



# Pacific Northwest Waters *Gateway to Our Future*

## Why We Are Here

**David Martin**  
**Chair, NANOOS Board**



# Outline

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- The U.S. Integrated Ocean Observing System (IOOS<sup>®</sup>)
  - Vision
  - Structure
  - Components
  - Drivers and Examples
- Payoffs and Outcomes
- Why we are here



# *Beginning with the Vision*

## *Seven goals, one system*

- » Improve predictions of **climate change and weather** and their effects on coastal communities and the nation
- » Improve the safety and efficiency of **maritime operations**
- » Improve forecasts of **natural hazards** and mitigate their effects more effectively
- » Improve **national defense and homeland security**
- » Minimize **public health risks**
- » Protect and restore **healthy coastal ecosystems** more effectively
- » Sustain living marine **resources**

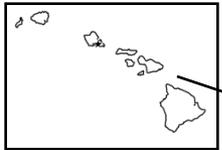
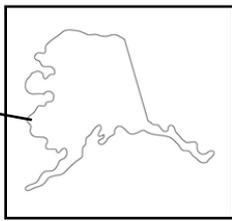
# The Integrated Ocean Observing System “IOOS”

- IOOS has both a **regional** and a **federal** footprint
- This strategy allows both:
  - Local connection with regional stakeholders
  - National consistency
- **Regional** presence is via 11 Regional Associations, who collaborate together under the National Federation of Regional Associations (NFRA)
- **Federal** agencies also contribute to IOOS; the US IOOS office in NOAA funds and coordinates the RAs

