Preliminary Observational Data Management Plan (DMP)

Draft Interim Guidance

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# Preface

*The Council staff acknowledges that there may need to be exceptions made on specific elements contained in this interim guidance because of the wide range of project types (planning, implementation, ecosystem restoration, infrastructure, etc*.). A number of examples have been included in the appendices to help provide clarity. Please contact Jessica Henkel (jessica.henkel@restorethegulf.gov) or Brie Bernik (brie.bernik@restorethegulf.gov) if you have questions about an exception and would like to discuss.

All interim guidance is DRAFT only and will be subsequently updated with programmatic guidance developed by the Council Program Staff in coordination with the Council Monitoring and Assessment Workgroup (CMAWG) in 2019. The CMAWG has representatives from all Council Members and will be making recommendations to the Council regarding monitoring parameter guidelines, monitoring plan formats, and reporting requirements. Elements of the Preliminary Observational Data Management Plan could necessitate updates in the future based on subsequent guidance from the Council (including CMAWG programmatic guidance).

Data management plans are necessary for RESTORE Council funded projects to facilitate the Council’s compliance with the following federal laws and policies: [GPRA Modernization Act (P.L. 111­352)](https://www.gpo.gov/fdsys/pkg/PLAW-111publ352/pdf/PLAW-111publ352.pdf), Office of Management and Budget (OMB) guidance (2 C.F.R. § 200.328); OMB Memorandum “[Open Data Policy ­ Managing Information as an Asset](https://obamawhitehouse.archives.gov/sites/default/files/omb/memoranda/2013/m-13-13.pdf)” (9 May 2013); [Digital Accountability and Transparency Act of 2014](https://www.congress.gov/113/plaws/publ101/PLAW-113publ101.pdf) (Pub. L. No. 113-101, 128 Stat. 1146; i.e. Data Act of 2014); and the requirements of the [RESTORE Act](https://www.treasury.gov/services/restore-act/Documents/Final-Restore-Act.pdf) (Section 1603(t)(2)(C)(vii)(VII)(dd)) (Appendix D).

# Background

The RESTORE Council (Council) recognizes the importance of managing data at both the project­specific level and the regional level, especially for reporting purposes. Managing and ensuring comparability of these foundational data require consistencies in data collection and management among the projects to enable future assessment and reporting of the Council’s activities across the Gulf. Data management constitutes a comprehensive end­to­end process including movement of data and information from field observations to the data users. This process includes the acquisition, quality control, metadata cataloging, validation, reprocessing, storage, retrieval, dissemination, and archiving of data. Data management plans capture this process for projects and, in some cases, for specific observation systems.

As part of the Council's current financial award process, projects (and programs; *see below for details*) are required to develop the following two planning documents:

1. An **Observational Data Plan (ODP)** providing the Council information relevant to *data collection and compilation*—activities undertaken to evaluate if funded projects are meeting or exceeding project goals and/or restoration targets. An ODP should clearly identify the goals and objectives of its project or program, as well as quantitative metrics by which the project or program will be assessed. An ODP also ensures that data is collected properly for data comparison and compatibility (such as for compliance, engineering and design, baseline data, financial award reporting, etc.). Interim guidance on ODPs is provided separately, and available on the [Grants Resources webpage](https://restorethegulf.gov/gcerc-grants-office/gcerc-grants-resources).
2. A **Preliminary Observational Data Management Plan (DMP)** containing information relevant to project or program *data management and delivery*. The DMP is required to ensure that project data will be compatible and comparable with data collection efforts for the Council throughout the Gulf of Mexico region and that data is managed in a way to support the necessary reporting requirements.

Programs funded by the Council will be subject to the same requirements as projects, and should follow the same guidance provided for projects.

The DMP is paired with the ODP (re: data collection) and applies to all projects and all data, whether collected as part of compliance, engineering and design (E & D), planning, implementation, or post­implementation. Additionally, these plans will aid the Council in broader data management activities driven in part by Federal policies (see Preface for details).

# Planning Overview

For projects that are funded and administered through the Council­Selected Restoration Component and the Spill Impact Component, interim guidance in developing a DMP is provided to ensure the project documentation will (1) comply with Grant or Inter­Agency Agreement (IAA) reporting (collectively, the recipient community), and (2) meet data management objectives set forth by the Council.

