

January 28, 2004

To: Modeling group contacts

From: WGCM Climate Simulation Panel

Regarding: Update on plans for IPCC AR4, request for reply regarding what runs your group will be doing, and tentative completion date

As you know from the letter sent by Susan Solomon of IPCC WG1 in December, 2003, modeling groups around the world have been charged with performing an unprecedented set of coordinated 20th and 21st century climate change experiments, in addition to commitment experiments extending to the 22nd century, for the IPCC Fourth Assessment Report (AR4). This will require a considerable expenditure of human and computer resources to complete these experiments. The resulting multi-model dataset will be a unique and valuable resource that will enable international scientists to assess model performance, model sensitivity, and model response to a variety of forcings for 20th and 21st century climate and climate change.

There will be an international process to collect, compile, and analyze output from this multi-model dataset for direct input to the IPCC AR4. The WCRP/CLIVAR Working Group on Coupled Models (WGCM) is taking the lead in this activity. WGCM has set up a panel to oversee this effort (the WGCM Climate Simulation Panel) that consists of WGCM members. The panel is chaired by Gerald Meehl (NCAR, USA), with members John Mitchell (Hadley Centre, U.K.), Bryant McAvaney (BMRC, Australia), Curt Covey (PCMDI, USA), Mojib Latif (MPI, Germany), and Ron Stouffer (GFDL, USA). This panel will coordinate the collection and archival of the multimodel output at PCMDI. The initial deadline for submission of model data is September 1, 2004, to allow time for analysis of the model data before the model analysis workshop in March, 2005, (see below) and second lead author meeting in May, 2005.

Having collected and archived the multi-model data, there must also be an analysis effort to produce results to be assessed for the AR4. To do this, the panel listed above will lead an effort to enlist volunteers from around the world to analyze the model data. This will start with a general announcement of this effort in northern spring, 2004. Individuals and groups will be given instructions to register with the WGCM Climate Simulation Panel to analyze certain aspects of the simulations starting in late spring and continuing to September 1, 2004. Any interested party can have access to the model data. Therefore, this will not be a screening process but a registration process to provide AR4 lead authors an indication of what aspects of the model simulations will be analyzed. The Panel will compile a list of scientists and topics that will be turned over to the appropriate lead authors at the IPCC First Lead Authors Meeting in September, 2004. This material will serve as a place holder for results that can be incorporated into the first draft that will be prepared for the Second Lead Authors Meeting in May, 2005. The model data will be

available for analysis in early September, 2004, and the analysis activities will continue over the northern winter of 2004-2005.

After all this model data collection and analysis is completed, there will be a workshop to compile and present results. The results from the workshop will feed directly to the lead authors of the appropriate chapters of the AR4. This workshop, where results from the multi-model analyses will be presented, will be convened under the auspices of U.S. CLIVAR and will be hosted by the International Pacific Research Center at the University of Hawaii in early March, 2005. Members of the US CLIVAR Scientific Steering Committee who will lead the organization of this effort include Gerald Meehl (NCAR), James Hurrell (NCAR), Lisa Goddard (IRI), and Dave Gutzler (Univ. New Mexico).

Results presented at the workshop will be passed to the lead authors of the appropriate AR4 chapters. Scientific papers describing the results then must be written by the respective investigators, and submitted to peer-reviewed journals by the time of the Second Lead Authors Meeting in May, 2005, in order to be fully included and assessed in the AR4.

List of runs:

1. 20th century simulation to year 2000, then fix all concentrations at year 2000 values and run to 2100 (CO₂ ~ 360ppm)
2. 21st century simulation with SRES A1B to 2100, then fix all concentrations at year 2100 values to 2200 (CO₂ ~ 720ppm)
3. 21st century simulation with SRES B1 to 2100, then fix all concentrations at year 2100 values to 2200 (CO₂ ~ 550ppm)
4. 21st century simulation with SRES A2 to 2100
5. 1% CO₂ run to year 80 where CO₂ doubles at year 70 with corresponding control run
6. 100 year (minimum) control run including same time period as in 1 above
7. 2XCO₂ equilibrium with atmosphere-slab ocean
8. Extend one A1B and B1 simulation to 2300
9. 1% CO₂ run to quadrupling with an additional 150 years with CO₂ fixed at 4XCO₂
10. 1% CO₂ run to doubling with an additional 150 years with CO₂ fixed at 2XCO₂
11. participate in AMIP, OMIP, and CFMIP

Though no priorities have been assigned to these simulations, all models will need to perform one run each of simulations 5 and 7 above to evaluate model sensitivity and response in relation to other models, and one run each of simulations 1, 2, 3, and 4. Given this minimum priority, then single simulations for the rest of the runs, and then ensembles, are encouraged. There is no general recommendation concerning ensemble size, but three to five member ensembles are probably going to be performed by at least some of the groups. Some may be able to complete even larger ensembles, but we will have a better idea once we get responses to the present email.

PCMDI will archive a collection of forcing datasets for 20th and 21st century climate simulations. PCMDI will also collect data from the runs above for a subset of fields [to be determined from the union of DDC, 20C3M, and CMIP2 lists and consistent with calculation of Frisch et al. extremes indices]. Additionally, daily data will be collected for periods during the experiments. All data must be submitted in netCDF and CF metadata standard, and using PCMDI-supplied software to facilitate archival of standardized data. This exercise is aimed to assist WG1 scientists. A subsequent message to modeling groups will provide details regarding a list of fields, model data preparation, and submission procedures to PCMDI.

As noted above, the scale of this ambitious exercise is unprecedented in our community. Given the considerable resources and effort required, we realize that all groups may not be able to participate at the same level, or on the same timetable. Note that the stated deadline to allow analysis of the multi-model dataset is September 1, 2004, but we recognize that all groups may not be able to make that deadline. However, the later the model data are submitted, the more complicated will be the model analysis effort, and the more difficult it will be to have your model data assessed in time for the AR4.

We would like to get a tentative idea as to nature of your group's participation. Please reply to this email with estimates for the following questions:

- 1. Will your group participate in the community simulations for the AR4?**
- 2. What runs, from the list above, does your group intend to perform?**
- 3. When do you intend to complete those runs for submission to PCMDI?**
- 4. Will you be doing ensembles of any of the runs?**

When we get a better feeling for what groups are planning, we can proceed with the announcement for the analysis activity. We want to send this out in the next month or two, so if you could **please respond before February 15, 2004**, we would greatly appreciate it.

Best regards,

The WGCM Climate Simulation Panel
Jerry Meehl (chair), Curt Covey, Mojib Latif, Bryant McAvaney, John Mitchell, Ron Stouffer