PHYTOPLANKTON AND ZOOPLANKTON MONITORING DATABASE: Version 3.0

DATABASE DESIGN DOCUMENTION AND DATA DICTIONARY

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BACKGROUND

In 1996, the Chesapeake Executive Counsel adopted the "Strategy for Increasing Basin-wide Public Access to Chesapeake Bay Information". This strategy calls for the Chesapeake Bay Program partners to develop the Chesapeake Bay Information Management System (CIMS). CIMS will electronically link a variety of information sources about the Bay and rivers and make this information available to anyone—from students, to scientists, to citizens groups—electronically through the Internet and World Wide Web. The information targeted by CIMS includes technical and public information, educational material, environmental indicators, policy documents and scientific data.

As a result of the CIMS initiative, the Bay Program is working to establish a system of distributed databases. In the ideal system, 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 the traditional single data repository. Primarily, the people with the most expertise and knowledge about the data, the originators, will manage the data. Additional advantages include reduced cost due to elimination of intermediate data handling at a central repository, and decreased time between collection and release of the data.

The key to the success of a distributed data management system lies in the willingness of the data generators to take responsibility for the quality and maintenance for their data as well as and in their adherence to the established data standards. As part of the implementation of CIMS, the Living Resources Biological Data Management program has chosen to design a series of relational database structures for managing various types of Chesapeake Bay related Monitoring data. Once developed, these database designs are populated with the existing data and were intended to be turned over to the data generators for long term maintenance. The advantage of this implementation scheme is that the data generators of like data types will be running databases of identical structure. The use of these identical database structures will facilitate implementing search engines and combining data from multiple sources. The design of these databases has been done as a joint effort between the data generators and the CBP technical staff. The participation of the data generators in this process has provided critical expertise about the data and its usage, producing a better database.

The original Phytoplankton and Zooplankton Monitoring Database was designed in 1995 using Microsoft Access. The data base was migrated in to Microsoft SQL server in September 2007. During this migration, minor modifications were made to tables and fields to accommodate SQL Server and maintain continuity where possible with the Chesapeake Bay program Tidal Water Quality Monitoring Database. This updated document is not intended to provide a complete discussion of the concepts of a relational database. Instead, this document describes in detail the Phytoplankton and Zooplankton Monitoring Database's revised structural design.

INTRODUCTION

PHYTOPLANKTON AND ZOOPLANKTON MONITORING DATA

The states of Maryland and Virginia, in cooperation with the US EPA Chesapeake Bay Program, have conducted baseline monitoring of the lower trophic levels in the Chesapeake Bay and it's tidal tributaries since 1984. These programs are designed to give comprehensive spatial and temporal information on phytoplankton composition and abundance; picoplankton abundance; primary production rates; microzooplankton composition and abundance; and mesozooplakton composition, biomass and abundance. These monitoring programs are performed in conjunction with the water quality monitoring programs in both jurisdictions. All Maryland monitoring programs began in July of 1984. The Virginia Phytoplankton and mesozooplankton monitoring programs began in 1985, primary production and picoplankton monitoring

began in 1989, and microzooplankton monitoring began in 1993. All sampling for mesozooplankton and microzooplankton was discontinued in October 2002 in both states.

RELATIONAL DATABASE CONCEPTS

In a relational database, data is stored in tables, which are linked to one another by common fields. Most tables are related to one another in a series of one to many relationships. In this type of arrangement, the one record in the "Parent" or one table is related to many records in the "child" or many table. The common fields are set as primary and/or foreign keys. The creation of relationships between tables using key fields allows for the enforcement of referential integrity. Referential integrity prohibits the data manager from entering records into a child table containing a foreign key for which there is not an associated primary key in the parent table. This database also employs the use of auto-generated key field. An auto generated key field cannot be edited; it is a unique, sequential or random number automatically assigned to each new record added to the table. In the case of this database, auto-generated keys are assigned to unique records based on a combination of fields in the parent table. The auto-generated key is then added to a child table as part of its primary key. The principle advantage of an auto-generated key is that once assigned a table can be indexed and linked on one field instead of the combination of fields used to determine a unique record. This serves to increase the efficiency of the database and decrease data recovery time.

The following relational data structure for the Living Resource Monitoring data contains description of the primary data tables as well as the numerous lookup tables required to define in detail the codes contained in the primary tables. The primary tables contain the bulk of the data in the database and are generally related to one another by multiple key fields. The primary tables in the Plankton database are TAB_BIOTA_EVENT, TAB_BIOMASS_SETVOL, TAB_IBI_METRICS, TAB_PHYTO_INDICATOR_METRICS, TAB_ PHYTO_PICO, TAB_PRIMARY_PROD, AND TAB_ZOO_TAX. Information related specifically to monitoring stations (e.g. latitude, longitude, basin, etc.) is stored in the TAB_STATIONS table. Information related specifically taxonomic names of organisms is stored in the TAB_CBP_MSTR table. When a data provider collects a biological sample at a station, information related to sampling event is stored in the TAB_BIOTA_EVENT table. Parameter values obtained from field measurements or laboratory analysis will be stored in the TAB_BIOMASS_SETVOL, TAB_ PHYTO_PICO, TAB_PRIMARY_PROD, or TAB_ZOO_TAX table depending upon its type. Information contained in the associated look-up tables supports the referential integrity of the database.

RELATIONAL DATABASE STRUCTURE

The following relational data structure for water quality data contains descriptions of the primary data tables as well as the numerous lookup tables required to define in detail the codes contained in the primary tables. The table columns in this document used to describe the fields in the database tables are described below.

FIELD - This column contains the field name in the database table as well as the designation of the field as either a primary key (PK), a foreign key (FK), a not null (NN) field, a unique field (U) or a auto-generated key field (AK). Primary, foreign and auto-generated key fields, by definition, are not null fields. However primary and foreign keys may contain zero length value fields. Fields which are neither primary nor foreign key fields, but which have been designated as not null or unique are those fields deemed essential to certain applications of the database.

DESCRIPTION - This column contains a definition of the database table field.

TYPE (FORMAT) - This column specifies the field type as character, number, or date/time; it also includes the format of the field and the precision of the text value where appropriate. Currently accepted data types in Microsoft SQL server used in the plankton database include the following.

Exact numeric’s

Type	From	To
BIGINT	-9,223,372,036,854,775,808	9,223,372,036,854,775,807
INT	-2,147,483,648	2,147,483,647
SMALLINT	-32,768	32,767
TINYINT	0	255
BIT	0	1
DECIMAL	-10^38 +1	10^38 –1
NUMERIC	-10^38 +1	10^38 –1

numeric and decimal are Fixed precision and scale data types and are functionally equivalent.

datetime and smalldatetime

Type	From	To
DATETIME (3.33 milliseconds accuracy)	Jan 1, 1753	Dec 31, 9999
SMALLDATETIME (1 minute accuracy)	Jan 1, 1900	Jun 6, 2079

Character Strings

Type	Description
CHAR	Fixed-length non-Unicode character data with a maximum length of 8,000 characters.
VARCHAR	Variable-length non-Unicode data with a maximum of 8,000 characters.
TEXT	Variable-length non-Unicode data with a maximum length of 2,147,483,647 characters.

LENGTH (BYTES) - This column specifies the maximum character length of a field as well as the internal database storage requirement.

PHYTOPLANKTON AND ZOOPLANKTON DATABASE STRUCTURE

PRIMARY DATA TABLES

Within the current design, the primary tables are the TAB_BIOTA_EVENT TABLE, BIOMASS_SETVOL TABLE , TAB_PHYTO_PICO TABLE, TAB_PRIMARY_PROD TABLE ,TAB_ZOO_TAX TABLE, TAB_IBI_METRICS and TAB_PHYTO_INDICATOR_METRICS. The BIOTA EVENT TABLE contains all sampling event data for all types of sample collection events. The remaining table all store data of the type designated in the table name.

TAB_BIOTA_EVENT

Field Name	Description	Data Type	Length
SURVEY_ID (AK,PK)	PRIMARY_ID KEY- (STATION+SAMPLE_DATE+SAMPLE_TIME+ SOURCE+LAYER+DATA_TYPE)	INTEGER	
STATION (PK,NN,FK)	SAMPLING STATION- Sampling station identifier	VARCHAR	15
SAMPLE_DATE _TIME (PK,NN)	SAMPLING DATE/TIME- Date and time of sample collection	DATE/TIME	8
LAYER (PK,NN,FK)	LAYER- Layer of Water Column in which Sample was Taken	CHAR	3
SOURCE (PK,NN,FK)	AGENCY/CONTRACTOR DATA SOURCE CODE- Code identifying data generator	VARCHAR	10
DATA_TYPE (PK,NN)	SAMPLE TYPE CODE- Denotes type of biological sample collected	CHAR	2
SAMPLE_TYPE (PK,NN,FK)	SAMPLE COLLECTION TYPE CODE Denotes type of sample collected for analysis of a given Data_type	VARCHAR	2
TOTAL_DEPTH	TOTAL STATION DEPTH- Total Station Depth in Meters	DECIMAL	
P_DEPTH	COMPOSITE SAMPLE CUT-OFF DEPTH- Depth used as the cutoff depth between upper (AP) and lower (BP) LAYERS during a sampling event.	DECIMAL	
TOTAL_ SAMPLE_ VOLUME (NN)	TOTAL VOLUME OF SAMPLE	DECIMAL	
TOTAL_ SAMPLE_ VOLUME_UNITS (NN)	REPORTING UNITS OF SAMPLE VOLUME	DECIMAL	

Field Name	Description	Data Type	Length
G_METHOD (FK)	GEAR METHOD CODE- Code of Sampling Gear used for sample collection	CHAR	3
SALZONE (FK)	SALINITY ZONE- Salinity classification of water column in which sample was collected, based on Venice Classification system.	CHAR	2
R_DATE (NN)	DATA VERSION DATE- Date denoting when data records were entered in to database	DATE/TIME	8
SAMPLE_DATE	SAMPLE COLLECTION DATE ONLY- Date on which the sample was collected (calculated field)	TEXT	10
SAMPLE_TIME	SAMPLE COLLECTION TIME ONLY-Time (24 hour) which the sample was collected (calculated field)	TEXT	20

Notes:

1) GENERAL: Every event for which there were sample taken of any kind must have a record in this table. Event records must be loaded into the database first and all unique records are assigned a SURVEY_ID number. The SURVEY_ID must then be merged onto all other data based on the key fields before data may be loaded into any other primary data tables.

2) SURVEY_ID: The actual primary key for this table is a composite key base on the following fields: STATION, SAMPLE_DATE_TIME, LAYER, SOURCE AND DATA_TYPE. An Auto-Key number is generated for each unique combination of these fields.

3) SAMPLE_TIME: Sampling events where sample collection time is missing, SAMPLE_TIME has been set to 00:00 (Mid-Night).

TAB_BIOMASS_SETVOL

Field Name	Description	Data Type	Length
SURVEY_ID (PK,FK)	PRIMARY_ID KEY- AN AUTO-GENERATED FIELD	INT	
SAMPLE_ NUMBER (PK)	SAMPLE NUMBER- Number of sample collected at Station(replicate number)	TINYINT	
METHOD (PK, FK)	METHOD CODE- Method code identifying field/laboratory analysis procedure	CHAR	6
VALUE_TYPE (FK)	ACTUAL OR ESTIMATED VALUE TYPE CODE- Code for measurement type	CHAR	1
REPORTING_ PARAMETER (PK)	REPORTING_PARAMETER- Biological monitoring parameter code	VARCHAR	15

Field Name	Description	Data Type	Length
REPORTING_ VALUE (NN)	PARAMETER VALUE	DECIMAL	
REPORTING_ UNITS (NN)	REPORTING UNITS OF PARAMETER	VARCHAR	25
SER_NUM	SOURCE SAMPLE SERIAL NUMBER	VARCHAR	12
R_DATE	DATA VERSION DATE- Date denoting when data records were entered in to database	SMALL DATETIME	

NOTES:

1) GENERAL: This table stores information relating to measurements of zooplankton biomass and settled volumes. This table assumes that all biomass or zooplankton volume information is derived directly from zooplankton tows or estimated after correcting for the presence of detritus. This table assumes that all biomass and volume information is from composite samples. The maximum depth at which water making up a sample was derived from is assumed to be TOTAL_DEPTH (from TAB_BIOTA_EVENT TABLE) minus 0.5 meters for all whole water column samples. AP (Above Pycnocline samples) are derived from water taken between 0.5 meters below the surface and 0.5 meters ABOVE the P_DEPTH (from TAB_BIOTA_EVENT TABLE). BP (Below Pycnocline samples) are derived from water taken between 0.5 meters above the bottom (TOTAL_DEPTH) and 0.5 meters BELOW the P_DEPTH (from TAB_BIOTA_EVENT TABLE).

2) SURVEY_ID: The primary key for this table is a composite key base on the following fields: STATION, SAMPLE_DATE_TIME, SOURCE, DATA_TYPE, SAMPLE_NUMBER, METHOD, VALUE_TYPE, and PARAMETER. The composite key of SURVEY_ID is base on the combination following fields: STATION, SAMPLE_DATE_TIME, LAYER, SOURCE AND DATA_TYPE. An Auto-Key number is generated for each unique combination of these fields in the TAB_BIOTA_EVENT TABLE and must be merged on to data before it can be loaded into this table.

TAB_PHYTO_PICO

Field Name	Description	Data Type	Length
SURVEY_ID (PK,FK)	PRIMARY_ID KEY- AN AUTO-GENERATED FIELD	INT	
SAMPLE_ NUMBER (PK)	SAMPLE NUMBER- Number of sample collected at Station(replicate number)	TINYINT	
METHOD (PK,FK)	METHOD CODE- Method code identifying field/laboratory analysis procedure	CHAR	6
TSN (PK,FK)	TAXON SERIAL NUMBER- ITIS Serial Number for Species Identification	CHAR	7

Field Name	Description	Data Type	Length
SIZE_RANGE (PK)	SPECIES SIZE FRACTION- Additional species identifier	VARCHAR	30
REPORTING_ PARAMETER (PK)	PARAMETER- Name identifying parameter	VARCHAR	30
REPORTING_ VALUE (NN)	PARAMETER VALUE	DECIMAL	
REPORTING_ UNITS (NN)	REPORTING UNITS OF PARAMETER	VARCHAR	25
SPEC_CODE	SOURCE INHOUSE SPECIES CODE	VARCHAR	14
SER_NUM	SOURCE SAMPLE SERIAL NUMBER	VARCHAR	12
R_DATE	DATA VERSION DATE- Date denoting when data records were entered in to database	SMALL DATETIME	

NOTES:

GENERAL: This table stores information relating to measurements of Phytoplankton and Picoplankton species abundance and composition. This database uses the Interagency Taxonomic Identification System (ITIS) Taxon Serial Numbers (TSN) for species identification within the database. For species with no TSN values temporary Chesapeake Bay TSN's are generated until a species can be submitted to ITIS for recognition. If no taxonomic analysis was performed on a sample, there should be no records present for that sample in this table. The maximum depth at which water making up a sample was derived from is assumed to be TOTAL_DEPTH (from TAB_BIOTA_EVENT TABLE) minus 0.5 meters for all whole water (Layer = WC) column samples. Above Pycnocline samples (Layer =AP) are derived from water taken between 0.5 meters below the surface and 0.5 meters ABOVE the P_DEPTH (from TAB_BIOTA_EVENT TABLE). Below Pycnocline samples (Layer =BP) are derived from water taken between 0.5 meters above the bottom (TOTAL_DEPTH) and 0.5 meters BELOW the P_DEPTH (from TAB_BIOTA_EVENT TABLE). The type of organism targeted in a count (Phytoplankton or Picoplankton) is expressed in the method code.

