Maryland CORE/Trend Water Quality Monitoring Program – 2023

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Maryland Department of Natural Resources (MD DNR), Resource Assessment Service.
Publication_Date: 20240409
Title: MD DNR 2023 Core/Trend Water Quality Monitoring Project
Geospatial_Data_Presentation_Form: Spatial database
Online_Linkage:
[https://www.chesapeakebay.net/what/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-two stations for a time period beginning January 1986 and extending to the present. Fifty-one 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:
Core/Trend stations GEO0009, WIL0013, TOW0030, ANT0366, CAC0148, PXT0972, NPA0165, GWN0115, GUN0258, and DER0015 are also used as sampling locations for the Maryland Non-Tidal Network Monitoring Program. The Non-Tidal Network Monitoring

Program collects baseflow and stormflow samples to aid in the determination of nutrient and sediment loads to the Chesapeake Bay. Details of the Non-Tidal Network Monitoring Program can be found here:
[https://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/MD117eQAPP2023.pdf]

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. [https://d18lev1ok5leia.cloudfront.net/chesapeakebay/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.

Water Quality Database - Database Design and Data Dictionary, Prepared For: U.S. Environmental Protection Agency, Region III, Chesapeake Bay Program Office, January 2004. [https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/cbwqdb2004_rb.pdf]. An updated data dictionary is a Chesapeake Bay Program work in progress.

Guide to Using Chesapeake Bay Program Water Quality Monitoring Data, EPA 903-R-12-001, February 2012, CBP/TRS 304-12
[https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/wq_data_userguide_10feb12_mod.pdf].

Methods and Quality Assurance for Chesapeake Bay Water Quality Monitoring Programs. Chesapeake Bay Program, May 2017, CBP/TRS-319-17
[https://d38c6ppuviqmfp.cloudfront.net/documents/CBPMethodsManualMay2017.pdf].

The Quality Assurance Project Plan for the Maryland Department of Natural Resources Chesapeake Bay Water Quality Monitoring Program - Chemical and Physical Properties Component, May 2023
[https://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/MdDNR_MTQAPP_May2023.pdf].

Maryland Department of Natural Resources Quality Assurance Project Plan for the Chesapeake Bay Tidal and Non-tidal Monitoring Programs Long-term Trends Analysis Methods Version 1, July 2023
[https://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/MD117e_QAPP_TrendsAnalysis_July2023.pdf].

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 20230104

Ending_Date: 20231213
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: USGS Thesaurus
Theme_Keyword: hydrologic processes
Theme_Keyword: watershed management
Theme_Keyword: ecological processes
Theme:
Theme_Keyword_Thesaurus: Global Change Master Directory (GCMD). 2024. GCMD Keywords, Version 17.9, Greenbelt, MD: Earth Science Data and Information System, Earth Science Projects Division, Goddard Space Flight Center (GSFC), National Aeronautics and Space Administration (NASA). URL (GCMD Keyword Forum Page): [https://forum.earthdata.nasa.gov/app.php/tag/GCMD+Keywords].
Theme_Keyword: EARTH SCIENCE>BIOSPHERE>ECOLOGICAL DYNAMICS>ECOSYSTEM FUNCTIONS>NUTRIENT CYCLING
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Theme_Keyword: EARTH SCIENCE>TERRESTRIAL HYDROSPHERE>WATER QUALITY/WATER CHEMISTRY>WATER CHARACTERISTICS>WATER TEMPERATURE

Place:
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Place_Keyword: Chesapeake Bay
Place_Keyword: Hydrologic Unit
Place_Keyword: Major Watershed/Basin
Place_Keyword: Subbasin
Place_Keyword: Tributary
Place_Keyword: Ohio River
Place:
Place_Keyword_Thesaurus: USGS Common geographic areas
Place_Keyword: United States
Place_Keyword: Maryland
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Place_Keyword: Frederick County
Place_Keyword: Garrett County
Place_Keyword: Harford County
Place_Keyword: Howard County

