

IOOS[®]: Our Eyes on the Oceans, Coasts and Great Lakes

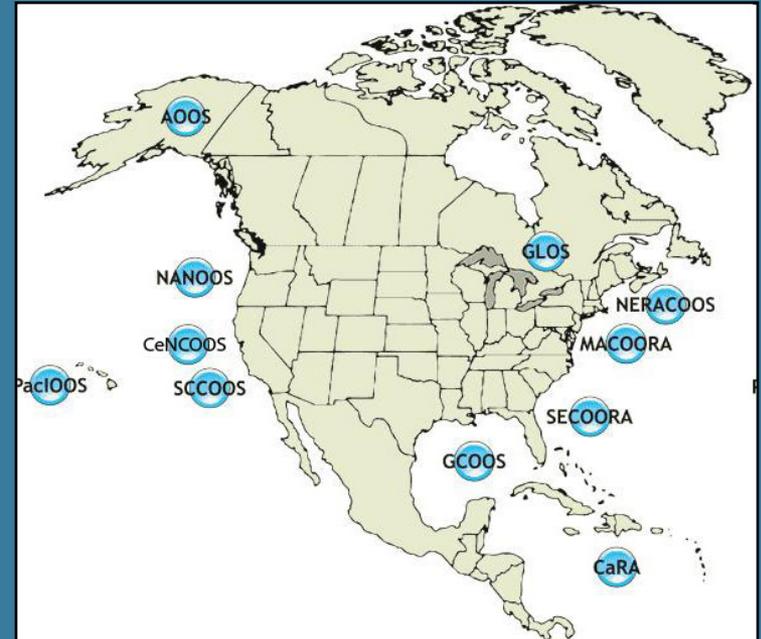
Zdenka Willis, Director
NOAA IOOS[®] Program

HAB Summit
February 2009

Background: IOOS[®]

IOOS[®] Development Plan defines:

- Global Component
- Coastal Component
 - 17 Federal Agencies
 - 11 Regional Associations



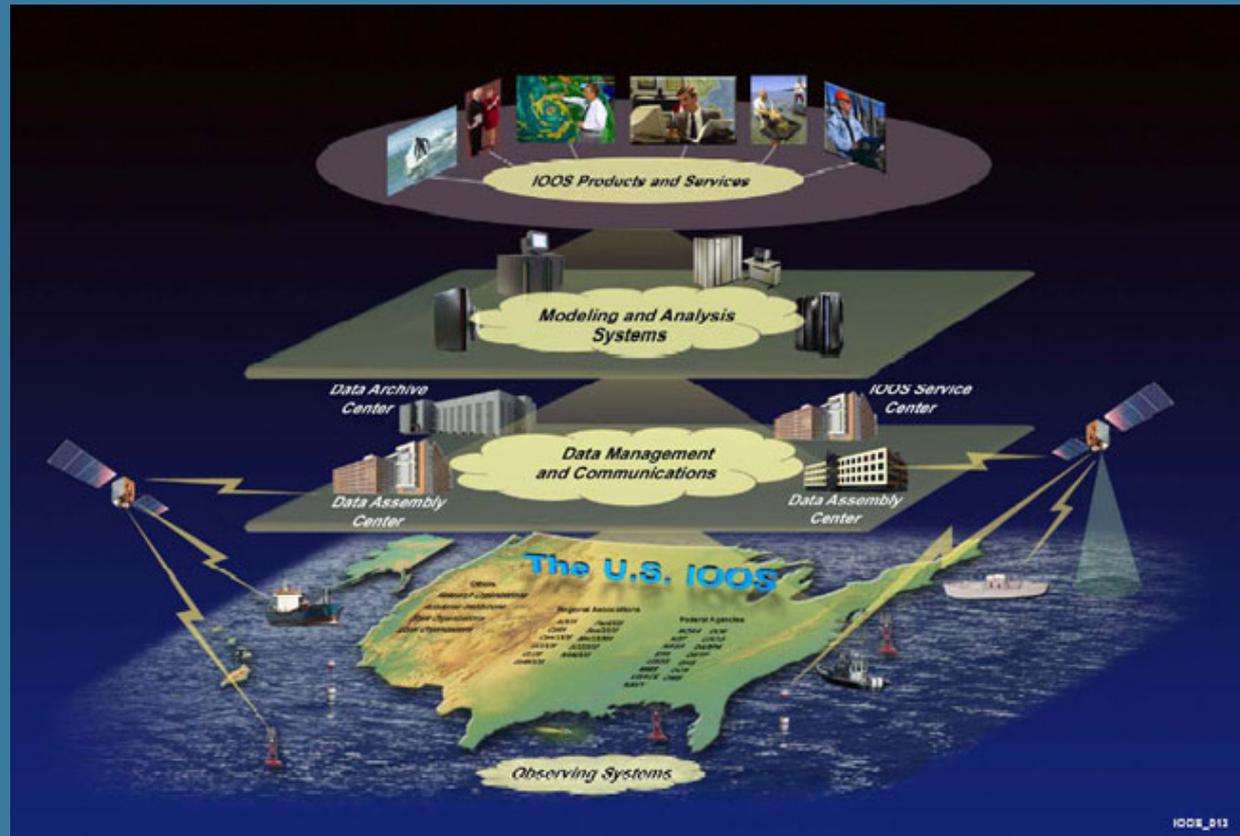
Background: IOOS[®]

