Maryland CORE/Trend Water Quality Monitoring Program – 2016

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Maryland Department of Natural Resources (MD DNR), Resource Assessment Service
Publication_Date: 20170410
Title: MD DNR 2016 CORE/Trend Water Quality Monitoring Project
Geospatial_Data_Presentation_Form: Spatial database
Online_Linkage:
[http://www.chesapeakebay.net/data/downloads/cbp_water_quality_database_1984_present]

Description:
Abstract: These are water quality monitoring data from a long-term fixed location monitoring study of stations located in the Chesapeake Bay and Ohio River watersheds. The data are collected from fifty-six stations for a time period beginning January 1986 and extending to the present. Fifty-five of the stations are in non-tidal waters. One station (XGG8251) is in tidal waters.

Purpose:
The Maryland Department of Natural Resources Section 106 Ambient Water Quality Monitoring Program (CORE\Trend) 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 concentrations in Maryland's waters.

The information is integrated with data from other Chesapeake 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 tributaries from the list of impaired waters.

Supplemental_Information:
Two reports contain information that should be considered when CORE/Trend data are used for data analysis. The reports are named: DAITS 043: Comparability of parameter estimates from whole water and filtered samples for MD Department of Health and Mental Hygiene data (June 2006, revised April 2009) and DAITS 046: Comparison of chlorophyll and pheophytin analyzed at DHMH and CBL (May 2009). Copies of the reports may be downloaded. [http://www.chesapeakebay.net/documents/Completed_DAITS_as_of_9-21-10.pdf].

Data users who desire very detailed information about Water Quality Monitoring data definition, sampling procedures and data processing are encouraged to refer to 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]. An updated data dictionary is a Chesapeake Bay Program work in progress.

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, 2016 - June 30, 2017 [http://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/MdDNR_MTQAPP2016.pdf].

Guide to Using Chesapeake Bay Program Water Quality Monitoring Data, EPA 903-R-12-001, February 2012, CBP/TRS 304-12 [http://www.chesapeakebay.net/documents/3676/wq_data_userguide_10feb12_mod.pdf].

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 20160105
Ending_Date: 20161219
Currentness_Reference: Ground Condition
Status:
Progress: In Work
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: Global Change Master Directory (GCMD). 2016. GCMD Keywords, Version 8.4. Greenbelt, MD: Global Change Data Center, Science and Exploration Directorate, Goddard Space Flight Center (GSFC) National Aeronautics and Space Administration (NASA). URL (GCMD Keyword Forum Page): [https://earthdata.nasa.gov/gcmd-forum]
Theme_Keyword: Biosphere > Ecosystems > Marine Ecosystems > Estuary
Theme_Keyword: Biosphere > Ecosystems > Freshwater Ecosystems > Rivers/Stream
Theme_Keyword: Biosphere > Ecological Dynamics > Ecosystem Functions > Nutrient Cycling
Theme_Keyword: Terrestrial Hydrosphere > Surface Water > Surface Water Features > Rivers/Streams

Theme_Keyword: Terrestrial Hydrosphere > Surface Water > Surface Water Processes/Measurements > Discharge/Flow
Theme_Keyword: Terrestrial Hydrosphere > Surface Water > Surface Water Processes/Measurements > Stage Height
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Alkalinity
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Chlorophyll
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 Ion Concentration
Theme_Keyword: Terrestrial Hydrosphere > Water Quality/Water Chemistry > Water Temperature

Place:
Place_Keyword_Thesaurus: User Defined Keyword List
Place_Keyword: Chesapeake Bay
Place_Keyword: Hydrologic Unit
Place_Keyword: Major Watershed/Basin
Place_Keyword: Subbasin
Place_Keyword: Tributary
Place:
Place_Keyword_Thesaurus: Common geographic areas
Place_Keyword: fUS = United States
Place_Keyword: fUS24 = Maryland
Place:
Place_Keyword_Thesaurus: USGS Thesaurus
Place_Keyword: hydrologic processes
Place_Keyword: watershed management
Temporal:
Temporal_Keyword_Thesaurus: USGS Thesaurus
Temporal_Keyword: autumn
Temporal_Keyword: spring (season)
Temporal_Keyword: summer
Temporal_Keyword: winter
Access_Constraints: NONE
Use_Constraints: Use At Your Own Risk

Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: William D. Romano

Contact_Position: Natural Resources Biologist
Contact_Address:
Address_Type: Mailing and physical
Address: 580 Taylor Avenue, C-2
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21401
Contact_Voice_Telephone: 410.260.8630
Contact_Electronic_Mail_Address: bill.romano_no_spam_@maryland.gov [remove _no_spam_ for valid email address]

Browse_Graphic:
Browse_Graphic_File_Name: MDDNR Core\Trend Monitoring Project 2016 Station Map: [http://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/metadata/MdDNR_2016_CORE_TrendStns.pdf]. If the map URL raises a file not found error, drill down from [http://eyesonthebay.net].
Browse_Graphic_File_Description: Fifty-six Maryland Department of Natural Resources CORE/Trend water quality monitoring stations.
Browse_Graphic_File_Type: PDF
Data_Set_Credit:
Survey and calibration data were collected by MD DNR Resource Assessment Service (RAS) Annapolis Field Office staff.

The Maryland Department of Health and Mental Hygiene (DHMH) analyzed samples for most of the CORE Trend sites.

The Nutrient Analytical Services Laboratory (NASL) at the Chesapeake Biological Laboratory (University of Maryland) analyzed samples collected at stations: PIS0033, TF1.0 and XGG8251. NASL analyzed CORE\Trend station chlorophyll a, phaeophytin, chloride and sulfate samples.

The USGS Kentucky Water Science Center Sediment Laboratory analyzed sediment samples collected at stations: ANT0366, CAC0148, CON0180, DER0015, GEO0009, GUN0258, GWN0115, NPA0165, PXT0972, TOW0030 and WIL0013. Sediment samples are co-sampled under the non-tidal network program.

The project was made possible with funding provided by the State of Maryland and the United States Environmental Protection Agency Chesapeake Bay Program.

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) and Maryland Department of Health and Mental Hygiene (DHMH) 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. The Chesapeake Bay Program Data Integrity Workgroup (formerly AMQAW) oversees the CSSP. 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 2016: The Secchi disk measurement at station XGG8251 was greater than the station total depth. An extremely small amount of Didymo was present at station SAV0000. The upstream pipe at station NPA0165 was not discharging and 10 percent “fast” ice coverage was noted. PH data values measured at stations: PXT0809, PXT0972, CJB0005, POT1184, RCM0111 and ANA0082, were deemed unreliable due to pH probe failure. The water surface at station BPC0035 was 90 percent covered with ice. Ice coverage was 80 percent at stations MON0269 and CAC0148. Ice coverage was noted to be 100 percent upstream at station MON0528 and 25 percent of the river near station CAC0031 contained ice floes. Small amounts of ice were also noted at stations CON0180, NBP0689 and ANT0044. Heavy rains occurred two days before sampling at stations WIL0013 and TOW0030. High water level was noted at station POT2766. Above normal water clarity was observed at station GEO0009.

February 2016: Post-calibration readings of the pH probe for the following stations were 0.21 units higher than the pH standard: ANA0082, GUN0125, GWN0115, JON0184,

NPA0165, PAT0176, PAT0285, PXT0972 and RCM0111. Snow on the ground was noted at stations: ANT0044, BPC0035, CAC0148, CB1.0, DER0015, GUN0476, GUN0258, MON0528, MON0269 and POT1830. Muddy water was observed at stations ANT0044, CAC0148, POT1184 and POT1830. Ice was seen at stations DER0015, MON0258, MON0269, POT1830, POT1595 and POT1596. Stations POT1595 and POT1596 were sampled under Potomac flood watch conditions. Snowmelt was noted at stations: ANT0203, ANT0366, CON0005, CON0180, POT2386 and NBP0326. Similarly, snowmelt, in the days preceding sampling, was noted at stations: BDK0000, GEO0009, NBP0103, NBP0023, NBP0461, NBP0534, NBP0689, POT2766, TOW0030 and WIL0013. Rain fell during sampling operations at stations: ANT0203, ANT0366, CON0005, CON0180, NBP0689 and POT2386. Station POT1596 was deemed bank full. The presence of lots of debris was noted at station POT1830. The Secchi disk measurement at station XGG8251 was greater than the station total depth. High water levels were described at stations: NBP0326, NBP0534, POT1184 and POT2766.

