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# BoM in-house validation of AWRA-L model using Oznet, AACES and SMOS Data

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# AWRA-L

- Australian Water Resource Assessment, Landscape model
  - Albert van Dijk et al
  - For BoM water resource assessment, accounting, near real-time products (eg. Drought monitoring)
  - Part of a landscape-groundwater-river modelling system
- BoM-CSIRO WIRADA project

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# Aim

- Long-term:
  - Produce BoM in-house national soil moisture verification
  - First simple step this year using OzNet data, AACES field campaign, SMOS data
- Complemented by/should be links to:
  - WIRADA spatial data assimilation: verification of and characterisation of error structure of satellite soil moisture (Brent Henderson: CMIS)
  - CAWCR/Monash assimilation/verification of ACCESS soil moisture (Pete Steinle, Clara Draper, Jeff W, Imtiaz Dharssi )

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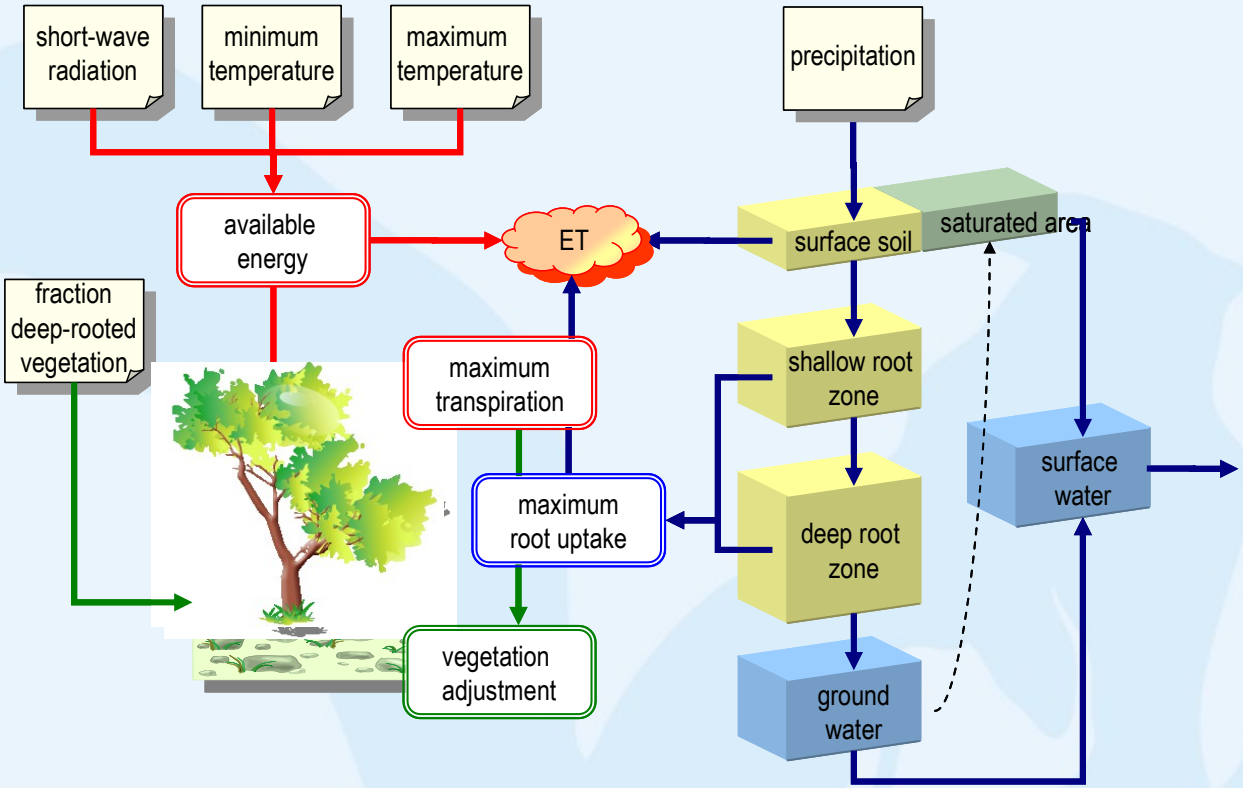
# The AWRA-L conceptual model

