InfoMAP regional infrastructure -Overview – July 2020

Established by the Barcelona Convention, the mission of the Information and Communication Regional Activity Centre (INFO/RAC) is to provide adequate information and communication services and infrastructure technologies on public participation of Barcelona Convention (Article 15) and on reporting (Article 26) related to the issue for the protection of the Mediterranean marine and coastal environment. From January 2010, the functions of INFO/RAC in ensured by the Italian Institute for Environmental Protection and Research (ISPRA).

INFO/RAC is responsible to manage dataflows related to the Barcelona Convention reporting obligations (BCRS, NBB, and IMAP), data policy, data exchange protocols, online reporting tools, as well as further developing the governance IT platform for common standardisation and specification of data.

INFO/RAC has designed the InfoMAP System that is the UN Mediterranean knowledge platform conceived to provide and share data, information services and knowledge for the benefit of the Mediterranean Action Plan (MAP) components and Contracting Parties, based on the Shared Environmental Information System (SEIS) principles. It is also able to support the Mediterranean Quality Status and the State of Environment Report. Its main scope is to:

- Provide access to reporting system;
- Harmonise data structure and models;
- Create a common catalogue of resources;
- Integrate data with interoperability layer;
- Create a common platform to view, query and analyse data;
- Produce tools to support data & information dissemination.

The InfoMAP platform represents the unique access point to the all the InfoMAP nodes and other data services at regional level. The InfoMAP platform is composed of:

- InfoMAPNode (Geoportal to orchestrate the Spatial Data Infrastructure);
- The Data Centre Reporting system;
- The MEDPOL Info System;
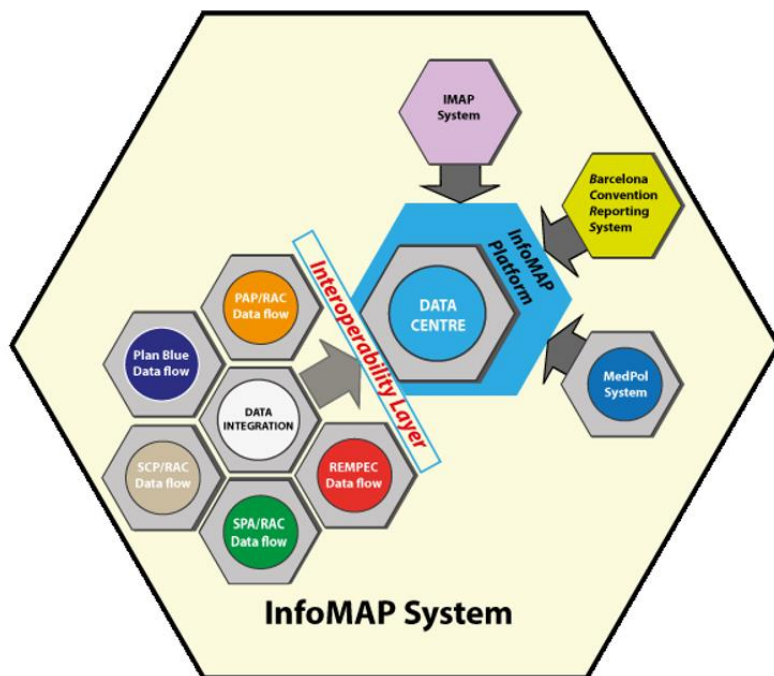- The IMAP Pilot Platform.

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Figure 1: InfoMAP System

InfoMAPNode

The InfoMAPNode is the portal to manage and access to the Spatial Data Infrastructure (SDI). Developed in the biennium 2018-2019, the InfoMAPNode is an open source geoportal for sharing with different level of authentications, geospatial data, maps and related metadata of relevance for the Mediterranean area. It represents, also, the entry point to InfoMAP Spatial Data and Metadata catalogue based on open source suite. It is composed by a set of technical and non-technical components that facilitate the sharing of geographic information. The main components are:

- Spatial Data Management system to store, query and manage directly the data in the database;
- A Catalogue system with a specific discovery service to harvest, search and query metadata and with integrated Metadata editor. the system is implemented on the open software component GeoNetwork;
- Network Service system based where data are distributed and elaborated via Web Service (mainly following OGC/INSPIRE Standard);
- A portal within a client to search, view, query and analyze the spatial data. It is based on the software package GeoNode.

