Runoff generation in SE Spain

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We are working to improve a hydrological model for prediction of runoff in medium-scale semi-arid catchments in SE Spain, by investigating the impact of different landscape elements on runoff, to estimate runoff within two 150 km^2 catchments, Rambla Nogalte and Rambla de Torrealvilla. The study areas have been studied since early 1990's with rainfall (at 7-9 sites) and some runoff data regularly collected over this period. The approach is to use the concept of Hydrologically Similar Surfaces (HYSS), which are defined as areas with similar1-D (vertical) partitioning of net rainfall between infiltration and overland flow. HYSS are identified from field measurements of soils, micro and macro-topography and infiltration rates; combined with analysis of existing photographic + multi-spectral airborne Remote Sensed (RS) images. HYSS are selected to minimise internal variability in the relationship between rainfall and local runoff generation. HYSS characteristics are based on measurements of plot characteristics, and have been scaled up to cover larger areas. Most storms within these catchments are of short duration, typically with intense bursts of 30 - 60 minutes. The aim is to develop and improve the understanding of runoff generation in semi-arid areas and hopefully improve modelling of runoff in semi-arid areas. Objectives are to investigate the influence of geology, landuse and seasonality on infiltration rates and use RS and GIS to classify an area into HYSS categories . The overall sampling strategy for measurements has been to undertake constant intensity rainfall simulator measurements within provisional HYSS categories, and to augment this with a large number of minidisk infiltrometer measurements. This strategy captures as much of the variability in the landscape as possible, and provides data on both local and coarser scales. The wide variability within even small areas has led to the final adoption of only a few large classes that can be effectively distinguished. The final part of the research is to link the spatial partition of the two catchments into HYSS with

the detailed rainfall records for the areas, and combine these two sets of data into a grid-based model for runoff generation across the area.

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