



Environmental Response Management Application

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Talk Outline

- Overview background and design process
- Discuss of how web based GIS technology can assist in a environmental response effort
- Show a few examples of the project's capabilities



Coastal Response Research Center (CRRC)

- CRRC is partnership between NOAA's Office of Response and Restoration (ORR) and University of New Hampshire
- CRRC Mission:
 - Develop new approaches to spill response and restoration through research/synthesis of information
 - Serve as a resource for ORR and NOAA
 - Serve as a hub for spill research, development, and technical transfer
 - Oil spill community (e.g., RRTs, internationally)
 - Conduct outreach to improve preparedness and response



Continuum of "Response" for the OR&R

Response
(24 hours)



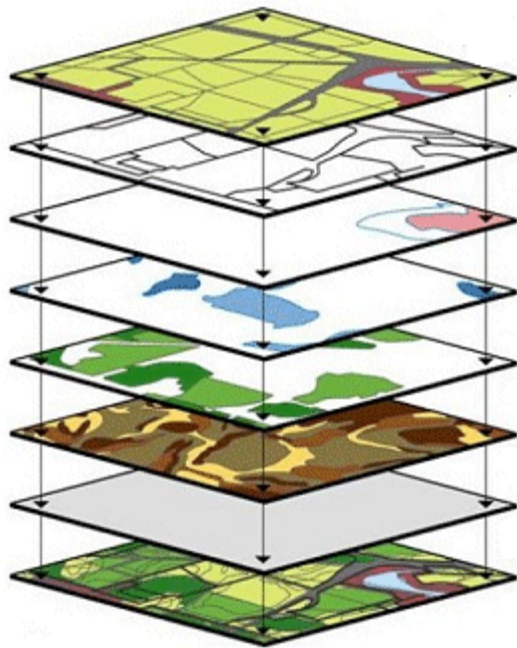
Restoration -
Recovery
(Years to
Decades)

Emergency
Response Division
(ERD)

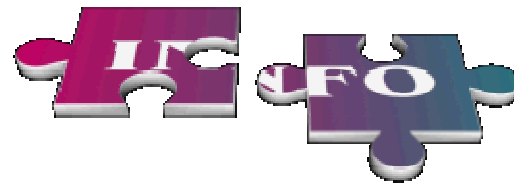
Assessment and
Restoration Division
(ARD)



A Picture is Worth a Thousand Words...



- Diverse datasets can be interlaced on a single map to better visualize a the complex nature of an area



How has the technology advanced?

Past

- Software and Hardware were cost prohibitive
- Difficult to obtain accurate data
- Advanced training to produce products
- Data limited to working desktop computer
- Limited product output- hard copy maps



How has the technology advanced?

Today

- Increase software options available
- Compact and inexpensive data acquisition
- Easy to use interfaces
- Systems are portable and flexible- network interface
- Products are more complex
- Web accessible (ArcIMS, Google Maps, Google Earth, Open Source WebGIS)



Why use a web based GIS platform during a Response?

- Integrate and synthesize various types of information
- Provide fast visualization of current information
- Improve communication and coordination among responders and stakeholders
- Provide resource managers with the information they need to make better informed decisions



Functional Web GIS Platform for Response

- Package data in a well-designed management, visualization, and analysis tool:
 - Easily accessible - field and command
 - User friendly
 - Quick to display
 - Capable of real-time data display
 - Simple to update/ download from
 - Secure



Project Partners: Technical Advisers

NOAA

- Office of Response and Restoration
- Coastal Services Center
- Office Coast Survey
- Weather Service
- Gulf of ME Ocean Observing System

