# ERMA™

# **E**nvironmental **R**esponse **M**anagement **A**pplication

Michele Jacobi ,
Nancy Kinner, Rob Braswell, Kurt Schwehr,
Kim Newman, & Amy Merten
May 7th, 2008

Coastal Response Research Center

1

# Talk Outline

- Overview background and design process
- Discuss of how <u>web based</u> 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

Coastal Response Research Center

# Continuum of "Response" for the OR&R

**Response (24 hours)** → **Restoration - Recovery (Years to Decades)**

Emergency Response Division (ERD)
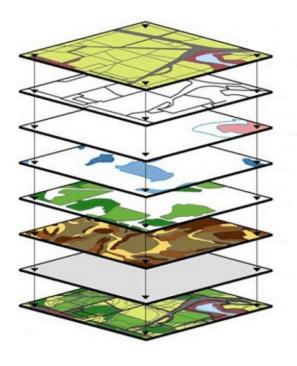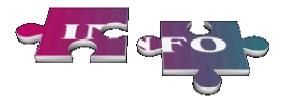
Assessment and Restoration Division (ARD)

# 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
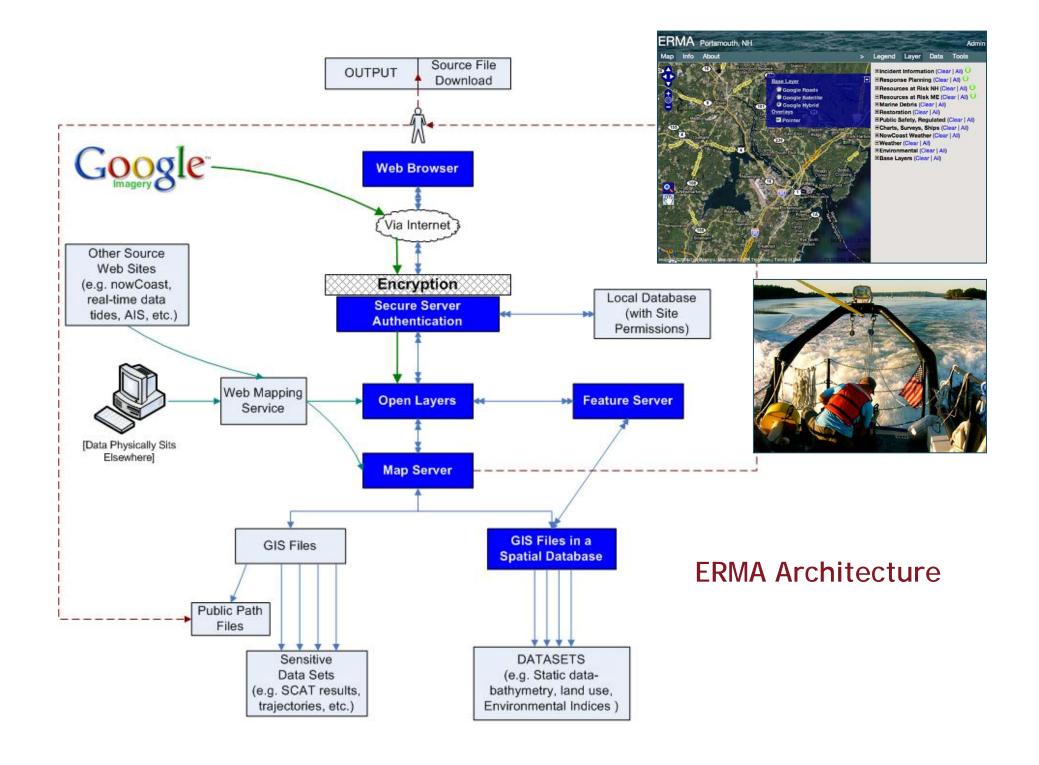- Earth Systems Data Collaborative

