

DARRP

DAMAGE ASSESSMENT, REMEDIATION, & RESTORATION PROGRAM

DIVER Application: Common Data Models for Data Integration

2018 Gulf of Mexico Oil Spill & Ecosystem Science Conference

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IEc Inc.



DWH Damage Assessment Data



Shoreline Data



Marsh Assessment



Oyster Collections



Telemetry Data

- **20,000+** trips for field data collection
- **1 million+** field data forms and related electronic files
- **100,000+** water, tissue, oil and sediment samples
- **15 million+** database records
- **30 terabytes** of data
- Data Referenced in many Publications/Journals



Toxicity Data



Water Column



Seafood Safety



Marine Mammal & Turtle Assessment

Overview

DIVER

(Data Integration, Visualization, Exploration, and Reporting)

DIVER is a **data warehouse** and **query** application. The DIVER approach **integrates standardized** datasets so users can query across data holdings and download information and results.

<https://www.diver.orr.noaa.gov>

Injury Assessment

Deepwater Horizon Administrative Record

Marine Mammals Injury Data

Data related to the Deepwater Horizon incident is available in a variety of size and format. DWH data may be available through tools such as DIVER direct downloads. Also, in some cases, data may be available by request. Descriptions in this box below are general and may not be applicable to data available for this specific resource as described later in this document.

DIVER

NOAA created a [public website](https://www.diver.orr.noaa.gov) as the primary public access for data related to the Deepwater Horizon incident. To provide additional context to the NRDA data, the site includes 2010 contaminant chemistry data for the onshore area of the Gulf of Mexico. These data are available through the [DIVER](https://www.diver.orr.noaa.gov) (Data Integration Visualization Exploration) mapping interface called DIVER (Data Integration Visualization Exploration). Please visit the [help](https://www.diver.orr.noaa.gov) materials to learn more.

ERMA Deepwater Gulf Response

[ERMA@Deepwater Gulf Response](https://www.erma.gov) (Environmental Response Management Application) is an online mapping tool used to integrate environmental response information. ERMA was used as the Common Operational Picture during the DWH variety of spatial layers related to the DWH Response and damage assessment operations, oiling observations, sampling results and analysis products provide public access to data from the response through the NRDA.

Direct Downloads

Data files may be available as direct downloads from DIVER or other repositories. Use the links provided to access these files.

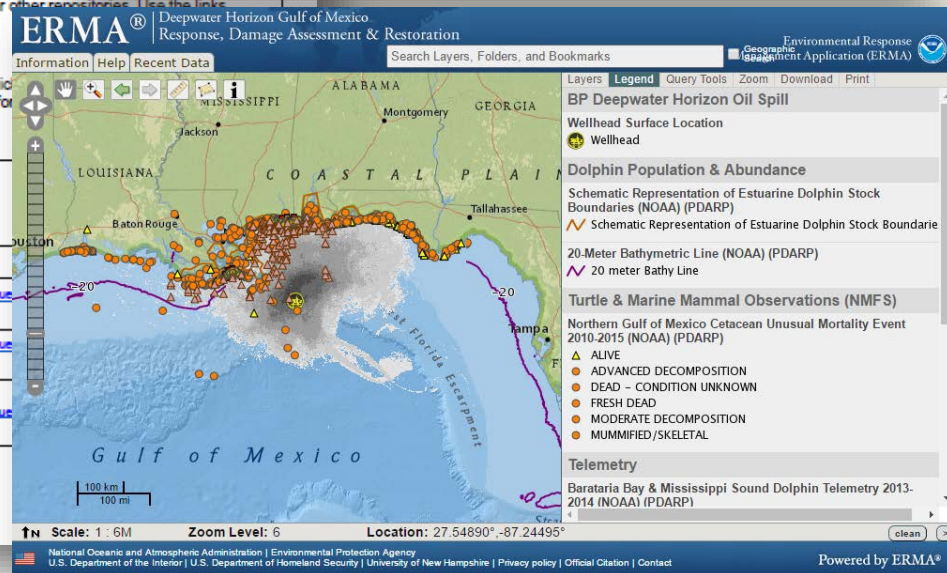
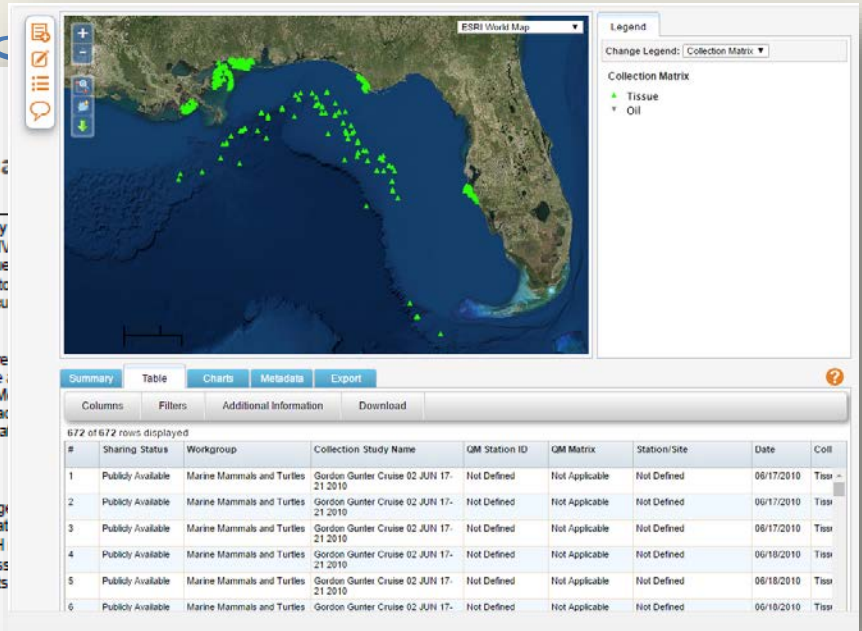
By Request

