Center for Community-Based Resource Management (CBRM)

Natural Resources Institute, University of Manitoba

CBRM Database

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Case Study Name:	**Numerical modeling of the impact of the Ancão Inlet relocation (Ria Formosa, Portugal)**		
Authors:	J.M. Dias, M.C. Sousa, X. Bertin, A.B. Fortunato, A. Oliveira		
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Region:	Europe		
Country:	Portugal		
Ecosystem Type:	Lagoon		
Social Characteristics:	Coastal community		
Scale of Study:	Regional		
Resource Type:	Urban commons		
Type of Initiative:	Research-driven project		
Community-Based Work:	Modelling		
Keywords:	Hydrodynamics, Models, Ria Formosa Lagoon, Ancão inlet,		

Summary:	This work describes the application of hydrodynamic (ELCIRC) and transport (VELA and VELApart) models to the Ria Formosa lagoon (Portugal) to study the impact of the relocation of the Ancão Inlet. Located in the south of Portugal, this lagoon is a mesotidal barrier island system that communicates with the sea through 6 inlets. The Old Ancão Inlet was artificially closed and the New Ancão Inlet was relocated into a westward position. This work investigates the hydrodynamic patterns and the potential pathways of tracers in Ria Formosa in two distinct configurations: before and after the Ancão Inlet relocation. The hydrodynamic model was successfully calibrated and validated against elevation, velocity and inlet discharges data, accurately reproducing the tidal propagation. The inlet relocation increases the magnitude of tidal currents, residual velocities and the tidal prism across the bar, suggesting a better stability. The tracers transport simulations suggest enhanced water exchanges through the Ancão Inlet and smaller residence times in the western part of Ria Formosa with the present configuration. Overall, it is concluded that the Ancão Inlet relocation had a positive contribution towards increasing the water renewal of the western part of the lagoon, thus decreasing its vulnerability to pollution.