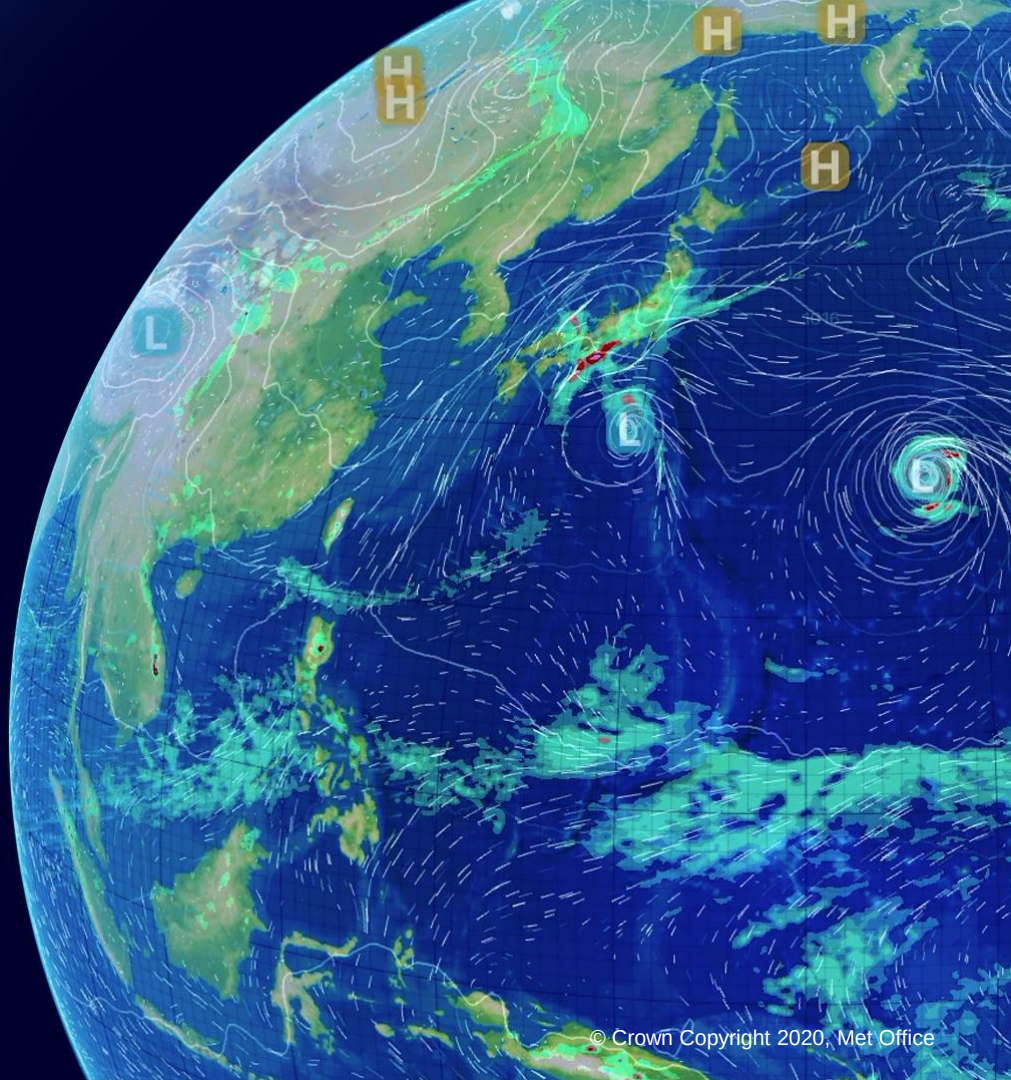
The JULES Surface Module

JULES Annual Science Meeting

September 2023

John Edwards & Rich Ellis



Recent Tickets

- https://code.metoffice.gov.uk/trac/jules/ticket/1327 (vn7.1) Interpret forcing data as being in local solar time, regardless of the time-stamp
  - l_local_solar_time in jules_time
  - Trivial, but important if the albedo depends on the solar zenith angle
- https://code.metoffice.gov.uk/trac/jules/ticket/1189 (vn7.2) Improved numerics in albedo calculation
  - Science unchanged, but KGOs differ

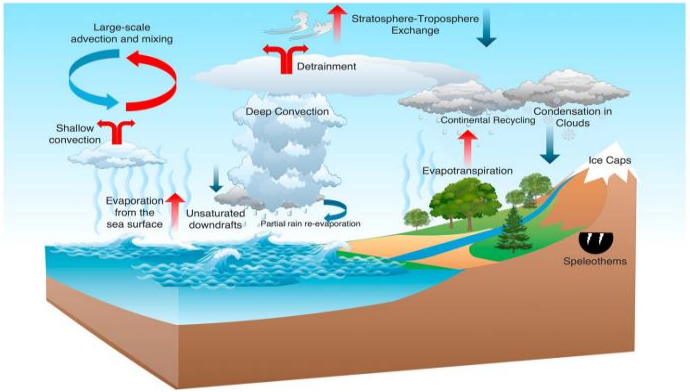
Forthcoming Tickets & Future Plans

- https://code.metoffice.gov.uk/trac/jules/ticket/1390 Implementation of water tracers by Alison McLaren (BAS) – next slide
- https://code.metoffice.gov.uk/trac/jules/ticket/1396 Removal of negative snow
  - Reformulation of melting and unloading of snow from the canopy
  - Improved numerics
  - Will change KGOs

Adding water tracers/isotopes to JULES

- Diagnostic tool to investigate model's hydrological cycle and allow comparison with observed isotopic concentrations (both for palaeo work and present day)
- Project being led by BAS (Contact: Alison McLaren)
- Water tracers have been added to the UM
- Current focus is on water tracers in UMJULES – not available in standalone JULES at this stage

- Staggered approach to introduce code to JULES:
  - Oct-23 release: Surface science code under review
  - Next release: Hydrology/snow and river routing science code
  - Following release: Technical infrastructure to link the science code and coupling with the UM



Galewsky et al., 1996

British Antarctic Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

TiPES

SURFEIT

Further Testing of 17 Tiles

- We will test 17 tiles in global and regional NWP over the next 6 months
  - Is there any benefit in forecasts?
  - If we can adopt this set of tiles, it will improve the seamlessness of the forecasting system
  - We still have some work to do on ancillaries!