UNH

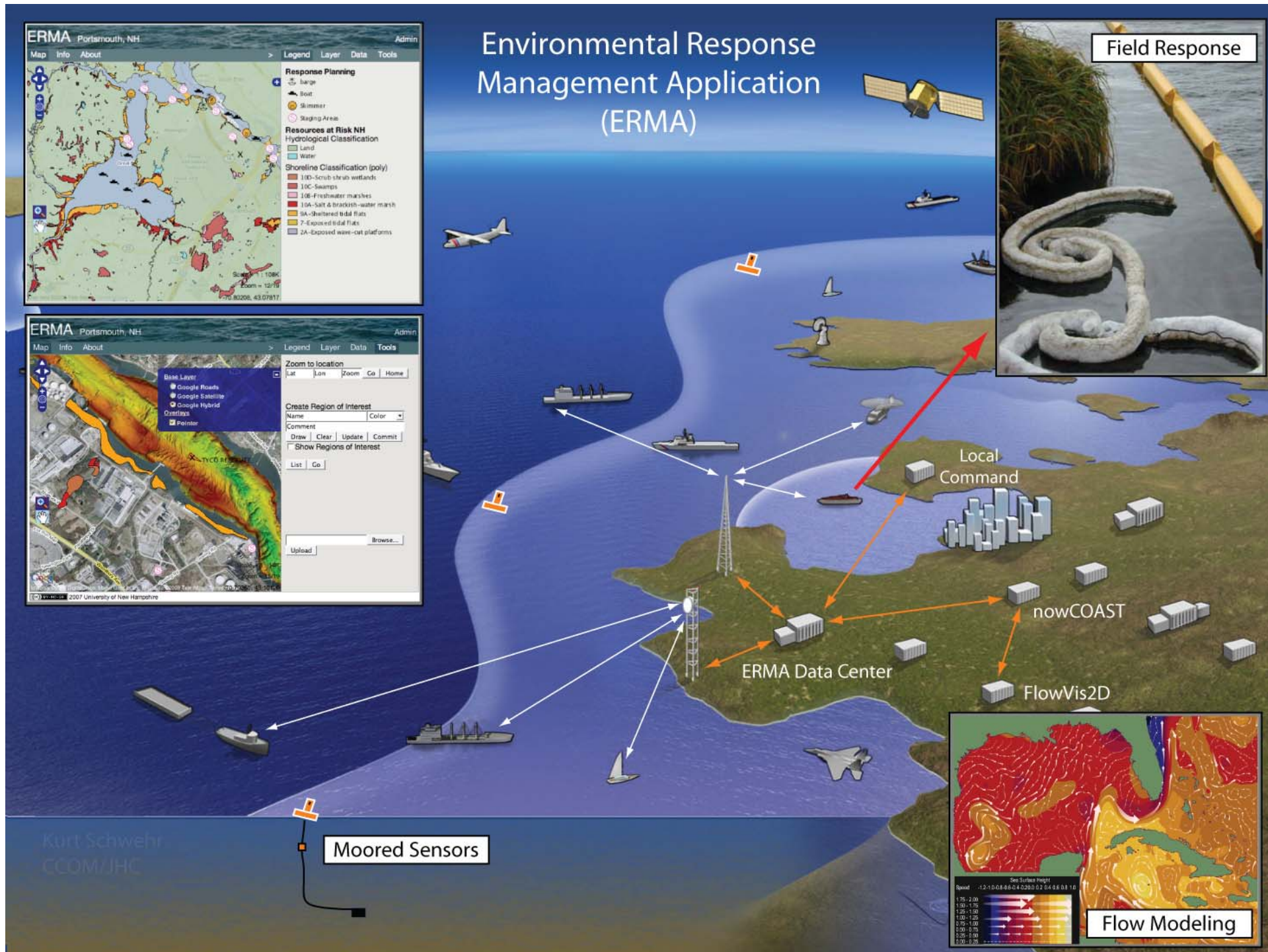
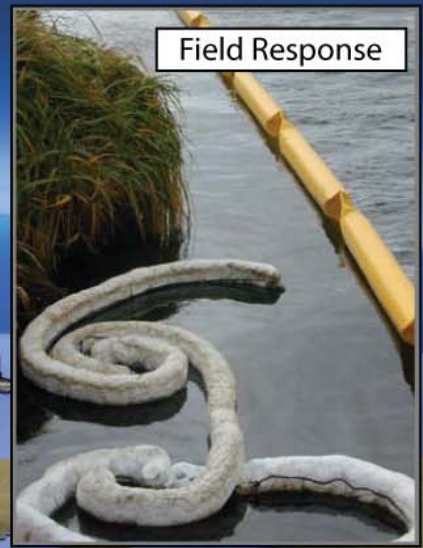
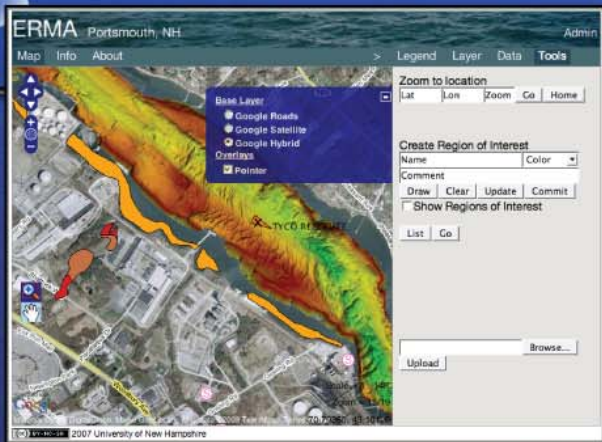
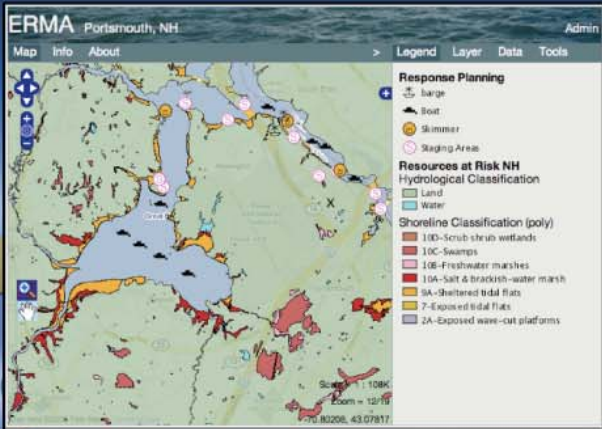
- Joint Hydrographic Center
- Joint Center for Ocean Observing Technology
- Cooperative Institute for Coastal and Estuarine Environmental Technology
- Coastal Ocean Observing and Analysis
- Research Computing Center
- Earth Systems Data Collaborative

