CALL FOR TECHNOLOGICAL CONSULTANCY SERVICES

Update and enhancement of a spatial data viewer and general interface in an online platform

As lead partner of the Interreg Mediterranean co-funded project called Mediterranean Biodiversity Protection Community, ETC-UMA has developed an online platform to support open access to key knowledge and spatial data from several sources on regional biodiversity and current pressures and impacts. This online platform (biodiversity.uma.es) has been built following European standards to facilitate interaction and integration with other online data sources.

Objective
Development of a web spatial data viewer integrable with the current website and able to show existing interlinked web services I.e. WMS, and to retrieve related metadata information.

Development of a web content management system to host and manage the map viewer and the other platform components.

Functionalities
The final users will be able to explore the layers available by activating, and deactivating them, zooming with the support of the navigation panel tools, to display the legend, to query the information provided by the data and the metadata, download the data, and to share the displayed map. The map viewer should allow the user to tailor-make maps with the layers of his/her choice, with the option to export them as images or pdf for later use, including the relevant source and disclaimer related to the data included in the platform.

Maintenance
The contractor will have the possibility to create new layers (categories, groups of layers) and to update and/or replace some of the layers made available in the viewer.

Software
The contractor will not require the use of any particular software but will give preference to open-source solutions. The final software choice will need however to ensure continuity and compatibility with the existing components and products, databases, web services, and metadata and have a CMS interface for the contractor for future management and handling.

Language
English

Budget
Economic offers should include all costs for staff implementation, coordination meetings and the purchase of any licensing/graphic components if needed for the finalization of the new platform. The economic offer should include relevant taxes as per the country of origin of the contractee.

Timing

A calendar of estimated deliveries through the production process should be provided by the applicants including dates for coordination meetings and at least 1 beta version for testing and feedback by the contractor. The final online functional platform is expected to be delivered by 30 September 2021.

How to apply

Candidates should send a descriptive offer including a contact person, detailed budget, timeline of deliveries, and at least two examples of previous work. The documents will be sent by email to the following address: **panacea-med@uma.es** **by no later than 30 May 2021.** Pre-selected candidates might be called for an interview in May/June to complete the selection process.

Context

The second phase of PANACeA, known as the Mediterranean Biodiversity Protection Community (MBPC), oversees improvements for the platform related to the usability and design. Were identified two priorities, described in the following document, namely "a new centralized map viewer", which would take the role of main map viewer, as unique entry point for users to visualize main spatial outputs, and a new general interface to bring in and harmonize the different platform components.

A new centralized map viewer

The structure of the actual viewer[3] allows the implementation of different viewers as well as the possibility to create personalized maps, just adding the data from the catalogue. In this new update the idea is to have instead a new centralized viewer with a predefined list of layers (15 to 20) subdivided by categories and groups, whose visualization can be activated/deactivated. The users will also have the possibility to retrieve info from the metadata and the main layer characteristics as the attribute table and legend. The map viewer development is not restricted to any specific software (open-source solutions are preferable) but must be compatible with the existing web platform.

Table of Content (TOC) - Tree menu structure for layers

The layers to be included into the TOC must be harvested from the existing database (PostgreSQL), which has a metadata and webservice (e.g., WMS). The harvesting can be in a semiautomatic way always when is guaranteed the possibility to update the layer list and/or specific layers whenever a new update is available.

The viewer must allow the possibility to include more than one TOC, e.g. selectable by tabs to differentiate the type of inputs namely a) general information, b) community projects, and c) storylines and thematic maps. Each of the TOC has the same structure *i) Category*, *ii) Group iii) Layer*. The *Category* elements will not have control on the layers visualization but can be unfolded to facilitate the view; the category elements would have the possibility to add a small picture/icon to link relevant online pages e.g. web sites, web app, documents. The *Category* name can be changed internally as the icon when needed. The *Group* element is meant for grouping different layers, must have the option to activate/deactivate the visualization of the layers nested below. The *Group* layer name can be modified internally when needed. The *Layer* element is corresponding to a single layer (e.g. WMS). The *layer* element in addition has to offer the possibility by mean of bottom/dropdown menu to a) unfold legend, b) download option, c) change legend style, d) metadata info (popup), e) attribute table, f) zoom to layer, and g) apply transparency; some of the listed action can be grouped on a pop-up window, which become active just after clicking the info button. The figures at the end of the document illustrate this proposal with a concept of design and structure of the content and tools.

