Dr Steven J. Phipps:

Climate Change Research Centre

1. Personal details

BA (Hons) University of Oxford, 1993; MA University of Oxford, 1999; PhD University of Tasmania, 2006. Research Fellow from 2008.
Email: s.phipps@unsw.edu.au
Website: http://www.stevenphipps.com

2. Achievements & aims in research

Achievements

In 2006, I completed a PhD at the University of Tasmania. One of the primary outcomes of that project was the development of the CSIRO Mk3L climate system model, a fast, portable version of CSIRO's climate model. I also studied past, present and future climate variability and change, and developed a novel technique for initialising climate system models.

Since completing my PhD, I have continued to develop and enhance Mk3L as a research tool. The model has been released to the community, and I have sought to build up a user base. These efforts have included giving a highly successful training workshop at UNSW in 2006, which saw 35 participants.

I have also used Mk3L to conduct novel research into past climate change. Simulations of the past 10,000 years have shown a significant strengthening of the El Nino-Southern Oscillation over this period, consistent with evidence gathered from sources such as lake sediments and coral reefs.

In a collaboration between CSIRO and the Australian Bureau of Agricultural and Resource Economics (ABARE), I have worked on coupling Mk3L to ABARE's GTEM economic model. The result was a novel and world-class integrated assessment model, suitable for costing and evaluating climate change mitigation strategies. Initial results from this model were included in the recent Garnaut Climate Change Review.

I was awarded the 2008 CSIRO Medal for Research Achievement, jointly with 12 others, in recognition of my efforts in developing Mk3L.

Aims

Since joining UNSW as a Research Fellow in October 2008, my aims have been threefold: to continue to develop the CSIRO Mk3L climate system model as a research tool, to use this model to conduct novel palaeoclimate research, and to work with the Australasian palaeoclimate data and modelling communities to build research capacity and to initiate new collaborative research projects.

As an initial step towards achieving these aims, I am co-convening a workshop to be held at UNSW in November 2008. This will bring together around 30 of the leading palaeoclimatologists from Australia and New Zealand, and will identify key outstanding research questions. It is anticipated that this workshop will initiate a considerable number of new collaborative research projects, which will in turn generate a significant number of applications for new research funding.

Both personally, and in collaboration with scientists at UNSW and at other institutions, I intend to oversee the development of Mk3L into a truly world-class *earth* system model. Work is already underway on the incorporation of dynamic vegetation, and of the carbon, nitrogen and phosphorous cycles. Future work will see the incorporation of additional components, including an aerosol scheme.

I also intend to use Mk3L to study the evolution of the dominant modes of Southern Hemisphere climate variability - including the El Nino-Southern Oscillation and the Southern Annular Mode - over the past 10,000 years. I will seek out national and international collaborators in order to maximise the scope and impact of this work. I will also participate in relevant international projects, including in my capacity as an experimental co-ordinator for Phase 3 of the Palaeoclimate Modelling Intercomparison Project.

3. Quantitative measures of productivity

Total no. of DEST publications:	9	DEST publications from 2003): 8
Career no of citations:	38	*h*-index*: 1
Total grant support (from 2003):	$1.5m	Competitive grants (from 2003): $1.5m
Hons students** (from 2003):	0	PhD/MSc HDRs** (from 2003): 0

Note that the grant support listed above consists almost exclusively of grants of computer time from the Australian Partnership for Advanced Computing.

List refereed publications over the last 5 years

Refereed journal publications

1. Gunasekera, D., M. Ford, E. Heyhoe, A. Gurney, H. Ahammad, S. J. Phipps, I. Harman, J. Finnigan and M. Brede, 2008. Global Integrated Assessment Model: A New Analytical Tool for Assessing Climate Change Risks and Policies, *Australian Commodities*, *15*(1), 195-216.

2. Roberts, J., P. Heil, S. J. Phipps and N. Bindoff, 2007. AusCOM: The Australian Community Ocean Model, *Journal of Research and Practice in Information Technology*, *39*(2), 127-150.

3. Karsh, K. L., N. L. Bindoff, S. J. Phipps, I. Cummings, J. L. Roberts and

P. Heil, 2003. Digital Libraries for Oceans and Climate, *Bulletin of the Australian Meteorological and Oceanographic Society*, *16*(5), 112-116.

Refereed conference papers

1. Roberts, J., G. Hyland, A. Woolf, D. Benda, S. J. Phipps and N. Bindoff, 2007. Expanding OPeNDAP, in *APAC '07: Proceedings of the APAC Conference and Exhibition on Advanced Computing, Grid Applications and eResearch*.

2. Roberts, J., P. Heil, S. J. Phipps, N. Bindoff, G. Brassington, O. Alves, L. Hanson, A. Schiller, R. Fiedler, R. Matear, J. Church, T. Hirst, S. O'Farrell, D. Bi, J. Hunter, S. Marsland, M. England, N. Holbrook, N. Adams and B. Budd, 2005. AusCOM: The Australian Climate Ocean Model, in *APAC '05: Proceedings of the APAC Conference and Exhibition on Advanced Computing, Grid Applications and eResearch*.

3. Heil, P., J. L. Roberts, S. J. Phipps, R. Fiedler and N. L. Bindoff, 2003. Toward a high-resolution coupled ocean-sea ice model, in *APAC '03: Proceedings of the APAC Conference and Exhibition on Advanced Computing, Grid Applications and eResearch*.

Refereed technical reports

1. Phipps, S. J., 2006. The CSIRO Mk3L Climate System Model, *Technical Report No. 3*, Antarctic Climate & Ecosystems CRC, Hobart, Tasmania, Australia, 236pp., ISBN 1-921197-03-X.

Theses

1. Phipps, S. J., 2006. On Long-Term Climate Studies Using a Coupled General Circulation Model, Ph.D. thesis, University of Tasmania, Hobart, Tasmania, Australia.