Northwest Association of Networked Ocean Observing Systems

The IOOS Regional Association for the Pacific NW

IOOS Regional Association for the Pacific Northwest

NANOOS

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Washington State Dept. of Ecology / University of Washington

May 5, 2004

A brief history of IOOS

- NOPP established by law in 1997
- NORLC oversight of NOPP
- NORLC recommends an IOOS in 1998-9
- NOPP establishes Ocean.US in 2000 to implement IOOS
- IOOS to have two components:
  - National Backbone
  - Regional Associations

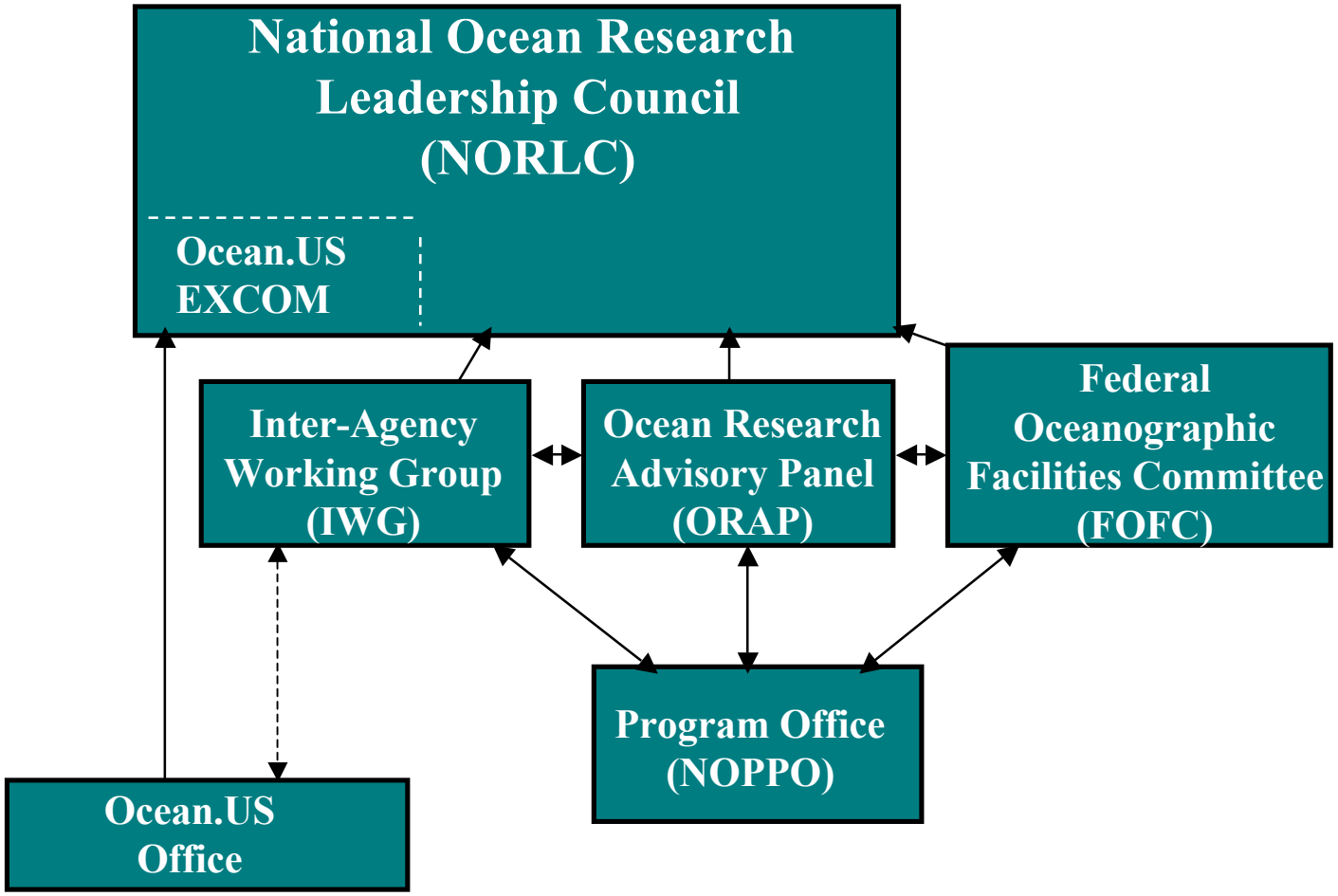
Background: NOPP

The National Oceanographic Partnership Program (NOPP) was established by Legislation in Public Law 104-201 [FY 1997 National Defense Authorization Act]

1. To Promote the National Goals of:
   - Assuring National Security
   - Advancing Economic Development
   - Protecting the Quality of Life
   - Strengthening Science Education and Communication through Improved Knowledge of the Ocean

2. And to Coordinate and Strengthen Oceanographic Efforts in Support of these Goals by:
   - Identifying and Carrying out Partnerships among Federal Agencies, Academia, Industry, and other Members of the Oceanographic Scientific Community in the Areas of Data, Resources, Education, and Communication

NOPP Organizational Structure



National Ocean Research Leadership Council (NORLC)

Chair:	**Director, National Science Foundation**
Vice Chair:	**Administrator, National Oceanic and Atmospheric Administration**
Vice Chair	**Secretary of the Navy**
Administrator	**National Aeronautics and Space Administration**
Deputy Secretary	**Department of Energy**
Administrator	**Environmental Protection Agency**
Commandant	**United States Coast Guard**
Director	**United States Geological Survey**
Director	**Defense Advanced Research Projects Agency**
Director	**Minerals Management Service**
Director	**Office of Science and Technology Policy**
Director	**Office of Management and Budget**

Ocean.US Established by NOPP

NORLC-commissioned reports in 1998 & 1999 recommended establishment of a national capability for integrated and sustained ocean observations & prediction.

In May 2000: (1) The NORLC directed the establishment of Ocean.US
(2) Formation of Ocean.US was announced to Congress.