2) SURVEY_ID: The primary key for this table is a composite key base on the following fields: STATION, SAMPLE_DATE_TIME, SOURCE, DATA_TYPE, SAMPLE_NUMBER, METHOD, VALUE_TYPE, and PARAMETER. The composite key of SURVEY_ID is base on the combination of the following fields: STATION, SAMPLE_DATE_TIME, LAYER, SOURCE AND DATA_TYPE. An Auto-Key number is generated for each unique combination of these fields in the TAB_BIOTA_EVENT TABLE and must be merged on to data before it can be loaded into this table.

TAB_PRIMARY_PROD

Field Name	Description	Data Type	Length
SURVEY_ID (PK,FK)	PRIMARY_ID KEY- AN AUTO-GENERATED FIELD	INT	
SAMPLE_ NUMBER (PK,FK)	SAMPLE NUMBER- Number of sample collected at Station(replicate number)	TINYINT	
CARBFIX	CARBON FIXATION RATE	REAL	
REPORTING_ UNITS	REPORTING UNITS OF CARBON FIXATION	VARCHAR	25
QUALIFIER (FK)	PARAMETER QUALIFIER CODE- Code identifying the parameter value as less than or greater than the method detection limits	CHAR	2
METHODS (FK)	METHOD CODE- Method code identifying field/laboratory analysis procedure	CHAR	6
CHLA	CHLOROPHYLL A (MICROGRAMS/LITER)	DECIMAL	
ASMRATIO	PRODUCTION EFFICIENCY (MICROGRAMS CARBON PER MICROGRAM CHLOROPHYLL A)	DECIMAL	
SER_NUM	SOURCE SAMPLE SERIAL NUMBER	TEXT	12
R_DATE	DATA VERSION DATE- Date denoting when data records were entered in to database	SMALL DATETIME	

NOTES:

GENERAL: This table stores information relating to measurements of Primary Production rates and efficiency. This table assumes that all information is from composite Above Pycnocline samples. Waters making up AP (Above Pycnocline samples) are derived from water taken between 0.5 meters below the surface and 0.5 meters ABOVE the P_DEPTH (from TAB_BIOTA_EVENT TABLE). Note that either CARBFIX or CHLA must not be null to have a valid record. Both CARBFIX and CHLA must have values in order to have an ASMRATIO.

2) SURVEY_ID: The primary key for this table is a composite key base on the following fields: STATION, SAMPLE_DATE_TIME, SOURCE, DATA_TYPE, SAMPLE_NUMBER, METHOD, VALUE_TYPE, and PARAMETER. The composite key of SURVEY_ID is base on the combination following fields: STATION, SAMPLE_DATE_TIME, LAYER, SOURCE AND DATA_TYPE. An Auto-Key number is generated for each unique combination of these fields in the TAB_BIOTA_EVENT TABLE and must be merged on to data before it can be loaded into this table.

TAB_ZOO_TAX

Field Name	Description	Data Type	Length
SURVEY_ID (PK,FK)	PRIMARY_ID KEY- AN AUTO-GENERATED FIELD	INT	
SAMPLE_ NUMBER (PK)	SAMPLE NUMBER- Number of sample collected at Station(replicate number)	TINYINT	
METHOD (PK,FK)	METHOD CODE- Code identifying the lab method used to ennumerate biological sample	CHAR	6
TSN (PK,FK)	TAXON SERIAL NUMBER- ITIS Serial Number for Species Identification	CHAR	7
LIFE_STAGE (PK,FK)	SPECIES LIFE STAGE CODE- Chesapeake bay program species life stage code	CHAR	2
PARAMETER_ VALUE (PK,FK)	PARAMETER VALUE- Biological monitoring parameter name.	VARCHAR	15
REPORTED_ VALUE (NN)	REPORTED_VALUE	DECIMAL	
UNITS (NN)	REPORTING UNITS OF PARAMETER	VARCHAR	15
SPEC_CODE	SOURCE INHOUSE SPECIES CODE	VARCHAR	14
SER_NUM	SOURCE SAMPLE SERIAL NUMBER	VARCHAR	12
R_DATE	DATA VERSION DATE- Date denoting when data records were entered in to database	SMALL DATETIME	

NOTES:

GENERAL: This table stores information relating to measurements of zooplankton, microzooplankton and Gelatinous zooplankton abundance and composition. This database uses the Interagency Taxonomic Identification System (ITIS) Taxon Serial Numbers (TSN) for species identification within the database. For species with no TSN values temporary Chesapeake Bay TSN's are generated until a species can be submitted to ITIS for recognition. If no taxonomic analysis was performed on a sample, there should be no records present for that sample in this table. The maximum depth at which water making up a sample was derived from is assumed to be TOTAL_DEPTH (from TAB_BIOTA_EVENT TABLE) minus 0.5 meters for all whole water (Layer =WC) column samples. Above Pycnocline samples (Layer =AP) are derived from water taken between 0.5 meters below the surface and 0.5 meters ABOVE the P_DEPTH (from BIOTA_EVENT TABLE). Below Pycnocline samples (Layer =BP) are derived from water taken between 0.5 meters above the bottom (TOTAL_DEPTH) and 0.5 meters BELOW the P_DEPTH (from TAB_BIOTA_EVENT TABLE).

The type of organism targeted in a count (ex gelatinous zooplankton, mesozooplankton or microzoplankton) is expressed in the method code.

2) SURVEY_ID: The primary key for this table is a composite key base on the following fields: STATION, SAMPLE_DATE_TIME, SOURCE, DATA_TYPE, SAMPLE_NUMBER, METHOD, VALUE_TYPE, and PARAMETER. The composite key of SURVEY_ID is base on the combination following fields: STATION, SAMPLE_DATE_TIME, LAYER, SOURCE AND DATA_TYPE. An Auto-Key number is generated for each unique combination of these fields in the BIOTA_EVENT TABLE and must be merged on to data before it can be loaded into this table.

TAB_IBI_METRICS

Field Name	Description	Data Type	Length
SURVEY_ID (PK,FK)	PRIMARY_ID KEY- AN AUTO-GENERATED FIELD	INT	
STATION (PK,NN,FK)	SAMPLING STATION- Sampling station identifier	VARCHAR	15
SAMPLE_DATE_ TIME (PK,NN)	SAMPLING DATE/TIME- Date and time of sample collection	SMALLDATE TIME	
SAMPLE_NUMBER (PK)	SAMPLE NUMBER- Number of sample collected at Station(replicate number)	TINYINT	
IBI_PARAMETER (PK, FK)	IBI PARAMETER- Name of IBI Metric parameter	VARCHAR	25
IBI_VALUE	IBI_VALUE- IBI metric parameter reported value.	DECIMAL	
IBI_SCORE	IBI SCORE VALUE- IBI metric reported IBI score value.	DECIMAL	
IBI_SALZONE (FK, NN)	IBI SALINITY ZONE-IBI site salinity zone classification	CHAR	1
IBI_LAYER (NN)	IBI SAMPLING LAYER- IBI water column layer classification.	CHAR	2
R_DATE (NN)	DATA VERSION DATE- Date denoting when data records were entered in to database	SMALLDATE TIME	
SEASON (NN)	IBI SEASON CLASS-IBI season classification	CHAR	6

1) GENERAL: This table stores calculated Phytoplankton Index of Biotic Integrity (PIBI) metrics and scored values. The PIBI's are calculated based on the published in Lacouture RV, Johnson JM, Buchanan C, Marshall HG (2006) Phytoplankton Index of Biotic Integrity for Chesapeake Bay and its Tidal Tributaries. Estuaries and Coasts: Vol. 29, No. 4 pp. 598–616. For more details on the calculation of specific parameters included in the database see the document: Methodology Applied in the Calculation of Chesapeake Bay Program Phytoplankton Composite Metrics and Index of Biotic Integrity (PIBI) (url to be determined).

2) SURVEY_ID: Once the SURVEY_ID number is merged on to this table based on STATION, SAMPLE_DATE, SAMPLE_TIME and SOURCE the fields may be deleted. The actual primary key for this table is a composite key composed of the following field: STATION, SAMPLE_DATE_TIME, SOURCE, SAMPLE NUMBER and IBI_PARAMETER..

3) IBI_LAYER: The current Chesapeake Bay PIBI is valid for only above pycnocline (AP) or whole water column sample. For data processing purposes WC sample have been reassign a layer code of AP, but are still matched to the appropriate WC TAB_BIOTA_EVENT survey_id event.

4) SEASON: The current Chesapeake Bay PIBI is a seasonal index. There are currently two index periods SPRING (March, April, May) and SUMMER(July, August, September). Sampling events are assigned to a season by sample_date.

TAB_PHYTO_INDICATOR_METRICS

Field Name	Description	Data Type	Length
SURVEY_ID	PRIMARY_ID KEY (STATION+DATE+TIME+LAYER+SOURCE+DATATYPE+SAMPLE_TYPE)	INT	
STATION	CBP SAMPLING STATION	VARCHAR	15
SAMPLE_DATE	PHYTOPLANKTON SAMPLING DATE	SMALLDATETIME	
UP_DATE	UPPER END OF 3 DAY DATA MATCHING WINDOW	SMALLDATETIME	
DN_DATE	LOWER END OF 3 DAY DATA MATCHING WINDOW	SMALLDATETIME	
WQ_DATE	WATER QUALITY SAMPLING DATE	SMALLDATETIME	
SEASON	CBP SEASON DESIGNATION	CHAR	6
IBI_LAYER	SAMPLE LAYER	CHAR	2
IBI_SALZONE	WATER LAYER SALINITY ZONE DESIGNATION	CHAR	1
CHL_SURF	SURFACE CHLOROPHYLL A (0.5 M) UG/L	DECIMAL	
CHLORO_ABUND	TOTAL CHLOROPHYTE ABUNDANCE IN NUMBER/LITER	DECIMAL	
CHLORO_ BIOMASS	TOTAL CHLOROPHYTE BIOMASS IN UG CARBON/LITER	DECIMAL	
CHRYSO_ABUND	TOTAL CHRYSOPHYTE ABUNDANCE IN NUMBER/LITER	DECIMAL	
CHRYSO_ BIOMASS	TOTAL CHRYSOPHYTE BIOMASS IN UG CARBON/LITER	DECIMAL	
COCHLODINIUM_ HET_ABUND	TOTAL COCHLODINIUM ABUNDANCE IN NUMBER/LITER	DECIMAL	
COCHLODINIUM_ HET_BIOMASS	TOTAL COCHLODINIUM BIOMASS IN UG CARBON/LITER	DECIMAL	
CRYPTO_ABUND	TOTAL CRYPTOPHYTE ABUNDANCE IN NUMBER/LITER	DECIMAL	

Field Name	Description	Data Type	Length
CRYPTO_ BIOMASS	TOTAL CRYPTOPHYTE BIOMASS IN UG CARBON/LITER	DECIMAL	
CYANO_ABUND	TOTAL CYANOPHYTE ABUNDANCE IN NUMBER/LITER	DECIMAL	
CYANO_ BIOMASS	TOTAL CYANOPHYTE BIOMASS IN UG CARBON/LITER	DECIMAL	
DIATOM_ABUND	TOTAL DIATOM ABUNDANCE IN NUMBER/LITER	DECIMAL	
DIATOM_ BIOMASS	TOTAL DIATOM BIOMASS IN UG CARBON/LITER	DECIMAL	
DINO_ABUND	TOTAL DINOFLAGGELATE ABUNDANCE IN NUMBER/LITER	DECIMAL	
DINO_BIOMASS	TOTAL DINOFLAGGELATE BIOMASS IN UG CARBON/LITER	DECIMAL	
EUGLENO_ ABUND	TOTAL EUGLENOPHYTE ABUNDANCE IN NUMBER/LITER	DECIMAL	
EUGLENO_ BIOMASS	TOTAL EUGLENOPHYTE BIOMASS IN UG CARBON/LITER	DECIMAL	
HAPTO_ABUND	TOTAL HAPTOPHYTE ABUNDANCE IN NUMBER/LITER	DECIMAL	
HAPTO_ BIOMASS	TOTAL HAPTOPHYTE BIOMASS IN UG CARBON/LITER	DECIMAL	
MICROCYSTIS_ AER_ABUND	TOTAL MICROCYSTIS ABUNDANCE IN NUMBER/LITER	DECIMAL	
MICROCYSTIS_ AER_BIOMASS	TOTAL MICROCYSTIS BIOMASS IN UG CARBON/LITER	DECIMAL	
PICO_ABUND	TOTAL PICOPLANKTON ABUNDANCE IN NUMBER/LITER	DECIMAL	
PICO_BIOMASS	TOTAL PICOPLANKTON BIOMASS IN UG CARBON/LITER	DECIMAL	
PRASINO_ ABUND	TOTAL PRASINOPHYTE ABUNDANCE IN NUMBER/LITER	DECIMAL	
PRASINO_ BIOMASS	TOTAL PRASINOPHYTE BIOMASS IN UG CARBON/LITER	DECIMAL	
PROROCENTRUM _MIN_ABUND	PROROCENTRUM_MINIMUM ABUNDANCE IN NUMBER/LITER	DECIMAL	
PROROCENTRUM _MIN_BIOMASS	PROROCENTRUM_MINIMUM BIOMASS IN UG CARBON/LITER	DECIMAL	
TOT_ABUND	TOTAL PHYTOPLANKTON ABUNDANCE IN NUMBER/LITER	DECIMAL	
TOT_BIOMASS	TOTAL PHYTOPLANKTON BIOMASS IN UG CARBON/LITER	DECIMAL	
SALINITY	AVE LAYER SALINITY IN PSU	DECIMAL	
PO4	AVE LAYER PO4 CONC IN MG/L	DECIMAL	
DIN	AVE LAYER DISSOLVED ORGANIC N (NO2+NO3+NH4) IN MG/L	DECIMAL	
SECCHI	SECCHI DEPTH IN METERS	DECIMAL	
SECCHI_RANK	SECCHI DEPTH RANK-RELATIVE STATUS METHOD	VARCHAR	8
PO4_RANK	PO4 CONC RANK-TOM FISHER NUTRIENT LIMITATION THRESHOLDS	VARCHAR	8
DIN_RANK	DIN CONC RANK-TOM FISHER NUTRIENT LIMITATION THRESHOLDS	VARCHAR	8
CHLA	AVELAYER CHLA IN UG/L	DECIMAL	
DO_VALUE	AVE LAYER DISSOLVED OXYGEN IN PPM	DECIMAL	
DOC	AVE LAYER DISSOLVED ORGANIC CARBON CONC IN MG/L	DECIMAL	

Field Name	Description	Data Type	Length
PC	AVE LAYER PARTICULATE CARBON CONC IN MG/L	DECIMAL	
PHEO	AVE LAYER PHEOOHYTIN CONC IN MG/L	DECIMAL	
TSS	AVE LAYER TOTAL SUSPENDED SOLIDS	DECIMAL	
WTEMP	AVE LAYER WATER TEMP CELSIUS	DECIMAL	
TOC	AVE LAYER TOTAL ORGANIC CARBON CONC IN MG/L	DECIMAL	
BIOMASS_CHL_ RATIO	TOTAL PHYTOPLANKTON BIOMASS TO AP CHL RATIO	DECIMAL	
CELL_SIZE	AVERAGE CELL SIZE PG/CELL	DECIMAL	
CRYPTO_BIO_ PCT	PERCENT CRYPTOPHYTE BIOMASS	DECIMAL	
CYANO_BIO_PCT	PERCENT CYANOPHYTE BIOMASS	DECIMAL	
DIATOM_BIO_ PCT	PERCENT DIATOM BIOMASS	DECIMAL	
DINO_BIO_PCT	PERCENT DINOFLAGGELATE BIOMASS	DECIMAL	
WQ_CATEGORY	FISHER WATER QUALITY CATEGORY	VARCHAR	20
R_DATE	DATA VERSION DATE	SMALLDATETIME	

1) GENERAL: This table stores composite phytoplankton metrics and commonly used water quality parameters. This table is not a normalized table, but does provide data in a format compatible with many common statistics programs. The composite metrics are calculated based on the published in Buchanan, C., R.V. Lacouture, H.G. Marshall, M. Olson and J.M. Johnson. 2005. Phytoplankton reference communities for Chesapeake Bay and its tidal tributaries. Estuaries 28(1): 138-159. For more details on the calculation of specific parameters included in the database see the document: Methodology Applied in the Calculation of Chesapeake Bay Program Phytoplankton Composite Metrics and Index of Biotic Integrity (PIBI) (url to be determined).

