

Sharing data for conservation. Atlas of marine biodiversity in the Balearic Sea

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Introduction

The **Atlas of marine biodiversity in the Balearic Sea** is a digital atlas of marine species covering a sea area of 150.000 km² and integrating a wide array of taxonomic groups: 33 phylum, 615 families, 1058 genus and 1600 Mediterranean marine species in the Balearic islands.

This is the first marine atlas of Mediterranean species with relevant data on endemic, protected and exploited species of valuable interest for marine biodiversity knowledge.

This GIS geoportal represents a useful tool for decision making processes for coastal management, ranging from recreational uses, marine protected areas, fisheries, industry and conservation purposes.



Objectives

- Elaboration of a marine species inventory from the Balearic Sea based on historical data series including diverse taxonomical groups.
- Development of a Spatial Data Infrastructure of marine biodiversity.
- Creation of marine biodiversity maps and indexes (geoportal) as a decision making management tool for conservation purposes .



Collecting information

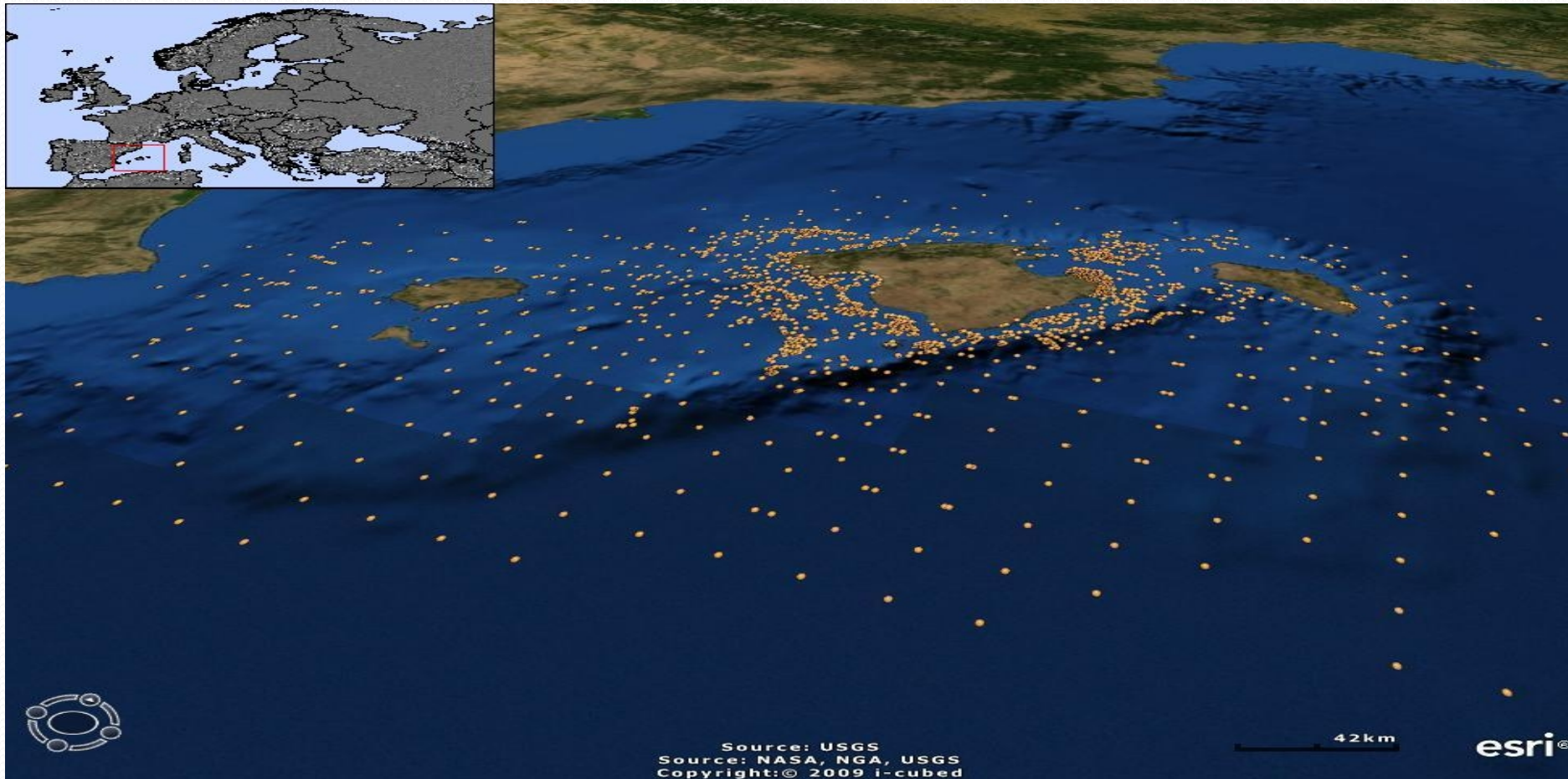
Data have been collected from research projects and oceanographic surveys carried out by the COB (Centre Oceanogràfic de les Balears, IEO) in the Balearic islands and it covers a long period of time (48 years).