**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
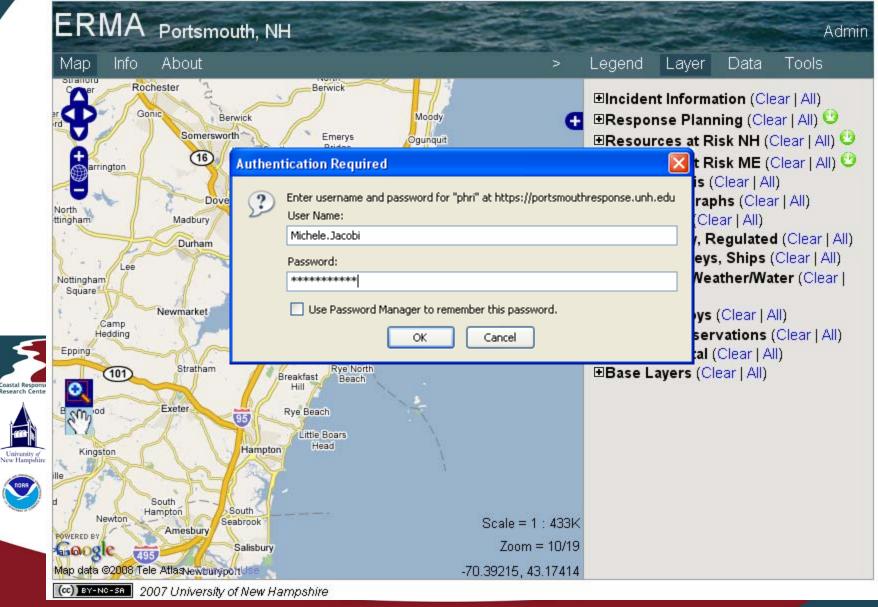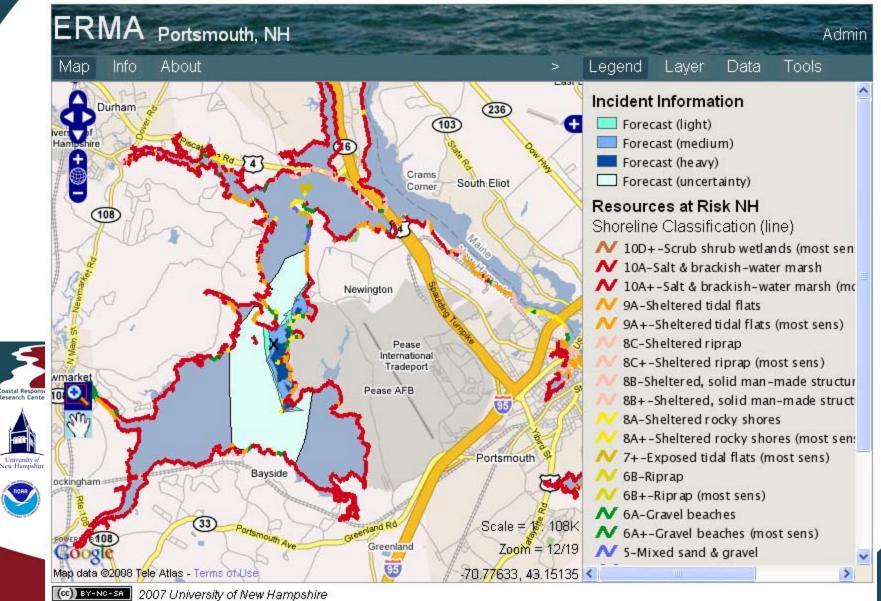