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**REPORT ON THE COOP IMPLEMENTATION STRATEGY**

Submitted by Tom Malone



## **Report on the COOP Implementation Strategy**

*Submitted by Tom Malone*

The COOP completed the C-GOOS design plan and the implementation strategy in 2003 and 2005, respectively. Both have received extensive external review and have been endorsed by the GSSC and the I-GOOS.

### Background: The COOP Integrated Strategic Design Plan for the Coastal Ocean Observations Module of GOOS.

The Design Plan calls for the establishment of a Global Coastal Network (GCN) with regional coastal ocean observing systems (RCOOSs) embedded in it. The GCN is designed to (1) measure variables needed by most, if not all, GOOS Regional Alliances to address the six societal goals of GOOS; (2) establish a sparse network of sentinel stations and transects; (3) implement common standards and protocols for measurements and data telemetry; and (4) link basin scales to coastal ecosystem scales of variability and change. RCOOSs are designed by GRAs to meet national and regional priorities and to do so by engaging user groups from both public and private sectors, increasing the spatial resolution of the GCN, measuring more variables, and enhancing data management and modeling capabilities. GRA also contribute to building the GCN and function as R&D incubators and focal points for capacity building.

The provisional common variables include geophysical variables (sea level, temperature, salinity, currents, surface waves, bathymetry, and shoreline position), chemical variables (sediment grain size and organic content, dissolved inorganic nitrogen, phosphorus and silicon, and dissolved oxygen), and biological variables (chlorophyll-a, attenuation of solar radiation, benthic biomass, and fecal indicators).

GOOS Regional Alliances and National GOOS Programs have already begun developing RCOOSs globally. Implementation of the GCN has yet to begin.

### Implementation Strategy: Objectives and Requirements

Since RCOOSs are designed and implemented by GRAs, the Implementation Strategy focuses on developing the GCN and the importance of GRAs and national GOOS Programmes as the primary implementers of the GCN. It presents recommendations for developing the coastal module in 7 related areas: implementing mechanisms, observing subsystem requirements, data communications and management, modeling and analysis, capacity building, pilot projects, and performance metrics. Over 50 recommendations are made to guide implementation. Highlighted here are a few the Panel believes are critical to global development of the C-module.

Recommendations for developing the GCN include the following:

- Review and update the provisional common variables;
- Adopt and facilitate implementation of international standards and protocols;
- Periodically review the quality and utility of coastal satellite products;
- Select programs for incorporation into the GCN, and
- Determine optimal locations and observing requirements for sentinel stations and transects.

Priorities for implementing the Data Management Subsystem are to establish a distributed subsystem by establishing nested networks of data centers on national, regional and global scales (clusters of centers); to employ common metadata standards, enable data discovery and access, develop web-based services, and establish archives; and to explore the potential for JCOMM-IODE to manage biogeochemical data streams (the non-physical variables).

Priorities for developing operational modeling capabilities are to (1) establish community modeling networks that target all six societal goals of GOOS; (2) promote access to and development of freely available, well documented model codes; (3) define and apply performance metrics to assess internal consistency and skill of coastal models; and (4) implement pilot projects that will accelerate the development of operational models for coastal hydrodynamics, susceptibility to coastal inundation, ecosystem-based management of resources and water quality, and integrated coastal area management.

Implementing pilot projects through partnerships among developed and developing countries is an essential step in the implementation of the coastal module. High priority pilot projects include those that will (1) improve forecasts and mitigation of the impacts of coastal inundation, (2) produce blended ocean color products for coastal ecosystems, (3) improve coastal circulation models by providing more accurate oceanic boundary conditions, and (4) implement coastal equivalents of GODAE for real-time surface current mapping.

#### Implementation Strategy: Mechanisms

The GCN will be established through 2 parallel processes: (1) incorporation of existing global programs and (2) networking or scaling up elements developed nationally or regionally. Successful development of GRAs and their RCOOSs is critical to both. Regional efforts need to be strengthened by

- Engaging industry and government in the development of C-GOOS;
- Establishing partnerships with existing regional efforts;
- Implementing pilot projects to build capacity.

Establishing a GCN will require global coordination and regional collaboration. Global coordination is needed to ensure interoperability among GRAs and the development of a GCN that serves the collective needs of GRAs and related monitoring and research activities. Regional collaboration is needed to build on existing programmes and leverage funding through partnerships.

In regard to global coordination, JCOMM oversees the development of the global ocean-climate modules. No equivalent body exists for the coastal module of GOOS. The COOP recommends the establishment of a global body to oversee development of the coastal module, especially as related to biogeochemical variables and products. In addition, the IGOS Coastal Theme report recommends the establishment of a Joint Panel for Integrated Coastal Observations (J-PICO) to provide scientific and technical advice for coordinated implementation of the coastal modules of GOOS and GTOS across the land-sea interface (item 6.3 below).

In regard to regional collaboration, partnerships with related programs that have similar goals are critical to ensuring that we make effective use of limited resources. In particular, successful development of LME Programs worldwide is important to successful development of coastal GOOS. To this end, it is recommended that the Global Body of GRAs promote development of LMEs and that GRAs form alliances with LME Programmes to make more effective use of limited resources and to leverage funding.