Some datasets are in the process of being integrated into public access. Please contact dwh.data@noaa.gov for access to these data.

Data Links

Datasets	Links
DIVER: Contaminant Chemistry Sample Data	https://www.diver.orr.noaa.gov/web/que
DIVER: Other Lab Results Data	https://www.diver.orr.noaa.gov/web/que
DIVER: Photographs	2010: https://www.diver.orr.noaa.gov/web/que

Questions? Email dwh.data@noaa.gov.



Adminis

Search

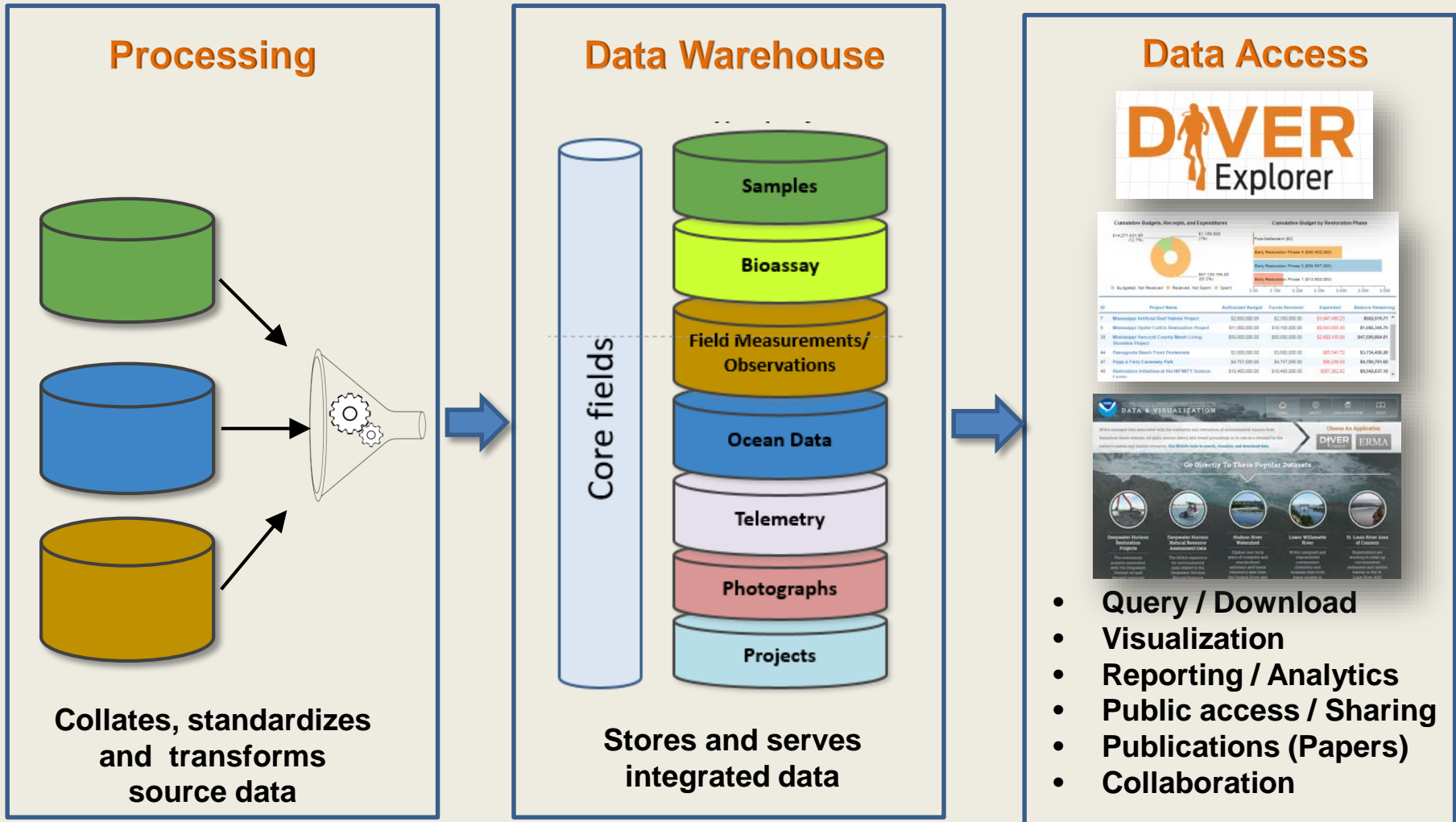
DOCUMENT TITLES

- + 1 Case File Index
- + 2 Applicable Laws, Regulations,
- + 3 Legal Documents
- + 4 Trustee Coordination and Ma
- 5 Preassessment/Assessment (5