The main functionality of InfoMAPNode application are: upload, manage and share geospatial, non-spatial data; create and modify metadata; create and share interactive maps and collaborate and interact with other users or group of users.

2

In the framework of the EU funded "ENI-SEIS II South Support Mechanism" project, UNEP/MAP and EEA collaborate to support the implementation of the infrastructure and data management component of the project. This implies specific support to ENI South countries in enhancing their national infrastructure and data systems, as well as adjust and extend as appropriate the regional data infrastructure and management systems to cover the data management needs for assessing the agreed H2020 Initiative Indicators. The ENI SEIS II South project further builds on the Decision IG.21/3, COP 18, Istanbul, regarding data management in Mediterranean by developing a Shared Environmental Information System (SEIS) supporting the regular production and sharing of quality assessed environmental data and indicators.

The InfoMAPNode is now available as final release version 1.1 online at: http://infomapnode.info-rac.org/. All the SDI components are realized within the INFO/RAC mandate and are already available and running in the Infrastructure. The platform provides users with visualisation and interaction features with the most advanced maps. Enabled users have the possibility to create maps by superimposing data loaded on the platform together with visualization services provided by other servers.

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The Data Centre

At the core of the InfoMAP System, the INFO/RAC Data Centre (IDC) aims at offering a reporting system that is officially used by the countries, based on common standards and aligned with the EEA's reporting system Reportnet2. The IDC is like a bookshelf with data reports on the environment as submitted to International clients. Each country either has a collection for its deliveries or a referral to a different preferred repository. The data reports within each country collection are arranged under the relevant reporting obligations or agreements. The scope is to improve the harmonisation and standardisation of the management of data flows, from the detailed definition of the required data to the delivery of the final information products such as reports or environmental indicators. The services available through the IDC are the following:

- People directory : stores users credentials and information, allows to implement a single sign-in mechanism between InfoMAP services;
- Groupware : web application that offers a set of tools useful to share documents; drafts, minutes, etc. among the MAP Components of UNEP/MAP;
- Data Dictionary : component system able to manage the different data flow, with defined vocabularies/code lists, quality control, etc;
- Data Repository : share directory where each country can upload their data, following the different data flow procedures;
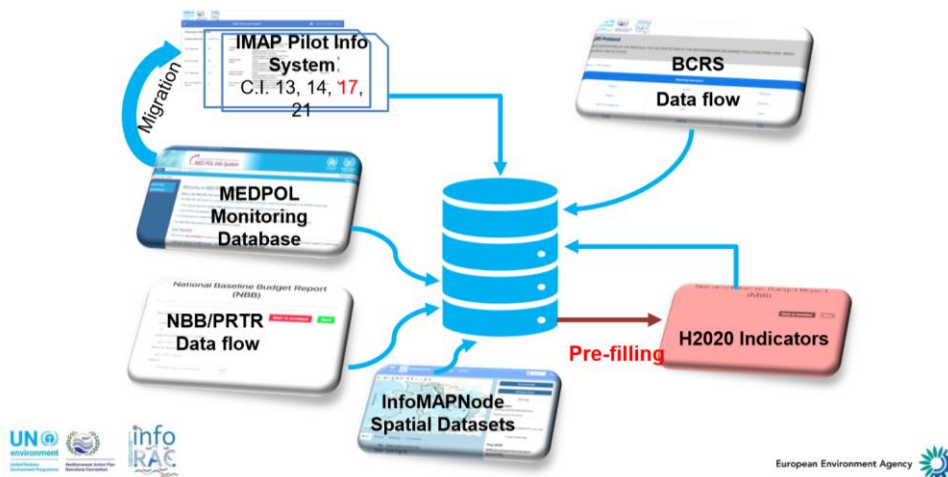- Web form : web tool to compile the reporting obligation data flow.