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# Bureau intentions

- Validate AWRA-L soil profile estimates temporally against
  - OzNet constant soil monitoring sites
- Validate AWRA-L surface soil estimates spatial properties against:
  - AACES in-situ soil measurements
  - SMOS relative soil moisture

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# Methodology OzNet: Timeseries comparison

- Similar approach to that undertaken in Draper et al (2009)
  - Upscale point data appropriately to match modelled scale
    - How should we do this appropriately eg. Where there is a single obs point in a model pixel?
    - How do we deal with differences in model depth/sampling depth in these comparisons?
  - Compare using standard stats:
    - Spearman rank correlation coefficient
    - Nash-Sutcliffe/RMSE
    - Bias

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# Methodology AACES: Spatial comparison

- Upscale AACES 1 km airborne data to AWRA-L scale
- Compare AWRA-L against AACES snapshots in time
  - What are some appropriate methods to do this? Standard statistics?
- Can we use the airbourne/site data for some form of temporal comparison also?

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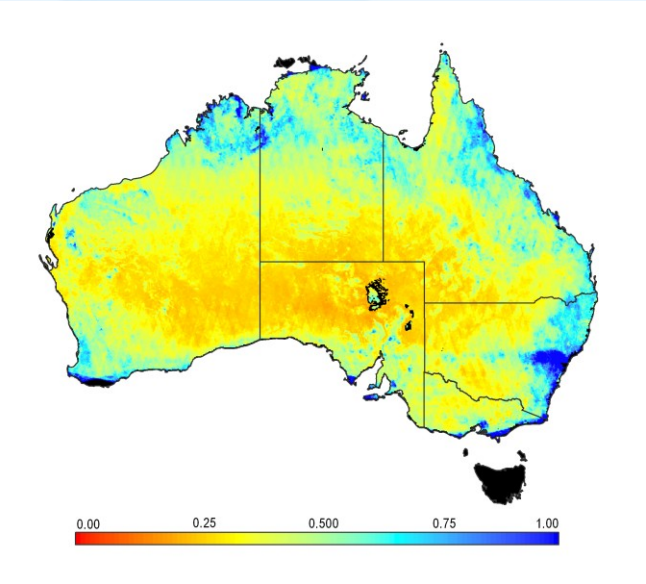
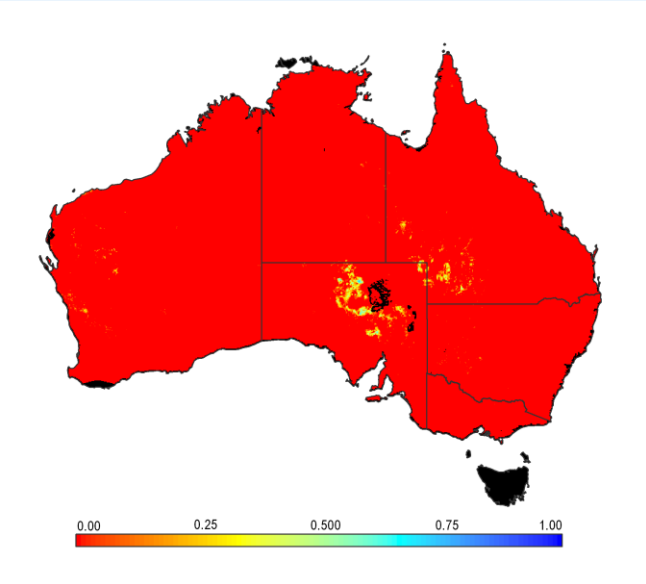
# Methodology SMOS

- Upscale/downscale & compare using standard stats




(a) SD and (b) NSME between AWRA and ASAR GM surface wetness. Missing or invalid data is shown in black. (van Dijk, 2010)

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# Expected outcomes

- Understanding of modelled soil moisture uncertainty (Conference paper: MODSIM)
- Understanding of the current ability of the AWRA-L model in different areas:
  - Where does it work well and why?
  - Is the assumption of a constant soil depth across Australia appropriate?
- Collaboration with:
  - Monash: use of AACES data and expertise
  - CAWCR: verification/assimilation system being developed for ACCESS
  - CMIS: verification/assimilation system being developed for AWRA-L
- Eventual single verification/assimilation system?

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# Thank you…

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