

International Conference on Marine Data and Information Systems IMDIS 2016



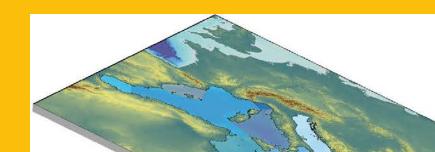
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The CoCoNet solution for management and access heterogeneous marine datasets and metadata

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The CoCoNet Project

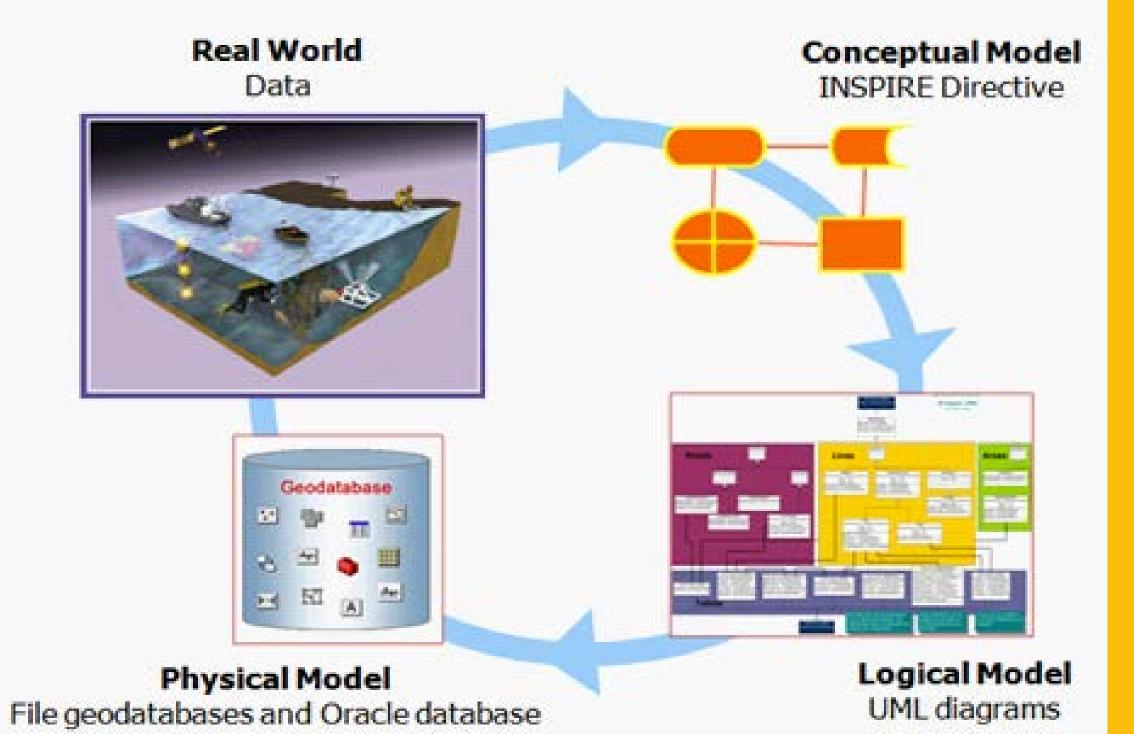
The aim of the project was identify groups of putatively interconnected Marine Protected Areas (MPAs) in the Mediterranean and the Black Seas, shifting from local (single MPA) to regional (networks of MPAs) and basin (network of networks) scales. The identification of physical and biological connections with clear the processes that govern patterns of biodiversity distribution. This enhances policies of effective environmental management, also to ascertain if the existing MPAs are sufficient for ecological networking and to suggest how to design further protection schemes based on effective exchanges between protected areas. The coastal focus was widened to offshore and deep sea habitats, comprising them in MPAs networks. These activities also individuated areas where Offshore Wind Farms (OWFs) might become established, avoiding too sensitive habitats but acting as stepping stones through MPAs. Two pilot project areas (one in the Mediterranean Sea and one in the Black Sea) tested in the field the assumptions of theoretical approaches.



GEODATABASE LAYERS

Figure 2. CoCoNet geodatabase layers integrated in the WebGIS.

