Maryland Chesapeake Bay Mainstem Water Quality Monitoring Program - 2015

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Maryland Department of Natural Resources, Resource Assessment Service
Publication_Date: 20160322
Title: MD Dept. of Natural Resources, Chesapeake Bay Mainstem Water Quality Monitoring 2015
Geospatial_Data_Presentation_Form: Spatial dataset
Online_Linkage: [http://www.chesapeakebay.net/data/index.htm]

Description:
Abstract:
The physical/chemical component of the Maryland Chesapeake Bay Water Quality Monitoring Program consists of data collected at twenty-two stations located in Maryland's Chesapeake Bay mainstem. (Note the station count was incorrectly listed as twenty-one in previous mainstem project metadata records).

In total, sixteen samplings were completed in the period of 12-Jan-2015 through 16-Dec-2015. Sampling was conducted twice monthly in June, July, August of 2015, and once monthly during February, March, April, May, September, October, November and December; a special study second cruise on October 7-9, 2015 was conducted with the University of Maryland to measure impacts from a tropical storm. Sampling during the July cruise was limited to physical measurements collected to better assess dissolved oxygen levels in the mainstem deep waters. No samples were collected January, February, November or December at eastern and western transect stations, resulting in only twelve mainstem flanking station samplings during year 2015.

The water quality monitoring program began in 1984 and is ongoing. The program assesses the water quality by evaluating the levels of nutrients and closely related habitat impacts such as dissolved oxygen and water clarity. One of the main goals of the Chesapeake Bay restoration is to reduce the impacts of excess nutrients on the Bay and these measures provide some of the most direct linkages to management programs that are achieving this goal. The Chesapeake Bay Program jurisdictions have agreed to reduce nitrogen, phosphorus and sediment pollution to the Bay.

Purpose:
The Maryland Department of Natural Resources Chesapeake Bay Water Quality Monitoring Program is part of a cooperative effort between the Federal government and State

and local governments in the Chesapeake Bay watershed to assess the status and trends of nutrient and sediment concentrations in Maryland's Chesapeake Bay mainstem.

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 the 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 two documents listed below. The documents may be obtained from The Chesapeake Bay Program Office.

Water Quality Database - Database Design and Data Dictionary, Prepared For: U.S. Environmental Protection Agency, Region III, Chesapeake Bay Program Office, January 2004. [http://archive.chesapeakebay.net/pubs/cbwqdb2004_RB.PDF]. 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, 2015 - June 30, 2016 can be found using publication type 'Quality Assurance Project Plan' to search the monitoring stories and publications page of [http://www.eyesonthebay.net]

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: 20150112
Ending_Date: 20151216
Currentness_Reference: Ground Condition
Status:
Progress: Complete
Maintenance_and_Update_Frequency: As needed
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -80.53758

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 > 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
Temporal:
Temporal_Keyword_Thesaurus: Producer Defined
Temporal_Keyword: 2015
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
Country: USA
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: MDDNR Mainstem Monitoring Project 2015 Station Map can be found using publication type 'map' to search the monitoring stories and publications page of [http://www.eyesonthebay.net]
Browse_Graphic_File_Description: Map of twenty-two 2015 Maryland Chesapeake Bay Mainstem 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, 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 Mainstem 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 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 2015: Rain preceded sampling at stations CB5.1, CB5.2 and CB5.1. Field log notes described meter scoping at stations CB3.3C, CB4.C and CB4.2C. 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. Surface and 1 m water samples were drawn from water collected at the same depth at stations CB3.3C, CB4.2C and CB4.3C.

February 2015: It was not possible to conduct post calibration checks on the dissolved oxygen probe used at station CB5.1W due to failure of the probe. A frozen sample pump hose was also noted at station CB5.1W. Water for both the surface and the 1.0 m samples at each of the stations CB4.1C, CBCB4.2C, CB4.3C, CB4.4 and CB5.1 were collected at the same depth.

March 2015: Water for both the surface and the 1.0 m samples at each of the stations CB3.1, CB3.2 and CB4.4 were collected at the same depth.

April 2015: Water for both the surface and the 1.0 m samples at stations CB4.4, 5.1, CB5.1W and CB5.2 were collected at the same depth. At station CB3.2, water for both the below pycnocline and the bottom sample was collected from the same bottle.

