

ERMA[®] Environmental Response Management Application

Matt Dorsey



Oil Spill Technology Conference
San Ramon, CA
January 28, 2013

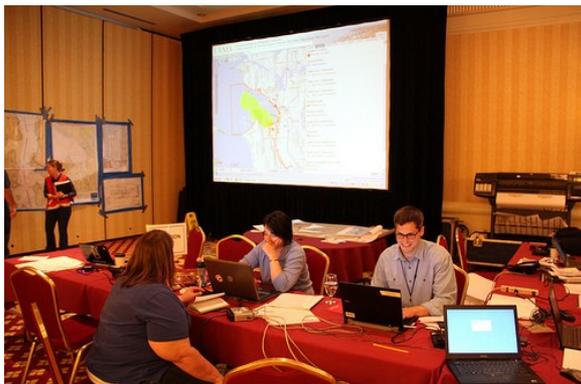
What is ERMA?

- Online mapping tool
- Analyze and visualize environmental information relevant to all hazards
- Prepare for, respond to, assess impacts from hazardous incidents or conditions
- Provides centralized access to information
- Increases communication, coordination, and efficiency



Use ERMA to...

Visualize the situation status during an oil spill drill



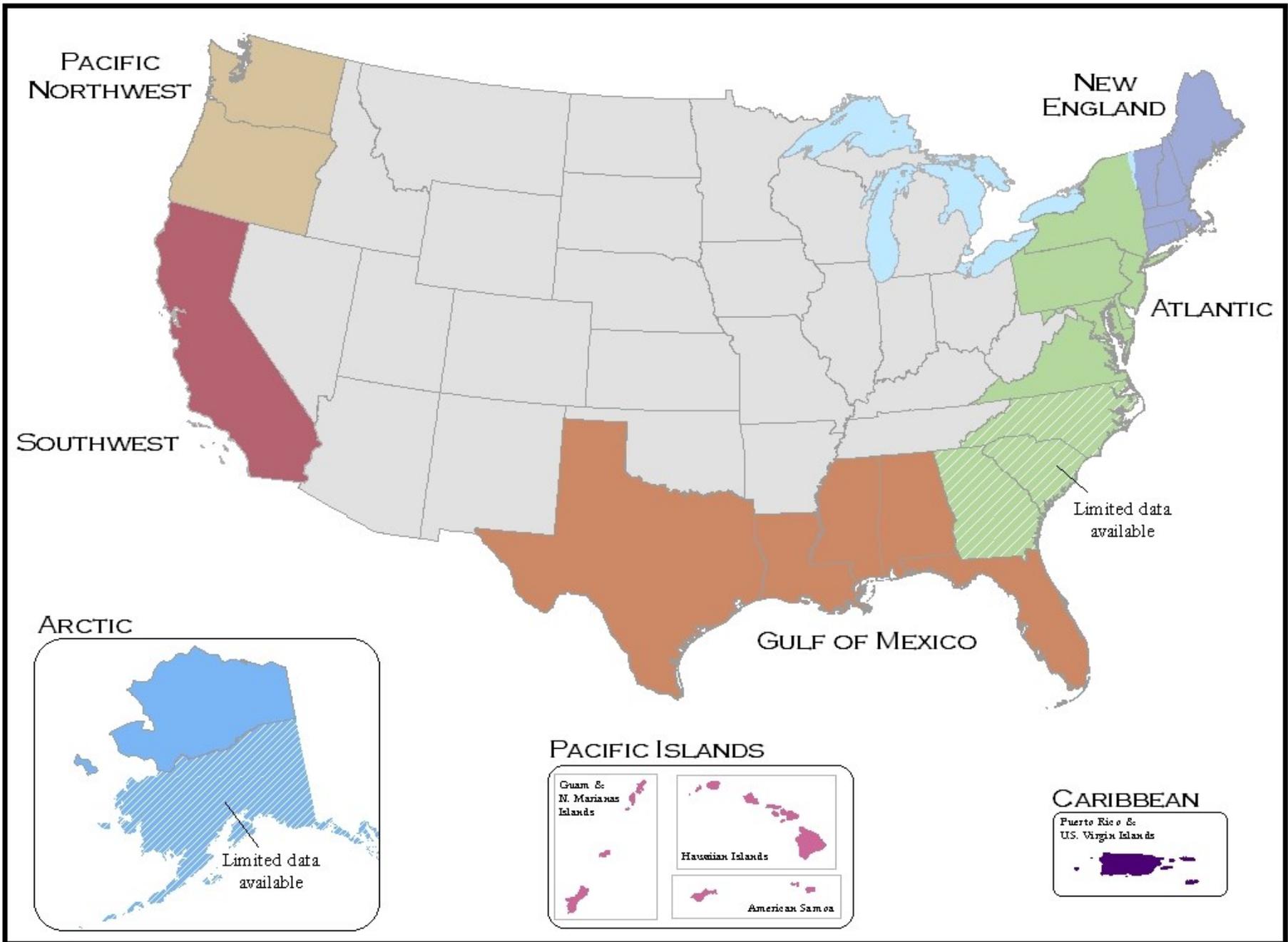
Assess damage and plan for restoration



Analyze threats from climate change, drilling, and hurricanes



Create a Common Operational Picture in a disaster response



Common Operational Picture

People



OSCs

Command Post Responders



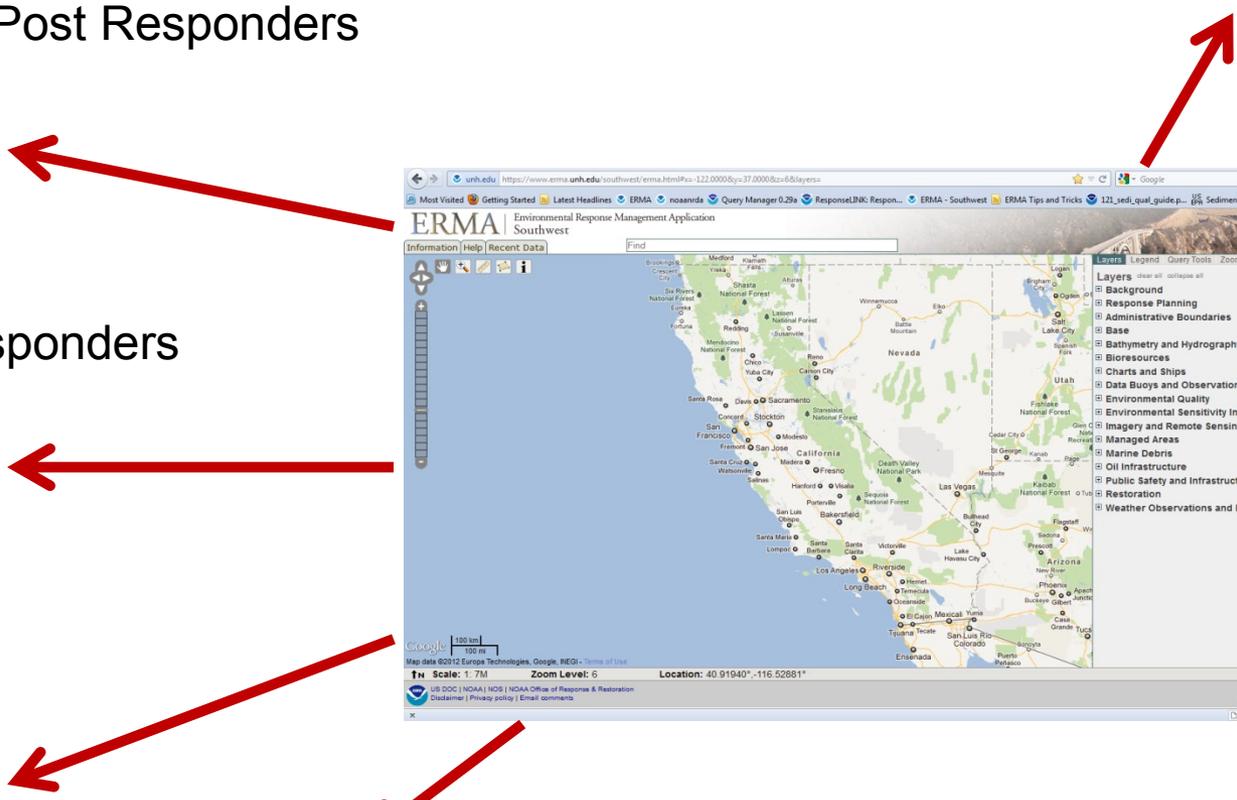
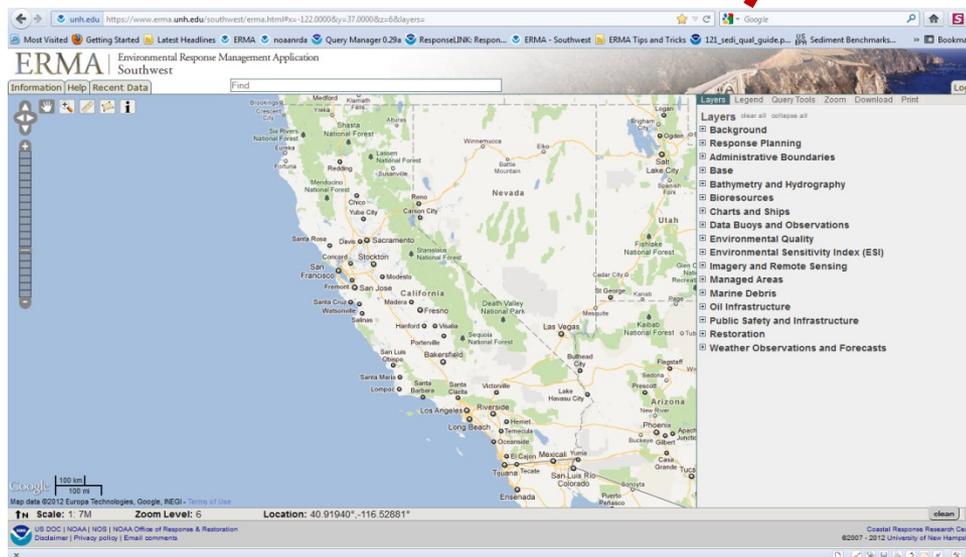
Remote Responders



