Maryland Chesapeake Bay Water Quality Monitoring Program: Phytoplankton and Picoplankton Component

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Richard Lacouture-Current
Originator: Stella Sellner-Current
Originator: Morgan State University- Benedict Estuarine Reseach Labortory
Originator: Anne Marie Hartsig- Current
Originator: Kevin Sellner-Previous
Publication_Date: 20081031
Title:
Maryland Chesapeake Bay Water Quality Monitoring Program: Phytoplankton and Picoplankton Component
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none
Online_Linkage: www.chesapeakebay.net
Larger_Work_Citation:
Citation_Information:
Originator: Jacqueline Johnson
Publication_Date: 20080301
Title:
Chesapeake Bay Program Plankton Database
Edition: Version 3.0
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Publication_Information:
Publication_Place: Annapolis, MD
Publisher: US EPA Chesapeake Bay Program
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None

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Description:

Abstract:

The overall phytoplankton monitoring program is designed to detectand monitor changes in phytoplankton abundances and taxonomic composition in relation to changing water quality conditions in the Chesapeake Bay. They are presently the dominant primary producers in Chesapeake Bay and are the base of the food chain for many higher trophic levels. Excessive blooms of phytoplankton species are considered evidence of eutrophication in the bay and are known to degrade water quality and block light from submerged aquatic vegetation. Phytoplankton samples are collected in conjunction with the Maryland Chesapeake Bay water quality, C14 primary production, fluorometry, microzooplankton, mesozooplankton, and jellyfish monitoring programs. Phytoplankton counts were obtained from replicate surface layer and bottom layer composite samples taken at 16 stations in the Maryland portion of the Chesapeake Bay and its tributaries. After March 1985, replicate samples were combined for each station, yielding one above-pycnocline and one below-pycnocline sample. After June, 1986, stations ET4.2 and EE3.1 were no longer sampled. Beginning July 1989, whole water column samples were enumerated from stations RET2.2, TF1.7,TF1.5, ET5.1, CB1.1 and CB2.2. Beginning in January,1996, stations CB1.1 and CB5.2 were no longer sampled. Samples are collected 18 times during the course of the year. Between 1984 and 1994, monthly sampling occurs from October-March while twice monthly sampling takes place from April-September. The stations in the Choptank River (ET5.1) and (ET5.2)and the station in Baltimore Harbor (WT5.1)are not sampled in January and February. Beginning in July 1995, only surface composite samples were enumerated for those stations where a surface layer and bottom layer sample are collected. Bottom composite samples were collected and archieved if future funds for sample enumeration become available. After June 1986, stations T4.2 and EE3.1 were no longer sampled. Beginning in January, 1996, the Patuxent River is the only sampling during January. All sampling in February and November was discontinued and sampling in June and September was reduced to a single cruise.

Purpose:

The state of Maryland, in cooperation with the US EPA Chesapeake Bay Program, has monitored phytoplankton species abundance's in the Maryland Chesapeake Bay mainstem and tributaries since August 1984. The program is designed to give comprehensive geographic and temporal information on phytoplankton. Sampling is performed in conjunction with the Maryland C14 primary production, fluorometry, mesozooplankton, microzooplankton, jellyfish and water quality monitoring programs.

Supplemental_Information:

STATION NAMES AND DESCRIPTIONS
CB1.1 mouth of Susquehanna River, main Bay
CB2.2 west of Still Pond near buoy R34, main Bay
CB3.3C north of Bay Bridge, main Bay
CB4.3C east of Dares Beach near buoy R64, main Bay
CB5.2 east of Point No Point, main Bay
ET4.2 lower Chester R. south of Eastern Neck Island at buoy 9
WT5.1 Patapsco River east of Hawkins Point at buoy 5M (Baltimore Harbor)
TF2.3 mid-channel off Indian Head at buoy N54, Potomac River
RET2.2 mid-channel off Maryland Point at buoy 19, Potomac River

LE2.2 off Ragged Point at buoy BW51B, Potomac River (prior to April 1988, this station was designated XBE9541
ET5.1 upper Choptank River at Ganey's Wharf, downstream of confluence with Tuckahoe Creek
ET5.2 lower Choptank R. near Rt. 50 bridge at Cambridge
EE3.1 North Tangier Sound NW of Haines Point 1,000 yds. north of buoy R16
TF1.5 mid-channel at Nottingham, Patuxent River
TF1.7 mid-channel on a transect heading of approximately 115 deg. from Jacks Creek, Patuxent River
LE1.1 mid-channel SSW of Jack Bay sandspit and NE of Sand gates,Patuxent River

