VIRGINIA CHESAPEAKE BAY PROGRAM PHYTOPLANKTON PRIMARY PRODUCTION DATA DICTIONARY

Virginia Chesapeake Bay Water Quality Monitoring Program: Phytoplankton Primary Production Component
- Primary Production Data Dictionary
- Event Data Dictionary

NOTES:
1) THIS PROGRAM WAS TERMINATED AS OF 30 SEPTEMBER 2009
2) THIS DICTIONARY WAS REVISED ON 01/11/2010 AND SUPERSEDES ALL OTHER DICTIONARIES FOR THE VIRGINIA PRIMARY PRODUCTION DATA

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 Virginia phytoplankton, fluorometry and water quality monitoring programs.

NAMES AND DESCRIPTIONS OF ASSOCIATED DATA DICTIONARY FILES
The 2000 Users Guide to Chesapeake Bay Program Biological and Living Resources Monitoring Data

PROJECT TITLE
Virginia Chesapeake Bay Water Quality Monitoring Program: Phytoplankton- Primary Productivity Component

CURRENT PRINCIPAL INVESTIGATORS

THIS PROGRAM WAS TERMINATED AS OF 30 SEPTEMBER 2009; THE FOLLOWING WERE THE INVESTIGATOR AND PROJECT MANAGERS AT TIME OF PROJECT TERMINATION.

>PROGRAM MANAGER: Frederick Hoffman, Virginia Department of Environmental Quality
>PRINCIPLE INVESTIGATORS: Dr. Kneeland K. Nesius and Dr. Harold G. Marshall, Old Dominion University
>PROGRAMMER/ANALYST: Michael Lane, Department of Biology, Old Dominion University
>DATA COORDINATOR: TBD, Department of Biology, Old Dominion University

CURRENT FUNDING AGENCIES
Not Applicable

PROJECT COST
Not Applicable

QA/QC OFFICER
Not Applicable

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LOCATION OF STUDY
Lower Chesapeake Bay and its' tidal tributaries in the Commonwealth of Virginia

DATE INTERVALS
01/07/1989- 09/30/2009

#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. Phytoplanktons 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 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. The sampling of tributary stations during November and December was discontinued in 2003. 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.

#STATION NAMES AND DESCRIPTIONS

LE5.5	Mouth of James River/Bay transition VIMS Historical Station (JA0.0) Slack Water Station
LE5.5-W	Off Mouth of James River
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

STATION NAMES, LATITUDES (decimal degrees) , LONGITUDES (decimal degrees), TOTAL DEPTH (meters), LATITUDES (degrees, minutes and decimal seconds), AND LONGITUDES (degrees, minutes and decimal seconds). These station latitudes and longitudes represent target values and not actual positions. They are the values used by the Chesapeake Bay Program as a whole to coordinate data for the stations. All data positions are provided in NAD83 coordinates.

STATION	LATITUDE	LONGITUDE	T_DEPTH	LATITUDE (DMS)	LONGITUDE (DMS)
CB6.1	37.58833	-76.1625	13.1	37 35' 18"	-77 50' 15"
CB6.4	37.23639	-76.2083	10.5	37 14' 11"	-77 47' 30"
CB7.3E	37.22861	-76.0542	17.8	37 13' 43"	-77 56' 45"
CB7.4	36.99556	-76.0208	13.8	36 59' 44"	-77 58' 45"
LE3.6	37.59667	-76.285	9.8	37 35' 48"	-77 42' 54"
LE5.5	36.99889	-76.3136	21.4	36 59' 48"	-76 18' 12"
LE5.5-W	36.99903	-76.31328	6.0	36 59’ 56”	-76 18’ 49”
RET3.1	37.92014	-76.8214	5.8	37 55' 12.488"	-77 10' 43.138"
RET4.3	37.50681	-76.788	5.2	37 30' 24.522"	-77 12' 43.14"
RET5.2	37.21015	-76.793	8.3	37 12' 36.533"	-77 12' 25.145"
SBE2	36.81265	-76.3058	13.0	36 48' 45.533"	-77 41' 39.212"
SBE5	36.76987	-76.2961	10.0	36 46' 11.534"	-77 42' 14.215"
TF3.3	38.01874	-76.908	6.6	38 1' 7.481"	-77 5' 31.122"
TF4.2	37.57987	-77.0216	6.4	37 34' 47.52"	-78 58' 42.113"
TF5.5	37.31293	-77.2328	9.0	37 18' 46.534"	-78 46' 2.087"
WE4.2	37.24167	-76.3867	14.1	37 14' 30"	-77 36' 48"

