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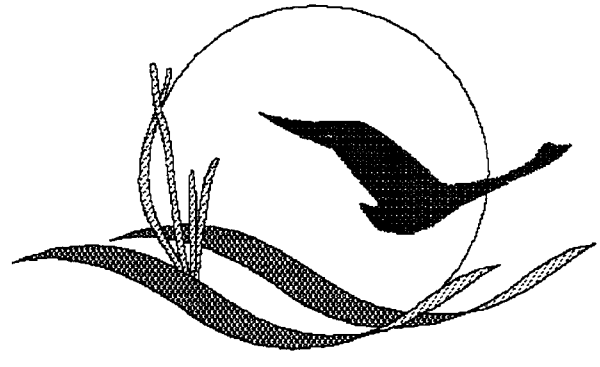
The 1996 Users Guide to Chesapeake Bay Program Biological and Living Resources Monitoring Data



Chesapeake Bay Program

September 1996

Chesapeake Bay Program

The Chesapeake Bay Program is a unique regional partnership leading and directing restoration of Chesapeake Bay since 1983. The Chesapeake Bay Program partners include the states of Maryland, Pennsylvania, and Virginia; the District of Columbia; the Chesapeake Bay Commission, a tri-state legislative body; the U. S. Environmental Protection Agency, which represents the federal government; and participating citizen advisory groups.

In the 1987 Chesapeake Bay Agreement, Chesapeake Bay Program partners set a goal to reduce the nutrients nitrogen and phosphorus entering the Bay by 40% by the year 2000. In the 1992 Amendments to the Chesapeake Bay Agreement, partners agreed to maintain the 40% goal beyond the year 2000 and to attack nutrients at their source - upstream in the tributaries. The Executive Council guided the restoration effort in 1993 with five directives addressing key areas of the restoration, including the tributaries, toxics, underwater grasses, fish passages, and agricultural nonpoint source pollution. In 1994, partners outlined initiatives for habitat restoration in the Bay's tributaries; and toxics reductions, with an emphasis on pollution prevention.

Since its inception, the Chesapeake Bay Program's highest priority has been the restoration of the Bay's living resources - its finfish, shellfish, bay grasses, and other aquatic life and wildlife. Improvements include fisheries and habitat restoration, recovery of bay grasses, nutrient reductions, and significant advances in estuarine science.

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4. http://cave.epa.gov/cgi/nph-bwcgis/BASIS/ncat/pub/ncat/SBC
5. http://www.epa.gov/natlibra/olshelp.htm

The 1996 Users Guide to Chesapeake Bay Program Biological and Living Resources Monitoring Data

September 1996

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by

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SUMMARY

This document describes how to access biological monitoring data at the Chesapeake Bay Program (CBP) Data Center in Annapolis, Maryland. It provides information on:

- *currently* available and soon-to-be-released CBP databases;
- how to obtain biological and living resources monitoring data online from the CBP's CHESIE computer, online from the CBP Internet Home Page, online from other Home Pages, or directly from the Biological Monitoring Data Manager;
- the semi-relational database structure used for biological and living resources monitoring data, including field names and attributes; and
- data dictionary tables.

☞ WATCH FOR DOCUMENT UPDATES AS NEW DATA SETS BECOME AVAILABLE

Currently Available Databases

Phytoplankton, Zooplankton and Benthos

Much of the phytoplankton, zooplankton (includes microzooplankton, mesozooplankton, jellyfish and ctenophores) and benthos monitoring data and data documentation for Maryland and Virginia from 1984 to 1995 can now be obtained directly from CHESIE by individuals with user accounts or from the Biological Monitoring Data Manager. Historical plankton and benthic data sets and the District of Columbia plankton monitoring data are currently being placed on CHESIE. All data are in standardized, semi-relational databases and are compatible with the CBP water quality databases (BayStats). They are a) available as comma delimited, ASCII flat files; b) available from the Data Manager as dBASE (*.DBF) files; and c) can be converted to SAS data sets from the ASCII flat files with conversion scripts available on-line or from the Data Manager.

Benthos data sets for 1984 through 1995 are available in comma delimited, ASCII flat files on the Internet at the Chesapeake Bay Program Home Page. Other data are being added.

Submerged Aquatic Vegetation (SAV)

Data and documentation for the annual Chesapeake Bay Submerged Aquatic Vegetation Aerial Survey are generated and managed by the Virginia Institute of Marine Sciences (VIMS). Data is maintained as Geographic Information System (GIS) Data Layers and are available from the VIMS Internet Home Page. Pointers on the CBP Home Page direct users to the VIMS Home Page for the SAV data.

Data and documentation for the Maryland Department of Natural Resources Trends in Distribution and Abundance of Submerged Aquatic Vegetation can now be obtained directly from CHESIE by individuals with user accounts or from the Biological Monitoring Data Manager. The data are currently being made available "as is" in the original SAS data files.

Soon-To-Be-Released Databases

Mammals, Turtles, and Birds

The Maryland Marine Mammal and Sea Turtle Strandings data and the Annual Chesapeake Bay Midwinter Waterfowl Survey are expected to be available on CHESIE by the Fall of 1996. State distribution rights/costs issues need to be resolved for other aquatic bird surveys before they can be made available on CHESIE.

Finfish and Blue Crabs

The Biological Monitoring Data Manager is working with staff of the Maryland Department of Natural Resources, the Virginia Institute of Marine Sciences and the NOAA Chesapeake Bay Office this year to obtain, reformat and document as needed, and make available a) the Maryland and Virginia juvenile seine surveys and trawl surveys, and b) the Blue Crab Winter Dredge Survey data.

Summary statistics for the Virginia juvenile seine survey are presently available through the VIMS Internet Home Page. Pointers on the CBP Home Page direct users to the VIMS Home Page for these data.

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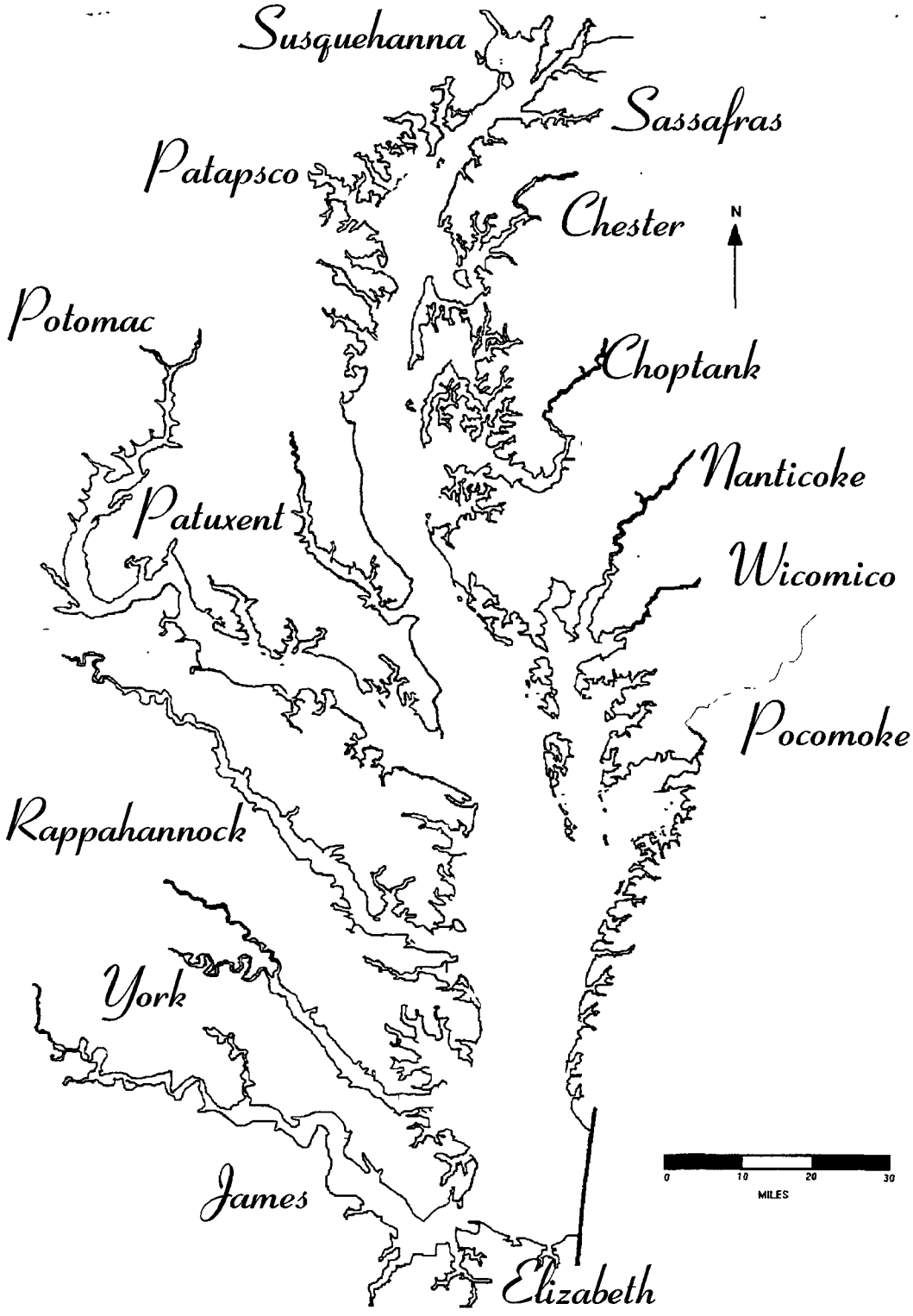

THE 1996 USERS GUIDE TO CHESAPEAKE BAY PROGRAM BIOLOGICAL AND LIVING RESOURCES MONITORING DATA

INTRODUCTION

The 1996 Users Guide is intended to aid the Bay community in effectively accessing and using biological monitoring data collected in Chesapeake Bay and its tidal tributaries. The 1996 Guide describes all biological and living resources databases currently available in standardized, Chesapeake Bay Program structures and formats ("CBP databases"). It describes where the data reside and how to obtain them. Future versions will include guidance for obtaining indicators and summary statistics derived from the monitoring data.

Chesapeake Bay Program Data Center

The Chesapeake Bay Program (CBP) presently maintains a Data Center at its office in Annapolis, Maryland. The purpose of the Data Center is to provide data management and technical support to program participants in order to accomplish the goals agreed on by the Chesapeake Executive Council. The Data Center manages the computer hardware and software of the office, provides user support for these computer resources, acquires and stores data sets, and provides data analysis support for Bay Program activities. Recipients of Data Center services are the CBP subcommittees, Bay Program managers, and the watershed's scientific community and stakeholders.

The current CBP information management system is centrally located on a variety of controlled platforms at the Chesapeake Bay Program Office. The majority of data used by the CBP are distributed across these platforms, although a few geographically distributed platforms and data sets are included. The primary information and data analysis system is a-DEC Alpha 3800 Computer running an Open-VMS operating system. This system is referred to as CHESIE. Other high level computing needs are meet with a variety of SUN, Data General, and Alpha PC workstations running UNIX operating systems. Normal computer needs are met with the multiple networked IBM and Macintosh personal computers on site.

A menu-driven software package entitled CHESSEE is currently on the CHESIE computer. It is an information retrieval program designed to give users data documentation files about selected water quality and toxic pollutant monitoring data available from the Data Center. A relational database engine will be chosen in 1996 and configured to allow all monitoring databases at the Data Center to be related and accessed.

Types of Data

Five different kinds of data are collected, used or generated by the Chesapeake Bay Program and its participants. These types of data are described in the 1996 USEPA Chesapeake Bay Program document "Chesapeake Bay Program Information Management Requirements and Recommendations, version 1.0" (Contract Number 01-08833-07-3872-005).

- Raw Data - Original field sampling and laboratory results
- Primary Data - Information submitted and exchanged "as is" by data providers
- Chesapeake Bay Program Data - Information reviewed (e.g. QA/QC) and processed to Chesapeake Bay Program standards and specifications
- Analyzed Data - Summary results from data analysis
- Indicators Data - Highly summarized data designed to tell a story about the health of the Bay

"Raw data" are collected and managed offsite by the data originators - typically a monitoring program - and are not available from the Data Center. "Primary data" are the data sets delivered to the CBP Data Center by the data originators. Many are currently available from the Data Center "as is" with their existing documentation. A long-term goal of the CBP is to work with the data originators to produce primary data sets that meet or come close to CBP standards and specifications, and to deemphasize use of primary data in favor of "Chesapeake Bay Program data."

"Chesapeake Bay Program data" are in databases directly compatible with other CBP databases such as the existing water quality monitoring data available in CBP BAYSTATS and the CBP Toxics Database. Biological and living resources point data become CBP data after they are placed in uniform, semi-relational database structures, with indexing fields or information. The data are rigorously checked for duplicate fields, outliers, erroneous data, and other errors, and problems in the data are resolved with the data providers. Biological and living resources point data in CBP database structures are presently stored as comma delimited, ASCII flat files on CHESIE. They will eventually be directly accessible through the CBP Internet Home Page as well.

An effort is presently underway to create and make available databases of derived information consisting of analyzed data and biological indicators. The information is calculated from biological and living resources CBP databases using accepted algorithms or GIS (Geographical Information System) methods. These forms of the data are expected to be most useful to CBP participants and resource managers.

Distributed Databases

The Chesapeake Bay Program is developing a system of distributed databases as a result of the rapid expansion of the Internet and the advancement of data management practices. In the system envisioned, a CBP database would be created and managed by the data originator, reside with the data originator, and made directly available from the data originator's institution on an Internet server. This system has several advantages over a single data repository. Primarily, the people with the most expertise and knowledge about the data - the data originators - are

managing the data. Additional advantages include reduced costs due to elimination of intermediate data handling at a central repository, and decreased time between collection and release of the data.

CURRENTLY AVAILABLE CBP DATA FILES

Point Data

Most of the 1984 - 1994 phytoplankton, zooplankton and benthos monitoring data for the Maryland and Virginia CBP monitoring programs are currently on CHESIE as CBP databases. Data for 1995 are available as CBP databases from the Biological Monitoring Data Manager. The benthos and Primary Production CBP databases can also be found on the CBP Internet Home Page and the other plankton databases are scheduled to be placed on the web shortly. Plankton and benthos data sets are currently submitted by the monitoring program Principal Investigators in structures very close to the CBP standardized, semi-relational database structure. The Biological Monitoring Data Manager at the Data Center (see "CBP Data Center Contacts" below) rigorously QA/QC's the data, finishes carrying them into the CBP database structure, and updates the data document provided. The data are in comma delimited, ASCII flat files in single calendar year blocks. Files in dBASE (*.DBF) are available on request and scripts to convert the ASCII files into SAS files will be on-line soon.

Selected historical benthos files in CBP database structures and submerged aquatic vegetation (SAV) files in their original SAS files are available on CHESIE. The benthos data files were assembled Dr. Robert Diaz and staff at the Virginia Institute of Marine Sciences. The Maryland SAV ground survey data were provided to the Bay Program several years ago by the Maryland Department of Natural Resources.

Data in the directory LRDATA:[LR.PUBLIC] include:

- Phytoplankton taxonomic counts
- Primary productivity (C^{14})
- Vertical and horizontal *insitu* fluorescence
- Microzooplankton taxonomic counts
- Mesozooplankton taxonomic counts
- Mesozooplankton measured and estimated biomass
- Gelatinous zooplankton measured biovolume
- Benthos taxonomic counts
- Benthos measured biomass
- Sediment data (collected simultaneously with benthos samples)
- Bottom water quality data (collected simultaneously with benthos samples)
- Submerged aquatic vegetation biomass as measured by volume displacement, % crown cover, species idenfications and coverages, and ancillary water quality data

Files associated with these data files in the relational database system are:

- Various event files (contain information on station name, latitude, longitude, and depth; sample volume; sample time; salinity zone; pycnocline depth; tide stage, etc.)
- Chesapeake Bay species codes file (NODC code, Taxonomic Serial Number, and individual agency codes)

Database structures (i.e. field names, definitions and attributes) for the currently available CBP standardized data files are provided in Appendix A and online with the data files. A list of possible CBP field names for biological and living resources data, and their definitions and units, are provided in Appendix B. Appendix C contains definitions of the parameter codes used in the databases.

Phytoplankton Abundance

Maryland Phytoplankton Taxonomic Count Files (and Related Event Files). Data have been collected at fixed sampling stations in the upper Chesapeake Bay, Maryland tributaries and the Potomac River since July 1984. Sampling was coordinated with the CBP water quality surveys. The data through December of 1995 are available on CHESIE. Count files are for single calendar years and include taxonomic identifications of species. Data were collected by the Academy of Natural Sciences Benedict Estuarine Research Center through the Maryland Department of the Environment/Maryland Department of Natural Resources.

Virginia Phytoplankton Taxonomic Count Files (and Related Event Files). Data for the lower Chesapeake Bay and the Virginia tributaries have been collected at fixed sampling stations since July 1985 (Chesapeake Bay mainstem), July 1986 (tributaries), and January 1989 (Elizabeth River). Sampling was coordinated with the CBP water quality surveys. Data through 1995 is available on CHESIE. Count files are for single calendar years and include taxonomic identifications of species and conversion factors for biomass estimation. Data were collected by Old Dominion University through the Virginia Department of Environmental Quality.

Primary Productivity

Maryland Carbon-14 Primary Production Files (and Related Event Files). Data have been collected at fixed sampling stations in the upper Chesapeake Bay, Maryland tributaries and the Potomac River since July 1984. Sampling was coordinated with the CBP water quality surveys. The data through December of 1995 are available on CHESIE and the CBPO Home Page. Data files are for single calendar years and includes precision measurements of primary photosynthetic production. Data were collected by the Academy of Natural Sciences Benedict Estuarine Research Center through Maryland Department of the Environment / Maryland Department of Natural Resources.

Virginia Carbon-14 Primary Production Files (and Related Event Files). Data were collected at fixed sampling stations in the Chesapeake Bay mainstem since January 1989 in Virginia tributaries since July 1996, and in the Elizabeth River since January 1989. Sampling was coordinated with the CBP water quality surveys. Data through December 1995 are available on CHESIE and the CBP Home Page. Data files are for single calendar years and include precision measurements of primary photosynthetic production. Data prior to 1995 lacks concurrent measurement of chlorophyll *a* for determination of assimilation ratio (production efficiency). Data were collected by Old Dominion University through the Virginia Department of Environmental Quality.

Fluorescence (*Note: These data sets are the only exception to the relational data structure format. Each file contains both instrument readings and event information for single calendar years.*)

Maryland Vertical Fluorescence Profiles. Surface to bottom fluorescence measurements have been made at fixed sampling stations in the upper Chesapeake Bay, Maryland tributaries and the Potomac River since July 1984. Sampling was coordinated with the CBP water quality surveys. The data through December of 1995 are available on CHESIE. Files contain calculated values of chlorophyll *a*. Data were collected by the Academy of Natural Sciences Benedict Estuarine Research Center through Maryland Department of the Environment / Maryland Department of Natural Resources.

Virginia Vertical Fluorescence Profiles. Surface to bottom *insitu* fluorescence measurements were conducted at fixed sampling stations in the lower Chesapeake Bay and some Virginia tributaries since 1990. Sampling was coordinated with the CBP water quality surveys. Data for the tributaries were collected by Old Dominion University through Virginia Department of Environmental Quality and have not been completely delivered to the CBP Data Center. Data for the bay mainstem prior to January 1995 was collected by the Virginia Institute for Marine Science and will be available shortly from the Data Center pending processing.

Maryland Horizontal Fluorescence Transects. Insitu fluorescence measurements were taken along surface transects between monitoring stations in the upper Chesapeake Bay and some Maryland tributaries since 1984, and between monitoring stations in the Potomac River since 1989. Sampling was coordinated with the CBP water quality surveys. Data through December 1995 are available on CHESIE. Data files contain calculated values of chlorophyll *a*. *Note: Sampling sites along all transects except those in the Potomac were extrapolated from the time-of-travel and the known distance between stations. Potomac transect sites were measured with a Loran receiver. See Data Documentation for details.* Data were collected by the Academy of Natural Sciences Benedict Estuarine Research Center through the Maryland Department of the Environment/Maryland Department of Natural Resources.

Virginia Horizontal Fluorescence Transects. Insitu fluorescence measurements were taken along surface transects between monitoring stations in the lower Chesapeake Bay and some Virginia tributaries since 1990. Sampling was coordinated with the CBP water quality monitoring surveys. Data for the tributaries were collected by Old Dominion University through Virginia Department of Environmental Quality and have not been completely delivered to the CBP Data Center. Data for the bay mainstem prior to January 1995 were collected by the Virginia Institute for Marine Science and will be available shortly from the Data Center pending processing. *Note: In some cases sampling site postions were not determined with G.P.S. or Loran receivers and latitude/longitude values in the files will be extrapolated from the time-of-travel and the known distance between stations. See data documentation files for details.*

Microzooplankton

Maryland Microzooplankton Count Files (and Related Event Files). Data have been collected at fixed sampling stations in the upper Chesapeake Bay, Maryland tributaries and the Potomac River

since July 1984. Sampling was coordinated with the CBP water quality surveys. Data through December 1995 are available on CHESIE. Count files are for single calendar years and include taxonomic identifications of species. Data were collected by the Academy of Natural Sciences Benedict Estuarine Research Center through the Maryland Department of the Environment/Maryland Department of Natural Resources.

