Virginia Chesapeake Bay Water Quality Monitoring Program:Primary Production Component

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: Kneeland Nesius
Originator: Old Dominion University
Publication_Date: 20000101
Title:
Virginia Chesapeake Bay Water Quality Monitoring Program:Primary Production Component
Publication_Information:
Publication_Place: Annapolis, MD USA
Publisher: US EPA Chesapeake Bay Program Office
Other_Citation_Details:
Unknown
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 plankton production in relation to changing water quality conditions in Chesapeake Bay. Phytoplankton are the dominant producers in the Chesapeake Bay and are the base of the food chain for many higher tropic levels. Excessive blooms of plankton species are considered evidence of eutrophication in the bay and are known to degrade water quality and block light from submerged aquatic vegetation. Sampling is performed in conjunction with the Virginia phytoplankton, fluorometry, mesozooplankton, microzooplankton, jellyfish and water quality monitoring programs. Carbon fixation rates (C14) were obtained from replicate surface layer composite samples at 15 stations, sampled monthly from January - December in Virginia. Stations were located to characterize primary productivity in the lower Bay and Bay mouth systems, Virginia Tributaries and Southern Branch of the Elizabeth River. Sampling in the Elizabeth River did not begin until February of 1991. In 1998, sampling at Elizabeth River Station SBE2 was Discontinued and a second sampling cruise was added in July and August for all remaining station.

Purpose:

The state of Virginia, in cooperation with the US EPA Chesapeake Bay Program, has monitored phytoplankton primary production in the Virginia mainstem and tributaries since January 1989. The program is designed to give comprehensive spatial and temporal information on primary production. Sampling is performed in conjunction with the Maryland phytoplankton, fluorometry, mesozooplankton, microzooplankton, jellyfish and water quality monitoring programs.

Supplemental_Information:

#STATION NAMES AND DESCRIPTIONS
LE5.5-Mouth of James River/Bay transition VIMS Historical Station (JA0.0) Slack Water Station
CB7.4-Baltimore Channel at Bay Bridge - Bay/Ocean transition area at mid-Bay mouth channel
CB7.-3E Lower Eastern Shore Channel area
CB6.4-Central Bay Stem offshore from the York River mouth
LE3.6-Mouth Rappahannock River/Bay Transition (VIMS Hist. Sta. - RAO.O)
CB6.1-Lower end of Main Bay Channel - Anoxia Monitoring
WE4.2-Mouth of York River/Bay Transition Area (VIMS Hist. Sta.- YKO.O)
SBE2-Southern Branch of the Elizabeth River - Adjacent to Atlantic Wood
SBE5-Southern Branch of the Elizabeth River - Adjacent to Virginia Power
TF3.3-N40, Clay Bank, Rappahannock River
RET3.1 -N. Buoy R10, VIMS Slack Water Station, Rappahannock River
RET4.3 -VIMS Historic Station C57, York River
TF5.5 -Red buoy 107 JRWQMP Station #13, James River
RET5.2 -Swann's Point JRWQMP STA. #19, VIMS Slack Water Station, James River
TF4.2 -White House, York River

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 19890101
Ending_Date: 20090830

Currentness_Reference:

ground condition

Status:

Progress: Complete

Maintenance_and_Update_Frequency: None planned
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -76.3872
East_Bounding_Coordinate: -75.63389
North_Bounding_Coordinate: 37.95083
South_Bounding_Coordinate: 36.945
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: Water
Theme_Keyword: Primary Production
Theme_Keyword: Water Quality
Theme_Keyword: Plankton
Place:
Place_Keyword_Thesaurus: None
Place_Keyword: Virginia
Place_Keyword: Chesapeake Bay
Place_Keyword: James River
Place_Keyword: York River
Place_Keyword: Rappahanock River
Place_Keyword: Elizabeth River
Stratum:
Stratum_Keyword_Thesaurus: None
Stratum_Keyword: Water Column
Temporal:
Temporal_Keyword_Thesaurus: None
Temporal_Keyword: Bimonthly
Temporal_Keyword: Monthly
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:
Relational Database
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

Back to Top

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
The phytoplankton field chief was the custodian for all samples collected, and verifies proper labeling of bottles, complete field data entries, the collection of the samples, preservative used and transport to the laboratory. He also supervised the calibration and availability of field equipment. Samples were turned over to the laboratory chief who oversees the sample processing, analysis and recording of the raw data. Chemical analysis, raw data sheets and other stages of the collection and analysis procedures are routinely checked by the principal investigator and laboratory chief for quality assurance.
Logical_Consistency_Report:
Not Applicable
Completeness_Report:
Standard protocol procedures will be followed to guard against errors and maintain accuracy and precision thought out the collection and analysis procedures (Strickland and Parsons, 1972). These include first hand instruction to all assistants by the re-check and first hand observations by the PI., and periodic duplicate analysis of samples collected. The C14 work will be performed on four separate replicates taken from each composite sample. Carbonate alkalinity will be determined on four separate replicates. Comparison between replicates will be constantly monitored.
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:

Station positions 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:

Vertical_Positional_Accuracy_Report:

Water column conductivity is recorded immediately before plankton sampling. 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. If a station has no pycnocline then the is divided into thirds by depth and the top third of the water column is treated as the upper water column. The pycnocline is determined as follows: ((Bottom Conductivity-Surface Conductivity) / Bottomdepth)*2= Threshold If Threshold is less than 500 then Station has no Pycnocline. If Threshold is greater than 500, then the pycnocline is the first depth at which the conductivity change is greater than the threshold value. Units of measurement: Conductivity -uhhos/cm Depth- meters

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: Kneeland Nesius

Originator: Old Dominion University

Publication_Date: 20000101

Title:

Virginia Chesapeake Bay Water Quality Monitoring Program:Primary Production Component

Publication_Information:

Publication_Place: Annapolis, MD USA

Publisher: US EPA Chesapeake Bay Program Office

Other_Citation_Details:

Unknown

Online_Linkage: www.chesapeakebay.net

Online_Linkage: ftp.chesapeakebay.net

Larger_Work_Citation:

Citation_Information:

Originator: Jacqueline Johnson

Publication_Date: 19981231

Title:

Chesapeake Bay Program Plankton Database

Edition: Version 2.0

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: 19890101
Ending_Date: Present
Source_Currentness_Reference:
ground condition
Source_Citation_Abbreviation:
None
Source_Contribution:
None
Process_Step:
Process_Description:
-Chesapeake Bay Program Laboratory Method Code PD102
Water sub-samples for the productivity measurements were taken from each of the two composite water samples taken from above the pycnocline at each station. Two one-liter water samples were taken from each of the two composite sample carboys (a total of four samples per station). Samples were placed in labeled bottles and placed in a cooler and transported back to the laboratory for analysis. Productivity analysis was performed immediately upon returning to the laboratory.

In the laboratory, a one hundred milliliter samples from each composite sample were placed in separate dilution bottles and transferred to a water bath equipped with a bottle holder, which rotates between banks of cool-white fluorescent lights. The light levels exceeded the light saturation point of the phytoplankton. The temperature of the water bath was the same as the temperature at each station when the samples were taken. After one hour of acclamation the bottles were inoculated with two to five uCi C14-NaHCO3. The samples were returned to the water bath for one hour. One of the samples was analyzed for C14 activity immediately (zero Time of Sample). At the end of the incubation period (one and half to two hours) the remaining samples was filtered through a 25 mm 0.45 pore-size millipore filter under a vacuum less than 5 cm Hg pressure. After the contents of the milk dilution bottle and its rinses were filtered, the Millipore filters were removed and fumed over concentrated HCl for 30 seconds and placed in scintillation vials. Scintillation fluid was added to each vial and C14 activity was determined using a Beckman Model LS 1701 scintillation counter. The amount of C14 in the stock bottle was determined by placing 20 to 50 micro liter of stock solution in scintillation vials containing 0.5 milliliters of phenethylamine. Scintillation fluid was added to the vials set in the dark over night and analyzed for C14 activity.

Chlorophyll A is determined from grab samples for chlorophyll determination are filtered through Whatman GF/F filters. Filters are placed in 90% aqueous acetone and ground to a uniform consistency with a tissue grinder. Samples are steeped overnight at 4 degrees C in the dark. The extract is clarified by centrifugation. Spectrophotometric readings are taken at 750, 664, 647, and 630 nm. The sample is acidified by placing 2 drops of 1 N HCl into the extract and read at 750 and 665 nm.

Total alkalinity is calculated in the following manner: Initial pH is determined. Then 0.025N HCl is add in 0.2-milliliter aliquots until pH is 3.8-4.2. There after pH is recorded for five cumulative additions of 0.025N HCl.

FORMULAS, CALCULATIONS, AND CONVERSIONS

>Calculation of Carbon Fixation

The following equations were used to determine the rate of carbon fixation in ug/l/hr. Note that the raw data used in these calculations are not presented in the associated data set. Only the resulting carbon fixation rate is included.

1) CARBALK = 120 * (Total Alkalinity)
2) CARBFIX = IVOL * ((DPMSAM/FVOL)-(DPMT0/FVOL)) * CARBALK * 1.05 / DPMSP * (ETIME-BTIME)

where CARBFIX = Carbon fixation rate in ug C/l/hr
IVOL = Volume incubated
FVOL = Volume filtered
DPMSAM = Disintegrations per minute from incubated sample
DPMT0 = Disintegrations per minute from corresponding unincubated (time zero - t0) sample
DPMSP = Total disintegrations per minute for C-14 spike
BTIME = Beginning time of incubation (h)
ETIME = Ending time of incubation (h)
CARBALK = Total inorganic carbonate