The oldest data was recorded in 1972 and the last one in 2010. Some data series covers a long period of time (up to 10 years) and others only a specific moment of a survey.

The project covers all the Balearic Sea. Most of the data is located along the coast, especially in Mallorca island, and the number of records decreases as long as we move away from the coast.



Study area



Centre Oceanogràfic
de les Balears

Instituto Español de Oceanografía

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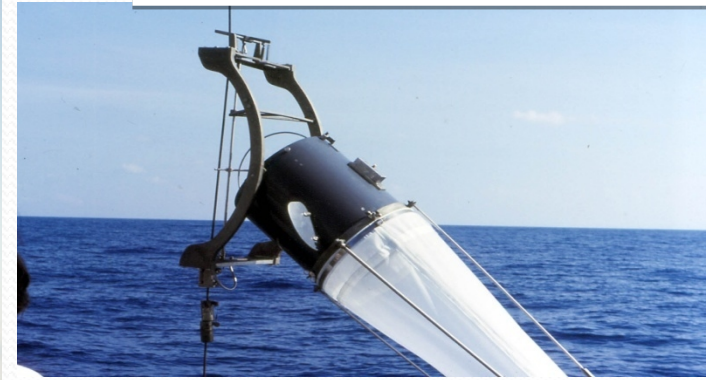


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Data Model

An Oracle database was used for the alphanumeric data and ESRI ArcSDE was used as a middleware to manage spatial information.

A data model has been build comprising 87000 registers from 1600 marine species covering from foraminifera, sponges, algae, crustaceans, phytoplankton, to fishes among others.

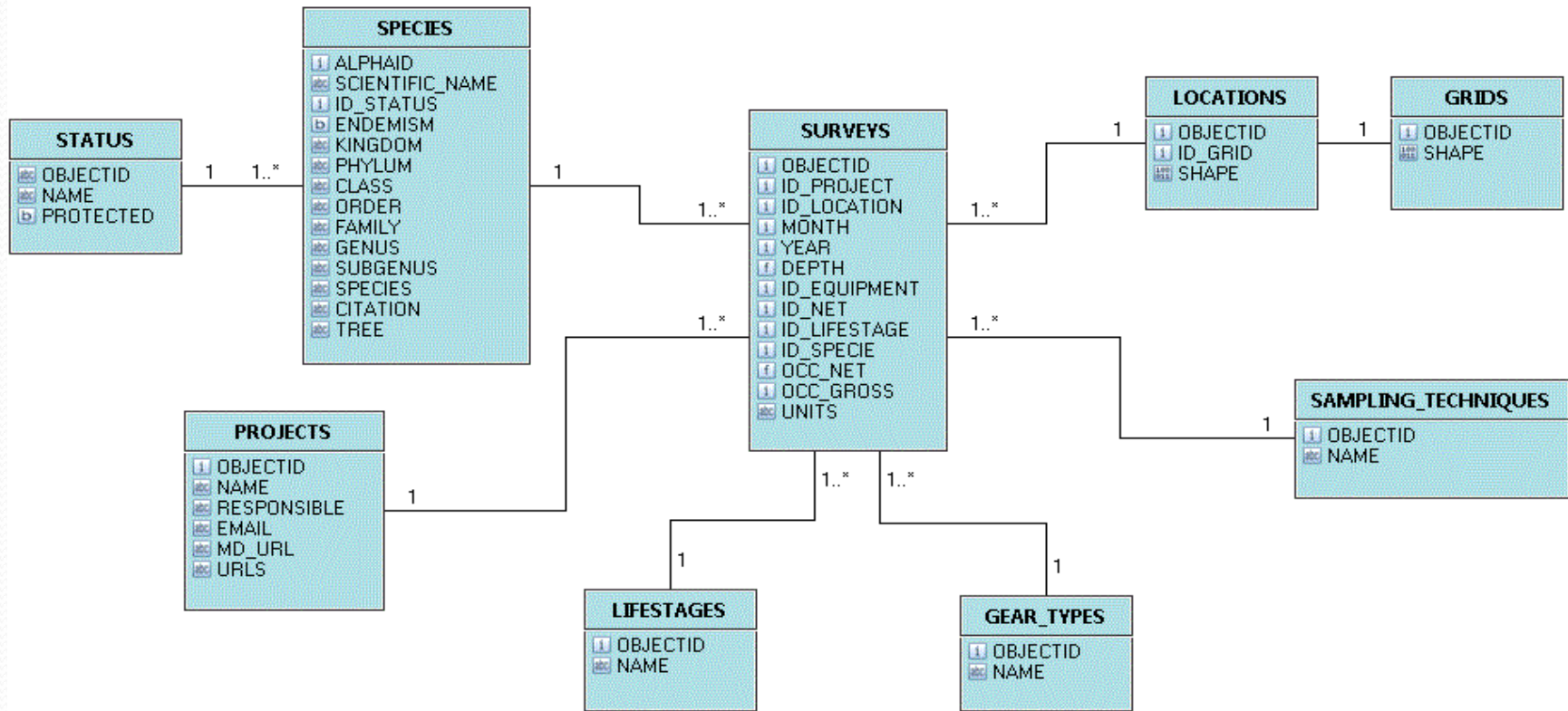
Its structure allows the integration of new data coming from new projects or surveys in the future.

