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Agenda item 4: MAP Data Management Policy

Architecture of Spatial Data Infrastructure (SDI)

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Introduction

The scope of this document is to show to users how the Spatial Data Infrastructure (SDI) and InfoMap System data flow reporting system work, that are set-up within ENI SEIS South II project.

In the first section there will be described the general functionality of *InfoMapNode* SDI in order to understand how a user can browse data and metadata, how an accredited user can upload and edit data and metadata in order to support the specific data flow or data collection campaign.

The second section will be focused on how a reporting user can upload the data flow package into the INFO/RAC reporting System. With the reporting system, Mediterranean countries can follow specific data reporting protocol in order to supply Barcelona Convention and some linked project.

Spatial Data Infrastructure guide

The InfoMapNode represents the entry point for InfoMAP Spatial Data and Metadata catalogue, and as better described in the SDI Architecture document, it is the front-end to access and use all SDI components. InfoMapNode is an open source geoportal for sharing different levels of geospatial data and maps and to expose all relevant metadata in the Mediterranean Area, with a specific focus on Barcelona Convention.

In this section it can find a description of the different parts of InfoMapNode platform; how browse, use or download data and metadata; how an authenticated user can upload and/or edit data and services, create metadata, create specific geographic layers or create maps.

The main InfoMapNode functionalities are:

- Upload, manage and share geospatial and not-spatial data;
- Create and edit metadata;
- Create and share interactive maps;
- Collaborate and interact with other users or group of users.

InfoMapNode common user

The InfoMapNode homepage (figure 1) is reachable by a common browser at <http://infomapnode.info-rac.org> and starting from this page, a user can easily access to main contents: *Data (Layers and Documents)*, *Maps*, *Involved* and *Search*. If available, the user can select, from the top right side or bottom part of page, the language in the list.

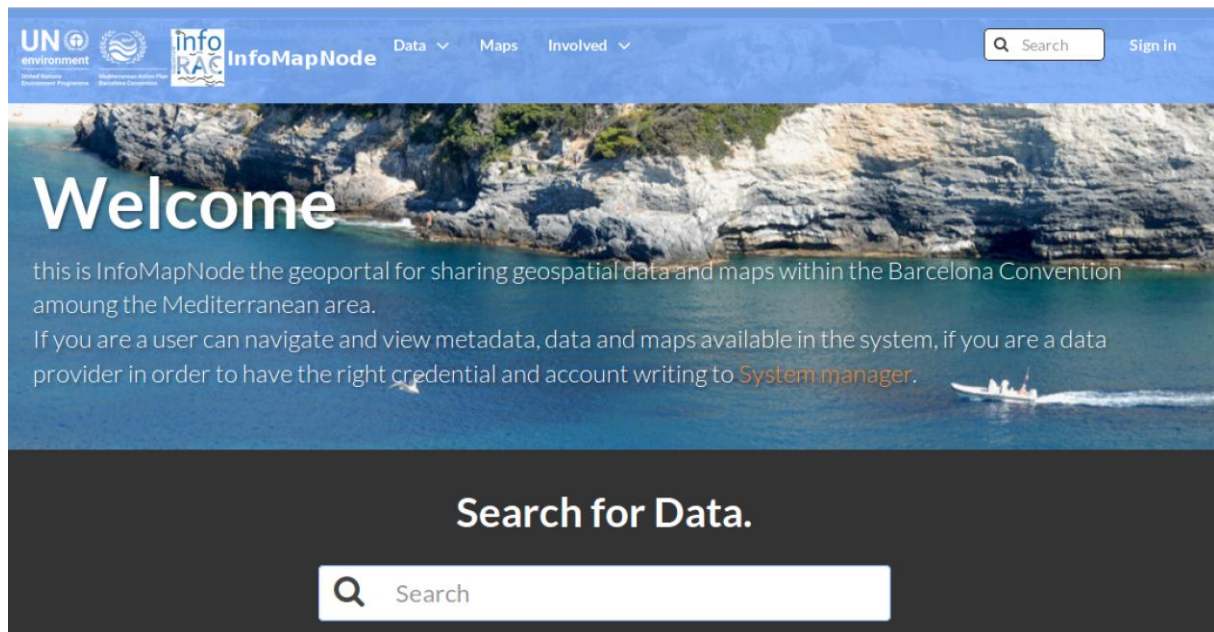


Figure 1. The InfoMapNode home-page, top part.

There are also specific cluster categories of data, in order to facilitate the users to browse related data and metadata (figure 2):

- Biodiversity
- Boundary
- Ocean
- Pollutant
- Water

From the home page you can explore data with their metadata:

- Data:
 - Documents
 - Layers
- Maps

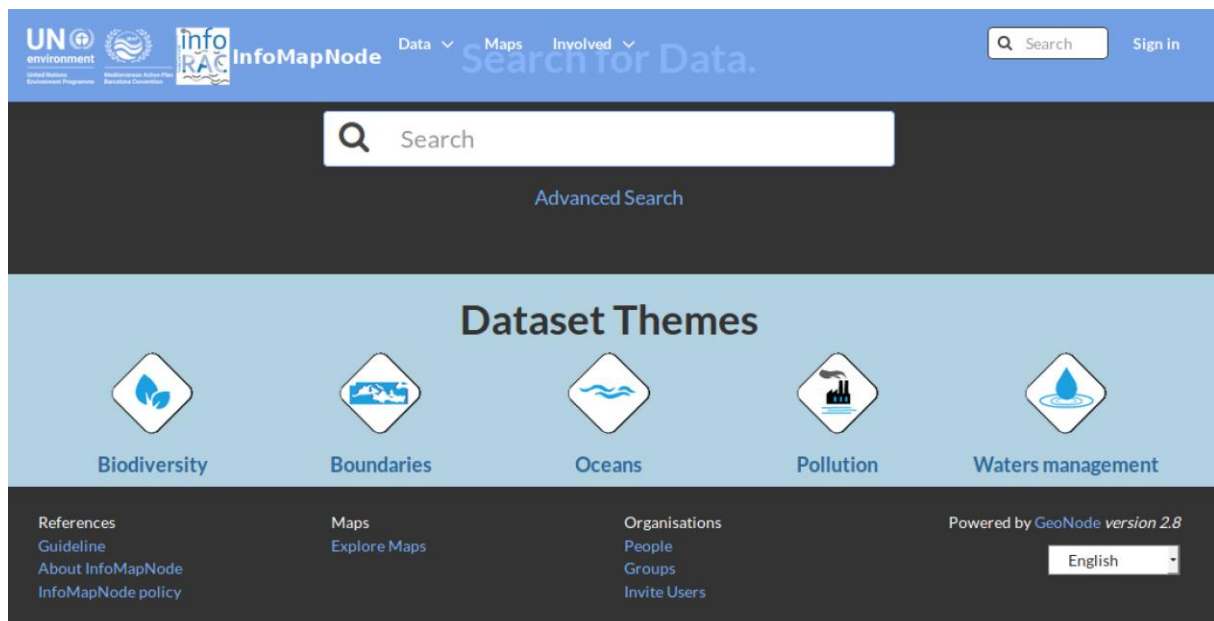


Figure 2. the lower part of home-page, where cluster data classes are shown.

Explore Documents

InfoMapNode allows users to navigate documents in different formats, as descriptive documents (i.e. paper and guideline), technical documents, website and applications or tables that can be linked to existing layers or maps in order to connect additional relevant information. The permanent link **Documents** (under **Data** section) takes you to the **Explore Documents** interface (figure 3) where all existing documents in the system can be found.

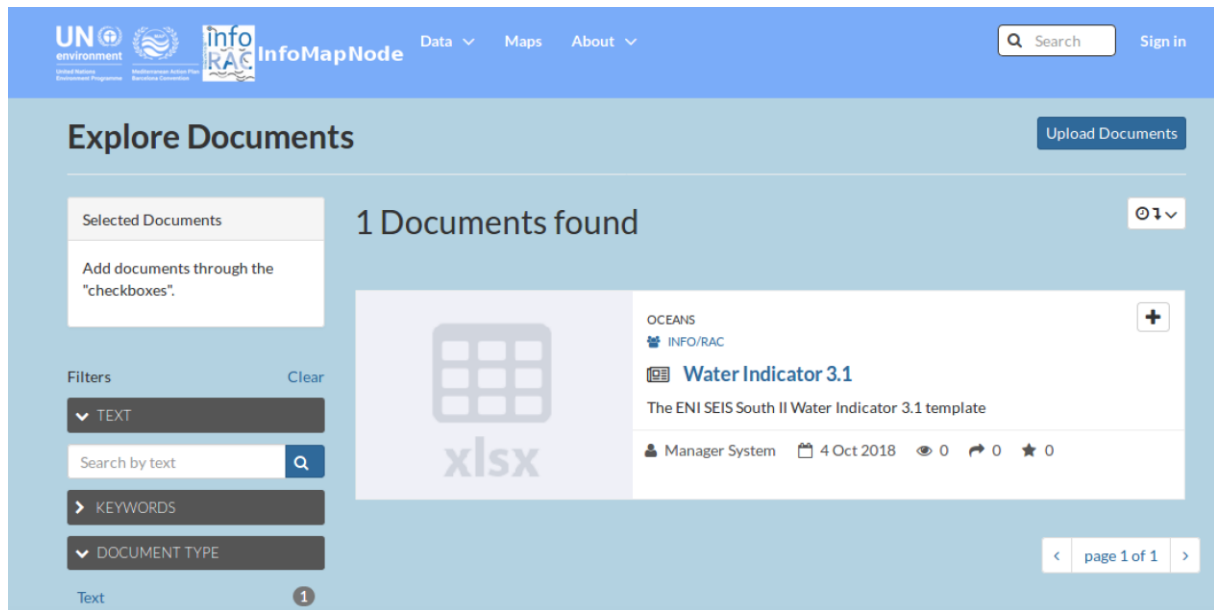


Figure 3. The documents section exploration, an example on how look like the research using a ENI SEIS H2020 indicators template.