Place_Keyword: Montgomery County
Place_Keyword: Prince George s County
Place_Keyword: Queen Anne s County
Place_Keyword: Washington County
Temporal:
Temporal_Keyword_Thesaurus: USGS Thesaurus
Temporal_Keyword: autumn
Temporal_Keyword: spring (season)
Temporal_Keyword: summer
Temporal_Keyword: winter
Access_Constraints: NONE
Use_Constraints: Acknowledgement of the MD Department of Natural Resources, Resource Assessment Service as a data source, in products developed from these data, would be appreciated.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Scott Stranko
Contact_Position: Monitoring and Nontidal Assessment Director, Resource Assessment Service
Contact_Address:
Address_Type: Mailing and physical
Address: 580 Taylor Avenue, C2
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21401
Contact_Voice_Telephone: 410.260.8603
Contact_Electronic_Mail_Address: scott.stranko_no_spam_@maryland.gov [remove _no_spam_ for valid email address]

Browse_Graphic:
Browse_Graphic_File_Name: MDDNR Core\Trend Monitoring Project 2023 Station Map: [https://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/metadata/MdDNR_2023_Core_TrendStns.pdf]. If the map URL raises a file not found error, drill down from [http://eyesonthebay.net].
Browse_Graphic_File_Description: Fifty-two 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 (MDH) analyzed samples for most of the Core/Trend sites.

The Nutrient Analytical Services Laboratory (NASL) at the University of MD Center for Environmental Science Chesapeake Biological Laboratory analyzed samples collected at station XGG8251. NASL analyzed Core\Trend station chlorophyll a, pheophytin, chloride and sulfate samples.

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 used to control and assure the accuracy of field measurements involved the calibration of field instruments, 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 (MDH) 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 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.

ADDITIONAL COMMENTS

January 2023: Scattered showers occurred the day before sampling stations CAC0031, MON0155, POT1471, and SEN0008. The water was reported to be very brown at station ANA0082, and barge and dredge equipment were evident downstream. At station CON0005,

three-fourths of the bridge was blocked by debris. Hazy conditions were reported at station POT2386. The water level was recorded as being high and murky at stations CAS0479 and YOU0925. At WIL0013 the water was described as a murky greenish color, as the influence of Braddock Run was visible across the entire stream. There were no signs of Didymo (Didymosphenia geminate) at station SAV0000, but algae were observed growing on the ramp at NBP0103, and on the rocks at station NBP0326. The water sample taken at NBP0326 had algae in the water and was resampled as a precaution.

February 2023: A power dredge was present upstream from the station at ANA0082. At station SEN0008 the pH and dissolved oxygen values were double-checked with a second meter. The water was described as bubbly when viewed in a bucket at stations CON0005, ANT0203, and ANT0366, but was not observed to be so in the creek. The water level was reported to be high at station CON0005 and flowing over debris. However less debris was noted at this site than in previous months. Lots of algae were present at station NBP0103, and bright green algae was noted to be growing on the rocks at station BDK0000. At station WIL0013, the influence of Braddock Run was visible along the far edge of the creek, but the water was clear. The water at station NBP0534 was reported to be slightly murky due to a recent release. Thin and wispy clouds were recorded for stations CCR0001, GEO0009, NBP0326, NBP0461, NBP0534, NBP0689, and YOU1139. Strong gusts of wind occurred during sampling station POT2766.

March 2023: Two days of rain preceded sampling on 1-Mar. Heavy rain also occurred the Friday before sampling stations ANT0366, CON0180, and POT2386, and water at these locations was reported to be murky. The Secchi disk depth measurement at station XGG8251 was greater than the total depth.

Bridge work was noted upstream from station CAC0148. A winter storm brought approximately five inches of snow on 14-Mar, prior to sampling stations LYO0004, NBP0689, CCR0001, and YOU1139. Due to an active mine blowout at St. George s Creek, Maryland Department of the Environment (MDE) was onsite at station GEO0009, where the water was described as dark orange in color. Due to this mine incident, the water was also murky at station NBP0461, however no signs of the mine blowout were apparent at NBP0326 during sampling. Water was reported to be very clear at station BDK0000, with bright green algae growing on the rocks at this location. A fisherman was observed upstream from station CAS0479, and a sewage smell was reported at this site. The clouds were described as thin and wispy at stations CAS0479, NBP0023, POT2766, and TOW0030. Windy conditions were reported at station CON0180. Station POT2766 was observed to have a lot of leaf litter flowing downstream.