PRINCIPAL LOOK-UP TABLES

The primary tables also contain many fields containing codes that are described or defined in detail in related lookup tables. By creating one-to-many relationships between lookup tables and the primary data tables and enforcing referential integrity, data managers are restricted to entering only valid lookup table values into the primary data tables. Again, this provides an automatic layer of quality assurance that will improve the utility of the database for all users.

TAB_CBP_BASINS

Field	Description	Type	Length
CBP_BASIN (PK)	CHESAPEAKE BAY PROGRAM BASIN	VARCHAR	30
CBP_BASIN_ DESCRIPTION (NN)	BASIN DESCRIPTION- Location of the monitoring station with respect to the geologic fall line or the zone of tidal influence	VARCHAR	100

GENERAL- The TAB_CBP_BASINS TABLE contains Chesapeake Bay program basins and descriptions of the Bay Program basin in which the station is located. These basin designations have been used by the Chesapeake bay Program since its inception to summarize watershed model loads from all sources. Point related data naturally fall into one of these basins, so this field has been retained in order to maintain the ability to summarize information using this scheme For stations located within Chesapeake Bay, the CBP may want to consider assigning the most proximal CBP_BASIN to these stations as a means of providing the ability to determine cause and effect relationships. The CBP_BASIN code OUTSIDE is included because there are water quality stations as well as point source facilities located outside the watershed that are tracked for specific purposes.). The currently accepted CBP_BASINS AND DESCRIPTIONS are as follows:

CBP_BASIN	CBP_BASIN_DESCRIPTION
CHESAPEAKE BAY	Chesapeake Bay
JAMES RIVER	James River Watershed
MD EASTERN SHORE	Maryland East Of Chesapeake Bay
MD WESTERN SHORE	Maryland West Of Chaesapeake Bay, Excluding The Potomac And Patuxent Watersheds
OUTSIDE	Outside Of The Chesapeake Bay Watershed
PATUXENT RIVER	Patuxent River Watershed
POTOMAC RIVER	Potomac River Watershed
RAPPAHANNOCK RIVER	Rappahannock River Watershed
SUSQUEHANNA RIVER	Susquehanna River Watershed
VA EASTERN SHORE	Virginia East Of Chesapeake Bay
VA WESTERN SHORE	Virginia West Of Chesapeake Bay, Excluding The Potomac, James, Rappahannock And York Watersheds
YORK RIVER	York River Watershed

TAB_CBP_MSTR

Field Name	Description	Data Type	Length
TSN_NUM	TAXON SERIAL NUMBER- ITIS Serial Number for Species Identification (defined as a numeric value)	INT	
TSN (PK,FK)	TAXON SERIAL NUMBER- ITIS Serial Number for Species Identification (defined as a fixed 7 character value with leading zeros)	CHAR	7
NODC_CODE	NATIONAL OCEANOGRAPHIC DATA CENTER TAXONOMIC CODES	VARCHAR	12
SYN	SYNONYM FLAG- Chesapeake Bay Program flag denoting species with synonymous name	VARCHAR	2
LATIN_NAME (NN)	SPECIES LATIN NAME- Species Latin/Scientific Name	VARCHAR	45
TAXON_LEVEL	PHYLOGENIC CLASSIFICATION- Denotes Phylogenic Level (phylum, class, order, etc)	VARCHAR	6
COMMON_ NAME	COMMON NAME- Species Common Name	VARCHAR	40
R_DATE (NN)	DATA VERSION DATE- Date denoting when data records were entered in to database	SMALLDATE TIME	

General: This table stores information in relating to the identification of species in the PHYTO_PICO TABLE and the ZOO_TAX TABLE. The list includes listings for all types of organisms including phytoplankton, zooplankton, fish and benthos. This database uses the Interagency Taxonomic Identification System (ITIS) Taxon Serial Numbers (TSN) for species identification within the database. For species with no TSN values temporary Chesapeake Bay TSN's are generated until a species can be submitted to ITIS for recognition. The use of the standardized TSN codes among all Bay Program databases will allows for queries by species from multiple State and National biological databases.

TSN: Each species has been given its ITIS Taxonomic Serial Number (TSN). The ITIS (Interagency Taxonomic Information System) is a partnership of federal agencies working together to improve the organization of, and access to, standardized nomenclature. As part of this system a national, easily accessible database with reliable information on species names and their hierarchical classification has been established. The database is reviewed periodically to ensure high quality with valid classifications, revisions, and additions of newly described species. As part of this effort all Federal agencies have been asked to adopt the use of TSN code which assigns each recognized species a permanent number. The TSN allows a species to be tracked over time regardless of changes in name and taxonomic classification. TSN also provides a uniform key field for database development and species identification across multiple organizations. When used in conjunction with the NODC, the TSN overcomes the problem of numeric changes in the NODC code whenever species are reclassified. Temporary codes are assigned to taxa that are recognized in the scientific literature but have not been assigned an NODC Code and a TSN. The value bayxxxx has been assigned to all taxa without TSN. A temporary NODC code is developed for each unassigned taxon based on its known taxonomy and its species name. For example, the beginning couplets of the NODC code which reflect the known phylogeny of an unassigned taxon are combined with letters from its species name to form a temporary code. The most up to date TSN numbers are available at http://www.itis.gov/. The most recent *Comprehensive List of Chesapeake Bay Basin Species 2007* can be found at ftp://ftp.chesapeakebay.net/pub/Living_Resources/species2007.pdf .

NODCCODE: All species on the list have been assigned at least partial National Oceanographic Data Center (NODC) Taxon Codes (Version 8.0). The NODC Taxon Code is a hierarchical system of numerical codes used to represent the scientific names and phylogeny 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. An NODC code contains a maximum of 12 digits partitioned into 2-digit couplets. Each couplet represents one or more levels of the taxonomic hierarchy. For example,

Digit	Represents
1-2	Phylum
3-4	Class and/or Order
5-6	Family
7-8	Genus
9-10	Species
11-12	Subspecies

One drawback of the NODC code is it changes over time to reflect current changes in taxonomic classifications. However, it provides data analysts with a very useful tool for sorting organisms into taxonomic groups.

SYN: Synonymous species are denoted in the table TAB_CBP_MSTR by a flag field named SYN. A code of S means a name is an ITIS recognized synonym and SA indicates the name is the accepted name for the taxa. Synonymous species will have identical NODC Taxon Codes.

TAXON_LEVEL: **T**he phylogentic levels for all taxa in the TAB_CBP_MSTR are denoted not only by NODC_CODE but also a TAXON_LEVEL code. Taxon levels are assigned through the Linnean system of biological nomenclature as implemented in ITIS. Currently accepted TAXON_LEVELS and DESCRIPTION designations are as follows:

TAXON_LEVEL	DESCRIPTION
CLS	CLASS
DIV	DIVISION
FAM	FAMILY
GEN	GENUS
GRP	GROUP
HYB	HYBRED
IFC	INFRA-CLASS
IFO	INFRA-ORDER
NON	NON SPECIFIC LEVEL
ORD	ORDER
PHY	PHYLUM

TAXON_LEVEL	DESCRIPTION
SBC	SUB-CLASS
SBF	SUB-FAMILY
SBO	SUB-ORDER
SBP	SUB-PHYLUM
SGEN	SUB-GENUS
SPC	SUPER-CLASS
SPE	SPECIES
SPO	SUPER-ORDER
SSP	SUB-SPECIES
TRI	TRIBE
VAR	VARIETY

TAB_DATA_TYPE

Field Name	Description	Data Type	Length
DATA_TYPE (PK,FK)	SAMPLE TYPE CODE- Denotes type of sample collected	CHAR	2
DATA_TYPE_ DESCRIPTION (NN)	DATA TYPE DESCRIPTION	VARCHAR	50

GENERAL: This table stores information related exclusively to DATA_TYPE codes in the TAB_BIOTA_EVENT TABLE. This table contains information to type of sample collected during an event. The following list of data types represent those which either directly measured in the field or analyzed in the laboratory. Additional codes may be added as needed. Currently accepted DATA_TYPE and DESCRIPTION designations are as follows:

DATA_TYPE	DESCRIPTION
BE	BENTHIC
FL	FLUORESCENCE
MI	MICROZOOPLANKTON
MZ	MESOZOOPLANKTON
PD	PRIMARY PRODUCTION
PH	PHYTOPLANKTON
PP	PICOPLANKTON

TAB_FIPS

Field Name	Description	Data Type	Length
FIPS (PK)	FIPS CODE Federal Information Processing System code	CHAR	5
STATE_INITIALS	STATE INITIAL DESIGNATION Federal Information Processing System code Two-letter state postal abbreviation	CHAR	2
COUNTY_NAME	COUNTY DESIGNATION County name	VARCHAR	30

GENERAL: This table contains (FIPS) Federal Information Processing System codes identifying state and county type of field samples taken at given site. This code is used in the STATIONS tables. Additional codes may be added as needed. Currently accepted FIPS CODES, STATE AND COUNTY designations are as follows:

11001	DC	WASHINGTON	24045	MD	WICOMICO
10001	DE	KENT	24047	MD	WORCESTER
10003	DE	NEW CASTLE	36003	NY	ALLEGANY
10005	DE	SUSSEX	36007	NY	BROOME
24001	MD	ALLEGANY	36015	NY	CHEMUNG
24003	MD	ANNE ARUNDEL	36017	NY	CHENANGO
24005	MD	BALTIMORE	36023	NY	CORTLAND
24510	MD	BALTIMORE CITY	36025	NY	DELAWARE
24009	MD	CALVERT	36043	NY	HERKIMER
24011	MD	CAROLINE	36051	NY	LIVINGSTON
24013	MD	CARROLL	36053	NY	MADISON
24015	MD	CECIL	36065	NY	ONEIDA
24017	MD	CHARLES	36067	NY	ONONDAGA
24019	MD	DORCHESTER	36069	NY	ONTARIO
24021	MD	FREDERICK	36077	NY	OTSEGO
24023	MD	GARRETT	36095	NY	SCHOHARIE
24025	MD	HARFORD	36097	NY	SCHUYLER
24027	MD	HOWARD	36101	NY	STEUBEN
24029	MD	KENT	36107	NY	TIOGA
24031	MD	MONTGOMERY	36109	NY	TOMPKINS
24033	MD	PRINCE GEORGES	36123	NY	YATES
24035	MD	QUEEN ANNES	42001	PA	ADAMS
24039	MD	SOMERSET	42009	PA	BEDFORD
24037	MD	ST MARYS	42011	PA	BERKS
24041	MD	TALBOT	42013	PA	BLAIR
24043	MD	WASHINGTON	42015	PA	BRADFORD

42021	PA	CAMBRIA
42023	PA	CAMERON
42027	PA	CENTRE
42029	PA	CHESTER
42033	PA	CLEARFIELD
42035	PA	CLINTON
42037	PA	COLUMBIA
42041	PA	CUMBERLAND
42043	PA	DAUPHIN
42047	PA	ELK
42055	PA	FRANKLIN
42057	PA	FULTON
42061	PA	HUNTINGDON
42063	PA	INDIANA
42067	PA	JUNIATA
42069	PA	LACKAWANNA
42071	PA	LANCASTER
42075	PA	LEBANON
42079	PA	LUZERNE
42081	PA	LYCOMING
42083	PA	MCKEAN
42087	PA	MIFFLIN
42093	PA	MONTOUR
42097	PA	NORTHUMBERLAND
42099	PA	PERRY
42105	PA	POTTER
42107	PA	SCHUYLKILL
42109	PA	SNYDER
42111	PA	SOMERSET
42113	PA	SULLIVAN
42115	PA	SUSQUEHANNA
42117	PA	TIOGA
42119	PA	UNION
42127	PA	WAYNE
42131	PA	WYOMING
42133	PA	YORK
51001	VA	ACCOMACK
51003	VA	ALBEMARLE
51510	VA	ALEXANDRIA
51005	VA	ALLEGHANY
51007	VA	AMELIA
51009	VA	AMHERST
51011	VA	APPOMATTOX
51013	VA	ARLINGTON
51015	VA	AUGUSTA
51017	VA	BATH
51019	VA	BEDFORD
51023	VA	BOTETOURT
51029	VA	BUCKINGHAM
51031	VA	CAMPBELL
51033	VA	CAROLINE
51036	VA	CHARLES CITY
51550	VA	CHESAPEAKE CITY
51041	VA	CHESTERFIELD
51043	VA	CLARKE
51570	VA	COLONIAL HEIGHTS
51045	VA	CRAIG
51047	VA	CULPEPER
51049	VA	CUMBERLAND
51053	VA	DINWIDDIE
51057	VA	ESSEX
51059	VA	FAIRFAX
51610	VA	FALLS CHURCH
51061	VA	FAUQUIER
51065	VA	FLUVANNA
51069	VA	FREDERICK
51630	VA	FREDERICKSBURG
51071	VA	GILES
51073	VA	GLOUCESTER
51075	VA	GOOCHLAND
51079	VA	GREENE
51650	VA	HAMPTON
51085	VA	HANOVER
51087	VA	HENRICO
51091	VA	HIGHLAND
51093	VA	ISLE OF WIGHT
51095	VA	JAMES CITY
51097	VA	KING AND QUEEN
51099	VA	KING GEORGE
51101	VA	KING WILLIAM
51103	VA	LANCASTER
51107	VA	LOUDOUN
51109	VA	LOUISA
51680	VA	LYNCHBURG
51113	VA	MADISON
51115	VA	MATHEWS
51119	VA	MIDDLESEX
51121	VA	MONTGOMERY
51125	VA	NELSON
51127	VA	NEW KENT
51700	VA	NEWPORT NEWS
51710	VA	NORFOLK
51131	VA	NORTHAMPTON
51133	VA	NORTHUMBERLAND
51135	VA	NOTTOWAY
51137	VA	ORANGE
51139	VA	PAGE
51730	VA	PETERSBURG
51740	VA	PORTSMOUTH
51145	VA	POWHATAN
51147	VA	PRINCE EDWARD
51149	VA	PRINCE GEORGE
51153	VA	PRINCE WILLIAM
51157	VA	RAPPAHANNOCK
51159	VA	RICHMOND
51760	VA	RICHMOND CITY
51161	VA	ROANOKE
51163	VA	ROCKBRIDGE
51165	VA	ROCKINGHAM
51171	VA	SHENANDOAH
51177	VA	SPOTSYLVANIA
51179	VA	STAFFORD
51800	VA	SUFFOLK
51181	VA	SURRY
51810	VA	VIRGINIA BEACH
51187	VA	WARREN
51193	VA	WESTMORELAND
51830	VA	WILLIAMSBURG
51199	VA	YORK
54003	WV	BERKELEY
54023	WV	GRANT
54027	WV	HAMPSHIRE
54031	WV	HARDY
54037	WV	JEFFERSON
54057	WV	MINERAL
54063	WV	MONROE
54065	WV	MORGAN
54071	WV	PENDLETON