Figure 1. CoCoNet workflow, from the real word to a physical model.



Sea Regions: physical conditions of seas and saline water bodies divided into regions and sub-regions with common characteristics.

Socioeconomics: units of administration at land, dividing areas where States have and/or exercise jurisdictional rights, for local, regional and national governance, separated by administrative boundaries.

OWF: existing and planning site for Offshore Wind farms turbines and potential locations based on physical parameters (depth, distance from shore, etc) or environmental data (habitat presence, marine protected sites, etc).

Threats: storing data about natural and anthropogenic activities and impact such as: invasive species, outfalls, marine litter, fishing, navigation routes

Geology: geological samples, geological units (lithostratigraphic units, seabed substrate, system tracks, base of Quaternary, etc), geological structures (folds, faults), geomorphologic features and geophysical elements.

Maritime Units: data about units of administration at sea, dividing areas where States have and/or exercise jurisdictional rights, for local, regional and national governance, separated by administrative boundaries.

Habitat and Biotopes: habitats extension and characterization. The geographical information is completed by no-spatial information about species, sources and cover types

Oceanography: data about physical (temperature, salinity, currents), biogeochemical variables (chlorophyll, phytoplankton, dissolved oxygen, etc) and ecoregions.

Biodiversity: species occurrences, species distribution, mammals, birds and turtles at sea and nesting sites at land. Information about taxonomy and sources are stored in related tables.

Protected Site: protected sites at sea and in 15 km inland from the coast.Each site has its zones of protection and its characteristics are described in related table.

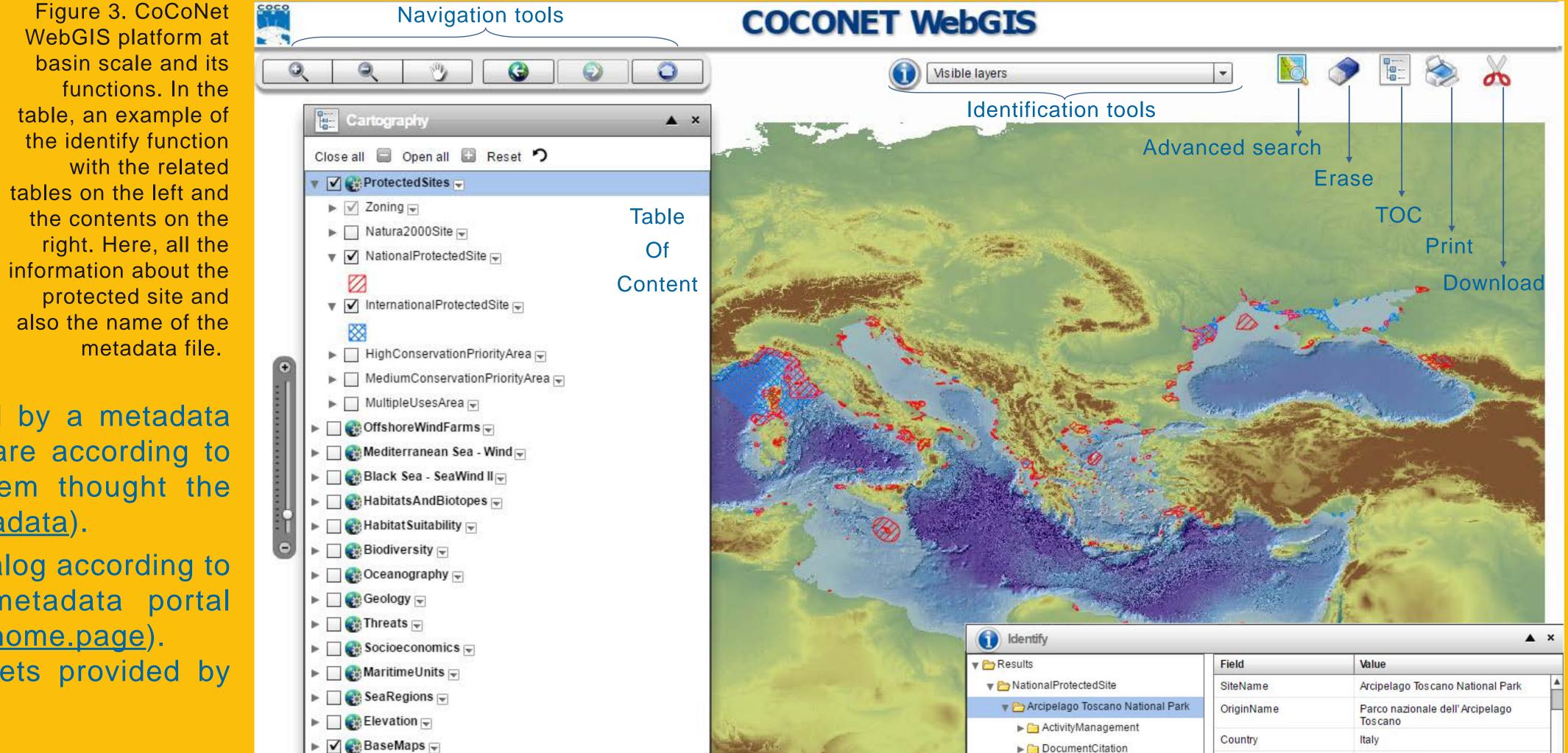
ation: Digital Elevation models for land