Ocean.US charged to manage the development of an Integrated and Sustained Ocean Observing System (IOOS) for research & operations in the following areas:

- **Detecting and Forecasting Oceanic Components of Climate Variability**
- **Facilitating Safe and Efficient Marine Operations**
- **Ensuring National Security**
- **Managing Marine Resources**
- **Preserving and Restoring Healthy Marine Ecosystems**

Ocean.US MOA Signatories

10/12/00
Robert B. Pirie, Jr. Date
Under Secretary of the Navy
Acting

10/17/00
Dr. D. James Baker Date
Under Secretary of Commerce
for Oceans and Atmosphere

10/24/00
Dr. Rita Colwell Date
Director, National Science Foundation

29 January 2001
Dr. Ghassem Asrar Date
Associate Administrator for Earth Science,
National Aeronautics and
Space Administration

10/25/00
Mr. Walt Rosenbusch Date
Director
Minerals Management Service
Department of the Interior

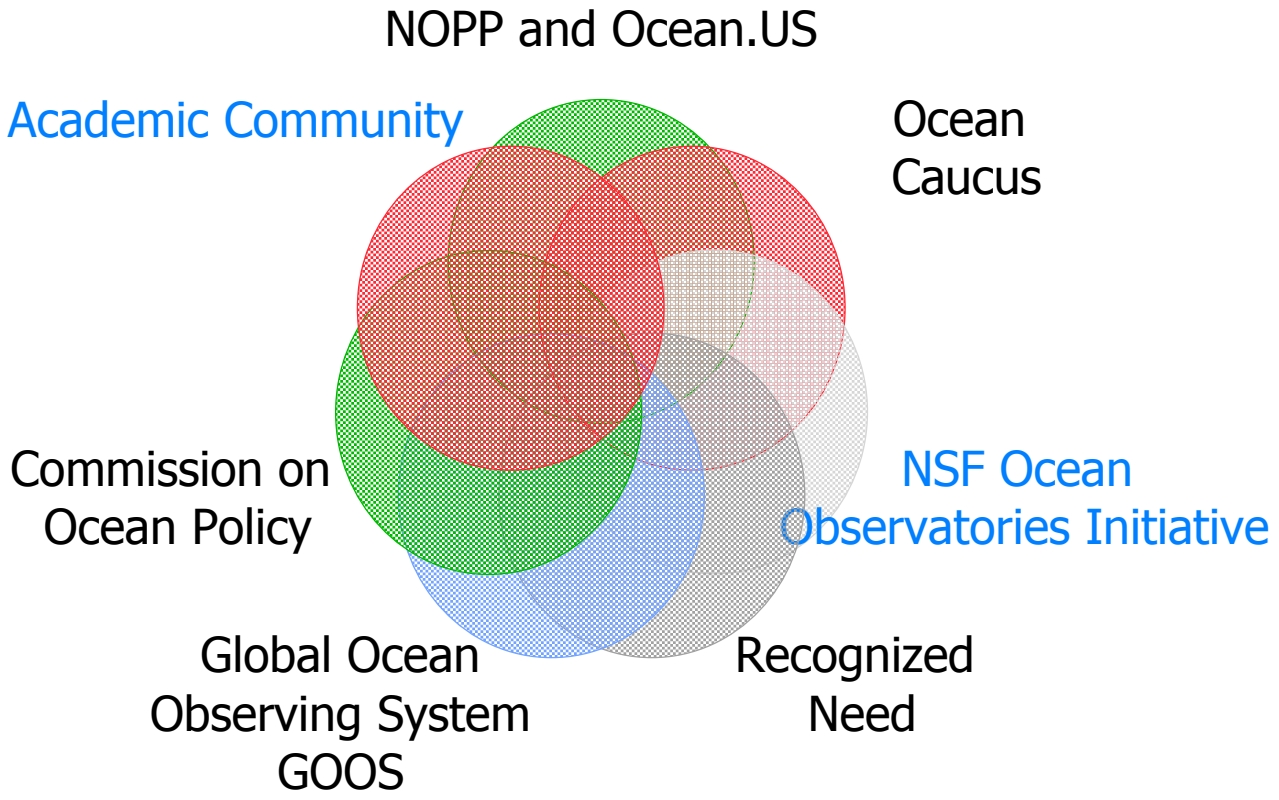
2/1/01
Dr. Charles G. Groat Date
Director
U.S. Geological Survey
Department of Interior

3/19/01
Dr. Ari Patrinos Date
Associate Director for Biological
and Environmental Research
Office of Science
Department of Energy

06/28/01
Terry M. Cross Date
Rear Admiral, U.S. Coast Guard
Assistant Commandant for Operations

11/19/01
Hans A. Van Winkle Date
Major General, U.S. Army
Deputy Commander
U.S. Army Corps of Engineers

Convergence of Interests and Capabilities – Leading to IOOS



Congressional Expectations

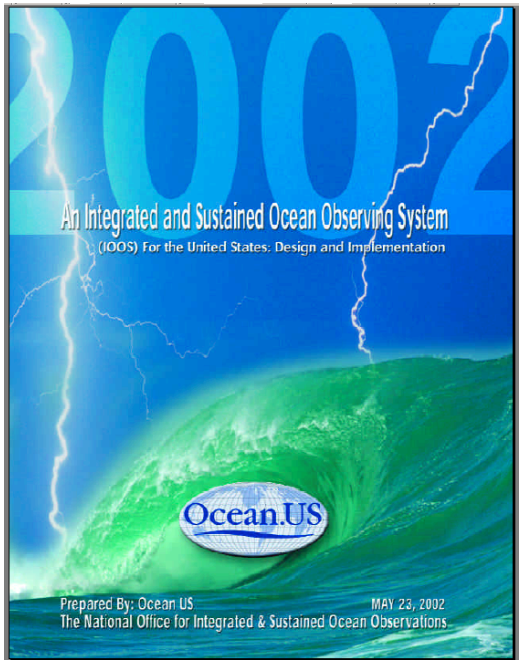
The plan "shall, at minimum

- **include an interagency governance structure;**
- **define the roles and responsibilities of each agency in implementing and operating the system;**
- **provide multi-year funding estimates by agency; and**
- **include a process for regional coordination and technical support to ensure development of integrated regional systems within a national observing initiative."**

Ocean.US Meeting, Airlie House March 2002

An Integrated and Sustained Ocean Observing System (IOOS) for the United States:

Design and Implementation.