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 19840701
Beginning_Time: unknown
Ending_Date: 20080630
Ending_Time: unknown
Currentness_Reference:
ground condition

Status:
Progress: Complete
Maintenance_and_Update_Frequency: Irregular

Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -77.2936
East_Bounding_Coordinate: -75.9222
North_Bounding_Coordinate: 39.4794
South_Bounding_Coordinate: 37.9947

Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: Phytoplankton
Theme_Keyword: Water Quality
Theme_Keyword: Water
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Place_Keyword_Thesaurus: None
Place_Keyword: Choptank River
Place_Keyword: Chester River
Place_Keyword: Maryland
Place_Keyword: Chesapeake Bay
Place_Keyword: Potomac River
Place_Keyword: Patapsco River
Place_Keyword: Patuxent River
Stratum:
Stratum_Keyword_Thesaurus: None
Stratum_Keyword: Water Column
Temporal:
Temporal_Keyword_Thesaurus: None
Temporal_Keyword: Monthly
Temporal_Keyword: Bimonthly

Access_Constraints: None

Use_Constraints:
Dataset credit required
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Jacqueline Johnson
Contact_Organization: Interstate Commission on Potomac River Basin
Contact_Position: Chesapeake Bay Program Living Resources Data Manager
Contact_Address:
Address_Type: mailing and physical address
Address:
410 Severn Avenue, Suite 109
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21403
Country: USA
Contact_Voice_Telephone: 1-800-968-7229
Contact_Voice_Telephone: 410-267-5729
Contact_Facsimile_Telephone: 410-267-5777
Contact_Electronic_Mail_Address: jjohnson@chesapeakebay.net
Hours_of_Service: 8:00 a.m. to 4:00 p.m. Monday Through Friday
Contact Instructions:
unavailable
Security_Information:
Security_Classification_System: None
Security_Classification: None
Security_Handling_Description: None
Native_Data_Set_Environment:
Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 3; ESRI ArcCatalog 9.3.0.1770
Cross_Reference:
Citation_Information:
Originator: Jacqueline Johnson
Publication_Date: 20000101
Publication_Time: Unknown
Title:
2000 Users' Guide to Chesapeake Bay Program Biological and Living Resources Data
Edition: Version 1
Publication_Information:
Publication_Place: Annapolis, MD
Publisher: USEPA CHESAPEAKE BAY PROGRAM OFFICE
Other_Citation_Details:
Unknown
Online_Linkage: ftp.chesapeakebay.net/pub/living_resources/guide2000.pdf

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Data_Quality_Information:
Attribute_Accuracy:

Attribute_Accuracy_Report:

Random sample recounts of previously counted phytoplankton samples are undertaken in order to determine counting error. One in every 20 samples is blindly selected and recounted with the C.V. between total counts in the two samples recorded and stored at the laboratory.

Logical_Consistency_Report:

Not Applicable

Completeness_Report:

DATA ENTRY METHOD: Computerized phytoplankton counting automatically produces data sheet and data file. Field data is Key punched from field data sheets.

DATA VERIFICATION: Visual inspection and computer verification program.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

Station positions (Latitudes and Longitudes) in data set are approximations of actual positions in the field. Station latitudes and longitudes are input into a Loran-C or GPS receiver and sampling begins when boat reaches preprogrammed coordinates. Loran-C is accurate to +/- 1500 ft. The actual Loran/ GPS coordinates for each sampling event are not currently recorded in data set.

Vertical_Positional_Accuracy:

Quantitative_Vertical_Positional_Accuracy_Assessment:

Vertical_Positional_Accuracy_Value: P_Depth

Vertical_Positional_Accuracy_Explanation:

Composite Sample Cut off Depth in Water column conductivity is recorded immediately before plankton sampling. Conductivity is usually determined using a Hydrolab CTD. P_Depth is set at 0.5 meters above the Pycnocline and is used at the cutoff depth between upper and lower water column composite samples. The pycnocline is determined to be the depth at which the greatest conductivity change is observed. The minimum threshold change is 1000 uhhos/cm.

