Ocean Observing Systems in the Pacific: Relevance to Coastal Decision-Making

2006 Ocean and Coastal Program Managers' Meeting
Washington, DC
March 8, 2006

Molly McCammon
Alaska Ocean Observing System

Diverse Needs Require a Regional Approach

PacIOOS

GCOOS

CarIOOS

The Multifaceted Benefits of IOOS

Deployment and operation of an Integrated and Sustained Ocean Observing System will:

- More effectively protect and restore healthy ecosystems,
- Sustain and restore living marine resources,
- Improve the safety and efficiency of marine operations,
- Improve prediction of natural hazards (including tsunamis and storm surges) to reduce resulting damages and costs,
- Improve predictions of climate change and its socio-economic consequences,
- Improve national security and Coast Guard operations, and
- Reduce public health risks.

Regional Associations Also Build IOOS Partnerships (an informed constituency)

~ 480 partners and growing

- Business and Industry (66)
- Shipping (18)
- Researchers and Universities (149)
- State agencies (59)
- NGOs (58)
- International Organizations (11)
- Local and Tribal governments (8)
- Federal Agencies (106)

Southern California Regions

Morro Bay
Santa Barbara Channel
Ventura County
Los Angeles
South Channel Islands
Orange County
North San Diego
San Diego / Mexico

Available Products

Automated Shore Stations
Manual Shore Stations
Bathymetry
Moorings
Satellite Imagery
Shoreline Water Quality
- Overview
- Historic Data Access
- Santa Barbara
- Ventura / Oxnard
- Orange County
- San Diego

Surface Current Maps
Surface Winds
Wave Conditions (CDIP)
Cast Data (Ships & Gliders)

Grab Raw Data

SCCOOS Shoreline Water Quality Data Retrieval System

UTC Time: 2005-10-24 18:41:58
Local Time: 2005-10-24 11:41:58

Station List

MB-203
MB-223
MB-225
MDP10
MDP11
MHH01
MHH07
MHH10
MHH14
OC-010
OC-020
OC-022
OC-023
OC-030
OC-035
OC-040
OC-050
OC-080
OC-090
OC-100
OC-110
ODB02
ODB05
OLB00
OLB05

Water Quality Data Retrieval System

View Sample Age Map

Location		**Last Sampled: 2005-09-19**	
Station:	OLB05	Total Coliforms:	>= 60 CFU/100ml
Beach:	Laguna Beach	Fecal Coliforms:	= 20 CFU/100ml
Position:	33.54717 N, -117.80167 E	Enterococci:	= 6 CFU/100ml
Location:	CRESCENT BAY		
Exceedances (last 365 days)	Total Coliforms: 0	Fecal Coliforms: 0	Enterococci: 0

Single Sample standards

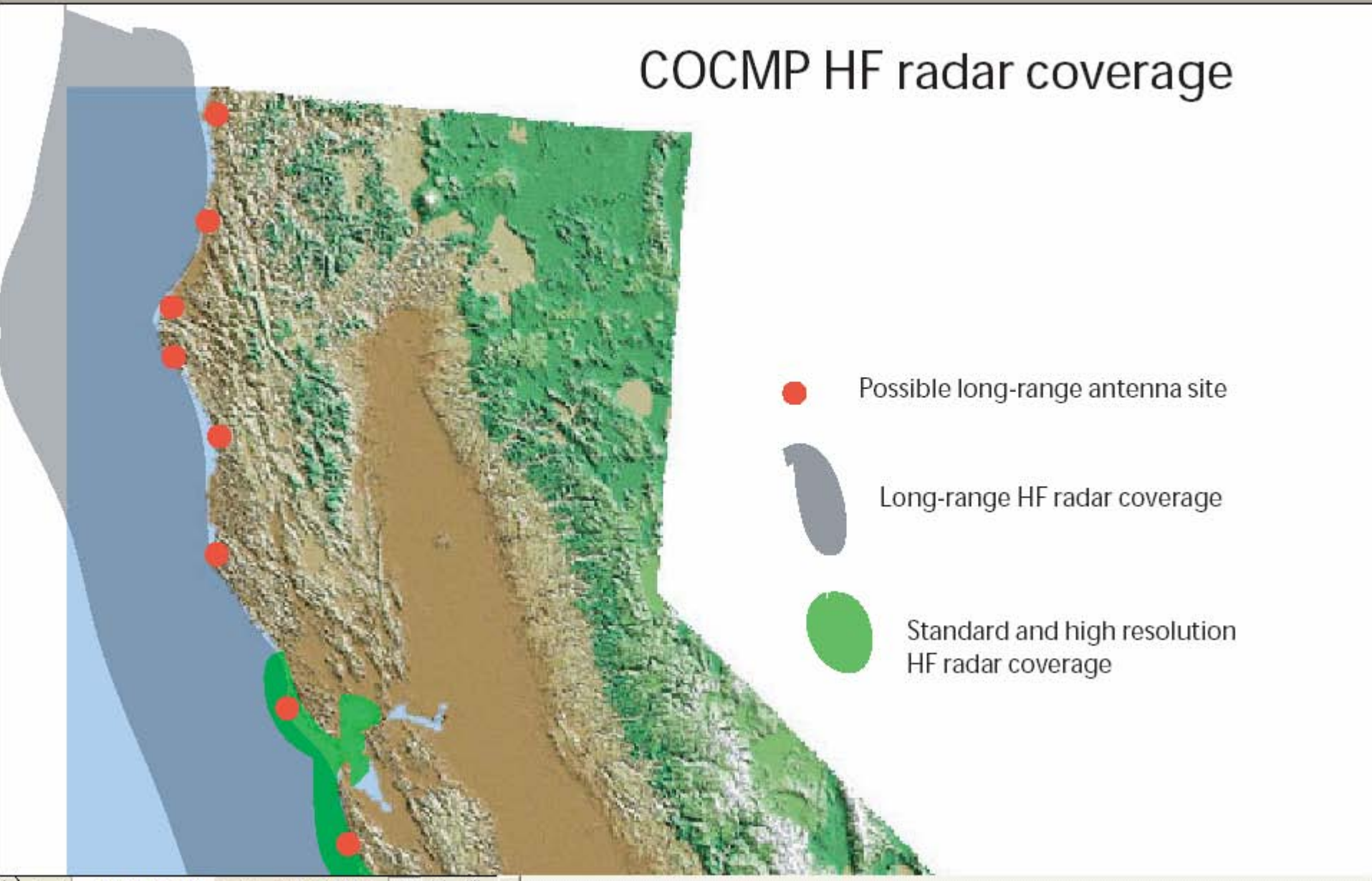
Total Coliforms	10,000 organisms per 100 ml. sample
Fecal Coliforms	400 organisms per 100 ml. sample
Enterococci	104 organisms per 100 ml. sample
Fecal:Total ratio	If total coliforms >1,000 & ratio > 0.1

For more information, please visit http://www.sdcounty.ca.gov/deh/.
Select "*Beach and Bay Report*" from their 'Key Issues' menu.

COCMP
HF Radar Coverage
CA Prop 40/50
$21M for funding
Coastal current
Monitoring program
Southern California Coastal Ocean Observing System
Coastal Conservancy
CENCOOS

le Edit Document Tools View Window Help
158%

COCMP HF radar coverage



name:1 (1 of 1) 8.5 x 10.15 in

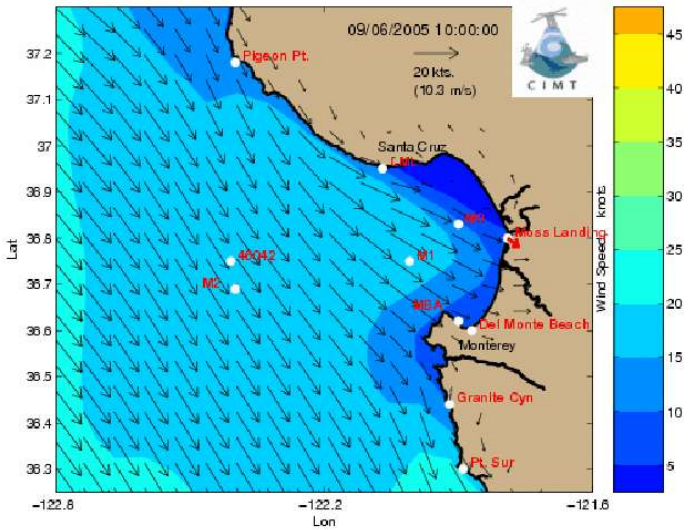
Center for Integrated Marine Technology End User Driven Product Development

Center for Integrated Marine Technologies

Monterey Bay Winds | CIMT Home | Information | Wind Product | Disclaimer

CIMT Realtime Wind Product Test Page

Wind for 09/06/2005 10:00 Pacific Daylight Saving Time



View More Images

09/04/2005 10:00:00
09/04/2005 11:00:00
09/04/2005 12:00:00
09/04/2005 13:00:00
09/04/2005 14:00:00
09/04/2005 15:00:00
09/04/2005 16:00:00
09/04/2005 17:00:00
09/04/2005 18:00:00
09/04/2005 19:00:00
09/04/2005 20:00:00
09/04/2005 21:00:00
09/04/2005 22:00:00
09/04/2005 23:00:00
09/05/2005 00:00:00
09/05/2005 01:00:00
09/05/2005 02:00:00
09/05/2005 03:00:00
09/05/2005 04:00:00
09/05/2005 05:00:00