Explore Layers

In order to find layers stored in the InfoMapNode you need to click on **Layers** link in the **Data** menu on the top bar or in the bottom of the web page. It can be used the most relevant cluster categories too:

Specific layers can be also founded typing in the **Search** field (e.g. Boundaries) at the top of the homepage.

Following explained methods to access layers, a list of results will appear (Figure 4) sorted by date of sharing (from more recent and less recent) as well as alphabetically (A-Z and Z-A) or by order of importance (Most Popular and Relevance). The results can be filter according to Categories, Date and Keywords by using the left-side panel.

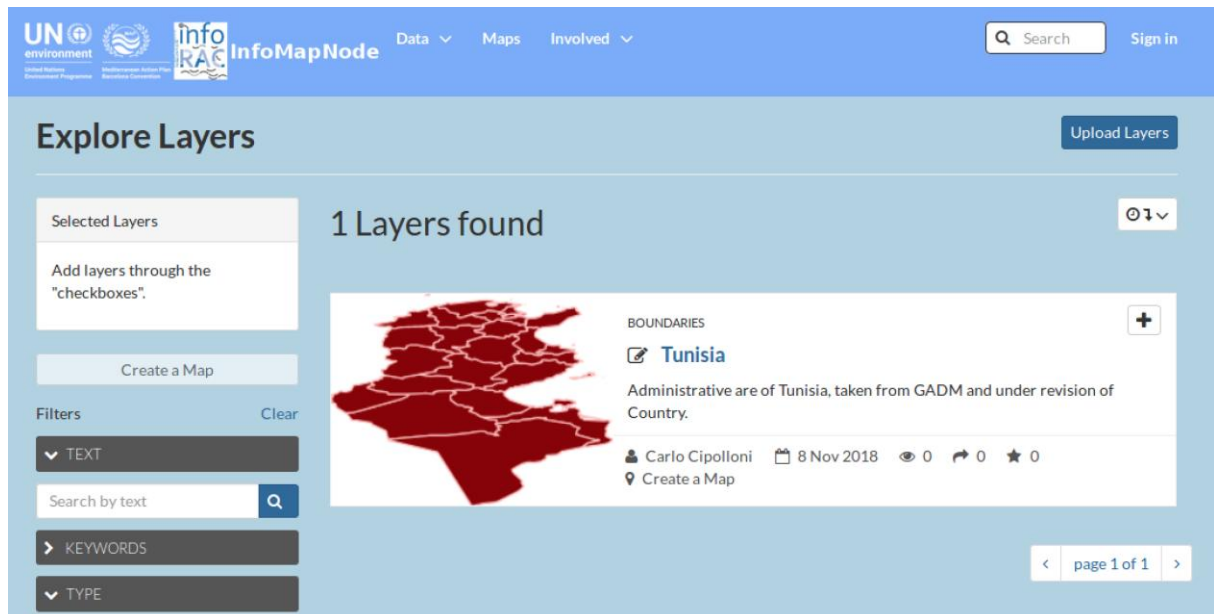


Figure 4. Explore layer page, on the left side there are the parameters to filter the request.

Access Layers Metadata and Details

After searching, clicking on the layer title a user can visualize the layer, accessing more detailed information. The interface (Figure 5) is very similar to the map interface, including the navigation toolbar and information about the owner.



Figure 5. layer or document metadata detail information.

There is an additional tab below the map:

- “**More Info**” to access metadata details;
- “**Attributes**” to browse layer associated attributes.

On the right side of page, there is also the **Legend** associated, the layer under the Maps using this Layer.

Using “**Create a map**”, the current layer will upload in a map. Furthermore, it is possible to extract data of a vector layer with different file formats (KML, GeoJson, Excel, CSV or Zipped Shapefile) as well as data of a raster layer (GeoTIFF, ArcGrid, KML, PNG or JPEG), using the Orange button “**Download Layer**”. This is useful for sending data or use it in offline mode with other GIS software such as QGIS or ArcGIS.

Create a map using layer

The platform allows to create a map easily using layers already saved into the platform. You can choose between two simple procedures to create a map this way:

- Search the layer you would like to use through “**Search**” or by clicking on “**Layers**”. Then use the blue button “**Create a map**”. The chosen layer will automatically uploaded in a **new map** and shown in the left side panel (Figure 7).

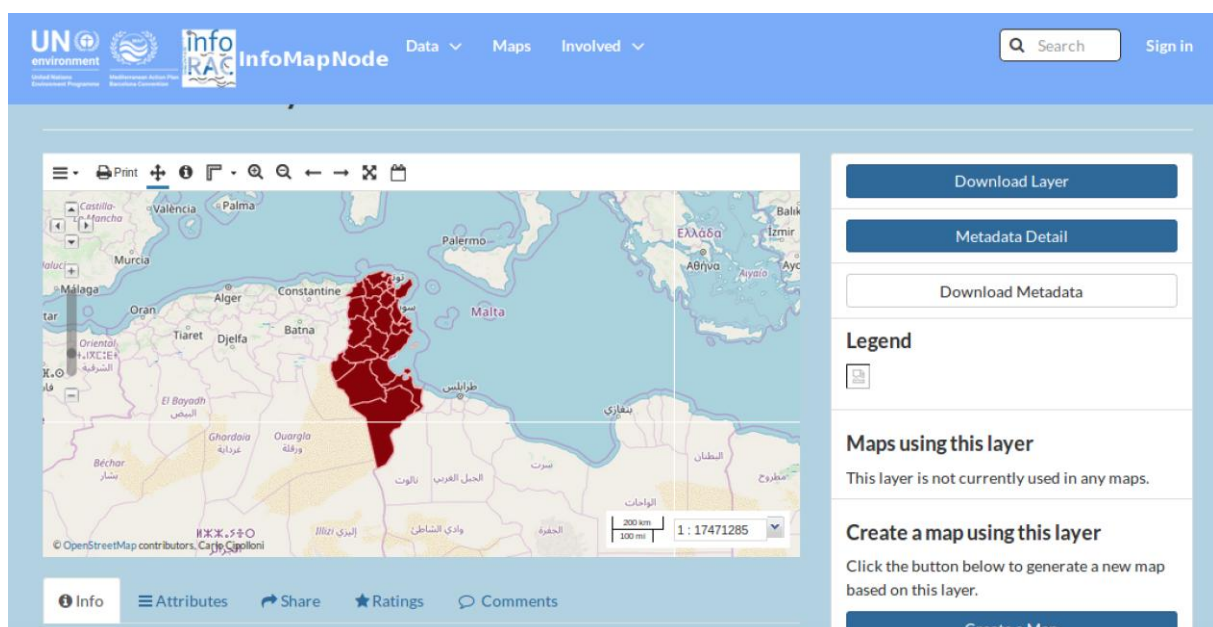


Figure 6. Map created from the layer list, also in this case some extra information area available in bottom part of map.

- Use “**Maps**” and click on the blue button “**Create a New Map**”. No layer will appear automatically, instead you have to choose layer by clicking on **Add Layers** “+ button” → **Add Layers** (Figure 7). Ensure that GeoServer WMS link is selected in the drop-down box at the top of the panel, then select your layers and click “**Add Layers**” at the bottom (Figure). When you have added all your selected layers click “**Done**” and your layer will appear in the map and as an overlay in the side panel.

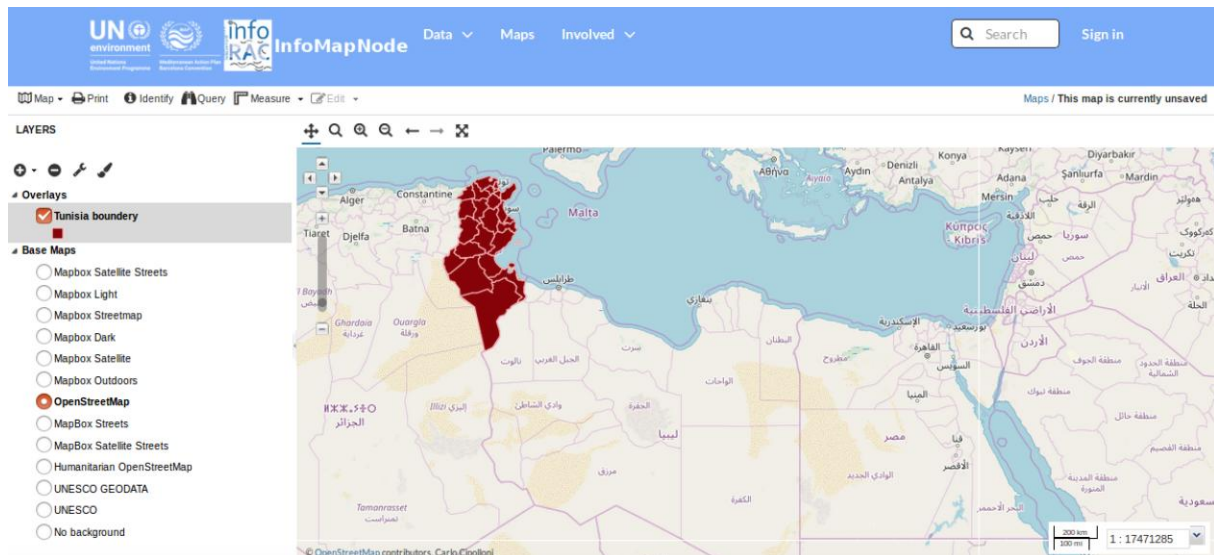


Figure 7. Map compositor – the user can decide basemap and manipulate map also add other layer available in the system or as web map service (WMS) on the intranet.

