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# AOMIP : Overview

## Overview

The Arctic Ocean Model Intercomparison Project (AOMIP; see also its continuation: Forum for Arctic Modeling and Observational Synthesis, FAMOS at www.whoi.edu/projects/famos) is an international effort to identify systematic errors in Arctic Ocean models and to reduce uncertainties in model results and climate predictions.

The 16th annual AOMIP Workshop and School and the 1st annual FAMOS meeting will be held at the Woods Hole Oceanographic Institution October 23-26, 2012 read more >>

## AOMIP Motivation

The initial AOMIP studies have revealed striking differences among Arctic model results. The question was and still is: *What are the causes of these differences: errors of model implementation, forcing, boundary conditions, model physics, numerics, or design of numerical experiments?*

This question is also relevant to the understanding of differences among global climate model results represented in IPCC studies. In order to address this question for the Arctic Ocean environment, the AOMIP was organized in 2001. It has created a broad-based energetic and motivated "community" of directly involved Arctic modelers from the U.S.A., Canada, France, Germany, Japan, Russia, Sweden, and United Kingdom.

AOMIP foci and approach: Since 2001, AOMIP has been focused on Arctic regional coupled ice-ocean model intercomparisons and investigations of different aspects of ocean and sea ice changes for the time period 1948-present. Among the major themes were investigations of the origin and variability of Atlantic Water (AW), mechanisms of accumulation and release of fresh water, causes of sea level rise and the role of tides in the shaping of climate. In the course of these investigations, problems with numerical implementation and validation against observations have been emphasized. Some problems have been found to occur only in a few models, while others have been found in many or most.

Exposing these issues is an extremely important part of AOMIP, and would have been difficult or impossible to achieve without coordinated activities. Preliminary investigations into improving the models have also been initiated by AOMIP. AOMIP is not a "top-down" organization that can dictate model changes to all participants. Rather, a vital function of this project is to expose consistent problems in numerical models and then to provide a forum for individual investigators to propose solutions.

The AOMIP approach is to leverage the existing financial support of each participant for a comparative analysis of different models and scientific results. This strategy has provided a unique opportunity to coordinate AOMIP studies via a set of carefully-planned numerical experiments covering the most important processes and interactions. A clear advantage was that each AOMIP participant was able to work with her/his specific research theme using simulation results from all AOMIP models and to analyze differences and test hypotheses using a multi-model suite of outputs. The result is a synthesis that integrates observational and modeling efforts toward the overall goal of developing advanced Arctic models able to accurately reconstruct past, describe current and predict future Arctic conditions. We view AOMIP as a collaborative framework wherein modelers and observers discuss results, problems, and new ideas, all with the goals of model improvement and better understanding of the Arctic climate system.

## Goals and Activities

The first 5-year AOMIP research cycle was completed in March 2007. The overall AOMIP science goals for the second 3-year cycle (2008 – 2011) are to:

- *Validate and improve Arctic Ocean models in a coordinated fashion;*
- *Investigate variability of the Arctic Ocean and sea ice at seasonal to decadal time scales, and identify mechanisms responsible for the observed changes.*

The project objectives for the second cycle are to:

- *Maintain and enhance the established AOMIP international collaboration to reduce uncertainties in model predictions;*
- *Support synthesis across the suite of Arctic models and organize scientific meetings and workshops;*
- *Conduct collaboration with other MIPs with a special focus on model improvements and analysis;*
- *Disseminate findings of AOMIP effort to broader communities;*
- *Train a new generation of ocean and sea-ice modelers.*

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