The ACCESS Simulation and Modelling Service

NeCTAR Climate and Weather Science Laboratory

Martin Dix

Australian Government
Bureau of Meteorology

The Centre for Australian Weather and Climate Research
A partnership between CSIRO and the Bureau of Meteorology

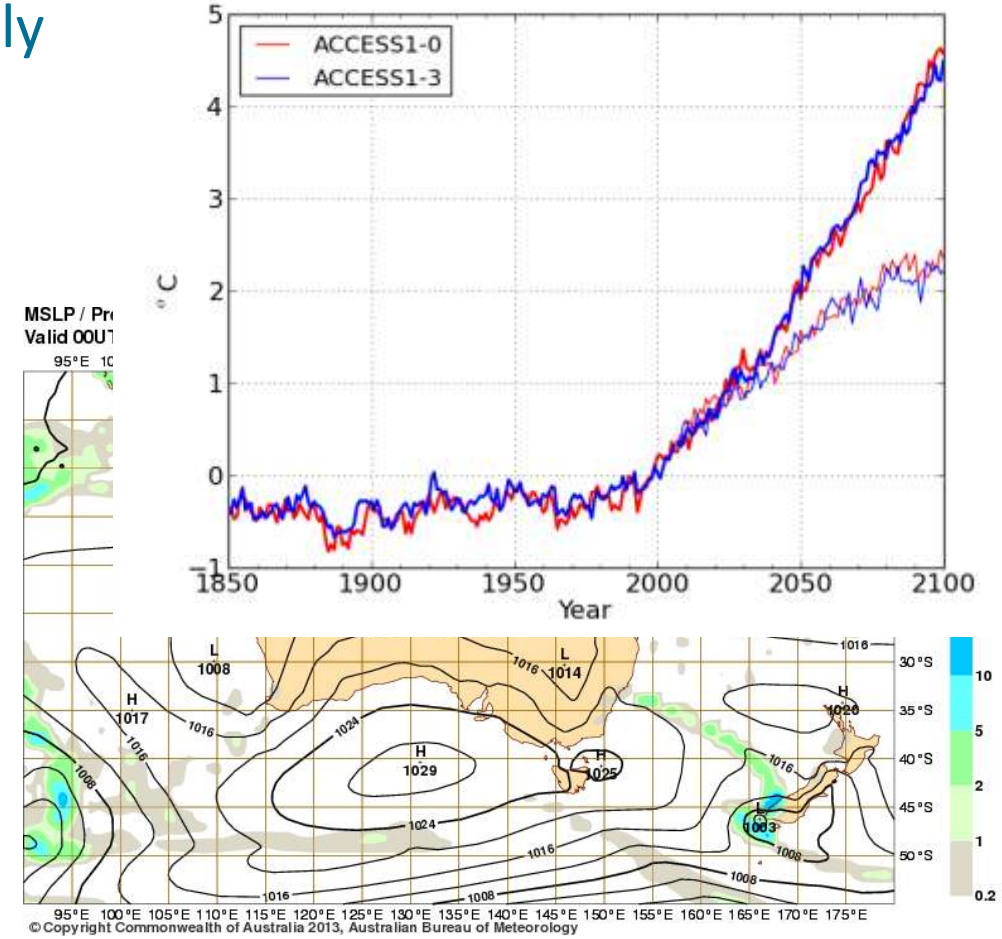
CSIRO

Overview

- ACCESS configurations
- Drivers for this project
- Our development plans
- Current infrastructure status – strengths and weaknesses
- Standard experiments, UIs, data
- Milestones and Progress

ACCESS Configurations

- Global climate – Fully coupled and atmosphere only
  - CMIP5 ACCESS 1.0 & 1.3 (N96 38L)
  - Met Office GA4.0 (N96 85L)
  - Also N48, N216 85L test versions
- Global NWP 40 & 25 km resolution
- Regional NWP: 12, 5, 1.5 km resolution
- Single column model
- Multiple nesting from global to 100 m resolution
- UKCA chemistry & aerosol scheme
- *Regional climate*
- *Nudged global climate*



Drivers for this project

- Existing environment is a hurdle, particularly for new users
  - Coupled model much harder to use than atmospheric model
  - Post – CMIP5 we have some time to think about how to do it better
- New NCI machine
- BOM moving research to NCI
  - Enhances possibilities for new collaborations
- Met Office developing new model technical infrastructure
  - ROSE user interface
  - Experiment repository
  - Cylc (NIWA) for suite control
  - IRIS (python for graphics and analysis)

NecTAR: ACCESS simulation and modelling service

- Library of supported and documented standard experiments
  - Including climate, NWP, idealised
- Improved user interface for the coupled model
  - Experiment configuration database for coupled model
- BOM research and operational NWP configurations available
- Adoption of new Met Office technical infrastructure
- Integration with archiving and analysis services
- Better access to BOM data (forecasts, analyses, initial conditions)