Public



Field Responders



Common Operating Picture



Common Operating Picture

Phases of a spill

- **Planning**
 - Easily view ACP data
 - Collaborate as committee
- **Spill/Drill Response**
 - Current Situation Status
 - Operations Tracking
 - Wildlife Observations
- **Damage Assessment**
 - Data carry over
 - Visualize logical areas of investigation
- **Restoration**
 - Staging/Planning
 - Progress Monitoring

Planning - ACP Data

ERMA Environmental Response Management Information System
Southwest

Information Help Recent Data Admin Upload

Map showing the location of Paradise Cay Eelgrass & Marina near Bolinas Bay. The map includes labels for Lagunitas-Forest Knolls, Woodacre, Five Brooks, Bolinas, Stinson Beach, and Bolinas Bay. A red circle with the number '1' is placed over the marina area.

2-424 -A Site Strategy - Paradise Cay Eelgrass & Marina

County and Thomas Guide Location
AAA - Mill Vall Marin

NOAA CHART
Entrance to San Francisco Bay 18649

Latitude N 3 7 54 Longitude W 122 27
Last Page Update : 7/1/2005

CONCERNS and ADVICE to RESPONDERS:
Eelgrass has high ecological value and is used by lots of birds and fish. Eelgrass leaves are rough, and unlike most water plants, oil will readily attach. Booming eelgrass will also protect the sandy shoreline.

HAZARDS and RESTRICTIONS:
Shallow throughout. Some obstructions near shore where of

SITE STRATEGIES
Because this is a low energy area, light boom and few are southerly, heavier or redundant gear will be neces

Strategy 2-424.1 Objective: Primary: Assess vulnerab
Assign a scientist to assess eelgrass exposure to oil a

Strategy 2-424.2 Objective: exclusion around eelgras
Use 5,100 ft of boom (4X4+ under calm conditions and from the southeast corner (jetty) of Paradise Cay Mari

Strategy 2-424.3 Objective: exclude oil from enterin
deploy 250' swamp boom in chevron configuration at e

Table of Response Resources

strategy number	harbor boom	swamp boom	Other boom type	sorb boom	Anchoring no	Anchoring type and gear	Boom boat
2-424.1	0	0	0	0	0		0
2-424.2		5100		0	6	22#+ danforths	1
2-424.3	0	500	0	0	6	13#+ anchors	0

California Coastal Records Project

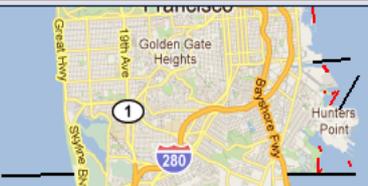
New Lookup

N37 49.21 W122 29.57 Image 201007628 Sat Sep 25 12:30:49 2010
Nearest caption: Kirby Cove, Marin Headlands (at [Image 201007632](#), 950 ft North)
[Copyright © 2010 Kenneth & Gabrielle Adelman. All rights reserved.](#)

Identify

ACP Booming Strategies

gid	type	strat no	acp	describe	label
1110	hboom	2-424.2	2	4500' swamp boom	Harbor Boom http://ftp.dfg.ca.gov/Public/OSPR/WebMapp



Common Operational Picture

Phases of a spill

- **Planning**
 - Easily view ACP data
 - Collaborate as committee
- **Spill/Drill Response**
 - Current Situation Status
 - Operations Tracking
 - Wildlife Observations
- **Damage Assessment**
 - Data carry over
 - Visualize logical areas of investigation
- **Restoration**
 - Staging/Planning
 - Progress Monitoring

Spill/Drill - Situation Status

ERMA Environmental Response Management Application
Southwest

Information Help Recent Data Admin Upload Find Logout

Layers Legend Query Tools AOI Labels Zoom Download Print

18-Sept-2011

Trajectory Estimate for 18-Sept-11 at 1800

- FORECASTHEAVY
- FORECASTMEDIUM
- FORECASTLIGHT
- FORECASTUNCERTAINTY

LA/LB NPREP Drill

Southern California Bight Collision

- Incident Location

T/V Tap Dance - incident location

- Incident Location

Incident Location and Photo (DRILL)

Oiling Observations

- Observed Sheen 15-Sept-11 0900 hrs
- Observed Recoverable Oil 15-Sept-11 0900 hrs
- Observed Recoverable Oil 15-Sept-11 1100 hrs
- Observed Recoverable Oil 15-Sept-11 1100 hrs

Restricted Areas

- Vessel Safety Zone 14-Sept-11 at 1200
- Vessel Safety Zone 14-Sept-11 at 1200

Dispersant Boundaries

- Trustee Recommended Dispersant No-Spray Zone
- Trustee recommended no dispersant spray zone

Wildlife Observations

- NOAA Aerial Survey Track 09-14-11 1230hrs
- NOAA Marine Mammal Aerial Survey Track 14-Sept-11 1230hrs
- NOAA Whales Aerial Survey 14-Sept-11 1230hrs

Scale: 1: 433K Zoom Level: 10 Location: 34.34040°, -119.07054°

US DOC | NOAA | NOS | NOAA Office of Response & Restoration
Disclaimer | Privacy policy | Email comments

Coastal Response Research Center
©2007 - 2012 University of New Hampshire

Common Operational Picture

Phases of a spill

- **Planning**
 - Easily view ACP data
 - Collaborate as committee
- **Spill/Drill Response**
 - Current Situation Status
 - Operations Tracking
 - Wildlife Observations
- **Damage Assessment**
 - Data carry over
 - Visualize logical areas of investigation
- **Restoration**
 - Staging/Planning
 - Progress Monitoring

