

CABLE-Development

Jatin Kala (J.kala@unsw.edu.au)

- Soil albedo parameterization based on soil color and moisture – currently writing up
- Soil albedo parameterization with solar zenith angle dependence – Will look at in the future
- Vegetation albedo – compare with other LSMS, e.g., CLM and possibly others and incorporate in CABLE - Will look at in the future

Offline or online simulations

Jatin Kala (J.kala@unsw.edu.au)

- 30-year CABLE offline in LIS over Aus, 0.25 deg res, LAI ensemble
- 30-year CABLE offline in LIS with and without soil albedo param, 0.25 deg res
- 30-year CABLE-WRF coupled simulation, ERA-Interim, 50 km res
- Testing CABLE-SLI in LIS offline (just started)

Analysis of pre-existing CABLE simulations

Jatin Kala (J.kala@unsw.edu.au)

- LAI ensemble run close to submission to JGR – Biogeosciences
- Albedo evaluation paper in prep for JGR or GMD
- CABLE-WRF 30-year climatology in prep for Clim Dyn or the like

CABLE-Development:

Bala Narapussety (balachandrudu.narapusetty@nasa.gov)

- Improving soil numerical code
 - Higher order numerical scheme for advection-diffusion equations
 - Addition of Ludwig-Soret and Dufour effects to account for soil moisture change due to temperature gradients and temperature change due to soil-moisture gradient
- Focus on permafrost dynamics in Arctic during Spring (melting) season

CABLE-Development

Jeff Exbrayat (j.exbrayat@unsw.edu.au)

- Parameterization of heterotrophic respiration / soon to be resumed
- Improve the N component of CASA / have to chat with Ying-Ping
- Optimality and adaptation of plant physiology / gathering literature in eco-hydrology

Offline or online simulations with CABLE

Jeff Exbrayat (j.exbrayat@unsw.edu.au)

- Site-scale data-assimilation with CABLE-2.0 (sensitivity to initial conditions, etc...) / ongoing
- High resolution offline runs over the Australian continent / to be started as soon as multi-processor CABLE-CASA is out or CABLE 2.0 is in LIS

Analysis of pre-existing CABLE simulations

Jeff Exbrayat (j.exbrayat@unsw.edu.au)

- Global scale influence of alternative parameterizations of Rh on NEE in C-only, CN and CNP modes (27 members) / under review in GRL
- Regional influence of these parameterizations in CN modes / under preparation for Clim Dyn or Glob Biogeochem Cycles
- Implications on future global NEE with RCPs simulations / manuscript in early stage
- Regional implications to compare with regional emissions / manuscript in early stage

Simulations

- Offline over Australia for tuning and validation
- Coupled (WRF) either SE or continental

Model Development

- LIS-CABLE, LIS-CABLE-SLI, WRF-LIS-CABLE-SLI
- Incorporating simple groundwater module
 - Similar to CLM4 and Decker and Zeng [2010]
 - Diagnostic water table depth
 - Top-Model like runoff
- Realistic Australian Soil Depths
 - Root depths

Mark Decker

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Climate Change Research Centre

Hamish Clarke

(Hamish.Clarke@environment.nsw.gov.au)

Bush fire fuel load (CABLE-LIS)

- NPP as proxy for load (*fuel load \propto NPP from BIOS2*)
- NOW: Analysis (*CABLE-LIS 1990-2008 via Jatin Kala, forced by bias-corrected MERRA (Mark Decker) & MODIS LAI*)
- SOON: Simulation (*offline, coupled to WRF*)
- CI Hamish Clarke (*supes Andy Pitman, Jason Evans*)
- Penny Watson, UOW (*fuel load obs*)
- Vanessa Haverd, CSIRO (*BIOS2*)

Land-atmosphere feedbacks during extreme events using ACCESS-CABLE

Ruth Lorenz (r.lorenz@unsw.edu.au)

- Overall aim: Investigate link between land surface anomalies and extreme events in Australia and globally (my timeline ~2 years)
- Method: ACCESS1.3, AMIP style runs 1951-2008
- Research questions and tasks:
 - How well are climate extremes modelled by ACCESS-CABLE? Comparison to observations (e.g. HadEX2)
 - How does the description of land surface processes in CABLE affects the simulated extreme events? → More model runs, different datasets and/or parameters (e.g. soil type, LAI, land use), different parameterizations? → Details still to decide, suggestions very welcome!
- Involved: Ruth Lorenz (r.lorenz@unsw.edu.au), Andy Pitman

Gab Abramowitz (gabsun@gmail.com)

Benchmarks in PALS

- A restructure of the PALS back end is in progress
 - Generic “Experiments” structure to allow distributed evaluation experiments (global, regional, catchment scales), as well as experiments across multiple sites
- First distributed benchmark experiments:
 - Runoff using Neil Viney’s unimpaired catchment data set (~600 catchments) – engagement from OzEWEX WG2
 - Continental C budget – Vanessa Haverd’s RECCAP work – engagement from TERN eMAST
 - Global albedo, likely coarse resolution
- Model comparison experiment underway now (GLASS panel / UKMO):
 - So far: CABLE2.0, CABLE2.0_SLI, JULES3.1, Noah3.2, COLASSiB2.0. CLM, CHTESSEL coming
 - Benchmarking: Manabe bucket, Penmen-Monteith models and 3 empirical benchmarks
 - More work likely to use this resource (7 LSMs, 20 sites, 5 benchmarks)
- Other PALS features in development
 - User-defined benchmarks
 - Report generation
 - Better error reporting

WRF-CABLE coupled simulations

Annette Hirsch (a.hirsch@unsw.edu.au)

- Diagnosing Land-atmosphere coupling strength:
 - GLACE-2 paper under review in JHM
 - Influence of soil initialisation on sub-seasonal forecasts
 - GLACE-1 work on-going
 - Quantification of land-atmosphere coupling strength
- Influence of land surface conditions on recent heat-waves