



Modelling water quality of temporary waters at large temporal and spatial

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Management of ephemeral river systems is important at a number of time and space scales. Perhaps the most important are: 1. Short term (within storm event) management of flood alleviation, flood warning and water quality within reservoirs. 2. Long term (between storm events) management of land use, quality of irrigation water and application of fertilisers and agri-chemicals.

The PESCAS model addresses the longer time scales, and, for this purpose, is designed to operate with a daily time step, representing the aggregate response to each event. With high spatial and temporal variability in storm rainfall and the use of flood waters for irrigation in many Mediterranean regions, water, sediment and solute discharges may decrease with respect downslope and downstream ($dQ/dA < 0$), resulting in sediment and nutrient deposition on the hillslope and within the stream bed. In the extreme, where flow is lost completely, all material is deposited, to be re-mobilised in subsequent floods. A simplified physical approach is proposed, estimating first the production of sediment-linked and dissolved material from the land and second the downstream delivery of material on the basis of event magnitude, seasonal probabilities of continuous flow downstream and valley floor morphology.

PESCAS offers spatial and seasonal estimates of erosion risk and potential nutrient load respectively from the land-phase. Water, sediment and nutrients from the land-phase are delivered to and routed through the stream network for each event. This approach offers a methodology for long term management of water quality, focusing on spatial and seasonal differences, not intra-event dynamics. This approach is less demanding in computing resources than a continuous time model running through each event. By providing estimates of long term seasonal average rates for the many

areas which lack data at high spatial and temporal resolution, PESCAS can be used as a tool for planning sustainable management strategies at regional scales.