3 Subsystems:

- Observing
- Data Management and Communication (DMAC)
- Modeling and Analysis

2 Cross Cuts

- Research and Development
- Education



IOOS_011

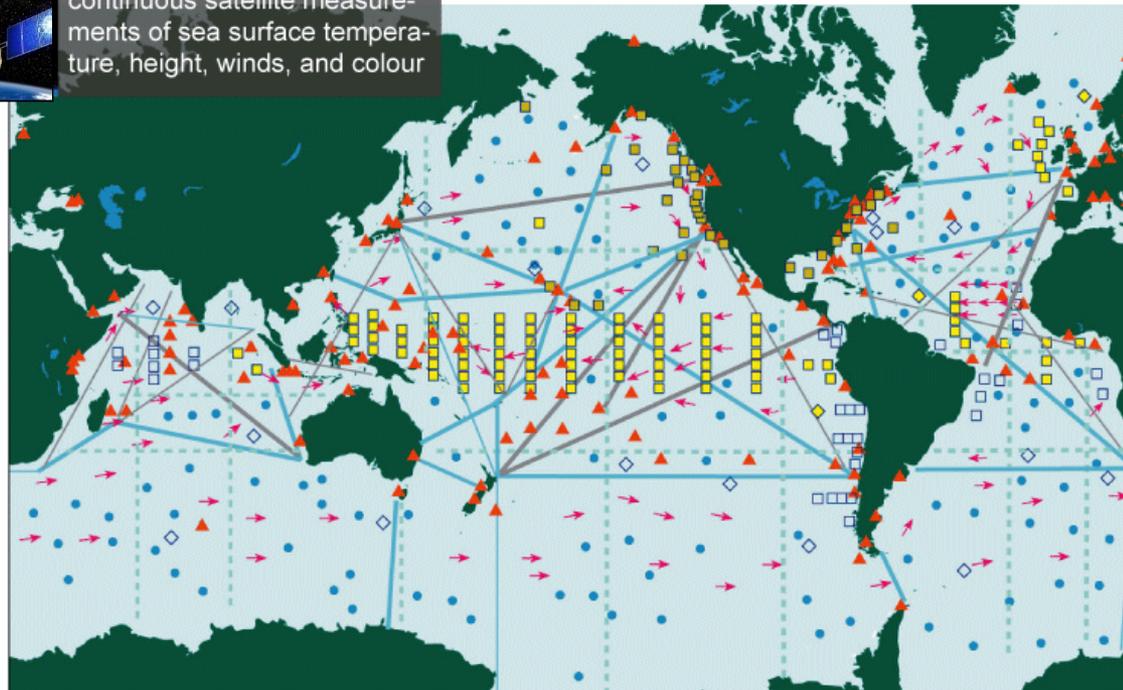
IOOS[®] : Global Component



continuous satellite measurements of sea surface temperature, height, winds, and colour

Total *in situ* networks **60%**

February 2008



87% **Surface measurements** from volunteer ships (VOSclim)

200 ships in pilot project



100% Global **drifting surface buoy array**

5° resolution array: 1250 floats



62% **Tide gauge network** (GCOS subset of GLOSS core network)

