

Southern California Bight 2008 Regional Monitoring Survey (Bight'08)

Information Management Plan

**Prepared by:
Bight'08 Information Management Committee**



**Prepared for:
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Disclaimer: While we strive to make the Information Management Plan as accurate as possible when we publish it, there may be times at which we may find it necessary to make some minor changes. Please check the data submission website at www.sccwrp.org/datasubmission/bight08 for the most current version of the Information Management Plan and most current values in a given lookup list. If a value seems appropriate for a field but is not listed, please contact the Information Management Officer to discuss its inclusion.

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I. INTRODUCTION TO BIGHT'08

The Southern California Bight 2008 Regional Monitoring Project (Bight'08) is a cooperative effort involving more than 60 agencies to assess the overall ecological health of the Southern California Bight (SCB). Bight'08 builds upon previous successful regional surveys and includes new questions and new participants. Cooperative programs such as this one are important in providing a regional perspective to conditions in the marine and estuarine habitats of the Southern California Bight.

The large scope of this survey provides a unique challenge to organizing and structuring the necessary committees and data management practices to ensure its success. The overall structure of all of the Bight surveys has varied from survey to survey depending on the focus; however, the general structure of the groups has stayed the same throughout. For Bight'08 there are five major working groups (Figure 1): 1) Coastal Ecology; 2) Shoreline Microbiology; 3) Water Quality; 4) Rocky Reef; and 5) Areas of Special Biological Significance. In addition, there are six sub committees responsible for the technical aspects of the survey. These technical committees are responsible for delineated a set of common methods and standards to be used in the field and lab. Specifically, the Information Management technical committee is responsible for creating Standardized Data Transfer Protocols (SDTPs) to ensure data comparability and ease of data analyses.

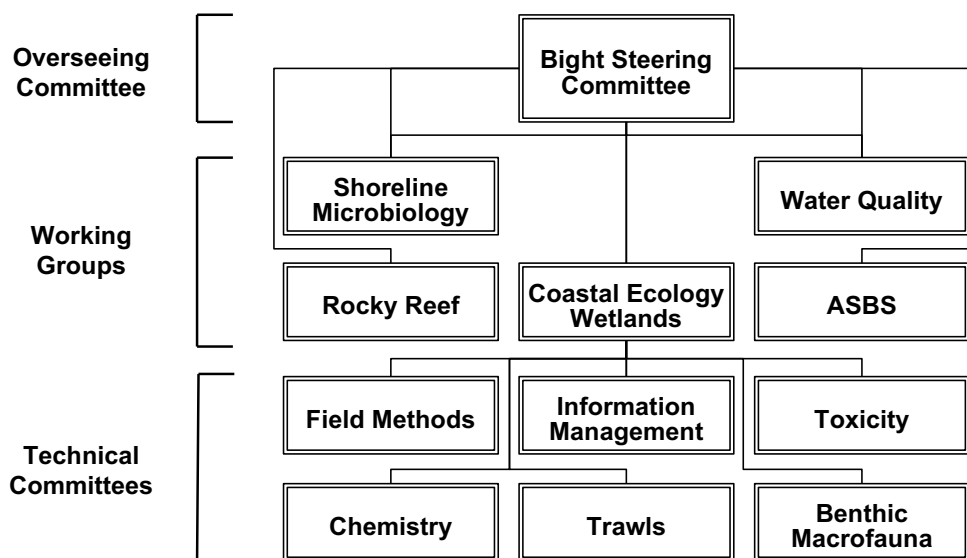


Figure 1. Layout of the groups and committees for Bight'08.

The main challenge for the Bight'08 Information Management committee is the development of a unified data system. Each of the participating organizations has developed and is using their own data management system. These systems vary in the types of data captured, the software systems in which they are stored, and the degree of data documentation. In order to meet the project goal of producing a regional assessment of the Southern California Bight, a cooperative information management

system is necessary to ensure that the collected data can be shared effectively among participants.

Information management needs to occur on several levels. First, a process must be developed to ensure the quality, compatibility, and timeliness of the data each organization collects. Once collected and organized, it must be readily available to the project scientists for review, analysis and interpretation. Ultimately, this information will be made available to other interested organizations and the general public.

This document describes the information management system (IMS) that will support Bight'08. The document focuses on four major functions of the IMS:

- The Standardized Data Transfer Protocols each participating agency will use to transfer data from their internal IMS to the Bight'08 IMS.
- The data submission process for submitting data to the Bight'08 Information Management Officer.
- The technical guidelines of how the data will be organized in the centralized Bight'08 database.
- The milestones and mechanisms by which the data will be made accessible to project participants, other organizations and the general public.

II. APPROACH TO INFORMATION MANAGEMENT

The Bight'08 Information Management System (IMS) serves several purposes, the primary of which is to provide a mechanism for sharing data among project participants. Data sharing is required if the Bight'08 goal of producing an integrated regional assessment of the Southern California Bight is to be achieved. While this is the primary focus, the IMS has been developed in recognition that Bight'08 represents an ongoing effort toward data standardization among Bight-wide regional monitoring participants and that protocols adopted here may be later used for other data sharing purposes beyond this project. Thus, the system was designed to be flexible to future adaptation. In addition, the system was constructed primarily to serve the project scientists, but it has also been designed to supply data to non-project scientists and the interested public.

The IMS will be based on a centralized data storage model. A centralized system was selected because Bight'08 is an integrated project and the typical data user will be interested in obtaining the whole data set (or large parts thereof), rather than smaller units of data (individual parameters, subset of the geographic range) residing in individual laboratories. The centralized system was selected over the alternative of a distributed system linked through a series of FTP sites because sophisticated tools would have to be developed for users to access those sites, plus the difficulty of maintaining a linked-distributed system over an extended number of years.

The centralized database will be developed using standardized data transfer protocols (SDTP) for data exchange. The SDTP details the information to be submitted with each sample collection or processing element, the units and allowable values for each parameter, and the order in which that information will be submitted. They are necessary to ensure that data submitted by the participants are comparable and easily merged without significant effort or assumptions by the organization responsible for maintaining the centralized data system. Use of SDTP allows each participating organization to retain data they generate in their local data management system while providing a mechanism for data exchange among project participants and a means for populating a centralized database.

The SDTP will be organized through a relational structure. A relational structure involves use of multiple data tables linked through one or more common fields. A relational structure allows data created at different times (e.g. lab data vs. field data) to be entered at the time of data production, minimizing the possibility of data loss. A relational structure also minimizes redundant data entry, by allowing data that are recorded only once (e.g. station location) to be entered into separate tables rather than to be repeated in every data record.

A. *STANDARDIZED DATA TRANSFER PROTOCOLS*

The SDTP for Bight'08 survey includes two common tables, the Stations table and the StationOccupation tables. In addition, the Coastal Ecology component contains 15 additional data tables and the Rocky Habitat component contains 5 additional data tables. More data tables will be added to the Information Management Plan as other Bight'08 survey components (i.e. shoreline microbiology, water quality, ASBS and wetlands) are solidified.

The first level in all of the components is the Station table, which includes a single data record for each site sampled. The Station table includes descriptors such as latitude, longitude, and general location. The Station table will also contain inclusion probabilities/area weights for each sample type at each sample site to ensure that samples are properly weighted in data analysis; since a stratified random sampling design was used to select sample sites for many Bight'08 stations, data are not equally weighted in their contribution to an overall project mean. One difference between the Bight'08 survey and previous surveys is that approximately half of the sample stations will be revisits to previous survey sites ($\frac{1}{4}$ Bight'98 and $\frac{1}{4}$ Bight'03) in order to produce a trends assessment.

The second level is the Station Occupation table, which requires a record for each visit to a sampling site. Date, time, and environmental descriptors such as weather and sea state are included in this table. The Station Occupation table is linked to the Station table by a StationID field, which resides in both tables.

The third level is the Sample Event table, which contains a record for each sampling activity conducted during a visit to a site. All sampling efforts will be recorded to the

event level regardless of whether the sample attempt was successful or not. This information is recorded not only to show level of effort, but also to indicate areas that potentially cannot be sampled, for future surveys. There are currently three types of Sampling Event Tables (more will be added later) corresponding to the three types of sampling activities conducted in the Coastal Ecology and Rocky Habitat components of Bight'08 (Grab, Trawl and Dive). The Sampling Event table is used to record information about each of these events, such as trawl duration, observations about sediment type in a grab, etc. Both StationID, SampleDate link the Sampling Event tables to Station Occupation table.

The fourth level is the Results table, which contains a separate record for every measurement result. These Results tables corresponding to different types of measurements conducted in the field (e.g. fish abundance) or in the laboratory (e.g. chemical concentration). StationID and Date link the Results tables to Sampling Event tables. For some tables, they are also linked by Sample Time and Trawl Number.

Within the Results tables, all data are captured at the level of individual replicate, rather than in a summarized form. Fields for summary quality assurance information are also included. Detailed laboratory QA data will be retained at the laboratory where the data were generated.

Figure 1 provides a listing of all of the tables in the SDTP for Coastal Ecology and Rocky Habitat, and illustrates their relational structure. The detailed descriptions of each field in each data table in the SDTP are found in each section related to specific portions of the project. Appendix 1 provides lookup lists of acceptable entries for each field, where a constrained list is required. Appendix 2 provides the structure in which metadata for the project will be stored.

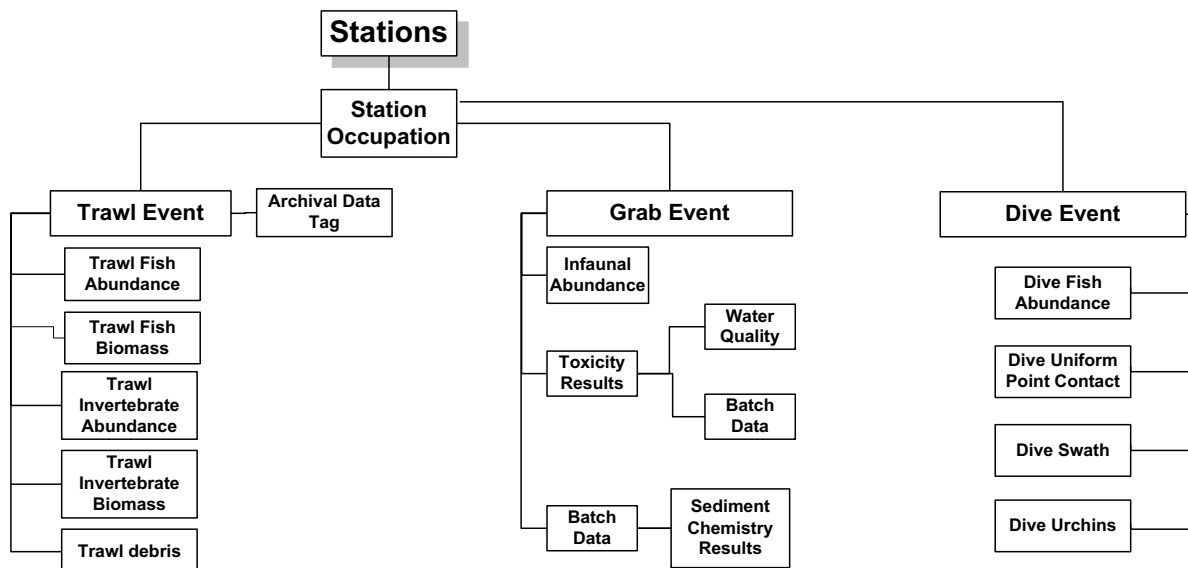


Figure 1. Coastal Ecology and Rocky Habitat Relation Data Structure.

B. FIELD COMPUTER

A field computer will be used whenever possible to collect station occupation (visual observation) and event data during the Bight'08 survey. A field data acquisition application had been developed by SCCWRP and LACSD for use during the Bight'03 survey, and has subsequently been refined for use with Bight'08. This system facilitates the collection of all the required station occupation and field sampling event information (e.g., grab, trawl and dive sampling events). This system has been designed to be used on laptop computers and has special built-in features that accommodate the upload of data through SCCWRP's web-based data submission page. Use of the Bight'08 Field Data System is strongly recommended during the survey. The most current version of the field computer software, the Bight'08 Field Data System, can be downloaded from SCCWRP's website at www.sccwrp.org/datatools/bight08/.

If a field computer cannot be used, all required sampling event information must be recorded on Bight'08 field data sheets and subsequently loaded into Microsoft Excel (preferred) data files for submission to the Bight'08 Information Manager. Data submission formats and standards are described in this document.

The Bight'08 Field Data System has the following requirements:

- Runs in Windows XP, 2000 or Vista OS environments;
- Stores data in an MS Access 2000, 2003 or 2007 application;
- Receives direct input of data from DGPS through serial port assuring that all samples are associated with accurate location information and eliminating transcription error associated with hand-written entry of these data.

Some of the Bight'08 Field Data System features include:

- Provides data entry templates for all sampling event information required by Bight'08 Information Management Plan;
- Employs drop down lists of acceptable values for many entry fields, thereby reducing entry time and assuring accuracy and compliance with Bight'08 data standards;
- Capable of producing fully completed hardcopy Bight'08 field sampling data sheets which can be used for data backup;
- Produces export data files of all sampling event information in Bight'08 compliant Microsoft Excel files suitable for direct submission to the project Information Manager.

III. ROLES AND RESPONSIBILITIES

Bight'08 is a cooperative effort among more than 60 organizations (plus numerous additional subcontractor labs), which have limited experience working together. Effective implementation of the Bight'08 Information Management Plan requires clearly defined roles for each participant.

For the purpose of defining roles, there will be four types of participants in Bight'08:

- Data generator - Field crew leaders and laboratory supervisors who will be responsible for compiling the data their organization generates and entering the data into one or more of the SDTP tables. The data generator is also responsible for QA/QC checks on the data prior to its submission.
- Agency Information Management (AIM) Coordinator - Responsible for keeping track of all data generated within their agency and acting as the primary contact for the Bight'08 Information Management Officer.
- Bight'08 Information Management Officer (IMO) - Responsible for working with Agency Information Managers to develop and create SDTPs and manage the data submission process, as well as the centralized Bight'08 database.
- Bight'08 Technical Subcommittee chairs (TSC) - Responsible for overseeing the scientific quality assurance of data through the database development and analyses processes. They are also responsible for working with the Bight'08 Information Management Officer to generate metadata.

A. INFORMATION MANAGEMENT OFFICER (IMO)

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B. AGENCY INFORMATION MANAGEMENT (AIM) CONTACT INFORMATION

Table 1. Coastal Ecology Agency Information Management Coordinators (AIM).

NAME	AGENCY	E-MAIL	TELEPHONE
Shelly Moore	Southern California Coastal Water Research Project (SCCWRP) - Chair	shellym@sccwrp.org	(714) 755-3207
Lisa Haney	Los Angeles County Sanitation Districts (LACSD) – Co-Chair	lhane@lacsd.org	(310) 830-2400 x 5605
Diane O'Donohue	City of San Diego Metropolitan Wastewater Department (CSDMWWD)	dodonohue@sandiego.gov	(619) 758-2326
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Mike Mengel	Orange County Sanitation Districts (OCSD)	mjmengel@ocsd.com	(714) 593-7465
Karin Wisenbaker	Aquatic Bioassay Consultants (ABC)	Karin@aquabio.org	(805) 643-5621 x 17

C. DATA FLOW

Each field crew or laboratory generating data will initially enter the data into their own data management system and subject it to their own internal QA/QC procedures (Figure 4). Recommended QA procedures include double entry of data, completeness, and range checks. Data will next be submitted to the Bight'08 Information Management Officer (IMO) via the online data submission system. Each Agency Information Manager (AIM) will be notified via email when a data set is submitted by their agency. Submission in Microsoft Excel format which follows the SDTP is recommended. Each data generator will retain a copy of each file submitted as a back-up, until the centralized database is declared complete by the Bight'08 IMO.

Each submitting group within the agency will initiate a series of error checks to ensure the data: 1) are within specified ranges appropriate to each parameter measured, 2) contain all required fields, 3) have encoded valid values from constrained look-up lists

where specified, and 4) are in correct format (text in text fields, values in numeric fields, etc.).

Once the data is successfully submitted to the IMO it will then be passed onto the appropriate Technical Committee Chair (TCC) for scientific review. If errors are found in the data during this review, the AIM will be notified and can work with the data generator to submit a data change request, if deemed appropriate. Data will not be changed at any time without prior permission from the AIM and/or data generator. If there are only a few, easily correctable errors, the data generator may submit a change request to the IMO via SCCWRP's online change request form located at the following website: www.sccwrp.org/datasubmission/changes/. If larger, more detailed changes are required the IMO will work with the AIM to submit a new complete set of data through the online data submission system.

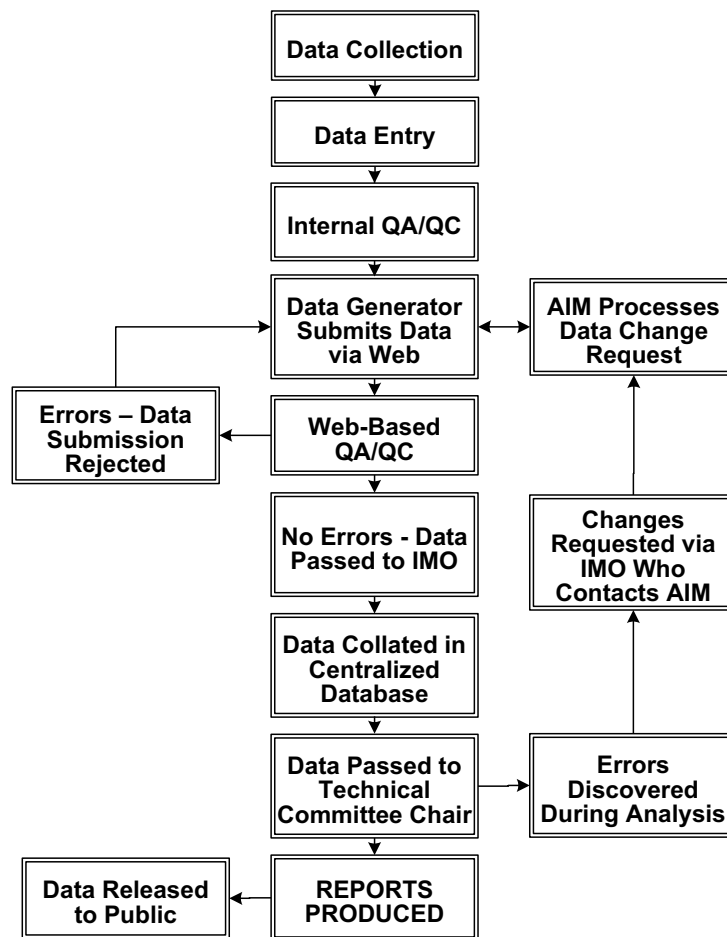


Figure 4. Data flow from collection through submission and release to the public.

Once all data tables of a particular data type (e.g. all tables containing fish data) have been certified by the IMO and the TCC, the data will be available to other committee members, as assigned by the TCC, for final data analysis.

D. DATA REVISION

Three types of data revisions are likely to be required after the data have been submitted to the IMO. The first type of revision is to data where errors have been discovered by data users, who may find anomalies after conducting analyses beyond those done by the TCC. If the data in question is maintained as part of a locally available data set, the IMO will contact the AIM and ask them to work with the data generator to resolve the discrepancy. If the agency is not maintaining the data locally, the IMO will contact the data generator directly, using contact information provided in the metadata.

Following resolution, corrections to the centralized data will be made by the IMO. Access to the database for other users will be in read-only form. Prior to making any changes, the IMO will document the changes and receive (written or electronic) concurrence from the organization that originated the data (or the AIM, as appropriate). The IMO will only make changes in the centralized database. Originating organizations will be responsible for making corresponding changes in their own internal data storage systems. All changes to the data will be documented in a computerized file available to all data users or through an on-line data change form.

The second type of error is those discovered after the fact by the data generators. Any project participant can initiate a request for changing data by notifying the IMO, who will then follow the procedures outlined above.

The third type of error is those resulting from changes in taxonomy or nomenclature following data completion. No attempt will be made as part of Bight'08 data maintenance to update species names and keep the taxonomy current with future name changes. The IMO may choose to add a taxonomy equivalency table to the metadata in subsequent years, as appropriate.

E. SCHEDULE

The schedule for data submission varies by data type. Data collected in the field will be due first, while data that requires laboratory analysis will be produced on a schedule consistent with nominal laboratory processing times. The schedule for initial submission of data to the IMO is summarized in Table 2. It is recommended that individual data generators provide their data to their AIM approximately one month prior to the deadlines listed in Table 2, so that there is sufficient time for the AIM to resolve any data discrepancies and to ensure that the data are in the proper format for submission to the IMO.

Table 2. Expected time between the end of sampling and the transfer of Coastal Ecology and Rocky Habitat data from the Data Generators to the Bight'08 Information Management Officer (IMO).

TABLE TYPE	DUE DATE (MONTHS AFTER SAMPLING COMPLETE)	ACTUAL DUE DATE
GrabEvent	3 Months	05-Dec-2008
StationOccupation	3 Months	05-Dec-2008
TrawlDebris	5 Months	09-Feb-2009
TrawlEvent	3 Months	05-Dec-2008
FishBiomass	8 Months	09-May-2009
FishAbundance	8 Months	09-May-2009
InvertBiomass	8 Months	09-May-2009
InvertAbundance	8 Months	09-May-2009
ArchivalDataTag	18 Months	10-Mar-2010
SedimentToxBatch	3 Months	05-Dec-2008
SedimentToxResults	3 Months	05-Dec-2008
SedimentToxWQ	3 Months	05-Dec-2008
Chem Metals	1 Year	10-Sep-2009
Chem Nutrients	1 Year	10-Sep-2009
Chem Organics	1 Year	10-Sep-2009
Chem Tissue	1 Year	10-Sep-2009
BioaccumulationOrganism	1 Year Sampling in 2009	10-Sep-2010
Benthic Infauna	18 Months	10-Mar-2010
Dive Event	3 Months	05-Dec-2008
Dive Fish Abundance	5 Months	09-Feb-2009
Dive Uniform Point Contact	5 Months	09-Feb-2009
Dive Swath	5 Months	09-Feb-2009
Dive Urchins	5 Months	09-Feb-2009

IV. SUBMISSION GUIDELINES

A. OVERVIEW

All monitoring data will be submitted to the Bight'08 Information Management Officer. The preferred method of submission is via SCCWRP's online data system (www.sccwrp.org/datasubmission/bight08/); however, other methods may be used if the data submitter clears it through the Information Management Officer. The guidelines for each data table are included in this document. Please refer to the appropriate table for the correct structure and information. All data submissions are preferred to be complete and partial data submissions are discouraged.

Data may be submitted in almost any format, although the online web submission system requires files be in Microsoft Excel format. Some examples of different formats include Microsoft Access, Dbase IV, Lotus, or comma delimited ASCII files, although additional file types may be equally appropriate.

B. *HOW TO USE THIS DOCUMENT*

The tabular descriptions of each data type give useful information to the person(s) responsible for submitting tables in the appropriate format. The first column contains the exact name for the field or the column name, as it should be used for data submissions. Do not add spaces or other characters to the field names. Field names that are bolded are intended to indicate a combination of fields that provide a unique record within the table.

The second column describes the type of variable to be used for the data in the field. The variable types are:

- Text any alphanumeric character
- Number numbers are divided into two numeric types
 - Integer Whole numbers (no decimal places)
 - Decimal Decimal numbers (Floating Point in SQL Server)
- Date/Time allows for formatted date or time data
- Yes/No Boolean indicating Yes or No

The third column indicates whether the field is mandatory or not.

- Y indicates that the field is mandatory,
- N indicates the field is not mandatory,
- * indicates that the field is conditionally mandatory

The fourth column indicates the size of the text fields. Only text fields have sizes. Comment fields are typically limited to 100 characters and it is highly recommended that only comments necessary and relevant to that record be recorded.

The fifth column gives a short description of the field and may contain a reference to a relevant look up list containing a constrained list of values that are allowable. In addition, any default values may be listed here.

Submission Documentation

The preferred method of data submission is through SCCWRP's online data submission page. This page can be found at: www.sccwrp.org/datasubmission/bight08/. Additional information and instructions can be found on this web site. Our system requires that files be submitted as Microsoft Excel spreadsheets with specific tab names and field names (see table structures below). Data will be checked for consistency and quality. Our system provides instant feedback on any data problems and allows the user to refine their data and submit again. Once the data are accepted by the data checker the data submitter will receive a receipt indicating successful submission and any other

relevant information. This receipt can be printed for proof of data submission. The data is then transferred into a centralized Bight'08 database. Once all data for a given portion of the survey is complete it will be given to the appropriate Technical Committee Chair for scientific review.

Common Errors

Certain errors commonly occur that prevent the data from loading to the database. These include spelling the field names incorrectly or typing additional characters such as spaces or underscores. Other errors include using values in fields that are not appropriate for the specific field, such as inputting character data to numerical fields or inputting values into fields that are limited by constrained lists. Additional errors can result from simply omitting fields. Each file should be scrutinized for these common errors prior to submission.

Completeness

Data submissions typically will be rejected if they are incomplete. Partial data sets are discouraged; however, special circumstances may make it necessary to accept partial data sets. Please contact the Information Management Officer if there are questions about the submission of partial data sets.

Geographic Conventions:

All latitude and longitude positions are based on the NAD83 datum and are expressed in decimal degrees (to five decimal places) to facilitate easy interfacing with GIS systems. All longitudes will be expressed as negative numbers.

C. DATA SUBMISSION PROTOCOLS

The first row in the file will be the entire list of Field Names. These Field Names must be spelled exactly as they are in the description for each data table in the Information Management Plan. The subsequent rows will contain the actual data.

This Information Management Plan is only as current as the date it was published. In the event that additional modifications need to be made to data structures or lookup lists, these changes will be reflected on the web data submission page. For the most current information on a given data table or lookup list please refer to this web site (www.sccwrp.org/datasubmission/bight08/).

Example of a submitted file:

	A	B	C	D	E	F	G	H	I	J	K	L
	StationID	SampleID	SampleDate	SamplingOrganization	TrawlNumber	Species	SizeClass	AbundanceQualifier	Abundance	Anomaly	BodyLocation	Comments
2	2200	AA12345	02-Jul-1999	AG	1	Paraloanax nebulifer	10		4	None		
3	2200	AA12346	02-Jul-1999	AG	1	Paraloanax nebulifer	10		1	L	Skin / Fins	
4	2200	AA12347	02-Jul-1999	AG	1	Paraloanax nebulifer	11		2	None		

D. DATA ENTRY TEMPLATES

To assist organizations in meeting the SDTP and improve the efficiency of data input, the IMO has created a series of computerized data entry templates. Requests for this data input templates can be made to the IMO. An example of a data input template is the Bight'08 Field Data System. The data entry templates available for the field sampling effort link to a shipboard global positioning system to automatically download date, time, location and trawl direction/speed. These templates provide drop-down lists for station designation, sea surface, weather, sediment quality observations, and most other data types. They reduce errors through the elimination of hand-made entries. The templates also eliminate spelling errors, ensure that the data entered is appropriate for that field, and that the data is complete. Development of laboratory data entry templates can also be created at the request of data users.