Ocean.US

http://www.ocean.us

Design: Prioritization of Variables

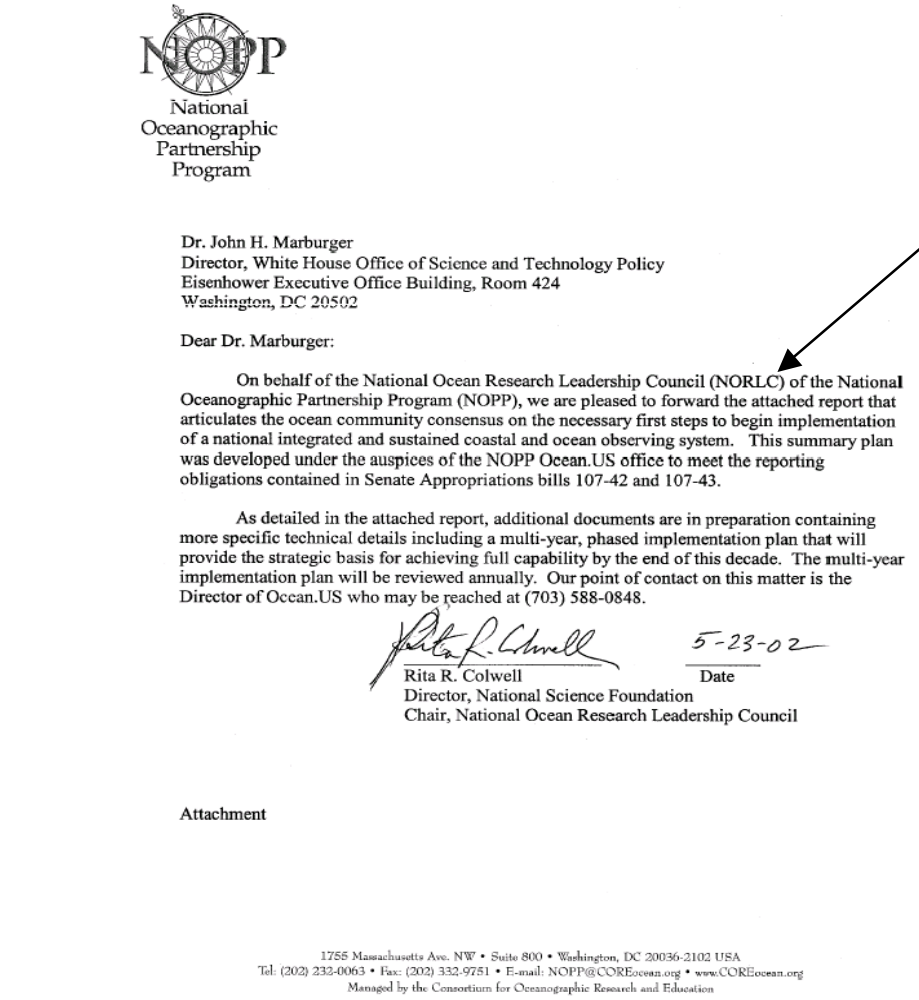
- **Based on technical feasibility and importance, the following core variables were given high priority for incorporation into the national backbone of the IOOS:**
  - Physical: salinity, temperature, bathymetry, sea level, surface waves, vector currents, ice concentration, surface heat flux, bottom characteristics
  - Chemical: water column contaminants, dissolved inorganic nutrients, dissolved oxygen
  - Biological: fish species and abundance, zooplankton species and abundance, optical properties, ocean color, water column concentration of pathogens, phytoplankton species

- **In addition to those variables required to characterize the marine environment, the following variables are required to quantify the external drivers of change on a national scale:**
  - Meteorological: vector winds, temperature, pressure, precipitation, humidity
  - Terrestrial: river discharge
  - Human health and use: seafood contamination

Implementation: Priorities

- **Immediate**
  - Build Regional Systems – pilot projects, start ups
  - Initiate a Data Management and Communications System
  - Enhance existing Federal Systems
  - Fulfill US Commitment to Global system for climate
- **Intermediate**
  - Enable Research identified in many areas
- **Very long term research commitment required**
  - For example: Predictive ecosystem models

Letter to the President's Science Advisor from the NORLC



NOPP
National Oceanographic Partnership Program

Dr. John H. Marburger
Director, White House Office of Science and Technology Policy
Eisenhower Executive Office Building, Room 424
Washington, DC 20502

Dear Dr. Marburger:

On behalf of the National Ocean Research Leadership Council (NORLC) of the National Oceanographic Partnership Program (NOPP), we are pleased to forward the attached report that articulates the ocean community consensus on the necessary first steps to begin implementation of a national integrated and sustained coastal and ocean observing system. This summary plan was developed under the auspices of the NOPP Ocean.US office to meet the reporting obligations contained in Senate Appropriations bills 107-42 and 107-43.

As detailed in the attached report, additional documents are in preparation containing more specific technical details including a multi-year, phased implementation plan that will provide the strategic basis for achieving full capability by the end of this decade. The multi-year implementation plan will be reviewed annually. Our point of contact on this matter is the Director of Ocean.US who may be reached at (703) 588-0848.