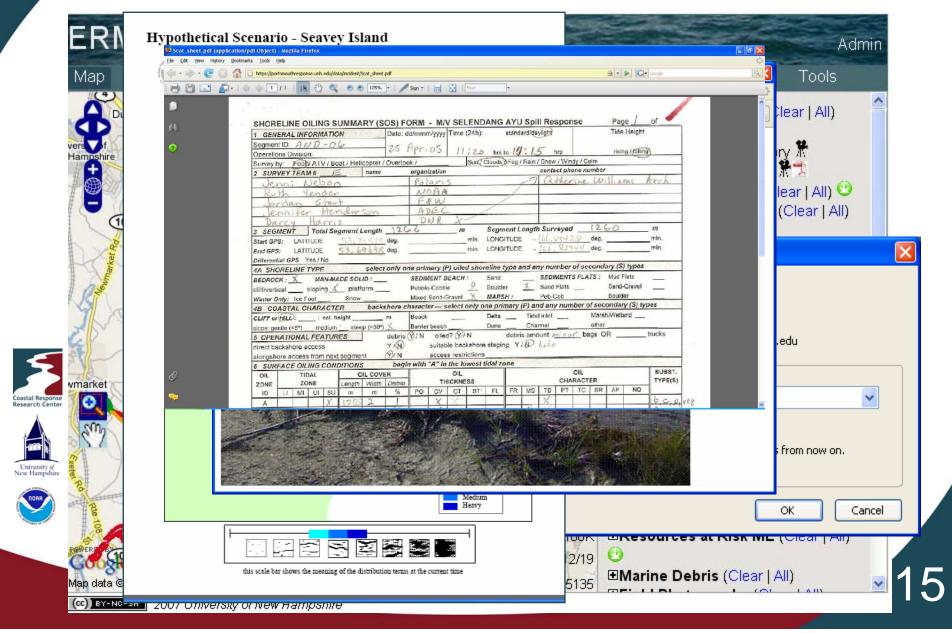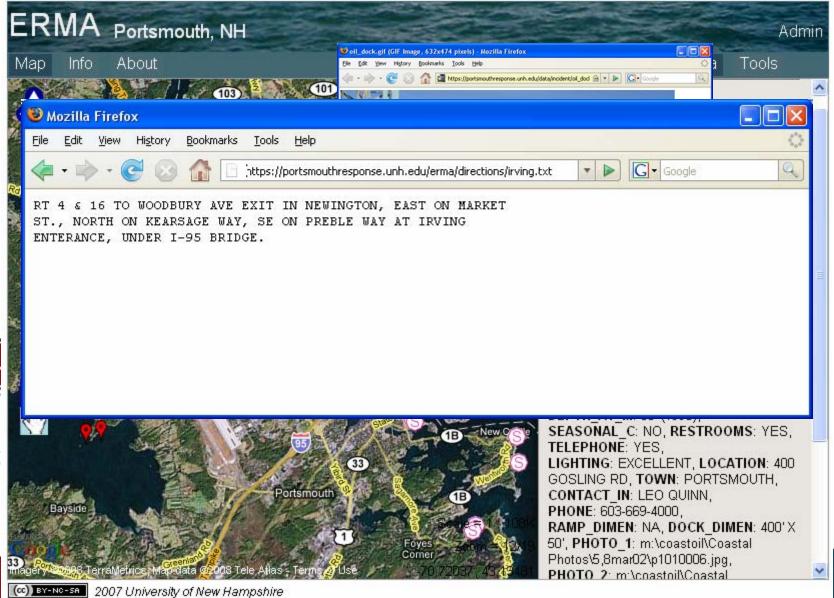- Piscataqua River Cooperative
- FL Fish & Wildlife