NRDA

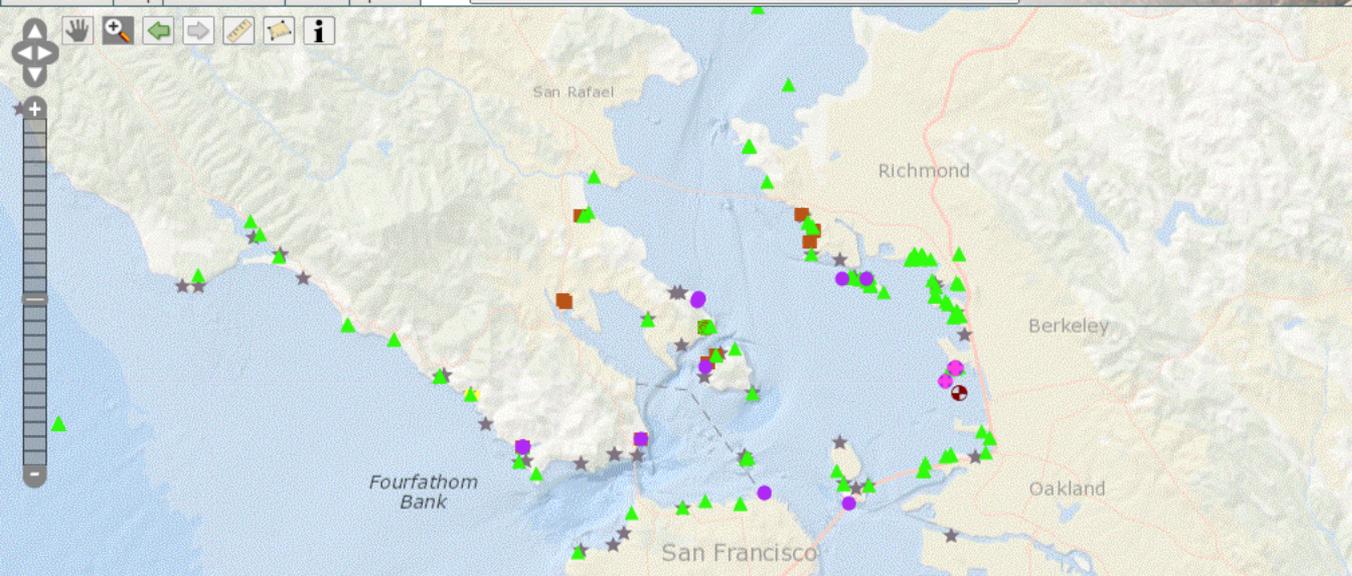
← → ↻ <https://www.erma.unh.edu/southwest/erma.html#x=-122.45338&y=37.84859&z=11&layers=13374+13416>

[Latest Headlines](#)
[noanrda](#)
[Query Manager 0.29a](#)
[ResponseLINK: Resp...](#)
[RESPONSE DATA - ...](#)
[ERMA](#)
[Deepwater Horizon ...](#)
[MyMeetings](#)
[ERMA - Southwest](#)
[ERMA - DWH](#)
[ERMA - Atlantic](#)

ERMA | Environmental Response Management Application
Southwest

[Information](#)
[Help](#)
[Recent Data](#)
[Admin](#)
[Upload](#)

Find



[Layers](#)
[Legend](#)
[Query Tools](#)
[AOI](#)
[Labels](#)
[Zoom](#)
[Download](#)
[Print](#)

Environmental Quality & Monitoring

- Cosco Busan NRDA Sample Matching (CDFW OSPR)**
- Vegetation/Tissue
 - Solid
 - Water
 - Tarball
 - Sediment
 - Tissue
 - Source
 - Filter
 - Scrapings
 - Vegetation

Bathymetry & Hydro

- Ocean Basemap (ESRI)
- Ocean_Basemap

Identify

Cosco Busan NRDA Sample Matching (CDFW OSPR)

gid	id	newfields	peci_call	peci_db	matrix	sample_id	lab_id	date_colle	noaa_tpah	units	tpb	lat	long	site_name	site_speci	species	comments
57	57	Mixture*	PM Mixture	232	Tarball	MR-P-120407-01PILING	0712042-05	12/4/2007	236420	Åµg/g	610000	37.833217	-122.47525				*Primary coal tar with traces of CB oil
91	91	No-Match	NM	348	Sediment	MR-O-EG-111607-02-S	0711154-14	11/16/2007	5361	ng/g	140	37.833217	-122.47525				
269	269	I	M?	295	Water	MR-P_WC_111607_2NT	0711134-02	11/16/2007	2235.5	ng/L	0.79	37.833217	-122.47525				Sample from plankton tows, High polar organics, cleanup F1

Scale: 1: 217K

Common Operational Picture

Phases of a spill

- **Planning**
 - Easily view ACP data
 - Collaborate as committee
- **Spill/Drill Response**
 - Current Situation Status
 - Operations Tracking
 - Wildlife Observations
- **Damage Assessment**
 - Data carry over
 - Visualize logical areas of investigation
- **Restoration**
 - Staging/Planning
 - Progress Monitoring

Restoration

ERMA | Environmental Response Management Application
Gulf of Mexico

The screenshot displays the ERMA web application interface. At the top, there is a navigation bar with links for Information, Help, Recent Data, Admin, and Upload. Below this is a search bar and a Logout button. The main map area shows an aerial view of the Grande Lagoon region, with several sites marked by colored polygons and symbols. A legend on the right side of the map provides details for these markers:

- Field Transects**
 - DRAFT SAV Petit Bois Is MS Emergency Restoration Transects 16- (green checkmark)
 - DRAFT SAV Petit Bois Is MS Emergency Restoration Transects 16- (red checkmark)
- SAV Emergency Restoration Project**
 - Restoration Alternative - Blowhole Centroids**
 - Blowhole Location - Restoration Planned (green square)
 - Blowhole Location - No Action (purple square)
 - Restoration Alternative - Scar Centroids**
 - Scar Location - Restoration Planned (green star)
 - Scar Location - Stake and Signage Only (purple star)
 - Scar Location - No Action (blue star)
- SAV Emergency Restoration Locations 15-Feb-2011**
 - DRAFT SAV Emergency Restoration Locations 15-Feb-2011 (red checkmark)
- Imagery Identified Potential Boom Damage Polygons**
 - Imagery Identified Potential Restoration Locations (orange checkmark)

At the bottom of the map, there is a scale bar (1:14K), zoom level (15), and location coordinates (30.31878°, -87.41505°). The footer contains the NOAA logo and text: "US DOC | NOAA | NOS | NOAA Office of Response & Restoration", "Disclaimer | Privacy policy | Email comments", and "Coastal Response Research Center ©2007 - 2012 University of New Hampshire".

Types of Information in ERMA

- Base Mapping
 - Google aerial, terrain, roads
 - Nautical charts
- Incident Information
 - Trajectories
 - Resource tracking –MMIS & Vessel Name
 - Shoreline oiling
 - Sampling data
- Weather & Buoys
 - Hurricane/Storms
 - Remote-sensing imagery
- Resources at Risk
 - NOAA ESI data layers
 - Local habitat and species
 - Seafood safety
- Document & Photo Links
 - ESI and GRP .pdfs
 - Attached to layers
 - Field photos

