

# **OOPC Meeting COOP Report**

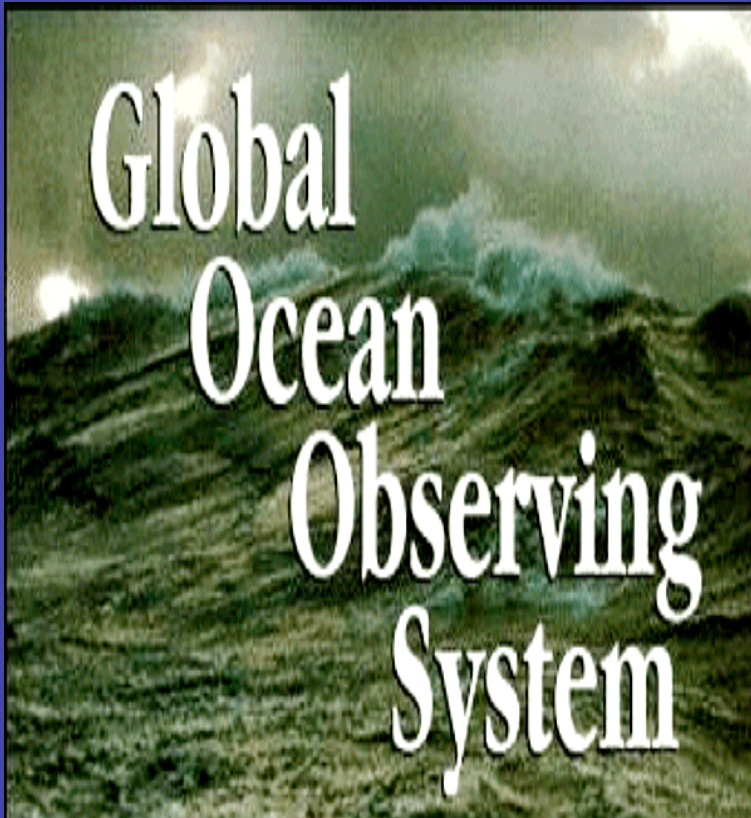
**Tom Malone & Tony Knap, Co - Chairs**

**Integrated, Strategic Design Plan for the  
Coastal Ocean Observations Module of the  
Global Ocean Observing System**

**<http://ioc.unesco.org/goos/gsc6/COOP-Design-Plan.doc>**

# Coastal Ocean Observations Panel

2000 - 2002

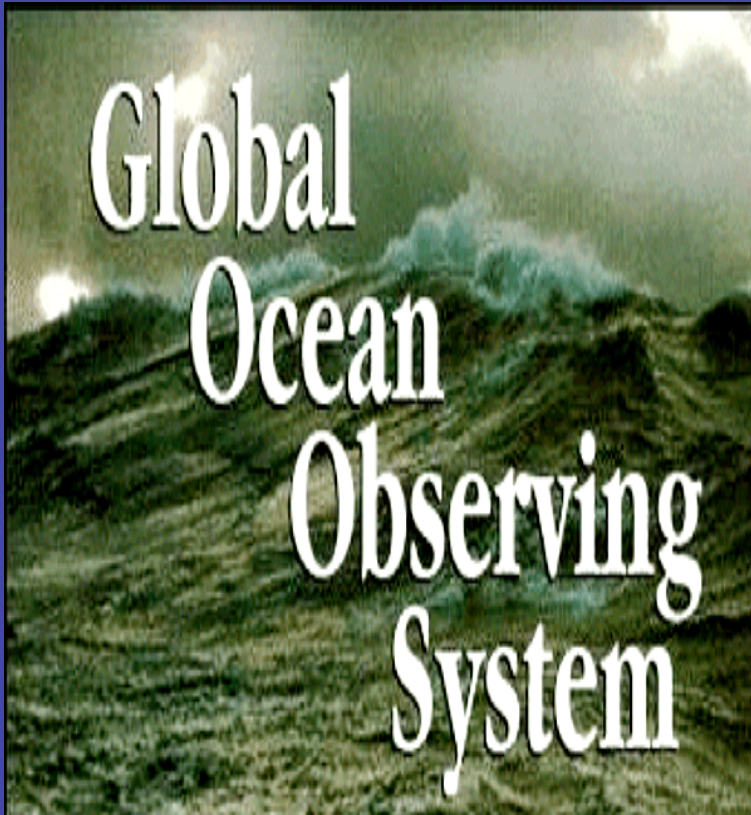


<http://ioc.unesco.org/goos/COOP-4/coop4.htm>

- Physical Oceanography/Meteorology  
Lauro Calliari, Johannes Guddal, Hiroshi Kawamura, Nadia Pinardi, Validimir Smirnov, Keith Thompson
- Biological Oceanography  
Bodo von Bodungen, John Cullen, Julie Hall, Tom Malone, Mohideen Wafar
- Fisheries  
Dagoberto Arcos, Mike Fogarty, Kwame Korenteng, Coleen Moloney
- Contamination/Human Health  
Alfonso Botello, Mike Depledge, Eric Dewailly, Tony Knap, Hillel Shuval, Rudolph Wu
- Data Management  
Juliusz Gajewski, Savi Narayanan
- Socio-Economics  
Bob Bowen