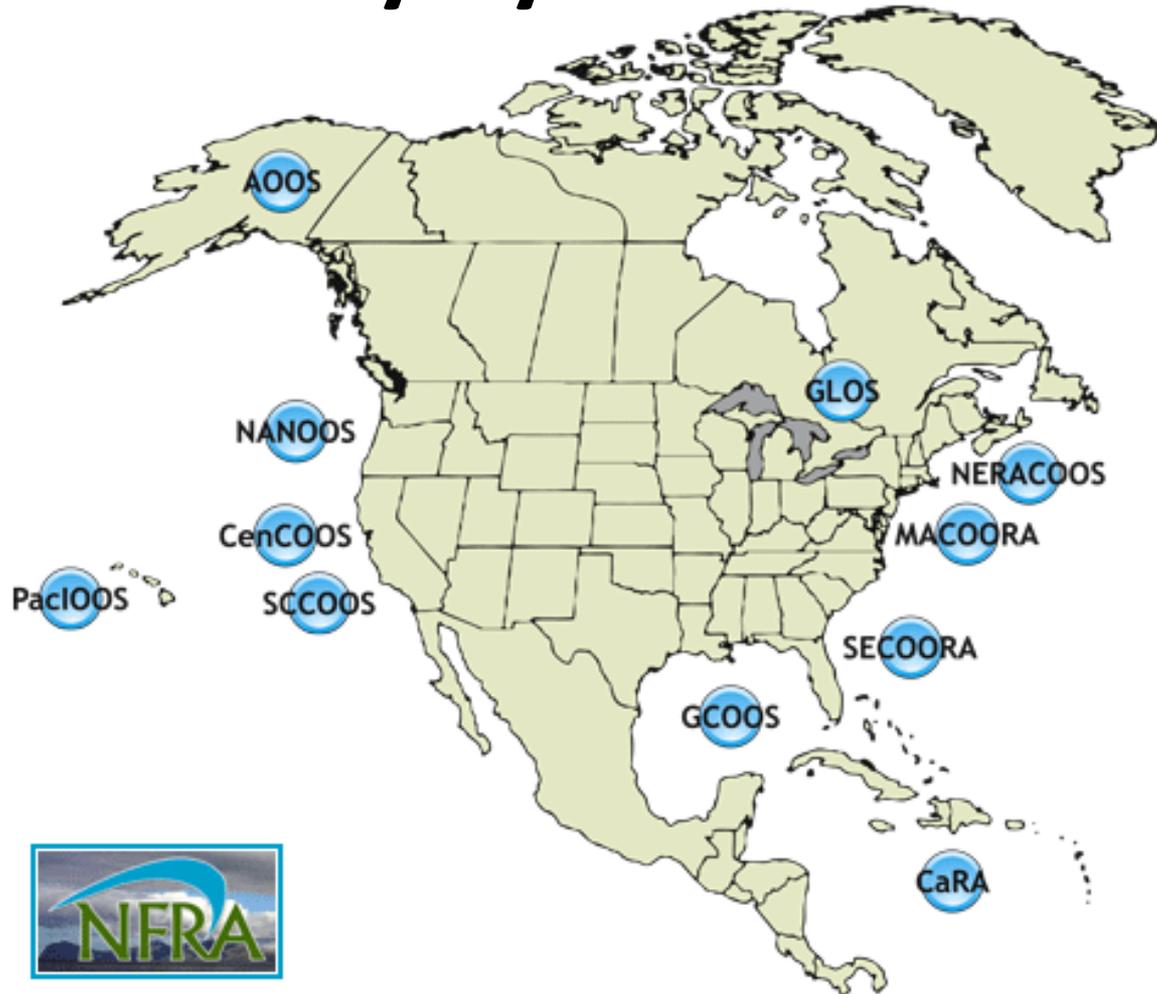


# U.S. IOOS<sup>®</sup> consists of National and Regional Components

**AOOS**  
Alaska Ocean Observing System



# IOOS Regional Associations coordinated nationally by US IOOS office



## IOOS FEDERAL PARTNERS:



# IOOS Observing System

- Various Modes of Observing Assets
- Distributed Data Management and Communication (DMAC)
- Modeling, Analysis, and Products
- Education and Outreach

*all prioritized and driven by users*



INTEGRATED OCEAN OBSERVING SYSTEM



# OBSERVATIONS



# DMAC & ANALYSIS PRODUCTS



INTEGRATED OCEAN OBSERVING SYSTEM

# EDUCATION & OUTREACH



INTEGRATED OCEAN OBSERVING SYSTEM

# Marine Operations

## *IOOS works to:*

- Promote safe and efficient marine commercial shipping and recreational boating
- Support Coast Guard search and rescue and NOAA spill response
- Inform offshore energy planning and operations

