
University capacity / input into ACCESS

Summary

The university sector comprises substantial climate modelling and numerical weather prediction (NWP) capacity. There is significant interest in ACCESS, with a large number of researchers anticipating being involved in the development, analysis and/or evaluation phases of ACCESS. This is particularly the case for the **oceanic, sea-ice** and **land surface** components of ACCESS.

Development phase: The university sector anticipates playing a major role in the development phase for the ocean, sea-ice and land-surface models. However, the universities are unlikely to play a major role in the configuration of the atmospheric model. Input into the AGCM is likely focused on individual physics areas and parameterisations.

Evaluation phase: The University sector is well positioned to play a lead role in the evaluation phase of ACCESS, especially in the context of climate simulations. Substantial assessment projects have been undertaken in the past at several Universities for both component sub-models and full climate models. In contrast, evaluation of NWP skill is likely to be led by BMRC.

Road blocks: There are several obstacles to the seamless integration of University and BMRC/CSIRO efforts with regard to ACCESS. These obstacles are for the most part related to key differences between the block-funded organisations (BMRC, CSIRO) and the University sector. Foremost:-

- The two sectors use different supercomputing systems (APAC, HPCCC)
- The Universities do not receive block funding for research
- University research funding and PhD projects are typically 3 years, not ongoing
- University research funding agencies (e.g. ARC) will not support model development activities, except via schemes such as the ARC Network (which is funded to 2009)
- Climate modelling capacity within the University is significant as a whole but comprised of dispersed nodes (both geographically and thematically)

Other present obstacles include:-

- University research funding agencies (e.g. ARC) will not generally support scoping projects. Components of ACCESS that are in a planning phase cannot easily be flagged in present-round ARC *Linkage* proposals. The situation should have improved by the February 2007 round for 2008 funding.
- The timeline for ACCESS should be communicated to the Universities: this will be a priority at the upcoming workshop. It is difficult to plan for ACCESS-related projects for PhDs/postdocs starting now: this should improve in the next 6-9 months.

- ACCESS strategies, implementation plans, and contact points are not yet available to the Universities – so they cannot therefore formulate local strategies for engagement. Again, this will be addressed at the upcoming workshop.

Potential obstacles in the future include:

- Porting to APAC must occur **before** the Universities can use the ACCESS model for experiments – traditionally the lag time here is ~1 year suggesting that some form of co-development needs to occur.
- A culture of genuine collaboration remains to be firmly established. Unfortunately *ARC Linkage* proposals cannot be used to link the University sector to BMRC/CSIRO. The ARC Network is unique in this regard.
- Many in the University community need results not model development – e.g., simulations to use for impacts modelling. Australia has a poor infrastructure to serve data – neither BoM nor CSIRO are resourced to provide data and there is no accessible archive of results apart from the TPAC initiative. An infrastructure whereby data is more easily accessible from within Australian (as opposed to from NCAR/PCMDI) needs serious consideration.
- There needs to be a well maintained control version of the model
- Model documentation has been minimal in the past due to poor resourcing.

Specific development components.

- Land-surface – The University sector has significant expertise in data collection, modelling, model evaluation, innovative model calibration, model intercomparison, and component building. Main opportunities appear to be in data synthesis of measurements (led perhaps by Monash), physical modelling (led by Macquarie) where new parameterizations are built and tested, and model evaluation both off-line and coupled. Specific experiments driven by the land surface including land cover change, GLACE, AMIP-style analyses, GSWP, PILPS, C20C (land) and so on can all be led by University groups. The leadership in hydrology and in dynamic vegetation modelling is most likely to be sourced from the University sector although significant expertise should be brought permanently into ACCESS.
- Ocean and sea-ice – This is another area where the University sector can contribute in a major capacity. ACCESS will incorporate the AusCOM configuration of MOM4, and the sea-ice model developed at TPAC (for details follow URL link to the TPAC proposal to APAC in Appendix 1). Capacity for ocean model evaluation is also housed within several University groups.
- Atmosphere – This is the one area where the University capacity in model development is relatively limited. There is however expertise in atmospheric chemistry and in specific areas of model physics (e.g. tropical convection, cloud physics, gravity wave generation and momentum transport, tropical cyclones, de-

coupling of the land surface and boundary layer components, developments in the PBL and LSM codes).

- NWP and data assimilation – The extent to which the University community can contribute to the development of the numerical weather prediction component and data assimilation techniques in ACCESS is yet to be defined. At the very least a number of University researchers have expressed an interest in running NWP projects utilising the ACCESS model.

