

Nearshore bathymetry estimation by indirect methods

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The monitoring of physical processes and the generation of databases with high spatial and temporal resolution is essential to know the evolutionary dynamics of coastal systems and define future evolution tendencies. The topo-bathymetric monitoring by in-situ methods, although highly accurate, due to operational limitations, does not always allow to capture the real-time response of the system to extreme (storm) events. Due to this fact, under such conditions, port authorities face management issues related with water security levels for commercial traffic in the port entrance, which are potentially exposed to intense sedimentary transport.

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The use of inverse methods, based on signal decomposition techniques - wavelets, is being successfully applied to investigate the dynamic of submerged bars using wave data from various image sources. The developed algorithms, have been especially efficient in retrieving the bathymetry during more energetic wave events. The results are promising, in particular, the ones achieved from multi-images data sources (video cameras). Validation tests have revealed accuracy levels of some decimetre, when compared with in-situ bathymetric survey. This enables to generate bathymetric estimation services which are been implemented through dedicated mobile applications. Thus, the NAVSAFETY web app emerged as a solution that will be very useful for different user profiles. The application presents information on the state of the sea and weather, specific information, such as the bathymetric estimate, and scientific research-related information, such as the evolution of depth values at the harbor mouths.



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