Oil Spill Response using E.R.M.A.

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Talk Outline

• Overview of how NOAA’s Office of Response and Restoration responds at a spill

• Background on Coastal Response Research Center and our collaboration in Portsmouth Harbor area

• Environmental Response Management Application- E.R.M.A.
  • Overview
  • Demo
  • Next Steps
NOAA’s Role in Oil Spill Response

- Spills happen so what do we do????
AGENCY MISSION STATEMENT

- Reducing threats to coastal resources and human health through planning and response.
- Protecting coastal resources and human health by recommending and implementing appropriate response actions.
- Restoring injured trust resources.
Continuum of “Response” for the OR&R

Response (24 hours)
- Emergency Response Division (ERD)
- Assessment and Restoration Division (ARD)

Restoration - Recovery (Years to Decades)
NOAA Scientific Support Includes:

- Weather Forecast
- Tides and Currents
- Hazard Characterization
- Tactical Trajectory
- Natural Resources at Risk (RAR)
- Overflight Obs.
- SCAT
- Environmental issues and trade-offs
- Consultation

GOAL: Best Response Possible for the situation
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
UNH - NOAA Centers working to collectively solve common management challenge

• Can we apply the ‘data collaborative’ technology to improve response capabilities?
• Use Portsmouth Harbor as a test case
  • Data-rich
  • Critical mass of capabilities UNH - NOAA Centers

“Portsmouth Harbor Response Initiative”
“Portsmouth Harbor Response Initiative”

- Example of Center interaction with other UNH/NOAA centers (e.g., Joint Hydrographic Center, CICEET, Environmental Data Collaborative)
- Broad integration across oil spill community (e.g., USCG, NOAA, state agencies, potential responsible parties)
- Integrated “modeling” approach to displaying incident information and providing validated data with GIS-based technology
- NOAA ORR detail at UNH
  - EOS- Rob Braswell
  - CCOM- Kurt Schwehr
E.R.M.A.

Environmental Response Management Application
What is GIS?

• Computer hardware and software system designed to collect, manipulate, analyze, and display spatially referenced data for solving complex resource issues.
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.
Why Use a Web Based GIS Platform during a Response?

- Integrate and synthesize various types of info
- Provide a common operational picture for situational awareness
- Improve communication and coordination among responders and stakeholders
  - Visualization of a complex situation
- 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

- US Coast Guard
- US EPA
- NH DES
- ME DEP
- NH Fish and Game
- NH Coastal Manager
- NH Div. Emergency Services
- Piscataqua River Cooperative

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

- UNH
  - JHC
  - CCOM
  - COOA
  - Research Computing
Leveraging Existing Data Resources

- Environmental - contaminant datasets, water quality monitoring sites, protected areas, restoration sites, etc.
- Habitat classifications and species distributions data
- Navigational - electronic navigation charts & scanned paper charts
- Meteorological observations
- Models - trajectories/forecasts
Spill Incident Info
Volume & Chemistry of Spill
Hydrodynamic and Shoreline Data
Resources at Risk

Baseline Environmental Info
(Georeferenced)
What Has Been Compiled?

- Library of background data
  - Base maps- shoreline data, roads, etc.
  - Imagery
  - Navigational charts
  - Bathymetry surveys
  - Environmental Sensitivity Indices
  - Environmental monitoring sites
  - Weather observation buoys
  - Restoration sites
What Can be Displayed?

• Real-time observations and monitoring data
  • Observation buoys - What is being collected?
  • Re-direct to the data source

• Data links to documents and websites
  • Restoration Project
    • Summary PDFs
    • Websites

• Field data & georeferenced photos
  • International Coastal Clean-up Surveys
    • Specific data marine debris items
    • Photos collected during survey
How Does This Help in Spill Response?

• Hypothetical Spill
  • Uploaded trajectory - movie display
  • Where did it hit relative to ESI layer?
    - See exact classification or download and print map
    - View data sources
  • Show results of Shoreline Cleanup and Assessment Team (SCAT) work
  • Visualize spill relative to ship traffic
  • Gather current weather observations from buoys
  • Display existing environmental contaminant data
Practical Implementation of ERMA

- Assist with spill preparedness
  - Display jurisdictional boundaries, specially regulated areas, areas of socio-economic importance
- Access points for cleanup
- Staging areas and command centers
- Regional documentation, points of contact, etc.
Practical Implementation of ERMA

• Assist in coordinating response efforts
  • Visualize magnitude and extent
  • Triage sites for action
  • Track progress of clean-up
  • Access real-time data
  • Upload data from the field and access forms
  • Increase communication
Practical Implementation of ERMA

- Define the extent of potential impacts
  - General habitat and land use information
  - Areas of biological significance - haul outs, rookeries, nesting grounds, essential or critical habitat
  - Species-specific data - biological resources in the region - threatened or endangered?
  - Where is there current monitoring data
Practical Implementation of ERMA

• Assist in Recovery and Restoration
  • Access existing environmental monitoring sites
  • Assist with sampling design
  • Inventory restoration projects
  • Locate long-term monitoring sites
  • Coordinate with regional projects
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www.crrc.unh.edu