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Dynamics of stream flow generation in a small Mediterranean catchment (Kamech, Tunisia) from the storm to the water year scale

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The study aims at identifying and quantifying the main hydrological processes in stream flow generation in a small Mediterranean agricultural catchment over time scale ranging from the storm event to the water year. The study site, the Kamech catchment, is located in Northern Tunisia, and belongs to the Environmental Research Observatory OMERE (www.umr-lisah.fr/omere/). The approach is based on the water budget calculation at three embedded spatial scales: the field scale (1ha), the subcatchment scale (15 ha) and the catchment scale (175 ha). For every spatial scale, the water budget was calculated annually, monthly and for most of the storm events. The study is based on three year continuous monitoring of surface runoff, stream flow, rainfall and PET. The results shows that excess infiltration runoff is the main process contributing to stream flow at the storm and at the water year scale. Saturation excess runoff contributed significantly for few storms. Soil saturation was caused by water table rise up to the soil surface. Baseflow due to shallow groundwater discharge accounted for few percents in the annual water budget at the catchment scale. It turns out that if it does not play directly a major role in stream flow generation, the shallow groundwater can contribute to stream flow indirectly by controlling soil wetness that in turn controls surface runoff occurrence.