Recent activities:

1. TPAC ocean model development and configuration of AusCOM and a sea-ice model – see relevant TPAC attachment in Appendix 1.
2. CABLE – ACCESS workshop being held on 7-8 June – see attached schedule from Jason Beringer / Andy Pitman for details (Appendix 1).
3. CABLE – recoding partially financed by and conducted by the ARC Network. Evaluation of CABLE also conducted by Macquarie and the coupling of parameter estimation techniques, an ANN-based calibration method and a self-organizing feature map technology all provided and integrated into CABLE.
4. CSIRO Mk3L workshop see attached schedule for details (Appendix 1). This workshop was held on May 25-26, 2006. The workshop attracted 35 university researchers – primarily PhD students and Postdoctoral Research Fellows. The goal of the workshop was to train participants in the configuration, integration, and analysis of the CSIRO Mk3L model on the APAC National Facility. The rationale for the workshop is that while ACCESS is in development phase, the University sector could make use of CSIRO Mk3L on the APAC NF. The outcomes of the workshop with regard to ACCESS include (i) Entraining new students into climate modelling science while ACCESS is in development phase; (ii) The CSIRO Mk3L model incorporates earlier versions of MOM and the sea-ice component that will both form a part of ACCESS, so students will become familiar with these submodels, (iii) CSIRO Mk3L will soon include CABLE; (iv) Next generation climate modellers will gain expertise with regard to the APAC National Facility; and may in some cases form joint projects with CSIRO, BMRC.
5. An application for an ARC Special Research Initiative is being developed – led by Andy Pitman. The objective of the SRI scheme is to support high-quality research which will assist in advancing Australia's research excellence to be globally competitive and deliver benefits to the community. This extends, but is not limited, to supporting research-related activities which will respond to emerging opportunities or changing priorities. If the ARC funds an SRI related to ACCESS, it would secure a block of funding for the University sector in ACCESS related development and evaluation.

The way forward

1. Workshop on August 9th 2006, to coincide with the next ACCESS SAG meeting, to discuss the way forward. Include leads from both ACCESS and the University sector, as well as open invitation to all respondents of the ACCESS survey.
2. Obtain licence for HadGEM model and begin porting / testing on APAC (2006), funded by ARC Network
3. Continue to support and develop the CSIRO Mk3L model on APAC, including porting CABLE, to ensure the University sector has use of an Australian climate model while ACCESS develops
4. ARC Linkage application to import Lund-Potsdam-Jena (LPJ) Dynamic Global Vegetation Model (DGVM) and couple to CABLE
5. ARC NESS carbon workshop to discuss long-term objectives in enhancing and supporting a DGVM
6. Ongoing TPAC development of AusCOM and sea-ice components of ACCESS in collaboration with BMRC and CSIRO, and coupling via OASIS to Hadley UM.
7. Flesh out the role that the University sector can play in the evaluation phase of ACCESS, including the potential appointment of a university researcher to be the evaluation Team Leader. (*) Under this model, evaluation would be undertaken by BMRC, CMAR, and university researchers, but led by a university researcher.
8. Where appropriate, ask other ACCESS Team Leaders to identify specific data resources that need (i) cleaning up and/or (ii) collecting to support planned parameterization developments
9. When possible, liaise with APAC, ACCESS lead, and ARC Network on creating a mirror of the HPCCC ACCESS filesystem space, with appropriate licensing, and with all code optimised and de-bugged for specific use on the APAC NF (to re-iterate: the HPCCC and APAC HF are very different computing architectures).

Down the track:

10. Run a series of training workshops in the configuration and implementation of the UM and, eventually, ACCESS on APAC facilities (akin to the Mk3L workshop recently held).

() For the University to take a lead role in ACCESS model evaluation requires approved researchers to gain access to the HPCCC, and/or support for accessing and analysing the relevant model output.*

Acknowledgements:

Nathan Bindoff, Andy Pitman and Amanda Lynch provided input, text and comments that helped form the basis of this report. Penny Ajani helped assimilate results of the survey.

Appendix 1: Attachments (URL links provided below):-**1. [Future TPAC activities planned under APAC \(stage 3\).](#)**

This document details plans of how TPAC plans to support the implementation of ACCESS on HPC facilities in Australia.

2. Workshop schedule, [“The Australian Community Climate and Earth System Simulator and Australian Terrestrial Carbon Cycle Research”](#) *Hosted by the ARC Network for Earth System Science, the GCP and CSIRO.* June 8-9, 2006.

Workshop goal: Using the wealth of International expertise we will summarise the state of knowledge of the coupled carbon and water system. We hope to engage with international visitors on key issues arising of relevance to the Australian effort toward a Community Climate and Earth System Simulator (ACCESS).

