MARYLAND CHESAPEAKE BAY PROGRAM PHYTOPLANKTON PRIMARY PRODUCTION DATA DICTIONARY

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

NOTES
1) THIS DICTIONARY WAS REVISED ON 11/6/2008 AND SUPERSEDES ALL OTHER CBP DICTIONARIES FOR THE MARYLAND PRIMARY PRODUCTION DATA
2) THIS PROGRAM WAS CONDUCTED BY THE ACADEMY OF NATURAL SCIENCES (ANS) FROM AUGUST, 1984 THROUGH AUGUST, 2004. MORGAN STATE UNIVERSITY (MSU) TOOK OVER THE ANS LABORATORY IN SEPTEMBER, 2004, BUT THE PROGRAM AND PERSONNEL REMAINED THE SAME.
3) THIS PROGRAM WAS SUSPENDED FROM JUNE 2005 THROUGH DECEMBER 2007

PROJECT PURPOSE
The state of Maryland, in cooperation with the US EPA Chesapeake Bay Program, has monitored phytoplankton primary production in the Maryland mainstem and tributaries since August 1984. The program is designed to give comprehensive spatial and temporal information on primary production. Sampling is performed in conjunction with the Maryland phytoplankton, fluorometry and water quality monitoring programs.

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

PROJECT TITLE
Maryland Chesapeake Bay Water Quality Monitoring Program: Primary Productivity Component

CURRENT PRINCIPAL INVESTIGATORS
>PROGRAM MANAGER: Bruce Michaels, Renee Karrh, Maryland Department of Natural Resources
>PRINCIPLE INVESTIGATORS: Richard V. Lacouture, Morgan State University Estuarine Research Center. Previous principal
>TECHNICAL STAFF: Field Collection by Morgan State University Estuarine Research Center staff. Sample analysis by R. V. Lacouture, and T. D. Wohlford. Data Files Verified by Verified by R. V. Lacouture,and T. D. Wohlford Morgan State University Estuarine Research Center.
>STATISTICIAN: Elgin S. Perry, consultant
>PROGRAMMER/ANALYST: T. D. Wohlford Morgan State University Estuarine Research Center
> DATA COORDINATOR: T. D. Wohlford, Morgan State University Estuarine Research Center
>PREVIOUS PRINCIPLE INVESTIGATORS: Kevin Sellner, Chesapeake Research Consortium

CURRENT FUNDING AGENCIES
Maryland Department of Natural Resources

PROJECT COST
$220,530 (July 1, 2008 - June 30, 2009)

QA/QC OFFICER
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LOCATION OF STUDY
Chesapeake Bay and Tidal Tributaries in State of Maryland

DATE INTERVALS
07/02/1984-06/30/2008

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 Maryland phytoplankton, fluorometry and water quality monitoring programs. Carbon fixation rates (C-14) were obtained from replicate surface layer composite samples at 16 stations in the Maryland portion of the Chesapeake Bay and its tributaries through June, 1986. After June, 1986, stations MET4.2 and MEE3.1 were no longer sampled. Prior to 1996, samples were collected 18 times over the year, with monthly samples in October through March, and biweekly samples in April through September. In January and February, the stations in the Choptank River and Baltimore Harbor were not sampled. Stations in the Potomac River, (MLE2.2, XDA1177, and XEA6596) were sampled sporadically in January and February. Beginning in January 1996, the Patuxent River was the only sampling done in January, there was no sampling done in February and November, and there was only one sampling cruise in June and September. Mainstem sampling was reinstituted in January in 1999-2002 and then discontinued again in 2003. Beginning in June 2005, productivity measures were temporarily stopped because of licensing issues with MSU and the state of Maryland. Between late July 2007 and November 2007, productivity data was not calculated because of the lack of stock solution used in the procedure. New stock solution was made for the sampling cruise in December 2007. The productivity data from 01/01/2008-06/30/2008 were based on samples which were stored for 1-6 months because of problems with the liquid scintillation counter.