Additional Partners

- US Coast Guard
- US EPA
- NH Dept. Environmental Services
- ME Dept. Environmental Protection
- NH Fish and Game
- NH Coastal Manager
- NH Div. Emergency Services
- Piscataqua River Cooperative
- FL Fish & Wildlife

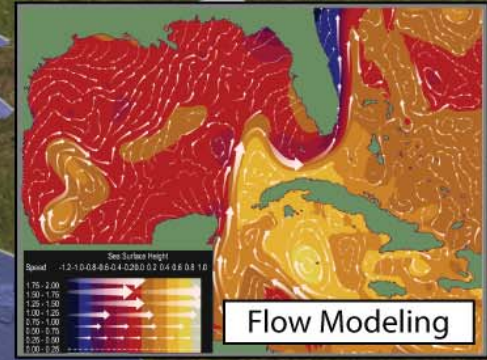


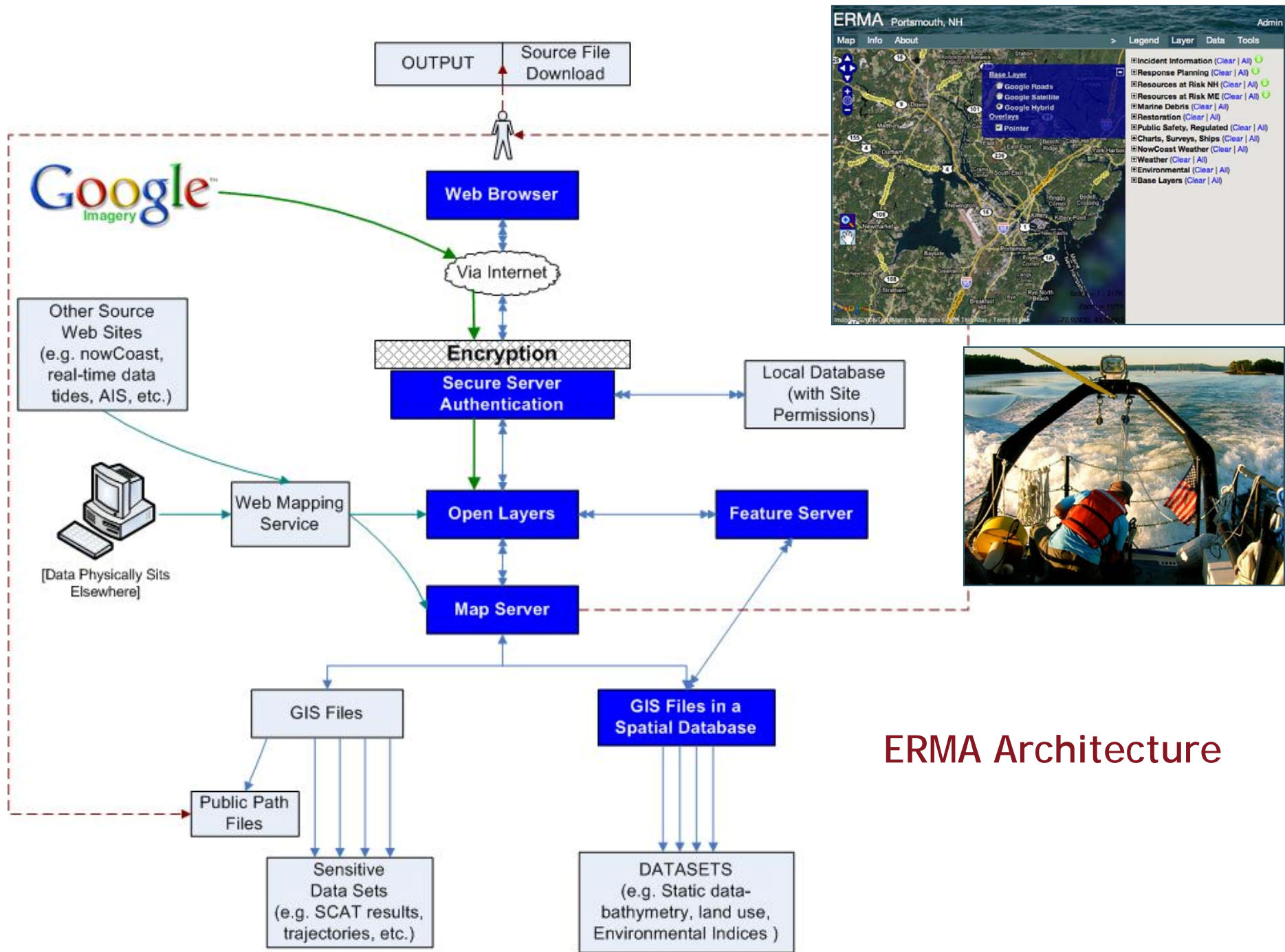
Environmental Response Management Application (ERMA)



Kurt Schwehr
CCOM/JHC

Moored Sensors





ERMA Architecture

Easy to Access Data Types

ERMA Portsmouth, NH Admin

Map Info About > Legend Layer Data Tools

Authentication Required

Enter username and password for "phri" at <https://portsmouthresponse.unh.edu>

User Name:

Password:

Use Password Manager to remember this password.

Incident Information (Clear | All)
Response Planning (Clear | All)
Resources at Risk NH (Clear | All)
Resources at Risk ME (Clear | All)
Observations (Clear | All)
Regulated (Clear | All)
Ships, Vessels, Boats (Clear | All)
Weather/Water (Clear | All)
Base Layers (Clear | All)