- + 5.1 Preassessment Related M
- + 5.2 Bird Injury
- + 5.3 Deep Benthic Injury
- + 5.4 Fish Injury
- + 5.5 Oyster Injury
- + 5.6 Marine Mammal Injury
- + 5.7 Sea Turtle Injury
- + 5.8 Shoreline Habitat Injury
- + 5.9 Water Column Injury
- + 5.10 Lost Human Use
- + 5.11 General Chemistry Activi
- + 5.12 General Toxicity Asses
- + 5.13 General Data Managem
- + 5.14 Aerial Imagery/Remote Sensing Activities

<http://>

What is DIVER?



Data Integration

Protocols and Standards

Field Forms (Data)

Transcribe

Electronic Data

FAST Field Assessment & Support Techniques

Home **Field Assessment & Sample Management** Data Management

[Field Assessment & Sample Management](#) >

[Field Sampling Forms](#)

These forms were developed by NOAA for DWH field assessments and for the DWH NRDA assessment and have had minor modifications for the Arctic standards. Guidelines and forms developed for ephemeral data collection; guidelines/forms may be available for some resources. Please contact the

These PDF and Excel field sampling and survey forms are preset for easy minor modifications. To print the PDF, click on the link to open the Google open the Google preview then click the Download button.

The Preassessment datasheet was used in the DWH NRDA to document data that could be combined with SCAT for a more comprehensive shoreline datasheet, a preassessment exposure datasheet based on point observation.

The Rapid Assessment datasheet could be used as a supplement to SCAT could also potentially be used in a streamlined assessment without collection.

Survey Forms

Beach

- [Beach Arctic Guidelines Excel Form \(2014\)](#)
- [Beach Arctic Guidelines PDF Form \(2014\)](#)

Eelgrass

- [Eelgrass Arctic Guidelines Excel Form \(2014\)](#)
- [Eelgrass Arctic Guidelines PDF Form \(2014\)](#)

Fish

- [Fish Arctic Guidelines Excel Form \(2014\)](#)
- [Fish Arctic Guidelines PDF Form \(2014\)](#)

Kelp

- [Kelp Arctic Guidelines Excel Form \(2014\)](#)
- [Kelp Arctic Guidelines PDF Form \(2014\)](#)

Marsh/Vegetation

- [ARD Northeast Branch Herbaceous Cover & Invertebrate Plot Data](#)

Spring 2011 v2 - Herbaceous

Shoreline TWG

Coastal Wetland Vegetation Plan

Electronic
Data

JEP/DM 05/27/11 (1)

Coastal Wetland Vegetation Plan - Site Set-up Verification

Page 1 of 13

Date: 05/27/2011 Time: 10:50 Site ID: H-01 Team ID: 0

Data Recorder: Hassan

Other Team Members:

DIVER_Explorer_2015_03_03_shoreline_obsshorelinemangrovecoverplotfall2013.csv - Microsoft Excel

File Home Insert Page Layout Formulas Data New Tab Review View Developer Acrobat

Cut Copy Paste Format Painter Clipboard Font Alignment Number

Calibri 11 A A Wrap Text General Normal Good

B I U Bold Italic Underline Merge & Center \$ % Conditional Formatting as Table Styles

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Offshore (1-2

Offshore (1-2 m) looking inland (center of photo across point between cover and productivity plots):

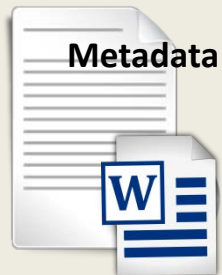
Offshore (1-2 m) looking inland (center of photo right of productivity plots):

