

# Coastal Response Research Center Overview

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# Today's Topics

- Overview of Center
  - Origins/Mission
  - Research Foci
  - Sample Center Projects/Products:
    - Environmental Response Management Application
    - Arctic: Oil-in-Ice
    - PAH Toxicity Field Manual
    - Sea Grant/NOAA Human Dimensions Project



# Center Creation

- NOAA's Office of Response and Restoration (ORR)/UNH spill partnership in 2004
- Co-Directors:
  - UNH - Nancy Kinner
  - NOAA - Amy Merten
- Funding for oil spill research decreasing
  - Government
  - Private sector
- Many research needs exist regarding spill response, recovery and restoration



# Overall Center Mission

- Develop new approaches to spill response and restoration through research/synthesis of information
  - Annual request for proposal (RFP) of ~\$1M/year
  - Focused peer reviewed research projects
    - Oil-in-Ice
- Serve as a resource for ORR and NOAA
- Serve as a hub for spill research and tech transfer for all stakeholders
- Hot topic workshops with All stakeholders
- NOAA Practitioner needs

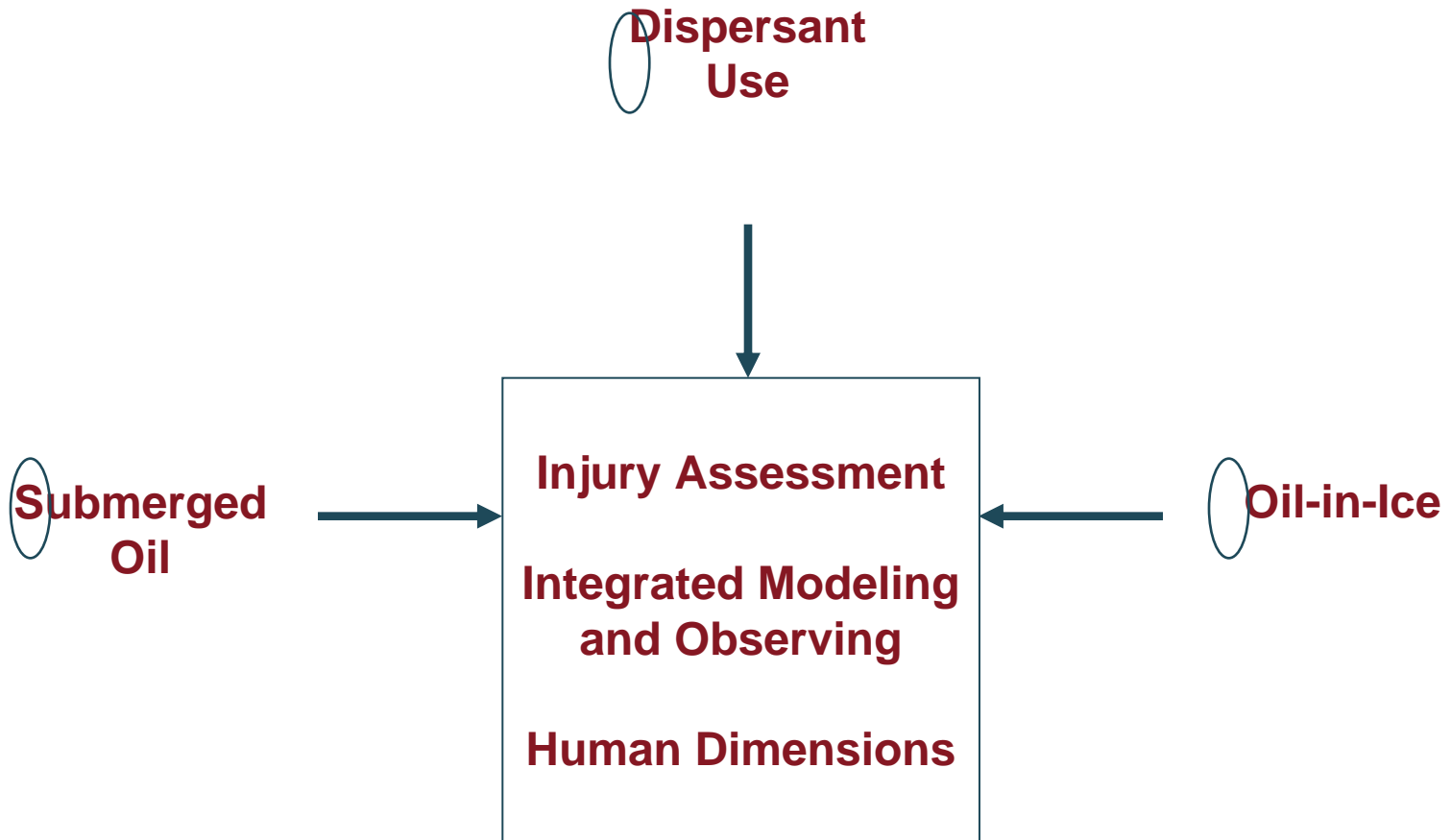


# Specific Center Missions

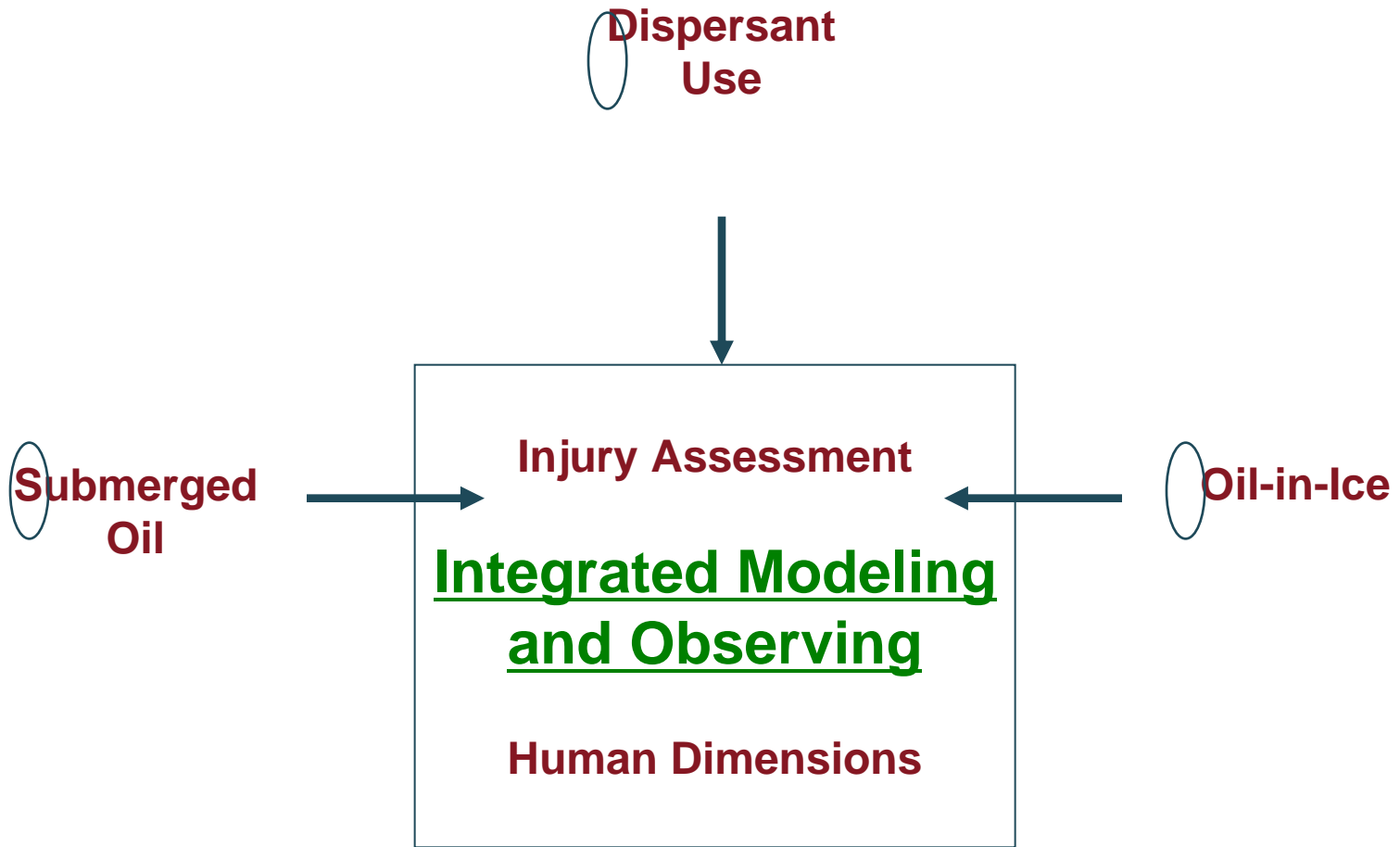
- Conduct and oversee basic and applied research and outreach on spill response and restoration
- Transform research results into practice
  - NOAA Liaisons
- Educate/train students who will pursue careers in spill response and restoration