Scale = 1 : 433K
Zoom = 10/19
-70.39215, 43.17414

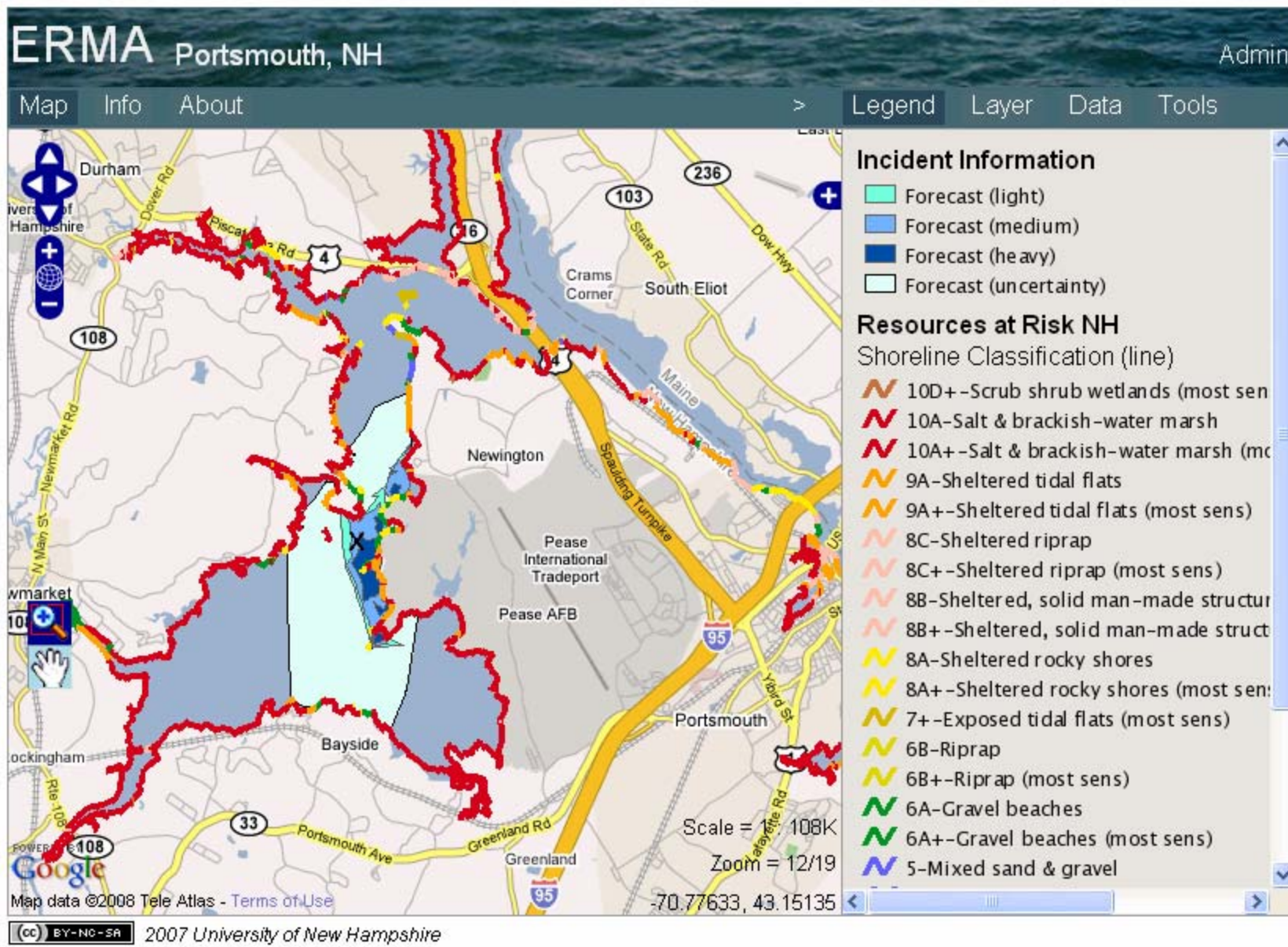
Map data ©2008 Tele Atlas

POWERED BY Google

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Critical Datasets for Environmental Response



Link to documents and Download data

Hypothetical Scenario - Seavey Island

The screenshot displays a web-based interface for an environmental assessment. On the left, a map shows the location of Seavey Island, with a red line indicating the survey segment. The main area contains a 'SHORELINE OILING SUMMARY (SOS) FORM' for the 'M/V SELENDANG AYU Spill Response'. The form includes sections for general information, survey team details, segment GPS coordinates, shoreline types, coastal character, operational features, and surface oiling conditions. A photo of the shoreline is visible at the bottom of the form. On the right, there are navigation and tool options, including 'Clear | All' buttons and a 'Tools' menu. At the bottom, there are 'OK' and 'Cancel' buttons, and a legend for oiling conditions.

SHORELINE OILING SUMMARY (SOS) FORM - M/V SELENDANG AYU Spill Response Page 1 of 1

1 GENERAL INFORMATION Date: dd/mm/yyyy Time (24h): standard/daylight Tide Height

Segment ID: *AVD-06* 25 Apr. 05 11:20 hrs to 14:15 hrs rising/falling

Operations Division:

Survey by: *FOOTV A/TV / Boat / Helicopter / Overlook /* Surf/ Clouds/ Fog / Rain / Snow / Windy / Calm

2 SURVEY TEAM # *E* name organization contact phone number

Jenni Nelson *Palanis* *Catherine Williams Arch*

Ruth Vender *NOAA*

Jordan Stout *FEW*

Jennifer Henderson *ADEC*

Darcy Harris *DNR*

3 SEGMENT Total Segment Length *1266* m Segment Length Surveyed *1260* m

Start GPS: LATITUDE *53.72912* deg. min. LONGITUDE *-116.97429* deg. min.

End GPS: LATITUDE *53.69198* deg. min. LONGITUDE *-116.93747* deg. min.