Mandatory functionalities per each layer

[Legend button] – display the legend, generally provided by the map server (e.g. GeoServer).

[Download button] –to download the data in the original format e.g. .shp - .tif

[Metadata info button] – provide a summary of main metadata elements, title, abstract, thumbnail, and hyperlinks; additional items can be defined on a second stage.

[Attribute table button] – opens a tab or popup to show the content of the layer's attribute table and be able to explore its content by searching, filtering, selecting, etc. Also allowing to zoom to the selected features and downloading the table in the most common formats (CSV, Excel, etc.).

[Zoom to layer button] – to adjust the scale and position of the viewer to the extent of the layer and quickly locate the data.

[Opacity and swipe sliders] – to adjust the layer's visibility percentage (opacity) and the visible extent percentage starting from the left edge (swipe).

Optional tools per each layer

[Change legend style selector] – The layer can have different styles, optionally the user can choose by mean of a selector the different symbology available for the same layer.

Other map viewer elements

Beside the listed elements that the TOC must include, the map viewer interface has to offer additional functionalities by mean of buttons/dropdown menus along the map windows, as below described.

[Search/add new layer bar] – to search on the existing catalogue of service, select and add it to visualize in the map viewer one or more new layers. The search engine has to dig into the metadata catalogue elements (e.g. title, abstract, …) and provide to the user an entry per each matching criteria, each entry if clicked will add the layer to the map viewer.

[Base layer selector] – A configurable selector of several background map must be included in the map. It can be placed on the top of the TOC or rather on a map window corner. The selector has to support standard web services type (e.g. WMS) as offered by Open Street Map, Bing Aerial, or personalized with ad-hoc project requests. The user must be able to change between these layers to meet his data needs.

[Navigation bar] – it can be set along the right border of the map – must include basic map functionalities provided by buttons as zoom in, zoom out, zoom to extent, panning zoom, measure tools, etc (some can be defined later).

[Query tool] – it can be part of the Navigation bar - Polygon/pixel query tool to explore the data. Query must show a popup window or tab with a list of fields/values based on the layer's attribute table. This fields/values list must be internally configurable to show just a view of the existing attributes to the users: the field names and layer title can be renamed; the fields to be finally shown can be defined internally selecting only the required ones. The values can be defined showing less, or more digital numbers. The pop-up windows will need to have the option to include additional material, e.g. a small picture and a hyperlink.

[Selection tools] – it can be part of the Navigation bar - A tool for vector data to selecting polygons and being able to access the attribute table and check the information associated to them.

[Share map tool] – it can be located on the top bar/navigation bar - to share the maps as they are customized in a certain view, i.e. zoom map extent and layers activated, by a hyperlink. The hyperlink, preferably, will be generated by mean of a button and can also be generated as embedded code.

[hyperlinks buttons] – it is a requirement to give the redirection to external web links e.g. web pages, web map, web document – Different options can be defined on where to place it, 1) aside each *category* in the TOC, 2) in the metadata detail windows, 3) in the query pop-up windows –. The data viewer must provide access to these via buttons or hyperlinks (figure 4). E.g. In the case of thematic maps, with a regional scale, the storylines must be accessible with a visible button associated to the corresponding layer group. This feature will be useful to link relevant documents or content to other data groups. For local actions, the storylines will be geolocated in a layer in which we can click on the points to show a popup with a title, abstract and the corresponding link.

A new interface.

In addition to the improvement of the map viewer component, it would be foreseen to develop/ apply a new interface. This new interface capable to provide a complete harmonization among the different platform components e.g. a one solution for an integrated Content Management System with a spatial viewer, metadata catalogue and a Library. The new interface would be preferably making use of the existing infrastructure components to extract the relevant content and information. In details, GeoServer is responsible to generate OGC web services namely WMS, WMTS, WFS. GeoNetwork, is creating and cataloguing metadata in ISO 19115:2003 and ISO/TS 19139:2007, including the possibility to harvest metadata from standardized service CWS, OAI PMH; Open-source repository for hosting the geospatial data (PostgreSQL)