**Environmental Response Management Application (ERMA)**

Field Response

Local Command

nowCOAST

ERMA Data Center

FlowVis2D

Moored Sensors

Flow Modeling

ERMA Portsmouth, NH

Kurt Schwehr
CCOM/JHC

OUTPUT | Source File Download

Google™ Imagery

Web Browser

Via Internet

Other Source Web Sites (e.g. nowCoast, real-time data tides, AIS, etc.)

Encryption

Secure Server Authentication

Local Database (with Site Permissions)

[Data Physically Sits Elsewhere]

Web Mapping Service

Open Layers

Feature Server

Map Server

GIS Files

GIS Files in a Spatial Database

Public Path Files

Sensitive Data Sets (e.g. SCAT results, trajectories, etc.)

DATASETS (e.g. Static data-bathymetry, land use, Environmental Indices )

ERMA Architecture

ERMA Portsmouth, NH — Admin
Map  Info  About                                    >    Legend  Layer  Data  Tools

Base Layer
 ○ Google Roads
 ○ Google Satellite
 ○ Google Hybrid
Overlays
 ☑ Pointer

⊞ Incident Information (Clear | All)
⊞ Response Planning (Clear | All)
⊞ Resources at Risk NH (Clear | All)
⊞ Resources at Risk ME (Clear | All)
⊞ Marine Debris (Clear | All)
⊞ Restoration (Clear | All)
⊞ Public Safety, Regulated (Clear | All)
⊞ Charts, Surveys, Ships (Clear | All)
⊞ NowCoast Weather (Clear | All)
⊞ Weather (Clear | All)
⊞ Environmental (Clear | All)
⊞ Base Layers (Clear | All)

# Easy to Access Data Types

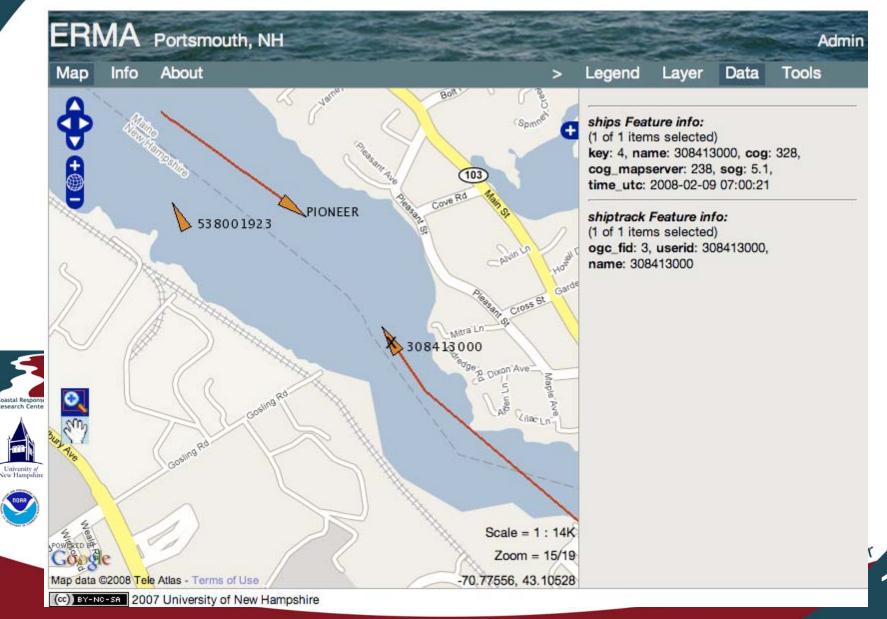# Critical Datasets for Environmental Response
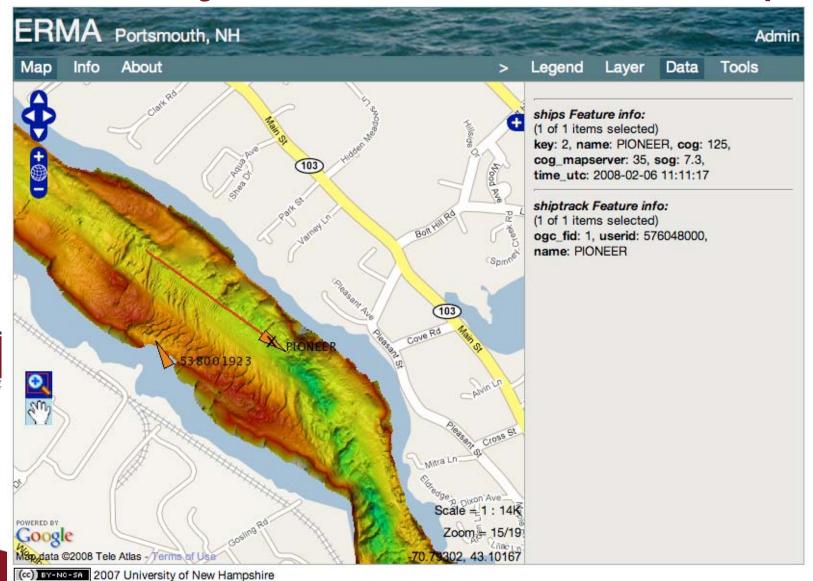