STATION NAMES AND DESCRIPTIONS
CB1.1 Mouth of Susquehanna River, main Bay
CB2.2 West of Still Pond near Buoy R 34, main Bay
CB3.3C North of Bay Bridge, main Bay
CB4.3C East of Dares Beach near Buoy R 64, main Bay
CB5.2 East of Point No Point, main Bay
EE3.1 North Tangier Sound, Northwest Of Haines Point, 100 Yards North Of Buoy R-16;
ET4.2 Lower Chester River, South Of Eastern Neck Island At Buoy Fig-9
ET5.1 Downstream of confluence with Tuckahoe Creek, upper Choptank River
ET5.2 Near Route 50 bridge at Cambridge, lower Choptank River
LE1.1 Between Jack Bay sandspit and Sandgates in mid channel, Patuxent River
LE2.2 Off Ragged Point at buoy BW 51B, Potomac River
RET2.2 Off Maryland Point at Buoy 19, Potomac River
TF1.5 At Nottingham in mid channel, Patuxent River
TF1.7 East South East of Jacks Creek in mid channel, Patuxent River
TF2.3 Off Indianhead at Buoy N 54, Potomac River
WT5.1 East of Hawkins Point at Buoy 5M, Patapsco River (Baltimore Harbor)

STATION NAMES, LATITUDE (decimal degrees) , LONGITUDE (decimal degrees), TOTAL DEPTH (meters), LATITUDE(degrees, minutes and decimal seconds), AND LONGITUDE (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. The MSU investigators have measured more precise positions, which are available upon request. All station positions provided as NAD83 coordinates.

STATION	LATITUDE	LONGITUDE	T_DEPTH	LATITUDE (DMS)	LONGITUDE (DMS)
CB1.1	39.54	-76.08	6.1	39 32' 41.407"	-77 55' 7.18"
CB2.2	39.35	-76.17	12.1	39 20' 48.395"	-77 49' 31.172"
CB3.3C	39.00	-76.36	23.7	38 59' 45.403"	-77 38' 25.154"
CB4.3C	38.56	-76.43	26.1	38 33' 23.437"	-77 33' 55.176"
CB5.2	38.14	-76.23	30.1	38 8' 12.448"	-77 46' 19.206"
EE3.1	38.20	-75.97	13.7	38 12' 0.443"	-76 1' 31.237"
ET4.2	38.99	-76.22	14.6	38 59' 30.404"	-77 47' 1.172"
ET5.1	38.81	-75.91	5.3	38 48' 25.411"	-76 5' 17.229"
ET5.2	38.58	-76.06	14.3	38 34' 48.426"	-77 56' 31.217"
LE1.1	38.43	-76.60	12.0	38 25' 30.447"	-77 23' 54.15"
LE2.2	38.17	-76.58	11.0	38 10' 0.461"	-77 25' 1.153"
RET2.2	38.35	-77.20	9.5	38 21' 7.452"	-78 47' 44.077"
TF1.5	38.71	-76.70	10.3	38 42' 36.421"	-77 17' 55.125"
TF1.7	38.58	-76.68	2.3	38 34' 54.434"	-77 19' 11.134"
TF2.3	38.61	-77.17	12.7	38 36' 29.426"	-78 49' 34.073"
WT5.1	39.21	-76.52	15.7	39 12' 30.39"	-77 28' 31.134"

Station depths are based on a ten-year average of Maryland Department of the Environment water quality hydrographic data collected concurrently with the phytoplankton samples.