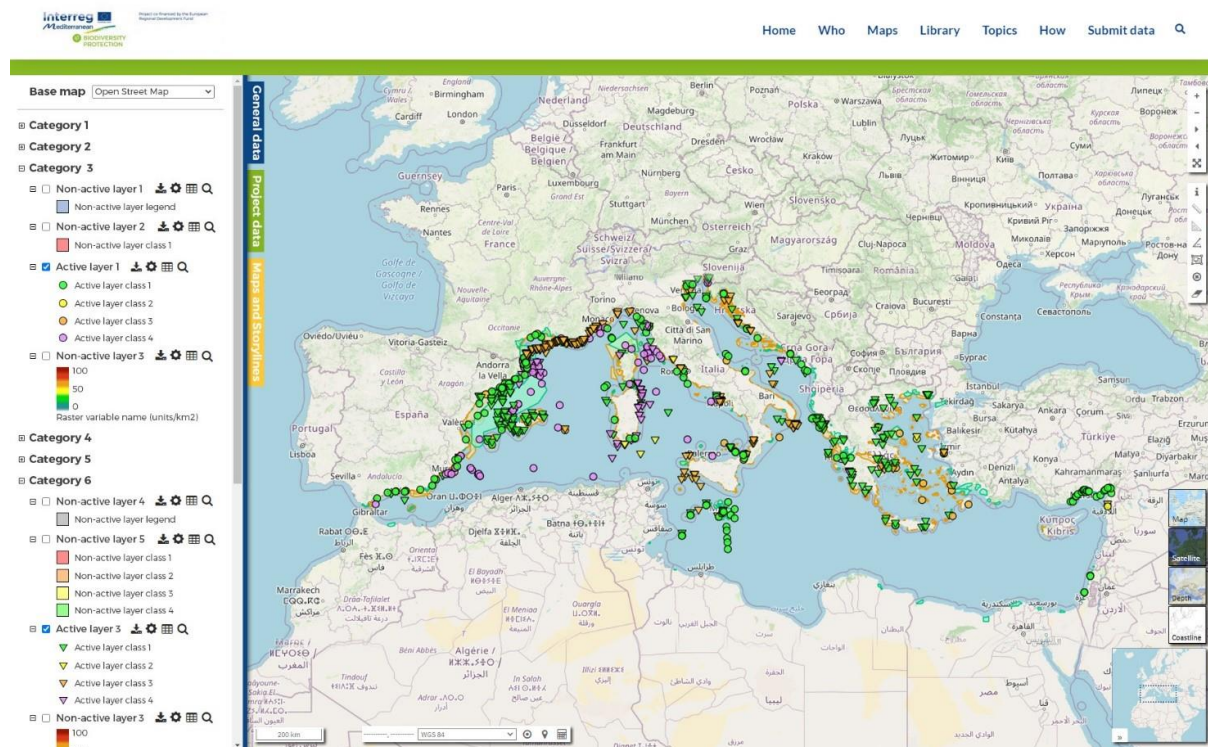## Conceptual proposal of a new design for the data viewer