Station depths are given in meters, based on a (1985-1994) nine year average of Virginia Department of Environmental Quality, water quality hydrographic data collected concurrently with the primary production samples.

METHODOLOGY DESCRIBING CHAIN OF CUSTODY FOR LAB SAMPLES

The phytoplankton field supervisor will be responsible for the collection of these samples, bottle labeling, custody, storage in a cooler and transport to the phytoplankton laboratory. In the laboratory their custody will be given to Dr.K. Nesius, the Principal investigator. The field supervisor also oversees the calibration and availability of field equipment. Dr. Nesius oversees the sample processing, analysis and recording of the raw data.

BIOLOGICAL ENUMERATION TECHNIQUES

-Chesapeake Bay Program Laboratory Method Code PD102

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.

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

MONITORING QA\QC PLAN FOR PROJECT
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.

MONITORING VARIABLE NAMES, MEASUREMENT UNITS AND DESCRIPTIONS

> PARAMETER: Alkalinity for total inorganic carbon. (Used for determination of carbon fixation rate. Value not provided in data set)
- COLLECTION METHODS: See above.
- SAMPLE PRESERVATION: Refrigerate over night or process immediately.
-TIME IN STORAGE: <24 hours.
-LABORATORY TECHNIQUE WITH REFERENCES: 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.

Strickland, J.D.H. and T.R., Parsons. 1972. A Practical Handbook for Seawater Analysis. Fish. Res. Bd. Canada. Bull. 167. Ottawa 310pp.

>PARAMETER: CARBFIX (Carbon fixation rate in micrograms carbon per liter per hour)
-COLLECTION METHODS:
Water sub-samples for the productivity measurements will be taken from each of the two composite water samples (carboys) taken from the upper water column series and within the euphotic zone at each station in the lower Bay and the four rivers. From each of the two carboys, 2 - 1 liter water samples (total of 4/station) are placed in labeled bottles and placed in a cooler, until their return to the laboratory.
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.
-SAMPLE PRESERVATION: Refrigerate over night or process immediately.
-SAMPLE STORAGE ENVIRONMENT: Refrigerator and or cooler.
-TIME IN STORAGE:< 24 hours.
-LABORATORY TECHNIQUE WITH REFERENCES:
-Chesapeake Bay Program Laboratory Method Code PD102
C-14 activities determined for each filtered aliquot on liquid scintillation counter with external standardization.

Strickland, J.D.H. and T.R., Parsons. 1972. A Practical Handbook for Seawater Analysis. Fish. Res. Bd. Canada. Bull. 167. Ottawa 310pp.

>PARAMETER: CHLA (Chlorophyll a concentration in micrograms per liter)
-COLLECTION METHODS: IN Vitro chlorophyll from composite samples or mean surface layer fluorometric chlorophyll from station. Grab samples for chlorophyll determination are filtered through Whatman GF/F filters.
-SAMPLE PRESERVATIVES: Grab sample filters frozen
-SAMPLE STORAGE ENVIRONMENT: -4 C
-TIME IN STORAGE: 0.1-2 months
-LAB TECHNIQUES WITH REFERENCES: 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.

Strickland, J. D. H. and T. R. Parsons. 1972. A Practical Handbook of Seawater Analysis. Fish. Res. Bd. Canada,Bull. 167. Ottawa. 310pp.