# Focus Topics



# Focus Topics



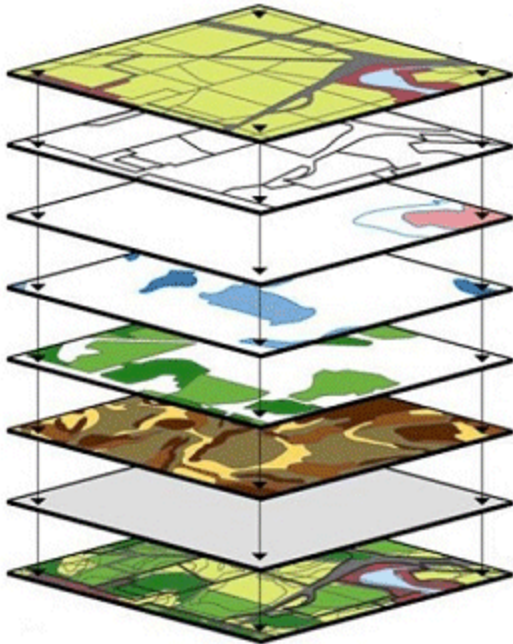
# ERMA

## Environmental Response Management Application





# A Picture is Worth a Thousand Words...



- Diverse datasets interlaced on single map to visualize complex nature of situation



# Advantage of Web Based GIS Platform for Spill Response

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

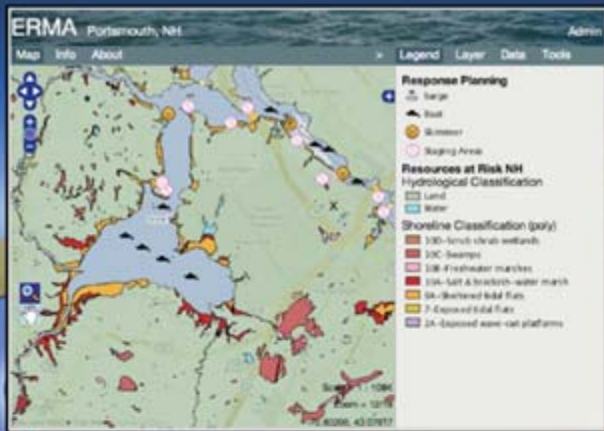


# Functional Web GIS Platform for Response

- 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

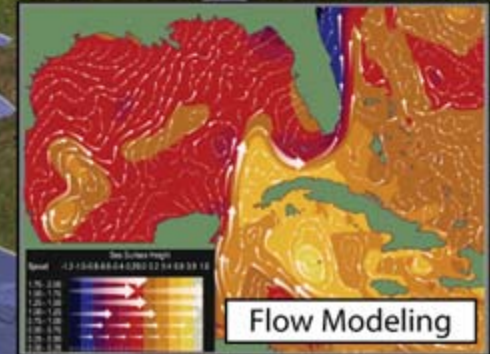


# Environmental Response Management Application (ERMA)



Kurt Schwehr  
CCOM/IHC

Moored Sensors



# Features

- Secure Login
- Critical Datasets for Environmental Response
- Real-Time Vessel Traffic from Coast Guard
- Layers as Base Maps
- NOAA Navigational Charts
- Weather and Buoy Observations
- Interactive Tools



# Practical Implementations of ERMA™

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

(DEMO)



# Other Applications of ERMA

- Damage to infrastructure
- Larger storm events
- Coastal flooding
  - Rita, Katrina, Ike, Gustav
- Climate change
  - C. Wake later today
- Use ERMA as a decision aid



# Potential Pilot Project for ERMA

- Ease of visualizing potential impact
- Possible Inputs (NH/Great Bay):
  - Flood plain models
  - Freshwater discharge models
  - Storm surge models
  - Sea level rise
- Collaboration with C. Wake?



