Geophysical Research Abstracts, Vol. 8, 09688, 2006
SRef-ID: 1607-7962/gra/EGU06-A-09688

Water and nutrient balance modeling in an intermittent river in Southern Italy.

A.M. De Girolamo (1), **A. Lo Porto** (1), R. Masciale (1), I. Portoghese (1)

(1) Water Research Institute - National Research Council (IRSA-CNR); (Email antonio.loporto@ba.irsa.cnr.it; phone +39 080 5820527; fax +39 080 5313365)

In South Italy, as in many other Mediterranean regions, the recurrent droughts and climate change have dramatically reduced the water availability.

The Alento river is located in the Campania Region, an area representative of problems due to drought, typical of the Mediterranean climate. A dam was built in Piano della Rocca to store water resources aimed at satisfying drinking and irrigation purposes requirements in the large plain downstream.

The catchment is characterized by a Mediterranean semiarid climate, where a long dry period is followed by high rainfall events. In such ecosystems, which are very sensitive to diffuse and point pollution sources, pollution incidences can lead to a further reduction of usable water resources.

The study of this kind of ecosystems in order to derive suitable environmental sound management strategies is important since these catchments, even if incredibly are considered not significant by the WFD, play a big role in making water resources available to a large portion of Peninsular Italy.

To gather more insight into the field of the functioning of such catchments, a perceptual model of the Alento basin has been developed built on the results of simulation done using the distributed process-based model SWAT. This management, continuous time, catchment scale model is capable of taking into account geomorphologic features, landuse, weather and management practices to output water and nutrient balances estimates at HRU (Hydrological Response Unit) level and at time scale up to sub-daily.

One of the noteworthy findings regarded the confirmation of the idea that in the Alento

catchment, like in many of the intermittent rivers in the Mediterranean areas characterized by large flat gravel alluvial plains with multiple meandering river bed, the dominant runoff generation process consists in the saturation excess occurring in the coarse alluvial aquifer at the valley bottom which is in turn fed laterally by the subsurface flows through the hillslopes. Surface runoff only takes place in correspondence of very high rainfall events.

This conceptual model explains also the good quality of freshwater saved in the reservoir, since most of sediments and particle-bound pollutants detached by erosive rainfall in the hillslopes are intercepted by the gravel matrix.

The linkages of such findings with possible management plans of the reservoir are presented.