CASE STUDY OF HABITAT MAPPING FOR ENVIROMENTAL ASSESSMENT IN CIVIL ENGINEERING

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Abstract
This is an example of coastal management and environmental surveillance where geophysical, biological and oceanographic disciplines are geographically linked through Geographic Information Systems in order to evaluate and minimize the environmental impact of civil engineering. Operational needs of the harbor of Maó force the recurring dredge of the harbor what means a potential environmental impact of the seabed, not only in the harbor area where seafloor is already altered by human activity, but in the spoils dumping site as well.

Keywords: Gis, Coastal management, Mapping, Geomorphology, Balearic Islands

Introduction
The Instituto Español de Oceanografía was commissioned to assist in the environmental observation of civil engineering operations related to the Maó harbor refurbishment that took place during spring and summer of year 2014. Among other working groups focused on the monitoring of seagrass meadows, intertidal zone, costal circulation and the presence of pollutants in fisheries and aquaculture, a working group concerning insular shelf habitat mapping and monitoring was established [1].

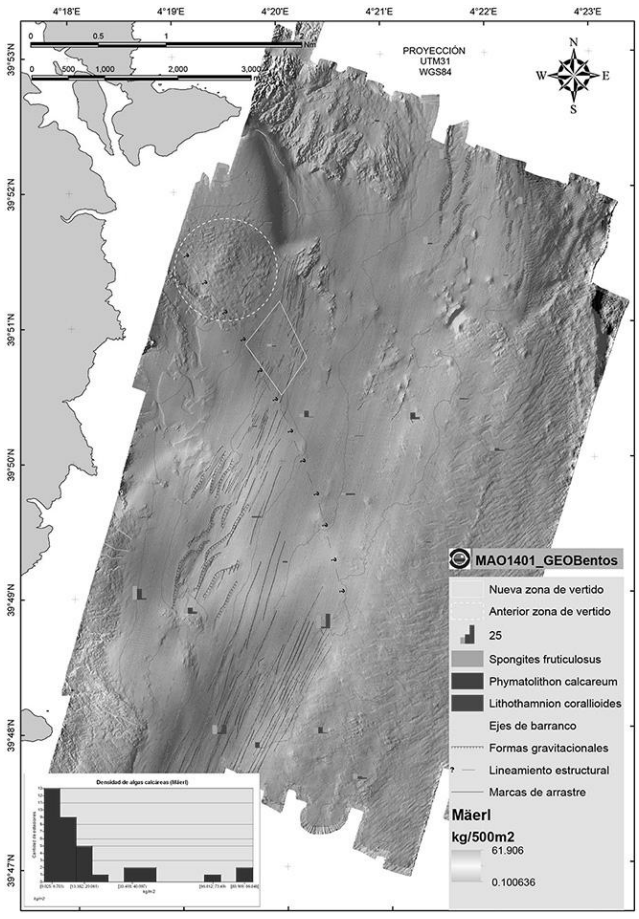

Fig. 1. **Map of the study area.** Digital elevation model from mutibeam bathymetry data. Seabed colour show mäerl densities in kg / m^2. Histograms show densities of Spongites fruticulosus, Phymatolithon calcareum, Lithothamnion corallioides in each sampling location.

Two surveys were planned in order to assist in the environmental monitoring of the seabed were the dumping site was considered. First one with the aim of determine the previous conditions of the seabed, and suggest the best location of the precise dumping site within the considered area. The second survey, after the dredging works, was needed to evaluate the impact of the spoils.

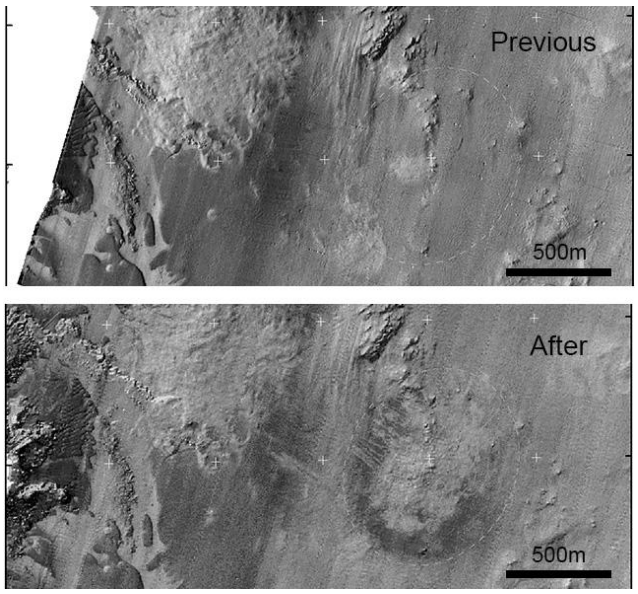

Fig. 2. **Disposal site.** Backscatter of the same area before and after the disposal of dredge spoils.

The two swath bathymetry data sets show previous dredge spoils and trawl marks and allow us to determine the volume and extension of the current spoils. Sediment sampling using a Van-Veen dredge, and benthic fauna sampling using a beam-trawl lead us to map the middle and inner shelf maërl community through geostatistical tools. The methods and resultant maps are discussed in detail through this work.

Acknowledgements
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References
1 - Massutí, E., Santaella-Álvarez, E., et al. 2014. Revisión y Control del Plan de Vigilancia Ambiental de las obras de dragado del Puerto de Maó.