



Assimilation of Streamflow and Surface Soil Moisture Observations into a Land Surface Model

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Several studies have demonstrated the potential for improved estimates of soil moisture variation in the top several metres when remotely sensed surface soil moisture data are assimilated into a land surface model, but such observations are not available in densely vegetated areas. To overcome this limitation, the potential for improved soil moisture estimation by assimilating streamflow observations has been demonstrated using a variational data assimilation scheme in the Catchment Land Surface Model (CLSM). While the assimilation of streamflow improved the deeper soil moisture estimates, the surface soil moisture content was poorly estimated. This was due to the small influence surface soil moisture content had on the CLSM streamflow prediction. To further constrain the soil moisture retrieval, we are additionally assimilating remotely sensed surface soil moisture data where the vegetation is not too dense. A comparison of soil moisture retrieval results from surface soil moisture assimilation, streamflow assimilation, and combined assimilation is presented for a sub-humid catchment in south-eastern Australia.