Virginia Microzooplankton Count Files (and Related Event Files). Data were collected at fixed sampling stations in the lower Chesapeake Bay and the Virginia tributaries, including Elizabeth River since July 1993. Sampling was coordinated with the CBP water quality surveys. Data through December 1995 are available on CHESIE. Count files are for single calendar years and include identifications of general taxonomic groups. Data were collected by Old Dominion University through the Virginia Department of Environmental Quality.

Mesozooplankton and Gelatinous Zooplankton

Maryland Zooplankton Count, Biomass and Biovolume Files (and Related Event Files). Data have been collected at fixed sampling stations in the upper Chesapeake Bay, Maryland tributaries and the Potomac River since July 1984. Sampling was coordinated with the CBP water quality surveys. Data through December of 1995 are available on CHESIE. Count files are for single calendar years and include taxonomic identifications of mesozooplankton (>202μ) species, actual or estimated measurements of mesozooplankton biomass, and measurements of gelatinous zooplankton biovolumes. Data were collected by Versar, Incorporated, through the Maryland Department of the Environment/Maryland Department of Natural Resources.

Virginia Zooplankton Count and Biovolume Files (and Related Event Files). Data were collected at fixed sampling stations in the lower mainstem since July 1985, at tributary stations since July 1986, and in the Elizabeth River since January 1989. Sampling was coordinated with the CBP water quality surveys. Mesozooplankton (>202μ) count files are for single calendar years and include taxonomic identifications of species. Biovolume data was collected sporadically from 1985-1995 and is available in a single file. Data files are currently being resubmitted to the Data Center, please contact the Biological Data Manager for details. Data were collected by Old Dominion University through the Virginia Department of Environmental Quality.

Benthos

Maryland Benthic Count, Biomass, and Sediment and Bottom Water Analyses Files (and Related Event Files). Data have been collected at fixed sampling stations in the upper Chesapeake Bay, Maryland tributaries and the Potomac River since July 1984. Sampling was not coordinated with the CBP water quality surveys. Data through December of 1995 are available on CHESIE and the CBPO Home page. Files include detailed taxonomic identifications and counts of species, determination of sample biomass, sediment analysis and hydrographic profiles. The protocol for selection of sampling stations, collection gear and methods of biomass analysis has changed over the ten years of the monitoring program. Please see the Data Documentation for details. Data were collected by Versar, Incorporated, through the Maryland Department of the Environment/Maryland Department of Natural Resources.

Virginia Benthic Count, Biomass, and Sediment and Bottom Water Analyses Files (and Related Event Files). Data were collected at fixed sampling stations in the lower Chesapeake Bay and its Virginia tributaries since July 1985 and in the Elizabeth River monitoring data since January 1989. Sampling is done quarterly and separately from the regular CBP water quality surveys. Locations of the sampling stations deviate slightly from those in CBP water quality and plankton monitoring program. The files include taxonomic identifications and counts of species, biomass determinations, sediment analysis and hydrographic profiles. Data through December of 1995 are available on CHESIE and the CBPO Home Page. Data were collected by Old Dominion University through the Virginia Department of Environmental Quality.

Historic Benthic Count, Sediment and Bottom Water Analyses Files (and Related Event File). Data were collected at fixed sampling stations in Chesapeake Bay and some of its tributaries prior to 1984. These data complement and enhance the ongoing CBP benthic monitoring programs which began in 1984. In all cases, the raw data from these studies are kept by the authors. Dr. Robert Diaz, Virginia Institute of Marine Sciences, reformatted the following data sets to the CBP database structure:

✦ Piney Point, Potomac River	1975	Virnstein & Boesch, 1975
✦ Possum Point, Potomac River	1977-78	Ecological Analysts, 1979
✦ Tangier Island, Chesapeake Bay	1975	Orth & Boesch, 1975
✦ Amoco Refinery, Lower York River	1977	Hinde, 1981
✦ Thimble Shoals, Chesapeake Bay	1981	Hobbs et al., 1985
✦ Warwick River, James River	1975-76	Diaz & Boesch, 1976
✦ Hampton Roads to Richmond, James River	1981	Schaffner et al., 1987

The studies were combined into single files for taxon counts, sediment water analysis, bottom water analysis and event information because of their small size. These related data sets are available on CHESIE.

Submerged Aquatic Vegetation

Maryland Department of Natural Resources Trends in Distribution and Abundance of Submerged Aquatic Vegetation. Ground surveys of SAV were conducted periodically between 1971 and 1983 in the Chesapeake Bay mainstem between Susquehanna Flats and Smith Island. Additionally, regular surveys of SAV were conducted in the Potomac River between 1984 and 1986. Survey information includes SAV biomass as measured by volume displacement, percent crown cover, species identifications and coverages, depth, salinity, surface temperature, and secchi depth. The data have not been converted to a CBP database structure and are available on CHESIE as the original SAS files.

GIS (Geographical Information System) Data

Several types of biological, living resources and habitat coverages are available by contacting the Living Resources GIS Specialists (see "CBP Data Center Contacts"). The

coverages are listed below. They are available as uncompressed Arc Info export files. Detailed information about the coverages can be provided by the Living Resources GIS Specialists.

Oysters

- Virginia's Public Oyster Grounds and Privately Leased Oyster Grounds
- Virginia's Oyster and Aquatic Reef Restoration Sites
- Maryland's Legal Oyster Bed Boundaries
- Maryland's Aquatic Reef Restoration Sites
- Yates Survey for Maryland

Fish, Fisheries and Fish Passage

- Recreational fishing areas in Maryland
- Commercial fishing areas in Maryland
- Miscellaneous low resolution stream reach files
- Pennsylvania Phase I & II migratory fish passage blockages

Submerged Aquatic Vegetation

- Historical surveys for 1971, 1974, 1978, 1979, 1980, 1981, 1985, 1986, 1989, 1990, 1991, 1992, 1993 and 1994 (coverages are not bay-wide until 1978)
- Tier I coverage (all areas historically supporting SAV from 1971 - 1990)
- Tier III (old "hand drawn" coverage that will be updated with new bathymetry layer)
- SAV bed perimeter, area and density

Habitat

- Pennsylvania stream habitat survey data for selected streams in the lower Susquehanna watershed

LIVING RESOURCES AND BIOLOGICAL MONITORING DATABASES AVAILABLE FROM OTHER SOURCES

The Chesapeake Bay Program partners are working together to developing a system of distributed databases to better utilize the rapid expansion of the Internet and the advancement of data management practices. In the envisioned distributed database system, data will be collected, managed and maintained by the data originator. The data access is provided via the data originator's Internet server. One distributed database presently exists for CBP data: the Bay Program funded Submerged Aquatic Vegetation Aerial Survey. Other distributed databases are in various stages of development by CBP participants, including the completed database of summary statistics and indices for the Virginia Fish Trawl Surveys.

Chesapeake Bay Submerged Aquatic Vegetation Aerial Surveys (ArcInfo Coverages)

The Chesapeake Bay Submerged Aquatic Vegetation (SAV) data are mapped from 1:24,000 aerial photography for 1971, 1974, and 1980; 1984 (Virginia only); 1979 (Maryland only); 1978, 1984 through 1987, and 1989 through 1995. Each area of SAV was traced onto 1:24,000 USGS quadrangles and classified into one of four density classes by the percentage of cover. The SAV beds were then digitized into an Arc/Info GIS coverage using the quality control procedures documented in the individual metadata files. Data were collected by the Virginia Institute of Marine Sciences. The SAV data files are in uncompressed Arc/Info (ESRI, Redlands, CA) export format. They have been compressed using PKZIP compression to form .zip files for use on IBM-compatible personal computers and also compressed using UNIX standard compression to form .tar.Z files for use on UNIX platforms. Each file contains both the .e00 Arc/Info export file and also a .txt metadata file. Please consult the metadata file to determine if a particular data set will satisfy your needs. The Internet address for the Virginia Institute of Marine Sciences SAV Home page is:

http://www.vims.edu/bio/sav/index.html

Virginia Fish Trawl Surveys (Summary Statistics and Juvenile Indices)

The Virginia Institute of Marine Science (VIMS) has conducted a trawl survey annually since 1955. The primary objective of the survey is to monitor trends in abundance of juvenile fish of about twenty recreationally, commercially, and ecologically important finfish and invertebrates. Currently, the survey samples waters from the mouth of the Chesapeake Bay north to the freshwater interfaces of the James, York, and Rappahannock Rivers. Samples from about 60 stations are collected every month. At each station, a 30 foot wide shrimp trawl is towed for five minutes. The Internet address for the Virginia Institute of Marine Sciences Fisheries Home page is:

http://www.vims.edu/fish/trawlsurvey/index.html

☞ The CBP Data Center is interested in listing and describing Chesapeake Bay living resources and biological monitoring data sets which are presently available on the Internet. If you know of data sets of this nature, please contact the Biological Monitoring Data Manager at the CBP Data Center (see "CBP Data Center Contacts").

DATA FILES AVAILABLE SOON FROM THE CBP DATA CENTER

Point Data

Additional plankton and benthic data sets are currently being restructured, reformatted, QA/QC'ed and documented, and will become available on CHESIE as they are completed. These data sets are close to being final because of earlier work of prior computer support contractors and the Interstate Commission on the Potomac River Basin (ICPRB).

- Taylor Phytoplankton Data
- District of Columbia Plankton Monitoring Data (1983 - 1992)

The Cooperative Oxford Laboratory (Maryland Department of Natural Resources/National Oceanographic & Atmospheric Administration) has forwarded the following data to the CBP Data Center to be computerized, augmented with National Marine Fisheries Service data, and made available:

- Maryland Marine Mammal and Sea Turtle Strandings Data

The Biological Monitoring Data Manager is working with staff of the Maryland Department of Natural Resources, the Virginia Institute of Marine Sciences and the NOAA Chesapeake Bay Office this year to obtain, reformat and document as needed, and make the following data available on CHESIE and possible the Internet:

- Juvenile Finfish Summer Seine Surveys
- Finfish Summer Trawl Surveys
- Blue Crab Winter Dredge Survey

GIS Data

The CBP Biological Monitoring Data Manager is working with the U. S. Fish & Wildlife Service to make several aquatic bird survey databases and GIS coverages more readily available from the CBP Data Center or from the US Fish and Wildlife Service. State distribution rights/costs issues need to be resolved for some of these surveys. However one survey is available:

- Annual Chesapeake Bay Midwinter Waterfowl Survey

The Living Resources GIS Specialists will also be finishing or receiving the following coverages soon and making them available from the CBP Data Center:

Boundary Layers

- Maryland Tributary Strategy Boundaries
- Virginia Tributary Strategy Boundaries

Habitat

- Bay bottom survey (Oxford Lab)

Fish, Fisheries and Fish Passage

- Virginia impediment database
- Maryland blockage database
- Pennsylvania Phase III blockage data
- New York dams database
- EPA RF3 streams by 8-digit Huc @ 1:100,000
- Basin-wide hydrography @ 1:24,000 (PA,MD) and 1:100,000 (remainder)

Submerged Aquatic Vegetation

- 1995 SAV aerial survey

Oysters

- Maryland Oyster Reef Restoration Sites (MDDNR)

Priority Data Sets

The Living Resources/Monitoring Workgroup (jointly held by the Living Resources and Monitoring Subcommittees) has prioritized the *categories* of biological monitoring data that they believed are critically important to CBP activities (see Appendix E). The Workgroup recommended that key data sets in these categories be made available from the CBP Data Center, preferably as CBP databases. The Biological Monitoring Data Manager and the Living Resources GIS Specialists are using this prioritized list of data categories as a guide for obtaining and assembling data.

DATA DIRECTORIES

CHESIE

The living resources data directory on CHESIE is LRDATA:[LR.PUBLIC]. The CHESIE computer system consists of a DEC Alpha 3800 computer with an Open-VMS operating system. Point data and data documentation are directly accessible as ASCII flat files to all individuals with user accounts on CHESIE. Subdirectories presently in LRDISK:[LR.PUBLIC] contain the CBP plankton and benthos monitoring data (Figure 1). Other types of point data will be placed in additional, appropriately named subdirectories of LRDISK:[LR.PUBLIC] when they become available from the Data Center. Data from ongoing programs will remain in separate subdirectories and historical data will be placed in a single subdirectory.

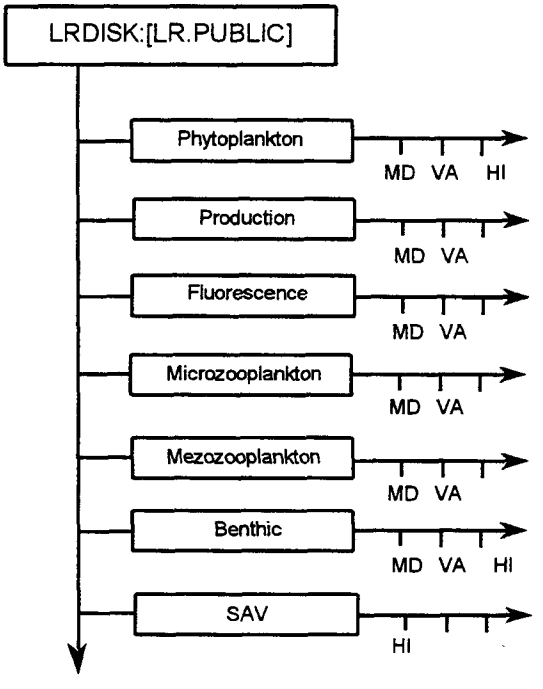

Figure 1. Diagram of present LRDISK:[LR.PUBLIC] directory structure for point data. MD = Maryland; VA = Virginia; HI = historical. Arrows indicate future directories.

Biological and living resources GIS (Geographical Information System) coverages will not be stored on CHESIE. They will be accessible from a GIS directory on the CBP Internet Home Page and "hot linked" to biological and living resources point data residing on the Home Page.

CBP Internet Home Page

The CBP effort to establish and populate an Internet Home Page is in its early stages. A series of menus leading to a directory of CBP biological databases has been created at this time. However, only the Maryland and Virginia benthos and C^{14} productivity data and an order form for other biological data currently reside there. The data are provided in the same format as on CHESIE: comma delimited, ASCII flat files. Other CBP databases and data management "tools" (e.g. QA/QC programs, documentation, conversion tables, algorithms to calculate indicators) are being added to the Home Page server in installments. "Hot links" to Chesapeake Bay data on other Internet servers will be formed as the developing CBP distributed database is implemented. A user will eventually be able to download databases, summary statistics and indicators, data documentation, and key data management documents and data inventories from several servers via the CBP Home Page: The CBP Internet Home Page address is:

http://www.epa.gov/r3chespk/

The Home Page clearly requests that data users acknowledge the original monitoring programs as the data originators in future publications which reference or use the databases.

RELATIONAL DATABASES FOR POINT DATA FILES

Relational database systems

The Chesapeake Bay Program has experimented in the development of a relational database for point data collected in monitoring programs which it fully/partially sponsors or matches. This specifically includes the CBP plankton and benthos monitoring data. However, the Bay Program is still searching for a database engine and applications which meet the diverse needs of the Program. In lieu of a functioning relational database system at the Data Center, the plankton and benthos data were placed in a semi-relational database structure which consists of sets of related computer files.[1] For example, benthos monitoring information is distributed in files of species count data, simultaneously collected water quality, sediment data, and a related event file which includes repetitive ancillary information. In addition, there is a supporting file containing species Latin names and the various species coding schemes used in the bay area. The files can be linked, or related, on several common fields, eliminating the need to include repetitive sample information. This arrangement of the data saves electronic storage space and electronic transfer time for files, and aids in QA/QC'ing the data. Related files can be quickly merged to create a single, complete data record when necessary.

☞ **Please read the section below entitled "Merging and Working with Relational Data Files." Incorrectly merged data files may result in problematic databases and erroneous results.**

Field names and attributes defined in the CBP Data Management Plan (USEPA, March 1993) and the CBP Living Resources Data Management Plan, Revision 1 (USEPA, August 1989) were used in constructing the plankton and benthos semi-relational database system. This feature of the databases allows them to be joined and compared with ease to independent water quality and toxic contaminant data sets containing common fields.

Data Format

Data in the LRDISK:[LR.PUBLIC] are stored as comma delimited, ASCII flat files. ASCII files can be readily uploaded to a relational database system at a future time.

File naming protocol

A standard method for naming the CHESIE living resources data sets and data documentation has been established. The protocol is described in Table 1.

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[1] Technically, the files are in a semi-relational database structure since a true RDBS contains files linked by only one common field and these are linked by two to seven common fields. Multiple common fields make the files easier to use in the absence of a relational database application.

Table 1. File naming protocol for living resources monitoring data sets.

All CBP biological database or documentation files are named using the following convention:

SSDDTTYY.TXT
HISSDDTT.TXT
SSDDDOC.TXT

Where
SS = State Providing Data
HI = Historic Data Set
DD = Data Type
TT = Data File Type
YY = Collection Year of Data in File
DOC = Data Documentation Text

The extension .TXT refers to the file type which is comma delimited ASCII.

State Provider Abbreviations
VA = Virginia
MD = Maryland
PA = Pennsylvania
DC = District of Columbia
NY = New York
WV = West Virginia

Data Type Abbreviations
PH = Phytoplankton
MZ = Mesozooplankton
MI = Microzooplankton
PD = Primary Production
FL = Fluorescence
BE = Benthic

Data File Type Abbreviations

DOC	= Data Dictionary	SD	= Sediment data
TX	= Taxonomic	CF	= Carbon 14 Fixation Rates
EV	= Sampling Event	LD	= Light/Dark Bottle
BM	= Biomass	VF	= Vertical Fluorescence
BV	= Biovolume	HF	= Horizontal Fluorescence
LD	= Production (Light/Dark Bottle)	FL	= Fluorescence (Light/Dark Bottle)
KY	= Taxon Key	WQ	= Water Quality

ACCESSING DATABASES

CBP CHESIE Computer

Individuals with user accounts on CHESIE can obtain living resources and water quality monitoring data as well as access to computing resources. You can apply for a user account by calling the of the CBP Computer Support Help Desk, at 1-800-968-7229, extension 769. The help desk will explain the application procedure and provide you with the necessary paper work to receive an account. (If you do not want to apply for a user account but would like to obtain data, see "Obtaining data on diskettes" below.)

CHESIE can be accessed by TELNET (for working on CHESIE via Internet from a remote location), FTP (for Internet data transfer) and by dial-in modem (KERMIT and ZMODDEM protocol are supported for data download). **Anonymous FTP is not allowed into CHESIE at this time.** The directions below provide basic instructions for accessing files by these three methods. For problems connecting to the system and transferring files, please call the help desk. If you have problems with the actual contents of a data set, please contact the Biological Monitoring Data Manager.

Dial in Procedures

1) Configure your local communications software package for the following settings:
   no parity
   8 bit per character
   1- stop bit
   software flow control (ctrl-S, ctrl-Q)
   ASCII format
   modem speed may be set anywhere between 1200 and 14400 baud

2) Initiate dial-in procedure. The local phone numbers are either 410-267-5782, 5783 or 5784 and they connect you directly with CHESIE. There is a toll free dial-in line: 1-800-968-7229, ext. 782, 783 or 784. The phones are programmed to automatically select the next available line so that users do not have to call several numbers to find an open line.
NOTE: A pause is required between dialing the 800 number and the extension. In your dial string, insert a sufficient number of commas between the 800 number and the extension to ensure proper handling of your computer dial-in by the CBP phone system. The length of the pause between the 800 number and the extension depends on your modem software. Suggested starting number of commas is nine and add or subtract as necessary.

3) At the EPA47> prompt, enter c CHESIE and hit return. You will then reach a screen asking for your username and password.

4) Note when logging out of the system you will need to type logout from both CHESIE and from the EPA47> prompt before you can disconnect from the system.

Telnet Procedures

1) Login to your local machine with INTERNET access as usual.

2) Type **TELNET**.

3) Type **connect chesie.ann.epa.gov**.

4) Login to CHESIE with your username and password.

5) For details on copying files to your personal user space see "Working with Files" below.

6) Typing **logout** or **logoff** will end your CHESIE TELNET session.

7) Typing **exit** will end your TELNET session.

Working with Files

1) Once logged onto CHESIE you are in your home directory. You will need to enter the Living Resources public access directory as described above to obtain data sets. Enter the living resources directory by typing **set def LRDISK:[lr.public.*.*]**. (For *.*, insert data type and state directory names. For example, Maryland benthic data requires the command **set def LRDISK:[lr.public.benthic.md]**.)

2) The living resources LR.PUBLIC directory has READ ONLY areas. You must copy data to your user area to use the data. The command **copy *.txt userdisk:[yourusername]** will copy all the data files and necessary documentation to your user area for a given data set.

3) Type **set def userdisk:[yourusername]** followed by **dir** to confirm all files were copied.

4) Type **help** at any point to receive online help.

5) Water quality data may be accessed by typing **baystats** from your userdisk space. The menu driven BAYSTATS explains how to retrieve data. Please see the Users Guide to Water Quality Data for details.

File Transfer Protocol (FTP)

1) Login to your local machine with INTERNET access as usual.

2) Type **ftp**

3) Type **open chesie.ann.epa.gov**.

4) Login to CHESIE with your username and password.

