Data Interoperability in the French Marine Environmental Information System (SIMM)

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SIMM ("Système d'Information pour le Milieu Marin") is the Marine Environmental Information System created in 2018 at the request of the French Ministry for Ecological and Inclusive Transition. SIMM was created to support public decision-making, to provide France citizens with information and to support European data policies related to the marine environment such as Regional Sea Conventions or European Directives including: MSFD (Marine Strategy Framework Directive), WFD (Water Framework Directive), and MSP (Maritime Spatial Planning).

SIMM provides a unique framework for bringing together standardized descriptions and for providing access to marine datasets processed in various contexts including observation data from monitoring centers, data products from GIS maps and models, and indicators oriented toward public policy decisions such as the indicators required by MFSD. SIMM manages both environmental and human activities data (fisheries, marine renewable energies, marine traffic, etc.).

Marine data in France are provided by many producers and managed through various databases and information systems. The SIMM portal "milieumarinfrance.fr" is a public service, which allows for sharing and retrieving, in a one place, open access marine data for scientists, environmental stakeholders and the general public.

In the European Marine Strategy Framework Directive (MSFD), significant advances have been achieved both at national and transnational levels including data policies, sharing of environmental data and in the technical implementation of distributed spatial data systems (metadata management, portal accessing distributed repositories, etc.). The creation of a new national information system offers the opportunity for integrating all current good practices in marine data management.

Data repositories: SIMM "common language"

SIMM governance has established an authority dedicated to interoperability: the Repository Administration Service (SAR). SAR's roles are to manage the SIMM repositories and to implement and develop the technical means to provide a common language within SIMM's framework, which brings together more than 20 information subsystems. SAR's goal is to enable the interoperability of databases within SIMM while ensuring that it is connected with other systems (federal, public, or international systems).

SAR is required to provide common vocabularies to describe various parameters, such as a taxonomy for species as well as physics, chemistry or biology observation parameters. SAR is careful not to re-create existing data repositories if the already existing ones match with marine environmental community needs. As such, through a detailed analysis of existing repositories in other national or international organizations, SAR chooses the one repository that best suits SIMM needs. If no repository already exists, SAR keeps open the opportunity to create a new one. In any case, compliance

with international standards is a key point for the success of the “common vocabulary” repositories integration.

Thus, SAR must ensure the interoperability of SIMM with international standards, such as the ones developed under MSFD. Therefore, SAR has been commissioned to represent France at the Technical Working-Group on Marine Data of MSFD in order to integrate their recommendations and best practices in SIMM repositories.

Data models

SAR is also in charge of data models management, which allows databases to organize their data to encourage exchanges and reuse at least at the national level. For instance, SAR applies ISO and OGC standards, and INSPIRE and IHO recommendations about data models. A modeling software such as Enterprise Architect is used in order to be able to exchange models with other standardization organizations.

Cooperation between French standardization organizations

SAR works closely with the other French standardization bodies. For example, a working group has been set up with SANDRE (equivalent of SAR for the French Fresh Water Information System, established 20 years ago) and CARET (equivalent of SAR for the French Biodiversity Information System, established in early 2020) with the aim of sharing their knowledge and experience in order to improve their repositories management. These organizations work together to put in place innovative tools, and to integrate and promote international recommendations into their practices. They cooperate to follow up on international recommendations, and to present their work and needs on repositories to international working groups. Finally, this working group is helped by the “pôle INSIDE”, which offers its expertise on interoperability standards and innovative tools and advises on good practices in this area.

A principle of subsidiarity exists among these three organizations: SAR can choose to use a repository managed by SANDRE and vice versa, and it can ask for minor changes such as adding international identifiers. If each information system has its own repository on the same objects, cross-coding tables are set up in order to be interoperable.

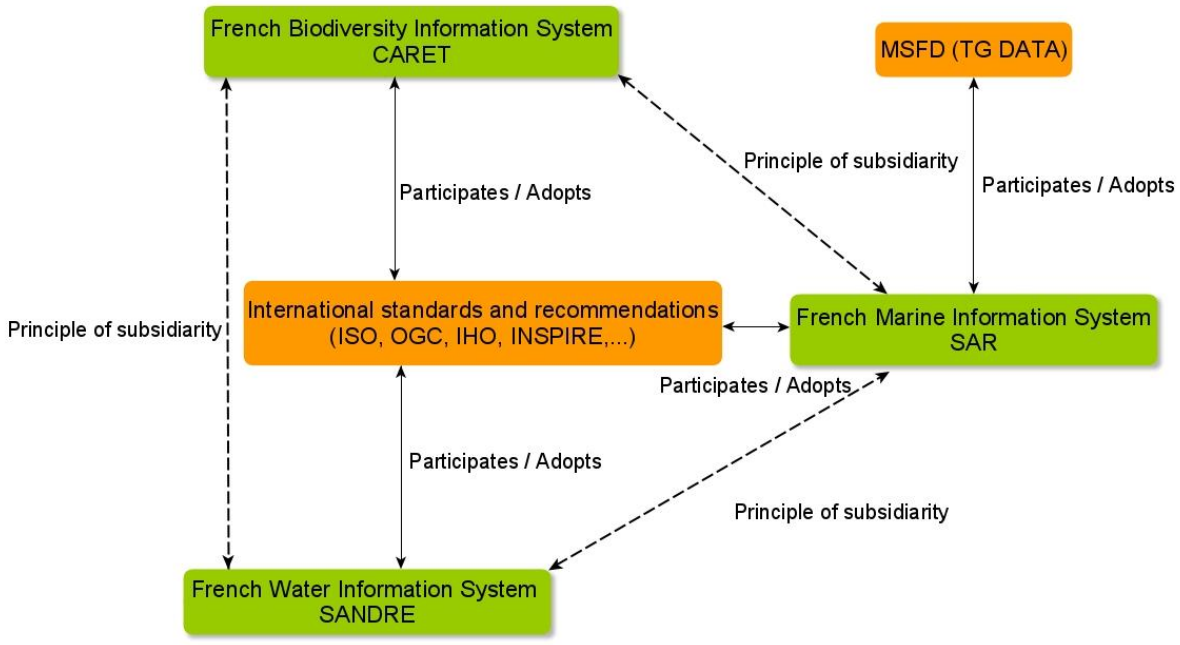

Figure 1: Links between the SAR and other standardization organizations