Differential GPS Yes/No

4A SHORELINE TYPE select only one primary (P) oiled shoreline type and any number of secondary (S) types

BEDROCK: cliff/vertical sloping platform SEDIMENT BEACH: Sand Boulder Sand Flats Sand-Gravel Water Only: Ice Foot Snow Mixed Sand-Gravel MARSH: Pet-Cob Boulder

4B COASTAL CHARACTER backshore character — select only one primary (P) and any number of secondary (S) types

CLIFF or HILL: est. height m Beach Delta Tidal inlet Marsh/Wetland slope gentle (<5°) medium steep (>30°) Barrier beach Dune Chnarmel other

5 OPERATIONAL FEATURES debris oiled? debris amount *minor* bags OR trucks

direct backshore access suitable backshore staging *Y/N* *like*

alongshore access from next segment access restrictions

6 SURFACE OILING CONDITIONS begin with "A" in the lowest tidal zone

OIL ZONE ID	TIDAL ZONE				OIL COVER			OIL THICKNESS					OIL CHARACTER							SURST. TYPE(S)	
	LI	MI	UI	SU	Length	Width	Distrib.	PO	CV	GT	ST	FL	FR	MS	TB	PT	TC	SR	AP		NO
A			<input checked="" type="checkbox"/>		<i>1255</i>	<i>2</i>	<i>1</i>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>											<i>b.c.o.veg</i>

Legend: Medium Heavy

this scale bar shows the meaning of the distribution terms at the current time

Resources at RISK: *2/19* *5135* **Marine Debris** (Clear | All)



Data Table Access

The screenshot displays the ERMA Portsmouth, NH web application. The interface includes a navigation menu with 'Map', 'Info', and 'About' options, and an 'Admin' link in the top right corner. A map of Portsmouth, NH, is visible, showing major roads like I-95 and I-295, and landmarks like the Bayside area. A data table entry is shown, detailing information for a specific location. The entry includes fields for seasonal closure, restrooms, telephone, lighting, location, contact person, phone number, ramp dimensions, dock dimensions, and photo paths. A text box in the foreground provides directions to the location.

ERMA Portsmouth, NH

Map Info About

Admin

Tools

oil_dock.gif (GIF Image, 632x474 pixels) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://portsmouthresponse.unh.edu/data/incident/oil_dod

https://portsmouthresponse.unh.edu/erma/directions/irving.txt

RT 4 & 16 TO WOODBURY AVE EXIT IN NEWINGTON, EAST ON MARKET ST., NORTH ON KEARSAGE WAY, SE ON PREBLE WAY AT IRVING ENTERANCE, UNDER I-95 BRIDGE.

SEASONAL_C: NO, RESTROOMS: YES, TELEPHONE: YES, LIGHTING: EXCELLENT, LOCATION: 400 GOSLING RD, TOWN: PORTSMOUTH, CONTACT_IN: LEO QUINN, PHONE: 603-669-4000, RAMP_DIMEN: NA, DOCK_DIMEN: 400' X 50', PHOTO_1: m:\coastoil\Coastal Photos\5_8mar02\p1010006.jpg, PHOTO_2: m:\coastoil\Coastal

Coastal Response Research Centre

University of New Hampshire

NARR

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Real-time vessel traffic from AIS

ERMA Portsmouth, NH Admin

Map Info About > Legend Layer Data Tools

ships Feature info:
(1 of 1 items selected)
key: 4, name: 308413000, cog: 328,
cog_mapserver: 238, sog: 5.1,
time_utc: 2008-02-09 07:00:21

shiptrack Feature info:
(1 of 1 items selected)
ogc_fid: 3, userid: 308413000,
name: 308413000

Scale = 1 : 14K
Zoom = 15/19
-70.77556, 43.10528

Map data ©2008 Tele Atlas - [Terms of Use](#)

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Coastal Response Research Centre
University of New Hampshire
NOAA

Weather Forecast
Powered by Google

Raster layers can be used as base maps

ERMA Portsmouth, NH Admin

Map Info About > Legend Layer Data Tools

ships Feature info:
(1 of 1 items selected)
key: 2, name: PIONEER, cog: 125,
cog_mapserver: 35, sog: 7.3,
time_utc: 2008-02-06 11:11:17

shiptrack Feature info:
(1 of 1 items selected)
ogc_fid: 1, userid: 576048000,
name: PIONEER

Scale = 1 : 14K
Zoom = 15/19
-70.79302, 43.10167

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Logos: Coastal Response Research Center, University of New Hampshire, NOAA