[Document detailing the workshop’s rationale.](#)

3. [The 2006 CEDL/TPAC/ARC NESS Workshop: "The CSIRO Mk3L climate model"](#)

Workshop goal: This workshop was held on May 25-26, 2006. The workshop attracted 35 university researchers – primarily PhD students and Postdoctoral Research Fellows. The goal of the workshop was to train participants in the configuration, integration, and analysis of the CSIRO Mk3L model on the APAC National Facility.

Appendix 2: E-mail survey

The process of documenting how the University sector can genuinely contribute to ACCESS involved two parallel activities:

1. Strategic discussions and analysis by the key players (Bindoff, Pitman, Lynch, England, Reeder, Walsh, Beringer, ... please add names); mainly coming under ARC Network initiatives; and
2. An email survey that was sent out to University researchers (see attached Appendices)

The email survey that was sent out to University researchers in the ARC Network asked for the following input:

1. Name and contact details.
2. A sentence on **climate modelling experience**.
3. The *area* of climate modelling of interest with regard to ACCESS - either in **development or evaluation phase**?
4. Specific goals in terms of **parameterization development**?
5. What features of the ACCESS model that would need to exist to permit this?
6. Are there specific experiments planned?

APPENDIX 3: People contacted for input

All registered members of the Network in the University sector were contacted for input. This includes a mix of senior and junior academic staff, postdoctoral research fellows and PhD students.

In alphabetical order...

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 al gabric <a.gabric@griffith.edu.au>,
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 John You <you@geosci.usyd.edu.au>,
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APPENDIX 4: Respondents and responses

Below is a list of respondents followed by their answers grouped broadly by their area of expertise. Note that some respondents are individuals, others lead groups of order 5-10 EFT (postdocs, PhDs).

Name	Institution	Model component
Andy Pitman	Macquarie University	Land surface; including carbon
Jason Beringer	Monash University	Land surface; Biosphere
Amanda Lynch	Monash University	Land-surface, ice, atmosphere
Nigel Tapper	Monash University	Land-surface (observations)
Clara Draper	University of Melbourne	Land surface; hydrology
Michael Roderick	Australian National University	Land surface; biogeochemistry
Alistair Williams	ANSTO	Atmosphere; boundary layer
Michael Reeder	Monash University	Atmosphere; tropical convection
Kevin Walsh	University of Melbourne	Atmosphere; tropical climate
Todd Lane	University of Melbourne	Atmosphere; Cloud processes
Lixin Qi	University of New South Wales	Atmosphere; cyclones
Frank Drost	University of New South Wales	Atmosphere; UM experience
Merv Lynch	Curtin University of Technology	Atmosphere, remote sensing
Guergana Guerova	University of Wollongong	Atmosphere; chemistry
Ian Enting	The University of Melbourne	Carbon components
Nathan Bindoff	University of Tasmania, TPAC	Ocean and sea-ice
Simon Marsland	University of Tasmania, TPAC	Ocean and sea-ice
Jason Roberts	University of Tasmania, TPAC	Ocean
Petra Heil	University of Tasmania, TPAC	Sea-ice
Matthew England	University of New South Wales	Ocean
Ruediger Gerdes	Australian National University	Ocean and sea-ice
Andy Hogg	Australian National University	Ocean
Neil Holbrook	Macquarie University	Ocean
Jochen Kaempf	Flinders University	Ocean; downslope flows, sea-ice
Joachim Ribbe	Univ. of Southern Queensland	Ocean
Andrew Kiss	UNSW at ADFA	Ocean
Al Gabric	Griffith University	Ocean, biota and trace gases
Graham Jones	Southern Cross University	Ocean DMS production model

Andy Pitman, Macquarie University

1. Your name and contact details.

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2. A sentence on your climate modelling experience.

Land surface modelling, model evaluation, some climate impacts. I've used the BMRC GCM, the NCAR CCM3 and a couple of regional climate models using boundary conditions from CSIRO MK3.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Terrestrial processes including carbon

4. Are there specific things you want to do in terms of parameterization development?

I have a general interest in exploring the role of carbon stability in the coupled climate system, an interest in the contribution of terrestrial processes to climate feedbacks and the impact of land cover change on climate. I would be interested in working jointly in a variety of areas ranging from river routing to enhancing specific parameterizations in the land surface - but this depends on specific postgraduate student interests.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

I need to be able to run at APAC. I need to be able to modify the land surface and associated data sets. I need multiple realizations.

6. Are there specific experiments you plan?

No - it will depend on the precise configuration of the ACCESS model and where perceived priorities emerge from ACCESS.

Jason Beringer, Monash University

1. Your name and contact details.

Jason Beringer
Monash University

2. A sentence on your climate modelling experience.

Parameterisation, validation and some limited development of land surface models.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Land surface. Biosphere. Development of CABLE.