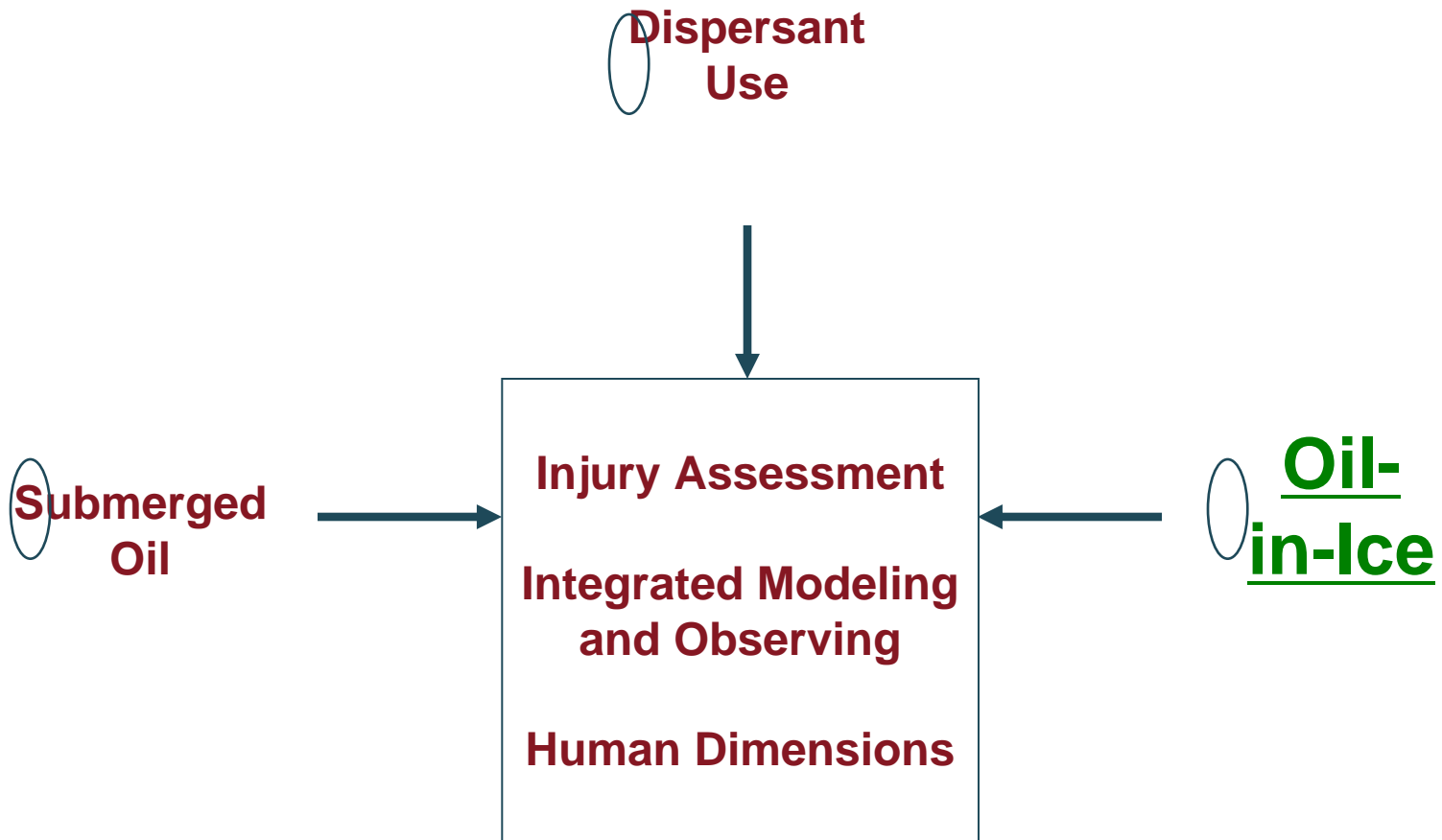


# Potential Pilot Project for ERMA

- Example: Coastal wastewater treatment plants
  - Which are at risk?
  - What are the potential consequences of plant damage/shutdown?
  - Are there preventative steps?