170 real-time reporting gauges



81% **XBT sub-surface temperature section network**

51 lines occupied



100% **Profiling float network** (Argo)

3° resolution array: 3000 floats



43% **Repeat hydrography and carbon inventory**

Full ocean survey in 10 years

Reference time series **24%**

58 sites



48% **Global reference mooring network**



29 moorings planned



79% **Global tropical moored buoy network**



119 moorings planned

IOOS[®] – Coastal Component

Societal Challenges

- The global climate is not well understood
- Coastal populations are at risk from weather, climate & natural hazards
- Our ocean, coastal and Great Lakes ecosystems are complex; many are at risk
- Expanding the Marine Transportation System

Information Needs

- Characterize the state of the global climate system and its variability
- Improved models (e.g., hurricane intensity, coastal inundation, and harmful algal bloom model)
- Improved ecosystem assessments
- Updated management approaches
- Improved access to data, and scientific information

IOOS Variables

Temperature
Salinity
Sea Level
Surface currents
Ocean color
Bathymetry
Surface waves
Ice distribution
Contaminants
Dissolved nutrients
Fish species
Fish abundance
Zooplankton species
Optical properties
Heat flux
Bottom character
Pathogens
Dissolved O₂
Phytoplankton species
Zooplankton abundance
Winds*

NOAA Decision Tools

Hurricane Intensity Model

Coastal Inundation Model

Harmful Algal Bloom Model

Integrated Ecosystem Assessment

Integration

Long-term data series, coordinated in space and time

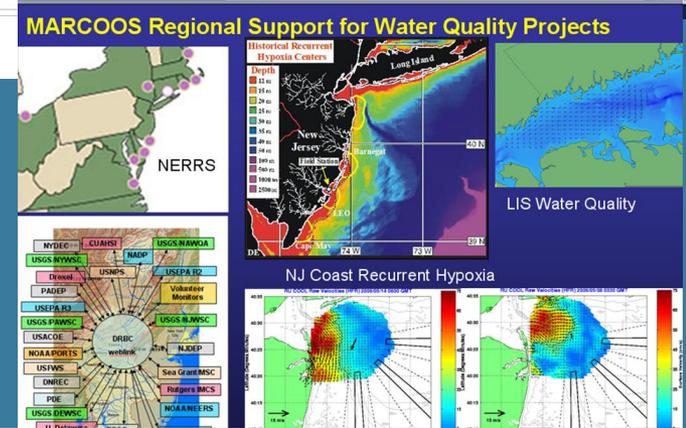
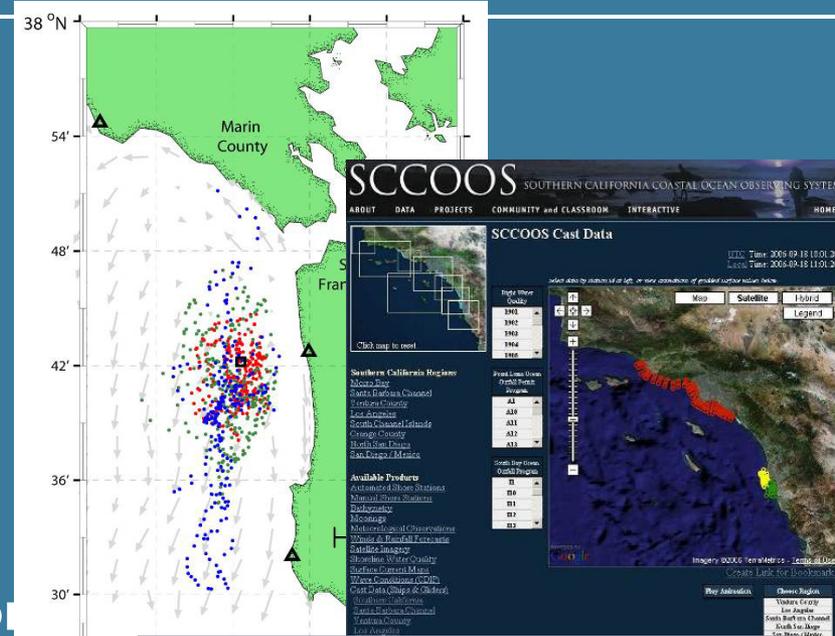
Regional Partnership



