Maryland Chesapeake Bay Tributary Water Quality Monitoring Program - 2008

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Maryland Department Of Natural Resources, Resource Assessment Service
Publication_Date: 20100101
Title: Maryland Department of Natural Resources Tributaries Water Quality Monitoring Program 2008.
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 14 times a year at 22 stations located in Maryland's Chesapeake Bay mainstem and 20 times a year at 72 tidal tributary stations. 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 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 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://www.chesapeakebay.net/pubs/cbwqdb2004_RB.PDF

Quality Assurance Project Plan for the Maryland Department of Natural Resources Chesapeake Bay Water Quality Monitoring Program for the period July 1, 2008 - June 30, 2009 http://mddnr.chesapeakebay.net/eyesonthebay/documents/MainStemTributaries2008-2009QAPP.pdf

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 20080101
Ending_Date: 20081231
Currentness_Reference: Ground Condition
Status:
Progress: Complete
Maintenance_and_Update_Frequency: Monthly
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -80.53758
East_Bounding_Coordinate: -074.5759
North_Bounding_Coordinate: +42.979
South_Bounding_Coordinate: +36.66154
Keywords:
Theme:
Theme_Keyword_Thesaurus: CIMS Subject Keyword List
Theme_Keyword: Monitoring
Theme_Keyword: Nitrogen
Theme_Keyword: Nutrient
Theme_Keyword: Phosphorus
Theme_Keyword: Salinity
Theme_Keyword: Water Clarity
Theme_Keyword: Water Temperature
Theme_Keyword: Water Quality Data
Theme_Keyword: Chlorophyll
Theme_Keyword: Specific Conductance
Theme_Keyword: Dissolved Oxygen
Theme_Keyword: Particulates

Theme_Keyword: pH
Theme_Keyword: Secchi Depth
Place:
Place_Keyword_Thesaurus: User Defined Keyword List
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
Country: USA
Contact_Voice_Telephone: 410-260-8630
Contact_Facsimile_Telephone: 410-260-8640
Contact_Electronic_Mail_Address: rkarrh_No_Spam_@dnr.state.md.us [Remove _No_Spam_ for valid email address]
Hours_of_Service: Monday-Thursday 8:00 am - 5:00 pm
Browse_Graphic:
Browse_Graphic_File_Name:
http://mddnr.chesapeakebay.net/eyesonthebay/documents/metadata/mdDNR_tribsstns08-09.pdf
Browse_Graphic_File_Description: Map of seventy-two 2008-2009 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 Maryland Department of Mental Health and Mental Hygiene (DHMH) analyzed chlorophyll samples. The Nutrient Analytical Services Laboratory (NASL) at the Chesapeake Biological Laboratory (Univ. of MD) analyzed 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.

Native_Data_Set_Environment: Windows
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 Hydrolabs 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: Nothing to report.
Completeness_Report:
The 2008 Chesapeake Bay Tributary 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 2008.

Sampling-event and physical properties, nutrient and suspended solid data from 72 Chesapeake Bay Tributary stations are included in the dataset.

At station ET7.1 on January 15, 2008 Secchi depth was not measured and there was no bottom sample. Sampling was conducted from Ferry.

At stations TF1.0 and TF2.0 salinity was not measured on January 10, 2008.

Bottom sample was not collected at station ET2.3 on February 19, 2008 due to rough conditions.

Secchi depth was not measured at stations ET5.1 and ET5.2 on February 11, 2008.

Photosynthetic active radiation (par)was not measured at stations LE1.1, LE1.2, LE1.3, LE1.4, TF1.6, and TF1.7 on February 2, 2008.

Secchi depth was not measured at station XGG8251 on February 11, 2008.

Secchi depth was not measured at station TF1.3 on March 3, 2008; sample was collected from bridge.

Photosynthetic active radiation was not measured at stations CB5.1W, and LE1.4 on April 7 and April 16 2008 due to rough conditions.

Photosynthetic active radiation was not measured at stations CB5.1W, LE1.1, LE1.2, LE1.3, LE1.4, RET1.1, TF1.5, TF1.6, and TF1.7 on May 5 and April 16 2008 due to equipment failure.

Secchi depth and total depth was not measured at station TF1.3 on July 2, 2008.

Secchi depth was not recorded at station WXT0001 on August 4, 2008.

Secchi depth was not recorded at station WT7.1 on October 23, 2008.

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 manufacturers' 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. 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 wit a calibrated rope. Observations were made on the shady side of the boat.

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 - MD DHMH.
Chlorophyll a samples were analyzed by Maryland Department of Health and Mental Hygiene's (DHMH) Environmental Chemistry Division.

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: Asoka Katumuluwa

Contact_Position: Chief, Division of Environmental Chemistry, Laboratory Administration, Maryland Department of Health and Mental Hygiene

Contact_Address:

Address_Type: mailing and physical

Address: Department of Health and Mental Hygiene, 201 West Preston Street

City: Baltimore

State_or_Province: Maryland

Postal_Code: 21201

Country: USA

Contact_Voice_Telephone: 410-767-5839

Contact_Electronic_Mail_Address: KatumuluwaA_nospam_@dhmh.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 analyzed total dissolved nitrogen, particulate nitrogen, nitrite, nitrite + nitrate, ammonium, total dissolved phosphorus, particulate phosphorus, orthophosphate, particulate carbon, total suspended solids, and volatile suspended solids.

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 Laboratories.

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]

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 Mainstem . Project data are an aggregation of data collected at 72 Maryland tributary stations during 2008.

The data are contained in three related entities (tables): Station_Information, Monitoring_Event_Data, Water_Quality_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://www.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 Water Quality Monitoring Program, for the period July 1, 2008 - June 30, 2009. [http://mddnr.chesapeakebay.net/eyesonthebay/documents/MainstemTributaries2008-2009QAPP.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 Severen Avenue, Suite 109
City: Annapolis
State_or_Province: Maryland
Postal_Code: 71403
Country: USA
Contact_Voice_Telephone: 800-968-5785
Contact_Facsimile_Telephone: 410-260-8640
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.

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.

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: 7.3
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: 20090608
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Michael Weldon
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: mweldon _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