**NEED:**

*U.S. Coast Guard Search-And-Rescue operations*

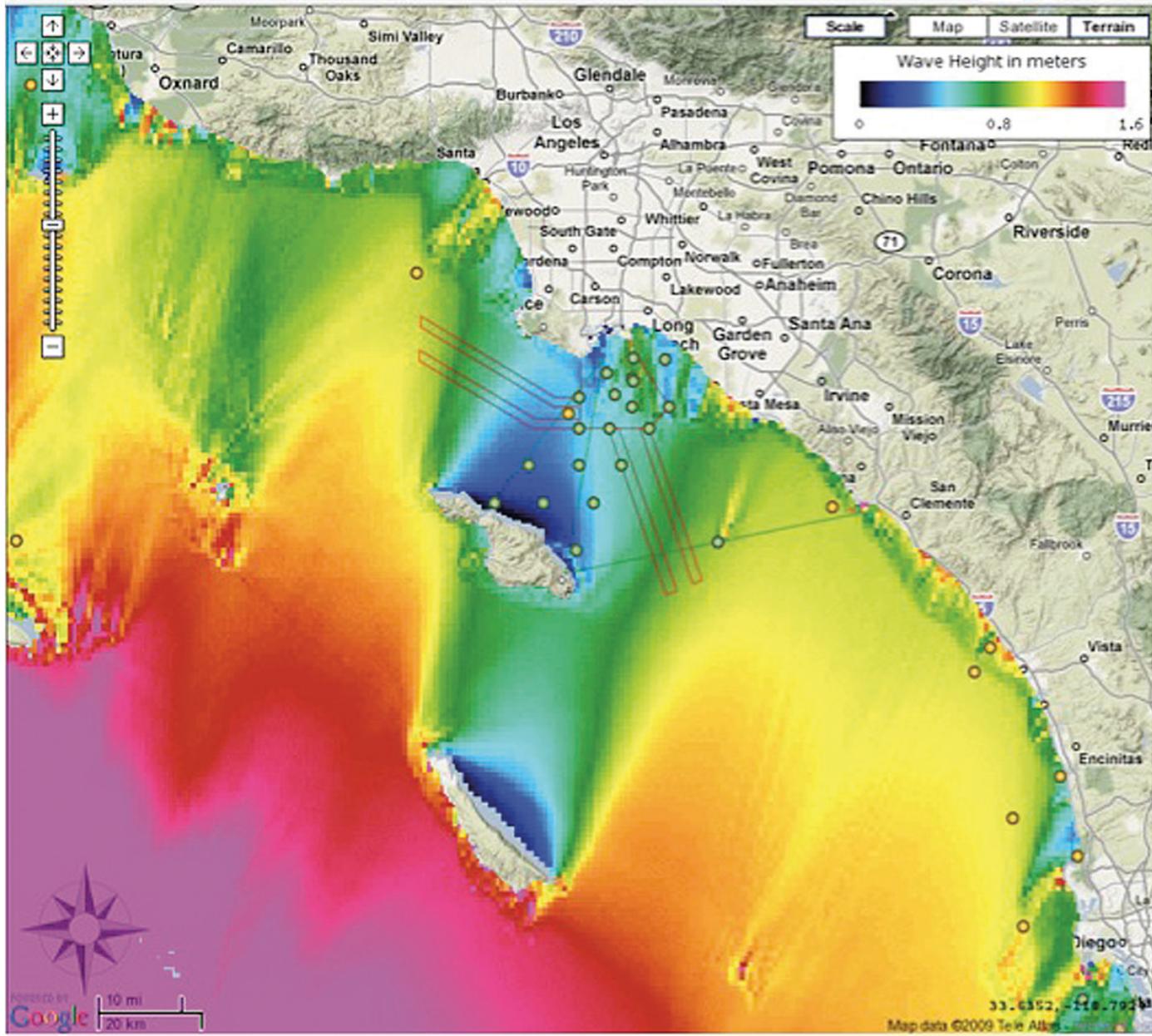


# OBSERVATION:

*Land-based high-frequency radar antennae*



# PRODUCT: *sccoos 100S modeled product on wave height*



# Climate