The database

In the lifespan of the project the WP9 collected a big amount of data from different sources and disciplines (real world). The data are organized and stored in 11 ESRI File geodatabases (see Figure 2) created in ArcGIS (physical model) and implemented as UML diagram with Microsoft Visio (logical model) starting from the INSPIRE Directive (conceptual model). Other 3 geodatabase have been developed for the pilot project areas: HabitatMapping, Connectivity and a more detailed version of the geodatabase Oceaography. The 14 geodatabases converge in a unique Oracle database and are accessible thought a WebGIS portal.

The WebGIS platform

We implemented two CoCoNet WebGIS platforms: 1) at basin scale for the Mediterranean and Black Seas; 2) at mesoscale for the pilot project areas. The platforms have been developed though the software ArcGIS Server 10 and the Moka CMS. The Moka CMS GIS (Content Management System GIS) is the core of the GIS infrastructure. The CMS is a tool for creating GIS application using cartographic object organized in a catalogue. The CoCoNet WebGIS platforms are free accessible from a webpage at the link: http://coconetgis.ismar.cnr.it. The platforms allow to browse the data with the navigation tools and the TOC. The user can identify the single object in the map with the identification tools, query the contents in the tables with the advanced search, print a map and download the layers according to the data policy of the project.



and sea surface. Includes bathymetry, marine contours, bathymetric surfaces.

The Metadata portal

Each layer in the WebGIS platforms is described by a metadata file. We created the metadata with Mikado software according to the SeaDataNet vocabolaries and published them thought the SeaDataNet portal (<u>http://www.seadatanet.org/Metadata</u>).

A metadata file for each layer, created with ArcCatalog according to the ISO 19139, is stored in the CoCoNet metadata portal (<u>http://gp.sea.gov.ua:8082/geoportal/catalog/main/home.page</u>). Here, more detailed information about the datasets provided by each partner is available.

