CABLE (holistically): present and future

-jhan (O&A CSIRO)

ACCESS-UM-MOSES-JULES-CABLE

– UM – UKMOs GCM

- Atmosphere, ocean, land, sea-ice

– MOSES was part of the UM atmospheric model

– ~7.3-8.2 Land model MOSES renamed as JULES

– ~8.2 FCM build included JULES from independent code repository

– JULES standalone

– ACCESS-X replaces land model with CABLE

CABLE-ACCESS-X

– Calling points

– re-packing

– UM/control/top_level/

- I/O includes CABLE type vars
- 17 tiles/ 6 soil layers / 3 snow layers
- tiled soil/snow

ACCESS1.3x

- 4 calling points to CABLE
- All required variables are threaded through the UM (messy)

ACCESS1.3x

ACCESS1.3

- src/atmosphere/cable/*.F90
- CABLE~1.8

ACCESS1.3b

- src/atmosphere/~~cable/~~
- CABLE is included via an independently compiled library (libcable.a)
- CABLE-2.X

CABLE: now

- CABLE-UM7.3 N96 (CABLE resolution)
  - ACCESS1.3 (CABLE~1.8)
  - ACCESS1.3b (CABLE2.X)
  - ACCESS1.4 (1.3b+CASA-CNP)

CABLE-NWP

- NWP wanted CABLE coupled through JULES
  - Run standalone for data-assimilation
  - Use JULES I/O to run CABLE offline

ACCESS-CM2

- 3 calling points to CABLE
- Coupled via JULES
- JULES/src/CABLE/ (FCM) included into UM build
- All required variables are stored in cable_data_module (no threading)
- CABLE-2.X

CABLE: near future

- CABLE-UM8.5 N96?
  - ACCESS-CM2
    - although this may use UM9.1
    - ROSE-CYLC migration
  - Coupled to UM8.5 via JULES, standalone
  - CABLE moving towards NWP
    - GSWP2 (works)
    - AMIP Transpose

CABLE: future (2015:2016)

- CABLE-JULES
  - Co-existance in JULES repo
  - CABLE benefits
    - ROSE-CYLC
    - UM Coupling maintained by MO
    - Rigorous? Nightly testing by MO
  - JULES to implement land startdump

CABLE-2.X

- CABLE
  - core
    - biogeophys
    - biogeochem
  - offline
  - UM

CABLE's future

- CABLE's deficiencies addressed this afternoon
- Input appreciated from community

CABLE's deficiencies

- CABLE science description does not readably match code
  - from top-down modify to reflect generic description of land-surface model
- Use of data structure is less than favourable
  - cable_define_types (cable_global_data)
- Modularity is underutilised
  - effectively cable_global_module

A suggested CABLE

- cable_data_module:
  - cable %fluxes(return)   - defines model flow
  - cable %forcing   - defines state
  - cable %state   - calculated -> fluxes
  - cable %progs   - calculated and kept
  - cable %diags   - viewed
  – cable %fluxes %canopy %fe(+%metadata)
  – cable %state %rough %za(+%metadata)
- cable(i) %
  – wont see cable% in science modules

A suggested CABLE

- selected real kind r_2 will be removed in preference of compile option
- I would also like to kill intent() statements in preference of using "allocated"
- CABLE
  - core
    - biogeophys
      - canopy
      - radiation
      - albedo
      - utils
      - common
        - rad_albedo