4. Are there specific things you want to do in terms of parameterization development?

DVGM (ARC Linkage submitted with Pitman, Steffan and Wang), fire disturbance module, Australian parameter sets, Unique Australian processes

5. Are there particular features of the ACCESS model that would need to exist to permit this?

Land surface model that is coupled to ACCESS (i.e. not the current Hadley centre model which has the land surface scheme infesed into the main code.)

6. Are there specific experiments you plan?

Regional carbon simulations for northern Territory

Amanda Lynch, Monash University

1. Your name and contact details.

Amanda Lynch, Geography and Environmental Science, Monash University
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2. A sentence on your climate modelling experience.

Learned on the MUGCM. Built a coupled regional climate model ARCSyM (Including developing a flux coupler) based in the Penn State/NCAR MM4, the NCAR LSM, the Flato-Hibler sea ice model (later replaced with CSIM) and the SPEM ocean model (later replaced with MOM.) Did model improvement in radiation code, cloud microphysics, and basic dynamics loop structure. Over the years I have had a hand in substantial development to land surface models and sea ice models. I've used a range of limited area and global climate models including MM5, CCSM and predecessors, and more recently FOAM, CCAM. Currently also playing around with WRF but not on climate timescales.

I've also been involved in several novel approaches for model evaluation, including regime-dependent evaluation.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

I'm interested in evaluation of the model, particularly in the polar regions. I also want to do downscaling applications particularly over Australia. So, for instance, I would be keen to conduct experiments using the Hadley regional model once implemented on APAC. I'd also love to see a regional re-analysis over Australia using this model. I might use the global model for palaeo applications.

4. Are there specific things you want to do in terms of parameterization development?

See above - model evaluation and sensitivity experiments, particularly with the regional version.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

I need access to that model and license to use it.

For global model evaluation, initially I only need access to model output and code documentation. I might want to run a few sensitivity studies if the model evaluation required it.

It is crucial (particularly for the utility of model evaluations) that if the model is implemented on APAC for university researchers, that the APAC version remain *constantly* up to date with the "official" ACCESS model version. So either the model management system needs a mirror on APAC, or university researchers need to have access (no pun intended) to the ACCESS computing resources.

6. Are there specific experiments you plan?

Depends on the timing of the ACCESS program and the progress of my various projects.

Nigel Tapper, Monash University

1. Your name and contact details.

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Monash University
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<http://www.arts.monash.edu.au/ges/who/nigel.html>

2. A sentence on your climate modelling experience

Work more in observations; limited experience in urban heat island modelling, mesoscale modelling and contributing data to regional scale modelling activities

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Possible contributions to development via measurements leading to improved parameterizations and evaluation via measurements (probably in collaboration with Beringer)

4. Are there specific things you want to do in terms of parameterization development?

I think that there are substantial improvements that can be made to flux estimates in tropical Australia.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

Unsure

6. Are there specific experiments you plan?

Continued tropical savanna work with Beringer/Hutley.

Clara Draper, University of Melbourne, BMRC

1. Your name and contact details.

Email: cdraper@bom.gov.au

2. A sentence on your climate modelling experience

My experience is in NWP, rather than climate modelling. I have worked with the Bureau's current NWP, looking at the role of the land surface scheme in determining atmospheric moisture (in particular errors in the moisture processes). I am a PhD candidate.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

The land surface scheme/hydrology (development).

4. Are there specific things you want to do in terms of parameterization development?

I am working on the assimilation of remotely sensed soil moisture into the Bureau's operational NWP (LAPS currently, or the UKMO model once it is available).

5. Are there particular features of the ACCESS model that would need to exist to permit this?

The UKMO model to be operational/available as an NWP at the BoM.

6. Are there specific experiments you plan?

Simulated forecasts with/without the assimilated soil moisture observations, in order to compare effect of the assimilation on the surface state and on atmospheric forecasts.

Michael Roderick, RSBS, Australian National University

1. Your name and contact details.

Michael Roderick <Michael.Roderick@anu.edu.au>
Research School of Biological Sciences
The Australian National University

2. A sentence on your climate modelling experience

Expertise is land surface processes and biogeochemical cycles.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Land surface processes and biogeochemistry

4. Are there specific things you want to do in terms of parameterization development?

As far as I know, Ying Ping Wang (CSIRO) has an existing land surface scheme – I would like to add some longer term vegetation dynamics to that.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

I am not familiar enough with ACCESS to respond.

6. Are there specific experiments you plan?

Not as yet.

Alastair Williams, Australian Nuclear Science and Technology Organisation

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2. A sentence on your climate modelling experience.

