UPDATE ON CLIMATE PROCESS TEAMS (CPTs)

- CPT ON EDDY – MIXED LAYER INTERACTIONS (Ferrari, MIT),
- CPT ON GRAVITY CURRENT ENTRAINMENT (Legg, Princeton).

Call for new CPT proposals:

Deadline: September 24, 2009 (NSF),

Proposal start date: May 1, 2010 (for 3 years),

NCAR Oceanography Section is involved in 3 proposals, requesting 0.5 FTE per proposal.

COLLABORATIVE RESEARCH: BOUNDARY MIXING

PIs: Dewar (FSU), Bryan (NCAR), Danabasoglu (NCAR), Ferrari (MIT), Gent (NCAR), Gregg (UW), Griffies (GFDL), Hallberg (GFDL), Jochum (NCAR), Large (NCAR), MacCready (UW), McWilliams (UCLA), Nash (OSU), Speer (FSU), Thomas (Stanford)

Summary: The central hypothesis for this CPT is that fundamental control of the ocean circulation occurs at the boundaries by processes that are currently absent or poorly represented in OGCMs. The goals are to propose and test physically based parameterizations of boundary processes in large scale models, focusing on i) boundary induced diapycnal mixing, ii) lateral form stress and PV generation, and iii) inertia-gravity waves generated by bottom roughness. In addition, the CPT involves the quantification of the effects of these on essential ocean processes like mesoscale dissipation and diapycnal mixing.

COLLABORATIVE RESEARCH: REPRESENTING INTERNAL-WAVE DRIVEN MIXING IN GLOBAL OCEAN MODELS

PIs: MacKinnon (UCSD), Alford (UW), Arbic (FSU), Bryan (NCAR), Chassignet (FSU), Danabasoglu (NCAR), Gent (NCAR), Gregg (UW), Griffies (GFDL), Hallberg (GFDL), Jayne (WHOI), Jochum (NCAR), Large (NCAR), Legg (Princeton), Pinkel (UCSD), Polzin (WHOI), Simmons (UAF), St. Laurent (WHOI)

Summary: The CPT is focused on the development of ocean mixing parameterizations for use in representing internal wave driven mixing in climate simulations. It will focus on three developments: i) the maturing of near-field parameterizations accounting for mixing processes at internal wave generation sites, ii) a new parameterization for the mixing resulting from the breakdown of near inertial energy transported in the wave field, and iii) a parameterization for the breakdown of internal wave energy in the ocean interior far away from sources.

COLLABORATIVE RESEARCH: OCEAN MIXING PROCESSES ASSOCIATED WITH HIGH SPATIAL HETEROGENEITY IN SEA ICE AND THE IMPLICATIONS FOR CLIMATE MODELS

PIs: Jin (UAF), Danabasoglu (NCAR), Hallberg (GFDL), Holland (NCAR), Hutchings (UAF), Polyakov (UAF), Winton (GFDL)

Summary: In current climate models, the heat and tracer fluxes between the sea ice and ocean are calculated based on the average of all ice categories and a single ocean column. Resolving the high spatial variability in ice-ocean brine exchange has important implications for ocean mixing and consequent sea ice mass budgets that influence critical climate feedbacks. This CPT will implement and test the Multi-Column Ocean Grid (MCOG) parameterization in the CCSM and GFDL coupled models. The goals include investigating the influence on climate and biological feedbacks.