V. DATA ACCESS

A. DATA RELEASE PHILOSOPHY

Information management has been an important component of previous Bight surveys and has been instrumental in the successful analysis and assessment of environmental conditions in southern California. An area of concern with any collaborative project involving large numbers of participants is not only the timing of data release, but to which groups it is made available. The data release for Bight'08 will follow those used for previous Bight surveys and is based on a chronologically tiered system. The chronological steps with tiers include:

- **Collection Agency:** This agency can use any data collected by themselves or their contractors at any time at their own discretion.
- **Information Management Officer (IMO):** All organizations will submit their data to the IMO in accordance with the Bight'08 Information Management Plan. Upon receiving the data, the IMO will conduct detailed QA/QC procedures to check for regional data consistency. Once the data has passed these tests, the IMO will release the data to the appropriate Technical Committee Chair for further review.
- **Technical Committees:** The Technical Committee Chair will be provided data of the type for which they are responsible (i.e., chemistry or infauna or trawl or toxicity, etc.) immediately following certification by the IMO that the data is complete. The Technical Committee Chair may release this data to members of

their committee to assist with scientific review and data analysis for their respective element of the Bight'08 program. The regional data set shall not be distributed outside of the Technical Committee until a data review has been completed.

- Other Technical Committees: Other Technical Committees will have access to the Bight'08 regional data once the primary Technical Committee Chair has conducted the scientific review for data analysis following approval by the Planning and/or Steering Committee. Any special requests for early data release to other Technical Committees or nonparticipants must go through the Steering Committee for approval.
- Nonparticipants: Data will be released to nonparticipants once the Technical Committees have produced a final report that has been approved by the Planning and/or Steering Committee.

Once the Steering Committee has approved the Technical Committee Final Report the IMO will compile the regional data with necessary supporting documentation (i.e. metadata and Final Report) with access through the SCCWRP web site (www.sccwrp.org/data). Individual data tables, collections of data, and maps of the data can be downloaded or printed from the SCCWRP website.

B. METADATA

Each release of Bight'08 data to the public will include comprehensive documentation of the data sets. Referred to as metadata, this documentation will include database table structures (including table relationships) and lookup tables used to populate the fields in each table. It will also include quality assurance classifications of the data and documentation of the methodologies by which the data were collected.

A second type of metadata will document changes made to the data over time. As the data are used, we anticipate that errors will be found. As changes to the data are made, they will be documented in a file organized by date and data table. Including this file with each data download will allow users to reconcile potential differences in analysis output that result from using different versions of the data.

Metadata will follow guidelines from the Federal Geographic Data Committee, Content standard for digital geospatial metadata, version 2.0. FGDC-STD-001-1998 (FGDC 1998), including the Biological Data Profile and the Biological Names and Taxonomy Data Standards developed by the National Biological Information Infrastructure (NBII 1999).

V. DATA TABLES

A. COMMON TABLES

Two tables are held in common for each of the data components that will be collected for Bight'08. The first table is the Stations table, which includes information on each station, such as general location, inclusion probabilities and area weights. This table is necessary to complete data analysis using the stratified, random sampling process. Descriptions of the sample draw can be found in the Bight'08 Coastal Ecology Workplan. This table is filled in by the IMO and will not be considered complete until all sampling for a given survey component has been completed. This is necessary for computing area weights, as these values are computed based on the number of successful samples taken.

The second table is the Station Occupation table which includes information on the conditions and Sample Type (i.e. Grab, Trawl or Dive) taken at each station. This table links to the Stations table by the field StationID. This table includes whether a station was successfully sampled or abandoned due to some unforeseen reason.

tblStations

PURPOSE: The file will be generated by SCCWRP. Each record represents a description of a geographical location including label, latitude, longitude, statistical subpopulation, inclusion probability and statistical weight of the station. This table may be appended as stations are added from the overdraw pool to replace abandoned stations.

TABLE GUIDELINES: Each record will be unique based on StationID.

tblStations

Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label
SurveyID	Text	Y	25	The survey the station originated from
Location	Text	Y	50	The general location of the station
Stratum	Text	Y	50	The parent sub-population to which the station belongs
Latitude	Decimal	Y		The latitude of the station expressed in decimal degrees to <u>five decimal places</u> .
Longitude	Decimal	Y		The longitude of the station expressed as a negative number in decimal degrees <u>to five decimal places</u> .

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Ports	Text	Y	50	A code for the ports. Z for not a member of stratum
BaysHarbors	Text	Y	50	A code for the bay or harbor station. Z for not a member of the stratum.
Marinas	Text	Y	50	A code for the marina station. Z for not a member of the stratum
Bath6to30	Yes/No	Y	1	The station belongs to the 6 to 30 meters stratum
Bath30to120	Yes/No	Y	1	The station belongs to the 30 to 120 meters stratum
Bath120to200	Yes/No	Y	1	The station belongs to the 120 to 200 meters stratum
Bath200to500	Yes/No	Y	1	The station belongs to the 200 to 500 meters stratum
Bath500to1000	Yes/No	Y	1	The station belongs to the 500 to 1000 meters stratum
Estuaries	Text	Y	35	A code for all Non-Los Angeles County estuaries. Z for not a member of the stratum.
USGS	Text	Y	35	A code describing USGS sampling areas. Z for not a member of the stratum
SPME	Text	Y	50	A code for areas sampled by Solid Phase Microwave Extraction. Z for not a member of the stratum.
ChannellIslands	Text	Y	50	A code for all Channel Islands stations. Z for not a member of the stratum.
InclusionProbility	Decimal	Y		Inclusion Probability
AreaWeight	Decimal	Y		Area Weight

tb\StationOccupation

PURPOSE: The purpose of the Station Occupation table is to document the conditions under which each sample was collected. This table is used for sediment grab, trawl

assemblage, and dive sampling regimes. Each record contains a characterization of the station at the time of sampling in terms of the weather, sea state, sample type, vessel name, agency, and quality of the GPS signal at the time of sampling.

TABLE GUIDELINES:

- Each record will be unique based on a combination of StationID, SampleDate, ArrivalTime, SamplingOrganization, and SampleType.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblStationOccupation for submission to the Bight'08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblStationOccupation

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from the station table. From tblStations.
SampleDate	Date/Time	Y		The date the of the station visit expressed as dd-mmm-yyyy.
ArrivalTime	Date/Time	Y		The time of arrival on station expressed in 24 hour time hh:mm
ArrivalTimeZone	Text	Y	10	The time zone of the arrival time. From luList42_TimeZoneCodes.
SamplingOrganization	Text	Y	15	An agency code from luList01_AgencyCodes.
SampleType	Text	Y	25	From luList04_SampleTypes
Vessel	Text	Y	50	The name of the vessel.
NavType	Text	Y	10	DGPS for differential / GPS for non-differential From luList20_Navigationallnstruments. <u>Default = "DGPS"</u>
Salinity	Decimal	*		The salinity of the station expressed in PSU. <u>This is used for estuary samples only.</u>
SalinityUnits	Text	*	15	Required if Salinity present. From luList28_Units. <u>Default = "PSU"</u> .
WeatherCode	Text	Y	35	Predetermined weather codes from luList08_WeatherCodes. <u>Default = "Clear"</u>

Field Name	Type	Required	Size	Description
WindSpeed	Integer	Y		Speed in knots.
WindSpeedUnits	Text	Y	15	From luList28_Units. <u>Default value is KTS.</u>
WindDirection	Text	Y	10	N,NE,E,SE,S,SW,W,NW, (XX for calm) (NR for not recorded) From luList05_OrdinalDirections. <u>Default = "XX"</u>
SwellHeight	Decimal	Y		The estimated height of the swell.
SwellHeightUnits	Text	Y	15	From luList28_Units.
SwellPeriod	Integer	Y		The estimated swell period in seconds.
SwellDirection	Text	Y	10	N,NE,E,SE,S,SW,W,NW, (XX for calm) (NR for not recorded) From luList05_OrdinalDirections.
SeaState	Text	Y	25	Calm, rough, choppy, or confused from luList16_SeaState.
StationFailCode	Text	Y	25	From luList40_EventFailureCodes. <u>Default value = "None"</u>
Abandoned	Yes/No	Y		Was the station abandoned? Default is no, but a yes requires a comment.
Comments	Text	*	100	Additional comments. <u>* required if Abandoned = "Yes".</u>

B. COASTAL ECOLOGY

The Coastal Ecology project has three main objectives: 1) Estimate the extent and magnitude of ecological change in the SCB, 2) Determine the trends in extent and magnitude of ecological change in the SCB, and 3) Determine the mass balance of pollutants that currently reside within the SCB. To answer these questions, a probability based design was selected in order to apply statistical analyses to these questions. The tables in this project are intended to support those analyses by providing data at the replicate level and including QA/QC data within the tables themselves.

tbISedimentGrabEvent

PURPOSE: The sediment grab event table documents all relevant information about each grab sample collected. The attributes of the grab are described including the geographic position to ensure that each grab met all of the sampling guidelines. Each successful grab will generate a record containing data used to describe the

characteristics of the sediment collected in terms of the latitude, longitude, date, time, color, composition, odor, penetration, the presence or absence of shell hash, and the usage for the individual grab.

TABLE GUIDELINES:

- The combination of the fields StationID, SampleDate, SampleTime, GrabEventNumber, and SamplingOrganization ensure unique values for each record in the table.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblSedimentGrabEvent for submission to the Bight'08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblSedimentGrabEvent

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from the station table.
SampleDepth	Double	Y		The sample depth expressed in meters
SampleDepthUnits	Text	Y	15	From luList28_Units. <u>Default = "m"(meters)</u>
SampleDate	Date/Time	Y		The date the sample was collected. Format dd-mmm-yyyy
SampleTime	Date/Time	Y		The time the sample was collected expressed as 24 hour time (hh:mm).
SampleTimeZone	Text	Y	10	The time zone of the arrival time. From luList42_TimeZoneCodes.
GrabEventNumber	Integer	Y		Sequential number of each grab
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes.
GearCode	Text	Y	25	From luList03_EquipmentCodes.
Latitude	Decimal	Y		Degrees to <u>5 decimal places</u> (NAD83).
Longitude	Decimal	Y		Degrees to <u>5 decimal places</u> (NAD83) expressed as a <u>negative number</u> .
Datum	Text	Y	10	The datum on which the latitude and longitude are based. <u>The default =</u>

<u>NAD83.</u>				
Penetration	Integer	Y		Penetration of the grab into the sediment expressed in cm.
PenetrationUnits	Text	Y	15	From luList28_Units. <u>The default value is cm.</u>
Color	Text	Y	20	Color of the sediment from luList18_SedimentColors. <u>The default is "Olive Green"</u>
Composition	Text	Y	20	Composition of the sediment from luList06_SedimentCompositionCodes.
Odor	Text	Y	30	Odor of the sediment from luList07_OdorCodes.
BenthicInfauna	Yes/No	Y	1	Was this grab used for collecting Benthic Infauna?
SedimentChemistry	Yes/No	Y	1	Was this grab used for testing Sediment Chemistry?
Toxicity	Yes/No	Y	1	Was this grab used for testing Toxicity?
GrainSize	Yes/No	Y	1	Was this grab used for testing Grain Size?
DistanceToTarget	Decimal	N		Distance from target location in meters
GrabFailCode	Text	Y	25	From luList40_EventFailCodes. <u>Default = "None"</u>
Comments	Text	N	100	Additional remarks relative to the grab.

tblChemistryBatchData

PURPOSE: This table contains information about preparation methods and dates within each lab. A batch is defined as a group of samples with which the QA results are associated. For some labs, QA data is associated with the preparation batch while other labs associate the QA data with analytical batches. Samples prepared in the same batch may move through the lab in different analytical batches. To minimize redundant data entry, the preparation batch information has been broken off into a separate table and is related to the tblChemistryResults through the PreparationBatchID code. Each record in this table represents all information common to each preparation batch.

TABLE GUIDELINES:

- The PreparationBatchID and LabCode fields will ensure that each record in the table is unique.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblChemistryBatchData for submission to the Bight'08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblChemistryBatchData

Field Name	Type	Required	Size	Description
PreparationBatchID	Text	Y	50	The code for all of the samples processed in the same preparation batch
PreparationCode	Text	Y	50	The PreparationCode from luList25_PreparationCodes
PreparationDate	Date/Time	Y		The date the sample was extracted expressed as dd-mmm-yyyy
LabCode	Text	Y	10	Agency code from luList01_AgencyCodes
Comments	Text	N	100	Additional comments

tblChemistryResults

PURPOSE: The purpose of the chemistry results table is to document the analysis results for sediment chemistry and sediment grain size (other sample types such as tissue or water chemistry may be added at a later time). Each record represents a result from a specific analysis for a particular parameter at a single station or a single QA sample. This table will also contain all supporting QA sample results.

This table contains some information that will be derived from field data in order to facilitate data analysis. These fields are not required and may be loaded at a later time by the IMO. The fields include: DiscreteSampleDepth, DiscreteSampleDepthUnits, SampleTime, and SampleTimeUnits.

SPECIAL CASES:

Results vs. TrueValue:

The reported result is the number gathered from the analytical instrument. The "True Value" is the concentration of the parameter in the reference sample. The purpose of the "True Value" is to facilitate the calculation of percent recovery. The True Value is only reported for matrix spikes and surrogates. A True Value of –99 will be reported for all other samples.

The range values for the minimum and maximum for parameters in the certified reference material will be carried in an ancillary table within the analytical database and will not be described here.

Matrix spikes:

The reported result is the number gathered from the instrument and is the net amount recovered from the sample after being corrected for the concentration from the non-spiked sample. For spiked samples the "True Value" is the concentration of the parameter added to the sample before analysis. Percent recovery will be calculated by dividing the result by the True Value times 100. The SampleType must be MS or MSD and the same LabSampleIDs must be used for both.

Recovery corrected data:

This is not reported because it can be calculated using the True Value of the reference material processed within the same batch.

Lab Replicates:

Lab replicates are defined as replicate samples taken from the same jar. The result for each replicate will be numbered starting at one, e.g. the result for the first replicate will have a LabReplicate of 1 and the result for the second duplicate will have a LabReplicate of 2, etc. Replicate samples taken in the field will have separate FieldDuplicate numbers and a LabReplicate of 1.

Non-Detects:

If the result is not reportable, a qualifier of "ND" should be used and the result reported as –99. In the case where the result is below method detection level or below the reporting level, but is being reported anyway, a qualifier of BMDL (below method detection limit) or BRL (below reporting level) should be used and the result reported.

QA Samples:Sediment Chemistry:

QA samples not performed on site collected sediment samples will be given a StationID of "0000". All site collected sediment samples will retain the StationID relative to the origin of the sample. QA SampleTypes include one of the following values: CRM-016, CRM-540, FEB, LCM, MB, MS, MSD, SRM-1944 (see luList04_SampleTypes for definitions). All non-QA records should have a SampleType of "Result".

Grain Size Parameter Codes:

The Gravel2m code is the percentage of the sediment sample retained on a 2-mm sieve. If no sediments are retained, the value will be zero. The other parameter codes refer to the percentage of sample in the size range. These data should not be adjusted for material retained on the sieve. Optional parameter codes to describe the statistical properties of the laser analyzer are included and may be reported. Default unit is percent under phi size. (check with infauna group microns vs phi)

Units:

Values expressed in parts per billion will carry the unit tag of UG/KG (organics). Values expressed in parts per million will carry the unit tag of MG/KG (metals).

TABLE GUIDELINES:

- The combination of the fields StationID, SampleDate, PreparationBatchID, Matrix, SampleType, ParameterCode, FieldDuplicate, LabReplicate, LabSampleID and LabCode will ensure that all records in the table are unique.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblChemistryResults for submission to the Bight'08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblChemistryResults

<i>Field Name</i>	<i>Type</i>	<i>Required</i>	<i>Size</i>	<i>Description</i>
StationID	Text	Y	25	A geographic location label from tblStations.
DiscreteSampleDepth	Decimal	*		Required only for water chemistry. Depth within water column Report as -99 for sediment.
DiscreteSampleDepthUnits	Text	*	15	From luList28_Units.
SampleDate	Date/Time	Y		The date the sample was collected expressed as dd-mmm-yyyy.
SampleTime	Date/Time	Y		The time the sample was collected expressed as 24 hour time hh:mm.
SampleTimeZone	Text	Y	10	The time zone of the arrival time. From luList42_TimeZoneCodes.

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Field Name	Type	Required	Size	Description
BioaccumulationSampleID	Text	*	50	*Required for tissue samples. Must match the BioaccumulationSampleID in the bioaccumulation organism table.
PreparationBatchID	Text	Y	50	A unique agency identifier for each batch of samples prepared together.
AnalysisBatchID	Text	Y	25	The code for all samples processed in the same batch
AnalysisMethod	Text	Y	75	The analysis method from luList24_AnalysisMethods
AnalysisDate	Date/Time	Y		The date the sample was processed in the instrument expressed as dd-mm-yyyy
Matrix	Text	Y	25	The test material from luList14_TestMatrices.
SampleType	Text	Y	10	The type of QA or sample result from luList04_SampleTypes.
ParameterCode	Text	Y	50	The measured parameter from luList15_ParameterCodes.
Qualifier	Text	N	10	Any necessary qualifier from luList11_QualifierCodes.
Result	Text	Y		The measured result from the sample analysis.
Units	Text	Y	15	Units for the result from LuList28_Units.
MeasurementBasis	Text	Y	2	Dry weight (DW) for sediment or wet weight (WW) for tissue. From luList17_MeasurementBasisCodes.
FieldDuplicate	Integer	Y		Count from the field.
LabReplicate	Integer	Y		Count from the laboratory.
LabSampleID	Text	Y	25	Unique sample identifier for the reporting agency. Replicates and MS/MSD must have the same LabSampleID.
TrueValue	Decimal	*		Required for all Spiked Samples and surrogates.
MDL	Decimal	Y		Method Detection Limit based on 40CFR136.

Field Name	Type	Required	Size	Description
RL	Decimal	Y		Reporting Level as defined in metadata.
LabCode	Text	Y	15	Agency code from luList01_AgencyCodes.
Comments	Text	N	100	Additional remarks.

tblInfaunalAbundance

PURPOSE: The purpose of the infaunal abundance table is to document the numerical presence of all infaunal animals collected at a station. Each record represents the abundance of a particular infaunal species in an individual sample and the agency that collected the species.

The exclude code is explained below. If the agency wishes to separate adults and juveniles of the same species, the number of juveniles can be carried in the comments field, but the abundance number will reflect the total number of animals of that species at that station.

The species field should contain genus and species names free of any punctuation, including, periods, commas, and quotation marks. The ScreenSize field refers to the size screen used to process the sample on board ship and is carried for historical purposes.

Exclude Notation

Purpose: Provides an aid to data analysis when calculating metrics using the number of taxa present (e.g., diversity, species richness). This field in the final data set represents the taxonomist's recommendation that the reported taxon be excluded from counts of the number of taxa reported in the sample.

Rule of Use: The Exclude annotation is made on the bench sheet whenever a taxon should be excluded from counts of the number of taxa reported in the sample. This annotation is employed when three conditions co-exist:

The identification is not at the species-level (e.g., Pleustidae or *Polydora* sp).

And

The reported taxon is represented in the sample by other members of its taxon, which have been identified at lower levels.

And

The taxonomist cannot determine if the specimen is distinct from the other members of its taxon represented in the sample.

It is necessary that the taxonomists make this evaluation during sample analysis (*i.e.*, by annotation of the bench sheet). It cannot be effectively applied after the fact, as there is no way of determining later whether the third criterion for use was met.

TABLE GUIDELINES:

- The combination of StationID, Replicate, SampleDate, Subcore, Species, and LabCode will ensure that each record in the table is unique.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblInfaunalAbundance for submission to the Bight'08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblInfaunalAbundance

<i>Field Name</i>	<i>Type</i>	<i>Required</i>	<i>Size</i>	<i>Description</i>
StationID	Text	Y	25	A geographic location label from tblStations.
SampleID	Text	N	10	The laboratory internal sample identifier if any.
Replicate	Integer	Y		The sequential number of the grab. The field may contain a one if there are no replicates.
SampleDate	Date/Time	Y		The date the sample was collected expressed as dd-mmm-yyyy
Subcore	Text	Y	10	The subcore the sample represents (A, B or C). <u>The default is "None".</u>
Species	Text	Y	50	The species of infauna collected from luList09_SpeciesList.
Qualifier	Text	N	10	Any qualifier pertaining to the abundance from luList11_QualifierCodes (special

				case p for colonials to indicate their presence only).
Abundance	Integer	Y		The number of individuals (0 for colonials).
Exclude	Yes/No	Y		Flag to exclude from the analysis.
LabCode	Text	Y	15	The agency code from luList01_AgencyCodes.
ScreenSize	Text	Y	3	Sieve size in mm. The default for this project is 1.0.
ScreenSizeUnits	Text	Y	15	From luList28_units. <u>The default will be millimeters (mm)</u>
Voucher	Integer	N		The number of animals vouchered of this species from this station.
Comments	Text	N	100	Additional comments.

tbIToxicityBatchInformation

PURPOSE: This table is used to record information specific to each test batch processed in the laboratory and is used as supporting documentation for the Toxicity Test data. Each record represents specific information common to a group of samples processed at the same time and is pertinent to all replicates processed. This is QA/QC data needed to document the test results.

TABLE GUIDELINES:

- Each record will be unique based on a combination of the fields QABatch, LabCode and TestDuration.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tbIToxicityBatchInformation for submission to the Bight'08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tbIToxicityBatchInformation

<i>Field Name</i>	<i>Type</i>	<i>Required</i>	<i>Size</i>	<i>Description</i>
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QABatch	Text	Y	50	The batch code for the sample processing batch.
LabCode	Text	Y	15	The agency code from luList01_AgencyCodes of the processing laboratory.
Species	Text	Y	50	The species code from luList34_ToxicitySpecies.
Protocol	Text	Y	50	The test protocol from luList35_ToxicityProtocols.
TestDate	Date/Time	Y		The starting date of the test expressed as dd-mm-yyyy.
Matrix	Text	Y	50	The test matrix from luList36_ToxicityMatrices.
TestDuration	Decimal	Y		The duration of the test expressed in days.
TestDurationUnits	Text	Y	15	From luList28_Units (Days or Hours).
Temperature	Decimal	Y		The temperature at which the test was conducted (degrees C).
TemperatureUnits	Text	Y	15	From luList28_Units.
TestAcceptability	Text	Y	50	Evaluation of the test results from luList39_ToxicityTestAcceptabilityCodes.
Comments	Text	N	100	Additional remarks.

tbIToxicityResults

PURPOSE: The Toxicity Results table carries data relevant to sediment or water toxicity tests and their replicates. Each record represents the results of an individual replicate for an individual species processed in a batch of replicates.

TABLE GUIDELINES:

- Each record will be unique based on a combination of the fields StationID, SampleType, QABatch, LabCode, Species, Dilution, Concentration and LabRep.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tbIToxicityResults for submission to the Bight'08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tbIToxicityResults

<i>Field Name</i>	<i>Type</i>	<i>Required</i>	<i>Size</i>	<i>Description</i>
StationID	Text	Y	25	A geographic location label from the station table.
SampleDepth	Decimal	N		Depth the sample was taken.
SampleDepthUnits	Text	*	15	Unit the sample depth was measured. From

luList28_Units. *Required if SampleDepth present				
SampleType	Text	Y	50	Sample type from luList04_SampleTypes.
QABatch	Text	Y	50	Batch number for batch processed samples.
Matrix	Text	Y	50	The test matrix from luList36_ToxicityMatrices.
LabCode	Text	Y	15	The agency code from luList01_AgencyCodes.
Species	Text	Y	50	Test species from luList34_ToxicitySpecies.
Dilution	Decimal	Y		The dilution factor expressed as a proportion. Report as –99 for stations with no dilution factor.
Concentration	Decimal	Y		Concentration in mg/L. Report as –99 for stations with no concentration.
ConcentrationUnits	Text	Y	15	From luList28_Units.
EndPoint	Text	Y	50	The type of end point from luList37_ToxicityEndPoints.
LabRep	Integer	Y		Count.
Value	Decimal	Y		The numerical result of the test.
ValueUnits	Text	Y	15	The units of the value from luList28_Units.
QACode	Text	Y	50	The quality assurance code from luList39_ToxicityTestAcceptabilityCodes.
Comments	Text	N	100	Additional remarks.

tbIToxicityWQ

PURPOSE: This table is used to document water quality during the course of a toxicity test. Each record represents a measurement of an individual water quality parameter at a specific time interval during the course of the test batch.

TABLE GUIDELINES:

- Each record will be unique based on a combination of the fields StationID, QABatch, Matrix, Dilution, Concentration, TimePoint, Parameter, LabRep, and LabCode.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tbIToxicityWQ for submission to the Bight'08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tbIToxicityWQ

<i>Field Name</i>	<i>Type</i>	<i>Required</i>	<i>Size</i>	<i>Description</i>
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StationID	Text	Y	25	A geographic location label from the station table.
QABatch	Text	Y	50	The batch code for the sample processing batch.
Matrix	Text	Y	50	The test matrix from luList36_ToxicityMatrices.
Dilution	Decimal	Y		The dilution factor expressed as a proportion.
Concentration	Decimal	Y		Concentration expressed in mg/L.
ConcentrationUnits	Text	Y	15	From luList28_Units.
TimePoint	Decimal	Y		The number of days from the start of the test. TimePoints done before the start of the tests can be negative.
Parameter	Text	Y	50	The water quality parameter being measured from luList15_ParameterCodes.
Qualifier	Text	N	10	Any necessary qualifier from luList11_QualifierCodes.
Value	Decimal	Y		The numerical result for the parameter.
ValueUnits	Text	Y	15	Any necessary qualifier from luList28_Units.
LabRep	Integer	Y		The number of the replicate in which the measurement was taken. Report "0" for surrogate chambers.
LabCode	Text	Y	15	From luList01_AgencyCodes.
Comments	Text	N	100	Additional remarks.

tblToxicitySummaryResults

PURPOSE: This table is used to document the final determination of toxicity for each station. This table has been added to make the results easier to interpret by the final end users of the data set. SCCWRP will generate this table after all other toxicity data has been submitted.

TABLE GUIDELINES:

- Each record will be unique based on a combination of the fields StationID, Species, and LabCode.

EXAMPLE DATA:

TABLE STRUCTURE:

**NEED INPUT FROM TOX COMMITTEE
MIGHT WANT TO COMPARE WITH SWAMP**

tblToxicitySummaryResults

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from the station table
LabCode	Text	Y	15	From luList01_AgencyCodes.
SampleType	Text	Y	10	Type of sample. Refer to luList04
QABatch	Text	Y	50	Identifier to match samples analyzed as a group
Species	Text	Y	50	Code of species or type of biological system used for the toxicity test; refer to luList34.
Dilution	Decimal	N		The dilution factor expressed as a proportion.. When not required, complete with -99.
Concentration	Decimal	N		Concentration in mg/L. When not required, complete with -99
EPCode	Text	Y	10	The type of endpoint for the test. Refer to luList37
Units	Text	Y	15	The units for the endpoint from luList28_Units.
StatisticalTest	Text	Y	50	The statistical method used to determine toxicity.
Mean	Decimal	Y		The mean value for the test and sample generated from the lab replicates in tblCoreToxicityResults
N	Integer	Y		The number of replicates used to calculate mean and standard deviation from the lab replicates in tblCoreToxicityResults
StdDev	Decimal	Y		The standard deviation for the test and sample generated from the lab replicates in tblToxicityResults
PctControl	Decimal	Y		The mean expressed as a percentage of the mean for the control (i.e., mean of the lab replicates divided by the mean for the control and multiplied by 100)
SigEffect	Text	Y	5	Statistically significant effect based on control response. From luList41_ControlResponses
QACode	Text	Y	10	The quality assurance code for the analysis. Refer to luList39
Comment	Text	N	100	Note comments on statistical test used if known (e.g. ANOVA, t-test, etc.)

tblTrawlAssemblageEvent

PURPOSE: The purpose of the trawl data table is to document the track of all trawls conducted during the course of the project and the type of samples collected for each trawl. Each record represents a record of an individual trawl track.

There are four positions recorded during a trawl; net over, net on the bottom, end of trawl, and net on deck. The first and last positions are recorded for Quality Assurance

purposes. The time is recorded for each of these positions. The latitude and longitude are recorded for all of the positions in terms of decimal degrees.