To ensure appropriate data management (and planning and provisions, see Observational Data Plan Interim Guidance provided separately), all approved projects will be required to submit a DMP following the information in this interim guidance for Council approval prior to being awarded funds. Although projects may not yet be developed to the point where a comprehensive data management plan can be written, all projects will necessitate delivery of a comprehensive data management plan at a later date, when the Council releases a final Comprehensive Data Management Plan outline for recipients. Until such time, all projects must provide a Preliminary Data Management Plan (DMP) containing information on how collected observational data will be managed.

The Council recognizes that the projects funded under the Council­Selected Restoration Component and the Spill Impact Component vary in scope and stage of project development, as well as vary by type. For example, some projects are in the early stages of the project planning phase, whereas others have completed engineering and design and are ready for implementation. The majority of projects are ecosystem restoration projects, however there are some economic and infrastructure projects as well. All of these projects need to be able to provide DMPs. It is understood that projects that have completed the planning and design process will be able to provide DMPs with a greater level of detail than projects initiating a planning effort. The DMP is a living document and the elements should be based on currently available information. Elements of the DMP could necessitate updates in the future based on subsequent guidance from the Council (including CMAWG guidance), evolving project components, coordination with existing local and regional programs, and other new information.

# Interim Guidance

Recipients are responsible for providing all project­related data to the Council in digital, machine­readable, non­proprietary formats; described with appropriate metadata (FGDC or ISO standards compliant documentation providing information about the context and contents of the dataset); and in compliance with all federal laws and policies (for example, a .pdf is not considered a digital, machine­readable format and is therefore not an acceptable way to manage and deliver data).

All project-related data are to be included in the DMP including data as required by regulatory agencies for compliance (e.g., Threatened and Endangered species) and/or engineering and design data (e.g., soil coring data) for planning projects; this data supports the metrics being reported on in RAAMS for grants or through the IAA.

*The information outlined in the following section must be prepared, submitted, and approved by the Council prior to award of funds for planning and implementation projects.*

Please note that *DMPs are meant to act as a stand-alone documents*, and will thus contain information found elsewhere in the grant application. As such, please repeat such information in the DMP as requested rather than making reference to other sections of the grant application.

Please also note that any information that cannot be provided at the time of submitting the application should be designated TBD for “to be determined,” with a timeframe and plan for providing updated information. Recipients must deliver updated DMPs to the Council at least annually until all “N/A” or “TBD” values are provided.

## Components of a Preliminary Observational Data Management Plan

Applicants must provide the following in their DMP:

1. General project information, including:
	1. Project name, matching exactly the application project name (and the project name in an approved FPL, if applicable)
	2. Sponsoring agency
	3. Project phase to which the DMP applies (for example, Planning/Implementation/Post­Implementation)
	4. Contact information for one or more Data Stewards who will act as primary points of contact for all project­related data management activities
	5. Estimated data collection period (start and end dates)
	6. Brief project description (i.e. brief project abstract)
	7. A short description of the project location
	8. A general description of *data collection* activities
2. Estimated budget for data management including:
	1. Overall budget for data management
	2. Indication of where in the Overall Project Budget, Budget Narrative and/or Milestones the data management costs are found. (*Note: Data management budgets cannot be their own line item cost in the overall project budget but can be included as a milestone)*,
3. Your organization’s data management and metadata capacities, including:
	1. How your organization intends to store data
	2. How/if your organization intends to archive data (*Note: Data archiving is different from data storage*),
	3. How your organization plans to disseminate project data
	4. How your organization plans to protect any sensitive data from exposure
	5. How/if your organization utilizes digital object identifiers (DOI) (*Note: If your organization does not utilize DOIs please indicate this as well)*
4. For all observational data, applicants must provide a list of ***each*** of the data types that will be collected during the project (see Appendix D for examples), and the following information for each data type:
	1. GIS representation type (e.g., point, line, polygon), representing where data collection is to occur (an overview of GIS representation types is available at <https://www.gislounge.com/geodatabases-explored-vector-and-raster-data/>)
	2. Geospatial projection (a searchable database with projection information available at <http://georepository.com/>)
	3. Horizontal/vertical datums (if applicable)
	4. A point of contact for the data type
	5. Frequency and duration of collection
	6. Data storage format (e.g. .xls, .csv., geoTIFF)
	7. Units of measure

## Completing a Preliminary Observational Data Management Plan

The Council acknowledges that data management capacities vary across organizations and requests all applicants indicate if Council data management assistance is needed.

As part of the grants/IAA and reporting process, digital data will be required to be provided to the Council for review and approval on a yearly basis.

A DMP template is provided in Appendix A. An example DMP is provided in Appendix B, and example data types can be found in Appendix C.