May 2015: The water quality data sonde touched bottom at 11.0 m. at station CB2.2. The CB2.2 bottom water sample was collected at the depth of 10.0 m. The occurrence of scattered thunderstorms on the night before samples were collected was observed on the field sheets for stations CB2.2, CB3.1, CB3.2, CB3.3C, CB3.3E, CB3.3W, CB4.1C, CB4.1E, CB4.1W, CB4.2C, CB4.2E, CB4.3C, CB4.3E, CB4.3W and CB5.1W.

June 2015: During the first June cruise (June1-3), water for both the surface and the 1.0 m samples at every station was collected at the same depth with just three exceptions, stations CB4.3E, CB5.2 and CB5.1W. A June 2 log book note indicated that the meter wheel was not operating reliably. During the second survey (Jun22-24), meter scoping occurred during sampling at station CB3.2. 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. Conductivity readings at 4.0 m. depth at station CB3.2 were unstable.

July 2015: During the first July survey (July 6-8), morning rain showers were noted on stations CB4.4, CB5.1 and CB5.2 field sheets. Water for both the surface and the 1.0 m samples at each of the stations CB4.4, CB5.1, CB5.2 and CB5.3 were collected at the same depth. Below pycnocline and bottom water samples collected at stations CB4.1C, CB4.2C, CB4.3C, CB4.3E and CB5.1 had hydrogen sulfide (H2S) odors. Similarly, H2S smells were noted in bottom water samples at stations CB4.4 and CB5.2. Meter scoping occurred at station CB3.3C and at station CB3.2, conductivity readings changed when the data sonde was returned to the surface. On the second July mainstem survey (July 20-23), a station CB5.3 field sheet note stated that bottom dissolved oxygen readings were double checked.

August 2015: On the first survey (August 3-5), hydrogen sulfide odors were observed in bottom and below pycnocline water sampled at stations CB3.3C, CB4.1C, CB4.1E, CB4.2C, CB4.3C and CB4.3E. Station CB3.2 3.0 m. depth dissolved oxygen readings were re-checked and station CB5.2 10.0 m. dissolved oxygen readings were double checked. The 0.5 m and 1.0 m water samples of stations CB4.4 and CB5.1 came from the same depth. Meter scoping occurred at station CB4.3E.

During the second cruise (August 24-26), both the 0.5 m and 1.0 m water samples at stations CB3.2, CB4.3C, CB4.3E, CB4.4, CB5.1, CB5.2 and CB5.3 were collected at the same depth. Meter scoping was reported at stations CB3.1, CB4.2C and CB4.3C.

September 2015: Both the 0.5 m and 1.0 m water samples at stations CB4.4, CB5.1, CB5.2 and CB5.3 were collected from water collected at the same depth. Station CB3.1 bottom and below pycnocline water samples were collected from the same sample bottle. At station CB3.3E, the 6 m depth oxygen reading was considered stable. At station CB3.3C, bottom sonde readings were very unstable. A hydrogen sulfide odor was observed in bottom water sampled at stationCB3.3C.

October 2015: A special survey was conducted 7-9 October 2015. The goal was assessing the effects of Hurricane Joaquin. At Station CB1.1, bottom conductivity was checked with meter Y. Both the 0.5 m and 1.0 m water samples at stations CB5.2 and CB5.3 were collected from water collected at the same depth. During the routine survey (19-21 October), the 0.5 m and 1.0 m water samples at stationsCB5.3 and CB4.3E were collected from water drawn from the same depth. The bottom and below pycnocline water samples drawn at station CB2.2 came from the same bottle. Unstable 10 m depth conductivity readings were reported at station CB4.2C. Similarly, unstable 12 m depth conductivity readings were reported at station CB4.1C.

November 2015: The 0.5 m and 1.0 m water samples at stations CB5.1W, CB4.3C, CB4.2C and CB4.1C were collected from water drawn from the same depth.

December 2015: The surface and above pycnocline water samples at station CB5.3 were collected from different bottles. The 0.5 m and 1.0 m water samples at stations CB5.2, CB5.1, CB4.4, CB4.3C, CB4.2C, CB4.1C, CB3.3C and CB3.2 were drawn from the same bottle. The surface and above pycnocline water samples at station CB3.2 were collected from a single bottle.

Logical_Consistency_Report:

For logistical reasons, station LE2.3, a Potomac River water quality sampling project station, is routinely sampled during Chesapeake Bay mainstem sampling cruises. Tributaries monitoring project boat stations are sampled using small boats for most of the year. The larger mainstem sampling vessel is used when weather and safety are concerns. In addition to mainstem stations sampling, one or more of the following tributaries project stations may be sampled using the larger vessel during December, January and February surveys: EE2.2, EE2.1, EE1.1, ET4.2 and WT5.1. For logistical reasons, water samples for mainstem project station CB5.1W are routinely collected on the Tributaries project Patuxent boat survey. Two surveys were conducted in each of months: June, July and August and October 2015.

