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Spatial extent of temporary waters in the Mediterranean region - Implications to water management

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The semi-arid climate of the Mediterranean region in combination with climatic, land-use and population density changes pose significant water management problems. A significant proportion of the catchments in the region have temporary rivers. Temporary rivers are defined as the rivers that experience a recurrent dry phase of varying duration and spatial extend. The wetting and drying cycles are impacting the biogeochemical in-stream processes and the dynamics of sediment transport. The dynamics of contraction/expansion of the channel wet area is used in this work as a framework to understand a number of important processes in temporary rivers. These dynamics include (i) the drying of the channel bed, (ii) the duration of the dry period and related accumulation of organic matter, (iii) the rate of rewetting determining the resuspension and transport of pollutants and (iv) the nutrient concentrations and availability of water that is influencing the biological transformations. The objective of this work is to evaluate the extent of temporary rivers in Mediterranean and study the contraction/expansion dynamics at the catchment and reach scales. The estimation of aerial extent of temporary waters for the Mediterranean region at country scale was obtained using the ratio of precipitation to potential ET. Monthly values below 0.4 are a fair indicator of ephemerality. This ratio can also be modified to provide a good estimate of runoff, and this can be accumulated down the network on the DEM, to indicate ephemerality for larger catchments. The flow accumulation model is being further developed at the country level to improve estimates of ephemeral extent at the Mediterranean scale. 42% of Greece and 46% of Portugal is temporary waters. Three catchments from Portugal, Italy and Greece were studied at the catchment scale and at the reach scale regarding the temporal dynamics of contraction/expansion. The sensi-

tivity of temporary Mediterranean streams to future impacts such as water abstraction was evaluated.