April 2023: The meter used at stations ANT0044, BPC0035, CAC0148, MON0269, MON0528, and POT1830 post-calibrated out of range for specific conductance, but the data appeared normal. Clouds were reported to be thin and wispy at stations ANT0203, ANT0366, CON0180, POT2386, BDK0000, CCR0001, NBP0023, TOW0030, WIL0013, GEO0009, LYO0004, NBP0461, YOU1139, and POT2766. Lots of geese were observed at station ANT0203. Algae were present on the rocks at station BDK0000.

May 2023: Rain was reported earlier in the day before sampling CON0180, where one third of the bridge was blocked by debris on the lower eastern side. Rain occurred during the week before sampling at stations POT2386, YOU1139, NBP0689, and LYO0004. Heavy rain the

evening before, and rain and thunderstorms the morning of sampling, was noted for stations CAS0479 and CCR0001. Water appeared tannic at station CCR0001. Hazy conditions were noted at stations LYO0004, GEO0009, NBP0461, NBP0534, NBP0689, and SAV0000. A possible release due to rain was noted for station NBP0534. Didymo strands were observed to be present on multiple rocks at station SAV0000. Dissolved oxygen values at station NPA0165 were double checked. At station YOU0925 a fuel or oil spill was observed to be draining into the river slightly downstream from the sampling location. The Secchi disk depth measurement at station XGG8251 was greater than the total depth.

June 2023: The following stations were reported as being hazy due to Canadian wildfires: PXT0972, PXT0809, MON0528, ANT0044, BPC0035, CAC0148, MON0269, POT1830, CAC0031, MON0155, POT1471, POT1596, SEN0008, ANT0203, CON0180, POT2386, ANT0366, CON0005, CJB0005, and ET5.0. At station CON0005 debris was reported to be piled up along the right side of the bridge. There were no signs of Didymo at station SAV0000. Rain was reported for most of the day prior to sampling stations CCR0001, LYO0004, and YOU1139. Station NBP0534 was sampled at the peak of release. Water was noted to be quite clear at station GEO0009, and dark brown at station BDK0000. At station WIL0013, where it was reported to be the first rain in weeks, the water was full of sediment.

July 2023: Field staff successfully navigated around a road closure and fixed a pump at station DER0015. Rain showers occurred the day prior to sampling stations ANT0203, ANT0366, CON0005, POT2386 and CON0180. Rain was recorded the Sunday preceding sampling at stations WIL0013, POT2386, DER0015, CAS0479, NBP0023, NBP0103, YOU0925, YOU1139, POT2766, and BDK0000. Water was reported to be murky from the Sunday rain at YOU1139, yet clear at BDK0000 despite the rain. Tannic water was observed at station CCR0001. The clouds were described as thin and wispy at stations CCR0001, YOU1139, and LYO0004. The water level at station POT2386 was recorded as being low. At station SAV0000 fishy-smelling scat was detected, possibly from otter. The dissolved oxygen values at station GUN0125 were noted as being high.

August 2023: Hazy conditions were noted at stations ANT0366, ANT0203, CON0180, CON0005, POT1471, SEN0008, ET5.0, and MON0155. At station CON0005, three quarters of the bridge was blocked by debris, and algae was observed along the right eastern streambank, upstream of the bridge. Rain fell earlier in the day at station NBP0689, and it was noted that the ground was still wet. Rain was noted overnight prior to sampling station YOU1139, and rain overnight and continued during sampling station LYO0004. Strong thunderstorms occurred on the Monday preceding sampling stations WIL0013, CAS0479, and YOU0925. Sampling at station WIL0013 was difficult due to an ongoing pipe installation. Very cold water was noted at stations GUN0476 and GUN0258, with an additional note of high dissolved oxygen being observed at station GUN0258. At station NBP0023, the thermometer was hung in the shade behind a sign to obtain a more accurate air temperature.

