

CLIVAR Ocean Model Development Panel (OMDP) Future Activities

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The role of the Working Group on Ocean Model Development (WGOMD) has been evolving in accordance with the evolution of CLIVAR. Indeed, the CLIVAR SSG recommended that WGOMD becomes the CLIVAR Ocean Model Development Panel (OMDP) to serve an advisory role in support of the CLIVAR ocean basin panels, the development of the ocean observing system, and the relevant CLIVAR Research Foci. At our recent panel meeting in April 2014 in Kiel, Germany, our panel members were excited to provide expanded leadership for ocean modeling activities within CLIVAR and were in agreement with this name change.

OMDP is the only CLIVAR global ocean modeling group and plays a role within WCRP together with the WGSIP and WGCM global modeling groups, under the coordination of the WCRP Modeling Advisory Council (WMAC). In consideration of our roles as a new panel within CLIVAR and as a modeling liaison within CLIVAR and between CLIVAR and WCRP, the OMDP will revise its Terms of References (ToRs) to reflect these new responsibilities.

We list below brief summaries of our panel's activities for the next five to ten years:

Supporting and advancing CLIVAR science

Reflecting its new and additional responsibilities, OMDP will enhance its interactions with both the CLIVAR basin panels (BP) and CLIVAR Research Foci teams (RFTs). Such enhanced and continuous, two-way communications will be accomplished primarily by designated modeling liaisons drawn from memberships of each BPs and RFTs. OMDP will collect all conveyed information regarding BPs' and RFTs' modeling requests and needs, including model biases to be addressed. Drawing from the expertise of both the OMDP membership and the interested members of BPs and RFTs, OMDP plans to prioritize these requests and needs and form subgroups (small working groups) to coordinate extant or new activities to resolve them. We anticipate that these activities will form the bulk of our near-term efforts.

Updates and expansion of the Coordinated Ocean-ice Reference Experiments (CORE) framework (modified from section 2.3 of the achievements document)

CORE simulations do not resolve the many problems related to forcing global ocean-ice models. Rather, the CORE framework highlights difficulties, and provides a means to lift disparate modeling efforts onto a common plateau from which alternative experimental designs and forcing data sets can be systematically explored. As the traditional CORE approach matures, there have been further proposals put forward in hopes of resolving some of the limitations with the traditional methods. In particular, at the 2014 Kiel WGOMD workshop and meeting, proposals were discussed regarding, for example, modifications to the surface

salinity restoring; use of a simplified interactive anomaly atmosphere; application of other partial coupling approaches where certain surface fluxes are overwritten in fully-coupled simulations for mechanism testing purposes; and a forcing protocol aimed at assessing the transient sensitivity of climate using forced ocean-ice models.

As the ocean modeling community embarks on high-resolution (mesoscale- and submesoscale-resolving) simulations more broadly, there is an emerging need for high-resolution data sets to force such models. OMDP will consider the needs required to develop a high resolution CORE forcing dataset suitable for high-resolution ocean – sea-ice models.

Additional interest remains in developing common freshwater perturbation protocols. One such protocol, sometimes called CORE-III, aims at assessing the oceanic response to large scale melting scenarios for Greenland. OMDP, in collaboration with the SOP, is investigating where coordinated freshwater perturbations are best applied to study impacts of Antarctic glacial melt. These discussions and proposals lend much promise to the hope that the future of CORE-like model comparisons will remain rich and exciting.

CORE in CMIP

The CORE phase II (CORE-II) framework has sufficiently matured that it can be considered as a MIP for inclusion within the CMIP framework. While we recognize that such inclusion will further increase the prominence of CORE-II efforts and enforce the standardization of output data, there are some additional work and responsibilities that come with being a MIP. These include updates and improvements of the CORE-II protocol; continuing updates, corrections, and maintenance of the forcing data sets; and management of broader efforts, all requiring dedicated and significant resources. To overcome these challenges, OMDP will explore and seek funding opportunities to support the CORE-II efforts more reliably so that a CORE-II MIP can be proposed and supported within CMIP framework.

Evaluation of CORE-II simulations and reanalysis products

OMDP will collaborate with GSOP to perform evaluations of solutions from CORE-II experiments and those provided by reanalysis. The initial focus will be on Atlantic meridional overturning circulation (AMOC), Atlantic heat transport, and mixed layer depths.

Continuing activities

OMDP will continue to provide requested information to WGCM and CMIP panel, regarding ocean model output data, their prioritization, use, and gridding, etc. OMDP expects to continue organizing summer schools and high profile, topical workshops to educate and inform the broader ocean and climate science community.