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Spatial conditioning of Evapo-transpiration potential for distributed hydrological modelling in Southern Africa

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A component often missing from distributed Hydrological modeling applications is a suitable estimate of the potential Evapo-transpiration (ET_0). As part of a project focussed on soil moisture estimation in Southern Africa (using remote sensing), a grid of spatial ET_0 estimates will be produced routinely.

Point estimates will be produced using a Penman-Monteith approach with measurements of the variables required obtained from a network of automatic weather stations. In parallel, the required variables (analysis and forecast) will be obtained from the South African Weather Service's Unified Model runs and an estimate of ET_0 computed for each grid cell. The model output will be post-conditioned on the point observations from the weather stations to improve the spatially distributed estimates of ET_0.

The resulting ET_0 estimates will be produced on a 12×12 km spatial grid over Southern Africa. The methodology and initial results will be presented with the primary focus being as input to a distributed Hydrological model used to compute estimates of soil moisture. However, there are many other potential uses; for example Hydrological modelling, agriculture and validation of numerical weather prediction model forecasts.