Rita R. Colwell — 5-23-02
Rita R. Colwell — Date
Director, National Science Foundation
Chair, National Ocean Research Leadership Council

Attachment

1755 Massachusetts Ave. NW • Suite 800 • Washington, DC 20036-2102 USA
Tel: (202) 232-0063 • Fax: (202) 332-9751 • E-mail: NOPP@COREocean.org • www.COREocean.org
Managed by the Consortium for Oceanographic Research and Education

"On behalf of the National Ocean Research Leadership Council (NORLC) of the National Oceanographic Partnership Program (NOPP), we are pleased to forward the attached report that articulates the ocean community consensus on the necessary first steps to begin implementation of a national integrated and sustained coastal and ocean observing system."

Creating an IOOS

- Within the structure of the National Oceanographic Partnership Program
- Using the leadership of the National Ocean Research Leadership Council
  - While anticipating the recommendations of the Commission on Ocean Policy, and
  - Expecting action by the Legislative and Executive branches.

IOOS Will be an Integrated System

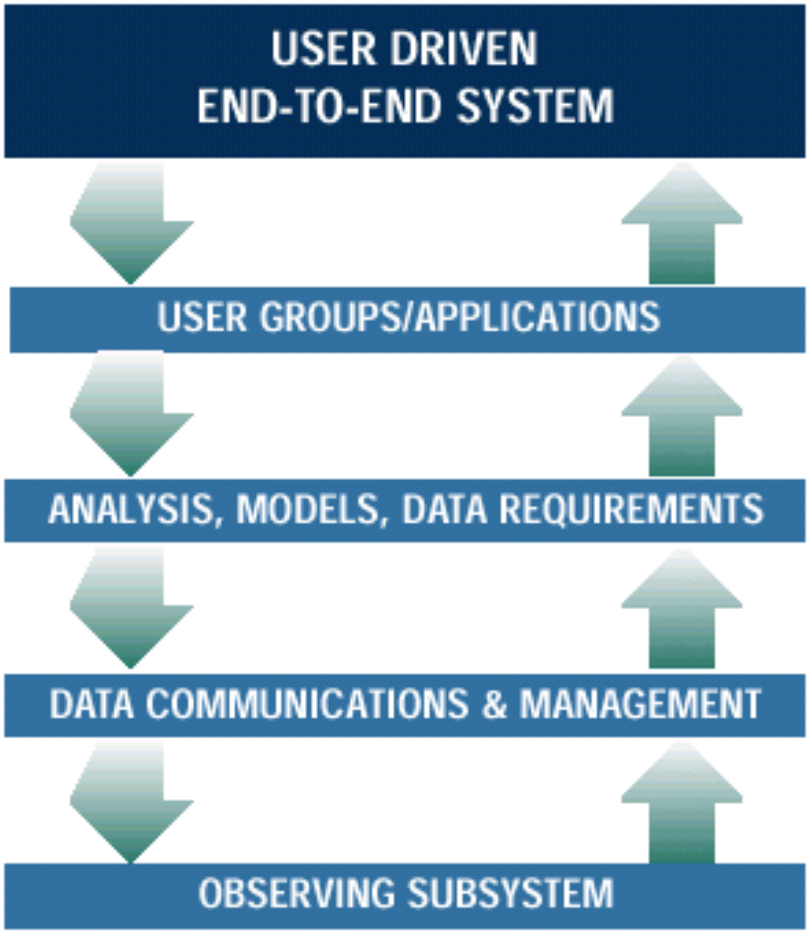
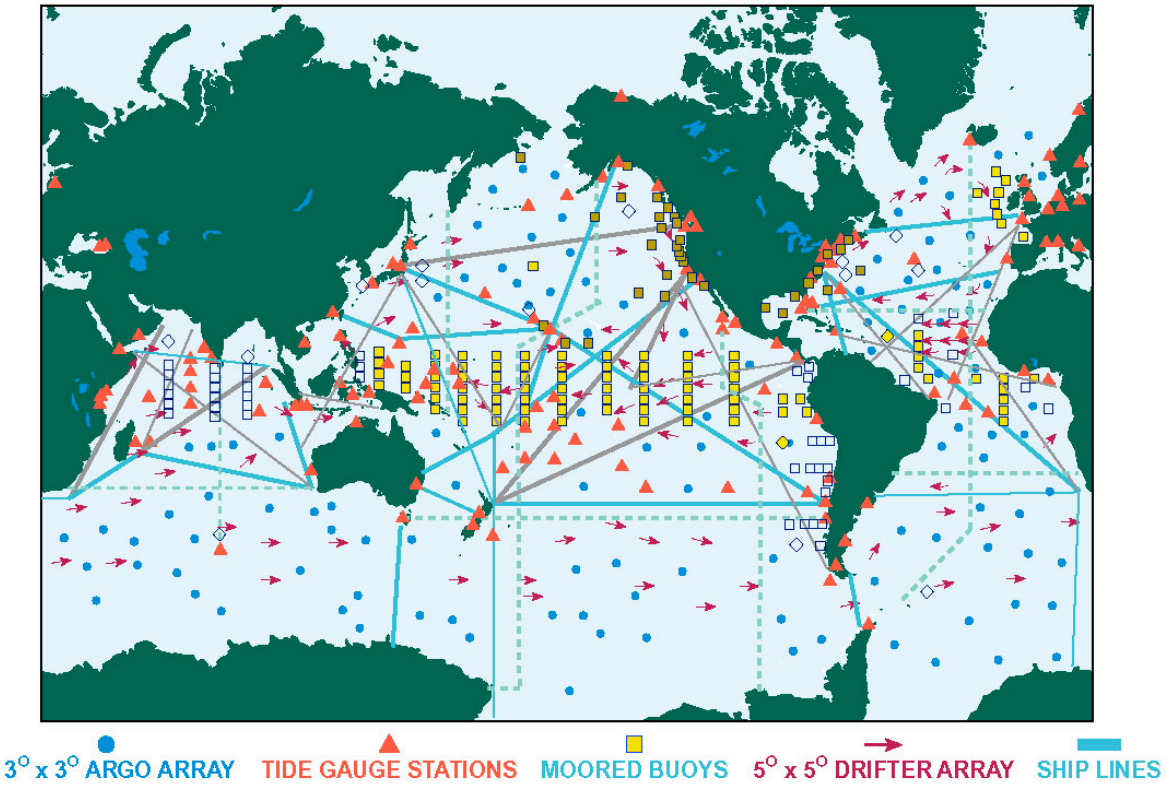


FIGURE 1. Linking user needs to measurements requires a managed, two-way flow of data and information among three essential subsystems: (1) observations (2) data communications and management, and (3) modeling and data analysis. The IOOS is "user-driven" in that the user needs determine what variables are measured, how data are managed and analyzed, and the speed with which quality data and data-products become available to users.

