Maryland Chesapeake Bay Tributary Water Quality Monitoring Program - 2014

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Maryland Department of Natural Resources, Resource Assessment Service
Publication_Date: 20150401
Title: Md DNR Chesapeake Bay Tributary Water Quality Monitoring Program 2014
Geospatial_Data_Presentation_Form: Spatial dataset
Online_Linkage: http://www.chesapeakebay.net/data/index.htm

Description:
Abstract:
One of the main goals of the Chesapeake Bay restoration is to reduce the impacts of excess nutrients on the Bay and its tributaries. In accordance with this goal, the Chesapeake Bay Program jurisdictions have agreed to reduce nitrogen, phosphorus and sediment pollution to the Bay. The Maryland Chesapeake Bay Tributary Water Quality Monitoring Program evaluates the physical/chemical component of water quality at sixty tributary stations. By measuring levels of nutrients and closely related habitat characteristics such as dissolved oxygen and water clarity, the monitoring program provides some of the most direct linkages to management actions that are reducing nutrient loads to the Bay.

Samples are collected monthly at each tributary station with one exception. Samples are not routinely collected at station EE3.3 in January and February.

Note that due to funding constraints, the number of sites sampled in year 2014 was reduced by nine. Tributary water quality monitoring project sampling ceased in January 2014 at the following stations: BXK0031, CCM0069, MNK0146, XDJ9007, POK0087, XAK7810, TRQ0088, TRQ0146 and XCI4078.

Note that the year 2013 tributary project station count was sixty-nine. The number of project sampling stations was incorrectly listed as seventy, instead of sixty-nine, in metadata records describing project years preceding 2013.

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 three 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 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 for the period July 1, 2014 - June 30, 2015 [http://mddnr.chesapeakebay.net/eyesonthebay/documents/MdDNR_MTQAPP2014.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: 20140113
Ending_Date: 20141222
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: Global Change Master Directory (GCMD). 2015. GCMD Keywords, Version 8.1. Greenbelt, MD: Global Change Data Center, Science and Exploration Directorate, Goddard Space Flight Center (GSFC) National Aeronautics and Space Administration (NASA). URL:[http://gcmd.nasa.gov/learn/keywords.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 River
Place_Keyword: Big Annemessex River
Place_Keyword: Bohemia River
Place_Keyword: Bush River
Place_Keyword: Chester 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: Wicomico River

Temporal:
Temporal_Keyword_Thesaurus: Global Change Master Directory Science Keywords
Temporal_Keyword: 2014
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: renee.karrh_nospam_@maryland.gov[Remove _nospam_ for valid email address]
Browse_Graphic:
Browse_Graphic_File_Name: [http://mddnr.chesapeakebay.net/eyesonthebay/documents/metadata/MdDNR_TribStns2014.pdf]
Browse_Graphic_File_Description: Map of sixty year 2014 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.

ADDITIONAL COMMENTS

January 2014: Comments for stations PIS0033 and MAT0078 noted that creek levels were high due to rainfall during the weekend preceding sampling. Overnight rain was noted in comments for stations: WT8.2, WT8.3, WT7.1 and WT6.1. Rain was falling when water quality samples were collected at station WT8.1. Bottom sonde readings at station WT8.1 were

double checked. At station ET7.1, conductivity readings were checked using a second meter and the samples were collected from the ferry.

February 2014: Meter scoping affected sampling at stations: LE1.3, LE1.2, LE1.1, RET1.1 and RET2.4. Scoping is a term used to describe situations when strong currents and/or winds make it difficult to maintain the water quality data sonde at a depth long enough for readings to stabilize. At station RET2.4, the sonde was scoping so hard it was not possible to lower it to the bottom depth. Surface and 1.0 meter water quality samples were collected from the same parcel of water at station LE1.4. A backup thermometer was used to measure station ET10.1 air temperature. The river level was characterized as full at station WXT0001. The river was described as muddy at stations: TF1.4, TF1.3, TF1.2 and WXT0001. Rainfall preceding sampling was noted at stations: EE1.1 and ET4.2. At station TF1.2 the river was full. Post-calibration readings of the conductivity sensor, used to measure water quality at stations: EE2.2, EE2.1, EE1.1 and ET4.2, were 1448 UMHOS/CM lower than the 24820 UMHOS/CM standard.

April 2014: At station WXT0001, the creek was described as high and muddy. Similarly, comments made at stations TF1.4 and TF1.3 characterized the river water as muddy. The creek was high at station TF1.2. A station WT5.1 note stated that the sonde was scoping.

May 2014: The Secchi disk depth at station TF1.3 was greater than the total depth of the water at the site. A note recorded at station ET4.2 mentioned that the bottom pycnocline samples should have been collected at 9 meters of depth.