Thematic information was also loaded: bathymetric map, physical elements (substrate, salinity...), political boundaries (fishing areas, protected areas...)... This data is important for the Map Viewer in order to contextualise the study area.



Data Model

DATABASE MODEL: ATLAS OF MARINE BIODIVERSITY IN THE BALEARIC SEA



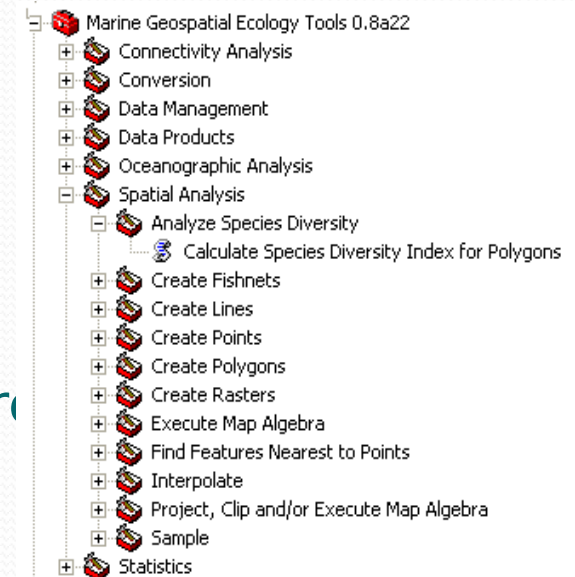
Biological Indices

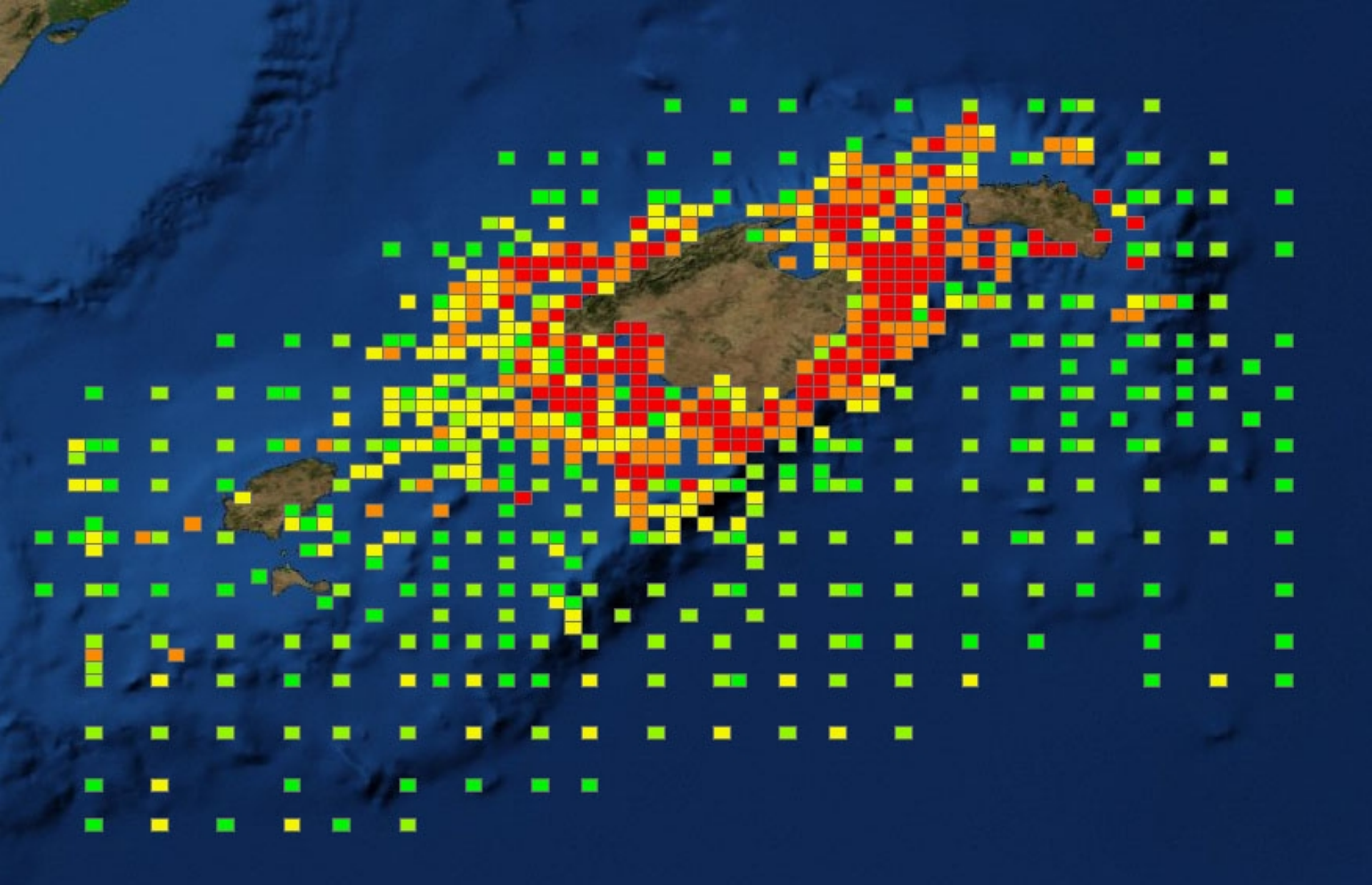
Based on the data collected some biological indices were applied using Marine Geospatial Ecology Tools from Duke University and ArcGis:

- Shannon index.
- Simpson's index of diversity.
- Species Richness.

In addition, other interesting outputs were

- Number of registers.
- Number of species.
- Number of species depending on the sampling technique.





▲ Number of species depending on the technique

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Marine data

Some interoperable services have been published using ArcGis Server 10.

Some complementary marine data were added to the atlas from different sources via WMS (Web Map Service):

- NOAA