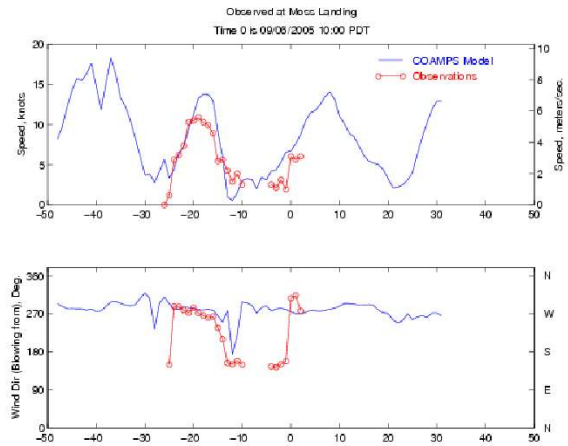
ANIMATE STOP

Center for Integrated Marine Technologies

Monterey Bay Winds | CIMT Home | Information | Wind Product | Disclaimer

Time Series Plots for the COAMPS wind and the observations

Station Moss Landing: 09/06/2005 10:00 PDT



http://ourocean.jpl.nasa.gov/cgi-bin/cimtwind.cgi

NANOOS Pilot Marine Monitoring Components

PRISM: Puget Sound Regional Synthesis Model

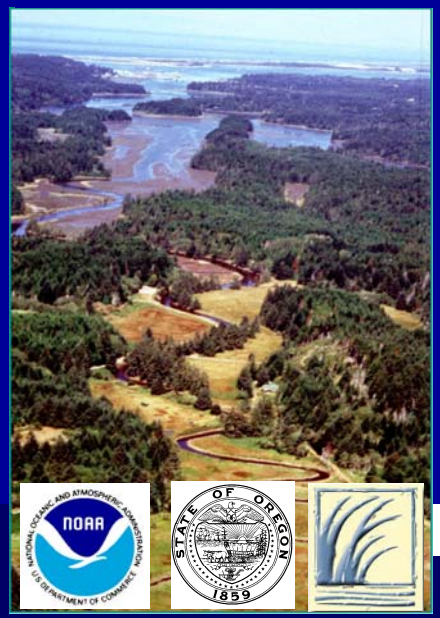
Science • Education • Partners • Operations • Utilities

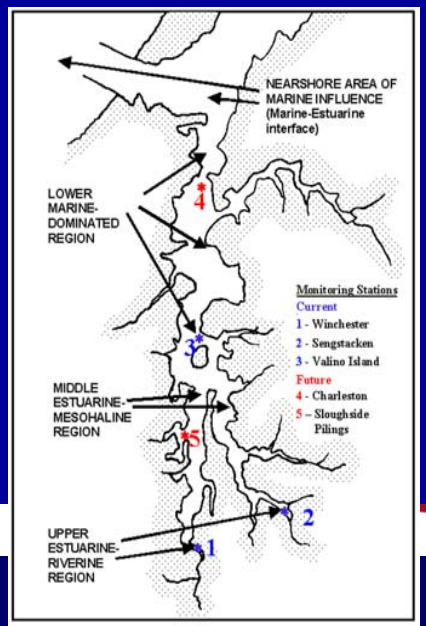
Puget Sound, WA

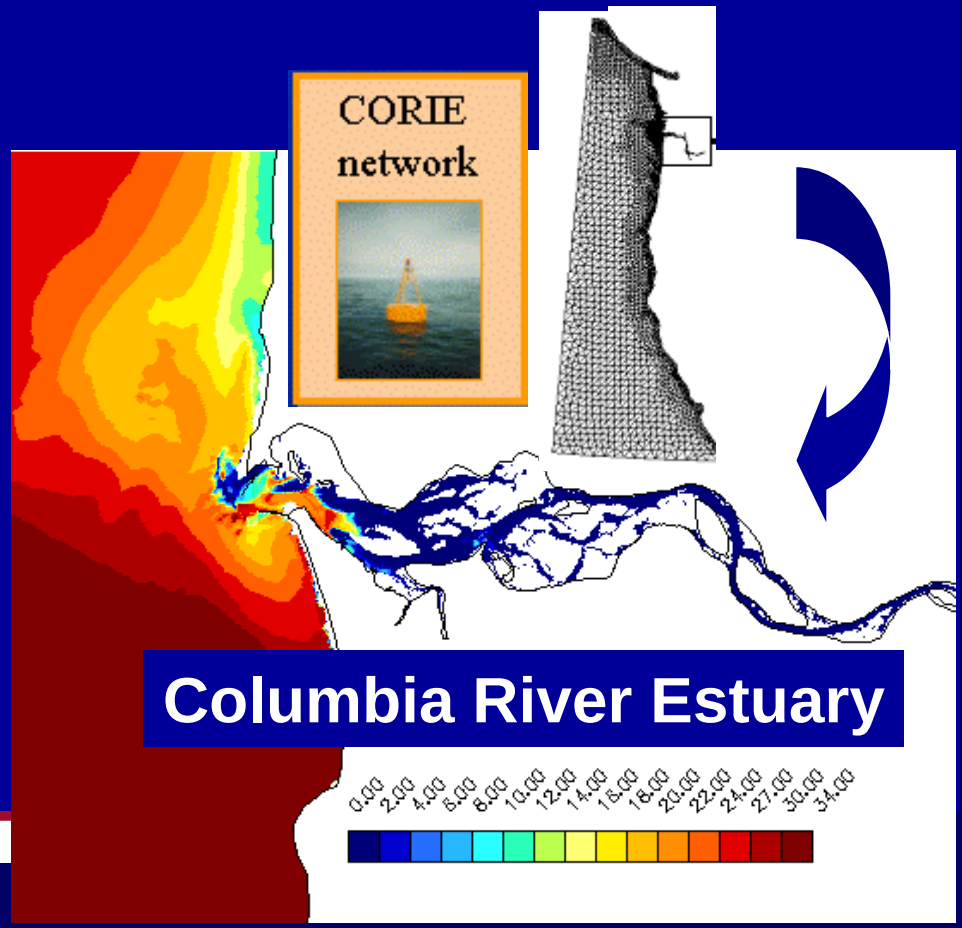
Willapa Bay, WA

WASHINGTON STATE DEPARTMENT OF ECOLOGY

South Slough Estuary, OR







Columbia River Estuary

Northwest Association of Networked Ocean Observing Systems

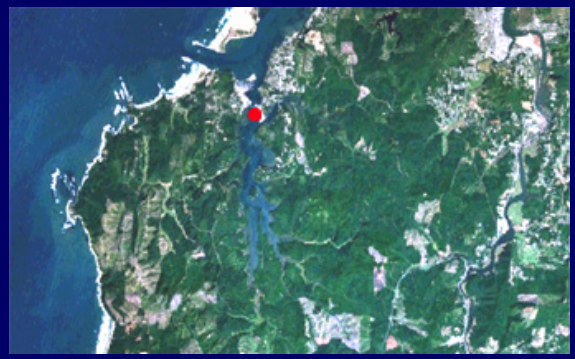
South Slough National Estuarine Research Reserve

Utility of South Slough NERR / ICOOS Datastreams:

1. **Development and validation of numerical hydrodynamic circulation model (w/ A. Baptista – OHSU)**
2. **Index of growing conditions for commercial and recreational shellfish (w/ local oyster growers and ODFW)**

Coos Bay, Charleston Bridge, OR
Observatory: South Slough NERR

http://www.ccalmr.ogi.edu/nanoos/network/southslough/sosch



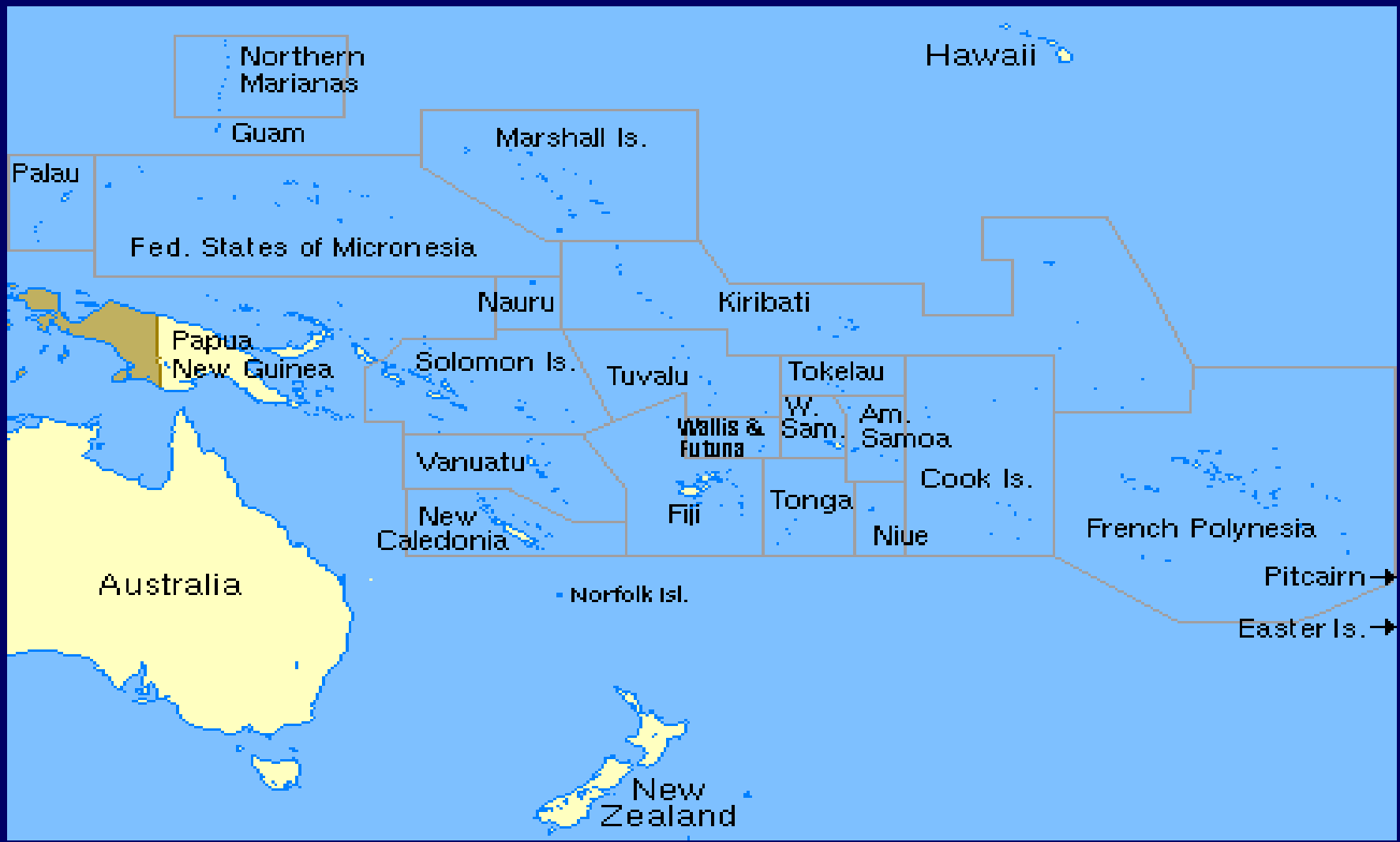
YSI Estimated depth: depth unavailable

Most recent data:
Temperature: 10.54 °C
Salinity: 15.81 psu
Conductivity: 25.90 mS/cm
Oxygen: 9.61 mg/l
Oxygen Saturation: 95.40 %
pH: 7.86
Turbidity: 12.70
database last updated: 2006-01-30 19:30:00 PST

