River, Pocomoke Sound, Rhode River, Sassafras River, Severn River, South River, Tangier Sound, Transquaking River, West River and Wicomico River.
Direct_Spatial_Reference_Method: Point

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: 0.0001
Longitude_Resolution: 0.0001
Geographic_Coordinate_Units: Decimal degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137
Denominator_of_Flattening_Ratio: 298.257

Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
This metadata record is a description of the Maryland Department of Natural Resources Chesapeake Bay Water Quality Monitoring Program - Chemical and Physical Properties Component Database for the Maryland Chesapeake Bay Tributaries. Project data are an aggregation of data collected at 70 Maryland tributary stations during 2010.

The data are contained in three related entities (tables): Station_Information, Monitoring_Event_Data and Water_Quality_Data. Each table contains attributes (fields).

The entity Station_Information is comprised of the attributes: STATION, DESCRIPTION, WATER_BODY, CBP_BASIN, TS_BASIN, BASIN, CBSEG_2003, CBSEG_2003_DESCRIPTION, HUC8, CATALOGING_UNIT_DESCRIPTION, HUC11, WATERSHED, FIPS, STATE, COUNTY/CITY, FALL_LINE, LATITUDE, LONGITUDE, LL_DATUM, UTM_X and UTM_Y

The entity Monitoring_Event_Data is comprised of the attributes: EVENT_ID, SOURCE, AGENCY, PROGRAM, PROJECT, STATION, EVENT_START_DATE, EVENT_START_TIME, CRUISE, TOTAL_DEPTH, UPPER_PYCNOCLINE, LOWER_PYCNOCLINE, AIR_TEMP, WIND_SPEED, WIND_DIRECTION, PRECIP_TYPE, TIDE_STAGE, WAVE_HEIGHT, CLOUD_COVER, GAGE_HEIGHT, PRESSURE, FLOW_STAGE, DETAILS and WATER_BODY.

The entity Water_Quality_Data is comprised of the attributes: EVENT_ID, SOURCE, PROJECT, STATION, SAMPLE_DATE, SAMPLE_TIME, DEPTH, LAYER, SAMPLE_TYPE, SAMPLE_ID, PARAMETER, QUALIFIER, VALUE, UNIT, METHOD, LAB, PROBLEM, DETAILS, TOTAL_DEPTH, UPPER_PYCNOCLINE, LOWER_PYCNOCLINE, LAT, and LONG.

Entity_and_Attribute_Detail_Citation:
Water Quality Database - Database Design and Data Dictionary Prepared For: U.S. Environmental Protection Agency, Region III, Chesapeake Bay Program Office, January 2004. [http://archive.chesapeakebay.net/pubs/cbwqdb2004_RB.PDF]

The most current version of the Water Quality Data Dictionary - Online may be found at: [http://archive.chesapeakebay.net/data/data_dict.cfm?DB_CODE=CBP_WQDB].

The Quality Assurance Project Plan for the Maryland Department of Natural Resources Chesapeake Bay Water Quality Monitoring Program - Chemical and Physical Properties Component for the period July 1, 2011 - June 30, 2012
[http://mddnr.chesapeakebay.net/eyesonthebay/documents/MTQAPP2011_draft1v1.pdf]

Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Michael Mallonee
Contact_Position: Water Quality Database Manager
Contact_Address:
Address_Type: Mailing and Physical
Address: 410 Severn Avenue, Suite 109
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21403
Contact_Voice_Telephone: 800-968-5785
Contact_Electronic_Mail_Address: mmallone@_no_spam_chesapeakebay.net[Remove _nospam_ for valid email address]
Resource_Description: Downloadable data
Distribution_Liability: None of the Chesapeake Bay Program partners nor any of their employees, contractors, or subcontractors make any warranty, expressed or implied, nor assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any

information or data contained within the web site. Reference to any specific commercial products, processes, or services or the use of any trade, firm, or corporation name is for the information and convenience of the public and does not constitute endorsement, recommendation or favoring by the Chesapeake Bay Program partners.

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: ASCII file, formatted for text attributes, declared format
Format_Information_Content: Station Information data, Monitoring Event data, and Water Quality data
File_Decompression_Technique: No compression applied
Transfer_Size: 10.3

Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name:
[http://www.chesapeakebay.net/data/downloads/cbp_water_quality_database_1984_present]
Access_Instructions: Data are available though the Chesapeake Bay Programs CIMS data hub. Select Water Quality Database (1984-Present). Access the data by following web site (see network resource name) instructions.
Fees: None
Metadata_Reference_Information:
Metadata_Date: 20120501
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Ben Cole
Contact_Organization: Maryland Department Of Natural Resources, Resource Assessment Service
Contact_Position: Natural Resource Biologist
Contact_Address:
Address_Type: Mailing and Physical
Address: 580 Taylor Avenue, D-2
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21401
Country: USA
Contact_Voice_Telephone: 410-260-8630
Contact_Facsimile_Telephone: 410-260-8640
Contact_Electronic_Mail_Address: bcole_Nospam_@dnr.state.md.us [Remove _Nospam_ for valid email address]
Metadata_Standard_Name: Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998