Use of CMIP2+ Sea Surface Temperatures for Climate Sensitivity Experiments

Brian Soden

NOAA/GFDL

Co-Investigators: Isaac Held (GFDL), Jeff Kiehl (NCAR), Paul Kushner (U. Toronto)

This proposal seeks to use model output from the CMIP2+ archive to construct an ensemble-mean SST perturbation for use in climate model sensitivity experiments at GFDL and NCAR. Our intent is to create a "consensus" SST perturbation corresponding to the time of CO_2 doubling by averaging output from each of the participating CMIP2+ models. The resulting SST perturbation will then be used to force atmosphere-only versions of the GFDL AM2 and NCAR CAM3 climate models for the purpose of comparing the climate sensitivity and individual feedback components of those two models. Such comparisons have already been performed using the conventional -2/+2 uniform SST perturbations (e.g., following the method of Cess and Potter, 1988). Our objective here is to create a "consensus" SST perturbation whose spatial and seasonal distribution is more consistent with model projections of CO_2-induced warming, but yet is not tied to any one specific model.

We recognize that there are other diagnostic subprojects which have related interests (e.g., #22, #55) and we will communicate with these groups to insure that our interests do not conflict with each other. It is also recognized that other modeling groups may wish to join in this intercomparison at some point in the future. We welcome their participation and will inform the CMIP panel if this activity expands beyond the two models presently being proposed (GFDL AM2 and NCAR CAM3).

The requested CMIP2+ variables include:

Sea surface temperature (monthly resolution with geographic coverage)

Sea-ice fraction and/or Sea-ice thickness (monthly resolution with geographic coverage)