e-MAST : Tools -> Data and Models
ecosystem Modelling And Scaling infrastrucTure (e-MAST)
Presentation by Brad Evans - OzFlux 2013 – Palm Cove, Cairns

With examples of the work of Prentice, Hutchinson, Barrett, Renzullo, Whitley, Medlyn, Wright, Cleugh, Haverd, Briggs and contributors from their organizations

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Objectives

To create and develop research infrastructure capable of integrating multiple data streams to enable benchmarking, evaluation and optimization of next-generation terrestrial ecosystem models in support of ecosystem science, impact assessment and management.
Who are we?

- Macquarie University
  Prentice, Evans, Whitely and Yin + Keenan

- Australian National University
  Hutchinson et al.

- CSIRO CMAR & UNSW
  Cleugh, Haverd and Briggs
  Abramowitz

- CSIRO CLW & University of Queensland
  Barrett and Renzullo
What *are* we producing?

**SOFTWARE** to link model inputs and targets and evaluate them (i.e. PALS)

**SOFTWARE** to assimilate target data into models

**SOFTWARE** to downscale climate data and scenarios, using topographic data

**DERIVED INFORMATION**, e.g.

- High-resolution climate surfaces
- High-resolution ecosystem exchange (primary production, water use, canopy conductance)
What else are we producing?

A DATA SET of ecophysiological measurements from the field

A DATA SET of ecophysiological measurements from ecosystem experiments

DATA SETS compiled from existing sources, within TERN and beyond (mainly CSIRO CMAR): fire, streamflow, [CO$_2$]

➢ These data sets will form part of the toolkit
Examples: OzFlux and PALS

e-MAST is developing...

- The ability to ingest the next generation (NetCDF CF) of OzFlux data into PALS
- The ability to ingest e-MAST and AusCover data into PALS
- Quantitative comparison of land surface models to assist differentiation

Case study: Australian Tropical Savanna’s: Past, Present and Future
e-MAST and plant TRAITS

• MQ Have been developing a database of plant traits with data from LTERN, Supersites, AusPlots and the Ecophysiology community (Medlyn and Wright et al)

• Data will be made available, in the first instance and national surfaces of plant traits
Re-mapping leaf N concentration for Australia

5 x 5 Input Classification Map

Inputs \((x_1, x_2)\)

Annual Total Precipitation

Mean Annual Temperature

Input/Output Prediction Map

Output \((z)\)
Re-mapping leaf N concentration for Australia

5x5 node surface map reconstruction

LEAF NITROGEN CONCENTRATION
(AREA BASED)

TERN

e-MAST
Ecosystem Modeling