

## Increasing FAIRness of marine data within ENVRI-FAIR

**Peter Thijse**, MARIS, Nootdorp (The Netherlands), [peter@maris.nl](mailto:peter@maris.nl)  
**Thierry Carval**, IFREMER, Plouzané (France), [Thierry.Carval@ifremer.fr](mailto:Thierry.Carval@ifremer.fr)  
**Dick Schaap**, MARIS, Nootdorp, (The Netherlands), [dick@maris.nl](mailto:dick@maris.nl)  
**Valerie Harscoat**, IFREMER, Plouzané (France), [Valerie.Harscoat@ifremer.fr](mailto:Valerie.Harscoat@ifremer.fr)  
**Sylvie Pouliquen**, IFREMER, Plouzané (France), [Sylvie.Pouliquen@ifremer.fr](mailto:Sylvie.Pouliquen@ifremer.fr)  
**Ivan Rodero**, EMSO ERIC, Rome (Italy), [ivan.rodero@emso-eu.org](mailto:ivan.rodero@emso-eu.org)  
**Benjamin Pfeil**, University of Bergen, Bergen (Norway), [benjamin.pfeil@uib.no](mailto:benjamin.pfeil@uib.no)  
**Katrina Exter**, VLIZ, Oostende (Belgium), [katrina.exter@vliz.be](mailto:katrina.exter@vliz.be)  
**ENVRI-FAIR WP9 partners**, IFREMER, Plouzané (France), [envrifair-wp9-coordination@ifremer.fr](mailto:envrifair-wp9-coordination@ifremer.fr)

Humans increasingly rely on computational support to deal with data as a result of the increase in volume, complexity, and creation speed of data. Machine-actionability (i.e., the capacity of computational systems to find, access, interoperate, and reuse data with none or minimal human intervention) is key, but how to achieve this? Starting from an RDA initiative in 2016 guidelines have been drafted - The FAIR principles - to improve the findability, accessibility, interoperability, and reuse of digital assets [GoFair.org]. Several metrics have been defined to “score” FAIRness against the principles, although the main concept of FAIR is the process to improve, more than a quantitative score card.

The ENVRI-FAIR project is engaging Research Infrastructures (RIs) in the environmental domain covering the subdomains Atmosphere, Marine, Solid Earth and Biodiversity / Ecosystems. The overarching goal of ENVRI-FAIR is that all participating research infrastructures (RIs) will improve their FAIRness and become ready for machine-to-machine access, e.g. for services in the European Open Science Cloud (EOSC).

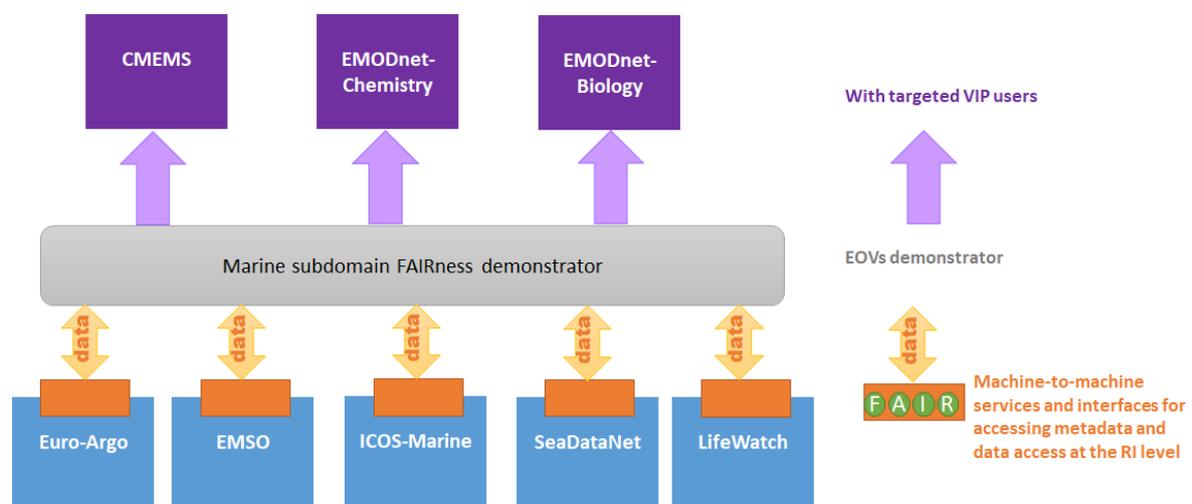


Figure 1: FAIRness roadmap for the Marine subdomain within ENVRI-FAIR

The Marine subdomain work package (WP9) of ENVRI-FAIR has a focus on (see figure 1): Euro-Argo-ERIC, EMSO-ERIC, ICOS (Marine) and LifeWatch (Marine), as RIs listed on the ESFRI roadmap, as well as SeaDataNet as European marine data management infrastructure. The overall aim is to analyse the FAIRness of each of these RIs and to implement within each RI the necessary actions to improve its

FAIRness. The latter is critical for the Marine subdomain as it will provide a coherent base for developing the integrated services systems required by a broad variety of research, regulatory and operational communities. Climate change and anthropogenic impacts are among the key issues that already affect and concern European and worldwide societies, but there are others that also have an enormous socio-economic impact (natural hazards, water quality, and acidification). Therefore, “Essential Ocean Variables” (EOV) as identified by the Global Ocean Observing System (GOOS) will provide guidance to the WP9 activities for setting priorities at data type level.

Considering the ENVRI-FAIR challenge of multiple RIs and multiple subdomains, the agreed way forward is that the FAIR principles will be implemented within each RI to improve RI FAIRness at three levels: 1) to better serve its own users; 2) to facilitate the development of cross RI services at Marine subdomain level; and 3) to facilitate the development of cross subdomain services at the level of ENVRI-FAIR cluster. The approach is bottom-up: respecting the autonomy of RIs concerning requirements and solutions, however in close and regular interaction with experts in ENVRI-FAIR about common standards, training, common implementation options at environmental domain level, and shared implementation activities with other subdomains.

An analysis process on FAIRness in the Marine RIs has been undertaken by the partners in the marine subdomain to come to a list of priorities to enhance RI data FAIRness. This list of priorities for enhancing their FAIRness has been drafted in a roadmap of actions and an implementation plan that is on its way till the end of 2020. The next step within ENVRI-FAIR project will be to setup an “EOV” demonstrator in the form of a metadata broker for the Marine subdomain (figure 1) that aims to serve SeaDataNet, CMEMS and EMODnet, as integrators and processors of Marine EOV data accessed via the RI machine-to-machines services.