14

# Link to documents and Download data
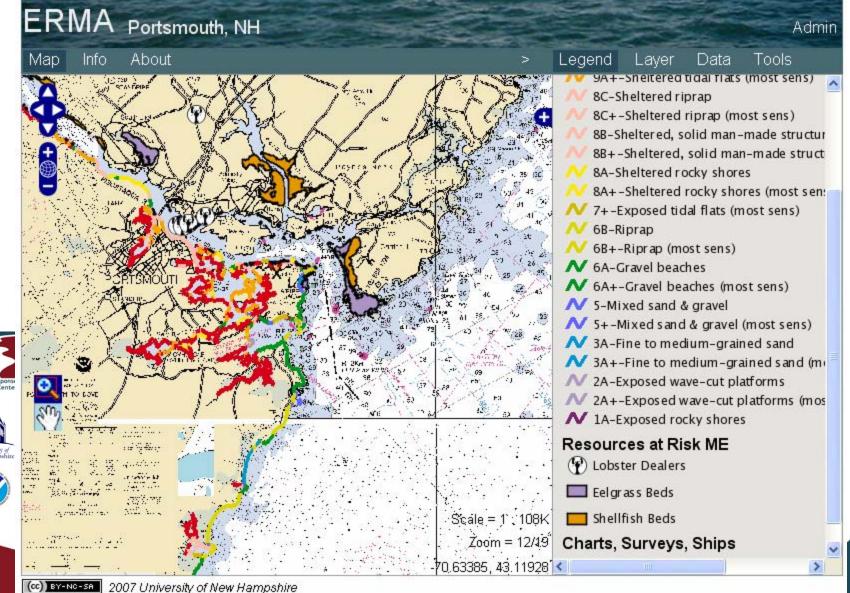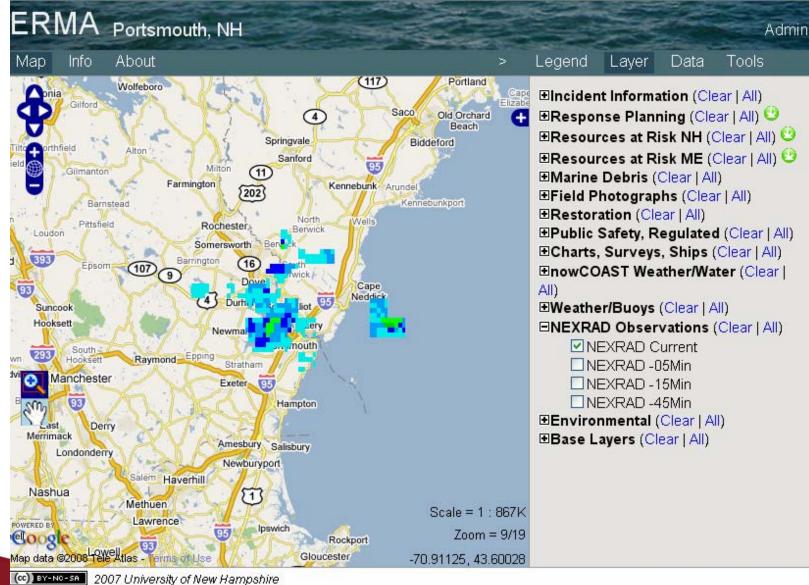
# Data Table Access