Figure 1. Conceptual proposal of the design of the data viewer with the organization of elements and tools. Different topics are organized in data categories and layers or layer groups. The ToC on the left shows the tree menu structure for layers available.
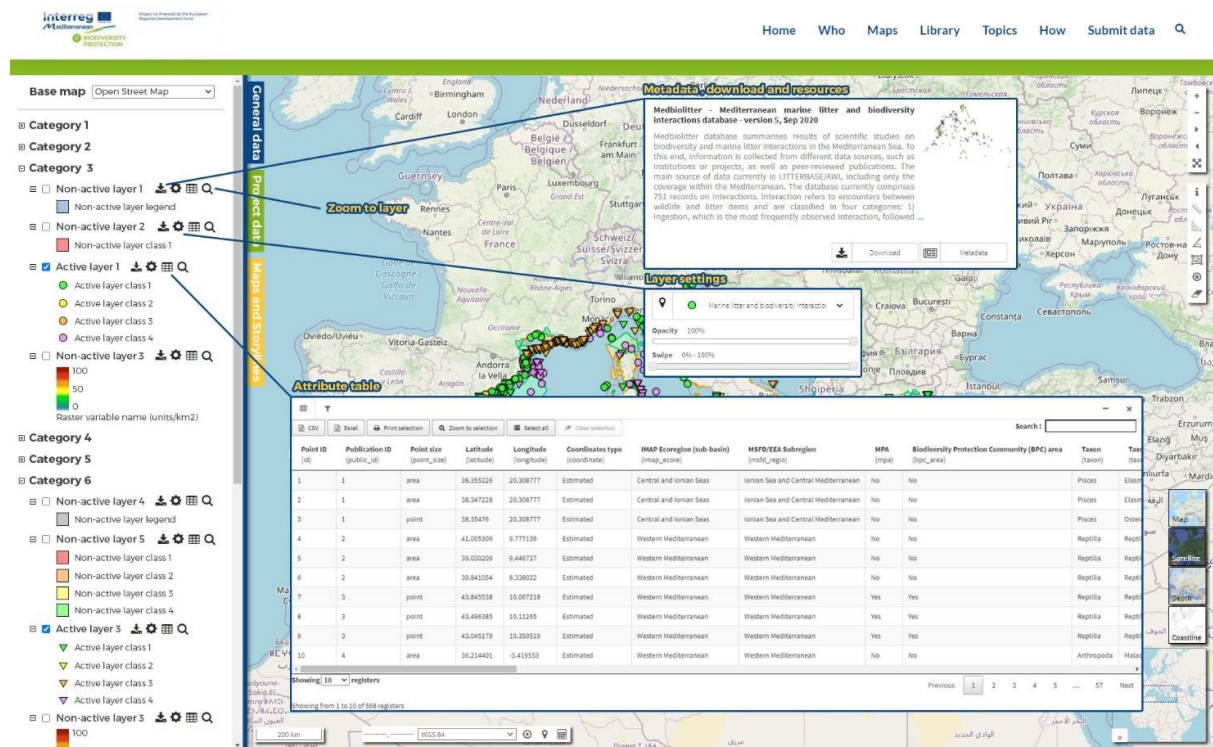