- Conduit from regions to Federal Agencies
- Regions meet National missions through
 - Strong connections to stakeholders → 475 partnerships
 - Observing, DMAC, modeling, and products

Regions Meet National Missions

- Fisheries-Climate
 - SCCOOS: 50 years of CalCOFI web accessible in '09
- Water Quality
 - SCCOOS: Hyperion Treatment Plant Diversion
 - CeNCOOS: Effluent trajectories
 - MACOORA: Delaware River Basin NMQWM Pilot Study
 - SECOORA: Surface currents monitoring to mitigate impacts of dredged material on nearby reefs
- West Coast Governors' Agreement Action Plan using IEAs to define ecosystem health
- Instrument Testing and Validation
 - Alliance for Coastal Technologies

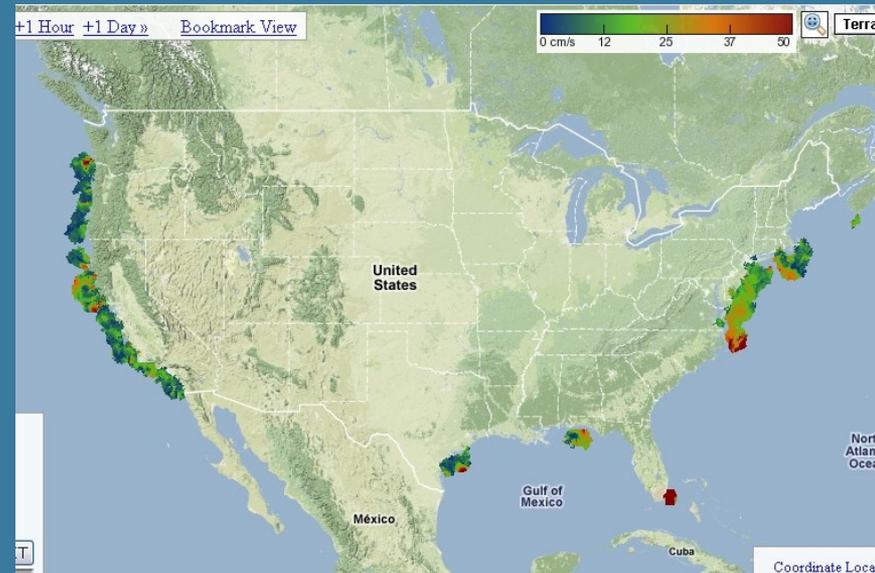


WEST COAST GOVERNORS' AGREEMENT on OCEAN HEALTH
CALIFORNIA OREGON WASHINGTON

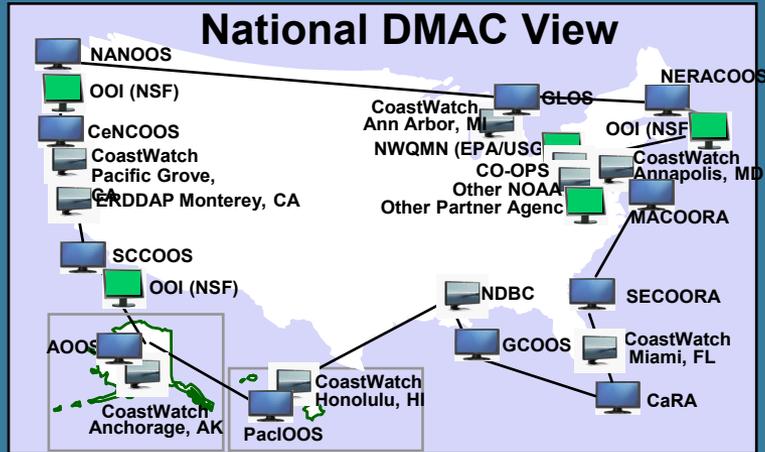


Federal and Regional Partners

- **California Seafloor Mapping (NOAA and USGS)**
 - California planned major seafloor mapping investment
 - Data could not support hydrographic mission unless to IHO standards
- **High Frequency Radar (HFR)**
 - Significant non-federal investment
 - Serves many missions
 - Implemented national HFR servers/data management system