- ESRI
- IEO SDI
- IDEIB (Balearic Islands SDI)



Map Viewer

A web map viewer was developed using ArcGis JS API technology. It has the basic navigation tools and allows the user to query the data from the inventory through a form where they can search data based on several parameters.

The information can be shown as points aggregated in 5x5 km grid or as a result of applying some indices (biodiversity) via geoprocessing.

Background marine data from different sources can also be displayed.





Criterios de Búsqueda:

Endémicas
 Exóticas

Búsqueda geográfica (vista actual)



Metadata and web diffusion

Metadata for every project in the atlas was created and published using Esri Geoportal Server and following the INSPIRE Metadata Schema. This data is linked in the data in the map viewer or searched within the Project web page.

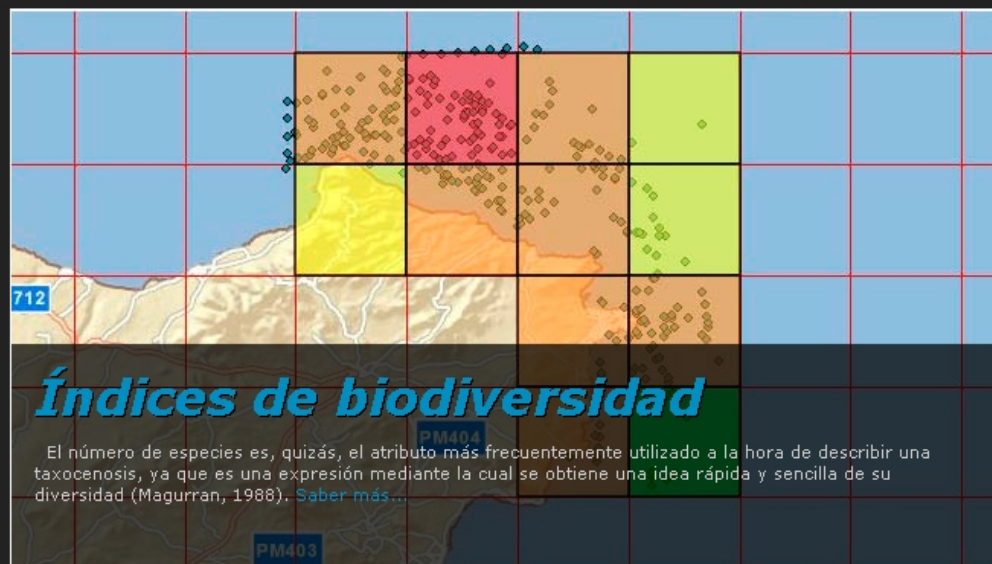
A web site was created for the project and is hosted in the COB. It contains some basic information on the project and links to the map viewer and to the metadata. It has a news sections and links.



