

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

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Identification_Information:

Citation:

Citation_Information:

Originator: Richard Lacouture-Current

Originator: Stella Sellner-Current

Originator: Morgan State University- Benedict Estuarine Research Laboratory

Originator: Anne Marie Hartsig- Current

Originator: Kevin Sellner-Previous

Publication_Date: 20081031

Title:

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

Geospatial_Data_Presentation_Form: tabular digital data

Publication_Information:

Publication_Place: Annapolis, Maryland USA

Publisher: US EPA Chesapeake Bay Program

Other_Citation_Details:

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

Geospatial_Data_Presentation_Form: database

Publication_Information:

Publication_Place: Annapolis, MD

Publisher: US EPA Chesapeake Bay Program

Other_Citation_Details:

None

Online_Linkage: www.chesapeakebay.net*Description:**Abstract:*

The overall phytoplankton monitoring program is designed to detect and 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 archived 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

Place:

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: https://archive.chesapeakebay.net/pub/living_resources/guide2000.pdf[Back to Top](#)*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

Publication_Time: Unknown

Title:

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

Publication_Information:

Publication_Place: Annapolis, Maryland USA

Publisher: US EPA Chesapeake Bay Program

Other_Citation_Details:

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

Publication_Information:

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 enumeration.

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 enumeration.

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:

$$\text{DENSITYV} = \text{RAWCNT} * (\text{NUMCHFLD} / \text{NUMCTFLD}) * (1 / \text{FRAC_CNT}) * 2$$

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 enumeration.

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

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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

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 Tributaries 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: Geodetic Reference System 80

Semi-major_Axis: 6378206.4

Denominator_of_Flattening_Ratio: 294.98

*Vertical_Coordinate_System_Definition:**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

https://archive.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

Contact_Address:

Address_Type: mailing and physical address

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410 Severn Avenue, Suite 109

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State_or_Province: Maryland

Postal_Code: 21403

Country: USA

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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

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.

Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Format_Name: ASCII

Digital_Transfer_Option:

Online_Option:

Computer_Contact_Information:

Network_Address:

Network_Resource_Name: <http://www.chesapeakebay.net>

Offline_Option:

Offline_Media: CD-ROM

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:

None

Technical_Prerequisites:

None

Available_Time_Period:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 19840701

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

Country: USA

Contact_Voice_Telephone: 1-800-968-7229

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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

Metadata_Access_Constraints: None

Metadata_Use_Constraints:

None

Metadata_Security_Information:

Metadata_Security_Classification_System: None

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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