## *IOOS works to:*

- Support regional climate status and trends
- Provide national climate experts with regional measurements
- Provide coastal communities with more accurate estimates

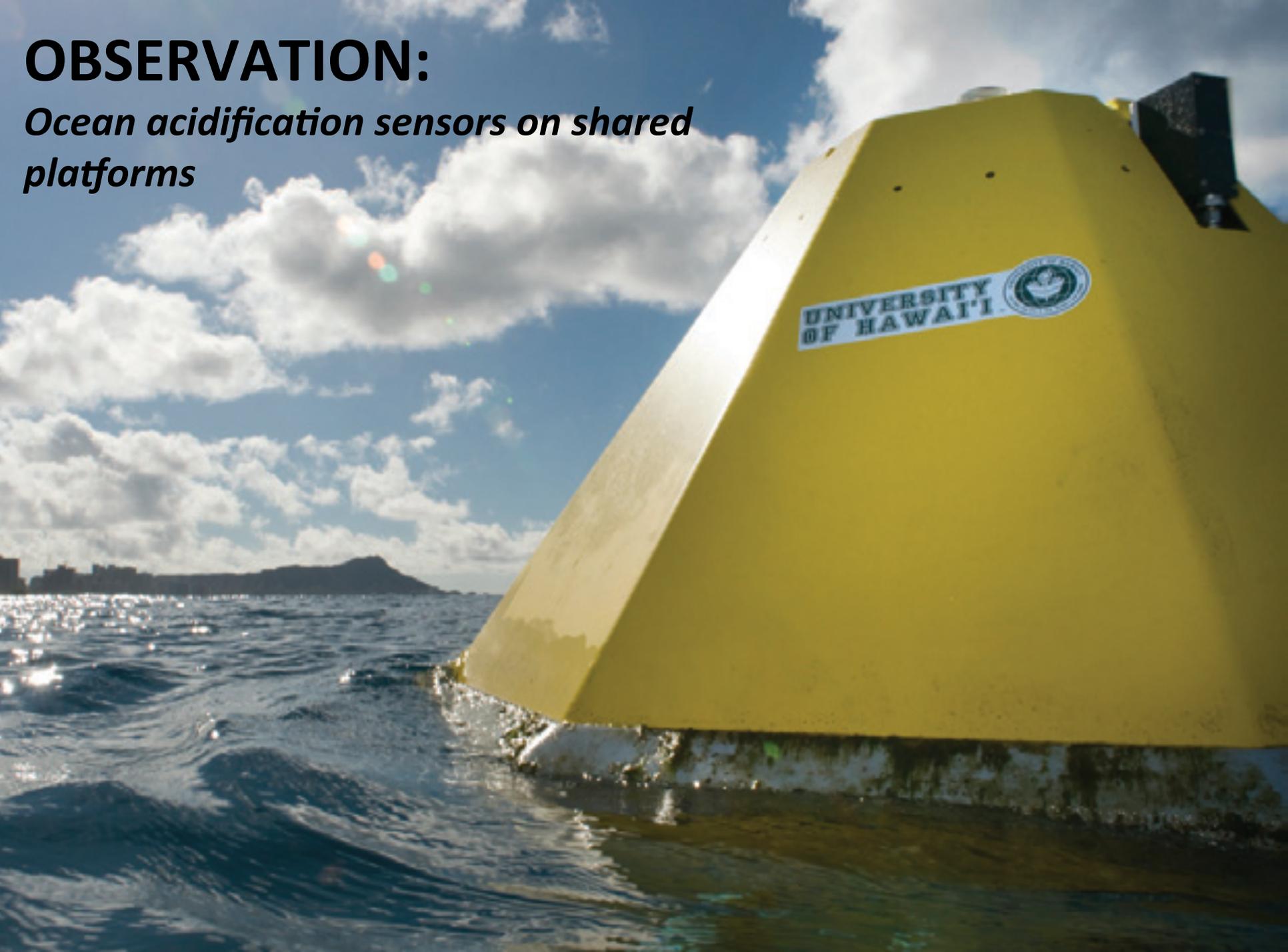
# NEED:

*Marine ecosystems are highly sensitive to climate variation*

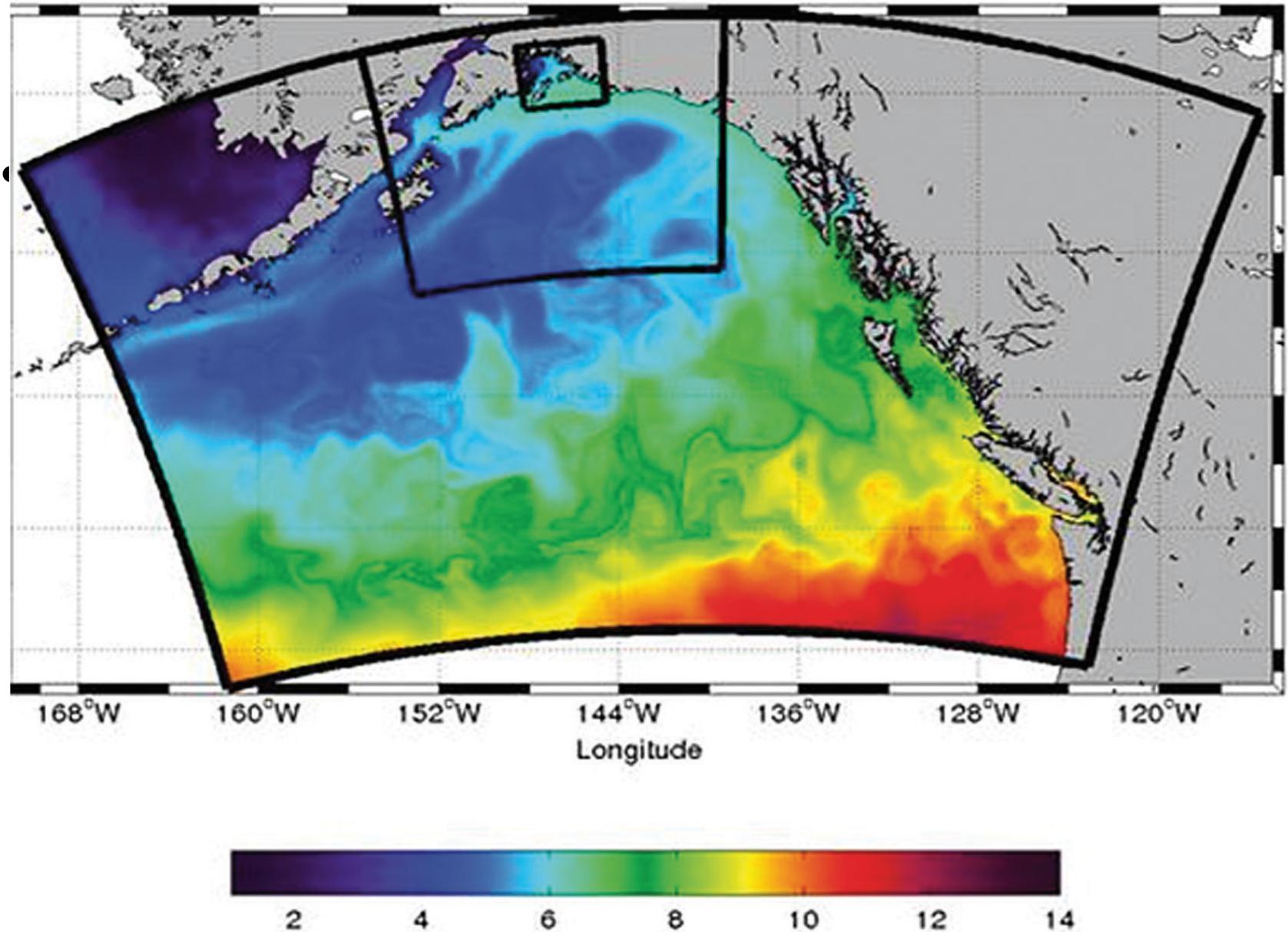


# OBSERVATION:

*Ocean acidification sensors on shared platforms*



# PRODUCT: *AOOS IOOS nested models link global to local*



# Ecosystems, Fisheries & Water Quality

## *IOOS works to:*

- Minimize potential harm from HABs, hypoxia, ocean acidification, etc. via early warnings
- Support ecosystem-based management
- Support protection of drinking water supplies
- Assist public health officials, resource managers and public users via data access

# **NEED:**

*More than 40 million people depend on  
the Great Lakes for drinking water*



# OBSERVATION:

*Water quality monitoring buoys*



# PRODUCT: *Real-time data and models provide public health and safety information*



# Coastal Hazards

## *IOOS works to:*

- Promote safe and efficient marine commercial shipping and recreational boating
- Support Coast Guard search and rescue and NOAA spill response
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# NEED:

