

## **4S project, the PT use cases, Satellite Derived Bathymetry analysis on the Portuguese Coast and estuaries**

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Earth is largely covered by water, and it is already a cliché that our complete knowledge of the seafloor is still a utopia. Hydrography, Oceanography, Marine Geology, Nautical Cartography are some of the areas of knowledge focused on the water, the seas, the ocean. For nautical cartography, the main areas of concern are undoubtedly the coastal areas, port areas, areas where navigation is intense and water depth is limited, basically the shallow areas. With shallow areas being usually dangerous to acoustically survey and of such a high variability, it is imperative that one diverts to using other methodologies.

Satellite Derived Bathymetry (SDB) is already a widely used method, and the resolution and uncertainties achieved are becoming more and more appealing. The H2020 4S (Satellite Seafloor Survey Suite) project, led by EOMAP company, intends to use contemporary technology, modern satellite capabilities, and earth observation analysis to improve the data gathering of shallow water morphology and habitats through time. The IHPT (Portuguese Hydrographic Office) is part of this 8 consortium and is focused on studying some selected areas covering river estuary, water channels, port entrance bars and beach areas. The target is now greater than solely hydrography, Oceanography and Geology are also in the spot light for this project. And for the areas selected, IHPT will also be using UAV imagery to complement the source data for the 4S tool.

With the 4S terminating by the end of 2023, the 4S tool is surely not finished, nevertheless, the areas that are being studied are already producing results and a brief analysis will show evidence of meaningful information such as bathymetry, benthic habitat, morphology, depth and its knowledge on change and trends.