- Until **sign in** with a user account it is not possible to save the map created on InfoMapNode SDI. However, it is possible to save the map itself as a pdf file on local computer, using the **Print** button in the toolbar for map editing.
- Clicking “**Print**”, a pop-up window will appear where it can be set the zoom level, the paper-size and the map resolution. It can be defined a title for the map, providing additional information about data included in the map. Clicking the **Print** button the map will be saved in local file system (Figure 8).

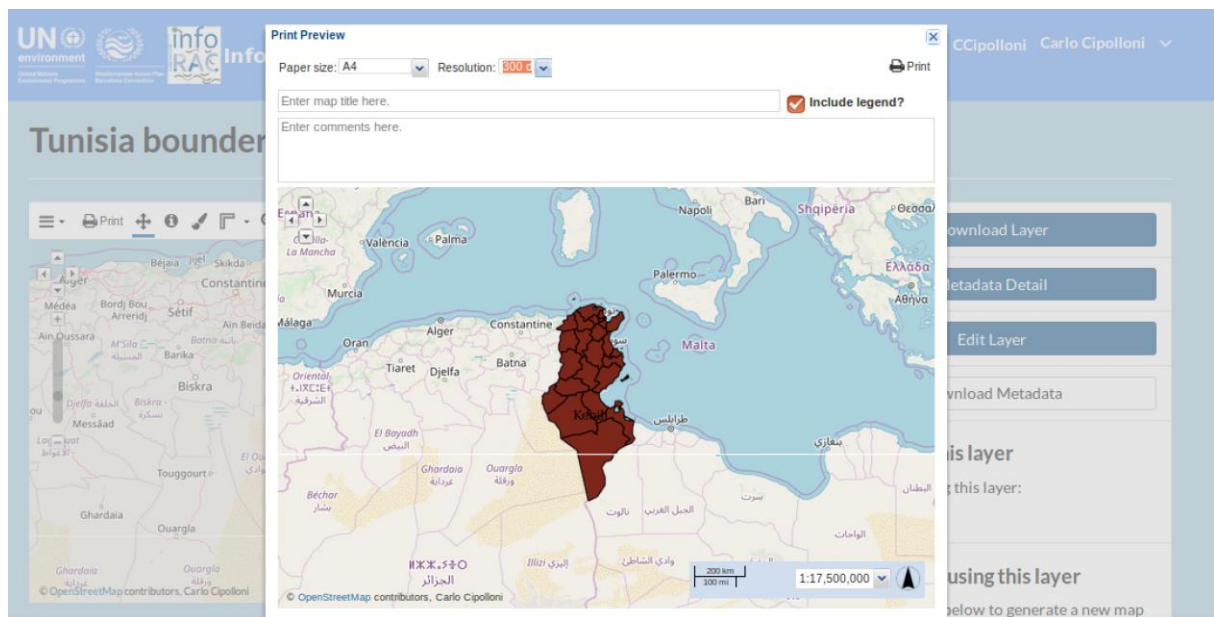


Figure 8. The print pop-up window for export in pdf the maps.

Explore Maps

In order to access maps stored in InfoMapNode, click on “**Maps**” link on the top bar or on the bottom part of home page.

Specific maps can be founded also typing in the “**Search**” field (e.g. Biodiversity Map) at the top of the homepage.

A list of results will appear (Figure 9) sorted by sharing date (most recent and less recent) as well as alphabetically order (A-Z and Z-A) or by order of importance (Most Popular and Relevance). The results can be filter according to Categories, Date and Keywords, using the left-side panel.

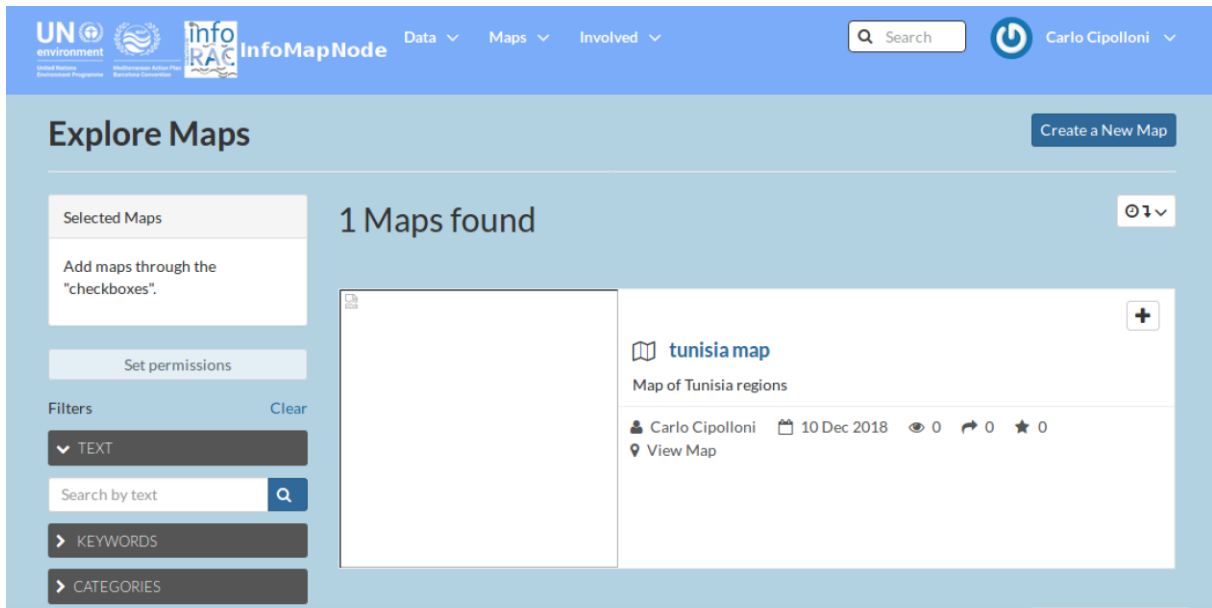


Figure 9. Explore Maps page, when a map has published it will be available in the searching section.

Metadata Map and details

Like for the procedure followed for layers, clicking on **Maps** section, it can be obtained a list of maps available. Click on the title for visualizing and accessing to all detailed information about each map (Figure 10).

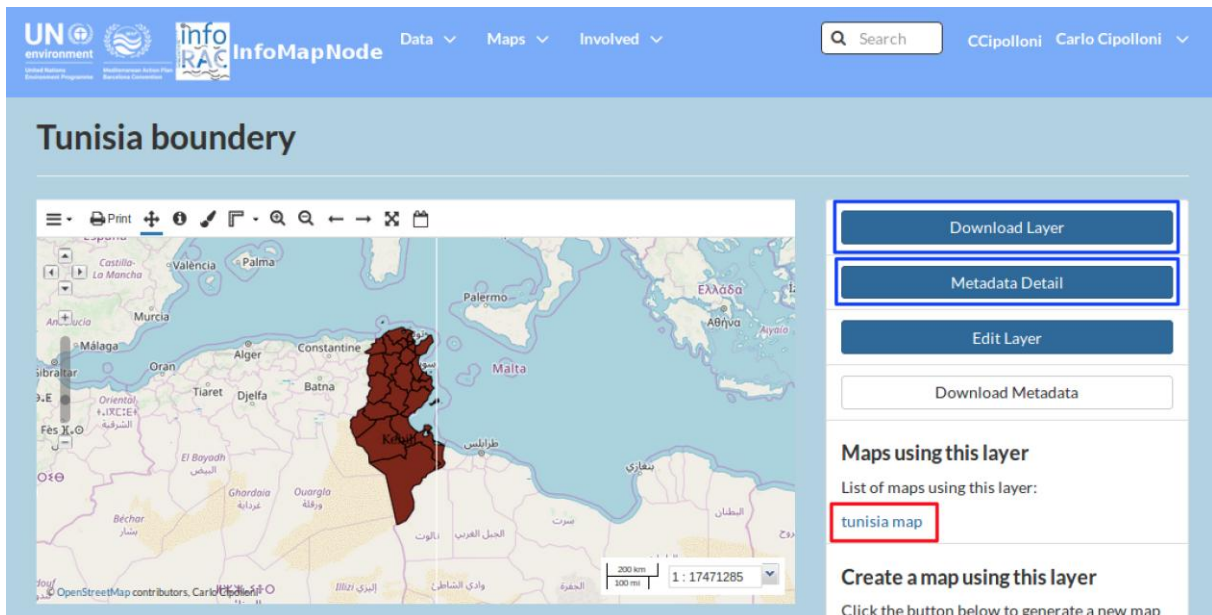


Figure 10. Maps overview, on the right side in blue square are highlighted the download layer (if you have the right) and metadata detail buttons, in order to explore more information.

It is possible to pan the map holding down mouse button and moving cursor, or using the arrows and zoom tools on the left side of the map.

In the **Map Overview** interface, there is also a tab section below the map itself where more Info about are provided, such as all metadata. Furthermore, the map can be **shared** through social media, Ratings it and/or leave Comments.

On the right side of Map Layers, there is a list of data layers used for the current map (Figure 10 - red square).

Use “**Download Map**” (top right of the page) to extract all data layers, used for creating the map itself, saving them on your computer.

Clicking on “**View Map**”, a full screen map will appear in the Map Composer interface, as well as tools for changing the map and a list of layers used for that specific map.

InfoMapNode authenticated user

If you are a user with specific credential provided by INFO/RAC Manager, you have the rights to login in the platform, view restricted data and metadata, upload documents, layer and specific maps published. In this part of the manual we will provide instructions about how the platform works for this type of user.