*Erosion and other coastal hazards create risk to property and lives*



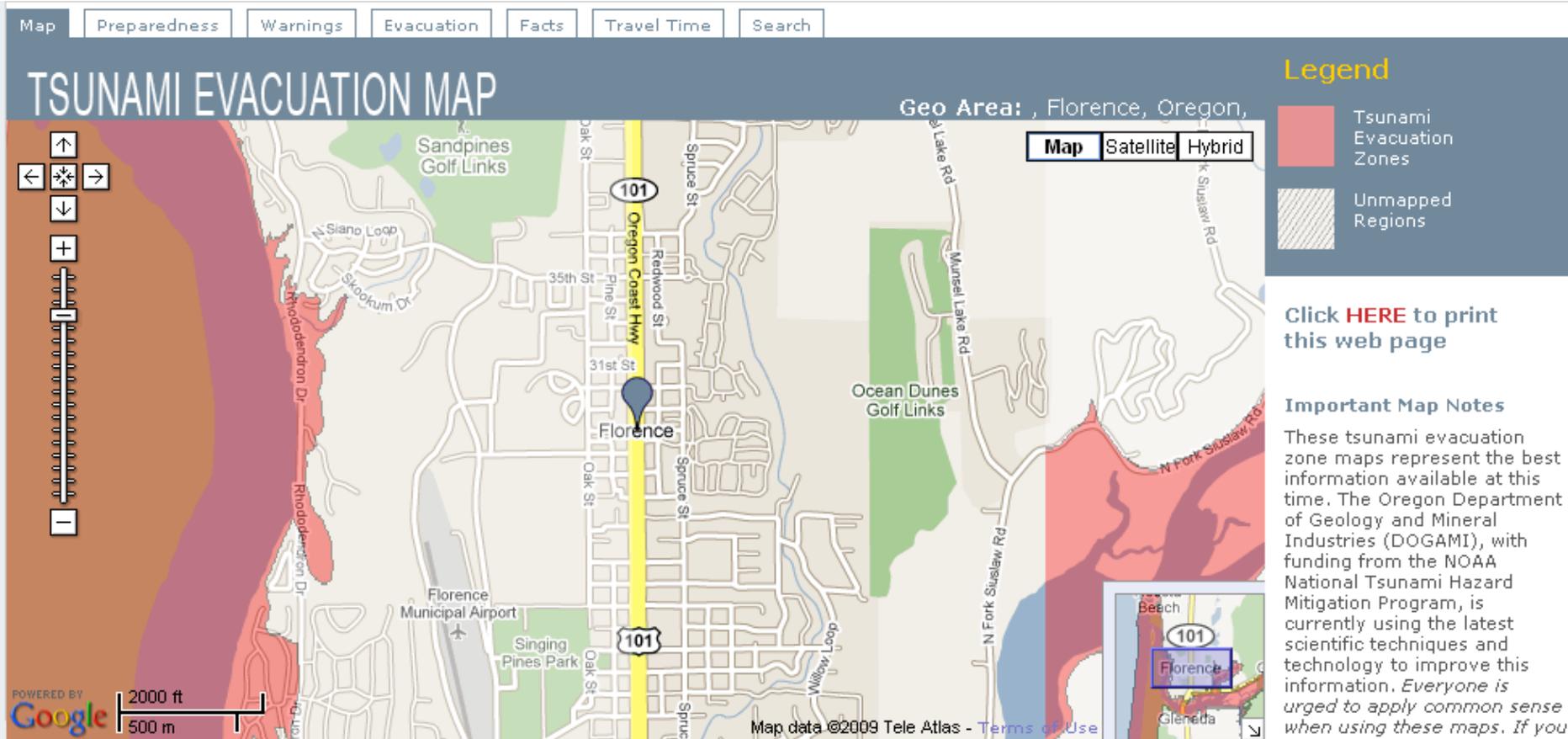
# OBSERVATION:

*Shoreline and beach mapping*



# PRODUCT:

## *NANOOS IOOS Tsunami inundation zones and evacuation map*



**ATTENTION:** If you are in the tsunami evacuation zone or a low-lying coastal area during a strong earthquake get to high ground outside of the tsunami evacuation zone immediately; a tsunami could reach the shore within minutes.

