U.S. Clivar Working Group on Hurricanes

Minutes of first teleconference, Feb. 8, 2011

Attendees: Gabriel Vecchi, Lennart Bengtsson, Suzana Camargo, Kerry Emanuel, Jim Elsner, Jim Kossin, Chris Landsea, Tim LaRow, Kazuyoshi Oouchi, Mike Patterson, Adam Sobel, Siegfried Schubert, Cathy Stevens, Enrico Scoccimarro, Gabriele Villarini, Kevin Walsh, Hui Wang, Ming Zhao

[have I missed anyone?]

Mike Patterson (Interim Director, U.S. Clivar) began the telecom by noting that the issues being addressed in this working group arose out of issues discussed at the annual Clivar summit. A subsequent proposal for this new working group was approved. Cathy Stevens noted that Clivar can provide support for meeting organization and communication activities, such as a web site.

Gabe Vecchi outlined the rationale for the existence of the working group, based on the submitted proposal. Kevin noted that one aspect of the proposal was to suggest some simple experiments that could be done and analysed in a common fashion, building on previous work.

Timelines: The discussion then moved on to an outline of suggested timelines. The group has a finite lifetime of about 2 years, with a “drop dead” date for the production of final results of December 2012. Some intermediate milestones were noted:

- It is intended to hold a working group workshop sometime in the winter of 2011/2012. After some discussion, it was agreed that this would be at the 2012 AMS Annual Meeting in New Orleans, in January. Cathy volunteered the resources of Clivar to organize this.

- It was suggested that model output from a first common set of experiment should probably be available by July or August of this year. Analysis could then be undertaken in time for discussion of those results at the first workshop.

- A later deadline is the IPCC reporting deadline of July 31 2012, by which time papers have to be submitted in order to be considered for discussion in the AR5 reports (and must be accepted by March 15 2013). It was pointed out that the proposed experiments would be useful in interpreting some of the CMIP5 results.

Proposed Experiments: A discussion ensued on the proposed experiments listed in the submitted proposal. Kerry noted that there were significant scientific issues regarding the uncritical use of AMIP-type simulations, in that hurricane intensity was more influenced by thermodynamic disequilibrium than by SST per se, and that for this reason coupled model experiments were to be preferred. Gabe pointed out that the timelines did not permit full coupled model experiments. Kerry suggested that if AMIP-type experiments were to be performed, then they should include a diagnostic for surface energy imbalance. Lennart supported the use of such a diagnostic.

ACTION ITEM: List of variables required for this diagnostic, along with relevant equations, to be supplied to group.
Lennart mentioned the possible use of a mixed-layer model. Ming noted that a mixed layer model could be run by several groups but producing a good TC climatology would require some work, as this has not really been tried. Other groups pointed out that their models did not have a mixed layer coupled to them. Lennart suggested another experiment where a fully coupled model was initialised statistically and some limited experiments could be performed with a fully coupled system. Kerry agreed and suggested that even if the coupled models could only be run for a few decades, this would be enough to assess the “natural” variability of these coupled models. Siegfried pointed out that some seasonal coupled runs are already available for analysis, as a product of the Drought working group. Gabe suggested that group members might like to sketch out such an experimental methodology off-line and then distribute it to group members. Gabe then suggested that a two-tier approach for experiments be used: the first tier would consist of some of the simple experiments described in the proposal, while the second tier might comprise more scientifically challenging experiments designed and carried out by subsets of the group. Kerry pointed out that one such experiment might be to run a CMIP3 SST anomaly climate change experiment with no corresponding increase in CO2 and compare the results to one where AMIP SSTs are used but including the climate change CO2 forcing, to determine the relative importance of the two and to help resolve whether AMIP-style runs actually give the correct forcing or not. Lennart pointed out that whatever experiments are done, they need to have high horizontal and temporal resolution to enable TCs to be analysed.

** ACTION ITEM:** Group to circulate ideas for “tier-two” experiments. General agreement on pursuing, in the first instance, runs 1-3 of the proposal (“tier-one” experiments): AMIP-style, climatological SSTs, climatological SSTs plus 2K, plus Kerry’s idea for CMIP3 forcing with and without CO2.

** ACTION ITEM:** A “minimal” list of publicly-available variables supplied from each model experiments needs to be drawn up, for subsequent comment by the group.

** Data archiving:** The idea of a central data repository, similar to the LLNL archive for CMIP3, was discussed. Lennart pointed out that for certain studies, much more model output was required than could be stored in such a data repository, and would require access to individual model output archives. So therefore some kind of “two-step” analysis was required: first on an agreed subset of the data, and then on the full model output. Siegfried reinforced the idea that more than monthly-mean data was needed, especially for cyclone tracking. Adam pointed out that common analysis algorithms were needed for best intercomparison. Kevin pointed out that the advantage of storing a subset of the data on a common repository was that common algorithms could then be easily applied for analysis. Gabe pointed out that it would be interesting to compare the results of any common tracking schemes to those already used by individual groups. Kerry asked whether such trackers could be applied on the fly, to minimize data storage (this was confirmed).

** ACTION ITEM:** Groups to supply a list of variables and temporal resolutions required for their tracking schemes. Also, to supply an estimate of the size of 3-D global monthly mean data for a single variable, specifying the horizontal resolution and number of levels, so that central data storage requirements can be better estimated.

Kerry also suggested that groups supply a handful of “snapshots” of individual storms, with many more variables, so that structural analysis could be done.
A discussion was held on the possible locations for a data store. Siegfried suggested the APTC storage and he would follow this up. Adam suggested Lamont. Jim Kossin said that he would find out about NCDC storage. Kerry suggested a clearinghouse approach rather than a central data store, and Lennart suggested similar arrangements with different groups involving the transfer of data from place to place. Gabe suggested that the group think about the pros and cons of each approach. He also noted that the archive would likely have a useful existence after the termination of this working group, just as CMIP3 analysis has continued long after the publication of the IPCC FAR reports.

Questions:

- Standardised formats: there was general agreement on netcdf for model output. Jim Elsner pointed out that it would be best if the tracking schemes also produced output in a standard format, like Hurdat. Others suggest IBTracs format. Jim Kossin volunteered to coordinate this.

- Web site: it was suggested that links, papers and so on could be sent to Cathy for mounting. Gabe suggested that it would be good if the site also had some general information on hurricanes and climate, for instance, with the MJO working group as a model.

- Ensembles: Ming raised this issue. Gabe suggested that 3 would be a minimal target (more would be better), but this would depend upon the resources of the groups and fewer ensembles were preferable to not running experiment.

- Specification of forcings: Ming suggested AR5 historical radiative forcings for the AMIP-type runs, and constant radiative forcing for the climatological runs, and has these data for distribution. A final decision on aerosol forcings was deferred until this issue is examined. SST forcings will be placed on the web site.

Next conference call: late March/early April