Before providing information on how an authenticated user can contribute, it is needed to introduce platform permission and rights system.

Permissions and Rights

Permissions define who can **view, download, edit and manage layers, maps and documents**. It is important to understand the differences among these settings, in order to avoid unintentional access to layers/maps. The following settings are available:

1. Who can view and download this Layer/Map/Data?

- **Anyone:** anyone can access data, including unregistered users.
- **Any registered users:** only users with an InfoMAP account can access data.
- **Only users who can edit:** access is limited to users specified in setting below.

2. Who can edit this data?

- **Any registered users:** any user can edit, replace or remove data uploaded.
- **Only the following users:** limits editing rights to the users specified (in addition to the owner of the layer/map).

3. Who can manage and edit this Layer/Map/Data?

- **Limits managing permissions to specified users:** They are the only users able to set the permissions of layer/map. The user uploading a layer is, by default, the owner of that layer with full managing permissions.

To ensure correct permissions are selected, adjust them before uploading new layers, creating maps or uploading documents (Figure 14). You can change these settings later in the Layer View, Map View and Document View interfaces, by using the red button Edit Layer/Edit Map/Edit Document button and Edit (Map) Permissions.

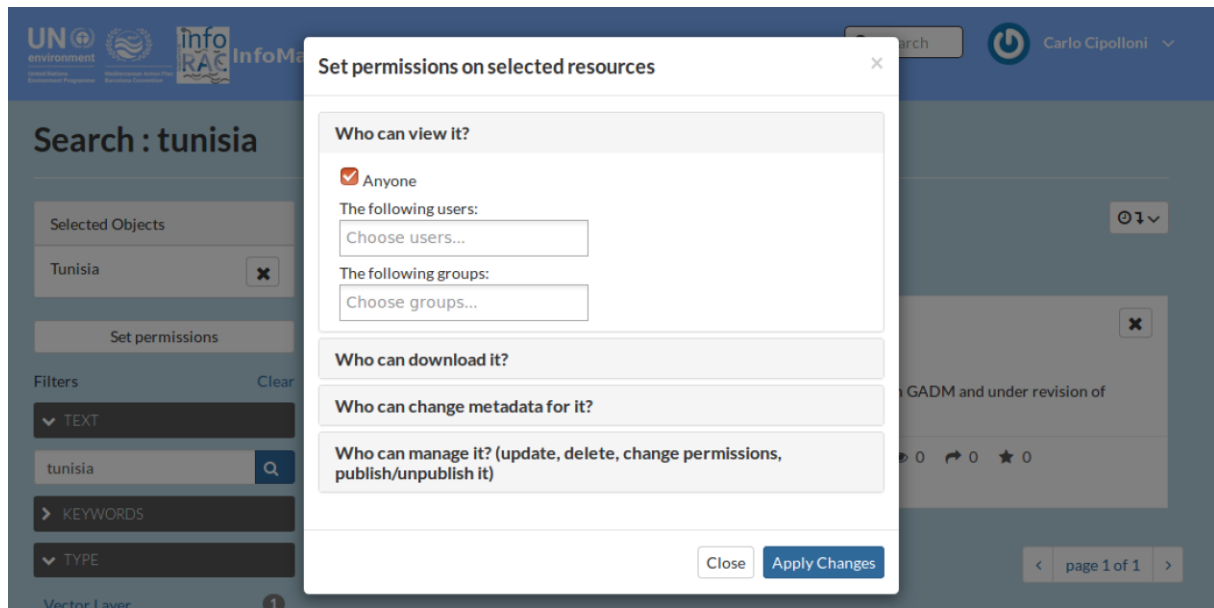


Figure 11. permission window, the authenticated user after upload a document, layer or produce a map can decide the permission granularity for the different level (view, download, metadata edit and data edit).

Upload Documents

After login into the system, using your credential as reporter, focal point or project partners, it is possible to upload documents related to a particular Layer or any general document (Figure 15):

In the **Upload Document** interface, the user can upload a document as following:

- Choose a file, selecting it from your file system. The files will appear right to **Choose File**.
- Click on **Upload Button** for uploading it.

Link Documents To A Layer Or Map: during upload time, a user can link the document to a related Layer or map published in the platform (Figure 15 – red highlights).

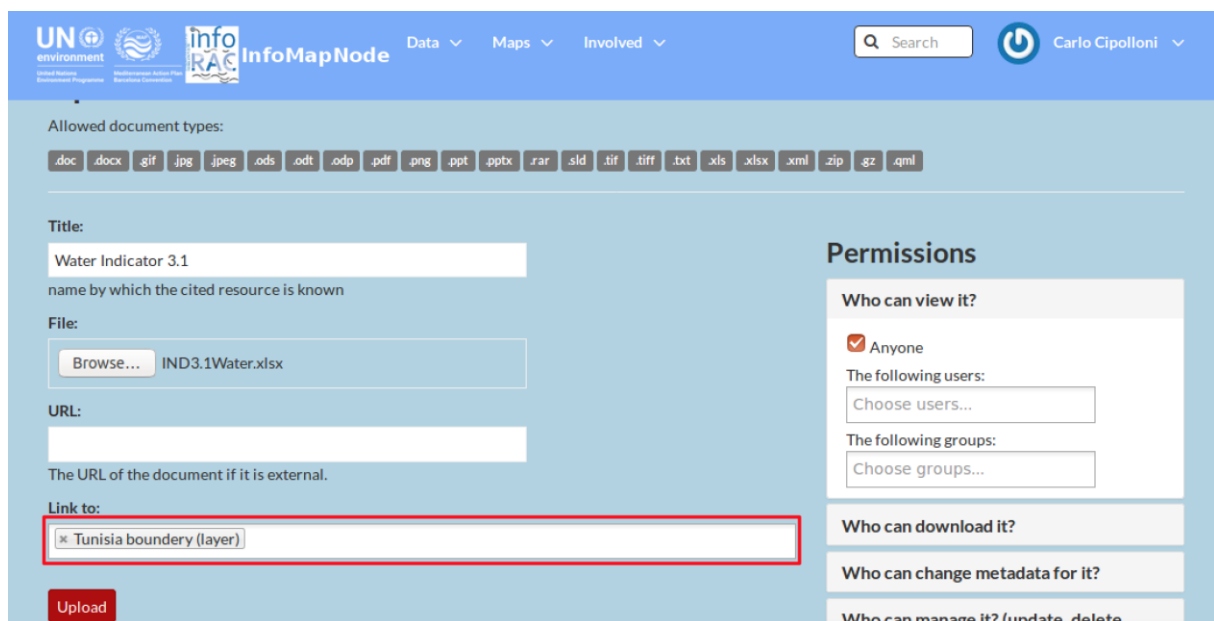


Figure 12. Document upload page, during this phase the user can link some data service, as well as define the permissions.

Upload Layers

In the InfoMapNode authentication side, it is also possible to upload your **Layer** into the system, allowing to create **rasters** and **vector** layers that can be shared or used to create maps.

First click on “**Layer**” button on Data Menu, then click on “**Upload Layers**” button, after that, user can upload file in two ways:

- drag-and-drop a files onto the gray area;
- Browse and select the files from file system.

The files will appear below the drag-and-drop area, and the system will automatically specify the file format as Shape files or GeoTIFF (Figure 13). In case a required file is missing (for shape files) it will be requested to add it before proceeding with upload.

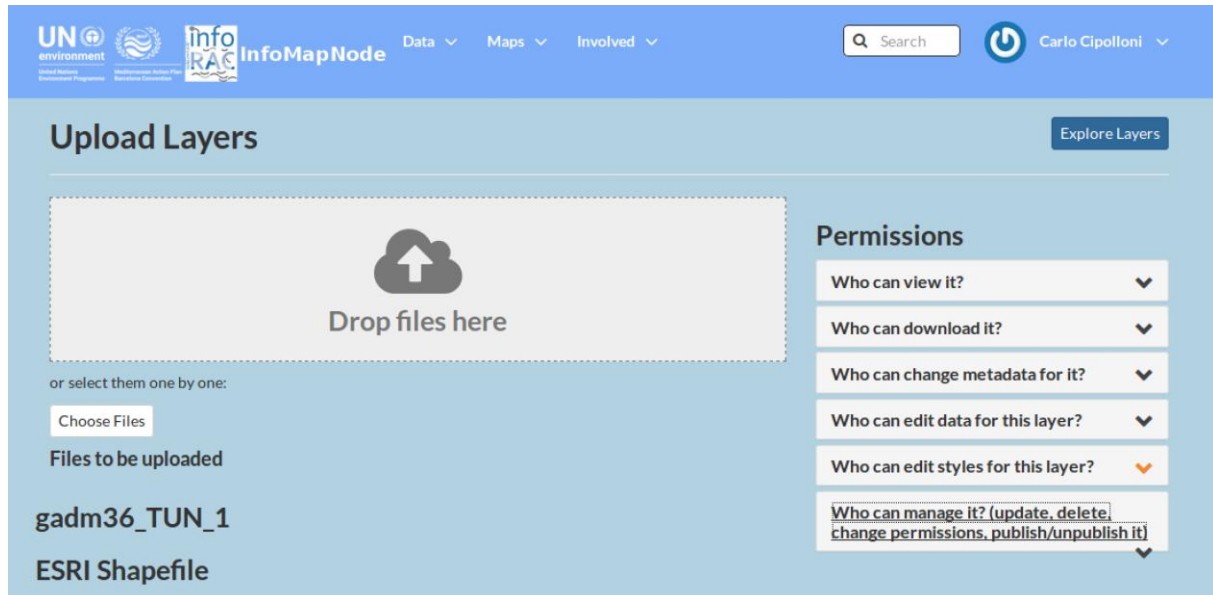


Figure 13. Upload layer page to upload a spatial dataset, during this phase the user can define the permissions.