5) After the initial login you will be in your own personal user space so to transfer files to your local machine you will need to change directories. Type **cd LRDISK:[lr.public]**.
(Please note that proper VMS disk and file addresses must be used with ftp command)

6) You will enter the living resources public access directory as described above. Enter the directory containing the desired data sets by typing **cd LRDISK:[lr.public.*.*]**. (For *.*, insert data type and state directory names. For example, type the command **cd LRDISK:[lr.public.benthic.md]** for Maryland benthic data.)

7) You are now ready to transfer data. (The default data transfer mode is ASCII.) To transfer the complete data set and documentation type **mget <filename.txt>**. You will be prompted if you wish to transfer the first file. Type **a** (for all) when prompted and all files in the current directory will be transferred to your local machine.

8) Type **bye** or **quit** to end your FTP session.

Obtaining data from the CBP Internet Web Page

The Internet address for the Chesapeake Bay Program Home Page is:

http://www.epa.gov/r3chespk/

The procedure to download data will vary according to web browser type. Please see your in-house or online documentation for details.

Obtaining data on diskettes

Individuals without user accounts on CHESIE, users wishing to obtain SAS conversion scripts or users wishing to obtain the data files in dBASE (.dbf) format can request data sets directly from the Biological Monitoring Data Manager. All requests must be made in writing. A data request form is provided in Appendix D and can be sent to:

Ms. Jacqueline Johnson
Biological Monitoring Data Manager
Chesapeake Bay Program Data Center
410 Severn Avenue, Suite 109
Annapolis, MD 21403

Phone (local):	410-267-5729
Phone (long distance):	800-968-7229, ext. 729
FAX:	410-267-5777
E-mail:	JJOHNSON@CHESIE.ANN.EPA.GOV

The data form may be copied. Please request only one data set per form. Requests for data other than living resources data may be made on this form but should be mailed to the Chesapeake Bay Program Data Center Manager:

Mr. Lowell Bahner
Data Center Manager
Chesapeake Bay Program Data Center
410 Severn Avenue, Suite 109
Annapolis, MD 21403
Phone (long distance): 1-800-968-7229, ext. 671
FAX: 410-267-5777
E-mail: LBAHNER@CHESIE.ANN.EPA.GOV

MERGING AND WORKING WITH RELATIONAL DATA FILES

Data availability and demand for data access have grown at exponential rates due to the extensive growth of the Internet. The combination of increased data access and new mechanisms to store and distribute data have radically changed the job of the data management. It has become increasingly difficult to provide adequate guidance to data users on correctly handling the databases and interpreting the data. Analysts frequently derived unsatisfactory results because they used data unsuitable for the analysis or incorrectly interpret the information in a database. On a more basic level, they can incorrectly merge related files in a relational database system and create corrupted databases.

PLEASE READ THE DATA DOCUMENTATION FILES. Before you use the data, make yourself aware of the original objective(s) and sampling design of a study or monitoring program as well as the database structure. The data documentation files explain the details of sample collection and processing and the structure of the data files for each study. All of the data documentation sets have been written or rewritten with the end data user in mind. They assume that a user has no previous knowledge of the data collection program. The biological data sets described in this document are typically either from large scale monitoring programs or intensive, targeted studies. The Chesapeake Bay monitoring programs and other long term efforts are intended to detect changes and/or trends in the status of living resources on a large scale. They were designed to be used in a wide variety of analyses. These monitoring programs do not have a spatial or temporal scale fine enough to answer many site or time specific questions. However, they are useful in answering complex, bay-wide questions. Another portion of the data sets, predominantly the historic data sets, are targeted studies. These studies were originally designed to answer specific scientific or resource management questions on a fine scale. Therefore, sampling design, analytical protocol or site selection criteria may preclude or obscure elements of the data set critical for your analytical questions.

This chapter provides guidance on how to correctly merge related files of the CBP biological and living resources monitoring data. Common pitfalls in using the data are also noted. The Chesapeake Bay Program relational database structures and formats have been discussed in previous sections of this document. Actual field names and attributes appear in Appendix A and online in the individual data set documentation files. A list of possible CBP field names for biological and living resources data, and their definitions and units, are provided in Appendix B. Appendix C contains definitions of parameter codes used in the databases.

Phytoplankton

CBP Databases

These data sets require merging to be fully functional. The Virginia and Maryland files may be combined with no special preparation. The Taxon and Event files should be merged by linking the following fields:

DATE
STATION
LAYER
SER_NUM

Common user errors or pitfalls for these data include:

1) Composite Samples: It should be noted that the CBP sampling protocol utilizes composite samples. There are no samples for individual depths.

2) NODC CODES and TSN's: All species were assigned National Oceanographic Data Center (NODC) species coded and permanent Taxon Serial Numbers (TSN) where available. The NODC taxonomic Code is a hierarchical system of numerical codes used to represent the scientific names of organisms. The Code links the *Linnean* system of biological nomenclature to a numerical schema that facilitates modern methods of computerized data storage and retrieval. Additionally each recognized species is given an unique permanent taxon serial number. The TSN value does not ever change regardless of changes in taxonomic classification over time. NODC CODES are updated regularly. Please look at the R_DATE field in the Taxon Key file for each Data type, this date should never be more than a year old.

3) Virginia Picoplankton Counts: Picoplankton counts are available in the Virginia phytoplankton data and not in the Maryland data. They appear as a single record for each Virginia sample and are listed as "Autotrophic Picoplankton." They are included in the total count of organisms (TDEN_L) for a sample. It may be desirable to separate this size fraction and recalculate total count of organisms (TDEN_L) for some analysis.

Primary Production

CBP Databases

These data sets require merging to be fully functional. The Virginia and Maryland files may be combined with no special preparation. The Taxon and Event files can be merged by linking the following fields:

DATE
STATION
LAYER
SER_NUM

Common user errors or pitfalls for these data include:

1) The Maryland production data was resubmitted in 1995 due to errors in the calculation of some primary production values. Do not use data with an R_DATE prior to May 31, 1995.

2) It should be noted that the CBP sampling protocol utilizes composite samples. There are no samples for individual depths.

Fluorescence

CBP Databases

These data sets **do not** require merging to be fully functional. The horizontal and vertical files may be combined with no special preparation. You should pay attention to the SDEPTH field. Some measurements are at depth and others at the surface. A note of caution in regards to the Maryland Horizontal Fluorescence data between 1984 and 1995 and all Virginia Horizontal fluorescence: the station latitudes and longitudes in these data records are **approximations** of actual positions in the field. Please see FORMULAS, CALCULATIONS, AND CONVERSIONS in the Data Documentation for detailed explanation of how the positions were estimated. This method of locating position does not meet EPA sampling position policy since sampling locations were not measured with G.P.S. (Global Positioning System). Inaccuracies in the estimated station locations may be problematic in GIS or other mapping applications. The Horizontal Potomac Fluorescence locations and the Maryland and Virginia Vertical Fluorescence locations were determined with Loran-C and should be less problematic than the remaining Horizontal Fluorescence locations which were estimated by extrapolating between the start and end locations.

Common user errors and pitfalls for these data include:

1) The Maryland Fluorescence data was resubmitted due to errors in the calculation of fluorescence values. Do not use data with an R_DATE prior to May 31, 1995.

Microzooplankton and Mesozooplankton

CBP Databases

These data sets require merging to be fully functional. The Virginia and Maryland files for mesozooplankton may be combined with no special preparation. The Taxon and Event files for mesozooplankton can be merged by linking the following fields:

DATE
STATION
LAYER
SER_NUM

Mesozooplankton Biomass, Biovolume and Event files can be merged by linking the following fields:

DATE
STATION
LAYER
SER_NUM

Please ***READ THE DATA DOCUMENTATION FILE*** before attempting to merge the Maryland and Virginia microzooplankton data. The taxonomic identification levels in the Virginia microzooplankton data are not as detailed as those in the Maryland data. You may want to make the taxononic identification levels comparable by removing species identifications in specific cases and summing counts for genus, family or order levels. The Taxon and Event files for microzooplankton can be merged by linking the following fields:

DATE
STATION
LAYER
SER_NUM

The Microzooplankton and Mesozooplankton Taxon files can be merged **provided the following corrections are made to the mesozooplankton:**

1) Mezozooplankton counts are reported in organisms per cubic meters. Microzooplankton counts are reported in organisms per liter. The mesozooplankton taxon counts and total counts must be converted to liters before the sets can be merged. The conversion is:

DEN_M3 / 1000 = DEN_L
and
TDEN_M3 / 1000 = TDEN_L

2) Copepoda nauplii were counted in both the mesozooplankton and microzooplankton samples and included in both data sets. The smaller mesh size (<44u) of the net used to collect microzooplankton samples in Maryland and the whole water sample collection method in Virginia are more efficient in retaining the smallest copepod nauplii. Therefore, the microzooplankton estimates of copepod nauplii density are considered by the Principal Investigators to be more accurate. Remove the copepod nauplii in the Mesozooplankton files prior to merging the Micro- and Mesozooplankton files.

3) Barnacle nauplii were reported in the Virginia Mesozooplankton data from January 1985 through December 1992. After January 1993 barnacle nauplii were reported only in the Microzooplankton data.

Common user errors and pitfalls for these data include:

1) Not paying attention to the life stage column. These data sets will have multiple records for the same species that differ by the life stage. An empty life stage column means the taxon counted were adult organisms.

2) NODC CODES and TSN's: All species were assigned National Oceanographic Data Center (NODC) species coded and permanent Taxon Serial Numbers (TSN) where available. The NODC taxonomic Code is a hierarchical system of numerical codes used to represent the scientific names of organisms. The Code links the *Linnean* system of biological nomenclature to a numerical schema that facilitates modern methods of computerized data storage and retrieval. Additionally each recognized species is given an unique permanent taxon serial number. The TSN value does not ever change regardless of changes in taxonomic classification over time. NODC CODES are updated regularly. Please look at the R_DATE field in the Taxon Key file for each Data type, this date should never be more than a year old.

3) CBP monitoring program components collect composited samples. There are no samples for individual depths.

4) Mesozooplankton settled volumes for non-gelatinous zooplankton were estimated in all cases where biomass was estimated. Values were estimated when samples contained high levels of detritus. To determine if the settled volume is actual or estimated, merge the biomass and biovolume files by station, date, rep_num and ser_num.

Benthos

CBP Databases

These data sets require merging to be fully functional. The Virginia and Maryland CBP monitoring programs and the historic files may be combined with no special preparation. All Benthic Taxon, Biomass, Sediment, Water Quality and Event files can be merged by linking the following fields:

DATE
STATION
(REP_NUM) for most files
NETMESH

Protocols in the Maryland CBP benthos monitoring program diverge significantly from those in the Virginia CBP benthos monitoring programs and the historic data sets. The Maryland Benthic Monitoring program has changed its criteria for selecting sampling locations several times in the course of the program, going from fixed sites to randomly stratified sites to a mixture of the two. The Living Resources Data Manager can not stress enough how critical it is

to ***READ THE DATA DOCUMENTATION FILE*** before attempting to use the Maryland Benthic Monitoring data. Below is a brief outline of the differences between the Maryland and Virginia CBP programs.

Maryland CBP Benthic Monitoring Program

1) Multiple sampling schemes: fixed stations, sites randomly selected for identified strata, and a combination random strata and fixed site sampling. Sampling sites are not associated with any standard CBP monitoring stations. Analysts must use a geographic mechanism to relate stations (e.g., CBP Chesapeake Bay segmentation scheme, centroids). A unique station naming convention was developed to account for the various site selection processes.

2) Multiple sampling gears. Sampling gear artifacts vary in data.

3) Changing sampling frequencies. Sampling frequency varies from 7 to 10 times annually, and occur in the spring, summer and fall.

4) Major change in biomass methodology in 1989. (See data documentation.)

5) Analyses performed on sediment samples varied by date.

6) Full water column hydro casts were made at each site.

Virginia CBP Benthic Monitoring Program

1) Single sampling scheme: fixed sampling sites, most of which corresponded with regular CBP monitoring stations. The data, therefore, has direct locational linkages to plankton, zooplankton and water quality data sets.

2) One sampling gear used.

3) Sampling frequency is quarterly.

4) No change in any methodologies until 1996.

5) Water quality data for bottom of water column only.

Historic Benthic Data Sets

Most of the historic benthic data sets were "targeted studies". This means they were concentrated around areas of resource management interest such as power plants and industrial sites. Some of the studies were meant as baseline studies to study the environmental effect of the operation of these facilities before and after they went operational. Other studies were begun after a power plant or industrial site was operational and were designed to determine how much damage had been done to an area.

These studies frequently did not measure all the parameters found in current monitoring data sets and do not include biomass determinations.

Common user errors and pitfalls for these data include:

1) Using the Maryland CBP Monitoring data without understanding the randomized strata sampling protocol which was adapted in 1989.

2) NODC CODES and TSN's: All species were assigned National Oceanographic Data Center (NODC) species coded and permanent Taxon Serial Numbers (TSN) where available. The NODC taxonomic Code is a hierarchical system of numerical codes used to represent the scientific names of organisms. The Code links the *Linnean* system of biological nomenclature to a numerical schema that facilitates modern methods of computerized data storage and retrieval. Additionally each recognized species is given an unique permanent taxon serial number. The TSN value does not ever change regardless of changes in taxonomic classification over time. NODC CODES are updated regularly. Please look at the R_DATE field in the Taxon Key file for each Data type, this date should never be more than a year old.

3) In the CBP monitoring data, Benthic Biomass values are done on a per taxon basis. See documentation for Maryland methodology changes.

Submerged Aquatic Vegetation

CBP Databases

Data sets and GIS coverages from the annual aerial survey are one of the Bay Program's first attempts at supporting a distributed data set. The SAV data are collected and processed by the Virginia Institute of Marine Sciences. The data are then made available for distribution on the VIMS Internet server. The ***ONLY*** guidelines the CBP Data Center can provide for effective use of this information is: ***READ THE DATA DOCUMENTATION FILES BEFORE ATTEMPTING TO USE THE DATA AND THE GIS LAYERS.***

Historical Data

CBP documentation for this data set has not been prepared. The data files available on CHESIE are the original SAS data files.

☞ Even if you choose to ignore all other recommendations and cautions made in this section, ***PLEASE READ THE DATA DOCUMENTATION FILES!***

CBP DATA CENTER CONTACTS

Three staff at the Chesapeake Bay Program Data Center in Annapolis, Maryland, are responsible for creating, maintaining, facilitating the use of, and analyzing biological and living resources data and GIS coverages:

Ms. Jacqueline Johnson
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Chesapeake Bay Program Data Center
410 Severn Ave.
Annapolis, MD 21403
Phone (local): 410-267-5729
Phone (long distance): 1-800-968-7229, ext. 729
FAX: 410-267-5777
E-mail: JJOHNSON@CHESIE.ANN.EPA.GOV

Ms. Paula Hill Jasinski
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Chesapeake Bay Program Office
410 Severn Avenue
Annapolis, Maryland 21403
Phone (local): 410-267-5835
Phone (long distance): 1-800-968-7229, ext. 835
FAX: 410-267-5777
E-mail: phill@cbpws4.ann.epa.gov

Mr. Howard Weinberg
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Chesapeake Bay Program Office
410 Severn Avenue
Annapolis, Maryland 21403
Phone (local): 410-267-5735
Phone (long distance): 1-800-968-7229, ext.5735
FAX: 410-267-5777
E-mail: hweinber@cbpws1.ann.epa.gov

Chesapeake Bay Program, maintains a computer support desk to assist in resolving hardware and software difficulties with Data Center equipment. You can contact the help desk at:

Phone (local): 410-267-5769
Phone (long distance): 1-800-968-7229, ext. 769
FAX: 410-267-5777

The Chesapeake Bay Program Data Center Manager is:

Mr. Lowell Bahner
Data Center Manager
Chesapeake Bay Program Data Center
410 Severn Avenue, Suite 109
Annapolis, MD 21403
Phone (long distance): 1-800-968-7229 EXT. 671
Phone (local): 410-267-5671
FAX: 410-267-5666
E-mail: LBAHNER@CHESIE.ANN.EPA.GOV

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US Environmental Protection Agency. July 1988. *Chesapeake Bay Living Resources Monitoring Plan, Agreement Commitment Report.* Chesapeake Bay Program, Annapolis, Maryland, 94pp.

US Environmental Protection Agency. August 1989. *Living Resources Data Management Plan, Revision 1.* Chesapeake Bay Program, Annapolis, MD, CBP/TRS 33/89.

US Environmental Protection Agency. March 1993. *Chesapeake Bay Program Data Management Plan.* Chesapeake Bay Program, Annapolis, MD.

APPENDIX A

DATABASE STRUCTURES FOR AVAILABLE CBP DATA

September 1996

This appendix lists the field names, attributes and descriptions for the phytoplankton, zooplankton and benthos databases which are available through CHESIE on LRDISK:[LR.PUBLIC] and through the Chesapeake Bay Program Internet Home Page. For complete data documentation please see the data documentation files which accompany the data sets at either source.

Table 1. Phytoplankton Count Data Files in LRDISK:[LR.PUBLIC.PHYTOPLANKTON]

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	COLTYPE	Character	2	Sample Collection Type
3	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
4	DATE	Character	8	Sampling Date (MM/DD/YY)
5	DEN_L	Numeric	12	Density of a Taxon (#Individual per Liter)
6	GMETHOD	Character	3	Chesapeake Bay Program Gear Method Code
7	LAYER	Character	2	Layer of Water Column in which Sample was Taken
8	LBL	Character	45	Species Latin Name (with Size Groupings when Taken)
9	MAXDEPTH	Numeric	8 (1)	Maximum Depth of Composite Sample (Meters)
10	R_DATE	Character	8	Version Date of Data (MM/DD/YY)
11	REP_NUM	Numeric	8	Replicate Number
12	REP_TYPE	Character	3	Replicate Type
13	SER_NUM	Character	12	Sample Serial Number
14	NODCCODE	Character	12	National Oceanographic Data Center Species Code
15	SPECCODE	Character	14	Agency Species Code
16	STATION	Character	8	Sampling Station
17	TDEN_L	Numeric	12	Total Density (# All Individuals/ Liter)
18	TRIB_COD	Character	3	Tributary Code
19	TSN	Character	7	National Oceanographic Data Center Taxon Serial Number

Table 2. Phytoplankton Event Data Files in LRDISK:[LR.PUBLIC.PHYTOPLANKTON]

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	COLTYPE	Character	2	Collection Type
3	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
4	DATE	Character	8	Sampling Date (MM/DD/YY)
5	LAYER	Character	2	Layer of Water Column in which Sample was Taken
6	LAT	Numeric	9 (4)	Latitude in Decimal Degrees
7	LONG	Numeric	9 (4)	Longitude in Decimal Degrees
8	P_DEPTH	Numeric	8 (1)	Composite Sample Cut Off Depth (Meters)
9	R_DATE	Character	8	Data Version Date (MM/DD/YY)
10	SALZONE	Character	1	Salinity Zone
11	SAMVOL_L	Numeric	8 (1)	Total Volume of Sample (Liters)
12	SER_NUM	Character	12	Sample Serial Number
13	STATION	Character	8	Sampling Station
14	TDEPTH	Numeric	8 (1)	Total Station Depth (Meters)
15	TIME	Character	8	Sample Collection Time (HHMM)
16	TRIB_COD	Character	3	Tributary Code

Table 3. Primary Production Data Files in LRDISK:[LR.PUBLIC.PRODUCTION] and http//www.epa.gov/r3chespk/infobase/lr/lrscpg1.htm.

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	ASMRATIO	Numeric	8 (2)	Production Efficiency (ug-c/ug-chl)
3	C14_D	Character	2	C.I. Limits Method
4	C14_M	Character	7	Chesapeake Bay Program Analytical Method Code
5	CARBFIX	Numeric	8 (2)	Carbon Fixed (ug/l/hr)
6	CHLA	Numeric	8 (2)	Chlorophyll A (ug/l)
7	COLTYPE	Character	2	Collection Type
8	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
9	DATE	Character	8	Sample date (MM/DD/YY)
10	GMETHOD	Character	3	Chesapeake Bay Program Gear Method
11	INS_CODE	Character	5	Chesapeake Bay Program Instrument Code for C14 Measurement
12	LAYER	Character	2	Layer in Water Column From Which Sample was Taken
13	MAXDEPTH	Numeric	8 (1)	Maximum Depth of Composite Sample (meters)
14	R_DATE	Character	8	Data Version Date (MM/DD/YY)
15	REP_NUM	Numeric	8	Replicate Number
16	REP_TYPE	Character	4	Replicate Type
17	SER_NUM	Character	12	Sample Serial Number
18	STATION	Character	8	Sampling Station
19	TRIB_COD	Character	3	Tributary Code

Table 4. Primary Production Event Data Files in LRDISK:[LR.PUBLIC.PRODUCTION] and http//www.epa.gov/r3chespk/infobase/lr/lrscpg1.htm.