TAB_G_METHOD

Field Name	Description	Data Type	Length
G_METHOD (PK,FK)	GEAR METHOD CODE- Code of Sampling Gear used for sample collection	CHAR	2
G_METHOD_ DESCRIPTION (NN)	GEAR DESCRIPTION- Chesapeake bay program biological field sampling gear descriptions	VARCHAR	29
G_METHOD_ DETAILS	DETAILED DESCRIPTION- Detailed Description of Sampling Gear Including Dimensions	VARCHAR	46

GENERAL: This table stores information relating to the type of gear used to collect samples for all analysis. This table stores identification codes for sampling gear used primary in the TAB_BIOTA_EVENT TABLE. The primary key in this table is defined by G_METHOD. Additional codes may be added as needed. Currently accepted G_METHODS designations are as follows

G_METHOD	G_METHOD_DESCRIPTION
01	HAND DREDGE
02	DREDGE
03	ARTIFICIAL SUBSTRAIT
04	DIATOMER SLIDES
05	CLARKE-BUMPUS SAMPLER
06	PLANKTON TRAP
07	PLANKTON PUMP
08	PLANKTON NET
09	PLANKTON NET
10	PLANKTON NET
11	PLANKTON NET
12	BEAM PLANKTON LINE
13	ANCHOR DREDGE
14	HYDRAULIC GRAB
15	HAND CORE
16	POST-HOLE DIGGER
17	PONAR GRAB
18	PONAR GRAB
19	PONAR GRAB
20	BOX CORE GRAB
21	VAN VEEN GRAB
22	SHIPEK GRAB
23	SEINE HAUL
24	SMITH-MACINTIRE GRAB
25	SEINE NET

G_METHOD	G_METHOD_DESCRIPTION
26	SEINE NET
27	SEINE NET
28	SEINE NET
29	SEINE NET
30	TRAWL
31	OTTER TRAWL
32	OTTER TRAWL
33	TRAWL
34	TUCKER TRAWL
36	TRAWL
37	OTTER TRAWL
38	MID-WATER TRAWL
40	TRAP NET
41	ELECTROSHOCKER
42	ECKMAN CAGE
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

G_METHOD	G_METHOD_DESCRIPTION
60	ENDICO CURRENT METER
61	BRAINCON CURRENT METER
62	SEDIMENT TRAP ARRAY
63	SEINE NET
64	BONGO NET
65	PURSE SEINE
66	FYKE AND HOOP NETS
67	POTS
68	BOX TRAP
69	PUSH NET
70	GREAT LAKE SHOAL
71	GREAT LAKE SHOAL
72	GREAT LAKE SHOAL
73	GREAT LAKE SHOAL
74	BEAM TRAWL
75	BONGO NET
76	BONGO NET
78	SLAT TRAP
80	GIL NETS
81	USNOL SPADE CORE
82	PONAR GRAB-ODU
83	DOUBLE PONAR GRAB-VA DEQ
85	MID-WATER TRAWL

TAB_HUCS8

Field Name	Description	Data Type	Length
HUC8 (PK)	8 DIGIT HUC CODE 8-digit USGS hydrologic unit code	CHAR	8
REGION	2 DIGIT HUC CODE Region associated with the first two digits of HUC8	CHAR	2
SUBREGION	4 DIGIT HUC CODE Sub-region associated with the first four digits of HUC8	CHAR	4
ACCOUNTING_UNIT	6 DIGIT HUC CODE Accounting unit associated with the first six digits of HUC8	CHAR	6
REGION_ DESCRIPTION	REGION DESIGNATION Detailed Description of Region described by first two digits of HUC code	VARCHAR	15
SUBREGION_ DESCRIPTION	SUBREGION DESIGNATION Detailed Description of Region described by first four digits of HUC code	VARCHAR	20
ACCOUNTING_UNIT _DESCRIPTION	ACCOUNTING DESIGNATION Detailed Description of Region described by first six digits of HUC code	VARCHAR	30
CATALOGING_UNIT _DESCRIPTION	CATALOGING DESIGNATION Detailed Description of Region described by first eight digits of HUC code	VARCHAR	35

GENERAL: The TAB_HUCS8 TABLE contains 8-digit USGS hydrologic unit codes and descriptions The HUC8 code is the 8-digit USGS hydrologic unit code in which the station is located. The list that follows contains only the HUC and the associated cataloging unit description. Additional lookup tables related to this table may or may not be included in the final database design. These tables contain specific information related to the REGION, SUBREGION, ACCOUNTING_UNIT, and CATALOGING_UNIT fields (i.e. detailed description, states covered, and area in square miles). The currently accepted 8 digit HUC and CATALOGING_UNIT_DESCRIPTIONS are as follows:

02050101	UPPER SUSQUEHANNA
02050102	CHENANGO
02050103	OWEGO-WAPPASENING
02050104	TIOGA
02050105	CHEMUNG
02050106	UPPER SUSQUEHANNA-TUNKHANNOCK
02050107	UPPER SUSQUEHANNA-LACKAWANNA
02050201	UPPER WEST BRANCH SUSQUEHANNA
02050202	SINNEMAHONING
02050203	MIDDLE WEST BRANCH SUSQUEHANNA
02050204	BALD EAGLE
02050205	PINE
02050206	LOWER WEST BRANCH SUSQUEHANNA
02050301	LOWER SUSQUEHANNA-PENNS
02050302	UPPER JUNIATA
02050303	RAYSTOWN
02050304	LOWER JUNIATA
02050305	LOWER SUSQUEHANNA-SWATARA
02050306	LOWER SUSQUEHANNA
02060001	UPPER CHESAPEAKE BAY
02060002	CHESTER-SASSAFRAS
02060003	GUNPOWDER-PATAPSCO
02060004	SEVERN
02060005	CHOPTANK
02060006	PATUXENT
02060007	BLACKWATER-WICOMICO
02060008	NANTICOKE
02060009	POCOMOKE
02060010	CHINCOTEAGUE
02070001	SOUTH BRANCH- POTOMAC
02070002	NORTH BRANCH- POTOMAC
02070003	CACAPON-TOWN
02070004	CONOCOCHEAGUE-OPEQUON
02070005	SOUTH FORK SHENANDOAH
02070006	NORTH FORK SHENANDOAH
02070007	SHENANDOAH
02070008	MIDDLE POTOMAC-CATOCTIN
02070009	MONOCACY
02070010	MIDDLE POTOMAC-ANACOSTIA- OCCOQUAN
02070011	LOWER POTOMAC
02080101	LOWER CHESAPEAKE BAY
02080102	GREAT WICOMICO-PIANKATANK
02080103	RAPIDAN-UPPER RAPPAHANNOCK
02080104	LOWER RAPPAHANNOCK

02080105	MATTAPONI	02080202	MAURY
02080106	PAMUNKEY	02080203	MIDDLE JAMES-BUFFALO
02080107	YORK	02080204	RIVANNA
02080108	LYNNHAVEN-POQUOSON	02080205	MIDDLE JAMES-WILLIS
02080109	WESTERN LOWER DELMARVA	02080206	LOWER JAMES
02080110	EASTERN LOWER DELMARVA	02080207	APPOMATTOX
02080201	UPPER JAMES	02080208	HAMPTON ROADS

TAB_IBI_PARAMETER

Field Name	Description	Data Type	Length
IBI_PARAMETER (PK,FK)	IBI PARAMETER CODE	VARCHAR	25
IBI_PARAMETER_ DESCRIPTION (NN)	IBI PARAMETER DESCRIPTION	VARCHAR	75

General: This table stores information related exclusively to the IBI_PARAMETER codes in codes in the IBI_METRICS_TABLE. This table contains information to parameter names. Currently accepted PARAMETER and DESCRIPTION designations are as follows:

IBI_PARAMETER	IBI_PARAMETER_DESCRIPTION
BIOMASS_CHL_RATIO	TOTAL PHYTOPLANKTON BIOMASS TO AP CHL RATIO
CHLA_SURF	SURFACE CHLOROPHYLL A (0.5 M) UG/L
CRYPTO_BIO_PCT	PERCENT CRYPTOPHYTE BIOMASS
CYANO_BIOMASS	TOTAL CYANOPHYTE BIOMASS IN UG CARBON/LITER
DIATOM_BIOMASS	TOTAL DIATOM BIOMASS IN UG CARBON/LITER
DINO_BIOMASS	TOTAL DINOFLAGGELATE BIOMASS IN UG CARBON/LITER
DOC	AVE LAYER DISSOLVED ORGANIC CARBON CONC IN MG/L
MICROCYSTIS_AER_ABUND	TOTAL MICROCYSTIS BIOMASS IN UG CARBON/LITER
PHEO	AVE LAYER PHEOOHYTIN CONC IN MG/L
PICO_ABUND	TOTAL PICOPLANKTON ABUNDANCE IN NUMBER/LITER
PROROCENTRUM_MIN_ABUND	PROROCENTRUM_MINIMUM ABUNDANCE IN NUMBER/LITER
TOT_BIOMASS	TOTAL PHYTOPLANKTON BIOMASS IN UG CARBON/LITER
TOTAL_SCORE	AVERAGE PIBI SCORE FOR SAMPLING EVENT

TAB_IBI_SALZONE

Field Name	Description	Data Type	Length
IBI_SALZONE (PK,FK)	IBI SALINITY ZONE CODE	char	1
IBI_SALZONE _DESCRIPTION (NN)	DESCRIPTION	varchar	25
SALZONE_RANGES	SALINITY RANGE-in PSU	varchar	15

GENERAL: This table stores information related exclusively to IBI SALZONE codes in the TAB_IBI_METRICS and TAB_PHYTO_INDICATOR_METRIC tables . In many cases the Water Quality and Living Resource monitoring programs performed field sample collection at the same time. Therefore salinity

zones were determined based on the water quality data. However, in cases where water quality measurements and Living Resources data were not collected synchronous, the SALZONE is based on the water quality profile collected with in a 3 day window of the Living Resources sampling event. Only when water quality data was unavailable were SALZONES reported as missing. Salinity classes are as follows:

IBI_SALZONE	IBI_SALZONE_DESCRIPTION	SALZONE_RANGES
F	TIDAL FRESH	<0.5 PSU
M	MESOHALINE	=>5.0 TO 18 PSU
O	OLIGOHALINE	=>0.5 TO 5.0 PSU
P	POLYHALINE	=>18 PSU

TAB_LAYER

Field Name	Description	Data Type	Length
LAYER (PK,FK)	LAYER Layer of Water Column in which Sample was Taken	CHAR	3
LAYER_ DESCRIPTION (NN)	LAYER DESCRIPTION	VARCHAR	30

GENERAL: This table stores information relating to the LAYER in the water column in which all samples are taken. This table stores identification codes for LAYER used primary in the TAB_BIOTA_EVENT TABLE. The primary key in this table is defined the LAYER. Additional codes may be added as needed. Currently accepted LAYER designations are as follows

LAYER	DESCRIPTION
AE	ABOVE EUPHOTIC ZONE
AP	ABOVE PYCNOCLINE
AT	ABOVE THERMOCLINE
B	BOTTOM
BE	BELOW EUPHOTIC ZONE
BP	BELOW PYCNOCLINE
BT	BELOW THERMOCLINE
M	MIDDLE
M1	MIDDLE 1/3 TOT DEPTH
M2	MIDDLE 2/3 TOT DEPTH
MI	MICROLAYER
S	SURFACE
SE	SEDIMENT
SW	SEDIMENT/WATER INTER
WC	WHOLE WATER COLUMN
WCA	WHOLE WATER COLUMN TOW A
WCB	WHOLE WATER COLUMN TOW B

TAB_LIFE_STAGE

Field Name	Description	Data Type	Length
LIFE_STAGE (PK,FK)	LIFE STAGE CODE Chesapeake Bay Program Life Stage Code	CHAR	3
LIFE_STATE_ DESCRIPTION (NN)	DESCRIPTION Detailed Life Stage code Description	VARCHAR	50

General: This table stores information in relating to the identification of species life stages in the TAB_ZOO_TAX TABLE. The currently accepted LIFE_STAGE values and DESCRIPTIONS are as follows:

LIFE_STAGE	LIFE_STAGE_DESCRIPTION
00	EGG
01	YOLK SAC
02	FIN FOLD
03	POST FIN FOLD
04	YEAR CLASS O
05	YEAR CLASS 1 OR OLDER

LIFE_STAGE	LIFE_STAGE_DESCRIPTION
06	JUVENILES AND ADULTS
07	LARVAE AND JUVENILES AND ADULTS
08	LARVAE AND JUVENILES
09	NAUPLII AND PERITRICHS
10	NAUPLII OR COPEPODITE
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 FOR FUTURE USE
19	COPEPOD EGG
20	NYMPH
21	PUPAE
22	PHARATE
23	INSTAR
24	NAIAD
25	HATCHERTY MARKED ORGANISM
26	YEAR CLASS 2 OR OLDER
27	AGE 0 MDDNR HATCHERTY MARKED ORGANISM
28	AGE 1 MDDNR HATCHERTY MARKED ORGANISM
29	AGE 2 OR GREATER MDDNR HATCHERTY MARKED ORGANISM
30	PREZOEA
31	ZOEA
32	METAZOEA
33	MEGALOPS
34	MALE,UNSPECIFIED AGE
35	FEMALE, ADULT
36	FEMALE,JUVENILE
37	MDDNR HATCHERTY MARKED ORGANISM
38	MALE, AGE CLASS 0
39	MALE, AGE CLASS 1
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
52	SPECIES A
53	SPECIES B
54	SPECIES C
55	SPECIES D
56	SPECIES E
57	SPECIES F
58	SPECIES A-FULL
59	SPECIES A-EMPTY
60	SPECIES B-FULL
61	SPECIES B-EMPTY
62	SPECIES C-FULL
63	SPECIES C-EMPTY
64	EMBRYO
65	NEONITES
66	MALE, AGE CLASS 2
67	FEMALE, IMMATURE AGE CLASS 0
68	FEMALE, IMMATURE AGE CLASS 1
69	FEMALE, MATURE AGE CLASS 1
70	FEMALE, MATURE AGE CLASS 2
71	FEMALE, MATURE AGE CLASS 0
72	FEMALE, IMMATURE AGE CLASS 2
73	SALPS
74	RESERVED FOR FUTURE USE
75	RESERVED FOR FUTURE USE
76	RESERVED FOR FUTURE USE
77	RESERVED FOR FUTURE USE
78	RESERVED FOR FUTURE USE
79	RESERVED FOR FUTURE USE
80	MOLTED
81	UNMOLTED
82	LARGE
83	LARGE-FULL
84	LARGE-EMPTY
85	FULL
86	EMPTY
87	MEDIUM
88	SMALL
89	NOT SPECIFIED
90	EGG- NOT VIABLE
91	SUBADULT
92	POST LARVAL
93	JUVENILE
94	TAXON WITH COUNT STORED AS VOLUME IN MILLILITERS
95	MATURE
96	IMMATURE
97	LARVAE
98	ADULT
99	NOT APPLICABLE