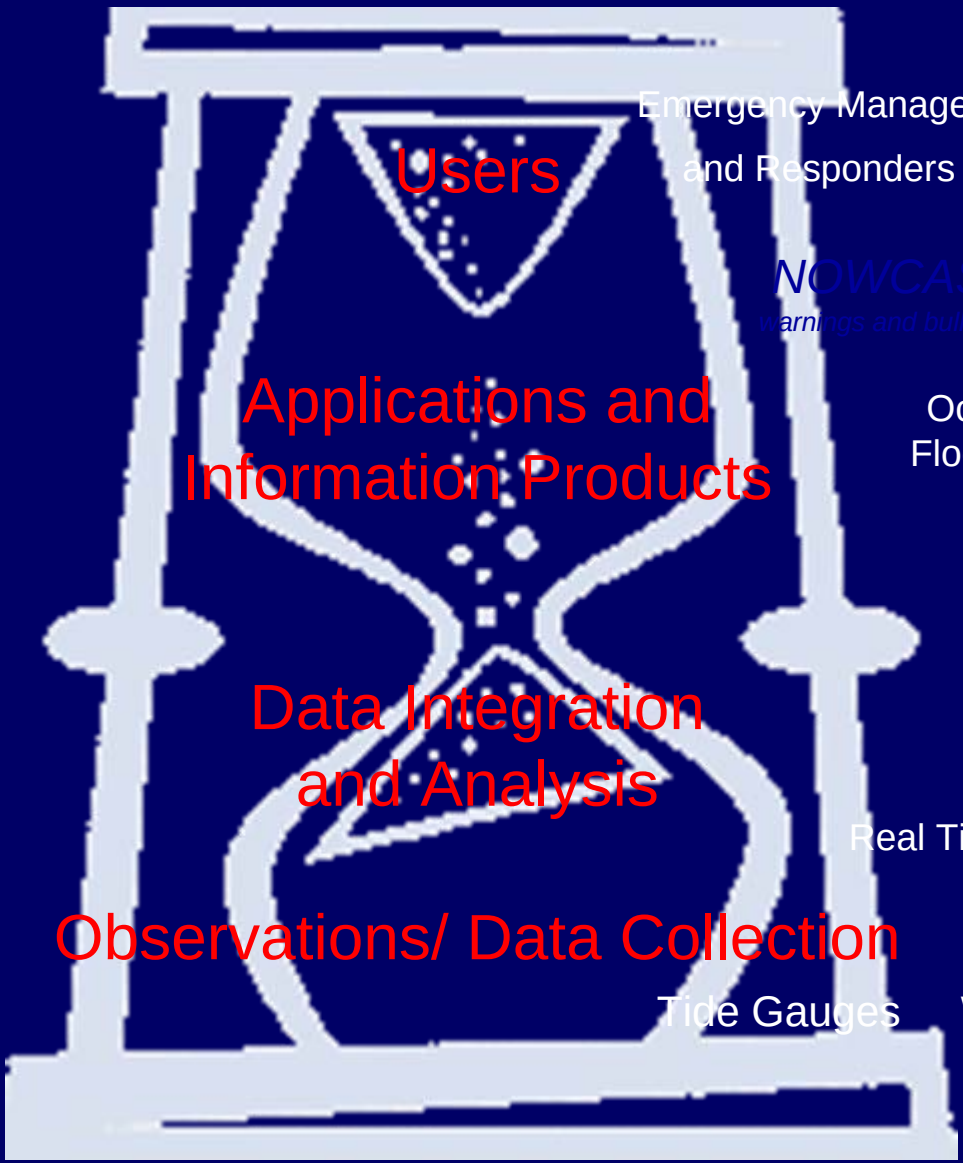
NANOOS Station Map Public Data Access

2 days
7 days
15 days

PacIOOS Region



Waves and Water Level
Integrated System, Data, and Products Architecture



Users

Emergency Managers and Responders

Ship Masters and Port Managers

Recreation and Tourism

Mitigation Planners and Managers

Applications and Information Products

NOWCAST — *warnings and bulletins*

FORECAST — *weekly, monthly, seasonal outlook*