100-0034

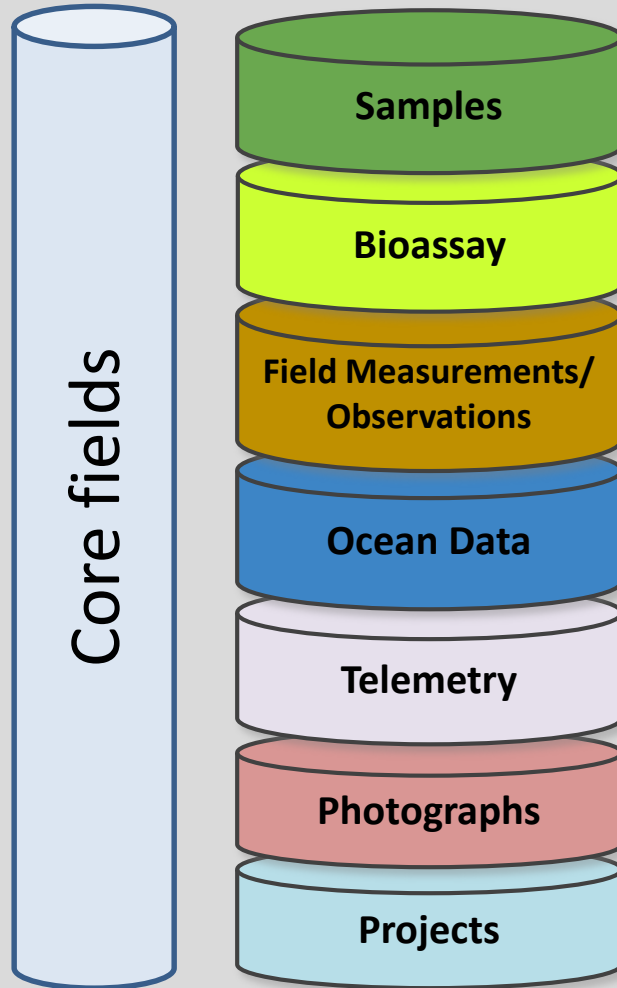
100-0033

File Collections

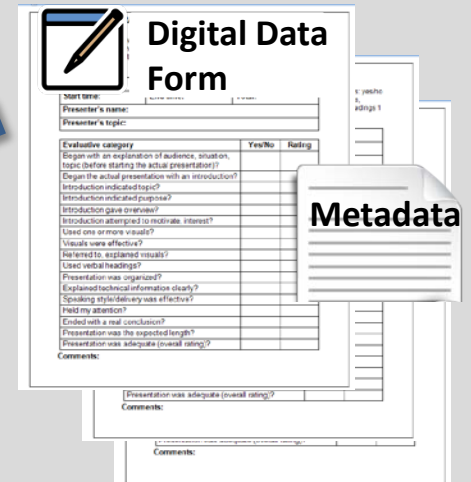
Unstructured Data



Core fields



Structured Data



Digital Data Form

Start time: _____

Presenter's name: _____

Presenter's topic: _____

Evaluate category: _____

Begin with an explanation of audience, situation, topic (before starting the actual presentation)?

Introduction gave overview?

Introduction aligned to motivate, interest?

Used one or more visuals?

Visuals were effective?

Visuals explained results?

Used verbal headings?

Presentation was organized?

Explained technical information clearly?

Spelling style delivery was effective?

Held my attention?

Ended with a real conclusion?

Presentation was the expected length?

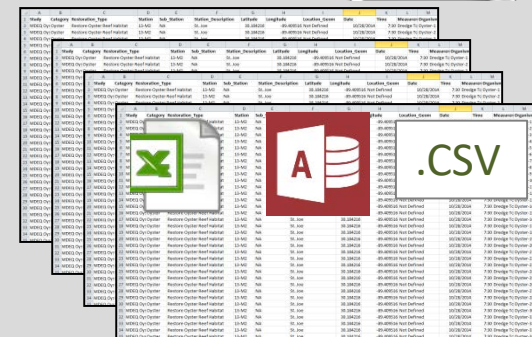
Presentation was adequate (overall rating)?

