MARYLAND CHESAPEAKE BAY PROGRAM MESOZOOPLANKTON MONITORING SURVEYS DATA DICTIONARY

Maryland Chesapeake Bay Water Quality Monitoring Program: Mesozooplankton Component
- Taxonomic Data Dictionary
- Biomass And Biovolume Data Dictionary
- Event Data Dictionary

NOTES:
1) THIS PROGRAM WAS TERMINATED AS OF 31 DECEMBER 2002
2) THIS DICTIONARY WAS REVISED ON 31 JANUARY 2007 AND SUPERSEDES ALL OTHER DICTIONARIES FOR THE MARYLAND MESOZOOPLANKTON DATA

The state of Maryland, in cooperation with the US EPA Chesapeake Bay Program, has monitored mesozooplankton species abundance, species composition, biomass and biovolume in the Maryland Chesapeake Bay mainstem and tributaries since August 1984. The program is designed to give comprehensive spatial and temporal information on mesozooplankton, i.e. zooplankton retained by 202-micrometer mesh plankton net excluding rotifers and copepod nauplii. The program also provides counts and biovolumes of Cnidaria (jellyfish) and Ctenophora (comb jellies) when they are present in the plankton. Sampling is performed in conjunction with the Maryland C14 primary production, fluorometry, phytoplankton, microzooplankton, jellyfish and water quality monitoring programs.

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

PROJECT TITLE
Maryland Chesapeake Bay Water Quality Monitoring Program: Mesozooplankton Component

CURRENT PRINCIPAL INVESTIGATORS

THIS PROGRAM WAS TERMINATED AS OF 31 DECEMBER 2002; THE FOLLOWING WERE THE INVESTIGATOR AND PROJECT MANAGERS AT TIME OF PROJECT TERMINATION.

>PROGRAM MANAGER: Bruce Michaels, Renee Karrh, Maryland Department of Natural Resources
>PRINCIPAL INVESTIGATORS: William Burton and Kris Sillet, Versar, Inc.
>TECHNICAL STAFF: Data collected and counts performed by the staff of Versar, Inc.
>STATISTICIAN: Jodi Dew, Versar Inc.
>PROGRAMMER/ANALYST: Jodi Dew- Versar, Inc.
>DATA COORDINATOR: Kris Sillet and Craig Bruce- Versar, Inc.
>PREVIOUS PRINCIPAL INVESTIGATORS: Fred Jacob and John Siebel, AKRF, Inc.;

CURRENT FUNDING AGENCIES
Not Applicable

PROJECT COST
Not Applicable

CURRENT QA/QC OFFICER
Not Applicable

POINT OF CONTACT FOR INQUIRIES
Jacqueline M. Johnson
Living Resources Data Manager
US EPA Chesapeake Bay Program Office
410 Severn Avenue, Suite 109
Annapolis, MD 21403
1-800-968-7229 x729
1-410-267-5729
EMAIL JJOHNSON@CHESAPEAKEBAY.NET

LOCATION OF STUDY
Chesapeake Bay and Tidal Tributaries in the state of Maryland

DATE INTERVALS
19840801 - 20021031

ABSTRACT
The overall mesozooplankton monitoring program is designed to detect and monitor changes in mesozooplankton and jellyfish abundance, species composition, biomass and biovolume in relation to changing water quality conditions in the Chesapeake Bay. Mesozooplankton are a critical link between primary producers and higher trophic levels in the bay. Samples are collected in conjunction with the Maryland Chesapeake Bay phytoplankton, C14 primary productivity, fluorometry, and microzooplankton and water quality studies. Two stepped oblique tows with paired bongo nets are taken at each station through the entire water column. One of the nets is used for taxonomic purposes (counting), the other for biomass measurements. Samples were collected at 16 stations once a month from August 1984 to June 1986. Sampling at stations ET4.2 and EE3.1 was discontinued after June 1986. In 1992, the program was changed so that mesozooplankton samples would no longer be collected during January and February, but would be collected twice during May in anadromous fish spawning habitats (white perch and striped bass). The stations included in the second May sampling are CB1.1, CB2.2, TF2.3, RET2.2, ET5.1, ET5.2, TF1.5, and TF1.7. In 1993, the station CB2.1 in the upper mainstem was added to be sampled during the fish-spawning period April to June (twice in May). In 1996 the sampling design was altered. Historical main bay stations CB1.1 and CB5.2 were dropped. Collections are conducted at main bay station CB2.1 near Turkey Point during the months of April, May, and June to characterize zooplankton during the striped bass spawning and nursery season. In addition, three stations were added to the tributary sampling for the spring anadromous spawning season to increase the program's spatial coverage of the striped bass nursery areas. These additional stations were located between the upper two stations in the Potomac (TF2.4) and Patuxent (TF1.6) and in the upper Choptank River (ET5.0). Samples are collected once a month at 12 regular (non-anadromous spawning stations) from March through October, and once in the month of December. A second series of collections are taken at spawning stations TF1.5, TF1.7, TF2.3, RET2.2, ET5.1, CB2.1, CB2.2, and the three new stations listed above. Replicate samples were still taken in the field, but the collections are composited into one sample for laboratory analysis of species abundance and biomass. Sampling for mesozooplankton at all stations ended in September 2002 due to the termination of the zooplankton portion of the monitoring program in December 2002.

NOTE: biomass samples include nauplii and rotifers caught by the 202-micrometer mesh net. These groups are considered part of the microzooplankton by the Chesapeake Bay Program, but are difficult to remove from the mesozooplankton samples and are therefore included in mesozooplankton biomass measurements.

STATION NAMES AND DESCRIPTIONS
CB1.1 Mouth Of Susquehanna River, Main Bay
CB2.1 Near Turkey Point At The Mouth Of The Elk River, Main Bay
CB2.2 West Of Still Pond Near Buoy R34, Main Bay

CB3.3C	North Of Bay Bridge, Main Bay
CB4.3C	East Of Dares Beach Near Buoy R64, Main Bay
CB5.2	East Of Point No Point, Main Bay
ET4.2	Lower Chester R. South Of Eastern Neck Island At Buoy 9
WT5.1	Patapsco River East Of Hawkins Point At Buoy 5M (Baltimore Harbor)
TF2.3	Mid-Channel Off Indian Head At Buoy N54, Potomac River
TF2.4	East Side Of Potomac River Adjacent To Moss Point Near Buoy 44
RET2.2	Mid-Channel Off Maryland Point At Buoy 19, Potomac River
LE2.2	Off Ragged Point At Buoy BW51B, Potomac River (Prior To April1988, This Station Was Designated XBE9541)
ET5.0	Mid-Channel Of Mouth Of Kings Creek On Choptank River
ET5.1	Upper Choptank River At Ganey's Wharf, Downstream Of Confluence With Tuckahoe Creek
ET5.2	Lower Choptank R. Near Rt. 50 Bridge At Cambridge
EE3.1	North Tangier Sound NW Of Haines Point 1,000 Yds. North Of Buoy R16
TF1.5	Mid-Channel At Nottingham, Patuxent River
TF1.6	Off Lower Marlboro Boat Launch On The Patuxent River
TF1.7	Mid-Channel On A Transect Heading Of Approximately 115 Degrees From Jacks Creek, Patuxent River
LE1.1	Mid-Channel SSW Of Jack Bay Sandspit And NE Of Sand Gates, Patuxent River

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

STATION	LATITUDE	LONGITUDE	TOTAL_DEPTH	LATITUDE (DMS)	LONGITUDE (DMS)
CB1.1	39.54484	-76.0813	6.1	39 32' 41.407"	-77 55' 7.18"
CB2.1	39.44011	-76.0247	6.2	39 26' 24.412"	-77 58' 31.19"
CB2.2	39.34678	-76.1747	12.1	39 20' 48.395"	-77 49' 31.172"
CB3.3C	38.99595	-76.3597	23.7	38 59' 45.403"	-77 38' 25.154"
CB4.3C	38.55651	-76.4347	26.7	38 33' 23.437"	-77 33' 55.176"
CB5.2	38.13679	-76.228	30.1	38 8' 12.448"	-77 46' 19.206"
EE3.1	38.20012	-75.9747	13.7	38 12' 0.443"	-76 1' 31.237"
ET4.2	38.99178	-76.2163	14.6	38 59' 30.404"	-77 47' 1.172"
ET5.0A	38.46522	-75.5809	13.5	38 27' 54.778"	-76 25' 8.59"
ET5.1	38.80706	-75.9119	5.3	38 48' 25.411"	-76 5' 17.229"
ET5.2	38.58012	-76.058	12.3	38 34' 48.426"	-77 56' 31.217"
LE1.1	38.42512	-76.6016	12.0	38 25' 30.447"	-77 23' 54.15"
LE2.2	38.16679	-76.583	11.0	38 10' 0.461"	-77 25' 1.153"
RET2.2	38.35207	-77.2044	9.5	38 21' 7.452"	-78 47' 44.077"
TF1.5	38.71012	-76.7014	10.3	38 42' 36.421"	-77 17' 55.125"
TF1.6	38.6579	-76.6844	3.0	38 39' 28.427"	-77 18' 56.13"
TF1.7	38.58179	-76.6802	2.3	38 34' 54.434"	-77 19' 11.134"
TF2.3	38.60817	-77.1739	12.7	38 36' 29.426"	-78 49' 34.073"
TF2.4	38.52984	-77.2653	9.0	38 31' 47.435"	-78 44' 5.068"
WT5.1	39.20844	-76.5247	15.7	39 12' 30.39"	-77 28' 31.134"

Station depth is based on a ten-year (1984-1994) average of Maryland Department of the Environment Water Quality Hydrographic data collected concurrently with the plankton samples.

