# Maryland Chesapeake Bay Mainstem Water Quality Monitoring Program - 2011

## Metadata:

*Identification_Information:*
*Citation:*
*Citation_Information:*
*Originator:* Maryland Department Of Natural Resources, Resource Assessment Service
*Publication_Date:* 20120430
*Title:* MD Dept. of Natural Resources, Chesapeake Bay Mainstem Water Quality Monitoring 2011
*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-one stations located in Maryland's Chesapeake Bay mainstem.

Sampling was conducted twice monthly in June, August and October of 2011, and once monthly during the remaining months, for a total of fifteen samplings in the period of 1-Jan-2011 through 31-Dec-2011. The second October cruise was scheduled to capture water quality impacts from Tropical Storm Lee. A one-day abbreviated July cruise was also conducted with only physical measurements collected to better assess dissolved oxygen levels in the mainstem deep waters; the cruise track did not include the upper bay stations. However, at eastern and western transect mainstem stations, samples were not collected November through February, resulting in only ten flanking station samplings a year.

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 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 the 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>.

The most current version of the Water Quality Data Dictionary - Online may be found at: <http://archive.chesapeakebay.net/data/data_dict.cfm?DB_CODE=CBP_WQDB>.

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, 2011 - June 30, 2012 <http://mddnr.chesapeakebay.net/eyesonthebay/documents/MTQAPP2011_draft1v1.pdf >.

*Time_Period_of_Content:*
*Time_Period_Information:*
*Range_of_Dates/Times:*
*Beginning_Date:* 20110101
*Ending_Date:* 20111231
*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:* Olsen, L.M., G. Major, K. Shein, J. Scialdone, R. Vogel, S. Leicester, H. Weir, S. Ritz, T. Stevens, M. Meaux, C.Solomon, R. Bilodeau, M. Holland, T. Northcutt, R. A. Restrepo, 2007. NASA/Global Change Master Directory (GCMD) Earth Science Keywords. Version 6.0.0.0.0 online: <http://gcmd.nasa.gov/Resources/valids//gcmd_parameters.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

*Access_Constraints:* None

*Use_Constraints:* None

*Point_of_Contact:*

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*City:* Annapolis

*State_or_Province:* Maryland

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*Country:* USA
*Contact_Voice_Telephone:* 410-260-8630
*Contact_Electronic_Mail_Address:* rkarrh_No_Spam_@dnr.state.md.us [Remove _No_Spam_ for valid email address]
*Browse_Graphic:*
*Browse_Graphic_File_Name:*
<http://mddnr.chesapeakebay.net/eyesonthebay/documents/metadata/MD_DNR_MainstemStns2011.pdf>
*Browse_Graphic_File_Description:* Map of twenty-one 2010 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, and the National Atmospheric and Oceanic Administration Chesapeake Bay Program Office.

*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.

February 2011 - Greater meter scope than normal was required at stations CB3.2. Greater meter scope than normal was required at stations CB3.3C on the bottom and at 24m, 23 m. was sampled. Greater meter scope than normal was required at station CB5.1, the sample was collected at 32 m. It was also noted that the surface conductivity changed at station CB2.2 and that the below pycnocline sample should have been collected at 6 m.

March 2011 - Secchi disk depth of less than 0.5m and brown water were noted at station CB3.1. Brown water was also observed at station CB3.3C. Dissolved oxygen readings at 9m were re-checked at station CB4.2W. Unstable readings at 7m were also noted ate station CB4.2W.

May 2011 - Greater LICOR meter scope than normally required was noted at station CB5.1. Secchi disk scoping was also noted at stations CB4.4 and CB5.1.

June 6-7, 2011 - Notes about "unstable" readings were made at stations CB3.3, CB3.3E and CB4.2W. Conductivity readings at 1m were re-checked at station CB3.2.

June 27-28, 2011 - Bottom dissolved oxygen readings were re-checked at station CB4.1W. The passage of a tanker prior to sampling was observed at station CB4.3C. Finally, it was noted that the tide state could not be determined at the following stations: CB3.3C, CB3.3E, CB3.3W, CB4.1C, CB4.1E, CB4.1W, CB4.2C, CB4.2E, CB4.2W, CB4.3C, CB4.3E, CB4.3W, CB4.4, CB5.1, CB5.3 and LE2.3.