Using **Explore Layers** → **Upload Layers**, a user can upload a specific layer. Before starting upload it, layer **Permissions** need to be specified (Fig 13) on **the right side of the gray drag-and-drop area** (see previous section for details on permissions). Clicking on “**Upload Files**” the process will start.

After a successful upload, five options on how to continue managing the data will appear (Figure 14):

Layer Info: it allows to access the **Layer View** interface, editing specific layer, including changing Permissions for it.

Edit Metadata: it drives user to interface where detailed layer information are provided. In the section below, this function will be explained more in detail.

Upload Metadata: it allows to upload an existing xml file of metadata associated to the layer.

Upload SLD: it allows user to upload an existing style file, in order to associate a specific legend to a layer.

Manage Styles: it allows user to select a predefined style for your layer amongst the styles already created. This complex function should be reserved for administrators or very advanced users.

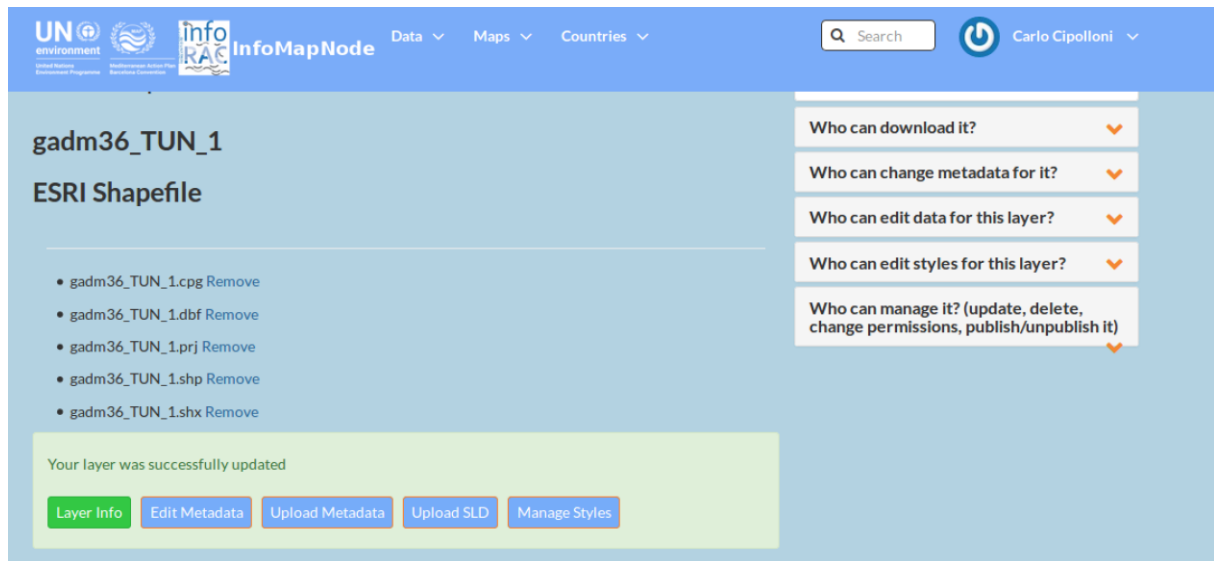


Figure 14. After upload dataset there are some functionality available to manage layer info, metadata and data style representation.

Metadata management

Providing additional information about layers or documents after it has been uploaded, it is possible to specify data and make these more accessible to other users.

Thereby, providing metadata helps to identify and search layers and documents, aiming to increase overall user experience of the platform.

After a layer/document has been uploaded, it is possible to **Edit Metadata** (figure 15), in order to start providing more information about the specific layer. Some fields are automatically filled.

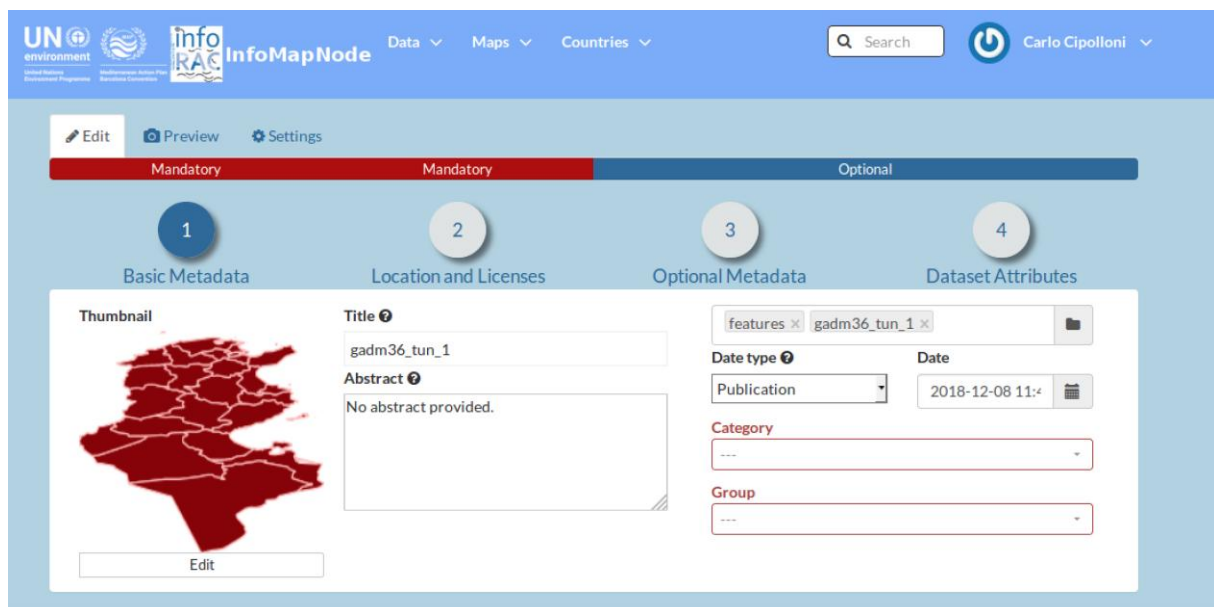


Figure 15. Metadata editor, there are some tabs to manage different information.

- **Title:** Provide an explanatory name for your layer. The name should not follow the naming conventions for data files but instead correctly reflect main aspects of the data. Start the title with a geographical specification (country, region, or “Global”).
- **Abstract:** Provide a brief description for your layer. This text will appear together with your layer e.g. in the search results.
- **Keywords region:** Select one or more countries that the layer represents.

- **Keywords:** Specify keywords for your layer to appear in search results.
- **Supplemental information:** Specify what the attributes represent by giving a brief description of each attribute. This information is the only explanation other users will have to understand the attribute short names and therefore it is critical that a description is provided. The supplemental information will appear under your layer in the Layer View interface when you click Show/Hide.
- **Attributes:** Provide further descriptions of all the attribute short names or change the display order of the attributes.

When metadata standard and mandatory elements are filled click **“Update”** at the bottom to save and enter the Layer/Document View interface.

Style a Layers and Create Rules

This section is helpful for advance level user as **Admin** to display certain Data attributes of a layer, it is possible to modify the appearance of the layer, i.e. style the layer, in a variety of ways. It can include control over the colors of lines (e.g. roads) or areas (e.g. regions), as well as the display of labels (e.g. names of cities). It is also possible to use rules to support complex symbolization schemes based on database and scale conditions.

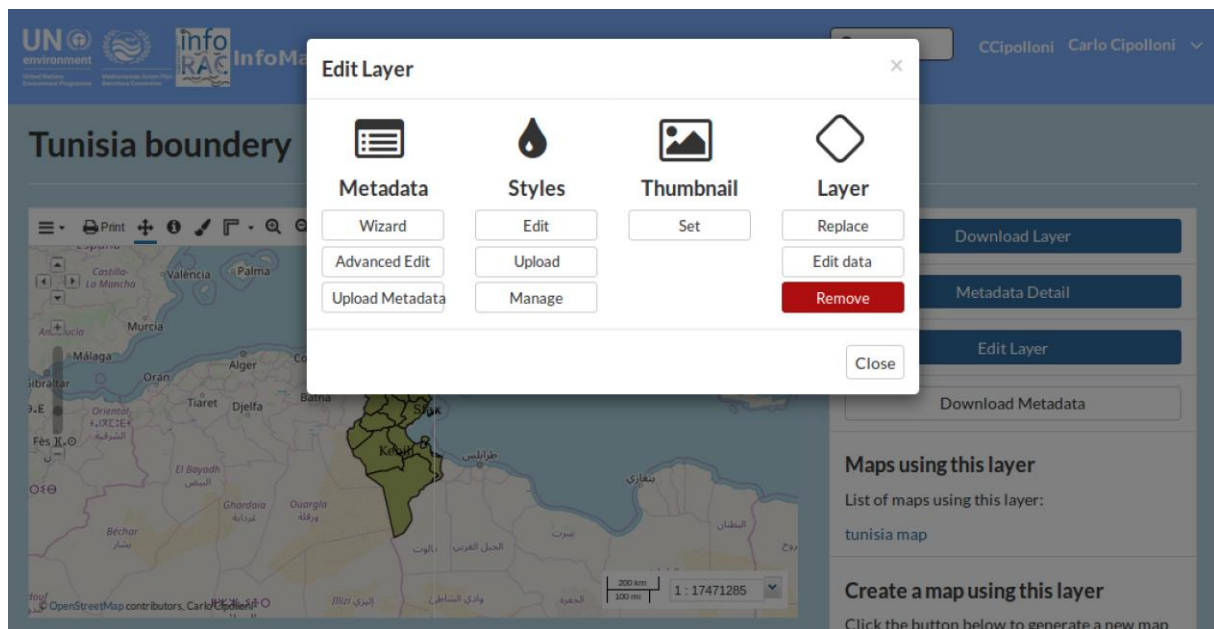


Figure 16. default mode with different tools for editing styles.