I am a boundary layer meteorologist, with 15 years experience (after my PhD) in aircraft-based boundary layer turbulence measurements and model parameterisation. Before I returned to Australia in 2003 to work at ANSTO, I spent four years at the UK Met Office developing parameterisation schemes for boundary layer processes in the Hadley Centre Model. As a result, I am very familiar with the Hadley Centre Model boundary layer scheme, and in fact administered the code for 2 years (2001-2002). I also know something about some of the other physics schemes in the Hadley Centre Model (land surface, convection), and how they are connected together in the Model infrastructure.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Development and evaluation of boundary layer turbulence parameterisations. Also, perhaps, a bit of land surface micrometeorological stuff.

4. Are there specific things you want to do in terms of parameterization development?

I would like to use *vertically-resolved* atmospheric concentration data of the naturally-occurring radioactive noble tracer gas Radon to evaluate and develop boundary layer mixing parameterisations in ACCESS. These new datasets are currently being collected by tower- and aircraft-based sampling systems developed at ANSTO over the last 2 yrs.

5. Are there particular features of ACCESS that would need to exist to permit this?

An ability to predict concentrations of non-reactive tracer species that have a radioactive decay sink term. However, I am sure that the Hadley Centre model can already handle passive tracers, and it would be an almost trivial exercise to include a decay term. It may already be done.

6. Are there specific experiments you plan?

Not at this stage. We are mainly concentrating on generating useful datasets at the moment, and are looking to identify potential collaborative partners within the ARC-NESS community (possibly university partners with interested PhD students?) to help us to realize our modelling goals.

I hope this information is useful to you when you go to the next ACCESS steering committee meeting. Please note that, given my background and experience, I am broadly interested in the development of the ACCESS model in general, and the boundary layer and other physics schemes in particular. I would certainly be interested in being involved more closely if an opportunity presented itself and the committee thought my help might be useful.

Michael Reeder, Monash University

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2. A sentence on your climate modelling experience.

I have written several simple numerical model codes for specific problems in meteorology. I have used MM5, WRF, LAPS and a cloud model developed at NCAR by Terry Clark.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

I'm interested especially in the phenomena and scales that straddle weather and climate. One area of particular interest is tropical convection and its role in NWP and climate (including MJO, climate variability, gravity wave generation and momentum transport, tropical cyclones, dynamics and onset of the monsoon).

4. Are there specific things you want to do in terms of parameterization development?

I'm interested in the how tropical convection is parameterized in climate models, and the effect the parameterizations have on the dynamics and predictability of weather and climate.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

No, nothing specific.

6. Are there specific experiments you plan?

Not at present.

Kevin Walsh, University of Melbourne

1. Your name and contact details.

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2. A sentence on your climate modelling experience.

I've run, modified and help develop climate models, specifically the CSIRO models Mark 2, Mark 3, DARLAM and CCAM, as well as the University of Melbourne model.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Development is a bit tricky: being in a University environment, it's difficult to find the blocks of time required to meet model development deadlines. Thus I see my role as being more in the evaluation phase. In particular, I am interested in the model's simulation of tropical climate.

4. Are there specific things you want to do in terms of parameterization development?

Not at present.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

Not that I am aware of.

6. Are there specific experiments you plan?

Yes. I would like to see how well the modeling system generates tropical lows, and why, as this is an area that I have some experience in.

Todd Lane, University of Melbourne, Earth Sciences

1. Your name and contact details.

tplane@unimelb.edu.au

2. A sentence on your climate modelling experience.

No climate model experience, extensive mesoscale and cloud-scale modeling experience.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Cloud processes

4. Are there specific things you want to do in terms of parameterization development?

Cumulus parameterisation, and possible gravity wave drag parameterisation. The "unified model" framework is perfect for multi-scale studies to assess and improve these.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

It would need to maintain the full "unified" structure that the Met Office currently uses.

6. Are there specific experiments you plan?

Detailed case studies from TWP-ICE - (subject to requested funding).

Lixin Qi, University of New South Wales

1. Your name and contact details.

Climate and Environmental Dynamics Laboratory,
School of Mathematics
email: lixin@unsw.edu.au, ph: (02) 9385 6541

2. A sentence on your climate modelling experience

Cyclone and severe weather modelling

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

I am interested in both of the two phases

4. Are there specific things you want to do in terms of parameterization development.

Couple it with AusCOM, the CSIRO land model

5. Are there particular features of the ACCESS model that would need to exist to permit this?

Relatively high resolution

6. Are there specific experiments you plan?

Investigate the impacts of climate variation on cyclone tracks and intensity over Western Australia, and the rainfall patterns in NSW

Frank Drost, The University of New South Wales

1. Your name and contact details.

Climate and Environmental Dynamics Laboratory
School of Mathematics
The University of New South Wales
Sydney NSW 2052
Australia

2. A sentence on your climate modelling experience

The last 5 years I have worked with the UM at NIWA, Wellington, NZ. I have worked with global and regional atmospheric models, ran models in different configurations and under different boundary conditions.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

I would be interested in both aspects of climate modelling.