Questions regarding the overall preparation of an appropriate DMP may be directed to Jessica Henkel (jessica.henkel@restorethegulf.gov) or Brie Bernik (brie.bernik@restorethegulf.gov).

# Appendix A. Preliminary Observational Data Management Plan (DMP) Template

## NOTE

Complete documentation, including descriptions of all observational data collection elements will be required by recipients for consideration and approval by the Council prior to plan implementation and award of funds. Where applicable, metric units are required (e.g., horizontal, geospatial, measurements, etc.) except when dealing with vertical datums (i.e., ft NAVD88).

## Project Information

### Project name:

[fill in, please making sure to match the name provided in the RAAMS application]

### Agency:

[fill in]

### Project phase(s) to which this DMP pertains:

[fill in, selecting from planning, implementation, and/or post-implementation]

### Data Steward(s):

[fill in, including name, phone, and email]

### Expected data collection start date:

[fill in]

### Expected data collection end date:

[fill in]

### Brief project description:

[fill in; e.g., project abstract]

### Project location:

[fill in, using a short description]

### General description of data collection activities (methods, sampling frequency, etc.):

[fill in]

### Estimated budget for data management:

[fill in]

### Location of costs in the Overall Project Budget, Budget Narrative, and/or Milestones:

[fill in]

## Data Management Capabilities

### Do you have in-house data management and metadata capacity? (Yes/No):

[fill in]

#### If yes, describe how this project’s data and metadata will be:

##### Stored

[fill in]

##### Archived

[fill in]

##### Made available to others (including delivery to the Council)

[fill in]

##### Protected from exposure, if sensitive in nature

[fill in]

#### If no, describe how you will ensure items 1-3 above are accomplished:

[fill in]

### Will project data/metadata use digital object identifiers (DOIs)?:

[fill in]

## Observational Data Types

Fill out the following fields of information for each type of data being collected. For information that is not known at this time, please indicate that it is TBD and include a timeframe and plan for providing updated information. Recipients must deliver updated DMPs to the Council at least annually until all “N/A” or “TBD” values are provided.

### Data type 1:

[fill in]

#### GIS representation:

[fill in]

##### Projection:

[fill in]

##### Horizontal and vertical datum:

[fill in]

#####  GIS POC:

[fill in]

#### Frequency of collection:

[fill in]

#### Duration of collection:

[fill in]

#### Data storage format:

[fill in]

#### Units:

[fill in]

 [continue, repeating the above fields for each additional data type and numbering data types consecutively]

# Appendix B. Example Preliminary Observational Data Management Plan (DMP)

## NOTE

The following information is provided as an example using a hypothetical/fictitious project and provides information regarding only three observational data types, corresponding to the example Observational Data Plan (ODP) provided separately, in Appendix A of the ODP interim guidance available on the [Grants Resources webpage](https://restorethegulf.gov/gcerc-grants-office/gcerc-grants-resources). The specifics provided below are not factual and do not reflect elements of a real project. The information serves simply as an example.

Complete documentation, including descriptions of all observational data collection elements will be required by recipients for consideration and approval by the Council prior to plan implementation and award of funds. Where applicable, metric units are required (e.g., horizontal, geospatial, measurements, etc.) except when dealing with vertical datums (i.e., ft NAVD88).

## Project Information

### Project name:

Golden Island Restoration

### Agency:

Department of Success

### Project phase(s) to which this DMP pertains:

Implementation & Post-Implementation

### Data Steward(s):

John Smith, (123) 456­7777, john.smith@dos.gov

### Expected data collection start date:

Targeted FY16, prior to project construction (exact dates TBD based on award date, and will be included in an updated version of this plan with the first annual report)

### Expected data collection end date:

XX/XX/XXXX, 10 years post construction (exact dates TBD based on award date, and will be included in an updated version of this plan with the first annual report)

### Brief project description:

The Golden Island Restoration project is composed of both dune and marsh creation tasks. The dune creation phase of the project will extend for 2800m along the Gulf of Mexico shoreline raising the supratidal, intertidal, and subtidal environments to dune and supratidal elevations on Golden Island. The marsh creation phase will elevate subtidal and intertidal areas directly behind the dune to intertidal and supratidal elevations.

### Project location:

An island 30 km south­southwest of Pascagoula, FL in the Gulf of Mexico.

