# Development and application of field observations and predictive models of the dynamics of landforms in the Venice lagoon in response to environmental change and the operation of the MOSE system

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**Summary:** In this project we aim at describing the dynamics of tidal landforms in the Venice Lagoon, and in other tidal systems worldwide, through the joint information deriving from field observations and biomorphodynamic models. We are particularly interested in unravelling the effects of changes in the environmental forcings and of human activity, such as the operation of the MOSE system (Experimental Electromechanical Module), on the typical morphological landforms that characterize tidal systems, such as salt marshes, tidal flats and tidal channels.
Important questions that need to be addressed are e.g., **"How will tidal landforms respond to climate changes and human interferences?"** and **"Will the operation of the MOSE system have an effect on the resilience of tidal landforms to climate change?"**
Addressing these questions is of the utmost importance, both from a theoretical and practical point of view, for the great morphological, ecological, social, and economic value of tidal landforms.

**Aim of the project.** Despite a number of studies have addressed the biogeomorphic response of tidal landforms to changes in the environmental forcings and of human activity, most of these studies have been carried out within separate disciplines. **Within this project we aim at** developing an **innovative, integrated, interdisciplinary approach** that combines hydrodynamic, geomorphological, ecological, and sedimentological analyses, carried out through field observations, laboratory analyses and numerical modelling.

**Expected Results.** The results of this project will allow the PhD candidate to:
i) bring new insight into the biogeomorphic processes driving tidal landform dynamics;
ii) integrate different techniques to study landform dynamics through an interdisciplinary approach;
iii) use field observations to benchmark mathematical models and provide a predictive framework for tidal landform dynamics and evolution.

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