



## **Mountain water resources: the value of hydrological modelling to understand problems and challenges of future management strategies**

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The scientific community has developed in the recent years an increasing awareness concerning the problems that are going to affect water resources originating from mountainous regions. Among them the most obvious appear to be the threat due to a potential climate change, and the need for a better fluvial ecosystem conservation downstream of impounded river systems. In both cases the investigation of the problems and of the challenges, which the future management strategies will have to face, can be conveniently approached by means of comprehensive modelling systems. These help to understand the sensitivity of mountain water resources systems as a whole, but can also provide insights into important interactions among processes, that have been to date envisaged but are only now being quantitatively addressed. Examples and results of currently ongoing research projects are provided to discuss the value of watershed-oriented interdisciplinary modelling as a virtual laboratory to understand the water and environmental system dynamics. Space and time scale issues jointly with the concepts of nested modelling are addressed to illustrate the implications of natural and anthropogenic forcings on the highly sensitive mountain water systems.