Comments: _____

Yes/No Rating: _____

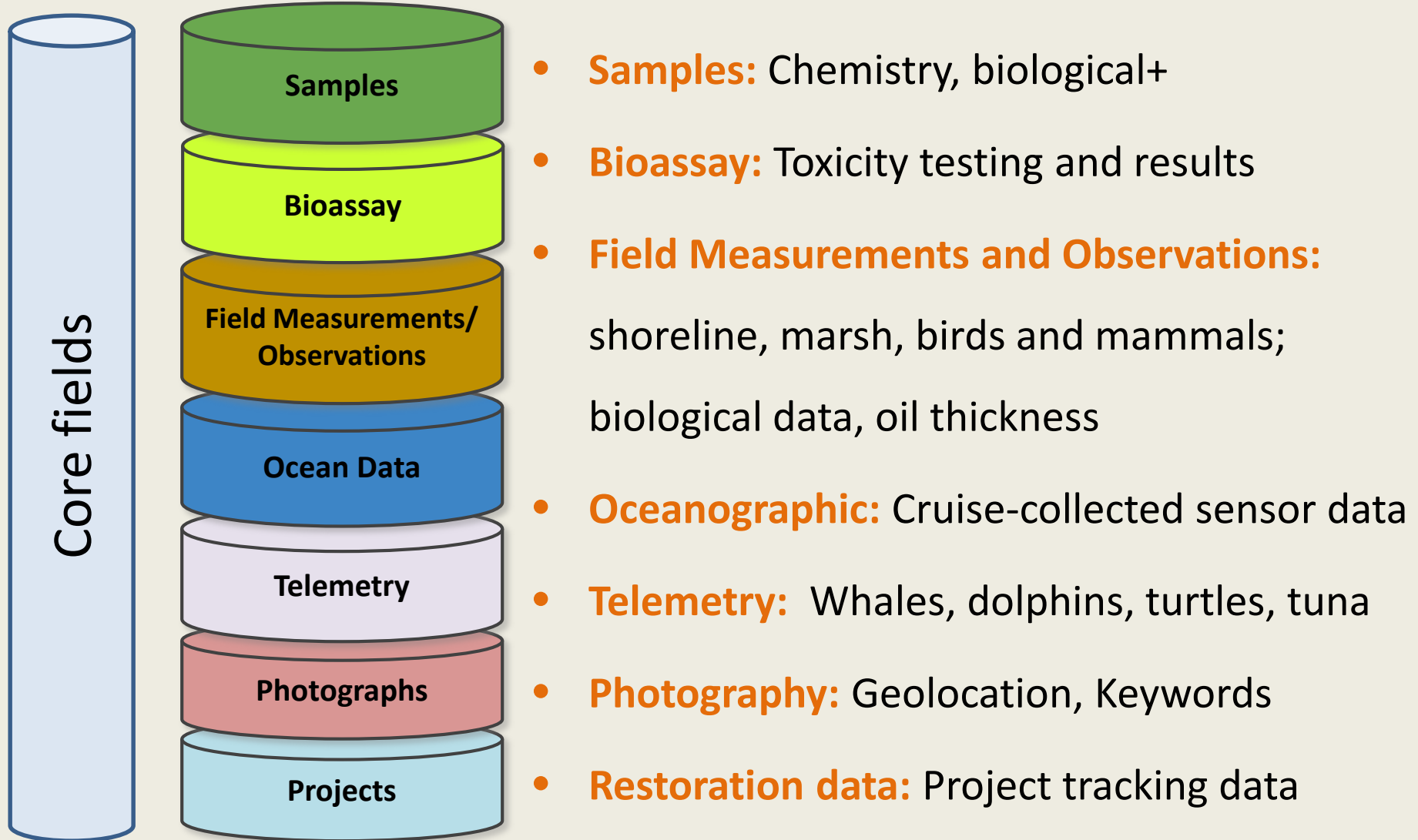
Metadata

Metadata



Common Data Models

Data type specific models (Data Categories)



Common Data Model (example)

Core Fields

Workgroup | Workplan | Data Source |
Matrix | Location | Date | Form | Station |
Sample ID...

Data Category

Samples

Bioassay

Detail Fields

Analysis

Units


Depth

Species

Endpoint

Duration

Environmental Data Specification



NATURAL RESOURCE DAMAGE ASSESSMENT & RESTORATION
DATA & VISUALIZATION

HOME

ABOUT

DATA OVERVIEW

HELP

WHAT'S NEW

DATA OVERVIEW

DIVER (Data Integration, Visualization, Exploration, and Reporting) is a NOAA application for the integration and distribution of primarily NRDA-related response, assessment, and restoration data, as well as historical data collected from hazardous sites around the country. Both environmental data and project planning data are available in DIVER. Below, we provide a general description of the data structures used in DIVER, and access to detailed data specifications.

CHECK OUT THE FORMS AND GUIDANCE NOAA USES TO COLLECT FIELD DATA →

ENVIRONMENTAL DATA STRUCTURE

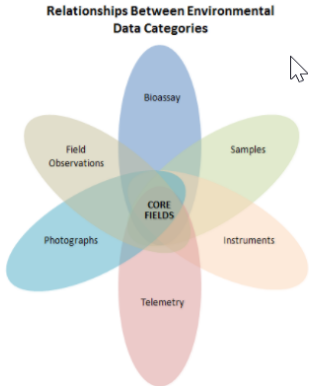

Environmental data are organized by data category:

- Samples:** Collection data and analysis results for discrete samples;
- Bioassay:** Results from field and laboratory-based bioassay studies;
- Instruments:** Packages of data from CTDs or other oceanographic instruments;
- Field Observations:** Observations and measurements from field studies;
- Telemetry:** Position tracks and related data for tagged animals; and
- Photographs:** Field photos keyword tagged using NOAA's Photologger.

Each data category contains a set of fields necessary to describe that data. Some common fields, like date and coordinates, appear in multiple categories (see diagram). Fields that appear in every environmental data category are known as **core fields** and form the fundamental relationships among data categories.

In DIVER, queries which are run across multiple data categories return and map information at the core fields level (also called "Overview"). In these cross-category queries, data category-specific fields are available as related downloads. For queries within a single data category (e.g. Samples or Field Observations), the data table and maps will present a wider set of fields specific to that data category.

The **DIVER Environmental Data Specification** describes the underlying data structures and data exchange methods, including detailed field information and valid values, and is intended as a resource for both data providers and data users. The data specification includes a discussion of the core fields required to organize and categorize data brought into DIVER, as well as general requirements regarding submission of structured and unstructured data and metadata. Tabular versions are available for **Appendix 1B**, defining available DIVER fields across different data categories, and **Appendix 2**, valid values and chemical dictionary.