What will IOOS Look Like?

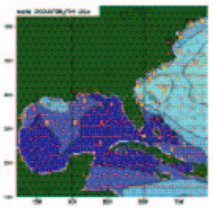
- Global Component: nearly entirely a Federal responsibility – for both operations & research support
- Coastal Component: two integral pieces
  - 1. National System ('backbone') – mostly Federal
  - 2. Federation of Regional Observing Systems
    - Federal, Tribal, State, & local government, involvement with academia, private industry, NGOs and other stakeholders

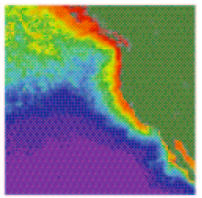
IOOS Global System

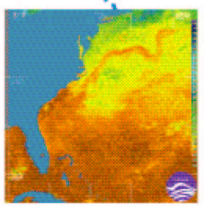


- Full implementation of Argo and the global ocean time series observatories.
- Successful completion of the Global Ocean Data Assimilation Experiment (GODAE).
- Optimizing the global network of observations, and
- Enhancing the ocean time series observatories with key biological and chemical sensors.

Possible Components of the IOOS National Backbone







- Measure and process variables needed by all regional systems
  - Including Biological measurements (e.g., PaCOS)
- Satellite remote sensing
- Reference, sentinel stations
- Link to global system
- Data standards & exchange protocols
- Capacity building

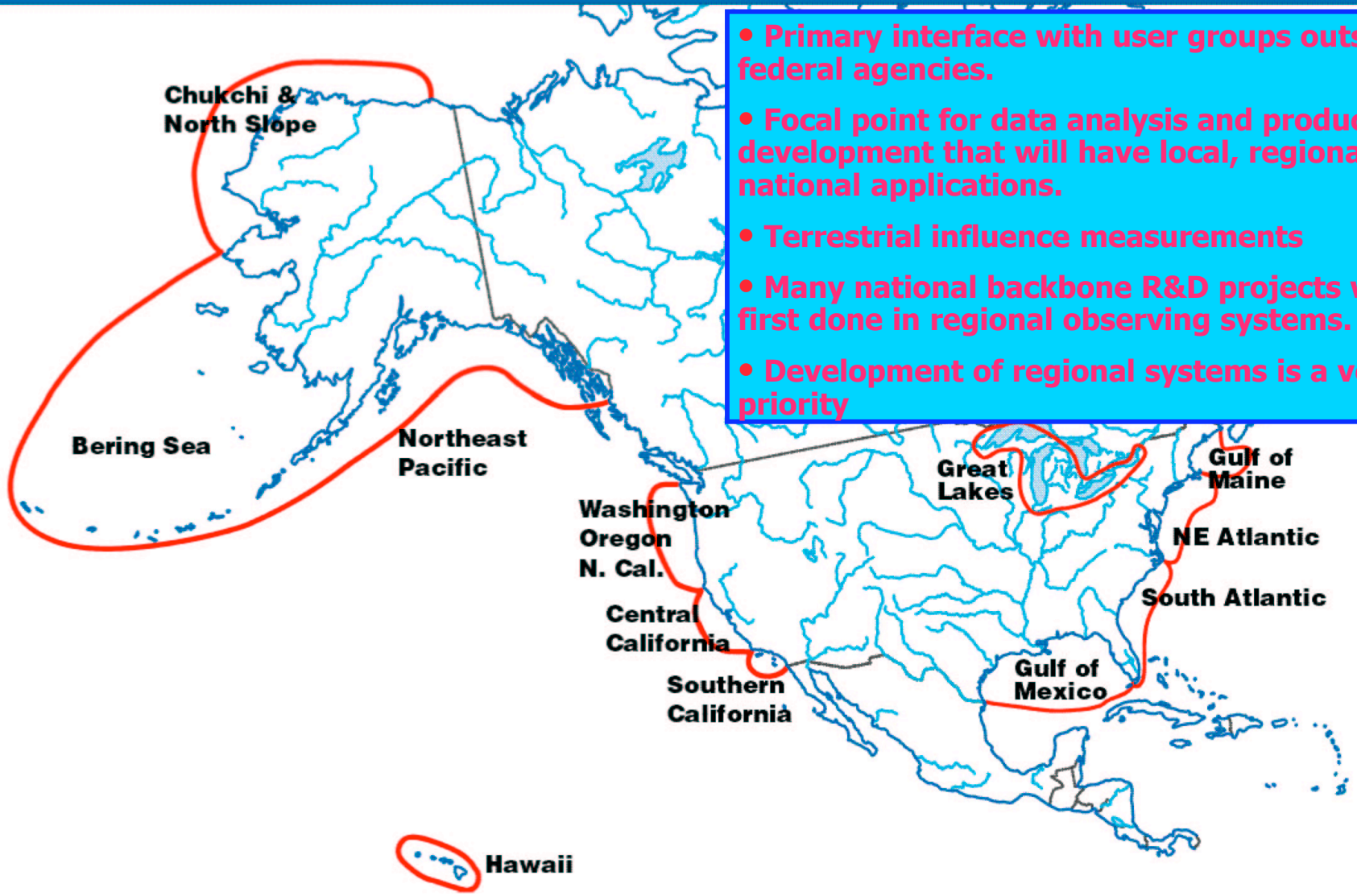
Physical Oceanography Real Time System (PORTS)

National Water Level Observation Network (NWLON)

National Data Buoy Center marine buoy network

CMAN stations

Possible Regional Observing Systems



- Primary interface with user groups outside federal agencies.
- Focal point for data analysis and product development that will have local, regional and national applications.
- Terrestrial influence measurements
- Many national backbone R&D projects will be first done in regional observing systems.
- Development of regional systems is a very high priority

What is the role of RAs?

