

Predicting potential areas for the formation of Co-rich ferromanganese crusts in the Canary Islands Seamount Province using multi-criteria GIS analysis.

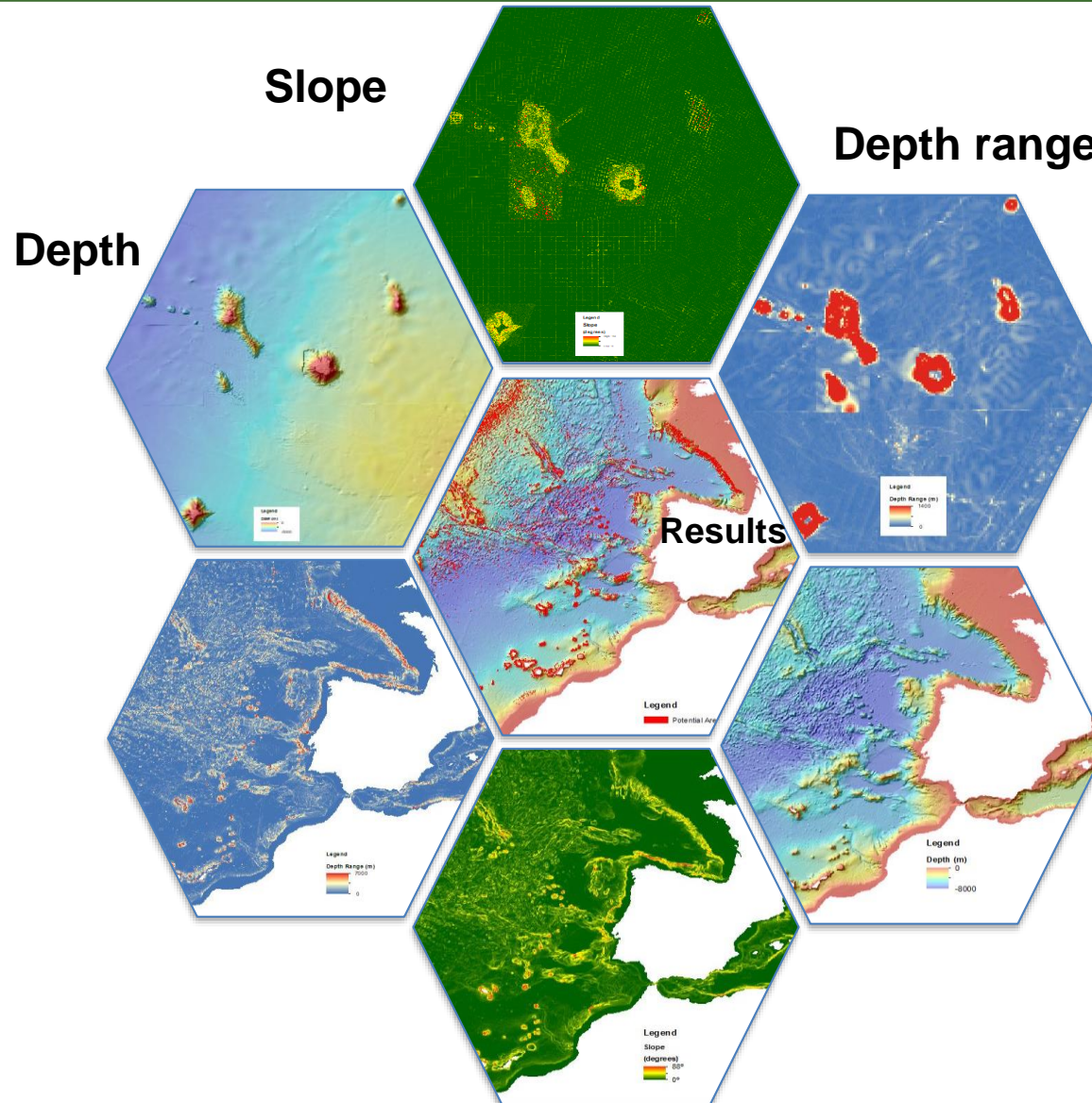
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ABSTRACT

Marine ferromanganese crusts are metal-rich chemical sediments showing an increasing economic interest as potential mineral resources for strategic and critical metals. Formation of Fe-Mn crusts is linked to a series of different factors that favor or limit their genesis on the seabed. The objective of this work is the search of areas for potential formation of these deposits, using data obtained in the Canary Islands Seamount Province. The study has been carried out based on multi-criteria analysis, using a Geographic Information System (ArcGis 10.5, Spatial Analysis and Statistical tools). For this purpose, it has been created a cartographic model, which considers data related to depth, seabed substrate nature and age, slope and exposure to marine bottom currents. This model has been applied to non-sampled areas, contrasting them with data derived from the analysis of samples taken in different oceanographic surveys, in order to establish the correct conclusions. This work has been carried out using bathymetric and geological data shared by the Geological Survey of Spain (IGME) with the MINDeSEA [1] and EMODnet-Geology [2] European projects.

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[2] EMODnet-Geology project (EASME/EMFF/2018/1.3.1.8-Lot 1/SI2.811048).



Multi-criteria GIS analysis

Multi-criteria analysis has been performed with bathymetric data and the location of known occurrences in the Canary Islands Seamounts Province using ArcGIS 10.5, in order to highlight potential areas of Fe-Mn crust presence. The parameters used were: depth, slope, depth range and distance to the coast. The result has allowed to generate a series of polygons that represent areas that with the same characteristics as those of the Canary Islands seamounts and that can thus be of potential presence of mineral deposits. All the parameter can be programmed in order to analyze different bathymetry and obtain polygons automatically..

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