Marine Operations: Multiple Uses
Regional Association Activities Supporting Marine Operations: Multiple Responses - Navigation, Safety and Efficiency

- Real Time Sea State Conditions
- Customized Products Integrating observations and model forecasts
- Emergency Response
- Beach Safety
- Ship Tracking
Operational Partnerships Integrating IOOS Data: Multiple Delivery Methods

National Data Buoy Center

• Serving non-federal data from RAs
• Over 50% of data served by NDBC is from external partners, enabled by IOOS DMAC

Integrating IOOS data into NOAA’s PORTS

• Waves: Chesapeake, San Francisco, Long Beach/Los Angeles and Mouth of Columbia River (through MOU with USACE & PORTS)
• Currents: underway for NY/NJ Harbor
• Methodology established that allows for other sites to be incorporated
Commonalities Across Regions: IOOS Sponsored 2 National Plans

- Developed with community support from academia, regions, and federal agencies (ACT facilitated plans)
- Identified critical gaps, technical needs and data management requirements
- Includes estimated cost based on decades of experience
- Framework to facilitate leveraging
San Francisco

Safety, Economics, Environment

CDIP Point Reyes Buoy

CDIP San Francisco Bar Buoy

USACE disposal site

Long Period Swell

Short Period Seas

USACE Project Site (Regional Sediment Management)

NOAA 46026
San Francisco Wave Map Browser

Safety, Efficiency

Understanding of Management Issues
San Francisco - SAFETY

Marine Incidents (rescues) near SF Bar

Data supplied by the Coast Guard. Assimilated and Disseminated by the SF NWS Office.
“This buoy allows for safer transits, safer pilot boat operations, and efficiency for the shippers that call at San Francisco Bay.”
Captain Bill Greig

“The valuable information available from this weather buoy plays a very crucial roll in my decision that relates to safe navigation of ships across the bar.” Captain Carl Martin, Jr.

“This station has been a great benefit to me as a San Francisco Bar Pilot in route planning and risk assessment.” Captain H.W. Kenyon
U.S. Coast Guard: Search And Rescue Optimal Planning System

National HF Radar Network – 151 Sites

Mid-Atlantic Operational Data Flow to SAROPS

SAROPS 96-Hour Search Area: **HYCOM = 36,000 km²**

SAROPS 96-Hour Search Area: **HF Radar = 12,000 km²**

Responders
IOOS Mid-Atlantic Bight: *High Frequency Radar (HFR) Coverage*

### Annual Coverage Changes:

**2008 to 2009** – Increase due to a focus on resiliency

**2009 to 2010** – Decrease due to a lack of spares

### USCG Coverage Target:
- **80% Spatial Coverage**
- **80% of the Time**

### Staffing Requirements:
- **MAB HFR Network** = 14 LR HFRs + 14 SR HFRs.
- National HFR Plan Recommends 8 Technicians.
- IOOS Currently Supports 3 Technicians.
IOOS Coordinated Rapid Response: *Deepwater Horizon Oil Spill*

In 12 days, IOOS coordinated response resulted in 6 operating HF Radars in 2 networks.
Contributed Assets:

HF Radar Networks
  USF, USM
Gliders
  iRobot, Mote, Rutgers, SIO/WHOI, UDel, USF
Drifters & Profilers
  Horizon Marine, Navy
Satellite Imagery
  CSTARS, UDel
Ocean Forecasts
  Navy, NCSU
Data/Web Services
  ASA, Rutgers, SIO

Tropical Storm Bonnie crosses the Gulf of Mexico

USM HFR validation of SABGOM Forecast in region with satellite detected oil slicks

HFR used for Oil Slick Forecasts by NOAA/NOS/OR&R
**IOOS Surface Current Mapping Applications: Derived Products**

**Water Quality**

- Tracking pollution from the Tijuana River plume in Southern California

**Fisheries**

- Are there preferred locations for the fall Squid migration to the Middle Atlantic Bight outer continental shelf?

- **IOOS + NMFS data indicate** Squid prefer persistent upwelling zones.

**3-Day Plume Dispersion**

- Day 0
- Day 3

**Persistent Divergence (Upwelling)**

- Positive Correlation w/ Upwelling

- Negative Correlation w/ Downwelling

- Persistent Convergence (Downwelling)
Discussion Questions

1. How do we continue to build the IOOS partnerships that support Maritime Operations?

2. How can we move forward with implementation of The National Wave Observation Plan and The National Surface Current Mapping Plan?

3. Are there additional National Plans that support Maritime Operations that IOOS could coordinate?
   - Data Based – Water Levels.
   - Technology Based – Gliders.
   - Product Based – Ocean Current Forecast Ensembles.

4. What additional data acquisition, aggregation and product delivery methods can be leveraged to support Maritime Operations? How can this be facilitated?