- Oversee & manage the design and sustained operation of integrated Regional observing systems addressing societal needs
- Provide regional identity and identify regional priorities
- Obtain and disperse funds to operate and improve Regional observing systems
- Ensure the timely provision of quality controlled data and information to users

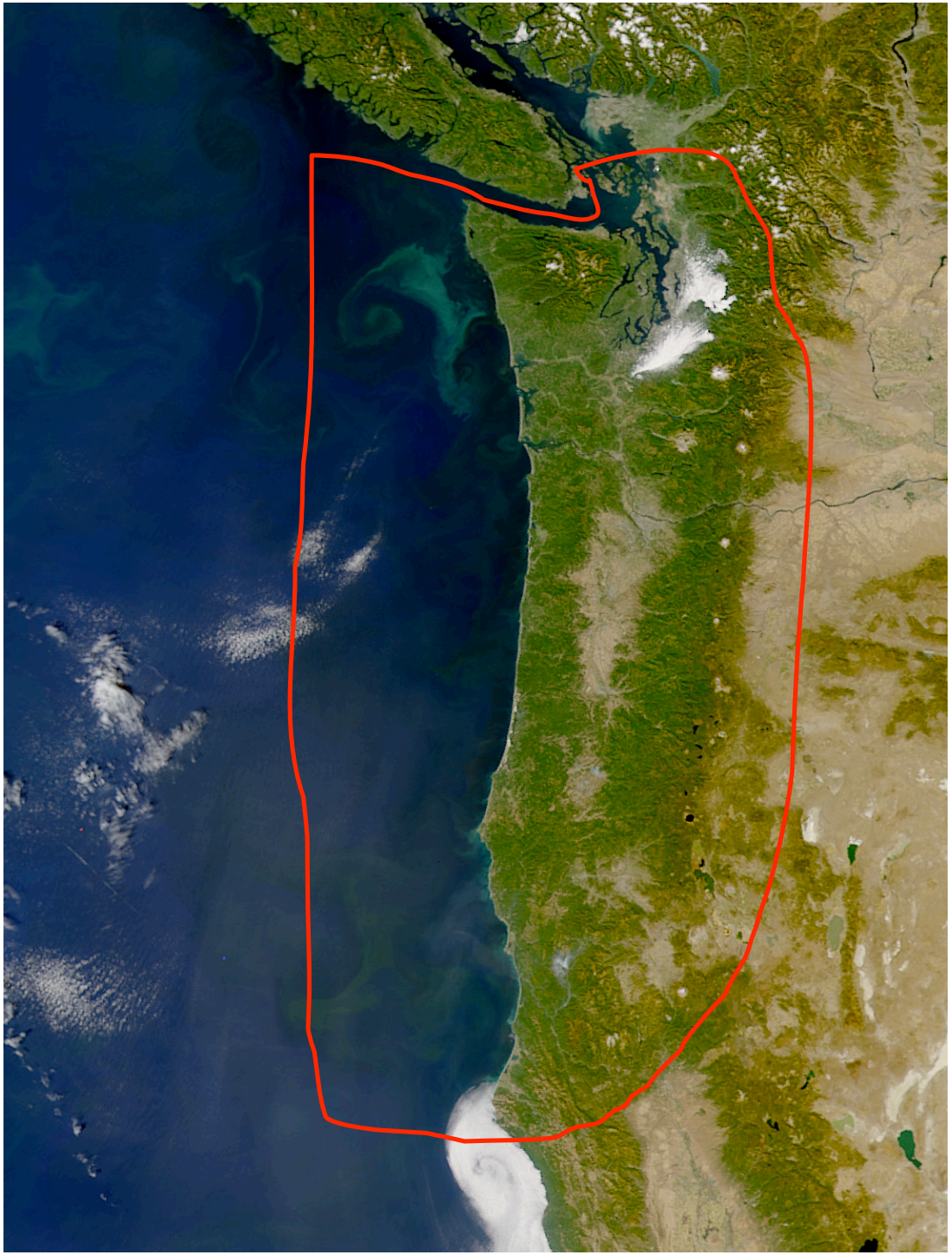
RAs Provide Legitimizing Framework

- For the individual U.S. regions:
  - They provide a focal point for a regional consortia of stakeholders to whom accountable (performance-based) transfers of Federal resources can occur
  - Enhance intra-regional connectivity and collaboration
    - Priorities, technology transfer, science, etc., etc., etc.
- As part of a National Federation of Regional Associations
  - Lessons learned from other RAs (best practices, etc.)
  - Facilitates seamless interconnectivity (interoperability) between Regions
  - Demonstration to national leadership of maturity
  - Ease pressure for Congressional earmarks/plus-ups as RAs become

Northwest Association of Networked Ocean Observing Systems

The IOOS Regional Association for the Pacific NW

The domain of NANOOS



A brief history of NANOOS

- Regional Associations part of IOOS
- Interested group forms
- Organizational proposal funded
- 1st Workshop: NANOOS born, charter signed, interim steering committee
- Follow-up organizational proposal funded
- Pilot proposals submitted; one funded
- 2nd Workshop: Governance and Observing