March 2016: Conowingo Dam on the Susquehanna was releasing water when station CB1.0 was sampled. The presence of new USGS turbidity probes was noted at stations: PAT0176, PAT0285 and GUN0258. Rain fell three days before stations WIL0013 and POT2766 were sampled. Rainfall the night before sampling was noted at the following stations: ANA0082, BDK0000, CAC0031, CJB0005, ET5.0, MON0020, MON0155, NBP0023, NBP0103, PXT0809, PXT0972, POT1184, POT1471, POT1472, POT1595, POT1596, POT2766, RCM0111, SEN0008 and TOW0030. The Secchi disk measurement at station XGG8251 was greater than the station total depth.

April 2016: The presence of an 8 inch boom at the river's edge and new rocks at the ramp were noted at station CB1.0. When samples were collected at station NPA0165, the pipe was not discharging. Dissolved oxygen readings at station CAC0148 were checked using a second meter. A station SEN0008 field data sheet note stated "meter L pH reads 8.47". The occurrence of rain showers during the previous night was logged at station SAV0000.

May 2016: Three days of rainfall preceded sampling at stations: ANT0044, BPC0035, CAC0148, MON0269 and MON0528. Severe thunderstorms occurred during the night preceding sampling at stations CB1.0, DER0015, GUN0258 and GUN0476. Scattered showers, the night before sampling, were noted at stations: CAC0031, GEO0009, MON0155, MON0020, NBP0326, NBP0534, POT1471, POT1472, POT1595 and SEN0008. Rain fell the morning of sampling at stations: GEO0009, NBP0326 and NBP0534.The waters were described as high and muddy at the following stations: BPC0035, CAC0031, CAC0148, MON0020, MON0155, MON0269, POT1471, POT1472, POT1595, POT1596 and SEN0008. Bridge repairs were ongoing when stations ANT0044 and NBP0326 were sampled. The Secchi disk measurement at station XGG8251 was greater than 1 meter.

June 2016: Back flow of water at the wall was noted when station POT1184 was sampled. The discharge water at station POT2386, characterized as murky during sampling, continued to fall during collection. The level of the river at station ANA0082 was very low. At station CON0005, a field data sheet note indicated, that debris which had previously accumulated under the bridge had cleared.

July 2016: The river was muddy and above bank when samples were collected at TF1.0. Rain fell during the two day preceding sampling at station PXT092. A group of students on inner tubes passed prior to sampling at station ANT0044. A huge log dam, on the upstream side of the Station SEN0008 bridge, diverted 3/4ths of the river flow. When station CON0180 was sampled, the river was characterized as large and dirty with lots of tree debris. An increase in flow from 15 to 37 Cubic Feet per Second (CFS) was also noted. At station, CON0005 clear water was observed and contrasted to a plume upstream at station CON0180. A severe thunderstorm passed through shortly before station TOW0030 was sampled and sediment plumes were observed along both banks. Field data sheet notes entered at station GEO0009 described a peak in flow an hour before sampling, an increase in flow from 15 to 37 CFS and stated dark orange colored water.

August 2016: The occurrence of a record, 6-inches, rainfall 30-Jul-2016 was noted at stations: PAT0176, POT2386, PAT0285, GWN0115, NPA0165, JON0184, PXT0809, PXT0972, BPC0035 and CAC148. Sewage spills were noted in field log notes recorded at stations GWN0115, JON0184, PAT0175 (5 million gallons) and PXT0809 (2 million gallons). The hydrograph reading was still declining from the record rain when station POT2386 was sampled. Station PAT0285 flow went to 11300 CFS. The pipe at station NPA0165 was not discharging. Station BPC0035 flow went to 2100 CFS. Station CAC0148 flow went to 418 CFS. Braddock Run waters were noted across Wills Creek when station WIL0013 samples were collected. Water at station NBP0103 had an orange tint. A storm rolled in during station NBP0023 sampling and the waters were dark with higher sediment loads than usual. A storm passed just prior to sampling operations at station POT2766. A heavy storm preceded station TOW0030 sampling by half an hour. Rain fell during the morning before station NBP0689 samples were collected. Rain fell during the night before the following stations were sampled: NBP0534, SAV0000 and GEO0009.