National DMAC View



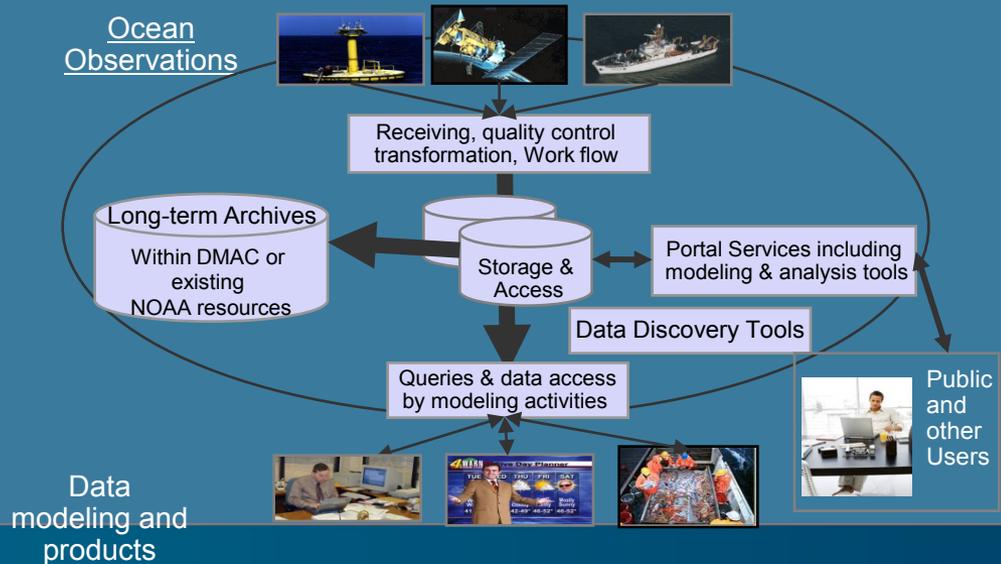
Overview

- Distributed Regional & Federal Data Assembly Centers
- Develops and manages technical design & standards
- Leverages existing Federal and Non-Federal technologies