NANOOS Charter

A. PURPOSE:

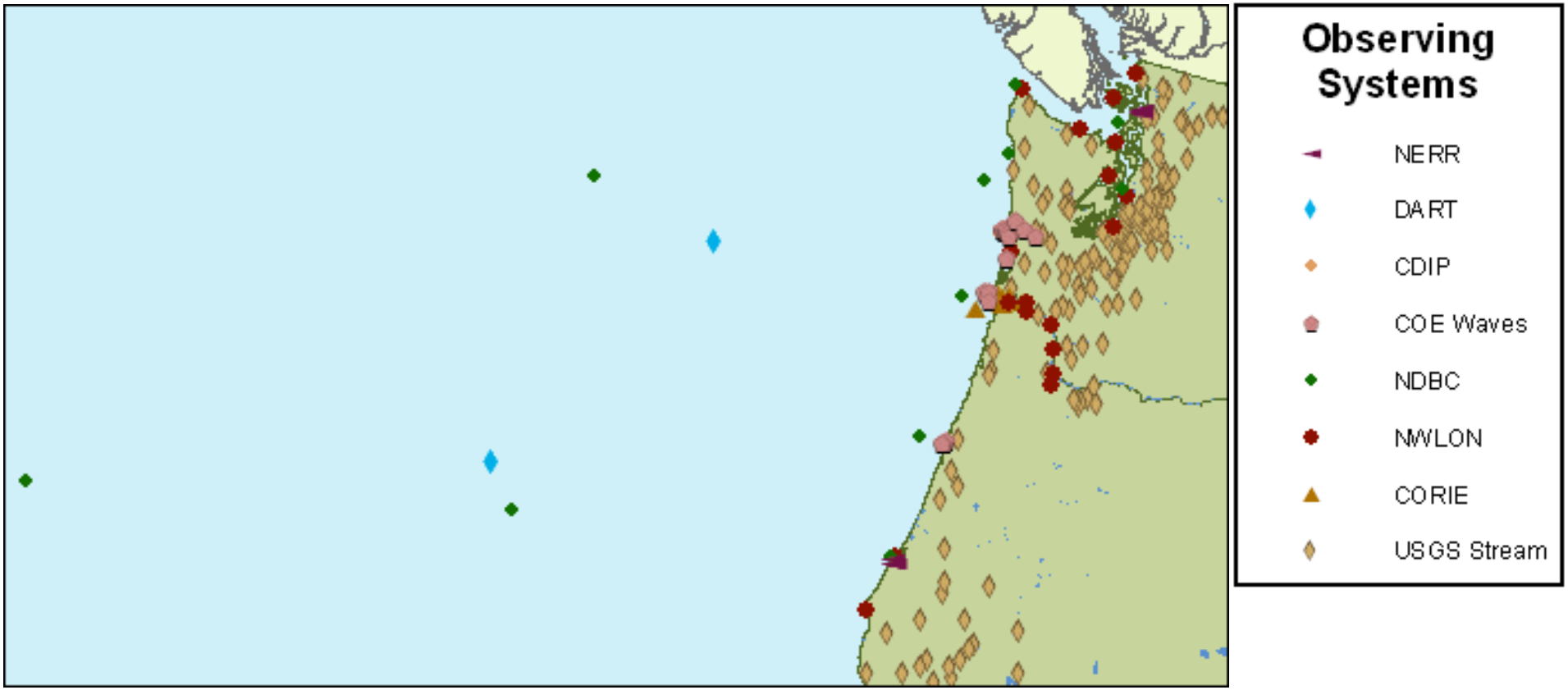
a. To explore the cooperative steps necessary, within the Pacific Northwest region, to establish a Pacific Northwest Regional Association, to be known as NANOOS, the Northwest Association of Networked Ocean Observing Systems.
b. To collaborate with Ocean.US and other Regional Associations to establish a National Federation of Regional Associations.

NANOOS Charter

D. IMPLEMENTATION: The Signatories resolve to:

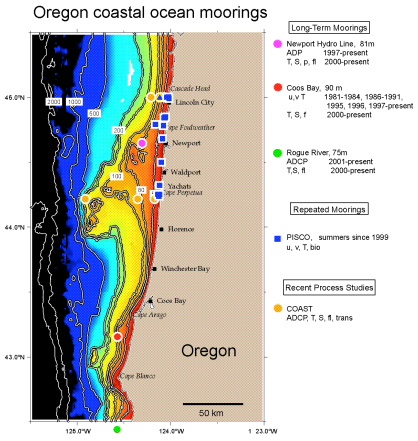
- ❑ Collaborate to establish NANOOS, the Northwest Association of Networked Ocean Observing Systems.
- ❑ Develop governance structures for NANOOS (the articles and bylaws of the Regional Association), through community involvement and workshops.
- ❑ Give acting authority to an interim Steering Committee, composed initially of David Martin, Jan Newton, Antonio Baptista, Jack Barth and Mike Kosro, until such time as the NANOOS articles and bylaws are adopted. The committee may be modified to reflect community input.
- ❑ Participate in the formulation of national standards and protocols for data management and communication
- ❑ Advocate free and open sharing of data, metadata and related information consistent with Ocean.US recommendations
- ❑ Foster improved public awareness, involvement and education
- ❑ Identify and engage stakeholders and establish a process by which we continuously assess the Pacific Northwest needs and the alignment of NANOOS with those needs.
- ❑ Collaborate and integrate with other West Coast, national and Canadian regional observing consortia.

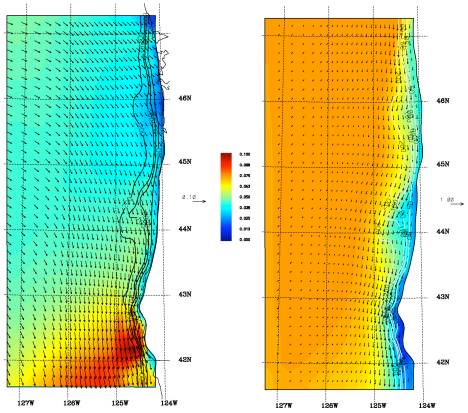
Possible NANOOS ingredients involving federal agencies

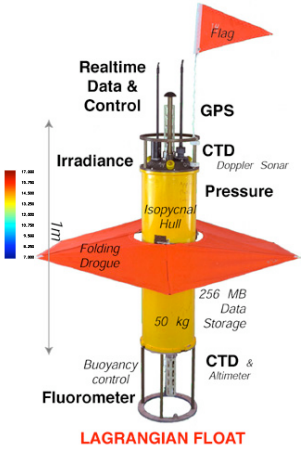


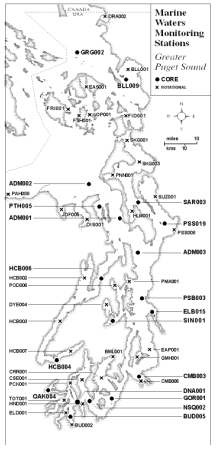
From: NOAA Coastal Services Center http://www.csc.noaa.gov/coos/northwest.html

Possible NANOOS ingredients involving Tribal, State, local governments, Academia, etc.

