Maryland Chesapeake Bay Tributary Water Quality Monitoring Program - 2009

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Maryland Department Of Natural Resources, Resource Assessment Service
Publication_Date: 20100609
Title: Md DNR Chesapeake Bay Tributary Water Quality Monitoring Program 2009
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 water quality monitoring data collected at seventy tributary stations. Sites on the Patuxent and Potomac Rivers are sampled twenty times each year. Two Chester, two Choptank and one Patapsco River stations are sampled sixteen times yearly. Samples at the remaining forty tributary stations are collected monthly.

This 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 its tributaries and these measurements 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 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 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, 2009 - June 30, 2010 [http://mddnr.chesapeakebay.net/eyesonthebay/documents/MD_DNR_MTQAPP09_Draft1.pdf]

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 20090101
Ending_Date: 20091231
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: 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 > 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 Creek
Place_Keyword: Back River
Place_Keyword: Big Annemessex River
Place_Keyword: Bohemia River
Place_Keyword: Bush River
Place_Keyword: Chester River
Place_Keyword: Chicamacomico 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: Pocomoke River

Place_Keyword: Rhode River
Place_Keyword: Sassafras River
Place_Keyword: Severn River
Place_Keyword: South River
Place_Keyword: Transquaking River
Place_Keyword: Wicomico River

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 Boulevard, D2
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21401
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/MDDNR_TribsStns2009-2010.pdf
Browse_Graphic_File_Description: Map of seventy 2009-2010 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) and Maryland Department of Health and Mental Hygiene Environmental Chemistry Division (DHMH ECD) laboratory 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.

Logical_Consistency_Report:

January 2009 - Low pH was observed at BXK0031. At stations ET7.1 and POK0014 one meter was used for pH while all other parameters were measured with another meter. The ET7.1 surface sample was collected from the Ferry. The ET7.1 bottom sample was collected with an alpha bottle.

February 2009 - The station TF1.3 sample was collected from the bridge. The Ferry was not operating so the WIW0141 sample was collected from the end of the ramp. The ET10.1 bottom sample was collected at 3m depth due to a short alpha bottle line.

March 2009 - Field sheet comments at two stations sampled in March mentioned that February was the lowest rainfall month since 1877. A snow storm preceded March sampling. Construction near streambed at station GUN0125 continued. Air temperatures of less than -10 degrees C were noted at several stations. An alpha bottle was used to collect the bottom sample at ET6.1. The WIW0141 sample was collected from the end of the Ferry.

April 2009 - No unusual conditions were noted.

May 2009 - Turbid, high water, heavy flow conditions were observed at the more than 30 stations. LICOR readings at stations LE1.3 and RET1.1 were not considered reliable. The specific conductance reading at TF1.6 was double-checked.

June 2009 - Three was no water at the station TF1.3 pier. High water levels and elevated turbidity were observed at many stations. A hydrogen sulfide odor was noted in EE2.2 bottom sample water.

July 2009 - LICOR readings were not considered reliable at stations: CB5.1W, LE1.4, LE1.3, LE1.2 and CB5.1W. LICOR data at stations LE1.4, LE1.3, LE1.2, LE1.1, RET1.1, TF1.7, TF1.6 and TF1.5 were measured using the Morgan State University instrument. The bottom sample at station TF1.5 was collected from a depth of 9m. The TF1.3 samples were collected from the bridge.

August 2009 - The TF1.3 samples were collected from the bridge. Muddy water conditions were noted at station TF1.0. The WIW0141 samples were collected from the Ferry bulkhead.

September 2009 - High water conditions were observed at station TRQ0088. A plankton sample was collected at station TRQ0146. Very green water was noted at station TRQ0203. Station WIW0141 samples were collected from the Ferry. The LE2.3 bottom and BP samples were collected form different bottles.

October 2009 - Low water conditions were noted at stations GUN0125 and POT1184. Samples for station JON0184 were collected from the Falls Road Bridge above the gage. Water conditions at TRQ0088 and WIW0141 were high. The WIW0141 sample was collected from the bulkhead.