TABLE GUIDELINES:

- The combination of StationID, SampleDate, SamplingOrganization, and TrawlNumber ensure that each record in the table will be unique.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblTrawlAssemblageEvent for submission to the Bight'08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblTrawlAssemblageEvent

<i>Field Name</i>	<i>Type</i>	<i>Required</i>	<i>Size</i>	<i>Description</i>
StationID	Text	Y	25	A geographic location label from the station table.
SampleDate	Date/Time	Y		The date the sample was collected expressed as dd-mmm-yyyy.
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes.
GearCode	Text	Y	25	From luList03_EquipmentCodes.
TrawlNumber	Integer	Y		The sequence number of the trawl at the station. <u>Default = 1</u>
TrawlLength	Decimal	Y		Trawl distance from start of trawl to end of trawl in meters. (Field Computer computes this value).
Datum	Text	Y	10	The datum on which the latitude and longitude are based (default is NAD83).
OverTime	Date/Time	Y		The time the net was deployed expressed as 24 hour time (hh:mm).
OverTimeZone	Text	Y	10	The time zone of the arrival time. From luList42_TimeZoneCodes.
OverLatitude	Decimal	Y		Decimal Degrees to five places (NAD 83).
OverLongitude	Decimal	Y		Decimal Degrees to five places (NAD 83) expressed as a negative number.

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StartTime	Date/Time	Y		The time the net started fishing expressed as 24 hour time (hh:mm).
StartTimeZone	Text	Y	10	The time zone of the arrival time. From luList42_TimeZoneCodes.
StartLatitude	Decimal	Y		Decimal Degrees to five places (NAD 83).
StartLongitude	Decimal	Y		Decimal Degrees to five places (NAD 83) <u>expressed as a negative number.</u>
StartDepth	Decimal	Y		The depth at the start of trawl in meters.
StartDepthUnits	Text	Y	15	From list28 Units.
WireOut	Integer	Y		The length of wire out expressed in meters.
WireOutUnits	Text	Y	15	From luList28_Units.
EndTime	Date/Time	Y		The time the net finish fishing expressed as 24 hour time (hh:mm).
EndTimeZone	Text	Y	10	The time zone of the arrival time. From luList42_TimeZoneCodes.
EndLatitude	Decimal	Y		Decimal Degrees to five places (NAD 83).
EndLongitude	Decimal	Y		Decimal Degrees to five places (NAD 83) expressed as a negative number.
EndDepth	Number	Y		The depth at the end of the trawl in meters.
EndDepthUnits	Text	Y	15	From luList28_Units.
DeckTime	Date/Time	Y		The time the net is recovered and on deck expressed as 24 hour (hh:mm).
DeckTimeZone	Text	Y	10	The time zone of the arrival time. From luList42_TimeZoneCodes.
DeckLatitude	Decimal	Y		Decimal Degrees to five places (NAD 83).
DeckLongitude	Decimal	Y		Decimal Degrees to five places (NAD 83) expressed as a negative number.
TrawlFailCode	Text	Y	25	From luList40_EventFailCodes. <u>Default = "None"</u>
ArchivalDataTag	Yes/No	Y		Is there Archival data associated with this trawl? <u>Default = "No"</u>

ArchivalTagManufacturer	Text	*	50	Who manufactured the archival data tag. Required if ArchivalDataTag was used.
ArchivalTagNumber	Text	*	50	Tag number listed on tag or generated by user. Required if ArchivalDataTag was used.
DistanceToTarget	Decimal	Y		Distance from target location in meters
DistanceToTargetUnits	Text	Y	15	Default is "m"(meters). From luList_28_Units
Comments	Text	N	100	Additional comments relative to the trawl.

tblArchivalDataTag

PURPOSE: This table is used to record temperature and depth information specific to each trawl. Each record represents specific information collected at a certain time and depth. This is QA/QC data needed to document actual time a trawl net spends on the bottom of the ocean.

TABLE GUIDELINES:

- Each record will be unique based on a combination of the fields StationID, SamplingOrganization, TrawlNumber, SampleDate and Time.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblArchiveDataTag for submission to the Bight 08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblArchiveDataTag

<i>Field Name</i>	<i>Type</i>	<i>Required</i>	<i>Size</i>	<i>Description</i>
StationID	Text	Y	25	A geographic location label from tblStations.
SamplingOrganization	Text	Y	10	From luList01_AgencyCodes.

TrawlNumber	Integer	Y		The sequential number of the trawl. The field may contain a one if there are no replicates.
SampleDate	Date/Time	Y		The date recorded by the instrument/sensor expressed as dd-mmm-yyyy.
Time	Date/Time	Y		The time recorded by the instrument/sensor expressed as hh:mm:ss (include seconds).
TimeZone	Y	10		The time zone of the arrival time. From luList42_TimeZoneCodes.
Temperature	Number	Y		The temperature recorded by the instrument/sensor.
TemperatureUnit	Text	Y		From luList28_Units.
Depth	Decimal	Y		The pressure/depth recorded by the instrument/sensor.
DepthUnit	Text	Y	15	From luList28_Units (psi, dbar, meters, etc.).
SensorCategory	Text	Y	1	Description of trawl event based on sensor pressure data: S=surface, D=descent, B=bottom, R=Retrieval.
BoatCategory	Text	Y	2	Description of trawl event based on boat/fieldcrew trawl assemblage event table: SB=surface, DB=descent, BB=bottom, RB=Retrieval.
Comments	Text	N	100	Additional comments.

tblTrawlDebris

PURPOSE: The purpose of the trawl debris table is to document the type and amount of debris encountered during each trawl.

TABLE GUIDELINES:

- The combination of StationID, SampleDate, TrawlNumber, SamplingOrganization and DebrisType ensures that each record in the table will be unique.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblTrawlDebris for submission to the Bight'08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblTrawlDebris

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from the station table.
SampleDate	Date/Time	Y		The date the sample was collected expressed as dd-mmm-yyyy.
TrawlNumber	Integer	Y		The number of the trawl from which the sample was collected.
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes
DebrisType	Text	Y	25	Debris type from luList31_TrawlDebrisType. Comment required if "Other"
AbunEstimate	Text	Y	10	Estimated numerical abundance code from luList32_TrawlDebrisAbundanceEstimates.
WtEstimate	Text	Y	10	Estimated weight of debris code from luList33_TrawlDebrisWeightEstimates.
Comments	Text	*	100	Additional remarks. Required if DebrisType = "Other".

tblTrawlFishAbundance

PURPOSE: The purpose of the trawl fish abundance table is to document the number of individuals of each species within a size class from a successful trawl. Gross pathology of these fish will be checked and recorded as anomalies. Each record represents the number of fish in a particular size class of a particular species and a particular anomaly state.

Each fish is measured individually and examined for anomalies. In the event that anomalies are found in combination, use the codes for anomaly combinations from luList 22_TrawlFishAnomalyCodes.

TABLE GUIDELINES:

- The combination of the fields StationID, SampleDate, SamplingOrganization, TrawlNumber, Species, SizeClass, and Anomaly will ensure that each record is unique in the table.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblTrawlFishAbundance for submission to the Bight'08 online system.

EXAMPLE DATA: Although the Trawl Fish Abundance table is simple in structure, the actual application is sometimes confusing, and so an example is included to clarify the use of this table. In this example the collected species was *Paralabrax nebulifer*. There were five fish in size class 10, one of which has a lesion. There were 2 fish in size class 11, both of which have no anomalies.

TABLE STRUCTURE:

tblTrawlFishAbundance

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from the station table.
SampleID	Text	N	10	The laboratory internal sample identifier.
SampleDate	Date/Time	Y		The date the sample was taken expressed as dd-mmm-yyyy.
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes.
TrawlNumber	Integer	Y		The sequential number of the trawl taken at the station.
Species	Text	Y	50	The species being measured from luList09_SpeciesList.
SizeClass	Integer	Y		The size class into which the fish falls expressed in cm.
AbundanceQualifier	Text	N	10	Any necessary qualifier from luList11_QualifierCodes.
Abundance	Integer	Y		The number of fish in the size class.
Anomaly	Text	Y	20	Any present anomaly or combination of anomalies from luList22_TrawlFishAnomalies.
BodyLocation	Text	N	50	From luList29_FishBodyLocations.
Comments	Text	N	100	Additional remarks.

tblTrawlFishBiomass

PURPOSE: The purpose of this table is to document the collective weight of each fish species in all size classes collected in the trawl used for assemblage.

The biomass will be recorded to a single decimal place. The “units” field default value is kg and is carried to document the units used in this survey for historical purposes. If a species group weighs less than 0.1 kg it will be recorded as < 0.1 kg and be retained and weighed with other species groups that fall into this weight category. A single record will be entered with the species name “CompositeWt” for each station that had at least two species groups weighing less than 0.1 kg. This is essential for computing a total biomass of fish for the trawl.

TABLE GUIDELINES:

- The combination of the fields StationID, SampleDate, SamplingOrganization, TrawlNumber, and Species will ensure that each record is unique in the table.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblTrawlFishBiomass for submission to the Bight’08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblTrawlFishBiomass

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from tblStations.
SampleID	Text	N	10	The laboratory internal sample identifier.
SampleDate	Date/Time	Y		The date the sample was collected expressed as dd-mmm-yyyy.
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes.
TrawlNumber	Integer	Y		The sequential number of the trawl at that station.
Species	Text	Y	50	The species measured from luList09_SpeciesList.
BiomassQualifier	Text	N	10	Any necessary qualifier from luList11_QualifierCodes.
Biomass	Decimal	Y		The weight of the collected members of the species in kg.

Field Name	Type	Required	Size	Description
BiomassUnits	Text	Y	15	The units used for the weight, normally KG, from LuList28_Units.
Comments	Text	N	100	Additional comments.

tblTrawlInvertebrateAbundance

PURPOSE: The trawl invertebrate abundance table is used to document the numerical abundance of megabenthic invertebrates collected in trawls used for assemblage characterization. Each record represents the abundance and occurrence of anomalies in an individual species.

The qualifier field may carry an “A” indicating that the abundance was estimated by aliquot. In the case of certain species like urchins, where very large numbers of individuals may be encountered, a number (100 or 200 for example) may be weighed and the total haul number estimated from the total weight.

TABLE GUIDELINES:

- The combination of the fields StationID, SampleDate, SamplingOrganization, TrawlNumber, Species, and Anomaly will ensure that each record is unique in the table.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblTrawlInvertebrateAbundance for submission to the Bight’08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblTrawlInvertebrateAbundance

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from tblStations.
SampleID	Text	N	10	The laboratory internal sample identifier.
SampleDate	Date/Time	Y		The date the sample was collected expressed as dd-mmm-yyyy.
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes.

TrawlNumber	Integer	Y		The sequential number of the trawl taken at that station.
Species	Text	Y	50	Scientific names of collected invertebrates from luList09_SpeciesList.
AbundanceQualifier	Text	N	10	A qualifier from luList11_QualifierCodes.
Abundance	Integer	Y		Number of individuals of the species.
Anomaly	Text	Y	30	Anomaly from luList23_InvertebrateAnomalyCodes recorded as None if no anomaly. <u>Default = "None"</u>
Comments	Text	N	100	Additional remarks.

tblTrawlInvertebrateBiomass

PURPOSE: The purpose of the trawl invertebrate biomass table is to record the collective biomass of each megabenthic invertebrate species collected at a trawl station. Each record represents the collective biomass of an individual species expressed in kilograms.

As with the fish biomass, the biomass of megabenthic invertebrates will be recorded to a single decimal place. The “units” field default value is kg and is carried to document the units used in this survey for historical purposes. If a species group weighs less than 0.1 kg it will be recorded as < 0.1 kg and be retained and weighed with other species groups that fall into this weight category. A single record will be entered with the species name “CompositeWt” for each station that had at least two species groups weighing less than 0.1 kg. This is essential for computing a total biomass of megabenthic invertebrates for the trawl.

TABLE GUIDELINES:

- The combination of the fields StationID, SampleDate, SamplingOrganization, TrawlNumber, and Species will ensure that each record is unique in the table.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblTrawlInvertebrateBiomass for submission to the Bight’08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblTrawlInvertebrateBiomass

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from tblStations.
SampleID	Text	N	10	The laboratory internal sample identifier.
SampleDate	Date/Time	Y		The date the sample was collected expressed as dd-mmm-yyyy.
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes.
TrawlNumber	Integer	Y		The sequential number of the trawl at that station from which assemblage data was collected expressed as dd-mmm-yyyy.
Species	Text	Y	50	The species being measured from luList09_SpeciesList.
BiomassQualifier	Text	N	10	Any necessary qualifier code from luList11_QualifierCodes. <u>Default = "None"</u>
Biomass	Decimal	Y		The weight of the collected individual species expressed in KG <u>to 1 decimal places</u>
BiomassUnits	Text	Y	15	Normally KG from luList28_Units.
Comments	Text	N	100	Additional comments.

B. ROCKY HABITAT

tblDiveEvent

PURPOSE: The dive event table documents all relevant information about each dive survey conducted. The attributes of the dive are described including the geographic position to ensure that each dive meets all of the sampling guidelines. Each successful dive will generate a record containing data used to describe the characteristics of the dive in terms of the latitude, longitude, date, sampling organization and what surveys were conducted at the time of the dive.

TABLE GUIDELINES:

- The combination of the fields StationID, SampleDate, SamplingOrganization, Replicate, Side and DepthZone ensure unique values for each record in the table.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblDiveEvent for submission to the Bight 08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblDiveEvent

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from the station table.
SampleDate	Date/Time	Y		The date the sample was collected. Format dd-mmm-yy
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes.
DiveReplicate	Integer	Y		Sequential number of each dive.
Side	Text	Y	10	From luList43_DiveSurveySide.
DepthZone	Text	Y	15	From luList44_DiveSurveyDepthZone (inner, middle, outer and deep).
Heading	Integer	Y		Heading direction in compass degrees (0-360).
Temperature	Decimal	N		The temperature in C to the nearest one decimal place.
TemperatureUnits	Text	*	15	From luList28_Units. <u>Default = "°C"(celsius)</u>
Visibility	Integer	N		The visibility to the nearest meter.
VisibilityUnits	Text	*	15	From LuList28_Units. <u>Default = "m"(meters)</u>
Surge	Integer	N		The surge of the water.
SurgeUnits	Text	*	15	From LuList28_Units. <u>Default = "m"(meters)</u>
Datum	Text	Y	10	The datum on which the latitude and longitude are based. <u>The default = NAD83.</u>
Latitude	Decimal	Y		Degrees to <u>5 decimal places</u> .
Longitude	Decimal	Y		Degrees to <u>5 decimal places</u>

Field Name	Type	Required	Size	Description
				expressed as a <u>negative number</u> .
SurveyStartTime	Date/Time	Y		The time at the start of the survey expressed in 24 hr time (hh:mm).
SurveyStartTimeZone	Text	Y	10	The time zone of the arrival time. From luList42_TimeZones.
SurveyDepth	Decimal	Y		The actual survey depth (expressed in meters <u>to one decimal place</u>).
SurveyDepthUnits	Text	Y	15	From luList28_Units. <u>Default = "m"(meters)</u>
FishAbundance	Yes/No	Y	1	Was fish abundance done in this dive event?
Swath	Yes/No	Y	1	Was swath done in this dive event?
UniformPointContact	Yes/No	Y	1	Was Uniform Point Contact done in this dive event?
Urchins	Yes/No	Y	1	Were urchins measured in this dive event?
DiveFailCode	Text	Y	15	From luList40_EventFailCodes. <u>Default = "None"</u>
DistanceToTarget	Decimal	N		Distance from target in meters.
DiveEventComments	Text	N	100	Additional remarks.

tblDiveFishAbundance

PURPOSE: The purpose of the dive fish abundance table is to document the number of individuals in each size class in each species from four replicates within each depth zone. Each record represents the number of fish in a particular size class of a particular species.

Fish are counted and their sizes (total length) estimated to the nearest cm in small fish and the nearest 5cm in larger fish (>15cm).

TABLE GUIDELINES:

- The combination of the fields StationID, SampleDate, SamplingOrganization, DiveReplicate, DepthZone, Level, Species and SizeClass will ensure that each record is unique in the table.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblDiveFishAbundance for submission to the Bight 08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblDiveFishAbundance

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from the station table.
SampleDate	Date/Time	Y		The date the sample was taken expressed as dd-mmm-yyyy.
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes.
DiveReplicate	Integer	Y		The sequential number of the dive taken at the station.
DepthZone	Text	Y	15	From luList44_DiveSurveyDepthZone (inner, middle, outer and deep).
Level	Text	Y	15	From luList45_DiveSurveyLevels (benthic, middepth or canopy).
Species	Text	Y	50	The species being measured from luList46_DiveSurveySpecies.
EstimatedLength	Integer	Y		The estimated total length class into which the fish falls expressed in cm.
EstimatedLengthUnits	Text	Y	15	From luList28_Units. <u>Default = "cm"</u> <u>(centimeters)</u>
Abundance	Integer	Y		The number of fish in the estimated length class.
AbundanceQualifier	Text	N	4	Any necessary qualifier from luList11_QualifierCodes. Counted or estimated.
DiveFishAbunComments	Text	N	100	Additional remarks.

tblDiveUniformPointContact

PURPOSE: To estimate the substrate type, substrate relief and benthic organisms. Each record represents the substrate type, substrate relief and benthic organisms at one meter marks within the 30 meter transect.

TABLE GUIDELINES:

- The combination of the fields StationID, SampleDate, SamplingOrganization, DiveReplicate, Meter, Zone and BenthicReefSpecies will ensure that each record is unique in the table.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblDiveUniformPointContact for submission to the Bight 08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblDiveUniformPointContact

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from the station table.
SampleDate	Date/Time	Y		The date the sample was taken expressed as dd-mmm-yyyy.
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes.
DiveReplicate	Integer	Y		The sequential number of the dive taken at the station.
Meter	Integer	Y		Meter at which the Uniform Point Contact was measured.
DepthZone	Text	Y	15	From luList44_DiveSurveyDepthZone (inner, middle, outer and deep).
BenthicReefSpecies	Text	Y	50	The species being measured from luList46_DiveSurveySpecies.
Substrate	Text	Y	50	Substrate types include bedrock ($\geq 1\text{m}$), boulder (1m), cobble ($\leq 10\text{cm}$) or sand
Relief	Text	Y	50	The maximum relief within a rectangle centered on the point that is 0.5 meter along the tape and 1m wide. Clarify units.
UPCComments	Text	N	100	Additional remarks.

tbIDiveSwath

PURPOSE: To estimate the density of conspicuous, solitary and mobile invertebrates as well as specific macroalgae. Each record represents the segment and species within the 30 meter transect.

TABLE GUIDELINES:

- The combination of the fields StationID, SampleDate, SamplingOrganization, DiveReplicate, Segment, DepthZone and BenthicReefSpecies will ensure that each record is unique in the table.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tbIDiveSwath for submission to the Bight 08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tbIDiveSwath

<i>Field Name</i>	<i>Type</i>	<i>Required</i>	<i>Size</i>	<i>Description</i>
StationID	Text	Y	25	A geographic location label from the station table.
SampleDate	Date/Time	Y		The date the sample was taken expressed as dd-mmm-yyyy.
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes.
DiveReplicate	Integer	Y		The sequential number of the dive taken at the station.
Segment	Text	Y	15	Segment in which counts were taken (0-10, 10-20, 20-30)
DepthZone	Text	Y	15	From luList44_DiveSurveyDpthZone (inner, middle, outer and deep).
BenthicReefSpecies	Text	Y	50	The species being measured from luList46_DiveSurveySpecies.
Abundance	Integer	Y		Number of organisms within each species.
AbundanceQualifier	Text	N	10	Any necessary qualifier from luList11_QualifierCodes.

Field Name	Type	Required	Size	Description
MetersTo30	Integer	*		Number of meters in which 30 of a species was found. Abundance is extrapolated after a count of 30. If Abundance = 30 then required.
NumberOfStipes	Integer	*		Number of stipes per plant at 1m above the substrate. Only applicable to certain species.
DiveSwathComments	Text	N	100	Additional remarks.

tblDiveUrchins

PURPOSE: The purpose of the dive urchins table is to document the size length frequency of both red and purple sea urchins in each dive survey. Each record represents the number of urchins in a particular size class of a particular species.

Where abundant, 100 red and 100 purple urchins will be collected and their test diameters measured to the nearest centimeter.

TABLE GUIDELINES:

- The combination of the fields StationID, SampleDate, SamplingOrganization, DepthZone, Species and TestSizeClass will ensure that each record is unique in the table.
- This file can be named at the discretion of the user; however the excel sheet tab must be named tblDiveUrchins for submission to the Bight 08 online system.

EXAMPLE DATA:

TABLE STRUCTURE:

tblDiveUrchins

Field Name	Type	Required	Size	Description
StationID	Text	Y	25	A geographic location label from the station table.
SampleDate	Date/Time	Y		The date the sample was taken expressed as dd-mmm-yyyy.

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Field Name	Type	Required	Size	Description
SamplingOrganization	Text	Y	15	From luList01_AgencyCodes.
DepthZone	Text	Y	15	From luList44_DiveSurveyDepthZone (inner, middle, outer and deep).
Species	Text	Y	50	The species being measured - <i>Strongylocentrotus purpuratus</i> or <i>Strongylocentrotus franciscanus</i>.
TestSizeClass	Integer	Y		The size class into which the urchin falls expressed in cm.
TestSizeClassUnits	Text	Y	15	From luList28_Units. <u>Default = “cm” (centimeters)</u>
AbundanceQualifier	Text	N	10	Any necessary qualifier from luList11_QualifierCodes.
Abundance	Integer	Y		The number of urchins in the size class.
DiveUrchinComments	Text	N	100	Additional remarks.

Appendix 1. Lookup Lists

luList01_AgencyCodes

AgencyCode	AgencyDescription
AES	AES Corporation
ABC	Aquatic Bioassay and Consulting Laboratories
CSUCI	California State University at Channel Islands
CINMS	Channel Islands National Marine Sanctuary
CUPC	Chevron USA Products Company
CLB	City of Long Beach
CLAEMD	City of Los Angeles Environmental Monitoring Division
OC	City of Oceanside
OX	City of Oxnard
CSD	City of San Diego
VT	City of Ventura
CRG	CRG Labs
EW	Encina Waste Water Authority
GC	Granite Canyon Marine Pollution Studies Lab
HI	Houston Industries Inc.
UABC	Instituto de Investigacione, Oceanologicas
JPL	Jet Propulsion Laboratory
LACDBH	Los Angeles County Department of Beaches and Harbors
LACDHS	Los Angeles County Dept. of Health Services
LACRWQCB	Los Angeles County Regional Water Quality Control Board
LACSD	Los Angeles County Sanitation Districts
LADWP	Los Angeles Department of Water and Power
LMU	Loyola Marymount University
MBC	Marine Biological Consulting
MCB	Marine Corps Base – Camp Pendleton
MMS	Minerals Management Service
NPS	National Park Service
NES	NES Energy Inc.
NRG	NRG Energy Inc.
OCEHD	Orange County Environmental Health Division
OCPFRD	Orange County Public Facilities and Resources
OCSD	Orange County Sanitation Districts
POLA	Port of Los Angeles
POSD	Port of San Diego

AgencyCode	AgencyDescription
RC	Reliant Corporation
SDCDEH	San Diego County Department of Environmental Health
SDRWQCB	San Diego Regional Water Quality Control Board
SEJPA	San Elijo Joint Powers Authority*
SARWQCB	Santa Ana Regional Water Quality Control Board
SBHCS	Santa Barbara Health Care Services
SMBRC	Santa Monica Bay Restoration Commission
SMBRP	Santa Monica Bay Restoration Project
SV	Sea Ventures
SCCWRP	Southern California Coastal Water Research Project
SCWRP	Southern California Wetland Recovery Project
SOCWA	Southern Orange County Water Authority
SWRCB	State Water Resources Control Board
TENERR	Tijuana Estuary National Estuarine Research Reserve
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UCLA	University of California at Los Angeles
UCSB	University of California, Santa Barbara
VRG	Vantuna Research Group
WS	Weston Solutions
NE	Nautilus Environmental
NWAS	Northwest Aquatic Sciences

luList02_CTDMethodCodes

Method	Description
RAM	Data recorded in RAM of device
REAL TIME	Data recorded on a computer

luList03_EquipmentCodes

EquipmentCode	EquipmentType
TRL	Otter Trawl w. 7.62 meter head rope
TVV	Tandem van Veen 0.1 m ²
VV	Van Veen Grab
SBE19	Water Quality Analyzer SeaBird SBE/19
SBE25	Water Quality Analyzer SeaBird SBE/25
SBE911	Water Quality Analyzer Seabird SBE/911
RigFishing	Fishing by hook and line
NR	Not recorded

luList04_SampleTypes

SampleType	SampleTypeDescription	AssociatedTable
CARP	Certified Carp Samples	Chemistry
CRM-016	RTC Metals in Sediment	Chemistry
CRM-540	Metals in Soil	Chemistry
DORM	Dog Fish Muscle Tissue	Chemistry
FEB	Field Equipment Blank	Chemistry
LCM	Laboratory Control Material	Chemistry
MB	Method Blank	Chemistry
MS	Matrix spike – must have the same LabSampleID as MSD	Chemistry
MSD	Matrix spike duplicate – must have same LabSampleID as MS	Chemistry
SRM-1944	NIST Sample Organics in Marine Sediment	Chemistry
RESULT	Numerical Result of analysis	Chemistry/Toxicity/Microbiology
DIVE	Dive Survey	StationOccupation
GRAB	A 0.1 m2 van Veen Grab	StationOccupation
TRAWL	A 7.62 meter Marinovich trawl	StationOccupation
WQ	Water Quality	StationOccupation
CNEG	Laboratory Negative Control	Toxicity
LB	Laboratory Blank	Toxicity
RFCD	Cadmium Reference Control	Toxicity
RFCU	Copper reference control	Toxicity
RFSDS	Reference Sodium dodecal sulphate	Toxicity
RFNH3	Ammonia Reference Toxicant	Toxicity
RFPH	Phenol Reference control	Biomarker
EDTA	Ethylenediaminetetraacetic acid	Toxicity –TIE
C-18	C-18 column extraction	Toxicity –TIE
CEE	Carboxylesterase enzyme	Toxicity –TIE
BSA	Bovine serum albumin	Toxicity –TIE
TR	Temperature reduction	Toxicity –TIE
PBO	Piperonyl butoxide	Toxicity –TIE
SIR	SIR 300 resin beads	Toxicity –TIE
CC	Coconut charcoal	Toxicity –TIE

luList05_OrdinalDirections

Direction	Description
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Direction	Description
E	East
N	North
NE	Northeast
NR	Not Recorded
NW	Northwest
S	South
SE	Southeast
SW	Southwest
W	West
XX	Calm

luList06_SedimentCompositionCodes

SedimentCompositionCodes	SedimentCompositionDescription
Cobble	Tennis ball size rocks or bigger (can be flat).
Coarse Gravel	Marble size to near tennis ball size (can be flat).
Fine Gravel	2mm to marble size.
Coarse Sand	Texture mostly larger grained sand particles.
Fine Sand	Texture mostly smaller grained sand with some fine.
Silt/Clay	Fine particles (texture smooth).
Shell Hash	Mostly shell hash (50% or greater).
Mixed	Any combination of above – requires comment.
NR	Not Recorded

luList07_OdorCodes

Odor	OdorDescription
Humic	Decay
Hydrogen Sulfide	Sulfur
None	No Detectable Odor
NR	Not recorded
Other	requires a comment
Petroleum	Oil and grease

luList08_WeatherCodes

WeatherCode
Clear
Drizzle
Fog

WeatherCode
Fog and Drizzle
Haze
NR
Overcast
Partly Cloudy
Rain
Thunderstorm

luList09_SpeciesList

Species	CommonName	Type
Acanthogobius flavimanus	yellowfin goby	Fish
Agonopsis sterletus	southern spearnose poacher	Fish
Agonopsis vulsa	northern spearnose poacher	Fish
Albula sp	Cortez bonefish	Fish
Alepocephalus tenebrosus	California slickhead	Fish
Alloclinus holderi	island kelpfish	Fish
Amphistichus argenteus	barred surfperch	Fish
Anarrhichthys ocellatus	wolf-eel	Fish
Anchoa compressa	deepbody anchovy	Fish
Anchoa delicatissima	slough anchovy	Fish
Anisotremus davidsonii	sargo	Fish
Anoplopoma fimbria	sablefish	Fish
Apodichthys flavidus	penpoint gunnel	Fish
Apristurus brunneus	brown cat shark	Fish
Apristurus kampae	longnose cat shark	Fish
Argentina sialis	Pacific argentine	Fish
Argyropelecus affinis	slender hatchetfish	Fish
Argyropelecus sladeni	lowcrest hatchetfish	Fish
Artedius harringtoni	scalyhead sculpin	Fish
Artedius lateralis	smoothhead sculpin	Fish
Artedius notospilotus	bonyhead sculpin	Fish
Atherinops affinis	topsmelt	Fish
Atherinopsis californiensis	jacksmelt	Fish
Atractoscion nobilis	white seabass	Fish
Aulorhynchus flavidus	tube-snout	Fish
Bathyagonus pentacanthus	bigeye poacher	Fish
Bathyraja interrupta	sandpaper skate	Fish
Bellator xenisma	splitnose searobin	Fish
Bollmannia gomezi	Colombian goby	Fish
Bothrocara brunneum	twoline eelpout	Fish
Brachyistius frenatus	kelp perch	Fish