# Focus Topics



# Oil in Ice

- Opening the Arctic Seas: Envisioning Disasters and Framing Solutions Workshop-March 2008
  - Goal: identify key strategies, action items and research needs so Arctic Nations and communities can prepare for and respond to marine disasters incidents
  - Participants: 7 Arctic states/3 indigenous nations, governments, NGOs, private sector
  - Scenarios: oil tanker collision, cruise ship grounding, oil rig fire, tug/barge accident, fishing vessels trapped in ice
  - Agreement on 11 overarching conclusions used directly by:
    - Arctic Maritime Shipping Assessment
    - Arctic Council



# Oil-in-Ice: Behavior, Biodegradation and Potential Exposure Research



## Participation in Joint Industry Project:

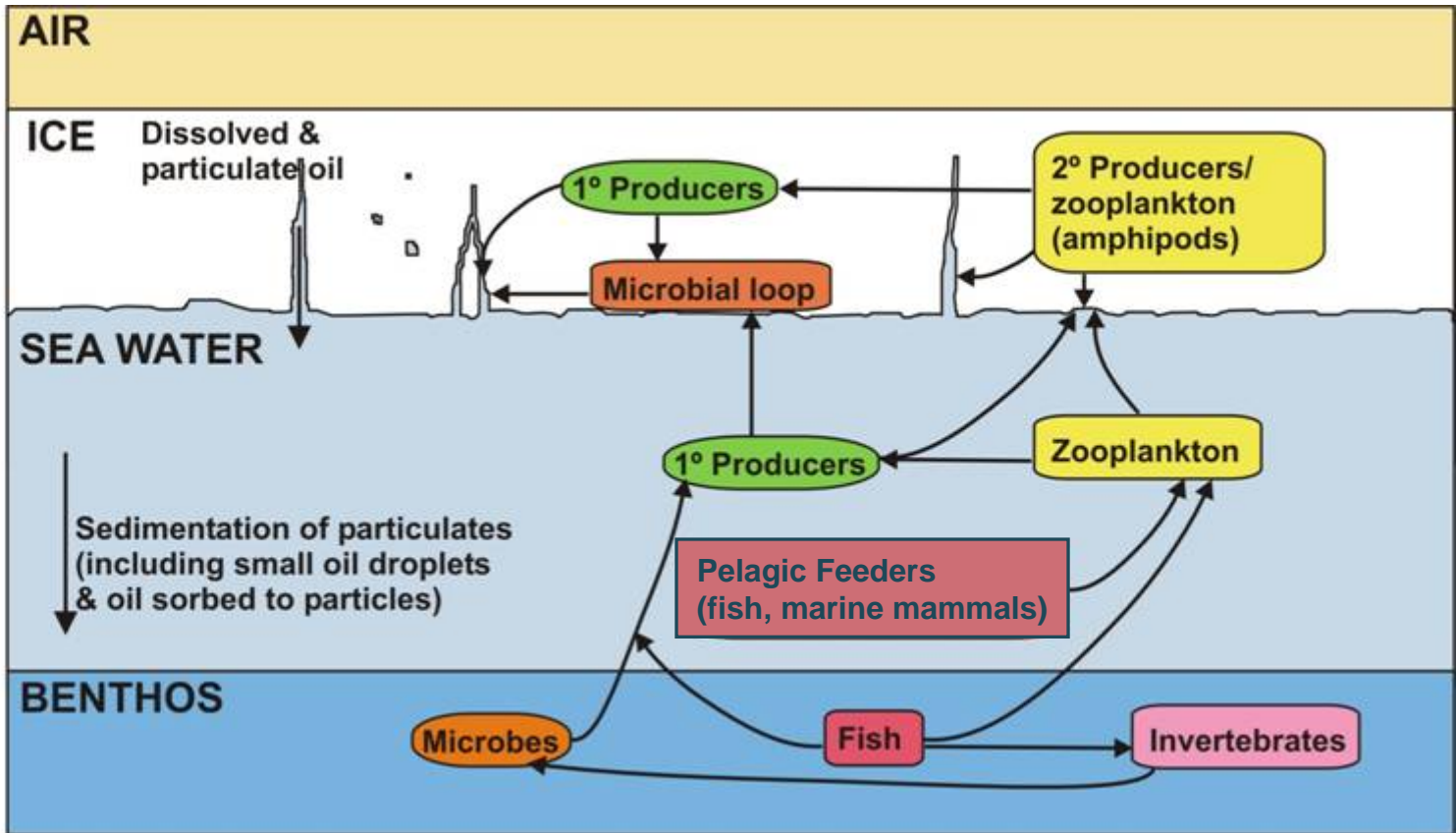
- \$6+M
- Norwegian, Canadian, French, U.S., Russian participants
- Industry and Government partnership



