AQUACOAST: A Simulation Tool to Explore Coastal Groundwater and Irrigation Farming Interactions

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In the framework of coastal groundwater-dependent irrigation agriculture, modelling becomes indispensable to know how this renewable resource responds to complex (usually not conceptualized nor monitored) biophysical, social, and economic interactions. Friendly user interfaces are essential to involve nonmodeling experts in exploiting and improving models. Decision support systems (DSS) are software systems that integrate models, databases, or other decision aids and package them in a way that decision makers can use. This paper addresses these two issues: firstly with the implementation of a System Dynamics (SD) model in Vensim software that considers the integration of hydrological, agronomic, and economic drivers and secondly with the design of a Venapp, push-button interfaces that allow users access to a Vensim model without going through the Vensim modelling environment. The prototype designed, the AQUACOAST tool, gives an idea of the possibilities of this type of models to identify and analyze the impact of apparently unrelated factors such as the prices of cultivated products, subsidies or exploitation costs on the advance of saltwater intrusion, and the great threat to coastal groundwater-dependent irrigation agriculture systems.