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. The project covered a high number of countries and involved researchers covering a vast array of subjects, developing a timely holistic approach and integrating the Mediterranean and Black Seas scientific communities.

The Work Package 9 named Data Management and Synthesis provided a common framework for data management and final synthesis of the outcomes.

The database

In the lifespan of the project the WP9 collected a big amount of data from different sources and disciplines, from biology to geology, oceanography, socioeconomics (real world). The data are organized and stored in 11 ESRI File geodatabases with ArcGIS (physical model), implemented as UML diagram with Microsoft Visio, (logical model), starting from the INSPIRE Directive (conceptual model). The 11 themes are: PreotectedSites, OffshoreWindFarms, HabitatsAndBiotopes, Biodiversity, Threats, Socioeconomics, Geology, Oceanography, MaritimeUnits, SeaRegions, Elevation. Other 3 File geodatabases have been developed for the pilot project areas: HabitatMapping, Connectivity and a more detailed version of the geodatabase Oceaography.
The 14 File geodatabases converge in a unique Oracle database and are accessible thought a WebGIS portal.
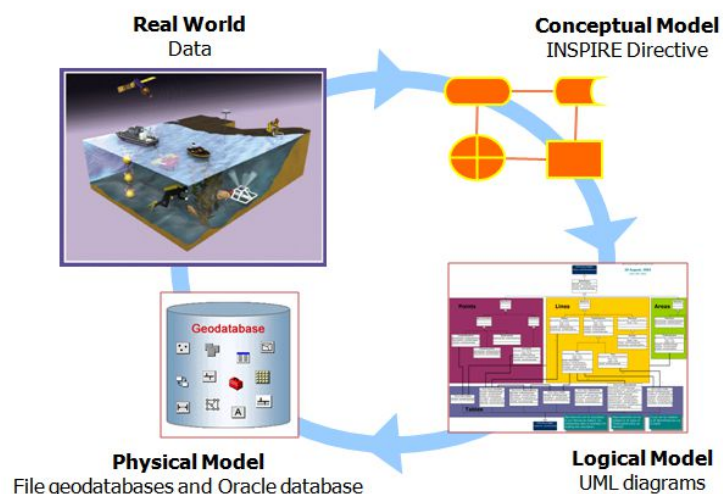

Figure 1. CoCoNet workflow, from the real word to a physical model.

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/.
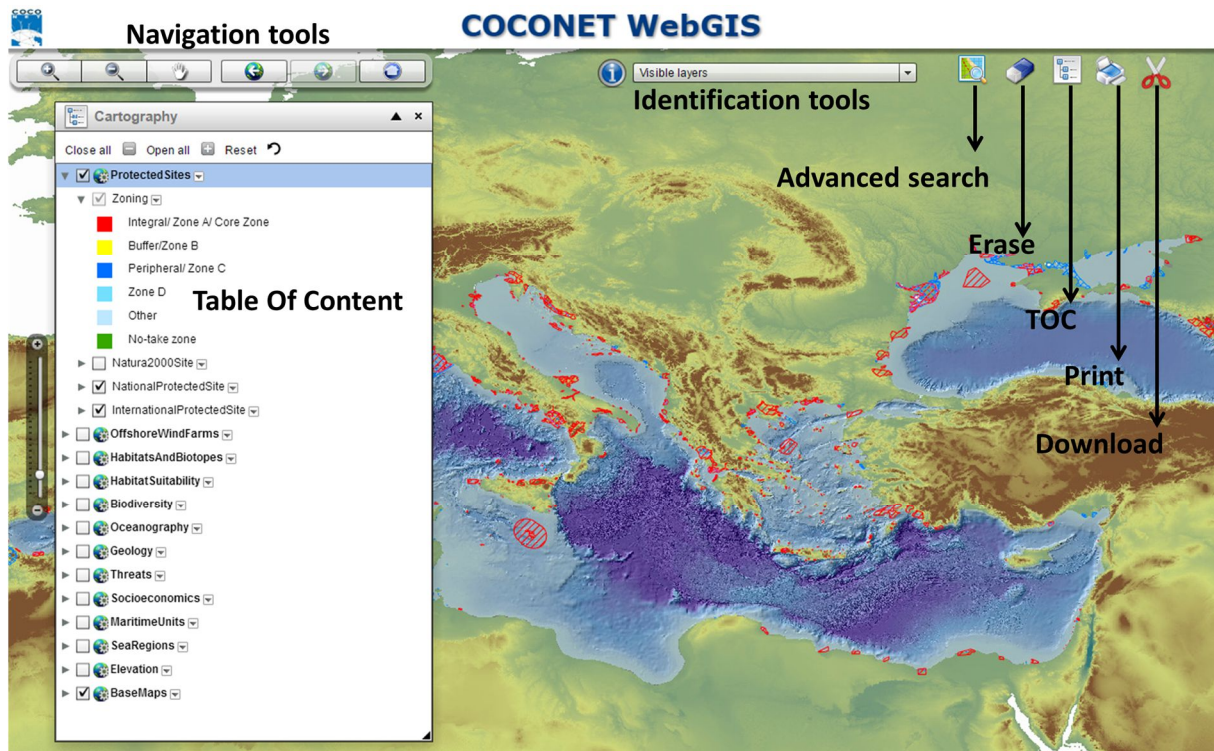

Figure 2. CoCoNet WebGIS platform at basin scale and its functions.

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 and print a map. At least, the user can download the layers according to the data policy of the project or use the 14 geodatabase as map service and feature service (WMS and WFS OGC services) on his desktop.

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 (http://www.seadatanet.org/Metadata).

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