

# Draft Refugio Beach Oil Spill (RBOS) Damage Assessment and Restoration Plan (DARP)

## APPENDIX B – Data Management and Access

### 1. Introduction

A number of datasets were collected by Technical Working groups (TWG) to support the Refugio Beach Oil Spill (RBOS) Natural Resources Damage Assessment (NRDA) and its determination of oil exposure and injury to habitats and resources, as described in the Damage Assessment and Restoration Plan (DARP). This document briefly describes how the public can access NRDA data and provides information on NRDA data management.

### 2. Data Access

In general, supporting data can be accessed in several ways:

1. On NOAA's DIVER website (Data Integration Visualization Exploration and Reporting) with links to queries and download options.
2. On Southwest ERMA (Environmental Response Management Application); geospatial layers with a shapefile download option.
3. Within the RBOS NRDA administrative record, as PDF documents or zipped data packages
4. By request via email.

This document also provides direct chapter by chapter data links (to numbers 1-3 above) for specific data used to prepare the DARP.

#### a. DIVER

Data collected in support of the NRDA were collected and managed in the DIVER platform, an environmental data warehouse developed and maintained by the National Oceanic and Atmospheric Administration (NOAA) Office of Response and Restoration (ORR) Assessment and Restoration Division (ARD). DIVER is a web-based data warehouse that allows the secure storage, management, query and dissemination of data and information.

Direct access to RBOS NRDA data is provided in the Data Links section of this document, organized by DARP chapter. Data are accessed through hyperlinked saved queries in the DIVER Explorer query tool.

To access DIVER use the links below that will take you directly to the DIVER Queries or visit <https://www.diver.orr.noaa.gov/>.

#### b. ERMA

Spatial data or analyses are also made available using ERMA, an online mapping and visualization tool. For the RBOS NRDA, ERMA was used to provide a spatial representation of

some datasets that have been processed and exported to an ESRI shapefile and can be downloaded by using the ERMA download tab.

To access ERMA use the links below that will take you directly to the ERMA layers or visit <https://erma.noaa.gov/southwest/>.

### **c. Administrative Record**

Datasets that were not integrated into DIVER or into a GIS format and uploaded into Southwest ERMA will be made available in the RBOS NRDA administrative record. These files will be mainly available in folders called “Data Documents.”

To access the administrative record visit <https://www.darrp.noaa.gov/oil-spills/refugio-beach-oil-spill>.

### **d. Data Available Upon Request**

There are some datasets that were not made immediately available on DIVER or in Southwest ERMA due to volume or complexity. To access these data sets or to request further information on RBOS data please contact [orr.diver@noaa.gov](mailto:orr.diver@noaa.gov) or [orr.erma@noaa.gov](mailto:orr.erma@noaa.gov).

## **3. Data management**

### **a. Field Data Collection and Processing Workflow**

Field data collection activities were completed following a standard protocol that maintains chain of custody (COC) Field teams were dispatched with data collection equipment that included a subset of the following sampling equipment or supplies: handheld GPS devices, digital cameras, notebooks, sample containers, and field forms. Upon return from the field to a data intake location, field staff worked with data managers to download GPS and photos and scan field forms, notes and documentation. Chain of custody forms were filled out, scanned and included with samples shipped to laboratories for analysis. Once all of the data files were transferred to the data managers’ laptop, they were loaded into DIVER for secure storage and sharing among the project teams.

### **b. Laboratory Data**

After samples were collected, relevant field data were transcribed and loaded into DIVER. The samples were sent to laboratories for chemical, forensic or toxicological analyses. The four primary laboratories used during the damage assessment were: California Department of Fish and Wildlife (CDFW) State Water Pollution Control Lab (Rancho Cordova, CA), Alpha Analytical (Boston, MA), NOAA Northwest Fisheries Science Center (Seattle, WA) and Pacific Eco Risk (Fairfield, CA). Laboratories conducted analyses and transcribed field data found on the sample labels and COCs into their Laboratory Information Management System (LIMS) along with the analysis results. Laboratories exported the analysis result data into an Electronic Data Deliverable (EDD) and sent it back to NOAA data managers for integration with the existing field data in DIVER.

### **c. Quality Assurance**

Quality assurance of field data was conducted at various stages during the processing of data. Field data were reviewed by the responsible party and trustee data representatives, while analytical result data were validated by a third party, Moss Landing Marine Laboratories (MLML). A final data validation report from MLML can be found in the [administrative record](#).

### **4. DARP Chapter-by-Chapter Data Links**

Below are links to ERMA layers and DIVER data queries referenced throughout the RBOS Damage Assessment and Restoration Plan (DARP). The outline below refers back to the DARP chapter organization. Only chapters that discuss or reference data are included below.