Data Categories

Core Fields

Detail Fields

Valid Values


Data Submission

Data Access

References/Appendices

Public DIVER website: <https://www.diver.orr.noaa.gov>

Field Forms, Data Templates and Guidelines



NATURAL RESOURCE DAMAGE ASSESSMENT & RESTORATION
DATA & VISUALIZATION

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FIELD FORMS, DATA TEMPLATES, AND GUIDELINES

Through the Field Assessment and Science Techniques (FAST) program, NOAA's Assessment and Restoration Division (ARD) creates tools to improve preparation for and implementation of Natural Resource Damage Assessment (NRDA) field efforts. Field and laboratory protocols, data templates, chain of custody, and field data collection forms to standardize data collection and intake are a key component of FAST. Many of these materials, such as the [Sampling Guidelines for Arctic Oil Spill Damage Assessments](#), are the genesis of field practices and lessons learned from the Deepwater Horizon oil spill. While many of these documents were developed for use in the Arctic, they are generally applicable to other regions.

NOAA provides these materials to partners and the public as part of ensuring consistency and best practices across different environmental assessments in all regions of the United States. NOAA's FAST team is actively reviewing, revising and developing forms and guidelines with partners, and will post updated materials as they become available. For more information please contact the [FAST team](#). Current documents can be downloaded by document type, or environmental resource through the dashboard below.

FIELD FORMS AND GUIDANCE DOCUMENTS

Document Type: Resource: Search: [RESET FILTERS](#)[DOWNLOAD](#)

SELECT ALL <input type="checkbox"/>	DOCUMENT TYPE	RESOURCE	DESCRIPTION	FILENAME
<input type="checkbox"/>	Form	Plankton, Fish, Water	Sample collection form for plankton, including tow, flow meter, and other instrument data. Also includes a short Chain of Custody (COC).	Plankton_Form_2014.pdf
<input type="checkbox"/>	Form	Beach, Tidal Flat, Marsh, Vegetation	Preassessment data sheet to collect shoreline oiling exposure information at a point location.	Preassessment datasheet_2016_08.xlsx
<input type="checkbox"/>	Form	Beach, Tidal Flat, Marsh, Vegetation	NRDA rapid shoreline assessment datasheet to document exposure to marsh habitat by collecting linear data.	Rapid Pre-Assessment Datasheet_2016_0816.pdf
<input type="checkbox"/>	Form	Soil, Sediment	Sample collection form for soil and sediment, including the sampling method and depth. Also includes a short Chain of Custody (COC).	Soil_Sediment_Form_2014.pdf
<input type="checkbox"/>	Form	Tissue, Vegetation, Wrack	Sample collection form for tissue and wrack, including the species, tissue type, and number of organisms. Also includes a short Chain of Custody (COC).	Tissue_Wrack_Form_2014.pdf
<input type="checkbox"/>	Form	Vegetation	Field data sheet for vegetative habitat, including physical and chemical parameters, transect characterization, exposure to oiling, quadrat characterization, and sample collection.	VegetationForm_2014.pdf

Showing 1 to 37 of 37 entries

DIVER Data Templates

Electronic Data Deliverables

Labs: Electronic Data Deliverables (EDDs)

- Chemistry and Bioassay (Toxicity)

Data Providers: Electronic Data Deliverables (EDDs)

- Chemistry
- Bioassay (Toxicity)
- Biological Data
- Field Measurements and Observations

Guidance, Study Notes and Template “Tester”