September 2016: Field sheet notes described very low water levels at stations: PAT0176 and GUN0125; low at stations: MON0020, POT1472, POT1471, POT1596, POT1595 and SEN0008; and the lowest water level seen in a long time at station CON0180. Muddy water and upstream construction were observed at station JON0184. Submerged aquatic vegetation extended half way across the river at station GUN0125. A MD DNR Fishing and Boating Services team was sampling at the same time samples were collected at station POT1595. A lot of submerged aquatic vegetation was seen on the Maryland side during sampling at station POT1471. It rained upstream minutes before station CON0005 samples were collected. When station WIL0013 was sampled, Braddock Run waters were evident across Wills Creek. The waters at stations BDK0000 and NBP0461 were orange. Lots of submerged aquatic vegetation and fish were observed at station TOW0030. Secchi disk depth at station XGG8251 exceeded 0.6m.

October 2016: The flow rate at station CAC0031 was very low. Station WIL0013 samples were collected from the left side of the bridge in order to eliminate Braddock Run waters as much as possible. Lots of dust in the air, from trucks on the dirt road and parking lot, was noted when station NBP0534 samples were collected. Field sheet notes made when station SAV0000 was sampled, described a drain pipe installed directly into the river and algae (possibly didymo)

covering sixty percent of the rocks. The Secchi disk measurement at station XGG8251 was greater than 1.1m.

November 2016: Lots of geese were present near the POT2386 sample collection site. Much leaf debris was observed in the station CON0180 sample area but the water seemed to be normal. The water at station CON0005 appeared to be normal and clear. At stations BCP0035, CAC0148, MON0269 and MON0528 the river was low and slow. Morning showers preceded sampling at stations: MON0020, POT1471, POT1472, POT1595, POT1596, SEN0008 and WIL0013. Braddock Run waters were evident when station WIL0013 was sampled. The river level was low when stations ANT0044 and POY1830 were sampled. Many leaves were observed in the creek when station ANT0082 was sampled. Filamentous algae were seen at station NBP0326 and the water was orange. The Secchi disk measurement at station XGG8251 exceeded station total depth. Leaf debris was present in the sample water collected at station NBP0326. Rain drizzle preceded sampling at stations: CJB0005, POT1184, PXt0972, RCM0111 and ANA0082.

December 2016: Rain fell the night before station TF1.0 was sampled. At stations PAT0176 and GUN0125 the rivers were low and slow. When station NPA0165 was sampled, sleet was falling, a new wire-weight auxiliary gage had been installed and culvert construction was taking place downstream. A station JON0184 field data sheet note stated that upstream restoration appeared to be complete and sleet fell during sampling.

Logical_Consistency_Report:

January 2016: Sampling at station POT2766 was conducted under the bridge.

February 2016: Station CAC0031 samples were collected under the bridge. Station MON0020 samples were taken from the shoreline on South side of the bridge. Similarly, station POT1471 samples were collected from the shoreline. Station CAC0148 samples were collected from the bridge. Station ANT0044 samples were collected from the bridge. Samples for station POT2766 were collected downstream of the bridge due to high river water level. Station NBP0326 samples were taken from the bank upstream of the bridge due to very high water levels.

March 2016: Station POT2766 samples were collected downstream of the bridge. Due to bridge construction, station NBP0326 samples were also collected downstream of the bridge, from the bank.

April 2016: Station POT2766 samples were collected from the beach area upstream of the bridge. Station NBP0326 samples were collected downstream of the bridge due to bridge construction. Station XGG8251 was sampled at the Western side bulkhead under the Route 50.

May 2016: Station NBP0326 samples were taken downstream of the bridge due to bridge construction.

June 2016: Station POT2766 samples were collected from the bank downstream of the bridge. Due to bridge construction, station NBP0326 samples were taken downstream of the bridge.

July 2016: Station POT1596 samples were collected from the boat ramp upstream of the bridge. Station POT1595 samples were collected from the boat ramp downstream of the bridge. Samples at stations POT1595 and POT1596 were collected from the ferry. Station NBP0326 samples were taken downstream of the bridge due to bridge construction.

