Maryland Chesapeake Bay Mainstem Water Quality Monitoring Program - 2016

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Maryland Department of Natural Resources, Resource Assessment Service
Publication_Date: 20170403
Title: MD Dept. of Natural Resources, Chesapeake Bay Mainstem Water Quality Monitoring 2016
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 2009-2012 mainstem project metadata records).

In total, fifteen samplings were completed in the period of 27-Jan-2016 through 14-Dec-2016. Sampling was conducted twice monthly in June, July, August of 2016, and once monthly during February, March, April, May, September, October, November and December. Sampling during the second 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 2016.

The water quality monitoring program began in 1984 and is an ongoing effort by Chesapeake Bay Program jurisdictions to monitor progress in reducing nitrogen, phosphorus and sediment pollution to the Bay. The program assesses water quality by evaluating concentrations of nutrients and sediments, along with resulting habitat parameters such as dissolved oxygen, turbidity/water clarity, and chlorophyll. Monitoring these parameters allows resource managers to determine the effectiveness of management and restoration actions, and helps to guide future actions.

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

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

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 20160127
Ending_Date: 20161214
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: USGS Thesaurus
Theme_Keyword: estuarine ecosystems
Theme_Keyword: river systems
Theme_Keyword: eutrophication
Theme_Keyword: ecosystem functions
Theme_Keyword: nutrient cycling
Theme_Keyword: nutrient content (water)
Theme_Keyword: water temperature
Theme_Keyword: oxygen content (water)
Theme_Keyword: salinity
Theme_Keyword: water pH
Theme_Keyword: dissolved organic compounds
Place:
Place_Keyword_Thesaurus: Common geographic areas
Place_Keyword: fUS = United States
Place_Keyword: fUS24 = Maryland
Place_Keyword: h02080101 = Lower Chesapeake Bay
Place_Keyword: h02060001 = Upper Chesapeake Bay
Place_Keyword: f24005 = Baltimore
Place_Keyword: f24029 = Kent
Place_Keyword: f24025 = Harford
Place_Keyword: f24035 = Queen Anne's
Temporal:
Temporal_Keyword_Thesaurus: USGS Thesaurus
Temporal_Keyword: summer
Temporal_Keyword: spring (season)
Temporal_Keyword: autumn
Temporal_Keyword: winter
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, C2
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 2016 Station Map [http://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/metadata/MdDNR_MainstemStns2016.pdf]. If the map URL raises a file not found error, drill down from [http://eyesonthebay.net].
Browse_Graphic_File_Description: Map of twenty-two 2016 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 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 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 2016: Silicate samples were not frozen after collection due to equipment issues. Water for both the surface and the 1.0 m samples at stations CB5.2 and CB4.3C was collected at the same depth. Pycnoclines were not evident at stations: CB5.2, CB5.1, CB4.4, CB4.3C, CB4.2C and CB4.1C. Therefore the above pycnocline and below pycnocline water samples were collected at 1/3 and 2/3 of total water column depth, respectively.

February 2016: Silicate samples were not frozen after collection due to equipment issues. 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. Meter scoping was noted at stations: CB4.4, CB4.3C, CB4.2C, CB4.1C and CB3.3C. Water samples for surface and 1.0m at stations: CB4.3C, CB4.2C, CB4.1C and CB3.3C were collected at the same depth.

March 2016: At station CB2.2, water for both the below pycnocline and the bottom sample was collected from the same bottle. Meter scoping was noted at stations: CB5.2, CB5.1, CB4.4 and CB4.3C. There was no pycnocline at station CB5.2 and the above pycnocline and below pycnocline water samples were collected at 1/3 and 2/3 of the total water column depth, respectively.

April 2016: Meter scoping at the bottom was logged when station CB3.1 was sampled. Surface and 1.0m water samples at stations: CB5.2, CB5.1, CB4.4, CB4.3C and CB4.2C were collected at the same depth. Due to no pycnocline, above pycnocline and below pycnocline water samples were collected at 1/3 and 2/3 of the total water column depth, respectively, at the following stations: CB5.2, CB5.1, CB4.4, CB4.3C, CB4.2C, CB4.1C, CB3.3C and CB2.2.

May 2016: Station CB4.4 data sonde readings were double checked at 15.0m. Surface and 1.0m water samples at stations: CB4.3E, CB4.3W and CB4.2W were collected at the same depth. A strong tide was noted at station CB3.3C. Station CB3.3W conductivity readings were unstable at 7.0m. Attempts to post-calibrate the meter D dissolved oxygen sensor, used for sampling at station CB5.1W, were not successful.