FUTURECAST — *scenarios and projections*

Ocean Flooding

Coastal Erosion

Tsunami

Sea Level Change

Data Integration and Analysis

Archived Historic

Near Real Time

Delayed Mode

Real Time

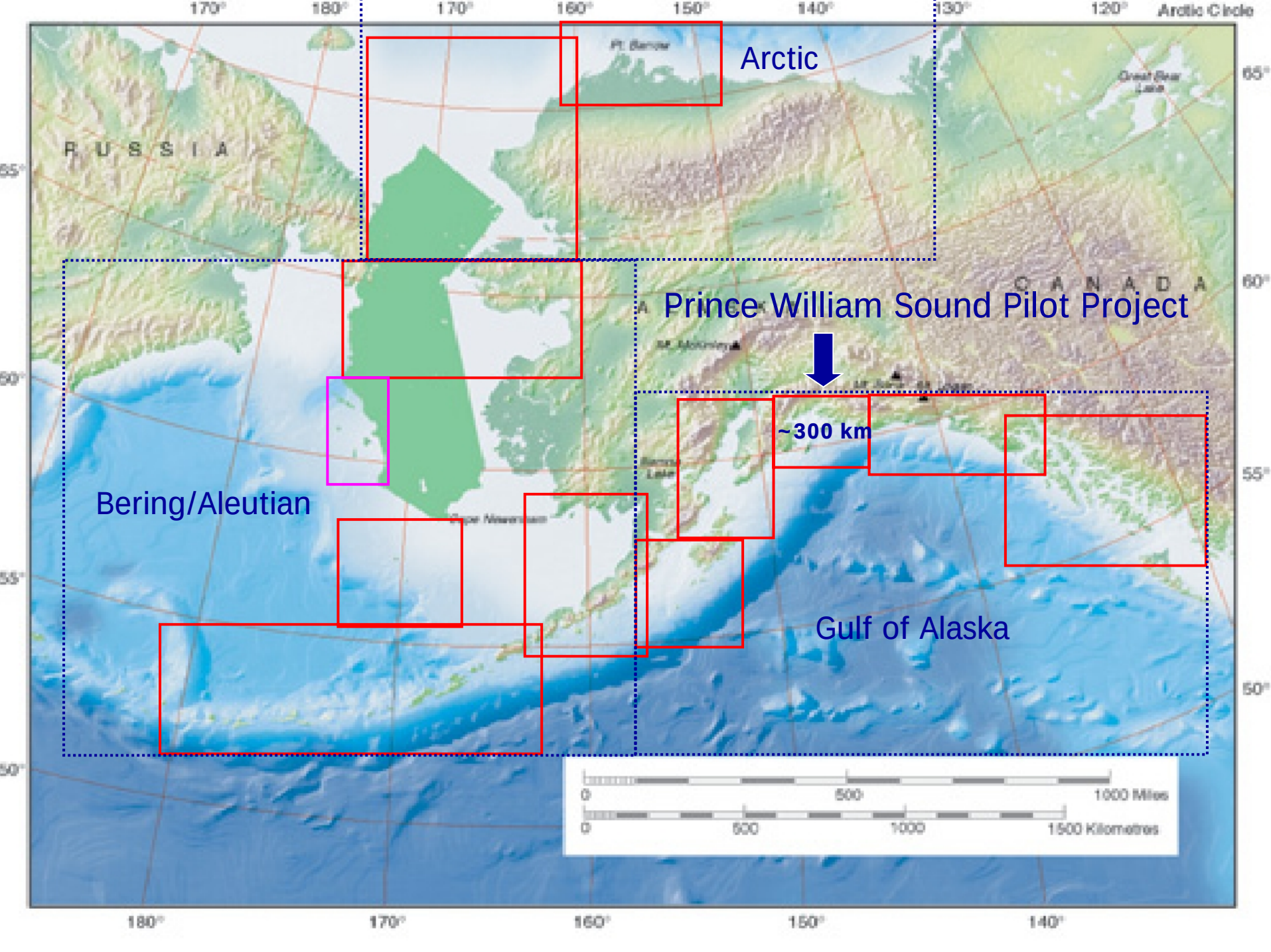
Observations/ Data Collection

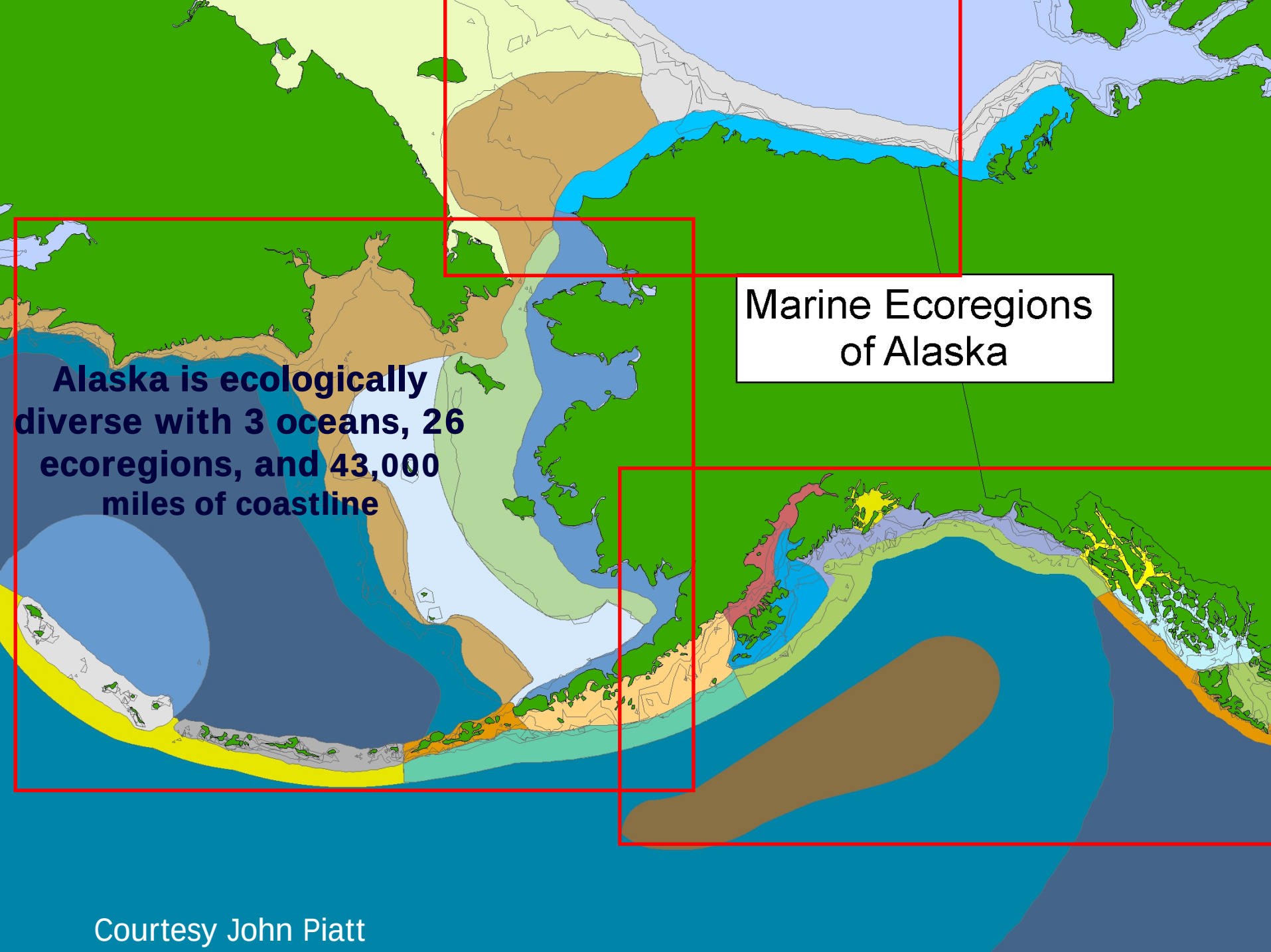
Tide Gauges

Wave Buoys

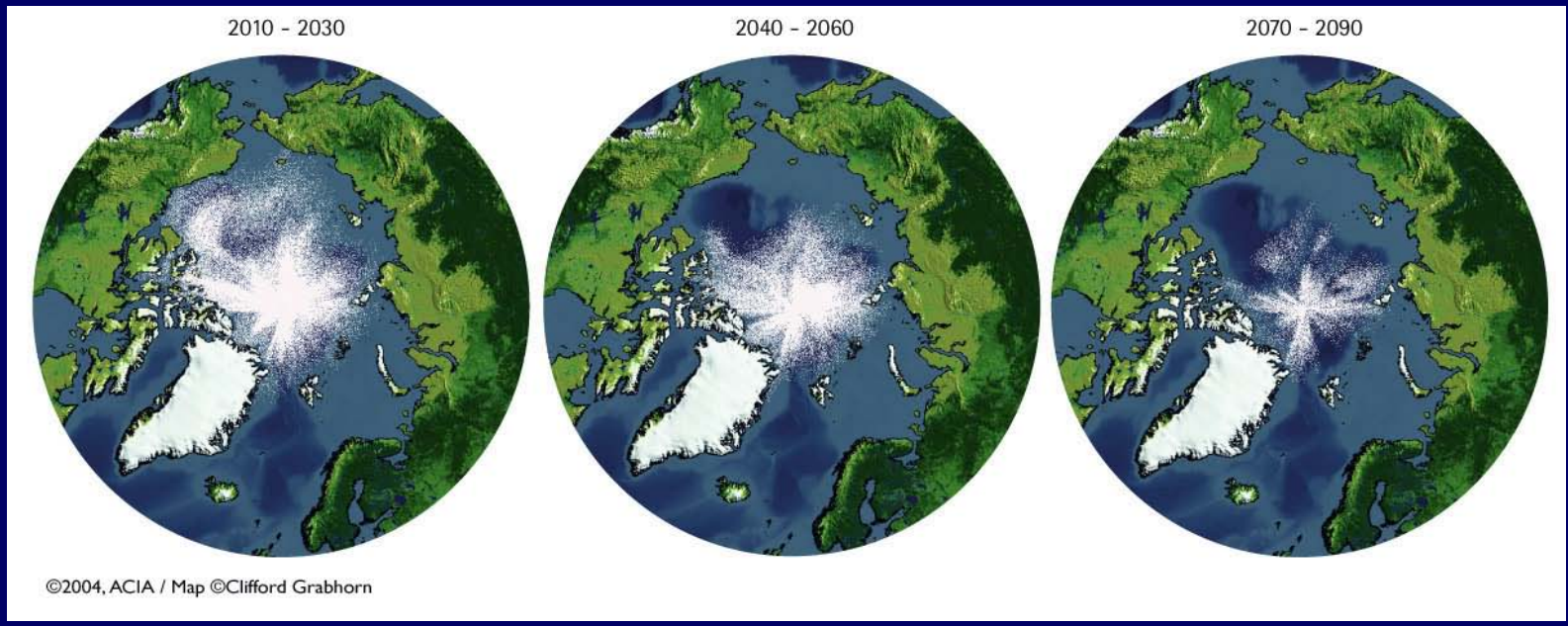
Satellites

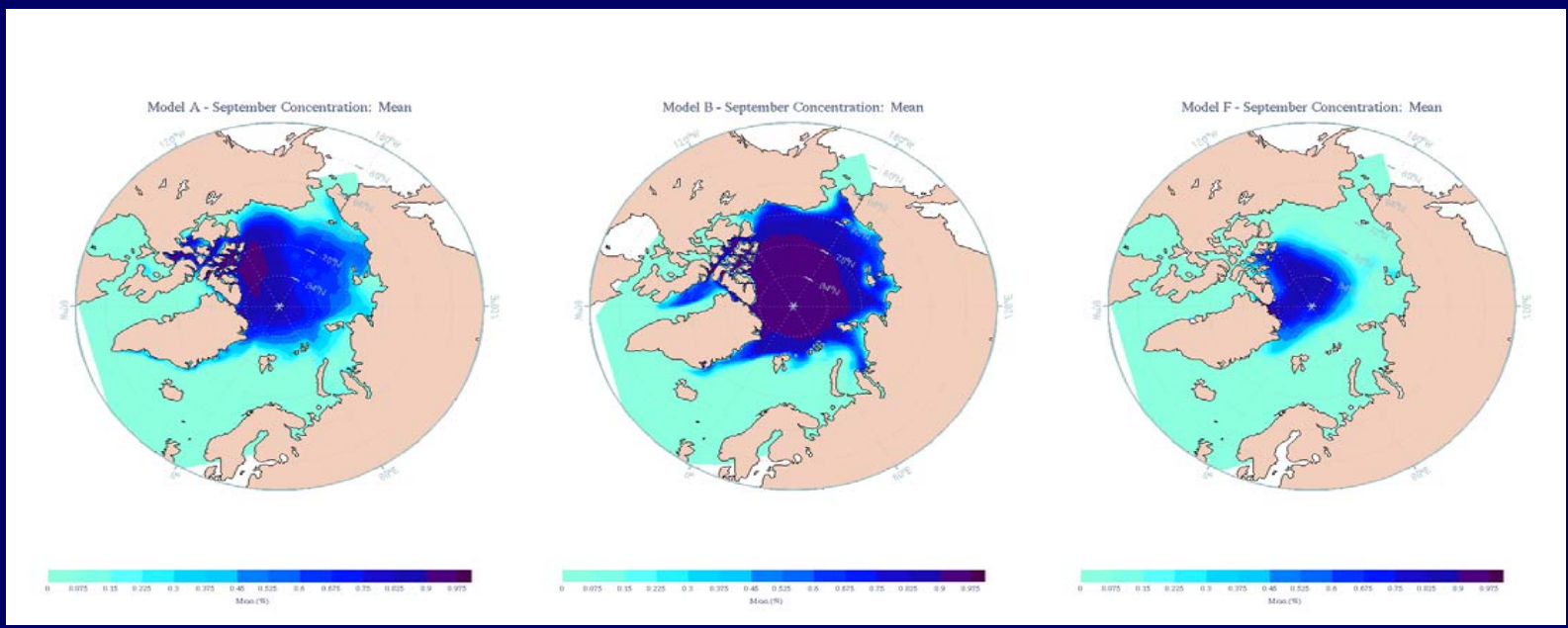
Radar, Video, etc.