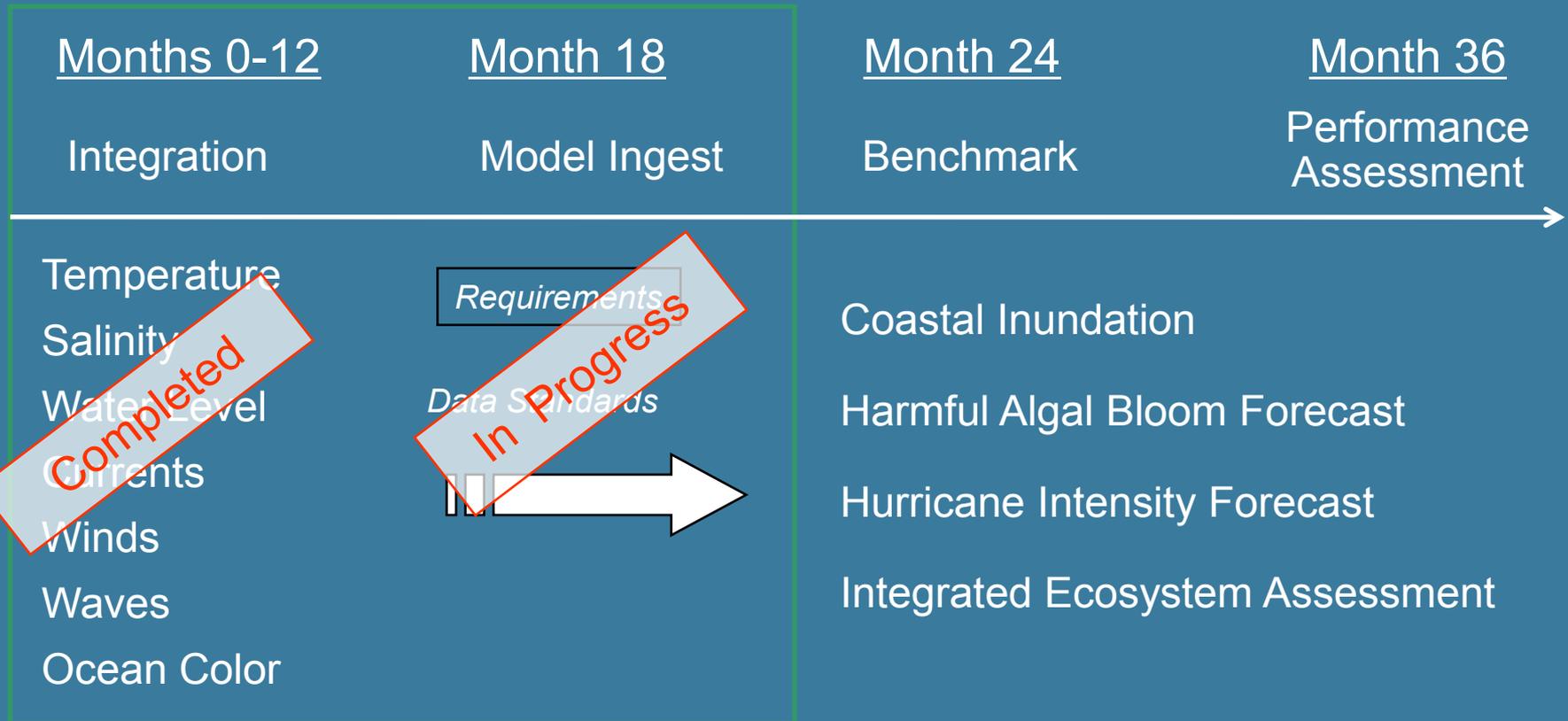
Functionality

- Integrated data #1 request
- Standardize, integrate, and simplify delivery of data from multiple sources
- Access to broader data resources to understand impacts of climate change and improved management decisions