August 2016: Station POT2766 samples were collected upstream from the bridge. Station NBP0326 samples were taken downstream of the bridge due to bridge construction.

September 2016: Samples at station POT2766 were collected upstream of the bridge. Sample collection was conducted upstream of the station GEO0009 bridge due to very low water downstream. Station NBP0326 samples were collected from the bank downstream of the bridge due to bridge construction.

October 2016: Station PAT0285 samples were collected from the bridge. Station POT2766 samples were collected under the bridge. Station NBP0326 sampling operations were conducted from the bank downstream because access was limited by bridge construction. Station NBP0326 samples were collected from the bank upstream of the bridge.

December 2016: Station POT2766 water samples were collected from under the bridge. Station NBP0326 samples were collected from the bank upstream of the bridge.

Completeness_Report:

Biological Oxygen Demand samples were collected at a subset of CORE\Trend project stations: ANA0082, ANT0044, BPC0035, CAC0031, CAC0148, CJB0005, MON0020, MON0155, MON0269, MON0528, PIS0033, POT1184, POT1471, POT1472, POT1595, POT1596, POT1830, RCM0111 and SEN0008. When a holiday interfered with laboratory measurement of BOD, samples were not collected.

Chloride and sulfate samples were collected at the following subset of CORE\Trend stations: GEO0009, NBP0023, NBP0103, NBP0461, NBP0534 and TOW0030.

January 2016: The USGS gage at station GEO0009 was frozen and no gage readings were recorded.

February 2016: Station PXT0809 was not sampled due to a locked gate. Although attempts were made on multiple days, the ferry closure prevented sampling at station POT1472.

November 2016: USGS gage data were not available.

There are no known completeness issues in March, April, May, June, July, August, October and December 2016.

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

HydroLab sondes were maintained and calibrated before and after each survey in accordance with manufacturer's recommendations.

HYDROLAB PROFILE SAMPLING PROTOCOLS:

Measurements of temperature, specific conductance, dissolved oxygen and pH were obtained from YSI or Hydrolab water quality sensors immersed just below the water surface.

GRAB SAMPLING DEPTH PROTOCOLS:

Grab samples of water for laboratory analysis were collected at stations at a depth of 0.0m.
Process_Date: Unknown
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Kristen Heyer
Contact_Position: Manager, Water Quality Monitoring
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: kristen.heyer_nospam_@maryland.gov[Remove _nospam_ for valid email address]

Process_Step:
Process_Description:
CORE/Trend DHMH ECDL LABORATORY ANALYSIS

Maryland Department of Health and Mental Hygiene, Environmental Chemistry Division Laboratory, Baltimore, MD, analyzed total dissolved nitrogen, particulate nitrogen, nitrite, nitrite + nitrate, ammonium, total dissolved phosphorus, particulate phosphorus, orthophosphate, dissolved organic carbon, particulate carbon, total suspended solids, biological oxygen demand, total alkalinity and turbidity for CORE/Trend stations.
Process_Date: Unknown
Process_Contact:

Contact_Information:
Contact_Person_Primary:
Contact_Person: Shahla Ameli
Contact_Position: Laboratory Scientist Supervisor
Contact_Address:
Address_Type: mailing and physical
Address: 1770 Ashland Ave.
City: Baltimore
State_or_Province: Maryland
Postal_Code: 21205
Country: USA
Contact_Voice_Telephone: 433.681.3855
Contact_Electronic_Mail_Address: shahla.ameli_nospam_@maryland.gov[Remove _nospam_ for valid email address]

Process_Step:
Process_Description:
CORE/Trend NASL LABORATORY ANALYSIS

University of Maryland's Chesapeake Biological Laboratory (CBL), Nutrient Analytical Services Laboratory (NASL), Solomons, MD, analyzed chlorophyll, Phaeophytin, sulfate and chloride for CORE/Trend stations.