January 2015: There were no pycnoclines at stations CB4.1C, CB4.2C, CB4.3C, CB4.4, CB5.1, CB5.2 and CB5.3. At each of those stations, above pycnocline and below pycnocline samples were collected at one third and two thirds of the total water column depth, respectively.

February 2015: No pycnocline was found at stations CB3.3C, CB4.1C, CB4.2C, CB4.3C, CB4.4 and CB5.1. Therefore above pycnocline and below pycnocline samples were collected at one third and two thirds of the total water column depth, respectively.

April 2015: Due to absence of water column pycnoclines at stations CB2.2, CB3.2, CB5.1 and CB5.2, above pycnocline and below pycnocline samples were collected at one third and two thirds of the total water column depth, respectively.

May 2015: There was no pycnocline at station CB2.2, therefore above pycnocline and below pycnocline samples were collected at one third and two thirds of the total water column depth, respectively.

June 2015: During the first June cruise, July 1-3, pycnoclines were not found at stations CB3.2, CB4.2C, CB4.3C, CB4.3E, CB4.4, CB5.1 CB5.2 and CB5.3. At each of the stations, above pycnocline and below pycnocline samples were collected at one thirds and two thirds of the total water column depth, respectively. On the June 22-24 survey, above pycnocline and below pycnocline samples were collected at one third and two thirds of the total water column depth, respectively, at station CB2.2.

July 2015: During the first July survey, July 6-8, above and below pycnocline water samples for station CB2.2 were collected at one and two thirds of the water column depth, respectively.

August 2015: There were two August 2015 cruises. Full suites of nutrient samples were collected on both cruises. During the first cruise, August 3-5, there was no pycnocline at station CB2.2. Therefore, above pycnocline and below pycnocline samples were collected at one thirds and two thirds of the total water column depth, respectively.

September 2015: The above pycnocline sample at station CB3.3C should have been collected at a depth of 1 m instead of 4 m.

October 2015: A special survey was conducted 7-9 October 2015. The goal was to assess the effects of Hurricane Joaquin. Due to the absence of a pycnocline at stations CB4.2C and CB5.1, above pycnocline and below pycnocline samples were collected at one thirds and two thirds of the total water column depth, respectively. There were no known logical consistency issues during the routine survey (19-21 October).

November 2015: Due to the absence of a pycnocline at stations CB5.2 and CB5.1, above pycnocline and below pycnocline samples were collected at one thirds and two thirds of the total water column depth, respectively. At station CB3.1 the below pycnocline sample should have been collected at the depth of 7 m.

December 2015: There was no pycnocline at station CB4.1; the above pycnocline and below pycnocline samples were collected at one thirds and two thirds of the total water column depth, respectively.

Completeness_Report:

NOTE: Water samples for mainstem project station CB5.1W are routinely collected on the Tributaries Patuxent Boat survey for logistical reasons. Two surveys were conducted in each of months: June, July, August and October 2015.

January 2015: Stations CB1.1, CB2.1, CB2.2 and CB3.1 were not sampled due to upper Chesapeake Bay ice conditions.

February 2015: Stations CB5.3 and CB5.2 were not sampled due to gale winds and rough seas.

March 2015: Stations CB4.1E, CB4.1W, CB4.2E, CB4.2W and CB4.3W were not sampled due to predicted gale winds.

June 2015: Stations CB4.1E, CB4.1W, CB4.2E and CB4.2W were not sampled due to small craft warnings.

July 2015: Two mainstem surveys were conducted in July 2015. No calibration samples were collected during the second July mainstem water quality monitoring cruise. Sampling on the second cruise was limited to water column profiles using the data sonde.

September 2015: Station CB5.3 was not sampled due to rough seas and high winds.

There are no known completeness issues for the months: April, May, August, October, November or December 2015.

Lineage:

Process_Step:

Process_Description:

SONDE CALIBRATION and POST-CALIBRATION

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

WATER COLUMN PROFILE SAMPLING PROTOCOLS:

A profile of temperature, specific conductance, dissolved oxygen, and pH was obtained from the water column by deploying the data sonde 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. If the change in dissolved oxygen exceeded 1.0 mg/L or if the change in specific conductance equaled or exceeded 1,000 micromhos/cm over any 2.0 m interval, readings were taken at 1.0 m intervals between these two readings. For total depths less than or equal to 10.0 m, readings were taken at 1.0 m intervals.

