

The Effect of Soil Datasets on Offline CABLE Soil Moisture Simulations in the Murray Darling Basin

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Abstract The CSIRO Atmospheric Biosphere Land Exchange (CABLE) model is the land surface model (LSM) used in the Australian Community Climate Earth System Simulator (ACCESS) (Kowalczyk et al. 2006). ACCESS is to be used by both the Bureau of Meteorology and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) for operational numerical weather prediction (NWP) and climate studies (both regional and global). Currently VB95 (Viterbo and Beljaars, 1995), an older version of the European Centre for Medium-Range Weather Forecasting (ECMWF) LSM the Tiled ECMWF Scheme for Surface Exchanges over Land (TESSEL) (Van den Hurk et al. 2000), is used operationally at the Bureau of Meteorology for NWP. Richter et al. (2004) assessed the sensitivity of VB95 to soil and vegetation parameters via offline simulations at 10 locations in the temperate Murrumbidgee River Catchment (NSW, Australia). Similarly, this work assesses the impact of replacing the default CABLE soil parameters (from the Zobler (1999) global 1° x 1° resolution soil map) with parameters derived from the 1:2,000,000 scale Digital Atlas of Australian Soils. Using Automatic Weather Station (AWS) forcing data for 2000-2007 offline CABLE simulations are compared with observed soil moisture data for 2002-2007 at 10 locations in the Murrumbidgee Catchment. Overall the performance of CABLE in simulating soil moisture (with the default soil parameters) is quite satisfactory. Using parameters derived from the Australian Atlas of Soils results in degraded model performance at the majority of sites. This finding is in agreement with that of Richter et al. (2004) for VB95.

References

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