Arctic
Prince William Sound Pilot Project
~300 km
Bering/Aleutian
Gulf of Alaska
RUSSIA
CANADA
Arctic Circle
0
500
1000 Miles
0
500
1000
1500 Kilometres

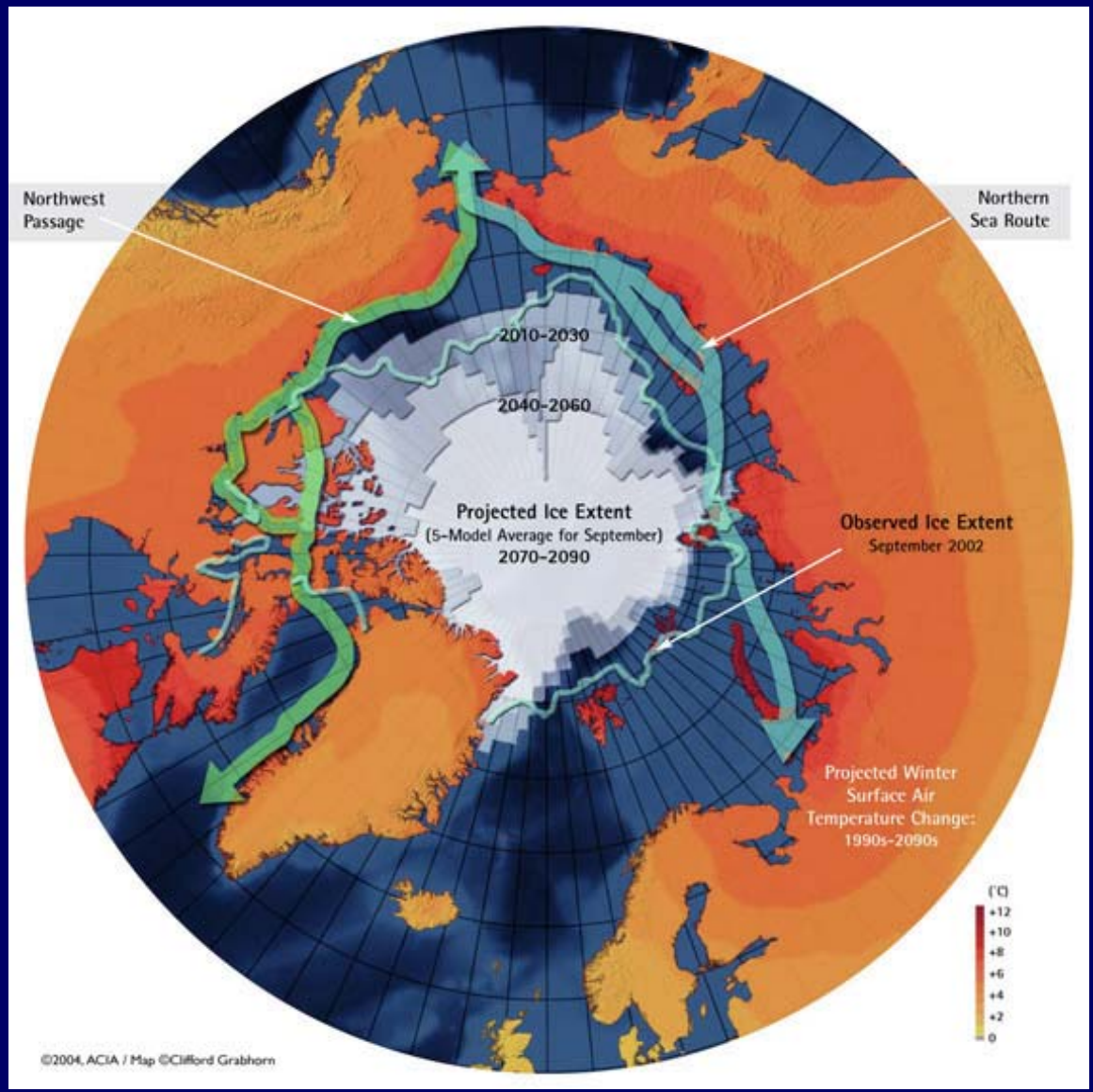

Marine Ecoregions of Alaska
Alaska is ecologically diverse with 3 oceans, 26 ecoregions, and 43,000 miles of coastline
Courtesy John Piatt

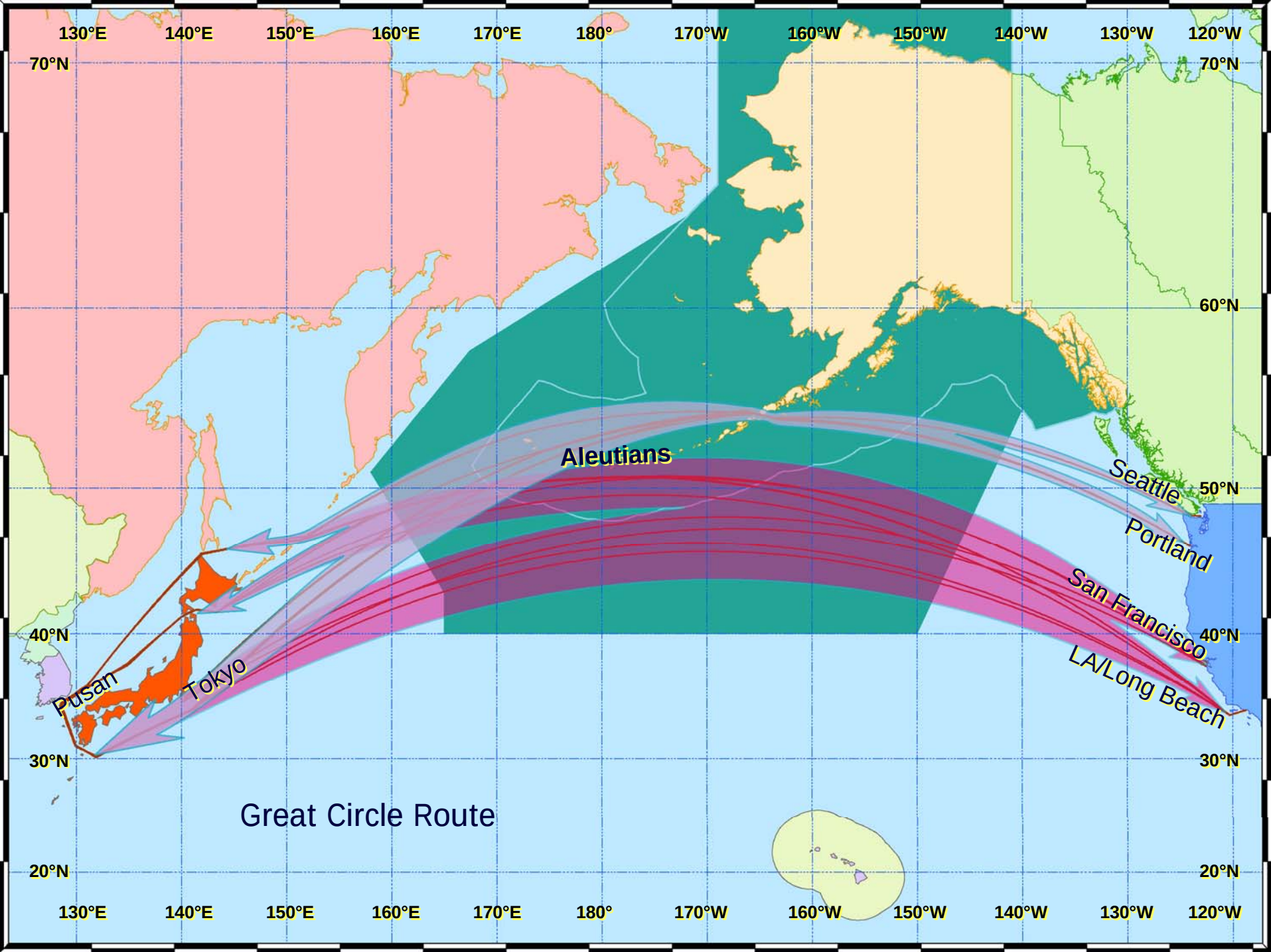
ACIA sea-ice forecasts





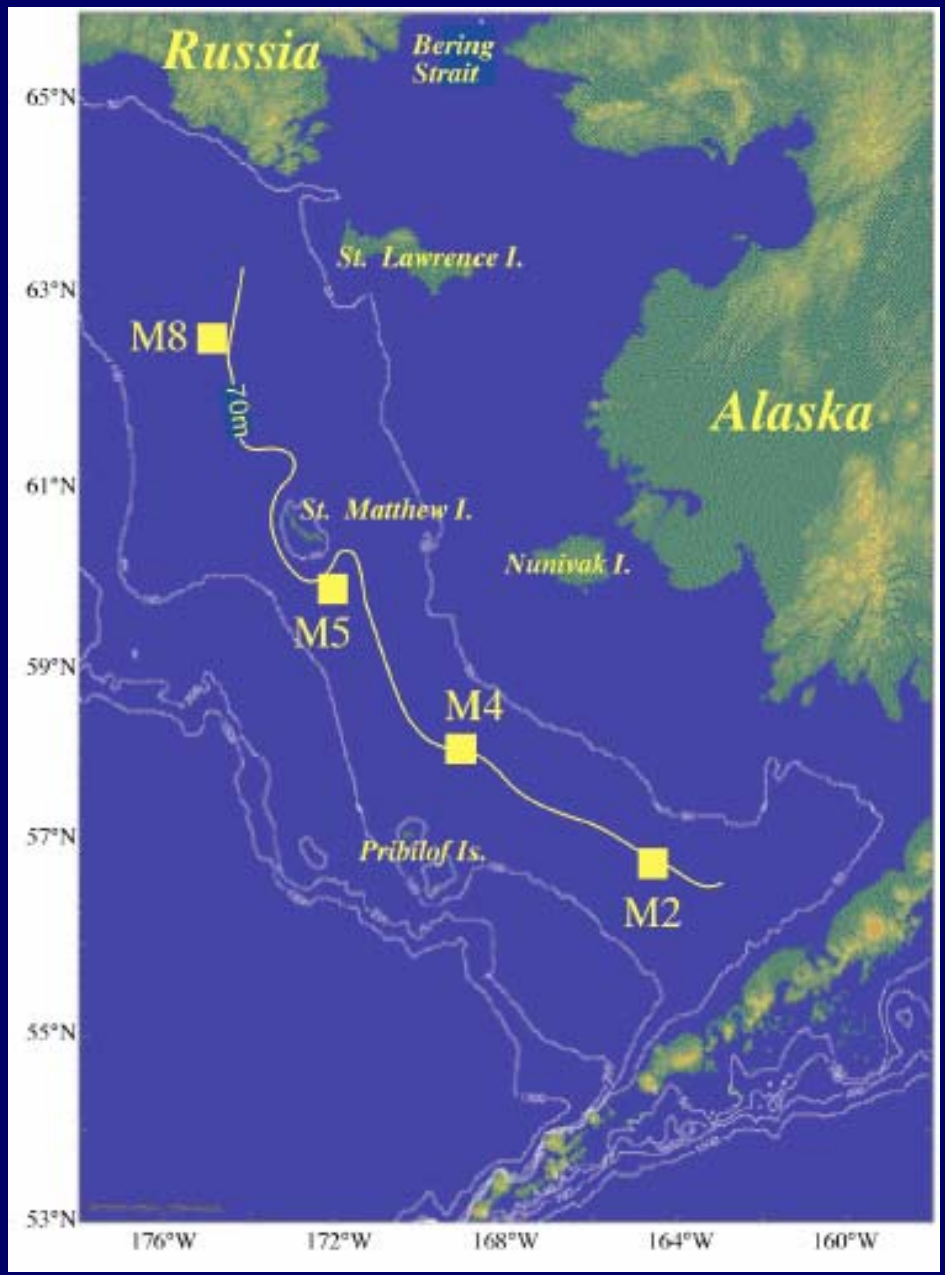
- ACIA Key Finding #6: Reduced sea ice is very likely to increase marine transport