#### **DARP Section 1. Introduction and Purpose**

##### **1.1 Overview of Incident**

##### **1.1.2 Transport and Fate of Spilled Oil**

Figure 2. Particle densities (relative to maximum for the entire simulation) for the base-case of 1-4% windage. Black dots mark the locations where particles contact the shoreline.

##### [ERMA Link](#)

- Layer Name: GNOME NRDA Oil Trajectory Time Animation

NOTE: This is a time animation layer that allows the user to see an animation of the modeled trajectory through time. To view, press the play button on the time slider bar at the bottom right of the screen. The clock icon on the layer name should be green. If it is not, click the clock icon to start the animation and activate the time slider bar.

- Layer Name: GNOME NRDA Shoreline Oiling (NOAA) Multiple Days (May 20 – 29, 2015)
- Layer Name: GNOME NRDA Trajectory (NOAA) Multiple Days (May 20 – 29, 2015)

Figure 3. Map showing total U.S. Coast Guard overflight observations of surface oil over a 14 day period between May 21, 2015 and June 3, 2015. Note that the representations of sheen in this graphic are cumulative, i.e., oil was not in all of these locations at any given time.

##### [ERMA Link](#)

- Layer Name: Overflight Observation of Sheen (500 Meters)
- Layer Name: Oil Exposure Boundaries

##### **1.1.3 Forensic Identification of Line 901 Oil in the Environment**

Figure 4. Geographic extent of Line 901 oil. This Figure shows oil samples collected and analyzed on behalf of the Trustees through June 2, 2015, when the Trustees' trajectory modeling suggests that oil would have moved through the impacted area. This does not include samples collected by the response and analyzed for the criminal investigation. In *People of the State of California v Plains All American Pipeline, L.P.*, Sup. Court of State of California, County of

Santa Barbara, Case No. 1495091, People's Trial Exhibit 078.0001 oil was documented as far south as Seal Beach in Orange County.

[ERMA Link](#)

- Layer Name: NRDA Oil Fingerprint Results from May 19th to June 2nd, 2015

### **1.3 Summary of Natural Resource Injuries**

Figure 5. Refugio Beach Oil Spill fingerprint matches (red circles) along with the habitats and resources that were injured by the spill.

[ERMA Link](#)

- Layer Name: NRDA Exposure Zones
- Layer Name: RBOS All Fingerprint Matches
- Layer Name: Refugio Incident Location

## **2.0 Affected Environment**

### **2.1 Physical Environment**

Figure 7. Public lands and protected areas in the vicinity of the Refugio Beach Oil Spill origin. Additional public lands managed by Counties and Cities occur in the area but are not shown on this map.

[ERMA Link](#)

- Layer Name: Refugio Incident Location
- Layer Name: Coal Oil Point Reservation Boundary
- Layer Name: DARP California State Parks (CDFW, 2014)
- Layer Name: DARP California Marine Protected Areas
- Layer Name: DARP National Park Boundaries
- Layer Name: DARP NOAA National Marine Sanctuary Boundaries

## **5.0 Injury Approved Quantification and Restoration Alternatives**

Figure 8. Exposure zones A-D, defined for the Refugio Beach Oil Spill NRDA (black lines) with shoreline oiling categories documented during Shoreline Cleanup Assessment Technique surveys conducted by the Unified Command.

[ERMA Link](#)

- Layer Name: NRDA Exposure Zones
- Layer Name: Shoreline Oiling Categories (Nixon, 2018)

### **5.1 Shoreline Habitats**

#### **5.1.1 Overview of Data Collection and Studies**

Environmental Sample Collection and Chemical Analysis

#### [DIVER Query Link](#)

- Query Name: Refugio DARP All NRDA Chemistry Analysis Results

#### Sandy Beach Intertidal Invertebrate Population Surveys

- Data available upon request.

#### Rocky Intertidal Habitat Photo Transect

- Data available upon request.

#### Laboratory Tests with Shoreline Species

- Data available upon request.

#### Shoreline Clean Up Data

- Data available upon request.

### **5.1.2 Sandy Beach Habitat Injury**

Figure 17. Map showing the summary of shoreline injury by zones.

#### [ERMA Link](#)

- Layer Name: Shoreline Oiling Categories (Nixon, 2018)
- Layer Name: NRDA Exposure Zones

#### Porewater Individual Chemical Analysis Results

#### [DIVER Query Link](#)

- Query Name: Refugio DARP Porewater Chemistry Analysis Results

#### Talitrid Tissue Individual Chemical Analysis Results

#### [DIVER Query Link](#)

- Query Name: Refugio DARP Beach Hopper (Talitrid) Chemistry Analysis Results

Tissue Individual Chemical Analysis Results of Other Shoreline Organisms (mussels, sandcrabs, polychaete worms)

#### [DIVER Query Link](#)

- Query Name: Refugio DARP Sandy Beach Chemistry Analysis Results for "Other Shoreline Organisms"

#### Talitrid Amphipod Abundance

- Data available upon request.