June 2016: The first June cruse was conducted June 6-8. A squall passed through during sampling operations at station CB1.1 8-Jun-2016. The sampling array touched the bottom at 11m at station CB2.2. Similarly, the array hit bottom at station CB2.1. Absence of pycnoclines at stations: CB5.1, CB4.4 and CB4.3E necessitated collection of the above pycnocline and below pycnocline samples at 1/3 and 2/3 of total water column depth. A ship passed during sample collecting at station CB4.3C. Station CB4.1E temperature readings at 5m were double checked. Surface and 1m water samples at stations CB3.2 and CB3.1 came from water collected at the same depth.

Rough conditions June 14, at station CB5.1W, made LI-COR sampling unsafe.

The second June cruise was conducted June 27-29. Station CB5.2 sonde readings at 10m and 13m were double checked. At station CB4.3C meter scoping at the bottom was noted. Surface and 1m samples were comprised of water collected at the same depth. The above pycnocline and below pycnocline samples at station CB4.1E were collected from 1/3 and 2/3 of the total water depth, respectively. The 2m sonde readings were checked twice at station CB3.3E

July 2016: During the first July survey (July 11-13), 14m and 15m sonde readings at station CB4.4 were double checked. Meter scoping was noted at station CB4.1C. The surface and 1m samples were taken from water collected at the same depth.

August 2016: On the first survey (August 8-10), hydrogen sulfide odors were observed in bottom and below pycnocline water sampled at stations: CB4.3E, CB4.3C, CB4.2C, CB4.1E and CB4.1C. The bottom sample water at station CB3.3C had a hydrogen sulfide smell. Split samples were churned by hand when water was dispensed into sample bottles. (Normally, churning is accomplished using an electric drill). Meter scoping was noted at station CB4.4. A tanker passed while samples were collected at station CB3.2. Station CB3.2 and CB3.1 surface and 1m samples came from water collected at the same depth.

During the second cruise (August 29-31), a hydrogen sulfide odor was observed in bottom water sampled at stations CB5.1 and CB3.3C. Hydrogen sulfide odors were also noted in water samples collected at stations: CB4.3E, CB4.3C, CB4.2C, CB4.1C bottom and below pycnocline depths. Both the 0.5 m and 1.0 m water samples at stations: CB5.3, CB4.3C, CB4.3W and CB4.2W were collected at the same depth. Meter scoping was reported at stations CB4.3C, CB4.2C and CB3.3C. The air temperature reading at station CB2.2 was taken in the sun.

September 2016: Heavy storms preceded sample collection at station CB5.3. Similarly, heavy rainfall occurred before station CB5.2 was sampled. Stations: CB5.3, CB4.3W, CB4.2E, CB4.2C and CB4.2W 0.5m and 1m water samples were drawn from water collected at a single depth. Meter scoping was noted at station CB4.2C and near the bottom when station CB4.1C when water quality was measured. Absence of a pycnocline at station CB2.2 necessitated collection of the above pycnocline and below pycnocline samples at 1/3 and 2/3 of total water column depth.

October 2016: USS Zumwalt passed while sampling was conducted at station CB5.1. Coiling and kinking of a newly-deployed sampling hose were noted. The bottom and below pycnocline water samples drawn at stations: CB4.4, CB4.3E, CB4.3C, CB4.2C, CB4.1E, CB4.1C, CB3.3C, CB3.2 and CB2.2 came from the same bottle. Meter scoping was noted at station CB4.1C. Dissolved oxygen reading at station CB3.1 were double checked.

November 2016: Split samples were churned by hand when water was dispensed into sample bottles. Station CB3.1 0.5m and AP water samples were drawn from water collected in a single bottle. Pycnocline thresholds were not met at stations: CB5.3, CB5.2, CB5.1, CB4.4, CB4.3C, CB4.2C and CB2.2. Therefore, the above pycnocline and below pycnocline samples, for each station, were collected from 1/3 and 2/3 of the total water depths, respectively.

December 2016: Stations CB5.2 and CB5.1 surface samples were collected at 1m depths. Pycnoclines did not exist at stations: CB5.2, CB5.1, CB4.4, CB4.3C, CB4.2C, CB4.1C and CB3.3C. Therefore, above pycnocline and below pycnocline samples at each station were collected from 1/3 and 2/3 of the total water depth. Surface conductivity readings changed between the beginning and the end of the hydrocasts at station CB3.1. pH readings took more than five minutes to stabilize at 9.3m at station CB1.1.