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	COLTYPE	Character	2	Collection Type
3	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
4	DATE	Character	8	Sampling Date (MM/DD/YY)
5	LAYER	Character	2	Layer in Water Column Which Sample was Taken
6	LAT	Numeric	9 (4)	Latitude in Decimal Degrees
7	LONG	Numeric	9 (4)	Longitude in Decimal Degrees
8	PDEPTH	Numeric	8 (1)	Composite Sample Cut Off Depth (meters)
9	R_DATE	Character	8	Data Version Date (MM/DD/YY)
10	SALZONE	Character	1	Salinity Zone
11	SAMVOL_L	Numeric	8 (1)	Total Volume of Sample (liters)
12	SER_NUM	Character	12	Sample Serial Number
13	STATION	Character	8	Sampling Station
14	TDEPTH	Numeric	8 (1)	Total Station Depth (meters)
15	TIME	Character	8	Sampling Time (HH:MM:SS)
16	TRIB_COD	Character	3	Tributary Code

Table 5 *In Situ* Fluorescence Data Files in LRDISK:[LR.PUBLIC.FLUORESCENCE]

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	CHL_F	Numeric	8 (2)	Fluorescence Value in Micrograms Chlorophyll a per Liter
3	CHL_F_D	Character	2	Chlorophyll a Detection Limit Code
4	CHL_F_M	Character	7	Chlorophyll a Method Code
5	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
6	DATE	Character	8	Sampling Date (MM/DD/YY)
7	GMETHOD	Character	3	Chesapeake Bay Program Gear Method Code
8	LAT	Numeric	9 (4)	Latitude in Decimal Degrees
9	LONG	Numeric	9 (4)	Longitude in Decimal Degrees
10	P_DEPTH	Numeric	8 (1)	Composite Sample Cut Off Depth
11	R_DATE	Character	8	Version Date of Data (MM/DD/YY)
12	SALZONE	Character	1	Salinity Zone
13	SDEPTH	Numeric	8 (1)	Sample Collection Depth (Meters)
14	SER_NUM	Character	12	Sample Serial Number
15	STATION	Character	8	Sampling Station
16	TDEPTH	Numeric	8 (1)	Total Station Depth (Meters)
17	TIME	Character	8	Sample Collection Time (HH:MM:SS)
18	TRIB_COD	Character	3	Tributary Code

Table 6. Microzooplankton Count Data Files in LRDISK:[LR.PUBLIC.MICROZOO-PLANKTON]

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	COLTYPE	Character	2	Collection Type
3	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
4	DATE	Character	8	Sampling date (MM/DD/YY)
5	DEN_L	Numeric	12 (2)	Density of a Taxon (#Individuals per liter)
6	GMETHOD	Character	3	Chesapeake Bay Program Gear Method Code
7	LAYER	Character	2	Layer in Water Column Which Sample was Taken
8	LBL	Character	45	Species Latin Name with Size Grouping
9	LIFE_STG	Character	3	Life stage, Chesapeake Bay Program Code
10	MAXDEPTH	Numeric	8 (1)	Maximum Depth of Composite Sample (Meters)
11	R_DATE	Character	8	Version Date of Data (MM/DD/YY)
12	REP_NUM	Numeric	8	Replicate Number
13	REP_TYPE	Character	4	Replicate Type
14	SER_NUM	Character	12	Sample Serial number
15	NODCCODE	Character	12	NODC Species code
16	SPECCODE	Character	14	Agency Taxon code
17	STATION	Character	8	Sampling station
18	TDEN_L	Numeric	12 (2)	Total Density (# All individuals/liter)
19	TRIB_COD	Character	3	Tributary Code
20	TSN	Character	7	National Oceanographic Data Center Taxon Serial Number

Table 7. Microzooplankton Event Data Files in LRDISK:[LR.PUBLIC.MICROZOO-PLANKTON]

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	COLTYPE	Character	2	Collection Type
3	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
4	DATE	Character	8	Sampling Date (MM/DD/YY)
5	LAYER	Character	2	Layer in Water Column Which Sample was Taken
6	LAT	Numeric	9 (4)	Latitude in Decimal Degrees
7	LONG	Numeric	9 (4)	Longitude in Decimal Degrees
8	PDEPTH	Numeric	8 (1)	Composite Sample Cut Off Depth (meters)
9	R_DATE	Character	8	Data Version date (MM/DD/YY)
10	SALZONE	Character	1	Salinity Zone
11	SAMVOL_L	Numeric	8 (1)	Total Volume of Sample (liters)
12	SER_NUM	Character	12	Sample Serial Number
13	STATION	Character	8	Sampling Station
14	TDEPTH	Numeric	8 (1)	Total Station Depth (meters)
15	TIME	Character	8	Sample Collection Time (HHMM)
16	TRIB_COD	Character	3	Tributary Code

Table 8 Mesozooplankton Count Data Files in LRDISK:[LR.PUBLIC.MEZOZOO-PLANKTON]

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	COLTYPE	Character	2	Collection Type
3	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
4	DATE	Character	8	Sampling Date (MM/DD/YY)
5	DEN_M3	Numeric	12 (3)	Density of a Taxon (# individual per meter cubed)
6	GMETHOD	Character	3	Chesapeake Bay Program Gear Method Code
7	LAYER	Character	2	Layer in Water Column in Which Sample was Taken
8	LBL	Character	45	Species Latin Name
9	LIFE_STG	Character	3	Chesapeake Bay Program Life Stage Code
10	MAXDEPTH	Numeric	8 (1)	Maximum Depth of Composite Sample (Meters)
11	R_DATE	Character	8	Data Version Date (MM/DD/YY)
12	REP_NUM	Numeric	8	Replicate Number
13	REP_TYPE	Character	4	Replicate Type
14	SER_NUM	Character	12	Sample Serial Number
15	NODCCODE	Character	12	NODC Species Code
16	SPECCODE	Character	14	Agency Species Code
17	STATION	Character	8	Sampling Station
18	TDEN_M3	Numeric	12 (3)	Total Density (# all individual per meter Cubed)
19	TRIB_COD	Character	3	Tributary Code
20	TSN	Character	7	Taxon Serial Number

Table 9. Mesozooplankton Biomass Data Files in LRDISK:[LR.PUBLIC.MEZOZOO-PLANKTON]

	Field Name	Field Type	Width (dec)	Descriptions
1	AEASH	Character	1	Actual or Estimated Ash Free Dry Weight
2	AEDRY	Character	1	Actual or Estimated Dry Weight
3	AGENCY	Character	6	Data Collection Agency
4	ASH_FRWT	Numeric	10 (5)	Ash Free Dry Weight (mg/m**3)
5	ASH_WT	Numeric	9 (4)	Total Ash Weight (mg/m**3)
6	AFDW	Numeric	9 (4)	Ash Free Dry Weight (g/sample)
7	ASHWT	Numeric	9 (4)	Total Ash Weight (g/sample)
8	COLTYPE	Character	2	Collection Type
9	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
10	DATE	Character	8	Sampling Date (MM/DD/YY)
11	DRY_WT	Numeric	10 (5)	Total Dry Weight (mg/m**3)
12	DRYWT	Numeric	9 (4)	Total Dry Weight (g/sample)
13	GMETHOD	Character	3	Chesapeake Bay Program Gear Method Code
14	LAYER	Character	2	Layer in Water Column Which Sample was Taken
15	MAXDEPTH	Numeric	8 (1)	Maximum Depth of Composite Sample (Meters)
16	R_DATE	Character	8	Version date of data (MM/DD/YY)
17	REP_NUM	Numeric	8	Replicate Number
18	REP_TYPE	Character	4	Replicate Type
19	SER_NUM	Character	12	Sample Serial number
20	STATION	Character	8	Sampling Station
21	TRIB_COD	Character	3	Tributary Code

Table 10. Mesozooplankton Biovolume Data Files in LRDISK:[LR.PUBLIC.MEZOZOO-PLANKTON]

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	BEROE	Numeric	8	Number of Beroe (#/sample)
3	BEROEVOL	Numeric	8	Volume of Beroe (ml/sample)
4	COLTYPE	Character	2	Collection Type
5	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
6	CTENO	Numeric	8	Number of Ctenophores (#/sample)
7	CTENOVOL	Numeric	8	Ctenophores Volume (ml/sample)
8	DATE	Character	8	Sampling date (MM/DD/YY)
9	GMETHOD	Character	3	Chesapeake Bay Program Gear Code
10	HYDRA	Numeric	8	Number of Hydromedusae (#/sample)
11	HYDRAVOL	Numeric	8	Volume of Hydromedusae (ml/sample)
12	JELLY	Numeric	8	Jellyfish Volume (ml/sample)
13	JELLYVOL	Numeric	8	Number of Jellyfish (#/sample)
14	LAYER	Character	2	Layer in Water Column in Which Sample was Taken
15	MAXDEPTH	Numeric	8 (1)	Maximum Depth of Composite Sample (Meters)
16	MNEMIOP	Numeric	8	Number of Mnemiopsis (#/sample)
17	MNEMVOL	Numeric	8	Volume of Mnemiopsis (ml/sample)
18	R_DATE	Character	8	Data Version Date (MM/DD/YY)
19	REP_NUM	Numeric	8	Replicate Number
20	REP_TYPE	Character	4	Replicate Type
21	SER_NUM	Character	12	Sample Serial Number
22	SET_VOL	Numeric	8 (4)	Settled Volume All Non-Gelatinous Material (ml/m**3)
23	SET_VOLZ	Numeric	8 (4)	Settled Volume of Zooplankton (ml/m**3)
24	SETVOL	Numeric	8	Settled Volume All Non-Gelatinous Material (ml/sample)
25	SETVOLZ	Numeric	8	Settled Volume of Zooplankton (ml/sample)
26	STATION	Character	8	Sampling Station
27	TRIB_COD	Character	3	Tributary Code

Table 11. Mesozooplankton Event Data Files in LRDISK:[LR.PUBLIC.MEZOZOO-PLANKTON]

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	COLTYPE	Character	2	Collection Type
3	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
4	DATE	Character	8	Sampling Date (MM/DD/YY)
5	LAYER	Character	2	Layer in Water Column Which Sample was Taken
6	FVOL_M3	Numeric	8 (2)	Volume Filtered (M**3)
7	LAT	Numeric	9 (5)	Latitude in Decimal Degrees
8	LONG	Numeric	9 (5)	Longitude in Decimal Degrees
9	P_DEPTH	Numeric	8 (1)	Composite Samples Cut Off Depth (meters)
10	R_DATE	Character	8	Data Version Date (MM/DD/YY)
11	SALZONE	Character	1	Salinity Zone
12	SER_NUM	Character	12	Sample Serial Number
13	STATION	Character	8	Sampling Station
14	TDEPTH	Numeric	8 (1)	Total Station Depth (meters)
15	TIME	Character	5	Sample Collection Time (HHMM)
16	TRIB_COD	Character	3	Tributary Code

Table 12. Benthic Count Data Files in LRDISK:[LR.PUBLIC.BENTHIC] and http//www.epa.gov/r3chespk/infobase/lr/lrscpg1.htm.

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	8	Data Collection Agency
2	CNT_TOT	Numeric	8	Total Count of All Organisms in Sample
3	CNT_TAX	Numeric	8	Total Count of Given Taxa in Sample
4	COLTYPE	Character	2	Collection Type
5	CONVFACT	Numeric	8 (2)	Conversion Factor (# Individual /Sample to #Individuals /MeterSquared)
6	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
7	DATE	Character	8	Sampling Date (MM/DD/YY)
8	GMETHOD	Character	3	Chesapeake Bay Program Gear Method Code
9	LBL	Character	45	Species Latin Name
10	NETMESH	Numeric	8 (3)	Screen Mesh Width (Millimeters)
11	NODCCODE	Character	12	National Oceanographic Data Center Species Code
12	REP_NUM	Numeric	8	Replicate Number
13	REP_TYPE	Character	3	Replicate Type
14	R_DATE	Character	8	Data Version Date (MM/DD/YY)
15	SER_NUM	Character	12	Sample Serial Number
16	SPECCODE	Character	14	Agency Species Code
17	STATION	Character	14	Sampling Station
18	TRIB_COD	Character	3	Tributary Code
19	TSN	Character	7	National Oceanographic Data Center Taxon Serial Number

Table 13. Benthic Biomass Data Files in LRDISK:[LR.PUBLIC.BENTHIC] and http//www.epa.gov/r3chespk/infobase/lr/lrscpg1.htm.

	Field Name	Field Type	Width (dec)	Descriptions
1	AEAFDW	Character	2	Actual or Estimated Ash Free Dry Weight
2	AFDW_TAX	Numeric	12 (5)	Taxon Ash Free Dry Weight (grams/sample)
3	AGENCY	Character	6	Data Collection Agency
4	COLTYPE	Character	2	Sample Collection Type
5	CONVFACT	Numeric	8 (2)	Conversion Factor (# Individual/Sample to # Individuals/Meter Squared)
6	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
7	DATE	Character	8	Sampling Date (MM/DD/YY)
8	GMETHOD	Character	3	Chesapeake Bay Program Gear Method Code
9	LBL	Character	45	Species Latin Name
10	NETMESH	Numeric	8 (2)	Screen Mesh Width (millimeter)
11	NODCCODE	Character	12	National Oceanographic Data Center Species Code
12	REP_NUM	Numeric	8	Replicate Number
13	REP_TYPE	Character	5	Replicate Type
14	R_DATE	Character	8	Data Version Date (MM/DD/YY)
15	SER_NUM	Character	12	Agency Sample Serial Number
16	SPECCODE	Character	14	Agency Species Code
17	STATION	Character	14	Sampling Station
18	TRIB_COD	Character	3	Tributary Code
19	TSN	Character	7	National Oceanographic Data Center Taxon Serial Number

Table 14. Benthic Water Quality Data Files in LRDISK:[LR.PUBLIC.BENTHIC and http//www.epa.gov/r3chespk/infobase/lr/lrscpg1.htm.

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	COLTYPE	Character	2	Sample Collection Type
3	CONDUCT	Numeric	8	Conductivity (umHo/cm)
4	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
5	DATE	Character	8	Sampling Date (MM/DD/YY)
6	DISOXY	Numeric	8 (2)	Dissolved Oxygen (ppm)
7	INS_CODE	Character	5	Chesapeake Bay Program Instrument Code
8	ORP	Numeric	8 (4)	Oxidation-Reduction Potential (mV/cm)
9	PH	Numeric	8 (2)	pH
10	REP_NUM	Numeric	8	Replicate Number
11	REP_TYPE	Character	3	Replicate Type
12	R_DATE	Character	8	Data Version Date (MM/DD/YY)
13	SALINITY	Numeric	8 (2)	Salinity (ppt)
14	SDEPTH	Numeric	8 (1)	Sample Collection Depth
15	STATION	Character	14	Sampling Station
16	TEMP	Numeric	8 (2)	Water Temperature (C)
17	TRIB_COD	Character	3	Tributary Code

Table 15. Benthic Sediment Data Files in LRDISK:[LR.PUBLIC.BENTHIC] and http//www.epa.gov/r3chespk/infobase/lr/lrscpg1.htm.

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	CARBNATE	Numeric	8 (2)	Carbonate Content (Percent)
3	CARCHN	Numeric	8 (2)	Carbon-CHN Analyzer (Percent)
4	CARIGN	Numeric	8 (2)	Carbon-Ignition (Percent)
5	CARWET	Numeric	8 (2)	Carbox-Wet Oxidation (Percent)
6	COLTYPE	Character	2	Sample Collection Type
7	CRUISE	Character	6	Chesapeake Bay Program Bay Cruise Number
8	DATE	Character	8	Sampling Date (MM/DD/YY)
9	GMETHOD	Character	3	Chesapeake Bay Program Gear Method Code
10	KURT	Numeric	8 (4)	Kurtosis (Folk Method)
11	MEDDIAM	Numeric	8 (4)	Median Diameter (PHI)
12	MOIST	Numeric	8 (4)	Sediment Moisture (Percent)
13	NITCHN	Numeric	8 (2)	Nitrogen-CHN Analyzer (Percent)
14	REP_NUM	Numeric	8	Replicate Number
15	REP_TYPE	Character	5	Replicate Type
16	R_DATE	Character	8	Data Version Date (MM/DD/YY)
17	SAND	Numeric	8 (2)	Sand Content (Percent)
18	SER_NUM	Character	12	Sample Serial Number
19	SILTCLAY	Numeric	8 (2)	Silt-Clay Content (Percent)
20	SILT_G	Numeric	8 (2)	Silt (Grams)
21	SKEW	Numeric	8 (4)	Skewness (Folk Method)
22	SORT	Numeric	8 (4)	Sorting (Folk Method)
23	STATION	Character	14	Sampling Station
24	VOLORG	Numeric	8 (4)	Volatile Organics Content (Percent)
25	TRIB_COD	Character	3	Tributary Code

Table 16. Benthic Event Data Files in LRDISK:[LR.PUBLIC.BENTHIC and http//www.epa.gov/r3chespk/infobase/lr/lrscpg1.htm.

	Field Name	Field Type	Width (dec)	Descriptions
1	AGENCY	Character	6	Data Collection Agency
2	COLTYPE	Character	2	Sample Collection Type
3	CRUISE	Character	6	Chesapeake Bay Program Cruise Number
4	DATE	Character	8	Sampling Date (MM/DD/YY)
5	LAT	Numeric	8 (4)	Latitude (Decimal Degrees)
6	LONG	Numeric	8 (4)	Longitude (Decimal Degrees)
7	PENETR	Numeric	8 (1)	Sampling Gear Penetration Depth (cm)
8	R_DATE	Character	8	Data Version Date (MM/DD/YY)
9	SITETYPE	Character	4	Site Selection Criteria
10	STATION	Character	14	Sampling Station
11	TRIP	Character	8	Agency Trip Number
12	TDEPTH	Numeric	8 (1)	Total Station Depth (Meters)
13	TIDE	Character	12	Tidal Stage (When Recorded)
14	TIME	Character	5	Sample Collection Time (HHMM)
15	TRIB_COD	Character	3	Tributary Code

APPENDIX B

BIOLOGICAL AND LIVING RESOURCES DATA DICTIONARY: POSSIBLE FIELD NAMES

September 1996

This data dictionary is the source of terms used in defining data in the Chesapeake Bay Program living resources and biological database. The purpose of the data dictionary is to provide consistency within the CBP monitoring database by making data submittal and retrieval compatible among institutions that participate in the Program. This dictionary will be expanded as new parameters names are required. Institutions submitting data to the CBP monitoring database should use these variable names whenever possible so that names and units of measure are consistent within the CBP monitoring database.

This document of terms for living resources parameters lists the one- to eight-character parameter name, a brief parameter description, and the unit of measure for each parameter currently in the living resources data base. **Bold text** indicates current field name in Chesapeake Bay Program Living Resources Data sets.

CBP CODE	DESCRIPTION	UNITS
ABOVEMLW	Meters above mean low water	meter
ACTIV_ML	Activity in sample (C14)	uCi/ml
AEAFDW	**Actual or estimated ash-free dry weight**	**char**
AEDRY	**Actual or estimated dry weight**	**char**
AFDW	**Ash-free dry weight for a sample**	**grams/sample**
AFDWNB	**Ash-free dry weight of non-bivalve species for a sample**	**grams**
AFDW_TAX	**Ash-free dry weight for a taxon**	**grams/sample**
AFDWNB_TAX	**Ash-free dry weight of non-bivalve species**	**grams**
AFDWPROF	Total Ash-free dry weight of profile sample	grams
AGENCY	**Data collecting agency .**	**Table 1**
AIRBLD_B	Presence or absence of an air bladder	0 or 1
ANSCODE	**Academy of Natural Science species code**	**char**
ASH_FRWT	**Ash-free dry weight for a taxon**	**mg/m**3**
ASH_WT	**Total sample ash-free dry weight**	**mg/m**3**
ASHNB_WT	**Total Ash-free dry weight of non-bivalve species**	**mg/m**3**
ASHWT	**Total sample ash-free dry weight**	**grams**
ASMRATIO	**Production Efficiency Ratio**	**ug-C/ug-chl A**
ATEMP	Air Temperature	deg C
ATEMP_M	Method code	Table 21
BEROE	**Number of Beroe**	**number/sample**
BEROEVOL	**Volume of Beroe**	**ml/sample**
BOTTYPE1	Primary bottom sediment characterization	Table 26
BOTTYPE2	Primary bottom sediment characterization	Table 26
C14_D	**Carbon-14 detection limit**	**Table 27**
C14_M	**Carbon-14 analytical methods**	***char***
CARBCHN	**Carbon content (chn analyzer)**	**%**
CARBFIX	**Carbon fixation Rate**	**ug/L/H**
CARBIGN	**Carbon content (ignition)**	**%**
CARBNATE	**Carbonate content**	**%**
CARBWET	**Carbon content (wet oxidation)**	**%**
CHLAM	Monochromatic Total chlorophyll A (uncorrected for phaeophytin)	ug/l
CHLAM_A	Analysis problem	Table 28
CHLAM_C	Spike concentration	number
CHLAM_D	Detection limit	Table 27
CHLAM_M	Method code	Table 21
CHLAM_N	Number of values for standard deviation	number
CHLAM_O	Lab analysis sign-off	Initial
CHLAM_P	Percent recovery	%
CHLAM_S	Standard deviation of lab replicates	number
CHLAM_SK	Background and spike value	number
CHLA	Monochromatic active chlorophyll A (corrected for phaeophytin and turbidity)	ug/l
CHLA_A	Analysis problem	Table 28
CHLA_C	Spike concentration	number
CHLA_D	Detection limit	Table 27
CHLA_M	Method code	Table 21
CHLA_N	Number of values for standard deviation	number
CHLA_O	Lab analysis sign-off	Initial
CHLA_P	Percent recovery	%
CHLA_S	Standard deviation of lab replicates	number
CHLA_SK	Background and spike value	number
CHL_A	Trichromatic chlorophyll A (corrected for turbidity)	ug/l
CHL_A_A	Analysis problem	Table 28
CHL_A_C	Spike concentration	number