TAB_LL_DATUMS

Field	Description	Type	Length
LL_DATUM (PK)	GEOGRAPHIC DATUM CODE Latitude/longitude datum code	CHAR	5
LL_DATUM_ DESCRIPTION (NN)	Description/definition of GEOGRAPHIC DATUM	VARCHAR	50

GENERAL- The LL_DATUM TABLE contains latitude/longitude datum and descriptions The LL_DATUM code defines the datum under which the latitude and longitude measurements for a particular station were calculated.). The currently accepted LL_DATUM and DESCRIPTIONS are as follows:

LL_DATUM	LL_DATUM_DESCRIPTION
NAD27	1927 NORTH AMERICAN DATUM
NAD83	1983 NORTH AMERICAN DATUM
WGS84	WORLD GEODETIC SYSTEM 1984
UNID	UNKNOWN DATUM

TAB_METHODS

Field Name	Description	Data Type	Length
METHOD (PK,FK)	ANALYTICAL METHOD CODE - Method Description code	CHAR	8
TITLE	DATA GENERATOR METHOD IDENDIFICATION	VARCHAR	50
DESCRIPTION (NN)	METHOD DESCRIPTION	VARCHAR	400
DETAILS	DETAILED METHOD DESCRIPTION	TEXT	-

General: This table stores information related exclusively to METHOD codes in the PHYTO_PICO TABLE, ZOO_TAX TABLE, BIOMASS_SETVOL TABLE and the PRIMARY_PROD TABLE. This table contains descriptions of the field and laboratory methods for parameter determination. The METHOD code is used to define the field or lab procedure used to obtain the parameter value. Currently accepted METHODS designations are as follows (PLEASE SEE DATABASE FOR DETAILS):

METHOD	METHOD	METHOD
BM101	MI101A	PD101
BM101B	MI102	PD102
BM102	MZ101A	PH101
BV101	MZ101B	PH102
JF101	MZ101C	PH102M
JF102	MZ102	PH103
JF103	MZ102B	PP101
MI101	MZ103	PP102

TAB_PARAMETERS

Field Name	Description	Data Type	Length
REPORTING_ PARAMETER (PK,FK)	Reporting Parameter Code	Text	8
REPORTING_ PARAMETER_ DECRIPTION (NN)	Reporting Parameter Description-Parameter description/definition	Text	60

General: This table stores information related exclusively to PARAMETER codes in codes in the TAB_PHYTO_PICO, TAB_ZOO_TAX, TAB_BIOMASS_SETVOL and TAB_PRIMARY_PROD tables. This table contains information to parameter names and standard detection limits. The following list of parameters represent those parameters that are either directly measured in the field or analyzed in the laboratory. Additional codes may be added as needed. Currently accepted PARAMETER and DESCRIPTION designations are as follows:

PARAMETER	DESCRIPTION
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)
BIOVOLUME	BIOVOLUME(ML/SAMPLE)
COUNT	NUMBER PER UNIT MEASURE
DRY_WT	TOTAL DRY WEIGHT (MG/M**3)
DRYWT	TOTAL DRY WEIGHT (G/SAMPLE)
SET_VOL	SETTLED VOLUME ZOOPLANKTON AND DETRITUS (ML/M**3)
SET_VOLZ	SETTLED VOLUME OF ZOOPLANKTON (ML/M**3)
SETVOL	SETTLED VOLUME ZOOPLANKTON AND DETRITUS (ML/SAMPLE)
SETVOLZ	SETTLED VOLUME OF ZOOPLANKTON (ML/SAMPLE)

TAB_QUALIFIERS

Name	Description	Data Type	Length
QUALIFIERS (PK,FK)	QUALIFIER CODE Parameter value qualifier code	CHAR	2
QUALIFIERS _ DESCRIPTION (NN)	DESCRIPTION definition of QUALIFIER	VARCHAR	110

General: This table stores information related exclusively to REPORTING_PARAMETER codes in the TAB_PRIMARY_PROD table. The QUALIFIER code is used to describe the parameter value as less than or greater than the method detection limit or as a calculated value which has been calculated using a method detection limit. Currently accepted QUALIFIERS and DESCRIPTION designations are as follows:

QUALIFIERS	DESCRIPTION
<0	LESS THAN THE LOWER METHOD DETECTION LIMIT (MDL)
>0	GREATER THAN THE UPPER METHOD DETECTION LIMIT (MDL)
#	TRACE (LESS THAN AN UNKNOWN DETECTABLE VALUE)
J	ESTIMATED VALUE
N	NOT DETECTED
NA	NOT RECORDED/NOT APPLICABLE/PARAMETER VALUE ACCEPTABLE

TAB_SALZONES

Field Name	Description	Data Type	Length

Field Name	Description	Data Type	Length
SALZONE (PK,FK)	SALINITY ZONE CODE	CHAR	2
SALZONE _ DESCRIPTION (NN)	CODE DEFINITION	VARCHAR	50
SALZONE_RANGE	SALINITY RANGE FOR ZONE In Parts Per Thousand	VARCHAR	15

GENERAL: This table stores information related exclusively to SALZONE codes in the TAB_BIOTA_E VENT TABLE. In many cases the Water Quality and Living Resource monitoring programs performed field sample collection at the same time. Therefore salinity zones were determined based on the water quality data. However, in cases where water quality measurements and Living Resources data were not collected synchronous, the SALZONE is based on the water quality profile collected with in a one week window of the Living Resources sampling event. Salinity zones determined in this manner are noted as estimated. Only when water quality data was unavailable were SALZONES reported as missing. Salinity classes are as follows:

SALZONE	DESCRIPTION
F	FRESH (0-0.5 PPT)
FE	ESTIMATED FRESH (0-0.5 PPT)
M	MESOHALINE (5.1- 18.0 PPT)
ME	ESTIMATED MESOHALINE (5.1- 18.0 PPT)
N	NOT RECORDED
O	OLIGOHALINE (0.51-5.0 PPT)
OE	ESTIMATED OLIGOHALINE (0.51-5.0 PPT)
P	POLYHALINE (>18.0 PPT)
PE	ESTIMATED POLYHALINE (>18.0 PPT)

TAB_SAMPLE_TYPES

Name	Description	Data Type	Length
SAMPLE_TYPE (PK)	SAMPLE COLLECTION TYPE CODE	VARCHAR	5
DESCRIPTION (NN)	CODE DEFINITION	VARCHAR	130

GENERAL: This table stores information relating to the type of field samples taken at given site. These codes are used in the TAB_BIOTA_EVENT table. Additional codes may be added as needed. Currently accepted SAMPLE_TYPE designations are as follows:

C = Composite Sample (May be composite of multiple samples from a site or multiple depths)
D = Discrete (GRAB) Sample (Single sample from site or depth)
ISM_H = In-Situ Measurement, Collected as part of a Horizontal Transect
ISM_V = In-Situ Measurement, Collected as part of a Vertical Profile

TAB_SEGS_1985

Field Name	Description	Data Type	Length
CBSEG_1985 (PK,FK)	CHESAPEAKE BAY PROGRAM SEGMENT-1985 1985 monitoring segment	CHAR	4
CBSEG_1985_ DESCRIPTION (NN)	DESCRIPTION Description/definition of SEG_1985	VARCHAR	125

GENERAL- The table TAB_CBSEGS_1985 provides the monitoring segment codes describing in which segment a station is located. It is based upon the Chesapeake Bay Programs original 1985 segmentation scheme. These codes are used in the TAB_STATIONS table. The currently accepted CB_SEG85 values and DESCRIPTIONS are as follows:

CB-SEG85	DESCRIPTION
AFL	NON-TIDAL AREAS OF THE CHESAPEAKE BAY WATERSHED
CB1	SUSQUEHANNA FLATS
CB2	UPPER PORTION OF THE CHESAPEAKE BAY MAINSTEM
CB3	UPPER-MOST ESTUARINE ZONE IN THE CHESAPEAKE BAY MAINSTEM
CB4	UPPER PORTION OF THE CENTRAL CHESAPEAKE BAY MAINSTEM
CB5	CENTRAL PORTION OF THE CHESAPEAKE BAY MAINSTEM
CB6	LOWER WEST-CENTRAL PORTION OF THE CHESAPEAKE BAY MAINSTEM
CB7	LOWER EAST-CENTRAL PORTION OF THE CHESAPEAKE BAY MAINSTEM
CB8	SOUTHERN-MOST PORTION OF THE CHESAPEAKE BAY MAINSTEM
EE1	EASTERN BAY, MILES RIVER, AND WYE RIVER
EE2	CHOPTANK RIVER WEST OF CASTLE HAVEN, INCLUDING THE TRED AVON RIVER, BROAD CREEK, HARRIS CREEK, AND THE LITTLE CHOPTANK RIVER
EE3	TANGIER AND POCOMOKE SOUNDS
ET1	NORTHEST RIVER
ET2	ELK AND BOHEMIA RIVERS
ET3	SASSAFRAS RIVER
ET4	CHESTER RIVER
ET5	CHOPTANK RIVER, EXCLUDING EE2
ET6	NANTICOKE RIVER
ET7	WICOMICO RIVER
ET8	MANOKIN RIVER
ET9	BIG ANNEMESSEX RIVER
ET10	POCOMOKE RIVER
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
WE4	MOBJACK BAY
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

TAB_CBSEGS_2003

Field	Description	Type	Length
CBSEGS_2003 (PK, FK)	2003 CHESAPEAKE BAY PROGRAM MONITORING SEGMENT CODE	CHAR	6

Field	Description	Type	Length
CBSEGS_ 2003 _ DESCRIPTION (NN)	2003 MONITORING SEGMENT DESCRIPTION	VARCHAR	50

General- The CBSEGS_2003 TABLE provides the monitoring segment codes describing in which segment a station is located. It is based upon the new segmentation scheme developed in 1997, revised in 2000 and 2003. These codes are used in the TAB_STATIONS table. The currently accepted CBSEGS_2003 values and DESCRIPTIONS are as follows:

CBSEG_2003	CBSEG_2003_DESCRIPTION
ANATF	ANACOSTIA RIVER-TIDAL FRESH REGION
APPTF	APPOMATTOX RIVER-TIDAL FRESH REGION
BACOH	BACK RIVER-OLIGOHALINE REGION
BIGMH	BIG ANNEMESSEX RIVER-MESOHALINE REGION
BOHOH	BOHEMIA RIVER-OLIGOHALINE REGION
BSHOH	BUSH RIVER-OLIGOHALINE REGION
C&DOH	C&D CANAL-OLIGOHALINE REGION
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
CB6PH	CHESAPEAKE BAY-POLYHALINE REGION
CB7PH	CHESAPEAKE BAY-POLYHALINE REGION
CB8PH	CHESAPEAKE BAY-POLYHALINE REGION
CHKOH	CHICKAHOMINY RIVER-OLIGOHALINE REGION
CHOMH1	CHOPTANK RIVER-MESOHALINE REGION 1
CHOMH2	CHOPTANK RIVER-MESOHALINE REGION 2
CHOOH	CHOPTANK RIVER-OLIGOHALINE REGION
CHOTF	CHOPTANK RIVER-TIDAL FRESH REGION
CHSMH	CHESTER RIVER-MESOHALINE REGION
CHSOH	CHESTER RIVER-OLIGOHALINE REGION
CHSTF	CHESTER RIVER-TIDAL FRESH REGION
CRRMH	CORROTOMAN RIVER-MESOHALINE REGION
EASMH	EASTERN BAY-MESOHALINE REGION
EBEMH	EAST BRANCH ELIZABETH RIVER-MESOHALINE REGION
ELIMH	ELIZABETH RIVER-MESOHALINE REGION
ELIPH	ELIZABETH RIVER-POLYHALINE REGION
ELKOH	ELK RIVER-OLIGOHALINE REGION
FSBMH	FISHING BAY-MESOHALINE REGION
GUNOH	GUNPOWDER RIVER-OLIGOHALINE REGION
GUNTF	GUNPOWDER RIVER-TIDAL FRESH REGION
HNGMH	HONGA RIVER-MESOHALINE REGION
JMSMH	JAMES RIVER-MESOHALINE REGION
JMSOH	JAMES RIVER-OLIGOHALINE REGION
JMSPH	JAMES RIVER-POLYHALINE REGION
JMSTF	JAMES RIVER-TIDAL FRESH REGION
LAFMH	LAFAYETTE RIVER-MESOHALINE REGION
LCHMH	LITTLE CHOPTANK RIVER-MESOHALINE REGION
LYNPH	LYNNHAVEN RIVER-POLYHALINE REGION
MAGMH	MAGOTHY RIVER-MESOHALINE REGION
MANMH	MANOKIN RIVER-MESOHALINE REGION

CBSEG_2003	CBSEG_2003_DESCRIPTION
MATTF	MATTAWOMAN CREEK-TIDAL FRESH REGION
MIDOH	MIDDLE RIVER-OLIGOHALINE REGION
MOBPH	MOBJACK BAY-POLYHALINE REGION
MPNOH	MATTAPONI RIVER-OLIGOHALINE REGION
MPNTF	MATTAPONI RIVER-TIDAL FRESH REGION
NANMH	NANTICOKE RIVER-MESOHALINE REGION
NANOH	NANTICOKE RIVER-OLIGOHALINE REGION
NANTF	NANTICOKE RIVER-TIDAL FRESH REGION
NORTF	NORTHEAST RIVER-TIDAL FRESH REGION
PATMH	PATAPSCO RIVER-MESOHALINE REGION
PATTF	PATAPSCO RIVER-TIDAL FRESH REGION
PAXMH	PATUXENT RIVER-MESOHALINE REGION
PAXOH	PATUXENT RIVER-OLIGOHALINE REGION
PAXTF	PATUXENT RIVER-TIDAL FRESH REGION
PIAMH	PIANKATANK RIVER-MESOHALINE REGION
PISTF	PISCATAWAY CREEK-TIDAL FRESH REGION
PMKOH	PAMUNKEY RIVER-OLIGOHALINE REGION
PMKTF	PAMUNKEY RIVER-TIDAL FRESH REGION
POCMH	POCOMOKE RIVER-MESOHALINE REGION
POCOH	POCOMOKE RIVER-OLIGOHALINE REGION
POCTF	POCOMOKE RIVER-TIDAL FRESH REGION
POTMH	POTOMAC RIVER-MESOHALINE REGION
POTOH	POTOMAC RIVER-OLIGOHALINE REGION
POTTF	POTOMAC RIVER-TIDAL FRESH REGION
RHDMH	RHODE RIVER-MESOHALINE REGION
RPPMH	RAPPAHANNOCK RIVER-MESOHALINE REGION
RPPOH	RAPPAHANNOCK RIVER-OLIGOHALINE REGION
RPPTF	RAPPAHANNOCK RIVER-TIDAL FRESH REGION
SASOH	SASSAFRAS RIVER-OLIGOHALINE REGION
SBEMH	SOUTH BRANCH ELIZABETH RIVER-MESOHALINE REGION
SEVMH	SEVERN RIVER-MESOHALINE REGION
SOUMH	SOUTH RIVER-MESOHALINE REGION
SUSTF	SUSQUEHANNA RIVER-TIDAL FRESH REGION
TANMH	TANGIER SOUND-MESOHALINE REGION
WBEMH	WEST BRANCH ELIZABETH RIVER-MESOHALINE REGION
WBRTF	WESTERN BRANCH-TIDAL FRESH REGION
WICMH	WICOMICO RIVER-MESOHALINE REGION
WSTMH	WEST RIVER-MESOHALINE REGION
YRKMH	YORK RIVER-MESOHALINE REGION
YRKPH	YORK RIVER-POLYHALINE REGION