# Conceptual Model Arctic Food Web Cycle

Surface

Water depth

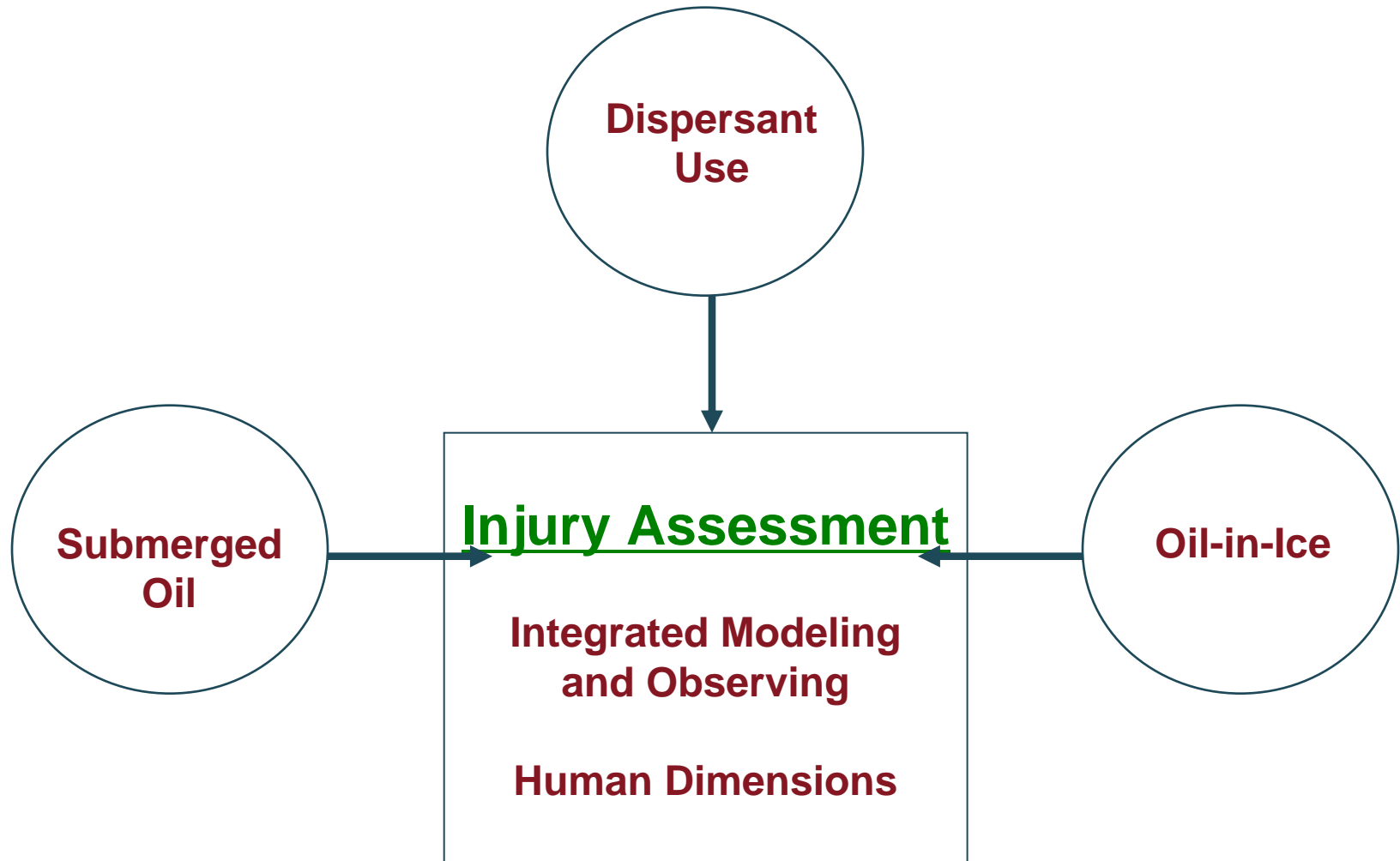


# Oil-in-Ice: Behavior, Biodegradation and Potential Exposure

- Questions We Want to Answer?
  - What is behavior of oil in ice?
  - What are transport & degradation processes and rates that control fate of oil frozen in ice?
  - What are exposures and effects for ice-related organisms?
  - How will response options affect exposure?



