TIDAL BENTHIC MONITORING DATABASE: Version 4.0

DATABASE DESIGN DOCUMENTATION 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 (CBP) partners to develop the Chesapeake Bay Information Management System (CIMS). CIMS will electronically link a variety of information sources about the Bay and tributary 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, CBP is working to establish a system of distributed data bases. 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 Data Management program designed 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. They are 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 XML data exchanges between multiple sources. The design of these databases is done as a joint effort between the data generators and the CBP technical staff. Participation of the data generators in this process provides critical expertise about the data and its usage, producing a better database.

The original Tidal Benthic Monitoring Data base was designed as a joint effort between CBP Data Center Staff and the monitoring program Principal Investigators in 1997 using Microsoft Access. The database was migrated in to Microsoft SQL server in July 2010. During this migration, minor modifications were made to tables and fields to accommodate SQL Server and maintain continuity where possible with the CBP 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 Tidal Benthic Monitoring Database's revised structural design.

Introduction

The Tidal Benthic Monitoring Data

The study of tidal benthic communities in Chesapeake Bay is an ongoing process. Benthic monitoring studies were in progress before the signing of the 1983 Chesapeake Bay Agreement. In Virginia, much of the historical research focused on documenting the condition and dynamics of benthic communities. In Maryland, a series Power Plant monitoring studies were conducted which had significant benthic components. In 1983, the Chesapeake Bay Agreement was signed laying the ground work for the current EPA Chesapeake Bay Environmental Monitoring Program. The current long-term benthic community monitoring programs are run by the states of Maryland and Virginia, have been instrumental in development of the CBP Benthic Restoration Goals and the Chesapeake Bay Index of Benthic Integrity.

Chesapeake Bay benthic monitoring programs have historically collected diverse data types using multiple data collection protocols. This trend is anticipated to continue as technology and scientific knowledge about the benthos evolves. Therefore, the final database design has to be suitable for storing data from historic studies and current monitoring programs and have the flexibility to accommodate future data forms. The data housed in the current benthic database includes species abundance and composition counts, biomass determinations, sediment and water quality analyses and photographic images and other multimedia material. Method codes are used to distinguish different collecting methods and gear types.

Relational Data Concepts

The various benthic monitoring data are stored in a relational database structure where data are stored in tables related to one another by several common fields. These 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 structure 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. 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 chapters describe the relational database structure for the tidal benthic data including the primary data tables and the numerous lookup or secondary tables required to define in detail the codes contained in the primary tables. Primary data tables contain the bulk of the actual data stored in a data base while secondary tables store reference information. The seven primary tables in the tidal benthic database are TAB_EVENT, TAB_BIOMASS, TAB_BIOTA_SAMPLING, TAB_IBI_METRICS, TAB_PHOTO_ANALYSIS, TAB_PHOTO_EVENT, TAB_SEDIMENT_ANALYSIS, TAB_TAXONOMIC_COUNT, AND TAB_WQ_DATA. The remaining associated look-up tables in the data base contain information supports the referential integrity of the database.

Relational Database Structure

Fields in the related tables of the database have specific attributes which ensure data consistency and integrity. The various tables provided in this document contain descriptions of the database attributes. The columns in these documentation tables and their information codes 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. In the case of auto generated primary keys there must be a unique clustered index (CI) for the table.

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 2005 used in the CBP database include the following.

Exact Numerics

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
MONEY	-922,337,203,685,477.5808	+922,337,203,685,477,5807
SMALLMONEY	-214,748.3648	+214,748.3647

Numeric and decimal are fixed precision, scale data types, and are functionally equivalent.

Approximate Numeric

Type	From	To
FLOAT	-1.79E + 308	+1.79E + 308
REAL	-3.40E + 308	+3.40E + 308

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.
VARCHAR(MAX)	Variable-length non-Unicode data with a maximum of 2^{31} characters.
TEXT	Variable-length non-Unicode data with a maximum length of 2,147,483,647 characters.

Unicode Character Strings

Type	Description
NCHAR	Fixed-length non-Unicode character data with a maximum length of 4,000 characters.
NVARCHAR	Variable-length non-Unicode data with a maximum of 4,000 characters.
NVARCHAR(MAX)	Variable-length non-Unicode data with a maximum of 2^{30} characters.
NTEXT	Variable-length non-Unicode data with a maximum length of 1,073,741,823 characters.

Binary Strings

Type	Description
binary	Fixed-length binary data with a maximum length of 8,000 bytes.
varbinary	Variable-length binary data with a maximum length of 8,000 bytes.
varbinary(max)	Variable-length binary data with a maximum length of 2^{31} bytes
image	Variable-length binary data with a maximum length of 2,147,483,647 bytes.

Other Data Types

Type	Description
sql_variant	Stores values of various SQL Server-supported data types, except text, ntext, and timestamp
timestamp	Stores a database-wide unique number that gets updated every time a row gets updated.
uniqueidentifier	Stores a globally unique identifier (GUID).
xml	Stores XML data. You can store xml instances in a column or a variable
cursor	A reference to a cursor.
table	Stores a result set for later processing.

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

AUTO-GENERATED FIELD- By definition these are primary or foreign key fields. As mentioned above a unique record for an auto-key is based a combined primary key field. The fields that make up the combined primary key in child tables have been maintained in this version of the database for ease of properly assigning auto- keys. These fields may be dropped in subsequent versions of the database since they are unnecessary once the appropriate auto-key is assigned to a data record.

Benthic Database Structure

Primary Data Tables

Within the current design, the primary tables are the TAB_EVENT, TAB_BIOMASS, TAB_BIOTA_SAMPLING, TAB_IBI_METRICS, TAB_PHOTO_ANALYSIS, TAB_PHOTO_EVENT, TAB_SEDIMENT_ANALYSIS, TAB_TAXONOMIC_COUNT, AND TAB_WQ_DATA.. The TAB_EVENT table contains all sampling event data for all types of sample collection events. It also contains fields specifying both the type and origin of the data. It places the occurrence of a sampling event in space and time. The BIOTA_SAMPLING_TABLE contains all sampling event data collected and analyzed for biologic content. This table was determined to be necessary due to the multiple instances where sampling events occurred and water quality, sediment and other parameters were measured but were not analyzed for biota content. The remaining table all store data of the type designated in the table name.
Future version of this database may include modifications of the TAB_TAXONOMIC_COUNT and TAB_SEDIMENT_ANALYSIS to store data derived from long-core benthic samples.

TAB_EVENT

Field Name	Description	Data Type	Length
EVENT_ID (AK,PK,)	PRIMARY_ID KEY-(STATION+SAMPLE_DATE_TIME+SOURCE)	Integer	
STATION (CI,NN)	SAMPLING STATION-Sampling Station identifier	Varchar	15
SAMPLE_ DATE_TIME (CI,NN)	SAMPLING DATE-Date of sample collection	Small Date/Time	
STRATUM (FK, NN)	SAMPLING STRATUM CODE-Code describing sampling stratum	Char	6
SITE_TYPE_ CODE (FK,NN)	SAMPLING SITE TYPE-Station Sampling Site Type Code	Char	2
SOURCE (CI,FK,NN)	DATA GENERATING AGENCY-Code identifying data generator	Char	6
LATITUDE (NN)	STATION LATITUDE-Station Latitude in decimal degrees	Decimal	9,6
LONGITUDE (NN)	STATION LONGITUDE-Station Longitude in negative decimal degrees	Decimal	9,6
LL_DATUM	LL_DATUM-Geographic Datum for Latitude and Longitude	char	5
FIPS (FK)	FIPS CODE-Federal Information Processing System code.	Char	5
CBSEG_2003	Chesapeake Bay Program 2003 Segment Designation	Char	6
HUC8 (FK)	8 DIGIT USGS HYDROLOGIC UNIT CODE	Char	8
PROJECT (FK)	STATE MONITORING PROJECT-Code identifying State Monitoring Project	Char	10
PROGRAM (FK)	STATE MONITORING PROGRAM-Code identifying State Monitoring Program	Char	10
TOTAL_DEPTH (NN)	TOTAL STATION DEPTH-Total Station Depth in Meters	Decimal	8,2
R_DATE (NN)	DATA VERSION DATE-Date denoting when data records were entered in to database	SmallDateTime	

Field Name	Description	Data Type	Length
UTM_X (NN)	UTM_X-UTM Zone 18 North X Coordinate	Integer	
UTM_Y (NN)	UTM_Y-UTM Zone 18 North Y Coordinate	Integer	
SAMPLE_DATE	SAMPLING DATE-Sample Collection Date Only-Database generated Field	Date/Time	
SAMPLE_TIME	SAMPLING TIME-Sample Collection Time Only-Database generated Field	Date/Time	

1) GENERAL: Every event for which there were sample taken of any kind must have a record in this table.

2) EVENT_ID: The actual primary key for this table is a composite key base on the following fields: STATION, SAMPLE_DATE _TIME and SOURCE. 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_BIOTA_SAMPLING

Field Name	Description	Data Type	Length
EVENT_ID (PK, FK,NN)	PRIMARY_ID KEY-(STATION+DATE+TIME+ SOURCE)	Integer	
SAMPLE_NUMBER (PK, NN)	SAMPLE NUMBER-Number of sample collected at Station(replicate number)	TinyInteger	4
GMETHOD (FK,NN)	GEAR METHOD CODE-Code of Sampling Gear used for sample collection	Char	3
NET_MESH (NN)	NET MESH-Size of sieve used to sort field sample in millimeters	Real	4
AEPENETR (FK,NN)	ACTUAL OR ESTIMATED GEAR PENETRATION DEPTH- Code for Measurement type	Char	2
PENETR	GEAR PENETRATION DEPTH-Sediment penetration depth of gear for sample in Centimeters	Real	
SER_NUM	SOURCE SAMPLE SERIAL NUMBER	Varchvar	12
SOURCE (NN)	DATA GENERATING AGENCY-Code identifying data generator	Char	10

1) GENERAL: Every sample for which there were either taxonomic identification or abundance determinations and /or biomass determinations performed must have a corresponding record in this table. If no biota analysis were performed there should be no records present for the event record. This table is used to accurately account for biota sampling effort.

2) EVENT_ID: The primary key for this table is a composite key base on the following fields: EVENT_ID, and SAMPLE_NUMBER,. The composite key of EVENT_ID is base on the combination following fields: STATION, and SAMPLE_DATE_TIME. EVENT_ID is an Auto-Key number is generated for each unique combination of these fields in the TAB _EVENT table and must be merged on to data before it can be loaded into this table.

TAB_BIOMASS

Field Name	Description	Data Type	Length
EVENT_ID (PK, FK,NN)	PRIMARY_ID KEY- (STATION+DATE_TIME+SOURCE)	Integer	4
SAMPLE_NUMBER (PK)	SAMPLE NUMBER-Replicate Number of sample collected at Station	Tinyint	4
BIOMASS_VALUE_TYPE (FK,NN)	ACTUAL OR ESTIMATED VALUE TYPE CODE-Code for measurement type	Char	3
TSN (PK,FK,NN)	TAXON SERIAL NUMBER- ITIS Serial Number for Species Identification	Char	7
LIFESTAGE_CODE (PK,FK,NN)	SPECIES LIFE STAGE-Additional species identifier	Char	3
REPORTING_PARAMETER (FK)	REPORTING PARAMETER-Name identifying parameter	Varchar	15
REPORTING_VALUE (NN)	REPORTED PARAMETER VALUE	Real	8
REPORTING_UNITS (FK,NN)	REPORTING UNITS OF PARAMETER	Varchar	15
SPEC_CODE	SOURCE INHOUSE SPECIES CODE	Varchar	15
SAMPLE_TYPE (FK,)	SAMPLE COLLECTION TYPE CODE	Char	1
BIO_METHOD	CBP BIOLOGICAL METHOD CODE	Char	6

1) GENERAL: This table stores information relating to measurements of benthic biomass. 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 TSNs are generated until a species can be submitted to ITIS for recognition. If a sample was NOT examined for species abundance and composition, there should be no records present for that sample in this table. Samples which were analyzed for biota content, but no organisms were found are denoted by the presence of a "Empty Sample Record" denoted by a TSN value of BAY0291. AN UNMATCHED RECORD QUERY SHOULD NOT BE USED TO DETERMINE SAMPLES WITH NO BIOTA PRESENT. AN UNMATCHED RECORD QUERY COMPARING THE BIOTA_TABLE AND THE BIOMASS_TABLE WILL PRODUCE A LIST OF EVENTS WHERE BIOTA CONTENT WAS EXAMINED BUT BIOMASS WAS NOT DETERMINED. This table assumes that all biomass information is derived from sediment surface grab samples. A Parameter's SAMPLE_DEPTH is assumed to be TOTAL_DEPTH from the TAB_EVENT. (See Beginning of Primary Table section for details.)

2) EVENT_ID: The primary key for this table is a composite key base on the following fields: EVENT_ID, TSN, LIFE_STAGE_CODE and SAMPLE_NUMBER,. The composite key of EVENT_ID is base on the combination following fields: STATION, and SAMPLE_DATE_TIME. EVENT_ID is an Auto-Key number is generated for each unique combination of these fields in the TAB _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
EVENT_ID (PK,FK)	PRIMARY_ID KEY-(STATION+DATE_TIME+SOURCE)	Integer	
SAMPLE_NUMBER (PK,NN)	SAMPLE NUMBER-Replicate Number of sample collected at Station	TinyInteger	
IBI_PARAMETER (PK,FK)	IBI PARAMETER-Name identifying IBI Metric	Varchar	15
IBI_VALUE	IBI METRIC VALUE	Real	
IBI_SCORE	IBI METRIC SCORE	Real	
IBI_SALZONE (FK,NN)	IBI SITE SALINITY ZONE CLASSIFCIATION	Char	2
IBI_BOTTOM_TYPE (FK,NN)	IBI SITE BOTTOM TYPE CLASSIFICATION	Char	1
IBI_METHOD (FK,NN)	INDICATES SOURCE OF IBI CALULATIONS	Char	6
R_DATE (NN)	DATA VERSION DATE-Date denoting when data records were entered in to database	Small DateTime	

1) GENERAL: This table stores calculated Benthic Index of Biotic Integrity (BIBI) metrics and scored values. The BIBI's are calculated based on the published in An Estuarine Benthic Index of Biotic Integrity for Chesapeake Bay (Estuaries 20(1): 149-158 (1997)). For more details on the calculation programs included in the database see section on IBI Metric Calculation Program.