METHODOLOGY DESCRIBING CHAIN OF CUSTODY FOR LAB SAMPLES

Upon completion of field sampling, mesozooplankton collections are inspected for proper labeling and logged into a master control notebook. Taxonomic samples are stored on shelves in the lab by sample date until processing. After processing, samples are boxed and labeled by date and moved to storage areas at Versar, Inc. Biomass samples are stored in the lab freezer until processing. Biomass samples that contain

detritus are not processed and are disposed of after the final report for the sampling period is completed (the samples are retained as backup for count samples during the storage period). All sample are tracked on an archive log sheet, which is maintained in the project files.

BIOLOGICAL ENUMERATION TECHNIQUES
Chesapeake Bay Program Analytical Method Code-

METHOD	TITLE
BM101	VERSAR MESOZOOPLANKTON BIOMASS- July 1984 to January 1998
BM101B	VERSAR MESOZOOPLANKTON BIOMASS- January 1998 to October 2002
BV101	VERSAR MESOZOOPLANKTON SETTLED VOLUMES
JF101	VERSAR JELLYFISH COUNT METHOD- JULY 1984 TO JULY 1987
JF102	VERSAR JELLYFISH COUNT METHOD- JULY 1987 TO October 2002
MZ101C	VERSAR MESOZOOPLANKTON METHOD- January 1998 to October 2002
MZ101A	VERSAR MESOZOOPLANKTON METHOD- July 1984 to January 1990
MZ101B	VERSAR MESOZOOPLANKTON METHOD- January 1990 to October 2002

>Gelatinous Zooplankton Enumeration

When they occur, Cnidarians (true jellyfish, hydromedusae) and ctenophores (comb-jellies) are removed from the zooplankton samples in the field and their numbers and biovolume (settled volume) measured from the bongo net that was used to collect count samples.

-Chesapeake Bay Program Analytical Method JF101

Prior to July 1987, all gelatinous zooplankton were reported as count and volumes in the two classes- Ctenophores (CTENO, CTENOVOL) [All Beroe, and Mnemiopsis specimens were combined] and Cnidarians (CNIDA, CNIDAVOL) [All Hydrozoas, and true Jellyfish specimens were combined]. All gelatinous zooplankton were removed from samples in the field after sample preservation, and their numbers and settled volumes were recorded from the net that was used as the count sample.

-Chesapeake Bay Program Analytical Method JF102

After July 1987, all gelatinous zooplankton were reported as count and volumes in the four classes -Beroe (BEROE, BEROEVOL), Hydrozoans (HYDRO, HYDROVOL), Mnemiopsis (MNEMIOP, MNEMVOL), and true Jellyfish ((JELLY, JELLYVOL). All gelatinous zooplankton were removed from samples and sorted in the field after sample preservation, their numbers and settled volumes were recorded from the net that was used as the count sample.

>Zooplankton Settled Volume Determinations

-Chesapeake Bay Program Analytical Method BV101

VALUE_TYPE=A or actual

In the laboratory, the mesozooplankton taxonomic (count) samples (i.e. samples from which jellyfish have been removed) are poured into Imhoff cones and left undisturbed for 2 - 4 days as plankton settles to the bottom of the cone. Sample volumes are then either concentrated or diluted to achieve efficient sub sample counts. The volume of the total sample from which sub samples are taken is the dilution volume. Sub samples of mesozooplankton are taken with a Hensen-Stemple pipette and counted under a dissecting microscope.

VALUE_TYPE=E or estimated

In cases where field samples contained large amounts of detritus or algae, the biovolume could not be determined directly. The settled volumes were estimated by regressing total dry weight versus biovolume in detritus free samples.

>Zooplankton Species Composition and Abundance Enumeration

NOTE: CURRENTLY COUNTS USING BOTH METHOD MZ101B AND MZ101C VALUES ARE REPORTED

-Chesapeake Bay Program Analytical Method MZ101A

From July 1984 through January 1990, a hierarchical counting technique was employed to obtain density estimates. This procedure consists of first counting at least 60 individuals of the most dominant forms (e.g. Acartia tonsa) in a small sub sample (usually 1 - 2 milliliters), followed by 5- and 10- milliliter

Sub samples from which all species that had counts less than 60 in the previous sub sample are counted. The entire sample was also scanned under a dissecting microscope and larger macro zooplankton (amphipods, shrimp, fish eggs, fish larvae and juvenile fish, etc.) was counted. Appropriate calculations are made to express counts for each species as numbers per cubic meter of water filtered.

-Chesapeake Bay Program Analytical Method MZ101B
From January 1990 through Present, A hierarchical counting technique is employed to obtain density estimates. This procedure consists of first counting at least 60 individuals of the most dominant forms (e.g. Acartia tonsa) in a small sub sample (usually 1 - 2 milliliters), followed by 5- and 10- milliliter sub samples from which all species that had counts less than 60 in the previous sub sample are counted. The scanning of the entire sample for larger macro zooplankton (amphipods, shrimp, etc.) was discontinued. Appropriate calculations are made to express counts for each species as numbers per cubic meter of water filtered.

-Chesapeake Bay Program Analytical Method MZ101C
From January 1998 to present, a hierarchical counting technique is employed to obtain density estimates. This procedure consists of first counting at least 60 individuals of the most dominant forms (e.g. Acartia tonsa) in a small sub sample (usually 1 - 2 milliliters), followed by 5- and 10- milliliter sub samples from which all species that had counts less than 60 in the previous sub sample are counted. Macro zooplankton (amphipods, shrimp, etc.) that were scanned prior to 1990 are now identified when observed in sub samples. In addition, all samples, after the standard hierarchical counting technique, were filtered through an 850-micrometer sieve. Mesozooplankton that were retained in the 850-micrometer sieve that were not previously identified in the sub samples and/or macro zooplankton were counted and identified. Note that after 1 January 99 smaller species occurring in small numbers in the standard count but occurred predominantly in the special 850-micron sieve counts were reported only in the method MZ 101C count.

>Zooplankton Biomass Enumeration
-Chesapeake Bay Program Analytical Method BM101

NOTE THAT BIOMASS IS BASED ON MZ101B ENUMERATED TAXA

VALUE_TYPE=A or actual
Biomass determination of dry weights and ash weights are measured by gravimetric methods for detritus-free samples. Samples containing detritus are not processed and are disposed of after the final report is completed. A regression-based computer program is used to estimate mesozooplankton biomass in samples containing detritus. In detritus contaminated samples values for dry weight are based on the known weight (from literature or by weighing of organisms) multiplied by the number present and summed across all taxa in the sample.

VALUE_TYPE=E or ESTIMATED
Biomass determination was performed using a regression-based computer program to estimate mesozooplankton biomass in ALL samples containing detritus. Values for dry weight are based on the known weight (from literature or by weighing of organisms) multiplied by the number present and summed across all taxa in the sample.

-Chesapeake Bay Program Analytical Method BM101B

VALUE_TYPE=E or ESTIMATED
Biomass determination was performed using a regression-based computer program to estimate mesozooplankton biomass in ALL samples containing detritus. Values for dry weight are based on the known weight (from literature or by weighing of organisms) multiplied by the number present and summed across all taxa in the sample. NOTE THAT ALL TAXA ENUMERATED IN THE MZ101C METHOD ARE INCLUDED IN THESE ESTIMATES

FORMULAS, CALCULATIONS, AND CONVERSIONS

> Taxonomic Determination Formulas
The following equation is used to convert raw counts to density for each taxon identified:

DENSITY = A * (B/(C * FVOL_M3))

Where DENSITY = density in numbers per cubic meter
A = number of individuals counted in the subsample
B = volume in milliliters of sample from which sub samples are taken
C = subsample volume in milliliters
FVOL_M3 = volume of water filtered by the bongo nets in cubic
meters = (3.14*(r**2)) * (Y*(26,873/999,999))
Where
r = radius of the bongo net
Y = flow meter count (i.e. difference between beginning count and end count)
26,873 = a rotor constant equal to the standard distance traveled in meters for 999,999 revolutions
Of the flow meter
999,999 = the maximum revolutions that can be read by flow meter

>Biomass Determination Formulas
AFDW = DRYWT - ASHWT
DRY_WT = DRYWT*1000 / FVOL_M3
ASH_WT = ASHWT * 1000 / FVOL_M3
ASH_FRWT = AFDW*1000 / FVOL_M3
Where DRY_WT = Total Dry Weight as Milligrams per Cubic Meter (Calculated Value)
DRYWT = Total Dry Weight as Grams per Sample (Measured Value)
ASH_WT = Total Ash Weight as Milligrams per Cubic Meter (Calculated Value)
ASHWT = Total Ash Weight as Grams per Sample (Measured Value)
ASH_FRWT = Ash Free Dry Weight as Milligrams per Cubic Meter (Calculated Value)
AFDW = Ash Free Dry Weight as Grams per Sample (Calculated Value)
FVOL_M3 = Volume Water Filtered Through Net, Calculated as (
3.14*((net diameter)**2)/4) * (revolutions of rotor * rotor constant)/999999
And the rotor constant = 26.873 (Measured Value)

Dry weights of taxa used for estimation of zooplankton biomass in detritus contaminated samples.