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<i>Brosmophycis marginata</i>	red brotula	Fish
<i>Caelorinchus scaphopsis</i>	shoulderspot grenadier	Fish
<i>Careproctus melanurus</i>	blacktail snailfish	Fish
<i>Cataetyx rubrirostris</i>	rubynose brotula	Fish
<i>Caulolatilus princeps</i>	ocean whitefish	Fish
<i>Cephaloscyllium ventriosum</i>	swell shark	Fish
<i>Cheilopogon pinnatibarbatus</i>	smallhead flyingfish	Fish
<i>Cheilotrema saturnum</i>	black croaker	Fish
<i>Chilara taylori</i>	spotted cusk-eel	Fish
<i>Chitonotus pugetensis</i>	roughback sculpin	Fish
<i>Chromis punctipinnis</i>	blacksmith	Fish
<i>Citharichthys fragilis</i>	Gulf sanddab	Fish
<i>Citharichthys sordidus</i>	Pacific sanddab	Fish
<i>Citharichthys stigmaeus</i>	speckled sanddab	Fish
<i>Citharichthys xanthostigma</i>	longfin sanddab	Fish
<i>Clevelandia ios</i>	arrow goby	Fish
<i>Clupea pallasii</i>	Pacific herring	Fish
CompositeWT	Composite Weight	Fish
<i>Cryptotrema corallinum</i>	deepwater blenny	Fish
<i>Cymatogaster aggregata</i>	shiner perch	Fish
<i>Dasyatis dipterura</i>	diamond stingray	Fish
<i>Decodon melasma</i>	blackspot wrasse	Fish
<i>Diaphus theta</i>	California headlightfish	Fish
<i>Elassodiscus caudatus</i>	humpback snailfish	Fish
<i>Embassichthys bathybius</i>	deepsea sole	Fish
<i>Embiotoca jacksoni</i>	black perch	Fish
<i>Embiotoca lateralis</i>	striped seaperch	Fish
<i>Engraulis mordax</i>	northern anchovy	Fish
<i>Engyophrys sanctilaurentii</i>	speckledtail flounder	Fish
<i>Enophrys taurina</i>	bull sculpin	Fish
<i>Eopsetta jordani</i>	petrale sole	Fish
<i>Eptatretus deani</i>	black hagfish	Fish
<i>Eptatretus stoutii</i>	Pacific hagfish	Fish
<i>Etrumeus teres</i>	round herring	Fish
<i>Eucryphycus californicus</i>	persimmon eelpout	Fish
<i>Facciolella equatorialis</i>	dogface witch eel	Fish
<i>Genyonemus lineatus</i>	white croaker	Fish
<i>Gibbonsia elegans</i>	spotted kelpfish	Fish
<i>Gibbonsia metzi</i>	striped kelpfish	Fish
<i>Gibbonsia montereyensis</i>	crevice kelpfish	Fish
<i>Girella nigricans</i>	opaleye	Fish
<i>Glyptocephalus zachirus</i>	rex sole	Fish
<i>Gnathophis cinctus</i>	hardtall conger	Fish
<i>Gobiesox eugrammus</i>	lined clingfish	Fish
<i>Gobiesox rhessodon</i>	California clingfish	Fish

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<i>Gymnura marmorata</i>	California butterfly ray	Fish
<i>Halichoeres semicinctus</i>	rock wrasse	Fish
<i>Heterodontus francisci</i>	horn shark	Fish
<i>Heterostichus rostratus</i>	giant kelpfish	Fish
<i>Hexagrammos decagrammus</i>	kelp greenling	Fish
<i>Hippocampus ingens</i>	Pacific seahorse	Fish
<i>Hippoglossina stomata</i>	bigmouth sole	Fish
<i>Hydrolagus coliei</i>	spotted ratfish	Fish
<i>Hyperprosopon anale</i>	spotfin surfperch	Fish
<i>Hyperprosopon argenteum</i>	walleye surfperch	Fish
<i>Hypsoblennius jenkinsi</i>	mussel blenny	Fish
<i>Hypsurus caryi</i>	rainbow seaperch	Fish
<i>Icelinus cavifrons</i>	pit-head sculpin	Fish
<i>Icelinus filamentosus</i>	threadfin sculpin	Fish
<i>Icelinus fimbriatus</i>	fringed sculpin	Fish
<i>Icelinus oculatus</i>	frogmouth sculpin	Fish
<i>Icelinus quadriseriatus</i>	yellowchin sculpin	Fish
<i>Icelinus tenuis</i>	spotfin sculpin	Fish
<i>Ichthyococcus irregularis</i>	bulldog lightfish	Fish
<i>Icichthys lockingtoni</i>	medusafish	Fish
<i>Ilypnus gilberti</i>	cheekspot goby	Fish
<i>Isopsetta isolepis</i>	butter sole	Fish
<i>Kathetostoma avertuncus</i>	smooth stargazer	Fish
<i>Lampanyctus tridentata</i>	Pacific lamprey	Fish
<i>Leiocottus hirundo</i>	lavender sculpin	Fish
<i>Lepidogobius lepidus</i>	bay goby	Fish
<i>Lepidopsetta bilineata</i>	rock sole	Fish
<i>Lepidopus fitchi</i>	Pacific scabbardfish	Fish
<i>Leptocottus armatus</i>	Pacific staghorn sculpin	Fish
<i>Leuroglossus stilbius</i>	California smoothtongue	Fish
<i>Liparis mucosus</i>	slimy snailfish	Fish
<i>Lycodapus fierasfer</i>	blackmouth eelpout	Fish
<i>Lycodapus mandibularis</i>	pallid eelpout	Fish
<i>Lycodes cortezianus</i>	bigfin eelpout	Fish
<i>Lycodes diapterus</i>	black eelpout	Fish
<i>Lycodes pacificus</i>	blackbelly eelpout	Fish
<i>Lyconema barbatum</i>	bearded eelpout	Fish
<i>Lyopsetta exilis</i>	slender sole	Fish
<i>Lythrypnus dalli</i>	bluebanded goby	Fish
<i>Lythrypnus zebra</i>	zebra goby	Fish
<i>Macroramphosus gracilis</i>	slender snipefish	Fish
<i>Medialuna californiensis</i>	halfmoon	Fish
<i>Melanostigma pammelas</i>	midwater eelpout	Fish
<i>Menticirrhus undulatus</i>	California corbina	Fish
<i>Merluccius productus</i>	Pacific hake	Fish

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Micrometrus minimus	dwarf perch	Fish
Microstomus pacificus	Dover sole	Fish
Mustelus californicus	gray smoothhound	Fish
Mustelus henlei	brown smoothhound	Fish
Myliobatis californica	bat ray	Fish
Nemichthys scolopaceus	slender snipe eel	Fish
Neoclinus blanchardi	sarcastic fringehead	Fish
Neoclinus uninotatus	onespot fringehead	Fish
Nezumia liolepis	smooth grenadier	Fish
Nezumia stelgidolepis	California grenadier	Fish
No_Org_Pres	No Organism Present	Fish
Odontopyxis trispinosa	pygmy poacher	Fish
Ophichthus zophochir	yellow snake eel	Fish
Ophidion scrippsae	basketweave cusk-eel	Fish
Ophiodon elongatus	lingcod	Fish
Orthonopias triacis	snubnose sculpin	Fish
Oxyjulis californica	señorita	Fish
Oxylebius pictus	painted greenling	Fish
Paralabrax clathratus	kelp bass	Fish
Paralabrax maculatofasciatus	spotted sand bass	Fish
Paralabrax nebulifer	barred sand bass	Fish
Paralichthys californicus	California halibut	Fish
Paraliparis albescens	phantom snailfish	Fish
Parmaturus xaniurus	filetail cat shark	Fish
Parophrys vetulus	English sole	Fish
Peprilus simillimus	Pacific pompano	Fish
Phanerodon atripes	sharpnose seaperch	Fish
Phanerodon furcatus	white seaperch	Fish
Physiculus rastrelliger	hundred-fathom codling	Fish
Platichthys stellatus	starry flounder	Fish
Platyrhinoidis triseriata	thornback	Fish
Plectobranthus evides	bluebarred prickleback	Fish
Pleuronichthys coenosus	C-O sole	Fish
Pleuronichthys decurrens	curlfin sole	Fish
Pleuronichthys guttulatus	diamond turbot	Fish
Pleuronichthys ritteri	spotted turbot	Fish
Pleuronichthys verticalis	hornyhead turbot	Fish
Porichthys myriaster	specklefin midshipman	Fish
Porichthys notatus	plainfin midshipman	Fish
Poroclinus rothrocki	whitebarred prickleback	Fish
Prionotus stephanophrys	lumptail searobin	Fish
Pronotogrammus multifasciatus	threadfin bass	Fish
Psettichthys melanostictus	sand sole	Fish
Pseudobathylagus milleri	robust blacksmelt	Fish
Quietula y-cauda	shadow goby	Fish

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Radulinus asprellus	slim sculpin	Fish
Radulinus boeoides	darther sculpin	Fish
Raja binoculata	big skate	Fish
Raja inornata	California skate	Fish
Raja rhina	longnose skate	Fish
Raja stellulata	starry skate	Fish
Rathbunella alleni	stripedfin ronquil	Fish
Rathbunella hypoplecta	bluebanded ronquil	Fish
Rhacochilus toxotes	rubberlip seaperch	Fish
Rhacochilus vacca	pile perch	Fish
Rhamphocottus richardsonii	grunt sculpin	Fish
Rhinobatos productus	shovelnose guitarfish	Fish
Rhinogobiops nicholsii	blackeye goby	Fish
Roncador stearnsii	spotfin croaker	Fish
Ruscarius creaseri	roughcheek sculpin	Fish
Sarda chiliensis	Pacific bonito	Fish
Sardinops sagax	Pacific sardine	Fish
Scomber japonicus	Pacific chub mackerel	Fish
Scorpaena guttata	California scorpionfish	Fish
Scorpaenichthys marmoratus	cabezon	Fish
Sebastes alutus	Pacific ocean perch	Fish
Sebastes atrovirens	kelp rockfish	Fish
Sebastes auriculatus	brown rockfish	Fish
Sebastes aurora	aurora rockfish	Fish
Sebastes babcocki	redbanded rockfish	Fish
Sebastes carnatus	gopher rockfish	Fish
Sebastes caurinus	copper rockfish	Fish
Sebastes chlorostictus	greenspotted rockfish	Fish
Sebastes constellatus	starry rockfish	Fish
Sebastes crameri	darkblotched rockfish	Fish
Sebastes dallii	calico rockfish	Fish
Sebastes diploproa	splitnose rockfish	Fish
Sebastes elongatus	greenstriped rockfish	Fish
Sebastes ensifer	swordspine rockfish	Fish
Sebastes eos	pink rockfish	Fish
Sebastes flavidus	yellowtail rockfish	Fish
Sebastes goodei	chilipepper	Fish
Sebastes hopkinsi	squarespot rockfish	Fish
Sebastes jordani	shortbelly rockfish	Fish
Sebastes lentiginosus	freckled rockfish	Fish
Sebastes levis	cowcod	Fish
Sebastes macdonaldi	Mexican rockfish	Fish
Sebastes melanostomus	blackgill rockfish	Fish
Sebastes miniatus	vermillion rockfish	Fish
Sebastes mystinus	blue rockfish	Fish

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Sebastes ovalis	speckled rockfish	Fish
Sebastes paucispinis	bocaccio	Fish
Sebastes pinniger	canary rockfish	Fish
Sebastes rastrelliger	grass rockfish	Fish
Sebastes rosaceus	rosy rockfish	Fish
Sebastes rosenblatti	greenblotched rockfish	Fish
Sebastes rubrivinctus	flag rockfish	Fish
Sebastes rufus	bank rockfish	Fish
Sebastes saxicola	stripetail rockfish	Fish
Sebastes semicinctus	halfbanded rockfish	Fish
Sebastes serranoides	olive rockfish	Fish
Sebastes serriceps	treefish	Fish
Sebastes simulator	pinkrose rockfish	Fish
Sebastes umbrosus	honeycomb rockfish	Fish
Sebastes wilsoni	pygmy rockfish	Fish
Sebastes zacentrus	sharpchin rockfish	Fish
Sebastolobus alascanus	shortspine thornyhead	Fish
Sebastolobus altivelis	longspine thornyhead	Fish
Semicossyphus pulcher	California sheephead	Fish
Seriphus politus	queenfish	Fish
Squalus acanthias	spiny dogfish	Fish
Squatina californica	Pacific angel shark	Fish
Stellerina xyosterna	pricklebreast poacher	Fish
Stenobranchius leucopsarus	northern lampfish	Fish
Stereolepis gigas	giant sea bass	Fish
Stomias atriventer	blackbelly dragonfish	Fish
Symphurus atricaudus	California tonguefish	Fish
Symphurus oligomerus	whitetail tonguefish	Fish
Synchiropus atrilabiatus	blacklip dragonet	Fish
Syngnathus californiensis	kelp pipefish	Fish
Syngnathus exilis	barcheek pipefish	Fish
Syngnathus leptorhynchus	bay pipefish	Fish
Synodus lacertinus	calico lizardfish	Fish
Synodus lucioceps	California lizardfish	Fish
Torpedo californica	Pacific electric ray	Fish
Trachurus symmetricus	jack mackerel	Fish
Triakis semifasciata	leopard shark	Fish
Trichiurus nitens	Pacific cutlassfish	Fish
Triphoturus mexicanus	Mexican lampfish	Fish
Ulvicola sanctaerosae	kelp gunnel	Fish
Umbrina roncadore	yellowfin croaker	Fish
Urobatis halleri	round stingray	Fish
Xeneretmus latifrons	blacktip poacher	Fish
Xeneretmus leiops	smootheye poacher	Fish
Xeneretmus ritteri	stripefin poacher	Fish

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Xeneretmus triacanthus	bluespotted poacher	Fish
Xenistius californiensis	salema	Fish
Xystreureys liolepis	fantail sole	Fish
Zalembius rosaceus	pink seaperch	Fish
Zalieutes elater	roundel batfish	Fish
Zaniolepis frenata	shortspine combfish	Fish
Zaniolepis latipinnis	longspine combfish	Fish
Zapteryx exasperata	banded guitarfish	Fish
Abietinaria sp	hyroid	Invert
Acanthodoris brunnea	brown spiny doris	Invert
Acanthodoris hudsoni	Hudson spiny doris	Invert
Acanthodoris rhodoceras	black-tipped spiny doris	Invert
Acanthoptilum annulatum		Invert
Acanthoptilum gracile		Invert
Acanthoptilum sp	trailtip sea pen	Invert
Actinaria sp SD 1	anemone	Invert
Actinauge sp	anemone	Invert
Actinostola callosa	anemone	Invert
Actinostola sp A	anemone	Invert
Addisonia brophyi	eggcase limpet	Invert
Adelogorgia phyllosclera	orange gorgonian	Invert
Aega lecontii	isopod	Invert
Aegires albopunctatus	salt-and-pepper doris	Invert
Aeolidia papillosa	shag-rug aeolis	Invert
Aglaophenia sp	hyroid	Invert
Aglaophenia struthionides	ostrichplume hydroid	Invert
Alcyonacea sp A	gorgonian	Invert
Alcyonacea sp SD 1	gorgonian	Invert
Alpheopsis equidactylus		Invert
Alpheus bellimanus	olive snapping shrimp	Invert
Alpheus californiensis	mudflat snapping shrimp	Invert
Alpheus clamator		Invert
Amphianthus sp OC1	anemone	Invert
Amphichondrius granulatus	roughdisk brittlestar	Invert
Amphiodia digitata	brittlestar	Invert
Amphiodia psara	brittlestar	Invert
Amphiodia urtica	red brittlestar	Invert
Amphioplus sp	brittlestar	Invert
Amphipholis pugetana	brittlestar	Invert
Amphipholis squamata	holdfast brittlestar	Invert
Amphissa bicolor	two-tone amphissa	Invert
Amphissa undata	Carpenter amphissa	Invert
Amphissa versicolor	variagate amphissa	Invert
Amphiura arcystata	brittlestar	Invert
Amygdalum politum	pallid papermussel	Invert

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Anomia peruviana	Peruvian jingle	Invert
Anoplodactylus erectus	sea spider	Invert
Anoplodactylus virdintestinalis	sea spider	Invert
Anthoptilum grandiflorum	feather boa sea pen	Invert
Antiplanes catalinae	Catalina turrid	Invert
Antiplanes thalea	turrid	Invert
Aphrocallistes vastus	cloud sponge	Invert
Aphrodita armifera	copper sea mouse	Invert
Aphrodita castanea	chestnut sea mouse	Invert
Aphrodita japonica	black sea mouse	Invert
Aphrodita negligens	shaggy sea mouse	Invert
Aphrodita refulgida	green sea mouse	Invert
Aplydium sp	colonial tunicate	Invert
Aplysia californica	purple sea hare	Invert
Aplysia vaccaria	black sea hare	Invert
Archidoris montereyensis	Monterey sea-lemon	Invert
Argis californiensis		Invert
Argopecten ventricosus	Pacific calico scallop	Invert
Arhynchite californicus	echiuran	Invert
Armina californica	California armina	Invert
Ascidia ceratodes	tunicate	Invert
Ascidia zara	tunicate	Invert
Asidiacea sp S3	tunicate	Invert
Asidiacea sp S4	tunicate	Invert
Asidiacea sp SD2	tunicate	Invert
Asidiacea sp SD5	tunicate	Invert
Asidiacea sp SD6	tunicate	Invert
Asidiacea sp SD7	tunicate	Invert
Asidiidae sp SD 1	tunicate	Invert
Asterina miniata	bat star	Invert
Asteronyx longifissus	ophiuroid	Invert
Astrometis sertulifera	sea star	Invert
Astropecten armatus	spiny sand star	Invert
Astropecten ornatissimus	orange sand star	Invert
Astropecten verrilli	California sand star	Invert
Austrotrophon catalinensis	Catalina forreria	Invert
Babelomurex oldroydi	Olyroyd coralsnail	Invert
Balanus nubilus	giant acorn barnacle	Invert
Balanus trigonus	barnacle	Invert
Bathypera feminalba	sea squirt	Invert
Bentheogennema borealis	northern blunt-tail shrimp	Invert
Bentheogennema burkenroadi	Burkenroad blunt-tail shrimp	Invert
Berthella californica	California sidegill slug	Invert
Betaeus harfordi		Invert
Boltenia villosa	spiny-headed tunicate	Invert

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Boreotrophon bentleyi	trophon	Invert
Boreotrophon eucymatus	grooved trophon	Invert
Brisaster latifrons	northern heart urchin	Invert
Brisaster townsendi	southern heart urchin	Invert
Brissopsis pacifica	Pacific heart urchin	Invert
Bugula neritina	seaweed bryozoan	Invert
Bulla gouldiana	California bubble	Invert
Cadlina flavomaculata	yellow-spot cadlina	Invert
Cadlina modesta	modest cadlina	Invert
Cadlina sparsa	dark-spot cadlina	Invert
Calinaticina oldroydii	delicate moonsnail	Invert
Callinectes sp	swimming crab	Invert
Calliostoma canaliculatum	channeled topsnail	Invert
Calliostoma gemmulatum	gem topsnail	Invert
Calliostoma gloriosum	glorious topsnail	Invert
Calliostoma keenae	topsnail	Invert
Calliostoma supragranosum	granulose topsnail	Invert
Calliostoma tricolor	tricolor topsnail	Invert
Calliostoma turbinum	spindle topsnail	Invert
Calliostoma variegatum	variegate topsnail	Invert
Callistochiton palmulatus	big-end chiton	Invert
Calliostoma platinum	silvery topsnail	Invert
Calocarides quinquieseratus	lobster shrimp	Invert
Calocarides spinulicauda	lobster shrimp	Invert
Calyptreaea fastigiata	Pacific Chinese-hat	Invert
Cancellaria cooperii	Cooper nutmeg	Invert
Cancellaria crawfordiana	Crawford nutmeg	Invert
Cancer amphioetus	bigtooth rock crab	Invert
Cancer antennarius	Pacific rock crab	Invert
Cancer anthonyi	yellow rock crab	Invert
Cancer branneri	furrowed rock crab	Invert
Cancer gracilis	graceful rock crab	Invert
Cancer jordani	hairy rock crab	Invert
Cancer productus	red rock crab	Invert
Caryophyllia alaskensis	cup coral	Invert
Cellaria mandibulata	bryozoan	Invert
Ceramaster sp	cookie star	Invert
Chaetopterus variopedatus	parchment tube worm	Invert
Chama arcana	secret jewelbox	Invert
Cheiraster californicus	sea star	Invert
Chionoecetes tanneri		Invert
Chlamys hastata	spiny scallop	Invert
Chorilia longipes	longhorn decorator crab	Invert
Cidarina cidaris	spiny margarite	Invert
Ciona intestinalis	yellow-green sea squirt	Invert

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Coenocyathus bowersi	colonial cup coral	Invert
CompositeWt	Composite Weight	Invert
Conopea galeata	barnacle	Invert
Conus californicus	California cone	Invert
Corella willmeriana	icy tunicate	Invert
Corynactis californica	strawberry corallimorpharian	Invert
Crangon alaskensis	Alaska bay shrimp	Invert
Crangon alba	stout crangon	Invert
Crangon holmesi		Invert
Crangon nigricauda		Invert
Crangon nigromaculata	blackspotted bay shrimp	Invert
Crassadoma gigantea	giant rock scallop	Invert
Crassispira semiinflata	California drillia	Invert
Crepidula onyx	onyx slippersnail	Invert
Crepidula perforans	white slippersnail	Invert
Crepidatella dorsata	Pacific half-slippersnail	Invert
Crossata californica	California frogsnail	Invert
Crucibulum spinosum	spiny cup-and-saucer	Invert
Cryptodromiopsis larraburei	Pacific sponge crab	Invert
Cucumaria miniata	orange sea cucumber	Invert
Cucumaria piperata	sea cucumber	Invert
Cucumaria salma	nestling sea cucumber	Invert
Cucumaria sp CI 1	sea cucumber	Invert
Cyamon neon	sponge	Invert
Cystodytes lobatus	lobed tunicate	Invert
Daphnella clathrata	daphnelle	Invert
Deilocerus planus		Invert
Delectopecten vancouverensis	Vancouver scallop	Invert
Dendraster excentricus	Pacific sand dollar	Invert
Dendraster terminalis	offshore sand dollar	Invert
Dendrochiton thamnopus	chiton	Invert
Dendrodoris fulva	doris	Invert
Dendronotus albopunctatus		Invert
Dendronotus frondosus	frond-aeolis	Invert
Dendronotus iris	giant frond-aeolis	Invert
Dendronotus subramosus	stubby frond-aeolis	Invert
Desmophyllum dianthus	cup coral	Invert
Diaperoforma californica	coralline bryozoan	Invert
Diaulula sandiegensis	ringed doris	Invert
Dipsacaster eximius	sea star	Invert
Dirona picta	painted dirona	Invert
Discerceis granulosa	isopod	Invert
Distichoptilum verrilli	sea pen	Invert
Doriopsilla albopunctata	salted yellow doris	Invert
Dougaloplus amphacanthus	brittlestar	Invert

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Dromalia alexandri	sea dandelion	Invert
Enallopaguropsis guatemoci	right-handed hermit	Invert
Epiactis prolifera	brooding anemone	Invert
Epialtoides hiltoni	winged kelp crab	Invert
Epizoanthus induratus	luminescent zoanthid	Invert
Erato vitellina	appleseed erato	Invert
Erileptus spinosus	shortneck pear crab	Invert
Eualus lineatus		Invert
Eugorgia rubens	purple gorgonian	Invert
Eugyra arenosa californica	tunicate	Invert
Euplexaura sp	gorgonian	Invert
Euspira draconis	Drake moonsnail	Invert
Euspira lewisii	Lewis moonsnail	Invert
Euvola diegensis	San Diego scallop	Invert
Excorallana truncata	cuttail sea louse	Invert
Farfantepenaeus californiensis	yellowleg shrimp	Invert
Filicrisia sp	bryozoan	Invert
Fissurella volcano	volcano keyhole limpet	Invert
Flabellina iodinea	Spanish shawl	Invert
Flabellina pricei	smooth-tooth aeolis	Invert
Florometra serratissima	feather star	Invert
Forreria belcheri	giant chorus snail	Invert
Fusinus barbarensis	Santa Barbara spindle	Invert
Galathea californiensis	California squat lobster	Invert
Geitodoris heathi	doris	Invert
Glyptolithodes cristatipes	lithodid crab	Invert
Gonatopsis borealis	boreopacific armhook squid	Invert
Gorgonocephalus eucnemis	basket star	Invert
Halipteris californica	sea pen	Invert
Halocynthia igaboja	spiny sea peach	Invert
Hamatoscalpellum californicum	California blade barnacle	Invert
Haminoea vesicula	blister glassy-bubble	Invert
Hancockia californica	nudibranch	Invert
Havelockia benti	sea cucumber	Invert
Hemectyon hyle	bushy sponge	Invert
Hemigrapsus oregonensis	yellow shore crab	Invert
Hemisquilla californiensis	blueleg mantis shrimp	Invert
Henricia aspera	sea star	Invert
Henricia leviuscula	blood star	Invert
Henricia polyacantha	sea star	Invert
Heptacarpus brevisrostris	stout coastal shrimp	Invert
Heptacarpus decorus		Invert
Heptacarpus flexus		Invert
Heptacarpus palpator	intertidal coastal shrimp	Invert
Heptacarpus sitchensis		Invert