130°E
140°E
150°E
160°E
170°E
180°
170°W
160°W
150°W
140°W
130°W
120°W
70°N
60°N
50°N
40°N
30°N
20°N
Aleutians
Seattle
Portland
San Francisco
LA/Long Beach
Tokyo
Pusan
Great Circle Route

Statewide Issues and Users

- Users
  - State economic interests: fisheries, oil & gas, military
  - Govt regulators/managers
- Issues
  - Importance of resource extraction and military to state economy
  - Transportation needs in remote, harsh environment
  - Increased climate change & coastal erosion impacts



Monitoring the Bering Sea

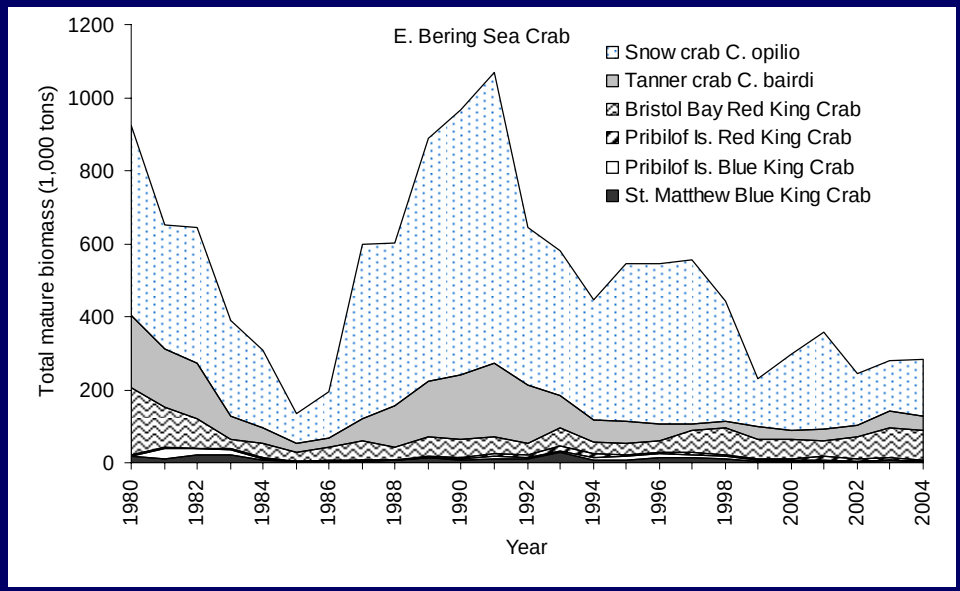
- 4 moorings along the 70-m isobath: temperature, salinity, fluorescence, nutrients, currents
- Spring and fall hydrographic transects: temperature, salinity, O_2, fluorescence, nutrients, chlorophyll, zooplankton

Results

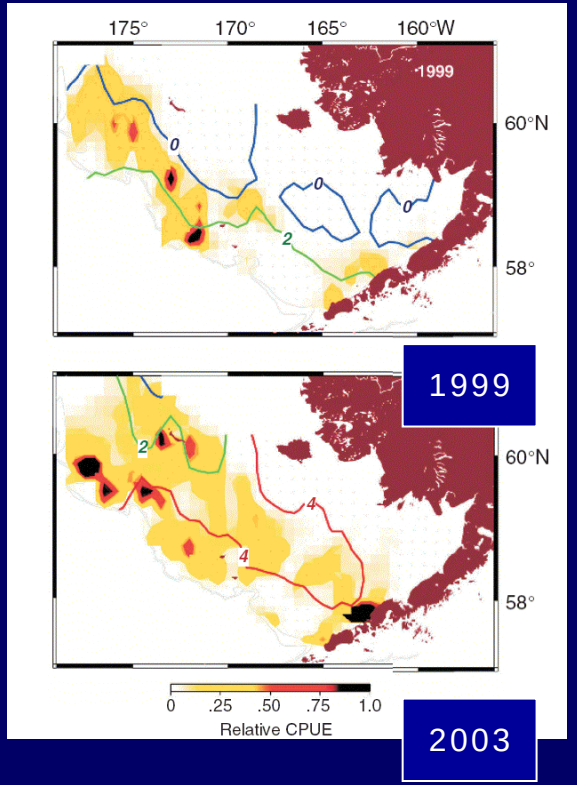
5th consecutive year with reduced ice cover (80-100% reduced from 1972) and increased temperature (~3°C).

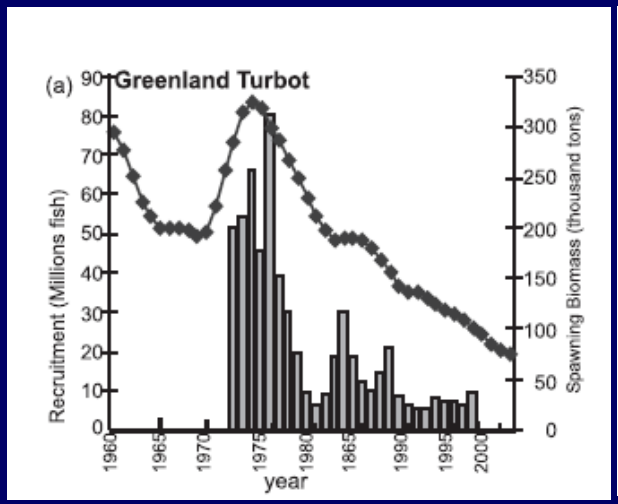
Sharp front divides the warmer, more saline southern shelf from the colder, fresher northern shelf.

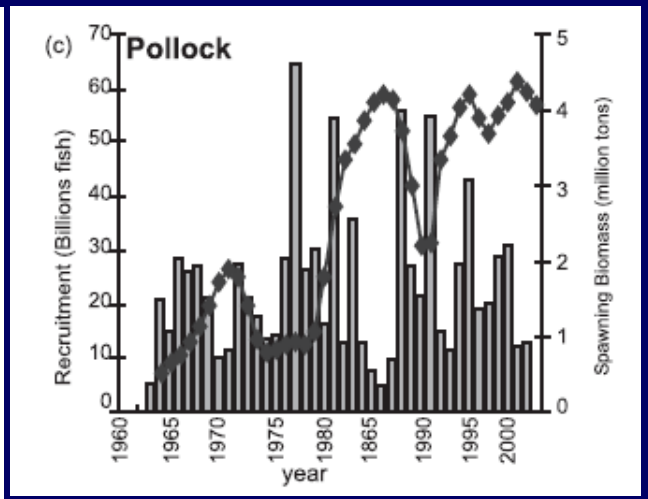
Southern Bering Sea Ecosystem Changes



Warm temperatures favor pollock over Arctic species







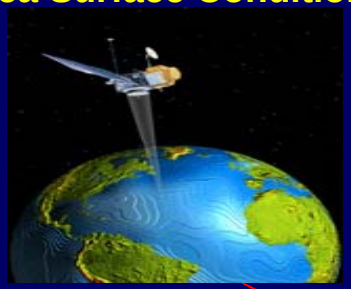
Credit Jim Overland

User communities

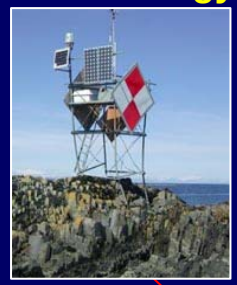
- Ocean Policy
- Oil Spill Response
- Maritime Transportation
- Commercial Charters
- Aquaculture
- Fishing
- Education