Current Weather Conditions

ERMA | Environmental Response Management Application
Southwest

Information Help Recent Data Admin Upload Find Logout

Layers Legend Query Tools AOI Labels Zoom Download Print

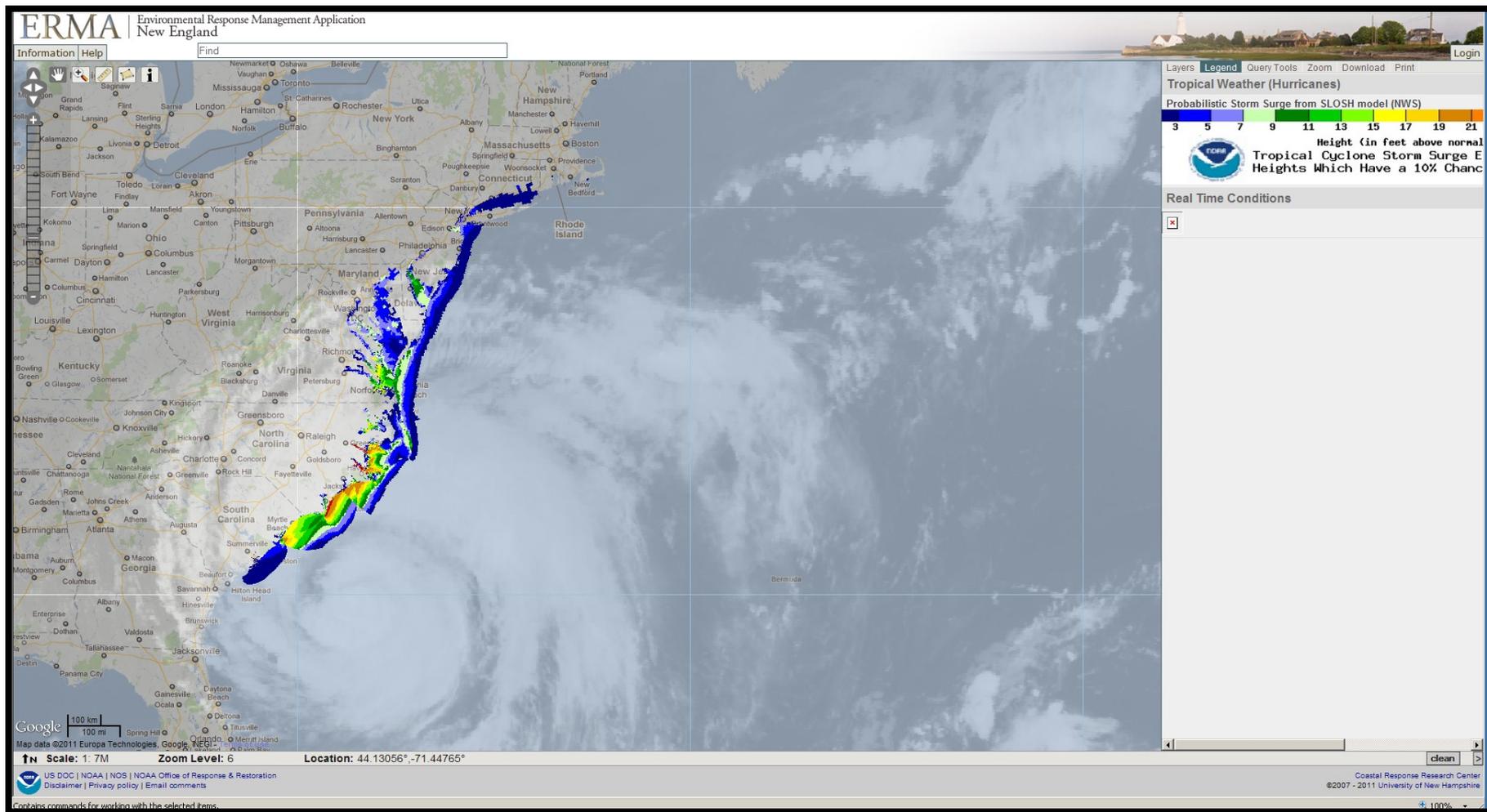
Precipitation
Weather Radar Mosaic (NWS hosted by NowCoast)
ND 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 dBZ
Valid At: Wed Jan 30 2:08 AM EST

Scale: 1: 3M Zoom Level: 7 Location: 38.69385°,-118.68507°

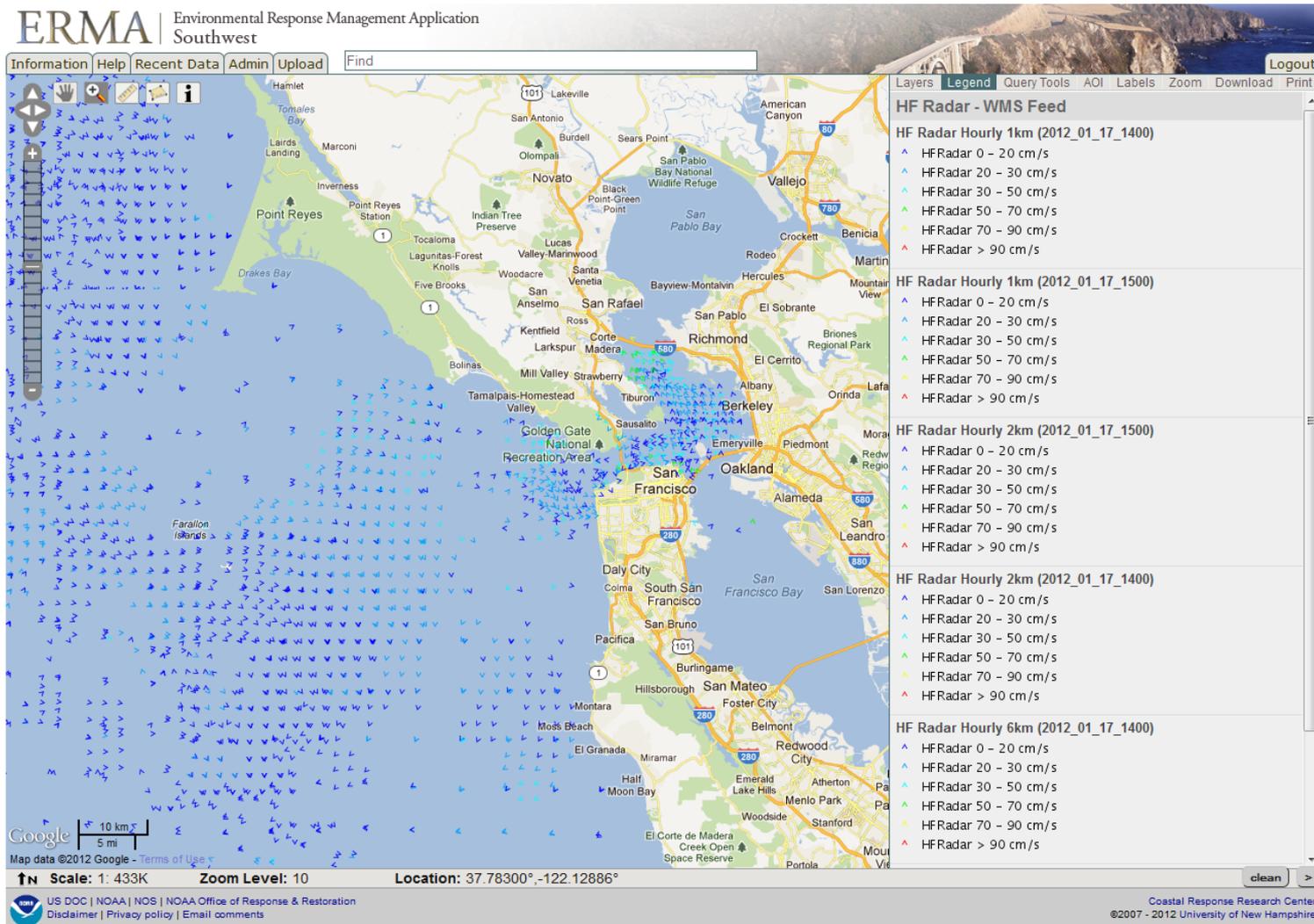
US DOC | NOAA | NOS | NOAA Office of Response & Restoration
Disclaimer | Privacy policy | Email comments