SPECIES	LIFE_STAGE	WEIGHT (ug)	SPECIES	LIFE_STAGE	WEIGHT (ug)
Cyclops biscuspidatus	adult	12.6	Acartia tonsa	adult	12.3
Cyclops biscuspidatus	copepodite	8.4	Acartia tonsa	copepodite	4.6
Cyclops vernalis	adult	9.6	Centropages furcatus	adult	15.4
Cyclops vernalis	copepodite	4	Centropages furcatus	copepodite	6.4
Eucyclops agilis	adult	2.8	Centropages hamatus	adult	15.4
Eucyclops agilis	copepodite	1.1	Centropages hamatus	copepodite	6.4
Halicyclops magnaceps		2.8	Diaptomus sp.	adult	20.9
Mesocyclops edax	adult	7.2	Diaptomus sp.	copepodite	9.4
Mesocyclops edax	copepodite	3.7	Eurytemora affinis	adult	10
Oithona colcarva	adult	2.7	Eurytemora affinis	copepodite	5.5
Oithona colcarva	copepodite	1.7	Pseudodiaptomus coronatus	adult	9.9
Paracyclops fibriatus	adult	3.5	Pseudodiaptomus coronatus	copepodite	4.6
Paracyclops fibriatus	copepodite	1.5	Temora turbiniata	adult	15.4
Acartia hudsonica	adult	12.3	Temora turbiniata	copepodite	6.4
Acartia hudsonica	copepodite	4.6	Alona affinis		1.1

SPECIES	LIFE_STAGE	WEIGHT (ug)
Alona costata		1.1
Alona spp.		1.1
Alonella sp.		1
Bosmina longirostris		2.3
Camptocercus rectirostris		2
Chydorus sp.		1.1
Daphnia retrocurva		3.1
Diaphanosona leuchtenbergia	num	2.7
Eubosmina coregoni		2.3
Eubosminia longspina		2.3
Ilyocryptus spinifer		1.1
Ilyocryptus sp.		1.1
Leptodora kindtii		36.6
Monia		1.4
Monia micrura		1.4
Podon polyphemoides		1
Scapholeberis kingi		8.3
Sida crystallina		8
Monospilus dispar		2.3
Evadne sp.		1

SPECIES	LIFE_STAGE	WEIGHT (ug)
Argulus sp.		56.6
Branchyurian		45.2
Corophium lacustre		347.8
Gammarus fasciatus		120.2
Leptocheirus plumulosus		120.2
Monoculodes edwardsi		61
Mysid		303.6
Palaemonetes sp.		136.1
Ampelisca abdita		347.8
Barnacle	nauplii	2.9
Copepod	nauplii	0.1
Chaoborus sp.		143.5
Chironomid	larvae	109
Dipterian	larvae	542.5
Harpacticoida	larvae	4.7
Hydracarina sp.		1
Ostracod		1
Polychaete	larvae	9.2
Sagitta sp.		36.3

Species excluded from biomass estimates:

Aemaceae
Alteutha depressa
Arachnida
Ceriodaphinia lacustria
Coleptera
Corixidae
Cyclops varicans
Ephemeroptera
Eubosmina sp.
Eucyclops speratus
Gastropoda
Hirudinea
Labidocera aestiva
Latona setifera
Lucifer faxoni
Macrothrix laticornus
Oligochaete
Paracaprella tenuis
Piscicolidae
Trichopthera
Tubellaria
All fish larvae
Anisoptera
Brachyuran
Ceriodaphinia quadrangula
Collembola
Cyathura polita
Ectocyclops phaleratus
Ergasilus sp.
Euceramus praelongus
Flat Worm
Hemiptera
Isopoda
Lathonura rectirostris
Leydigia quadrangularis
Macrocyclops abdidus
Mollusca
Oxyurosilus smithi
Parathemisto compressa
Saphirella sp.
Tropocyclops prasinus

The regression to estimate ash-free dry weight in detritus contaminated samples based on sum of dry weights for all taxa is as follows:

Y= 0.783(X) - 0.013

Where:
Y= Ash -free dry weight in grams
X= Total dry weight in grams

> Biovolume Determination Formulas
SET_VOL = SETVOL / FVOL_M3 = Settled Volume of all Non Gelatinous Zooplankton and Detritus

(Milliliters per Cubic Meter)
SET_VOLZ = SETVOLZ / FVOL_M3 = Estimated Settled Volume of Zooplankton
(Milliliters per Cubic Meter)

Where
SETVOL = Settled Volume of zooplankton and detritus (ml/sample)
SETVOLZ = Settled Volume of Zooplankton (ml/sample)
BEROEVOL = Volume of Beroe (ml/sample)
CNIDAVOL = Cnidaria Volume (ml/sample) ###
CTENOVOL = Ctenophore Volume (ml/sample) ###
HYDRAVOL = Volume of Hydromedusae (ml/sample)
JELLYVOL = Volume of Jellyfish (#/sample)
MNEMVOL = Volume of Mnemiopsis (ml/sample)
FVOL_M3 = Volume Water Filtered Through Net, Calculated as
(3.14*((net diameter)**2)/4) * (revolutions of rotor * rotor constant)/999999
And the rotor constant = 26.873

SEE BIOLOGICAL PARAMETERS SECTION FOR CHANGES IN REPORTING

In cases where field samples contained large amounts of detritus or algae, the biovolume and biomass could not be determined directly. The settled volumes were estimated by regressing total dry weight versus biovolume in detritus free samples.

The regression to estimate biovolume is as follows:

Y=24.96(X)

Where

Y= Settled biovolume in milliliters
X= Total sample dry weight in grams.

MONITORING QA/QC PLAN FOR PROJECT
Quality assurance/quality control procedures have been implemented for field and laboratory aspects of the program. In brief, some of these procedures include:
- Maintenance of nets to minimize clogging and to ensure maximum filtration efficiency
- Maintenance, replacement and/or calibration of flow meters
- Net tow of standard time at different depths
- Rejection of tows should flow meter readings fall outside of pre-established number of revolutions
- Appropriate preservation of taxonomic samples
- Redundancy in availability of gear, equipment, and expendables to allow for most efficient utilization of field time
- Reprocess of 10% of the taxonomic samples for both total counts and identifications. Should sample fail QC protocol, samples sorted by technician are reprocessed.
- Verification of all field and laboratory sheets by laboratory supervisor
- Verification of all data entered into computer sheets by laboratory supervisor
- Computerized checks on variable ranges, incorrect taxonomic codes, stations, etc.

VARIABLE NAMES, MEASUREMENT UNITS, AND DESCRIPTIONS

>PARAMETER: ASH_WT (Total Ash Weight as Milligrams per Cubic Meter), ASHWT (Total Ash Weight as Grams per Sample), ASH_FRWT (Ash Free Dry Weight as Milligrams per Cubic Meter), AFDW (Ash Free Dry Weight as Grams per Sample)
-COLLECTION METHODS: Two stepped oblique; replicate tows with paired bongo nets are taken at each station through the entire water column. Steps are taken in 1-4 meter increments depending on total station

Depth. There are always 5 step levels per station. Tows last between 5 to 10 minutes depending on zooplankton abundance. One of the paired nets is used for taxonomic purposes (counting), the other for biomass measurements.
-SAMPLE PRESERVATIVES: N/A
-SAMPLE STORAGE ENVIRONMENT: N/A
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES:
-Chesapeake Bay Program Analytical Method-BM101
Only material from detritus-free samples is processed for ash and ash-free dry weight estimates. Oven-dried samples are ignited in a muffle furnace at 550 degrees Celsius for approximately eight hours. Samples are removed to desiccators and weighed when cool to obtain ash dry weight in grams per sample. Ash free dry weight of the sample (AFDW) is calculated by subtracting ash weight of the sample from dry weight of the sample. Ash free dry weight as milligrams per cubic meter of water sampled (ASH_FRWT) is calculated by dividing AFDW by FVOL_M3, the volume of water filtered in cubic meters.

Biomass values for samples containing detritus could not be directly measured. For these samples, ash dry weight and ash-free dry weight were estimated by using known weights of individual species/life stage multiplied by the number that species/life stage in the sample and then summing across all species. Weight per individual was obtained from the literature or developed from microbalance techniques.