GRAB SAMPLING DEPTH PROTOCOLS:

At stations where two depths were sampled, collections were taken at 0.5 m below the surface, and 1.0 m above the bottom. If the station total depth was equal to 1.5 m, the bottom sample was also collected at 0.5 m. Great caution was exercised when taking bottom samples; if the bottom was disturbed and bottom sediments appeared to have been included, the sample was dumped out and collected after the sediments had settled. Alternately, the sample was collected slightly higher in the water column and the new bottom sample depth was noted.

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

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

SECCHI DEPTH:

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

Process_Date: Unknown
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Kristen Heyer
Contact_Position: Project Chief (Acting), 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: 410 990-4600
Contact_Electronic_Mail_Address: kristen.heyer_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 also performed chlorophyll analyses. Prior to 2009, chlorophyll analyses were performed by the Maryland Department of Mental Health and 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 conduct data QA/QC procedures. All of the water quality calibration "grab" sample data are plotted. Outliers and anomalous values are thoroughly researched. Staff members compare unusual values to historic values from the site and values from nearby sites. Weather events are considered, event logs are reviewed and CBL analytical laboratory staff members and DNR field staff members are consulted regarding possible legitimate causes for outlying values. In cases where values are not considered to be legitimate, they were masked in the published dataset with the approval of the field staff and the Quality Assurance Officer.

Process_Date: Unknown
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Renee Karrh
Contact_Position: Program Manager
Contact_Address:
Address_Type: mailing
Address: 580 Taylor Ave., D2
City: Annapolis
State_or_Province: MD
Postal_Code: 21401
Contact_Voice_Telephone: 410 260-8630
Contact_Electronic_Mail_Address: renee.karrh_nospam_@maryland.gov[Remove _nospam_ for valid email address]

Spatial_Data_Organization_Information:
Indirect_Spatial_Reference: Chesapeake Bay, Maryland
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 Mainstem. Project data are an aggregation of data collected at twenty-two Maryland mainstem stations during 2015.

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

The entity Station_Information is comprised of the attributes: Station, StationDescription, CBSeg2003, CBSeg2003Description, CBSegmentShed2009, CBSegmentShed2009Description, HUC12, FIPS, State, CountyCity, USGSGage, FallLine, Latitude, Longitude, UTMX, UTMY and LLDatum.

The entity Monitoring_Event_Data is comprised of the attributes: Details, GaugeHeight, EventId, Source, Program, Project, Station, Latitude, Longitude, EventStartDate, EventStartTime, Cruise, TotalDepth, UpperPycnocline, LowerPycnocline, WindSpeed, WindDirection, PrecipType, TideStage, CloudCover, Pressure and FlowStage.

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

The entity Light_Attenuation_Data is comprised of the attributes: EventId, Source, Station, Program, Project, SampleDate, SampleTime, HUC8, CatalogingUnitDescription, SampleReplicateType, Parameter, Depth, Unit, Method, Details, UpperPycnocline, LowerPycnocline, and TotalDepth.

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, 2015 - June 30, 2016 can be found using publication type 'Quality Assurance Project Plan' to search the monitoring stories and publications page of [http://www.eyesonthebay.net]

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
Country: USA
Contact_Voice_Telephone: 800.968.5785
Contact_Electronic_Mail_Address: mmallone@_no_spam_chesapeakebay.net[Remove _nospam_ for valid email address]
Resource_Description: Downloadable data
Distribution_Liability: None of the Chesapeake Bay Program partners nor any of their employees, contractors, or subcontractors make any warranty, expressed or implied, nor assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information or data contained within the web site. Reference to any specific commercial products, processes, or services or the use of any trade, firm, or corporation name is for the information and convenience of the public and does not constitute endorsement, recommendation or favoring by the Chesapeake Bay Program partners.

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: ASCII file, formatted for text attributes, declared format
Format_Information_Content: Station Information data, Monitoring Event data, Light Attenuation data and Water Quality data.
File_Decompression_Technique: No compression applied
Transfer_Size: 5.2

Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: [http://www.chesapeakebay.net/data]
Access_Instructions: Data are available through the Chesapeake Bay Program's 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: 20160405
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Ben Cole
Contact_Organization: Maryland Department of Natural Resources, Resource Assessment Service
Contact_Position: Natural Resource Biologist
Contact_Address:
Address_Type: Mailing and Physical

Address: 580 Taylor Avenue, D-2
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21401
Country: USA
Contact_Voice_Telephone: 410-260-8630
Contact_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