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Heptacarpus stimpsoni	Stimpson coastal shrimp	Invert
Heptacarpus taylori	Taylor coastal shrimp	Invert
Heptacarpus tenuissimus	slender coastal shrimp	Invert
Hermisenda crassicornis	hermissenda	Invert
Heterocrypta occidentalis	sandflat elbow crab	Invert
Heterogorgia sp	sea fan	Invert
Heterogorgia tortuosa	gorgonian	Invert
Hippasteria californica	sea star	Invert
Hippasteria spinosa	spiny red star	Invert
Hippodiplosia insculpta	fluted bryozoan	Invert
Hippopodina californica	bryozoan	Invert
Hirudinea	leech	Invert
Histioteuthis heteropsis	squid	Invert
Holmesiella anomala	mysid	Invert
Hololepida magna	scaleworm	Invert
Hymenodora frontalis	ambereye	Invert
Isocheles pilosus	moon snail hermit	Invert
Kelletia kelletii	Kellet whelk	Invert
Lamellaria diegoensis	San Diego lamellaria	Invert
Laqueus californianus	California lamp shell	Invert
Lepas pacifica	barnacle	Invert
Lepidopa californica		Invert
Lepidozona mertensii	Merten chiton	Invert
Lepidozona sinudentata	whitestripe chiton	Invert
Leptasterias hexactis	six-arm sea star	Invert
Leptopecten latiauratus	kelp scallop	Invert
Leucandra heathi	sponge	Invert
Leucilla nuttingi	urn sponge	Invert
Limaria hemphilli	Hemphill fileclam	Invert
Liponema brevicornis	tentacle-shedding anemone	Invert
Lithodes cousei		Invert
Lithopoma undosa	wavy turban	Invert
Livoneca californica	California fish louse	Invert
Livoneca vulgaris	Pacific fish louse	Invert
Loligo opalescens	California market squid	Invert
Lophapanopeus leucomanus	knobknee crestleg crab	Invert
Lophelia pertusa	cup coral	Invert
Lophogorgia chilensis	pink sea whip	Invert
Lopholithodes foraminatus	brown box crab	Invert
Lophopanopeus bellus	blackclaw crestleg crab	Invert
Lophopanopeus frontalis	molarless crestleg crab	Invert
Lovenia cordiformis	sea porcupine	Invert
Loxorhynchus crispatus	moss crab	Invert
Loxorhynchus grandis	sheep crab	Invert
Luidia armata	mosaic sand star	Invert

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Luidia asthenosoma	fringed sand star	Invert
Luidia foliolata	gray sand star	Invert
Lysmata californica	red rock shrimp	Invert
Lytechinus pictus	white sea urchin	Invert
Maxwellia gemma	gem murex	Invert
Maxwellia santarosana	Santa Rosa murex	Invert
Mediaster aequalis	red sea star	Invert
Megabalanus californicus	barnacle	Invert
Megasurcula carpenteriana	tower snail	Invert
Megasurcula stearnsiana	Stearns turrid	Invert
Melibe leonina	lion nudibranch	Invert
Mesocrangon munitella		Invert
Metacrangon spinosissima	southern spinyhead	Invert
Metapenaeopsis mineri		Invert
Metridium farcimen	gigantic anemone	Invert
Microcosmus squamiger	scaly tunicate	Invert
Mimulus foliatus	foliate kelp crab	Invert
Mitra idae	half-pitted miter	Invert
Modiolus neglectus	neglected horsemussel	Invert
Modiolus rectus	straight horsemussel	Invert
Modiolus sacculifer	bag horsemussel	Invert
Molgula pugetensis	tunicate	Invert
Molgula regularis	tunicate	Invert
Molgula verrucifera	warty tunicate	Invert
Moloha faxoni		Invert
Munida hispida	bristle squat lobster	Invert
Munida quadrispina	northern squat lobster	Invert
Munidopsis depressa	squat lobster	Invert
Muricea apressa	gorgonian	Invert
Muricea californica	golden gorgonian	Invert
Musculista senhousia	mat mussel	Invert
Mytilus galloprovincialis	Mediterranean mussel	Invert
Mytilus sp	mussel	Invert
Myxilla fimbriata	sponge	Invert
Myxilla incrustans	scallop sponge	Invert
Myxoderma platyacanthum	sea star	Invert
Nacospatangus laevis	heart urchin	Invert
Nassarius fossatus	channeled nassa	Invert
Nassarius insculptus	smooth western nassa	Invert
Nassarius mendicus	lean nassa	Invert
Nassarius perpinguis	fat western nassa	Invert
Nassarius tiarula	western mud nassa	Invert
Navanax inermis	California aglaja	Invert
Nellobia eusoma	echiuran	Invert
Neocrangon communis	gray shrimp	Invert

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Neocrangon resima	flagnose bay shrimp	Invert
Neocrangon sp MEC1	shrimp	Invert
Neocrangon zacaе	moustache bay shrimp	Invert
Neosabellaria cementarium	sabellariid polychaete	Invert
Neosimnia aequalis	Vidler spindlesnail	Invert
Neosimnia barbarensis	seapen spindlesnail	Invert
Neotrypaea californiensis	bay ghost shrimp	Invert
Neptunea tabulata	tabled whelk	Invert
Nerocila acuminata	fish louse	Invert
Neverita reclusiana	southern moonsnail	Invert
No_Org_Pres	No Organism Present	Invert
Norrisia norrisi	norrissnail	Invert
Nymphon pixellae	pycnogonid	Invert
Ocenebrina sp	rocksnail	Invert
Octopus bimaculoides	California two-spot octopus	Invert
Octopus californicus	orange bigeye octopus	Invert
Octopus rubescens	red octopus	Invert
Octopus veligero	brownspot octopus	Invert
Odontaster crassus	sea star	Invert
Ophiacantha diplasia	ophiuroid	Invert
Ophiacantha phragma	fragile spinyarm brittlestar	Invert
Ophiacantha rhachophora	ophiuroid	Invert
Ophiodermella cancellata	cancellate snakeskin-snail	Invert
Ophiodermella inermis	gray snakeskin-snail	Invert
Ophionereis eurybrachioplax	brittlestar	Invert
Ophiopholis bakeri	roughspine brittlestar	Invert
Ophiopholis longispina	ophiuroid	Invert
Ophiopteris papillosa	flatspine brittlestar	Invert
Ophioscolex corynetes	ophiuroid	Invert
Ophiosphalma jolliense	brittlestar	Invert
Ophiothrix rudis	brittlestar	Invert
Ophiothrix spiculata	Pacific spiny brittlestar	Invert
Ophiura luetkeni	brokenspine brittlestar	Invert
Ophiura sarsi	brittlestar	Invert
Opisthopus transversus	mottled pea crab	Invert
Opisthoteuthis californica	squid	Invert
Opisthoteuthis sp A	squid	Invert
Orthopagurus minimus	tubicolous hermit	Invert
Ostrea sp	oyster	Invert
Pachygrapsus crassipes	striped shore crab	Invert
Pachythyone rubra	redback sea cucumber	Invert
Paguristes bakeri	digger hermit	Invert
Paguristes sp 1		Invert
Paguristes sp A	left-handed hermit	Invert
Paguristes sp HYP1	hermit	Invert

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Paguristes turgidus	slenderclaw hermit	Invert
Paguristes ulreyi	furry hermit	Invert
Pagurus armatus	armed hermit	Invert
Pagurus quaylei		Invert
Pagurus redondoensis	bandclaw hermit	Invert
Pagurus sp 2		Invert
Pagurus sp 4		Invert
Pagurus spilocarpus	spotwrist hermit	Invert
Palicus lucasii	stilt crab	Invert
Pandalopsis ampla	deepwater bigeye	Invert
Pandalus danae	dock shrimp	Invert
Pandalus jordani	ocean shrimp	Invert
Pandalus platyceros	spot shrimp	Invert
Pannychia moseleyi	sea cucumber	Invert
Pantomus affinis	hinged shrimp	Invert
Panulirus interruptus	California spiny lobster	Invert
Paraconcaus pacificus	Pacific acorn barnacle	Invert
Paractinostola cymbactis	anemone	Invert
Paractinostola faeculenta	anemone	Invert
Paracyathus stearnsii	brown cup coral	Invert
Paralithodes californiensis	California king crab	Invert
Paralithodes rathbuni	forknose king crab	Invert
Parapagurodes laurentae	spiny palm hermit	Invert
Parapagurodes makarovi	smooth palm hermit	Invert
Parastenella doederleini	gorgonian	Invert
Parastichopus californicus	California sea cucumber	Invert
Parastichopus sp A	sea cucumber	Invert
Paraxanthias taylori	lumpy rubble crab	Invert
Paristichopus parvimensis	warty sea cucumber	Invert
Peltodoris nobilis	Pacific sea-lemon	Invert
Pennatula californica	sea pen	Invert
Pennatula phosphorea	sea pen	Invert
Pentamera lissoplaca	sea cucumber	Invert
Pentamera populifera	sea cucumber	Invert
Pentamera pseudocalcigera	globose hooked cucumber	Invert
Pentamera pseudopopulifera	southern hooked cucumber	Invert
Pentidotea resecata	kelp isopod	Invert
Pesionika trispinus	Colombian longbeak shrimp	Invert
Phidolopora labiata	lacy bryozoan	Invert
Philine alba	white paperbubble	Invert
Philine auriformis	New Zealand paperbubble	Invert
Phimochirus californiensis	porcelainclaw hermit	Invert
Pilumnus spinohirsutus	retiring hairy crab	Invert
Pinnixa franciscana	innkeeper pea crab	Invert
Pinnixa longipes	pea crab	Invert

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<i>Pinnixa occidentalis</i>	pea crab	Invert
<i>Pinnixa tomentosa</i>	pea crab	Invert
<i>Pinnixa tubicola</i>	pea crab	Invert
<i>Pisaster brevispinus</i>	shortspined sea star	Invert
<i>Pisaster giganteus capitatus</i>	giant spined star	Invert
<i>Pisaster ochraceus</i>	ochre star	Invert
<i>Placiphorella</i> sp SD1	veiled chiton	Invert
<i>Platydoris macfarlandi</i>	California flat doris	Invert
<i>Platydoris</i> sp	doris	Invert
<i>Platymera gaudichaudii</i>	armed box crab	Invert
<i>Plesionika beebei</i>	shrimp	Invert
<i>Pleurobranchaea californica</i>	California sea slug	Invert
<i>Pleuroncodes planipes</i>	pelagic red crab	Invert
<i>Plocamia karykina</i>	sponge	Invert
<i>Plumularia</i> sp	seabristle	Invert
<i>Podochela hemphillii</i>	Hemphill kelp crab	Invert
<i>Podochela lobifrons</i>	thinbeak neck crab	Invert
<i>Podochela schmitti</i>		Invert
<i>Podochela veleronis</i>		Invert
<i>Pododesmus macroschisma</i>	Alaska falsejingle	Invert
<i>Poecillastra tenuilaminaris</i>	plate sponge	Invert
<i>Polyandrocarpa</i> sp	sea squirt	Invert
<i>Polyclinum planum</i>	elephant ear tunicate	Invert
<i>Poraniopsis inflata</i>	spiny sea star	Invert
<i>Porifera</i> sp SD 1	sponge	Invert
<i>Porifera</i> sp SD 10	sponge	Invert
<i>Porifera</i> sp SD 11	sponge	Invert
<i>Porifera</i> sp SD 12	sponge	Invert
<i>Porifera</i> sp SD 13	sponge	Invert
<i>Porifera</i> sp SD 14	sponge	Invert
<i>Porifera</i> sp SD 15	sponge	Invert
<i>Porifera</i> sp SD 16	sponge	Invert
<i>Porifera</i> sp SD 2	sponge	Invert
<i>Porifera</i> sp SD 3	sponge	Invert
<i>Porifera</i> sp SD 4	sponge	Invert
<i>Porifera</i> sp SD 5	sponge	Invert
<i>Porifera</i> sp SD 6	sponge	Invert
<i>Porifera</i> sp SD 7	sponge	Invert
<i>Porifera</i> sp SD 8	sponge	Invert
<i>Porifera</i> sp SD 9	sponge	Invert
<i>Portunus xantusii</i>	Xantus swimming crab	Invert
<i>Protula superba</i>	chalktube worm	Invert
<i>Pseudarchaster pusilus</i>	sea star	Invert
<i>Pseudochama exogyra</i>	reversed chama	Invert
<i>Pseudochama granti</i>	Grant jewelbox	Invert

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<i>Pseudocnus lubricus</i>	sea cucumber	Invert
<i>Pseudocnus piperata</i>	nestling sea cucumber	Invert
<i>Pseudocoutierea elegans</i>		Invert
<i>Pseudosquillaopsis marmorata</i>	mantis shrimp	Invert
<i>Psolidium bidiscum</i>		Invert
<i>Psolidium</i> sp SD1	sea cucumber	Invert
<i>Psolus chitonoides</i>	slipper sea cucumber	Invert
<i>Psolus squamatus</i>	scaly sea cucumber	Invert
<i>Pteria sterna</i>	Pacific wing-oyster	Invert
<i>Pteropurpura festiva</i>	festive murex	Invert
<i>Pteropurpura macroptera</i>	frill-wing murex	Invert
<i>Pteropurpura trialata</i>	three-wing murex	Invert
<i>Pteropurpura vokesae</i>	wrinkle-wing murex	Invert
<i>Ptilosarcus gurneyi</i>	fleshy sea pen	Invert
<i>Pugettia dalli</i>	spined kelp crab	Invert
<i>Pugettia producta</i>	northern kelp crab	Invert
<i>Pugettia richii</i>	cryptic kelp crab	Invert
<i>Pugettia venetiae</i>		Invert
<i>Puncturella galeata</i>	helmet puncturella	Invert
<i>Puncturella multistriata</i>	many-rib puncturella	Invert
<i>Pycnopodia helianthoides</i>	sunflower star	Invert
<i>Pylopagurus diegensis</i>		Invert
<i>Pylopagurus holmesi</i>	right-handed hermit	Invert
<i>Pyromaia tuberculata</i>	tuberculate pear crab	Invert
<i>Pyura haustor</i>	sea squirt	Invert
<i>Pyura mirabilis</i>	sea squirt	Invert
<i>Randallia ornata</i>	globose sand crab	Invert
<i>Rathbunaster californicus</i>	California sun star	Invert
<i>Renilla koellikeri</i>	purple sea pansy	Invert
<i>Rhabdocalyptus dawsoni</i>	glass sponge	Invert
<i>Rictaxis painei</i>	barrel snail	Invert
<i>Rocinela angustata</i>	isopod	Invert
<i>Rocinela belliceps</i>	isopod	Invert
<i>Rossia pacifica</i>	eastern Pacific bobtail	Invert
<i>Salmacina tribranchiata</i>	serpulid polychaete	Invert
<i>Scabrotrophon grovesi</i>	trophon	Invert
<i>Schizoporella inarmata</i>	bryozoan	Invert
<i>Schmittius politus</i>	polished mantis shrimp	Invert
<i>Sclerasterias heteropaes</i>	banded sea star	Invert
<i>Scyra acutifrons</i>	sharpnose crab	Invert
<i>Sicyonia ingentis</i>	ridgeback rock shrimp	Invert
<i>Sicyonia penicillata</i>	peanut rock shrimp	Invert
<i>Simnia loebbeckeana</i>	Loebbeck's simnia	Invert
<i>Sinum scopulosum</i>	fat baby-ear	Invert
<i>Solenocera florea</i>	humpback shrimp	Invert

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Solenocera mutator	humpback shrimp	Invert
Spatangus californicus	California heart urchin	Invert
Spheciospongia confoederata	gray moonsponge	Invert
Sphincturella sp A	sponge	Invert
Spirontocaris holmesi	slender blade shrimp	Invert
Spirontocaris prionota		Invert
Spirontocaris sica	offshore blade shrimp	Invert
Spirontocaris snyderi		Invert
Stachytilum superbum	sea pen	Invert
Staurocalyptus solidus	glass sponge	Invert
Stelletta clarella	sponge	Invert
Stenorhynchus debilis	Pacific arrow crab	Invert
Stephanauge annularis	signet ring anemone	Invert
Stomphia vinosa	anemone	Invert
Strongylocentrotus fragilis	fragile sea urchin	Invert
Strongylocentrotus franciscanus	red sea urchin	Invert
Strongylocentrotus purpuratus	Pacific purple urchin	Invert
Styela clava	tuberculate sea squirt	Invert
Styela coriacea	pimpled sea squirt	Invert
Styela gibbsii	wrinkled sea squirt	Invert
Styela montereyensis	longstalk sea squirt	Invert
Styela plicata	cobblestone sea squirt	Invert
Styela sp A		Invert
Styela truncata		Invert
Stylasterias forreri	fish-eating star	Invert
Stylatula elongata	slender sea pen	Invert
Stylatula sp A	sea pen	Invert
Suberites suberea	hermitcrab sponge	Invert
Swiftia sp	gorgonian	Invert
Sympagurus haigae		Invert
Synalpheus lockingtoni	littoral pistol shrimp	Invert
Taliepus nuttalli	globose kelp crab	Invert
Tegula aureotincta	gilded turban	Invert
Telesto californica	soft coral	Invert
Telesto nuttingi	anemone	Invert
Terebra pedroana	San Pedro auger	Invert
Terebratalia occidentalis	ribbed lamp shell	Invert
Terebratalia transversa	red lamp shell	Invert
Terebratulina crosseii	white lamp shell	Invert
Terebratulina unguicula	lamp shell	Invert
Tethya aurantium	orange ball sponge	Invert
Tetilla arb	gray puffball sponge	Invert
Thalamoporella californica	chambered bryozoan	Invert
Thesea sp A	sea twig	Invert
Thesea sp B	yellow sea twig	Invert

Thrissacanthias penicillatus	sea star	Invert
Tochuina tetraquetra	giant orange tochui	Invert
Trientrion flabelliformis	sponge	Invert
Triopha catalinae	sea-clown triopha	Invert
Triopha maculata	maculated triopha	Invert
Tritonia diomedea	rosy tritonia	Invert
Tritonia festiva	diamondback tritonia	Invert
Trivia ritteri	gastropod	Invert
Tubularia crocea	pink-mouth hydroid	Invert
Turcica caffeea	two-tooth topsnail	Invert
Virgularia agassizi	sea pen	Invert
Virgularia bromleyi	sea pen	Invert
Virgularia californica	California sea pen	Invert
Virgularia galapagensis	Galapagos sea pen	Invert
Zoanthidae sp A	zooanthid	Invert
Zoanthidae sp B	zooanthid	Invert
Zoobotryon verticillatum	spaghetti moss-animal	Invert

luList10_TissueTypes

TissueType
NR
Whole Body

luList11_QualifierCodes

Qualifier	Description	AssociatedTable
<	less than	
<=	less than or equal to	
>	greater than	
>=	greater than or equal to	
A	Count base on calculation of Aliquot	TrawlInvertebrateAbundance
AE	Analyst Error	
BMDL	Below Method Detection Limit	Chemistry
BRL	Below Reporting Level	Chemistry
C	Colonial (not for use with infauna)	
CT	Contaminated	
E	Estimated	
I	Interference	
None	None	
NA	Not Analyzed	
ND	Not Detected	
NS	Not Sampled	

Qualifier	Description	AssociatedTable
P	Present, not counted	
R	Rare species	
S	Specialty taxonomy lot	
X	Exotic species	
NM	Not Measured	???

luList12_SizeDescriptors

SizeDescriptor
Carapace length
Carapace width
Fork length
Maximum dimension
Not recorded
Standard length
Standard length size class
Test diameter
Total length
Wing width

luList13_TidalStage

Stage
Ebb
Flood
NR
Slack

luList14_TestMatrices

MatrixCode	MatrixDescription	AssociatedTable
EX	Extract	Chemistry
FRESHWATER	Fresh water	Chemistry
SEAWATER	Sea Water	Chemistry / Discrete Water
SEDIMENT	Sediment	Chemistry
TISSUE	Fish Tissue	Chemistry

luList15_ParameterCodes

Parameter	ParameterCategory	AssociatedTable
2,4'-DDD	Chlorinated Hydrocarbons	Chemistry
4,4'-DDD	Chlorinated Hydrocarbons	Chemistry

Parameter	ParameterCategory	AssociatedTable
2,4'-DDE	Chlorinated Hydrocarbons	Chemistry
4,4'-DDE	Chlorinated Hydrocarbons	Chemistry
2,4'-DDT	Chlorinated Hydrocarbons	Chemistry
4,4'-DDT	Chlorinated Hydrocarbons	Chemistry
4,4'-DDMU	Chlorinated Hydrocarbons	Chemistry
cis-chlordane	Chlorinated Hydrocarbons	Chemistry
Dieldrin	Chlorinated Hydrocarbons	Chemistry
trans-chlordane	Chlorinated Hydrocarbons	Chemistry
Aluminum	Metals	Chemistry
Antimony	Metals	Chemistry
Barium	Metals	Chemistry
Beryllium	Metals	Chemistry
Cadmium	Metals	Chemistry
Chromium	Metals	Chemistry
Copper	Metals	Chemistry
Iron	Metals	Chemistry
Lead	Metals	Chemistry
Mercury	Metals	Chemistry
MetalsArsenic	Metals	Chemistry
Nickel	Metals	Chemistry
Selenium	Metals	Chemistry
Silver	Metals	Chemistry
Zinc	Metals	Chemistry
1,6,7-Trimethyl-naphthalene	PAH	Chemistry
1-Methylnapthalene	PAH	Chemistry
1-Methylphenanthrene	PAH	Chemistry
2,6-Dimethylnapthalene	PAH	Chemistry
2-Methylnapthalene	PAH	Chemistry
Acenaphthene	PAH	Chemistry
Acenaphthylene	PAH	Chemistry
Anthracene	PAH	Chemistry
Benz(a)anthracene	PAH	Chemistry
Benzo(a)pyrene	PAH	Chemistry
Benzo(b)fluoranthene	PAH	Chemistry
Benzo(e)pyrene	PAH	Chemistry
Benzo(g,h,i)perylene	PAH	Chemistry
Benzo(k)fluoranthene	PAH	Chemistry

Parameter	ParameterCategory	AssociatedTable
Biphenyl	PAH	Chemistry
Chrysene	PAH	Chemistry
Dibenz(a,h)anthracene	PAH	Chemistry
Fluoranthene	PAH	Chemistry
Fluorene	PAH	Chemistry
Indeno(1,2,3-c,d) pyrene	PAH	Chemistry
Naphthalene	PAH	Chemistry
Perylene	PAH	Chemistry
Phenanthrene	PAH	Chemistry
Pyrene	PAH	Chemistry
BDE017	PBDE	Chemistry
BDE028	PBDE	Chemistry
BDE047	PBDE	Chemistry
BDE099	PBDE	Chemistry
BDE100	PBDE	Chemistry
BDE138	PBDE	Chemistry
BDE153	PBDE	Chemistry
BDE154	PBDE	Chemistry
BDE183	PBDE	Chemistry
BDE190	PBDE	Chemistry
BDE209	PBDE	Chemistry
PCB018	PCB	Chemistry
PCB028	PCB	Chemistry
PCB037	PCB	Chemistry
PCB044	PCB	Chemistry
PCB049	PCB	Chemistry
PCB052	PCB	Chemistry
PCB066	PCB	Chemistry
PCB070	PCB	Chemistry
PCB074	PCB	Chemistry
PCB077	PCB	Chemistry
PCB081	PCB	Chemistry
PCB087	PCB	Chemistry
PCB099	PCB	Chemistry
PCB101	PCB	Chemistry
PCB105	PCB	Chemistry
PCB110	PCB	Chemistry

Parameter	ParameterCategory	AssociatedTable
PCB114	PCB	Chemistry
PCB118	PCB	Chemistry
PCB119	PCB	Chemistry
PCB123	PCB	Chemistry
PCB126	PCB	Chemistry
PCB128	PCB	Chemistry
PCB138	PCB	Chemistry
PCB149	PCB	Chemistry
PCB151	PCB	Chemistry
PCB153	PCB	Chemistry
PCB156	PCB	Chemistry
PCB157	PCB	Chemistry
PCB158	PCB	Chemistry
PCB167	PCB	Chemistry
PCB168	PCB	Chemistry
PCB169	PCB	Chemistry
PCB170	PCB	Chemistry
PCB177	PCB	Chemistry
PCB180	PCB	Chemistry
PCB183	PCB	Chemistry
PCB187	PCB	Chemistry
PCB189	PCB	Chemistry
PCB194	PCB	Chemistry
PCB201	PCB	Chemistry
PCB206	PCB	Chemistry
Bifenthrin	Pyrethroid	Chemistry
cis-Permethrin	Pyrethroid	Chemistry
Cyfluthrin	Pyrethroid	Chemistry
Cypermethrin	Pyrethroid	Chemistry
Deltamethrin	Pyrethroid	Chemistry
Esfenvalerate	Pyrethroid	Chemistry
Fenpropathrin	Pyrethroid	Chemistry
lambda-Cyhalothrin	Pyrethroid	Chemistry
trans-Permethrin	Pyrethroid	Chemistry
TN	Total NitrogenInorganic	Chemistry
TOC	Total Organic Carbon	Chemistry
TP	Total Phosphorus	Chemistry

Parameter	ParameterCategory	AssociatedTable
Gravel2m	Grain Size	Chemistry
Kurtosis	Grain Size	Chemistry
Mean	Grain Size	Chemistry
Median	Grain Size	Chemistry
Mode	Grain Size	Chemistry
Percent Fines	Grain Size	Chemistry
Phi-0.5	Grain Size	Chemistry
Phi00.0	Grain Size	Chemistry
Phi00.5	Grain Size	Chemistry
Phi01.0	Grain Size	Chemistry
Phi01.5	Grain Size	Chemistry
Phi02.0	Grain Size	Chemistry
Phi02.5	Grain Size	Chemistry
Phi03.0	Grain Size	Chemistry
Phi03.5	Grain Size	Chemistry
Phi04.0	Grain Size	Chemistry
Phi04.5	Grain Size	Chemistry
Phi05.0	Grain Size	Chemistry
Phi05.5	Grain Size	Chemistry
Phi06.0	Grain Size	Chemistry
Phi06.5	Grain Size	Chemistry
Phi07.0	Grain Size	Chemistry
Phi07.5	Grain Size	Chemistry
Phi08.0	Grain Size	Chemistry
Phi08.5	Grain Size	Chemistry
Phi09.0	Grain Size	Chemistry
Phi09.5	Grain Size	Chemistry
Phi-1.0	Grain Size	Chemistry
Phi10.0	Grain Size	Chemistry
Phi10.5	Grain Size	Chemistry
Phi11.0	Grain Size	Chemistry
Phi11.5	Grain Size	Chemistry
Phi12.0	Grain Size	Chemistry
Skewness	Grain Size	Chemistry
%Lipids	Tissue Only	Chemistry
%Moisture	Tissue Only	Chemistry
E. Coli	Bacteria	Microbiology

Parameter	ParameterCategory	AssociatedTable
Enterococcus	Bacteria	Microbiology
Fecal Coliforms	Bacteria	Microbiology
Total Coliforms	Bacteria	Microbiology
Ammonium	Inorganic	Toxicity
Hydrogen Sulfide	Inorganic	Toxicity
Salinity	Inorganic	Toxicity
Total Ammonia	Inorganic	Toxicity
Total Sulfides	Inorganic	Toxicity
Unionized Ammonia	Inorganic	Toxicity
Dissolved Oxygen	Oxygen	Toxicity
pH	pH	Toxicity

luList16_SeaStates

SeaStateCode
Calm
Choppy
Confused
NR
Rough

luList17_MeasurementBasisCodes

MeasurementBasisCode	Description
DW	Dry Weight - sediments
WW	Wet Weight – tissue only
NR	Not recorded - water

luList18_SedimentColors

Color	Description
Black	
Dark Brown	
Gray	
NR	
Olive Green	
Other	
Red	
Light Brown	

luList19_CurrentDirections

Direction
Down Coast
Indeterminate
No Current
Up Coast

luList20_NavigationalInstrumentTypes

NavType	Description
DGPS	Differential Global Positioning Satellite
GPS	Global Positioning Satellite
WAAS	Wide Area Augmentation System

luList21_MaterialofSewageOrigin

MSO	Description
Condoms	
Grease	
Mixed	
None	None present
NR	Not recorded
Odor	
Tampon applicators	
Tampons	
Other	Comment required

luList22_TrawlFishAnomalyCodes

AnomalyCode	Anomaly
A	Ambicoloration
AB	Ambicoloration/Albinism
ABD	Ambicoloration/Albinism/Deformity (Skeletal)
ABF	Ambicoloration/Albinism/Fin Erosion
ABL	Ambicoloration/Albinism/Lesion
ABP	Ambicoloration/Albinism/Parasite
ABT	Ambicoloration/Albinism/Tumor
AD	Ambicoloration/Deformity (Skeletal)
ADF	Ambicoloration/Deformity (Skeletal)/Fin Erosion
ADL	Ambicoloration/Deformity (Skeletal)/Lesion
ADP	Ambicoloration/Deformity (Skeletal)/Parasite