>Calculation of Assimilation Ratio

ASMRATIO = CARBFIX / CHLA - this ratio is calculated prior to rounding the CARBFIX value
where ASMRATIO = Assimilation ratio
CARBFIX = Carbon fixation in ug C/l/h from 2
CHLA = Chlorophyll a in ug/l

Process_Date: ongoing
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
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\xml623.tmp
Process_Date: 20081124
Process_Time: 10373000

Back to Top

Spatial_Data_Organization_Information:
Indirect_Spatial_Reference_Method:
Chesapeake Bay and Its Tidal Tribuaries in the Commonwealth of Virginia
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

Back to Top

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
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

Back to Top

Entity_and_Attribute_Information:

Overview_Description:

Entity_and_Attribute_Overview:

All data

Entity_and_Attribute_Detail_Citation:

8/01/96- Multiple sampling date discrepancies were found between the phytoplankton, zooplankton and production data, which were collected synchronously. Often the date of sample processing was placed on the sample and not the actual field collection date. Sampling event dates should be identical for phytoplankton and primary production. Note that zooplankton and phytoplankton data will have differing field dates because they are collected on separate sampling trips in the tributaries. Dates were corrected based on the original field sheets. Corrected data sets will have an R_DATE of 07/01/96 or later.

8/31/95- CRUISE NUMBERS - BAY012 - BAY211 were supplied by the Chesapeake Bay Program office. See Guide to Living Resource Data Sets for complete list of Bay Cruise periods.

8/31/95- G_METHOD was changed to 7- refers to Table 17, PAGE F-9 APPENDIX F, of the Living Resources Data management plan, 1989. This is a change in reporting of GMETHOD in previous versions of the data set, not a change in collection method

8/31/95- REP_NUM - NOTE: The sampling scheme for sample collection differ from those in the MARYLAND PRODUCTION DATA SET. The data values are comparable but the VIRGINIA sampling scheme takes two field replicates compared to the Maryland one field replicate. In order to accommodate this in the data sets all Virginia samples have had the replicate numbers reassigned as follows:

Virginia Field Replicate	Virginia Lab Replicate	REP_NUM
1	1	1
1	2	2
2	1	3
2	2	4

01/01/98- SER_NUM, MAX_DEPTH- Prior to 1997, these data field were unavailable for VIRGINIA data. CHLA and ASMRATIO were not always collected at time of C14 sampling prior to 1996. SER_NUM is not available because Virginia does use a serial number system to track samples.

SUMMER 1997 - The Living Resources Data manager supplied salinity zones to the plankton data based on salinity data collected by the Virginia Water Quality Monitoring Program. Values were derived from Water Quality Hydrographic data collected concurrently with the mesozooplankton. If data was not available for the of sampling but was collected within a one week window of sampling date, the water quality data was used to determine a salinity zone. However the salinity zone is marked with an E to denote being estimated.

02/01/98- The salinity zones appearing in the 1999 data are provisional. They have not yet been checked against the water quality data for validation. The 1999 Virginia Tributary water quality data will not be delivered to the CBPO until June 2000. After

delivery of the water quality data, salinity zones will be confirmed.

01/01/2000- All Latitudes and Longitudes converted to NAD83 coordinates.

Summer 2003- It was determined Maryland and Virginia production measurements, should analyzed separately due shipboard methodology differences. The current Maryland protocol holds productivity samples at near-ambient temperatures and shipboard light conditions for 0.5 - 6 hours. Thus samples able to begin acclimating to relatively high light levels on shipboard and samples may experience above-ambient temperatures before they are placed in light-saturated, temperature-controlled incubation chambers in the laboratory. The current Virginia protocol maintains productivity samples in a closed cooler on ice prior to being sent to the laboratory for analysis. Virginia's samples experience below-ambient temperatures in all seasons but winter, and are acclimated to low light when they are placed in the incubation chambers.

Winter 2002- For extensive details in regards to quality assurance issues and data comparability issues between Maryland and Virginia Programs please see the CBP Phytoplankton Split sample portion of the Chesapeake Bay Quality Assurance Program at:

http://www.chesapeakebay.net/qualityassurance.htm

April 2004- Chlorophylls for the river stations was not performed. Sept. 2003 LE 3.6 and CB 6.1, July 2003 RET 3.1,TF 3.3, TF5.5 were not taken. The tributary stations are no longer collected during November or December.

08/11/2005. Note due to contract changes starting in January 1996, station LE5.5 had a coordinate change. This station move was not documented until August 2005. Due to this station relocation, all data collected at the altered location had the station name changed to LE5.5-W in August 2005.

Back to Top

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
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

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_Capacity:
Recording_Density: 650
Recording_Density_Units: megabytes
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: 19890101
Ending_Date: Present

Back to Top

Metadata_Reference_Information:
Metadata_Date: 20000310
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
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
Metadata_Standard_Name: NBII Content Standard for National Biological Information Infrastructure Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
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

Back to Top