

Space for Shore

PORTUGUESE Success Story



The Challenge

The Portuguese coast, an environment exposed to high energetic waves, that has experienced a considerable coastal retreat (e.g. Costa Nova–Praia de Mira showed a maximum erosion rate of 5.8 m year in the period 1958-2010).

THE SPACE BASED SOLUTION

Dune foot extraction using two different algorithms:

- the cross-shore variation of first-order texture metrics from very high resolution (VHR) optical data.
- the mono-date or multi-date supervised classification process using training polygons and a Random Forest model.

Bathymetry extraction using the swell inversion algorithm.

The application of the Fast Fourier Transform (FFT) over Synthetic-Aperture Radar (SAR) image allows to obtain a directional spectrum and then, to calculate the wavelength and wave direction. After that, the water depth is estimated from linear wave theory.

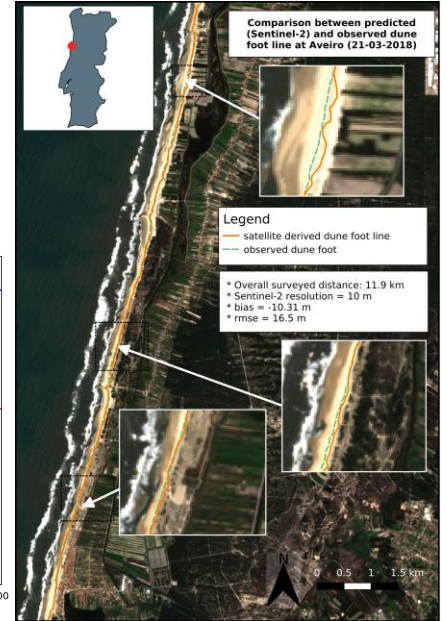
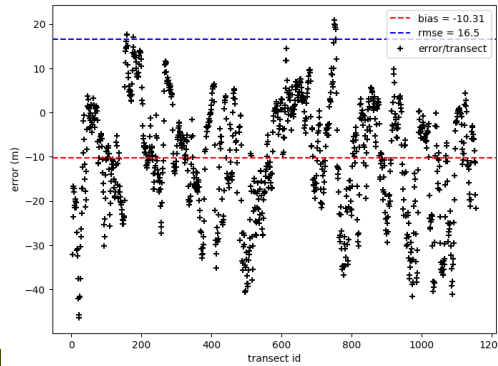
The Outcomes

Satellite Derived Coastline (i.e. dune foot extraction)

Satellite Derived Bathymetry

MONTH - MONTH YEAR

Comparison between a Sentinel-2 derived dune foot line and an observed dune foot line at South Aveiro (21st of March 2018) - comparison map - validation plot representing the distance between the observed dune foot line and the Sentinel-2 derived dune foot line by transects perpendicular to the coastline.



“We really think that Space For Shore Project might provide information about our coastline position at different time-scales and thus, it might fill the gap between field surveys of current monitoring programs.”

-Portuguese Environmental Agency (APA)

Bathymetry map derived from a Sentinel-1A subimage (2nd of February 2019) at South Aveiro.

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Years Retrospective

02

Indicators produced

01

Areas of Interest

15

Km of test sites