July 2011 - Greater meter scope than normal was required at station 5.2 generally and station CB5.3 at the bottom. Unstable readings were noted at 9m and 10m at station CB4.4, at 8m at station CB5.1 and at 7m at CB5.2. At station CB3.3, it was remarked that conductance reading had changed and that the below pycnocline sample should have been collected at a depth of 17m. A special July cruise to assess dissolved oxygen levels in the mainstem was also conducted.

August 8, 2011 - Greater meter scope than normally required was noted at stations: CB5.1, CB5.2, CB5.3 and LE2.3. At station 5.3 a remark about unstable readings at 11m was made.

August 30, 2011 - The need for greater meter scope was noted at station CB4.1C.

October 4-5, 2011 - Notes about needing greater meter scope than normal at the bottom were made at stations CB5.2 and CB5.3. Greater scope was generally needed at stations: CB4.1C, CB4.3C, CB4.3E, CB4.4 and CB5.1. It was noted that at CB4.3E readings were

unstable in the mixing zone. The CB4.3C 17m reading was re-done, the first conductivity reading was 27500 UMHOS/CM.

October 17-19, 2011 - Cruise was scheduled to assess the water quality effects of Tropical Storm Lee. It was noted that conductivity readings were not stable at 11m at station CB5.2. Observations about heavy rain the previous night were made at stations CB2.2 and CB3.2.

November 2011 - At station CB5.2, at 20m depth, greater than normal meter scope was required.

December 2011 - Greater than normal meter scope requirements at the bottom were notated at station CB5.1 and generally at stations CB4.3C and CB4.4. It was noted that surface conductivity changed from the start of sampling at station CB4.1C. Unstable conductivity readings at 8m were remarked at station CB3.1.

*Logical_Consistency_Report:*

For logistical reasons, station LE2.3, a Potomac River sampling project station, is routinely sampled during Chesapeake Bay mainstem sampling cruises.

January 2011 - At station CB4.1C the pump was on the bottom at 32m and the bottom sample was collected at 31m. The bottom and below pycnocline samples at station CB3.2 were collected from the same bottle.

February and March 2011 - No known issues.

April 2011 - Surface and 1m samples at same depth stations: CB4.1C, CB4.1E, CB4.1W, CB4.2C, CB4.2E, CB4.2W and LE2.3. (Surface water samples are normally collected at 0.5m collected using a water-cooled submersible pump. In order to avoid running the pump dry when sea conditions are rough, it is deployed at a deeper depth when surface samples are collected).

May 2011 - No known issues.

June 6-8, 2011 - The bottom and below pycnocline sample waters were collected from separate bottles at stations: CB3.2.and LE2.3 A H2S odor was noted in the bottom water sample collected at stations LE2.3 and CB3.3C and in the bottom and below pycnocline samples at stations: CB4.1C, CB4.1E, CB4.2C, CB4.3C and CB4.3E.

June 27-28 2011 - A H2S odor was observed in the bottom and below pycnocline samples at stations: CB3.3C, CB4.1E, CB4.2C, CB4.3E, CB4.1C, CB4.3C and LE2.3

July 2011 - A H2S odor was noted in the bottom water sample collected at stations CB4.3W and CB5.2 and in the bottom and below pycnocline samples at stations: CB3.3C, CB4.1C, CB4.1E, CB4.2C, CB4.3C, CB4.3E, CB4.4, CB4.4, CB5.1, CB5.1 and LE2.3. Surface and 1m samples were collected from the same depth at stations: CB4.4 and CB5.1.

August 8-10, 2011 - A H2S odor was noted in the bottom water sample collected at stations CB4.4 and CB5.1 and in the bottom and below pycnocline samples at stations:
CB3.3C, CB4.1C, CB4.1E, CB4.2C, CB4.3C, CB4.3E and LE2.3. Surface and 1m samples were collected from the same depth at stations: CB2.1, CB4.1C, CB4.1E, CB4.2C, CB5.3 and LE2.3.

August 29-31, 2011 - Hurricane Irene passed through the study area August 27-28, 2011.

September 2011 - No known issues.

October 3-5, 2011 - Mainstem surveys are conducted in three legs. Normally, Southern stations are sampled on the first day, the central stations on the second day and Northern stations on the last day. This survey was not the regular September survey. It was added to capture conditions that resulted from record high Susquehanna River flows following Tropical Storm Lee.

Surface and 1m samples were collected from the same depth at stations CB4.2C, CB4.2E, CB4.3E, CB4.4, CB5.1, CB5.2, CB5.3 and LE2.3.

