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Calibration, validation and predictive capability of a wetland evolution model for subtropical estuaries.

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Current coastal planning tools are mainly based on models at two different scales: national/regional and local. The national or regional scale tools are GIS based inundation models, with forcing functions that account for a very basic wetland dynamics. These models can be adequate for a global assessment, but the limited capacity of incorporating complex processes and the coarse resolution make them unsuitable for site-specific research or management. Local scale models are much more reliable and incorporate some of the processes, but they are typically developed for particular systems and are not easily adapted to different settings. In this contribution we present results of a physically-based model that incorporates a variety of physical and biological processes that can be potentially used in different wetland systems with a predictive capability suitable for local management.
Our model is calibrated using measured data in a subtropical wetland, both against flow and vegetation data and we discuss model performance based on statistical descriptors of model fitness. We then run the model for a number of scenarios relevant for management including tidal manipulation and vegetation control and again use measured data to validate results. We also run the model over the long term to assess the possible outcomes of management decisions based on local short-term goals when including global drivers like sea-level rise and infrastructure development pressure.