Coastal Response Research Center
©2007 - 2013 University of New Hampshire

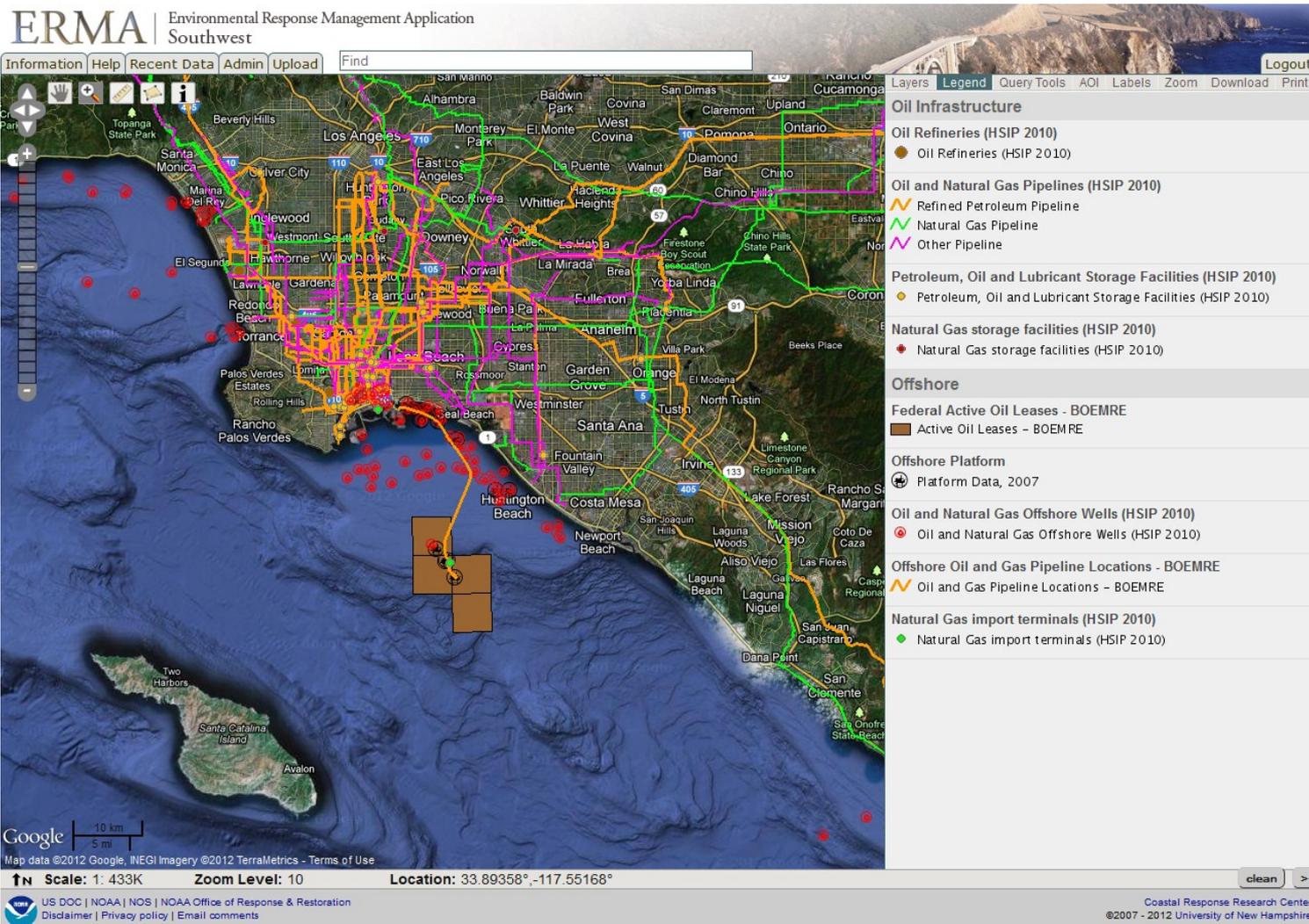
Model Output and Satellite



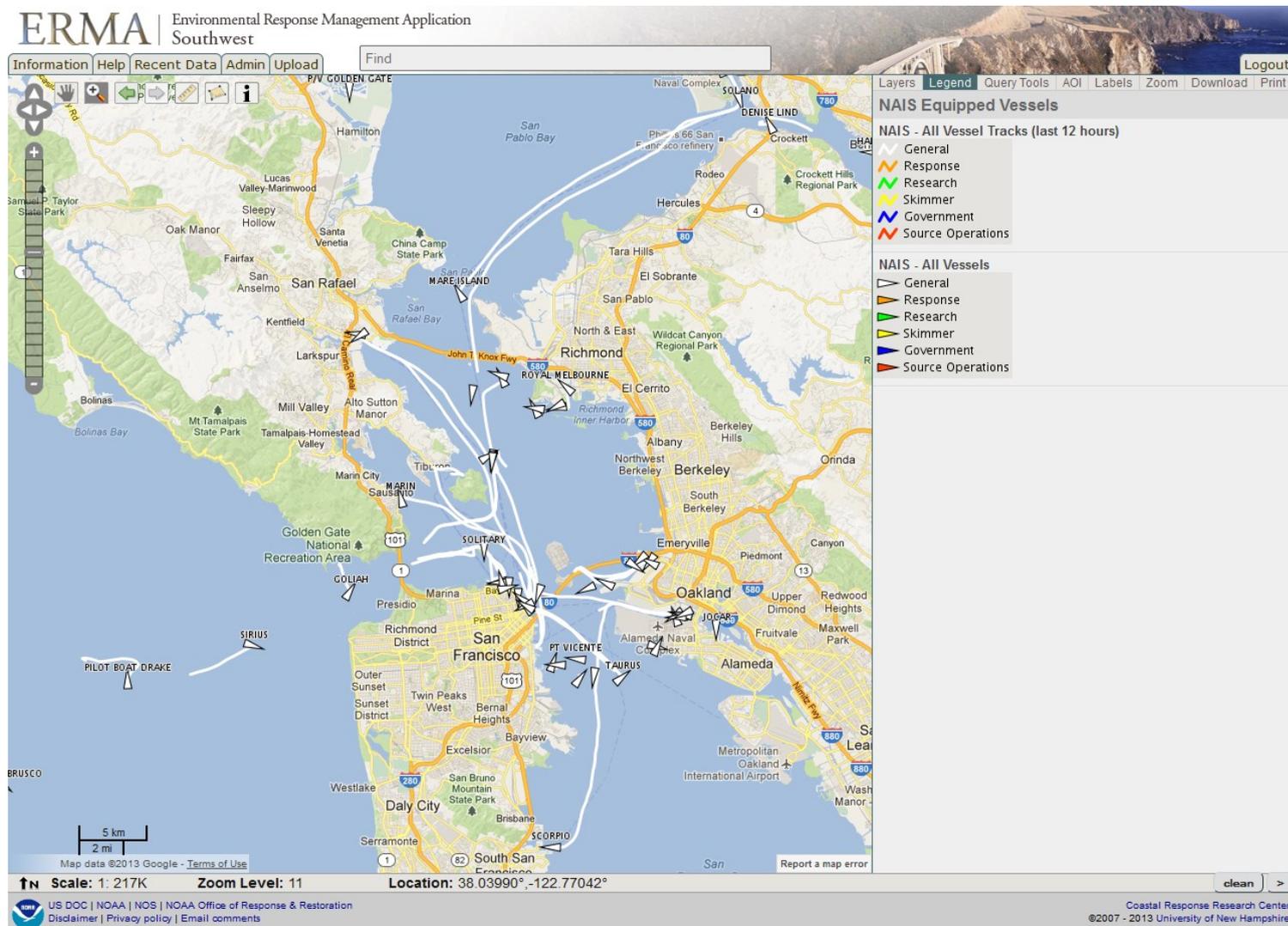
HF Radar – Live Feed



Offshore/Onshore Oil Infrastructure



Vessel Tracking



Field Personnel Tracking

ERMA | Environmental Response Management Application
Gulf of Mexico

Information Help Admin Upload Logout

Layers Legend Query Tools AOI Labels Zoom Download Print

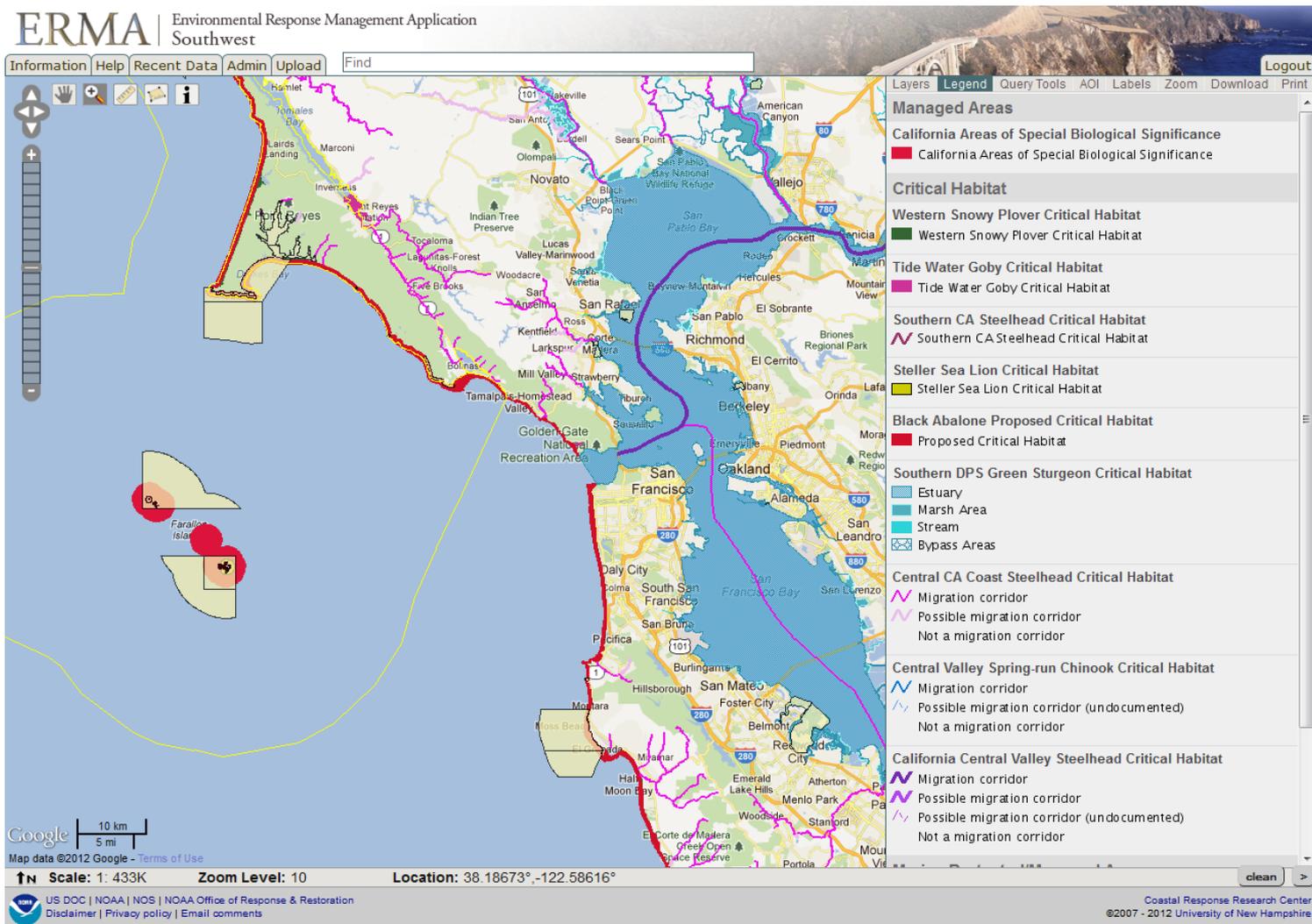
Deepwater Horizon MC 252 Incident

- Points + Labels + Tracks
 - All SPOT Teams
- Points + Labels + Tracks
 - Bird SPOT Teams
- Points + Labels + Tracks
 - Marsh SPOT Teams
- Points + Labels + Tracks
 - Rapid_Marsh SPOT Teams
- Points + Labels + Tracks
 - Submerged SPOT Teams
- Points + Labels + Tracks
 - Mussel Watch SPOT Teams
- Points + Labels + Tracks
 - Oyster SPOT Teams
- Points + Labels + Tracks
 - WQS SPOT Teams
- Points + Labels + Tracks
 - Fish SPOT Teams

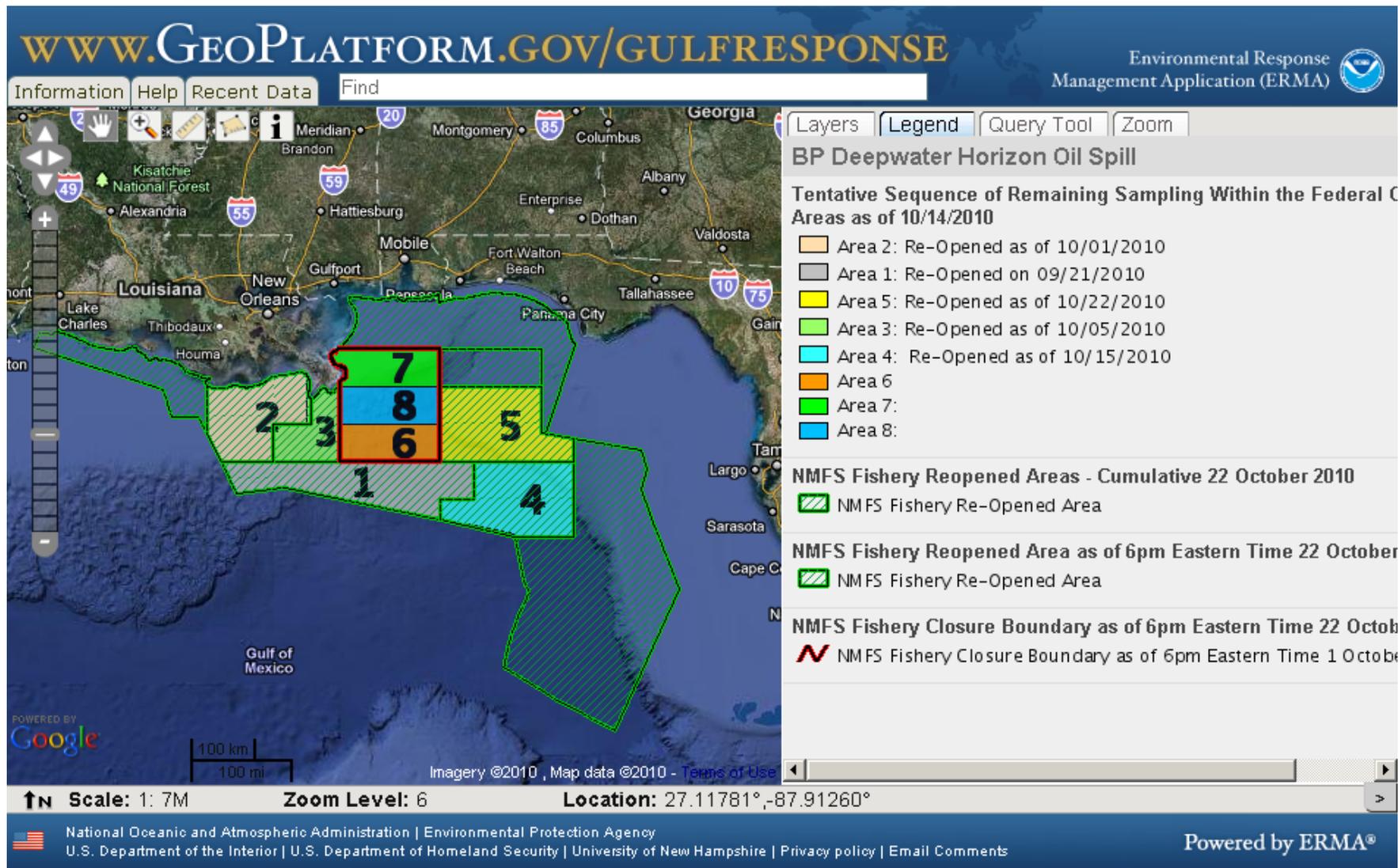
Scale: 1: 867K Zoom Level: 9 Location: 29.29359° -87.71210°

clean >

Marine Protected Areas



Fishery Closures and Re-Openings



Interactive Tools

- **Zoom To**
 - Lat/Long
 - Place name
 - Ship – Vessel Name (NEW)
- **Bookmark Views (NEW)**
 - Saves layers and location
 - Customizable slideshow
- **Areas of Interest**
 - User-made map features
- **Measurement Tools**
 - Length/Area
- **Animations**
 - Show key layers across time
- **Full Metadata Access**
- **Find tool**
 - Automated search of all layers
- **Map Labels**
 - Customize with user-made feature labels
- **Print Tools**
 - Timestamp
 - Various page sizes
- **Interactive Query Tools**
 - Layer Query by Polygon
 - NOAA ESI
 - US Fish and Wildlife IPAC
- **Identify tool**
 - Analytical chemistry results
 - Status of ship locations

“Find” Feature Layers

The screenshot displays the ERMA (Environmental Response Management Application) interface in a Windows Internet Explorer browser window. The browser's address bar shows the URL: `https://www.erma.unh.edu/pugetsound/erma.html#x=-122.38941&y=47.60176&z=12&layers=1266+1265+1344+1362+1262+187+128`. The page title is "ERMA | Environmental Response Management Application" and the subtitle is "Climate Assessment & Proactive Response Initiative: Pilot Project Puget Sound, Washington".