November 2009 - A remark was made at station TF1.7 about the bottom being stirred up by the boat. At station TF1.4 it was noted that the Secchi disk depth would have greater than the total depth.

December 2009 - The measurements of the underwater sensor used to measure PAR at stations RET1.1 and TF1.7 were considered questionable.

Completeness_Report:

January 2009 - Bottom samples were not collected at stations WT1.1, WT2.1, WT3.1 because the sample hose was frozen. The station WT7.1 sample was collected with an alpha bottle. No samples were collected at stations: WT6.1, WT8.2 and WT8.3 due to ice conditions. Conditions were too rough to sample LICOR at stations CB5.1W, LE1.4 and LE1.2.

February 2009 - Total depth and Secchi measurements were not taken at stations ET7.1 and TF1.3. Conditions were too rough to sample LICOR at stations CB5.1W, LE1.4, LE1.3, LE1.2, LE1.1, RET1.1 and TF1.7. Samples for station TF1.3 were collected from the bridge.

March 2009 - Total depth and Secchi measurements were not taken at station TF1.3. A different meter was used for water quality measurements at station ET6.1. The bottom sample at station ET6.1 was collected with an alpha bottle. Water column profile data were not collected at station ET6.1. The samples for station WIW0141 were collected from the end of the ferry, total depth was not measured.

April 2009 - Total Depth was not recorded when station TRQ0224 was sampled. Stations EE3.2 and EE3.3 were not sampled due to rough water conditions. The water level at station MNK0146

was too low for samples to be collected. Similarly, station XAK7810 was not sampled because there was no water on the ramp. LICOR readings were not taken at stations RET1.1, TF1.7, TF1.6 and TF1.5. Secchi depth and total depth were not measured at station TF1.3. Neither was total depth measured at station TF1.3.

May 2009 - High winds precluded sampling at station LE2.2. Station XHH4742 was not sampled. LICOR measurements were not made at stations CB5.1W and LE1.4 due to rough water conditions. LICOR measurements were not taken at stations TF1.7 and TF1.6.

June 2009 - Bottom samples were not collected at station EE3.2 due to high flow conditions. Total depth was not measured at stations TRQ0224 and WIW0141. The WIW0141 sample was obtained from the bulkhead. It was too rough to take LICOR samples at stations CB5.1W and LE1.4. Air temperature was not recorded at station TF1.7. Secchi depth was not measured at station TF1.3 because there was no water at the pier. The salinity measurement was not recorded at station TF1.2.

July 2009 - Air Temperature was not recorded at station LE2.2. LICOR was not measured at stations CB5.1W, LE1.1, RET1.1, TF1.7, TF1.6, TF1.5, because the instrument readings were considered unstable or unreliable. The gage was not operating at station TF1.0.

August 2009 - Secchi disk depth and wave height measurements were not taken at station TF1.3. Wind and wave height data were not recorded at station WXT0001. Secchi disk depth and total depth were not measured at station TF1.3.

September 2009 - Air temperature was not measured at station ET10.1. Total depth was not recorded at station WIW0141 and samples were collected from the Ferry. Due to gale warnings, station CB5.1W was not sampled. LICOR measurements were not taken at station LE1.4 because of rough water conditions. LICOR data were not collected at stations LE1.2, LE1.1, RET1.1, TF1.6 and F1.5.

October 2009 - Salinity values were not recorded at stations TF1.2 and TF1.0. On the Patuxent River no LICOR measurements were made. The instrument was out of service for repairs. Patuxent Secchi disk measurements were not taken because the disk was broken.

November 2009 - Hydrolab measurements were not possible at stations MAT0078 and PIS0033 because of a dead battery. Secchi measurements were not recorded at stations TRQ0203, CCM0069, ET6.1, TRQ0088, TRQ0146, TRQ0224 and WIW0141. Total depth values were not recorded at stations TRQ0203, CCM0069, TRQ0088, TRQ0146, TRQ0224 and WIW0141. Station EE3.2 was not sampled due to rough water conditions. LICOR values were not recorded at station CB5.1W because of rough water conditions. At station TF1.4 wave height was not recorded and Secchi disk depth was greater than the station total depth.