2) EVENT_ID: The primary key for this table is a composite key base on the following fields: EVENT_ID, SAMPLE NUMBER and IBI_PARAMETER. The composite key of EVENT_ID is base on the combination following fields: STATION, and SAMPLE_DATE_TIME. EVENT_ID is an Auto-Key number is generated for each unique combination of these fields in the TAB _EVENT table and must be merged on to data before it can be loaded into this table.

TAB_PHOTO_ANALYSIS

Field Name	Description	Data Type	Length
EVENT_ID (PK,FK,NN)	PRIMARY_ID KEY-(STATION+DATE+TIME+ SOURCE)	Integer	
SAMPLE_NUMBER (PK,NN)	SAMPLE NUMBER-Number of sample collected at Station(replicate number)	Smallinteger	
PHOTO_ANALYSIS_ PARAMETER (PK,FK, NN)	PHOTO_ANALYSIS_PARAMETER-Name identifying parameter	Varchar	20
REPORTED_VALUE (NN)	REPORTED PARAMETER VALUE	Real	
REPORTING_UNITS	REPORTING UNITS OF PARAMETER	Varchar	20
PHOTO_QUALIFIER (FK)	PARAMETER VALUE QUALIFIER	Char	2
TYPE (NN)	TYPE-Descriptor further describing parameter and value	Varchar	100

1) GENERAL: This table stores information derived from analysis of images from the SEDIMENT PROFILE CAMERA IMAGE DATA SETS.

2) EVENT_ID: The primary key for this table is a composite key base on the following fields: EVENT_ID, SAMPLE NUMBER and PHOTO_ANALYSIS_PARAMETER. EVENT_ID is an Auto-Key number is generated for each unique combination of these fields in the TAB _EVENT table and must be merged on to data before it can be loaded into this table.

TAB_PHOTO_EVENT

Field Name	Description	Data Type	Length
EVENT_ID (PK,FK,NN)	PRIMARY_ID KEY-(STATION+DATE+TIME+ SOURCE)	Integer	
SAMPLE_NUMBER (PK,FK,NN)	SAMPLE NUMBER-Number of sample collected at Station(replicate number)	Smallinteger	
PHOTO_CD_NUMBER (PK,,NN)	CD IDENTIFIER-Identification number of photo CD containing image	Varchar	15
CD_IMAGE_NUMBER (PK,NN)	IMAGE DESIGNATION-Name of image on photo CD	Varchar	50
SEDIMENT_TYPE (FK,NN)	SEDIMENT TYPE-Wentworth Sediment Classification	Varchar	15
SURFACE_FAUNA	SURFACE FAUNA DESCRIPTION-Characterization of any observed surface fauna	Varchar	50
TUBES (FK,NN)	TUBE COUNT-Descriptor of abundance of worm tubes observed in image	Varchar	8
PELLETS (FK,NN)	PELLET COUNT-Descriptor of abundance of worm fecal pellets observed in image	Varchar	10
COMMENTS	COMMENT-General comment about image	Varchar	150

1) GENERAL: This table stores pointer to the actual images and some gross characterizations of the
images from the SEDIMENT PROFILE CAMERA IMAGE DATA SETS.

2) EVENT_ID: The primary key for this table is a composite key base on the following fields: EVENT_ID, SAMPLE NUMBER, PHOTO_CD_NUMBER AND CD_IMAGE_NUMBER. EVENT_ID is an Auto-Key number is generated for each unique combination of these fields in the TAB _EVENT table and must be merged on to data before it can be loaded into this table.

TAB_SEDIMENT_ANALYSIS

Field Name	Description	Data Type	Length
EVENT_ID (PK, FK,NN)	PRIMARY_ID KEY (STATION+DATE+TIME+SOURCE)	Integer	
SAMPLE_NUMBER (PK,NN)	SAMPLE NUMBER-Number of sample collected at Station (replicate number)	Smallinteger	
REPORTING_PARAMETER (PK,FK,NN)	REPORTING_PARAMETER-Sediment Reporting parameter	Varchar	15
REPORTED_VALUE (NN)	PARAMETER VALUE	Real	
REPORTING_UNITS (FK,NN)	REPORTING UNITS OF PARAMETER	Varchar	15
SEDIMENT_METHOD (FK,NN)	METHOD CODE- Method code identifying field/laboratory analysis procedure	Char	6
SAMPLE_TYPE (FK,NN)	SAMPLE COLLECTION TYPE CODE	Char	5

1) GENERAL: This table stores information relating to measurements of benthic sediment characterization. This table assumes that all sediment information is derived from sediment surface grab samples. A Parameter's SAMPLE_DEPTH is assumed to be TOTAL_DEPTH from the TAB_EVENT. (See Beginning of Primary Table section for details.) If no sediment analysis was performed on a sampling station, there should be no records present for that station in this table.

2) EVENT_ID: The primary key for this table is a composite key base on the following fields: EVENT_ID, SAMPLE NUMBER and REPORTING_PARAMETER. EVENT_ID is an Auto-Key number is generated for each unique combination of these fields in the TAB _EVENT table and must be merged on to data before it can be loaded into this table.

TAB_TAXONOMIC_COUNT

Field Name	Description	Data Type	Length
EVENT_ID (PK, FK,NN)	PRIMARY KEY- (STATION+DATE+TIME+SOURCE)	Integer	
SAMPLE_NUMBER (PK, FK,NN)	SAMPLE NUMBER-Number of sample collected at Station (replicate number)	Smallinteger	
TSN (PK, FK,NN)	TAXON SERIAL NUMBER- ITIS Serial Number for Species Identification	Char	7
LIFE_STAGE_CODE (PK, NN)	SPECIES LIFE STAGE-Additional species identifier	Char	**3**
REPORTING_PARAMETER (PK, FK,NN)	PARAMETER-Name identifying parameter	Varchar	15
REPORTING_VALUE (NN)	PARAMETER VALUE	Smallinteger	4
REPORTING_UNITS (FK,NN)	REPORTING UNITS OF PARAMETER	Varchar	10
SPEC_CODE	SOURCE INHOUSE SPECIES CODE	Varchar	14
BIO_METHOD	BIO_METHOD-Biological Enumeration Method	Char	6
SAMPLE_TYPE (FK,NN)	SAMPLE COLLECTION TYPE CODE	Char	1
SKIP	SKIP-Denotes fragement or other items to be excluded from taxa count	Varchar	5

1) GENERAL: This table stores information relating to measurements of benthic 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 TSNs 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. Samples which were analyzed for biotic content but no organisms were found are denoted by the presence of a "Empty Sample Record" denoted by a TSN value of BAY0291. This table assumes that all taxonomic information is derived from sediment surface grab samples. A Parameter's SAMPLE_DEPTH is assumed to be TOTAL_DEPTH from the TAB_EVENT. (See Beginning of Primary Table section for details.)

2) EVENT_ID: The primary key for this table is a composite key base on the following fields: EVENT_ID, SAMPLE NUMBER TSN, LIFE_STAGE, REPORTING_PARAMETER. EVENT_ID is an Auto-Key number is generated for each unique combination of these fields in the TAB _EVENT table and must be merged on to data before it can be loaded into this table.

TAB_WQ_DATA

Field Name	Description	Data Type	Length
EVENT_ID (PK, FK,NN)	PRIMARY_ID KEY (STATION+DATE+TIME+SOURCE)	Integer	
SAMPLE_NUMBER (PK,NN)	SAMPLE NUMBER-Number of sample collected at Station (replicate number)	Smallinteger	
SAMPLE_DEPTH (PK,NN)	SAMPLE COLLECTION DEPTH Depths in METERS	Real	
REPORTING_PARAMETER (PK,NN)	PARAMETER-Name identifying parameter	Varchar	15
REPORTING_VALUE (NN)	PARAMETER VALUE	Real	8
REPORTING_UNITS (FK,NN)	REPORTING UNITS OF PARAMETER	Varchar	10
WQ_METHOD (FK,NN)	METHOD CODE- Method code identifying field/laboratory analysis procedure	Char	4
SAMPLE_TYPE (FK,NN)	SAMPLE COLLECTION TYPE CODE	Char	3

1) GENERAL: This table stores information relating to measurements of ambient water quality at sampling time. If no water quality sampling was performed on a sampling station, there should be no records present for that station in this table.

2) EVENT_ID: The primary key for this table is a composite key base on the following fields: EVENT_ID, SAMPLE NUMBER, SAMPLE_DEPTH and REPORTING_PARAMETER. EVENT_ID is an Auto-Key number is generated for each unique combination of these fields in the TAB _EVENT table and must be merged on to data before it can be loaded into this table.

Principal Look-Up Tables

The primary tables have 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_MASTER

Field Name	Description	Data Type	Length
TSN_NUM	TAXON SERIAL NUMBER-ITIS Serial Number for Species Identification (defined as a numeric value)	Integer	
TSN (PK,NN)	TAXON SERIAL NUMBER-ITIS Serial Number for Species Identification (defined as a fixed 7 character value with leading zeros)	Char	7
NODCCODE	NATIONAL OCEANOGRAPHIC DATA CENTER TAXONOMIC CODES	Varchar	12
SYN	SYNONYM FLAG-Chesapeake Bay Program flag denoting species with synonymous name/ accepted name (S= synonym, SA= synonym-accepted name)	Varchar	2
LATIN_NAME(NN)	SPECIES LATIN NAME-SpeciesLatin/Scientific Name	Varchar	45
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	Small Date/Time	

1) GENERAL: This table stores information in relating to the identification of species in the BIOMASS_TABLE and the TAXONOMIC_TABLE. The list includes listings for all types of organisms, benthic and non-benthic. 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 TSNs 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.

2) TNS: 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.

3) 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 and stopped being updated with Version 8.0. However, it provides data analysts with a very useful tool for sorting organisms into taxonomic groups.

4) 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.

5) TAXON_LEVEL: The 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
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_FIPS

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

1) 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 TAB_STATION tables. Additional codes may be added as needed. Currently accepted FIPS CODES, STATE AND COUNTY designations are as follows:

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

FIPS	STATE	COUNTY
36123	NY	YATES
42001	PA	ADAMS
42009	PA	BEDFORD
42011	PA	BERKS
42013	PA	BLAIR
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

FIPS	STATE	COUNTY
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

FIPS	STATE	COUNTY
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- CBP Code of Sampling Gear used for sample collection	Char	3
G_METHOD_ DESCRIPTION (NN)	GEAR DESCRIPTION-CBP biological field sampling gear descriptions	Varchar	30
G_METHOD_ DETAILS	DETAILED DESCRIPTION- Detailed Description of Sampling Gear Including Dimensions	Varchar	50

1) 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_SAMPLING_GEAR. 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	G_METHOD_DETAILS
01	HAND DREDGE	
02	DREDGE	
03	ARTIFICIAL SUBSTRAIT	UNSPECIFIED
04	DIATOMER SLIDES	
05	CLARKE-BUMPUS SAMPLER	
06	PLANKTON TRAP	UNSPECIFIED
07	PLANKTON PUMP	UNSPECIFIED
08	PLANKTON NET	UNSPECIFIED
09	PLANKTON NET	500µ MESH
10	PLANKTON NET	NO. 20, 80µ MESH
11	PLANKTON NET	10µ MESH
12	BEAM PLANKTON LINE	
13	ANCHOR DREDGE	
14	HYDRAULIC GRAB	1200 SQ. CM
15	HAND CORE	45 SQ. CM
16	POST-HOLE DIGGER	200 SQ. CM
17	PONAR GRAB	200 SQ. CM
18	PONAR GRAB	1000 SQ. CM
19	PONAR GRAB	50 SQ. CM
20	BOX CORE GRAB	0.018 M2
21	VAN VEEN GRAB	0.07 M2
22	SHIPEK GRAB	0.04 M2
23	SEINE HAUL	UNSPECIFIED
24	SMITH-MACINTIRE GRAB	1000 SQ CM
25	SEINE NET	15 FT, 1/8 IN STRECH MESH
26	SEINE NET	50 FT, 1/2 IN STRECH MESH
27	SEINE NET	50 FT, 1/4 IN STRECH MESH
28	SEINE NET	200 FT , 1/2 IN STRECH MESH, NET 200X 20
29	SEINE NET	10 FT , 1/4 IN STRECH MESH, NET 10X4
30	TRAWL	UNSPECIFIED
31	OTTER TRAWL	6 FT, 1 IN. MESH, W/ 1/2 IN INNER LINER
32	OTTER TRAWL	25 FT, 1.24 IN. MESH, W/ 1/2 IN INNER LINER
33	TRAWL	15 FT SEMI-BALLON
34	TUCKER TRAWL	2 MM . MESH, 1 SQ. METER
35	RESERVED	Cargo jellyfish sled
36	TRAWL	16 FT SEMI-BALLON, 1/2 IN MESH

