US IOOS COASTAL AND OCEAN MODELING TESTBED OVERVIEW

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Purpose: This document outlines the structure needed to maintain a sustainable Coastal and Ocean Modeling Testbed (COMT) and is intended as an overview to ensure all COMT stakeholders are in agreement about what this Testbed will encompass.

Background: Over the last year, US IOOS initiated the COMT as a pilot project to investigate the utility of a permanent testbed by selecting two important coastal processes, hypoxia and inundation, and investigating model skill in several regions rich with historical data. Cyberinfrastructure to facilitate model assessment was developed based on community standards, including a distributed data repository, automated cataloging mechanism, quick browse facility, and tools for flexible and detailed scientific investigation of both model output and observational data. As a result of the pilot COMT, stronger connections between the research and operational communities have emerged and enabled important outcomes for coastal ocean science and services. For example, the process of transitioning models, tools and techniques from the COMT (e.g. hypoxia models in the Chesapeake Bay and Northern Gulf of Mexico) into the NOAA operational framework is beginning. Based on the early success of the COMT, we now seek to define what a sustained Testbed should look like. Once this overview is approved by all the stakeholders, a more comprehensive Concept of Operations (CONOPS) will be created to detail the COMT structure for all stakeholders.

Mission: To use targeted research and development to accelerate the transition of scientific and technical advances from the coastal and ocean modeling research community to improve identified operational ocean products and services (i.e. via research to operations and also operations to research).

Vision: A National Coastal and Ocean Modeling Testbed to enhance the accuracy, reliability, and scope of the federal suite of operational ocean modeling products, while ensuring its diverse user community is better equipped to solve challenging coastal problems and recognize the COMT to be where the best coastal science is operationalized.

Definition: The US IOOS COMT will serve as a conduit between the federal operational and research communities and allow sharing of numerical models, observations and software tools. These tools are needed to elucidate, prioritize, and resolve federal operational coastal ocean issues associated with a range of existing and emerging coastal oceanic, hydrologic, and ecological models. The COMT is intended to be executed in the non-profit sector, anchored through infrastructure and transitional processes in an operational center. It will serve multiple federal agency operational requirements, providing funding opportunities that will target improved simulation and forecasts of coastal and ocean processes with societal importance.

Key Components

1. Organization

   The COMT will comprise an Executive Oversight Board (EOB), a Technical Advisory Group (TAG) and a Transition Management Group (TMG). The EOB will provide overarching guidance on operational needs, federal priorities and approve funding priorities. The TAG will comprise both federal operational and research scientific advisors to offer direction and endorsement of ongoing and planned activities. The TMG will execute plans approved by the EOB and TAG and provide direction on priorities, supervision and accountability to ensure success. Additionally, the

COMT will foster partnerships at all levels to allow multi-sector collaboration, uniting a broad community of federal, non-federal and academic partners.

2. Processes

The following processes will provide guidelines and specific procedures for how the COMT executes its mission and will be defined in the CONOPS.

a. Selection of technical priorities
b. Funding announcement, review, and selection
c. Technology transfer including transition guidelines for research to operations, a model and data access policy and a process for items that do not transition.
c. Communicating results and impacts
d. Research and development plan

3. Cyberinfrastructure (CI)

CI is a critical piece of the COMT, providing efficient and powerful tools and techniques to enable model-model and model-data comparison as well as promulgating and supporting community standard data formats, which enable transition to federal operational centers. The CI allows models and data to be accessed from a distributed repository via web services, and provides tools for quantitative analysis and visualization. The minimum capabilities will include:

a. Maintaining a server environment, tools and toolkits to facilitate access to data, models, model input files, and model results
b. Developing standards-based software and skill assessment metrics to enable data and model comparisons for the Testbed and for the geosciences community.
c. Documenting procedures and best practices for managing the model output life cycle.
d. Ensuring High Performance Computer access and allocation to support computational-intensive simulations required to meet Testbed priorities, as well as transition and computational infrastructure at Federal Center(s) to receive COMT outputs.

Resource Requirements:

The annual resource requirements will represent minimum operational costs to maintain the COMT. This does not include the grants and funding proposals that would be needed for new modeling themes and projects for the COMT to engage in. Those costs will be defined with scalability in mind, such that project quantity or scope can be adjusted based on resource availability. The resource requirements will be designed to cover minimal administrative and personnel costs, computing time for the modeling runs and software maintenance as illustrated below:

1. Operations
    a. Personnel/Admin (A Program Manager at a Non-Federal Entity (1/2 time); a Program Manager at NOAA/NCEP or US IOOS (1/2 time); an IT Infrastructure Manager at a Non-Federal Entity(server and HPC access acquisition and maintenance); and travel and meeting support
    b. Cyberinfrastructure support (a community portal (ie. www.testbed.org) and cyber-tool maintenance; COMT support capability (managed problem tracking and Help Desk function to support user community); and server platform/software acquisition and maintenance.

2. New Grants and Proposals