December 2009 - LICOR data were not collected at station LE1.4 due to rough water conditions.

Lineage:

Process_Step:

Process_Description:

SONDE CALIBRATION and POST-CALIBRATION

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

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 are sampled collections were taken at 0.5 m below the surface, and 1.0 m above the bottom. If station total depth was greater than 1.5 m, a bottom sample was also taken at 0.5 m. Great caution was exercised when taking bottom samples; if disturbed bottom samples appeared to have been included in a sample, the station was resample after sediments had settled or a sample was taken slightly higher in the water column.

At stations where 4 depths were sampled and a pycnocline exists, collections were taken at 0.5 m below the surface, 1.5 m above upper boundary of pycnocline, 1.5 m below lower boundary of pycnocline, and 1.0 m above 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 closest profile depth one third the distance from the surface to the bottom, at 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.

PHOTOSYNTHETIC ACTIVE RADIATION (PAR):

PAR readings were taken in the field in order to calculate a light attenuation coefficient. PAR measurements were taken with a LICOR quantum meter (Model LI-1000 Data Logger) with an attached underwater probe (Model LI-192SA). The probe was a flat, upwardly-directed probe.

A vertical profile of light penetration was begun by taking an initial reading with the sensor just below the surface of the water (0.1 m). Subsequent readings were taken at either 0.25 m or 0.50 m intervals depending on the turbidity of the water column, (taking shallower readings in more turbid water). Depth readings were continued until a value less than ten percent (10%) of the surface reading was attained. Once the readings stabilized, at least five readings were allowed to flash on the instrument display before recording the data reading for a specific depth. The mean of the previous five readings that appeared on the instrument display were recorded in the data logger.

Light measurements made for each profile are log-scale regressed against depth to determine the compensation depth, i.e., the depth of penetration of one percent (1 %) of the surface PAR. The compensation depth is used in computing the integrated carbon production for that water column. When light profiles are not available, the Secchi disk depth is used to calculate the compensation depth. A regression has been made between the Secchi depth and the compensation depth for the same water column (for those stations where both Secchi data and LICOR data are taken). By using this regression, a compensation depth can be estimated from a Secchi depth.

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.

Beginning in 2009, 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 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: Renee Karrh

Contact_Position: Natural Resources Biologist VI

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: Back Creek, Back River, Big Annemessex River, Bohemia River, Bush River, C&D Canal, Chesapeake Bay, Chester River, Chicamacomico 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, Transquaking River, 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 72 Maryland tributary stations during 2009.

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, 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.

The entity Light_Attenuation_Data is comprised of the attributes: EVENT_ID, SOURCE, PROJECT, STATION, SAMPLE_DATE, SAMPLE_TIME, SAMPLE_REPLICATE_TYPE, DEPTH, EPAR_S, EPARU_Z, EPARD_Z, UNIT, METHOD, DETAILS, WATER_BODY, TOTAL_DEPTH, UPPER_PYCNOCLINE, and LOWER_PYCNOCLINE.

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].

Quality Assurance Project Plan for the Maryland Department of Natural Resources, Chesapeake Bay Shallow Water Quality Monitoring Program, for the period July 1, 2008 - June 30, 2009. [http://mddnr.chesapeakebay.net/eyesonthebay/documents/SWM_QAPP_2008_draft2.pdf].

Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Michael Mallonee
Contact_Position: Water Quality Data Manager
Contact_Address:
Address_Type: Mailing and Physical
Address: 410 Severn Avenue, Suite 109
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21403
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, Light Attenuation data
File_Decompression_Technique: No compression applied
Transfer_Size: 11.3
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name:
http://www.chesapeakebay.net/data/index.cfm?subjectarea=WATER_QUALITY
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: 20090609
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_Facsimile_Telephone: 410-260-8640
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