June 2014: Surface and 1.0 meter water quality samples were collected from the same parcel of water at station LE1.4. A station LE1.3 field sheet comment stated that salinity and conductivity values did not match in the bottom two sample depths measured. Meter scoping at the bottom was noted at station LE2.3. Morning rain was noted at stations: WT6.1, WT8.1, WT8.3 and WT7.1. Rain showers during the night preceding sampling were listed in the comments made for stations: ET1.1, ET3.1, ET2.1, ET2.3, ET4.1 and ET2.2. Morning showers preceded sampling at stations TF1.7 and TF1.6. The creek was high and turbid when station TF1.2 was sampled. At station PIS0033, a remark stated that the water was not flowing.

August 2014: A broken dissolved oxygen probe precluded post-calibration procedures after stations: ET5.2, LE2.2 and WT5.1 were sampled. The smell of hydrogen sulfide was noted in the below pycnocline and bottom water samples collected at station EE1.1. A fluorescent green phytoplankton bloom was seen at station ET3.1. Notes about green flocs (plant material) in the water were logged at stations: RET2.1, RET2.2, TF2.3 and TF2.4.

September 2014: The data sonde water circulator was not working when stations PIS0033 and MAT0078 were sampled. A hydrogen sulfide odor in the bottom water sample was noted at station LE2.2. Bridge construction was underway when station ET4.1 was sampled. Rainfall preceded sampling at station ET6.1.

November 2014: Rainfall, the night before and during the morning of sampling, was noted on the field data sheets for stations ET10.1 and WIW0141.

December 2014: Heavy rain, during the weekend, preceded sampling at stations MAT0078 and PIS0033. A dinoflagellate bloom was observed at when station WT5.1 was sampled. A station ET2.2 surface dissolved oxygen reading (14.0 mg/L) was acquired using meter 'T'.

There were no other known issues in March, July and October 2014.

Logical_Consistency_Report:

Beginning in 2014, due to funding, nine stations sampled in previous years, were dropped from the tributaries water quality monitoring program: BXK0031, CCM0069, MNK0146, POK0087, TRQ0088, TRQ0146, XAK7810, XCI4078 and XDJ9007.

January 2014: The water samples for station ET7.1 were collected using a bucket from the ferry. When stations EE1.1, EE2.1, EE3.1 and EE3.2 were sampled, there was no pycnocline; above pycnocline and below pycnocline samples were collected at 1/3 and 2/3 of the station total depth, respectively.

February 2014: The ET7.1 water sample was collected from the ferry. Due to ice, station WT8.2 was collected on half mile east of the station location. When station EE2.1 was sampled, there was no pycnocline; above pycnocline and below pycnocline samples were collected at 1/3 and 2/3 of the station total depth, respectively.

March 2014: The station ET5.1 sample was collected from Ganeyâ€™s Wharf. The station ET5.2 sample was collected from the fishing pier. When stations EE1.1, EE4.2, EE3.1 and EE2.1 were sampled, there was no pycnocline; above pycnocline and below pycnocline samples were collected at 1/3 and 2/3 of the station total depth, respectively.

April 2014: There was no pycnocline when stations EE2.1, EE3.1 and EE3.2 were sampled; above pycnocline and below pycnocline samples were collected at 1/3 and 2/3 of the station total depth, respectively.

May 2014: The station ET5.2 water sample was collected from the fishing pier. A note from station ET4.2 mentioned that the bottom pycnocline samples should have been collected at 9 meters of depth. Due to construction, the station ET4.1 water sample was collected from the Crumpton (Southern) end of the bridge. When station EE3.1 was sampled, there was no pycnocline; above pycnocline and below pycnocline samples were collected at 1/3 and 2/3 of the station total depth, respectively.

June 2014: A field sheet comment for station LE1.3 states that salinity and conductivity measurements for the bottom two readings do not match. When stations EE2.1, EE3.1, ET5.2 and RET2.4 were sampled, there was no pycnocline; above pycnocline and below pycnocline samples were collected at 1/3 and 2/3 of the station total depth, respectively.

July 2014: When stations EE1.1, EE2.1, ET4.2 and ET5.2 were sampled, there was no pycnocline; above pycnocline and below pycnocline samples were collected at 1/3 and 2/3 of the station total depth, respectively. The station WIW0141 sample was collected from the ferry.

September 2014: The station TF1.3 sample was collected from the fishing pier. Bridge construction prevented collection of station ET4.1 samples from the deep part of the river. The station WIW0141 sample was collected from the ferry.

November 2014: Station LE1.3 bottom sonde values, normally read at 22 meters, were read at 21 meters. Station LE1.3 bottom sonde values, normally read at 15 meters, were read at 14 meters. The changed bottom sample depth was due to an unusually low tide. When stations EE1.1, EE2.1, EE3.1, EE3.2, ET4.1 and WT5.1 were sampled, there was no pycnocline; above pycnocline and below pycnocline samples were collected at 1/3 and 2/3 of the station total depth, respectively. Station ET5.1 was sampled on the Talbot County side of the river at the Burton Fishing pier.

December 2014: When stations RET2.4, EE2.1 and ET5.2 were sampled, there was no pycnocline; above pycnocline and below pycnocline samples were collected at 1/3 and 2/3 of the station total depth, respectively. The station ET7.1 sample was collected from the dock on the north shore.