### General description of data collection activities (methods, sampling frequency, etc.):

High resolution aerial photography will be used to map emergent habitats on Golden Island using the technical framework established by the USFWS National Wetlands Inventory (NWI) Classification of Wetlands and Deepwater Habitats (Cowardin et al. 1979). Data collection will occur once per year beginning with pre­implementation (year 0), and will continue post­implementation (years 1, 2, 5, and 10). Aerial photography will be analyzed and mapped as part of this observational data collection effort. Field investigations will be conducted to ground­truth various geomorphic and vegetation habitats in the field with corresponding signatures on aerial photography.

The composition and cover of emergent vegetation will also be surveyed. 10 cross­shore transects will be established at 300m intervals in the project area bisecting dune and marsh creation areas. Each transect will contain ten randomly located vegetation stations, for a total of 100 vegetation stations. Vegetation stations will consist of 2X2m plots and sampling protocol will be consistent with Folse et. al. 2014 using a modified version of Braun­Blaunquet method (Ellenberg and Mueller­Dombois 1974, Steyer et al. 1995). As­built (implementation phase) vegetation cover will be surveyed approximately 90­180 days following completion of construction within the marsh and dune cells. Post­implementation vegetation cover will be surveyed late summer/early fall of years 2 and 5.

### Estimated budget for data management:

$645,000

### Location of costs in the Overall Project Budget, Budget Narrative, and/or Milestones:

* $350,000 in Personnel (Salary and Fringe Benefits for GS­7 IT Specialist at 30% staff hours for 10 years) in project budget
* $13,000 in Equipment (Data Management Server) in project budget
* $282,000 in Software (Licenses, updates and annual maintenance) in project budget

## Data Management Capabilities

### Do you have in-house data management and metadata capacity? (Yes/No):

Yes

#### If yes, describe how this project’s data and metadata will be:

##### Stored

The project data along with corresponding ISO­compliant metadata will be stored on a DOS­managed server and backed up regularly to an off­site location.

##### Archived

At the completion of the project, final project data and metadata will be submitted to the National Centers for Environmental Information (NCEI) for archiving.

##### Made available to others (including delivery to the Council)

The applicable GIS data layers will be service­enabled and made available for consumption through the Golden Island Restoration Online Mapping Application. The tabular data will also be available for download through a password-protected web interface. In addition, all electronic data and metadata will be delivered to the RESTORE Council on a yearly basis for review and approval.

#### If no, describe how you will ensure items 1-3 above are accomplished:

N/A

### Will project data/metadata use digital object identifiers (DOIs)?:

DOIs will not be used

## Observational Data Types

Fill out the following fields of information for each type of data being collected. For information that is not known at this time, please indicate that it is TBD and include a timeframe and plan for providing updated information. Recipients must deliver updated DMPs to the Council at least annually until all “N/A” or “TBD” values are provided.

### Data type 1:

Aerial imagery

#### GIS representation:

Raster – High-resolution digital aerial photography (near-vertical, color-infrared)

##### Projection:

NAD83 UTM zone 17

##### Horizontal and vertical datum:

UTM, NAD83

#####  GIS POC:

John Smith, (123) 456­7777, john.smith@dos.gov

#### Frequency of collection:

Five discrete acquisitions will occur, one in each of years 0, 1, 2, 5, and 10.

#### Duration of collection:

Spanning 10 years

#### Data storage format:

Digital orthophotographs created from the native aerial imagery that will be service­enabled as a mosaic dataset

#### Units:

Meters

### Data type 2:

Habitat composition maps

#### GIS representation:

GIS raster files

##### Projection:

NAD83 UTM zone 17

##### Horizontal and vertical datum:

UTM, NAD83

##### GIS POC:

John Smith, (123) 456­7777, john.smith@dos.gov

#### Frequency of collection:

Five discrete acquisitions will occur, one in each of years 0, 1, 2, 5, and 10.

#### Duration of collection:

Spanning 10 years

#### Data storage format:

geoTIFF

#### Units:

Meters

### Data type 3:

Emergent vegetation surveys

#### GIS representation:

100 selected stations will be represented by lat/long points

##### Projection:

NAD83 UTM zone 17

##### Horizontal and vertical datum:

UTM, NAD83

##### GIS POC:

Jane Smith, (123) 456­7778, jane.smith@dos.gov

#### Frequency of collection:

Biannually (summer and early fall) surveys will occur in years 2 and 5, post-implementation.