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: Richard Lacouture

Originator: Stella Sellner

Publication_Date: 20000101

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Title:

Maryland Chesapeake Bay Water Quality Monitoring Program:Mainstem and Tributary Living Resource Component

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Publication_Place: Annapolis, Maryland USA

Publisher: US EPA Chesapeake Bay Program

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Unknown

Online_Linkage: http://www.chesapeakebay.net

Larger_Work_Citation:

Citation_Information:

Originator: Jacqueline Johnson

Publication_Date: 20080301
Title:
Chesapeake Bay Program Plankton Database
Edition: Version 3.0
Geospatial_Data_Presentation_Form: database
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Publication_Place: Annapolis, MD
Publisher: US EPA Chesapeake Bay Program
Other_Citation_Details:
None
Online_Linkage: www.chesapeakebay.net
Type_of_Source_Media: digital database file
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 19840701
Beginning_Time: unknown
Ending_Date: 20000101
Ending_Time: unknown
Source_Currentness_Reference:
ground condition
Source_Citation_Abbreviation:
None
Source_Contribution:
None
Process_Step:
Process_Description:
Phytoplankton samples were collected by members of the Benedict Estuarine Research Laboratory plankton section. At each station, 500 ml aliquots from the two surface composites are combined into a 1-liter bottle as are the two bottom composites, and a phytoplankton subsample is decanted into a 500 milliliters polyethylene bottle and fixed immediately with Acid Lugol's solution. The whole water column samples are taken by decanting 500 milliliters from a 30 liter composite sample which is collected from ten discrete depths evenly space throughout the water column. At the end of each sampling cruise, the samples are transferred to the phytoplankton taxonomist. Phytoplankton counts and identifications are then made and sample concentrates are subsequently archived. Samples were enumerated in the laboratory by the phytoplankton Taxonomist using one of the two following counting protocol.

-Chesapeake Bay Program Analytical Method Code PH101- This protocol was used from July 1985- December 2004 for Phytoplankton enmumeration.

Samples are gently mixed and a 1-25 milliliter aliquot is transferred to a settling chamber. The aliquot is made up to 10-50 milliliter with deionized water (depending on the volume of the settling chamber). After a settling period of 2-48 hours (depending on the volume of the settling chamber), the settled material is examined at 400X or 500X and 250X or 312X using a Leitz Diavert inverted microscope. Identification and enumeration of the dominant taxa, including detailed counts of the species, are made yielding densities

(cells/liter) of individual taxa as well as the total assemblage. A minimum of twenty random fields and 200 individual cells (not including blue-green spheres: 815 5) are counted at 500X-400X. The 312X-250X count consists of the examination of twenty random fields. For the rarer forms not encountered in the high magnification counts. In 1989 after doing a comparison with epifluorescence microscopy 815 5, or unidentified blue green spheres were no longer enumerated due to the inaccuracy of the Utermohl method in estimating numbers of these cells. The remainder of the sample is permitted to settle for at least 72 hours before concentration to a volume of 20-25 milliliters for archiving.

-Chesapeake Bay Program Analytical Method Code PH103 - Used from January 2005- Present for Phytoplankton enmumeration.

Beginning in 2005, the following enumeration technique was instituted for all Chesapeake Bay Program supported phytoplankton enumerations. Samples are gently mixed and a 1-25 milliliter aliquot is transferred to a settling chamber. The aliquot is made up to 10-50 milliliter with deionized water (depending on the volume of the settling chamber). After a settling period of 2-48 hours (depending on the volume of the settling chamber), the settled material is examined at 400X or 500X and 250X or 312X using a Leitz Diavert inverted microscope. Identification and enumeration of the dominant taxa, including detailed counts of the species, are made yielding densities (cells/liter) of individual taxa as well as the total assemblage.
(1) At 312X magnification, a minimum of ten random fields and 200 cells of taxa > 5 microns in largest dimension will be counted. If 200 cells are not tallied in 10 fields, cells in additional fields will be enumerated until 200 cells have been enumerated. All colonies, trichomes, & filaments are counted at this magnification. Very large (>60 Microns) or rare species (less than 1 cell in less than 10 Grids) not counted in this scan.
(2) At 500X magnification, twenty random fields will be counted for taxa >=3 and <=5 microns in diameter. No colonies, trichomes or filaments counted.
(3) At 125X magnification, the entire chamber will be scanned for taxa which were not enumerated at the other two magnifications.

The following equation is used to convert raw counts to density for each taxon identified:

DENSITYV = RAWCNT * (NUMCHFLD / NUMCTFLD) * (1 / FRAC_CNT) * 2

where DENSITYV = density in number per liter
RAWCNT = number of individuals counted
NUMCHFLD = number of fields in entire counting chamber
NUMCTFLD = number of field counted
FRAC_CNT = fraction of sample counted

NOTE: NUMCHFLD is a constant, either 2955.2, 3086.4 or 3489.7 when counting at 500X or 400X and 1141.9, 1189.1 or 1319.8 when counting at 312X or 250X, which is dependent on the specific microscope used for the enumeration.