Figure 2 Schematic representation of the reporting system - Data integration in InfoMAP database

Currently, the IDC manages two data flows to support the obligation of Barcelona Convention (Barcelona Convention Reporting System (BCRS), National Baseline Budget Reporting (NBB)) as well as the Horizon 2020 data flows.

The Barcelona Convention Reporting System (BCRS) is the InfoMAP module that allows Contracting Parties to report under article 26 of the amended Barcelona Convention and several articles of different Protocols of MAP. The main objective of the system is to collect, store, manage and process compliance reporting data (textual and numerical) regarding the implementation of the Barcelona Convention and its Protocols. The MAP Secretariat has the legal responsibility of BCRS, whereas INFO/RAC is responsible for its operation and development.

The BCRS data flow within the Data Center is subdivided in seven mandatory protocols that Contracting Parties have to report:

- Dumping Protocol;
- Land-Based Sources (LBS) Protocol;
- SPA Protocol;
- Prevention and Emergency Protocol;
- Offshore Protocol;
- Hazardous Wastes Protocol;
- ICZM Protocol.

The National Baseline Budget (NBB) is an inventory of the pollutant's releases from all substantial Land Based Sources of pollution reported by the Contracting Parties on yearly basis in order to monitor the implementation of the Strategic Action Programme (SAP) and the National Action Plans (NAP) adopted by the Contracting Parties in agreement with the Art. 5 of the LBS protocol. MEDPOL Programme is in charge for the follow up work related to the implementation of the LBS and Hazardous Wastes Protocols. MEDPOL Unit assists Mediterranean countries in the formulation and implementation of pollution monitoring programmes, including pollution control measures and the drafting of action plans aiming to eliminate pollution from land-based sources. INFO/RAC is responsible for the operation and development of the NBB data flow. NBB data flow is integrated into the Data Centre since 2018.

The BCRS and NBB data flows are completely operational, and the data are provided by the Contracting Parties through the web forms.

The Data Centre hosts also the **Horizon 2020 data flows** put in place with the support of the ENI SEIS II South project to enable ENI south countries to report data needed for the production of the Horizon 2020 indicators. In the first step a specific repository for the countries reporting on H2020 is set-up to provide indicators via excel file template, defined and prepared by INFO/RAC in a standard way.

The MEDPOL Info System

This system provides tools to collect, manage, share and store MEDPOL pollution monitoring data and information (including defined location of monitoring stations). MEDPOL has the legal responsibility of the MEDPOl Information system, and INFO/RAC is responsible for its operation and development.

The IMAP Pilot Platform

In the framework of the Programme of Work and Budget for 2018–2019 of UN Environment/MAP (Decision IG.23/14), INFO/RAC is leading the work on the development of the "InfoMAP platform for the implementation of IMAP fully operative and further developed, connected to MAP components' information systems and other relevant regional knowledge platforms, to facilitate access to knowledge for managers and decision-makers, as well as stakeholders and the general public" (output 1.5.1).

The EU funded EcAp-MED II Project is supporting this output by the development of a Pilot IMAP Compatible Data and Information System (IMAP (Pilot) Info System), that would enable the Contracting Parties to start reporting data as of mid-2019 for selected 11 IMAP Common Indicators and laying down the basis for building a fully *operational IMAP Info System as provided for by Decision IG.22/7.*

The IMAP (Pilot) Info System has been developed by INFO/RAC in close consultations with UN Environment/MAP Components. The IMAP (Pilot) Info System receives and processes data according to the agreed Data Standards (DSs) and Data Dictionaries (DDs) that set the basic information on data reporting within IMAP.

INFO/RAC has also developed the Data Standards and Data Dictionaries for each of the 11 selected common indicators, covering all **three clusters of IMAP** (Biodiversity and non-indigenous species (NIS), Pollution and Marine Litter, Coast and Hydrography).