>PARAMETER: LATITUDE (decimal degrees) and LONGITUDE (decimal degrees)
COLLECTION METHODS: Loran-C, NAD27-Before July 1995; GPS, NAD83 After-July 1995
-SAMPLE PRESERVATIVES: None
-SAMPLE STORAGE ENVIRONMENT: None
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES: 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 plus/minus 1500 ft. The actual Loran/GPS coordinates for each sampling event are not currently recorded in data set.
All coordinates have been converted to NAD83 coordinate for project consistantcy.

>PARAMETER: P_DEPTH (Composite sample cut-off depth in meters), LAYER (Layer of Water Column in Which Sample was Taken in meters)
COLLECTION METHODS: Hydrolab CTD
-SAMPLE PRESERVATIVES: None
-SAMPLE STORAGE ENVIRONMENT: None
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES Water column salinity, temperature and depth are recorded prior to zooplankton sampling. Pycnocline is used as the cutoff depth between upper and lower water column for composite samples. If a station has no pycnocline the water column is divided in to thirds by total 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)/ Bottom Depth)*2= Threshold
If Threshold is less than 500, then the station has no pycnocline. AP is determined to be the top 1/3 of the water column. This rule is also applied if conductivity was not measured at a station.
If Threshold is greater than 500, then the pycnocline depth is determined to be the first depth at which the conductivity change is greater than the threshold value.
Units of measurement:

Conductivity- uhhos/cm Depth- meters
Prior to 1997 this depth was not recorded in the datasets and is reported as missing. All samples for this program are taken from the upper water column.

>PARAMETER: SALZONE (Salinity zone)
-COLLECTION METHODS: Hydrolab CTD
-SAMPLE PRESERVATIVES: None
-SAMPLE STORAGE ENVIRONMENT: None
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES: Water column salinity, temperature and depth are recorded prior to water sample collection. Salinity values are averaged over the entire water column and a zone is determined. Salinity Ranges are as follows: Fresh 0-0.5 ppt (F), Oligohaline >0.5-5.0 ppt (O), Mesohaline >5.0-18 ppt (M) and Polyhaline >18 ppt (P).

>PARAMETER: TOTAL_DEPTH (Total station depth in meters),
-COLLECTION METHODS: Hydrolab CTD
-SAMPLE PRESERVATIVES: None
-SAMPLE STORAGE ENVIRONMENT: None
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES: Water column salinity, temperature and depth are recorded prior to water sample collection. Salinity values are averaged over the entire water column and a zone is determined.

>PARAMETER: SAMPLE_TIME (Sample Collection Time)
-COLLECTION METHODS: Hydrolab CTD
-SAMPLE PRESERVATIVES: None
-SAMPLE STORAGE ENVIRONMENT: None
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES: Water column salinity, temperature and depth are recorded prior to water sample collection. Time is reported in 24-hour time.

>DATA ENTRY METHOD: From 1989 to 2000- Rate of carbon 14 fixation is calculated in LOTUS and extracted to ASCII files. These files were then compared. Data keypunched to microcomputer and/or mainframe terminal. From 2000-Present- Production results were entered and calculated in a FOXPRO Database system directly from the bench sheets by the principle investigator and output as ASCII files.

>DATA VERIFICATION: From 1989 to 2000- Double entry with comparison of two files in SAS.
Re-entry until both copies match exactly. From 2000-Present-Bench sheets were double entered into FOXPRO Database system and re-entered until copies matched bench sheets.

SPECIED INHOUSE CODE AND SCIENTIFIC NAME
Not Applicable in this data set.

#VARIABLE NAMES AND DESCRIPTIONS FOR DATA FILES
Structure for data files on: http://www.chesapeakebay.net/

>PRIMARY PRODUCTION SURVEY DATA FILES
Files of name format:VAPDCFyy.TXT

Name	Type	Width	Variable Definition
SOURCE	Text	10	Data Collection agency
SAMPLE_TYPE	Text	2	Collection type
STATION	Text	15	Sampling Station
SAMPLE_DATE	Date/Time	8	Sample date (YYYYMMDD)
LAYER	Text	3	Layer in water column from which sample was Taken
SAMPLE_NUMBER	Number	4	Replicate number
GMETHOD	Text	3	Chesapeake Bay Program gear method