## Sandy and Mixed Sand/Rocky Substrate Exposure Acreage

### [ERMA Link](#)

- Layer Name: Intertidal Habitat Exposure Zones with Max Oiling - Exposure (UPDATED 2018)

### 5.1.3 Rocky Intertidal Habitat Injury

#### Rocky Intertidal Chemical Analysis Results

##### [DIVER Query Link](#)

- Query Name: Refugio DARP Rocky Intertidal Mussel Chemistry Analysis Results

#### Rocky Intertidal Photo Plot Surveys

- Data available upon request.

## 5.2 Subtidal and Fish Habitats

Figure 21. Exposure Zones defined for the Refugio Oil Spill NRDA showing shoreline tarball fingerprint matches (red circles). Zone B is the area of heaviest oiling and the extent of subtidal habitat injuries assessed. The inset shows the subtidal assessment area identifying the 10 m depth offshore extent of injury (red polygon).

### [ERMA Link](#)

- Layer Name: RBOS All Fingerprint Matches
- Layer Name: Subtidal Exposure Zones

### 5.2.1 Overview of Data Collection and Studies

#### Fish and Invertebrate Mortality Observations – Dead Box Observations

- Data available upon request.

#### California Grunion Assessment - Grunion Spawning Observations

- Data available upon request.

#### California Grunion Assessment - Grunion Hatching Observations

- Data available upon request.

#### Surfperch Assessment - Surfperch Individual Chemical Analysis Results

##### [DIVER Query Link](#)

- Query Name: Refugio DARP California Surfperch Chemistry Analysis Results

#### Water Chemistry and Toxicity to Fish and Invertebrate Early Life Stages

- Data available upon request.

#### Sunken Oil Subtidal Habitat Exposure Observations

- Data available upon request.

#### Subtidal Habitat Exposure Assessment - Subtidal Tissue Individual Chemical Analysis Results

##### [DIVER Query Link](#)

- Query Name: Refugio DARP Subtidal Tissue Chemistry Analysis Results

#### Subtidal Habitat Exposure Assessment - Fingerprinting Results

##### [ERMA Link](#)

- Layer: Subtidal Tissue Fingerprint Matches
- Layer: Additional Forensic Matches (Stout, Reddy, Valentine)

#### PAH's in Nearshore Fish and Invertebrate Tissue

##### [DIVER Query Link](#)

- Query Name: Refugio DARP Office of Environmental Health Hazard Assessment (OEHHA) Individual Chemical Analysis Results

#### Surfgrass and Algae Surveys

- Data available upon request.

### **5.2.2 Subtidal and Fish Habitat Injury**

Figure 25. The surfgrass and algal injury quantification was driven by studies where the area of discolored, dead and dying plants were assessed. Injury was defined as the percent cover of discolored, dead and dying surfgrass and algae at a study site. The overall area-weighted average percent injury was 54%. Green dots are sampling sites.

##### [ERMA Link](#)

- Layer: Surfgrass Sampling Locations
- Layer: NRDA Exposure Zones

### **5.3 Birds**

Figure 27. Location of live and dead birds recovered during wildlife operations. The back lines show the NRDA Exposure Zone boundaries for reference; however these boundaries were not used in the quantification of injury to birds.

##### [ERMA Link](#)

- Layer Name: Response Collected Birds

- NRDA Exposure Zones

### 5.3.3 Western snowy plover injury analysis

Figure 30. Refugio oil spill release location relative to nesting western snowy plover nesting sites.

[ERMA Link](#)

- Layer Name: Western Snowy Plover Nesting Locations

Wildlife Reconnaissance Aerial Surveys

- Data available upon request.

### 5.4 Marine Mammals

Figure 33. Location of marine mammal strandings, live and dead, collected during the spill cleanup period. The back lines show the NRDA Exposure Zone boundaries for reference; however these boundaries were not used in the quantification of injury to marine mammals.

[ERMA Link](#)

- Layer: Response Collected Mammals

California Marine Mammal Stranding Network Data

- Data available upon request.

#### 5.4.1 Overview of Data Collection Studies

Wildlife Response Reconnaissance Surveys – Unified Command

[ERMA Link](#)

- Layer: Wildlife Observations Multiple Days (May 21 – May 26, 2015)

Figure 35. Tracklines of one day of NRDA mammal surveys, including sightings for that day.

[ERMA Link](#)

- Layer: Marine Mammal Survey (Multiple) (June 3, 2015 – June 7, 2015)
- Layer: Marine Mammal Survey Tracklines (Multiple) (June 3, 2015 – June 7 2015)

### 5.5 Human Use

Figure 37. Overview of posted Closures and Advisories after the Refugio Beach Oil Spill.

[ERMA Link](#)

- Layer: Recreational Use Large Area Closures
- Layer: Recreational Use Advisories and Closures Compilation