September 2023: Weekend rain may have caused murky water conditions at station CAS0479. Rain was noted early in the morning prior to sampling stations YOU1139, LYO004, NBP0689, and CCR0001. Water clarity was purported to be clear at station NBP0689, but very tannic at CCR0001. Bridge construction work was observed downstream at station CON0005, it

was also noted that three quarters of the stream was covered in plants, algae, and debris. Lots of green algae in the water were also reported at station GUN0125; submerged aquatic vegetation (SAV) was observed at POT2766. Low water levels were reported at stations LYO0004 and NBP0689.

October 2023: Algae was observed on the rocks at stations GEO0009 and SAV0000. At station CON0005, over half of the bridge was blocked with debris, and a build-up of algae, scum, and submerged aquatic vegetation (SAV). A slight haze on the horizon was noted at station ANT0203, while the clouds at station NBP0461 were remarked to be thin and wispy. Water clarity conditions were reported to be clear at station NBP0103, cloudy at station BDK0000, and tannic at station CCR0001.

November 2023: Clouds were noted to be thin and wispy at stations YOU1139, GEO0009, NBP0326, NBP0534, LYO0004, NBP0461, NBP0689, and SAV0000.

The water level at station POT2386 was low, but water was reported to be clear. Submerged aquatic vegetation (SAV) was observed upstream at station CON0005, and half of the bridge was blocked by debris. Station YOU0925 was reported to be very windy during sampling.

December 2023: The clouds were described as thin and wispy at stations YOU1139, NBP0461 and SAV0000. Flurries occurred during sampling at station ET5.0. At stations CON0180 and CON0005 green algae was observed in the stream, however there was no algae visible in a bucket grab sample. There was also red sediment noted on the water surface at CON0180, and sample pads at that location were green. A greenish tint to the water was also noted at station NBP0689. The bridge at station CON0005 was blocked by two-thirds by debris and a foamy build-up. The water at station YOU1139 was noted to be slightly dirty from the rain and snow over the weekend prior to sampling.

Logical_Consistency_Report:

For logistical reasons, station XGG8251, a tidal monitoring station, is routinely sampled as part of the Chesapeake Bay tributary monitoring program. The station is sampled using Core protocols.

ADDITIONAL COMMENTS

January 2023: Station ANT0366 was sampled from the streambank upstream from the bridge. Stations CON0005 and WIL0013 were both sampled from their respective left eastern streambanks.

February 2023: The sample collected at station CJB0005 was processed at Lock #6. Station CB1.0 was sampled from the fishing area. Station DER0015 was sampled downstream of the bridge due to construction. Station POT2766 was sampled from the Pebble Beach area upstream from the bridge. At station NBP0326, the air temperature reading was taken from a smartphone because a thermometer hung on the guardrail provided unreliable results.

March 2023: The flow value recorded at station WIL0013 is an estimate by USGS. Station CON0180 was sampled at the gaging station, and station CAS0479 was sampled from the left

eastern streambank at the weir. The sample collected at station CJB0005 was processed at Lock #6.

April 2023: Station CAS0479 was sampled from the left eastern streambank. The sample at station POT2766 was collected from the streambank upstream from the bridge. The sample collected at station CJB0005 was processed off-site at Lock #6.

May 2023: Due to high water levels and the presence of eddies at the streambank, the sample at station NBP0326 was collected from the bridge. Station CON180 was sampled downstream from the gage due to lack of access to the river.

June 2023: The sample at station POT2766 was collected at the riverbank on Pebble Beach, upstream from the bridge. Sampling at station NBP0326 occurred from the streambank under the bridge. The sample collected at station CJB0005 was processed off-site at Lock #6.