Figure 2. Description of the buttons associated with the layers and a conceptual example of their operation.
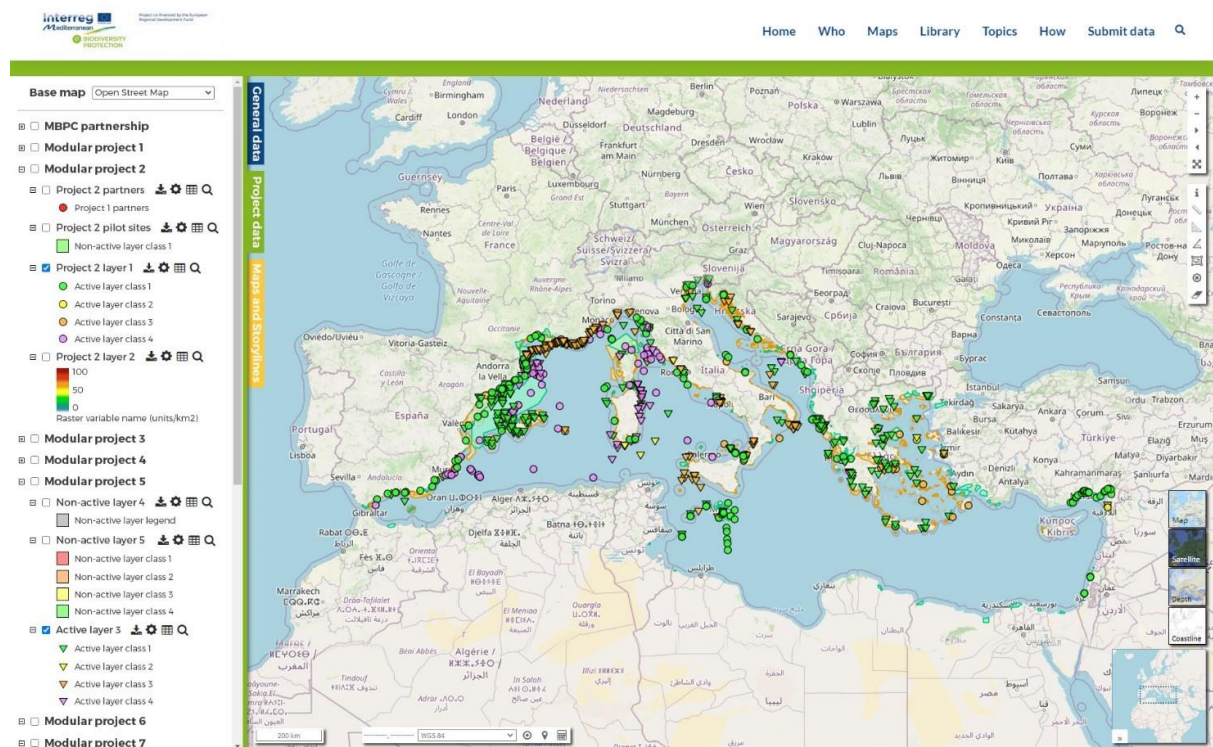
Figure 3. Conceptual proposal of the MBPC project data section. Data are organized in different categories or layer groups according to the project.
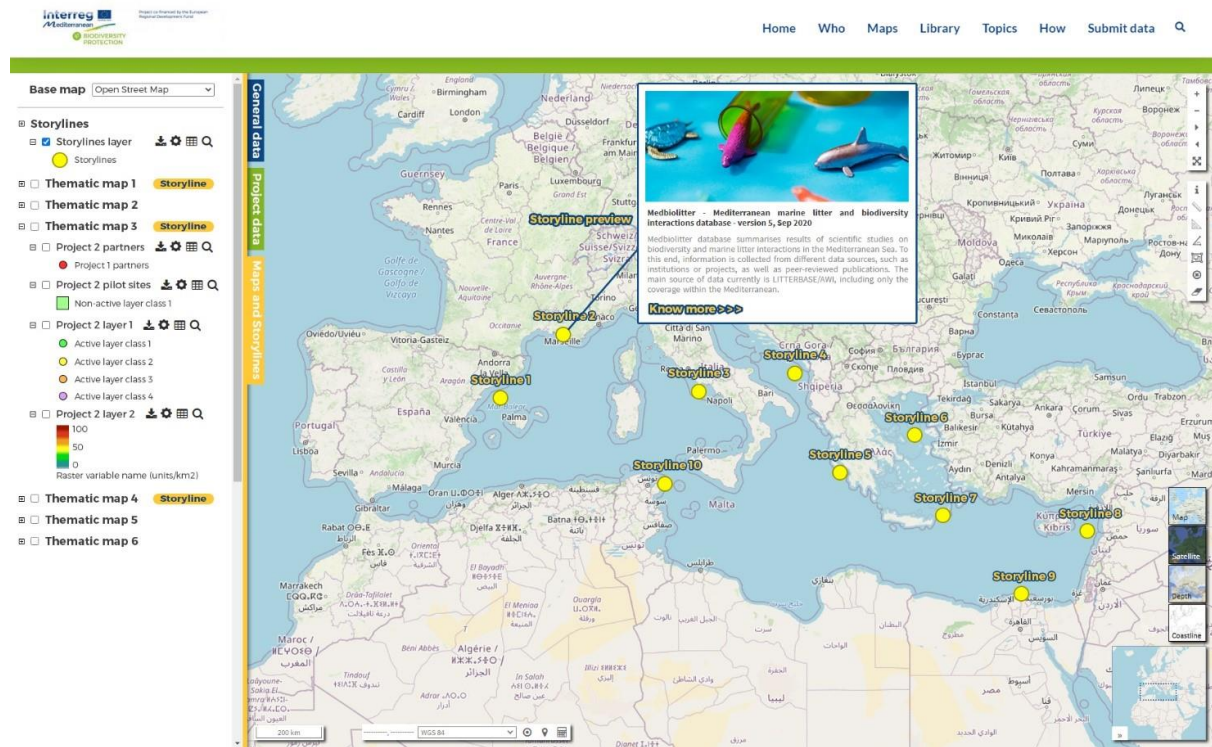

Figure 4. Conceptual proposal of the storylines and thematic maps section. Premade maps organized in different layer groups to show data on relevant topics and access to storylines: web or interactive documents with text, images, figures, etc.; with more information on the data.

Supporting documents
MBPKP Tutorial