METHODOLOGY DESCRIBING CHAIN OF CUSTODY FOR LAB SAMPLES

A member of the Benedict Estuarine Research Laboratory plankton section collects primary production samples. At the end of the sampling cruise, the samples are transferred to the C14 laboratory staff. Production and alkalinity measurements are made within twenty-four hours of sample collection. Chlorophyll a measurements are immediately frozen until analysis is performed. All Chlorophyll samples are processed within 2 months of sample collection

BIOLOGICAL ENUMERATION TECHNIQUES

Chesapeake Bay Program Analytical Method Code- PD101

At the end of a sampling day, four 100 ml sub samples per station are decanted from the two surface-layer composite samples (15 liters each) into sample-rinsed Pyrex milk dilution bottles (or polycarbonate bottles after July, 1989), one for time-zero C-14 blank (t0), one for alkalinity determination, and one from each composite for C-14 incubation. The two incubation samples per station are placed in a constant light incubator (>250 uE per sq m per sec) receiving running water from the study area for temperature control for an acclimation period >0.5 h. Then 1-2 uCi labeled $NaHCO_3$ is added and samples are returned to the incubator for >1 h. After incubation, 15 ml is filtered through a 0.45 um Millipore membrane filter, rinsed with filtered sample water and fumed over concentrated HCl. Fifteen ml of t0 sample is similarly filtered and fumed, immediately following the addition of the radioisotope. The filters are placed in scintillation vials and stored in a freezer. Scintillation cocktail (Aquasol 8/84 - 10/94 and Cytoscint 10/94 - present) is added to the scintillation vials and the samples are run on a Packard Tri-Carb 2500TR Liquid Scintillation Analyzer equipped with internal quench standards and serviced twice a year by the Packard technician.

Field stock solutions of radiolabel NaHCO3 are obtained from mixing portions of 25 mCi C-14 NaCO3 stock solutions with pH of 10-10.2 deionized water. Final field stock activities approximate 2 uCi C-14 per ml, determined from liquid scintillation counting of field stocks in phenethylamine and Biofluor. Field stock activities for each dilution are then recorded in a laboratory log and are assigned a date interval corresponding to the period that the field stock is employed in the program. Because of problems with determinations of initial field stock activities for the time interval May 1993 - March 1994, activity of the field NaHCO3 stock was determined from the mean of six previous field NaHCO3 stocks mixed from the same 25 mCi stock solution.

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 = 12000 * (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 un-incubated (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 from 1)

*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
Visual inspection of field sheets and computer files and comparison to previous data. All analysis runs with standards and laboratory spikes as described in method references.

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 PRESERVATIVES: Refrigerate in darkness overnight or process immediately
-SAMPLE STORAGE ENVIRONMENT: Refrigerator
-TIME IN STORAGE: <24 h
-LAB TECHNIQUES WITH REFERENCES: Total alkalinity is calculated in the following manner: Initial pH is determined followed by the addition of 0.2 ml aliquot of 0.025N HCL until pH 3.8-4.2. Thereafter, pH is recorded for five cumulative additions of 0.025N HCL. Total alkalinity is derived from intercept produced from the linear regression of MLs of acid vs 10-pH.

C.H. Culberson, Pers. Comm.
Edmond, J.M. 1970. Deep Sea Res. 17:737-750
Sharp, J. H., C. H. Culberson and T. M. Church. 1982. Limnol. Oceanogr. 27:1015-1028.

>PARAMETER: CHLA (Chlorophyll a concentration in micrograms per liter)

-COLLECTION METHODS: IN VIVO fluorometric chlorophyll from composite samples or mean surface layer fluorometric chlorophyll from station. Grab samples for fluorometer calibration 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: Extract filtered samples in 90% acetone and determine absorbance at 665 nm before and after addition of 50% HCl. Perform linear regression of field IVF values and the concentrations of chlorophyll a determined for the grab samples at 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: CARBFIX (Carbon fixation rate in micrograms carbon per liter per hour)
-COLLECTION METHODS: At each station, two surface composite samples (15-l) composite samples(15-l) (5 depths above the pycnocline, five below the pycnocline) are collected using a small diaphragm pump and hose. Once collected, 500-ml subsamples from the surface layer are pooled, yielding one sample from the surface mixed layer. The samples for primary production are taken from the replicate surface composite carboys (15-l) which have been previously subsampled for the phytoplankton species composition samples. There is a period of 0.5-6 h between the time that the samples are collected and when they are processed. On the Patuxent River and mainstem Chesapeake Bay cruises, the carboys are kept in a flow-through box at ambient water temperature and light conditions. For the other stations, the carboys are kept in the shade at ambient air temperatures until being processed.
-SAMPLE PRESERVATIVES: Freezer
-SAMPLE STORAGE ENVIRONMENT: -4 C
-TIME IN STORAGE: 0.1 - 2 months
-LAB TECHNIQUES WITH REFERENCES:

APHA-AWWA-WPCF. 1981. Standard Methods, 15th Edition. Washington, D. C. 1134pp.
Sellner, K. G. 1981. Mar. Biol. 65:101-112.
Sellner, K. G., R. G. Zingmark and T. G. Miller. 1976. Bot. Mar. 19:119-125.
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 using NAD27 from July 1984 to June 1997; GPS from June 1997 to present. All position have been converted to NAD83 coordinates.
-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 +/- 1500 ft. The actual Loran/ GPS coordinates for each sampling event are not currently recorded in data set.

>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 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. The pycnocline is determined to be the depth at which the greatest conductivity change is observed. The minimum threshold change is 1000 uhhos/cm.

>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 is recorded prior to water collection. Salinity values are averaged over water column above the P_DEPTH 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 is recorded prior to water collection.

>DATA ENTRY METHOD: Key to disk
>DATA VERIFICATION: Visual comparison and parameter checking programs

SPECIES 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

VARIABLE NAMES AND DESCRIPTIONS FOR SPECIES KEY
Not Applicable for this Data Set.

REFERENCE CODES IN DATA FILES AND TAXONOMIC KEY
See 2000 Users Guide to Chesapeake Bay Program Biological and Living Resources Monitoring Data for full listings.

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

> SOURCE: Data Collecting Agency
MSU- Morgan State University, formerly the Academy of Natural Sciences, Benedict Estuarine Research Laboratory

> 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
PD101- See ONLINE DOCUMENTATION AND QUALITY ASSURANCE PLANS 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
BAL - Baltimore Harbor
CHS - Chester River
CHP - Choptank River
PAX - Patuxent River
POT - Potomac River
TAN - Tangier River

> CBSEG_1998: Chesapeake Bay Program Monitoring Segment

CB1TF	Chesapeake Bay-Tidal Fresh Region
CB2OH	Chesapeake Bay-Oligohaline Region
CB3MH	Chesapeake Bay-Mesohaline Region
CB4MH	Chesapeake Bay-Mesohaline Region
CB5MH	Chesapeake Bay-Mesohaline Region
CHOMH2	Choptank River-Mesohaline Region 2
CHOOH	Choptank River-Oligohaline Region
CHSMH	Chester River-Mesohaline Region
PATMH	Patapsco River-Mesohaline Region
PAXMH	Patuxent River-Mesohaline Region
PAXOH	Patuxent River-Oligohaline Region
PAXTF	Patuxent River-Tidal Fresh Region
POTMH	Potomac River-Mesohaline Region
POTOH	Potomac River-Oligohaline Region
POTTF	Potomac River-Tidal Fresh Region
TANMH	Tangier Sound-Mesohaline Region

>FIPS: Federal Information Processing Codes

FIPS	STATE	COUNTY
24003	MD	ANNE ARUNDEL
24005	MD	BALTIMORE

24017	MD	CHARLES
24019	MD	DORCHESTER
24025	MD	HARFORD
24029	MD	KENT
24033	MD	PRINCE GEORGES
24037	MD	SAINT MARYS
24039	MD	SOMERSET

>HUC8: USGS Hydrologic Unit Codes

HUC8	CATALOGING_UNIT_DESCRIPTION
02060001	UPPER CHESAPEAKE BAY
02060002	CHESTER-SASSAFRAS
02060003	GUNPOWDER-PATAPSCO
02060005	CHOPTANK
02060006	PATUXENT
02060007	BLACKWATER-WICOMICO
02070011	LOWER POTOMAC