# Coastal Ocean Observations Panel

2000 - 2002



## 18 Countries

- **Brazil, Canada, Chile, China**
- **Germany, Ghana**
- **India, Israel, Italy**
- **Japan, Mexico, New Zealand, Norway**
- **Poland, Russia, South Africa**
- **United Kingdom, United States**

# Terms of Reference

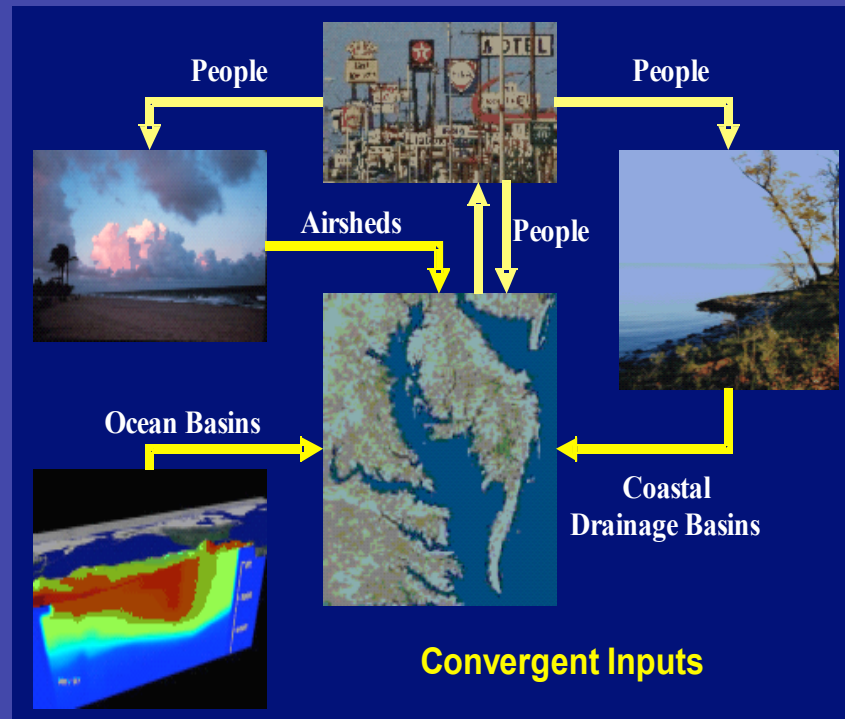
- **Integrate & refine the design plans of the HOTO, LMR, & the C-GOOS panels consistent with GOOS Design Principles.**
- **Formulate an implementation plan that is coordinated with the OOPC plan for climate services, research & marine services with due emphasis on**
  - **integrated observations, data and information management, data assimilation & modelling for the purposes of prediction and product development;**
  - **criteria & procedures for selecting observing system elements**
  - **procedures for ongoing evaluation of system components, reliability of data streams, access to data, and applications;**
  - **capacity building; &**
  - **national, regional, & global promotion of objectives and benefits of the observing system.**
- **Develop mechanisms for more effective and sustained involvement of user groups in the design & implementation of the coastal module of GOOS.**
- **Develop mechanisms that enable effective synergy between research & the development of the coastal module.**

# The Integrated, Strategic Design Plan for the Coastal Ocean Module of GOOS

<http://ioc.unesco.org/goos/gsc6/COOP-Design-Plan.doc>

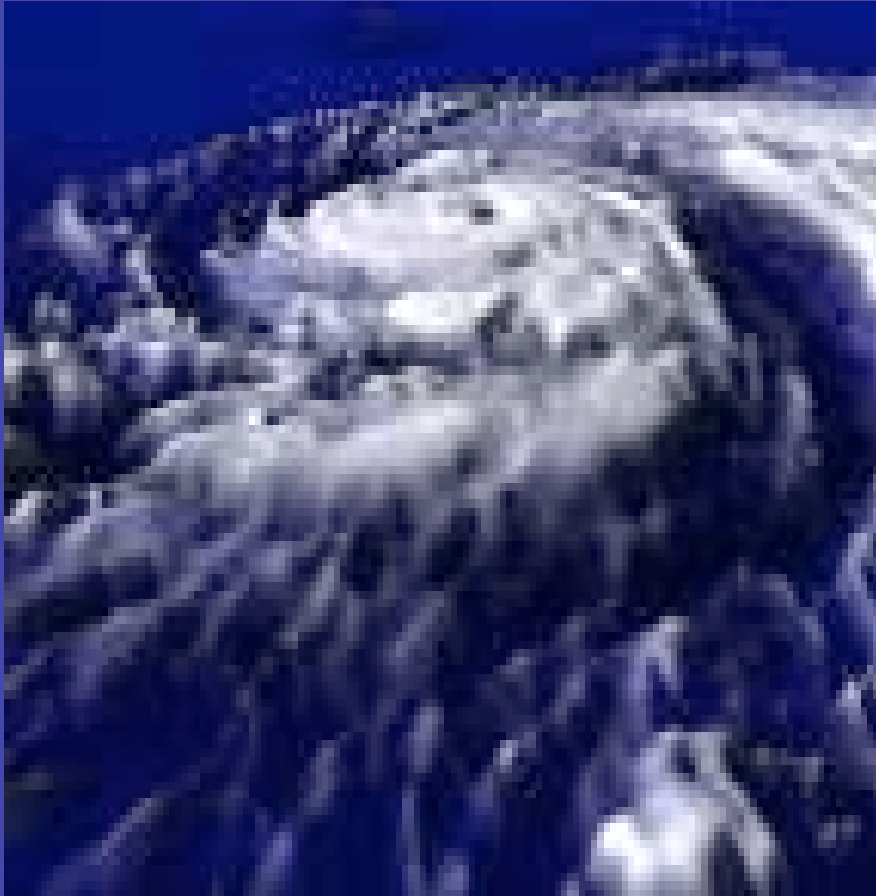
- **Executive Summary**
- **Prologue (Conventions, IGOS, ToR)**
- **BACKGROUND (Goals, Scope & Rationale)**
  1. Introduction
  2. Coastal Ecosystems: The Human Dimension
- **DESIGN OF THE GLOBAL COASTAL NETWORK**
  3. Conceptual Design
  4. The Initial Subsystem for Observations
  5. Combining Observations & Models
  6. Data Management & Communications
- **IMPLEMENTATION**
  7. Preliminary Guidelines for Implementation