The main interface includes a search bar at the top left with the text "marine" entered. A dropdown menu is open, listing search results:

- activate layer - **Marine Mammal**
- activate layer - National **Marine Protected Areas** (highlighted)
- activate layer - WDFW **Marine Protected Areas**
- expand folder - National **Marine Protected Areas**
- expand folder - State **Marine Protected Area (MPAs)**

The map shows the Puget Sound area with various layers overlaid, including a prominent green area representing National Marine Protected Areas. The map includes a scale bar (2 km / 1 mi) and a location box showing coordinates: `47.63000°,-122.34444°`. The map data is dated 2011.

On the right side, there is a "Layers" panel with a search bar and a "reload" button. Below the search bar, several layers are listed with checkboxes:

- NOAA ENC Charts Soundings
- Base**
- ERMA Tools**
- Data Buoys & Observations**
- Ecosystem and Species**
 - Pocket Estuaries
 - Habitat Areas for the Puget Sound Chinook Salmon ESU
 - Commercial shellfish growing areas
 - US National Estuarine Research Reserves
- Environmental Sensitivity Index**
- Shorezone**
- Recreational Shellfish Beaches**
- National Marine Protected Areas**
 - National Marine Protected Areas
- State Marine Protected Area (MPAs)**
- Environmental Quality**
- Weather Observations and Forecasts**
- Human Use**
- Hydro/Bathy**
- Restoration**

At the bottom of the page, there is a footer with the following text:

US DOC | NOAA | NOS | NOAA Office of Response & Restoration
 Disclaimer | Privacy policy | Email comments

Coastal Response Research Center
 ©2007 - 2011 University of New Hampshire

Bookmarked Map Views

The screenshot displays the ERMA Southwest web application interface. The browser address bar shows the URL: <https://www.erma.unh.edu/southwest/erma.html#view=3406&x=-117.15198&y=32.69656&z=13&layers=13435+13436+13424+13441+13446+13447+13440+13439+13437>. The application title is "ERMA | Environmental Response Management Application Southwest".

The main map area shows San Diego, California, with various overlays. A large grey shaded area is visible in the coastal region, and several red and yellow markers are scattered across the map. A scale bar at the bottom left indicates 1000 meters and 5000 feet. The location coordinates are 32.67164° latitude and -117.06546° longitude. The zoom level is 13, and the scale is 1:54K.

The right-hand sidebar contains a "Layers" panel with the following structure:

- Active View: 0900 Situation Status (edit info)
- clear all collapse all show all layers manage
- Universal Barcelona Drill - October 2012
 - Areas of Operation
 - Containment Boom for Universal Barcelona
 - Universal Barcelona Spill Location
 - Overflight Observations and Photos
 - Oil Thickness - 10/03/12 - 0900
 - Resources at Risk
 - Sensitive Sites - 1145 - Completed
 - Response Operations
 - Booming Strategies - 1100
 - Manmade Strategies - 1100
 - Decon Site
 - Response Vessels
- Bookmark Views: new Hide
 - overseas reymar allision
 - Sector San Diego
 - Sector San Francisco
 - Significant Wave Height 0 - 48 Hour Forecast
 - Universal Barcelona Spill
 - Environmental Unit
 - Approved Dispersant Spray Zone
 - ESI Shoreline Characteristics
 - Operations Unit
 - Situation Unit
 - 0700 Situation Status
 - [0900 Situation Status](#)

At the bottom of the page, there is a footer with the text: "US DOC | NOAA | NOS | NOAA Office of Response & Restoration" and "Coastal Response Research Center ©2007 - 2013 University of New Hampshire".

Full Metadata Access

ERMA - Windows Internet Explorer
 https://www.erma.unh.edu/pugetsound/erma.html#x=-122.40452&y=47.61403&z=12&layers=1266+1265+1344+1362+1262+187+128

ERMA Environmental Response Management Application
 Climate Assessment & Proactive Response Initiative: Pilot Project Puget Sound, Washington

Information Help Admin Upload

Layers Legend Query Tools AOI

Layers clear all collapse all
 NOAA REGION15 RNC 40K

ERMA: MPA_Inventory_2011_westc_single - Windows Internet Explorer
 https://www.erma.unh.edu/pugetsound/ERMA/metadata?layer_id=

File Edit View Favorites Tools Help

Parent Group: Ecosystem and Species>National Marine Protected Areas
Layer Name: National Marine Protected Areas
Full Metadata: [MPA_Inventory_2011_Metadata.htm](#)
Last Modified: 06/09/2011
Last Modified By: Shorr, Ben (NOAA/ ORR)
Shapefile: MPA_Inventory_2011_westc_single
Date Created: 6/9/2011 2:52 pm
Created By: Pickus, Hayley (NOAA/ORR)
Geometry: POLYGON
Additional Information: The Marine Protected Areas Inventory) is a comprehensive geospatial database designed to classify marine protected areas within US waters. It contains information on over 1,600 sites and is the only such compilation. The database has various applications for marine conservation, but its primary purpose is to maintain a base of MPA information to assist in the development of the National System of Marine Protected Areas defined in Executive Order 13158. This information should be used for regulatory purposes; please consult the Federal Register for more information. The MPA Inventory was developed with extensive input from MPA programs and drawn from other publically available products derived from the Inventory are served in various formats. Inventory data, so please contact us with any new site information or clarifications or updated spatial boundary data.

Scale: 1: 108K Zoom Level: 12 Location: 47.59922°

US DOC | NOAA | NOS | NOAA Office of Response & Restoration
 Disclaimer | Privacy policy | Email comments

MPA Inventory Database (3/2011)