DMAC Functions and Interfaces

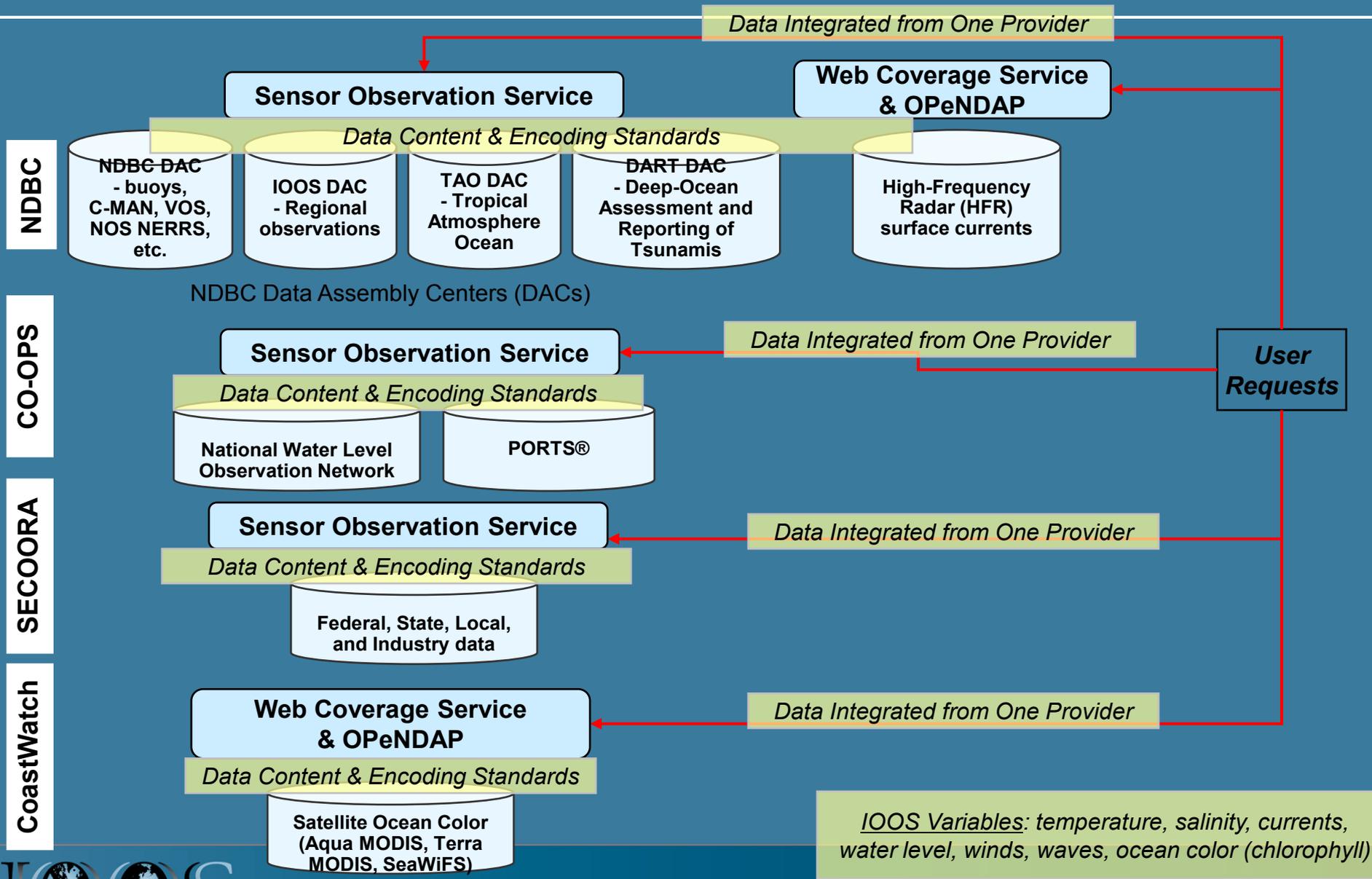


Data Integration Framework



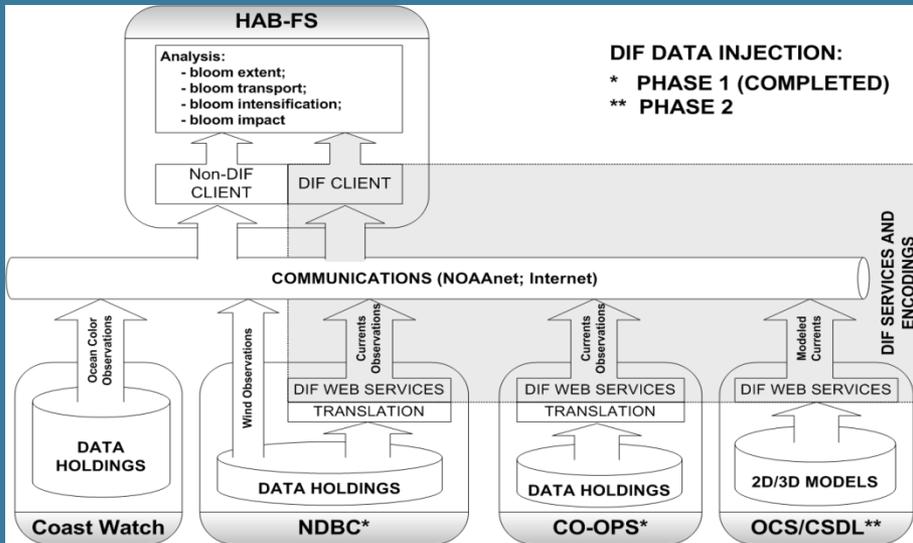
- *Regional Implementation of the DIF*
- *Interagency/GEOSS data management collaborations*
- *Documents at www.ioos.noaa.gov*

DIF Data Provider Status – end of CY08



Harmful Algal Blooms - FS

Data Flow



Timeline *

ID	Task Name	Q1 FY09		Q2 FY09			Q3 FY09			Q4 FY09					
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1	HAB-FS Phase 1	◆ (COMPLETED)													
2	Historical HAB review and selection	█													
3	Metric development	█													
4	NGOM Modeling & Data Stream	█													
5	GNOME Transport Modeling							█							
6	HAB-FS Skill Assessment								█						
7	Final Report											█			

* Timeline is contingent on funding schedule; likely Q2 FY09 start

Performance Assessment

Benefit	Metric	Measurement method
Spatial and temporal accuracy increase	HAB Transport & Extent accuracy	Hindcast vs. past HAB-FS bulletins
Nowcast when satellite imagery is unavailable	HAB Transport & Extent availability in cloudy days	Hindcast vs. past HAB-FS bulletins
Forecast for extended areas, e.g., Tampa Bay	Total area growth	Hindcast vs. past HAB-FS bulletins
Forecast length extension	Total forecast length increase	Hindcast vs. past HAB-FS bulletins

Performance measures development will be ongoing through Q3, FY09

Questions?



“Providing information needed to improve safety, enhance our economy and protect our environment”

<http://ioos.noaa.gov>