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 (DHMH) laboratory in Baltimore, MD. Sulfate analyses were performed by DHMH WMRL until March 2011, no sulfate samples were analyzed in February 2011 due to a reduction in staff. NASL began performing sulfate analyses in April 2011 and chloride analyses in May 2011.
Process_Date: Unknown
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Jerry Frank
Contact_Position: Manager Nutrient Analytical Services Laboratory
Contact_Address:
Address_Type: mailing and physical
Address: Chesapeake Biological Laboratory, Center for Environmental and Estuarine Studies, The University of Maryland System, 146 Williams St; P.O. Box 38
City: Solomons
State_or_Province: Maryland
Postal_Code: 20688
Country: USA
Contact_Voice_Telephone: 443.681.3855
Contact_Electronic_Mail_Address: frank _nospam_@umces.edu[Remove _nospam_ for valid email address]

Process_Step:
Process_Description:
CORE/Trend USGS-KDSL ANALYSIS

Kentucky Water Science Center Sediment Laboratory, 9818 Bluegrass Parkway, Louisville, KY analyzed sediment samples collected at CORE/Trend stations. Sediment samples are co-sampled under the non-tidal network program.

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: Aimee Downs
Contact_Position: Physical Scientist
Contact_Address:
Address_Type: mailing and physical
Address: USGS Kentucky Water Science Center, Sediment Lab, 9818 Bluegrass Parkway
City: Louisville
State_or_Province: Kentucky
Postal_Code: 40299
Country: USA
Contact_Voice_Telephone: 502.493.1944
Contact_Electronic_Mail_Address: acdowns _nospam_@usgs.gov[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 DHMH 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: Diana Domotor

Contact_Position: Data Analyst
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: diana.domotor_nospam_@maryland.gov[Remove _nospam_ for valid email address]

Spatial_Data_Organization_Information:
Indirect_Spatial_Reference: Anacostia River, Antietam Creek, Big Pipe Creek, Braddock Run, Cabin John Branch, Catoctin Creek, Chester River, Choptank River, Conococheague Creek, Deer Creek, Georges Creek, Gunpowder River, Monocacy River, North Branch Patapsco River, North Branch Potomac River, Patapsco River, Patuxent River, Piscataway Creek, Potomac River, Rock Creek, Savage River, Seneca Creek, Susquehanna River, Town Creek, Wills Creek
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 Maryland CORE/Trend project stations during 2016.

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: CBSeg2003, CBSeg2003Description, CBSegmentShed2009, CBSegmentShed2009Description, CountyCity, FallLine, FIPS, HUC12, HUC8, Latitude, LLDatum, Longitude, State, Station, StationDescription, USGSGage, UTMX, and UTMY.

The entity Monitoring_Event_Data is comprised of the attributes: Agency, CloudCover, Cruise, Details, EventId, FieldActivityEventType, FieldActivityRemark, FlowStage, GaugeHeight, Latitude, Longitude, LowerPycnocline, MonitoringStation, PrecipType, Pressure, Program, Project, SampleDate, SampleTime, Source, Station, TideStage, TotalDepth, UpperPycnocline, WaveHeight, WindDirection, and WindSpeed.

The entity Water_Quality_Data is comprised of the attributes: Agency, BiasPC, Cruise, Depth, Details, EventId, Lab, Latitude, Layer, Longitude, LowerPycnocline, MeasureValue, Method, MonitoringStation, Parameter, PrecisionPC, Problem, Program, Project, Qualifier, SampleDate, SampleReplicateType, SampleTime, SampleType, Source, Station, TotalDepth, Unit, and UpperPycnocline.

Entity_and_Attribute_Detail_Citation:
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, 2016 - June 30, 2017 [http://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/MdDNR_MTQAPP2016.pdf].

An updated data dictionary is a Chesapeake Bay Program work in progress.

Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Mike 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: 71403
Country: USA
Contact_Voice_Telephone: 410.267.5785
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 Text File
Format_Information_Content: Station Information data, Monitoring Event data, and Water Quality data
File_Decompression_Technique: No compression applied
Transfer_Size: 2.9
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 through the Chesapeake Bay Programs CIMS data hub. Select Water Quality Database (1984-Present). Access the data by following instructions on the web site (see Network Resource Name).
Fees: None

Metadata_Reference_Information:
Metadata_Date: 20170519
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, D2
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21401
Country: USA
Contact_Voice_Telephone: 410.260.8630
Contact_Electronic_Mail_Address: benjamin.cole_nospam_@maryland.gov[Remove _nospam_ for valid email address]
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998