# Geographic Boundaries



- Head of tide – Seaward Boundary of the EEZ
- Extends beyond the EEZ
  - Fisheries
  - Contaminants

# Large Scale Drivers of Change & Variability in Coastal Ecosystems



- **Human activities**
  - Land based sources of pollution
  - Combustion of fossil fuels
  - Extraction of resources
- **Natural hazards**
  - Extreme weather
  - Tsunamis
  - Earth quakes
- **Basin scale oscillations**
  - ENSO
  - PDO
  - NAO
- **Climate change**
  - Global warming, Sea level rise
  - Frequency of extreme weather
  - Patterns of precipitation/evaporation

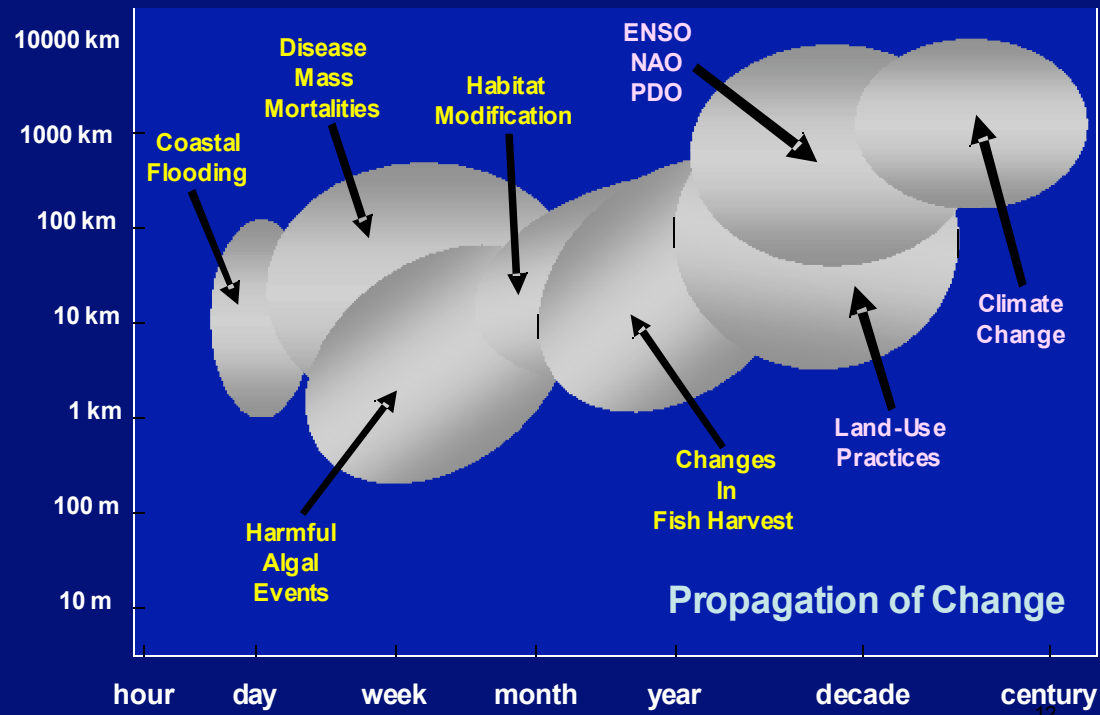
# Coastal Phenomena of Interest

## Six Goals, One System



- **Improve predictions of climate change & its impacts**
- **Improve safety & efficiency of marine operations**
- **Improve predictions of natural hazards & their impacts**
- **Reduce public health risks**
- **Protect & restore healthy marine ecosystems more effectively**
- **Sustain & restore living marine resources**