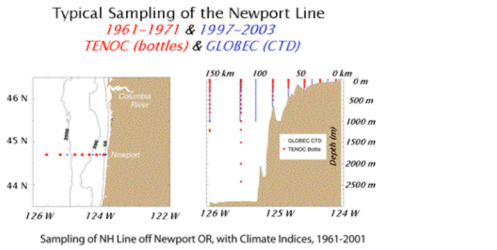


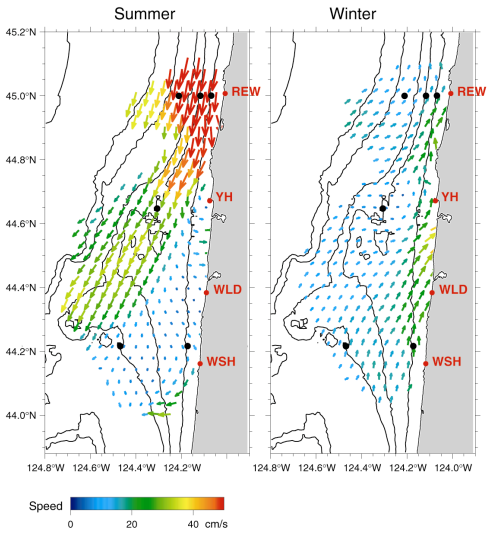


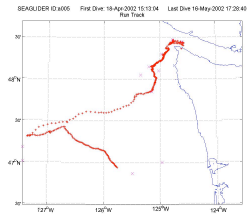




History of Sampling along the Newport Hydrographic Line







JEMS Joint Effort to Monitor the Strait

Critical to document water properties of waters entering Puget Sound from Pacific

Important for assessing: water quality, resource limitation, invasive species vectors

Monthly boat surveys

truly joint: *KC-DNR - funding*
Ecology - coordination
NOAA - boat
UW PRISM - analyses
UW FHL - staging, gas

Interannual variation in upwelling intensity off coast

Criteria for a Regional Ass'n

- Proof of a solid Governance Structure that can deliver a Regional IOOS incorporating/improving existing assets and engaging regional expertise
  - It must describe governing and executive bodies, the roles and responsibilities of members, and how decisions are made/modified, etc.
- Provision of an acceptable Strategic Plan that is endorsed by stakeholders
  - Plan must: articulate how Regional system goals address seven IOOS goals, specify products and customers, conform to protocols, be capable of 24/7 ops, provide timely user-driven products, describe sources of funding, provide a budget, etc.
- Documentation of the process by which the governance structure and strategic plan were developed
- Easy to list, rigorous to implement, and . . . how do we agree and/or

Governance System for RAs: Reaching Consensus

- A wide range of stakeholders needs to be approached, informed re NANOOS, and encouraged to participate.
  - Tribal leaders, Academia, Federal agencies, industry, other state/local governments, NGO's, etc.
  - Interactions in a number of Region have accelerated during past year
    - Need to identify the MANY others – a Region's constituents must help.
- Regional participants must remain engaged with colleagues in other Regional Associations, Ocean.US and others in D.C., and the nation
  - e.g., Regional Observing System "Summit," Regional Interoperability Forum, attend RA meetings nearby, etc.
    - e.g., NANOOS Workshop attendees should include Alaskans, Canadians, and Californians in addition to Oregon and Washingt representatives
- Regions must develop mechanisms to address the "hard" issues

RA Governance Means More Than Merely Getting Along ...

- **What is the governance mechanism for the RA? How is the RA to be chartered for a multi-state role (with international connectivity, if applicable)?**
  - What roles will various entities agree to play? And what will they not do?
    - e.g., what is role of Federal agencies; Tribal, State, and local, governments.; non-governmental entities (industry, academia, NGO's etc) in the Regional Association hierarchy and decisions
  - How are differences between stakeholders arbitrated?
    - Prioritization/scheduling of observing systems
    - Allocations of resources
  - How are "boundaries" between regions determined?
    - e.g., For the PNW, what is the geographical extent of "Northern California"?
- **These issues and others have been identified and discussed at various fora.**
  - Arriving at equitable solutions will take time and discourse – ignoring such issues is not an option

The "National Federation of Regional Associations" Will Assist

- Promote Regional observing systems nationwide
- Enhance communications between NOPP agencies and RA
- Assist in delineation of geographic boundaries
- Promote inter-RA collaboration
- Guide the development of the backbone
- Influence the development and enable the implementation of national standards and protocols.
- When mature, certify the RA's themselves

Summary

- **An IOOS is required to address a wide range of issues**
  - National effort has the support of both the Executive and Legislative branches & the Ocean.US plan was forwarded to Congress by the White House.
- **The IOOS will measure the full spectrum of ocean parameters needed to address a wide range of issues**
  - Physical, biological, chemical, geological, meteorological etc.
- **The IOOS has global and coastal modules**
  - Coastal effort consists of both the National "Backbone" and Regional Associations
    - established to address regional concerns and build regional constituencies WITHIN the construct of an integrated system.
    - The goal is Regional relevancy with National oversight.

Summary (cont.)

- NANOOS is the PNW RA
- But much work to do!!

(why you are here…)