October 17, 2011 - Surface and 1m samples were collected from the same depth at stations: CB5.2 and CB5.3.

November 2011 - The bottom and below pycnocline samples at station CB3.2 were collected from the same bottle. Surface and 1m samples were collected from the same depth at stations: CB5.1, CB5.2 and LE2.3.

December 2011 - No known issues.

*Completeness_Report:*
The 2011 Chesapeake Bay Mainstem Monitoring Program dataset includes physical and chemical water quality data along with ancillary information (weather, date, depth, etc.) acquired during monthly sampling cruises, between January and December 2011.

Sampling-event and physical properties, nutrient and suspended solid data from twenty-one Chesapeake Bay Mainstem stations are included in the dataset.

January 2011 - Stations CB1.1, CB2.1, CB2.2, CB3.1 and CB3.2 were not sampled due to ice conditions.

February 2011 - Wave height was not recorded at station CB3.1.

July 2011 - On 26-July-2011 sonde measurements of water column parameters were recorded at the following stations: CB3.2, CB3.3C, CB3.3E, CB3.3W, CB4.1C, CB4.1E, CB4.1W, CB4.2C, CB4.2E, CB4.2W, CB4.3C, CB4.3E, CB4.3W, CB4.4, CB5.1, CB5.2, CB5.3 and LE2.3. No other samples were collected.

November 2011 - Station CB5.3 was not sampled due to rough sea conditions.

Silica samples were not collected at any stations July through December 2011.

*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. 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 1.0 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 the distance from the surface to the bottom, at the closest profile depth two thirds the distance from the surface to the bottom, and 1.0 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:* 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:* SBOWEN_nospam_@dnr.state.md.us[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:* Carl Zimmerman
*Contact_Position:* Director of Chesapeake Biological Laboratory Analytical Services/Quality Assurance Officer

*Contact_Address:*
*Address_Type:* mailing and physical
*Address:* Chesapeake Biological Laboratory, Center for Environmental and Estuarine Studies, The University of Maryland System, 1 Williams St; P.O. Box 38
*City: Solomons*
*State_or_Province:* Maryland

*Postal_Code:* 20688
*Country:* USA
*Contact_Voice_Telephone:* 410 326-4281
*Contact_Electronic_Mail_Address:* carlz _nospam_@cbl.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:* rkarrh _Nospam_@dnr.state.md.us [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 one Maryland mainstem stations during 2010.

The data are contained in three 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, DESCRIPTION, WATER_BODY, CBP_BASIN, TS_BASIN, BASIN, CBSEG_2003, CBSEG_2003_DESCRIPTION, HUC8, CATALOGING_UNIT_DESCRIPTION, HUC11, WATERSHED, FIPS, STATE, COUNTY/CITY, FALL_LINE, LATITUDE, LONGITUDE, LL_DATUM, UTM_X and UTM_Y

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, AIR_TEMP, WIND_SPEED, WIND_DIRECTION, PRECIP_TYPE, TIDE_STAGE, WAVE_HEIGHT, CLOUD_COVER, GAGE_HEIGHT, PRESSURE, FLOW_STAGE, DETAILS and WATER_BODY.

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>

The most current version of the Water Quality Data Dictionary - Online may be found at: <http://archive.chesapeakebay.net/data/data_dict.cfm?DB_CODE=CBP_WQDB>.

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, 2011 - June 30, 2012
<http://mddnr.chesapeakebay.net/eyesonthebay/documents/MTQAPP2011_draft1v1.pdf >.

*Distribution_Information:*
*Distributor:*
*Contact_Information:*
*Contact_Person_Primary:*
*Contact_Person:* Michael Mallonee
*Contact_Position:* Water Quality Database Manager
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*City:* Annapolis
*State_or_Province:* Maryland
*Postal_Code:* 21403
*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, and Water Quality data.
*File_Decompression_Technique:* No compression applied
*Transfer_Size:* 6.2
*Digital_Transfer_Option:*
*Online_Option:*
*Computer_Contact_Information:*
*Network_Address:*
*Network_Resource_Name:* <http://www.chesapeakebay.net/data_waterquality.aspx>
*Access_Instructions:* Data are available though 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:* 20120430
*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:* bcole_Nospam_@dnr.state.md.us [Remove _Nospam_ for valid email address]
*Metadata_Standard_Name:* Content Standards for Digital Geospatial Metadata
*Metadata_Standard_Version:* FGDC-STD-001-1998