4. Are there specific things you want to do in terms of parameterization development.

I have not been involved in parameterization development, but I have extensive experience in updating codes for the vegetation and soil ancillary files for New Zealand's surface characteristics.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

As long as the ancillary generation code is part of the UM, and there are good datasets, no other requirements needed.

6. Are there specific experiments you plan?

Depending on my progress on my postdoc topics, I am potentially interested to use the UM to analyse Southern Hemisphere circulation features under different forcings.

Mervyn Lynch, Curtin University of Technology**1. Your name and contact details**

Assoc Prof Mervyn J Lynch, Curtin University of Technology. m.lynch@curtin.edu.au

2. Comments:

We have never run a climate model at Curtin and don't intend to run one. We have worked with other groups - Univ of Wisconsin, Univ of Oklahoma after being unsuccessful for many years in urging BoM (through the Academy of Science) to establish an university-accessible community climate model . While this never happened it would have been a problem since the model generally is wanting.

Our view is that there has been very poor uptake of remotely sensed data assimilated into the various versions of the Australian model. The assimilation of GMS cloud and water vapour drift winds by John LeMarshall, being an exception. We are a member of GHRSSST and would be interested in seeing GHRSSST product assimilated into ACCESS. Neville Smith was to put GHRSSST into GODAE but this seems to have failed or fallen by the wayside even though the GHRSSST field were available. These data sets do need to be validated so that we are adding information to the model not noise. I also believe that such data should have a quality flag attached to it at time of generation to determine how much emphasis is given to the time of generation to determine how much emphasis is given to the data. We would be prepared to assist with the definition and protocols for an implementation of satellite data assimilation if requested.

For severe weather, eg tropical cyclones, it is clear that there are a number of problems many of which won't be solved by the new model. There is also a real need for Doppler radar to support the NWP for such events.

I have had many meeting with Brian Ryan regarding the climate impacts aspect. The renewable and non-renewable resources sectors of the economy in WA are seeking extensions to the prediction of climate to also include climate impacts. Impact of warmer climate scenarios on particular species of native flora and fauna with respect the unnatural selection that may result. We at Curtin are concerned that to date the ocean modelling in Australia has only included the physical components and that the biogeochemical segment has been overlooked. Clearly, the data exists but not the model to support the assimilation.

Capacity building is important and we do much with the IOC on remote sensing aspects. The BoM plans open opportunities in this area. I am thinking of setting up a Workshop in Perth in November 2006 on this topic - with BoM, Don Hinsman (WMO), NOAA / NESDIS (Paul Menzel) and EUMETSAT (Joe Schmetz).

There is much more I could add on the range of experiments that could be proposed to evaluate impact of assimilation of additional RS data sets. This would certainly be a significant interest area for Curtin.

Guergana Guerova, The University of Wollongong

1. Your name and contact details.

Guergana Guerova, guergana@uow.edu.au
Department of Chemistry
University of Wollongong

2. A sentence on your climate modelling experience

No major climate modeling experience. Collaboration with ETHZ on evaluation of water vapour of the ECHAM (MPI model).

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Air chemistry of tropospheric trace gases and aerosols on global/regional scale. I will be interested to work on implementation/evaluation of the chemistry module and coupling with the terrestrial/ocean module.

4. Are there specific things you want to do in terms of parameterization development.

N/A

5. Are there particular features of the ACCESS model that would need to exist to permit this?

A chemistry module.

6. Are there specific experiments you plan?

N/A

Ian Enting, MASCOS, The University of Melbourne

1. Your name and contact details.

MASCOS, The University of Melbourne
139 Barry St, The University of Melbourne,
Vic 3010, Australia . Phone (61 3) 8344 1796.
<http://ms.unimelb.edu.au/~enting/>
ienting@unimelb.edu.au

I would see my only role as involvement in calibration/validation of carbon components, i.e. working with YingPing and others

We are still working on fleshing out details.

Nathan Bindoff, and co-workers, IASOS, CMAR and TPAC, Univ. of Tasmania

1. Your name and contact details.

TPAC, University of Tasmania
Private Bag 80, Hobart 7001

4. Are there specific things you want to do in terms of parameterization development?

Not sure. Inertial Oscillations in sea-ice...??

5. Are there particular features of ACCESS that would need to exist to permit this?

Sea-ice, oceans and atmosphere.... Paleo-climate models

6. Are there specific experiments you plan?

We have a whole suite of experiments planned as part of the ACE CRC activities..... basically reanalysis of the last 50 years, time variability, variations in the overturning, sea-ice distributions water mass transformations.... etc etc

Future TPAC activities planned under APAC are in attachment. In particular we plan to support the implementation of ACCESS on HPC facilities in Australia... the highly cut down version is attached.