Atlas de Biodiversidad Marina del Mar Balear



[Inicio](#) [Proyecto](#) [Inventario](#) [Mapas](#) [Índices de biodiversidad](#) [Galería de imágenes](#) [Metadatos](#) [Noticias](#) [Enlaces](#) [Contacto](#)



Proyecto

Mapas

Índices de biodiversidad

Metadatos

Noticias

- Presentación del Atlas en la
• World Conference on Marine Biodiversity 2011
- Presentación del poster
"Managing marine data:
• Atlas of marine biodiversity in the Balearic Sea, Western Mediterranean"

Noticias marinas

Realizado por:

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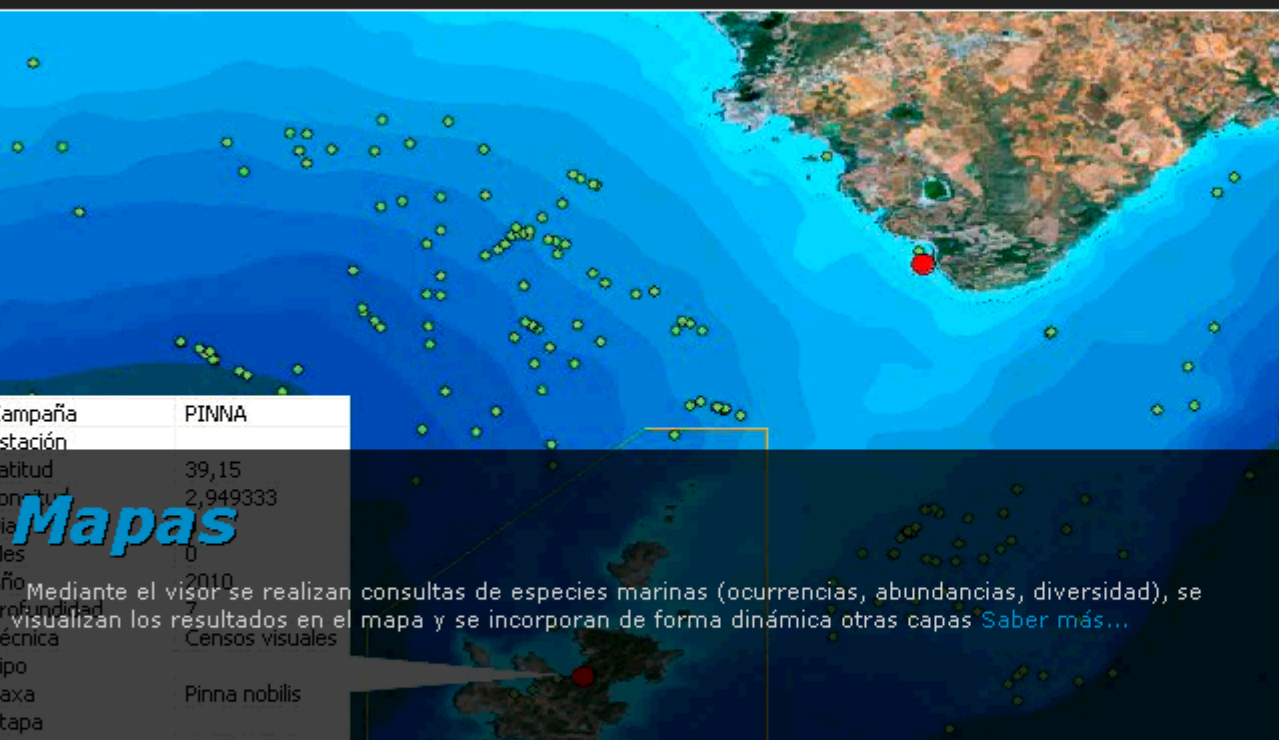
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