Conceptual model of PWS ocean observing system

Sea Surface Conditions



Meteorology



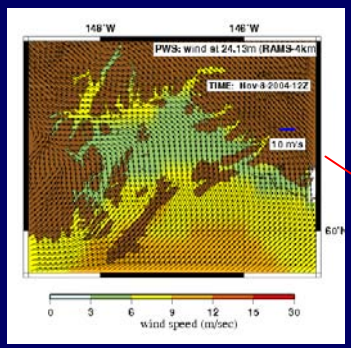
Oceanography

Water Quality

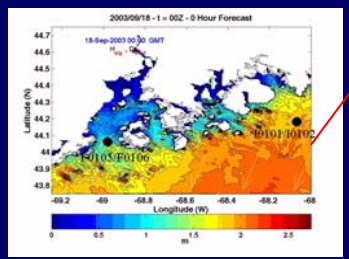
Currents

Precipitation

PWS Weather



PWS Waves



Data Assimilation

Data Assimilation

PWS ROMS

Model Data

Real time data Retrieval & Processing

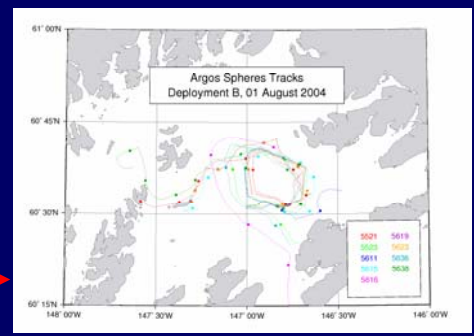
3D Model Assimilation

Application Server

Research Server

Public Feedback

Field Validation Experiments



Education

Economic models

Fishery management

Communities

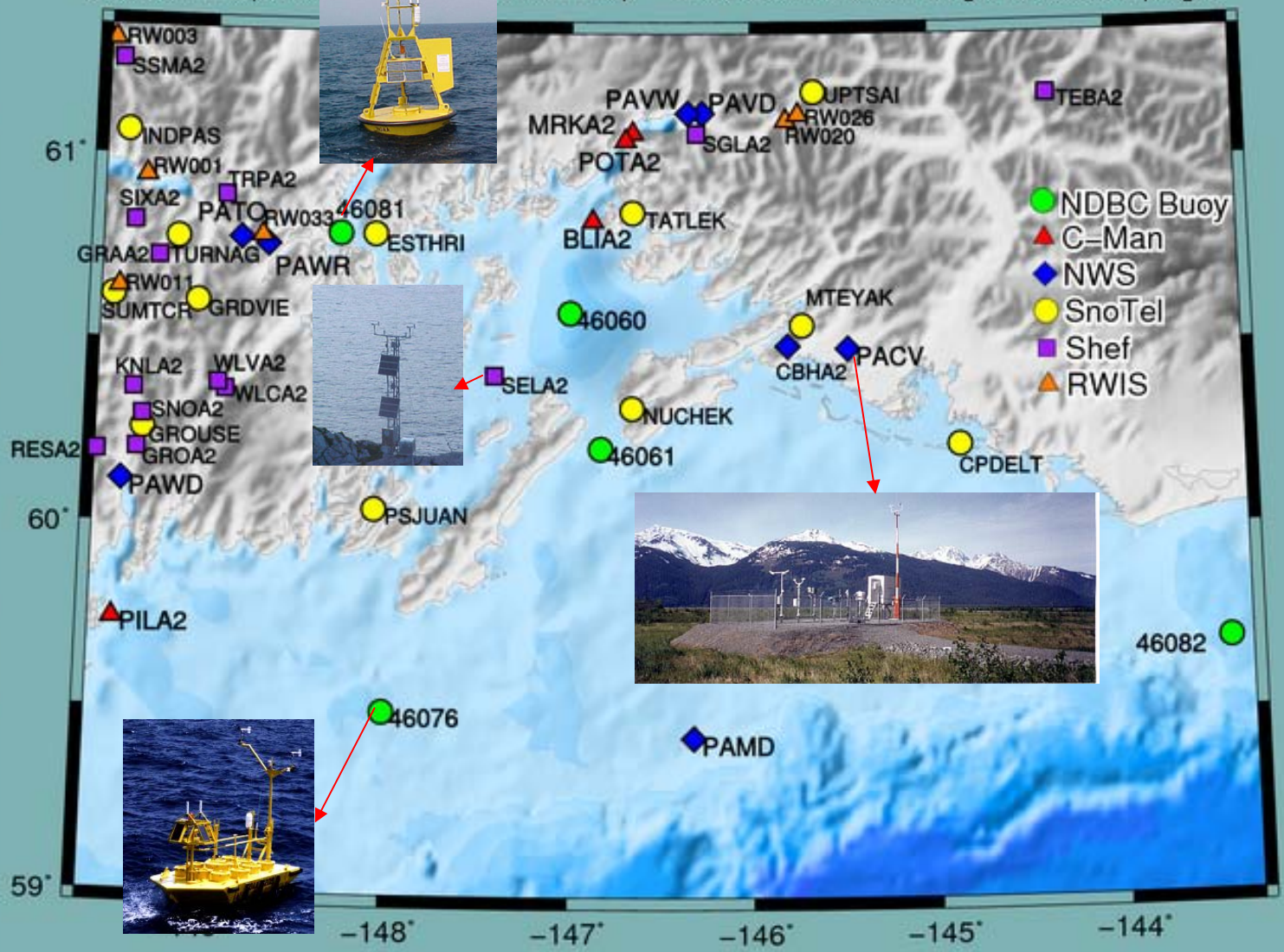
PWS Region

Maps
—Select Map—
Graphs
—Select Graph—
Data Tables
—HTML format—
—ASCII format—
Web Cameras
Interactive Station Data:
More station data
-Choose station-
Want more data?
Complete Recent Data Listing

Prince William Sound Stations - Recent data links

—Choose station—

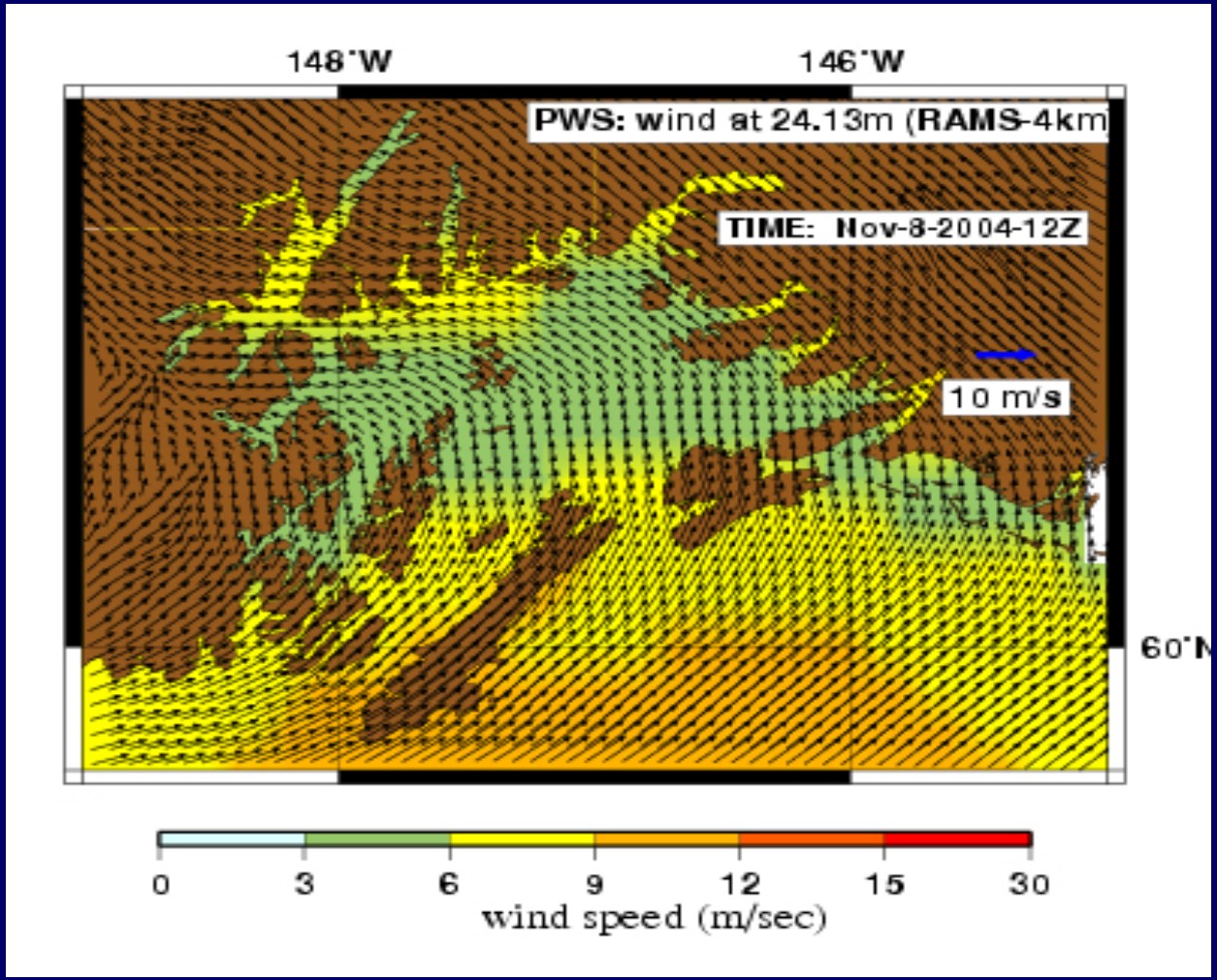
Click on map to v ation map - Or click on station to go to station page



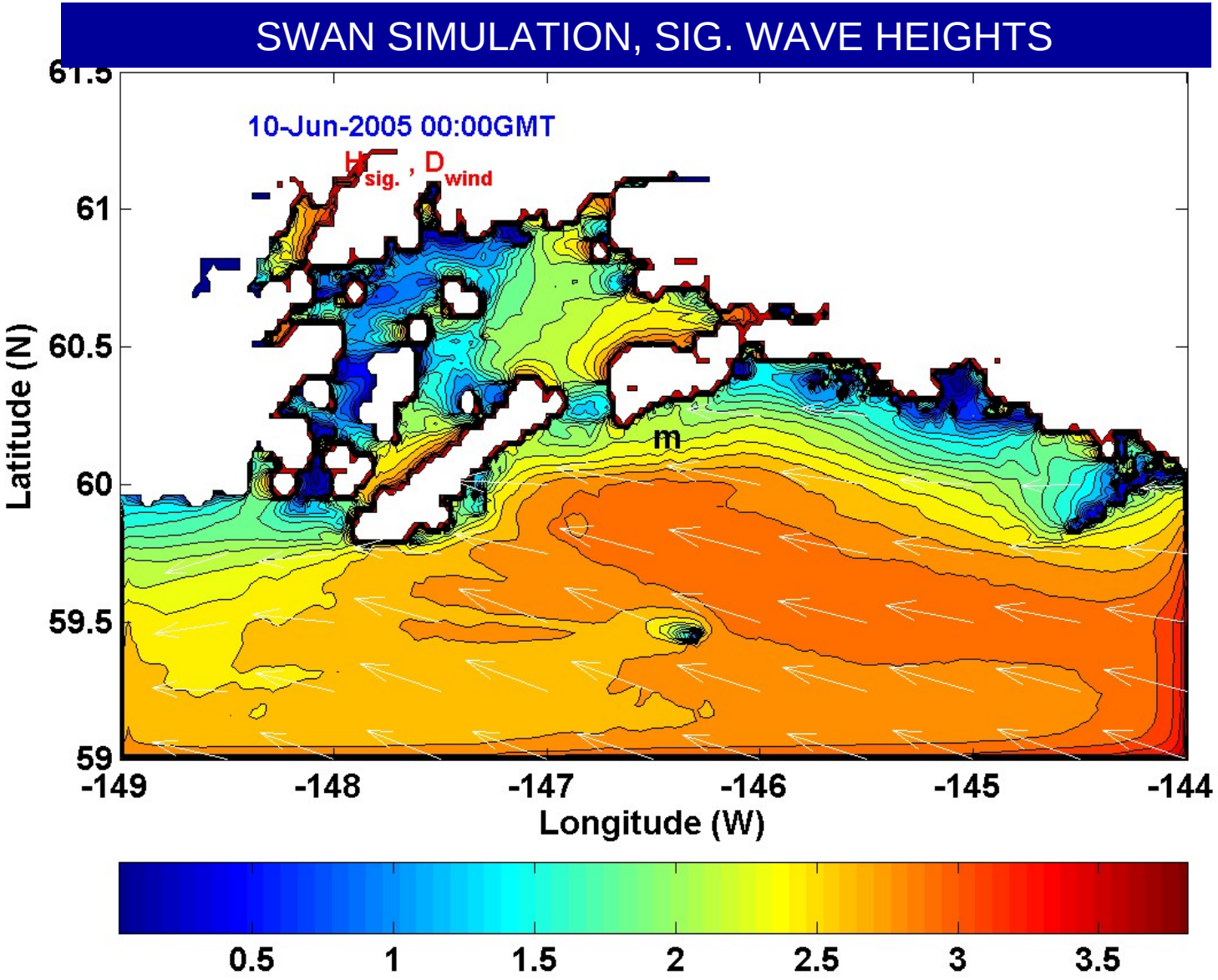
*** Shef and RWIS stations do not have station pages but will appear in regional maps ***