G_METHOD	G_METHOD_DESCRIPTION	G_METHOD_DETAILS
37	OTTER TRAWL	10 FT, 1/4 IN. MESH, W/500 µ IN INNER LINER
38	MID-WATER TRAWL	5 FT, 1/4 IN. MESH, W/500 µ IN INNER LINER
39	RESERVED	
40	TRAP NET	3 x 6 FT, 1/2 IN MESH, 50 FT LEAD
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	
51	DIAPHRAGM PUMP	
52	CENTRIFUGAL PUMP	
53	RESERVED	
54	POUND NET	
55	EPIFAUNA PANELS	
56	PONAR GRAB	UNSPECIFIED
57	D-FRAME NET	500 MICRON MESH, 12 INCH DIAMETER
58	RETANGULAR DIP NET	0.5 METER BY 0.5 METERS
59	HAND PICK	
60	ENDICO CURRENT METER	
61	BRAINCON CURRENT METER	
62	SEDIMENT TRAP ARRAY	6- 3"X30" CUPS {BOYTON-CBL}
63	SEINE NET	50 FT, 1/4 IN MESH, NET 100X4 FT
64	BONGO NET	UNSPECIFIED
65	PURSE SEINE	
66	FYKE AND HOOP NETS	
67	POTS	
68	BOX TRAP	
69	PUSH NET	
70	GREAT LAKE SHOAL	1-2 INCHES
71	GREAT LAKE SHOAL	2-4 INCHES
72	GREAT LAKE SHOAL	4-7 INCHES
73	GREAT LAKE SHOAL	7-14 INCHES
74	BEAM TRAWL	
75	BONGO NET	202 µ, 20 CM OPENING, 0.76 M LENGTH
76	BONGO NET	202 µ, 50 CM OPENING, 4 M LENGTH
77	RESERVED	
78	SLAT TRAP	
79	RESERVED	
80	GIL NETS	
81	USNOL SPADE CORE	0.06 M2 SPADE BOX CORE
82	PONAR GRAB-ODU	
83	DOUBLE PONAR GRAB-VA DEQ	50 SQ CM
84	RESERVED	
85	MID-WATER TRAWL	
86	KICK NET	23 CM x 46 CM, MESH OPEN SIZE 0.8MM BY 0.9 MM
87	KICK NET	UNSPECIFIED
88	RESERVED	
89	D-FRAME NET	UNSPECIFIED
90	HESTER DENDY MULTIPLATE SAMPL	
91	SURBER SAMPLER	
92	KICK SEINE	

G_METHOD	G_METHOD_DESCRIPTION	G_METHOD_DETAILS
93	D-FRAME NET	600 MICRON, 12 INCH DIAMETER
94	KICK NET	600 MICRON, 1 SQUARE METER KICK SCREEN
96	HYDROLIC VAN VEEN GRAB	0.1 SQUARE METERS
97	YOUNG MODIFIED VAN VEEN GRAB	0.04 SQ M
98	PETITE PONAR GRAB	25 SQUARE CM
99	SMITH-MACINTIRE GRAB	0.3 SQUARE METER
100	SMITH-MACINTIRE GRAB	0.2 SQUARE METER

TAB_HUCS_8

Field Name	Description	Data Type	Length
HUC_8 (PK,NN)	8 DIGIT HUC CODE- Sub-Basin unit associated with the first eight digits of HUC_12	Char	8
HUC_6 (NN)	6 DIGIT HUC CODE- Basin associated with the first six digits of HUC_12	Char	6
HUC_4 (NN)	4 DIGIT HUC CODE- Sub-region associated with the first four digits of HUC_12	Char	4
HUC_2 (NN)	2 DIGIT HUC CODE-Region two digits of HUC_12	Char	8
REGION_ DESCRIPTION (NN)	REGION_DESCRIPTION-Detailed Description of Region described by first two digits of HUC code	Varchar	80
SUBREGION_ DESCRIPTION (NN)	SUBREGION_DESCRIPTION-Detailed Description of Region described by first four digits of HUC code	Varchar	80
ACCOUNTING_ DESCRIPTION (NN)	ACCOUNTING_DESCRIPTION- Detailed Description of Region described by first six digits of HUC code	Varchar	80
CATALOGING_ DESCRIPTION (NN)	CATALOGING_DESCRIPTION_ Detailed Description of Region described by first eight digits of HUC code	Varchar	80

1) 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. The currently accepted 8-digit HUC and CATALOGING_DESCRIPTIONS are as follows:

HUC_8	CATALOGING_UNIT_DESCRIPTION
02040303	CHINCOTEAGUE
02040304	EASTERN LOWER DELMARVA
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

HUC_8	CATALOGING_UNIT_DESCRIPTION
02060002	CHESTER-SASSAFRAS
02060003	GUNPOWDER-PATAPSCO
02060004	SEVERN
02060005	CHOPTANK
02060006	PATUXENT
02060007	BLACKWATER-WICOMICO
02060008	NANTICOKE
02060009	POCOMOKE
02060010	CHINCOTEAQUE
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
02080106	PAMUNKEY
02080107	YORK
02080108	LYNNHAVEN-POQUOSON
02080109	WESTERN LOWER DELMARVA
02080110	EASTERN LOWER DELMARVA
02080201	UPPER JAMES
02080202	MAURY
02080203	MIDDLE JAMES-BUFFALO
02080204	RIVANNA
02080205	MIDDLE JAMES-WILLIS
02080206	LOWER JAMES
02080207	APPOMATTOX
02080208	HAMPTON ROADS
03010205	ALBEMARLE

TAB_IBI_BOTTOM_TYPE

Field Name	Description	Data Type	Length
IBI_BOTTOM_TYPE (PK,NN)	INDEX OF BIOTIC INTEGRETY BOTTOM TYPE	Char	1
IBI_BOTTOM_TYPE_ DESCRIPTION (NN)	BOTTOM TYPE DESCRIPTION	Varchar	10

1) GENERAL: This table stores information identifying bottom type classifications used in the calculation of BIBI metric values. Bottom type is based on the sand to clay percentages observed in the sediment analysis from each site. The IBI_BOTTOM_TYPE codes used to classify site types as follows:

IBI_BOTTOM_TYPE	IBI_BOTTOM_TYPE_DESCRIPTION
M	MUD
S	SAND

TAB_IBI_PARAMETER

Field Name	Description	Data Type	Length
IBI_PARAMETER (PK,NN)	INDEX OF BIOTIC INTEGRETY METRIC	Varchar	15
IBI_PARAMETER_ DESCRIPTION (NN)	METRIC DESCRIPTION	Varchar	50

1) GENERAL: This table stores information identifying BIBI metric values. Metrics are based on species abundance, biomass data from the TAB_BIOMASS and the TAB_TAXONOMIC_COUNT. IBI_PARAMETER- The current BIBI metrics calculated are as follows:

IBI_PARAMETER	IBI_PARAMETER _DESCRIPTION
GRAND_SCORE	FIXED STATION REPLICATE AVERAGED TOTAL BENTHIC RESTORATION GOAL SCORE
PCT_BIO_DP05	PERCENT TOTAL BIOMASS FOUNDGREATER THAN 5 CM BELOW SEDIMENT WATER INTERFACE
PCT_CARN_OMN	PERCENT CARNIVORES AND OMNIVORES
PCT_DEPO	PERCENT DEEP DEPOSIT FEEDERS
PCT_PI_ABUND	PERCENT POLLUTION INDICATIVE SPECIES ABUNDANCE
PCT_PI_BIO	PERCENT POLLUTION INDICATIVE SPECIES BIOMASS
PCT_PI_F_ABUND	PERCENT POLLUTION INDICATIVE SPECIES ABUNDANCE-FRE
IBI_PARAMETER	IBI_PARAMETER _DESCRIPTION
PCT_PI_F_BIO	PERCENT POLLUTION INDICATIVE SPECIES BIOMASS-FRESH
PCT_PI_O_ABUND	PERCENT POLLUTION INDICATIVE SPECIES ABUNDANCE-OLI
PCT_PI_O_BIO	PERCENT POLLUTION INDICATIVE SPECIES BIOMASS-OLIGO
PCT_PS_ABUND	PERCENT POLLUTION SENSITIVE SPECIES ABUNDANCE
PCT_PS_BIO	PERCENT POLLUTION SENSITIVE SPECIES BIOMASS
PCT_PS_O_ABUND	PERCENT POLLUTION SENSITIVE SPECIES ABUNDANCE-OLIG
PCT_PS_O_BIO	PERCENT POLLUTION SENSITIVE SPECIES BIOMASS-OLIGOH
PCT_TANYPODINI	PERCENT TANYPODINAE TO CHIRONOMIDAE
SW	SHANNON-WEINER SPECIES DIVERSITY INDEX
TOLARANCE	POLLUTION TOLARACE INDEX
TOT_ABUND	TOTAL SPECIES ABUNDANCE (NUMBER PER METER SQUARED)
TOT_BIOMASS	TOTAL SPECIES BIOMASS IN (GRAMS PER METER SQUARED)
TOT_TXA_DP05	SPECIES ABUNDANCE FOUND GREATER THAN 5 CM BELOW SEDIMENT WATER INTERFACE
TOTAL_SCORE	TOTAL BENTHIC RESTORATION GOAL SCORE FOR SAMPLE

TAB_IBI_SALZONE

Field Name	Description	Data Type	Length
IBI_SALZONE (PK)	INDEX OF BIOTIC INTEGRETY SALINITY ZONE	Char	2
IBI_SALZONE_ DESCRIPTION (NN)	DESCRIPTION OF SALINITY ZONE	Varchar	25
RANGE (NN)	SALINITY RANGE IN PSU	Varchar	20

1) GENERAL: This table stores information identifying salinity classifications used in the calculation of BIBI
metric values. Salinity zone is based on the observed salinity in the water quality data from each site.

IBI_SALZONE- The IBI_SALZONE codes used to classify site types as follows:

IBI_SALZONE	DESCRIPTION	RANGE
HM	HIGH MESOHALINE	=>12 TO 18 PPT
LM	LOW MESOHALINE	=>5.0 TO 12 PPT
O	OLIGOHALINE	=>0.5 TO 5.0 PPT
P	POLYHALINE	=>18 PPT
TF	TIDAL FRESH	<0.5 PPT

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	Carchar	50

1) GENERAL: This table stores information in relating to the identification of species life stages in the TAB_TAXONOMIC_COUNT table. The currently accepted LIFE_STAGE values and DESCRIPTIONS are as follows:

LIFE_STAGE_ CODE	LIFE_STAGE_ DESCRIPTION	LIFE_STAGE_ CODE	LIFE_STAGE_ DESCRIPTION
0	EGG	13	ORTHONAUPLII STAGE 1-3
1	YOLK SAC	14	METANAUPLII STAGE 4-6
2	FIN FOLD	15	COPEPODITE STAGE 1-3
3	POST FIN FOLD	16	COPEPODITE STAGE 4-6
4	YEAR CLASS O	17	CYPRIS LARVAE
5	YEAR CLASS 1 OR OLDER	18	RESERVED FOR FUTURE USE
6	JUVENILES AND ADULTS	19	COPEPOD EGG
7	LARVAE AND JUVENILES AND ADULTS	20	NYMPH
8	LARVAE AND JUVENILES	21	PUPAE
9	NAUPLII AND PERITRICHS	22	PHARATE
10	NAUPLII OR COPEPODITE	23	INSTAR
11	NAUPLII	24	NAIAD
12	COPEPODITE	25	HATCHERTY MARKED ORGANISM

LIFE_STAGE_ CODE	LIFE_STAGE_ DESCRIPTION
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	MALE, ADULT
75	FEMALE,UNSPECIFIED AGE
76	GROUP
77	WITH CAP. SETAE
78	WITHOUT CAP. SETAE
79	SPP.
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
100	20:49UM LENGTH <20UM WIDTH
101	20:49UM LENGTH
102	20:49UM LENGTH 50:99UM WIDTH
103	20:49UM LENGTH 20:49UM WIDTH CUP
104	20:49UM LENGTH 20:49UM WIDTH CONE
105	20:49UM LENGTH 20:49UM WIDTH
106	20:49UM LENGTH >20UM WIDTH
107	>200UM LENGTH
108	20:49UM LENGTH <20UM WIDTH CONE
109	50:99UM LENGTH <20UM WIDTH
110	100:199UM LENGTH >20UM WIDTH
111	>20UM WIDTH
112	<20UM LENGTH
113	<20UM LENGTH <20UM WIDTH CUP
114	<20UM LENGTH <20UM WIDTH CONE
115	<20UM LENGTH <20UM WIDTH
116	<20UM LENGTH CONE
117	20:49UM LENGTH <20UM WIDTH CUP
118	50:99UM LENGTH EMPTY
119	SPECIES C 100:199UM LENGTH 100:199UM WIDTH
120	SPECIES B 50:99UM LENGTH 50:99UM WIDTH
121	SPECIES B 50:99UM LENGTH 20:49UM

LIFE_STAGE_ CODE	LIFE_STAGE_ DESCRIPTION
	WIDTH
122	PARVULA GRP FULL
123	PARVULA GRP
124	20:49UM LENGTH FULL
125	BEROIDEA GRP
126	SPECIES C 100:199UM LENGTH 20:49UM WIDTH
127	50:99UM LENGTH
128	50:99UM LENGTH 50:99UM WIDTH CUP
129	50:99UM LENGTH 50:99UM WIDTH CONE
130	50:99UM LENGTH 20:49UM WIDTH CUP
131	50:99UM LENGTH 20:49UM WIDTH CONE
132	50:99UM LENGTH >20UM WIDTH
133	<20UM LENGTH 100:199UM WIDTH
134	<20UM LENGTH 100:199UM WIDTH CONE
135	<20UM LENGTH 100:199UM WIDTH CUP
136	<20UM LENGTH 20:49UM WIDTH
137	<20UM LENGTH 20:49UM WIDTH CONE
138	<20UM LENGTH 20:49UM WIDTH CUP
139	<20UM LENGTH 50:99UM WIDTH
140	<20UM LENGTH 50:99UM WIDTH CONE
141	<20UM LENGTH 50:99UM WIDTH CUP
142	<20UM LENGTH CUP
143	<20UM LENGTH EMPTY
144	<20UM LENGTH FULL
145	<20UM WIDTH
146	<20UM WIDTH EMPTY
147	<20UM WIDTH FULL
148	>200UM
149	>200UM EMPTY
150	>200UM FULL
151	>200UM LENGTH <20UM WIDTH
152	>200UM LENGTH <20UM WIDTH EMPTY
153	>200UM LENGTH <20UM WIDTH FULL
154	>200UM LENGTH >20UM WIDTH
155	>200UM LENGTH >20UM WIDTH EMPTY
156	>200UM LENGTH >20UM WIDTH FULL
157	>200UM LENGTH EMPTY
158	>200UM LENGTH FULL
159	>20UM WIDTH EMPTY
160	>20UM WIDTH FULL
161	100:199UM LENGTH <20UM WIDTH
162	100:199UM LENGTH <20UM WIDTH CONE
163	100:199UM LENGTH <20UM WIDTH CUP
164	100:199UM LENGTH <20UM WIDTH EMPTY
165	100:199UM LENGTH <20UM WIDTH FULL
166	100:199UM LENGTH >20UM WIDTH EMPTY
167	100:199UM LENGTH >20UM WIDTH FULL
168	100:199UM LENGTH 100:199UM WIDTH CONE