TAB_SOURCES

Name	Description	Data Type	Length
SOURCE (PK)	DATA SOURCE CODE	VARCHAR	10
SOURCE_ DESCRIPTION (NN)	DATA SOURCE DESCRIPTION Definition of SOURCE	VARCHAR	100
SOURCE_ DETAILS	MONITORING DATA SOURCE DESCRIPTION Details	VARCHAR	150

GENERAL: These codes, taken directly from the currently in the water quality, and living resources databases. As data from other sources (e.g. DCRA, PADEP, SRBC) is added, their SOURCE codes must first be added to this table. Currently accepted SOURCE designations are as follows:

SOURCE	SOURCE_DESCRIPTION	SOURCE_DETAILS
MDE	MARYLAND DEPARTMENT OF THE ENVIRONMENT	
MSU	MORGAN STATE UNIVERSITY	FORMERLY (ANS) ACADEMY OF NATURAL SCIENCES, BENEDICT ESTUARINE LABORATORY
ODU	OLD DOMINION UNIVERSITY	CONTRACTED BY THE STATE OF VIRGINIA
OEP	MARYLAND OFFICE OF ENVIRONMENTAL PROGRAMS	
VERSAR	VERSAR INC.	
VIMS	VIRGINIA INSTITUTE OF MARINE SCIENCE	CONTRACTED BY THE STATE OF VIRGINIA
VSWCB	VIRGINIA STATE WATER CONTROL BOARD	

TAB_STATIONS

Field Name	Description	Data Type	Length
STATION (PK, FK)	SAMPLING STATION- CBP station name	VARCHAR	15
LATITUDE (PK)	STATION LATITUDE- Station Latitude in decimal degrees	DECIMAL	
LONGITUDE (PK)	STATION LONGITUDE- Station Longitude in negative decimal degrees coordinates)	DECIMAL	
LL_DATUM (FK)	LAT_LONG DATUM CODE Code specifying the associated datum of the latitude and longitude values	CHAR	5
STATION_ DESCRIPTION	SAMPLING STATION DESCRIPTION- Physical or Geographical description of Station	VARCHAR	255
WATER_BODY	WATER BODY DESCRIPTION Water body (i.e. river, bay, creek, run) in which the station is located	VARCHAR	50
CBP_BASIN	CHESAPEAKE BAY PROGRAM BASIN Chesapeake Bay Program basin in which the station	VARCHAR	30

Field Name	Description	Data Type	Length
(FK,NN)	is located		
TS_BASIN (NN)	BASIN OR TRIBUTARY CODE Largest drainage basin (aside from Chesapeake Bay) with which the station is associated	VARCHAR	30
BASIN	BASIN- largest body of water with which the monitoring station is associated aside from chesapeake bay	VARCHAR	30
SUBBASIN	SUBBASIN (TRIBUTARY RIVER) Second largest drainage basin with which the station is associated (some stations will not have this attribute)	VARCHAR	30
CBSEG_1985 (FK,NN)	1985 BAY SEGMENT Code specifying the 1985 Chesapeake Bay watershed segment in which the station is located	CHAR	4
CBSEG_2003 (FK,NN)	2003 BAY SEGMENT Code specifying the 2003 Chesapeake Bay watershed segment in which the station is located	CHAR	6
HUC8 (FK,NN)	8 DIGIT USGS HYDROLOGIC UNIT CODE 8-digit USGS hydrologic unit code	CHAR	8
FIPS (FK,NN)	FEDERAL INFORMATION PROCESSING SYSTEM CODE - identifying the state and county in which the station is located	CHAR	5
FALL_LINE	Code specifying whether the station is located above or below the geologic fall line or the zone of tidal influence (A =above, B =below)	CHAR	1
UTM_X (NN)	UTM_X- X position for station Universal Transverse Mercator ZONE 18 coordinates.	INT	
UTM_Y (NN)	UTM_Y- Y position for station position in Universal Transverse Mercator ZONE 18 coordinates.	INT	
STATION_ DETAILS	COMMENTS- ANY COMMENTS RELATED TO THE MONITORING STATION	VARCHAR	300

NOTES:

GENERAL: The TAB_STATIONS table contains CBP water quality station names and associated attributes. Its primary use will be to establish common geographic referencing across data types. Because the Chesapeake Bay Program has historically used several “basin” designations (e.g. CBP_BASIN, TS_BASIN) to provide summary information to program participants and the public, these naming conventions must be preserved in order to maintain historical perspectives of the data. The newly proposed “basin” designations (e.g. WATER_BODY, BASIN, SUBASIN, SUBASIN2) are meant to provide the user with a more detailed geographic representation of point data to the sub-watershed or local level. By doing so, users will be able to retrieve information for water quality stations located within small creeks possibly in their neighborhoods. They will no longer be restricted to large basins. Stations currently used for biological monitoring are as follows:

STATION	STATION_DESCRIPTION
CB1.1	MOUTH OF SUSQUEHANNA RIVER; HEAD OF BAY; MID-CHANNEL
CB2.1	SOUTHWEST OF TURKEY POINT; UPPER LIMIT OF TRANSITION ZONE; MID-CHANNEL
CB2.2	WEST OF STILL POND NEAR BUOY R-34; MIDDLE OF TRANSITION ZONE; MID-CHANNEL
CB3.3C	NORTH OF BAY BRIDGE; CHARACTERIZES MID-CHANNEL
CB4.3C	EAST OF DARES BEACH NEAR BUOY R-64; CHARACTERIZES MID-CHANNEL
CB6.1	LOWER WEST CENTRAL CHESAPEAKE BAY (MAIN CHANNEL OFF LOWER END OF THE RAPPAHANNOCK RIVER)
CB5.2	EAST OF POINT NO POINT; MID-CHANNEL
ET3.1	SASSAFRAS RIVER NEAR ROUTE 213 BRIDGE; TIDAL FRESH WATER STATION
ET4.2	LOWER CHESTER RIVER, SOUTH OF EASTERN NECK ISLAND AT BUOY FIG-9; CHARACTERIZES LOWER ESTUARINE
CB6.4	CENTRAL CHESAPEAKE BAY OFFSHORE FROM MOUTH OF YORK RIVER
CB7.3E	LOWER EASTERN SHORE CHANNEL AREA
CB7.4	BALTIMORE CHANNEL AT THE BAY BRIDGE/TUNNEL
EE3.1	NORTH TANGIER SOUND, NORTHWEST OF HAINES POINT, 100 YARDS NORTH OF BUOY R-16; CHARACTERIZES EMBAYMENT
ET5.1	UPPER CHOPTANK RIVER AT GANEY WHARF, DOWNSTREAM OF CONFLUENCE; TUCKAHOE CIRCLE; TIDAL FRESH WATER STATION
ET5.0A	CHOPTANK RIVER, MID-CHANNEL OF MOUTH OF KINGS CREEK
LE5.5	MOUTH OF THE JAMES RIVER
ET5.2	LOWER CHOPTANK RIVER NEAR ROUTE 50 BRIDGE AT CAMBRIDGE; CHARACTERIZES LOWER ESTUARINE
LE1.1	MID-CHANNEL; SSW OF JACK BAY SANDSPIT AND NORTHEAST OF SANDGATES; CHARACTERIZES LOWER ESTUARINE
LE2.2	POTOMAC RIVER OFF RAGGED POINT AT BUOY 51B; LOWER ESTUARINE ZONE
LE3.6	MOUTH OF THE RAPPAHANNOCK RIVER
LE5.5-W	MOUTH OF THE JAMES RIVER, WEST OF LE5.5, STARTED IN 9/1/1996
RET2.2	BOUY 19 MID-CHANNEL OFF MARYLAND POINT; CHARACTERIZES TRANSITION ZONE
RET3.1	RAPPAHANNOCK RIVER NORTH OF BUOY R10, VIMS SLACK
RET4.1	PAMUNKEY RIVER AT SOUTHERN END OF LEE MARSH
RET4.3	YORK RIVER (VIMS SLACK WATER #C57)
RET5.2	SWANN'S POINT, JAMES RIVER WQMP STA#19
SBE2	SOUTHERN BRANCH ELIZABETH RIVER - ADJACENT TO ATLANTIC WOOD
SBE5	SOUTHERN BRANCH ELIZABETH RIVER - ADJACENT TO VIRGINIA POWER
TF5.5	JAMES RIVER AT RED BUOY #107 (JRWQMP STATION #13)
TF1.5	MID-CHANNEL AT NOTTINGHAM; CHARACTERIZES TIDAL FRESH ZONE
TF1.6	MID-CHANNEL OFF WHARF AT LOWER MARLBORO; CHARACTERIZES TRANSITION ZONE
TF1.7	MID-CHANNEL ON A TRANSSECT OF APPROXIMATE 115 DEGREE FROM JACK'S CREEK; CHARACTERIZES TRANSITION ZONE
TF2.3	BOUY N 54 MID-CHANNEL OFF INDIANHEAD; CHARACTERIZES TIDAL FRESH ZONE
TF2.4	BOUY 44 BETWEEN POSSUM POINT AND MOSS POINT; CHARACTERIZES TIDAL FRESH/TRANSITION ZONE
TF3.3	RAPPAHANNOCK RIVER AT JONES CREEK? (VIMS SLACK WATER #N40)
TF4.2	PAMUNKEY RIVER AT WHITE HOUSE, VA
WE4.2	MOUTH OF THE YORK RIVER, MID-CHANNEL
WT5.1	PATAPSCO RIVER, EAST OF HAWKINS POINT AT BUOY 5M; CHARACTERIZES LOWER ESTUARINE
WT6.1	MAGOTHY RIVER, NORTH OF SOUTH FERRY POINT AT BUOY FL R12; CHARACTERIZES LOWER ESTUARINE
WT8.1	SOUTH RIVER, SOUTH OF POPLAR POINT AT DAY MARKER R-"16"; CHARACTERIZES LOWER ESTUARINE

TAB_VALUE_TYPE

Field Name	Description	Data Type	Length
VALUE_TYPE (PK,FK)	VALUE TYPE CODE	CHAR	3
VALUE_TYPE_ DEFINITION	CODE DEFINITON	VARCHAR	10

General: This table stores information relating to the type of measurement a parameter is. This code is used primary in the BIOMASS_SETVOL TABLE. Additional codes may be added as needed. Currently accepted VALUE_TYPE designations are as follows:

A ACTUAL MEASUREMENT OF A PARAMETER VALUE
E ESTIMATED MEASUREMENT OF A PARAMETER VALUE

SECONDARY LOOK-UP TABLES

The following lookup tables are present in the database but are not linked to the main or lookup tables of the database. They can be used in queries to add additional fields exclusively to the WQ_DATA table. They include codes related to parameter names, sampling methods, and laboratory analysis of water quality samples.

TAB_CRUISE _TABLE

Field Name	Description	Data Type	Length
CRUISE (PK,NN)	OLD CBP CRUISE NUMBER	CHAR	6
START_DATE (U,NN)	STARTING DATE OF CRUISE	SMALLDATE TIME	8
END_DATE (U,NN)	ENDING DATE OF CRUISE	SMALLDATE TIME	8
NEWCRUISE	NEWCRUISE-1998 CBP cruise designation	CHAR	7

General: This table stores information relating to the time periods of water quality Monitoring Cruises. Cruise periods are a tool used as a data grouping mechanism for analysis. The field NEWCRUISE was a proposed system for reassigning cruise numbers that was never fully adapted.

CRUISE	START_DATE	END_DATE	NEWCRUISE
BAY001	6/15/1984	6/30/1984	198406A
BAY002	7/1/1984	7/15/1984	198407A
BAY003	7/16/1984	7/31/1984	198407B
BAY004	8/1/1984	8/15/1984	198408A
BAY005	8/16/1984	8/31/1984	198408B
BAY006	9/1/1984	9/15/1984	198409A
BAY007	9/16/1984	9/30/1984	198409B
BAY008	10/1/1984	10/15/1984	198410A
BAY009	10/16/1984	10/31/1984	198410B
BAY010	11/1/1984	11/30/1984	198411A
BAY011	12/1/1984	12/31/1984	198412A
BAY012	1/1/1985	1/31/1985	198501A
BAY013	2/1/1985	2/28/1985	198502A
BAY014	3/1/1985	3/15/1985	198503A
BAY015	3/16/1985	3/31/1985	198503B
BAY016	4/1/1985	4/15/1985	198504A
BAY017	4/16/1985	4/30/1985	198504B
BAY018	5/1/1985	5/15/1985	198505A
BAY019	5/16/1985	5/31/1985	198505B
BAY020	6/1/1985	6/15/1985	198506A
BAY021	6/16/1985	6/30/1985	198506B
BAY022	7/1/1985	7/15/1985	198507A
BAY023	7/16/1985	7/31/1985	198507B
BAY024	8/1/1985	8/15/1985	198508A
BAY025	8/16/1985	8/31/1985	198508B
BAY026	9/1/1985	9/15/1985	198509A
BAY027	9/16/1985	10/2/1985	198509B
BAY028	10/3/1985	10/14/1985	198510A
BAY029	10/15/1985	11/6/1985	198510B
BAY030	11/7/1985	11/30/1985	198511A
BAY031	12/1/1985	12/31/1985	198512A
BAY032	1/1/1986	1/31/1986	198601A
BAY033	2/1/1986	2/28/1986	198602A
BAY034	3/1/1986	3/15/1986	198603A
BAY035	3/16/1986	3/31/1986	198603B
BAY036	4/1/1986	4/15/1986	198604A
BAY037	4/16/1986	4/30/1986	198604B
BAY038	5/1/1986	5/15/1986	198605A
BAY039	5/16/1986	5/31/1986	198605B
BAY040	6/1/1986	6/15/1986	198606A
BAY041	6/16/1986	6/30/1986	198606B
BAY042	7/1/1986	7/15/1986	198607A
BAY043	7/16/1986	7/31/1986	198607B
BAY044	8/1/1986	8/15/1986	198608A
BAY045	8/16/1986	8/31/1986	198608B
BAY046	9/1/1986	9/15/1986	198609A
BAY047	9/16/1986	9/30/1986	198609B
BAY048	10/1/1986	10/15/1986	198610A
BAY049	10/16/1986	10/31/1986	198610B
BAY050	11/1/1986	11/30/1986	198611A
BAY051	12/1/1986	12/31/1986	198612A
BAY052	1/1/1987	1/31/1987	198701A
BAY053	2/1/1987	2/28/1987	198702A
BAY054	3/1/1987	3/15/1987	198703A
BAY055	3/16/1987	3/31/1987	198703B
BAY056	4/1/1987	4/15/1987	198704A
BAY057	4/16/1987	4/30/1987	198704B
BAY058	5/1/1987	5/15/1987	198705A

