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Satellite observations used in the Australian Water Resources Assessment system

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Observations or products from a range of satellite missions have been used to parameterize or evaluate the Australian Water Resources Assessment (AWRA) system, a high resolution water resources monitoring system that is currently being made operational and will underpin the daily delivery of water balance information across Australia by the Bureau of Meteorology. Satellite data used to develop or parameterize the hydrological model include albedo, vegetation indices, leaf area index, and fractions evergreen and seasonal vegetation (MODIS and Landsat). Satellite observations are also used along with station measurements to produce the gridded daily surfaces of precipitation and radiation used as model forcing. For evaluation of model simulation use was made of surface soil moisture products derived from passive microwave (AMSR-E, TRMM) and radar (ASAR GM) and total terrestrial water storage (GRACE). Several of these data and other satellite observations (e.g. land surface temperature, inundation) show promise for use in operational data assimilation, but careful assessment of the derived benefits is required given the implications for computational overheads and operational robustness.