There were no other known issues during sampling conducted during August and October 2014.

Completeness_Report:

January 2014: Station EE3.3 is not sampled in January and February. The temperature probe, used to measure water quality at stations: WT6.1, WT7.1, WT8.1, WT8.2 and WT8.3, failed. The water quality sample at station was collected at the surface depth only. The January Patuxent River monitoring cruise was cancelled due to weather and logistics and no samples were collected at the following stations: LE1.1, LE1.2, LE1.3, LE1.4, RET1.1, RET2.4, TF1.5, TF1.6 and TF1.7. Water quality samples were collected at Patuxent 'Land' stations: TF1.3, TF1.4 and WXT0001.

February 2014: Station EE3.3 is not sampled in January and February. Total depth was not recorded at station TF1.3. Station TF1.5 was not sampled due to an extreme low tide. Air temperature was not recorded at stations: RET2.4, WT7.1, WT8.1, WT8.2 and WT8.3. Station WT6.1 was not sampled to rough water conditions. Ice coverage prevented sample collection at the following stations: WT3.1, EE3.0, EE3.1, EE3.2, ET6.2, ET8.1 and ET9.1.

March 2014: Secchi disk depth and total depth were not recorded at station TF1.3.

April 2014: Air temperature was not measured at stations ET2.1 and ET2.3

May 2014: Air temperature was not measured at stations ET2.2 and ET2.1. Station XHH4742 was not sampled.

June 2014: At station ET3.1, lack of filter water made it impossible to process a chlorophyll a filter for CBL lab number 49R. The station ET3.1 filter processed for CBL lab number 50R was Chlorophyll a only. Secchi disk depth and total depth were not recorded at station TF1.3.

July 2014: Total depth was not measured at stations TF1.3 and WIW0141. The Secchi disk depth at station TF1.3 was not recorded.

August 2014: Air temperature was not measured at stations: ET10.1, ET6.1 and WIW0141.

September 2014: Rough water conditions at stations LE1.1, LE1.3, LE1.4 and RET1.1 prevented LICOR measurements. Cloud cover was not recorded when station TF1.2 was sampled.

October 2014: Air temperature was not measured at stations: MAT0078 and PIS0033. Station Total depth was not recorded at station WIW0141. No sampling was performed at station EE3.2 due to rough conditions.

November 2014: Station TF1.5 was not sampled due to an extreme low tide. Neither Secchi disk depth nor total depth were measured at station TF.13. Due to a broken thermometer, air temperature was not measured at stations WT2.1 and WT3.1. Only a surface water sample was collected at station ET5.1 and Secchi disk depth was not measured.

December 2014: Total depth was not recorded at station TF1.3. The station 10.0m sonde reading at RET2.4 was not recorded.

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

The Yellow Springs Instrument (YSI) data sondes and HydroLab multi-parameter sondes were maintained and calibrated before and after each cruise in accordance with manufacturer's recommendations. During year 2014, YSI series 6820 and 6920 and Hydrolab series 3 (rarely), series 4A, and series 5 sondes were deployed. Field sheet dissolved oxygen method and equipment-set unit number values were used to track sondes used for station water quality measurements.

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 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 m above the bottom.

Note that six Patuxent River stations, at which samples are also collected from four depths, use a different fixed-depth protocol for sampling mid-water depths. At station TF1.5 and RET1.1, samples are collected at 3 m and 6 m. Mid-water-column samples at stations LE1.1 and LE1.4 are collected at 3 m and 9 m. Samples are collected at 3 m and 12 m depths at stations LE1.2 and LE1.3.

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: sally.bowen_nospam_@maryland.gov[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: Jerry Frank
Contact_Position: Manager Nutrient Analytical Services Laboratory, Faculty Research Assistant IV

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: 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 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: Back River, Big Annemessex River, Bohemia River, Bush River, C&D Canal, Chesapeake Bay, Chester 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, 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 sixty Maryland tributary stations during 2014.

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, Station_Description, USGS_Gage, CBSEG_2003, CBSEG_2003_Description, CB_Segment_Shed_2009, CB_Segment_Shed_2009_Description, HUC12, FIPS, State, County_City, FallLine, Latitude, Longitude, UTMX, UTMY, and LL_Datum.

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, Wind_Speed, Wind_Direction, Precip_Type, Tide_Stage, Cloud_Cover, Gauge_Height, Pressure, Flow_Stage and Details.

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]. 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 for the period July 1, 2014 - June 30, 2015 [http://mddnr.chesapeakebay.net/eyesonthebay/documents/MdDNR_MTQAPP2014.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: 71403
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 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: 6.7
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 web site (see network resource name) instructions.
Fees: None

Metadata_Reference_Information:
Metadata_Date: 20150420
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
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Contact_Voice_Telephone: 410-260-8630
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Contact_Electronic_Mail_Address: benjamin.cole_nospam_@maryland.gov[Remove _nospam_ for valid email address]
Metadata_Standard_Name: Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998