The IMAP Pilot Info System is ready, fully operational and able to collect data from 1st July 2019. The IMAP Pilot Info System website is accessible to the general public.

The Horizon 2020 data flow

The Horizon 2020 data flow collects data for the set of indicators selected for the second phase of H2020 (2015-2020). National reporting is managed and coordinated by data focal points and data reporters nominated by each country. They have different roles and tasks, which are the following:

- Data Focal Point - an expert or group of experts nominated by the country and authorised to be the main contact point for the data submission to INFO/RAC. The main role of Data Focal Point is to coordinate the national network, review the data uploaded and validate the data submission.
- Data Reporters - responsible for delivering national data to the data repository. They receive upload permissions for specific folders only. The main role of data reporter is to collect data from the national team in the standard format and upload them into the information system.

The data flow followed the agreed common reporting format and detailed indicator factsheet developed for each H2020 indicator[1]. All data flows are subject to Quality Checks (QC), allowing to document methodological aspects, such as definition, units, geographical and temporal coverage, method for gap filling and uncertainties. Horizon 2020 data flow and reporting from partner countries is monitored via a dedicated dashboard[2].

Data structure definition : The H2020 dataflow is based on templates "spreadsheets"[3] (excel files processed by an automatic procedure) developed by thematic experts, distribution of "geotemplates"[4] or shapefile (coastline, administrative units, hydrological basins, coastal cities, etc.).

Developing webforms and data model for H2020 reporting : Webforms can offer users templates with pre-filled data harvested from different databases (external databases or other reporting for example first phase of the Project ENPI SEIS). The logical structure of a database needs to be defined to determine in which way data can be stored, organized and manipulated. For that reason, data model is the entry point for webforms development.

Considering the data delivery for the H2020 reporting coincides with the finalisation of the webforms two options were proposed to the countries:

1. Access the webforms that have been prefilled in order to double check the consistency with the spreadsheets and to make the necessary changes before submitting.
2. If there is no discrepancy between the spreadsheets and the webforms, country will upload the spreadsheets that will be transformed in xml to be processed for quality check procedures.

Code lists : In order to store all the data in a database code lists need to be adopted to model the database and relate all the elements in the different tables. Furthermore, standardized code lists ensure integration with other reporting tools such as Reportnet or international reporting. ISO standards are used to ensure internationally recognized codes that designate every element[5], for instance countries using two-letter codes (ISO alpha-2).

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[1] **Indicator factsheets**: https://eni-seis.eionet.europa.eu/south/areas-of-work/indicators-and-assessment

[2] Dashboard https://eni-seis.eionet.europa.eu/south/areas-of-work/data-and-statistics

[3] **Link to Data submission (spreadsheets):**
https://eni-seis.eionet.europa.eu/south/areas-of-work/data-management-and-infrastructure

[4] **Link to Geotemplates and geotemplates documentation:**
https://eni-seis.eionet.europa.eu/south/areas-of-work/data-management-and-infrastructure/spatial-data-collection-and-update-under-eni-seis-ii-south-project

[5] **Link to data dictionaries**: https://eni-seis.eionet.europa.eu/south/areas-of-work/indicators-and-assessment/all-data-dictionaries/view

Pre-filled solutions : Pre-filling is already implemented in InfoMAP system for instance for the BCRS and NBB reporting, however it has not been deployed for the H2020 data flow.

Towards integration of Mediterranean data flows : As part of the development and maintenance of relevant Mediterranean data flows, EEA and Info RAC explored the possible integration of data flows from different sources, e.g Horizon 2020 data flows are fully integrated and accessible both from the InfoRAC Data Centre and from the recently launched WISE MARINE platform under the Regional Sea Convention Section. The long term objective of such development is to ensure integration of data flows from Barcelona Convention Integrated Monitoring and Assessment Programme (IMAP) Information System developed by INFO/RAC with the EU Marine Strategy Framework Directive (MSFD) reporting contributing to a coordinated assessment of Good Environmental Status (GES) of the Mediterranean Sea.