LIFE_STAGE_ CODE	LIFE_STAGE_ DESCRIPTION
169	100:199UM LENGTH 100:199UM WIDTH CUP
170	100:199UM LENGTH 20:49UM WIDTH CONE
171	100:199UM LENGTH 20:49UM WIDTH CUP
172	100:199UM LENGTH 50:99UM WIDTH CONE
173	100:199UM LENGTH 50:99UM WIDTH CUP
174	100:199UM LENGTH CONE
175	100:199UM LENGTH CUP
176	100:199UM LENGTH
177	100:199UM LENGTH EMPTY
178	100:199UM LENGTH FULL
179	20:49UM LENGTH <20UM WIDTH EMPTY
180	20:49UM LENGTH <20UM WIDTH FULL
181	20:49UM LENGTH >20UM WIDTH EMPTY
182	20:49UM LENGTH >20UM WIDTH FULL
183	20:49UM LENGTH 100:199UM WIDTH
184	20:49UM LENGTH 100:199UM WIDTH CONE
185	20:49UM LENGTH 100:199UM WIDTH CUP
186	20:49UM LENGTH 50:99UM WIDTH CONE
187	20:49UM LENGTH 50:99UM WITDH CUP
188	20:49UM LENGTH CONE
189	20:49UM LENGTH CUP
190	20:49UM LENGTH EMPTY
191	RESERVED FOR FUTURE USE
192	50:99UM LENGTH <20UM WIDTH CONE
193	50:99UM LENGTH <20UM WIDTH CUP
194	50:99UM LENGTH <20UM WIDTH EMPTY
195	50:99UM LENGTH <20UM WIDTH FULL
196	50:99UM LENGTH >20UM WIDTH EMPTY
197	50:99UM LENGTH >20UM WIDTH FULL
198	50:99UM LENGTH 100:199UM WIDTH CONE
199	50:99UM LENGTH 100:199UM WIDTH CUP
200	50:99UM LENGTH CONE
201	50:99UM LENGTH CUP
202	RESERVED FOR FUTURE USE
203	RESERVED FOR FUTURE USE
204	50:99UM LENGTH FULL
205	BEROIDEA GRP EMPTY
206	BEROIDEA GRP FULL
207	LARVAE 20:49UM LENGTH
208	PARVULA GRP EMPTY
209	SMALL EMPTY
210	SMALL FULL
211	SPECIES B 50:99UM LENGTH
212	SPECIES B 50:99UM LENGTH <20UM WIDTH
213	SPECIES B 50:99UM LENGTH 100:199UM WIDTH
214	SPECIES C 100:199UM LENGTH
215	SPECIES C 100:199UM LENGTH <20UM WIDTH
216	SPECIES C 100:199UM LENGTH 50:99UM WIDTH

LIFE_STAGE_ CODE	LIFE_STAGE_ DESCRIPTION	LIFE_STAGE_ CODE	LIFE_STAGE_ DESCRIPTION
217	SPECIES V	234	SPECIES O
218	SPECIES W	235	SPECIES P
219	SPECIES X	236	SPECIES Q
220	SPECIES Y	237	SPECIES R
221	SPECIES Z	238	SPECIES S
222	SPECIES 1	239	SPECIES T
223	SPECIES 2	240	SPECIES U
224	SPECIES 3	241	SPECIES 4
225	COMPLEX	242	SPECIES 5
226	SPECIES G	243	SPECIES 6
227	SPECIES H	244	POLYPS
228	SPECIES I	245	TYPE
229	SPECIES J	246	VARIETY
230	SPECIES K	247	IMMATURE WITH CAP. CHAETE
231	SPECIES L	248	IMMATURE WITHOUT CAP. CHAETE
232	SPECIES M	249	FRAGMEMTS
233	SPECIES N		

TAB_LL_DATUMS

Field Name	Description	Data 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

1) GENERAL- This table stored geographic datum descriptions for codes in the TAB_EVENT and TAB_STATIONS tables. 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	WGS84	WORLD GEODETIC SYSTEM 1984
NAD83	1983 NORTH AMERICAN DATUM	UNID	UNKNOWN DATUM

TAB_METHODS_BIO

Field Name	Description	Data Type	Length
REPORTING_ PARAMETER (PK,NN)	REPORTING_PARAMETER-Biological Reporting parameter	Varchar	15
BIO_METHOD (PK,NN)	BIO_METHOD_CODE- Method Description code	Char	6
BIO_METHOD_ TITLE (NN)	BIO_METHOD_TITLE-Bio procedure method title	Varchar	100
BIO_METHOD_ DESCRIPTION (NN)	BIO_METHOD_DESCRIPTION-Basic description of IBI caclucation meton	Varchar	max
BIO_METHOD DETAILS	BIO_METHOD_DETAILS- additional details for method	Varchar	max

1) GENERAL: This table stores information related exclusively to BIO_METHOD codes in the TAB_TAXONOMIC_COUNT and TAB_BIOMASStables. This table contains descriptions of the field and laboratory methods for parameter determination. The BIO_METHOD code is used to define the field or lab procedure used to obtain the parameter value. Currently accepted BIO_METHODS designations are as follows:

REPORTING_ PARAMETER	BIO_METHOD	BIO_METHOD_TITLE
AFDW	BM201	VERSAR BIOMASS DETERMINATION PROTOCOL
AFDW	BM202	VERSAR BIOMASS ESTIMATION PROTOCOL
AFDW	BM203	ODU BIOMASS DETERMINATION PROTOCOL
AFDW	BM204	VERSAR GROUP BIOMASS DETERMINATION PROTOCOL
COUNT	BE201	VERSAR TAXA ENUMERATION PROTOCOL
COUNT	BE202	ODU TAXA ENUMERATION PROTOCOL
COUNT	BE203	VIMS GENERALIZED ENUMERATION PROTOCOL

TAB_METHODS_IBI

Field Name	Description	Data Type	Length
IBI_METHOD (PK,FK)	IBI ANALYTICAL METHOD CODE- Method Description code	Char	6
IBI_METHOD_ TITLE	IBI_METHOD_TITLE-IBI method title	Varchar	50
IBI_METHOD_ DESCRIPTION (NN)	IBI_METHOD_DESCRIPTION-Basic description of IBI caclucation meton	Varchar	max
IBI_METHOD DETAILS	IBI_METHOD_DETAILS- additional details for method	Varchar	max

1) General:_ This table stores information related exclusively to IBI_METHOD codes in the TAB_IBI_METRIC table. The IBI_METHOD code is used to define the analytical procedure used to obtain the parameter value.

IBI_METHOD	IBI_METHOD_TITLE
CBP	CBP IMPLEMENTATION OF THE CHESAPEAKE BAY B-IBI
VERSAR	VERSAR IMPLEMENTATION OF THE CHESAPEAKE BAY B-IBI

TAB_METHODS_SEDIMENT

Field Name	Description	Data Type	Length
REPORTING_ PARAMETER (PK,NN)	REPORTING_PARAMETER-Biological Reporting parameter	Varchar	15
SEDIMENT_ METHOD (PK,NN)	SEDIMENT _METHOD_CODE- Method Description code	Char	6
SEDIMENT_ METHOD_ TITLE (NN)	SEDIMENT _METHOD_TITLE- Sediment analysis method title	Varchar	100
BIO_METHOD_ DESCRIPTION (NN)	SEDIMENT _METHOD_DESCRIPTION-Basic description of sedimetn analysis procedure	Varchar	max
BIO_METHOD DETAILS	SEDIMENT _METHOD_DETAILS- additional details for method	Varchar	max

1) General: This table stores information related exclusively to SEDIMENT_METHOD codes in the TAB_SEDIMENT_ANALYSIS table. This table contains descriptions of the field and laboratory methods for parameter determination. The SEDIMENT_METHOD code is used to define the field or lab procedure used to obtain the parameter value. Currently accepted SEDIMENT_METHODS designations are as follows:

REPORTING_ PARAMETER	SEDIMENT_ METHOD	SEDIMENT_METHOD_TITLE
CLAY	L01	FOLK SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
INTSAL	L02	ARMY CORP OF ENGINEERS SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
KURTOSIS	L01	FOLK SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
MEANDIAM	L01	FOLK SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
MEDDIAM	L02	ARMY CORP OF ENGINEERS SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
MEDDIAM	L03	VIMS UNDOCUMENTED
MOIST	L02	ARMY CORP OF ENGINEERS SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
QUARTDEV	L02	ARMY CORP OF ENGINEERS SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
SAND	L01	FOLK SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
SAND	L02	ARMY CORP OF ENGINEERS SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
SAND	L03	VIMS UNDOCUMENTED
SILT	L01	FOLK SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
SILTCLAY	L01	FOLK SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
SILTCLAY	L02	ARMY CORP OF ENGINEERS SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
SILTCLAY	L03	VIMS UNDOCUMENTED
SKEWNESS	L01	FOLK SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
SKEWNESS	L02	ARMY CORP OF ENGINEERS SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
SORT	L01	FOLK SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
TC	L02	ARMY CORP OF ENGINEERS SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
TIC	L02	ARMY CORP OF ENGINEERS SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
TN	L02	ARMY CORP OF ENGINEERS SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
TOC	L02	ARMY CORP OF ENGINEERS SEDIMENT GRAIN SIZE ANALYSIS PROTOCOL
VOLORG	L01	ODU UNDOCUMENTED METHOD

TAB_METHODS_WQ

Field Name	Description	Data Type	Length
WQ_METHOD_ID	WQ_METHOD_ID-Autogenerated Number	Integer	
REPORTING_PARAMETER (PK,NN)	REPORTING_PARAMETER-CBP Reporting Parameter Name	Varchar	15
WQ_METHOD (PK,NN)	WQ_METHOD-CBP Method Code Assignment	Char	4
EPA_METHOD	EPA_METHOD-EPA Storet Method code	Varchar	50
WQ_TITLE	WQ_TITLE-Analytical Method Title	Varchar	100
WQ_DESCRIPTION	WQ_DESCRIPTION-Analytical Method Title	Varchar	max
REFERENCE1	REFERENCE1-Reference for Method	Varchar	900
REFERENCE2	REFERENCE2-Reference for Method	Varchar	900
REFERENCE3	REFERENCE3-Reference for Method	Varchar	900
REFERENCE4	REFERENCE4-Reference for Method	Varchar	900
WQ_DETAILS	WQ_DETAILS-additional details	Varchar	50
INSTRUMENTS	INSTRUMENTS-Analytical Instrumentation details	Varchar	500

1) GENERAL: This table stores information related exclusively to WQ_METHOD codes in the TAB_WQ_DATA 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. For Currently accepted WQ_METHODS designations PLEASE SEE DATABASE FOR DETAILS.

REPORTING_PARAMETER	WQ_METHOD	REPORTING_PARAMETER	WQ_METHOD	REPORTING_PARAMETER	WQ_METHOD
ACIDITY	L01	CLW	L01	DO_SAT_P	F01
AL	L01	CLW	L02	DOC	L01
ANC	L01	CLW	L03	DOC	L02
ANC	L02	COD	L01	DOC	L03
AS	L01	COD	L02	DON	D01
BATT	NA	COD	L03	DON	D01A
BIOSI	L01	COLOR	L01	DON	D01B
BOAT_SPEED	NA	CR	L01	DON	D01D
BOD20F	L01	CU	L01	DON	D02
BOD20W	L01	DCU	L01	DON	D02A
BOD5F	L01	DIC	L01	DON	D02B
BOD5W	L01	DIN	D01	DON	D02D
CA	L01	DIN	D01A	DON	D03
CD	L01	DIN	D01B	DON	D03A
CDOM_440	L01	DIN	D01D	DON	D03B
CDOM_SLOPE	L01	DIN	D02	DON	D03D
CHL_A	L01	DIN	D02A	DOP	D01
CHL_B	L01	DIN	D02B	DOP	D01A
CHL_C	L01	DIN	D02D	DOP	D01B
CHLA	F01	DO	F01	DOP	D01D
CHLA	L01	DO	F02	DZN	L01
CHLA	L02	DO	F03	EPAR_S	F01
CHLA	L03	DO	F04	EPARD_Z	F01
CLF	L01	DO_SAT_M	D01	EPARU_Z	F01