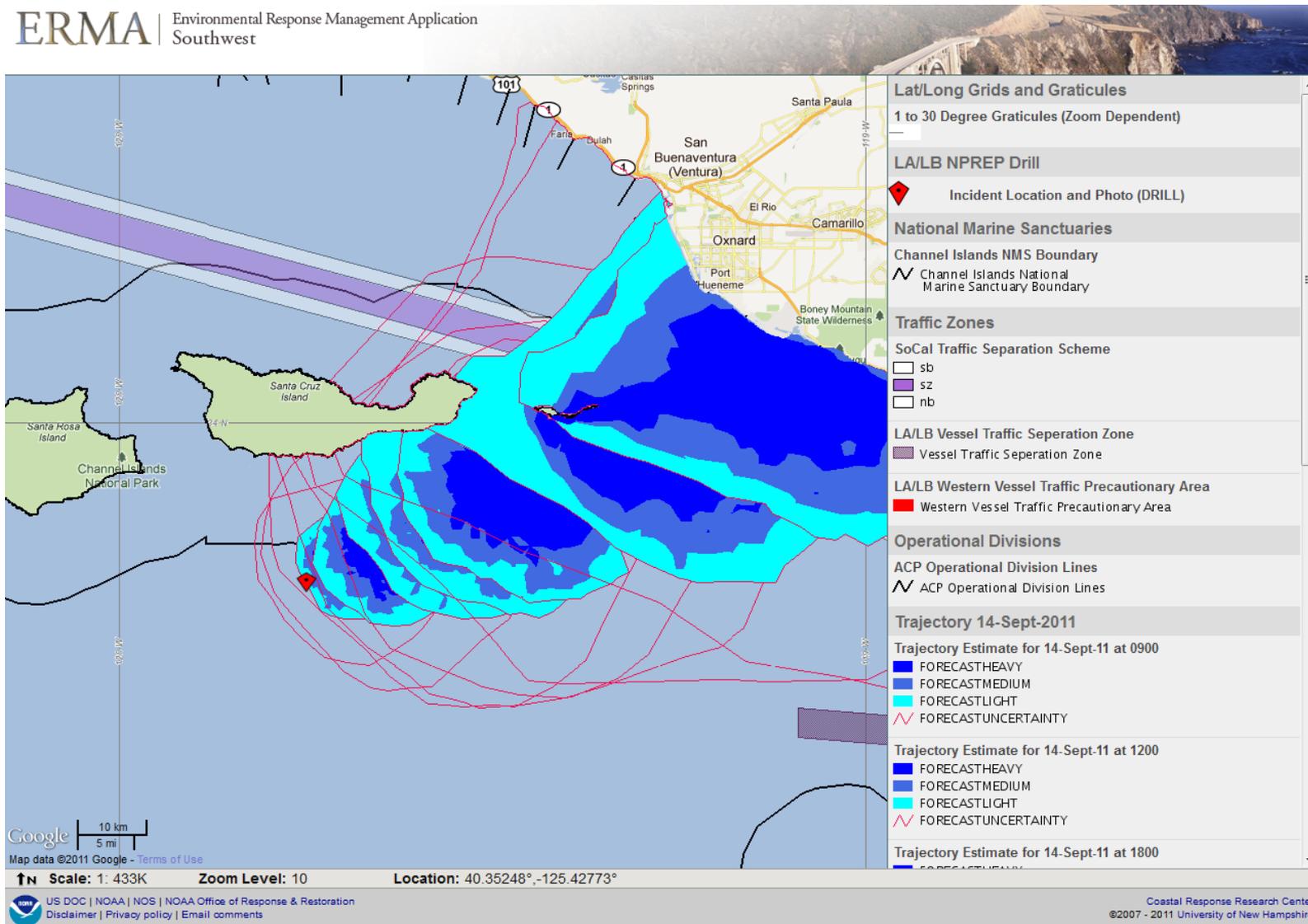
Metadata:

- [Identification Information](#)
- [Data Quality Information](#)
- [Spatial Data Organization Information](#)
- [Spatial Reference Information](#)
- [Entity and Attribute Information](#)
- [Distribution Information](#)
- [Metadata Reference Information](#)

Identification Information:
 Citation:
 Citation Information:
 Originator:
 Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), Ocean and Coastal Resource Management (OCRM), National Marine Protected Areas Center (MPAC)
 Publication Date:

Animation

ERMA | Environmental Response Management Application
Southwest



Link to Data Reports & Documentation

WWW.GEOPLATFORM.GOV/GULFRESPONSE

Information Help Recent Data

Environmental Response Management Application (ERMA)

Layers Legend Query Tool Zoom

Layers clear all reload

- NRDA Validated Data
 - Brooks McCall Analytical Chemistry Cruise 02 15-May-10 to 17-May-10
 - Brooks McCall Analytical Chemistry Cruise 03 19-May-10 to 21-May-10
 - Brooks McCall Analytical Chemistry Cruise 04 23-May-10 to 25-May-10
 - Endeavor Analytical Chemistry Cruise 01 26-Jun-10 to

Gulf of Mexico

Scale: 1: 867K Zoom Level: 9 Location: 28.67613°,-87

Joint Analysis Group (JAG)
 Review of Preliminary Data to Examine Subsurface Oil In the Vicinity of MC252#1
 May 19 to June 19, 2010

Background

This report presents preliminary data from 227 stations collected by the R/V *Brooks McCall*, R/V *Ocean Veritas*, R/V *Walton Smith*, R/V *Thomas Jefferson*, and R/V *Gordon Gunter*, near the site of the BP Deepwater Horizon incident located in the Mississippi Canyon Lease Block area 252 (MC252) and the BP#1 wellhead (MC252#1). The data were collected from May 19 to June 19, 2010. The results from measurements taken below approximately 150 m were examined by the Joint Analysis Group (JAG) as a continuation of analyses and data presented in its June 20, 2010 report.¹

Until June 3, the MC252 #1 well was releasing gas and oil from the broken riser pipe attached to the well. On June 3 the riser pipe was removed and a collection system installed to capture some of the escaping oil and gas. On May 27 the National Incident Command Flow Rate Technical Group estimated oil release rates of 12,000-1 revised that estimate on June 15 to 35,000-65,000 barrels per day. About 300,000 gallons

Download 860.60 KB of 4.14 MB

Targets and Field Photos (GeoRSS and Photologger)

The screenshot displays the ERMA (Emergency Response Management Application) interface. On the left is a map of the Atlantic coast of the United States, with a red dot indicating the location of the field photos. The main area shows a grid of photos with the following details:

- Top Photo:** USCG T/V Cadell Hurricane Sandy. Coordinates: N 40° 37.392', W 074° 04.281'. Timestamp: 11/05/2012 9:54:51 AM. Shows a large grey ship beached on a dark, rocky shore.
- Middle Photo:** Coordinates: N 40° 22.598', W 074° 01.752'. Timestamp: NOV 1 2012 11/01/2012 12:57:16 PM. Shows a white boat on a grassy shore.
- Bottom Photo:** Coordinates: N 40° 22.598', W 074° 01.752'. Timestamp: NOV 1 2012 11/01/2012 12:58:24 PM. Shows a house with debris on a grassy area.

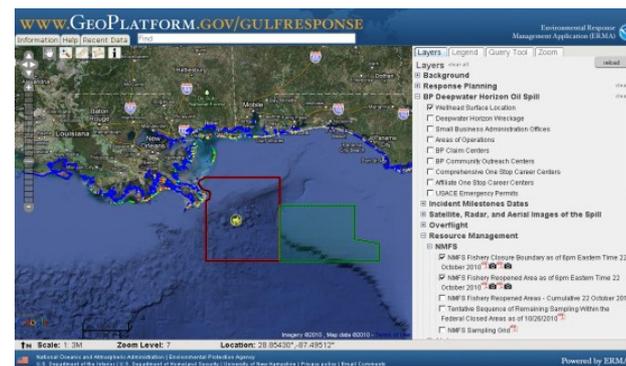
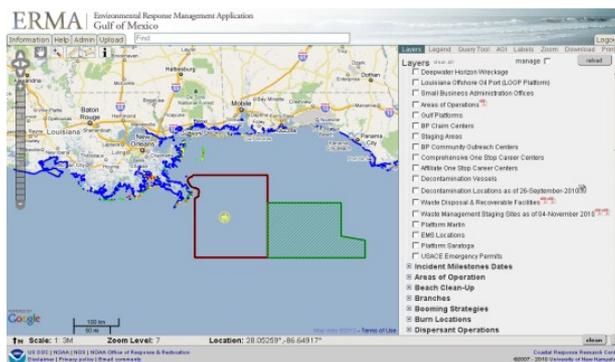
The interface includes a browser address bar with the URL <https://www.erma.unh.edu/atlantic/erma.html#x=-73.96642&y=40.60667&z=10&layers=13560+13646+13323+13330+13321>, a navigation menu, and a footer with the text "US DOC | NOAA Disclaimer | Privacy" and "Coastal Response Research Center 2007 - 2013 University of New Hampshire".

Benefits

- Customize your view to see only relevant information
- Download the data for your own use
- Distributive upload capability - upload multiple layers by multiple people
- Secure access to sensitive data sets
- Open Source
- Communicate with the public
- Improved collaboration across agencies and organizations through common view



NOAA | National Ocean Service
Office of **Response and Restoration**



<https://www.erma.unh.edu/southwest>

Matt Dorsey
mathew.dorsey@noaa.gov