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 2016.

December 2016: Sampling of station CB2.2 was deferred, at the request of the boat captain, on the northbound leg, in order to avoid tugboat traffic. Samples were collected at station CB2.2 on the southbound leg.

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, and August 2016.

January 2016: Stations LE2.3 and CB5.3 were not sampled due to high winds and rough seas. Ice rendered stations: CB1.1, CB2.1, CB2.2 and CB3.1 inaccessible and the stations were not sampled. Li-COR measurements were not made at station CB5.1W.

March 2016: When samples were collected at station CB5.1W, rough conditions precluded Li-COR sampling.

April 2016: Li-COR was not measured at station CB5.1W. Gale force winds and vessel schedule conflicts prevented sample collection at stations: CB4.3E, CB4.1W, CB4.3W, CB4.2E, CB3.3W, CB3.3E, CB4.2W and CB5.3. Beginning April 2016, phytoplankton sampling was discontinued at station CB5.1.

May 2016: Beginning May 2016, phytoplankton sampling was discontinued at station CB2.1.

June 2016: Li-COR was not measured at station CB5.1W 14-Jun-2016 due to rough conditions.

July 2016: Two mainstem surveys were conducted in July 2016. 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.

November 2016: Li-COR was not measured at station CB5.1W.

There are no known completeness issues for the months: February, August, September, October or December 2016.

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

The Yellow Springs Instrument (YSI) 6820 v2 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 0.5m, 1.0m, 2.0m and 3.0m depth intervals below the surface. Thereafter readings were taken at 2.0m 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 2.0m interval, readings were taken at 1.0m intervals between these two readings. For total depths less than or equal to 10.0m, readings were taken at 1.0m intervals.

GRAB SAMPLING DEPTH PROTOCOLS:

At stations where two depths were sampled, collections were taken at 0.5m below the surface, and 1.0m above the bottom. If the station total depth was equal to 1.5m, the bottom sample was also collected at 0.5m. 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 0.5m below the surface, 1.5m above the upper boundary of the pycnocline, 1.5m below the lower boundary of the pycnocline, and 1.0m above the bottom.

At stations where 4 depths were sampled and there was no discernable pycnocline, samples were taken at 0.5m 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 1.0m above the bottom.

SECCHI DEPTH:

Water transparency was determined, to the nearest 0.1m 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: 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: 410.990.4600
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, FRA 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 and physical
Address: 580 Taylor Ave., C2
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 2016.

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

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

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

The entity Light_Attenuation_Data is comprised of the attributes: Depth, Details, EventId, HUC8, LowerPycnocline, Method, Parameter, Program, Project, SampleDate, SampleReplicateType, SampleTime, Source, Station, 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. [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, 2016 - June 30, 2017. [http://eyesonthebay.dnr.maryland.gov/eyesonthebay/documents/MdDNR_MTQAPP2016.pdf]

Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Mike Mallonee
Contact_Position: Water Quality Database Manager
Contact_Address:
Address_Type: Mailing and physical
Address: 410 Severn Avenue, Suite 109
City: Annapolis
State_or_Province: Maryland
Postal_Code: 71403
Country: USA
Contact_Voice_Telephone: 410.267.5785
Contact_Electronic_Mail_Address: mmallone@_no_spam_chesapeakebay.net [Remove _nospam_ for valid email address]
Resource_Description: Downloadable data
Distribution_Liability: None of the Chesapeake Bay Program partners nor any of their employees, contractors, or subcontractors make any warranty, expressed or implied, nor assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information or data contained within the web site. Reference to any specific commercial products, processes, or services or the use of any trade, firm, or corporation name is for the information and convenience of the public and does not constitute endorsement, recommendation or favoring by the Chesapeake Bay Program partners.

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: ASCII 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: 6.0

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: 20170411
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Ben Cole
Contact_Organization: Maryland Department of Natural Resources, Resource Assessment Service
Contact_Position: Natural Resource Biologist
Contact_Address:
Address_Type: Mailing and physical
Address: 580 Taylor Avenue, D2
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21401
Country: USA
Contact_Voice_Telephone: 410.260.8630
Contact_Electronic_Mail_Address: benjamin.cole_nospam_@maryland.gov[Remove _nospam_ for valid email address]
Metadata_Standard_Name: Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998