

Australian Water Availability Project (AWAP)

Continental Soil Moisture and Water Balance Monitoring in Near-Real-Time

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What is AWAP?

AWAP is an operational data assimilation and modelling system that monitors the state and trend of the Australian terrestrial water balance at a resolution of 5 km.

The system determines the past history and present state of soil moisture and all water fluxes contributing to changes in soil moisture (rainfall, transpiration, soil evaporation, surface runoff and deep drainage).

Information is publicly available through an easy-to-use web interface which provides (1) weekly near-real-time reporting, (2) historical monthly time series (1900 to present), and (3) monthly climatologies.

AWAP is a joint effort by CSIRO Marine and Atmospheric Research, the Australian Bureau of Meteorology and the Bureau of Rural Science.

Web Interface www.csiro.au/awap

The CSIRO AWAP website offers a full suite of mapped model outputs and Bureau of Meteorology inputs, including weekly time series from March 2007 to last week, and monthly historical series from 1900. The data can be displayed in physical units or as percentile ranks with respect to the same time of year in the period 1961-1990.

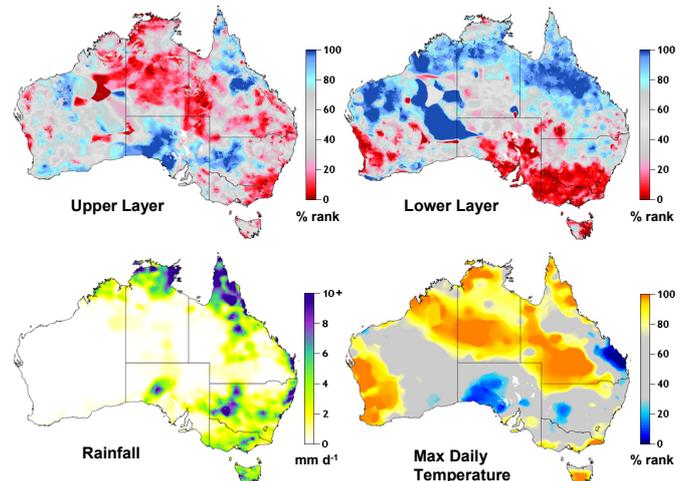
The display pages are easily customised to show only the data and time periods of interest. Maps are given as a series of thumbnails, each of which can be clicked on to reveal a full-page image. The AWAP homepage includes comprehensive project documentation and metadata.

By application, the full AWAP dataset is available for download via ftp in NetCDF and ArcGIS binary file formats.

AWAP interactive website: A partial screen-grab from the display page for weekly data. Soil moisture (the two rightmost columns) are shown as percentile ranks.

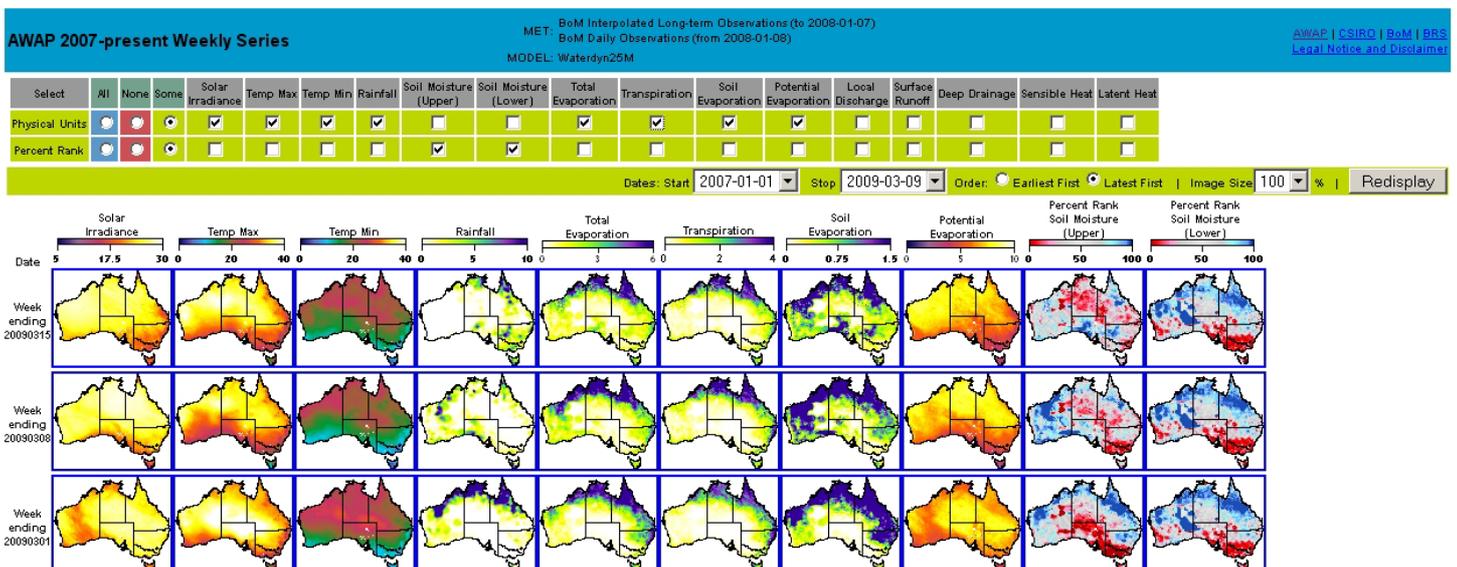
Soil Moisture in Near-Real-Time: March 9-15, 2009

A Recent Snapshot: Relative soil moisture in the upper (typically 0.2m) and lower (0.2 to 1.5m) soil layers expressed as percentile ranks (pcr). In the bottom panels, the corresponding rainfall (mm d⁻¹), and the pcr of the maximum daily temperatures. Percentile ranks are the rank of the current month in the cumulative probability distribution for that month over the climatological period 1961 to 1990. They are calculated separately at each 5 km grid cell. Artefacts in the Western Desert are interpolation effects due to the sparseness of the rain gauge network.



A Tale of Two Time Scales

The continental patterns of upper and lower layer soil moisture tell different stories due to the different time scales on which they respond to prevailing weather. The upper soil moisture responds quickly and will often have a pattern that reflects the rainfall and temperature events of the same week (as it does here). Lower layer soil moisture is a larger, deeper store that is slow to respond and tends to reflect accumulated events over seasonal and even longer time scales. In Australia's 'top end', the lower soil moisture still shows the effects of an extremely wet summer, even though the first two weeks of March were very dry. In the southeast, the deep soil moisture store remains very much drier than normal in spite of recent rains, a situation that has persisted in the AWAP record since 2002 and was one of the precursors of the catastrophic bushfires of Jan/Feb 2009.



References

Raupach MR, PR Briggs, V Haverd, EA King, M Paget, CM Trudinger (2008) Australian Water Availability Project (AWAP). CSIRO Marine and Atmospheric Research Component: Final Report for Phase 3.

<http://www.csiro.au/awap/doc/AWAP3.FinalReport.20080601.V10.pdf>

Further information

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