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Conclusion

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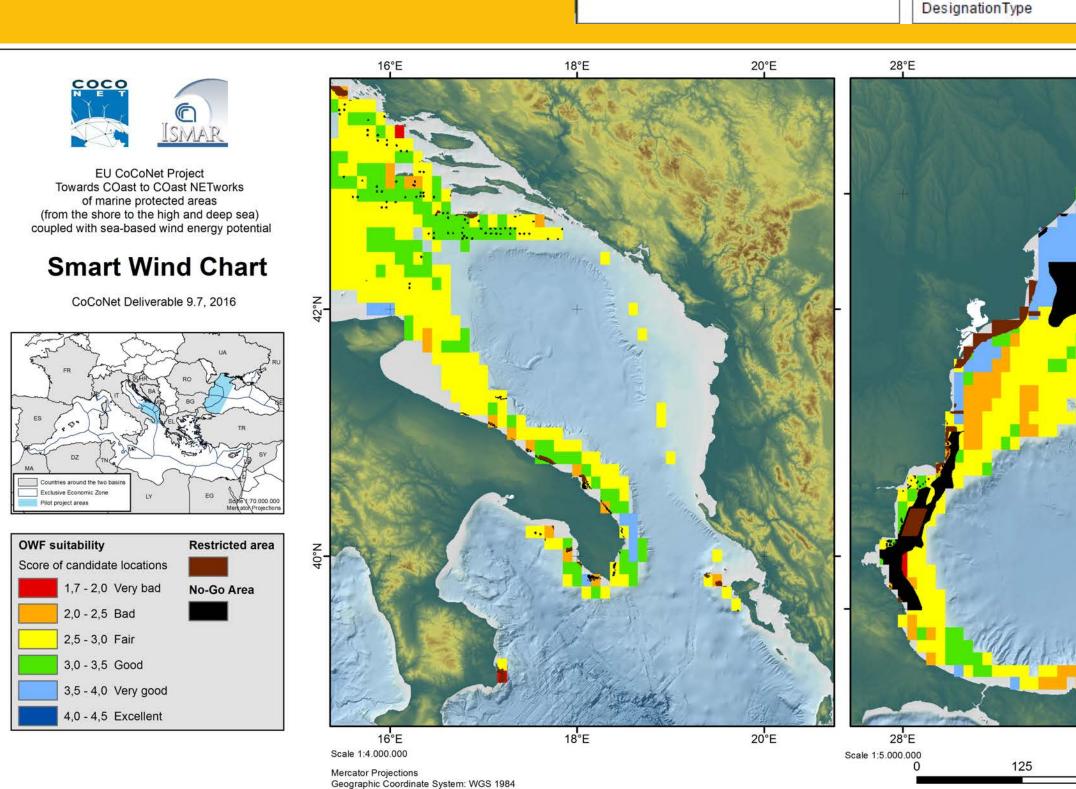
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Citation: Contact Info: Title: COCONET_V3.NationalProtectedSite Alternate Title: NationalProtectedSite Date: Date: 2015-07-06 Date Type: Publication Date Individual Name: The European database on Natura 2000 sites Organisation Name: European Environment Agency - EEA Position Name: All the polygons in this layer come from the EEA database, except for Burgarian data. The contents in the table of attributes have been improved during the project by the CoCoNet partners. Role: Owner Individual Name: MAPAMED (Marine Protected Areas in the Mediterranean) database Organisation Name: MedPAN association and RAC / SPA Position Name: The MPAs in the Mediterranean Sea come from the MAPAMED database (http://www.medpan.org/mapamed) Role: Owner Distribution Distribution Format. Format Name: CoCoNet WebGIS Format Version: OGC service: WFS Specification: http://gismarblack.bo.ismar.cnr.it:6080/arcgis/services/published_moka/ProtectedSites_44/MapServer/WFSServer? Distribution Format: Format Name: CoCoNet WebGIS Format Version: shapefile Specification: http://coconetgis.ismar.cnr.it/ Distribution Format: Format Name: CoCoNet WebGIS Format Version: OGC service: WMS Specification: http://gismarblack.bo.ismar.cnr.it:6080/arcgis/services/published_moka/ProtectedSites_44/MapServer/WMSServer?

The geodatabase, thought the WebGIS system, represents the linking tool for all partners, regions thematic research involving the and entire consortium in topics such as data provision and integration, GIS products, GIS interpretation, data archiving and data exchange. The use of SeaDataNet standards and repository, for implementing and storing CoCoNet Metadata, increases

access to these data resources the scientific from wider marine a community across Europe.



Web sites: http://www.coconet-fp7.eu/ http://coconetgis.ismar.cnr.it/ http://www.seadatanet.org/Metadata http://gp.sea.gov.ua:8082/geoportal/catalog/main/home.page

References: An International Journal of Earth Sciences, 2013. IMDIS 2013, Vol. 54 – supplement. Boero F. and the CoCoNet Consortium, 2016. The CoCoNet Guideline. SCIRES-IT. Supplement 2016 e-ISSN 2239-4303.

Figure 4. Final chart for the OWFs of the two pilot project areas