AnomalyCode	Anomaly
ADT	Ambicoloration/Deformity (Skeletal)/Tumor
AF	Ambicoloration/Fin Erosion
AFL	Ambicoloration/Fin Erosion/Lesion
AFP	Ambicoloration/Fin Erosion/Parasite
AFT	Ambicoloration/Fin Erosion/Tumor
AL	Ambicoloration/Lesion
ALP	Ambicoloration/Lesion/Parasite
ALT	Ambicoloration/Lesion/Tumor
AP	Ambicoloration/Parasite
APT	Ambicoloration/Parasite/Tumor
AT	Ambicoloration/Tumor
B	Albinism
BD	Albinism/Deformity (Skeletal)
BDF	Albinism/Deformity (Skeletal)/Fin Erosion
BDL	Albinism/Deformity (Skeletal)/Lesion
BDP	Albinism/Deformity (Skeletal)/Parasite
BDT	Albinism/Deformity (Skeletal)/Tumor
BF	Albinism/Fin Erosion
BFL	Albinism/Fin Erosion/Lesion
BFP	Albinism/Fin Erosion/Parasite
BFT	Albinism/Fin Erosion/Tumor
BL	Albinism/Lesion
BP	Albinism/Parasite
BT	Albinism/Tumor
D	Deformity (Skeletal)
DF	Deformity (Skeletal)/Fin Erosion
DFL	Deformity (Skeletal)/Fin Erosion/Lesion
DFP	Deformity (Skeletal)/Fin Erosion/Parasite
DFT	Deformity (Skeletal)/Fin Erosion/Tumor
DL	Deformity (Skeletal)/Lesion
DLP	Deformity (Skeletal)/Lesion/Parasite
DLT	Deformity (Skeletal)/Lesion/Tumor
DP	Deformity (Skeletal)/Parasite
DPT	Deformity (Skeletal)/Parasite/Tumor
DT	Deformity (Skeletal)/Tumor
F	Fin Erosion
FL	Fin Erosion/Lesion

AnomalyCode	Anomaly
FLP	Fin Erosion/Lesion/Parasite
FLT	Fin Erosion/Lesion/Tumor
FP	Fin Erosion/Parasite
FPT	Fin Erosion/Parasite/Tumor
FT	Fin Erosion/Tumor
L	Lesion
LP	Lesion/Parasite
LPT	Lesion/Parasite/Tumor
LT	Lesion/Tumor
None	No Anomaly
P	Parasite
PO	Parasite/Other
PT	Parasite/Tumor
T	Tumor

luList23_TrawlInvertAnomalyCodes

AnomalyCode	Anomaly
None	No Anomaly
P	Parasite
PU	Burnspot disease / Parasite
U	Burnspot disease

luList24_AnalysisMethodCodes

MethodCode	Method	Associated Table
AlpKem RFA 300 Series Nutrient Analyzer	AlpKem RFA 300 Series Nutrient Analyzer	Chemistry
APHA 9230 B	From Standard Methods	Micro
APHA 9230 C	From Standard Methods	Micro
CHN	EA1108 CHN Elemental Analyzer	Chemistry
Colilert (52 Well Tray)	Idexx	Micro
Colilert (96 Well Tray)	Idexx	Micro
CVAA	Cold Vapor Atomic Absorption Analysis	Chemistry
Entrolert (52 Well Tray)	Idexx	Micro
Entrolert (96 Well Tray)	Idexx	Micro
EPA 160.2	Total Suspended Solids analysis method	Chemistry
EPA 1600	From Standard Methods	Micro
EPA200.7	From Standard Methods	Chemistry

MethodCode	Method	Associated Table
EPA200.8	From Standard Methods	Chemistry
EPA206.2	From Standard Methods	Chemistry
EPA245.5	From Standard Methods	Chemistry
EPA270.2	From Standard Methods	Chemistry
FAA	Flame Atomic Absorption Spectrometer	Chemistry
FIAS	Flow Injection Analysis System	Chemistry
FIMS	Flow Injection Mercury System	Chemistry
FLUORO	Fluorometric analysis method for chlorophyll a and phaeopigment	Chemistry
GCECD	CG/ECD	Chemistry
GCMS	GS/MS	Chemistry
GFAA	Graphite Furnace Atomic Absorption Analysis	Chemistry
Gravimetric	Sediment Grain Size Sieve Analysis	Chemistry
HAA	Hydride Atomic Absorption Analysis	Chemistry
ICPAES	Inductively Coupled Plasma Atomic Emission Spectrometer	Chemistry
ICPMS	Inductively Coupled Plasma Mass Spectrometer	Chemistry
IONGCMS	Ion Trap GC/MS	Chemistry
MARPCN I	High temperature combustion method	Chemistry
Mettler H54AR Balance	Gravimetric	Chemistry
MF	Membrane Filtration	Micro
MF (APHA 9222 B)	From Standard Methods	Micro
MF (APHA 9222 D)	From Standard Methods	Micro
MF(APHA 9230 C)	From Standard Methods	Micro
MTF	Multiple Tube Fermentation	Micro
MTF (APHA 9221 B)	From Standard Methods	Micro
MTF by A-1 (APHA 9221 E.2)	From Standard Methods	Micro
MTF by EC (APHA 9221 E.1)	From Standard Methods	Micro
NA	Not analyzed	Chemistry
NR	Missing data	Chemistry
PCB Congeners Consistent with NPDES method 608	From Standard Methods	Chemistry
PSEP86	Sediment Grain Size	Chemistry
Real Time	CTD	Chemistry

MethodCode	Method	Associated Table
SM2540D	From Standard Methods	Chemistry
SM4500NH3	From Standard Methods	Chemistry
SM4500NO3	From Standard Methods	Chemistry
SM4500P	From Standard Methods	Chemistry
SW6010	From Standard Methods	Chemistry
SW7060	From Standard Methods	Chemistry
SW7740	From Standard Methods	Chemistry
SW8081	From Standard Methods	Chemistry
SW80818082	From Standard Methods	Chemistry
SW8270	From Standard Methods	Chemistry
Turner Designs 10-005R Fluorometer	Sensor	Chemistry
Wet Sieve Analysis	Gravimetric	Chemistry

luList25_PreparationCodes

PrepCode	Preparation Method
90% Acetone	90% Acetone Extract for chlorophyll a and phaeopigment
ASE	Accelerated Solvent Extraction
Conventional Oven	Conventional Oven
EPA245.5	Mercury in Sediment (Cold Vapor with Permanganate Digestion)
EPA3050A	Strong Acid Hot Plate Method (EPA3050A)
EPA3050B	Strong Acid Hot Plate or Microwave Method (EPA3050B)
EPA3051	Strong Acid Microwave Method (EPA 3051)
EPA3052	From standard methods.
EPA3052/3050B	From standard methods.
EPA3053	From standard methods.
EPA3055	Strong Acid Hot Plate Method (EPA 3055)
MASE	Microwave Assisted Solvent Extraction
MgNO3	Magnesium Nitrate
NA	No Applicable Prepcode
NR	Missing data
PSEP86	Sediment Grain Size
ROLLER	Roller Table Extraction
SFE	Supercritical Fluid Extraction
Solvent extraction	Solvent extraction
SONIC	Ultrasonic Extraction
SOXHLET	Soxhlet Solvent Extraction

PrepCode	Preparation Method
Varian-EPA245.5	From standard methods
	New values from M. Hoxey

luList26_EventTypes

EventTypeCode
Bioaccumulation Event
Microbiology Station Occupation / Event
Sediment Grab Event
Trawl Assemblage Event
Water Quality Cast Event
Water Quality Discrete Sample Event

luList27_SurfConditions

Height
High(7+)
Low(1-3)
Mid(4-6)

luList28_Units

Units	Description	AssociatedTable
UG/L	Micrograms per liter	All
MG/KG	Milligrams per kilogram	Chemistry – metals only
UG/KG	Micrograms per kilogram	Chemistry – organics only
PERCENT	Percent	Chemistry / Toxicity
MG/L	Milligrams per liter	Chemistry / Toxicity / Water Quality
KG	Kilograms	Fish & Invertebrate Abundance
CM	Centimeters	Grab Event
MM	Millimeters	Infauna
C	Degrees Centigrade	Micro
CFU/100ml	Colony Forming Units	Micro
MPN/100ml	Most Probable Number	Micro
M	Meters	Sediment Grab Event, Trawl Assemblage Event
FT	Feet	Station Occupation
KTS	Knots	Station Occupation
Hours	The number of hours	Toxicity
pH	Log of hydrogen ion concentration	Toxicity
Days	The number of days	Toxicity Batch

Units	Description	AssociatedTable
G	grams	Whole Fish Composites
M/S	Meters per second	WQ Cast
PSU	Practical Salinity Units	WQCast, StationOccupation
UG/L	micrograms per liter	All
PSI	Pounds per square inch (decibars)	Archival Data Tag

luList29_FishBodyLocation

BodyLocation
Branchial Cavity
Buccal Cavity
Eyes
Musculoskeleton
Skin / Fins

luList30_MissingValueCodes

Data Type	Code
Date	01/Jan/SampleYear (i.e. 01/Jan/2008)
Time	-99
Numerical	-99
Text	NR

luList31_TrawlDebrisType

DebrisType	Description
Rocks	
Terrestrial Vegetation	Branches, leaves, etc.
Marine Vegetation	Algae
Lumber	Modified wood
Plastic	
Metal Debris	
Paper	
Medical Waste	
Cans	
Glass Bottles	
Fishing Gear	
Tires	
Other	Comment required
Benthic Debris	

DebrisType	Description
Missing Data	
No_Debris_Present	

luList32_TrawlDebrisAbundanceCodes

Code	Description
None	No Debris Present
P	Present 1 item
L	Low 2-10 items
M	Moderate 11-100 items
H	>100 items
NR	Not recorded

luList33_TrawlDebrisWtEstimates

Code	Description
None	No Debris Present
T	Trace 0.0-0.1Kg
L	Low 0.2-1.0Kg
M	Moderate 1.1-10Kg
H	High >10Kg
NR	Not Recorded

luList34_ToxicitySpecies

SpeciesCode	SpeciesName
EE	Eohaustorius estuarius
SP	Strongylocentrotus purpuratus
MG	Mytilus galloprovincialis

luList35_ToxicityProtocols

ProtocolCode	ProtocolDescription
ASTM 1853	ASTM. 1997. E 1853-96
EPA 1994	EPA amphipod test method (EPA/600/R-94/025)
EPA 4425	From standard methods.
USGS F10.6	From standard methods.
USGS F10.7	From standard methods.
USGS SOP F10.6	Sea Urchin Fertilization Toxicity Test
USGS SOP F10.7	Sea Urchin Embryological Development Test
ANDERSON1996	For Sediment Water Interface
EPA2007	For Sediment TIEs

luList36_ToxicityMatrices

MatrixCode	MatrixDescription
BS	bulk sediment (whole sediment)
DW	Dilution Water
EL	Elutriate
EX	Extract
IW	interstitial water (pore water)
OL	overlying water
RT	reference toxicant
SWI	Sediment water interface

luList37_ToxicityEndPoints

EPCode	EndPoint
B[a]Peq	Benzo [a] Pyrene equivalents
DV	Percent Normal Pluteus Stage
EC50	median effective concentration
FP	Fertilized Percent
IC50	median inhibitory concentration
RL	relative luminescence
SP4	4 day survival percent
SP10	10 day survival percent
NPA	Percent normal-alive (mytilus)

luList38_ToxicityWaterQualityParameters

STWQCode	STWQName	Units
COND	Conductivity	uS/cm
DO	Dissolved Oxygen	mg/L
H2S	Hydrogen Sulfide	mg/L
NH3T	Total Ammonia	mg/L
NH3U	Unionized Ammonia	mg/L
PH	pH	pH
SAL	Salinity	g/L
ST	Total Sulfide	ug/L
TEMP	Temperature	C

luList39_ToxicityTestAcceptabilityCodes

AcceptCode	CodeDescription
A	Acceptable data for analysis
AEHJ	Combination Code

AcceptCode	CodeDescription
AH	Combination Code
AHJ	Combination Code
AJ	Combination Code
AK	Combination Code
C	Reduced number of replicates
CDEH	Combination Code
D	Control performance criteria not met
DE	Combination Code
DEH	Combination Code
DJ	Combination of codes D and J
E	Sample stored > 14 days
EK	combination of codes E and K
G	Reference test missing or outside limits
H	Water quality data incomplete
HD	Combination Code
J	Minor deviation in test conditions
K	Incoming sample temperature exceeds limits
Q	Control did not meet replicate acceptability criterion (>or=80% in any one rep)
AC	Combination Code
EC	Combination Code

luList40_EventFailure Codes

FailCode	FailureReason
A	Canted
B	Washed
C	Poor Closure
D	Disturbed Surface
E	< 5 cm Penetration
F	>5 & < 8 cm Penetration
G	Fouled Net
H	Torn Net
I	No contact w/ bottom
J	Improper Distance/Time
K	Irregular Bottom
L	Failed Trawls (comment req.)
M	Kelp Bed
N	Obstructions
None	No Failure

FailCode	FailureReason
O	Less than 3 m (bay)
Other	Comment Required
P	<6M (Ocean)
Q	Outside Radius Limit
S	Rocky Bottom
T	Pre abandoned
V	Not within 10% of Target Site Depth
W	On Land
Z	No Access

luList41_ControlResponseCodes

Code	Description
NS	Not Significant
S	Significant
NA	Not Applicable

luList42_TimeZoneCodes

TimeZoneCode	TimeZoneCodeDescription
NR	Not Recorded
PDT	Pacific Daylight Savings Time
PST	Pacific Standard Time

luList43_DiveSurveySide

Side	SideDescription
N	North
S	South
E	East
W	West
CEN	Center

luList44_DiveSurveyDepthZone

DepthZone	DepthZoneDescription
INNER	Inner Depth Zone
INMID	Inner/Middle Depth Zone
MID	Middle Depth Zone
OUTMID	Outer/Middle Depth Zone
OUTER	Outer Depth Zone

luList45_DiveSurveyLevel

SurveyLevel	SurveyLevelDescription
BOT	Bottom
MID	Middle
CAN	Canopy

luList46_DiveSurveySpecies

Sample Type	Sample Subtype	Species	CommonName	Group
FISH	FISH	Alloclinus holderi	Island Kelpfish	FISH
FISH	FISH	Alopias vulpinus	Thresher Shark	FISH
FISH	FISH	Anarrhichthys ocellatus	Wolf Eel	FISH
FISH	FISH	Anisotremus davidsonii	Sargo	FISH
FISH	FISH	Apodichthys sanctaerosae	Kelp Gunnel	FISH
FISH	FISH	Artedius corallinus	Coralline Sculpin	FISH
FISH	FISH	Atherinidae sp	Grunion Topsmelt or Jacksmelt	FISH
FISH	FISH	Atherinops affinis	Topsmelt	FISH
FISH	FISH	Atherinopsis californiensis	Jacksmelt	FISH
FISH	FISH	Aulorhynchus flavidus	Tubesnout	FISH
FISH	FISH	Bait	Bait Sardines/Anchovies	FISH
FISH	FISH	Balistes polylepis	Finescale Triggerfish	FISH
FISH	FISH	Bathymasteridae sp	Ronquils	FISH
FISH	FISH	Blenniidae sp	Blennies	FISH
FISH	FISH	Bothidae sp	Lefteyed flounders	FISH
FISH	FISH	Brachyistius frenatus	Kelp Surfperch	FISH
FISH	FISH	Caulolatilus princeps	Ocean Whitefish	FISH
FISH	FISH	Cebidichthys violaceus	Monkeyface Eel	FISH
FISH	FISH	Cephaloscyllium ventriosum	Swell Shark	FISH
FISH	FISH	Chaetodon falcifer	Scythemarked Butterflyfish	FISH
FISH	FISH	Cheilotrema saturnum	Black Croaker	FISH
FISH	FISH	Chirolophis nugator	Mosshead warbonnet	FISH
FISH	FISH	Chitonotus pugetensis	Roughback Sculpin	FISH
FISH	FISH	Chromis punctipinnis	Blacksmith	FISH
FISH	FISH	Citharichthys sordidus	Pacific Sanddab	FISH
FISH	FISH	Citharichthys sp	Sanddabs	FISH
FISH	FISH	Citharichthys stigmaeus	Speckled Sanddab	FISH
FISH	FISH	Clinidae sp	Kelpfishes and Fringeheads	FISH
FISH	FISH	Clupeidae sp	Sardines and anchovies	FISH
FISH	FISH	Coryphopterus nicholsii	Blackeye Goby	FISH

Sample Type	Sample Subtype	Species	CommonName	Group
FISH	FISH	Cottidae sp	Sculpins	FISH
FISH	FISH	Cymatogaster aggregata	Shiner Surfperch	FISH
FISH	FISH	Damalichthys vacca	Pile Surfperch	FISH
FISH	FISH	Embiotoca jacksoni	Black Surfperch	FISH
FISH	FISH	Embiotoca lateralis	Striped Surfperch	FISH
FISH	FISH	Embiotocidae sp	Surfperches	FISH
FISH	FISH	Engraulis mordax	Northern Anchovy	FISH
FISH	FISH	Ernogrammus walkeri	Masked prickleback	FISH
FISH	FISH	Galeorhinus galeus	Tope Shark	FISH
FISH	FISH	GBY Rockfish young of year	GBY Rockfish young of year	FISH
FISH	FISH	Gibbonsia sp	Kelpfish	FISH
FISH	FISH	Girella nigricans	Opaleye	FISH
FISH	FISH	Gobiidae sp	Gobies	FISH
FISH	FISH	Gymnothorax mordax	California Moray	FISH
FISH	FISH	Halicoeres semicinctus	Rock Wrasse	FISH
FISH	FISH	Heterodontus francisci	Horn Shark	FISH
FISH	FISH	Heterostichus rostratus	Giant Kelpfish	FISH
FISH	FISH	Hexagrammos decagrammus	Kelp Greenling	FISH
FISH	FISH	Hexagrammos lagocephalus	Rock Greenling	FISH
FISH	FISH	Hyperprosopon analis	Spotfin Surfperch	FISH
FISH	FISH	Hyperprosopon argenteum	Walleye Surfperch	FISH
FISH	FISH	Hyperprosopon ellipticum	Silver Surfperch	FISH
FISH	FISH	Hypsurus caryi	Rainbow Surfperch	FISH
FISH	FISH	Hypsypops rubicundus	Garibaldi	FISH
FISH	FISH	Jordania zonope	Longfin Sculpin	FISH
FISH	FISH	Kasatkia seigeli	Six-spot Prickleback	FISH
FISH	FISH	KGB Rockfish young of the year	KGB Rockfish young of the year	FISH
FISH	FISH	Leiocottus hirundo	Lavender Sculpin	FISH
FISH	FISH	Lepidogobius lepidus	bay goby	FISH
FISH	FISH	Lethops connectens	Kelp Goby Halfblind Goby	FISH
FISH	FISH	Liparis mucosus	Slimy Snailfish	FISH
FISH	FISH	Liparis sp.	Snailfish	FISH
FISH	FISH	Lythrypnus dalli	Bluebanded Goby	FISH
FISH	FISH	Medialuna californiensis	Halfmoon	FISH
FISH	FISH	Mola Mola	Ocean Sunfish	FISH
FISH	FISH	Mugil cephalus	Mullet	FISH
FISH	FISH	Myliobatis californica	Bat Ray	FISH

Sample Type	Sample Subtype	Species	CommonName	Group
FISH	FISH	na na	No fish on the transect	FISH
FISH	FISH	Neoclinus stephensae	Yellowfin Fringehead	FISH
FISH	FISH	Neoclinus uninotatus	Onespot Fringehead	FISH
FISH	FISH	Ophiodon elongatus	Lingcod	FISH
FISH	FISH	Orthonopias triacis	snubnose sculpin	FISH
FISH	FISH	Oxyjulis californica	Senorita	FISH
FISH	FISH	Oxylebius pictus	Painted Greenling	FISH
FISH	FISH	OYB Rockfish young of the year	OYB Rockfish young of the year	FISH
FISH	FISH	OYT (Olive/Yellowtail) Rockfish	OYT (Olive/Yellowtail) Rockfish	FISH
FISH	FISH	Paralabrax clathratus	kelp bass calico bass	FISH
FISH	FISH	Paralabrax maculatofasciatus	spotted sandbass	FISH
FISH	FISH	Paralabrax nebulifer	barred sandbass	FISH
FISH	FISH	Paralichthys californicus	california halibut	FISH
FISH	FISH	Phanerodon atripes	sharpnose surfperch	FISH
FISH	FISH	Phanerodon furcatus	white surfperch	FISH
FISH	FISH	Pholididae sp	Gunnels	FISH
FISH	FISH	Platyrrhinoides triseriata	thornback	FISH
FISH	FISH	Pleuronectidae sp	Righteyed flounders	FISH
FISH	FISH	Plueronichthys coenosus	C-O turbot	FISH
FISH	FISH	Porichthys notatus	plainfin midshipman	FISH
FISH	FISH	Prionace glauca	blue shark	FISH
FISH	FISH	Rathbunella hypoplecta	smooth ronquil	FISH
FISH	FISH	Rhacochilus toxotes	rubberlip surfperch	FISH
FISH	FISH	Rockfish unidentified sp	Rockfish unidentified sp	FISH
FISH	FISH	Rockfish young of the year unidentified sp	Rockfish young of the year unidentified sp.	FISH
FISH	FISH	Ronquilus jordani	northern ronquil	FISH
FISH	FISH	Sarda chiliensis	eastern pacific bonito	FISH
FISH	FISH	Sardinops sagax	pacific sardine	FISH
FISH	FISH	Scomber japonicus	pacific mackerel greenback mackerel	FISH
FISH	FISH	Scorpaena guttata	california scorpionfish sculpin	FISH
FISH	FISH	Scorpaenichthys marmoratus	cabazon	FISH
FISH	FISH	Sebastes atrovirens	kelp rockfish	FISH
FISH	FISH	Sebastes auriculatus	brown rockfish	FISH
FISH	FISH	Sebastes carnatus	gopher rockfish	FISH
FISH	FISH	Sebastes caurinus	copper rockfish	FISH
FISH	FISH	Sebastes chrysomelas	black and yellow	FISH

Sample Type	Sample Subtype	Species	CommonName	Group
			rockfish	
FISH	FISH	Sebastes dalli	calico rockfish	FISH
FISH	FISH	Sebastes diploproa	spitnose rockfish	FISH
FISH	FISH	Sebastes entomelas	widow rockfish	FISH
FISH	FISH	Sebastes hopkinsi	squarespot rockfish	FISH
FISH	FISH	Sebastes melanops	black rockfish	FISH
FISH	FISH	Sebastes miniatus	vermilion rockfish	FISH
FISH	FISH	Sebastes mystinus	blue rockfish	FISH
FISH	FISH	Sebastes nebulosus	china rockfish	FISH
FISH	FISH	Sebastes paucispinis	bocaccio	FISH
FISH	FISH	Sebastes pinniger	canary rockfish	FISH
FISH	FISH	Sebastes rastrelliger	grass rockfish	FISH
FISH	FISH	Sebastes rosaceus	rosy rockfish	FISH
FISH	FISH	Sebastes saxicola	stripetail rockfish	FISH
FISH	FISH	Sebastes serranoides	olive rockfish	FISH
FISH	FISH	Sebastes serriceps	treefish	FISH
FISH	FISH	Semicossyphus pulcher	California sheephead	FISH
FISH	FISH	Seriola lalandi	yellowtail	FISH
FISH	FISH	Sphyræna argentea	california barracuda	FISH
FISH	FISH	Squatina californica	pacific angel shark	FISH
FISH	FISH	Stereolepis gigas	giant sea bass	FISH
FISH	FISH	Stichæidae sp	Pricklebacks	FISH
FISH	FISH	Synchirus / Rimicola sp	Manacled sculpin/Kelp clingfish	FISH
FISH	FISH	Syngnathus sp	pipefish	FISH
FISH	FISH	Synodus lucioceps	California lizardfish	FISH
FISH	FISH	Torpedo californica	pacific electric ray	FISH
FISH	FISH	Trachurus symmetricus	jack mackerel	FISH
FISH	FISH	Triakis semifasciata	leopard shark	FISH
FISH	FISH	Unidentified Fish	Unidentified Fish	FISH
FISH	FISH	Zalembeius rosaceus	pink surfperch	FISH
FISH	SMURF	Apodichthys fucorum	Rockweed Gunnel	FISH
FISH	SMURF	Clinocottus analis	Wooly Sculpin	FISH
FISH	SMURF	Gobiesox maeandricus	Northern Clingfish	FISH
FISH	SMURF	KGB Rockfish young of the year	KGB Rockfish young of the year	FISH
FISH	SMURF	Oligocottus snyderi	fluffy sculpin	FISH
QUAD	QUAD	Alloclinus holderi	island kelpfish	FISH
QUAD	QUAD	Anthopleura artemesia	moonglow anemone	ANEMONE
QUAD	QUAD	Asterina miniata recruit	bat star	SEASTAR

Sample Type	Sample Subtype	Species	CommonName	Group
QUAD	QUAD	Calliostoma annulatum	purple-ringed top snail	SNAIL
QUAD	QUAD	Calliostoma ligatum	blue top snail	SNAIL
QUAD	QUAD	Centrostephanus coronatus	coronado urchin crowned urchin	URCHIN
QUAD	QUAD	Ceratostoma sp	Leafy or Nuttall's hornmouth	
QUAD	QUAD	Ceratostoma foliatum	Leafy hornmouth	SNAIL
QUAD	QUAD	Ceratostoma nuttalli	Nuttall's hornmouth	SNAIL
QUAD	QUAD	Chaceia /Parapholas sp	Wart-neck piddock/Scaleside piddock	CLAM
QUAD	QUAD	Chaceia ovoidea	Wart-necked piddock	BIVALVE
QUAD	QUAD	Citharichthys sp	Sanddab	FISH
QUAD	QUAD	Conus californicus	califonia cone snail	SNAIL
QUAD	QUAD	Coryphopterus nicholsi	black-eye goby	FISH
QUAD	QUAD	Cucumaria miniata	orange sea cucumber	SEA CUCUMBER
QUAD	QUAD	Cucumaria piperata	sea cucumber	SEA CUCUMBER
QUAD	QUAD	Cucumaria salma	sea cucumber	SEA CUCUMBER
QUAD	QUAD	Cucumaria sp	sea cucumber	SEA CUCUMBER
QUAD	QUAD	Cypraea spadicea	chestnut cowrie	COWRIE
QUAD	QUAD	Cystoseira osmundacea	bladder chain kelp	UNDERSTORY KELP
QUAD	QUAD	Diopatra/Chaetopterus sp	ornate tube worm	POLYCHAETE
QUAD	QUAD	Eisenia arborea juvenile		UNDERSTORY KELP
QUAD	QUAD	Eupentacta quinquesemita	white sea cucumber	SEA CUCUMBER
QUAD	QUAD	Gibbonsia sp	kelpfish	
QUAD	QUAD	Gorgonian	Gorgonian unidentified	SOFT CORAL
QUAD	QUAD	Haliotis corrugata	pink abalone	ABALONE
QUAD	QUAD	Henricia leviuscula	blood star	SEASTAR
QUAD	QUAD	Henricia/Linkia recruit	blood star	SEASTAR
QUAD	QUAD	Hermit crab	Hermit Crab unidentified sp	CRAB
QUAD	QUAD	Heterostichus rostratus	giant kelpfish	FISH
QUAD	QUAD	Kelletia kelletii	kellet's whelk	WHELK
QUAD	QUAD	Kelp	Kelp unidentified	UNDERSTORY KELP
QUAD	QUAD	Laminaria setchellii juvenile		UNDERSTORY KELP

