



Selected examples of needs for long term pilot areas in Mediterranean catchments: a mountain traditional agricultural system and a large and regulated hydrographic basin in Southern Spain

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Integrated River Basin Management (IRBM) aims at planning water, land and other natural resources for an equitable and sustainable management, also capable of preserving or restoring freshwater ecosystems. Long term series of significant variables at different scales and a sound knowledge of the river basin processes are needed to establish the current state and past&future evolution of the hydrological system, soil use and vegetation distribution, and their social impacts and feedbacks. This is particularly crucial if future scenario analyses are to be performed to assess decision-making processes and adaptive plans.

This work highlights the need for an adequate design and development of process-oriented monitoring systems at the basin scale in a decision-making framework. First, the hydrologic monitoring network of the Guadalfeo River Basin, in the southern face of Sierra Nevada Range (Spain), is shown, in a pilot catchment of 1300 km² in which snow processes in Mediterranean conditions have been studied over the last ten years with a holistic approach. The network development and the main features of the dataset are described together with their use for different scientific and environmental applications; their benefits for assessing social and economic impact in the rural environment are shown from a study case in which the sustainability of ancient channels fed by snowmelt, in use since the XIIIth century for traditional irrigated crops in the mountainous area, was assessed in a future scenarios analyses. Secondly, the standard flow and water quality monitoring networks in the Guadalquivir River Basin, a large (57400 km²) and highly regulated agricultural catchment in southern Spain, are shown, and their strengths and weaknesses for an IRBM framework are analysed. Sediments and selected pollutants are used to trace soil erosion and agricultural/urban exports throughout the catchment, and the final loads to the river estuary in the Atlantic Ocean are assessed for the last 35 years.

Both study areas require an integrated monitoring approach for future scenarios assessment, adaptive actions programming, and especially for the follow up of their short and long term effects and required corrections.