

A GLOBAL CCSM - HYCOM SYSTEM

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About CCSM

The Community Climate System Model (CCSM) is a coupled climate model for simulating the earth's climate system. The complete climate system is divided into four individual components – ocean, atmosphere, land, and sea-ice, which are connected by a coupler. This framework developed at the National Center of Atmospheric Research (NCAR), allows alternate models for each component, and therefore allows different configurations appropriate for different applications as well as model inter-comparison for any one of the four components.

The current CCSM version is CCSM3. The coupler version is 6.

About CORE/CNYF

The Corrected "Normal" Year Forcing (CNYF) consists of single annual cycles of all the data needed to force ocean general circulation model (OGCM) and sea-ice model (SIM) and it is the forcing in the Coordinated Ocean-ice Reference Experiments (CORE). CORE/CNYF was developed at NCAR to provide a uniformed global atmospheric forcing for OGCM and SIM that represents a normal state of the atmosphere. The data set utilized data from various data sources including NCEP/NCAR reanalysis with data spans over 43 years (1958-2000). The forcing with a full 43 year cycle can also be used to examine inter-annual variability.

The current data version is CNYF 1.0. The atmosphere model grid is the NCAR T62 grid which has a horizontal resolution of about 2°.

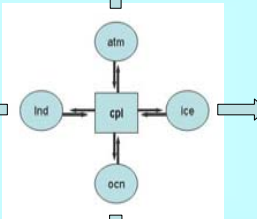
The atmospheric component can be a fully active atmospheric model (CAM); a standard data atmospheric model; a climatological-data atmospheric model using the CORE/CNYF data set; or a dead atmospheric model.

The ice component can be a fully active NCAR community ice model (CSIM); a standard data ice model using observational ice fraction data set; or a dead ice model.

CSIM is based on the Los Alamos Sea-Ice model (CICE). The ice model is on the same grid as the ocean model grid (gx1v3).

The land component can be a fully active NCAR community land model (CLM); a standard data land model; or a dead ice model.

The land model grid is identical to the atmosphere model grid (T62).

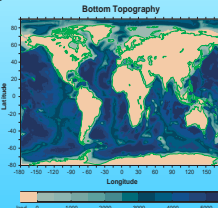


About HYCOM

The Hybrid Coordinate Ocean Model (HYCOM) has become a state-of-art OGCM through cooperative efforts among the RSMAS, NRL, and LANL modeling groups. The hybrid coordinate is one that is isopycnal in the open, stratified ocean, but smoothly reverts to terrain-following in the shallow coastal region, and to z-level coordinates in the mixed layer and/or unstratified seas. This coordinate configuration allows HYCOM to extend the geographic range of applicability of traditional isopycnal coordinate circulation models.

The current HYCOM version is 2.1. The model domain covers most of the whole globe with a NCAR bi-polar grid (gx1v3). The horizontal grid resolution is one degree at the higher latitudes and half of that at the equator.

The ocean component can be a fully active ocean model like HYCOM or POP; a standard data ocean model; or a dead ocean model.



Objectives

- Introducing HYCOM as an alternative ocean component in the CCSM framework
- Using the global CCSM-HYCOM system to evaluate the ocean and ice components in the coupled system as a part of the CORE project

Current Status

The global CCSM-HYCOM system has been set up. Test runs are being carried out to evaluate the system before performing production runs.

Planned Experiments

- HYCOM alone run forced by CORE CNYF
- HYCOM-CSIM run forced by CORE CNYF
- HYCOM-CSIM run forced by the 43-year CORE forcing

Acknowledgements

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