Want a bigger parameter map? —Larger Map— (WARNING: Large File)

Weather Forecasts
(Alaska Experimental Forecast Facility)

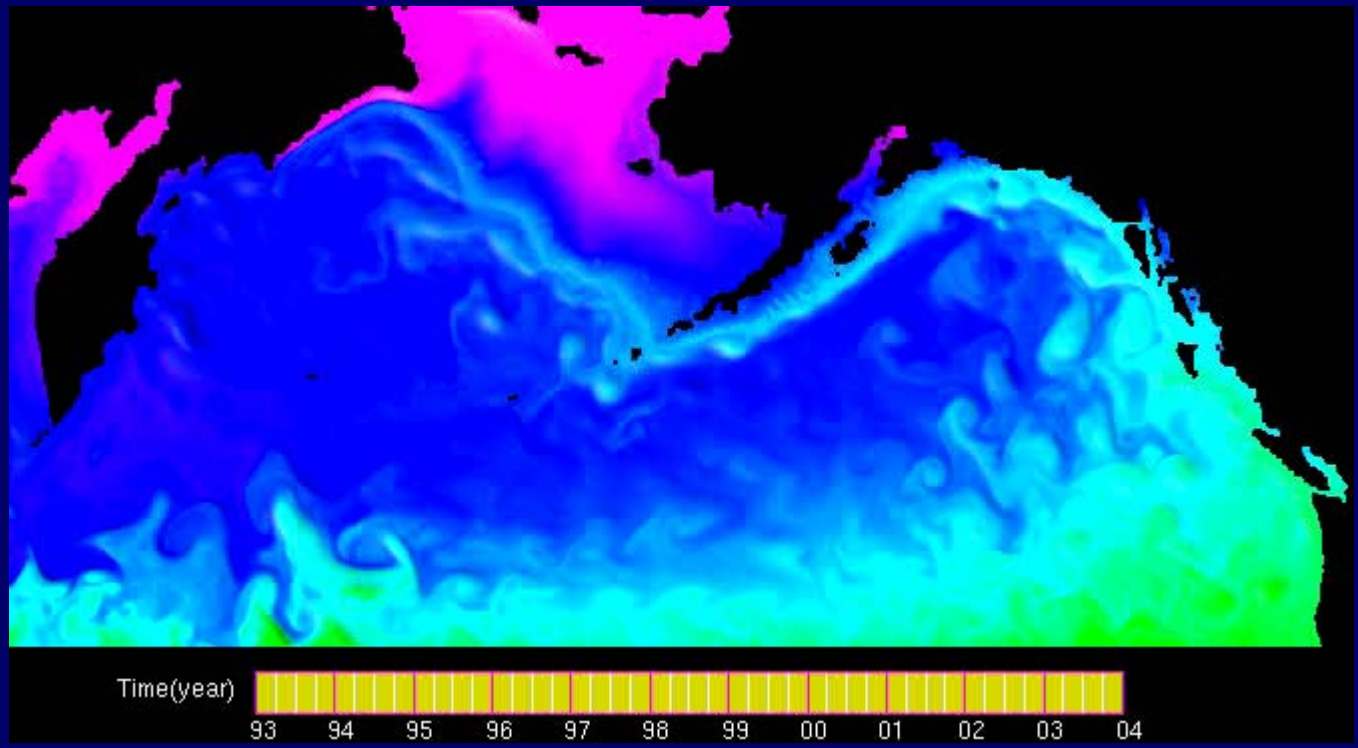


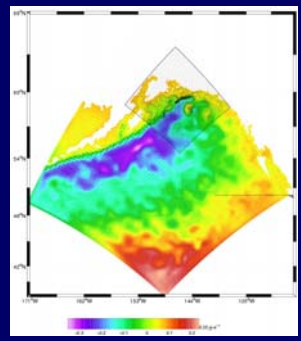
Wave Forecasts



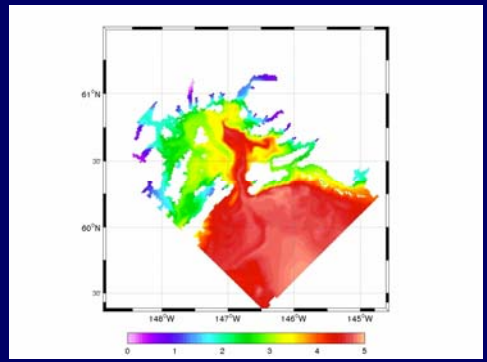
Ocean Circulation Forecasts

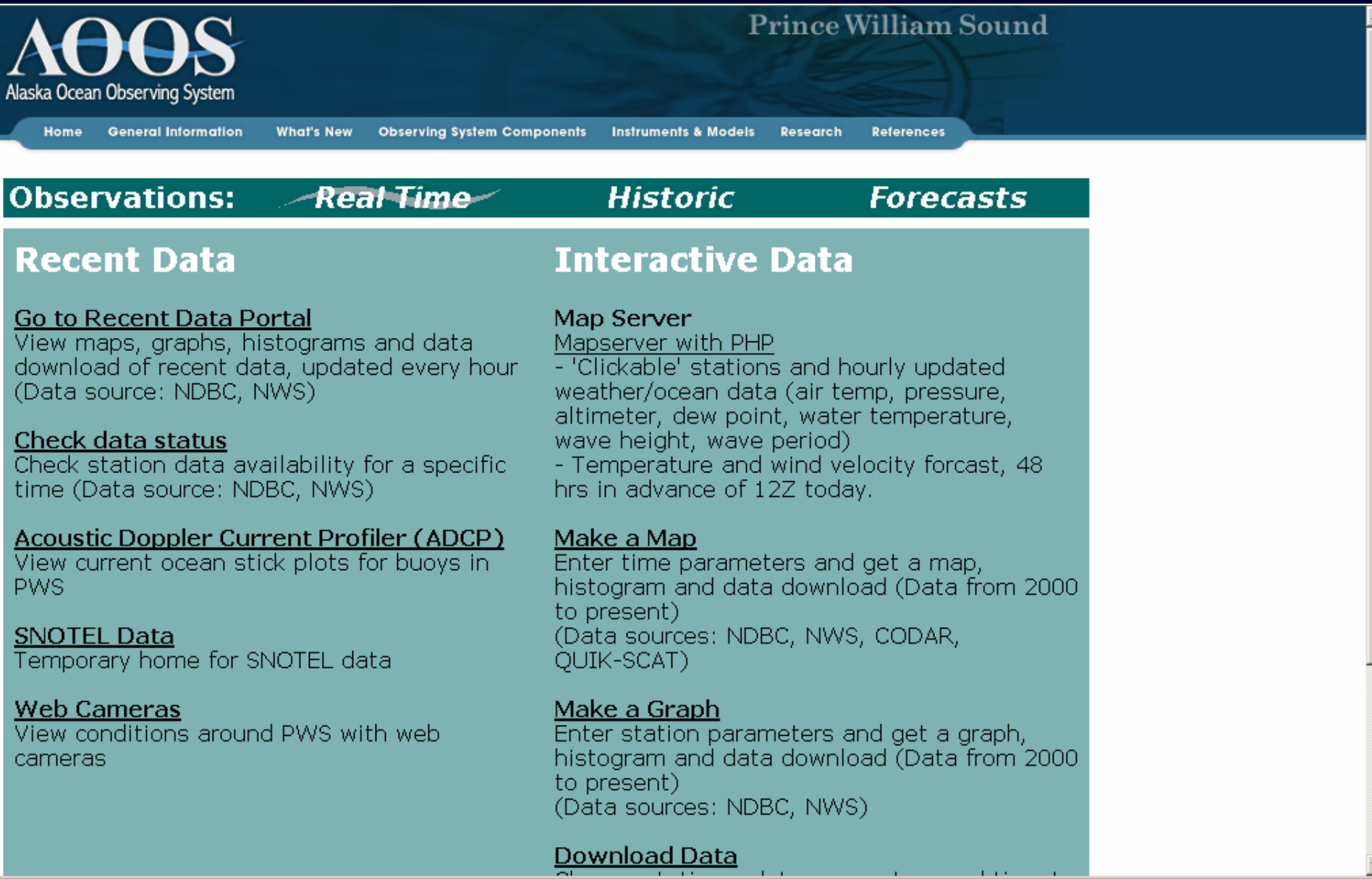
North
Pacific
12.5 km grid





GOA
3 km grid



PWS
1 km grid

Data dissemination and archiving