Abstract

Title: Timeline, Requirements and Design for MPAS-O:
July 2010 through June 2012

Institutions:
Los Alamos National Laboratory (LANL)
National Center for Atmospheric Research (NCAR)

Investigators:
TBD

Abstract

This document is intended to outline the development of MPAS-O between the times of July 2010 and June 2012.

Contents

Papers and Tasks

1 Paper: Introduce MPAS-Ocean on evenly spaced grids

- Description on MPAS-O horizontal grid structure
- POP versus MPAS-O comparison on quad grids
- quad versus hex global comparison, including 0.1^o

Task List	lead (& support)	projected date	reviewer
Higdon time splitting	Chris (Todd)		
initial POP vs MPAS-O comparison	Mark		Mat
z-level topography	Mark		
∇^2 and ∇^4 diffusion	Todd		Mark
Nonlinear EOS	Mark		Phil
Pac Phil & implicit vertical mixing	Mat		
high-order horizontal advection	Todd		
high-order vertical advection	Mark		
KPP vertical mixing*			
GM horizontal mixing*	Todd		
time varying surface forcing			
Analysis of POP versus MPAS			
Analysis of quad versus hex global grid			

* indicates task may not be required.

2 Paper: Introduce MPAS-Ocean on variable density grids

- Compare simulations on variable density global grid with corresponding evenly-spaced high and low-rez grids
- Parameterizations on variable resolution grids

Task List	lead (& support)	projected date	reviewer
variable ∇^2 and ∇^4 diffusion			
variable GM			
Analysis of simulations			

3 Paper: Higdon time-splitting scheme in MPAS-Ocean

4 Paper: Vertical advection versus vertical remapping

5 Paper: High order horizontal advection (after Lowrie)

6 Paper: Fully coupled climate simulations with MPAS-Ocean

7 Paper: Fully implicit timestepping in MPAS-Ocean