NUMERIC VARIABLE WARNING AND ERROR BOUNDS

Variable	Valid Ranges
ASMRATIO	0 - 92.2 -99.9 INDICATES A MISSING VALUE.
CARBFIX	0 - 1205.7, -999.99 INDICATES A MISSING VALUE.
CHLA	0.1 - 583 -99.99 INDICATES A MISSING VALUE.
SAMPLE_DATE	19840802-20031231
MAXDEPTH	0.5 - 22.0
R_DATE	19950501-20041231
SAMPLE_NUMBER	1 - 7
LATITUDE	See STATION NAMES, LATITUDES, LONGITUDES, AND TOTAL DEPTHS
LONGITUDE	See STATION NAMES, LATITUDES, LONGITUDES, AND TOTAL DEPTHS
PDEPTH	>0.5-<TDEPTH Note this is a composite sample cut off depth not pycnocline depth!
R_DATE	19950501-20041231
SAMVOL_L	10 - 20
SER_NUM	01001-190039
TDEPTH	1.8 - 33
SAMPLE_TIME	0651-1935, 0000 INDICATES A MISSING VALUE

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.

The Following Stations have had their names changed to the standard Chesapeake Bay Program names in 1998. Alternate names in the previous versions of the Living Resources Data Sets are as follows:

LRNAME	CBP NAME
XDE5339	LE1.1
XED4892	TF1.7
PXT0402	TF1.5
XEA6596	TF2.3
XDA1177	RET2.2
MLE2.2	LE2.2
MET5.1	ET5.1
MET5.2	ET5.2

MWT5.1 WT5.1

5/31/95- CRUISE NUMBERS - BAY004 - BAY211 were supplied by the Chesapeake Bay Program office and modified by Amy Imirie and Elgin Perry to reflect true start and end dates with corresponding MSUP trip numbers. This prevents the occurrence of two sampling events for one station during a Bay Cruise period.

5/31/95- G_METHOD was changed to 7- refers to the methods Table 17, 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

5/31/95- SAMPLE_NUMBER - NOTE: 5,6,7 WERE PREVIOUSLY REPORTED AS T,B,W CHANGE IN designation was NECESSARY BECAUSE REP_NUM IS A NUMERIC FIELD
5 - combined 1 & 3 (top sample)
6 - combined 2 & 4 (bottom sample)
7 - whole water column

5/31/95 CARBFIX - For the period 1991-1993, the chlorophyll data in the vertical profiles from the tributaries (Potomac, Choptank, and Patapsco) was miscalculated as we subtracted the blank of the dissolved fraction twice from each sample. This mistake was realized and those data have been corrected as of the 4/15/95 data submittal. The implication of this mistake was also reflected in the productivity data set since assimilation ratios are calculated as part of this program. Discontinue use of all data with an R_Date prior to 05/31/95.

SUMMER 1997 - ICPRB Staff calculated Salinity zones from water quality data provided by the Maryland Department of the Environment. Values were derived from Water Quality Hydrographic data collected concurrently with the plankton when ever possible. 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.

01/01/98 - 1997 Primary Production monitoring data is being released without salinity zones. Salinity zones will be filled in when the corresponding Water Quality monitoring data becomes available.

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

09/01/2004- This program was conducted by the Academy of Natural Sciences (ANS) from August 1984 through August 2004. Morgan State University (MSU) took over the MSU laboratory in September, 2004, but the program and personnel remained the same. All data previously codes with the data source as ANS was updated to MSU.

06/10/2005- In June 2005, productivity measures were temporarily stopped because of isotope licensing issues with MSU and the state of Maryland.

12/13/2006- MSU regains isotope licensing and resumes productivity measurements.

07/30/2007-Between late July, 2007 and November, 2007, productivity data was not analyzed due to equipment issues.

11/06/2008-The productivity data from 01/01/2008-06/30/2008 were based on samples which were stored for 1-6 months because of problems with the liquid scintillation counter.

11/06/2008- Primary production measurement were not made at stations the following stations:
CB1.1 and LE2.2 in March 2008, LE1.1, TF1.7, TF1.5 in April 2008 and WT5.1 in May 2008

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

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