# Ecosystem-Based Approach Adaptive Management



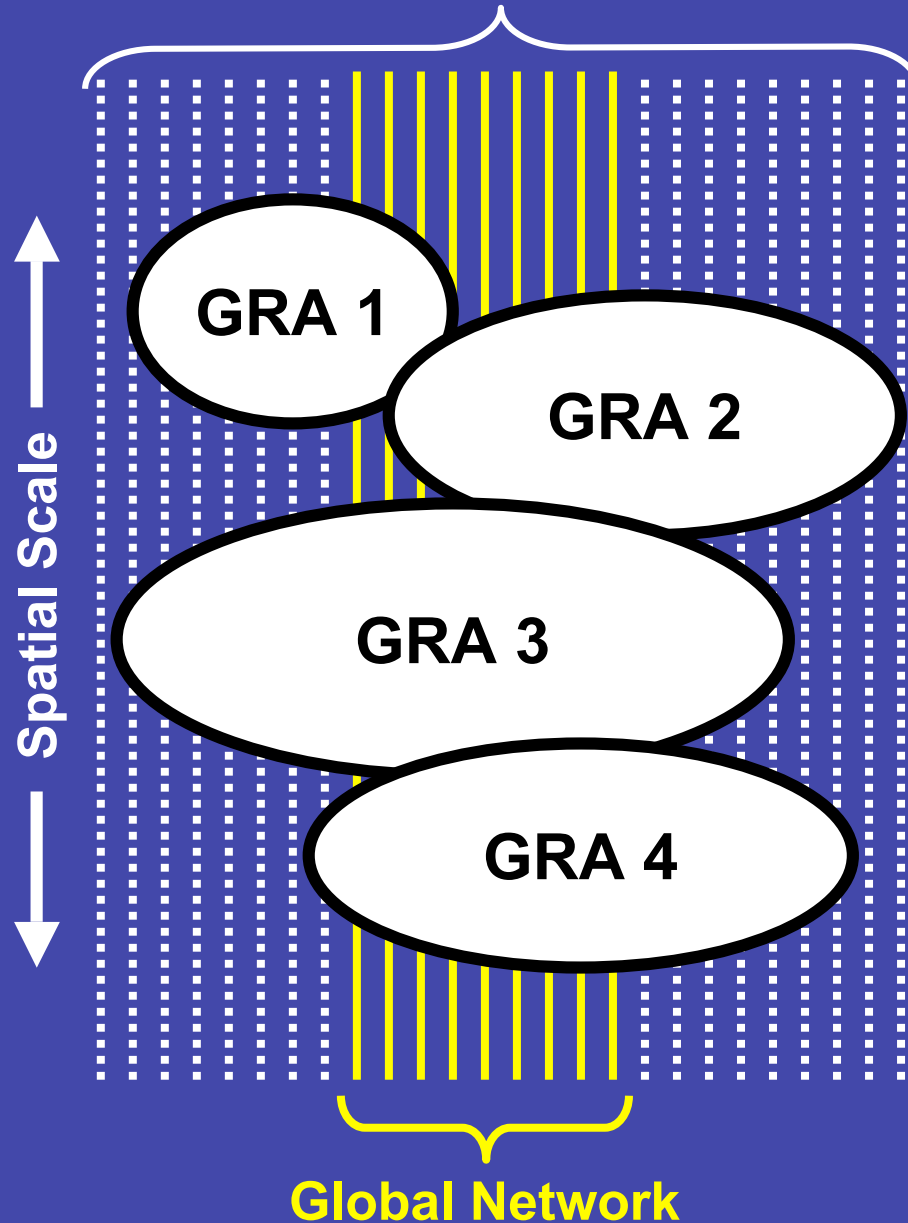
- Routine, Rapid Detection changes
  - over a broad spectrum of time-space scales
- Timely Predictions of such changes

**WE DO NOT HAVE THIS CAPABILITY TODAY**

# Basic Design Considerations

- **The 6 goals encompass a broad spectrum of phenomena**
  - Local expressions of global/basin scale forcings
  - Common requirements for data, data management, analysis
  - The observing system must be integrated & sustained
- **Priorities vary among nations/regions**
  - National & regional programmes provide most effective venue for interfacing with user groups & product development
  - National & regional programmes have common requirements for data, data management, analysis
- **Many building blocks of GOOS already exist**
- **Operational capabilities are most advanced for marine services, natural hazards, and climate**
- **Capacity to contribute to & benefit from GOOS varies enormously among nations and regions**

## GOOS Regional Alliances (GRAs)



## Coastal Module of GOOS

### GOOS Regional Alliances

- User group priorities/products
- Contribute to building GCN
- Higher resolution, more variables based on regional priorities

### Global Coastal Network (GCN)

- Provide data & information required by most GRAs

#### Common Variables

- Establish  
Reference & sentinel  
stations &  
Common  
standards/protocols
- Facilitate capacity building

# GOOS Regional Alliances



- Regional Seas Conventions
- Regional Fishery Bodies
- Large Marine Ecosystems
- Marine Protected Areas

# A Possible Model

## North Sea (GOOS) Pilot Project (NORSEPP)

- **A Regional Consortium in the making**
  - ICES, EuroGOOS, OSPAR, NOOS
- **Initiate operational fisheries oceanography by integrating existing monitoring**
  - Combine models & data to generate operational products for fisheries management
  - Streamline access to data & information
  - Evaluate outputs to assess usefulness & improve observing system
- **3<sup>rd</sup> EuroGOOS Conference**
  - NORSEPP – Bill Turrell
  - NOOS – Martin Holt