CBP CODE	DESCRIPTION	UNITS
CHL_A_D	Detection limit	Table 27
CHL_A_M	Method code	Table 21
CHL_A_N	Number of values for standard deviation	number
CHL_A_O	Lab analysis sign-off	Initial
CHL_A_P	Percent recovery	%
CHL_A_S	Standard deviation of lab replicates	number
CHL_A_SK	Background and spike value	number
CHL_B	Trichromatic chlorophyll B (corrected for turbidity)	ug/l
CHL_B_A	Analysis problem	Table 28
CHL_B_C	Spike concentration	number
CHL_B_D	Detection limit	Table 27
CHL_B_M	Method code	Table 21
CHL_B_N	Number of values for standard deviation	number
CHL_B_O	Lab analysis sign-off	Initial
CHL_B_P	Percent recovery	%
CHL_B_S	Standard deviation of lab replicates	number
CHL_B_SK	Background and spike value	number
CHL_C	Trichromatic chlorophyll C (corrected for turbidity)	ug/l
CHL_C_A	Analysis problem	Table 28
CHL_C_C	Spike concentration	number
CHL_C_D	Detection limit	Table 27
CHL_C_M	Method code	Table 21
CHL_C_N	Number of values for standard deviation	number
CHL_C_O	Lab analysis sign-off.	Initial
CHL_C_P	Percent recovery	%
CHL_C_S	Standard deviation of lab replicates	number
CHL_C_SK	Background and spike value	number
CHL_F	**Fluorometric chlorophyll A**	**ug/l**
CHL_F_A	Analysis problem	Table 28
CHL_F_C	Spike concentration	number
CHL_F_D	**Detection limit**	**Table 27**
CHL_F_M	**Method code**	**Table 21**
CHL_F_N	Number of values for standard deviation	number
CHL_F_O	Lab analysis sign-off	Initial
CHL_F_P	Percent recovery	%
CHL_F_S	Standard deviation of lab replicates	number
CHL_F_SK	Background and spike value	number
CKTL_VOL	Cocktail volume - C14 production	ml
CLAY	**Percent clay**	**%**
CLAY_G	Clay Weight	g/sample
CLAY_MG	Clay weight.	mg/sample
CLOUD	Cloud cover	Table 6
CNIDA	**Number of Cnidarians**	**number/sample**
CNIDAVOL	**Volume of Cnidarians**	**ml/sample**
CNT	#/sample	number
CNT_AL	#/sample of species alive	number
CNT_DE	#/sample of species dead	number
CNT_FE	#/sample of females	number
CNT_IM	#/sample of immature	number
CNT_L	Raw count/sample of a given length	number
CNT_LM2	Normalized count/m**2 of a given length	number
CNT_MA	#/sample of males	number
CNT_PROF	#/profile sample	number
CNT_SUB	#/subsample	number
CNT_TAX	**#organisms of a species/sample**	**number**

CBP CODE	DESCRIPTION	UNITS
CNT_TOT	**Total number organisms/sample**	**number**
CNT_VOL	Volume of particular species (esp Jellyfish, Ctenophore)	liters
CNTPROSP	# species in a profile sample	number
COLTYPE	**Integrated/discrete collection**	**Table 14**
COND_M	Specific conductivity method code	Table 21
CONDUCT	**Specific conductivity**	**umhos/cm**
CONVFACT	**Converts #/sample to normalized count**	**number**
CRUISE	**Chesapeake Bay Program Cruise identifier**	**Table 3**
CS_DEPTH	Depth of core slice	cm
CSDEPTHx	Depth of core slice x	cm
CTENO	**Number of Ctenophores**	**number/sample**
CTENOVOL	**Volume of Ctenophores**	**ml/sample**
DATE	**Date of sample collection**	**MM/DD/YY**
DEN_100l	#/100L	number
DEN_HM3	#/hundred m**3	number
DEN_L	**#/liter**	**number**
DEN_M2	#/m**2	number
DEN_M3	#/m**3	number
DEN_ML	#/milliliter	number
DISOFFS	Distance off shore	meters
DISOXY	**Dissolved oxygen**	**mg/l**
DISOXY_M	Dissolved oxygen method code	Table 22
DO_DK	Dark bottle dissolved oxygen	mg/l
DO_GROPR	Gross productivity	mgC/l/hr
DO_LI	Light bottle dissolved oxygen	mg/l
DO_NETPR	Light\Dark Bottle Net productivity	mgC/l/hr
DO_PRO_D	02 rate of change/day - production	number
DO_PRO_H	02 rate of change/hour - production	number
DO_RES_D	02 rate of change/day - respiration	number
DO_RES_H	02 rate of change/hour - respiration	number
DOC_ID	Documentation identification	number
DODEL_DK	Final DO - Init DO (dark)	mg/l
DODEL_LT	Final DO - Init DO (light)	mg/l
DRY_WT	Dry weight	mg/m**3
DRYWT	Dry weight	grams
DVOL_L	Dilution volume	liters
EUDEPTH	Euphotic zone (depth of 1% light)	meters
FOLKISTD	Inclusive graphic standard deviation (Folk Method)	number
FOLKMEAN	Mean diameter (Folk Method)	number
FVOL_L	Filtered volume	liters
FVOL_M3	**Filtered volume**	**m**3**
GMETHOD	**Sampling gear**	**Table 16**
GONAD_G	Gonad weight of individual	grams
GONAD_I	Mean population gonadal index for bivalves (Table XX)	number
HYDRA	**Number of Hydra medusae**	**number/sample**
HYDRAVOL	**Volume of Hydra medusae**	**ml/sample**
INS_CODE	**Instrument code**	**Table 22**
JELLY	**Number for jellyfish**	**number/sample**
JELLYVOL	**Volume of jellyfish**	**ml/sample**
KURT	**Kurtosis (Folk Method)**	**number**
LAT	**Latitude**	**DEC DEG**
LAYER	**Water column description**	**Table 15**
LBL	**Species Latin name**	**char**
LEN_CM	Length of individual	cm
LEN_MM	Length of individual	mm

CBP CODE	DESCRIPTION	UNITS
LIFE_STG	**Life stages of individual**	**Table 18**
LIGHT_E	Light expressed as microeinsteins	uE/m2/sc
LIGHT_L	LANGLEYS as radiant energy (light)	g/cl/cm2
LIGHT_P	Light expressed as photons	number
LIGHT_Q	Light expressed as quanta	number
LIGHT_T	Light transmitted	%
LONG	**Longitude**	**DEC DEG**
MAXDEPTH	**Maximum sample depth**	**meters**
MEDDIAM	**Median diameter**	**phi**
MINDEPTH	Minimum sample depth	meters
MNEMIOP	**Number of Mnemiopsis**	**number/sample**
MNEMVOL	**Volume of Mnemiopsis**	**ml/sample**
MOIST	**Moisture of sediment**	**%**
MOMCKURT	Kurtosis (Method of Moments - McBride in Carver 71)	number
MOMCSKEW	Skewness (Method of Moments - McBride in Carver 71)	number
MOMEAN_1	Mean diameter (Method of Moments)	number
MOMTKURT	Kurtosis (Method of Moments - Math Tables Handbook	number
MOMTSKEW	Skewness (Method of Moments - Math Tables Handbook)	number
MOSTD_2	Standard deviation (Method of Moments)	number
NETMESH	**Screen mesh width**	**mm**
NITCHN	**Nitrogen-CHN analyzer (Percent)**	**percent**
NODCCODE	**NOAA-NODC species code**	**Table 17**
ODUCODE	**Old Dominion University species code**	**char**
ORP	**Redox potential**	**mv/cm**
P_DEPTH	**Composite sample cut-off depth**	**meters**
PENETR	**Gear penetration depth**	**cm**
PH	**Sample pH**	**number**
PHEA	Monochromatic Phaeophytin	ug/liter
PHEA_A	Analysis problem	Table 28
PHEA_D	Detection limit	Table 27
PHEA_M	Method code	Table 21
PHEA_N	Number of values for standard deviation	number
PHEA_O	Lab analysis sign-off	Initial
PHEA_P	Percent recovery	%
PHEA_S	Standard deviation of lab replicates	number
PRECIP	Precipitation	Table 7
QUARTDEV	Quartile deviation	number
R_DATE	**Version date of data**	**MM/DD/YY**
REP_NUM	**Replicate number**	**number**
REP_TYPE	**Replicate type code**	**Table 24**
SALIN_I	Interstitial salinity	ppt
SALIN_M	Salinity method code	Table 21
SALINITY	**Salinity**	**ppt**
SALZONE	**Salinity zone**	**Table 13**
SAMVOL_L	**Sample volume**	**liters**
SAND	**Percent sand**	**%**
SAND_G	Sand weight	grams
SAND_MG	Sand weight	mg/sample
SAV_B	Presence or absence of submerged aquatic vegetation	0 or 1
SAV_P	Maximum percent of area covered by aquatic vegetation	%
SAVPRES	Translated or natural submerged aquatic vegetation	T/N
SC200	#/sample - 202 um size class	number
SC2000	#/sample - 2000 um size class	number
SC300	#/sample - 300 um size class	number
SC600	#/sample - 600 um size class	number

CBP CODE	DESCRIPTION	UNITS
SC850	#/sample - 850 um size class	number
SDEPTH	**Sample depth from water surface**	**meters**
SECCHI	Secchi depth	meters
SEGMENT	Chesapeake Bay Program segment designation	Table 4
SER_NUM	**Data collection agency sample serial number**	**num/char**
SET_VOL	Settled volume (ml per cubic meter)	ml/m**3
SET_VOLZ	Settled volume of zooplankton (ml per cubic meter)	ml/m**3
SETVOL	Settled volume (ml per sample)	ml/sample
SETVOLZ	Settled volume of zooplankton (ml per sample)	ml/sample
SEX	Sex of individuals	M/F/U
SIG_T	Specific gravity of water	number
SILT	Percent silt	%
SILT_G	**grams/sample**	
SILT_G	Silt Weight	grams
SILT_MG	Silt weight	mg/sample
SILTCLAY	**Percent silt to clay**	**%**
SITE	Collecting agency site code	char
SITETYPE	Site type	Table 12
SITENO	Collecting agency site number	char
SKEW	**Skewness (Folk Method)**	**number**
SORT	**Sorting (Folk Method)**	**number**
SPEC_ACT	Specific activity of label(DPM)	uCi/ml
SPECCODE	**Agency Species Code**	**Table 29**
SPIKETIM	Spike time	HHMM
SSVOL_ML	Subsample volume	ml
STATION	**Sampling station identifier.**	**Table 2**
STEMP	Sediment temperature	DEG C
TDEN_L	**Total number per liter**	**number**
TDEN_M3	**Total density per meter cubed**	**number**
TDEPTH	**Total water depth at station (bottom depth)**	**meters**
TEMP	**Water temperature**	**DEG C**
TEMP_M	Water temperature measurement method	Table 21
TIDE	**Tidal stage**	**Table 8**
TIM_CNT	Time counted - C14 production	DEC min
TIMDUR_H	Duration of incubation period	HHMM
TIME	**Sampling time.**	**2400**
TIME_BEG	Beginning time	HHMM
TIME_END	Ending time	HHMM
TOW_DUR	Towing duration	HHMMSS
TOW_LEN	Length of tow	meters
TOW_SPD	Speed of the tow	m/sec
TREATMT	Treatment code - phytoplankton productivity	Table 21
TRIB_COD	**Tributary or mainstem code**	**Table 5**
TRIP	**Agency sampling trip number**	**num**
TSN	**National Oceanographic Data Center Taxon Serial Number**	**Char**
TURB_JTU	Turbidity in Jackson units	JTU
TURB_NTU	Turbidity in Nephelometric units	NTU
TVS_P	Total volatile solids (w/w)	%
UNITS	Reported units	Table 22
VERCODE	**Maryland Power Plant Study (Versar) species codes**	**char**
VOLORG	**Volatile organics**	**%**
WAVHGT	Wave height	Table 9
WINDIR	Wind direction	Table 10
WINDSPD	Wind speed	Table 11
WT_ASH	Ash weight	mg/m**3

CBP CODE	DESCRIPTION	UNITS
WT_AWT	Wet ash weight	mg/m**3
WT_G	Weight in grams	grams
WT_MG	Weight in milligrams	mg
WT_MNG	Mean weight in grams	grams
WTASH	Ash weight	grams
WTAWT	Wet ash weight	grams
WTSED_G	Weight of sediment/sample	grams

APPENDIX C

LIVING RESOURCES DATA DICTIONARY: EXPLANATION OF PARAMETER CODES

September 1996

A variety of numeric and alphanumeric codes are used by the Chesapeake Bay Program to identify specific sampling gears, analytical methods, collecting agencies, segment, cruise number, etc. These codes are documented in this appendix.

Table 1. Data Collecting Agency (**AGENCY**). An eight-character code indicating who has submitted the data. Current values for this field are given.

ANS	Benedict Estuarine Research Center, Academy of Natural Sciences
DCRA	District of Columbia Department of Consumer and Regulatory Affairs
ICPRB	Interstate Commission on the Potomac River Basin
GMU	George Mason University
MD/DNR	Maryland, Department of Natural Resources
MD/MDE	Maryland, Maryland Department of the Environment
ODU	Old Dominion University
SRBC	Susquehanna River Basin Commission
PA/DER	Pennsylvania Department of Environmental Resources
UM/HPEL	University of Maryland, Horn Point Environmental Laboratory
UM/CBL	University of Maryland, Chesapeake Biological Laboratory
US/NOAA	U.S. National Oceanic and Atmospheric Administration
VA/WCB	Virginia Water Control Board
VERSAR	Versar Incorporated
VIMS	Virginia Institute of Marine Sciences

Table 2. Sampling Station Identifier (**STATION**). A list of the current, **fixed** monitoring stations for Chesapeake Bay Program biological monitoring programs is given here. The list can be obtained through CHESSEE by selecting 'Dictionary.' (CHESSEE is the menu-driven information retrieval software program currently on the CHESIE computer which is designed to give users data documentation files about selected water quality and toxic pollutant monitoring data available from the Data Center.) The Sampling Station file is made up of the 1 to 8 character station identifications and each station's associated latitude/longitude, basin, and station location description. Zero's in the latitude and/or longitude columns indicates these values are not available.

NOTE: the benthic monitoring program in Maryland and Virginia use randomly selected sampling sites at times. These sites are given unique station identifiers in the databases and are not included in the following list.

STATION	LATITUDE	LONGITUDE	TRIB_COD	RIVER
CB1.1	39.5467	76.0817	BAY	Chesapeake Bay
CB2.1	39.44	76.025	BAY	Chesapeake Bay
CB2.2	39.3483	76.175	BAY	Chesapeake Bay
CB3.1	39.25	76.24	BAY	Chesapeake Bay
CB3.2	39.165	76.3083	BAY	Chesapeake Bay
CB3.3W	39.0033	76.3883	BAY	Chesapeake Bay
CB3.3C	38.9958	76.36	BAY	Chesapeake Bay
CB3.3E	39.0033	76.3467	BAY	Chesapeake Bay
CB4.0C	38.9269	76.3947	BAY	Chesapeake Bay
CB4.0W	38.9272	76.4331	BAY	Chesapeake Bay
CB4.0E	38.9269	76.3872	BAY	Chesapeake Bay
CB4.1W	38.8142	76.465	BAY	Chesapeake Bay
CB4.1C	38.8267	76.4	BAY	Chesapeake Bay
CB4.1E	38.8167	76.3717	BAY	Chesapeake Bay
CB4.2W	38.6433	76.5017	BAY	Chesapeake Bay
CB4.2C	38.6467	76.4183	BAY	Chesapeake Bay
CB4.2E	38.645	76.4017	BAY	Chesapeake Bay
CB4.3W	38.5575	76.4933	BAY	Chesapeake Bay
CB4.3C	38.5567	76.4367	BAY	Chesapeake Bay

CB4.3E	38.5567	76.3917	BAY	Chesapeake Bay
CB4.4	38.4133	76.3433	BAY	Chesapeake Bay
CB5.1	38.3183	76.2933	BAY	Chesapeake Bay
CB5.2	38.1367	76.2292	BAY	Chesapeake Bay
CB5.3	37.9117	76.1683	BAY	Chesapeake Bay
LE2.3	38.0217	76.35	BAY	Chesapeake Bay
CB5.4	37.8	76.175	BAY	Chesapeake Bay
CB5.4W	37.8133	76.295	BAY	Chesapeake Bay
CB5.5	37.6917	76.19	BAY	Chesapeake Bay
EE3.4	37.9083	75.7917	BAY	Chesapeake Bay
EE3.5	37.7925	75.8436	BAY	Chesapeake Bay
LE3.6	37.5967	76.285	BAY	Chesapeake Bay
LE3.7	37.5306	76.3069	BAY	Chesapeake Bay
CB6.1	37.5883	76.1625	BAY	Chesapeake Bay
CB6.2	37.4867	76.1567	BAY	Chesapeake Bay
CB6.3	37.4114	76.16	BAY	Chesapeake Bay
CB7.1N	37.775	75.975	BAY	Chesapeake Bay
CB7.1	37.6833	75.99	BAY	Chesapeake Bay
CB7.1S	37.5811	76.0583	BAY	Chesapeake Bay
CB7.2	37.4114	76.08	BAY	Chesapeake Bay
CB7.2E	37.4114	76.025	BAY	Chesapeake Bay
WE4.1	37.3117	76.3467	BAY	Chesapeake Bay
WE4.2	37.2417	76.3867	BAY	Chesapeake Bay
WE4.3	37.1767	76.3733	BAY	Chesapeake Bay
WE4.4	37.11	76.2933	BAY	Chesapeake Bay
LE5.5	36.9967	76.3033	BAY	Chesapeake Bay
CB8.1	36.9875	76.1681	BAY	Chesapeake Bay
CB8.1E	36.945	76.025	BAY	Chesapeake Bay
CB7.4	36.9933	76.0106	BAY	Chesapeake Bay
CB7.4N	37.0581	75.9731	BAY	Chesapeake Bay
CB7.3	37.1167	76.1256	BAY	Chesapeake Bay
CB7.3E	37.2286	76.0542	BAY	Chesapeake Bay
CB6.4	37.2364	76.2083	BAY	Chesapeake Bay
ELI1	36.95	76.3458	ELZ	Elizabeth
ELI2	36.8822	76.3392	ELZ	Elizabeth
ELI3	36.8589	76.3256	ELZ	Elizabeth
WBE1	36.8431	76.3597	ELZ	Elizabeth
LAF1	36.9056	76.3061	ELZ	Elizabeth
SBE1	36.8325	76.295	ELZ	Elizabeth
SBE2	36.8125	76.3061	ELZ	Elizabeth
SBE3	36.7903	76.3042	ELZ	Elizabeth
SBE4	36.7767	76.3	ELZ	Elizabeth
SBE5	36.7697	76.2964	ELZ	Elizabeth
EBE1	36.8406	76.2894	ELZ	Elizabeth
EBE2	36.8394	76.2656	ELZ	Elizabeth
ANA01	38.9181	76.9419	ANA	Anacostia
ANA02	38.9156	76.9456	ANA	Anacostia
ANA03	38.9147	76.9503	ANA	Anacostia
ANA04	38.9128	76.9533	ANA	Anacostia
ANA05	38.9092	76.9561	ANA	Anacostia
ANA06	38.9056	76.9583	ANA	Anacostia
ANA07	38.9019	76.9606	ANA	Anacostia
ANA08	38.8986	76.9625	ANA	Anacostia
ANA09	38.895	76.9625	ANA	Anacostia
ANA10	38.8908	76.9633	ANA	Anacostia
ANA11	38.8839	76.9692	ANA	Anacostia
ANA12	38.8839	76.9692	ANA	Anacostia
ANA13	38.8772	76.9722	ANA	Anacostia
ANA14	38.8772	76.9758	ANA	Anacostia
ANA15	38.8758	76.9806	ANA	Anacostia
ANA16	38.8742	76.985	ANA	Anacostia
ANA17	38.875	76.9886	ANA	Anacostia
ANA18	38.8697	76.9428	ANA	Anacostia
ANA19	38.8703	76.9469	ANA	Anacostia
ANA20	38.8714	76.0014	ANA	Anacostia