REPORTING_ PARAMETER	WQ_METHOD	REPORTING_ PARAMETER	WQ_METHOD	REPORTING_ PARAMETER	WQ_METHOD
FCOLI_C	L02	NO3W	D01B	SSC_TOTAL	D01
FCOLI_M	L01	NO3W	D01D	SSC_TOTAL	L01
FCOLI_M	L03	NO3W	L01	SSC_TOTAL	L02
FE_M	L01	ORP	F01	TALK	L01
FE_M	L02	PB	L01	TCHL_PRE_CAL	F01
FE_U	L02	PC	L01	TCOLI_C	L02
FLOW_AVG	F01	PH	F01	TCOLI_M	L01
FLOW_INS	F01	PH	F02	TDN	D01
FLUOR	NA	PHEO	L01	TDN	D01A
FLUORESCENCE	NA	PHEO	L02	TDN	D01B
FS	L01	PHEO	L03	TDN	D01D
FSS	L01	PIC	L01	TDN	D02
HARDNESS	F01	PIP	L01	TDN	D02A
HARDNESS	L01	PN	L01	TDN	D02B
HARDNESS	L02	PO4F	L01	TDN	D02D
HARDNESS	L03	PO4F	L02	TDN	L01
HG	L01	PO4F	L03	TDN	L02
IBOD5F	L01	PO4W	L01	TDP	L01
IBOD5W	L01	POC	D01	TDP	L02
K	L01	POC	D01A	TDP	L03
KD	D01	POC	D01B	TDP	L04
KD	F01	POC	D01D	TDP	L05
MEASURED_DEPTH	NA	PON	D01	TDS	L01
MGF	L01	PON	D01A	TKNF	L01
MN	L01	PON	D01B	TKNF	L02
NAF	L01	PON	D01D	TKNF	L03
NH4F	L01	PP	D01	TKNW	L01
NH4F	L02	PP	D01A	TKNW	L02
NH4W	L01	PP	D01B	TKNW	L03
NI	L01	PP	D01D	TN	D01
NO23F	C01A	PP	L01	TN	D01A
NO23F	D01	SALINITY	F01	TN	D01B
NO23F	D01A	SALINITY	F02	TN	D01D
NO23F	D01B	SALINITY	F03	TN	D02
NO23F	D01D	SALINITY	F04	TN	D02A
NO23F	L01	SE	L01	TN	D02B
NO23F	L02	SECCHI	F01	TN	D02D
NO23F	L03	SECCHI	F02	TN	D03
NO23W	D01	SIF	L01	TN	D03A
NO23W	D01A	SIF	L02	TN	D03B
NO23W	D01B	SIF	L03	TN	D03D
NO23W	D01D	SIGMA_T	D01	TN	D04
NO23W	L01	SIW	L01	TN	D04A
NO23W	L02	SIW	L02	TN	D04B
NO2F	L01	SIW	L03	TN	D04D
NO2F	L02	SO4F	L01	TN	D05
NO2F	L03	SO4F	L02	TN	D05A
NO2W	L01	SO4F	L03	TN	D05B
NO2W	L02	SO4F	L04	TN	DO5D
NO2W	L03	SO4W	L01	TN	L01
NO3F	C01	SPCOND	F01	TOC	D01
NO3F	D01	SPCOND	F02	TOC	D01A
NO3F	D01A	SSC_%FINE	D01	TOC	D01B
NO3F	D01B	SSC_%SAND	D01	TOC	D01D
NO3F	D01D	SSC_FINE	L01	TOC	L01
NO3F	L01	SSC_FINE	L02	TOC	L02
NO3W	D01	SSC_SAND	L01	TOC	L03
NO3W	D01A	SSC_SAND	L02	TON	D01

REPORTING_ PARAMETER	WQ_METHOD	REPORTING_ PARAMETER	WQ_METHOD	REPORTING_ PARAMETER	WQ_METHOD
TON	D01A	TOTAL_DEPTH	NA	TURB_NTU	F01
TON	D01B	TP	D01	TURB_NTU	F02
TON	D01D	TP	D01A	TURB_NTU	L01
TON	D02	TP	D01B	TURB_NTU	UNK
TON	D02A	TP	D01D	VELOCITY	F01
TON	D02B	TP	L01	VELOCITY	F02
TON	D02D	TP	L02	VSS	L01
TON	D03	TP	L03	WIDTH	F01
TON	D03A	TP	L04	WTEMP	F01
TON	D03B	TP	L05	WTEMP	F02
TON	D03D	TS	L01	ZN	L01
TOTAL_DEPTH	F01	TSS	L01	ZNF	L02
TOTAL_DEPTH	F02	TURB_FTU	L01		
TOTAL_DEPTH	F03	TURB_JTU	L01		

TAB_PARAMETERS_BIO

Field Name	Description	Data Type	Length
BIO_REPORTING_ PARAMETER (PH,NN)	BIO_REPORTING_PARAMETER CODES	Varchar	15
BIO_REPORTING_ DESCRIPTION	BIO_REPORTING_PARAMETER DESCRIPTION- Parameterdescription/definition	Varchar	100
BIO_REPORTING_UNITS (NN)	BIO_REPORTING_UNITS	Varchar	15

1) GENERAL: This table stores information related exclusively to the REPORTING_PARAMETER codes in the TAB_BIOMASS and TAB_TAXONOMIC_COUNT tables. This table contains information to parameter names and standard detection limits. The following list of parameters represent those parameters that are measured in in the laboratory.. Currently accepted BIO_PARAMETER and BIO_PARAMETER_DESCRIPTION designations are as follows:

BIO_REPORTING_ PARAMETER	BIO_REPORTING _UNITS	BIO_PARAMETER_DESCRIPTION
AFDW	GRAMS/SAMPLE	GRAMS ASH FREE DRY WEIGHT IN GRAMS PER SAMPLE
COUNT	NUMBER/SAMPLE	ORGANISM COUNT PER SAMPLE

TAB_PARAMETERS_SD_WQ

Field Name	Description	Data Type	Length
PARAMETER_ID		Integer	
REPORTING_PARAMETER (PK,NN)	PARAMETER CODES	Varchar	15
REPORTING_UNITS (PK,NN)	BIO_REPORTING_UNITS	Varchar	15
PARAMETER_ DESCRIPTION	PARAMETER DESCRIPTION- Parameterdescription/definition	Varchar	40
PARAM_MAX	MAXIMUM PARAMETER VALUE	Real	
PARAM_MIN	MINIMUM PARAMETER VALUE	Real	

1) GENERAL: This table stores information related exclusively to REPORTING_PARAMETER codes in the TAB_WQ_DATA andthe TAB_SEDIMENT_ANALYSIS 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. Currently accepted REPORTING_PARAMETER and REPORTING_PARAMETER _DESCRIPTION designations are as follows:

REPORTING_ PARAMETER	REPORTING_PARAMETER_ DESCRIPTION
CARBNATE	CARBONTATE CONTENT
CARCHN	CARBON CONENT-CHN ANALYZER
CONDUCT	SPECIFIC CONDUCTIVITY
DISOXY	DISSOLVED OXYGEN
DO_PSAT	DISSOLVED OXYGEN PERCENT SATURATION
INTSAL	INTERSTITIAL SALINITY
KURT	KURTOSIS
MEANDIAM	MEAN SEDIMENT DIAMETER
MEDDIAM	MEDIAN SEDIMENT DIAMETER
MOIST	MOISTURE CONTENT
NITCHN	NITROGEN CONTENT-CHN ANALYZER
ORP	OXIDATION REDUCTION POTENTIAL
PENETR	GEAR PENETRATION DEPTH
PH	PH
QUARTDEV	QUARTILE DEVIATION
SALINITY	SALINITY
SAND	SAND CONTENT, PERCENT
SILT	SILT CONTENT, PERCENT
SILTCLAY	SILT CLAY CONTENT, PERCENT
SKEW	SKEWNESS
SORT	SORTING
VOLORG	VOLATILE ORGANIC, PERCENT
WTEMP	WATER TEMPERATURE, CENTEGRAGE

TAB_PELLETS

Field Name	Description	Data Type	Length
PELLETS (PK,NN)	FECAL PELLET CLASSIFICATION	Varchar	10
PELLETS _DESCRIPTION	DESCRIPTION OF PELLET CLASSIFICATION	Varchar	50

1) GENERAL: This table stores information identifying fecal pellet abundance classifications from the Sediment Profile Camera images. The current fecal pellet density classifications are as follows:

PELLETS	DESCRIPTION
FEW	1 TO 6 PELLETS
IND	INDETERMINATE
LAYER	PELLETS COVER SEDIMENT WATER INTERFACE
MANY	GREATER THAN 18 PELLETS
NA	NO ANALYSIS
NONE	0 PELLETS
SOME	7 TO 18 PELLETS

TAB_PHOTO_PARAMETER

Field Name	Description	Data Type	Length
PHOTO_ANALYSIS _ PARAMETER (PK,NN)	PHOTO_ANALYSIS PARAMETER CODES	Varchar	20
PHOTO_ANALYSIS_ PARAMETER_ DESCRIPTION	PHOTO_ANALYSIS_PARAMETER DESCRIPTION-Parameter description/definition	Varchar	50
REPORTING_UNITS (NN)	PHOTO_ANALYSIS_PARAMETER REPORTING UNITS	Varchar	20

1) GENERAL: This table stores information pertaining to the image parameters observed in the Sediment Profile Camera images. The current PHOTO_PARAMETERS are as follows:

PHOTO_ANALYSIS _PARAMETER	PHOTO_ANALYSIS _DESCRIPTION	REPORTING_UNITS
BURROWS	NUMBER OF BURROWS	COUNT
GAS VOID	DEPTH DEPTH OF GAS VOIDS	CENTIMETERS
GAS VOIDS	NUMBER OF GAS FILLED VOIDS	COUNT
INFAUNA	NUMBER OF INFAUNA ORGANISMS	COUNT
INFAUNA DEPTH	DEPTH OF INFAUNA OBSERVED	CENTIMETERS
PENETRATION	GEAR PENETRATION DEPTH	CENTIMETERS
RPD	REDOX POTENTIAL DISCONTINUITY LAYER DEPTH	CENTIMETERS
SURFACE RELIEF	SURFACE RELIEF	CENTIMETERS
VOID DEPTH	DEPTH OF WATER VOIDS	CENTIMETERS
WATER VOIDS	NUMBER OF WATER FILLED VOIDS	CENTIMETERS

TAB_PHOTO_QUALIFIERS

Field Name	Description	Data Type	Length
PHOTO_ QUALIFIERS (PK,NN)	QUALIFIER CODE Parameter value qualifier code	Char	2
PHOTO_ QUALIFIERS _ DESCRIPTION (NN)	DESCRIPTION definition of QUALIFIER	Varchar	120

1) GENERAL: This table stores information related exclusively to the Qualifiers codes in the TAB_PHOTO_ANALYSIS table. The PHOTO_QUALIFIER code is used to describe the parameter value. Currently accepted QUALIFIERS and DESCRIPTION designations are as follows:

PHOTO_ QUALIFIER	PHOTO_QUALIFIER _DESCRIPTION
#	Trace (less than an unknown detectable value)
<	Less than the detection limit of the method
>	Greater than detection limit of method
A	Within Range
I	INDETERMINATE
J	Estimated value
N	Not detected
NA	Not recorded/parameter value not acceptable
R	RANGE OF VALUES
SB	SHELL BED

TAB_PROGRAM

Field Name	Description	Data Type	Length
PROGRAM (PK,NN)	MONITORING PROGRAM-Code identifying State Monitoring Program	Char	10
PROGRAM_ DESCRIPTION (NN)	PROGRAM_DESCRIPTION-Detailed discription of monitoring program	Varchar	100

1) GENERAL: TAB_PROGRAM stores information related to the PROGRAM codes in TAB_EVENTS. The PROGRAM code was added to the database design because Maryland DNR has adopted a project-oriented approach to Monitoring Program data management. This approach relies upon the use of PROGRAM and PROJECT codes. Current Program codes in the data base include:

WQMAINSTEM	CHESAPEAKE BAY MAINSTEM AND TIDAL TRIBUTARY WATER QUALITY MONITORING PROGRAM
HISTORIC	DENOTES DATA COLLECTED PRIOR TO THE BEGINNING OF THE CURRENT CHESAPEAKE BAY MONITORING PROGRAM

TAB_PROJECT

Field Name	Description	Data Type	Length
PROJECT (PK,NN)	MONITORING PROJECT-Code identifying State Monitoring Project	Char	10
PROGRAM_ DESCRIPTION (NN)	PROJECT_DESCRIPTION-Detailed discription of monitoring project	Varchar	100

1) GENERAL: TAB_PROJECT stores information related to the PROJECT codes in TAB_EVENTS. The PROGRAM code was added to the database design because Maryland DNR has adopted a project-oriented approach to Monitoring Program data management. This approach relies upon the use of PROGRAM and PROJECT codes. Current Project codes in the database include:

PROJECT	PROJECT_DESCRIPTION
MAIN/TRIB	LONG-TERM BENTHIC MONITORING PROGRAM
VA/CBAY	VIRGINIA COASTAL BAY MONITORING
VA/HIST	VIRGINIA HISTORIC DATA RECOVERY

TAB_SAMPLE_TYPES

Field Name	Description	Data Type	Length
SAMPLE_TYPE (PK,NN)	SAMPLE COLLECTION TYPE CODE	Varchar	5
SAMPLE_TYPE_ DESCRIPTION (NN)	SAMPLE_TYPE CODE DEFINITION	Varchar	50

1) GENERAL: This table stores information relating to the type of field samples taken at given site. This code is used in all the primary data tables. 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	= In-Situ Measurement, No Sample Collected

TAB_SAMPLING_GEAR

Field Name	Description	Data Type	Length
SOURCE (PK,NN)	DATA GENERATING AGENCY-Code identifying data generator	Varchar	10
G_METHOD (PK,NN)	GEAR METHOD CODE-Code of Sampling Gear used for sample collection	Char	3
G_CONVERSION_FACT (NN)	CONVERSION FACTOR-(#/SAMPLE TO #/AREA SQUARED)	Real	
G_DESCRIPTION (NN)	GEAR DESCRIPTION-Description of Sampling Gear	Varchar	40
G_CONVERSION_UNITS (NN)	UNITS FOR CONVERSION FACTOR	Char	9
SOURCE_G_CODE	SOURCE_G_CODE-Data generator inhouse gear code	Varchar	100

1) GENERAL: This table stores information relating to the type of gear used to collect benthic samples for both biomass and taxonomic identification. This table stores not only the code identifications for sampling gear but also the necessary conversion values to convert from sample to area. These codes are used primary in TAB_BIOTA_SAMPLING. The primary key in this table is defined by G_METHOD and SOURCE since multiple agencies have identical pieces of sampling gear of differing sizes (and thus differing conversion factors). Currently accepted designations are as follows:

SOURCE	G_METHOD	G_CONVERSION_FACT	G_DESCRIPTION	G_CONVERSION_UNITS
EA	17	14.33	PONAR GRAB (200 SQ CM)	SAMPLE/M2
EA	19	6.8	PONAR GRAB (50 SQ CM)	SAMPLE/M2
ODU	20	57.24	BOX CORE GRAB (UNSPECIFIED)	SAMPLE/M2
ODU	82	40.4	PETITE PONAR GRAB	SAMPLE/M2
ODU	83	20.2	DOUBLE PETITE PONAR GRAB (50 SQ CM)	SAMPLE/M2
ODU	97	22.68	YOUNG MODIFIED VAN VEEN GRAB (0.04 SQ M)	SAMPLE/M2
VERSAR	16	40	POST HOLE DIGGER (0.025 SQ M)	SAMPLE/M2
VERSAR	20	45	BOX CORE GRAB (225 SQ CM) (45.45)	SAMPLE/M2
VERSAR	96	10	HYDROLIC VAN VEEN GRAB (0.1 SQ METER)	SAMPLE/M2
VERSAR	97	22.73	YOUNG MODIFIED VAN VEEN GRAB (0.04 SQ M)	SAMPLE/M2
VERSAR	98	40	PETITE PONAR GRAB (25 SQ CM)	SAMPLE/M2
VIMS	19	6.67	PONAR GRAB	SAMPLE/M2
VIMS	24	10	SMITH-MACINTIRE GRAB (1 SQ M)	SAMPLE/M2
VIMS	81	16.67	SPADE BOX CORE (0.06 SQ M)	SAMPLE/M2
VIMSTI	99	3.33	SMITH-MACINTIRE GRAB (0.3 SQ M)	SAMPLE/M2
VIMSWO	100	5	SMITH-MACINTIRE GRAB (0.2 SQ M)	SAMPLE/M2

TAB_SAMPLING_STRATA

Field Name	Description	Data Type	Length
STRATUM (PK)	SAMPLING STRATUM CODE-Code describing sampling stratum	Text	6
STRATUM_DESCRIPTION	SAMPLING STRATA DESCRIPTION-Physical or Geographical description of Stratum	Text	255
BASIN (NN)	BASIN OR TRIBUTARY CODE-Largest drainage basin (aside from Chesapeake Bay) With which the station is associated	Text	20
BOUNDING_LATITUDE _NORTH (NN)	NORTHERN BOUNDARY-Northern most coordinate of the limit of the strata expressed in latitude in decimal degrees (NAD83)	Decimal	9,6
BOUNDING_LONGITUDE _EAST (NN)	EASTERN BOUNDARY-Eastern most coordinate of the limit of the strata expressed in longitude in decimal degrees (NAD83)	Decimal	9,6
BOUNDING_LATITUDE _SOUTH (NN)	SOUTHERN BOUNDARY-Southern most coordinate of the limit of the strata expressed in latitude in decimal degrees (NAD83)	Decimal	9,6
BOUNDING_LONGITUDE _WEST (NN)	WESTERN BOUNDARY-Western most coordinate of the limit of the strata expressed in longitude in decimal degrees (NAD83)	Decimal	9,6

1) GENERAL: This table stores information relating additional geographic attributes of sampling stations in the TAB_EVENT table. Theattributes including researcher defined habitat stratum and river basins. Note that all coordinates are currently in the NAD83 projection. Current sampling stratum are as follows

STRATUM	STRATUM_DESCRIPTION
101	Calvert Cliffs
102	Calvert Cliffs
103	Calvert Cliffs
104	Holland Point
105	Holland Point
106	Bloody Point
107	Bodkin Point
108	Poole's Island
109	Turkey Point
110	Point Lookout
111	Point Lookout
112	St Clements Island
113	St Clements Island
114	Morgantown
115	Morgantown
116	Maryland Point
117	Rosier Bluff

STRATUM	STRATUM_DESCRIPTION
118	Todd's Point
119	Todd's Point
120	Jamaica Point
121	King's Creek
122	Piney Point
123	Frying Pan Point
124	Sparrows Point
125	Bear Creek
126	Curtis Bay
127	Middle Branch
128	Broomes Island
129	Broomes Island
130	Chalk Point
131	Jug Bay
BAY	Virginia Lower Bay
ELZ	Elizabeth River
JAM	James River

STRATUM	STRATUM_DESCRIPTION
LAR	Large Estuary
MET	Maryland Eastern Tributaries
MMS	Maryland Mainstem
MWT	Maryland Western Tributaries
PAR	Paradise Creek
PAT	Baltimore Harbor,Patapsco River
PMR	Potomac River
PXR	Patuxent River
RAP	Rappahanock River
SML	Small Estuary
TID	Tidal River
UPB	Maryland Upper Bay
VACB	VIRGINIA COASTAL BAYS
YRK	York River

2) BASIN: Basin is defined as the largest drainage basin (aside from Chesapeake Bay) With which the station is associated. The SUBBASIN refers to the second largest drainage basin. In some cases the BASIN and SUBBASIN values will be the same. Currently accepted BASIN designations are as follows:

CHESAPEAKE BAY	PATAPSCO RIVER	ELIZABETH RIVER	CHESTER RIVER
PATUXENT RIVER	YORK RIVER	CHOPTANK RIVER	POTOMAC RIVER
JAMES RIVER	CHOPTANK RIVER	RAPPAHANOCK RIVER.	

3) BOUNDING COORDINATES: Refers to the limits of coverage of a data set expressed by latitude and longitude values in the order western-most, eastern-most, northern-most, and southern-most. For data sets that include a complete band of latitude around the earth, the West Bounding Coordinate shall be assigned the value -180.0, and the East Bounding Coordinate shall be assigned the value 180.0

TAB_SEDIMENT_TYPE

Field Name	Description	Data Type	Length
SEDIMENT TYPE (PK,NN)	SEDIMENT TYPE CLASSIFICATION	Varchar	15
SEDIMENT_TYPE_ DESCRIPTION (NN)	WENTWORTH SEDIMENT TYPE CLASSIFICATION DESCRIPTION	Varchar	50

1) GENERAL: This table stores information pertaining to the Wentworth sediment classifications for sites based on the Sediment Profile Camera images found in TAB_PHOTO_EVENT. SEDIMENT_TYPE- The current Wentworth Sediment classifications in use are as follows:

SEDIMENT TYPE	DESCRIPTION
CL	CLAY
CLMS	CLAY-MEDIUM SAND
CLSH	CLAY-SHELL
CLSI	CLAY-SILT
CLSI/SH	CLAY-SILT-SHELL
CLSIFS	CLAY-SILT-FINE SAND
FS	FINE SAND
FS/FSSI	FINE SAND-FINE SANDY SILT
FS/SI	FINE SAND- SILT
FS/SICL	FINE SAND-SILTY CLAY
FSCL	FINE SAND-CLAY
FSGR	FINE SAND-GRAVEL
FSMS	FINE SAND-MEDIUM SAND
FSMS/SI	FINE SAND-MEDIUM SAND- SILT
FSMSSH/SI	FINE SAND-MEDIUM SAND-SHELL-SILT
FSSH	FINE SAND -SHELL
SICL/SH	SILTY CLAY-SHELL
SICLFS	SILTY CLAY-FINE SAND
SIFS	SILTY FINE SAND
SIFSMS	SILTY FINE SAND - MEDIUM SAND
SISA	SILTY SAND
SISACL	SILTY SANDY CLAY
SISH	SILTY SHELL
FSSICL	FINE SAND-SILT-CLAY
FSSISH	FINE SAND-SILT-SHELL
IND	INDETERMINATE
MFSCL	MEDIUM FINE SAND-CLAY
MS	MEDIUM SAND
MSC	MEDIUM SAND-CLAY
MSGR	MEDIUM SAND-GRAVEL
NA	NOT AVAILABLE
SA/SICL	SAND-SILTYCLAY
SACL	SANDY CLAY
SASH	SAND-SHELL
SASI	SANDY SILT
SH	SHELL
SHFS	SHELL-FINE SAND
SHFSSI/CL	SHELL-FINE SAND-SILT-CLAY
SHSA	SHELL-SAND
SHSICL	SHELL-SILT-CLAY
SI	SILT
SICL	SILTY CLAY

TAB_SEGS_2003

Field Name	Description	Type	Length
CBSEGS_2003 (PK, NN)	2003 CHESAPEAKE BAY PROGRAM MONITORING SEGMENT CODE	CHAR	6
CBSEGS_2003_ DESCRIPTION (NN)	2003 MONITORING SEGMENT DESCRIPTION	VARCHAR	50

1) GENERAL- This table stores information relating additional geographic attributes of sampling stations in the TAB_EVENT table. 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. 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_SITE_TYPE

Field Name	Description	Data Type	Length
SITE_TYPE_CODE (PK,NN)	SITE TYPE Code-Station Sampling Site Type Code	Char	2
SITE_TYPE_CODE_ DEFINITION (NN)	SITE TYPE CODE DEFINITION	Varchar	50

1) GENERAL: This table stores information relating to the criteria for sampling site selection. This code is used in the TAB_EVENT table. Additional codes may be added as needed. Currently accepted SITE_TYPE_CODE designations are as follows:

F	Fixed Location Sampling Site
R	Randomly selected Sampling Site within a habitat or other defined strata..

TAB_SOURCE

Field Name	Description	Data Type	Length
SOURCE (PK,NN)	DATA GENERATING AGENCY-Code identifying data generator	Char	10
SOURCE_ DESCRIPTION (NN)	DESCRIPTION	Varchar	100
CONTACT (NN)	Name of contact for Source	Varchar	100
STREET_ADDRESS (NN)	Physical Street Address	Varchar	100
CITY (NN)	City Where SOURCE is Located	Varchar	30
STATE_CODE (NN)	State Where Source is Located	Char	2
ZIP (NN)	Zip or Postal Code Source	Varchar	10
PHONE(NN)	Phone Number for SOURCE	Varchar	14
EMAIL	EMAIL-Email address for source	Varchar	100

1) GENERAL: This table stores information identifying the data generators and includes and contact persons for individual data generating programs. This code is used in the TAB_EVENT, TAB_SAMPLING_EVENT AND TAB_SAMPLING_GEAR table. Currently accepted SOURCE designations are as follows:

SOURCE	SOURCE_DESCRIPTION	CONTACT
EA	ECOLOGICAL ANALYSIS, INC.	
ODU	OLD DOMINION UNIVERSITY	DAN DAUER
VERSAR	VERSAR INC.	ROBERTO LLANSO
VIMS	VIRGINIA INSITUTE OF MARINE SCIENCES	BOB DIAZ
VIMSTI	VIRGINIA INSITUTE OF MARINE SCIENCES	BOB DIAZ
VIMSWO	VIRGINIA INSITUTE OF MARINE SCIENCES	BOB DIAZ

TAB_TUBE_CODES

Field Name	Description	Data Type	Length
TUBES_CODE (PK,NN)	FAUNA TUBE ABUNDANCE CLASSIFICATION	Varchar	8
TUBE_CODE_ DESCRIPTION (NN)	CLASSIFICATION DESCRIPTION	Varchar	50

1) GENERAL: This table stores information identifying Faunal Tube abundance classifications from the Sediment Profile Camera images found in TAB_PHOTO_EVENT table. The current faunal tube density classifications are as follows:

TUBES	DESCRIPTION
FEW	1 TO 6 TUBES
IND	INDETERMINATE
LAYER	PELLETS COVER SEDIMENT WATER INTERFACE
MANY	GREATER THAN 18 TUBES
NA	NO ANALYSIS
NONE	0 TUBES
SOME	7 TO 18 TUBES

TAB_VALUE_TYPE

Field Name	Description	Data Type	Length
VALUE_TYPE (PK,NN)	VALUE TYPE CODE	Char	3
DEFINITION	VALUE_TYPE CODE DEFINITON	Varchar	50

1) GENERAL: This table stores information relating to the type of measurement a parameter is.
This code is used primary in the BIOMASS_TABLE and BIOTA_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 secondary look-up tables are present in the database but are not linked to the main or primary look-up 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_BAY_CRUISE

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

1) 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.Please see database for complete cruise list.

TAB_PI_SPECIES_TABLE

Field Name	Description	Data Type	Length
SOURCE (PK,FK,NN)	DATA GENERATING AGENCY-Code identifying data generator	Char	10
SPEC_CODE (PK,NN)	SOURCE IN-HOUSE SPECIES CODE	Varchar	14
SOURCE_LBL (NN)	SOURCE IN-HOUSE SPECIES LATIN NAME	Varchar	45
LBL	FULL SPECIES LABEL (INCLUDES LIFESTAGE)-Latin Name Corrected to IT IS accepted spelling	Varchar	45
R_DATE(NN)	VERSION DATE-Date denoting when data records were entered in to database	Small Date/Time	
TSN(PK,FK NN)	TAXON SERIAL NUMBER-ITIS Serial Number for Species Identification	Char	7
LIFE_STAGE_CODE (NN)	SPECIES LIFESTAGE-Additional species identifier	Char	3
TAXON_GROUP	FUNCTIONAL TAXONOMIC GROUP-AdditionalTaxonomic information	Varchar	25
FEEDING_GROUP	FUNCTIONAL FEEDING GROUP-Additional Taxonomic information	Varchar	20
SENSITIVITY	POLLUTION SENSITIVITY-Additional Taxonomic information: PI-POLLUTION INDICATIVE, PS-POLLUTION SENSITIVE	Varchar	4

1) 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 TSNs 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 BIOMASS_TABLE or the TAXONOMIC_TABLE. Additional benthic species grouping keys have been added to this table for use in calculating Benthic Indexes of Biotic Integrity and routine calculated in the various Chesapeake Bay Water Quality and Ecosystem models.