-Chesapeake Bay Program Analytical Method Code PP102- This protocol was used from 2002 to present for picoplankton enmumeration.
Samples are gently mixed and an appropriate (1-5ml) sub-sample is pipetted from the collection bottle. This aliquot is filtered through a 0.2 um pore size Irgalan black-stained polycarbonate filter on top of a glass-fiber backing filter at low (< 5 psi) vacuum pressure. The polycarbonate filter is removed from the base and placed atop a drop of Cargille Type A immersion oil in the center of a glass slide. Another drop of immersion oil is placed atop the filter and a cover slip is placed atop the filter. The sample is enumerated at a magnification of 1250X with a Leitz Laborlux compound microscope fitted with a 100W Mercury bulb. Two filter cubes are used in order to enumerate the picoplankton - one in the excitation range of 420-490 nm and the other in the excitation range of 515-560 nm. A minimum of twenty random fields and 200 individual cells are counted.

Process_Date: Unknown
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Jacqueline Johnson
Contact_Organization: Interstate Commission on Potomac River Basin
Contact_Position: Chesapeake Bay Program Living Resources Data Manager
Contact_Address:
Address_Type: mailing and physical address
Address:
410 Severn Avenue, Suite 109
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21403
Country: USA
Contact_Voice_Telephone: 1-800-968-7229
Contact_Voice_Telephone: 410-267-5729
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Contact Instructions:
unavailable

Process_Step:
Process_Description:
Metadata imported.
Source_Used_Citation_Abbreviation:
C:\DOCUME~1\jjohnson\LOCALS~1\Temp\xml9B6.tmp
Process_Date: 20081003
Process_Time: 13265600

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Spatial_Data_Organization_Information:

Indirect_Spatial_Reference_Method:
Chesapeake Bay and Its Tidal Tribuaries in the State of Maryland
Direct_Spatial_Reference_Method: Point
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Entity point
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Area point

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Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: 30
Longitude_Resolution: 30
Geographic_Coordinate_Units: Decimal degrees
Geodetic_Model:
Horizontal_Datum_Name: North American Horizontal Datum of 1983
Ellipsoid_Name: Geodedic Reference System 80
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Denominator_of_Flattening_Ratio: 294.98
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Depth_System_Definition:
Depth_Datum_Name: Chart datum; datum for sounding reduction
Depth_Resolution: .1
Depth_Distance_Units: meters
Depth_Encoding_Method: Attribute values

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Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
All data
Entity_and_Attribute_Detail_Citation:
Please see
ftp://ftp.chesapeakebay.net/Pub/Living_Resources/plank/phyto/MDPHDOC.PDF
for complete up to date details.

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Distribution_Information:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Jacqueline Johnson
Contact_Organization: Interstate Commission on Potomac River Basin

Contact_Position: Chesapeake Bay Program Living Resources Data Manager\Analyst
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Address_Type: mailing and physical address
Address:
410 Severn Avenue, Suite 109
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Contact Instructions:
unavailable
Resource_Description: Downloadable Data
Distribution_Liability:
I, the data requestor, agree to acknowledge the Chesapeake Bay Program and any other agencies and institutions as specified by the Chesapeake Bay Program Office as data providers. I agree to credit the data originators in any publications, reports or presentations generated from this data. I also accept that, although these data have been processed successfully on a computer system at the Chesapeake Bay Program, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. This disclaimer applies both to individual use of the data and aggregate use with other data. It is strongly recommended that careful attention be paid to the contents of the data documentation file associated with these data. The Chesapeake Bay Program shall not be held liable for improper or incorrect use of the data described and/or contained herein.
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Digital_Form:
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Format_Name: ASCII
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Network_Resource_Name: http:www.chesapeakebay.net
Offline_Option:
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Recording_Format: ISO 9660
Compatibility_Information:
None
Fees: None
Ordering_Instructions:
All requests for data on media must be made in writing
Turnaround: 5 Working Days
Custom_Order_Process:
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Technical_Prerequisites:

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Time_Period_Information:
Range_of_Dates/Times:
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Beginning_Time: unknown
Ending_Date: 20080630
Ending_Time: unknown

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Metadata_Reference_Information:
Metadata_Date: 20120426
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Jacqueline Johnson
Contact_Organization: Interstate Commission on Potomac River Basin
Contact_Position: Chesapeake Bay Program Living Resources Data Manager
Contact_Address:
Address_Type: mailing and physical address
Address:
410 Severn Avenue, Suite 109
City: Annapolis
State_or_Province: Maryland
Postal_Code: 21403
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Contact_Facsimile_Telephone: 410-267-5777
Contact_Electronic_Mail_Address: jjohnson@chesapeakebay.net
Hours_of_Service: 8:00 a.m. to 4:00 p.m. Monday Through Friday
Contact Instructions:
unavailable
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
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Metadata_Security_Classification: Unclassified
Metadata_Security_Handling_Description:
None
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

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