>PARAMETER: BEROE (Number of Beroe per Sample), BEROEVOL (Volume of Beroe in Milliliters per Sample), CNIDA (Number of All Cnidarians per Sample), CNIDAVOL (Volume of All Cnidaria in Milliliters per Sample), HYDRA (Number of Hydromedusae per Sample), HYDRAVOL (Volume of Hydromedusae In Milliliters per Sample), JELLY (Volume of Sea Nettles in Milliliters per Sample), JELLYVOL (Number of Sea Nettles per Sample), MNEMIOP (Number of Mnemiopsis per Sample), MNEMVOL (Volume of Mnemiopsis in Milliliters per Sample)
-COLLECTION METHODS: Two stepped oblique; replicate tows with paired bongo nets are taken at each station through the entire water column. Steps are taken in 1-4 meter increments depending on total station depth. There are always 5 step levels per station. Tows last between 5 to 10 minutes depending on zooplankton abundance. One of the paired nets is used for taxonomic purposes (counting), the other for biomass measurements. The net for biovolume is randomly selected.
-SAMPLE PRESERVATIVES: Formalin
-SAMPLE STORAGE ENVIRONMENT: Room temperature
-TIME IN STORAGE: 2 to 4 days
-LAB TECHNIQUES WITH REFERENCES:
-Chesapeake Bay Program Analytical Method-JF101
Prior to July 1987, Ctenophores- [Beroe, and Mnemiopsis] (CTENO, CTENOVOL) and Cnidarians [Hydrozoans, true Jellyfish] (CNIDA, CNIDAVOL) were removed from samples in the field after sample Preservation, and their numbers and settled volumes were recorded from the net that was used as the count sample.
-Chesapeake Bay Program Analytical Method JF102
After July 1987, Beroe (BEROE, BEROEVOL), Hydrozoans (HYDRO, HYDROVOL), Mnemiopsis (MNEMIOP, MNEMVOL), and true Jellyfish ((JELLY, JELLYVOL) were removed from samples and sorted in the field after sample preservation, their numbers and settled volumes were recorded from the net that was used as the count sample.

>PARAMETER: COUNT (# of a Mesozooplankton Taxon per Cubic Meter),
-COLLECTION METHODS: Two stepped oblique; replicate tows are taken at each station through the entire water column. Steps are taken in 1-4 meter increments depending on total station depth. There are always 5 step levels per station. Tows last between 5 to 10 minutes depending on zooplankton abundance. One of the paired nets is used for taxonomic purposes (counting), the other for biomass measurements. The count sample is preserved.
-SAMPLE PRESERVATIVES: Formalin
-SAMPLE STORAGE ENVIRONMENT: Room temperature
-TIME IN STORAGE: Samples are usually processed within 1 or 2 months after collection. After processing, samples are archived for at least five years after the final report.
-LAB TECHNIQUES WITH REFERENCES: Hensen-Stemple pipette sub sampling techniques

-Chesapeake Bay Program Analytical Method MZ101A
-Chesapeake Bay Program Analytical Method MZ101B
-Chesapeake Bay Program Analytical Method MZ101C
See Biological Enumeration Techniques for Details.

>PARAMETER: DRY_WT (Total Dry Weight as Milligrams per Cubic Meter), DRYWT (Total Dry weight as Grams per Sample)
-COLLECTION METHODS: Two stepped oblique; replicate tows with paired bongo nets are taken at each station through the entire water column. Steps are taken in 1-4 meter increments depending on total station depth. There are always 5 step levels per station. Tows last between 5 to 10 minutes depending on zooplankton abundance. One of the paired nets is used for taxonomic purposes (counting), the other for biomass measurements.
-SAMPLE PRESERVATIVES: Frozen
-SAMPLE STORAGE ENVIRONMENT: Frozen
-TIME IN STORAGE: Frozen until thawed for drying
-LAB TECHNIQUES WITH REFERENCES:
-Chesapeake Bay Program Analytical Method-BM101
Only materials from detritus-free samples are processed. Samples are dried in preweighed crucibles in a drying oven at 60 degrees Celsius. Drying time varies depending on the sample volume, but one week is typically sufficient to stabilize the weight. Dried samples are removed to a dessector and weighed when cool. Biomass values for samples containing detritus could not be directly measured. For these samples, total dry weight was estimated by using known weights of individual species/life stage multiplied by the number that species/life stage in the sample and then summing across all species. Weight per individual was obtained from the literature or developed from microbalance techniques.

>PARAMETER: FVOL_M3 (Volume Water Filtered Through Net in Cubic Meters)
-COLLECTION METHODS: Digital General Oceanics flow meters
-SAMPLE PRESERVATIVES: None
-SAMPLE STORAGE ENVIRONMENT: None
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES: Number of revolutions (final reading minus initial reading, taken from the flow meter) is recorded in the field for each sample collected. Volume filtered is calculated from the standard conversion formula provided by the manufacturer. See # FORMULAS, CALCULATIONS, AND CONVERSIONS above.

>PARAMETER: LATITUDE, LONGITUDE (Both in decimal degrees)
-COLLECTION METHODS: Loran-C, NAD27-From July 1984 to June 1997
GPS, NAD83-From June 1997 to Present
-SAMPLE PRESERVATIVES: None
-SAMPLE STORAGE ENVIRONMENT: None
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES: Station positions in data set are approximations of actual positions in the field. Station latitudes and longitudes are input into a Loran-C/ GPS receiver and sampling begins when boat reaches pre-programmed coordinates. Loran-C is accurate to +/-1500 feet. The actual Loran/GPS coordinates for each sampling event are not currently recorded in data set. Standard station positions are reported in NAD83 Coordinates.

>PARAMETER: LAYER (Layer of Water Column in Which Sample was Taken)
-COLLECTION METHODS: Hydrolab CTD
-SAMPLE PRESERVATIVES: None
-SAMPLE STORAGE ENVIRONMENT: None
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES: The Layer sampled in this study is the whole water column, WC. The WC Layer is the entire water column without regard to P_DEPTH. P_DEPTH is set at 0.5 meters above the Pycnocline. Water column conductivity is recorded immediately before plankton sampling and the pycnocline is determined to be the depth at which the greatest conductivity change is observed. The

minimum threshold change is 1000 umhos/cm. TDEPTH for each station is based on a ten-year average of Maryland Department of the Environment Water Quality Hydrographic data collected concurrently with the plankton samples.

>PARAMETER: PDEPTH (Composite Sample Cut-Off Depth in meters)
-COLLECTION METHODS: None
-SAMPLE PRESERVATIVES: None
-SAMPLE STORAGE ENVIRONMENT: None
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES: Parameter not relevant with whole water column samples.

>PARAMETER: SALZONE (Salinity Zone)
-COLLECTION METHODS: Hydrolab CTD
-SAMPLE PRESERVATIVES: None
-SAMPLE STORAGE ENVIRONMENT: None
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES: Water column salinity is measured concurrently with zooplankton tows. Salinity values are averaged for the entire water column and a salinity classification is determined. Salinity classes are as follows: Fresh 0 - 0.5 ppt (F), Oligohaline >0.5 - 5.0 ppt (O). Mesohaline >5.0 - 18.0 ppt (M) and Polyhaline >18.0 ppt (P).

>PARAMETER: SET_VOL (Settled Volume of all Zooplankton and Detritus in Milliliters per Cubic Meter), SET_VOLZ (Settled Volume of Zooplankton in Milliliters per Cubic Meter), SETVOL (Settled Volume in Milliliters per Sample), SETVOLZ (Settled Volume of Zooplankton in Milliliters per Sample)
-COLLECTION METHODS: Stepped oblique bongo net tow, over the entire water column; two replicate tows are taken at each station. Steps are taken in 1-4 meter increments depending on total station depth. There are always 5 step levels per station. Tows last between 5 to 10 minutes depending on zooplankton abundance. One of the paired nets is used for taxonomic purposes (counting), the other for biomass measurements. The net for biovolume is randomly selected.
-SAMPLE PRESERVATIVES: Formalin
-SAMPLE STORAGE ENVIRONMENT: Room temperature
-TIME IN STORAGE: 2 to 4 days
-LAB TECHNIQUES WITH REFERENCES:
-Chesapeake Bay Program Analytical Method-BV101
Settled volumes are measured from the correlative count sample for each biomass sample. Samples are poured into Imhoff cones and left undisturbed for 2 - 4 days as plankton settles to the bottom of the cone. After settling time, the reading (top of settled material) is recorded in the lab notebook.

SETVOL and SETVOLZ- Values will be equivalent in samples lacking detritus

In samples where significant detritus was observed, biovolume values were determined by a regression correction. The correction factor calculated volume based on an average volume observed for each organism counted in the taxon sample, individual species volumes were then summed to estimate total SETVOLZ and SET_VOLZ. This procedure was used for all samples where species biomass was also estimated by regression correction.

>PARAMETER: TOTAL_DEPTH (Total Station Depth in meters)
-COLLECTION METHODS: Hydrolab CTD
-SAMPLE PRESERVATIVES: None
-SAMPLE STORAGE ENVIRONMENT: None
-TIME IN STORAGE: None
-LAB TECHNIQUES WITH REFERENCES: Total water column depth is measured concurrently with zooplankton tows. Depth values after 1993 are average station depth based on a ten-year mean station depth. Prior to 1993 actual station depth was recorded.
>DATA ENTRY METHOD: Keyed to disk
>DATA VERIFICATION: Visual inspection

SPECIES IN-HOUSE CODES AND SCIENTIFIC NAMES

The in-house species codes used by Versar are the same as the Maryland Power Plant Species Codes. Conversion of in-house species codes to National Oceanographic Data Center (NODC) Codes and spellings are in file MDMZKYyy.TXT.