#### Duration of collection:

Spanning 3 years

#### Data storage format:

Relational database and .csv files

#### Units:

% cover/species with status category (native/invasive)

# Appendix C. List of Data Type Examples

The following list of ecosystem-related observational data types should not be considered comprehensive, but rather a guide for those developing Preliminary Observational Data Management Plans. Many examples were adapted from the Deepwater Horizon (DWH) Natural Resource Damage Assessment (NRDA) Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0 (2017). Possible units of measurement are provided in parentheses for some examples.

* air quality (e.g. emissions)
* air temperature
* area (m2 or km2)
* bathymetry (e.g., LiDAR, multibeam, singlebeam, etc.)
* benthic macroinfauna survey
* bird survey (e.g., community composition, diversity, abundance, age, sex, distribution, etc.)
* channel dimensions (m)
* community composition
* conductivity
* contaminants (e.g. toxins, concentrations)
* currents (e.g., speed, direction)
* discharge (m3/s)
* dissolved oxygen [DO; milligrams per liter (mg/L) or parts per million (ppm)]
* *E. coli* [most probable number (MPN)/100 L or colony-forming units (CFU)/100 mL]
* elevation (m)
* emergent vegetation survey
* Enterococci (MPN/100 L or CFU/100 mL)
* fecal coliform (CFU/100 ml)
* habitat classification
* high­resolution aerial imagery
* mammal survey (e.g., species, abundance, age, sex, distribution, etc.)
* marine debris [counts (#) and/or weight (kg)]
* mollusk survey (e.g., species, abundance, age, sex, distribution, etc.)
* nekton diversity
* nekton/epibenthos composition, abundance/density (abundance: number of individuals, density: individuals/m2)
* nutrient concentrations (e.g., total, nitrate, phosphate, etc.)
* oblique photography
* pH (Standard Unit, SU)
* phytoplankton survey
* precipitation
* rectified aerial photography
* reptile/amphibian survey (e.g., species, abundance, age, sex, distribution, etc.)
* salinity (surface water, ppt)
* sediments (e.g., size, type, etc.)
* shoreline position
* shoreline profiles
* side­scan sonar
* species abundance/density (abundance: number of individuals, density: individuals/m2)
* species diversity
* specific conductance (µS/cm)
* sub­bottom profiles
* submerged aquatic vegetation survey (SAV)
* suspended sediments
* temperature (water; degrees Celsius °C)
* tides
* topography
* total nitrogen (TN; mg/L or ppm)
* total phosphorous (TP; mg/L or ppm)
* total suspended solids (TSS; mg/L or ppm)
* turbidity [nephelometric turbidity unit (NTU)]
* turtle survey (e.g., species, abundance, age, sex, distribution, etc.)
* vegetation density (individuals/m2)
* vegetation percent cover (%) and composition (unitless)
* vegetation survival (%)
* velocity (water; m/s)
* water chemistry (analytes, concentrations)
* water level
* water temperature
* waves (height, direction, period)
* wetland edge (units vary by method)
* winds (speed, direction)
* zooplankton

Examples of other types of data that may be collected (not necessarily ecosystem data), but that still need to be included in a DMP include:

* planning documents
* educational materials (count, nature, and extent)
* engineering/design reports
* environmental compliance documents
* infrastructure or habitat constructed and/or enhanced and completed as designed
* number of anglers using project site/per day
* number of labor hours of full time employees
* number of participants in a job development program
* number of studies conducted or tools created
* number of veterans trained
* number of volunteer hours
* number of water quality improvement practices implemented
* number of youth receiving technical skills training
* percent match dollars by a local organization
* percent of programs contracted out to existing local organizations
* recreational activities utilized by public (nature and extent)
* right of entry
* structural integrity and function of constructed features
* visitor satisfaction
* visitor use/access

# Appendix D: References

[Digital Accountability and Transparency Act of 2014](https://www.congress.gov/113/plaws/publ101/PLAW-113publ101.pdf), Pub. L. No. 113-101, 128 Stat. 1146 (2014).

OMB Memorandum M-13-13, [*Open Data Policy ­ Managing Information as an Asset*](https://obamawhitehouse.archives.gov/sites/default/files/omb/memoranda/2013/m-13-13.pdf)*,* (May 9, 2013).

[GPRA Modernization Act (P.L. 111­352)](https://www.gpo.gov/fdsys/pkg/PLAW-111publ352/pdf/PLAW-111publ352.pdf), Office of Management and Budget guidance (2 C.F.R. § 200.328), (2010).

[RESTORE Act](https://www.treasury.gov/services/restore-act/Documents/Final-Restore-Act.pdf) (Section 1603(t)(2)(C)(vii)(VII)(dd)), (2012).