ANA21	38.8528	77.005	ANA	Anacostia
ANA22	38.8683	77.0072	ANA	Anacostia
ANA23	38.8631	77.0094	ANA	Anacostia
ANA24	38.8611	77.0131	ANA	Anacostia
ANA25	38.8589	77.0172	ANA	Anacostia
ANA26	38.8561	77.0194	ANA	Anacostia
ANA27	38.8528	77.0208	ANA	Anacostia
ANA29	38.8506	77.0225	ANA	Anacostia
ANA30	38.9428	76.9675	ANA	Anacostia
KNG01	38.8903	76.9444	RC	Rock Creek
KNG02	38.8975	76.9661	RC	Rock Creek
PEC01	38.8122	77.0278	POT	Potomac
PEC02	38.8083	77.0244	POT	Potomac
PEC03	38.8053	77.025	POT	Potomac
PEC04	38.8042	77.0244	POT	Potomac
PEC05	38.8003	77.0244	POT	Potomac
PEC06	38.7947	77.025	POT	Potomac
PEC07	38.7908	77.0264	POT	Potomac
PEC08	38.7869	77.0225	POT	Potomac
PEC09	38.7833	77.0228	POT	Potomac
PEC10	38.7794	77.0283	POT	Potomac
PMS01	38.9178	77.105	POT	Potomac
PMS02	38.9144	77.1028	POT	Potomac
PMS03	38.9111	77.1003	POT	Potomac
PMS04	38.9086	77.0964	POT	Potomac
PMS05	38.7564	77.0925	POT	Potomac
PMS06	38.905	77.0883	POT	Potomac
PMS07	38.9036	77.0842	POT	Potomac
PMS08	38.9033	77.0797	POT	Potomac
PMS09	38.9028	77.0753	POT	Potomac
PMS10	38.9022	77.0697	POT	Potomac
PMS11	38.9014	77.0658	POT	Potomac
PMS12	38.9003	77.0617	POT	Potomac
PMS13	38.8983	77.0581	POT	Potomac
PMS14	38.895	77.0567	POT	Potomac
PMS15	38.8917	77.0556	POT	Potomac
PMS16	38.8881	77.0544	POT	Potomac
PMS17	38.8847	77.0533	POT	Potomac
PMS18	38.8811	77.0522	POT	Potomac
PMS19	38.8789	77.0489	POT	Potomac
PMS20	38.8764	77.0383	POT	Potomac
PMS21	38.8742	77.0425	POT	Potomac
PMS22	38.8719	77.0383	POT	Potomac
PMS23	38.8697	77.0344	POT	Potomac
PMS24	38.8664	77.0192	POT	Potomac
PMS25	38.8631	77.0294	POT	Potomac
PMS26	38.86	77.0278	POT	Potomac
PMS27	38.8569	77.0264	POT	Potomac
PMS28	38.8536	77.0244	POT	Potomac
PMS29	38.8503	77.0225	POT	Potomac
PMS30	38.8467	77.0233	POT	Potomac
PMS31	38.8428	77.0239	POT	Potomac
PMS32	38.8392	77.0253	POT	Potomac
PMS33	38.8356	77.0267	POT	Potomac
PMS34	38.8322	77.0283	POT	Potomac
PMS35	38.8286	77.0308	POT	Potomac
PMS36	38.8253	77.0308	POT	Potomac
PMS37	38.8217	77.0314	POT	Potomac
PMS38	38.8178	77.0328	POT	Potomac
PMS39	38.8139	77.0342	POT	Potomac
PMS40	38.8103	77.035	POT	Potomac
PMS41	38.8064	77.0361	POT	Potomac
PMS42	38.8042	77.0364	POT	Potomac
PMS43	38.8003	77.0369	POT	Potomac
PMS44	38.7947	77.0372	POT	Potomac

PMS45	38.7908	77.0375	POT	Potomac
PMS46	38.7869	77.0375	POT	Potomac
PMS47	38.7833	77.035	POT	Potomac
PMS48	38.7794	77.0358	POT	Potomac
PMS49	38.7792	77.0344	POT	Potomac
PMS50	38.7758	77.0344	POT	Potomac
PMS51	38.77	77.0317	POT	Potomac
PTB01	38.8869	77.0397	POT	Potomac Tidal Basin
PWC01	38.8811	77.0314	POT	Potomac Washington Channel
PWC02	38.8797	77.0281	POT	Potomac Washington Channel
PWC03	38.8769	77.0247	POT	Potomac Washington Channel
PWC04	38.8736	77.0225	POT	Potomac Washington Channel
PWC05	38.8706	77.0203	POT	Potomac Washington Channel
PWC06	38.8669	77.0203	POT	Potomac Washington Channel
PWC07	38.8631	77.0217	POT	Potomac Washington Channel
PWC08	38.86	77.0197	POT	Potomac Washington Channel
RCR01	38.9864	77.0639	RC	Rock Creek
RCR04	38.9603	77.0442	RC	Rock Creek
RCR07	38.9339	77.0492	RC	Rock Creek
RCR09	38.9283	77.0497	RC	Rock Creek
TBK01	38.9178	77.1208	RC	Rock Creek
TCO01	38.8944	77.075	RC	Rock Creek
TCO06	38.9275	77.1017	RC	Rock Creek
TDA01	38.9286	77.1222	RC	Rock Creek
TDU01	38.8833	76.9767	RC	Rock Creek
TFB01	38.9275	77.0833	RC	Rock Creek
TFC01	38.8867	76.9375	RC	Rock Creek
TFD01	38.87	76.9583	RC	Rock Creek
TFS01	38.8667	76.975	RC	Rock Creek
THR01	38.9083	76.9625	RC	Rock Creek
THR04	38.9156	76.9633	RC	Rock Creek
THRN4	38.9225	76.9683	RC	Rock Creek
THRP1	38.9186	76.9664	RC	Rock Creek
THRP2	38.9156	76.9631	RC	Rock Creek
TNA01	38.91	76.9417	RC	Rock Creek
TOR01	38.8317	77.0411	RC	Rock Creek
TPB01	38.8783	76.9722	RC	Rock Creek
TTX27	38.8683	76.9694	RC	Rock Creek
TUT01	38.9183	76.9533	RC	Rock Creek
TWB01	38.9033	76.9458	RC	Rock Creek
TWB02	38.8978	76.9489	RC	Rock Creek
TWB03	38.8956	76.9389	RC	Rock Creek
TWB04	38.8936	76.9292	RC	Rock Creek
TWB05	38.8908	76.9178	RC	Rock Creek
TWB06	38.8903	76.9183	RC	Rock Creek
MET1.1	39.575	75.958		Northeast
MET2.1	39.525	75.817		C & D Canal
MET2.3	39.508	75.9		Elk
MET2.2	39.467	75.875		Bohemia
MET3.1	39.367	75.883		Sassafras
MET4.1	39.258	75.925	CHS	Chester
MET4.2	38.992	76.217	CHS	Chester
MEE1.1	38.883	76.25		Eastern Chesapeake Bay
MWT1.1	39.433	76.242		Bush
MWT2.1	39.383	76.342		Gunpowder
MWT3.1	39.3	76.4		Middle
MWT4.1	39.292	76.45		Back
MWT5.1	39.208	76.525	PAT	Patapsco
MWT6.1	39.075	76.475		Magothy
MWT7.1	39.017	76.508		Severn
MWT8.1	38.933	76.517		South
MWT8.2	38.883	76.533		Rhode
MWT8.3	38.85	76.533		West
PXT0402	38.71	76.702	PAX	Patuxent
XED9490	38.658	76.685	PAX	Patuxent

XED4892	38.582	76.681	PAX	Patuxent
PXT0603	38.856	76.693	PAX	Patuxent
WXT0045	38.814	76.751	PAX	Patuxent
PXT0456	38.773	76.71	PAX	Patuxent
XDE9401	38.491	76.664	PAX	Patuxent
XDE5339	38.425	76.602	PAX	Patuxent
XDE2792	38.379	76.511	PAX	Patuxent
XDF0407	38.341	76.488	PAX	Patuxent
XCF8747	38.312	76.422	PAX	Patuxent
PXT0904	38.81	76.713	PAX	Patuxent
MET5.1	38.807	75.912	CHP	Choptank
MEE2.1	38.65	76.275	CHP	Lower Choptank
MET5.2	38.58	76.06	CHP	Choptank
MEE2.2	38.533	76.308	CHP	Choptank
XFB2470	38.706	77.049	POT	Potomac
XFB1433	38.691	77.111	POT	Potomac
XEA6596	38.608	77.174	POT	Potomac
MAT0016	38.565	77.194	POT	Potomac
XEA1840	38.53	77.266	POT	Potomac
MET6.1	38.533	75.717		Nanticoke
MET6.2	38.333	75.883		Nanticoke
MAT0078	38.588	77.119	POT	Lower Potomac
XDA4238	38.403	77.269	POT	Lower Potomac
XDB3321	38.388	77.131	POT	Lower Potomac
XDC1706	38.363	76.991	POT	Lower Potomac
XDA1177	38.352	77.205	POT	Lower Potomac
MLE2.2	38.167	76.583	POT	Lower Potomac
XCF9575	38.325	76.376	PAX	Lower-Mid Chesapeake Bay
XCG8613	38.311	76.312	PAX	Lower-Mid Chesapeake Bay
MEE3.0	38.283	76.017		Fishing Bay
MEE3.1	38.2	75.975	TAN	Upper Tangier Sound
MEE3.2	37.967	75.933	TAN	Lower Tangier Sound
MEE3.3	37.942	75.767		Pocomoke Sound
TF3.1A	38.255	77.412	RAP	Rappahannock
TF3.1B	38.246	77.234	RAP	Rappahannock
TF3.2	38.175	77.189	RAP	Rappahannock
TF3.3	38.019	76.908	RAP	Rappahannock
RET3.1	37.92	76.822	RAP	Rappahannock
RET3.2	37.808	76.713	RAP	Rappahannock
LE3.1	37.761	76.621	RAP	Rappahannock
LE3.3	37.693	76.473		Corrotoman
LE3.2	37.67	76.554	RAP	Rappahannock
LE3.4	37.633	76.463	RAP	Rappahannock
RET4.2	37.572	76.793		Mattaponi
RET4.3	37.507	76.788	YRK	York
LE4.1	37.418	76.693	YRK	York
LE4.2	37.292	76.558	YRK	York
LE4.3	37.235	76.485	YRK	York
TF5.2	37.531	77.434	JAM	James
TF5.2A	37.45	77.42	JAM	James
TF5.3	37.403	77.392	JAM	James
RET5.1A	37.312	76.873		Chickahominy
TF5.5	37.313	77.233	JAM	James
TF5.4	37.311	77.297	JAM	James
TF5.5A	37.3	77.125	JAM	James
TF5.6	37.275	76.989	JAM	James
LE5.1	37.207	76.652	JAM	James
RET5.2	37.21	76.793	JAM	James
LE5.2	37.058	76.583	JAM	James
LE5.3	36.99	76.46	JAM	James
LE5.4	36.955	76.392	JAM	James
LE5.6	36.903	76.333	JAM	James
TF4.4	37.723	77.024		Mattaponi
TF4.2	37.58	77.022	YRK	Pumunkey
RET4.1	37.525	76.87	YRK	Pumunkey

SUSQ4.8	39.571	76.092	SUS	Susquehanna
SUSQ44.5	40.054	76.531	SUS	Susquehanna
SUSQ289.	41.985	76.501	SUS	Susquehanna
SUSQ340.	41.966	75.743	SUS	Susquehanna
SUSQ365.	42.074	75.637	SUS	Susquehanna
CHEM12.0	42.002	76.468	SUS	Susquehanna
TIOG10.8	42.029	77.132	SUS	Susquehanna
SEEL10.3	42.001	76.903	SUS	Susquehanna
CAYT1.7	42	76.523	SUS	Susquehanna
SNAK2.3	41.994	75.795	SUS	Susquehanna
DEER44.2	39.717	76.586	SUS	Susquehanna
EBAV1.5	39.725	76.596	SUS	Susquehanna
CNWG4.4	39.726	76.186	SUS	Susquehanna
OCTO6.6	39.707	76.116	SUS	Susquehanna
APAL6.9	41.995	76.133	SUS	Susquehanna
BNTY0.9	42.009	76.73	SUS	Susquehanna
CPBK2.0	41.997	77.338	SUS	Susquehanna
CACS1.6	42	75.579	SUS	Susquehanna
CHOC9.1	41.991	76.001	SUS	Susquehanna
COWN2.2	41.989	77.147	SUS	Susquehanna
HLDN3.5	42.004	77.393	SUS	Susquehanna
LSNK7.6	41.997	75.898	SUS	Susquehanna
NFCR7.6	41.997	77.623	SUS	Susquehanna
SOUT2.8	41.989	76.774	SUS	Susquehanna
TRUP4.5	41.99	77.492	SUS	Susquehanna
TROW1.8	42	75.732	SUS	Susquehanna
WAPP2.6	41.994	76.344	SUS	Susquehanna
BRHR0.1	41.996	76.344	SUS	Susquehanna
SACK2.6	41.995	76.397	SUS	Susquehanna
PARK0.7	41.998	76.46	SUS	Susquehanna
HESS0.1	41.978	77.25	SUS	Susquehanna
LNGA2.5	39.725	76.982	SUS	Susquehanna
SBCC20.4	39.726	76.981	SUS	Susquehanna
BBCC4.1	39.717	76.492	SUS	Susquehanna
FBDC4.1	39.712	76.443	SUS	Susquehanna
SCTT3.0	39.723	76.337	SUS	Susquehanna
N0201	40.029	76.517	SUS	Susquehanna
N0202	40.258	76.887	SUS	Susquehanna
N0203	40.854	76.806	SUS	Susquehanna
N0204	39.893	76.358	SUS	Susquehanna
N0206	40.055	76.526	SUS	Susquehanna
N0207	40.011	76.711	SUS	Susquehanna
N0210	40.081	76.718	SUS	Susquehanna
N0211	40.199	76.717	SUS	Susquehanna
N0212	40.224	76.861	SUS	Susquehanna
N0213	40.26	77.103	SUS	Susquehanna
N0214	40.478	77.129	SUS	Susquehanna
N0217	40.609	78.136	SUS	Susquehanna
N0220	40.596	77.573	SUS	Susquehanna
N0223	40.215	78.265	SUS	Susquehanna
N0224	40.477	78.178	SUS	Susquehanna
N0228	40.775	76.87	SUS	Susquehanna
N0229	40.866	77.049	SUS	Susquehanna
N0231	39.961	76.366	SUS	Susquehanna
N0240	40.271	76.915	SUS	Susquehanna
N0243	40.381	77.082	SUS	Susquehanna
N0245	40.529	77.392	SUS	Susquehanna
N0249	40.335	77.86	SUS	Susquehanna
N0252	40.431	78.363	SUS	Susquehanna
N0301	40.958	76.619	SUS	Susquehanna
N0302	41.189	76.087	SUS	Susquehanna
N0303	41.35	75.801	SUS	Susquehanna
N0305	41.765	76.441	SUS	Susquehanna
N0306	41.963	75.743	SUS	Susquehanna
N0308	40.995	76.474	SUS	Susquehanna

N0309	41.055	76.232	SUS	Susquehanna
N0310	41.071	76.134	SUS	Susquehanna
N0313	41.359	75.745	SUS	Susquehanna
N0317	41.558	75.895	SUS	Susquehanna
N0318	41.708	76.485	SUS	Susquehanna
N0320	41.996	77.142	SUS	Susquehanna
N0324	41.958	77.116	SUS	Susquehanna
N0332	41.978	76.549	SUS	Susquehanna
N0333	41.79	76.462	SUS	Susquehanna
N0334	41.697	76.231	SUS	Susquehanna
N0335	41.831	76.35	SUS	Susquehanna
N0337	41.416	76.091	SUS	Susquehanna
N0401	40.967	76.879	SUS	Susquehanna
N0402	41.229	77.019	SUS	Susquehanna
N0406	40.897	78.677	SUS	Susquehanna
N0407	41.217	76.788	SUS	Susquehanna
N0408	41.325	76.912	SUS	Susquehanna
N0409	41.418	77.033	SUS	Susquehanna
N0410	41.283	77.323	SUS	Susquehanna
N0412	41.126	77.433	SUS	Susquehanna
N0413	40.975	77.743	SUS	Susquehanna
N0415	40.89	77.794	SUS	Susquehanna
N0418	41.261	77.903	SUS	Susquehanna
N0419	41.32	78.081	SUS	Susquehanna
N0420	41.413	78.197	SUS	Susquehanna
N0422	40.986	78.406	SUS	Susquehanna
N0423	41.075	77.592	SUS	Susquehanna
N0427	41.075	76.873	SUS	Susquehanna
N0428	41.456	76.69	SUS	Susquehanna
N0429	41.309	77.363	SUS	Susquehanna
N0430	41.738	77.431	SUS	Susquehanna
N0433	41.075	77.478	SUS	Susquehanna
N0434	41.319	77.874	SUS	Susquehanna
N0439	41.334	78.136	SUS	Susquehanna
N0501	39.507	77.791	SUS	Susquehanna
N0503	39.733	77.229	SUS	Susquehanna
N0505	39.723	78.06	SUS	Susquehanna
N0506	39.927	78.66	SUS	Susquehanna
MET7.1	38.267	75.792		Wicomico
MET8.1	38.142	75.817		Manokin
MET9.1	38.058	75.808		Big Annemessey
ANPC	38.9717	76.4633	SEV	Severn
ANPS	39.0067	76.4033	BAY	Chesapeake Bay
MLE2.3	38.0217	76.3483	POT	Lower Potomac
SOL	38.3217	76.45	PAT	Patuxent
TIL	38.72	76.3333	BAY	Chesapeake Bay
TOLCHES	39.2133	76.2467	BAY	Chesapeake Bay
XDA3000C	38.4388	77.2752	POT	Potomac
XDA3000E	38.4312	77.27	POT	Potomac
XDA3000	38.4312	77.315	POT	Potomac
XEA4000C	38.5598	77.2385	POT	Potomac
XEA4000E	38.5632	77.193	POT	Potomac
XEA5000C	38.594	77.2032	POT	Potomac
XEA5000E	38.5878	77.195	POT	Potomac
XEA6000	38.6772	77.1657	POT	Potomac
XEA9075	38.672	77.1322	POT	Potomac
LE3.4B	37.6242	76.4622	RAP	Rappahanock
LE4.3B	37.2294	76.4728	YRK	York
RET5.2A	37.2078	76.7042	JAM	James

Table 3. Cruise Identifier **(CRUISE)**. This alpha-numeric code identifies the cruise to which the data observation belongs. Cruise identification is useful for grouping data that are collected over a range of sample dates, but which are considered data for a specific sampling period. The complete listing may be found in LRDISK:[LR.PUBLIC] BAYCRUZ.TXT. Please note that the Maryland Phytoplankton program has adjusted some cruise periods. Deviations from the regular cruise schedule can be found in LRDISK:[LR.PUBLIC] ANSCRUZ.TXT. A sample of current values for this field are below.

CRUISE	BEGINNING DATE	ENDING DATE	CRUISE	BEGINNING DATE	ENDING DATE
BAY001	06/15/84	06/30/84	BAY044	08/01/86	08/15/86
BAY002	07/01/84	07/15/84	BAY045	08/16/86	08/31/86
BAY003	07/16/84	07/31/84	BAY046	09/01/86	09/15/86
BAY004	08/01/84	08/15/84	BAY047	09/16/86	09/30/86
BAY005	08/16/84	08/31/84	BAY048	10/01/86	10/15/86
BAY006	09/01/84	09/15/84	BAY049	10/16/86	10/31/86
BAY007	09/16/84	09/30/84	BAY050	11/01/86	11/30/86
BAY008	10/01/84	10/15/84	BAY051	12/01/86	12/31/86
BAY009	10/16/84	10/31/84	BAY052	01/01/87	01/31/87
BAY010	11/01/84	11/30/84	BAY053	02/01/87	02/28/87
BAY011	12/01/84	12/31/84	BAY054	03/01/87	03/15/87
BAY012	01/01/85	01/31/85	BAY055	03/16/87	03/31/87
BAY013	02/01/85	02/28/85	BAY056	04/01/87	04/15/87
BAY014	03/01/85	03/15/85	BAY057	04/16/87	04/30/87
BAY015	03/16/85	03/31/85	BAY058	05/01/87	05/15/87
BAY016	04/01/85	04/15/85	BAY059	05/16/87	05/31/87
BAY017	04/16/85	04/30/85	BAY060	06/01/87	06/15/87
BAY018	05/01/85	05/15/85	BAY061	06/16/87	06/30/87
BAY019	05/16/85	05/31/85	BAY062	07/01/87	07/17/87
BAY020	06/01/85	06/15/85	BAY063	07/18/87	07/31/87
BAY021	06/16/85	06/30/85	BAY064	08/01/87	08/15/87
BAY022	07/01/85	07/15/85	BAY065	08/16/87	08/31/87
BAY023	07/16/85	07/31/85	BAY066	09/01/87	09/15/87
BAY024	08/01/85	08/15/85	BAY067	09/16/87	09/30/87
BAY025	08/16/85	08/31/85	BAY068	10/01/87	10/15/87
BAY026	09/01/85	09/15/85	BAY069	10/16/87	10/31/87
BAY027	09/16/85	10/02/85	BAY070	11/01/87	11/30/87
BAY028	10/03/85	10/14/85	BAY071	12/01/87	12/31/87
BAY029	10/15/85	11/06/85	BAY072	01/01/88	01/31/88
BAY030	11/07/85	11/30/85	BAY073	02/01/88	02/28/88
BAY031	12/01/85	12/31/85	BAY074	03/01/88	03/15/88
BAY032	01/01/86	01/31/86	BAY075	03/16/88	03/31/88
BAY033	02/01/86	02/28/86	BAY076	04/01/88	04/15/88
BAY034	03/01/86	03/15/86	BAY077	04/16/88	04/30/88
BAY035	03/16/86	03/31/86	BAY078	05/01/88	05/15/88
BAY036	04/01/86	04/15/86	BAY079	05/16/88	05/31/88
BAY037	04/16/86	04/30/86	BAY080	06/01/88	06/14/88
BAY038	05/01/86	05/15/86	BAY081	06/15/88	06/30/88
BAY039	05/16/86	05/31/86	BAY082	07/01/88	07/15/88
BAY040	06/01/86	06/15/86	BAY083	07/16/88	07/31/88
BAY041	06/16/86	06/30/86	BAY084	08/01/88	08/15/88
BAY042	07/01/86	07/15/86	BAY085	08/16/88	08/31/88
BAY043	07/16/86	07/31/86	BAY086	09/01/88	09/13/88