# Focus Topics



# Oil Toxicity Field Guide for Aquatic Habitats

- Proof-of-Concept project designed to display oil toxicity information
- Consistent and easily searchable format
- Field guide and accompanying CD with additional data





# Functions of Manual

- Communication of synthesized toxicity information to stakeholders
  - Federal, State, and local responders
  - Responsible parties
- Training of various personnel about acute effects of oil compounds to aquatic species
- Rapid evaluation of toxicity thresholds in freshwater and salt water



# Example Scenario

- Cosco Busan oil spill (Nov. 2007)
- 58,000 gallons of heavy fuel oil
- San Francisco Bay Area
  - Dungeness Crab season
- Information collected
  - Source oil composition
- Is there a potential hazard to the crab catch this season?



*Photo courtesy: NASA*

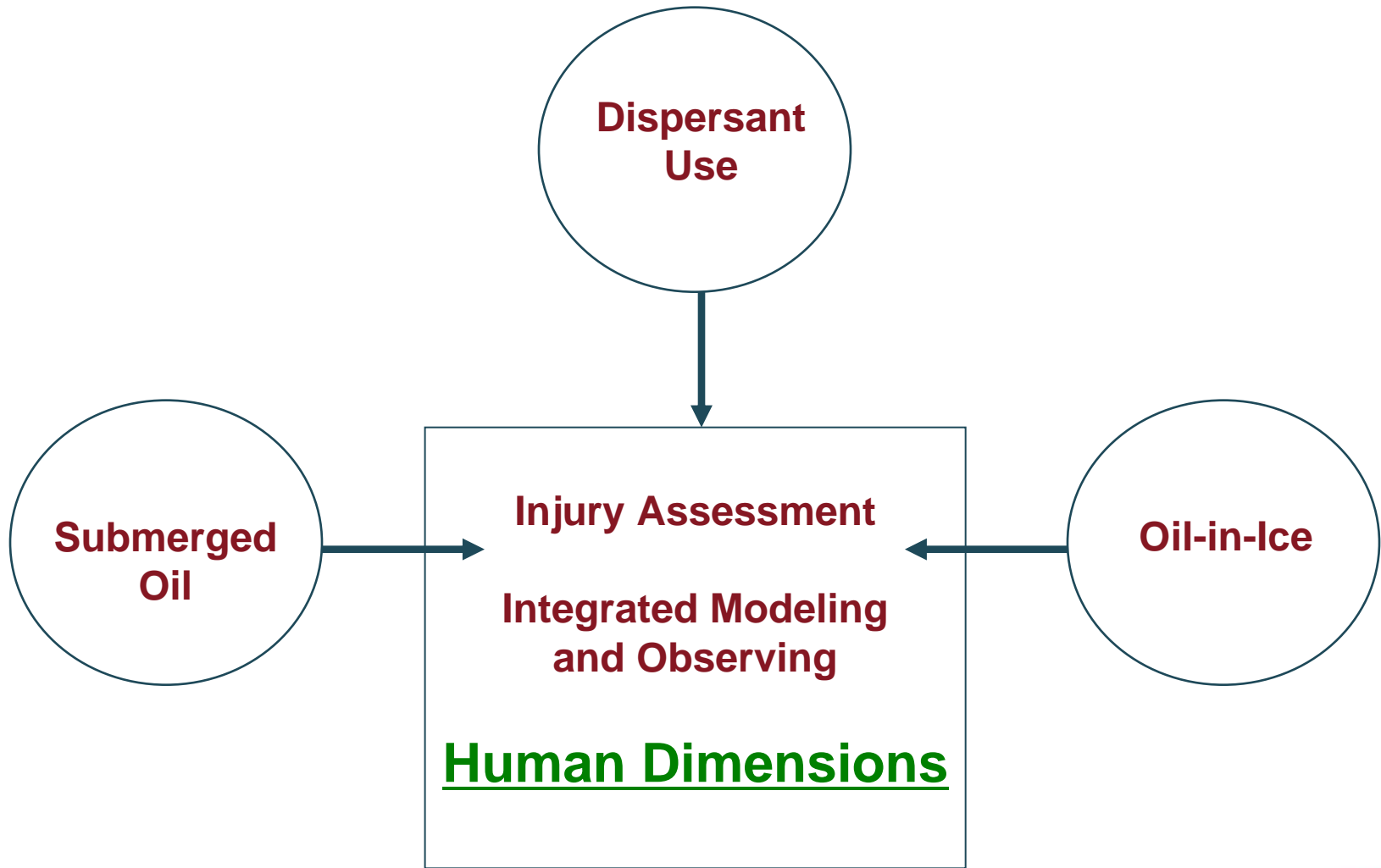


# Testing/Future of Project

- Tested successfully at Mississippi River spill in New Orleans last month
- Testing will continue through NOAA ORR
- Future improvements for guide:
  - Oil weathering models
  - CD with complete database and copies of source literature
  - Website
  - Continuing updates of database for both PAH toxicity levels and source oil compositions