DATA LOADING PROCEDURES

The following procedures outline the steps for loading data into the various major database tables. These are general directions and not meant to cover every possible problem, which may arise when loading data. There is no substitute for having a skilled data manager who is knowledgeable in both environmental data and relational databases.

MARYLAND AND VIRGINIA BENTHIC DATA LOADING PROTOCOL

These loading procedures assume that data to be added into the database are available in a comma delimited ASCII format in a predetermined format. All monitoring programs have been provided with PC SAS programs to the data generators to create the necessary files for loading of data into the database. Loading of tables must be performed in a predetermined order due to the referential integrity requirements of the relational database. The loading order of tables is as follows: the Benthic Event table followed by the Biota Event table. The TAB_PI_SPECIES_LIST updated and any additions that need to bemade to the TAB_CBP_MASTER species table should be done before any taxonomic or biomass data is loaded to the database. The remaining data tables may be then loaded in any order.

BENTHIC EVENT DATA

1) The comma delimited ASCII file available for data loading should contain a header row followed by rows of data in the following format and order:

FIELD	FORMAT
STATION	TEXT (CHAR 15)
SAMPLE_DATE	DATE YYYYMMDD (May Have Date Delimiters)
STRATUM	TEST(CHAR 4)
LATITUDE	NUMERIC (8.4) (NAD83)
LONGITUDE	NUMERIC (8.4) (NAD83)
SITE_TYPE	TEXT(CHAR 2)
SAMPLE_TIME	DATE/TIME (24 HH:MM)
SOURCE	TEXT (CHAR 8)
TOTAL_DEPTH	NUMERIC (8.1)
YEARCODE	TEXT (CHAR 8)
CRUISENO	TEXT (CHAR 8)
STAEQ85	TEXT (CHAR 8)
SITE	TEXT (CHAR 8)
SAMPTYPE	TEXT (CHAR 8)

2) Open the database in Microsoft Access and follow the import procedure outlined as follows:
   a) Next, select NEW, followed by IMPORT TABLE and click on OK.
   b) A common dialog box will come up. Change the File type to ASCII and select the file to import. (The CBP provided program should have named the MDBEEV.TXT). Then click on IMPORT.
   c) At this point the Microsoft file import wizard will come up to help you with the file import. Proceed by setting the file type to comma delimited ASCII using the control buttons and then press NEXT.
   d) On the next screen CLICK -FIRST LINE IS HEADER ROW BOX. Make sure the field delimiter is set correctly it should be a comma. Then press the ADVANCED button..
   e) In the Advanced menu set the following formats: Date format is YMD, check four digit year and leading zeros on dates, set a hyphen (-) as the date delimiter (Note this will have to be changed if the SAS program was modified to use another delimiter or date format). Make sure the Data/Field types are set correctly (see table in step one for correct field types). The fields STATION,

STAEQ85, SITE will need to be corrected. Once things are properly set, CLICK OK and NEXT.
f) On the following screen SELECT IMPORT AS NEW TABLE, then NEXT.
g) The next screen will allow you to double check each of the field types and import formats for the data set. Confirm each of the fields against the table above. You can press the advanced key to go back and modify anything that needs to be changed at this point. Then click on NEXT.
h) Select NO PRIMARY KEY and FINISH. This completes the import procedure.

3) Run data quality checks for appropriate station Ids, valid STRATUM, SITE_TYPE, AND SOURCE assignments, (i.e. Stratums in the data must be in the Sampling_Strata _Table or data will not load) and other missing key/not null fields as indicated in the Survey _Table. It may be necessary to run a check for duplicate records based on key fields using built in query wizard. Your working table is named MDBEEV.
4) Append the working file to Load Survey Table Template.
5) Merge UTM_X, UTM_Y, CBSEG2003, HUC_8 and FIPS codes on to the Load Survey Table from your GIS applications.
6) Run the query UPDATE SURVEY1. (This query will merge in some CBP required constants)
7) Run the query APPEND TO SURVEY2. (This query will add the new data to the existing Survey_Table, provided there are no referential integrity issues. It will also assign the Survey_ID number for each sampling event.
8) Run the UPDATE EVENT_ID query. This query will merge the EVENT_ID numbers back on to the working EVENT file. This file will be used in later data processing to assign EVENT_ID numbers to all of the remaining data. (HIS-Strata need to be coded with STAEQ85 Value.)

BENTHIC BIOTA EVENT DATA

1) The comma delimited ASCII file available for data loading should contain a header row followed by rows of data in the following format and order:

FIELD	FORMAT
STATION	TEXT (CHAR 15)
SAMPLE_DATE	DATE YYYYMMDD (May Have Date Delimiters)
SAMPLE_TIME	DATE/TIME (24 HH:MM)
SAMPLE_NUMB ER	NUMERIC(8.0)
GMETHOD	TEXT(CHAR 5)
NET_MESH	NUMERIC(8.1)
PENETR	NUMERIC(8.2)
SER_NUM	TEXT(CHAR 12)
SOURCE	TEXT (CHAR 8)
YEARCODE	TEXT (CHAR 8)
CRUISENO	TEXT (CHAR 6)
STAEQ85	TEXT (CHAR 8)
STAEQ89	TEXT (CHAR 8)
SITE	TEXT (CHAR 8).

2) Open the database in Microsoft Access and follow the import procedure outlined as follows:
a) Next, select NEW, followed by IMPORT TABLE and click on OK.
b) A common dialog box will come up. Change the File type to ASCII and select the file to import.(The CBP provided program should have named the MDBEBEEV.TXT). Then click on IMPORT.
c) At this point the Microsoft file import wizard will come up to help you with the file import. Proceed by setting the file type to comma delimited ASCII using the control buttons and then press NEXT.
d) On the next screen CLICK THE FIRST LINE IS HEADER ROW BOX. Make sure the field delimiter is set correctly it should be a comma. Then press the ADVANCED button.

e) In the Advanced menu set the following formats: Date format is YMD, check four digit year and leading zeros on dates, set a hyphen (-) as the date delimiter (Note this will have to be changed if the SAS program was modified to use another delimiter or date format). Make sure the Data/Field types are set correctly (see table in step one for correct field types). The fields STATION, STAEQ85, STAEQ89 ,SITE will probably need to be corrected. Once things are properly set, CLICK OK and NEXT.
f) On the following screen SELECT IMPORT AS NEW TABLE, then NEXT.
g) The next screen will allow you to double check each of the field types and import formats for the data set. Confirm each of the fields against the table above. You can press the advanced key to go back and modify anything that needs to be changed at this point. Then click on NEXT.
h) Select NO PRIMARY KEY and FINISH. This completes the import procedure.

3) Run data quality checks for appropriate station Ids, and other missing key/not null fields as indicated in the BIOTA_EVENT _Table. Run an unmatched query between the MDBEBEEV and the MDBEEEV table. Every record in the BIOTA EVENT table must have a record in the TAB_EVENT table. It may be necessary to run a check for duplicate records based on key fields using built in query wizard. Your working table is named MDBEBEEV.
4) Append the working file to LOAD_BIOTA_EVENT Table Template.
5) Run the query APPEND TO LOAD BIOTA AND CONSTANTS. (This query will merge in some CBP required constants and Chesapeake Bay Program sampling Gear codes.)
6) Run the UPDATE EVENT_ID_BIOTA query. This query will merge the EVENT_ID numbers back on to the working BIOTA file.
7) Run the query APPEND TO LOAD BIOTA TO RDBMS. (This query will add the new data to the existing TAB_BIOTA_SAMPLING, provided there are no referential integrity issues.).

BENTHIC WATER QUALITY DATA

1) The comma delimited ASCII file available for data loading should contain a header row followed by
rows of data in the following format and order:

FIELD	FORMAT
STATION	TEXT (CHAR 15)
SAMPLE_DATE	DATE YYYYMMDD (May Have Date Delimiters)
SAMPLE_TIME	DATE/TIME (24 HH:MM)
SAMPLE_NUMBER	NUMERIC(8.0)
SAMPLE_DEPTH	NUMERIC (8.1)
PARAMETER	TEXT (CHAR 20)
VALUE	NUMERIC(12.4)
UNITS	TEXT(CHAR 12)
INS_CODE	TEXT (CHAR 8)
SOURCE	TEXT (CHAR 8)
LABEL	TEXT (CHAR 50)
YEARCODE	TEXT (CHAR 8)
CRUISENO	TEXT (CHAR 6)
STAEQ85	TEXT (CHAR 8)
STAEQ89	TEXT (CHAR 8)
SITE	TEXT (CHAR 8)
SAMPLE_TYPE	TEXT (CHAR 2)

2) Open the database in Microsoft Access and follow the import procedure outlined as follows:
   a) Next, select NEW, followed by IMPORT TABLE and click on OK.
   b) A common dialog box will come up. Change the File type to ASCII and select the file to import. (The CBP provided program should have named the MDBEWQ.TXT). Then click on IMPORT.

c) At this point the Microsoft file import wizard will come up to help you with the file import. Proceed by setting the file type to comma delimited ASCII using the control buttons and then press NEXT.
d) On the next screen CLICK THE FIRST LINE IS HEADER ROW BOX. Make sure the field delimiter is set correctly it should be a comma. Then press the ADVANCED button.
e) In the Advanced menu set the following formats: Date format is YMD, check four digit year and leading zeros on dates, set a hyphen (-) as the date delimiter (Note this will have to be changed if the SAS program was modified to use another delimiter or date format). Make sure the Data/Field types are set correctly (see table in step one for correct field types). The fields STATION, STAEQ85, STAEQ89 ,SITE will probably need to be corrected. Once things are properly set, CLICK OK and NEXT.
f) On the following screen SELECT IMPORT AS NEW TABLE, then NEXT.
g) The next screen will allow you to double check each of the field types and import formats for the data set. Confirm each of the fields against the table above. You can press the advanced key to go back and modify anything that needs to be changed at this point. Then click on NEXT.
h) Select NO PRIMARY KEY and FINISH. This completes the import procedure.

3) Run data quality checks for appropriate station Ids, value range checks and other missing key/not null fields as indicated in the TAB_WQ_DATA Table. Run an unmatched query between the MDBEWQ and the MDBEEV table. Every record in the WATER_QUALITY table must have a record in the EVENT table. All water quality parameter names and methods must appear in their. respective lookup table in order to load the data. It may be necessary to run a check for duplicate records based on key fields using built in query wizard. Your working table is named MDBEWQ.
4) Append the working file to LOAD_WQ Table Template.
5) Run the query APPEND TO LOAD WQ.
6) Run the UPDATE EVENT_ID_WQ query. This query will merge the EVENT_ID numbers back on to the working WATER QUALITY file.
7) Run the query APPEND TO LOAD WQ TO RDBMS. (This query will add the new data to the existing TAB_WQ_DATA, provided there are no referential integrity issues.)

BENTHIC SEDIMENT DATA

1) The comma delimited ASCII file available for data loading should contain a header row followed by rows of data in the following format and order:

FIELD	FORMAT
STATION	TEXT (CHAR 15)
SAMPLE_DATE	DATE YYYYMMDD (May Have Date Delimiters)
SAMPLE_TIME	DATE/TIME (24 HH:MM)
SAMPLE_NUMBER	NUMERIC(8.0)
SAMPLE_DEPTH	NUMERIC (8.1)
PARAMETER	TEXT (CHAR 20)
VALUE	NUMERIC(12.4)
UNITS	TEXT(CHAR 12)
SOURCE	TEXT (CHAR 8)
YEARCODE	TEXT (CHAR 8)
CRUISENO	TEXT (CHAR 6)
STAEQ85	TEXT (CHAR 8)
STAEQ89	TEXT (CHAR 8)
SITE	TEXT (CHAR 8)
SAMPLE_TYPE	TEXT (CHAR 2)
LABEL	TEXT (CHAR 20)

2) Open the database in Microsoft Access and follow the import procedure outlined as follows:
   a) Next, select NEW, followed by IMPORT TABLE and click on OK.

b) A common dialog box will come up. Change the File type to ASCII and select the file to import.(The CBP provided program should have named the MDBESD.TXT). Then click on IMPORT.
c) At this point the Microsoft file import wizard will come up to help you with the file import. Proceed by setting the file type to comma delimited ASCII using the control buttons and then press NEXT.
d) On the next screen CLICK THE FIRST LINE IS HEADER ROW BOX. Make sure the field delimiter is set correctly it should be a comma. Then press the ADVANCED button.
e) In the Advanced menu set the following formats: Date format is YMD, check four digit year and leading zeros on dates, set a hyphen (-) as the date delimiter (Note this will have to be changed if the SAS program was modified to use another delimiter or date format). Make sure the Data/Field types are set correctly (see table in step one for correct field types). The fields STATION, STAEQ85, STAEQ89, SITE will probably need to be corrected. Once things are properly set, CLICK OK and NEXT.
f) On the following screen SELECT IMPORT AS NEW TABLE, then NEXT..
g) The next screen will allow you to double check each of the field types and import formats for the data set. Confirm each of the fields against the table above. You can press the advanced key to go back and modify anything that needs to be changed at this point. Then click on NEXT.
h) Select NO PRIMARY KEY and FINISH. This completes the import procedure.

3) Run data quality checks for appropriate station Ids, acceptable range checks and other missing key/not null fields as indicated in the SEDIMENT Table. Run an unmatched query between the MDBESD and the MDBEEV table. Every record in the SEDIMENT table must have a record in the SURVEY EVENT table. All SEDIMENT parameter names and methods must appear in their respective lookup table in order to load the data. It may be necessary to run a check for duplicate records based on key fields using built in query wizard. Your working table is named MDBESD.
4) Run the query APPEND TO LOAD SEDIMENT.
5) Run the UPDATE EVENT_ID_SEDIMENT query. This query will merge the EVENT_ID numbers back on to the working WATER QUALITY file.
6) Run the query APPEND TO LOAD SEDIMENT TO RDBMS. (This query will add the new data to the existing SEDIMENT_TABLE, provided there are no referential integrity issues.)

