

POP2 DOCUMENTATIONS FOR THE CCSM4 RELEASE

All updated documents will be available from the CCSM web pages.

- 1) Reference Manual for the Parallel Ocean Program (POP2): Ocean Component of the Community Climate System Model version 4 (CCSM4). LANL Tech. Report Smith, Jones + alphabetical list of contributors (about 20).

Purpose: Describe the details of the numerical methods, discretizations, parameterizations, and some software engineering practices used in POP2. It also contains a list of all the relevant references.

NEW FEATURES IN POP2 SINCE Smith & Gent (2002; 2004)

- Modified anisotropic horizontal viscosity scheme (Markus),
- Near-surface eddy flux parameterization (Gokhan),
- Vertically-varying isopycnal and thickness diffusivities (Gokhan),
- Sub-Mesoscale mixing (MLE) parameterization (Baylor),
- Overflow parameterization (Gokhan),
- Tidally-driven mixing scheme (Steve J.),
- Horizontally-varying internal wave breaking, i.e., background, vertical diffusivity / viscosity (Markus),
- Zenith angle dependent diurnal cycle of solar forcing (Keith),

- Flux limited advection scheme, i.e, Lax-Wendroff, (Keith),
- Summary of ideal age and CFC options (Synte & Keith),
- Eden & Greatbatch thickness diffusivity (Carsten, Markus, & Gokhan),
- Time-Averaging time step and coupling (Matthew, Nancy, & Gokhan),
- Internal generation of KMT (Steve Y.),
- Modify "acceleration techniques" section (Gokhan),
- Parallel I/O developments (Mariana),
- Space-Filling curve developments (John),
- Other LANL developments (Phil & LANL folks),
- Consistency of the document with the present LANL and CCSM versions (Phil & Peter).

2) Parallel Ocean Program (POP2) User Guide

Primarily a web-based document in html:

http://www.cgd.ucar.edu/~njn01/ccsm4_doc/POPusers_main_ccsm/

NCAR Lead: Nancy Norton

Purpose: Give detailed instructions for operating the POP code. It should be the only manual needed to use POP as is. The covered topics include:

- How to compile POP, including compile-time options,
- How to run POP, including run-time options in namelist input,
- Procedures for preparing auxiliary input files needed if one is setting up a new grid,
- Options for model diagnostics,
- Options for model output files and formats.

The document contains the LANL POP default settings as well as the CCSM4 default settings for the three resolution versions (gx1v6, gx3v7, and tx0.1v2) that will be in the CCSM4 release.

First draft: January 15, 2010.

Final version: April 1, 2010.

3) POP Code Reference STATUS: ????

A web-based document in html:

http://www.cesm.ucar.edu/models/ccsm3.0/pop/doc/POPcode_ref.html

Purpose: To provide additional details about the code structure for those who wish to know more. It is intended to be a companion reference for the user guide.

4) CCSM POP2 Developers' Guidelines

A web-based, living document in html:

http://www.cgd.ucar.edu/~njn01/omwg/ccsm_pop2_checkin_guidelines.html

Maintained by: Nancy Norton

Purpose: It contains procedures that are intended to

- provide guidance to developers who wish to contribute to the CCSM POP2 model development,
- result in easy-to-understand and easy-to-maintain code,
- allow for the orderly and timely integration of model improvements onto the CCSM POP2 repository trunk.

THIS DOCUMENT APPLIES ONLY TO THE CCSM POP2 VERSION.