Below, there are a few different ways to begin editing a style in InfoMapNode:

- After uploading a data layer, clicking on **“Layer Info”** to view the layer and using the red button **“Edit Layer”** and **“Edit Styles”**. (Figure 16);
- In the **Layer View** interface, using the blue button **“Edit Layer”** and **“Edit Style”**, or directly on the **Layer Styles** palette symbol (Figure 17);
- In the **Map Composer** interface, using the **palette symbol**.

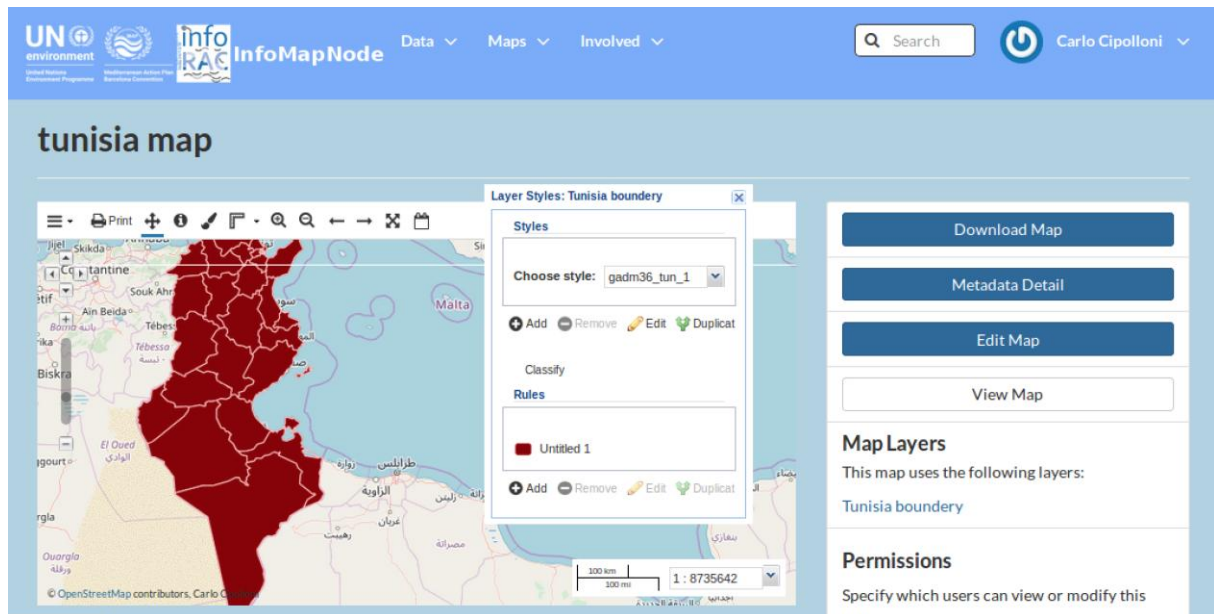


Figure 17. Layer style pop-up window to set-up the representation rules.

Following any of the above procedures, a pop-up window will allow you to choose Style and set Rules (Figure 18). Here you can Add, Remove, Duplicate or Edit rules.

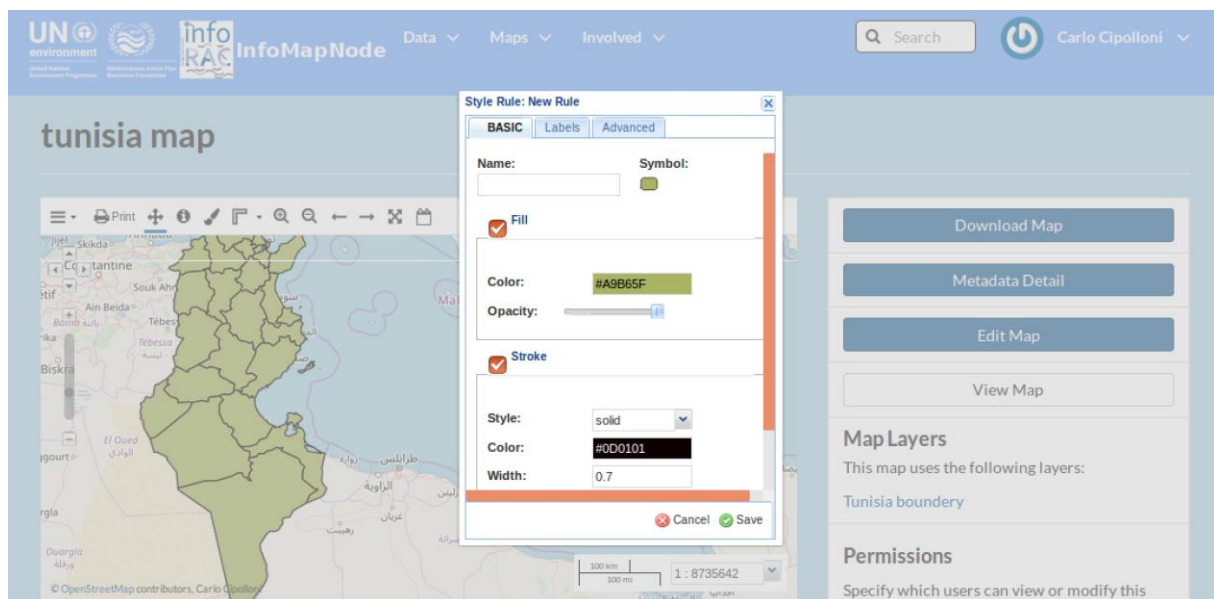


Figure 18. Some example how manage and modify the style of data.

To create a color scheme for Style Rule, select it and use **Edit symbol**. Another pop-up window will appear where it can be find three tabs called

- a. Basic
- b. Labels
- c. Advanced

It contains options for defining rule. Rule aspects, that you set under one of the tabs, are cumulative for the entire rule. This means that you can create a rule setting for color in the Basic tab and then a database condition to control the display of that color in the Advanced tab.

In the **Basic** tab it is possible to change the following style options:

- Name of the rule

- Symbol to represent a feature and its size and rotation
- Color and opacity (transparency) of a feature
- Style, color, width and opacity of the line of the feature.

Figure 18 shows how the default style of the Basic tab can be modified changing the rules of representation of symbols, like color and stroke.

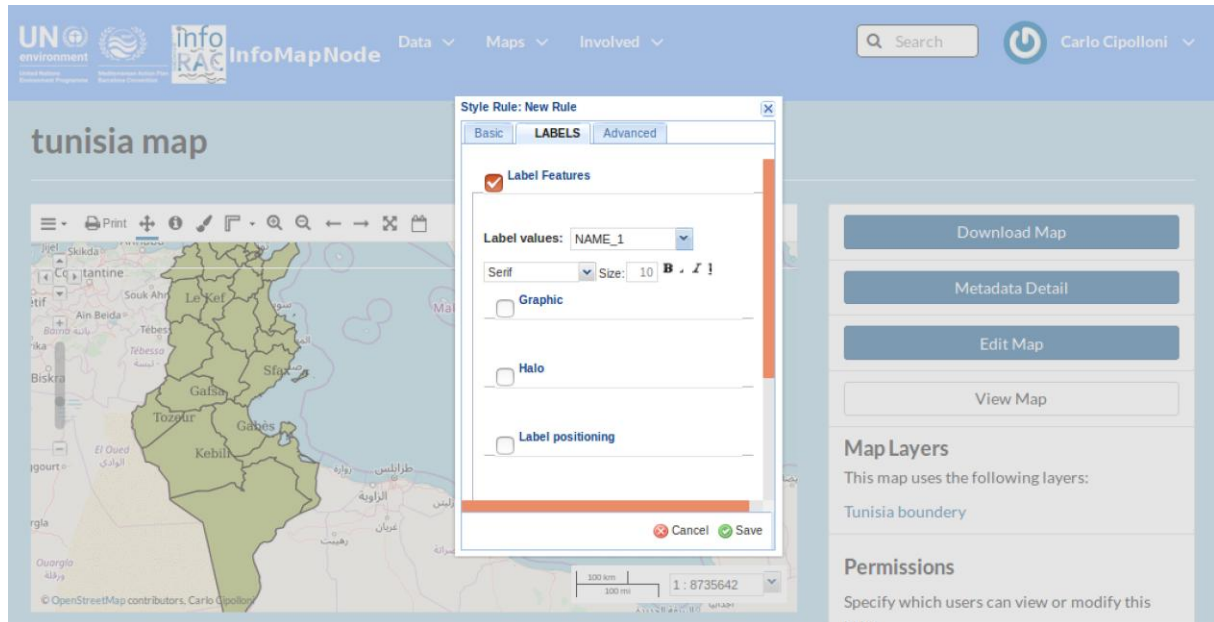


Figure 19. Label tab of style editor window to manage and modify some information in the representation.

In the **Labels tab** it is possible to do the following actions:

- Select a field to use as content for your labels;
- Choose a font type, size and style for the Label;
- Choose the color for the Label as well as the opacity;
- Choose a halo (background color) including color, size, and opacity.

The user should know the meaning of short name for a particular attribute, in order to set the label values. The **Label Feature** box (figure 19) has been ticked and the Label values is set on “Name_1”. In the example below, this short name represents name of warehouses location that need to be displayed in the layer.