Additional Templates

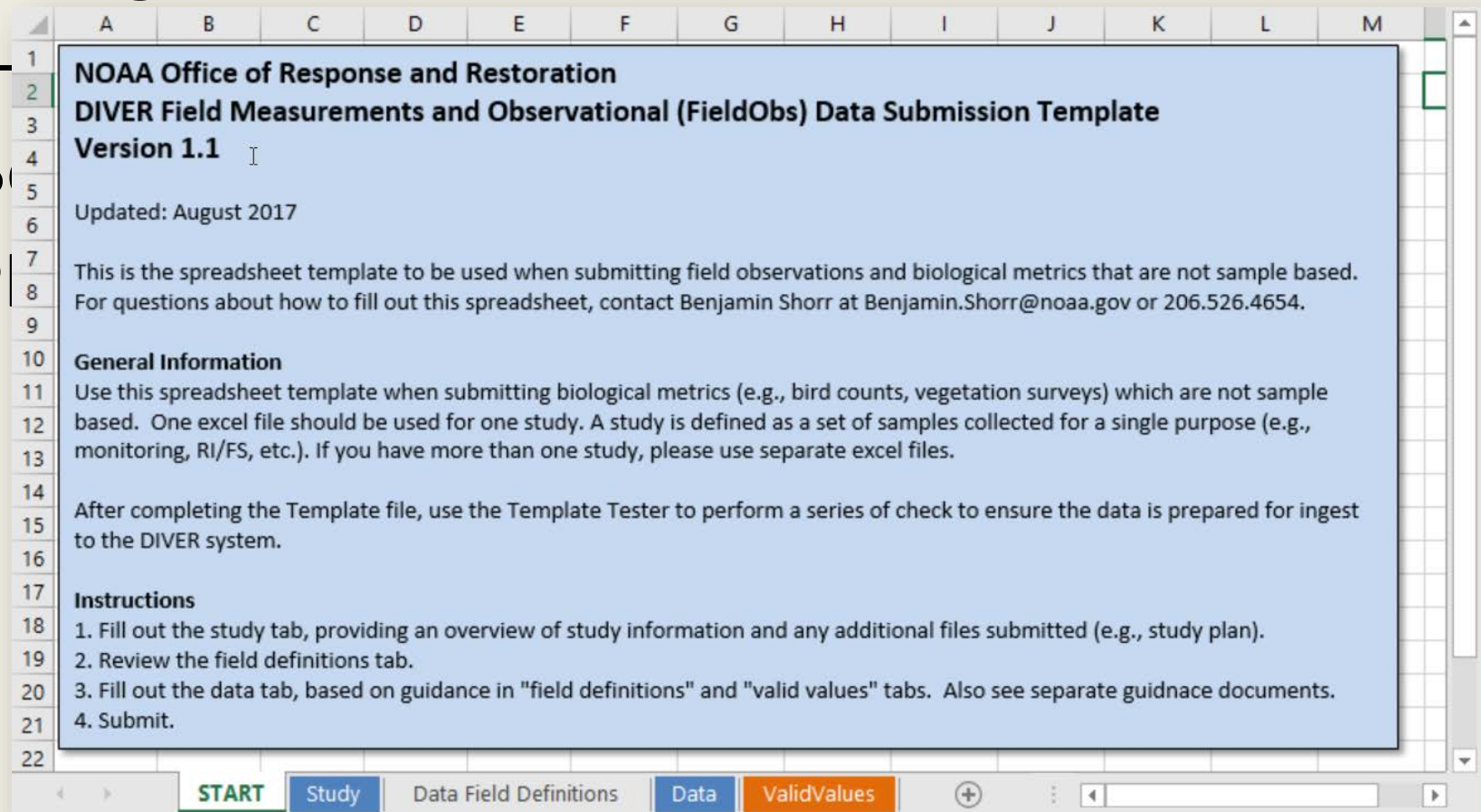
- Photos Database (NOAA Photologger)
- Shoreline Cleanup Assessment Techniques (SCAT)

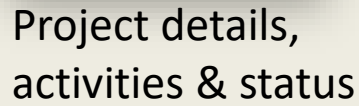
Field Measurements and Observations

- Biological

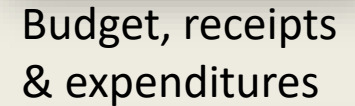
- B

- P





- **\$8.8 billion** settlement paid out over **15 years**
- Funds allocated to **7 Trustee Implementation Groups** (TIGs) across **15 resource types**
- Projects will be implemented by **17 trustee agencies**
- Commitment to **data-driven adaptive management**



Environmental compliance





Monitoring and Adaptive Management Standards

GULF SPILL RESTORATION

Website maintained by NOAA on behalf of the Deepwater Horizon Natural Resource Damage Assessment Trustees


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Monitoring and Adaptive Management

Adaptive restoration monitoring creates restoration approaches setting

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SELECT A WORKSPACE

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- Southeast ★
- Barge B No. 255 Fire ★
- Bay Long Incident LA ★
- Citgo Refinery/Calcasieu River ★
- Deepwater Horizon ★
 - Alabama TIG ★
 - DWH File Collections ★
 - DWH Harddrive Manifests ★
 - Equipment and Sample Forms ★
 - Florida TIG ★
 - Louisiana TIG ★
 - Mississippi TIG ★
 - File Collection ★
 - Open Ocean TIG ★
 - Regionwide TIG ★
 - Reports ★
 - Restoration Plan Tracking ★
 - Texas TIG ★
 - Toxicity Data ★
 - Trustee Council ★
- Demonstration ★
- Florida and Caribbean Marine Debris ★
- Green Canyon 248 ★
- Gulf of Mexico Marine Debris ★
- Hurricane Harvey ★
- Hurricane Irma ★
- Keathley Canyon 919 (MEXUS) ★
- South Alabama Mercury NRDAR ★
- Southeast Marine Debris ★

Project Details

Benjamin Shorr

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Last Data Refresh: 02/05/2018

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Documents

Monitoring Documents (12)

