



May landscape structure and connectivity changes to commit water supply in Mediterranean countries?

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Mediterranean countries experienced in the last decades a deep process of landscape dualization. Part of the region is being transformed to intensified exploitation (irrigation, greenhouses, urbanization, etc.) while mountainous marginal areas witness a relax in exploitation characterized by forest and shrubland encroachment and crop abandonment. These changes may be altering large scale patterns of connectivity of flows and sediments just in the headwaters of main rivers that provide water resources for intensively exploited coastal lowlands

Here, we show the example of Taibilla catchment that has an important role in water supply for human consumption in the semiarid SE Spain. Century-scale decreases on available water resources in the basin lack a clear explanation by the moment. This decrease in conjunction with strong increase in water-demand has led an energy-hungry solutions either 400 km-long water transfers or sea water desalination committing Kyoto protocol goals for Spain. We use a set of land use, water flow, climatic and socioeconomic data to suggest the importance of land uses changes in explaining the decrease of available water resources. Furthermore, we discuss how the problem of learning what are the effects of land use changes per se and what are the effects of changes in landscape connectivity. We discuss the possible relative weights of each process in explaining observed water flows. On the other hand, we describe slow increase aquifer recharge as a result of connectivity changes as a missing link that could increase water supply in the very long-term.

Finally we put the results in the context of very large-scale biophysical and socioeconomic changes observed in XXth century in the Mediterranean countries. And in the necessity of balancing the multiples demands of complex socioeconomic systems

embedded into biophysical systems.