>INHOUSE SPECIES LIST:

SPEC_CODE	SOURCE_LBL	TSN
T1	MORONE SAXATILIS	0167680
T101	AMPHIPODA	0093294
T103	RHITHROPANOPEUS HARRISI	0098790
T1037	GAMMARUS FASCIATUS	0093780
T106	PALAEMONETES SP.	0096383
T107	CRANGON SEPTEMSPINOSA	0097110
T1073	RHITHROPANOPEUS HARRISII ZOEA	0098790
T108	NEOMYSIS AMERICANA	0090062
T11	CLUPEIDAE	0161700
T1113	CHIRONOMIDAE PUPAE	0127917
T1133	HEMIPTERA SP.	0103359
T1160	ALONA SPP.	0083974
T1166	COPEPOD PARASITIC	0085257
T1223	CYMOTHIDAE (JUV.)	0092437
T1257	MYSIDAE	0089856
T1262	INSECTA	0099208
T1286	AMPELISCA ABDITA	0093329
T1300	MYSIDOPSIS BIGELOWI	0090139
T1579	PISCICOLIDAE	0069296
T165	ODONATA	0101593
T168	PLECOPTERA	0102467
T169	DIPTERA PUPAE	0118831
T1741	CYATHURA SP.	0092148
T1744	CHIRIDOTEA	0092637
T1745	EDOTEA SP.	0092623
T1749	AMPELISCA	0093321
T1756	LEPTOCHEIRUS SP.	0093485
T176	CYCLOPOIDA	0088530
T177	HARPACTICOIDA	0086110
T181	EPHEMERELLIDAE	0101232
T1975	MENIDIA	0165992
T2	MORONE AMERICANA	0167678
T2022	BRACHYURAN MEGALOPA	0098276
T2023	BRACHYURAN ZOEA	0098276
T2024	CUMACEAN	0090745
T2037	PALAEMONETES SP. ZOEA	0096383
T2038	DIAPHANOSOMA LEUCHTENBERGIANUM	0083839
T2039	SCAPHOLEBERIS KINGI	0083923
T2040	MONOSPILUS DISPAR	0084032
T2041	PARACYCLOPS FIMBRIATUS POPPEI	0088736
T2042	SKISTODIAPTOMUS PALLIDUS	BAY0325
T2047	OGYRIDES	0096736

SPEC_CODE	SOURCE_LBL	TSN
T2069	BARNACLE NAUPLII	0089599
T2185	CHAOBORUS PUPAE	0125904
T2186	CHAOBORUS PUNCTIPENNIS	0125923
T2188	CYCLOPOID COPEPODIDS	0088530
T2190	MOINA SPP.	0084163
T2206	HALICYCLOPS MAGNACEPS	BAY0124
T2207	CENTROPAGES TYPICUS	0085767
T2214	CRAB MEGALOPS UNID.	0095599
T2215	ANISOPTERA	0101594
T2217	SAGITTA SP.	0158727
T2218	SAPHERELLA SP.	0088628
T2266	EUCERAMUS PRAELONGUS	0098081
T2308	ALONA COSTATA	0083983
T2311	ALONA QUADRANGULARIS	0083980
T2318	CERIODAPHNIA QUADRANGULA	0083907
T2320	CYCLOPS VARICANS RUBELLUS	0088649
T2321	CERIODAPHNIA SP	0083905
T2323	DAPHNIA PULEX	0083874
T2327	EURYCERCUS LAMELLATUS	0084017
T2328	EUCYCLOPS SPERATUS	0088722
T2329	EUCYCLOPS SPP.	0088719
T2331	KIRZIA LATISSIMA	0084072
T2332	LEYDIGIA CILLIATE	BAY0290
T2335	MACROCYCLOPS ALBIDUS	0088738
T2337	MACROTHRIX SP	0084118
T2341	PLEUROXUS SP.	0084044
T2345	TROPOCYCLOPS PRASINUS	0088743
T235	POLYCHAETA	0064358
T236	BIVALVIA	0079118
T2360	ACARTIA SP.	0086084
T2368	ALONA AFFINIS	0083979
T237	EPHEMEROPTERA	0100502
T242	GAMMARIDAE	0093745
T25	ANCHOA MITCHILLI	0161839
T2520	PAGURUS LONGICARPUS	0097807
T2616	MYSIDOPSIS ALMYRA	0090141
T2617	PARATHEMISTO COMPRESSA	0095158
T2619	TEMORA TURBINATA	0085878
T2620	CENTROPAGES FURCATUS	0085765
T2621	LUCIFER FAXONI	0095916
T267	HYDRA CARNIA	0050848
T2723	EVADNE SPP.	0083960
T273	CAENIS	0101478

SPEC_CODE	SOURCE_LBL	TSN
T2802	MACROCYCLOPS SP.	0088737
T2803	PARACYCLOPS SP.	0088731
T2808	PARACAPRELLA TENUIS	0095434
T2809	PINNIXA SP.	0098993
T292	CHAOBORUS SP.	0125904
T3	MORONE SP.	0167676
T3001	LATHONURA RECTIROSTRIS	0084155
T3016	ECTOCYCLOPS PHALERATUS	0088797
T3017	PARACALANUS SP.	0085322
T3074	EUBOSMINA LONGISPINA	0083950
T3080	AMPHIOXUS SP.	0159689
T3093	ALTEUTHA DEPRESSA	0086413
T3102	PARACYCLOPS FIMBRIATUS	0088732
T3151	LABIDOCERA AESTIVA	0086047
T3157	UNID. HARPACTACOID	0086329
T3161	HEMICYCLOPS SP.	0088960
T3169	CALANUS SP.	0085263
T3181	CYCLOPS SP.	0088640
T3182	CYCLOPS SPP.	0088640
T3183	CYCLOPS VARICANS	0088648
T3187	CYCLOPS BICOLOR	BAY0085
T3205	OSPHRANTICUM LABRONECTUM	0085778
T3237	MACROCYCLOPS ATER	0088739
T3262	OITHONA SP.	0088802
T3263	TORTANUS DISCAUDATUS	0086100
T3296	EUCALANUS SP.	0085300
T3306	PENILIA AVIROSTRIS	0083836
T3379	CENTROPAGES	0085761
T3380	HEXARTHRA SP.	0059350
T3398	ACROPERUS	0084022
T3410	LIBINIA SP.	0098453
T3449	STREBLOCERUS SERRICAUDATUS	0084127
T3459	CHYDORUS BICORNUTUS	0084000
T365	ZYGOPTERA	0102042
T420	NEANTHES SUCCINEA	0065918
T463	MICROGAMMARUS MUCRONATUS	BAY0154
T464	GAMMARUS SP.	0093773
T466	LEPTOCHEIRUS PLUMULOSUS	0093486
T468	MONOCULODES SPECIES COMPLEX	0094519
T481	LEUCON AMERICANUS	0090790
T482	OXYUROSTYLIS SMITHI	0090923
T489	COLLEMBOLA	0099237
T497	CYATHURA POLITA	0092149
T500	ISOPODA	0092120
T570	SIDA CRYSTALLINA	0083863
T571	SIMOCEPHALUS SP.	0083899
T576	TRICHOPTERA	0115095
T578	TURBELLARIA	0053964

SPEC_CODE	SOURCE_LBL	TSN
T580	ARACHNIDA	0082708
T584	UNID. FISH EGGS	0159783
T585	UNID. FISH LARVAE	0159783
T587	GASTROPOD UNID.	0069459
T608	ALONA SP.	0083974
T609	ALONELLA SP.	0084033
T618	BOSMINA LONGIROSTRIS	0083938
T620	CAMPTOCERCUS RECTIROSTRIS	0084057
T621	CERATOPOGONIDAE	0127076
T622	CERIODAPHNIA LACUSTRIS	0083909
T625	CHYDORUS	0083992
T629	CHYDORUS SP.	0083992
T634	COROPHIUM SP.	0093589
T635	COROPHIUM LACUSTRE	0093594
T642	DAPHNIA RETROCURVA	0083879
T643	DAPHNIA	0083873
T645	DIAPHANOSOMA SP.	0083837
T653	EUBOSMINA COREGONI	0083952
T654	EUCYCLOPS AGILIS	0088720
T662	HIRUDINEA	0069290
T67	SYNGNATHUS FUSCUS	0166451
T671	ILYOCRYPTUS SPINIFER	0084133
T676	LATONA SETIFERA	0083865
T678	LEPTODORA KINDTII	0083972
T681	MACROTHRIX LATICORNIS	0084121
T682	MELITA SP.	0093806
T683	MOINA MICRURA	0084164
T684	MONOCULODES SP.	0094519
T699	PLEUROXUS DENTICULATUS	0084045
T700	ARGULUS SP.	0089407
T701	CALANOIDA	0085258
T702	EURYTEMORA AFFINIS	0085863
T703	ACARTIA TONSA	0086088
T704	ACARTIA HUDSONICA	0086097
T705	CENTROPAGES HAMATUS	0085766
T706	PSEUDODIAPTOMUS CORONATUS	0085849
T707	PARACALANUS CRASSIROSTRIS	0085324
T709	PSEUDOCALANUS MINUTUS	0085371
T715	DIAPTOMUS SP.	0085780
T721	OITHONA COLCARVA	0088811
T723	OITHONA SIMILIS	0088805
T726	CYCLOPS VERNALIS	0088641
T728	MESOCYCLOPS EDAX	0088692
T729	HALICYCLOPS SP.	0088635
T730	CYCLOPS BICUSPIDATUS	0088645
T734	ERGASILUS SP.	0088599
T736	CANUELLA ELONGATA	0086134
T749	COPEPOD NAUPLII	0085257
T751	UNID BARNACLE CYPRIS	0089599