Document Title	Document Type	Modified Date	File Size	File Type
Artificial Reef Data Spring 2014 - Tray	Monitoring Data	12/22/2017	88 kB	xlsx
Artificial Reef 2014 Baskets Summary	Monitoring Data	12/22/2017	74 kB	xlsx
Artificial Reef Data Spring 2015 - Tray	Monitoring Data	12/22/2017	41 kB	xlsx
Monitoring Progress Report Year 2 (2015) Mississippi Artificial Reef Habitat Early Restoration Project	DWH NRDA Monitoring Progress Report	12/22/2017	360 kB	pdf
Artificial Reef Spring 2015 Results - Baskets	Monitoring Data	12/22/2017	39 kB	xlsx
Artificial Reef 2015 Baskets Summary	Monitoring Data	12/22/2017	67 kB	xlsx
Artificial Reef Spring 2014 Results - Baskets	Monitoring Data	12/22/2017	41 kB	xlsx
Artificial Reef Monitoring Final Report Form GCRL 2017	DWH NRDA Final Monitoring Report	12/22/2017	803 kB	pdf
Monitoring Progress Report Mississippi Artificial Reef Habitat Project	DWH NRDA Monitoring Progress Report	12/22/2017	866 kB	pdf
MS DEQ Artificial Reefs Monitoring Plan May 2015 Final.pdf	Monitoring Plan	10/18/2017	635 kB	pdf
Monitoring Progress Report Year 3 (2016) Mississippi Artificial Reef Habitat Early Restoration Project	DWH NRDA Monitoring Progress Report	12/22/2017	347 kB	pdf
MS ER Artificial Reef Deployment and Monitoring Sites Final.pdf	DWH NRDA Monitoring Progress Report	10/18/2017	1583 kB	pdf

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
	Central 1	Central 6	Central 7	Central Control		Spring 2015	North 4	North 8	North 11	North Control		Spring 2015	South 13A	South 13B	South 13C	South 13D
	Taxa Count	Taxa Count	Taxa Count	Taxa Count		Identified Taxa List	Taxa Count	Taxa Count	Taxa Count	Taxa Count		Identified Taxa List	Taxa Count	Taxa Count	Taxa Count	Taxa Count
3	-	6	-	-		Alpheus sp.	-	-	-	-		Alpheus sp.	-	-	-	-
4	2	-	-	1		Callinectes sapidus	1	-	-	4		Callinectes sapidus	-	-	-	-
5	-	-	-	1		Caranx hippos	-	-	-	-		Caranx hippos	-	-	-	-
6	-	5	-	1		Chloroscombrus chrysurus	-	-	-	-		Chloroscombrus chrysurus	-	-	-	-
7	-	3	1	2		Clibanarius vittatus	-	-	-	-		Clibanarius vittatus	2	-	-	-
8	2	-	-	2		Eretelis smaragdus	-	-	-	-		Eretelis smaragdus	-	-	-	-
9	2	-	-	2		Farfantepenaeus aztecus	-	-	-	9		Farfantepenaeus aztecus	-	-	-	-
10	-	1	-	-		Gobiosox strumosus	-	-	-	-		Gobiosox strumosus	3	-	1	-
11	2	4	-	1		Gobiosoma bosc	-	-	-	-		Gobiosoma bosc	3	-	1	-
12	-	-	-	3		Hypsoblennius invemar	-	-	-	-		Hypsoblennius invemar	-	-	-	-
13	1	-	-	2		Hypsoblennius ionthas	-	-	-	-		Hypsoblennius ionthas	-	-	1	-
14	-	-	-	-		Lagodon rhomboides	-	-	-	1		Lagodon rhomboides	-	-	-	-
15	2	3	11	4		Menippe adina	-	-	-	-		Menippe adina	-	-	-	-
16	1	-	-	-		Myrophis punctatus	-	-	-	-		Myrophis punctatus	-	-	-	-
17	3	-	-	1		Opsanus beta	-	-	-	-		Opsanus beta	1	-	1	-
18	1	-	-	-		Palaemonetes sp	-	-	-	-		Palaemonetes sp	6	-	-	-
19	10	6	12	16		Panopeidae	-	-	4	1		Panopeidae	20	8	11	-
20	1	-	3	-		Stramonita haemastoma	4	1	-	-		Stramonita haemastoma	-	-	-	-
21																
22	27	28	27	36		Total	5	1	4	15		Total	35	8	15	10
23	11	7	4	12		# of Species	2	1	1	4		# of Species	5	1	5	2
24	4	3	3	4		# of Trays	4	4	4	4		# of Trays	3	1	2	1
25	27 per m2	28 per 0.75m2	27 per 0.75m2	36 per m2		Taxa Density (#/m2)	5 per m2	1 per m2	4 per m2	15 per m2		Taxa Density (#/m2)	35 per 0.75m2	8 per 0.25m2	15 per 0.5m2	10 per 0.25m2
26	11 per m2	7 per 0.75m2	4 per 0.75m2	12 per m2		Taxa Diversity (#taxa/m2)	2 per m2	1 per m2	1 per m2	4 per m2		Taxa Diversity (#taxa/m2)	5 per 0.75m2	1 per 0.25m2	5 per 0.5m2	2 per 0.25m2

A complex network graph visualization with numerous nodes of varying sizes (small dots, medium circles, and large central hubs) connected by a dense web of thin lines. The nodes are primarily grey, with a few larger white nodes in the center. The background is a light beige color.

Because, Data.