Report on the ACCESS/University meeting - 9 August 2006

Background

The ARC research Network for Earth System Science (ARC NESS) hosted a workshop for University researchers at the Bureau of Meteorology. The aims of the workshop were:

- to inform the university community regarding ACCESS,
- to identify areas where the Universities might *contribute* to ACCESS
- to identify areas where the Universities might *lead* components of ACCESS
- to identify issues and concerns in the ACCESS-university collaboration

This report details discussions and outcomes from the day. I believe these represent a consensus view – that is, the conclusions documented below represent the considered view of the leaders of the University community present. However, I have only recived specific confirmation of this from Lynch, England and Wilson.

Prior to the workshop, the leadership group of ARC NESS met (Pitman, England, Walsh, Wilson, Beringer). Professors Lynch (Monash), Karoly (Melbourne), and Professor Reeder (Monash), along with Jason Roberts representing TPAC were invited to attend. Prof. Will Steffen could not attend but provided input in writing. This collection represents the national leadership within the University sector in all components of ACCESS. All key Universities (ANU, Macquarie, Melbourne, Monash, UNSW and Wollongong) were represented.

The workshop was briefed in detail by Dr Kamal Puri (ACCESS lead scientist). This was an excellent introduction to the University sector of the status of ACCESS. Professor Matt England briefed the community on the ocean component and Andy Pitman briefed the community on the terrestrial community. A two hour session then ensued to discuss the status of, and the role of the Universities within, ACCESS.

Workshop Outcomes

Developing the ACCESS plan, and the beginnings of the implementation of this plan, has engaged the University sector better than before in the area of climate modeling. There remains, however, on-going decision making without consultation with the broader community. The first "C" in "ACCESS" is "community" and we think that communication with the community remains *ad hoc*. University representation on all implementation groups is aimed at helping communication and to ensure University expertise is brought on board where possible.

We emphasize that we believe that BoM and CSIRO have acted in good faith. They operate in a challenging environment and the required resources detailed in the ACCESS plan have simply not been made available. We fully accept that the "formal" involvement of the Universities via the strategic and science advisory groups has largely

been put in place. An outstanding question, however, is whether ACCESS is utilizing the significant expertise of the universities strategically.

The following was agreed without conflicting views:

1. The decision to import the Hadley Centre atmosphere, couple this to AusCOM, use CABLE, import LPJ was based on broad community consultation. We support this decision. The Matear carbon scheme for the ocean was agreed. Clarification was initially sought on the atmospheric chemistry but the decision to import the UKCA was also accepted;

2. The need for a continental scale reanalysis to underpin a significant array of research was strongly supported. There are genuine benefits of such an initiative including significant innovation on data assimilation, use of satellite data and improvements in other techniques. We strongly encourage further discussions with the Bureau of Meteorology and CSIRO;

3. The Universities called for representation on each implementation group within ACCESS. This was supported by existing ACCESS members from within the Bureau of Meteorology including Dr Puri;

4. The need to port the Unified model to APAC was strongly supported with the need to develop the infrastructure to ensure coding developments in the ACCESS model and in the APAC model remain tightly synchronous;

5. Needs for serving simulation results to the broader community were emphasized.

Andy Pitman will follow up these five with the relevant parties to encourage implementation. At least (3) and (4) can be revenue neutral (funded by ARCNESS and APAC). Some issues relating to (1) are raised below, and (2) is a new initiative that is not currently resourced.

Additional Avenues of University Involvement

In the last three months Macquarie University and UNSW have each invested $1 million in academic appointments in Climate Science. Monash has invested in two professors and Melbourne University has attracted David Karoly to a Federation Fellowship (a significant investment). In addition on-going investment at ANU is to be welcomed. This is roughly 20 permanent academic appointments – this represents a scale of **new** investment that is substantially larger than either CSIRO or BoM's new investment. The University sector has moved very rapidly, very positively, and very strategically in support of ACCESS. To re-enforce this investment, a formal role in ACCESS, that is a leadership role, is the way to provide a long-term commitment.