# Global Federation of GRAs



- **Select & integrate existing & new elements to build the global coastal network**
- **Ensure that the global network provides data & information required by States & GRAs in a timely fashion**
- **Establish & implement common standards and protocols**
- **Formulate & implement a coordinated strategy for capacity building**

# The Goal

Climate Change, Marine Ops, Natural Hazards,  
Public & Ecosystem Health, Living Marine Resources

Provide Data & Information  
Routinely, Rapidly & Continuously

End-to-End  
System

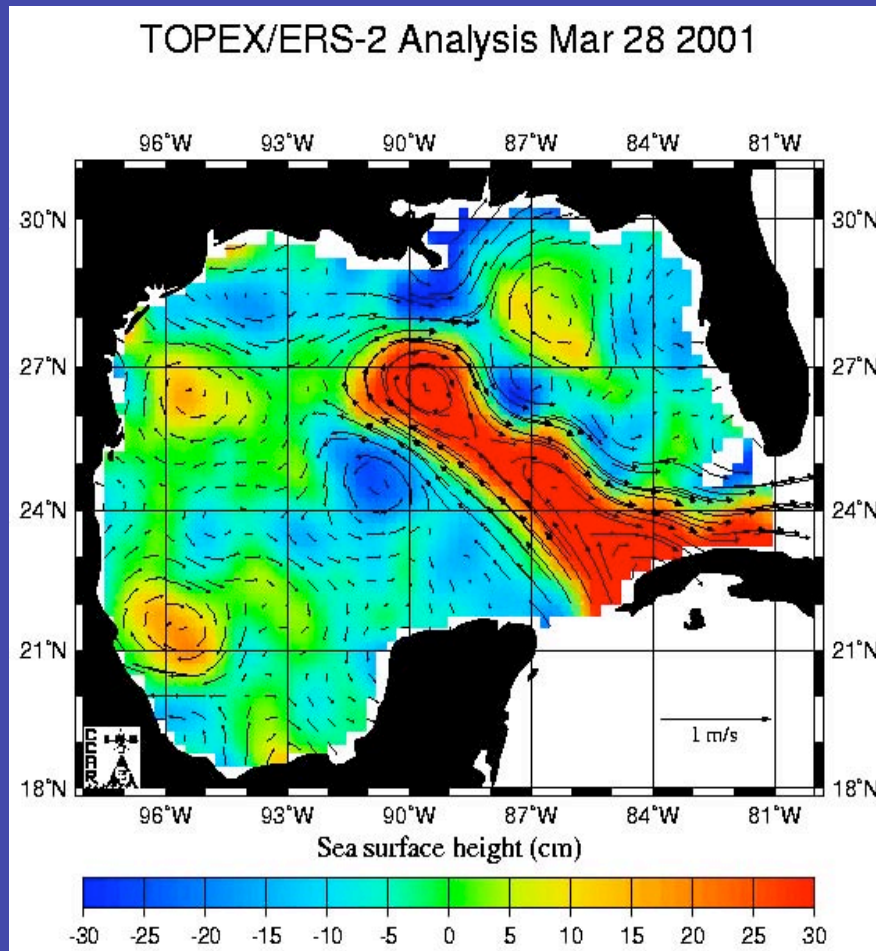


# The Global Coastal Network is the focus of the COOP Design Plan



# Selecting the Common Variables

## Minimum No./Maximum No. Phenomena



- **Comprehensive list of variables for all 6 goals**
- **Detection**
  - Weight variables based on
    - No. of phenomena of interest
    - No. of user groups
- **Prediction**
  - Weight variables based on
    - data requirements of models for each goal
    - No. of user groups

# Global Coastal Backbone Provisional Common Variables

## PHYSICAL

Sea level, Temperature, Salinity, Currents, Surface waves,  
Bathymetry, Shoreline position

## CHEMICAL

Sediment grain size/organic content,  
Dissolved inorganic N-P-Si, Dissolved O<sub>2</sub>