In the **Advanced tab** it is possible to do the following actions:

- **Limit** the visualization of what has been defined in the Basic and Label tabs in terms of one or more database conditions. It is also possible to set multiple groups of conditions.
- **Limit** the visualization of what has been defined in the Basic and Label tabs in terms of minimum and maximum scale display.

In order to limit the conditions of how the values are displayed the user must know what the name of a particular attribute represents. Moreover, the range of values that exists for that attribute also has to be known in order to create a meaningful display of the data (which will be visible in a legend).

Multiple rules in the same layer can be used to create a visual distinction among different values or ranges of values. Different rules and associated color schemes will be represented in a **legend** for an appealing visual reference. Use **Add symbol** to create new rules, or Duplicate existing rules before editing.

Edit a Layer's data

Depending on permissions that user has, it is possible to edit data directly in a vector layer by modifying existing features:

- Select the layer in the left-side panel in the Map Composer interface
- Otherwise click on a specific point, line or polygon feature in the map and a pop-up window with all attribute values will appear.
- Click on **Edit**, all points defining the shape of the feature will become visible in the map.

In the example below the point that needs modification is highlighted in blue (Figure 20)

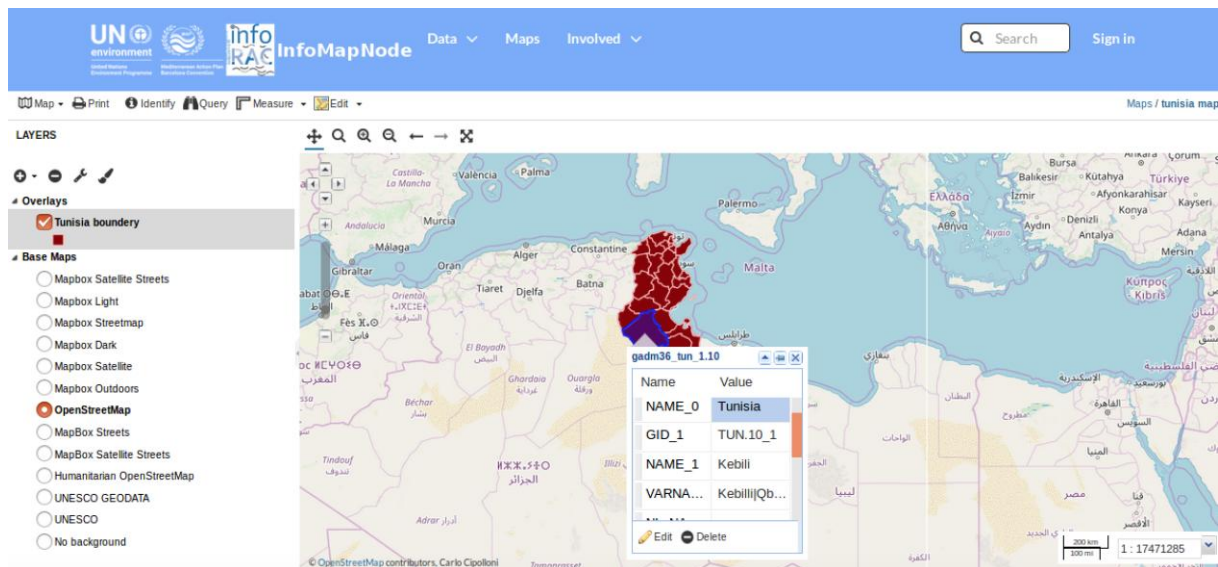


Figure 20. Map composer view with Editor window to modify and manage dataset content.

Since a feature only has one geographic reference simply drag-and-drop the symbol to the new location.

- Edit the attribute values in the pop-up window and then click on “Save”.

Create and remove data in a layer

To generate new data directly from the layer, the user can:

- 1) select the layer in the left-side panel in **the Map Composer interface**;
- 2) Use the “**Edit**” and “**Create**” button. (Figure 21)
- 3) If you wish to generate a point on the map **simply double-click** on the location and a feature window will appear with no associated values.
- 4) The attribute values needs to be provided before clicking Save.

To generate data in the shape of lines or polygons to symbolize e.g. roads or flood-areas, click once at the starting location and double-click at the endpoint. A pop-up window will appear with empty fields for you to provide the attribute values.

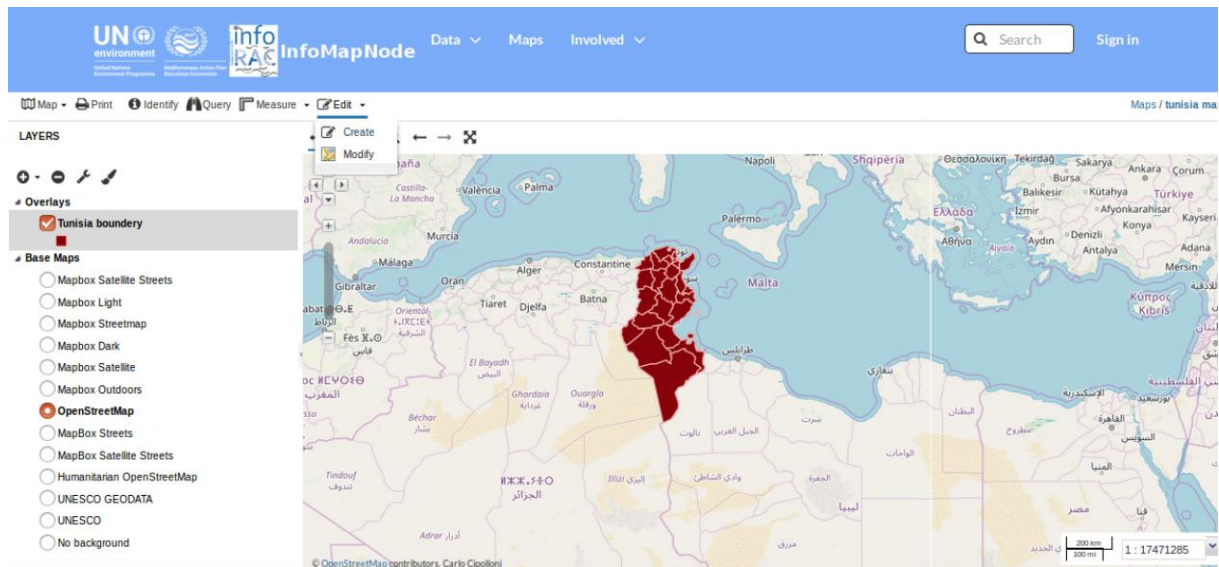


Figure 21. Map composer management of editor or map manipulation.

To remove existing data, or newly generated data, you can use:

- 1) “**Edit**” and “**Modify**” buttons in the toolbar and select the feature.
- 2) “**Delete**” option can be used to remove the feature completely from the layer after you confirm your choice.

Remove and replace layers, maps and document

With an appropriate permissions, it is possible to **remove** or **replace data, maps** or **documents** by simply clicking on the selected item and using

- The blue **Edit (Layer/Map/Document)** button.

A Popup box allows the user to **remove/replace** layers and documents, and

- To remove maps (Figure 22). Replacing a layer, the user has to upload another set of data containing the same attribute structure as the old one.
- Removing a layer/map/document, it will be asked to confirm the selection before final removal is completed.

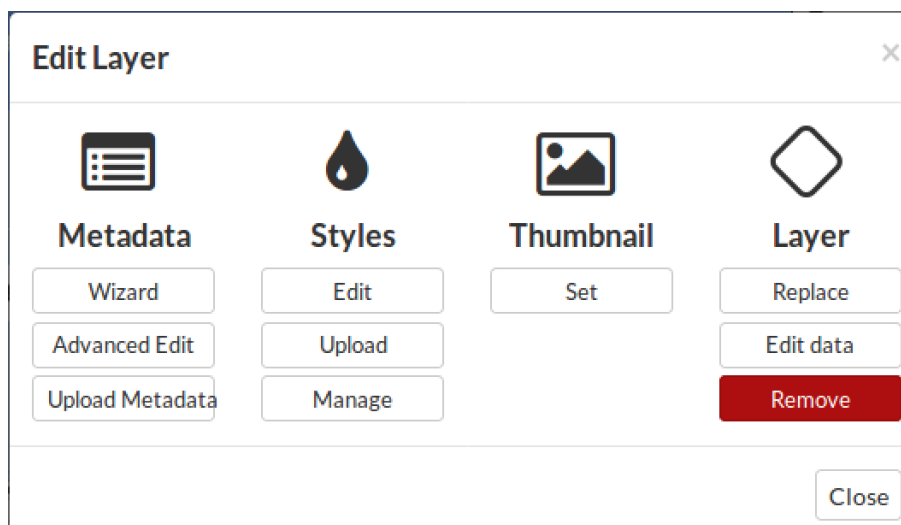


Figure 22. Remove and replace layer.

Reporting data flow system guide

In this part of the document, it will be presented the Data Centre InfoMAP component and how a authenticated user can manage a data flow related to a specific reporting procedure.

Obtaining permission to deliver in IDC

In order to use and manage the data flow call, first time users need to contact INFO/RAC Manager (info@info-rac.org) for the right to upload official national data required under the ENI SEIS South II project.

Normally, all nominated persons have already received their credential by email to enter in the system. They granted immediately if you already hold a relevant Data Centre role: Data flow PCPs and NRCs for the three topic of data indicators. Otherwise the request will be checked with the ENI SEIS II South national focal point for your country;

New users will receive an InfoMAP username and password automatically;

Data submission process

Member States are encouraged to create one envelope for their annual delivery in IDC under this data flow.

- All files relating to the annual delivery should be uploaded into this envelope. Additional envelopes should be used for subsequent submissions of revised information only.
- A recommended convention for naming and describing files in the IDC envelope is given in this document.
- A step by step guide on creating the IDC envelope and uploading the files is also provided in this document.
- The countries will deliver all the data flows into the InfoMAP Data Repository in the Data Centre <https://idc.info-rac.org> as XML or Table template files.