Sample Type	Sample Subtype	Species	CommonName	Group
QUAD	QUAD	Laminaria spp. juvenile		UNDERSTORY KELP
QUAD	QUAD	Lepidogobius lepidus	bay goby	FISH
QUAD	QUAD	Leptasterias hexactis		SEASTAR
QUAD	QUAD	Leptasterias hexactis recruit		SEASTAR
QUAD	QUAD	Linckia columbiae	fragile star	SEASTAR
QUAD	QUAD	Lytechinus anamesus	white urchin	URCHIN
QUAD	QUAD	Lythrypnus dalli	Bluebanded Goby	FISH
QUAD	QUAD	Lythrypnus zebra	zebra goby	
QUAD	QUAD	Macrocystis pyrifera juvenile	giant kelp	UNDERSTORY KELP
QUAD	QUAD	Maxwellia sp		SNAIL
QUAD	QUAD	Mitra idae	Ida's miter	SNAIL
QUAD	QUAD	Mytilus californianus	california mussel	BIVALVE
QUAD	QUAD	NO_ORG	No organism present in quadrat	
QUAD	QUAD	Norrisia norrisi	Norris's top snail	SNAIL
QUAD	QUAD	Ophioplocus esmarki	Smooth brittlestar	SEASTAR
QUAD	QUAD	Ophiothrix spiculata	Spiny brittlestar	SEASTAR
QUAD	QUAD	Oxylebius pictus	painted greenling	FISH
QUAD	QUAD	Pachycerianthus fimbratus	burrowing anemone	ANEMONE
QUAD	QUAD	Pachythone rubra	red sea cucumber	SEA CUCUMBER
QUAD	QUAD	Parapholas californica	scaleside piddock	
QUAD	QUAD	Pisaster spp. recruit		SEASTAR
QUAD	QUAD	Pterygophora californica juvenile		UNDERSTORY KELP
QUAD	QUAD	Pugettia producta	kelp crab	CRAB
QUAD	QUAD	Pugettia richii	kelp crab	CRAB
QUAD	QUAD	Pycnopodia helianthoides	sunflower star	SEASTAR
QUAD	QUAD	Scorpaena guttata	california scorpionfish sculpin	FISH
QUAD	QUAD	Scorpaenichthys marmoratus	cabezon	FISH
QUAD	QUAD	Sculpin	Sculpin, unidentified sp Cottidae	FISH
QUAD	QUAD	Starfish recruit	Starfish unidentified	SEASTAR
QUAD	QUAD	Strongylocentrotus franciscanus	red urchin	URCHIN
QUAD	QUAD	Strongylocentrotus purpuratus	purple urchin	URCHIN
QUAD	QUAD	Styela montereyensis	stalked tunicate	TUNICATE
QUAD	QUAD	Tegula sp		SNAIL
SWATH	ALGAE	Agarum fimbriatum	fringed sieve kelp	UNDERSTORY

Sample Type	Sample Subtype	Species	CommonName	Group
				KELP
SWATH	ALGAE	Alaria marginata	angel wing kelp	UNDERSTORY KELP
SWATH	ALGAE	Costaria costatum		UNDERSTORY KELP
SWATH	ALGAE	Cystoseira osmundacea	bladder chain	
SWATH	ALGAE	Dictyoneuropsis reticulata		UNDERSTORY KELP
SWATH	ALGAE	Dictyoneurum californicum		UNDERSTORY KELP
SWATH	ALGAE	Egregia menziesii	feather boa kelp	UNDERSTORY KELP
SWATH	ALGAE	Eisenia arborea		UNDERSTORY KELP
SWATH	ALGAE	Laminaria farlowii		UNDERSTORY KELP
SWATH	ALGAE	Laminaria setchellii		UNDERSTORY KELP
SWATH	ALGAE	Laminaria sp		UNDERSTORY KELP
SWATH	ALGAE	Macrocystis pyrifera	giant kelp	KELP
SWATH	ALGAE	Nereocystis luetkeana	bull kelp	KELP
SWATH	ALGAE	NO_ORG	No organism present on transect	
SWATH	ALGAE	Pleurophycus gardneri		UNDERSTORY KELP
SWATH	ALGAE	Pterygophora californica		UNDERSTORY KELP
SWATH	INVERT	Gorgonian	Gorgonian	SOFT CORAL
SWATH	INVERT	Anthopleura artemisia	moonglow anemone	ANEMONE
SWATH	INVERT	Anthopleura elegantissima	aggregating anemone	ANEMONE
SWATH	INVERT	Anthopleura sola	green anemone	ANEMONE
SWATH	INVERT	Anthopleura sp		ANEMONE
SWATH	INVERT	Anthopleura xanthogrammica	giant green anemone	ANEMONE
SWATH	INVERT	Aplysia californica	california brown sea-hare	NUDIBRANCH
SWATH	INVERT	Aplysia vaccaria		NUDIBRANCH
SWATH	INVERT	Asterina armatus		SEASTAR
SWATH	INVERT	Asterina miniata	bat star	SEASTAR
SWATH	INVERT	Balanus nubilis	barnacle	BARNACLE
SWATH	INVERT	Calliostoma sp	top snail	SNAIL
SWATH	INVERT	Cancer sp	cancer crab	CRAB
SWATH	INVERT	Centrostephanus coronatus	coronado urchin crowned urchin	URCHIN

Sample Type	Sample Subtype	Species	CommonName	Group
SWATH	INVERT	Ceratostoma foliatum	Leafy Hornmouth	SNAIL
SWATH	INVERT	Crassedoma giganteum	rock scallop	BIVALVE
SWATH	INVERT	Cryptochiton stelleri	gumboot chiton	CHITON
SWATH	INVERT	Cucumaria miniata	red sea cucumber	SEA CUCUMBER
SWATH	INVERT	Cucumaria sp	sea cucumber	SEA CUCUMBER
SWATH	INVERT	Cypraea spadicea	chestnut cowrie	COWRIE
SWATH	INVERT	Dermasterias imbricata	leather star	SEASTAR
SWATH	INVERT	Diodora aspera	keyhole limpet	LIMPET
SWATH	INVERT	Haliotis corrugata	pink abalone	ABALONE
SWATH	INVERT	Haliotis cracherodii	black abalone	ABALONE
SWATH	INVERT	Haliotis fulgens	green abalone	ABALONE
SWATH	INVERT	Haliotis kamtschatkana	pinto abalone	ABALONE
SWATH	INVERT	Haliotis rufescens	red abalone	ABALONE
SWATH	INVERT	Haliotis sp	Haliotis sp	ABALONE
SWATH	INVERT	Haliotis wallalensis	flat abalone	ABALONE
SWATH	INVERT	Henricia leviuscula	blood star	SEASTAR
SWATH	INVERT	Kelletia kelletii	kellet's whelk	WHELK
SWATH	INVERT	Leptasterias hexactis		SEASTAR
SWATH	INVERT	Linckia colombianus		SEASTAR
SWATH	INVERT	Lithopoma gibberosum	red turban snail	SNAIL
SWATH	INVERT	Lithopoma sp	turban snail	SNAIL
SWATH	INVERT	Lithopoma undosum	wavy turban snail	SNAIL
SWATH	INVERT	Lophogorgia chilensis	red gorgonian	SOFT CORAL
SWATH	INVERT	Loxorhynchus grandis	sheep crab	CRAB
SWATH	INVERT	Loxorhynchus/Scyra sp	decorator crab moss crab	CRAB
SWATH	INVERT	Lytechinus anamesus	white urchin	URCHIN
SWATH	INVERT	Mediaster aequalis	red star	SEASTAR
SWATH	INVERT	Megathura crenulata	giant key-hole limpet	LIMPET
SWATH	INVERT	Metridium sp	white plumed anemones	ANEMONE
SWATH	INVERT	Mimulus foliatus	mimicking crab	CRAB
SWATH	INVERT	Mitra idae	Ida's miter	SNAIL
SWATH	INVERT	Muricea californiica	california golden gorgonian	SOFT CORAL
SWATH	INVERT	Muricea fruticosa	brown gorgonian	SOFT CORAL
SWATH	INVERT	Orthasterias koehleri	rainbow star	SEASTAR
SWATH	INVERT	Pachycerianthus fimbratus	tube-dwelling anemone burrowing anemone	ANEMONE
SWATH	INVERT	Panulirus interruptus	spiny lobster	LOBSTER

Sample Type	Sample Subtype	Species	CommonName	Group
SWATH	INVERT	Parastichopus californicus	california sea cucumber	SEA CUCUMBER
SWATH	INVERT	Parastichopus parvimensis	warty sea-cucumber	SEA CUCUMBER
SWATH	INVERT	Parastichopus sp	sea cucumber	SEA CUCUMBER
SWATH	INVERT	Pisaster brevispinus	short spined star	SEASTAR
SWATH	INVERT	Pisaster giganteus	giant spined star	SEASTAR
SWATH	INVERT	Pisaster ochraceous	ochre star	SEASTAR
SWATH	INVERT	Pugettia producta	kelp crab	CRAB
SWATH	INVERT	Pugettia richii	kelp crab	CRAB
SWATH	INVERT	Pugettia sp	kelp crab	CRAB
SWATH	INVERT	Pycnopodia helianthoides	sunflower star	SEASTAR
SWATH	INVERT	Strongylocentrotus franciscanus	red urchin	
SWATH	INVERT	Strongylocentrotus purpuratus	purple urchin	
SWATH	INVERT	Styela montereyensis	stalked tunicate	TUNICATE
SWATH	INVERT	Stylaster californianus	california hydrocoral	HYDROCORAL
SWATH	INVERT	Tegula sp		SNAIL
SWATH	INVERT	Tethya aurantia	orange puff-ball sponge	SPONGE
SWATH	INVERT	Urticina lofotensis	strawberry anemone	ANEMONE
SWATH	INVERT	Urticina piscivora	fish-eating anemone	ANEMONE
SWATH	INVERT	Urticina sp		ANEMONE
UPC	COVER	Aglaophenia struthenoides	ostrich-plume hydroid	BRYOZOAN
UPC	COVER	Anemone	Anemone	ANEMONE
UPC	COVER	Bare Rock	Bare Rock	BARE ROCK
UPC	COVER	Bare Sand	Bare Sand	BARE SAND
UPC	COVER	Barnacle	Barnacle	BARNACLE
UPC	COVER	Brown algae	Brown algae	BROWN ALGAE
UPC	COVER	Bryozoan	Bryozoan	BRYOZOAN
UPC	COVER	Clam	Clam	BIVALVE
UPC	COVER	Clavularia sp	Octocoral	CORAL
UPC	COVER	Coralline algae -Crustose	Coralline algae - Crustose	RED ALGAE
UPC	COVER	Coralline algae - Erect/Articulated	Coralline algae - Erect/Articulated	RED ALGAE
UPC	COVER	Corynactis californica	strawberry anemone	ANEMONE
UPC	COVER	Cucumaria sp	Cucumber	SEA CUCUMBER
UPC	COVER	Cup Coral	Cup Coral	CUP CORAL
UPC	COVER	Cystoseira osmundacea	bladder chain kelp	UNDERSTORY

Sample Type	Sample Subtype	Species	CommonName	Group
				KELP
UPC	COVER	Desmarestia sp	acidic seaweed	BROWN ALGAE
UPC	COVER	Diaporecia californica	southern staghorn bryozoan	BRYOZOAN
UPC	COVER	Diatom Layer	Diatom Layer	
UPC	COVER	Dictyoneuropsis reticulata		UNDERSTORY KELP
UPC	COVER	Dictyoneuropsis/Dictyoneurum sp		UNDERSTORY KELP
UPC	COVER	Dictyoneurum californica		UNDERSTORY KELP
UPC	COVER	Dictyotales sp		BROWN ALGAE
UPC	COVER	Diopatra/Chaetopterus sp	ornate tube worm	POLYCHAETE
UPC	COVER	Dodecaceria fewkesi		POLYCHAETE
UPC	COVER	Egregia menziesii	feather boa kelp	UNDERSTORY KELP
UPC	COVER	Gorgonian	Gorgonian	SOFT CORAL
UPC	COVER	Green algae	Green algae	GREEN ALGAE
UPC	COVER	Hydroid	Hydroid	HYDROID
UPC	COVER	Laminariales holdfast (alive)	Laminariales holdfast (alive)	UNDERSTORY KELP
UPC	COVER	Macrosystis holdfast (alive)	Macrosystis holdfast (alive)	KELP
UPC	COVER	Macrosystis holdfast (dead)	Macrosystis holdfast (dead)	KELP
UPC	COVER	Mussel	Mussel	BIVALVE
UPC	COVER	Pachythone rubra	red sea cucumber	SEA CUCUMBER
UPC	COVER	Petalconchus montereyensis		SNAIL
UPC	COVER	Phragmatopoma californica	colonial sand tube worm	POLYCHAETE
UPC	COVER	Phyllospadix sp	surfgrass	SEAGRASS
UPC	COVER	Red alga with cylindrical branches	Red alga with cylindrical branches.	RED ALGAE
UPC	COVER	Red algae (branching flat blade)	Red algae (branching flat blade)	RED ALGAE
UPC	COVER	Red algae (lacy branching)	Red algae (lacy branching)	RED ALGAE
UPC	COVER	Red algae (leaf-like)	Red algae (leaf-like)	RED ALGAE
UPC	COVER	Red algae -Encrusting	Red algae -Encrusting	RED ALGAE
UPC	COVER	Red filamentous turf	Red filamentous turf	RED ALGAE
UPC	COVER	Red fleshy algae	Red fleshy algae	

Sample Type	Sample Subtype	Species	CommonName	Group
UPC	COVER	Salmacina tribranchiata	fragile tube worms	POLYCHAETE
UPC	COVER	Sargassum sp		BROWN ALGAE
UPC	COVER	Scallop	Scallop	BIVALVE
UPC	COVER	Sediment/Mud	Sediment/Mud	MUD
UPC	COVER	Serpulorbis squamigerus	tube snail scaled worm shell	SNAIL
UPC	COVER	Serpulorbis/Petaloconchus sp	tube snail scaled worm shell	SNAIL
UPC	COVER	Shell Debris	Shell Debris	SHELL
UPC	COVER	Sponge	Sponge	SPONGE
UPC	COVER	Stylaster californicus	california hydrocoral	HYDROCORAL
UPC	COVER	Tubeworm	Tubeworm	POLYCHAETE
UPC	COVER	Tubeworm mat.	Tubeworm mat.	POLYCHAETE
UPC	COVER	Tunicate –Colonial compound social	Tunicate –Colonial compound social	TUNICATE
UPC	COVER	Tunicate -Solitary	Tunicate -Solitary	TUNICATE
UPC	RELIEF	Vertical relief: Flat	Vertical relief: Flat	RELIEF
UPC	RELIEF	Vertical relief: High	Vertical relief: High	RELIEF
UPC	RELIEF	Vertical relief: Moderate	Vertical relief: Moderate	RELIEF
UPC	RELIEF	Vertical Relief: Slight	Vertical Relief: Slight	RELIEF
UPC	SUBSTRATE	Substrate: Bedrock	Substrate: Bedrock	ROCK
UPC	SUBSTRATE	Substrate: Boulder	Substrate: Boulder	ROCK
UPC	SUBSTRATE	Substrate: Cobble	Substrate: Cobble	ROCK
UPC	SUBSTRATE	Substrate: Sand	Substrate: Sand	SAND
UPC	SUPERLAYER	Brittlestars	Brittlestars	SEASTAR
UPC	SUPERLAYER	Detritus	Detritus	
UPC	SUPERLAYER	Laminaria farlowii sub-canopy	Laminaria farlowii sub-canopy	UNDERSTORY KELP
UPC	SUPERLAYER	Pachythyone rubra mat	Pachythyone rubra mat	SEA CUCUMBER

Appendix 2. Metadata

The data documentation approach outlined here is based on the Federal Geospatial Data Committee (FGDC) standard and has been selected to meet the needs of the Southern California Marine Monitoring Standard Data Transfer Formats, developed through the Regional Water Control Board and regional sampling Information Management Committee participants. All mandatory elements of the FGDC standard are included. In addition, further elements, identified in the standard as mandatory if applicable, are required. Bolded elements represent special applications of metadata agreed upon by the Information Management committee. These elements, indicated by the words “**Standard Data Exchange Format Requirements**”, specify a prescribed reporting value (either numeric or textual). Finally, elements of the Biological Data Profile, referenced by the preface “BDP”, are included. All required elements have their section number underlined.

The metadata are used to document information about the dataset. Documentation should include all information about Event Types, which include Sediment Grabs, Trawl Assemblage, Bioaccumulation, Microbiology Station Occupation, Water Quality Casts, and the tables that are generated from the Event Type. For example, grab event metadata should include information about the sediment chemistry table and benthic infaunal abundance table, as well as the actual grab event table.

SECTION 1: IDENTIFICATION INFORMATION

- 1 Identification Information -- basic information about the data set.
 - 1.1 Citation -- information to be used to reference the data set.
 - 1.2 Description -- a characterization of the data set, including its intended use and limitations.
 - 1.2.1 Abstract -- a brief narrative summary of the data set.
 - 1.2.2 Purpose -- a summary of the intentions with which the data set was developed.
 - 1.2.3 Supplemental Information -- other descriptive information about the data set.
 - 1.3 Time Period of Content -- time period(s) for which the data set corresponds to the currentness reference.
 - 1.3.1 Currentness Reference -- the basis on which the time period of content information is determined.
 - 1.4 Status -- the state of and maintenance information for the data set.
 - 1.4.1 Progress -- the state of the data set.
 - 1.4.2 Maintenance and Update Frequency -- the frequency with which changes and additions are made to the data set after the initial data set is completed.
 - 1.5 Spatial Domain -- the geographic areal domain of the data set.
 - BDP1.5.1 Description of Geographic Extent-- Short description of the geographic areal domain of the data set.
 - BDP1.5.2 Bounding Altitudes-- the limits of coverage of a data set expressed by altitude.
 - BDP1.5.2.1 Altitude Minimum-- the minimum altitude extent of coverage.
 - BDP1.5.2.2 Altitude Maximum-- the maximum elevation extent of coverage.
 - BDP1.5.2.3 Altitude Distance Units -- units in which altitudes are recorded.
 - 1.5.1 Bounding Coordinates-- 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

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- 1.5.1.1 West Bounding Coordinate -- western-most coordinate of the limit of coverage expressed in longitude.
- 1.5.1.2 East Bounding Coordinate -- eastern-most coordinate of the limit of coverage expressed in longitude.
- 1.5.1.3 North Bounding Coordinate -- northern-most coordinate of the limit of coverage expressed in latitude.
- 1.5.1.4 South Bounding Coordinate -- southern-most coordinate of the limit of coverage expressed in latitude.
- 1.5.2 Data Set G-Polygon -- coordinates defining the outline of an area covered by a data set. Repeat as needed.
- Data Set G-Polygon Outer G-Ring -- the closed nonintersecting boundary of an interior area.
- 1.5.2.1.1 G-Ring Point -- a single geographic location.
- 1.5.2.1.1.1 G-Ring Latitude -- the latitude of a point of the g-ring.
- 1.5.2.1.1.2 G-Ring Longitude -- the longitude of a point of the g-ring.
- 1.5.2.1.2 G-Ring -- a set of ordered pairs of floating-point numbers, separated by commas, in which the first number in each pair is the longitude of a point and the second is the latitude of the point. Longitude and latitude are specified in decimal degrees with north latitudes positive and south negative, east longitude positive and west negative
- 1.5.2.2 Data Set G-Polygon Exclusion G-Ring -- the closed nonintersecting boundary of a void area (or "hole" in an interior area). G-Ring Latitude--the latitude of a point of the exclusionary boundary. G-Ring Longitude--the longitude of a point of the exclusionary boundary.
- 1.6 Keywords -- words or phrases summarizing an aspect of the data set.
- 1.6.1 Theme** -- subjects covered by the data set (for a list of some commonly-used thesauri, see Part IV: Subject/index term sources in Network Development and MARC Standards Office, 1988, USMARC code list for relators, sources, and description conventions: Washington, Library of Congress). Repeat as needed.
- Standard Data Exchange Format Requirements: minimally the key words must include the permit number, the event type, and all of the table names referred to in this document.**
- 1.6.1.1 Theme Keyword Thesaurus** -- reference to a formally registered thesaurus or a similar authoritative source of theme keywords.
- Standard Data Exchange Format Requirements:** Reported as "None"
- 1.6.1.2 Theme Keyword** -- common-use word or phrase used to describe the subject of the data set. Repeat as needed.
- 1.6.2 Place -- geographic locations characterized by the data set. Repeat as needed.
- 1.6.2.1 Place Keyword Thesaurus -- reference to a formally registered thesaurus or a similar authoritative source of place keywords.
- 1.6.2.2 Place Keyword -- the geographic name of a location covered by a data set. Repeat as needed.
- 1.6.3 Stratum -- layered, vertical locations characterized by the data set. Repeat as needed.
- 1.6.3.1 Stratum Keyword Thesaurus -- reference to a formally registered thesaurus or a similar authoritative source of stratum keywords.
- 1.6.3.2 Stratum Keyword -- the name of a vertical location used to describe the locations covered by a data set. Repeat as need.
- 1.6.4 Temporal -- time period(s) characterized by the data set. Repeat as needed.
- 1.6.4.1 Temporal Keyword Thesaurus -- reference to a formally registered thesaurus or a similar authoritative source of temporal keywords.
- 1.6.4.2 Temporal Keyword -- the name of a time period covered by a data set. Repeat as needed.
- BDP1.7 Taxonomy Information--on the taxa (1 or more) included in the data set, including keywords, taxonomic system and coverage information, and taxonomic classification system.
- BDP1.7.1. Keywords/Taxon--Taxonomic ranks or common groups characterized by the data set. Repeat as needed.
- BDP1.7.1.1 Taxonomic Keyword Thesaurus--Reference to a formally registered thesaurus or similar authoritative source of taxonomic keywords.
- BDP1.7.1.2 Taxonomic Keywords--Common-use words or phrases describing the taxonomy covered by the data set. Repeat as needed.

BDP1.7.2 Taxonomic System--Documentation of taxonomic sources, procedures, and treatments. Repeat as needed.

BDP1.7.2.1 Classification System/Authority--Information about the classification system or authority used.

BDP1.7.2.1.1 Classification System Citation--A citation for the classification system or authority used, this might include monographs (e.g., a regional flora) or on-line data sets (e.g., the USDA PLANTS database), etc.

BDP1.7.2.1.2 Classification System Modifications--A description of any modifications or exceptions made to the classification system or authority used.

BDP1.7.2.2 Identification Reference--Information on any non-authoritative materials (e.g. field guides) useful for reconstructing the actual identification process. Repeat as needed.

BDP1.7.2.3 Identifier--Information about the individual(s) responsible for the identification(s) of the specimens or sightings, etc. Repeat as needed.

BDP1.7.2.4 Taxonomic Procedures--Description of the methods used for the taxonomic identification. Could include specimen processing, comparison with museum materials, keys and key characters, chemical or genetic analyses, etc.

BDP1.7.2.5 Taxonomic Completeness--Information concerning the proportions and treatment of unidentified materials (i.e. materials sent to experts, and not yet determined); estimates of the importance, and identities of misidentifications, uncertain determinations, synonyms or other incorrect usages; taxa not well treated or requiring further work; and expertise of field workers

BDP1.7.2.6 Vouchers--Information on the types of specimen, the repository, and the individuals who identified the vouchers. Repeat as needed.

BDP1.7.2.6.1 Specimen--A word or phrase describing the type of specimen collected (e.g. herbarium specimens, blood samples, photographs, individuals, or batches).

BDP1.7.2.6.2 Repository--Information about the curator or contact person and/or agency responsible for the specimens.

BDP1.7.3 General Taxonomic Coverage--A description of the range of taxa addressed in the data set or collection. For example, "all vascular plants were identified to family or species, mosses and lichens were identified as moss or lichen."

Standard Data Exchange Format Requirements: For surveys use a general description, not including the taxonomy of all species encountered.

BDP1.7.4 Taxonomic Classification--Information about the range of taxa addressed in the data set or collection. It is recommended that one provide information starting from the taxonomic rank of kingdom, to a level that reflects the data set or collection being documented. The levels of Kingdom, Division/Phylum, Class, Order, Family, Genus, and Species should be included as ranks as appropriate.

Standard Data Exchange Format Requirements: Use this section when the study is targeting a particular species or group of species, for example bioaccumulation.

For example, if the data set deals with the species "red maple" or *Acer rubrum* var. *rubrum*, then the contents might look like the following:

Taxonomic Classification:

Taxon Rank Name: Kingdom

Taxon Rank Value: Plantae

Applicable Common Name: plants

Taxonomic Classification:

Taxon Rank Name: Division

Taxon Rank Value: Magnoliophyta

Taxonomic Classification:

Taxon Rank Name: Class

Taxon Rank Value: Magnoliopsida

Taxonomic Classification:

Taxon Rank Name: Subclass

Taxon Rank Value: Rosidae

Taxonomic Classification:

Taxon Rank Name: Order

Taxon Rank Value: Sapindales

Taxonomic Classification:

Taxon Rank Name: Family
Taxon Rank Value: Aceraceae
Applicable Common Name: maples
Taxonomic Classification:
Taxon Rank Name: Genus
Taxon Rank Value: Acer
Applicable Common Name: maples
Taxonomic Classification:
Taxon Rank Name: Species
Taxon Rank Value: Acer rubrum var. rubrum
Applicable Common Name: red maple

If the data set pertains to many species, then the Taxonomic Classification structure can be built by adding additional families under the Taxonomic Classification rank of order. If the taxon of interest is undefined at any taxonomic rank, omit that rank from the structure. (One authority for this information is the Integrated Taxonomic Information System (ITIS) located at: "<http://www.itis.usda.gov/plantproj/itis/>").

BDP1.7.4.1 Taxon Rank Name--The name of the taxonomic rank for which the Taxon Rank Value is provided. See the example included in the definition of Taxonomic Classification.

BDP1.7.4.2 Taxon Rank Value--The name representing the taxonomic rank of the taxon being described. See the example included in the definition of Taxonomic Classification.

BDP1.7.4.3 Applicable Common Name--Specification of applicable common names. These common names may be general descriptions of a group of organisms if appropriate (e.g. insects, vertebrate, grasses, waterfowl, vascular plants, etc.) Repeat as needed.

1.7 Access Constraints -- restrictions and legal prerequisites for accessing the data set. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the data set.

1.8 Use Constraints -- restrictions and legal prerequisites for using the data set after access is granted. These include any use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the data set.

Standard Data Exchange Format Requirements: Include a description of the current state of taxonomy for this data set.

1.9 Point of Contact -- contact information for an individual or organization that is knowledgeable about the data set.

1.10 Browse Graphic -- a graphic that provides an illustration of the data set. The graphic should include a legend for interpreting the graphic.