NOAA Navigational Charts

ERMA Portsmouth, NH Admin

Map Info About > Legend Layer Data Tools

Legend

- 9A+- Sheltered tidal flats (most sens)
- 8C- Sheltered riprap
- 8C+- Sheltered riprap (most sens)
- 8B- Sheltered, solid man-made structur
- 8B+- Sheltered, solid man-made struct
- 8A- Sheltered rocky shores
- 8A+- Sheltered rocky shores (most sens)
- 7+- Exposed tidal flats (most sens)
- 6B- Riprap
- 6B+- Riprap (most sens)
- 6A- Gravel beaches
- 6A+- Gravel beaches (most sens)
- 5- Mixed sand & gravel
- 5+- Mixed sand & gravel (most sens)
- 3A- Fine to medium-grained sand
- 3A+- Fine to medium-grained sand (m
- 2A- Exposed wave-cut platforms
- 2A+- Exposed wave-cut platforms (mos
- 1A- Exposed rocky shores

Resources at Risk ME

- Lobster Dealers
- Eelgrass Beds
- Shellfish Beds

Charts, Surveys, Ships

Scale = 1 : 108K
Zoom = 12/19
70.63385, 43.11928

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Weather and Buoy Observations

ERMA Portsmouth, NH Admin

Map Info About > Legend Layer Data Tools

- Incident Information (Clear | All)
- Response Planning (Clear | All) ⬆
- Resources at Risk NH (Clear | All) ⬆
- Resources at Risk ME (Clear | All) ⬆
- Marine Debris (Clear | All)
- Field Photographs (Clear | All)
- Restoration (Clear | All)
- Public Safety, Regulated (Clear | All)
- Charts, Surveys, Ships (Clear | All)
- NowCOAST Weather/Water (Clear | All)
- Weather/Buoys (Clear | All)
- NEXRAD Observations (Clear | All)
 - NEXRAD Current
 - NEXRAD -05Min
 - NEXRAD -15Min
 - NEXRAD -45Min
- Environmental (Clear | All)
- Base Layers (Clear | All)

Scale = 1 : 867K
Zoom = 9/19
-70.91125, 43.60028

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Weather and Buoy Observations

ERMA Portsmouth, NH Admin

Map Info About Legend Layer Data Tools

Data Retrieval - Mozilla Firefox

http://tidesandcurrents.noaa.gov/data_menu.shtml?stn=8423898&Fort-Point,+NH&type=Tide+Data

TIDES & CURRENTS

Home | Products | Programs | Partnerships | Education | Help

Station Information: Fort Point, NH - [Data Disclaimer](#) Fort Point, NH: [Data Inventory](#)

Station ID: 8423898

Tide Data

NOAA/NOS/CO-OPS
Preliminary Water Level (M) vs. Predicted Plot
8423898 Fort Point, NH
from 2008-05-06 - 2008-05-07

Height relative to MLLW (Feet)

Date/Time (GMT)

Predicted MLLW (Feet) (Blue line)
Observed MLLW (Feet) (Green line)

Retrieve data from 20080506 through 20080506
Retrieve data from 20080507 through 20080508

Begin Date: May 6, 2008 End Date: May 7, 2008 Datum: MLLW Data Units: Feet

Time Zone: Local (LST/LEN)
GMT
Meters
LST

View Plot View Data Reset

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Pease AFB Portsmouth Harbor
Bayside Portsmouth Foyes Corner
Langs Corner Rye North Beach
Newfields Grand Rye
Stratham Breakfast Hill

Scale = 1 : 217K
Zoom = 11/19
-70.88860, 43.24320

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Boys Feature info:
(of 1 items selected)
LONG: -70.711700, LAT: 43.071700,
BOY_NAME: NOAA Tides,
DESC_TEXT: NOAA Fort Point, NH
Collects Primary Water Level data.,
BOY_URL: NOAA Tides