Jason Roberts, TPAC, University of Tasmania

2. A sentence on your climate modelling experience

Expert in model grids, in compilation running and analysis of MOM3. MOM4. Very strong experience in MPI and parallelism. Developer of the AusCOM model and physics. Growing experience in OASIS, OpenDAP and grid applications.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Development of ACCESS grids, support for???

Simon Marsland, ACE CRC, University of Tasmania

2. A sentence on your climate modelling experience.

Max Planck Ocean Model (formerly HOPE). Extensive experience both with model physics, and model design, and model analysis. Particular experience with coupled sea-ice and oceans, and applications to the Southern Ocean.

Petra Heil, AAD and ACE CRC, University of Tasmania

2. A sentence on your climate modelling experience

Arctic and Antarctic Sea-Ice models. High resolution modelling, including...??

Matthew England and co-workers, University of New South Wales**1. Your name and contact details.**

Matthew England
Climate and Environmental Dynamics Laboratory (CEDL)
The University of New South Wales UNSW SYDNEY NSW 2052
Telephone: +61-2-9385-7065
E-mail: M.England@unsw.edu.au,
www.maths.unsw.edu.au/~matthew

2. A sentence on your climate modelling experience

Mainly in ocean-only models; i.e. various incarnations of GFDL MOM. Members of my group have experience in using, developing and/or porting of the UVic ICCM, the NCAR CCSM Version 3 (PhD student Sen Gupta) and the Hadley Centre UM (postdoc Frank Drost). We also expect to use CSIRO Mk3L over the next few years until ACCESS is publicly available.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Mainly the oceanic component, especially evaluation of the global THC using CFCs, T-S and other tracers. Also have interest in the evaluation of the model's representation of Southern Hemisphere climate variability (especially the Southern Annular Mode and Indian Ocean variability). Also in sea-ice / ocean interactions.

4. Are there specific things you want to do in terms of parameterization development.

Not at this stage. MOM4 carries a rich array of physics, and ongoing development of MOM4 should suffice for our purposes.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

Main requirement is that ACCESS is operational on the APAC supercomputer. Our main CPU facility of use is the APAC National Facility, so without ACCESS operational on APAC, we could not use this model (unless of course we could access CPU time on the HPCCC).

6. Are there specific experiments you plan?

A range of interannual to multi-century simulations. Focus would be on natural variability experiments, as well as so-called 'perturbation' runs focusing on specific physical responses in the earth's climate system (e.g., response to enhanced sea-ice and land-ice melt, wind shifts, SST changes, etc.)

Ruediger Gerdes (soon to be at ANU)

1. Your name and contact details.

rgerdes@awi-bremerhaven.de

2. A sentence on your climate modelling experience

Ocean-sea ice modeling, global and high latitude; limited experience with EMICS and palaeoceanographic applications; ocean model development

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Ocean-sea ice modeling

4. Are there specific things you want to do in terms of parameterization development.

Treatment of surface fresh water fluxes; simple representation of atmospheric feedbacks in ocean-sea ice models; effects of ice bergs and ice shelves.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

Partial coupling, coupling of simple atmospheric components and data sets to the ocean-sea ice component should be simple - for instance like the data override feature of GFDL's FMS.

6. Are there specific experiments you plan?

Not yet

Andy Hogg, The Australian National University

1. Your name and contact details.

Research School of Earth Sciences, The Australian National University
Canberra ACT 0200 Australia
T: +61 2 6125 9962
F: +61 2 6257 2737
E: Andy.Hogg@anu.edu.au

2. A sentence on your climate modelling experience

Ocean modelling -- in particular process modelling studies through development of idealised models or analysis of existing models.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Ocean model development

4. Are there specific things you want to do in terms of parameterization development?

Yes, I have submitted an ARC proposal to investigate parameterisation of ocean eddies -- if this is funded I would like to be in a position to feed results into the ACCESS project.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

It would be easiest if there were existing modules for eddy parameterisation which could be replaced by new schemes

6. Are there specific experiments you plan?

See 4.

Neil Holbrook, Macquarie University

1. Your name and contact details.

Physical Geography, Division of Environmental and Life Sciences,
Macquarie University
Phone: +61 (0)2 9850-8429
Fax: +61 (0)2 9850-8420
E-mail: neil.holbrook@mq.edu.au
Sydney NSW 2109.

2. A sentence on your climate modelling experience.

I built a reduced-gravity model and continuously stratified model of the world's oceans for the MATLAB environment.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

The ocean component - I wish to continue to be involved in AusCOM.