1.10.1 Browse Graphic File Name -- name of a related graphic file that provides an illustration of the data set.

1.10.2 Browse Graphic File Description -- a text description of the illustration.

1.10.3 Browse Graphic File Type -- graphic file type of a related graphic file.

1.11 Data Set Credit -- recognition of those who contributed to the data set.

1.12 Security Information -- handling restrictions imposed on the data set because of national security, privacy, or other concerns.

1.12.1 Security Classification System -- name of the classification system.

1.12.2 Security Classification -- name of the handling restrictions on the data set.

1.12.3 Security Handling Description -- additional information about the restrictions on handling the data set.

1.13 Native Data Set Environment -- a description of the data set in the producer's processing environment, including items such as the name of the software (including version), the computer operating system, file name (including host-, path-, and filenames), and the data set size.

Standard Data Exchange Format Requirements: the software and version containing the data at the originating agency.

1.14 Cross Reference -- information about other, related data sets that are likely to be of interest.

BDP1.15. Analytical Tool--Tools, models, or statistical procedures that the data set is intrinsically bound to and are available for use in analyzing the data set. Examples include reconstructions of phylogenies, population viability analyses, community ordinations, most atmospheric and hydrological transport analyses, and inferences on the effects of climate change on forest composition and productivity. Enough information should be included such that a potential data

user can easily determine why they might wish to acquire the analytical tool, and the methodology to acquire it. Repeat as needed.

BDP1.15.1 Analytical Tool Description--Description of the analytical tool, model, or statistical procedure.

BDP1.15.2 Tool Access Information--Information on the steps required to access the tool. Repeat as needed.

BDP1.15.2.1 Tool Access Instructions--Instructions on the steps required to access the tool, model, or statistical procedure.

BDP1.15.2.2 Tool Computer and Operating System--The brand of computer and its operating system that the tool, model, or statistical procedure requires.

BDP1.15.3 Tool Contact--The party from whom the tool, model, or statistical procedure may be obtained.

BDP1.15.3.4 Tool Citation--Citation information about the tool, model, or statistical procedure.

SECTION 2: DATA QUALITY INFORMATION

2 Data Quality Information -- a general assessment of the quality of the data set. (Recommendations on information to be reported and tests to be performed are found in "Spatial Data Quality," which is chapter 3 of part 1 in Department of Commerce, 1992, Spatial Data Transfer Standard (SDTS) (Federal Information Processing Standard 173): Washington, Department of Commerce, National Institute of Standards and Technology.)

2.1 Attribute Accuracy -- an assessment of the accuracy of the identification of entities and assignment of attribute values in the data set.

2.1.1 Attribute Accuracy Report -- an explanation of the accuracy of the identification of the entities and assignments of values in the data set and a description of the tests used.

Standard Data Exchange Format Requirements: From field methods manual

2.1.2 Quantitative Attribute Accuracy Assessment -- a value assigned to summarize the accuracy of the identification of the entities and assignments of values in the data set and the identification of the test that yielded the value. Repeat as necessary.

2.1.2.1 Attribute Accuracy Value -- an estimate of the accuracy of the identification of the entities and assignments of attribute values in the data set.

2.1.2.2 Attribute Accuracy Explanation -- the identification of the test that yielded the Attribute Accuracy Value.

2.2 Logical Consistency Report -- an explanation of the fidelity of relationships in the data set and tests used.

Standard Data Exchange Format Requirements: Describe related tables included in this data set.

2.3 Completeness Report -- information about omissions, selection criteria, generalization, definitions used, and other rules used to derive the data set.

2.4 Positional Accuracy -- an assessment of the accuracy of the positions of spatial objects.

2.4.1 Horizontal Positional Accuracy -- an estimate of accuracy of the horizontal positions of the spatial objects.

2.4.1.1 Horizontal Positional Accuracy Report -- an explanation of the accuracy of the horizontal coordinate measurements and a description of the tests used.

2.4.1.2 Quantitative Horizontal Positional Accuracy Assessment -- numeric value assigned to summarize the accuracy of the horizontal coordinate measurements and the identification of the test that yielded the value.

2.4.1.2.1 Horizontal Positional Accuracy Value -- an estimate of the accuracy of the horizontal coordinate measurements in the data set expressed in (ground) meters.

2.4.1.2.2 Horizontal Positional Accuracy Explanation -- the identification of the test that yielded the Horizontal Positional Accuracy Value.

2.4.2 Vertical Positional Accuracy -- an estimate of accuracy of the vertical positions in the data set.

2.4.2.1 Vertical Positional Accuracy Report -- an explanation of the accuracy of the vertical coordinate measurements and a description of the tests used.

2.4.2.2 Quantitative Vertical Positional Accuracy Assessment -- numeric value assigned to summarize the accuracy of vertical coordinate measurements and the identification of the test that yielded the value.

2.4.2.2.1 Vertical Positional Accuracy Value -- an estimate of the accuracy of the vertical coordinate measurements in the data set expressed in (ground) meters.

2.4.2.2.2 Vertical Positional Accuracy Explanation -- the identification of the test that yielded the Vertical Positional Accuracy Value.

2.5 Lineage -- information about the events, parameters, and source data which constructed the data set, and information about the responsible parties. Repeat as needed.

BDP2.5.1 Methodology--Information about a single step of field and/or laboratory work. Repeat as needed.

BDP2.5.1.1 Methodology Type--The type of methodology being documented, such as field or laboratory methodology separately.

Standard Data Exchange Format Requirements: include field and laboratory methodology.

BDP2.5.1.2 Methodology Identifier--Keywords or phrases summarizing the field or laboratory methods used. Repeat as needed.

BDP2.5.1.2.1 Methodology Keyword Thesaurus--Reference to a formally registered thesaurus or a similar authoritative source of methodology keywords.2.5.1 Source Information -- list of sources and a short discussion of the information contributed by each. Repeat as needed.

BDP2.5.1.2.2 Methodology Keyword--The name of a method used in the field or laboratory work. Repeat as needed.

BDP2.5.1.3 Methodology Description--Equivalent to "Materials and Methods" in a journal article. Describe the physical methods used to gather data, the experimental design, sample frequency, treatments or strata, statistical and spatial design of the sampling, and sample completeness, representativeness, and biases. For example, in a bird survey, relevant elements would include the methods used to detect species occurrences (casual sightings, transects, focal point surveys, vocalizations, mist nets), whether or not evidence of breeding activity was required, descriptions of the habitat strata in a stratified design, and known biases (e.g., non-territorial birds were under sampled, and some juveniles could not be identified to species.)

Standard Data Exchange Format Requirements: describe application of methods

BDP2.5.1.4 Methodology Citation-- Information referencing the methods used.

2.5.1 Source Information-- List of sources and a short discussion of the information contributed by each. Repeat as needed.

Standard Data Exchange Format Requirements: Report as "None"

2.5.1.1 Source Citation -- reference for a source data set.

2.5.1.2 Source Scale Denominator -- the denominator of the representative fraction on a map (for example, on a 1:24,000-scale map, the Source Scale Denominator is 24000). Repeat as needed.

2.5.1.3 Type of Source Media -- the medium of "digital database file" "field notes" "photographic print" "printed table" "visually observed or measured"

2.5.1.4 Source Time Period of Content -- time period(s) for which the source data set corresponds to the ground.

2.5.1.4.1 Source Currentness Reference -- the basis on which the source time period of content information of the source data set is determined.

2.5.1.5 Source Citation Abbreviation -- short-form alias for the source citation.

2.5.1.6 Source Contribution -- brief statement identifying the information contributed by the source to the data set.

2.5.2 Process Step -- information about a single event. Repeat as needed.

2.5.2.1 Process Description -- an explanation of the event and related parameters or tolerances.

Standard Data Exchange Format Requirements: Report as "None" or "Not Applicable"

2.5.2.2 Source Used Citation Abbreviation -- the Source Citation Abbreviation of a data set used in the processing step. Repeat as needed.

2.5.2.3 Process Date -- the date when the event was completed.

Standard Data Exchange Format Requirements: Report as "Unknown"

2.5.2.4 Process Time -- the time when the event was completed.

2.5.2.5 Source Produced Citation Abbreviation -- the Source Citation Abbreviation of an intermediate data set that (1) is significant in the opinion of the data producer, (2) is generated in the processing step, and (3) is used in later processing steps. Repeat as needed.

2.5.2.6 Process Contact -- the party responsible for the processing step information.

2.6 Cloud Cover -- area of a data set obstructed by clouds, expressed as a percentage of the spatial extent.

SECTION 3: SPATIAL DATA ORGANIZATION INFORMATION

Standard Data Exchange Format Requirements: This section is not used.

SECTION 4: SPATIAL REFERENCE INFORMATION

Standard Data Exchange Format Requirements: This section is not used.

SECTION 5: ENTITY AND ATTRIBUTE INFORMATION

5 Entity and Attribute Information -- details about the information content of the data set, including the entity types, their attributes, and the domains from which attribute values may be assigned.

5.1 Detailed Description -- description of the entities, attributes, attribute values, and related characteristics encoded in the data set.

5.1.1 Entity Type -- the definition and description of a set into which similar entity instances are classified.

5.1.1.1 Entity Type Label -- the name of the entity type.

Standard Data Exchange Format Requirements: the name of the table from the Southern California Marine Monitoring Standard Data Transfer Formats.

5.1.1.2 Entity Type Definition -- the description of the entity type.

Standard Data Exchange Format Requirements: reported as "table"

5.1.1.3 Entity Type Definition Source -- the authority of the definition.

Standard Data Exchange Format Requirements: reported as "Southern California Marine Monitoring Standard Data Transfer Formats."

5.1.2 Attribute -- a defined characteristic of an entity. Repeat as needed.

Standard Data Exchange Format Requirements: Spreadsheet, database, ASCII,

5.1.2.1 Attribute Label -- the name of the attribute.

Standard Data Exchange Format Requirements: the name of the field

5.1.2.2 Attribute Definition -- the description of the attribute

Standard Data Exchange Format Requirements: the description of the field from the Southern California Marine Monitoring Standard Data Transfer Formats

5.1.2.3 Attribute Definition Source -- the authority of the definition.

Standard Data Exchange Format Requirements: Reported as "Southern California Marine Monitoring Standard Data Transfer Formats"

5.1.2.4 Attribute Domain Values -- the valid values that can be assigned for an attribute. Repeat as needed.

5.1.2.4.1 Enumerated Domain -- the members of an established set of valid values. Repeat as needed.

5.1.2.4.1.1 Enumerated Domain Value -- the name or label of a member of the set.

5.1.2.4.1.2 Enumerated Domain Value Definition -- the description of the value.

5.1.2.4.1.3 Enumerated Domain Value Definition Source -- the authority of the definition.

5.1.2.4.2 Range Domain -- the minimum and maximum values of a continuum of valid values. Repeat as needed.

5.1.2.4.2.1 Range Domain Minimum -- the least value that the attribute can be assigned.

5.1.2.4.2.2 Range Domain Maximum -- the greatest value that the attribute can be assigned.

5.1.2.4.3 Codeset Domain -- reference to a standard or list which contains the members of an established set of valid values. Repeat as needed.

5.1.2.4.3.1 Codeset Name -- the title of the codeset.

5.1.2.4.3.2 Codeset Source -- the authority for the codeset.

5.1.2.4.4 Unrepresentable Domain -- description of the values and reasons why they cannot be represented. Repeat as needed.

5.1.2.5 Attribute Units of Measure -- the standard of measurement for an attribute value.

- 5.1.2.6 Attribute Measurement Resolution -- the smallest unit increment to which an attribute value is measured.
- 5.1.2.7 Beginning Date of Attribute Values -- earliest or only date for which the attribute values are current. In cases when a range of dates are provided, this is the earliest date for which the information is valid.
- 5.1.2.8 Ending Date of Attribute Values -- latest date for which the information is current. Used in cases when a range of dates are provided.
- 5.1.2.9 Attribute Value Accuracy Information -- an assessment of the accuracy of the assignment of attribute values.
- 5.1.2.9.1 Attribute Value Accuracy -- an estimate of the accuracy of the assignment of attribute values.
- 5.1.2.9.2 Attribute Value Accuracy Explanation -- the definition of the Attribute Value Accuracy measure and units, and a description of how the estimate was derived.
- 5.1.2.10 Attribute Measurement Frequency -- the frequency with which attribute values are added.
- 5.2 Overview Description -- summary of, and citation to detailed description of, the information content of the data set.
- 5.2.1 Entity and Attribute Overview -- detailed summary of the information contained in a data set.
- 5.2.2 Entity and Attribute Detail Citation -- reference to the complete description of the entity types, attributes, and attribute values for the data set.

SECTION 6: DISTRIBUTION INFORMATION

- 6 Distribution Information -- information about the distributor of and options for obtaining the data set.
- 6.1 Distributor -- the party from whom the data set may be obtained.
- 6.2 Resource Description -- the identifier by which the distributor knows the data set.
- 6.3 Distribution Liability -- statement of the liability assumed by the distributor.
- 6.4 Standard Order Process -- the common ways in which the data set may be obtained or received, and related instructions and fee information. Repeat as needed.
- 6.4.1 Non-digital Form -- the description of options for obtaining the data set on non-computer-compatible media.
- 6.4.2 Digital Form -- the description of options for obtaining the data set on computer-compatible media. Repeat as needed.
- 6.4.2.1 Digital Transfer Information -- description of the form of the data to be distributed.
- 6.4.2.1.1 Format Name -- the name of the data transfer format.
- 6.4.2.1.2 Format Version Number -- version number of the format.
- 6.4.2.1.3 Format Version Date -- date of the version of the format.
- 6.4.2.1.4 Format Specification -- name of a subset, profile, or product specification of the format.
- BDP6.4.2.1.5 ASCII File Structure-- Information about the content and format of an ASCII data file.
- BDP6.4.2.1.5.1 Record Delimiter--The character(s) which indicate the end of a record.
- BDP6.4.2.1.5.2 Number Header Lines--The number of lines at the beginning of the file before the data content actually begins.
- BDP6.4.2.1.5.3 Description of Header Content- Description of the information content of the header lines.
- BDP6.4.2.1.5.4 Orientation--Definition of the direction of information content as represented in the ASCII file. Typical data sets are represented in column-major format, where each attribute in the data set is represented as a column and each observation is a row. In contrast, row-major data sets represent attributes as rows and observations as columns. For example, if one has 3 observations (1,2,3) of two attributes (A,B), in column-major format the first record of the datafile would contain the first observation for both attributes (values A1,B1), but in row-major format the first record would contain all of the observations for only attribute A (values A1,A2,A3).
- BDP6.4.2.1.5.5 Case Sensitive--If the content of the data set is encoded in case-sensitive ASCII (the capital and small letters have meaning), then this element should contain "y" or "Y", otherwise this element should contain "n" or "N".
- BDP6.4.2.1.5.6 Authentication--Information allowing verification of file contents to ensure accurate transmission of the file. This is generally a named checksum that uses a standard algorithm or a cryptographic signature. For example, a MD5 checksum could be provided and, if it matches a MD5 checksum calculated for the received file, one would conclude that the file is identical to the original.

- BDP6.4.2.1.5.7 Quote Character--Character used to quote fields in the data representation so that the field delimiter can be used as part of the field value. This character is typically a single quote mark or double quote mark. For example, in a field representing a person's name, one might use double quotes around the field (e.g., "Johnson, M.") to indicate that the embedded comma in the text string is not a field delimiter.
- BDP6.4.2.1.5.8 Data Field Information--describing the individual data fields (this would be equivalent to columns in most databases). Repeat as needed.
- BDP6.4.2.1.5.8.1 Data Field Name -- of the data field. This name should be the same as an Attribute Label documented in Section 5.1.2 Attribute (within Detailed Description which is itself within Entity and Attribute Information). The definition, domain, units of measure, and measurement resolution are all important pieces of information for ASCII file use.
- BDP6.4.2.1.5.8.1.2 Missing Value Code-- The code which represents missing data.
- BDP6.4.2.1.5.8.1.3 Data Field Width Delimiter--The character which indicates the end of the data field contents.
- BDP6.4.2.1.5.8.1.4 Data Field Width The number-- of characters of the data field.
- 6.4.2.1.5 Format Information Content -- description of the content of the data encoded in a format.
- File Decompression Technique -- recommendations of algorithms or processes (including means of obtaining these algorithms or processes) that can be applied to read or expand data sets to which data
- 6.4.2.1.7 Transfer Size -- the size, or estimated size, of the transferred data set in megabytes.
- 6.4.2.2 Digital Transfer Option -- the means and media by which a data set is obtained from the distributor.
- 6.4.2.2.1 Online Option -- information required to directly obtain the data set electronically.
- 6.4.2.2.1.1 Computer Contact Information -- instructions for establishing communications with the distribution computer.
- 6.4.2.2.1.1.1 Network Address -- the electronic address from which the data set can be obtained from the distribution computer.
- 6.4.2.2.1.1.1.1 Network Resource Name -- the name of the file or service from which the data set can be obtained.
- 6.4.2.2.1.1.1.2 Dialup Instructions -- information required to access the distribution computer remotely through telephone lines.
- 6.4.2.2.1.1.2.1 Lowest BPS -- lowest or only speed for the connection's communication, expressed in bits per second.
- 6.4.2.2.1.1.2.2 Highest BPS -- highest speed for the connection's communication, expressed in bits per second. Used in cases when a range of rates are provided.
- 6.4.2.2.1.1.2.3 Number DataBits -- number of data bits in each character exchanged in the communication.
- 6.4.2.2.1.1.2.4 Number StopBits -- number of stop bits in each character exchanged in the communication.
- 6.4.2.2.1.1.2.5 Parity -- parity error checking used in each character exchanged in the communication.
- 6.4.2.2.1.1.2.6 Compression Support -- data compression available through the modem service to speed data transfer.
- 6.4.2.2.1.1.2.7 Dialup Telephone -- the telephone number of the distribution computer. Repeat as needed.
- 6.4.2.2.1.1.2.8 Dialup File Name -- the name of a file containing the data set on the distribution computer. Repeat as needed.
- 6.4.2.2.1.2 Access Instructions -- instructions on the steps required to access the data set.
- 6.4.2.2.1.3 Online Computer and Operating System -- the brand of distribution computer and its operating system.
- 6.4.2.2.2 Offline Option -- information about media-specific options for receiving the data set.
- 6.4.2.2.2.1 Offline Media -- name of the media on which the data set can be received.
- 6.4.2.2.2.2 Recording Capacity -- the density of information to which data are written. Used in cases where different recording capacities are possible.
- 6.4.2.2.2.2.1 Recording Density -- the density in which the data set can be recorded. Repeat as needed.
- 6.4.2.2.2.2.2 Recording Density Units -- the units of measure for the recording density.
- 6.4.2.2.2.3 Recording Format -- the options available or method used to write the data set to the medium. Repeat as needed.

Compatibility Information -- description of other limitations or requirements for using the medium.

6.4.3 Fees -- the fees and terms for retrieving the data set.

6.4.4 Ordering Instructions -- general instructions and advice about, and special terms and services provided for, the data set by the distributor.

6.4.5 Turnaround -- typical turnaround time for the filling of an order.

6.5 Custom Order Process -- description of custom distribution services available, and the terms and conditions for obtaining these services.

6.6 Technical Prerequisites -- description of any technical capabilities that the consumer must have to use the data set in the form(s) provided by the distributor.

6.7 Available Time Period -- the time period when the data set will be available from the distributor.

SECTION 7: METADATA REFERENCE INFORMATION

7 Metadata Reference Information -- information on the currentness of the metadata information, and the responsible party.

7.1 Metadata Date -- the date that the metadata were created or last updated.

7.2 Metadata Review Date -- the date of the latest review of the metadata entry.

7.3 Metadata Future Review Date -- the date by which the metadata entry should be reviewed.

7.4 Metadata Contact -- the party responsible for the metadata information.

7.5 Metadata Standard Name -- the name of the metadata standard used to document the data set.

7.6 Metadata Standard Version -- identification of the version of the metadata standard used to document the data set.

Standard Data Exchange Format Requirements: FGDC-STD-001-1998 March 30, 2001

7.7 Metadata Time Convention -- form used to convey time of day information in the metadata entry. Used if time of day information is included in the metadata for a data set.

7.8 Metadata Access Constraints -- restrictions and legal prerequisites for accessing the metadata. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the metadata.

7.9 Metadata Use Constraints -- restrictions and legal prerequisites for using the metadata after access is granted. These include any metadata use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the metadata.

7.10 Metadata Security Information -- handling restrictions imposed on the metadata because of national security, privacy, or other concerns.

7.10.1 Metadata Security Classification System -- name of the classification system for the metadata.

7.10.2 Metadata Security Classification -- name of the handling restrictions on the metadata.

7.10.3 Metadata Security Handling Description -- additional information about the restrictions on handling the metadata.

7.11 Metadata Extensions -- a reference to extended elements to the standard which may be defined by a metadata producer or a user community. Extended elements are elements outside the Standard, but needed by the metadata producer. If extended elements are created, they must follow the guidelines in Appendix D, Guidelines for Creating Extended Elements to the Content Standard for Digital Geospatial Metadata.

7.11.1 Online Linkage -- the name of an online computer resource that contains the metadata extension information for the data set. Entries should follow the Uniform Resource Locator convention of the Internet.

7.11.2 Profile Name -- the name given to a document that describes the application of the Standard to a specific user community.

SECTION 8: CITATION INFORMATION

8 Citation Information -- the recommended reference to be used for the data set. (Note: this section provides a means of stating the citation of a data set, and is used by other sections of the metadata standard. This section is never used alone.)

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- 8.1 Originator** -- the name of an organization or individual that developed the data set. If the name of editors or compilers are provided, the name must be followed by "(ed.)" or "(comp.)" respectively. Repeat as needed.
- 8.2 Publication Date** -- the date when the data set is published or otherwise made available for release.
- 8.3 Publication Time** -- the time of day when the data set is published or otherwise made available for release.
- 8.4 Title** -- the name by which the data set is known.
- 8.5 Edition** -- the version of the title.
- 8.6 Geospatial Data Presentation Form** -- the mode in which the geospatial data are represented.
- Standard Data Exchange Format Requirements:** tabular digital data
- 8.7 Series Information** -- the identification of the series publication of which the data set is a part.
- 8.7.1 Series Name** -- the name of the series publication of which the data set is a part.
- 8.7.2 Issue Identification** -- information identifying the issue of the series publication of which the data set is a part.
- 8.8 Publication Information** -- publication details for published data sets.
- 8.8.1 Publication Place** -- the name of the city (and state or province, and country, if needed to identify the city) where the data set was published or released.
- 8.8.2 Publisher** -- the name of the individual or organization that published the data set.
- 8.9 Other Citation Details** -- other information required to complete the citation.
- 8.10 Online Linkage** -- the name of an online computer resource that contains the data set. Entries should follow the Uniform Resource Locator convention of the Internet.
- 8.11 Larger Work Citation** -- the information identifying a larger work in which the data set is included.

SECTION 9: TIME PERIOD INFORMATION

- 9 Time Period Information** -- information about the date and time of an event. (Note: this section provides a means of stating temporal information, and is used by other sections of the metadata standard. This section is never used alone.)
- 9.1 Single Date/Time** -- means of encoding a single date and time.
- 9.1.1 Calendar Date** -- the year (and optionally month, or month and day).
- 9.1.2 Time of Day** -- the hour (and optionally minute, or minute and second) of the day.
- BDP9.1.1 Geologic Age
- BDP9.1.1.1 Geologic Time Scale
- BDP9.1.1.2 Geologic Age Estimate
- BDP9.1.1.3 Geologic Age Uncertainty
- BDP9.1.1.4 Geologic Age Explanation
- BDP9.1.1.5 Geologic Citation
- 9.2 Multiple Dates/Times** -- means of encoding multiple individual dates and times. Repeat as needed.
- 9.2.1 Calendar Date** -- the year (and optionally month, or month and day).
- 9.2.2 Time of Day** -- the hour (and optionally minute, or minute and second) of the day.
- BDP9.2.1 Geologic Age
- BDP9.2.1.1 Geologic Time Scale
- BDP9.2.1.2 Geologic Age Estimate
- BDP9.2.1.3 Geologic Age Uncertainty
- BDP9.2.1.4 Geologic Age Explanation
- BDP9.2.1.5 Geologic Citation
- 9.3.1 Range of Dates/Times** -- means of encoding a range of dates and times.
- 9.3.1.1 Beginning Date** -- the first year (and optionally month, or month and day) of the event.
- 9.3.1.2 Beginning Time** -- the first hour (and optionally minute, or minute and second) of the day for the event.
- 9.3.1.3 Ending Date** -- the last year (and optionally month, or month and day) for the event.
- 9.3.1.4 Ending Time** -- the last hour (and optionally minute, or minute and second) of the day for the event.
- BDP9.3.1. Beginning Geologic Age
- BDP9.3.1.1 Geologic Age
- BDP9.3.1.1.1 Geologic Time Scale

BDP9.3.1.1.2 Geologic Age Estimate
BDP9.3.1.1.3 Geologic Age Uncertainty
BDP9.3.1.1.4 Geologic Age Explanation
BDP9.3.1.1.5 Geologic Citation
BDP9.3.2 Ending Geologic Age
BDP9.3.2.1 Geologic Age
BDP9.3.1.2.1 Geologic Time Scale
BDP9.3.1.2.2 Geologic Age Estimate
BDP9.3.1.2.3 Geologic Age Uncertainty
BDP9.3.1.2.4 Geologic Age Explanation
BDP9.3.1.2.5 Geologic Citation

SECTION 10: CONTACT INFORMATION

10 Contact Information -- Identity of, and means to communicate with, person(s) and organization(s) associated with the data set. (Note: this section provides a means of identifying individuals and organizations, and is used by other sections of the metadata standard. This section is never used alone.)

10.1 Contact Person Primary -- the person, and the affiliation of the person, associated with the data set. Used in cases where the association of the person to the data set is more significant than the association of the organization to the data set.

10.1.1 Contact Person -- the name of the individual to which the contact type applies.

Standard Data Exchange Format Requirements: Name and Position of responsible individual.

10.1.2 Contact Organization -- the name of the organization to which the contact type applies.

10.2 Contact Organization Primary -- the organization, and the member of the organization, associated with the data set. Used in cases where the association of the organization to the data set is more significant than the association of the person to the data set.

10.3 Contact Position -- the title of individual.

10.4 Contact Address -- the address for the organization or individual.

10.4.1 Address Type -- the information provided by the address.

10.4.2 Address -- an address line for the address. Repeat as needed.

10.4.3 City -- the city of the address.

10.4.4 State or Province -- the state or province of the address.

10.4.5 Postal Code -- the ZIP or other postal code of the address.

10.4.6 Country -- the country of the address.

10.5 Contact Voice Telephone -- the telephone number by which individuals can speak to the organization or individual. Repeat as needed.

10.6 Contact TDD/TTY Telephone -- the telephone number by which hearing-impaired individuals can contact the organization or individual. Repeat as needed.

10.7 Contact Facsimile Telephone -- the telephone number of a facsimile machine of the organization or individual. Repeat as needed.

10.8 Contact Electronic Mail Address -- the address of the electronic mailbox of the organization or individual. Repeat as needed.

10.9 Hours of Service -- time period when individuals can speak to the organization or individual.

10.10 Contact Instructions -- supplemental instructions on how or when to contact the individual or organization.

Appendix 3. Acronym Glossary

AIM - Agency Information Management coordinator

FGDC - Federal Geographic Data Committee

IMO - Project Information Management Officer

IMS - Information Management System

luList - Lookup list - contains a constrained list of values allowable in the specified field

SDTP – Standard Data Transfer Protocol

QA/QC - Quality Assurance / Quality Control

TBL - table

TSC - Technical Subcommittee Chairs