The date of delivery recognised by INFO/RAC is the date of ‘effective release’ of envelope(s).

‘Effective release’ means an uploaded file which has passed the InfoMAP Data Centre Repository automatic blocking QA checks.

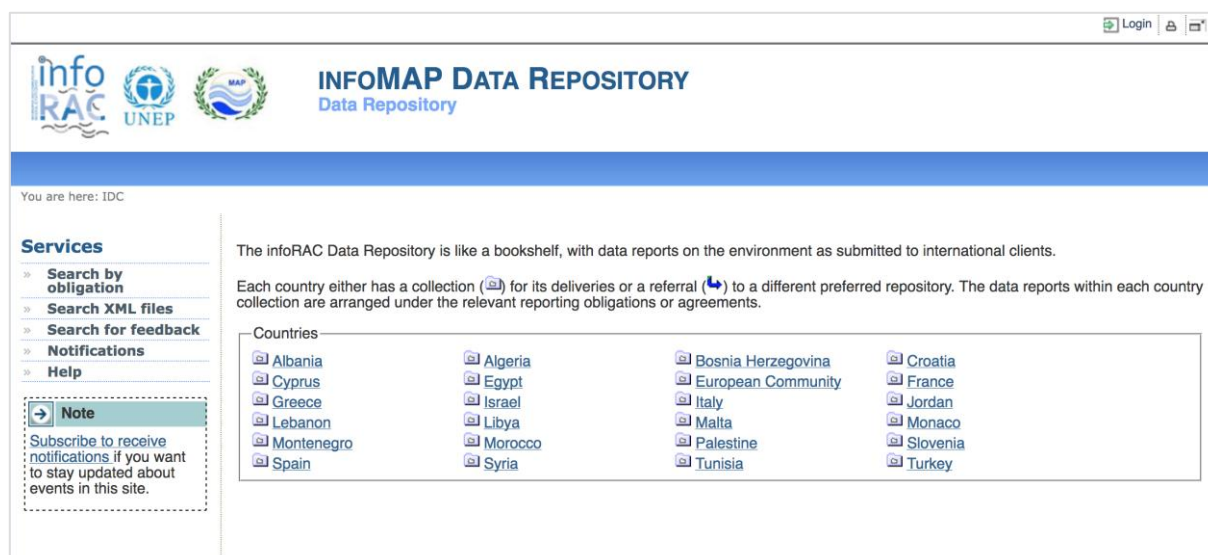


Figure 23. InfoMAP Data Centre repository.

Navigate to the Central Data Repository (IDC – figure 23) at: <http://idc.info-rac.org> and reporter can proceed in the delivery actions:

- after that log-in with your credential as reporter clicking on the “**Login**” button on the left side of the screen;

- Select your country;
- Select from the repository the obligation directory of H2020 Indicators (figure 24 and 25) and then the specific data flow (Water, Industrial Emission, Waste).
- Choose the button “**New envelope**” on the right of your screen.

A helpful envelope title is useful for IDC users. An example would be: “Reporting on ENI SEIS II South H2020 Data flow indicators on water”.

The field “**Relating to which year**” refers to the dates of the exceedances not the date of your delivery.

Use the “**Add button**” at the bottom of the screen to create the envelope.

Open the envelope and activate task on the right of your screen, this means that the envelope is now reserved for your use.

- Nobody else can upload files to this envelope while it is reserved for you.
- You can modify it later if you need to handover the uploading task to another person.
- Uploading a single file or a zip file which should not be unpacked
- Browse on your own system to select the file to upload.

The Id field allows you to assign a new file name in IDC to the file being uploaded. The file will have the keep the name from your system if you leave the Id field empty.

You can use the Id field to allocate the file name according to the recommended naming convention described earlier in this guidance document. Remember to include the file type extension (.xls or .zip) because the id must be unique.

The Title field allows you to assign a description in IDC for the file in addition to the name.

You can use the title to allocate descriptions according to the recommended description convention outlined earlier in this guidance document.

- Click on “**Add button**” to upload the file into the envelope.
- Mark the “**Restricted from public view**” check box if the file should not be visible to the public in IDC.

Restricting files is not normal Reporting system practice so there should be a good reason for taking this step

Users see the file with:

- the recommended name
- the additional description

Only authorised users will be able to see your file before you complete your delivery by releasing the envelope.

The file can be opened by clicking on the central icon, which is outlined in red on the diagram.

To edit the recommended name, use the checkbox and the rename option.

To edit the additional description, click on the file name.

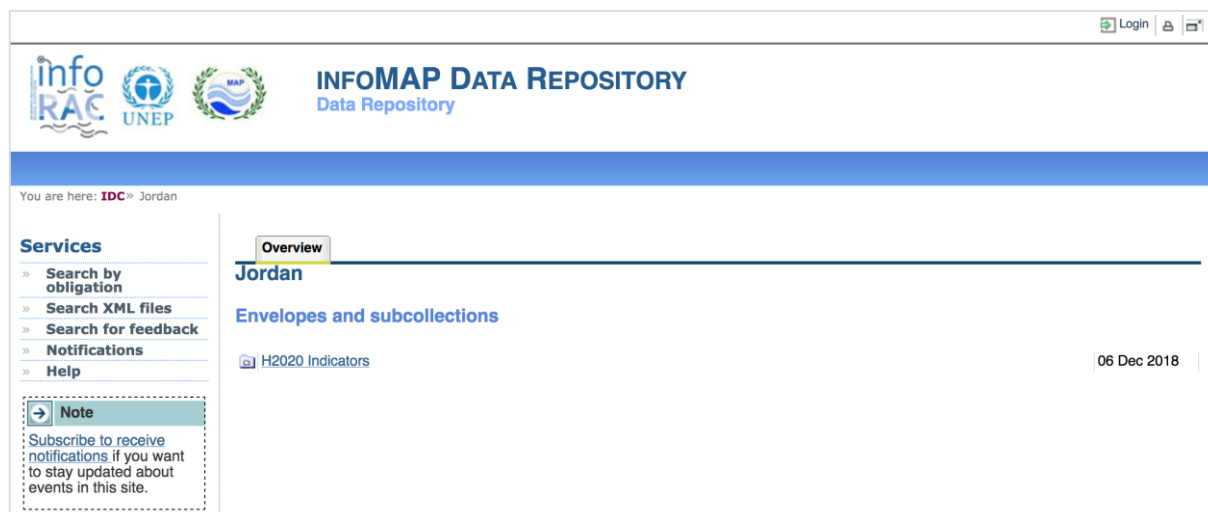


Figure 24. H2020 indicator data flow repository in each ENI SEIS participant country.

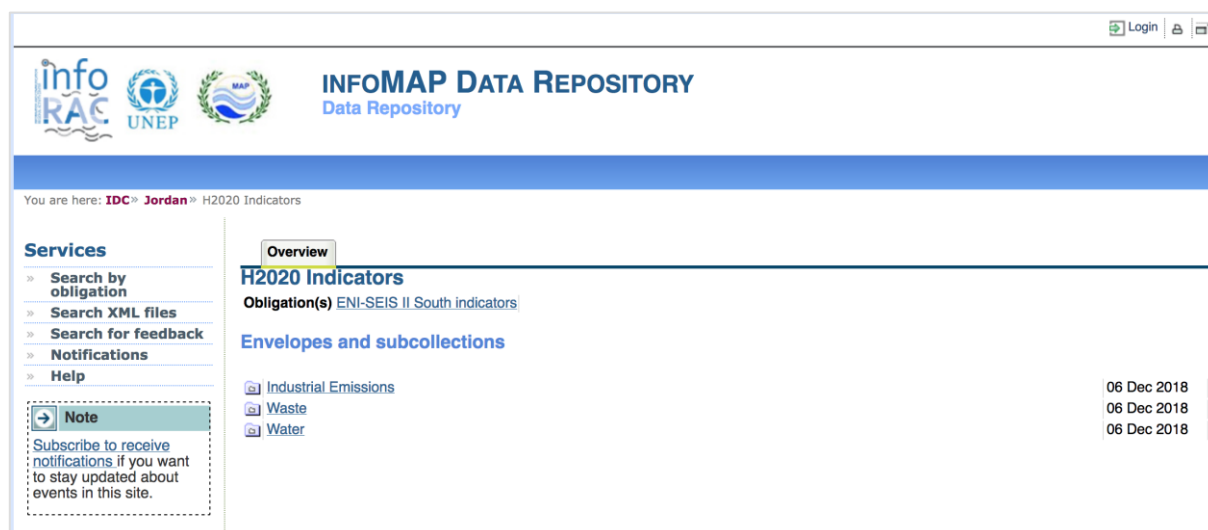


Figure 25. Different Indicators data flow repository within H2020 data flow.

Completing your delivery

Click on the “**Release envelope**” button on the right of your screen only when you are satisfied all necessary files are in the envelope. The envelope is considered as read for official submission when it is “**released**”. At this point the term “**Draft**” is removed.

The envelope contents cannot be modified when the envelope has been released.

Procedure to collect data template

The process to submit the requested information is very simple:

- 1) Download the template provided for tabular data;
- 2) Fill in the template in your personal computer;
- 3) Upload the filled in template into the InfoMAP Reporting system using delivery folder under (figure 24) H2020 Indicator (the delivery is different for the three different data flow: water, industrial emission and waste – figure 25);
- 4) Download the template provided for spatial data; Upload the requested spatial data as separate files or in a ZIP file and upload these on the InfoMapNode platform;
- 5) Complete the task (=equivalent to submit the information).