Response of a coastal lagoon sediment budget to extreme events and climate change implications: The case of the Bay of Cadiz

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Climate change has resulted in increased storminess and sea-level change that affects the morphodynamics of bays worldwide, impacting both the ecosystem and local infrastructure. This study explores the impact of differing storm winds on the sediment budget of the Bay of Cadiz. The Bay of Cadiz is a highly altered coastal lagoon located in Southwest Spain surrounded by ports, navigation channels, and urban developments and is of high socioeconomic and environmental importance. The human interactions with the bay have already caused morphological impacts, which could be exacerbated by increased storminess. Potential impacts on the sediment budget of the Bay of Cadiz will be modeled using a Delft3D model previously calibrated and tested using field data from December 2011 to January 2012. The model will consider a variety of storm wind scenarios and observe their impacts on sediment transport within the bay, identifying sources and sinks. This will help to estimate the potential impacts of climate change and increased storminess on the bay and the surrounding areas.