## BIOLOGICAL

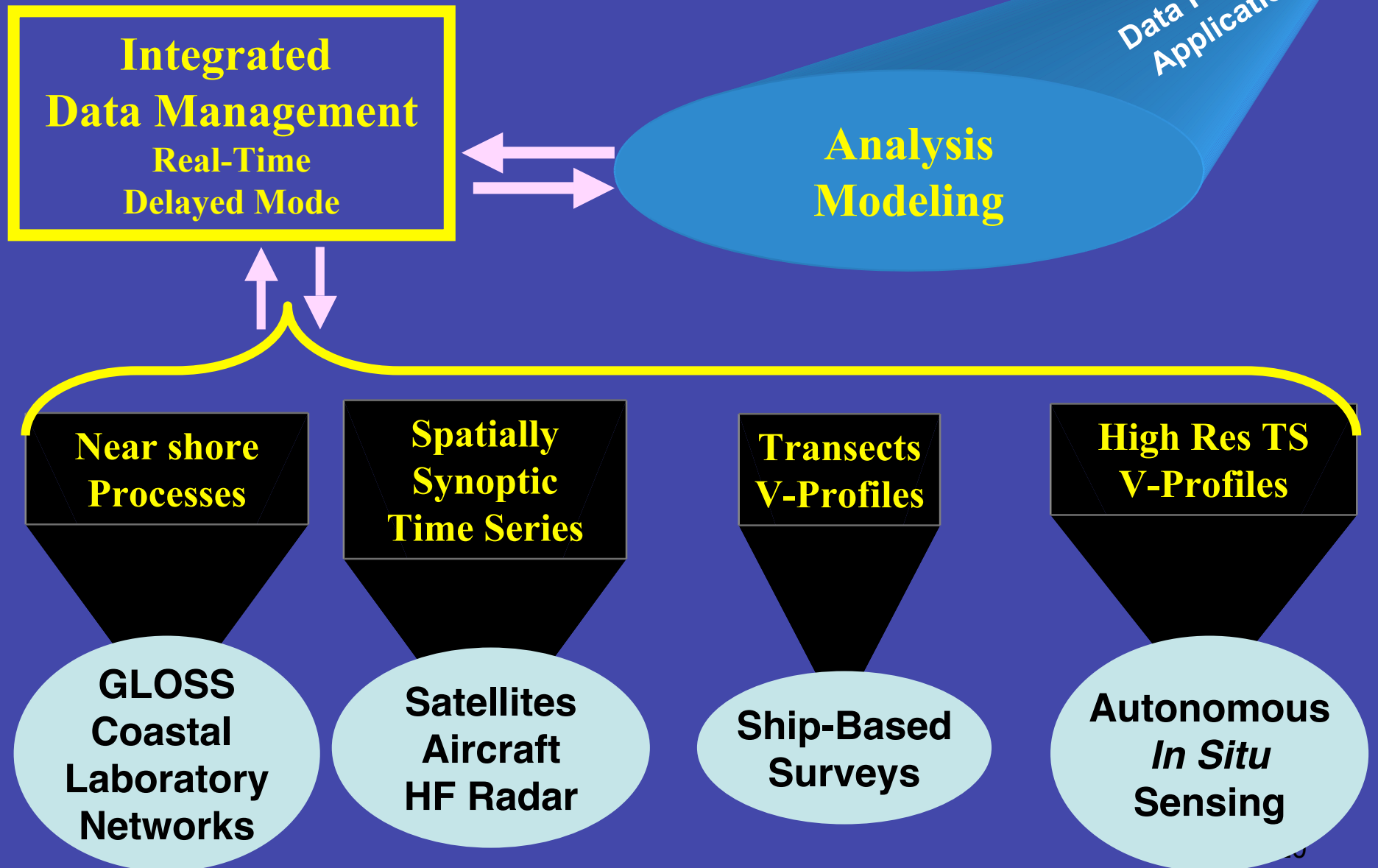
Benthic biomass,  
Phytoplankton biomass, Attenuation of solar radiation  
Fecal Indicators

# Globally Important Categories



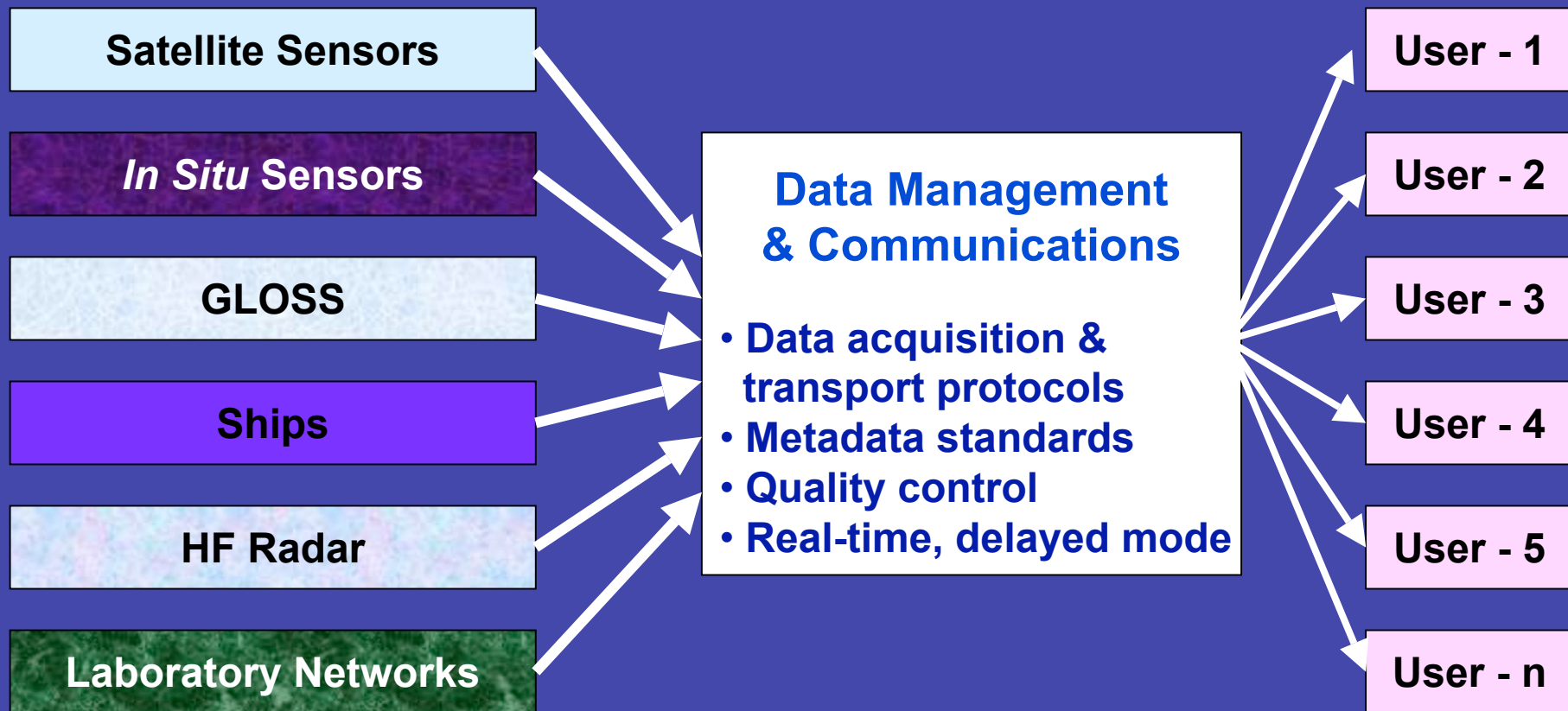
- **Fish Stocks**
- **Habitats, e.g., coral reefs, SAV, kelp beds, tidal wetlands**
- **Large marine animals, e.g., turtles, mammals, seabirds**
- **Invasive species**
- **HABs**
- **Chemical contaminants**