Obs Feature info:
(of 1 items selected)
STATION: 15893, ID: 8423898,
INTERNALID: 8423898, AGENCY: NOS,
TYPE: NWLON, AVAIL: 1,
ESONETROO: 0, STNNAME: Fort Point,
STATE: NH, LATITUDE: 43.07170,
LONGITUDE: -70.71170,
URL: http://tidesonline.nos.noaa.gov/plotcomp
BS_WX: 0, OBS_OC: 1, OBS_RIV: 0,
BS_WQ: 0, LLEST: 0,
ELEV_FT: 0.00000, ELEV: 0.00000,
DEPTH_BOT: 0.00000,
DEPTH_SURF: 0.00000,
ANEMHT: 0.00000, WINDS: 0,
AIRTEMP: 0, DEWPT: 0, PRECIP: 0,
RELHUM: 0, MSLP: 0, SOLARRAD: 0,
SOILTEMP: 0, WEATHER: 0,
SNOWFALL: 0, CLDCVR: 0, VIS: 0,
SSURTMP: 1, SALINITY: 0, WLEVEL: 1,
CURRENTS: 0 WAVES: 0 SSURTMP: 0



Interactive Tools

ERMA Portsmouth, NH Admin

Map Info About Legend Layer Data Tools

Zoom to location
43.08 -70.72 Zoom Go Home

Create Region of Interest
Name Color
Comment

 Show Regions of Interest

Scale = 1 : 217K
Zoom = 11/19
-70.60776, 43.13256

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Interactive Tools

ERMA Portsmouth, NH Admin

Map Info About Legend Layer Data Tools

Zoom to location
43.08 -70.72 Zoom Go Home

Create Region of Interest
Jacobi Olive
overflight 5/7
Done Clear Update Commit
 Show Regions of Interest

List Go

- 1752 area of clean surveyed 2/23 red
- 1758 boom deployed red
- 1775 SCAT Team 1 cyan

Browse... Upload

Scale = 1 : 217K
Zoom = 11/19
-70.63042, 43.07240

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Interactive Tools

ERMA Portsmouth, NH Admin

Map Info About > Legend Layer Data Tools

Zoom to location
43.08 -70.72 Zoom Go Home

Create Region of Interest
Team 1 Black
surveyed 2/23-heavy oil
Done Clear Update Commit
 Show Regions of Interest

List Go

- 1752 area of clean surveyed 2/23 red
- 1758 boom deployed red
- 1775 SCAT Team 1 cyan
- 1776 Team 1 surveyed 2/23-heavy oil BI

Changes committed
Browse...
Upload

Scale = 1 : 217K
Zoom = 11/19
-70.57755, 43.21168

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Interactive Tools

The screenshot displays the ERMA Portsmouth, NH web application interface. At the top, the title "ERMA Portsmouth, NH" is visible, along with an "Admin" link. Below the title is a navigation bar with "Map", "Info", and "About" tabs. To the right, there are tabs for "Legend", "Layer", "Data", and "Tools". The main area shows a map of Portsmouth, NH, with various streets and landmarks labeled. A "File Upload" dialog box is open in the foreground, showing a file explorer view of a folder named "ERMA_test". The files listed in the folder are "field_test_sites.zip", "Michele.dbf", "Michele.dbf.xml", and "RC_ME_NH.zip". The "RC_ME_NH.zip" file is selected. The dialog box also shows a "File name" field with "RC_ME_NH.zip" and a "Files of type" dropdown set to "All Files". Buttons for "Open" and "Cancel" are visible at the bottom of the dialog. In the background, the map interface includes a "Zoom to location" input field with coordinates "43.08" and "-70.72", and buttons for "Zoom", "Go", and "Home".



Interactive Tools

ERMA Portsmouth, NH Admin

Map Info About > Legend Layer Data Tools

- Incident Information (Clear | All)
- Response Planning (Clear | All) ↑
- Resources at Risk NH (Clear | All) ↑
- Resources at Risk ME (Clear | All) ↑
- Marine Debris (Clear | All)
- Field Photographs (Clear | All)
- Restoration (Clear | All)
- Public Safety, Regulated (Clear | All)
- Charts, Surveys, Ships (Clear | All)
- nowCOAST Weather/Water (Clear | All)
- Weather/Buoys (Clear | All)
- NEXRAD Observations (Clear | All)
- Environmental (Clear | All)
- Base Layers (Clear | All)
- Uploaded Layers (Clear | All)
 - NMFS_restoration Layer

Scale = 1 : 217K
Zoom = 11/19
-70.60638, 43.11953

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Practical Implementation of ERMA

- Assist with spill preparedness
- Assist in coordinating response efforts
- Define the extent of potential impacts
- Assist in Recovery and Restoration





Acknowledgement

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the Coastal Response Research Center

www.crrc.unh.edu



Coastal Response Research Center

Environmental Response Management Application