Table 3. Cruise Identifier (continued)

CRUISE	BEGINNING DATE	ENDING DATE	CRUISE	BEGINNING DATE	ENDING DATE
BAY087	09/14/88	09/30/88	BAY138	05/01/91	05/15/91
BAY088	10/01/88	10/15/88	BAY139	05/16/91	05/31/91
BAY089	10/16/88	10/31/88	BAY140	06/01/91	06/15/91
BAY090	11/01/88	11/30/88	BAY141	06/16/91	06/30/91
BAY091	12/01/88	12/31/88	BAY142	07/01/91	07/15/91
BAY092	01/01/89	01/31/89	BAY143	07/16/91	07/31/91
BAY093	02/01/89	02/28/89	BAY144	08/01/91	08/15/91
BAY094	03/01/89	03/15/89	BAY145	08/16/91	08/31/91
BAY095	03/16/89	03/31/89	BAY146	09/01/91	09/15/91
BAY096	04/01/89	04/15/89	BAY147	09/16/91	09/30/91
BAY097	04/16/89	04/30/89	BAY148	10/01/91	10/15/91
BAY098	05/01/89	05/15/89	BAY149	10/16/91	10/31/91
BAY099	05/16/89	05/31/89	BAY150	11/01/91	11/30/91
BAY100	06/01/89	06/15/89	BAY151	12/01/91	12/31/91
BAY101	06/16/89	06/30/89	BAY152	01/01/92	01/31/92
BAY102	07/01/89	07/15/89	BAY153	02/01/92	02/28/92
BAY103	07/16/89	07/31/89	BAY154	03/01/92	03/15/92
BAY104	08/01/89	08/15/89	BAY155	03/16/92	03/31/92
BAY105	08/16/89	08/31/89	BAY156	04/01/92	04/15/92
BAY106	09/01/89	09/15/89	BAY157	04/16/92	04/30/92
BAY107	09/16/89	09/30/89	BAY158	05/01/92	05/15/92
BAY108	10/01/89	10/15/89	BAY159	05/16/92	05/31/92
BAY109	10/16/89	10/31/89	BAY160	06/01/92	06/15/92
BAY110	11/01/89	11/30/89	BAY161	06/16/92	06/30/92
BAY111	12/01/89	12/31/89	BAY162	07/01/92	07/15/92
BAY112	01/01/90	01/31/90	BAY163	07/16/92	07/31/92
BAY113	02/01/90	02/28/90	BAY164	08/01/92	08/15/92
BAY114	03/01/90	03/15/90	BAY165	08/16/92	08/31/92
BAY115	03/16/90	03/31/90	BAY166	09/01/92	09/15/92
BAY116	04/01/90	04/15/90	BAY167	09/16/92	09/30/92
BAY117	04/16/90	04/30/90	BAY168	10/01/92	10/15/92
BAY118	05/01/90	05/15/90	BAY169	10/16/92	10/31/92
BAY119	05/16/90	05/31/90	BAY170	11/01/92	11/30/92
BAY120	06/01/90	06/15/90	BAY171	12/01/92	12/31/92
BAY121	06/16/90	06/30/90	BAY172	01/01/93	01/31/93
BAY122	07/01/90	07/15/90	BAY173	02/01/93	02/28/93
BAY123	07/16/90	07/31/90	BAY174	03/01/93	03/15/93
BAY124	08/01/90	08/15/90	BAY175	03/16/93	03/31/93
BAY125	08/16/90	08/31/90	BAY176	04/01/93	04/15/93
BAY126	09/01/90	09/15/90	BAY177	04/16/93	04/30/93
BAY127	09/16/90	09/30/90	BAY178	05/01/93	05/15/93
BAY128	10/01/90	10/15/90	BAY179	05/16/93	05/31/93
BAY129	10/16/90	10/31/90	BAY180	06/01/93	06/15/93
BAY130	11/01/90	11/30/90	BAY181	06/16/93	06/30/93
BAY131	12/01/90	12/31/90	BAY182	07/01/93	07/15/93
BAY132	01/01/91	01/31/91	BAY183	07/16/93	07/31/93
BAY133	02/01/91	02/28/91	BAY184	08/01/93	08/15/93
BAY134	03/01/91	03/15/91	BAY185	08/16/93	08/31/93
BAY135	03/16/91	03/31/91	BAY186	09/01/93	09/15/93
BAY136	04/01/91	04/15/91	BAY187	09/16/93	09/30/93
BAY137	04/16/91	04/30/91	BAY188	10/01/93	10/15/93

Table 3. Cruise Identifier (continued)

CRUISE	BEGINNING DATE	ENDING DATE	CRUISE	BEGINNING DATE	ENDING DATE
BAY189	10/16/93	10/31/93	BAY211	12/01/94	12/31/94
BAY190	11/01/93	11/30/93	BAY212	01/01/95	01/31/95
BAY191	12/01/93	12/31/93	BAY213	02/01/95	02/28/95
BAY192	01/01/94	01/31/94	BAY214	03/01/95	03/15/95
BAY193	02/01/94	02/28/94	BAY215	03/16/95	03/31/95
BAY194	03/01/94	03/15/94	BAY216	04/01/95	04/15/95
BAY195	03/16/94	03/31/94	BAY217	04/16/95	04/30/95
BAY196	04/01/94	04/15/94	BAY218	05/01/95	05/15/95
BAY197	04/16/94	04/30/94	BAY219	05/16/95	05/31/95
BAY198	05/01/94	05/15/94	BAY220	06/01/95	06/15/95
BAY199	05/16/94	05/31/94	BAY221	06/16/95	06/30/95
BAY200	06/01/94	06/15/94	BAY222	07/01/95	07/15/95
BAY201	06/16/94	06/30/94	BAY223	07/16/95	07/31/95
BAY202	07/01/94	07/15/94	BAY224	08/01/95	08/15/95
BAY203	07/16/94	07/31/94	BAY225	08/16/95	08/31/95
BAY204	08/01/94	08/15/94	BAY226	09/01/95	09/15/95
BAY205	08/16/94	08/31/94	BAY227	09/15/95	09/30/95
BAY206	09/01/94	09/15/94	BAY228	10/01/95	10/15/95
BAY207	09/16/94	09/30/94	BAY229	10/16/95	10/31/95
BAY208	10/01/94	10/15/94	BAY230	11/01/95	11/30/95
BAY209	10/16/94	10/31/94	BAY231	12/01/95	12/31/95
BAY210	11/01/94	11/30/94			

Table 4. Chesapeake Bay Program Segment Designation **(SEGMENT)**. This code identifies the Chesapeake Bay Segment from which the sample was taken. Due to controversy about the segmentation systems, these codes are not reported in current Living Resources data sets. However, segment codes are used in other CBP Monitoring data sets and are included here for the conveyance of the data user. The acceptable codes are given below.

CB1	Susquehanna Flats
CB2	Upper portion of the Chesapeake Bay mainstem
CB3	Upper-most Estuarine zone in mainstem of the Chesapeake Bay
CB4	Upper portion of the central Chesapeake Bay mainstem
CB5	Central portion of the mainstem of the Chesapeake Bay
CB6	Lower west-central mainstem of the Chesapeake Bay
CB7	Lower east-central mainstem of the Chesapeake Bay
CB8	Southern-most segment of the Chesapeake Bay
ET1	Northeast River
ET2	Elk River and Bohemia River
ET3	Sassafras River
ET4	Chester River
ET5	Choptank River
ET6	Nanticoke River
ET7	Wicomico River
ET8	Manokin River
ET9	Big Annemessex River
ET10	Pocomoke River
EE1	Eastern Bay, Miles River, and Wye River
EE2	Choptank River, west of Castle Haven, including Tred Avon River, Broad Creek, Harris Creek, and the Little Choptank
EE3	Tangier and Pocomoke Sounds
LE1	Patuxent River- Lower Estuarine Segment
LE2	Potomac River - Lower Estuarine Segment
LE3	Rappahannock River - Lower Estuarine Segment
LE4	York River - Lower Estuarine Segment
LE5	James River - Lower Estuarine Segment
RET1	Patuxent River- Riverine-estuarine transition zone
RET2	Potomac River - Riverine-estuarine transition zone
RET3	Rappahannock River - Riverine-estuarine transition zone
RET4	York River - Riverine-estuarine transition zone
RET5	James River- Riverine-estuarine transition zone
TF1	Patuxent River- Tidal Freshwater Segment
TF2	Potomac River- Tidal Freshwater Segment
TF3	Rappahannock River - Tidal Freshwater Segment
TF4	York River-Tidal Freshwater Segment
TF5	James River-Tidal Freshwater Segment
WT1	Bush River
WT2	Gunpowder River
WT3	Middle River and Seneca Creek
WT4	Back River
WT5	Patapsco River
WT6	Magothy River
WT7	Severn River
WT8	South, Rhode, and West Rivers
WE4	Mobjack Bay

Table 5. Tributary Code **(TRIB_COD)**. This is a three character code describing the position of a sampling station by tributary or mainstem. The codes for this field are as follows:

BAL	Baltimore Harbor
BAY	Main Bay
CHP	Choptank River
CHS	Chester River
ELZ	Elizabeth River
JAM	James River
PAX	Patuxnet River
POT	Potomac River
RAP	Rappahanock River
TAN	Tangier River
YRK	York River

Table 6. Cloud Cover **(CLOUD)**. This one digit code describes the type of cloud coverage during a sampling period. If these data are collected, they are located in the EVENT DATA FILE. Possible values for this field are:

' '	Not Recorded	
0	Clear	0 to 10 %
1	Scattered to Partly	10 to 50 %
2	Partly to Broken	50 to 90 %
3	Overcast	GT 90 %
4	Foggy	
5	Hazy	
6	Clouds:	No % given

Table 7. Precipitation Identifier **(PRECIP)**. This code describes the weather conditions encountered during a sampling period. If these data are collected, they are located in the EVENT DATA FILE. The possible values for this field are given below.

' '	Not Recorded
10	None
11	Drizzle
12	Rain
13	Rain, heavy
14	Squally
15	Frozen Precipitation

Table 8. Tidal Stage **(TIDE)**. This code describes the tidal state during the sampling period. If these data are collected, they are located in the EVENT DATA FILE. The possible values for this field are given below.

' '	Not recorded/not applicable
E	Ebb tide (stage of water movement from a higher to a lower level)
F	Flood tide (stage of water movement from a lower to higher level)
L	Low slack tide (stage of water where the level is below mean and velocity approaches zero)
H	High slack tide (stage of water where the level is above mean and velocity approaches zero)

Table 9. Wave Height **(WAVHGT)**. This code describes the height of the wave during a sampling period. If these data are collected, they are located in the EVENT DATA FILE. Possible values for this field are given below:

' '	Not Recorded
0	0 to 0.1 Meters - Calm
1	0.1 to 0.3 Meters
2	0.3 to 0.6 Meters
3	0.6 to 1.0 Meters
4	1.0 to 1.3 Meters
5	GT 1.3 Meters

Table 10. Wind Direction **(WINDIR)**. This code describes the predominant direction of the wind. If these data are collected, they are located in the EVENT DATA FILE. Possible values for this field are given below:

' '	Not Recorded
N	0 degrees, winds from the NORTH
NNE	22.5 degrees, winds from the NORTH NORTHEAST
NE	45 degrees, winds from the NORTHEAST
ENE	67.5 degrees, winds from the EAST NORTHEAST
E	90 degrees, winds from the EAST
ESE	112.5 degrees, winds from the EAST SOUTHEAST
SE	135 degrees, winds from the SOUTHEAST
SSE	157.5 degrees, winds from the SOUTH SOUTHEAST
S	180 degrees, winds from the SOUTH
SSW	202.5 degrees, winds from the SOUTH SOUTHWEST
SW	225 degrees, winds from the SOUTHWEST
WSW	247.5 degrees, winds from the WEST SOUTHWEST
W	270 degrees, winds from the WEST
WNW	292.5 degrees, winds from the WEST NORTHWEST
NW	315 degrees, winds from the NORTHWEST
NNW	337.5 degrees, winds from the NORTH NORTHWEST

Table 11. Wind Speed **(WINDSPD)**. This code describes the predominant speed of the wind during a sampling period. If these data are collected, they are located in the EVENT DATA FILE. Possible values for this field are given below.

' '	Not Recorded
0	0 knots to 1 knot - Calm
1	greater than 1 knot to 10 knots
2	greater than 10 knots to 20 knots
3	greater than 20 knots to 30 knots
4	greater than 30 knots to 40 knots
5	greater than 40 knots

Table 12. Site Selection Type **(SITETYPE)**. This code tells the user how a sampling site was selected.

F	Fixed Location Sampling Site
M	Randomly selected site within Chesapeake Bay mainstem
R	Randomly selected site within a habitat strata

Table 13. Salinity Zone **(SALZONE)**. Salinity zone layer code. If these data are collected, they are located in the EVENT DATA FILE.

F	Freshwater less than 0.5 ppt
O	Oligohaline 0.5 - 5.0 ppt
M	Mesohaline 5.0 - 18.0 ppt
P	Polyhaline 18.0 - 32.0 ppt
N	Not Recorded

Table 14. Sample Collection Type **(COLTYPE)**. Sample collection method code.

C	Composite
D	Discrete

Table 15. Sample Layer **(LAYER)**. This code is used to describe the water layer being sampled.

S	Surface
M	Middle
B	Bottom
SE	Sediment
SW	Sediment/water interface (0 - 1cm)
AP	Above pycnocline
BP	Below pycnocline
AT	Above thermocline
BT	Below thermocline
AE	Above euphotic zone
BE	Below euphotic zone
MI	Microlayer
WC	Whole Water column

Table 16. Sampling Gear **(GMETHOD)**. Sampling gear collection code.

1	Hand Collection
2	Dredge
3	Artificial Substrate (Unspecified)
4	Diatometer Slides
5	Clarke-Bumpus Sampler
6	Plankton Trap (Unspecified)
7	Plankton Pump (Unspecified)
8	Plankton Net (Unspecified)
9	Plankton Net (500 micron mesh)
10	Plankton Net (No. 20 size - 80 micron mesh
11	Plankton Net (10 micron mesh)
12	Beam plankton line
13	Anchor dredge
14	Hydraulic grab (1200 square centimeters)
15	Hand core (45 square centimeters)
16	Post-hole digger (25 square centimeters)
17	Ponar grab (200 square centimeters)
18	Ponar grab (1000 square centimeters)
19	Ponar grab (50 square centimeters, .05 m**2)
20	Box corer grab (unspecified)
21	Van veen grab (.07 m**2)
22	Shipek grab (.04 m**2)
23	Seine haul (unspecified)
24	Smith-Macintire grab (1000 square centimeters)
25	Seine net (15ft, 1/8 inch stretch mesh)
26	Seine net (50ft, 1/2 inch stretch mesh)
27	Seine net (50ft, 1/4 inch stretch mesh)
28	Seine net (200ft, 1/2 inch stretch mesh - net 200 x 20)
29	Seine net (10ft, 1/4 inch stretch mesh - net 10 x 4)
30	Trawl (unspecified)
31	Trawl - 6ft otter trawl, 1 inch stretch mesh with 1/2 inch cod end inner liner.
32	Trawl - 25ft otter trawl, 1 1/4 inch stretch mesh with 1/2 inch cod end inner liner.
33	Trawl - 15ft semi-balloon
34	2 mm mesh 1 square meter tucker trawl
35	
36	Otter trawl - 16ft, 1/2 inch mesh (semi-balloon)
37	Trawl - 10ft otter trawl, 1/4 inch (6.4 mm) mesh with 500 um cod end liner
38	Trawl - 5ft midwater trawl, 1/4 inch (6.4 mm) mesh with 500 um cod end liner
39	Reserved for trawl sample
40	Trap net - 3ft x 6ft, 1/2 inch mesh, 50ft lead
42	Eckman dredge
43	Cage
44	Catfish trap
45	Crayfish trap
46	Crab trap
47	Animal trap
48	Hook and line fishing
49	Dip net
50	Diver
54	Pound net
55	Epifauna panels
56	Reserved
57	Reserved
58	Reserved

59	Reserved
60	Endico current meter
61	Branco current meter
62	Sediment trap array (6 3" X 30" cups, W.R.Boynton, CBL)
63	
64	Bongo net (unspecified)
65	Purse seine
66	Fyke and hoop net
67	Pots
68	Box trap
69	Push net
70	Great Lakes shoal 1-2 inch
71	Great Lakes shoal 2-4 inch
72	Great lakes shoal 4-7 inch
73	Great lakes shoal 7-14 inch
74	Beam Trawl
75	Bongo net 202um mesh, 20 cm diameter opening
76	Bongo net 202um mesh, 50 cm diameter opening
77	Reserved
78	Slat trap
79	Reserved
80	Gill nets
81	0.06 meter squared spade box core
82	Reserved
83	Reserved
84	Reserved
85	Midwater trawl (unspecified)
86	Drift gill net brails
87	Drift gill net flop
88	Drift gill net jugs
89	Electrofishing
90	Shore
91	Pick
92	Drift gill net (unspecified)
93	Set gill net
94	Bottom trawl (unspecified)
95	Fish house
96	Hydraulic Van Veen grab (1 square meter)
97	Young modified Van Veen grab (.1 square meter)
98	Petite Ponar grab (25 square centimeters, .025 m**2)

Table 17. NOAA Species Code (**NODCCODE**). Reference the NOAA-NODC taxonomic code version 7.0 released in January 1995. For the user's convenience, a subset of that code is provided in here. The complete listing of currently recognized Chesapeake Bay basin species may be found in file LRDISK:[LR.PUBLIC] NODCCODE.TXT or in the document *A Comprehensive List of Chesapeake Bay Basin Species, 1996.* NODC code tables are subject to revision on a semi annual basis. Please check the R_DATE or version date of the species list to be sure you have the most current data set.

NODC TAXONOMIC CODE	LATIN NAME	COMMON NAME
8803020101	ABLENNES HIANS	FLAT NEEDLEFISH
8835160101	ACANTHARCHUS POMOTIS	MUD SUNFISH
3258090112	ACER SACCHARINUM	SILVER MAPLE
8729010104	ACIPENSER BREVIROSTRUM	SHORTNOSE STURGEON
1608020501	AGARDHIELLA TENERA	TAPERED RED WEED
9158320401	AGELAIUS PHOENICEUS	RED-WINGED BLACKBIRD
9112011002	AIX GALERICULATA	MANDARIN DUCK
9112011001	AIX SPONSA	WOOD DUCK
8747010103	ALOSA MEDIOCRIS	HICKORY SHAD
8747010105	ALOSA PSEUDOHARENGUS	ALEWIFE
8747010101	ALOSA SAPIDISSIMA	AMERICAN SHAD
6179140102	ALPHEUS NORMANNI	GREEN SNAPPING SHRIMP
8845010102	AMMODYTES AMERICANUS	AMERICAN SAND LANCE
9112010903	ANAS RUBRIPES	AMERICAN BLACK DUCK
6188030107	CANCER BOREALIS	JONAH CRAB
8835020301	CENTROPRISTIS STRIATA	BLACK SEA BASS
0902010103	CHARA BRAUNII	MUSKGRASS
874701020102	CLUPEA HARENGUS HARENGUS	ATLANTIC HERRING
5123030101	ELYSIA CATULUS	KITTY-CAT SEA SLUG
6118200201	EURYTEMORA AFFINIS	CALANOID COPEPOD
8850030102	EUTHYNNUS ALLETTERATUS	LITTLE TUNNY
3703180304	HYDRACTINIA ECHINATA	SNAIL FUR
3305010901	HYDRILLA VERTICILLATA	HYDRILLA
9128020108	LARUS ARGENTATUS	HERRING GULL
9002040401	LEPIDOCHELYS KEMPI	KEMP'S RIDLEY TURTLE
6169060701	LEPTOCHEIRUS PLUMULOSUS	COMMON BURROWER AMPHIPOD
9002030301	MALACLEMYS TERRAPIN	DIAMONDBACK TERRAPIN
330605010603	POTAMOGETON PERFOLIATUS BUPLEUROIDES	REDHEAD GRASS

Table 18. Life Stage **(LIFE_STG)**. Life stage code for biological monitoring of fish and zooplankton.