July 2023: Station NBP0326 was sampled from the streambank under the bridge. Sampling was conducted from the riverbank on Pebble Beach, upstream from the bridge at station POT2766.

August 2023: The sample collected at station CJB0005 was processed off-site at Lock #6. Station NBP326 was sampled from under the bridge. Due to a road closure, sampling at station ANT0203 occurred downstream at Wagaman Road.

September 2023: Station WIL0013 was sampled from the riverbank downstream from the bridge, due to an ongoing pipe installation. Low water warranted sampling from the upstream side at station GEO0009. A composite sample was necessary at GWN0115 due to low water levels.

October 2023: Station ANT0366 was sampled from the stream bank upstream from the bridge because staff from USGS were wading in the stream closer to the bridge.

November 2023: At station LYO0004 the pump would not work so a hand pump was used instead. Station CON0180 was sampled downstream from the normal location due to the presence of a deer carcass. Sampling occurred upstream from the bridge at station POT2766.

December 2023: Due to road construction, the sample collected at station CJB0005 was processed off-site at Lock #6. Sampling occurred upstream from the bridge at station POT2766. Station WIL0013 was sampled from the lower eastern streambank.

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, POT1184, POT1471, POT1472, POT1595, POT1596, POT1830, RCM0111 and SEN0008. When the Monday following Biological Oxygen Demand sample collection was a holiday, samples were not collected. However, BOD samples were discontinued in November 2023.

Chloride and sulfate samples were collected at the following subset of Core\Trend stations: CCR0001, GEO0009, LYO0004, NBP0023, NBP0103, NBP0461, NBP0534, TOW0030, and YOU0925 through September 2023, and discontinued thereafter.

Station POT1472 was dropped from the Core monitoring program in October 2022. The station had not been sampled since December 2020 after White s Ferry closed down and access to the Virginia shoreline became unavailable.

Sampling was discontinued at station MON0020 in October 2022. At station MON0020, bridge restoration deleted the roadway shoulders, making sampling from the bridge unsafe. Collecting wading samples at this station was not a viable alternative due to dangerous stream conditions.

ADDITIONAL COMMENTS
April 2023: No air temperature was recorded at station NBP0461 as the thermometer was reported to be lost to wind and a lawnmower.

May 2023: Station CB1.0 was unable to be sampled because all gates were closed due to high flow at the dam.

June 2023: Gage and flow data for station DER0015 were unavailable due to equipment malfunction.

July 2023: No gage data was available for station POT1830.

August 2023: Air temperature was not recorded at station SAV0000.

October 2023: No air temperature was recorded at station NBP0326, as the thermometer was accidentally left behind.

There were no known completeness issues in January, February, March, September, November, or December 2023.

Lineage:
Process_Step:
Process_Description:
SONDE CALIBRATION and POST-CALIBRATION
HydroLab and YSI sondes were maintained and calibrated before and after each survey in accordance with manufacturer's recommendations.

WATER COLUMN 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 MDH DES ECL LABORATORY ANALYSIS
Maryland Department of Health, Laboratories Administration, Division of Environmental Sciences, Inorganics 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.

The Maryland Department of Health, Laboratories Administration, Western Maryland Regional Laboratory, Cumberland, MD, analyzed total alkalinity and turbidity for the following stations: CCR0001, CCR0001, YOU0925, CAS0479, WIL0013, BDK0000, NBP0103, NBP0023, POT2766, TOW0030, YOU1139, LYO0004, NBP0689, NBP0534, SAV0000, GEO0009, NBP0461, NBP0326, ANT0203, ANT0366, CON0180, CON0005, and POT2386.

