

Ocean Model Development Panel (OMDP)

Co-Chairs

Gokhan Danabasoglu (NCAR, USA)

Simon Marsland (CSIRO, Australia)



www.clivar.org/clivar-panels/omdp

Key roles for OMDP in CLIVAR and WCRP

To collaborate with and to advise CLIVAR and WCRP panels and working groups as well as CLIVAR Research Foci Teams and WCRP Grand Challenges on issues related to ocean modeling.

To coordinate activities aimed at addressing

- modeling needs (e.g., experimental protocols, common diagnostics and analysis methods)
- model biases (e.g., eastern boundary upwelling, Gulf Stream separation)
- Improvements in ocean process representations and parameterizations

Coordinated Ocean-ice Reference Experiments (CORE-II)

An experimental protocol for ocean – sea-ice coupled simulations forced with inter-annually varying atmospheric data sets for the 1948-2009 period.

These hindcast simulations provide a framework for:

- Evaluation, understanding, and improvement of ocean models;
- Investigation of mechanisms that drive seasonal, inter-annual, and decadal variability;
- Attribution of ocean-climate variations to boundary vs. natural forcings;
- Evaluation of robustness of mechanisms across models and forcing data sets;
- Bridging observations and modeling by complementing ocean reanalysis from data assimilation;
- Providing consistent ocean and sea-ice states for initialization of climate (e.g., decadal) predictions.

Coordinated Ocean-ice Reference Experiments (CORE-II)

- CORE is recognized as the community standard for coordination of global ocean-ice simulations.
- 20+ models have participated
- CORE-II Virtual Special Issue *in Ocean Modelling*
- Forms the foundation of the CMIP6 Ocean Model Intercomparison Project (OMIP)

OMIP

PART I

Diagnostic analysis of
CMIP6 ocean components

- Physics
- Inert chemistry
- Biogeochemistry (BGC)

OMIP is independent of any
particular CMIPX

PART II

Forced ocean – sea-ice hindcast
simulations following the CORE-II
protocol

TIER 1 (OMIP-A)

One 310-year simulation forced
with the inter-annually varying
CORE-II atmospheric datasets for
the 1948-2009 period (5 repeat
forcing cycles):

Path I: physics + chemistry

Path II: physics + chemistry + BGC

BGC fields are initialized from
observations

TIER 2 (OMIP-B)

Same as Path II of
Tier 1, except that
BGC fields are
initialized from
spun-up fields

Japanese Reanalysis (JRA55)



Deficiencies of the existing forcing datasets used in CORE-II:

- Over 10 years old, produced 2004 (last updated 2009);
- Lower resolution (space and time) product

Strengths of JRA-55:

- Higher resolution (space and time) product as models go to higher resolution
- Near real-time updates (tackle science questions for 'current' events
 - e.g. "hiatus", 2015 El Nino, Arctic sea-ice decline, ...

Feature	JRA-55	CORE-II
Space resolution	55 km	200 km
Time resolution for the meteorology fields	8 times per day	4 times per day
Years available	1958-2015 (will be frequently updated)	1948-2009 (not updated)

OMDP Cross-Cutting Engagements

- OMDP members have significant ongoing involvements / collaborations with WGCM, WGSIP, DCPD, Metrics Panel, and WCRP Grand Challenges on Regional Sea-Level Change and Near-Term Climate Prediction.
- Promote use of ocean model output from the CMIP6 simulations.
- A new OMDP focus is evaluation of high-resolution (order 0.1°) ocean models via an inter-comparison project to assess fidelity of simulations.
- A permanent OMDP task is to improve the representation of physics (via sub-grid scale parameterizations) to address model biases – some quite persistent.
- OMDP is interested in i) informing the WCRP community of our activities and ii) learning about any emerging ocean (modeling)-related issues and ideas.