

# Impact of different data assimilation strategies for SMOS observations on flood forecasting accuracy

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**Abstract:** During the last decade, significant efforts have been directed towards establishing and improving flood forecasting systems for large river basins. Examples include the European Flood Alert System, and the Bureau of Meteorology Flood Warning Systems in Australia. A number of attempts have also been made to increase the accuracy of the forecasted flood volumes from these systems. One attractive way in which this can be achieved is to use remotely sensed surface soil moisture contents to constrain the hydrologic model predictions. Satellite missions such as SMOS can provide very useful information on the wetness conditions of these basins, which in many cases is an important initial condition for discharge generation. Assimilation of these satellite data is thus a logical way to proceed. We will present results from two different assimilation strategies for the Murray-Darling basin in Australia using the Variable Infiltration Capacity (VIC) model. Firstly, the SMOS soil moisture data are assimilated into the hydrologic model at their original spatial resolution. As the spatial resolution of the remote sensing data (25 km) is coarser than the spatial resolution of the model (10 km), a multiscale data assimilation algorithm needs to be implemented. Secondly, the SMOS data are downscaled to the model resolution, prior to their assimilation. In this presentation, the impact of the assimilation of both products on the accuracy of the forecasted flood volumes is assessed.

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