

GC8-Hydro-78, updated on 28 Mar 2024

<https://doi.org/10.5194/egusphere-gc8-hydro-78>

A European vision for hydrological observations and experimentation

© Author(s) 2024. This work is distributed under

the Creative Commons Attribution 4.0 License.



## Satellite images potentiality for calibration of hydrodynamic model in estuaries and coastal areas

**Antonia Menzione** and Marco Mancini

POLITECNICO DI MILANO, CIVIL AND ENVIRONMENTAL ENGINEERING, MILANO, Italy (antonia.menzione@polimi.it)

Over the last decades, numerous models for sediment transport prediction have been proposed with application to littoral transport. However, the morpho-dynamic interactions that occur at the river mouth are still largely unexplored given different concurring phenomena, deriving from both river hydraulics and marine hydrodynamics. Against the high technical-scientific interest, the calibration of the hydrodynamic models of coast-mouth interaction presents a lack of possible observations, due to both the spatial extension of domains and to their strong two-dimensional pattern.

To overcome this, the present work investigates the possibility of using satellite images, as tools for calibrating and validating hydrodynamic numerical models, an approach already successfully used over the years in the field of hydrological modelling.

For this purpose, hydrodynamic model (TELEMAC2D) were used to simulate the hydrodynamic components and the relative sediment transport components (SISYPHE), and the pattern of the superficial velocities fields is compared with the remote sensing images.

In this study two different cases study in Adriatic Basin were analysed. The River Piave (220 km), which flows from the eastern Italian Alps to the North Adriatic Sea, and a river in the southern part of Italy, Ofanto River (134km). The configuration of the Adriatic basin has such a shape as to generate particular tidal and wave conditions, which is why it is important to carry out a hydrodynamic study upstream, using the various drivers both on the river side and on the seaside, such as water discharge, tide, wind, etc. Then, depending on the results obtained from the hydrodynamic model, the dispersion of sediment during a flood event is analysed.

Early results show potential for using satellite images of suspended sediment plumes as calibration targets for numerical models.