# Coastal and Marine Spatial Planning

## *IOOS works to:*

- Promote safe and efficient marine commercial shipping and recreational boating
- Support Coast Guard search and rescue and NOAA spill response
- Inform offshore energy planning and operations



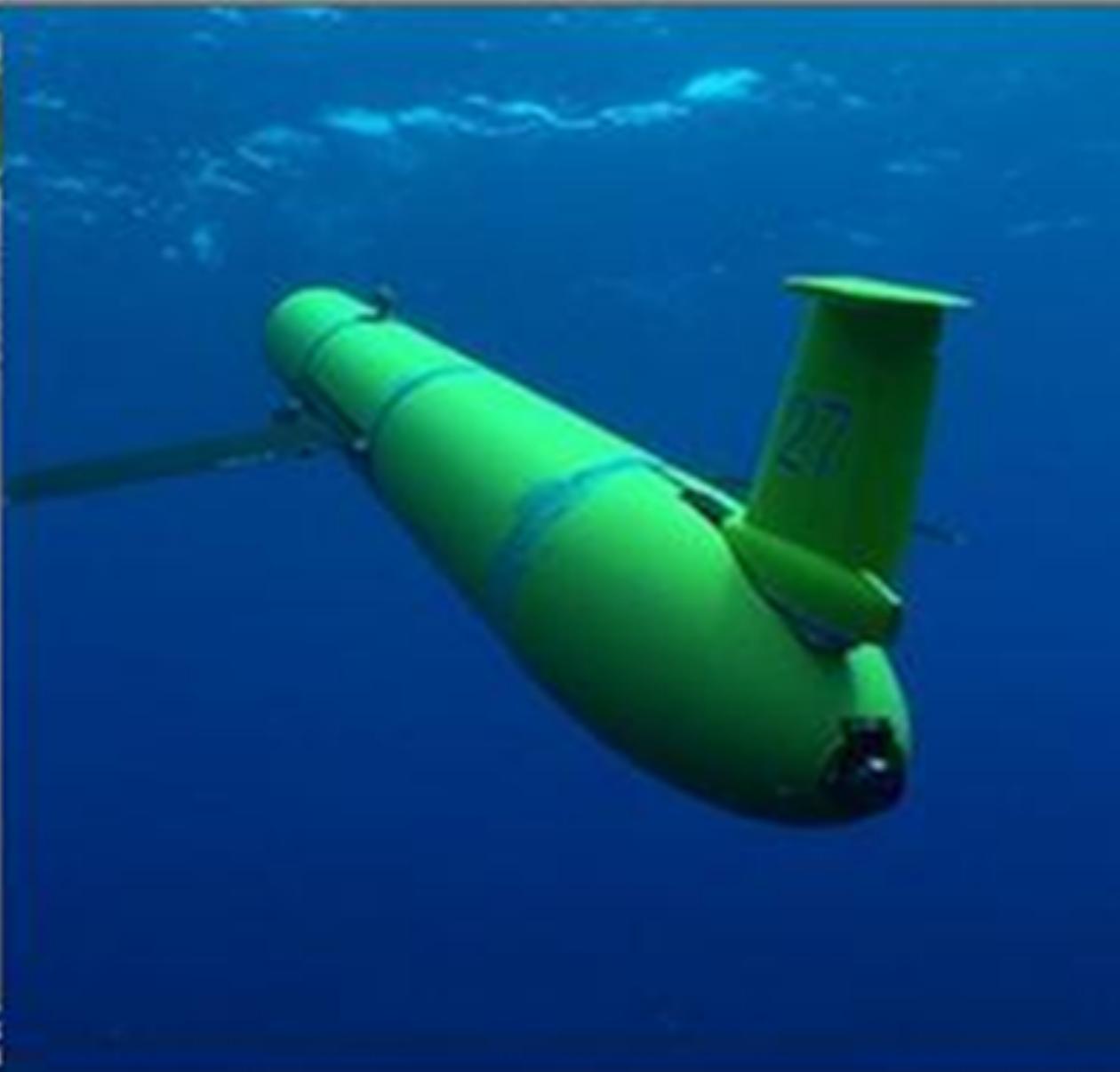
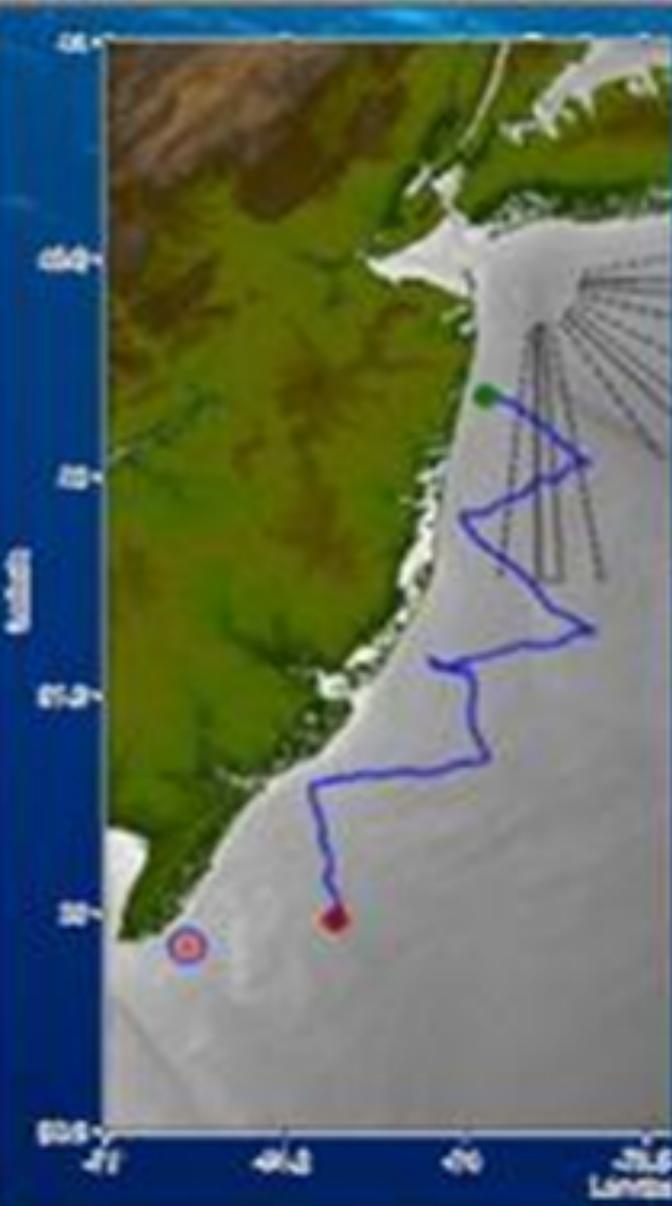
# NEED:

*Allow for multiple uses of our marine environment  
while minimizing potential conflicts*

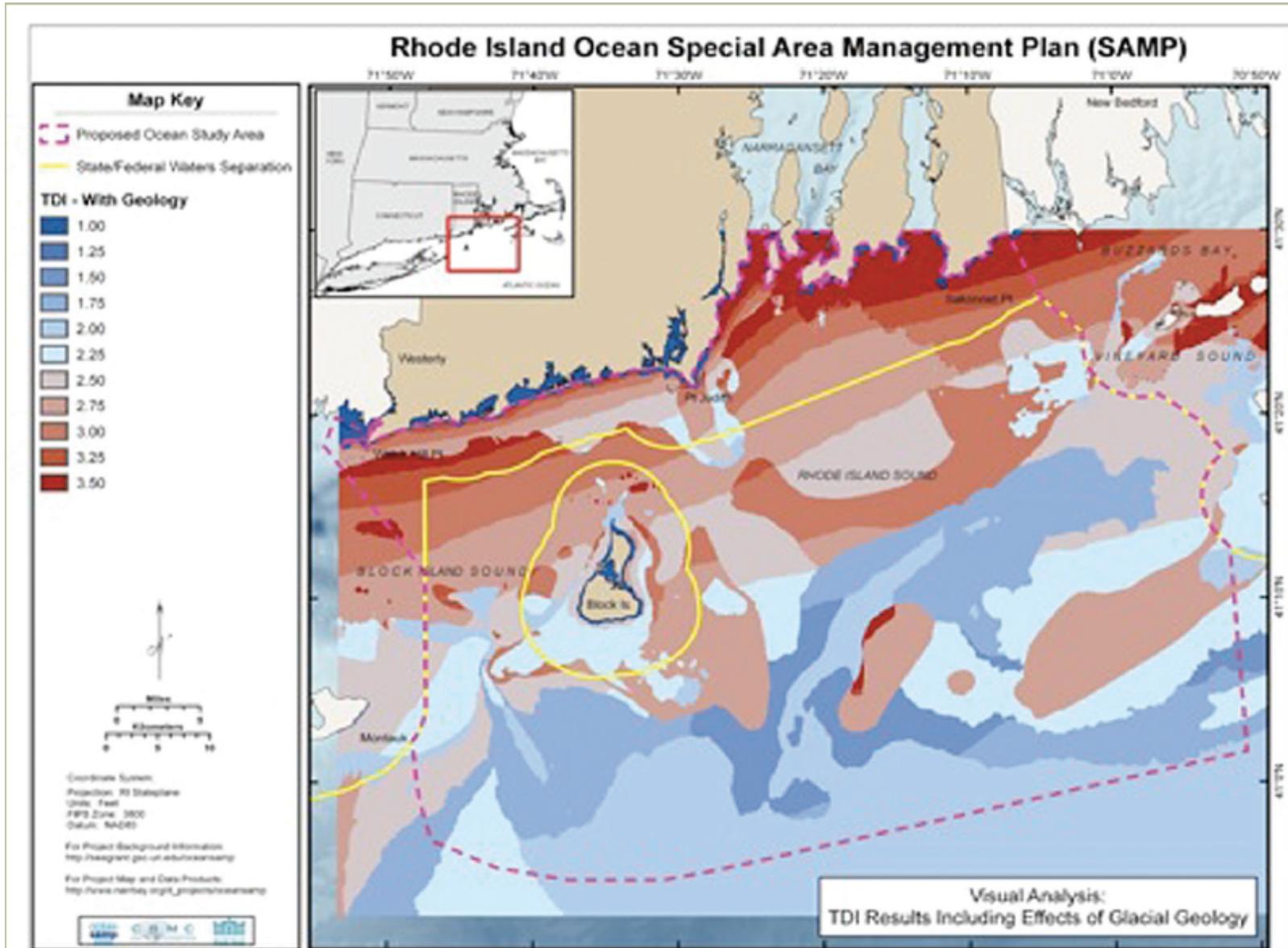


# OBSERVATION:

*AUV and ROV surveys along the coast*



# PRODUCT: *NERACOOS IOOS Technology Development Index map for wind energy development*



# IOOS System Payoff

## *Major IOOS benefits:*

- Increased **efficiencies** for data access
- Local **connections** with national **coordination**
- Significant **leverage** of IOOS investments
- **Linkage** of existing assets into a system

# IOOS Outcomes

- **ECONOMY**: IOOS unlocks the economic and business benefits of the ocean.
- **SAFETY**: IOOS helps ensure citizens' safety and security now and into the future
- **ENVIRONMENT**: IOOS is key to protecting our environment for future generations



# ECONOMY

- ✓ Enables forecasts that mariners can use to optimize **shipping routes**.
- ✓ Improves predictions that **farmers** can use to decide what crops to plant.
- ✓ Provides information on the siting and monitoring of offshore **energy facilities**.
- ✓ Supports **tourism and marine recreation** by providing safety and health alerts, and data to enhance the recreational experience.



# ENVIRONMENT

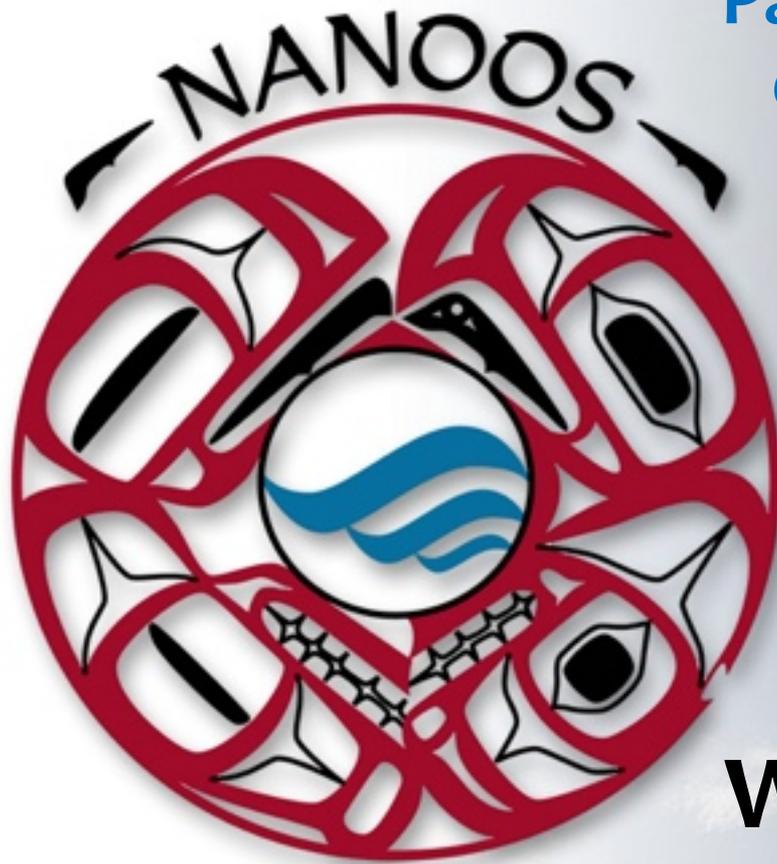
- ✓ Provides ongoing monitoring to understand and predict **climate change** effects.
- ✓ Improves tracking of **oil spills** and other pollutants.
- ✓ Provides information that mariners can use to reduce the risk of **vessel groundings**.
- ✓ Makes it possible to forecast **toxic algae outbreaks**.



# SAFETY

- ✓ Allows better **predictions of severe weather** so people can get to safety before disaster strikes.
- ✓ Helps **search-and-rescue** crews track the probable path of someone lost at sea.
- ✓ Part of the Common Operational Picture (COP) to improve **homeland security**.





## Pacific Northwest Waters *Gateway to Our Future*

### Why We Are Here

1. Educate & Inform
2. Hear from users
3. Encourage Agency Involvement