BENTHIC TAXONOMIC DATA

1) The comma delimited ASCII file available for data loading should contain a header row followed by rows of data in the following format and order:

FIELD	FORMAT
STATION	TEXT (CHAR 15)
SAMPLE_DATE	DATE YYYYMMDD (May Have Date Delimiters)
SAMPLE_NUMBER	NUMERIC(8.0)
TAXON	TEXT (CHAR 5)
PARAMETER	TEXT (CHAR 20)
VALUE	NUMERIC(8.0)
UNITS	TEXT(CHAR 12)
SER_NUM	TEXT (CHAR 12)
SOURCE	TEXT (CHAR 8)
YEARCODE	TEXT (CHAR 8)
CRUISENO	TEXT (CHAR 6)
STAEQ85	TEXT (CHAR 8)
STAEQ89	TEXT (CHAR 8)
SITE	TEXT (CHAR 8)
GEARCODE	TEXT (CHAR 5)
NETMESH	NUMERIC (8.1)
SKIP	TEXT (CHAR 1)

2) Open the database in Microsoft Access and follow the import procedure outlined as follows:
   a) Next, select NEW, followed by IMPORT TABLE and click on OK.
   b) A common dialog box will come up. Change the File type to ASCII and select the file to import. (The CBP provided program should have named the MDBETX.TXT). Then click on IMPORT.
   c) At this point the Microsoft file import wizard will come up to help you with the file import. Proceed by setting the file type to comma delimited ASCII using the control buttons and then press NEXT..
   d) On the next screen CLICK THE FIRST LINE IS HEADER ROW BOX. Make sure the field delimiter is set correctly it should be a comma. Then press the ADVANCED button.
   e) In the Advanced menu set the following formats: Date format is YMD, check four digit year and leading zeros on dates, set a hyphen (-) as the date delimiter (Note this will have to be changed if the SAS program was modified to use another delimiter or date format). Make sure the Data/Field types are set correctly (see table in step one for correct field types). The fields STATION, STAEQ85, STAEQ89, SITE will probably need to be corrected. Once things are properly set, CLICK OK and NEXT.
   f) On the following screen SELECT IMPORT AS NEW TABLE, then NEXT.
   g) The next screen will allow you to double check each of the field types and import formats for the data set. Confirm each of the fields against the table above. You can press the advanced key to go back and modify anything that needs to be changed at this point. Then click on NEXT.
   h) Select NO PRIMARY KEY and FINISH. This completes the import procedure.

3) Run data quality checks for appropriate station Ids, acceptable range checks and other missing key/not null fields as indicated in the TAXONOMIC_COUNT Table. Run an unmatched query between the MDBETX and the MDBEBEEV table. Every record in the TAXONOMIC_COUNT table must have a record in the SURVEY EVENT and BIOTA_EVENT table. It may be necessary to run a check for duplicate records based on key fields using built in query wizard. Your working table is named MDBETX.
4) Run the query APPEND TO LOAD TAXON. All data generator Species Codes and methods must appear in their respective lookup table in order to load the data.
5) Run the UPDATE SURVEY_ID_TAXON query. This query will merge the Survey_ID numbers back on to the working LOAD_TA XON file.
6) Run the UPDATE_TSN _TAXON query. This query will merge the IT IS Taxon serial numbers, CBP life stage designation and a sample type constant on to the working LOAD_TAXON file based on the data generators in house species codes. Be sure that all species lists are up to date before performing this query. Remember, species identification is by TSN Numbers in CIMS databases. Data records will not load if TSN numbers are missing.
7) Run the query APPEND TO LOAD TAXON TO RDBMS. (This query will add the new data to the existing TAXONOMIC_COUNT_TABLE, provided there are no referential integrity issues.).

BENTHIC BIOMASS DATA

1) The comma delimited ASCII file available for data loading should contain a header row followed by rows of data in the following format and order:

FIELD	FORMAT
STATION	TEXT (CHAR 15)
SAMPLE_DATE	DATE YYYYMMDD (May Have Date Delimiters)
SAMPLE_NUMBER	NUMERIC(8.0)
VALUE_TYPE	TEXT (CHAR 1)
TAXON	TEXT (CHAR 5)
PARAMETER	TEXT (CHAR 20)
VALUE	NUMERIC(8.5)
UNITS	TEXT(CHAR 12)
SER_NUM	TEXT (CHAR 12)
SOURCE	TEXT (CHAR 8)
SAMPLE_TYPE	TEXT (CHAR 2)
GEARCODE	TEXT (CHAR 5)
NETMESH	NUMERIC (8.1)
YEARCODE	TEXT (CHAR 8)
CRUISENO	TEXT (CHAR 6)
STAEQ85	TEXT (CHAR 8)
STAEQ89	TEXT (CHAR 8)
SITE	TEXT (CHAR 8)

2) Open the database in Microsoft Access and follow the import procedure outlined as follows:
   a) Next, select NEW, followed by IMPORT TABLE and click on OK.
   b) A common dialog box will come up. Change the File type to ASCII and select the file to import. (The CBP provided program should have named the MDBEBM.TXT). Then click on IMPORT.
   c) At this point the Microsoft file import wizard will come up to help you with the file import. Proceed by setting the file type to comma delimited ASCII using the control buttons and then press NEXT.
   d) On the next screen CLICK THE FIRST LINE IS HEADER ROW BOX. Make sure the field delimiter is set correctly it should be a comma. Then press the ADVANCED button.
   e) In the Advanced menu set the following formats: Date format is YMD, check four digit year and leading zeros on dates, set a hyphen (-) as the date delimiter (Note this will have to be changed if the SAS program was modified to use another delimiter or date format). Make sure the Data/Field types are set correctly (see table in step one for correct field types). The fields STATION, STAEQ85, STAEQ89, SITE will probably need to be corrected. Once things are properly set,CLICK OK and NEXT.
   f) On the following screen SELECT IMPORT AS NEW TABLE, then NEXT.
   g) The next screen will allow you to double check each of the field types and import formats for the data set. Confirm each of the fields against the table above. You can press the advanced key to go back and modify anything that needs to be changed at this point. Then click on NEXT.
   h) Select NO PRIMARY KEY and FINISH. This completes the import procedure.
3) Run data quality checks for appropriate station Ids, acceptable range checks and other missing key/not null fields as indicated in the BIOMASS Table. Run an unmatched query between the MDBEBM and the MDBEBEEV table. Every record in the BIOMASS table must have a record in the. SURVEY EVENT and BIOTA_EVENT table. It may be necessary to run a check for duplicate records based on key fields using built in query wizard. Your working table is named MDBEBM.
4) Run the query APPEND TO LOAD BIOMASS. All data generator Species Codes and methods must appear in their respective lookup table in order to load the data.
5) Run the UPDATE SURVEY_ID_BIOMASS query. This query will merge the Survey_ID numbers back on to the working LOAD_BIOMASS file.

6) Run the UPDATE_TSN _BIOMASS query. This query will merge the IT IS Taxon serial numbers, CBP life stage designation and a sample type constant on to the working LOAD_BIOMASS file based on the data generators in house species codes. Be sure that all species lists are up to date before performing this query. Remember, species identification is by TSN Numbers in CIMS databases. Data records will not load if TSN numbers are missing.
7) Run the query APPEND TO LOAD BIOMASSTO RDBMS. (This query will add the new data to the existing BIOMASS_TABLE, provided there are no referential integrity issues.)

BENTHIC INDEX OF BIOTIC INTEGRITY DATA

Beginning in January 2005, the data providers submitted calculated Benthic Index of Biotic Integrity indices. IBI Metrics (developed by Weisberg et.al. (1997), modified by Alden et.al. (2002)) are calculated using the protocol described in the document *Methods for Calculating the Chesapeake Bay Benthic Index of Biotic Integrity* This index data is currently caculated by the data generators using the protocol :
http://www.esm.versar.com/Vcb/Benthos/docs/ChesBayBIBI.PDF.

1) The comma delimited ASCII file available for data loading should contain a header row followed by rows of data in the following format and order:

FIELD	FORMAT
STATION	TEXT(CHAR 15)
SAMPLE_DATE	DATE YYYYMMDD (May Have Date Delimiters)
SAMPLE_NUMBER	NUMERIC(8.0)
IBI_PARAMETER	TEXT (15)
VALUE	NUMERIC(8.4)
SCORE	NUMERIC(8.2)
IBI_SALZONE	TEXT(CHAR 15)
IBI_BOTTOM_TYPE	TEXT(CHAR 15)
R_DATE	DATE YYYYMMDD (May Have Date Delimiters)

2) Open the database in Microsoft Access and follow the import procedure outlined as follows:
   a) Next, select NEW, followed by IMPORT TABLE and click on OK.
   b) A common dialog box will come up. Change the File type to ASCII and select the file to import. (The CBP provided program should have named the MDBEIBI.TXT). Then click on IMPORT.
   c) At this point the Microsoft file import wizard will come up to help you with the file import. Proceed by setting the file type to comma delimited ASCII using the control buttons and then press NEXT.
   d) On the next screen CLICK THE FIRST LINE IS HEADER ROW BOX. Make sure the field delimiter is set correctly it should be a comma. Then press the ADVANCED button.
   e) In the Advanced menu the select the import template specific for the data provider laboratory (VERSAR or ODU) and data type (IBI). Check to make sure the following formats are correct: Date format is YMD, check four digit year and leading zeros on dates, set a hyphen (-) as the date delimiter (Note this will have to be changed if the SAS program was modified to use another delimiter or date format). Make sure the Data/Field types are set correctly (see table in step one for correct field types). CLICK OK and NEXT.

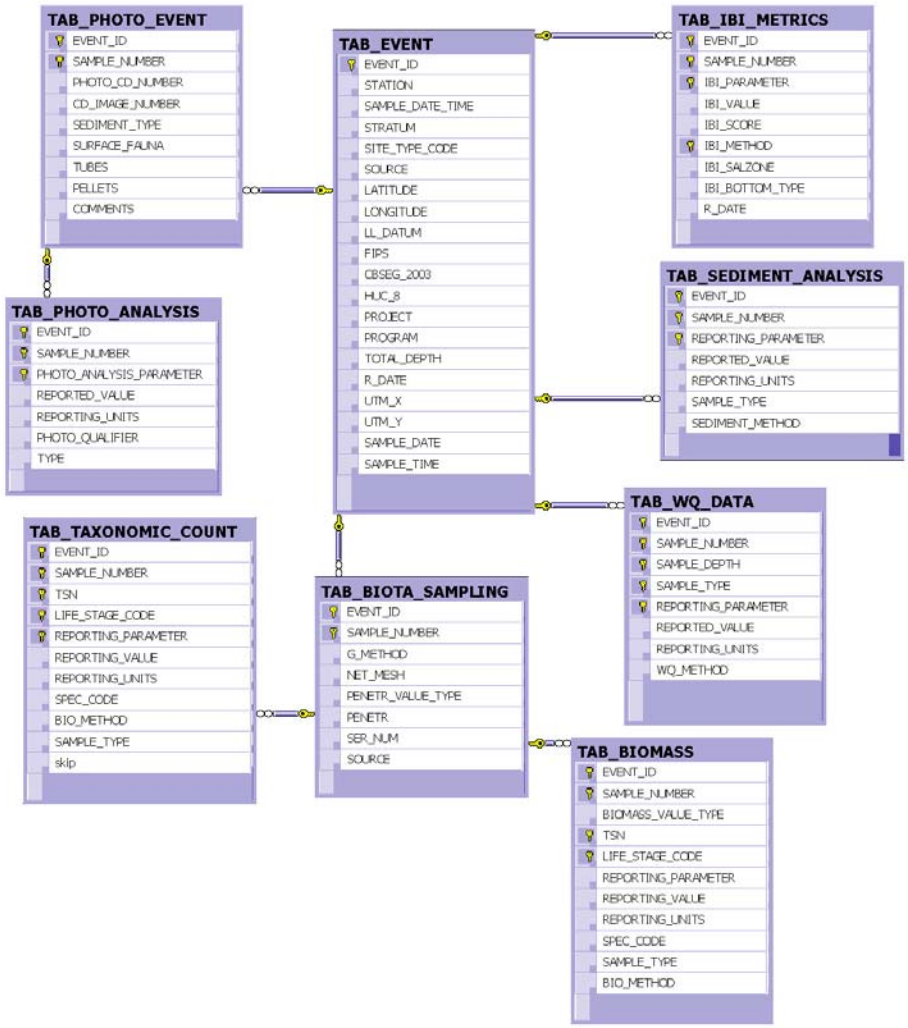
f) Run data quality checks for appropriate station Ids, value range checks and other missing key/not null fields as indicated in the TAB_IBI_METRICS Table. Run an unmatched query between the MDBEWQ and the MDBEEV table. Every record in the WATER_QUALITY table must have a record in the EVENT table. All water quality parameter names and methods must appear in their. respective lookup table in order to load the data. It may be necessary to run a check for duplicate records based on key fields using built in query wizard. Your working table is named MDBEIBI.

3) Run of data range checks are performed on the IBI_Parameter Values ranges found in the TAB_IBI_PARAMETER. If data values are found to not meet accepted data ranges shown in table 18 and do not have explanatory documentation from the laboratory, data are returned to the data provider for correction or minimally written explanation of problem.

4) A series of overall QA QC routines are run over the data. These checks include: Queries to look for duplicate records. If a station had biological data sampled and enumerated during a reporting period, were IBI data calculated for each sample replicate. If errors are found, data is returned to the data provider for correction or documentation.
5) Append the working file to LOAD_IBI Table Template.
6) Run the query APPEND TO LOAD IBI.

Run the UPDATE EVENT_ID_IBI query. This query will merge the EVENT_ID numbers back on to the working IBI file.Run the query APPEND TO LOAD IBI TO RDBMS. (This query will add the new data to the existing TAB_IBI_METRICS, provided there are no referential integrity issues.)

THE ENTITY RELATIONSHIP DIAGRAM



1-1

Note Major Tables Only