# Real-time vessel traffic from AIS
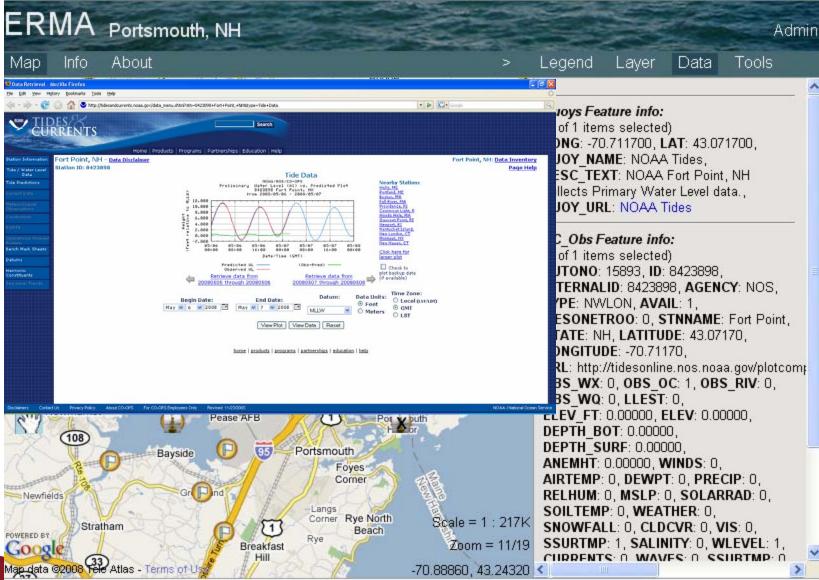
# Raster layers can be used as base maps
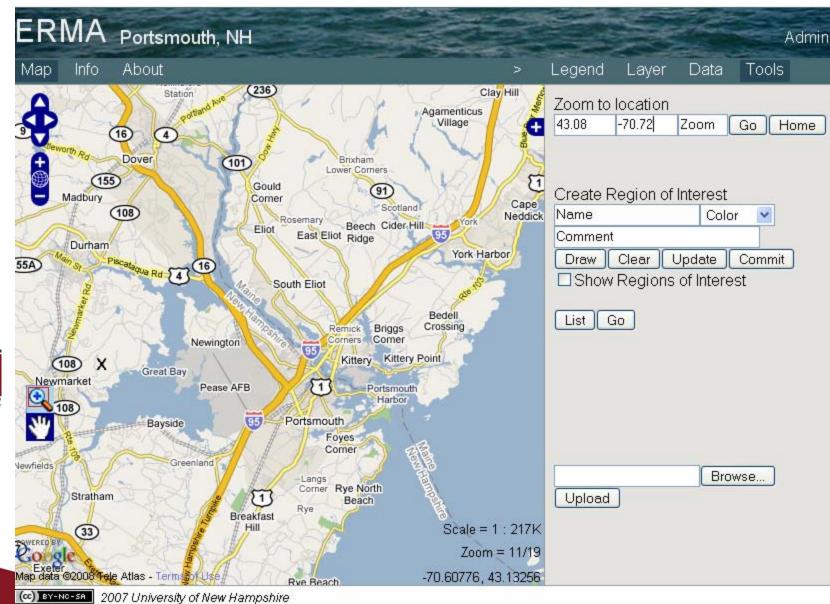
# NOAA Navigational Charts
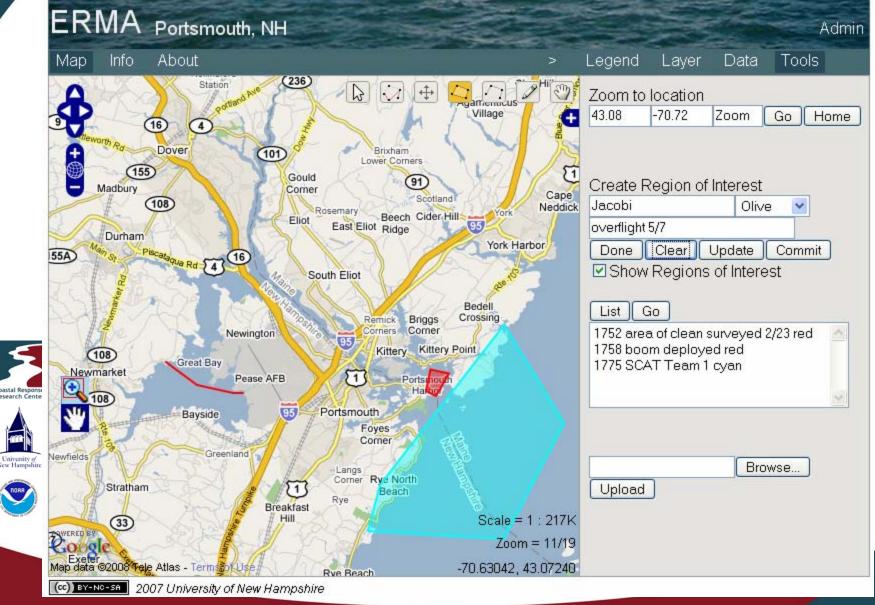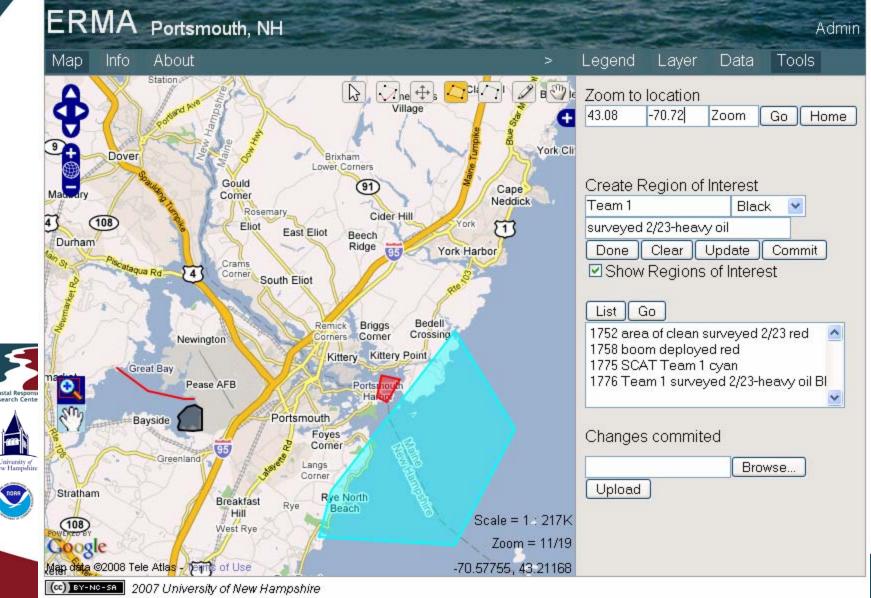


19

# Weather and Buoy Observations

# Weather and Buoy Observations

# Interactive Tools

# Interactive Tools

# Interactive Tools

# Interactive Tools

# Interactive Tools

# Practical Implementation of ERMA

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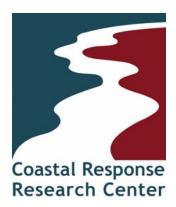- Assist in Recovery and Restoration

# Acknowledgement

Funding for this project was provided by
the Coastal Response Research Center
www.crrc.unh.edu

28

# Environmental Response Management Application