SPEC_CODE	SOURCE_LBL	TSN
T755	INVALID SEE T981	0084195
T760	POLYCHAETE LARVAE	0064358
T765	UNID. CRAB ZOEA	0095599
T775	PODON POLYPHEMOIDES	0083967
T776	BOSMINA SP.	0083936
T778	ILYOCRYPTUS SP.	0084132
T779	LEYDIGIA QUADRANGULARIS	0084026
T782	DIPTERAN LARVAE	0118831
T787	CHIRONOMID LARVAE	0127917
T788	FLAT WORM	0053963
T804	BRACHIONUS	0058434
T820	MYSID	0089856
T833	COLEOPTERA	0109216
T834	CORIXIDAE	0103364

SPEC_CODE	SOURCE_LBL	TSN
T84	MICROPOGON UNDULATUS	0169284
T871	GASTROPOD LARVAE	0069459
T875	HYDROID	0048740
T895	TATIGRADE	0155166
T90	GOBIOSOMA BOSCI	0171789
T967	GAMMARUS	0093773
T97	PSEUDOPLEURONECTES AMERICANUS	0172905
T974	OLIGOCHAETA	0068422
T978	MOLLUSCA	0069458
T980	CLADOCERA	0083832
T981	OSTRACODA	0084195
T982	BAETIDAE	0100755

VARIABLES NAMES AND DESCRIPTIONS FOR DATA FILES
Structure for data files in: ftp.chesapeakebay.net or http://www.chesapeakebay.net/

> MESOZOOPLANKTON TAXONOMIC RECORDS

Name	Type	Width	Variable Definitions:
SOURCE	Text	10	Data Collection Agency
STATION	Text	15	Sampling Station
SAMPLE_DATE	Date/Time	8	Sampling date (YYYYMMDD)
LAYER	Text	3	Layer in Water Column Which Composite Sample was Taken
SAMPLE_NUMBER	Number	4	Sample Replicate Number
GMETHOD	Text	3	Chesapeake Bay Program Sampling Gear Code
TSN	Text	7	ITIS Taxon Serial Number
LATIN_NAME	Text	45	Species Latin Name
LIFE_STAGE	Text	50	Life stage of individual- Chesapeake Bay Program Life Stage Code
METHOD	Text	8	Parameter Method Analysis Code
PARAMETER	Text	10	Parameter
VALUE	Number	8	Parameter Value
UNITS	Text	15	Parameter Reporting Units.
NODCCODE	Text	12	NODC Species Code
SPEC_CODE	Text	14	Source Species Taxon Code
R_DATE	Date/Time	8	Version Date of Data (YYYYMMDD)

> MESOZOOPLANKTON SAMPLING EVENT RECORDS

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

STATION	Text	15	Sampling Station
TOTAL_DEPTH	Number	4	Total Station Depth (meters)
SAMPLE_TIME	Date/Time	8	Sampling Time (HHMM)

>MESOZOOPLANKTON BIOVOLUME AND JELLY FISH SURVEY FILES

Name	Type	Width	Variable Description:
SOURCE	Text	10	Data Collection Agency
CRUISE	Text	6	Chesapeake Bay Program Cruise Number
STATION	Text	15	Sampling Station
SAMPLE_DATE	Date/Time	8	Sampling Date (YYYYMMDD)
LAYER	Text	3	Layer in Water Column in Which Sample was Taken
SAMPLE_NUMBER	Number	4	Replicate Number
GMETHOD	Text	3	Chesapeake Bay Program Gear Method Code
TSN	Text	7	Taxon Serial Number
LATIN_NAME	Text	45	Species Latin Name
LIFE_STAGE	Text	50	Chesapeake Bay Program Life Stage Description
METHOD	Text	8	Chesapeake Bay Program Analytical Analysis Method Code
PARAMETER	Text	10	Reporting Parameter
VALUE	Number	8	Parameter Value
UNITS	Text	15	Parameter Reporting Units
NODCCODE	Text	12	National Oceanographic Data Center Species Code
SPEC_CODE	Text	14	Agency Species Code
R_DATE	Date/Time	8	Version Date of Data (YYYYMMDD)

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

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

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

Name	Type	Width	Variable Descriptions
SPEC_CODE	Text	14	Source In-House Species Codes
SOURCE	Text	6	Data Source Identifier
DATA_TYPE	Text	2	Data Type Identifier Code
SOURCE_LBL	Text	45	Source Species Latin Name
LBL	Text	45	National Oceanographic Data Center Species Latin Name
TSN	Text	7	ITIS Taxon Serial Number
R_DATE	Date/Time	8	Version Date of Data (YYYYMMDD)
VOLUME	Number	8	Cell Biomass Estimator
SIZE	Text	30	Taxa Size-Fraction Identifier
LIFE_STG	Text	3	Chesapeake Bay Program Life Stage Code

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

>MISSING SAMPLING_TIME VALUES: Missing values have been replaced with 00:00

> DATA_TYPE: Data Type

BE	Benthic
FL	Fluorescence
MI	Microzooplankton
MZ	Mesozooplankton
PD	Primary Production
PH	Phytoplankton
PP	Picoplankton

>VALUE_TYPE: Sample Measurement Type
A - Actual Measurement
E - Estimated Value

>SOURCE: Data Collecting Agency
VERSAR - Versar, Inc.

>SAMPLE_TYPE: Collection Type
C- Field Composite Sample, sample made of subsamples from multiple depths

>CRUISE: Chesapeake Bay Program Cruise Number
For a complete listing of CBP cruise numbers please see
The 1997 Users Guide to Chesapeake Bay Program Biological and
Living Resources Data

>GMETHOD: Sampling Gear Code
75 - Bongo net, 202-micrometer mesh, 20-centimeter diameter opening

>LAYER: Layer of Water Column in Which Sample was Taken
WC -Whole Water Column
WCA-Whole Water Column Tow A
WCB-Whole Water Column Tow B

>LIFE_STG: Chesapeake Bay Program Life Stage Code

CODE	DESCRIPTION
00	EGG
01	YOLK SAC
03	POST FINFOLD (FULL DEVELOPMENT OF SECOND DORSAL FIN)
06	JUVENILES AND ADULT
11	NAUPLII
12	COPEPODITE
17	CYPRIS LARVAE
31	ZOEA
33	MEGALOPS
92	POST LARVAE
93	JUVENILE
97	LARVAE
98	ADULT

>NODCCODE: National Oceanographic Data Center Species Code NOTE: For current listing of Chesapeake Bay species and their codes, see 1998 Chesapeake Bay Basin Species List

>SALZONE: Salinity zone
F - Tidal fresh (0 - 0.5 ppt)
O - Oligohaline (>0.5 - 5.0 ppt)
M - Mesohaline (>5.0 - 18.0 ppt)
P - Polyhaline (>18.0 ppt)
N - Not Available
*E- an F, O, M, or P followed by an E indicates an estimated salinity range based on salinity data collected within a week of the biological sampling event. Used only when no actual salinity data available.

> STATION: See STATION NAME, LATITUDE, LONGITUDE, TOTAL DEPTH section for details

>TSN: ITIS Taxon Serial Number NOTE: For current listing of Chesapeake Bay species and their codes, see The Chesapeake Bay Basin Species List, 1998.

>BASIN: Chesapeake Bay Program Tributary Designation

CODE	Description
BAY	Chesapeake Bay
CHS	Chester River
PAX	Patuxent River
BAL	Baltimore Harbor
CHP	Choptank River
POT	Potomac River
TAN	Tangier River

>METHOD: Chesapeake Bay Program Method Codes

METHOD	DESCRIPTION
BM101	VERSAR MESOZOOPLANKTON BIOMASS- July 1984 to SEPT 2002
BM101B	VERSAR MESOZOOPLANKTON BIOMASS- January 1998 to SEPT 2002
BV101	VERSAR MESOZOOPLANKTON SETTLED VOLUMES
JF101	VERSAR JELLYFISH COUNT METHOD- JULY 1984 TO JULY 87
JF102	VERSAR JELLYFISH COUNT METHOD- JULY 87 TO Present
MZ101C	VERSAR MESOZOOPLANKTON METHOD- January 1998 to Present
MZ101A	VERSAR MESOZOOPLANKTON METHOD- July 1984 to January 1990
MZ101B	VERSAR MESOZOOPLANKTON METHOD- January 1990 to Present

>PARAMETER AND UNITS: Parameter descriptions and reporting units

PARAMETER	DESCRIPTION and UNITS
COUNT	Number of Zooplankton (#/meter cubed)
BEROE	Number of Beroe (#/sample)
BEROEVOL	Volume of Beroe (ml/sample)
CNIDA	Number of Cnidarians (#/sample)
CNIDAVOL	Cnidaria Volume (ml/sample)
CTENOS	Number of Ctenophores (#/sample)
CTENOVOL	Ctenophore Volume (ml/sample)
HYDRA	Number of Hydromedusae (#/sample)
HYDRAVOL	Volume of Hydromedusae(ml/sample)
JELLY	Jellyfish Volume (ml/sample)
JELLYVOL	Number of Jellyfish (#/sample)
MNEMIOP	Number of Mnemiopsis (#/sample)
MNEMVOL	Volume of Mnemiopsis (ml/sample)
ASH_FRWT	Ash Free Dry Weight (mg/m**3)
ASH_WT	Total Ash Weight (mg/m**3)
ASHFREWT	Ash Free Dry Weight (g/sample)
ASHWT	Total Ash Weight (g/sample)
DRY_WT	Total Dry Weight (mg/m**3)