' '	= Adult
00	= Egg (viable; for non-viable eggs use '90')
01	= Yolk Sac
02	= Fin fold
03	= Post fin fold (full development of second dorsal fin)
04	= Young of the year -- year class 0
05	= Specimens in year class 1 or older
06	= Juveniles and adults
07	= Larvae, juveniles and adults
08	= Larvae and juveniles
09	= Reserved for future use
10	= Nauplii or copepodites
11	= Nauplii
12	= Copepodite
13	= Orthonauplii stage 1-3
14	= Metanauplii stage 4-6
15	= Copepodite stage 1-3
16	= Copepodite stage 4-6
17	= Cypris Larvae
18	= Reserved
19	= Copepod eggs
20	= Nymph
21	= Pupae
22	= Pharate
23	= Instar
24	= Naiad
25	= Reserved
26	= Reserved
27	= Reserved
28	= Reserved
29	= Reserved
30	= Prezoea
31	= Zoea
32	= Metazoea
33	= Megalops
34	= Reserved
35	= Reserved
36	= Reserved
37	= Reserved
38	= Reserved
39	= Reserved
40	= Nauplii stage 1
41	= Nauplii stage 2
42	= Nauplii stage 3
43	= Nauplii stage 4
44	= Nauplii stage 5
45	= Nauplii stage 6
46	= Copepodite stage 1
47	= Copepodite stage 2
48	= Copepodite stage 3
49	= Copepodite stage 4
50	= Copepodite stage 5
51	= Copepodite stage 6
80	= Molted
81	= Unmolted
90	= Egg, non-viable
91	= Subadult
92	= Post larvae
93	= Juvenile
94	= Taxon with count stored as volume in milliliters
95	= Mature
96	= Immature
97	= Larvae
98	= Adult (mature)

Table 19. Gonad Index for bivalve populations **(GONAD_I)**. These codes were used to ensure that non-spawning bivalve organisms are being collected for use in lipophilic organic contaminant analyses (Batelle Ocean Sciences). These codes are not reported in current Living Resources data sets but are used in other CBP monitoring data sets. They are included here for the convience of the data user. The valid entries for this field are as follows:

GONAD_I = $\frac{\text{(\#Organisms in each stage x numerical ranking of each stage)}}{\text{Total \# of Organisms in Sample}}$

Stage 0 = Resting or spent gonad - inactive or neuter including virgin.

Stage 1 = Developing gonad - gametogenesis has begun although no ripe gametes are visible
or
= Spawning gonad - only residual gametes remain with some cytolysis.

Stage 2 = Developing gonad - ripe gametes with gonad one-third of final size
or
= Spawning gonad - gonad reduction with follicles about one-third full of ripe gametes.

Stage 3 = Developing gonad - equal portions of ripe and developing gametes with gonad one- half of final size
or
= Spawning gonad - gonad is half empty.

Stage 4 = Developing gonad - gametogenesis progressing, follicles contain mainly ripe gametes
or
= Spawning gonad - active emission has begun

Stage 5 = Ripe gonad - distended follicles with ripe gametes.

Table 20. Biomass Measurement Type **(AEAFDW)**. Biomass measurement type code.

A = Actual Measurement of Ash Free Dry Weight
E = Estimated Ash Free Dry Weight

Table 21. Analytical Method Codes **(associated with multiple field names, e.g. CHL_F_M, C14_M)**. This alpha-numeric code which refers to a method of analysis is described in detail in CHESSEE. This table currently defines the methods for each parameter in the monitoring data dictionary which are used by the data collection institutions of the Chesapeake Bay Program. Codes relevant to living resources and biological data are as follows:

ALK101	NO2101	PON101	TKNWF01
ALK102	NO2102	PON102	TKNWF02
ALKF01	NO2103	PON103	TKNWF03
ALKF02	NO23101	PONF01	TKNWF04
BOD5101	NO23102	SALINF01	TKNWF05
BOD5F01	NO2F01	SECCHIF01	TN101
C14101	NO2F02	SI101	TN102
CHLA101	NO2F03	SI102	TN103
CHLA102	NO2F04	SI103	TOC101
CHLA103	NO2F05	SI104	TOC102
CHLAF01	NO3101	SI105	TOCF01
CHLAF02	NO3102	SIF01	TOCF02
CHLAF03	NO3103	SIF02	TOCF03
CHLAF04	NO3104	SIF03	TOCF04
CHLAF05	NO3105	SIF04	TOCF05
CHLAF06	NO3F01	SIF05	TP101
CHLAF07	NO3F02	SOE101	TP102
CHLAF08	NO3F03	TCOLI101	TP103
CONDF01	NO3F04	TCOLIF01	TP104
DIN101	NO3F05	TCOLIF02	TP105
DIN102	NO3F06	TCOLIF03	TP106
DISOXY101	PHEA101	TDN101	TPF01
DISOXYF01	PHEA102	TDN102	TPF02
DISOXYF02	PHEAF01	TDN103	TPF03
DOC101	PHEAF02	TDNF01	TPF04
DOC102	PHEAF03	TDP101	TPF05
DOCF01	PHEAF04	TDP102	TPF06
DOCF02	PHEAF05	TDP103	TPF07
DOCF03	PHEAF06	TDP104	TSS101
DOCF04	PHEAF07	TDPF01	TSSF01
DON101	PHEAF08	TDPF02	TSSF02
DON102	PHF01	TDPF03	TSSF03
DOP101	PHF02	TDPF04	TSSF04
FCOLI101	PHOSP101	TDPF05	TSSF05
FCOLI102	PHOSP102	TDPF06	TSSF06
FCOLIF01	PO4F101	TDPF07	TVS101
FCOLIF02	PO4F102	TKNF101	WTEMPF01
FSS101	PO4F103	TKNF102	
FSSF01	PO4F104	TKNF103	
NH4101	PO4FF01	TKNF104	
NH4102	PO4FF02	TKNFF01	
NH4103	PO4FF03	TKNFF02	
NH4104	PO4FF04	TKNFF03	
NH4F01	PO4FF05	TKNFF04	
NH4F02	PO4FF06	TKNFF05	
NH4F03	PO4FF07	TKNFF06	
NH4F04	POC101	TKNW101	
NH4F05	POC102	TKNW102	
NH4F06	POC103	TKNW103	
NH4F07	POCF01	TKNW104	

Table 22. Analytical Instrument Codes **(INS_CODE)**. Instrument method codes.

AACHE	Atomic Absorption, Chelation Extraction Technique
AACV	Atomic Absorption, Cold Vapor Technique
AAFLAM	Atomic Absorption, Direct Aspiration Technique
AAGF	Atomic Absorption, Graphite Furnace Technique
AAHYD	Atomic Absorption, Gaseous Hydride Technique
AE	Atomic Emission
AF	Atomic Fluorescence
AMSCTD	Applied Microsystem CTD.
AUTOA	Auto-Analyzer (e.g., Technicon)
BECKRS-5	Beckman RS-5 Salinometer.
COLOR	Ultraviolet/Visible Spectrophotometer
CTD	In-situ probe (Field)
FLUOR	Fluorometer
GC/ECD	Gas Chromatograph with Electron Capture Detection
GC/FID	Gas Chromatograph with Flame Ionization Detection
GC/EC	Gas Chromatograph with Electron Capture Detection
GC/MS	Gas Chromatograph with Mass Spectrophotometer
GC/HECD	Gas Chromatograph with Hall Electrolyte Conduction
GC	Gas Chromatograph
GC/PID	Gas Chromatograph with Photo ionization Detection
GRAV	Gravimetric
HACH16300	Hach Portable cond. meter, Model 16300-00.
HL60	Hydrolab Model 60.
HL8000	Hydrolab 8000.
HLS4000	Hydrolab 4000.
HLSII	Hydrolab. (Hydrolab 4000 or Surveyor II)
HPLC/FL	High Performance Liquid Chromatograph/Fluorescence
HPLC/EC	High Performance Liquid Chromatograph/Electrochemical
HPLC/UV	High Performance Liquid Chromatograph/Ultraviolet
HSSVR2	Hydrolab SVR2-SU.
IC	Ion Chromatograph
ICP/MS	Inductively Coupled Plasma/Mass Spectrophotometer
ICP	Inductively Coupled Plasma Atomic Emission Spec.
IR	Infrared Detection
ISE	Ion Selective Electrode
KITS	Field Kits (e.g., Hach or CHEMetrics' or PCB comm. field kits)
PHMETER	PH Meter
POA/FID	Portable Organic Analyzer, Flame Ionization (e.g., Foxboro OVA)
POA/PID	Portable Organic Analyzer, Photo ionization (e.g., HNU, Photovac)
SCINT	Scintillation Counter
TEM	Transmission Electron Microscope
THERMO	Thermometer
TITRA	Titration
UNLISTED	Instrument not listed
WET	Analysis by Classical Wet Method
XRF/F	X-Ray Fluorescence, Field Portable or Transportable
XRF/L	X-Ray Fluorescence, Laboratory Scale Model
YSI33	YSI 33 S-C-T (back up).
YSI54	YSI Model 54.
YSI57	YSI Model 57
YSI59	YSI Model 54.
YSI85	YSI Model 58.
YSIS4	YSI S4ARC.

Table 23. Reported Units **(UNITS)**. This parameter describes the units in which a substance is measured. Some of the possible values for this field are as follows:

%	=	Parts per hundred; percent
absorbance	=	Spectrometer absorbance
cm	=	Centimeters
cpm	=	Counts per minute
cfs	=	Cubic feet per second
Deg C	=	Degrees Celsius
g	=	Grams
g/m**2/day	=	Grams per square meter per day
g/m**2/yr	=	Grams per square meter per year
l	=	Liters
m	=	Meters
mg	=	Milligrams
mg/kg	=	Milligrams per kilogram (ppm)
mg/l	=	Milligrams per liter (ppm)
mg/m**2	=	Milligrams per square meter
mg/m**2/day	=	Milligrams per square meter per day
mg/m**3	=	Milligrams per cubic meter
mg/sample	=	Milligrams per sample
ml	=	Milliliters
mm	=	Millimeters
MPN/100ml	=	Most Probable Number (Coliform)
mV	=	Millivolts
ng/l	=	Nanograms per liter
number/m**2	=	Number per square meter
number/m**3	=	Number per cubic meter
NTU	=	Nephelometric Turbidity Units
pCi/kg wet	=	Picocuries per kilogram
pCi/liter	=	Picocuries per liter
phi	=	Sediment particle size
ppb	=	Parts per billion
ppm	=	Parts per million
ppt	=	Parts per thousand (0/00)
pptr	=	Parts per trillion
su	=	Standard units
ug/g	=	Micrograms per gram
ug/kg	=	Micrograms per kilogram (ppb)
ug/l	=	Micrograms per liter (ppb)
um/cm	=	Micro mhos per centimeter

Table 24. Replicate Type **(REP_TYPE)**. This character code identifies sample types, and kinds and levels of sample replication. It is usually used in conjunction with REP_NUM. The current valid entries are as follows:

CTRL	=	Control sample
FLD	=	Field replicate
LAB	=	Laboratory replicate
FL	=	Field and laboratory replicates in data set
METH	=	Method comparison
SPK	=	Spike sample
SPLT	=	Field split

Table 25. Sampling Media Type. These codes are not reported in current Living Resources data sets but are used in other CBP Monitoring data sets. They are included here for the convience of the data user. The valid entries for this field are as follows:

MICROL	=	Microlayer (0 - .5cm)
WATCOL	=	Water column
SEDSAM	=	Sediment sample (other than core)
SEDCOR	=	Sediment core
SEDH2O	=	Core head water
SEDTRP	=	Sediment trap
SEDWAT	=	Sediment/water interface
WATINT	=	Interstitial water

Table 26. Sediment bottom codes **(BOTTYPE1, BOTTYPE2)**. These codes are not reported in current Living Resources data sets but are used in other CBP Monitoring data sets. They are included here for the convience of the data user. The valid entries for this field are as follows:

CL	=	Clay
GR	=	Gravel
MD	=	Mud
RK	=	Rocks
SN	=	Sand
SH	=	Shell
SL	=	Silt
RB	=	Rubble
UN	=	Unknown

Table 27. Detection Limit Codes **(associated with multiple field names, e.g. CHL_F_D, C14_D)**. This one-character code indicates when the value of the parameter is outside the detection limits of the method being used. The valid entries for this field are as follows:

<	=	Less than the detection limit of the method
' '	=	Not recorded/not applicable/parameter value acceptable
#	=	Trace (less than an unknown detectable value)
J	=	Estimated value
N	=	Not detected
>0	=	Greater than zero

Table 28. Analysis Problem Code. This letter code describes the problem associated with a questionable parameter value. These codes are not reported in current Living Resources data sets but are used in other CBP Monitoring data sets. They are included here for the convience of the data user. The valid entries for this field are as follows:

A	=	Laboratory accident
B	=	Interference
C	=	Mechanical/materials failure
D	=	Insufficient sample
E	=	Sample received too late
F	=	Sample too old when received
H	=	Analysis run by another lab

J = Wrong type sample (e.g., filtered sample requesting TSS)
K = Sample frozen when received (results questionable)
M = Sample received warm
N = Sample lost
P = Lost results
R = Sample contaminated
S = Sample container broken during analysis
T = No phaeophytin in sample
U = Matrix problem which is the result of the interrelationship between variables such as pH and ammonia
V = Sample results rejected due to QA/QC criteria
W = Duplicate results for all parameters
X = Sample not preserved properly
Y = Analyzed in duplicate, results below detection limit
Z = Analyzed by method of standard additions
AA = Sample thawed when received
BB = Torn filter pad
CC = Pad unfolded in foil pouch
DD = Assumed sample size (sample size not reported)
EE = Foil pouch very wet when received from field, therefore poor replication between pads, mean reported
FF = Poor replication between pads, mean reported
GG = Sample received after holding time, therefore results are questionable
HH = Sample not taken
JJ = Amount filtered not recorded (therefore calculation could not be done)
KK = Parameter test not required for study
LL = Mislabeled
MM = Over 20% of sample adhered to pouch and outside of pad
NN = Particulates found in filtered sample
PP = Assumed sample volume (pouch volume differs from data sheet volume pouch volume used)
QQ = Although value exceeds a theoretically equivalent or greater value (e.g., PO4F>TDP), the excess is within precision of analytical techniques and therefore not statistically significant.
RR = No sample received

Table 29. Agency Species Codes **(SPECCODE)**. Many of the agencies reporting data containing species information have developed their own inhouse species codes. All of these codes are found in the SPECCODE column of a given data type. Codes will vary by agency and data type. The agency code column in most cases has been given the agency name code in the data documentation. The valid alternate field names for SPECCODE are as follows:

ANSCODE = Academy of Natural Sciences, Benidict Estuarine Reseach Laboratory
VERCODE = Versar Incorporated- Maryland Power Plant Siting Codes
ODUCODE = Old Dominion University Species Code
VIMSCODE = Virginia Institute of Marine Sciences Species Codes

APPENDIX D

CHESAPEAKE BAY PROGRAM DATA REQUEST FORM

September 1996

Individuals without user accounts on CHESIE, users wishing to obtain SAS conversion scripts or users wishing to obtain the data files in dBASE (.dbf) format can request data sets directly from the Biological Monitoring Data Manager. All requests must be made in writing. A data request form is provided in this Appendix and can be sent to:

Ms. Jacqueline Johnson
Biological Monitoring Data Manager
Chesapeake Bay Program Data Center
410 Severn Avenue, Suite 109
Annapolis, MD 21403
Phone (local): 410-267-5729
Phone (long distance): 800-968-7229, ext. 729
FAX: 410-267-5777
E-mail: JJOHNSON@CHESIE.ANN.EPA.GOV

The data form may be copied. Please request only one data set per form. Requests for data other than living resources data may be made on this form but should be mailed to the Chesapeake Bay Program Data Center Manager:

Mr. Lowell Bahner
Data Center Manager
Chesapeake Bay Program Data Center
410 Severn Avenue, Suite 109
Annapolis, MD 21403
Phone (long distance): 1-800-968-7229, ext. 671
FAX: 410-267-5777
E-mail: LBAHNER@CHESIE.ANN.EPA.GOV

CHESAPEAKE BAY PROGRAM

CHESAPEAKE BAY PROGRAM OFFICE
410 Severn Avenue, Suite 109
Annapolis, MD 21403
(410) 267-5700 or 1 800 YOUR BAY
FAX- 410-267-5777

DATA ACCESS FORM

DATE REQUESTED:_____

SUBMITTED BY:_____

REQUESTED FOR :_____

ORGANIZATION: _____

CHESAPEAKE BAY PROGRAM SUB-COMMITTEE AFFILIATION:_____

ADDRESS:_____

_____

_____

PHONE: _(_____)_____ EXT. _____

INTERNET ADDRESS:_____

DESCRIPTION OF DATA AND ADDITIONAL DOCUMENTATION REQUESTED

_____

_____

INTENDED DATA USAGE:

_____

_____

FORMAT OF DATA TO BE RELEASED
POINT DATA FORMATS (CHECK ALL APPROPRIATE):

3 1/4" DISK_____ FTP_____ pkzip_____ mime compression_____

COMMA DELIMITED ASCII_____ TAB DELIMITED ASCII_____ DBF_____

GIS FORMATS (CHECK ALL APPROPRIATE):

COVERAGE _____ ARC/INFO EXPORT_____ UNIX TAR _____ 8 MM TAPE_____

GZIP_____ UNIX COMPRESSION_____ FTP_____ 0 150MB QIC TAPE _____

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.

SIGNATURE OF DATA REQUESTOR:_____
NO DATA REQUEST WILL BE HONORED WITH OUT SIGNATURE

**********FOR BAY PROGRAM USE ONLY**********

DATA PREPARED AND PROCESSED BY:_____ DATE DATA RELEASED FROM CBP_____ RELEASE AUTHORIZATION YES/NO DATE_____

APPENDIX E

DATA ACQUISITION PRIORITIES

September 1996

In 1995, the Living Resources/Monitoring Workgroup prioritized the *categories* of biological monitoring data believed to be critically important to CBP activities (Table 1). The workgroup recommended that key data sets in these categories be made available from the CBP Data Center. Living Resources Subcommittee staff are using this prioritized list of data categories as a guide for obtaining living resources and biological monitoring data for the Data Center. The list was updated at the January 16, 1996 Living Resources Subcommittee meeting.

Table 1. Categories of biological monitoring data which the Living Resources/Monitoring Workgroup recommends should be available from the CBP Data Center. This table reflects changes made at the January 16, 1996 Living Resources Subcommittee meeting.

High Priority Data Sets:

Phytoplankton[1]
Zooplankton[1]
Benthos[1]
Seine Surveys - MD, VA, DC[2]
Trawl Surveys - MD, VA, DC[2]
Fish Passage[2]
Blue crab surveys[2]
Oyster surveys[2]
Water bird concentrations and distributions[2]
SAV[3]

Medium Priority Data Sets:

Light (Photosynthetically Active Radiation [PAR], possibly PAR at depth)
Stream surveys[2]
RMAP[2]

[1] Data sets which have been restructured (relational database with standard CBP field names), QA/QC, documented and are presently available on CHESIE at the CBP Data Center. These monitoring data are sponsored or matched by the Chesapeake Bay Program and as such are required to be available at the Data Center in a standardized, relational database structure.

[2] The Living Resources Monitoring Workgroup tentatively agreed that construction of relational databases for the basin's diverse biological data sets was worth the additional effort. Numerous problems were foreseen in trying to provide common fields for, for example, organisms sampled at different times although possible solutions to the problems were also discussed. The Biological Monitoring Data Manager will be trying in the next year to put data for fish surveys and water bird concentrations and distributions in a relational database system. Her success or failure will help the workgroup decide if this is a reasonable goal.

[3] SAV data and documentation are generated and managed by the Virginia Institute of Marine Sciences(VIMS). Data is maintained as Geographic Information System (GIS) data layers and are available on VIMS Internet Home Page Pointers on the CBP Home Page are available to direct users to the VIMS Home Page for the SAV data

Background

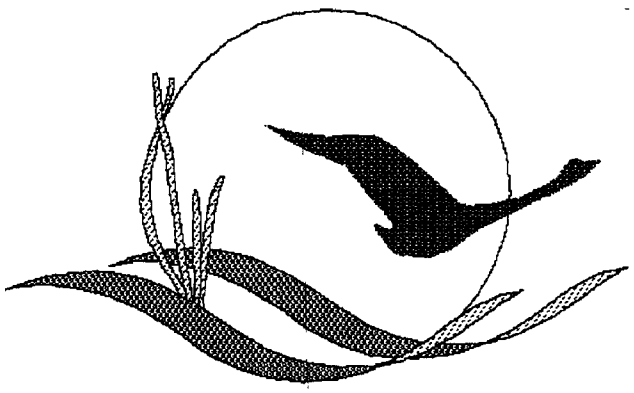
This document is one of several CBP products designed to implement the management goals set forth in the Living Resources Monitoring Plan (Chesapeake Bay Program Agreement Commitment Report, July 1988) and adopted by the Executive Council. As called for in the 1987 Chesapeake Bay Agreement, the Plan provides a framework for a bay-wide, core living resources monitoring program based on existing programs. The Plan was viewed as one step towards the goal of full integration of living resources, habitat and water quality monitoring.

The Plan specifically charges the CBP with instituting a data management and reporting system for the core living resources monitoring program. The system would build on the facilities of the existing CBP Computer Center and ultimately provide:

- *a large quantity of consistent data of known quality, in standardized formats and structures;*
- *ready access to the data for analytical and reporting purposes; and*
- *thorough data documentation.*

The Plan recognized that monitoring programs cannot achieve their ultimate goals of providing information to the Bay community and serving the restoration and management of the Bay if their data are inaccessible, poorly managed, inadequately documented, or not analyzed or reported in a timely manner.

In response to the charge, and to a restructuring of the Computer Center in 1993, the Living Resources Subcommittee hired three staff to continue implementing a data management and reporting system for biological and living resources monitoring data. These staff are responsible for a) creating, maintaining and updating key databases and GIS coverages, b) facilitating use of the databases and coverages, and c) providing data analysis support to the Living Resources Subcommittee and other CBP participants. Contact the Living Resources Subcommittee Coordinator (Carin Bisland) at 1-800-YOURBAY for more information.



U.S. Environmental Protection Agency
Chesapeake Bay Program Office
410 Severn Avenue
Annapolis, MD 21403
1-800-YOUR BAY
http://www.epa.gov/r3chespk/