# Coastal Module: Platforms



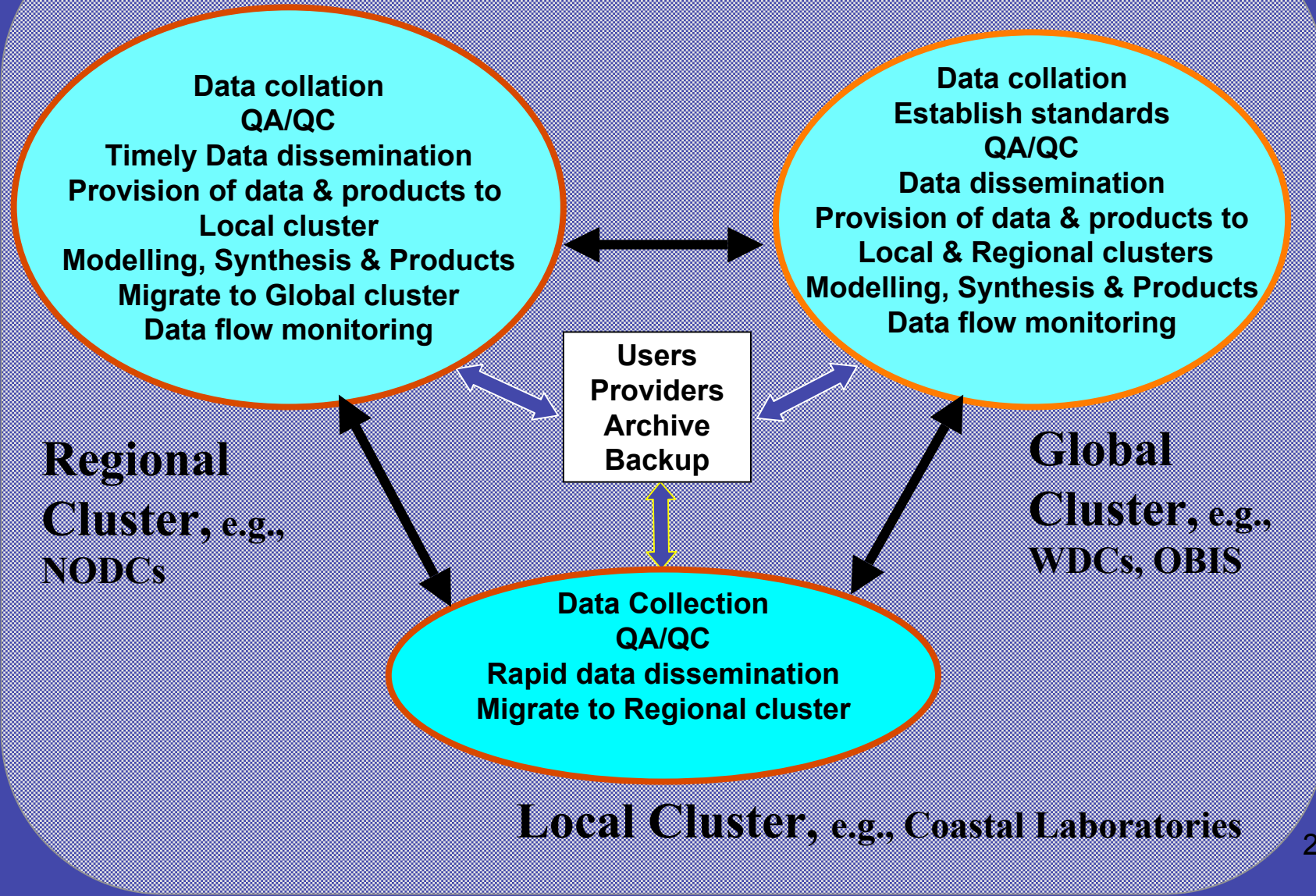
# GOOS Data Communications & Management Subsystem