Process_Date: Unknown
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Lara Phillips
Contact_Position: Supervisor, Inorganics Laboratory
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: 443.681.3863
Contact_Electronic_Mail_Address: lara.johnson_nospam_@maryland.gov[Remove _nospam_ for valid email address]

Process_Step:
Process_Description:
Core/Trend NASL LABORATORY ANALYSIS

University of MD Center for Environmental Science, Chesapeake Biological Laboratory (CBL), Nutrient Analytical Services Laboratory (NASL), Solomons, MD, analyzed chlorophyll, pheophytin, 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 (MDH) laboratory in Baltimore, MD. Sulfate analyses were performed by MDH Western Maryland Regional Laboratory 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 (Jerome) Frank
Contact_Position: Manager, Nutrient Analytical Services Laboratory
Contact_Address:
Address_Type: mailing and physical
Address: University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory, 146 Williams Street, P.O. Box 38
City: Solomons
State_or_Province: Maryland
Postal_Code: 20688
Country: USA
Contact_Voice_Telephone: (410)326-7252
Contact_Electronic_Mail_Address: frank_nospam_@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 MDH 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: Mark Trice
Contact_Organization: Maryland Department of Natural Resources, Resource Assessment Service
Contact_Position: Program Chief, Water Quality Informatics
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: mark.trice_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, Section 106 Ambient Water Quality Monitoring Program. Project data are an aggregation of data collected at Maryland Core/Trend project stations during 2023.

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

The entity Monitoring_Event_Data is comprised of the attributes: Agency, AirTemp, CBSeg2003, CBSegmentShed2009, CloudCover, Cruise, Details, EventId, FieldActivityEventType, FieldActivityRemark, FieldActivitySiteTypeCodeDescription, FIPS, FlowStage, GaugeHeight, HUC8, HUC12, Latitude, Longitude, LowerPycnocline, MonitoringStation, PrecipType, Pressure, Program, Project, SampleDate, SampleTime, Source, Station, TideStage, TierLevel, TotalDepth, UpperPycnocline, WaveHeight, WindDirection and WindSpeed.

The entity Optical_Density is comprised of the attributes: Agency, BiasPC, CBSeg2003, CBSegmentShed2009, Cruise, Depth, Details, EventId, FIPS, HUC8, HUC12, Lab, Latitude, Layer, Longitude, LowerPycnocline, MeasureValue, Method, MonitoringStation, Parameter, PrecisionPC, Problem, Program, Project, Qualifier, SampleDate, SampleReplicateType, SampleTime, SampleType, Source, Station, TierLevel, TotalDepth, Unit and UpperPycnocline.

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 Water_Quality_Data is comprised of the attributes: Agency, BiasPC, CBSeg2003, CBSegmentShed2009, Cruise, Depth, Details, EventId, FIPS, HUC8, HUC12, Lab, Latitude, Layer, Longitude, LowerPycnocline, MeasureValue, Method, MonitoringStation, Parameter, PrecisionPC, Problem, Program, Project, Qualifier, SampleDate, SampleReplicateType, SampleTime, SampleType, Source, Station, TierLevel, TotalDepth, Unit and UpperPycnocline.

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. [https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/cbwqdb2004_rb.pdf]. An updated version of the 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, May 2023 [https://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/MdDNR_MTQAPP_May2023.pdf].

Methods and Quality Assurance for Chesapeake Bay Water Quality Monitoring Programs. Chesapeake Bay Program, May 2017, CBP/TRS-319-17 [https://d38c6ppuviqmfp.cloudfront.net/documents/CBPMethodsManualMay2017.pdf].

Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Mike Mallonee
Contact_Position: Water Quality Data Manager
Contact_Address:
Address_Type: Mailing and Physical
Address: 1750 Forest Drive, Suite 130
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21401
Country: USA
Contact_Voice_Telephone: 410.267.5785
Contact_Electronic_Mail_Address: mmallone_no_spam_@chesapeakebay.net[Remove _no_spam_ for valid email address]

Resource_Description: Downloadable data
Distribution_Liability: None of the Chesapeake Bay Program partners or 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: Monitoring Event, Optical Density, Station Information and Water Quality data.
File_Decompression_Technique: No compression applied
Transfer_Size: 6.13
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name:
[https://www.chesapeakebay.net/what/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: 20230627
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Mark Trice
Contact_Organization: Maryland Department of Natural Resources, Resource Assessment Service
Contact_Position: Program Chief, Water Quality Informatics
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: mark.trice_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