4. Are there specific things you want to do in terms of parameterization development?

Not exactly - but I've indicated to the AusCOM community of my interest in involvement in helping to sort out the following:

- (i) possible future use of the AusCOM model as well as analysis of output fields that may help to improve future versions;
- (ii) provision of results and findings following ongoing:
 - (a) observational studies of the subtropical-midlatitude Pacific Ocean; and
 - (b) intermediate complexity modelling studies of the Indo-Pacific Ocean that may also help to diagnose the important dynamics/thermodynamics contributing to the upper ocean variability.

5. Are there particular features of the ACCESS model that would need to exist to permit this?

N/A.

6. Are there specific experiments you plan?

No.

Jochen Kaempf, Flinders University

1. Your name and contact details.

jochen.kaempf@flinders.edu.au

2. A sentence on your climate modelling experience.

Process-oriented modelling, dense-water formation & spreading, upwelling. Experienced with FORTRAN-based in-house-build models, model development & verification

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Parameterisation of dense-water cascading, thermohaline convection and new-ice formation, and cross-shelf exchange processes (upwelling).

4. Are there specific things you want to do in terms of parameterization development?

Try different parameterisations of dense water cascading e.g. Martin & Goose, develop new schemes

5. Are there particular features of the ACCESS model that would need to exist to permit this?

I need to be able to run the model at SAPAC (South Australia). I would like to have a small version of the code for teaching & training purposes. I need to be able to have full access to the code to play around with different parameters and parameterisations.

6. Are there specific experiments you plan?

Not yet. This depends on whether I have direct access to the code.

Joachim Ribbe, University of Southern Queensland

1. Your name and contact details.

Joachim.Ribbe@usq.edu.au

2. A sentence on your climate modelling experience

Large scale ocean/tracer modelling, off-line tracer modelling, coastal ocean modelling, currently involved in IPCC model diagnostics looking at precipitation and water mass distributions.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

Don't see myself contributing in the development phase, interested in gaining access to data in the future, and like to run the model on APAC; we are just in process of establishing a regional climate model, would like to use ACCESS data as boundary input in a few years.

4. Are there specific things you want to do in terms of parameterization development.

No

5. Are there particular features of the ACCESS model that would need to exist to permit this?

No, just would like to access ACCESS via APAC

6. Are there specific experiments you plan?

No

Andrew Kiss, University of New South Wales at ADFA

1. Your name and contact details

Dr Andrew Kiss,
Discipline of Oceanography,
School of Physical, Environmental and Mathematical Sciences,
University of New South Wales at ADFA,
Canberra ACT 2600
email: a.kiss@adfa.edu.au
web: <http://www.unsw.adfa.edu.au/pems/research/kiss/>

2. A sentence on your climate modelling experience

Nil, but it's an area I'd like to move into

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

See below

4. Are there specific things you want to do in terms of parameterization development.

I'm a CI on an ARC grant application (with Andy Hogg, Trevor McDougall and Pavel Berloff) to use advanced diagnostics on eddy-resolving ocean models in order to improve SGS parameterisations in coarse (eg climate) models. This could feed into parameterization development for the ACCESS model (probably late in the grant, eg 2010).

5. Are there particular features of the ACCESS model that would need to exist to permit this

A sufficiently modular design, to enable different eddy parameterisations to be "dropped in" easily

6. Are there specific experiments you plan ?

Too early to say at this stage

Al Gabric, Griffith University

1. Your name and contact details.

Environmental Sciences
Griffith University, Nathan 4111
Tel: 07 38757513
a.gabric@griffith.edu.au

2. A sentence on your climate modelling experience

Main interest in the impact of marine biota trace gas emissions and biogenic aerosol formation on climate, how they will respond to warming and importantly whether they might moderate warming.

3. What area of climate modelling are you interested in contributing to ACCESS within - either in development or evaluation phase?

See above

4. Are there specific things you want to do in terms of parameterization development?

Embed a marine biogeochemical component.

5. Are there particular features of hte ACCESS model that would need to exist to permit this?

Good vertical resolution in the upper ocean, say 10 m between 0-100m

6. Are there specific experiments you plan?

Present interest in contemporary simulations of the meridional circulation in the Antarctic SO, and associated impact primary production.

Graham Jones, Southern Cross University

1. Your name and contact details.

gjones@scu.edu.au

I am not a modeller but work with Al Gabric using his DMS production model. So I am really someone who can supply information e.g. DMS measurements we have made in the Antarctic sea ice zone. As DMS assists cloud formation over the ocean it has an important role in climate; particularly now that aerosols are now recognised as having a + thermal IR effect as well as a UV cooling effect.

Anyway I would most probably like to hear about the results of the modeling exercise but cannot contribute I feel.