## The Goal: “One Stop Shopping”



# IODE / JCOMM

## A Virtual Oceanographic Data Center



# Implementing the Coastal Module: Key Recommendations

## GOOS Regional Alliances (GRAs) are the building blocks of the Global Coastal Network

- R&D incubators
- Provide a venue for involving user groups & product development
- Implement sustained Capacity Building

## A Global Coastal Network

- Measure & manage variables required by most GRAs – The “Common” Variables
- Establish a network reference & sentinel stations

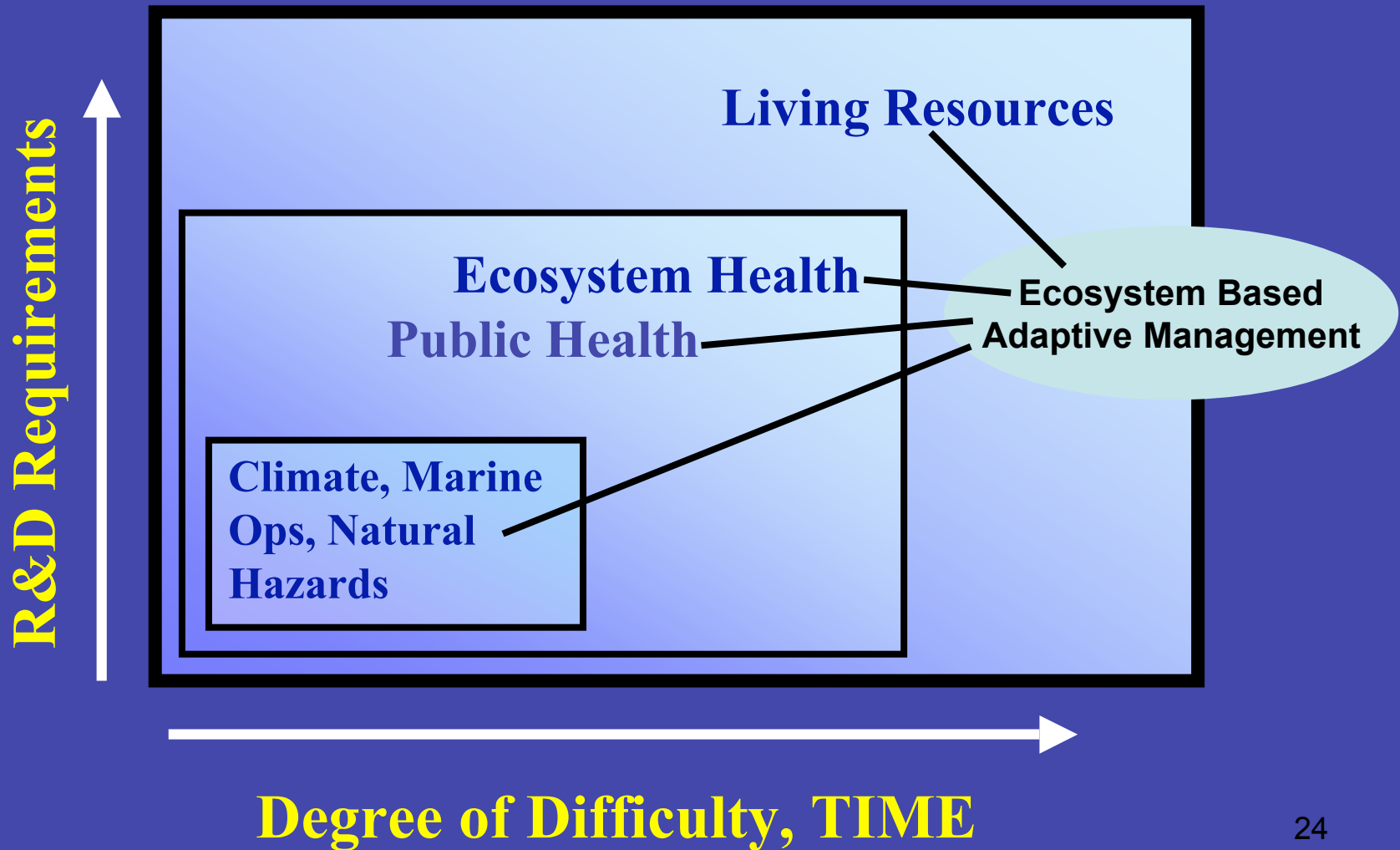
## A Global Federation of Regional Alliances

- Build the global coastal network
- Formulate international agreements on common standards & protocols
- Harmonize development of the Coastal & Open Ocean modules
- Facilitate technology transfer & capacity building

## Begin by

- Selectively linking existing elements through integrated data management on regional & global scales

# Building An Integrated System



# OOPC/COOP Pilot

- Sea level - storm surge - coastal erosion ?
- A regional study OOPC outer box of the models - North Sea ?
- Cycles PDO, ENSO,NAO and ocean productivity and fisheries ??
- Indices for storminess (tropical and non tropical storms)