CARBFIX	Number	8	Carbon Fixation Value
UNITS	Text	15	Carbon Fixation Reporting Units
QUALIFIER	Text	7	Detection Limit Qualifiers
METHOD	Text	8	Chesapeake Bay Program Analytical Method Code
CHLA	Number	8	Chlorophyll a (ug/l)
ASMRATIO	Number	8	Production efficiency (ug-c/l/hr)
SER_NUM	Text	12	Sample serial number
R_DATE	Date/Time	8	Data version date (YYYYMMDD)

> PRIMARY PRODUCTIVITY SAMPLING EVENT DATA FILES

Name	Type	Width	Variable Description
DATA_TYPE	Text	2	CBP Data Type Code
SOURCE	Text	10	Data Collection agency
SAMPLE_TYPE	Text	2	Collection type
LAYER	Text	3	Layer in water column from which sample was Taken
SAMPLE_DATE	Date/Time	8	Sample date (YYYYMMDD)
LATITUDE	Number	8	Latitude in Decimal Degrees (NAD83)
LONGITUDE	Number	8	Longitude in Decimal Degrees (NAD83)
P_DEPTH	Number	4	Composite Sample Cut Off Depth (meters)
R_DATE	Date/Time	8	Data version date (YYYYMMDD)
SALZONE	Text	2	Salinity Zone
SAMPLE_VOLUME	Number	8	Total Volume of Sample
UNITS	Text	15	Units for Sample Volume
STATION	Text	15	Sampling Station
TOTAL_DEPTH	Number	4	Total Station Depth (meters)
SAMPLE_TIME	Date/Time	8	Sampling Time (HHMM)

>The following field may also appear in a downloaded data set:

Name	Type	Width	Variable Definitions
BASIN	Text	20	Chesapeake Bay Basin Designation
HUC8	Text	8	USGS Eight Digit Hydrologic Unit Code
CATALOGING_UNIT_DESCRIPTION	Text	50	USGS Cataloging Unit Code Description
FIPS	Text	5	Federal Information Processing Code
STATE	Text	3	Federal Information Processing Code State Designation
COUNTY_CITY	Text	30	Federal Information Processing Code City or County Designation
LL_DATUM	Text	5	Latitude and Longitude Geographic Datum
CBSEG_1998	Text	6	1998 Chesapeake Bay Segment Designation
CBSEG_1998_DESCRIPTION	Text	50	1998 Chesapeake Bay Segment Designation Description

REFERENCE CODES IN DATA FILES

See the 2000 Users Guide to Chesapeake Bay Program Living Resources Monitoring Data for full listings.

> MISSING SAMPLE_TIME VALUES: Missing values have been replaced with 00:00.

> SOURCE: Data Collecting Agency
ODU- Old Dominion University

> QUALIFIER: Detection Limit Codes
- # Trace (less than an unknown detectable value)
- <0 Less than the detection limit of the method
- >0 Greater than zero

J Estimated value
N Not detected
NA Not recorded/not applicable/parameter value acceptable

> METHOD: Analysis Method Code
PD102- See ONLINE DOCUMENTATION FOR DETAILS

> SAMPLE_TYPE: Sample Collection Type
C- Composite Sample

> DATA_TYPE: Data Type
BE Benthic
FL Fluorescence
MI Microzooplankton
MZ Mesozooplankton
PD Primary Production
PH Phytoplankton
PP Picoplankton

> GMETHOD: Sampling Gear Code
07- Unspecified plankton pump

> LAYER: Layer of Water column in which Sample was Taken
AP- Above Pycnocline

>SALZONE: Salinity Zone
F - Fresh (0 TO 0.5 PPT)
O - Oligohaline (>0.5 TO 5.0 PPT)
M - Mesohaline (>5.0 TO 18.0 PPT)
P - Polyhaline (> 18.0 PPT)
*E- An F,O,M, or P followed by an E indicate an estimated salinity range based on salinity data collected within a week of the biological sampling event. Used only when no actual salinity data available.