DRYWT	Total Dry Weight (g/sample)
SET_VOL	Settled Volume of Zooplankton and Detritus(ml/m**3)
SET_VOLZ	Settled Volume of Zooplankton(ml/m**3)
SETVOL	Settled Volume of Zooplankton and Detritus (ml/sample)
SETVOLZ	Settled Volume of Zooplankton (ml/sample)

> CBSEG_1998: Chesapeake Bay Program Monitoring Segment

CBSEG_1998	DESCRIPTION
CB1TF	CHESAPEAKE BAY-TIDAL FRESH REGION
CB2OH	CHESAPEAKE BAY-OLIGOHALINE REGION
CB3MH	CHESAPEAKE BAY-MESOHALINE REGION
CB4MH	CHESAPEAKE BAY-MESOHALINE REGION
CB5MH	CHESAPEAKE BAY-MESOHALINE REGION
CHOMH2	CHOPTANK RIVER-MESOHALINE REGION 2
CHOOH	CHOPTANK RIVER-OLIGOHALINE REGION
CHSMH	CHESTER RIVER-MESOHALINE REGION
PATMH	PATAPSCO RIVER-MESOHALINE REGION
PAXMH	PATUXENT RIVER-MESOHALINE REGION
PAXOH	PATUXENT RIVER-OLIGOHALINE REGION
PAXTF	PATUXENT RIVER-TIDAL FRESH REGION
POTMH	POTOMAC RIVER-MESOHALINE REGION
POTOH	POTOMAC RIVER-OLIGOHALINE REGION
POTTF	POTOMAC RIVER-TIDAL FRESH REGION
TANMH	TANGIER SOUND-MESOHALINE REGION

>FIPS: Federal Information Processing Codes

FIPS	STATE	COUNTY
24003	MD	ANNE ARUNDEL
24005	MD	BALTIMORE
24015	MD	CECIL
24017	MD	CHARLES
24019	MD	DORCHESTER
24025	MD	HARFORD
24029	MD	KENT
24033	MD	PRINCE GEORGES
24037	MD	SAINT MARYS
24039	MD	SOMERSET

>HUC8: USGS Hydrologic Unit Codes

HUC8	CATALOGING_UNIT_DESCRIPTION
02050306	LOWER SUSQUEHANNA
02060001	UPPER CHESAPEAKE BAY
02060002	CHESTER-SASSAFRAS
02060003	GUNPOWDER-PATAPSCO
02060005	CHOPTANK
02060006	PATUXENT
02060007	BLACKWATER-WICOMICO
02070011	LOWER POTOMAC

NUMERIC VARIABLE NAMES - WARNING AND ERROR BOUNDS

VARIABLE	VALID RANGES
SAMPLE_DATE	19840801 - 20021031
R_DATE	19951002 - 20000131
SAMPLE_NUMBER	1, 2
FVOL_M3	0.5 - 500
LATITUDE	SEE STATION LISTING
LONGITUDE	SEE STATION LISTING
P_DEPTH	>0.5 and <TDEPTH Note this is a composite cut off, not a pycnocline depth!
TOTAL_DEPTH	05 - 33
SAMPLE_TIME	00:00 - 24:00, Missing 00:00

BIOLOGICAL VARIABLE VALID RANGES

PARAMETER AND RANGE	
ASH_FRWT	0 - 500
ASH_WT	0 - 20
AFDW	0 - 10
ASHWT	0 - 10
COUNT	1 - 99999999.999
SET_VOL	0 - 200
SET_VOLZ	0 - 100
SETVOL	0 - 300
SETVOLZ	0 - 200
DRY_WT	0 - 400
DRYWT	0 - 10
BEROE	0 - 2000
BEROEVOL	0 - 2000
CNIDA	0 - 20000
CNIDAVOL	0 - 2000
CTENO	0 - 20000
CTENOVOL	0 - 2000
HYDRA	0 - 2000
HYDRAVOL	0 - 2000
JELLYVOL	0 - 1000
MNEMIOP	0 - 2000
MNEMVOL	0 - 2000

IMPORTANT DATA REVISIONS

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

The following Station had their names changed to the standard Chesapeake Bay Program station names in July 1998. Alternate names appearing in previous versions of the Living Resources Data Sets are as follows:

LR NAME	CBP NAME
XDE5339	LE1.1
XED4892	TF1.7
PXT0402	TF1.5
XEA6596	TF2.3
XDA1177	RET2.2

MET4.2	ET4.2
MWT5.1	WT5.1
MLE2.2	LE2.2
MET5.1	ET5.1
MET5.2	ET5.2
MEE3.1	EE3.1
XEA1840	TF2.4
MET5.0	ET5.0
XED9490	TF1.6

10/31/95 - As part of the serial number correction problem of 07/31/95, two serial numbers were erroneously changed. The result was three serial numbers assigned twice. This was corrected in the data sets by changing serial numbers as follow:

Serial Number	Sample date	Serial Number reassigned
CZMPX86034B	12/03/86	No Change
CZMPX86035A	12/03/86	No Change
CZMPX86035B	12/03/87	No Change
CZMPX86034B	06/08/87	CZMPX87034B
CZMPX86035A	06/08/87	CZMPX87035A
CZMPX86035B	06/08/87	CZMPX87035B

There were no changes to actual data values.

07/31/95 - In several cases the sample serial number had been assigned to sampling events on two different dates. As part of the data corrections made on 05/19/95 a number of sample SER_NUM's were changed as follows:

OLD SER_NUM	NEW SER_NUM	SAMPLE DATE
CZM85TN004A	CZM85TN012A	05/12/85
CZM85TN004B	CZM85TN012B	05/12/85
CZM85CO018A	CZM85CO024A	10/19/85
CZM85CO018B	CZM85CO024B	10/19/85
CZM86PT025A	CZM86PT034A	10/14/86
CZM86PT025B	CZM86PT034B	10/14/86
CZM86PT026A	CZM86PT036A	10/14/86
CZM86PT026B	CZM86PT036B	10/14/86

5/31/95 - GMETHOD was changed to 75. Code 75 refers 202 micrometer mesh Bongo net with 0.2 meter opening. For an extensive gear code list see Table 17, PAGE F-9 APPENDIX F, of the Living Resources Data Management Plan, 1989. This is a change from GMETHOD code in previous versions of the data set. This does not represent a change in actual sampling gear.

5/31/93 - Spelling of all species Latin Names (LBL) have been corrected to the National Oceanographic Data Center (NODC) accepted spelling.

05/19/95 - A total of 237 pairs of DUPLICATE RECORDS were found in the mesozooplankton monitoring data during routine QA/QC checks at the CBP Data Center. Versar confirmed the duplicate records and made corrections to the affected files. These corrections affected the entire 1984-1994 TAXON data sets and the EVENT, BIOMASS AND BIOVOLUME data sets for 1985 - 1987. The CBPO Data Center recommends discontinuing use of mesozooplankton TAXON data sets without R_DATES or with R_DATE prior to 07/01/95.

05/05/95 - The VERSAR BAY CRUISE NUMBERS deviate from the standard CBPO CRUISE numbers. The Academy of Natural Sciences (ANS) has requested and was granted permission to match Bay Cruise

dates with sampling trip effort. By doing this, the occurrence of a station to be sampled twice during a cruise period is avoided. Since ANS applied this correction to all of their data, it was also necessary to apply the same correction to the Versar originated mesozooplankton data because they are collected at the same time and the sets are frequently merged. The table of variation from the CBPO Cruise dates can be found in the general Living Resources data documentation text. For a complete listing of BAY CRUISE NUMBERS, see The 2000 Data Users Guide

03/21/95- The record SER_NUM = CZM85MB021A, STATION = CB2.2, DATE =05/22/85 had the species code T626, with the identification of CHYDORUS. A duplication of codes was identified between T625 and T626 therefore all codes were changed to T629 CHYDORUS, with NODCCODE = 6190702.

03/21/85 - Two pairs of records were found that appeared to be unintentional duplicates. In one pair, all fields but the species density were identical; in the other, all fields were identical:

DATE	CRUISE	SAMPLE_NUM	LBL	DEN_M3
7/7/86	BAY042	2	MYSIDAE	133.200
7/7/86	BAY042	2	MYSIDAE	35.467
3/13/89	BAY094	2	EUCYCLOPS AGILIS	17.544
3/13/89	BAY094	2	EUCYCLOPS AGILIS	17.544

VERSAR found that an error in organism identification had been made during counting and then corrected. A final correction to the data set was required. In each case the two fields were summed to produce a final count.

01/10/95 - Life stages were removed from four records, because the life stage was inconsistent with the species identification.

SER_NUM	STATION	LIFE STAGE	VERCODE	LBL
CZM85MB020A	CB2.2	11	T585	Unid. fish larvae
CZM85CH005B	MET4.2	11	T585	Unid. fish larvae
CZM86MB045A	CB5.2	11	T871	Gastropod larvae
CZM85PT014B	XDA1177	31	T2038	Diaphanosoma leuchtenbergianum

SUMMER 1997 - Salinity zones, have been provided by Versar incorporated. However in the following cases salinity zones were replaced with values provided by the Maryland Department of the Environment. Values were derived from Water Quality Hydrographic data collected concurrently with the mesozooplankton. If data was not available for the of sampling but was collected within a one week window of sampling date, the water quality data was used to determine a salinity zone. However the salinity zone is marked with an E to denote being estimated.