CRUISE	START_DATE	END_DATE	NEWCRUISE
BAY059	5/16/1987	5/31/1987	198705B
BAY060	6/1/1987	6/15/1987	198706A
BAY061	6/16/1987	6/30/1987	198706B
BAY062	7/1/1987	7/17/1987	198707A
BAY063	7/18/1987	7/31/1987	198707B
BAY064	8/1/1987	8/15/1987	198708A
BAY065	8/16/1987	8/31/1987	198708B
BAY066	9/1/1987	9/15/1987	198709A
BAY067	9/16/1987	9/30/1987	198709B
BAY068	10/1/1987	10/15/1987	198710A
BAY069	10/16/1987	10/31/1987	198710B
BAY070	11/1/1987	11/30/1987	198711A
BAY071	12/1/1987	12/31/1987	198712A
BAY072	1/1/1988	1/31/1988	198801A
BAY073	2/1/1988	2/28/1988	198802A
BAY074	3/1/1988	3/15/1988	198803A
BAY075	3/16/1988	3/31/1988	198803B
BAY076	4/1/1988	4/15/1988	198804A
BAY077	4/16/1988	4/30/1988	198804B
BAY078	5/1/1988	5/15/1988	198805A
BAY079	5/16/1988	5/31/1988	198805B
BAY080	6/1/1988	6/14/1988	198806A
BAY081	6/15/1988	6/30/1988	198806B
BAY082	7/1/1988	7/15/1988	198807A
BAY083	7/16/1988	7/31/1988	198807B
BAY084	8/1/1988	8/15/1988	198808A
BAY085	8/16/1988	8/31/1988	198808B
BAY086	9/1/1988	9/13/1988	198809A
BAY087	9/14/1988	9/30/1988	198809B
BAY088	10/1/1988	10/15/1988	198810A
BAY089	10/16/1988	10/31/1988	198810B
BAY090	11/1/1988	11/30/1988	198811A
BAY091	12/1/1988	12/31/1988	198812A
BAY092	1/1/1989	1/31/1989	198901A
BAY093	2/1/1989	2/28/1989	198902A
BAY094	3/1/1989	3/15/1989	198903A
BAY095	3/16/1989	3/31/1989	198903B
BAY096	4/1/1989	4/15/1989	198904A
BAY097	4/16/1989	4/30/1989	198904B
BAY098	5/1/1989	5/15/1989	198905A
BAY099	5/16/1989	5/31/1989	198905B
BAY100	6/1/1989	6/15/1989	198906A
BAY101	6/16/1989	6/30/1989	198906B
BAY102	7/1/1989	7/15/1989	198907A
BAY103	7/16/1989	7/31/1989	198907B
BAY104	8/1/1989	8/15/1989	198908A
BAY105	8/16/1989	8/31/1989	198908B
BAY106	9/1/1989	9/15/1989	198909A
BAY107	9/16/1989	9/30/1989	198909B
BAY108	10/1/1989	10/15/1989	198910A
BAY109	10/16/1989	10/31/1989	198910B
BAY110	11/1/1989	11/30/1989	198911A
BAY111	12/1/1989	12/31/1989	198912A
BAY112	1/1/1990	1/31/1990	199001A
BAY113	2/1/1990	2/28/1990	199002A
BAY114	3/1/1990	3/15/1990	199003A
BAY115	3/16/1990	3/31/1990	199003B
BAY116	4/1/1990	4/15/1990	199004A
BAY117	4/16/1990	4/30/1990	199004B
BAY118	5/1/1990	5/15/1990	199005A
BAY119	5/16/1990	5/31/1990	199005B
BAY120	6/1/1990	6/15/1990	199006A
BAY121	6/16/1990	6/30/1990	199006B
BAY122	7/1/1990	7/15/1990	199007A
BAY123	7/16/1990	7/31/1990	199007B
BAY124	8/1/1990	8/15/1990	199008A
BAY125	8/16/1990	8/31/1990	199008B
BAY126	9/1/1990	9/15/1990	199009A
BAY127	9/16/1990	9/30/1990	199009B
BAY128	10/1/1990	10/15/1990	199010A
BAY129	10/16/1990	10/31/1990	199010B
BAY130	11/1/1990	11/30/1990	199011A
BAY131	12/1/1990	12/31/1990	199012A
BAY132	1/1/1991	1/31/1991	199101A
BAY133	2/1/1991	2/28/1991	199102A
BAY134	3/1/1991	3/15/1991	199103A
BAY135	3/16/1991	3/31/1991	199103B
BAY136	4/1/1991	4/15/1991	199104A
BAY137	4/16/1991	4/30/1991	199104B
BAY138	5/1/1991	5/15/1991	199105A
BAY139	5/16/1991	5/31/1991	199105B
BAY140	6/1/1991	6/15/1991	199106A
BAY141	6/16/1991	6/30/1991	199106B
BAY142	7/1/1991	7/15/1991	199107A
BAY143	7/16/1991	7/31/1991	199107B
BAY144	8/1/1991	8/15/1991	199108A
BAY145	8/16/1991	8/31/1991	199108B
BAY146	9/1/1991	9/15/1991	199109A
BAY147	9/16/1991	9/30/1991	199109B
BAY148	10/1/1991	10/15/1991	199110A
BAY149	10/16/1991	10/31/1991	199110B
BAY150	11/1/1991	11/30/1991	199111A
BAY151	12/1/1991	12/31/1991	199112A
BAY152	1/1/1992	1/31/1992	199201A
BAY153	2/1/1992	2/28/1992	199202A
BAY154	3/1/1992	3/15/1992	199203A
BAY155	3/16/1992	3/31/1992	199203B
BAY156	4/1/1992	4/15/1992	199204A
BAY157	4/16/1992	4/30/1992	199204B
BAY158	5/1/1992	5/15/1992	199205A
BAY159	5/16/1992	5/31/1992	199205B
BAY160	6/1/1992	6/15/1992	199206A
BAY161	6/16/1992	6/30/1992	199206B
BAY162	7/1/1992	7/15/1992	199207A
BAY163	7/16/1992	7/31/1992	199207B
BAY164	8/1/1992	8/15/1992	199208A
BAY165	8/16/1992	8/31/1992	199208B
BAY166	9/1/1992	9/15/1992	199209A
BAY167	9/16/1992	9/30/1992	199209B
BAY168	10/1/1992	10/15/1992	199210A
BAY169	10/16/1992	10/31/1992	199210B
BAY170	11/1/1992	11/30/1992	199211A
BAY171	12/1/1992	12/31/1992	199212A
BAY172	1/1/1993	1/31/1993	199301A

CRUISE	START_DATE	END_DATE	NEWCRUISE
BAY173	2/1/1993	2/28/1993	199302A
BAY174	3/1/1993	3/15/1993	199303A
BAY175	3/16/1993	3/31/1993	199303B
BAY176	4/1/1993	4/15/1993	199304A
BAY177	4/16/1993	4/30/1993	199304B
BAY178	5/1/1993	5/15/1993	199305A
BAY179	5/16/1993	5/31/1993	199305B
BAY180	6/1/1993	6/15/1993	199306A
BAY181	6/16/1993	6/30/1993	199306B
BAY182	7/1/1993	7/15/1993	199307A
BAY183	7/16/1993	7/31/1993	199307B
BAY184	8/1/1993	8/15/1993	199308A
BAY185	8/16/1993	8/31/1993	199308B
BAY186	9/1/1993	9/15/1993	199309A
BAY187	9/16/1993	9/30/1993	199309B
BAY188	10/1/1993	10/15/1993	199310A
BAY189	10/16/1993	10/31/1993	199310B
BAY190	11/1/1993	11/30/1993	199311A
BAY191	12/1/1993	12/31/1993	199312A
BAY192	1/1/1994	1/31/1994	199401A
BAY193	2/1/1994	2/28/1994	199402A
BAY194	3/1/1994	3/15/1994	199403A
BAY195	3/16/1994	3/31/1994	199403B
BAY196	4/1/1994	4/15/1994	199404A
BAY197	4/16/1994	4/30/1994	199404B
BAY198	5/1/1994	5/15/1994	199405A
BAY199	5/16/1994	5/31/1994	199405B
BAY200	6/1/1994	6/15/1994	199406A
BAY201	6/16/1994	6/30/1994	199406B
BAY202	7/1/1994	7/15/1994	199407A
BAY203	7/16/1994	7/31/1994	199407B
BAY204	8/1/1994	8/15/1994	199408A
BAY205	8/16/1994	8/31/1994	199408B
BAY206	9/1/1994	9/15/1994	199409A
BAY207	9/16/1994	9/30/1994	199409B
BAY208	10/1/1994	10/15/1994	199410A
BAY209	10/16/1994	10/31/1994	199410B
BAY210	11/1/1994	11/30/1994	199411A
BAY211	12/1/1994	12/31/1994	199412A
BAY212	1/1/1995	1/31/1995	199501A
BAY213	2/1/1995	2/28/1995	199502A
BAY214	3/1/1995	3/15/1995	199503A
BAY215	3/16/1995	3/31/1995	199503B
BAY216	4/1/1995	4/15/1995	199504A
BAY217	4/16/1995	4/30/1995	199504B
BAY218	5/1/1995	5/15/1995	199505A
BAY219	5/16/1995	5/31/1995	199505B
BAY220	6/1/1995	6/15/1995	199506A
BAY221	6/16/1995	6/30/1995	199506B
BAY222	7/1/1995	7/15/1995	199507A
BAY223	7/16/1995	7/31/1995	199507B
BAY224	8/1/1995	8/15/1995	199508A
BAY225	8/16/1995	8/31/1995	199508B
BAY226	9/1/1995	9/15/1995	199509A
BAY227	9/16/1995	9/30/1995	199509B
BAY228	10/1/1995	10/15/1995	199510A
BAY229	10/16/1995	10/31/1995	199510B
BAY230	11/1/1995	11/30/1995	199511A
BAY231	12/1/1995	12/31/1995	199512A
BAY232	1/1/1996	1/31/1996	199601A
BAY233	2/1/1996	2/29/1996	199602A
BAY234	3/1/1996	3/15/1996	199603A
BAY235	3/16/1996	3/31/1996	199603B
BAY236	4/1/1996	4/15/1996	199604A
BAY237	4/16/1996	4/30/1996	199604B
BAY238	5/1/1996	5/15/1996	199605A
BAY239	5/16/1996	5/31/1996	199605B
BAY240	6/1/1996	6/15/1996	199606A
BAY241	6/16/1996	6/30/1996	199606B
BAY242	7/1/1996	7/15/1996	199607A
BAY243	7/16/1996	7/31/1996	199607B
BAY244	8/1/1996	8/15/1996	199608A
BAY245	8/16/1996	8/31/1996	199608B
BAY246	9/1/1996	9/15/1996	199609A
BAY247	9/16/1996	9/30/1996	199609B
BAY248	10/1/1996	10/15/1996	199610A
BAY249	10/16/1996	10/31/1996	199610B
BAY250	11/1/1996	11/30/1996	199611A
BAY251	12/1/1996	12/31/1996	199612A
BAY252	1/1/1997	1/31/1997	199701A
BAY253	2/1/1997	2/28/1997	199702A
BAY254	3/1/1997	3/15/1997	199703A
BAY255	3/16/1997	3/31/1997	199703B
BAY256	4/1/1997	4/13/1997	199704A
BAY257	4/14/1997	4/30/1997	199704B
BAY258	5/1/1997	5/15/1997	199705A
BAY259	5/16/1997	5/31/1997	199705B
BAY260	6/1/1997	6/15/1997	199706A
BAY261	6/16/1997	6/30/1997	199706B
BAY262	7/1/1997	7/17/1997	199707A
BAY263	7/18/1997	7/31/1997	199707B
BAY264	8/1/1997	8/15/1997	199708A
BAY265	8/16/1997	8/31/1997	199708B
BAY266	9/1/1997	9/15/1997	199709A
BAY267	9/16/1997	9/30/1997	199709B
BAY268	10/1/1997	10/17/1997	199710A
BAY269	10/18/1997	10/31/1997	199710B
BAY270	11/1/1997	11/30/1997	199711A
BAY271	12/1/1997	12/31/1997	199712A
BAY272	1/1/1998	1/31/1998	199801A
BAY273	2/1/1998	2/28/1998	199802A
BAY274	3/1/1998	3/15/1998	199803A
BAY275	3/16/1998	3/31/1998	199803B
BAY276	4/1/1998	4/15/1998	199804A
BAY277	4/16/1998	4/30/1998	199804B
BAY278	5/1/1998	5/15/1998	199805A
BAY279	5/16/1998	5/31/1998	199805B
BAY280	6/1/1998	6/14/1998	199806A
BAY281	6/15/1998	6/30/1998	199806B
BAY282	7/1/1998	7/15/1998	199807A
BAY283	7/16/1998	7/31/1998	199807B
BAY284	8/1/1998	8/15/1998	199808A
BAY285	8/16/1998	8/31/1998	199808B
BAY286	9/1/1998	9/13/1998	199809A