# Focus Topics



# Problem

- Need for greater focus on human dimensions in state and national response process
- Projected increase in frequency and severity of oil spills
  - Natural disasters (e.g., hurricanes)
  - Subsidence
  - Aging infrastructure



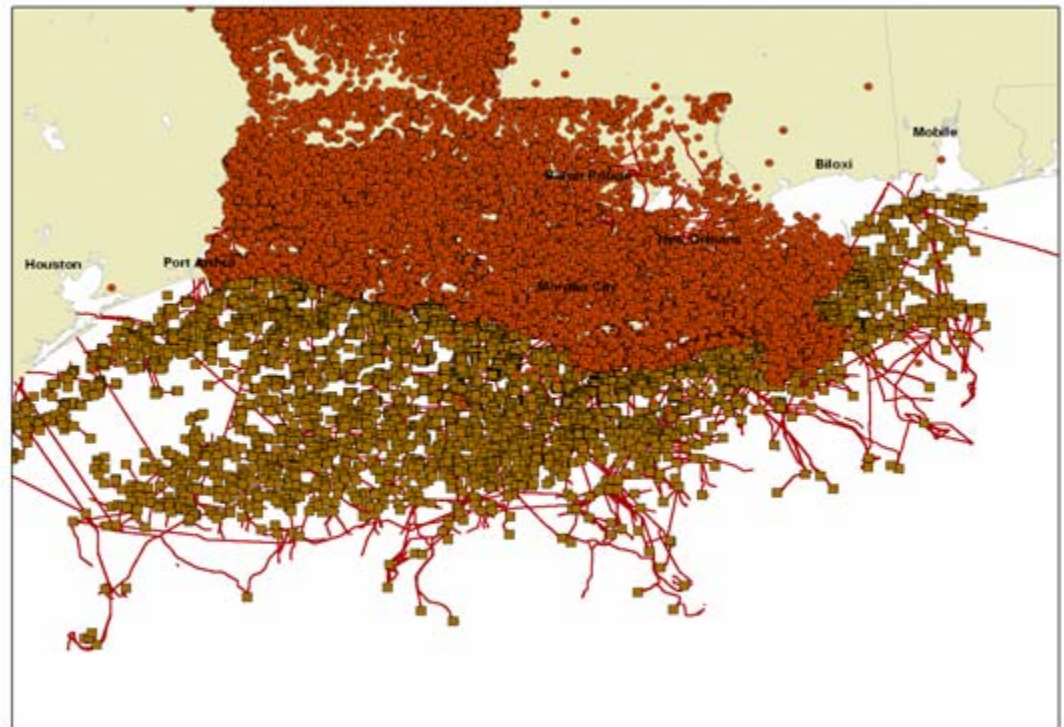
# Proposed Solution

- Enhance communications between NOAA OR&R and Sea Grant.
  - Link national, state, and local levels
  - Create more unified planning, response and restoration
- Sea Grant agents know unique set of potential oil spill stakeholders associated with:
  - Natural resources
  - Tourism and recreation
  - Cultural ties to community



# Origins of LA Sea Grant/ORR Project

- Pilot for nation-wide Sea Grant/ORR activities



# Spill Protocol

- NOAA ORR receives spill notification
- ORR personnel email spill information to Sea Grant extension agents (e.g., size, location, time of discharge)
- Sea Grant agents decide how to use the information (who to notify)





# Applications

- 2 spills since June meeting
- Grand Isle
  - Information passed on to Port Commissioners in Grand Isle and Port Fourchon
- Mississippi River at New Orleans
  - High media attention
  - But low environmental impacts explained and less stakeholder alarm thus far



# Coastal Response Research Center Website

[www.crrc.unh.edu](http://www.crrc.unh.edu)