DATE	STATION	LAYER	VERSAR SALZONE	CBP SALZONE	DATE	STATION	LAYER	VERSAR SALZONE	CBP SALZONE
1/9/85	XDE5339	WC	P	ME	12/11/85	CB1.1	WC	O	FE
1/9/85	XED4892	WC	M	OE	12/16/85	XED4892	WC	M	OE
2/20/85	XDE5339	WC	P	ME	2/10/86	XDE5339	WC	P	ME
2/26/85	XDA1177	WC	M	FE	6/11/86	CB2.2	WC	O	FE
3/26/85	XDE5339	WC	P	ME	8/11/86	XEA6596	WC	O	FE
5/20/85	PXT0402	WC	O	FE	9/8/86	XDA1177	WC	M	ME
9/9/85	XEA6596	WC	O	FE	11/5/86	XDE5339	WC	P	ME
10/15/85	PXT0402	WC	O	FE	11/17/86	XDA1177	WC	M	ME
11/18/85	PXT0402	WC	O	FE	11/17/86	XEA6596	WC	O	OE
11/18/85	XDE5339	WC	P	ME	12/3/86	XDE5339	WC	P	ME
11/19/85	MLE2.2	WC	P	ME	1/19/87	XED4892	WC	O	ME
11/19/85	XEA6596	WC	O	FE	3/16/87	XED4892	WC	O	ME

DATE	STATION	LAYER	VERSAR SALZONE	CBP SALZONE	DATE	STATION	LAYER	VERSAR SALZONE	CBP SALZONE
7/6/87	XDA1177	WC	F	OE	11/28/88	XDE5339	WC	P	ME
7/13/87	PXT0402	WC	F	OE	12/12/88	PXT0402	WC	O	FE
9/1/87	XEA6596	WC	O	FE	12/12/88	XDE5339	WC	P	ME
10/5/87	XEA6596	WC	O	FE	1/9/89	PXT0402	WC	O	FE
11/9/87	PXT0402	WC	O	FE	1/9/89	XDE5339	WC	P	ME
1/6/88	XDE5339	WC	P	ME	3/13/89	XDE5339	WC	P	ME
3/7/88	XDE5339	WC	P	ME	4/10/89	XDE5339	WC	P	ME
4/4/88	PXT0402	WC	O	FE	4/10/89	XED4892	WC	O	FE
4/4/88	XDE5339	WC	P	ME	10/10/89	XEA6596	WC	O	FE
6/7/88	MET5.1	WC	F	OE	12/18/89	XDE5339	WC	P	ME
6/13/88	XED4892	WC	F	OE	1/16/90	XDE5339	WC	P	ME
9/13/88	PXT0402	WC	O	FE	2/13/90	XDE5339	WC	P	ME
9/13/88	XED4892	WC	O	ME	9/10/90	XDA1177	WC	O	F
10/3/88	XDA1177	WC	F	O	4/20/92	XDE5339	WC	P	ME

JANUARY 1998
Macrozooplankton (amphipods, shrimp, etc.) that were scanned prior to 1990 are now identified when observed in subsamples. In addition, all samples, after the standard hierarchical counting technique, were filtered through an 850 micrometer sieve. Mesozooplankton that were retained in the 850 micrometer sieve that were not previously identified in the subsamples and/or macrozooplankton were counted and identified.

NOTE THAT SINCE JANUARY OF 1998 BOTH METHOD MZ101B AND MZ101C COUNTS ARE REPORTED IN THE DATA SET. THESE ARE NOT DUPLICATE COUNTS. BOTH METHODS ARE REPORTED TO ALLOW BACK COMPATABILITY WITH OLD DATA.

07 July 1998
Method codes were added to the data set to clearly delineate the modifications in the Biological Enumeration Techniques over time.

SUMMER 2000- Biomass Data now available by request from Living Resources Data Only.

SUMMER 2000- All Latitude and Longitude positions converted to NAD83 coordinates.

April 2002
The Maryland and Virginia mesozooplankton monitoring programs implemented modifications to their respective laboratory counting protocols in 1998 in order to better estimate species richness in Maryland and to eliminate large sieving losses of smaller taxa in Virginia. A 1998 - 1999 Mesozooplankton Split Sample Study indicates the desired outcomes of the modifications were only partially accomplished. The “new” Versar counting method (Method code MZ101C) has improved Versar’s ability to measure species richness, an important Bay-wide indicator, and the “new” ODU counting method (Method code MZ102B) has increased ODU’s taxa counts per sample. However, the “new” ODU method still produces split sample results with significantly lower total counts than those of Versar. It appears to selectively undercount key taxa, particularly the immature (copepodite) life stage of calanoid copepods, a common and frequently dominant taxonomic group. The study determined that counts produced with the “new” ODU protocol have variances that are much higher than counts produced with the Versar protocol, hence the ODU counts are less precise. Furthermore, the number of taxa identified per sample was on average lower in the ODU counts. The “old” (Method Code MZ102A) and “new” (Method code MZ102B) ODU counting protocols should be discontinued and a counting protocol patterned after the ICES recommended protocol (Harris et al. 2000) should be instated (Method Code MZ103). Backward comparability with the pre-1998 Chesapeake Bay Program mesozooplankton data will

unfortunately be lost in Virginia for most mesozooplankton taxa, but Maryland and Virginia results will become comparable and the CBP monitoring programs should be able to calculate and use multiple, Bay-wide mesozooplankton indicators. For extensive details in regards to quality assurance issues please see the CBP Phytoplankton Split sample portion of the Chesapeake Bay Quality Assurance Program at:

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

WINTER 2002- This monitoring program was terminated in October of 2002.

January 2007- When all sampling terminated in October 2002, approximately 1,000 archived split samples dating from 1996 to 2002 were in storage at Old Dominion University. In 2005, the Bay Program took formal custody of these sample in hopes that in the future these archived samples could be reprocess with the pipette sub-sampling technique. Funding for recounting a portion of the archive samples became available form CBPO in early 2006. 72 archived Virginia mesozooplankton samples were recounted by Versar, Inc., the contractor to the State of Maryland for the entire historic Maryland zooplankton program. Samples target for recount in this effort were samples collected during the summer (July- September) in mesohaline and polyhaline waters since their was a need for validation samples for the zooplankton Indexes of Biotic integrity in various stages of development at that time. Both the original Old Dominion University count data and the recounted data from Versar appear in the database. Versar recount data will have a method code of MZ101C. Please refer to the Virginia Mesozooplankton monitoring program project documentation station location and collection details. The following samples were part of the 2006 recount effort.

STATION	SAMPLE_DATE
CB6.1	7/9/1996
CB6.1	7/24/1996
CB6.1	8/5/1996
CB6.1	8/26/1996
CB6.1	9/8/1997
CB6.1	7/6/1998
CB6.1	7/6/1999
CB6.1	9/11/2000
CB6.1	8/14/2002
CB6.1	9/16/2002
CB6.4	7/24/1996
CB6.4	8/5/1996
CB6.4	8/12/1997
CB6.4	7/6/1998
CB6.4	8/7/2000
CB6.4	9/14/2000
CB6.4	7/15/2002
CB7.3E	8/7/1996
CB7.3E	7/15/1997
CB7.3E	9/3/1998
CB7.3E	7/6/1999
CB7.3E	8/5/1999
CB7.3E	9/21/1999
CB7.3E	7/11/2000

STATION	SAMPLE_DATE
CB7.3E	9/19/2002
CB7.4	7/22/1996
CB7.4	8/13/1997
CB7.4	8/10/1998
CB7.4	9/3/1998
CB7.4	7/6/1999
CB7.4	8/5/1999
CB7.4	9/21/1999
CB7.4	9/11/2000
LE3.6	7/9/1996
LE3.6	7/24/1996
LE3.6	8/5/1996
LE3.6	8/26/1996
LE3.6	7/15/1997
LE3.6	7/6/1998
LE3.6	9/1/1998
LE3.6	7/6/1999
LE3.6	8/9/2000
LE5.5	7/22/1996
LE5.5-W	9/21/1999
RET3.1	8/5/1998
RET3.1	7/8/1999
RET3.1	8/5/1999
RET3.1	8/9/2001

STATION	SAMPLE_DATE
RET3.1	9/12/2002
RET4.3	7/10/1996
RET4.3	7/24/1996
RET4.3	8/6/1996
RET4.3	7/10/1997
RET4.3	7/23/1997
RET4.3	7/20/1998
RET4.3	8/19/1998
RET4.3	9/9/1998
RET5.2	9/23/1997
RET5.2	8/17/1999
SBE5	7/8/1996
SBE5	7/23/1996
SBE5	7/8/1997
SBE5	9/15/1999
SBE5	9/21/2000
TF3.3	7/8/1999
TF3.3	8/24/1999
WE4.2	7/24/1996
WE4.2	8/5/1996
WE4.2	7/6/1998
WE4.2	9/1/1998

KEY WORDS (EXCLUDING VARIABLE NAMES)
Mesozooplankton Counts
Mesozooplankton Densities
Mesozooplankton Monitoring
Mesozooplankton Taxon
Mesozooplankton Biomass
Mesozooplankton Biovolume
Jellyfish Biovolume
Jellyfish Counts
Jellyfish Monitoring

THIS IS THE END OF THE MARYLAND CHESAPEAKE BAY PROGRAM MESOZOOPLANKTON DATA DICTIONARY
