

DIVER Data Specification

Appendix 1a: DIVER Data Categories and Fields

This appendix includes additional information about each environmental data category, with references to the spreadsheet tables that present the data fields represented within each data category, field definitions, and valid values or controlled vocabulary where that exists. The remainder of this document is organized by the following data categories.

- Section 1. Samples
- Section 2. Field Measurements and Observations
- Section 3. Photos
- Section 4. Telemetry
- Section 5. Instruments
- Section 6. Bioassay
- Section 7. Shoreline Cleanup Assessment Technique (SCAT)

Section 1. Samples

The Samples data category is primarily for environmental data from field-collected samples that are analyzed for contaminant chemistry, biological metrics, and/or compositional analyses in a laboratory experiment. For example, much of the data within the Samples data category is related to sediment collected in the field and then analyzed in a laboratory using industry standard methods to determine the concentrations of chemicals in that particular sample. Analyses may also determine the composition of the sediment including physical analyses such as grain size, organic carbon content, and dry weight. The majority of environmental matrices that are represented in the Samples data category are sediment, water, oil, biological tissues, and air samples collected and managed using techniques and protocols that meet the quality objectives of the lead sampling organization.

The fields in the Samples data category are listed in [Appendix 1b](#). Generally, these fields describe how the sample was collected in the field and analyzed in the laboratory, and the analysis result. In order to ensure a record is unique, the fields that comprise “Analysis Detail” are required. “Analysis Detail” is a concatenated field comprised of the fields Sample ID, Lab Name, Lab ID, Lab Replicate, and Analysis. A major source of contaminant chemistry data in the Samples data category were migrated from NOAA’s Query Manager databases.¹ Those data records are similarly made unique by the combination of QM Site ID, QM Study ID, QM Station ID, QM Sample ID, Lab Replicate, and Analysis.

¹ NOAA’s Query Manager data standard, databases and query application:
<http://response.restoration.noaa.gov/environmental-restoration/environmental-assessment-tools/query-manager.html>

Several fields in the Samples Data Category including chemical codes, qualifier codes related to the analysis, and validation codes are standardized to valid values in DIVER. Values for these fields and for additional fields including Collection Matrix, Lab Matrix and more are presented in [Appendix 2](#).

Section 2. Field Observations

The Field Observations Data Category organizes observational data and measurements that are collected in the field. Much of the data incorporated into the Field Observations data category is ecological data recorded to assess or evaluate the biological health of a particular habitat or ecosystem. The Field Observations data category was originally designed to organize and manage field observations and measurements gathered under the Deepwater Horizon Natural Resource Damage Assessment, but has been redeveloped to serve as a foundation for a broad range of observational data. Recent development has focused on the ability to standardize and manage restoration monitoring data collected to track the recovery of Gulf of Mexico ecosystems after the Deepwater Horizon oil spill in addition to biological data collected in support of long-term cleanup efforts in the Great Lakes. The Field Observations data category may undergo slight changes as additional biological and monitoring data are incorporated.

The fields that are part of the Field Observations data category are listed in [Appendix 1b](#). Currently, unique records are created with the combination of the following fields: Study Name, Station, Date, Measurement ID, Replicate, and Analysis. One topic that is expected in the next update to this Data Specification is expanded guidance for data providers on valid values for fields such as Analysis and Analysis Type, to ensure a level of standardization across wide-ranging types of data collected in the field. Expanded considerations for species naming conventions may also be incorporated; DIVER currently standardizes Latin species names using the Integrated Taxonomic Information System.²

Section 3. Photos

The Photos Data Category collects images and their associated keywords and metadata. The Photos Data Category was designed to be able to incorporate images, keywords, location and additional metadata from multiple sources. The NOAA Photologger³ desktop application, which has a protocol and process for gathering, geotagging and assigning keywords to photographs that meets litigation requirements, is one primary source of photos that can be incorporated into DIVER. Specific photos that are used for analysis (e.g. quadrat counts) or to document field conditions should be similarly organized and loaded into a DIVER File Collection. The DIVER team is continuing to develop processes for organizing packages of photographs that can be further managed and have metadata edited in the

² <https://www.itis.gov/>

³ NOAA Photologger and Forms are typically distributed and used for Response and Assessment activities; Forms will be distributed through the DIVER website.

DIVER Explorer application. The fields that are part of the Photos data category are listed in [Appendix 1b](#).

Section 4. Telemetry

The Telemetry data category organizes spatial and geographic data related to devices that are attached to a specific organism that track and store or transmit their movement. For example, the Telemetry Data Category includes information collected by biologists tracking marine turtles, marine mammals, or fish movements using tags that transmit information via satellite at various intervals or when the organism surfaces. If possible, all fields related to location, date, and time should be completed in order to ensure the record is unique. The DIVER team is collaborating with NOAA's Integrated Ocean Observing System (IOOS) and other organizations to expand the Telemetry Data Category and to better support data exchange. The fields that are currently part of the Telemetry data category are listed in [Appendix 1b](#).

Section 5. Instruments

The Instruments data category primarily contains information regarding technical devices or sensors used to collect measurements in the field. For example, the Instruments data category includes information about a Conductivity-Temperature-Depth (CTD) Rosette which is lowered through the water column and used to collect parameters related to water quality. The Instruments data category is primarily used for tracking information about sensor equipment, and does not generally contain the specific environmental results. To use the previous example, the Instruments data category presents technical information about the CTD Rosette equipment including the type of sensor, serial number, date, time, location and sampling organization and work plan, but not the water temperature or conductivity data collected in the field. A user querying Instrument data in DIVER can download the instrument results (and associated files potentially including raw or processed data, sampling forms, calibration details) that may be housed in DIVER or links to a partner agency such as the NOAA's National Center for Environmental Information. If a field sampling team collected sensor data and Samples data (for example, water samples) and submitted to a DIVER File Collection, the DIVER system is designed to return both the Instruments and Samples information with links to primary or processed data. The fields that are part of the Instruments data category are listed in [Appendix 1b](#).

Section 6. Bioassay

The Bioassay data category organizes and standardizes toxicity testing and other bioassay data from studies conducted in the laboratory to determine the effects of contaminants or other stressors on specific species. The Bioassay Data Category contains the legacy Query Manager bioassay data which primarily contains field collected samples (including sediment and water) that were brought into the laboratory to conduct toxicity tests, in addition to the extensive testing done for the Deepwater Horizon NRDA, which focused on laboratory tests under varying conditions (e.g. UV exposure, mixing method) . A combination of fields related to the sample and site are required to ensure a unique record,

including the following fields: Study ID, Site ID, Station ID, Sample ID, Bioassay Series, Test Description Code, and Chemical Analysis Replicate. The fields that are part of the Bioassay data category are listed in [Appendix 1b](#).

Section 7. Shoreline Cleanup Assessment Technique (SCAT)

The SCAT Observations data category contains standardized survey data that is collected to document shoreline oiling conditions. SCAT data is most often collected during a specific oil spill response effort, but baseline data could potentially be collected during training exercises. The SCAT Observations data category uses NOAA's draft SCAT Data Standard for baseline fields that must be included with SCAT data packages.⁴ The data include segments, surveys, zones, and pits. For more information on how to format a SCAT Observations data package for inclusion in DIVER Explorer see the [DIVER Data Package Formats](#) guide. Templates for the files can be downloaded [here](#), and the fields that are part of the SCAT data category are listed in [Appendix 1B](#).

⁴ More information on SCAT: <http://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources/shoreline-cleanup-and-assessment-technique-scat.html>