>STATION: See section STATION NAMES AND DESCRIPTIONS

>SAMPLE_TIME: Missing times are reported as 00:00

> BASIN: Chesapeake Bay Tributary Designation
BAY - Chesapeake Bay
RAP- Rappahanock River,
YRK- York River,
JAM- James River
ELZ- Elizabeth River

> CBSEG_1998: Chesapeake Bay Program Monitoring Segment

CBSEG_1998	DESCRIPTION
CB6PH	CHESAPEAKE BAY-POLYHALINE REGION
CB7PH	CHESAPEAKE BAY-POLYHALINE REGION
CB8PH	CHESAPEAKE BAY-POLYHALINE REGION
JMSOH	JAMES RIVER-OLIGOHALINE REGION
JMSPH	JAMES RIVER-POLYHALINE REGION

CBSEG_1998	DESCRIPTION
JMSTF	JAMES RIVER-TIDAL FRESH REGION
MOBPH	MOBJACK BAY-POLYHALINE REGION
PMKTF	PAMUNKEY RIVER-TIDAL FRESH REGION
RPPMH	RAPPAHANNOCK RIVER-MESOHALINE REGION
RPPOH	RAPPAHANNOCK RIVER-OLIGOHALINE REGION
SBEMH	SOUTH BRANCH ELIZABETH RIVER-MESOHALINE REGION
YRKMH	YORK RIVER-MESOHALINE REGION

>FIPS: Federal Information Processing Codes

FIPS	STATE	COUNTY
51095	VA	JAMES CITY
51097	VA	KING AND QUEEN
51103	VA	LANCASTER
51127	VA	NEW KENT
51131	VA	NORTHAMPTON
51149	VA	PRINCE GEORGE
51159	VA	RICHMOND
51199	VA	YORK
51550	VA	CHESAPEAKE CITY
51650	VA	HAMPTON
51740	VA	PORTSMOUTH
51810	VA	VIRGINIA BEACH

>HUC8: USGS Hydrologic Unit Codes

HUC8	CATALOGING_UNIT_DESCRIPTION
02080101	LOWER CHESAPEAKE BAY
02080104	LOWER RAPPAHANNOCK
02080106	PAMUNKEY
02080107	YORK
02080206	LOWER JAMES
02080208	HAMPTON ROADS

NUMERIC VARIABLE WARNING AND ERROR BOUNDS

VARIABLE	VALID RANGE
ASMRATIO	0 - 92.2
CARBFIX	0.0-1200
CHLA	-999.99 0- 2000.0
LATITUDE	See STATION NAMES, LATITUDES, LONGITUDES, AND TOTAL DEPTHS
LONGITUDE	See STATION NAMES, LATITUDES, LONGITUDES, AND TOTAL DEPTHS
P_DEPTH	>0.5-<TDEPTH Note the composite sample cut off depth is not pycnocline depth!
R_DATE	19950501-20041231
SAMPLE_DATE	19890101-20031231
SAMPLE_NUMBER	1,2,3,4
SAMPLE_TIME	0651-1935. 00:00 – Denotes Missing Time
SAMVOL_L	10 - 20
SER_NUM	Not Available
TOTAL_DEPTH	1.8 - 33

IMPORTANT DATA REVISIONS

THE LIVING RESOURCES DATA MANAGER RECOMMENDS THAT ALL DATA ANALYSIS BE PERFORMED WITH THE MOST RECENT DATA SETS VERSIONS AVAILABLE. HOWEVER IF YOU HAVE BEEN WORKING WITH OLDER DATA SETS THE FOLLOWING ARE IMPORTANT CHANGES TO BE AWARE OF.

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.

01/11/2010- The following stations were not sampled during the period due to bad weather. August 2009 RET 5.2 and RET 4,3. There are no chlorophyll data for RET 5.2, TF 5.5, July 21, 2009 because the test tube broke in the centrifuge.

KEY WORDS (EXCLUDING VARIABLE NAMES)
Assimilation ratio
Carbon fixation
Chlorophyll
Primary production

THIS IS THE END OF THE VIRGINIA CHESAPEAKE BAY PROGRAM PRIMARY PRODUCTION DATA DICTIONARY