While the Universities can *contribute* in all areas of ACCESS, there are two specific areas that the University sector has specific leadership expertise:

- Terrestrial processes (Pitman, Steffen, Beringer, Walker)
- Model evaluation (Lynch, England, Pitman, Karoly, Walsh, Holbrook)

We believe that leadership from the Universities in these two sectors would be in the strategic interests of ACCESS. It would broaden the ACCESS community. It would make ACCESS genuinely "community", it would force a structure within ACCESS that was more open and consultative and drive mechanisms, frameworks and protocols that allow end-user engagement. In all cases, of course, strong involvement from the Bureau of Meteorology and CSIRO would be required, in the same way as there is strong involvement from the Universities in ocean processes and sea ice now.

We recognize that the nature of operational research in the Bureau, and the nature of the research environment in CSIRO can make some areas of innovative research difficult to pursue. Further, "risky" research – that research that allows major advances, is more easily undertaken in the University environment. Facilitating this, and bringing University expertise into the core of ACCESS in a leadership capacity is in the national interest.

Recommendations on terrestrial processes

- Significant uncertainty remain on components of the terrestrial model (how to route water, biogeochemistry, soil moisture assimilation, leaf phenology etc have yet to be discussed by the community). Some decisions that appear to have been made in specific areas may or may not be appropriate – further consultation is clearly required to engender expert views;

- Decisions regarding how to bring NCAS-R into CABLE+LPJ is the subject of a pending ARC Linkage grant and will hopefully receive support.

The University sector could lead this area of ACCESS. It would require substantial investment and it would require AGO leadership to communicate to CSIRO/BoM the opportunities this offers. It would require a well developed plan involving key players, it would require sustained funding and would necessitate a clear understanding within the university sector of ACCESS timelines, deliverables etc. The investment required would require discussion but would be considerable.

Recommendations re model evaluation

It makes a great deal of sense to have model simulations evaluated by people independent of, but associated with, the model developers. Model evaluation is envisaged to be a three pronged approach, with strands in dataset development, numerical weather prediction and climate system simulation. Within each of these strands, tools for evaluation must be

enhanced and new tools developed. Many of these tools have been developed within the University sector

In support of this component, it is necessary that model and analysis data to be made available in a way that users can use (this forces the model developers to make data available in ways the broader community requires).

University researchers with specific capability in this area include Pitman (who is a lead author in IPCC on model evaluation), England, Lynch, and Holbrook. Lynch has already provided tools and training based on Self Organizing Maps to BMRC staff, and is currently working with other BMRC staff on cloud classification approaches. This university experience extends to NWP applications: for example, innovative techniques for the evaluation of US operational forecasts were presented by Lynch and collaborators at the recent SCAR meeting in Hobart.

Finally, model evaluation can be an excellent means of training students in climate science. Since an important role of the universities is to provide future ACCESS scientists, this provides an important forum for developing the student cohort.

It is important to note that all model evaluation activities, to have impact on ongoing model development plans, must include participation by BoM and CSIRO staff. However, in this context, the Universities would *lead* this initiative. It would require funding, sustained over some time. Similar procedures to the terrestrial modeling would need to be in place.

Funding

Chris Mitchell noted that there was a need to “catalyze” the University commitment to ACCESS. The University investment in ACCESS-related research has exploded in the last few months at a scale that is unprecedented. It is not University investment that is now required, it is the facilitation of University leadership in ACCESS. In the absence of core funding for ACCESS within the University community this is problematic – it takes 12-18 months from initiating an ARC grant proposal to its funding. A mechanism has to be found urgently to allow the dramatic investment in University positions to be targeted at ACCESS. In effect a “lever” has to be found to make it in the Universities interests to work within ACCESS. This likely involves a formal and significant funding mechanism for projects tightly coupled with ACCESS. The level of funding has to be significant and sustained – that is, sufficient to fund appointments.

The University sector will continue to argue for a Special Research Initiative, for Centres of Excellence and similar-scaled investment. These are all likely 2-5 year strategies and are far too slow to allow large scale involvement by the University sector in ACCESS.

Andy Pitman, Tuesday, August 22, 2006