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The contribution of detailed bathymetry to the identification of volcanic seamounts in Italian Seas

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EMODnet Geology is a European Project which promotes the collection and harmonization of existing marine geological data, in order to make them freely available through a web portal. One of the main objectives of the Project is the interoperability of data, in order to offer more complete, error-free and reliable information and to facilitate exchange and reuse of data even between non-homogeneous systems.
Among the several features considered within the Project, "Geological events and probabilities", coordinated by the Geological Survey of Italy - ISPRA, include submarine landslides, earthquakes, volcanic centers, tsunamis, fluid emissions and Quaternary faults in European Seas. Datasets consist of shapefiles representing each kind of event (as polygons, lines and points layers according to their geometry). Due to the different geological settings of European sea areas it was necessary to elaborate a comprehensive and detailed pattern of Attributes for the different features in order to represent the diverse characteristics of each occurrence, particularly aimed at the harmonization and standardization complying with the European INSPIRE Directive.
The systematic collection of Italian data, addressed at the EMODnet Geology Project, conducted to the compilation of the volume: "Atlas of Italian Submarine Volcanic Structures" (in press). The shaded relief model of the Italian seafloor and the relative contour lines used were obtained from the EMODnet Bathymetry portal (http://www.emodnet-bathymetry.eu/dataproducts). More detailed bathymetric maps were also available for some areas of the Tyrrhenian Sea and were used for morphological descriptions.
A polygon shapefile represents the basal area of each seamount, whereas a point shapefile indicates the highest culmination above seafloor. The drawing of the basal contour line of each seamount was based on geological and physiographic boundaries. It was extended to the main break in slope of the inferred base; consequently the extent of the edifices derives from the volcanological interpretation of their morphology, significantly improving previous outlines. The shape and extent of the volcanic structures were also inferred from structural and geophysical map images extrapolated from published literature and georeferenced by means of a GIS software. Once defined the seamount area, the volume of the entire edifice was calculated using the reference Digital Elevation Model (DEM EMODnet).
A total of 76 volcanic seamounts has been identified. Eighteen of these seamounts emerge above sea level as well-known volcanic islands, while three edifices are structures recognised as volcanic in nature from old studies, but previously un-named; so we have named them for the first time as Livia, Creusa and Tiro.
The volcanic centers identified have been complemented by very detailed information. From a thorough literature search, including seismic lines from Oceanic Cruises, it was possible to collect and enter information related to different characteristics such as morphological and structural seabed maps, chemical composition of dredged samples, geophysical surveys, and additional information where available.