



26 January 2009

Dear participants to the Toulouse Regional Climate Downscaling workshop

This letter serves as an introduction to the Toulouse workshop to give you some background information on it and its main objectives.

As you may know, the WCRP has recently formed a Task Force on Regional Climate Downscaling (TFRCD), chaired by F. Giorgi and C. Jones, with the task of supervising the development of a plan to carry out the following three main tasks:

- 1) Develop a framework to evaluate and improve RCD techniques for use in downscaling global climate projections.
- 2) Design an international coordinated effort to produce a new generation of RCD-based high resolution climate change projections over regions worldwide for input into the AR5 and use in impact/adaptation studies.
- 3) Promote greater interactions between climate modellers, downscalers and end-users to better support impact/adaptation activities, fostering in particular a greater involvement of developing country scientists

As you also know, although the use of RCD techniques (RCMs, variable resolution and statistical downscaling tools) has tremendously increased in the last years, there is still a good deal of scepticism about their value and usefulness in some sectors of the modelling community. One of the primary reasons for this is the lack of a coordinated framework by which RCD techniques can be benchmarked, evaluated and used to produce robust climate change information for use in impact and adaptation work. A reflection of this problem is the fact that very little RCD-based information has made it in past IPCC assessment reports.

To address this problem, WCRP, through WGCM, has created the TFRCD with the specific task of supervising the design of such an international coordinated experiment framework, something along the lines of what AMIP and CMIP3 have been for the GCM community. In particular, one of the specific goals of this framework is to facilitate the provision of information that would provide a strong RCD-based input into the AR5, scheduled to be released in 2013. This gives us a very stringent deadline as in principle such RCD-based information needs to be produced within the next couple of years so that it can be used by WGII scientists.

In the Toulouse workshop we will start to discuss the details of this framework, with the hope of making long strides towards the definition of a plan. Some of the key issues to be discussed, and that you might want to think of are:

- 1) Number of participating models and partners. Of course the more the better, however it should be realized that at the moment there is no funding specifically available for this, so that the participation needs to be necessarily on a voluntary basis. On the other hand, we feel that a well conceived and designed plan might elicit opportunities for funding.
- 2) Experiments to be completed. In the next round of IPCC there is a wide range of experiments planned, from decadal prediction to standard scenario runs (using specified GHG Reference Concentration Pathways), stabilization runs and a number of sensitivity experiments to isolate the effects of different forcings and processes. We cannot obviously do them all, so we need to prioritize the key ones to be carried out.
- 3) Choice of domains, resolution and time slices. WCRP is keen that as many regions of the globe as possible be treated. This may increase the number of domains by quite a lot. The model resolution should be state-of-the-art, and a value that has been floating around is 25 km grid point spacing. Should we do full 150 year simulations or time slices? We need to find an optimal compromise among these issues.
- 4) Choice of GCMs for providing lateral boundary conditions or, more generally, forcing fields. This is a key issue. In order to produce RCD runs, we need to have GCM data to downscale, and we need them in a timely fashion. At the last WGCM meeting, GCM groups generally expressed their support for this notion, as long as it does not add to much work for them. So we need to design an approach workable for them as well as for us.
- 5) Databanks and data accessibility. Another key issue. There will be a lot of data, both the GCM data to drive the RCDs and the output produced by the RCDs. CMIP3 has been incredibly successful because of the role of the PCMDI databank. How should we approach this? The idea has been floating around of regional databanks, since nobody might afford a comprehensive central one. And then, how to produce comprehensive but workable sets of model fields?
- 6) We need to involve the end-user community, represented in Toulouse by a number of impact experts, from the very beginning of the discussion, because they are the recipient of the RCD-information. How to optimize this process?
- 7) A final issue that WCRP is very keen on is to increase the involvement of scientists from developing countries, so we do need to discuss this issue as well.

These are some of the basic issues we will discuss in Toulouse. Hopefully, if we all come prepared we will have a straw-man plan that can be presented at the following JSC/WCRP meeting at the beginning of April in Maryland. The plan is then to eventually finalize the framework at the RCM workshop of May 4-8 in Lund, so that participating groups can gear up to start their simulations not too far thereafter. It is expected that the GCM groups will start their simulations sometimes in the second half of 2009, and we should plan to start ours not much later than that. We may even decide to use AR4 global simulations if it turns out that using the new AR5 ones is not feasible, in other words have a plan B. All this needs to be discussed in Toulouse.

We stress that if this enterprise is successful it will represent one of the newest aspects of the AR5 and will likely have an extremely high visibility, so that we hope you appreciate the importance of our task. Hoping that this letter is of some help for your participation in the Toulouse workshop, looking forward to see you there and to work with you in the next year,

With our best regards,

Filippo Giorgi