CRUISE	START_DATE	END_DATE	NEWCRUISE
BAY287	9/14/1998	9/30/1998	199809B
BAY288	10/1/1998	10/15/1998	199810A
BAY289	10/16/1998	10/31/1998	199810B
BAY290	11/1/1998	11/30/1998	199811A
BAY291	12/1/1998	12/31/1998	199812A
BAY292	1/1/1999	1/31/1999	199901A
BAY293	2/1/1999	2/28/1999	199902A
BAY294	3/1/1999	3/14/1999	199903A
BAY295	3/15/1999	3/31/1999	199903B
BAY296	4/1/1999	4/15/1999	199904A
BAY297	4/16/1999	4/30/1999	199904B
BAY298	5/1/1999	5/15/1999	199905A
BAY299	5/16/1999	5/31/1999	199905B
BAY300	6/1/1999	6/13/1999	199906A
BAY301	6/14/1999	6/30/1999	199906B
BAY302	7/1/1999	7/16/1999	199907A
BAY303	7/17/1999	7/31/1999	199907B
BAY304	8/1/1999	8/15/1999	199908A
BAY305	8/16/1999	8/30/1999	199908B
BAY306	9/1/1999	9/15/1999	199909A
BAY307	9/15/1999	9/30/1999	199909B
BAY308	10/1/1999	10/15/1999	199910A
BAY309	10/16/1999	10/31/1999	199910B
BAY310	11/1/1999	11/30/1999	199911A
BAY311	12/1/1999	12/31/1999	199912A
BAY312	1/1/2000	1/31/2000	200001A
BAY313	2/1/2000	2/29/2000	200002A
BAY314	3/1/2000	3/15/2000	200003A
BAY315	3/16/2000	3/31/2000	200003B
BAY316	4/1/2000	4/15/2000	200004A
BAY317	4/16/2000	4/30/2000	200004B
BAY318	5/1/2000	5/15/2000	200005A
BAY319	5/16/2000	5/31/2000	200005B
BAY320	6/1/2000	6/15/2000	200006A
BAY321	6/16/2000	6/30/2000	200006B
BAY322	7/1/2000	7/15/2000	200007A
BAY323	7/16/2000	7/31/2000	200007B
BAY324	8/1/2000	8/15/2000	200008A
BAY325	8/16/2000	8/30/2000	200008B
BAY326	9/1/2000	9/15/2000	200009A
BAY327	9/16/2000	9/30/2000	200009B
BAY328	10/1/2000	10/15/2000	200010A
BAY329	10/16/2000	10/31/2000	200010B
BAY330	11/1/2000	11/30/2000	200011A
BAY331	12/1/2000	12/31/2000	200012A
BAY332	1/1/2001	1/31/2001	200101A
BAY333	2/1/2001	2/28/2001	200102A
BAY334	3/1/2001	3/15/2001	200103A
BAY335	3/16/2001	3/31/2001	200103B
BAY336	4/1/2001	4/15/2001	200104A
BAY337	4/16/2001	4/30/2001	200104B
BAY338	5/1/2001	5/15/2001	200105A
BAY339	5/16/2001	5/31/2001	200105B
BAY340	6/1/2001	6/15/2001	200106A
BAY341	6/16/2001	6/30/2001	200106B
BAY342	7/1/2001	7/15/2001	200107A
BAY343	7/16/2001	7/31/2001	200107B
BAY344	8/1/2001	8/16/2001	200108A
BAY345	8/17/2001	8/31/2001	200108B
BAY346	9/1/2001	9/15/2001	200109A
BAY347	9/16/2001	9/30/2001	200109B
BAY348	10/1/2001	10/18/2001	200110A
BAY349	10/19/2001	10/31/2001	200110B
BAY350	11/1/2001	11/30/2001	200111A
BAY351	12/1/2001	12/31/2001	200112A
BAY352	1/8/2002	1/31/2002	200201A
BAY353	2/1/2002	2/28/2002	200202A
BAY354	3/1/2002	3/15/2002	200203A
BAY355	3/16/2002	3/31/2002	200203B
BAY356	4/1/2002	4/15/2002	200204A
BAY357	4/16/2002	4/30/2002	200204B
BAY358	5/1/2002	5/15/2002	200205A
BAY359	5/16/2002	5/31/2002	200205B
BAY360	6/1/2002	6/15/2002	200206A
BAY361	6/16/2002	6/30/2002	200206B
BAY362	7/1/2002	7/15/2002	200207A
BAY363	7/16/2002	7/31/2002	200207B
BAY364	8/1/2002	8/15/2002	200208A
BAY365	8/16/2002	8/31/2002	200208B
BAY366	9/1/2002	9/15/2002	200209A
BAY367	9/16/2002	9/30/2002	200209B
BAY368	10/1/2002	10/15/2002	200210A
BAY369	10/16/2002	10/31/2002	200210B
BAY370	11/1/2002	11/30/2002	200211A
BAY371	12/1/2002	12/31/2002	200212A
BAY372	1/1/2003	1/31/2003	200301A
BAY373	2/1/2003	2/28/2003	200302A
BAY374	3/1/2003	3/15/2003	200303A
BAY375	3/16/2003	3/31/2003	200303B
BAY376	4/1/2003	4/15/2003	200304A
BAY377	4/16/2003	4/30/2003	200304B
BAY378	5/1/2003	5/15/2003	200305A
BAY379	5/16/2003	5/31/2003	200305B
BAY380	6/1/2003	6/15/2003	200306A
BAY381	6/16/2003	6/30/2003	200306B
BAY382	7/1/2003	7/15/2003	200307A
BAY383	7/16/2003	7/31/2003	200307B
BAY384	8/1/2003	8/15/2003	200308A
BAY385	8/16/2003	8/31/2003	200308B
BAY386	9/1/2003	9/15/2003	200309A
BAY387	9/16/2003	9/30/2003	200309B
BAY388	10/1/2003	10/15/2003	200210A
BAY389	10/16/2003	10/31/2003	200210B
BAY390	11/1/2003	11/30/2003	200211A
BAY391	12/1/2003	12/31/2003	200212A
BAY392	1/6/2004	1/30/2004	200401A
BAY393	2/1/2004	2/29/2004	200402A
BAY394	3/1/2004	3/30/2004	200403A
BAY396	4/1/2004	4/15/2004	200404A
BAY397	4/16/2004	4/30/2004	200404B
BAY398	5/1/2004	5/15/2004	200405A
BAY399	5/16/2004	5/31/2004	200405B
BAY400	6/1/2004	6/15/2004	200406A
BAY401	6/16/2004	6/30/2004	200406B

CRUISE	START_DATE	END_DATE	NEWCRUISE
BAY402	7/1/2004	7/14/2004	200407A
BAY403	7/15/2004	7/31/2004	200407B
BAY404	8/1/2004	8/15/2004	200408A
BAY405	8/16/2004	8/31/2004	200408B
BAY406	9/1/2004	9/15/2004	200409A
BAY407	9/16/2004	9/30/2004	200409B
BAY408	10/1/2004	10/15/2004	200410A
BAY409	10/16/2004	10/31/2004	200410B
BAY410	11/1/2004	11/30/2004	200411A
BAY411	12/1/2004	12/31/2004	200412A
BAY412	1/5/2005	1/31/2005	200501A
BAY413	2/1/2005	2/28/2005	200502A
BAY414	3/1/2005	3/17/2005	200503A
BAY415	3/18/2005	3/31/2005	200503B
BAY416	4/1/2005	4/15/2005	200504A
BAY417	4/16/2005	4/30/2005	200504B
BAY418	5/1/2005	5/15/2005	200505A
BAY419	5/16/2005	5/31/2005	200505B
BAY420	6/1/2005	6/15/2005	200506A
BAY421	6/16/2005	6/30/2005	200506B
BAY422	7/1/2005	7/15/2005	200507A
BAY423	7/16/2005	7/31/2005	200507B
BAY424	8/1/2005	8/15/2005	200508A
BAY425	8/16/2005	8/31/2005	200508B
BAY426	9/1/2005	9/15/2005	200509A
BAY427	9/16/2005	9/30/2005	200509B
BAY428	10/1/2005	10/15/2005	200510A
BAY429	10/16/2005	10/31/2005	200510B
BAY430	11/1/2005	11/30/2005	200511A
BAY431	12/1/2005	12/31/2005	200512A
BAY432	1/1/2006	1/31/2006	200601A
BAY433	2/1/2006	2/28/2006	200602A
BAY434	3/1/2006	3/31/2006	200603A
BAY435	4/1/2006	4/15/2006	200604A
BAY436	4/16/2006	4/30/2006	200604B
BAY437	5/1/2006	5/15/2006	200605A
BAY438	5/16/2006	5/31/2006	200606B
BAY439	6/1/2006	6/15/2006	200606A
BAY440	6/16/2006	6/30/2006	200606B
BAY441	7/1/2006	7/15/2006	200607A
BAY442	7/16/2006	7/31/2006	200607B
BAY443	8/1/2006	8/17/2006	200608A
BAY444	8/18/2006	8/31/2006	200608B
BAY445	9/1/2006	9/30/2006	200609A
BAY446	10/1/2006	10/31/2006	200610A
BAY447	11/1/2006	11/30/2006	200611A
BAY448	12/1/2006	12/31/2006	200612A
BAY452	1/3/2007	1/31/2007	200701A
BAY453	2/1/2007	2/28/2007	200702A
BAY454	3/1/2007	3/15/2007	200703A
BAY455	3/16/2007	3/30/2007	200703B
BAY456	4/1/2007	4/15/2007	200704A
BAY457	4/16/2007	4/30/2007	200704B
BAY458	5/1/2007	5/15/2007	200705A
BAY459	5/16/2007	5/31/2007	200705B
BAY460	6/1/2007	6/15/2007	200706A
BAY461	6/16/2007	6/30/2007	200706B
BAY462	7/1/2007	7/15/2007	200707A
BAY463	7/16/2007	7/31/2007	200707B
BAY464	8/1/2007	8/15/2007	200708A
BAY465	8/16/2007	8/31/2007	200708B
BAY466	9/1/2007	9/15/2007	200709A
BAY467	9/16/2007	9/30/2007	200709B
BAY468	10/1/2007	10/15/2007	200710A
BAY469	10/16/2007	10/31/2007	200710B
BAY470	11/1/2006	11/30/2007	200711A
BAY471	12/1/2007	12/31/2007	200712A

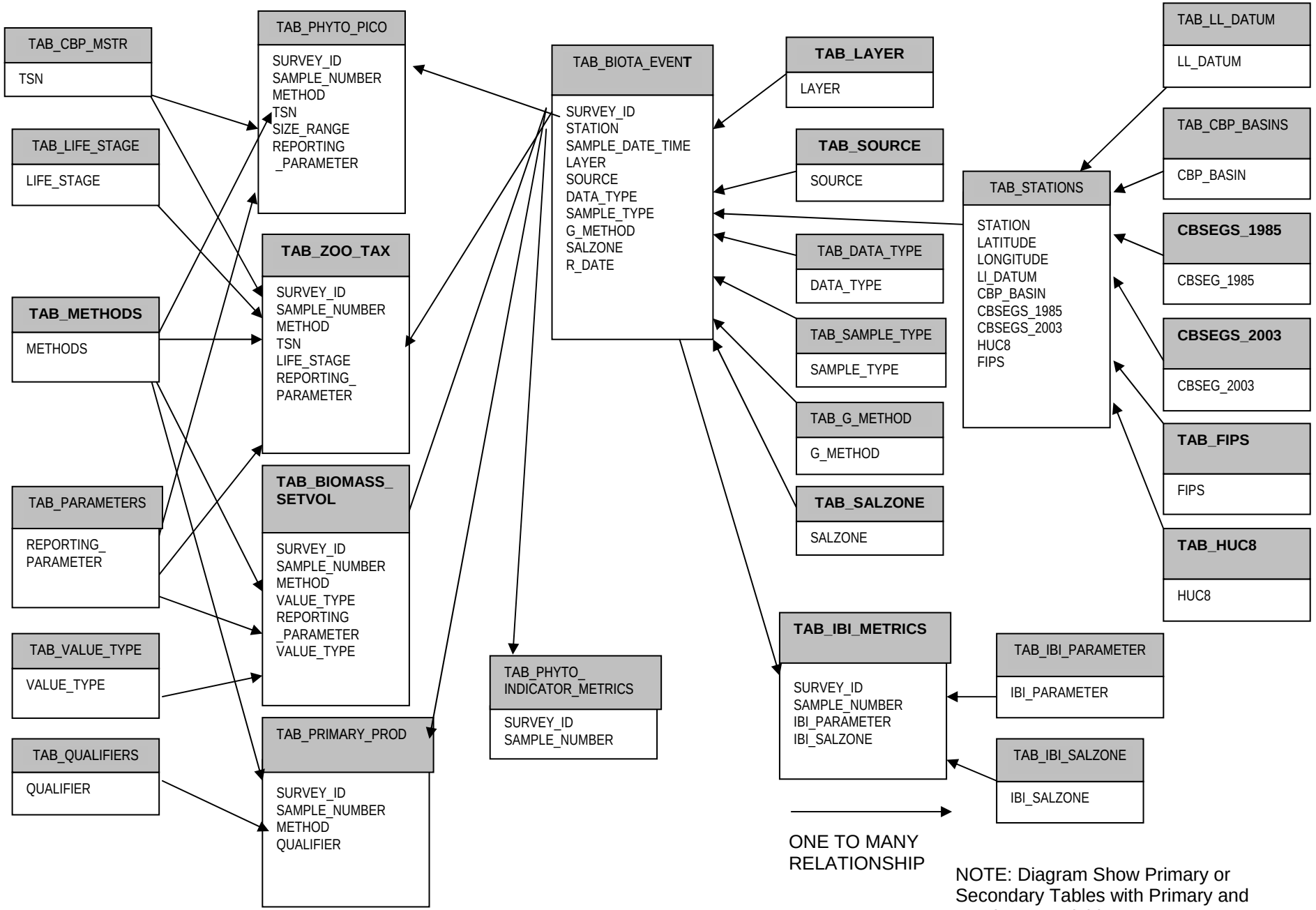
TAB_PI_SPECIES_LIST

Field Name	Description	Data Type	Length
SPEC_CODE (PK,FK,NN)	SOURCE IN-HOUSE SPECIES CODE	Text	14
SOURCE (PK,FK,NN)	DATA GENERATING AGENCY- Code identifying data generator	Text	6
DATA_TYPE (PK,FK,NN)	SAMPLE TYPE CODE- Denotes type of sample collected see DATA_TYPE TABLE for codes	Text	2
SOURCE_LBL	SOURCE IN-HOUSE SPECIES LATIN NAME	Text	45
LBL	FULL SPECIES LABEL- Latin Name Corrected to IT IS accepted spelling	Text	45

Field Name	Description	Data Type	Length
TSN (PK,PK,NN)	TAXON SERIAL NUMBER- ITIS Serial Number for Species Identification	Text	7
R_DATE	VERSION DATE- Date denoting when data records were entered in to database	Date/Time	8
VOLUME	BIOMASS CONVERSION VALUE Conversion factor to estimate biomass from a organism count	Number (Double)	8
SIZE	SPECIES CELL SIZE DESCRIPTOR- Additional species identifier- PHYTO_PICO TABLE ONLY	Text	30
LIFE_STAGE	SPECIES LIFESTAGE- Additional species identifier- ZOOTAX TABLE ONLY	Text	3

General: This table stores information relating to the Source SPEC_CODE. This database uses the Interagency Taxonomic Identification System (ITIS) Taxon Serial Numbers (TSN) for species identification within the database. For species with no TSN values temporary Chesapeake Bay TSN's are generated until a species can be submitted to ITIS for recognition. All data generators had developed and implemented internal species coding systems prior to the development of the ITIS standard. This table is provided as a conversion table from Source in-house species codes to ITIS TSN's prior to loading data to either the PHYTO_PICO TABLE or the ZOO_TAX TABLE.

APPENDIX A. DATABASE ENTITY RELATIONSHIP DIAGRAM


TAB_CBP_MSTR
TSN
TAB_LIFE_STAGE
LIFE_STAGE
TAB_METHODS
METHODS
TAB_PARAMETERS
REPORTING_ PARAMETER
TAB_VALUE_TYPE
VALUE_TYPE
TAB_QUALIFIERS
QUALIFIER
TAB_PHYTO_PICO
SURVEY_ID
SAMPLE_NUMBER
METHOD
TSN
SIZE_RANGE
REPORTING _PARAMETER
TAB_ZOO_TAX
SURVEY_ID
SAMPLE_NUMBER
METHOD
TSN
LIFE_STAGE
REPORTING_ PARAMETER
TAB_BIOMASS_ SETVOL
SURVEY_ID
SAMPLE_NUMBER
METHOD
VALUE_TYPE
REPORTING _PARAMETER
VALUE_TYPE
TAB_PRIMARY_PROD
SURVEY_ID
SAMPLE_NUMBER
METHOD
QUALIFIER
TAB_BIOTA_EVENT
SURVEY_ID
STATION
SAMPLE_DATE_TIME
LAYER
SOURCE
DATA_TYPE
SAMPLE_TYPE
G_METHOD
SALZONE
R_DATE
TAB_PHYTO_ INDICATOR_METRICS
SURVEY_ID
SAMPLE_NUMBER
TAB_LAYER
LAYER
TAB_SOURCE
SOURCE
TAB_DATA_TYPE
DATA_TYPE
TAB_SAMPLE_TYPE
SAMPLE_TYPE
TAB_G_METHOD
G_METHOD
TAB_SALZONE
SALZONE
TAB_STATIONS
STATION
LATITUDE
LONGITUDE
LI_DATUM
CBP_BASIN
CBSEGS_1985
CBSEGS_2003
HUC8
FIPS
TAB_LL_DATUM
LL_DATUM
TAB_CBP_BASINS
CBP_BASIN
CBSEGS_1985
CBSEG_1985
CBSEGS_2003
CBSEG_2003
TAB_FIPS
FIPS
TAB_HUC8
HUC8
TAB_IBI_METRICS
SURVEY_ID
SAMPLE_NUMBER
IBI_PARAMETER
IBI_SALZONE
TAB_IBI_PARAMETER
IBI_PARAMETER
TAB_IBI_SALZONE
IBI_SALZONE
ONE TO MANY RELATIONSHIP
NOTE: Diagram Show Primary or Secondary Tables with Primary and Foreign Key Fields