- *Goal is to improve ease of use, reproducibility, support and sharing of code, data and experiments*

Current status of ACCESS infrastructure

- ACCESS climate and NWP systems
  - Climate versions used by COE
- Atmospheric model user interface and experiment database on shared machine at NCI
- Shared code repositories at NCI
- Met Office atmospheric model documentation system
  - Scattered local documentation
- ACCESS help at NCI
- Experience running/debugging model in various configurations
- Experience with CMIP5 data processing and publication

Library of supported examples

- Documented and supported standard experiments
  - Designed to work for all users
  - Version controlled
- Archived results for comparison
- Kept up to date with new Met Office code and science releases, BOM research APS configurations, ACCESS2 prototypes etc
- Climate
  - Coupled and atmosphere only
- NWP
  - Global and regional
  - Research and operational configurations
- **Interested in community feedback on what should be included**

Coupled model user environment

- Atmospheric model UI has been valuable
  - Easier to configure model experiments
- A repository for experiment configurations
  - Makes sharing easier
  - Improves reproducibility and traceability, e.g. showing configuration differences
- Extend atmospheric user interface to ocean and sea-ice components and overall experiment control
  - Capture complete coupled model configuration in a repository
  - Integrate post-processing and archiving
  - Use new Met Office tools for the ocean and sea-ice components rather than extending the existing UMUI to the full system,
  - Modify the UMUI to work with new Met Office tools
- ACCESS2 prototype including new atmospheric UI

NWP

- Make the current and future BOM research NWP systems available for general use at NCI.
  - Adopt the new Met Office technical infrastructure
  - Move from SMS/SCS suite control to cylc

- *Access to archive of BOM analyses, model boundary conditions etc*

Integration

- Model output will be in standard format, written to WP3 catalogue
- Input data, standard case output available from WP3 catalogue

- Model analysis using WP2 tools

- Documentation, experiment database, links to results via WP4 portal

Milestones

- Apr 2013
  - Initial release of coupled model user interface
  - NWP suite installed at NCI
- July 2013
  - UI and experiment database for coupled model complete
- Oct 2013
  - Modelling service (climate and NWP) available for general users

- Ongoing support to end of 2015

Development team

- Martin Dix: Work package leader
- Michael Naughton: Science leader

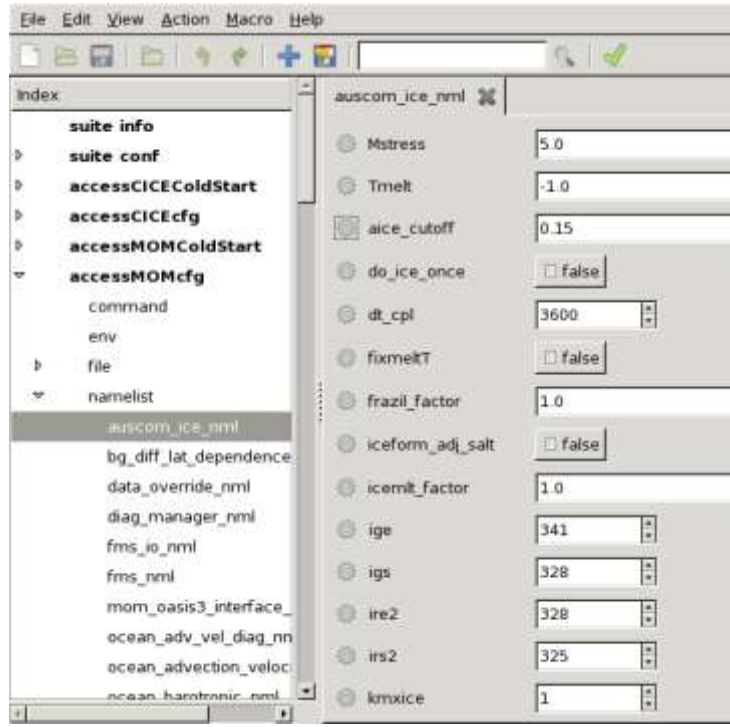
- Say Teong Ng , Peter Uhe, Ian Campbell, Hailin Yan: Coupled model infrastructure
- Wenming Lu, Asri Sulaiman, Zhihong Li ,Yi Xiao, Ilia Bermous , Robin Bowen: NWP infrastructure
- Greg Roff, David Smith: Standard experiment development

- Mike Rezny, Scott Wales (COE): Acceptance testing, community reference group

Progress

- APS1 city systems (using SMS) & APS2 global NWP (N512) (using cylc) running at NCI
- Prototype UI for ACCESS coupled model using ROSE
- Prototype coupled model suite running under cylc
- Working on setting up a new machine “accessdev” for the new UIs and run control
- Working on documentation

- **If you’re interested in testing prototypes or the experiments in the standard library please contact us**



Martin Dix
ACCESS model systems team leader

Phone: 03 9239 4533
Email: martin.dix@csiro.au
Web: www.cawcr.gov.au

Thank you

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