

FORCOAST



Earth Observation Services For Wild Fisheries, Oystergrounds
Restoration And Bivalve Mariculture Along European Coasts

PROJECT DELIVERABLE REPORT

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Report

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Executive Summary

This deliverable D6.7 refers to task 6.4 (Technology Transfer, Data Management Plan). It comprises the main directions and the first version of the Data Management Plan (DMP) for the FORCOAST project.

FORCOAST is a data-centred project, where data from different sources (Earth Observation, Copernicus products, in-situ monitoring, biology data...) is used as input in order to create new data from where useful information can be retrieved for the targeted sectors: fishery, bivalve mariculture and oysterground restoration. The formats of the pilot input data may vary depending on the source, however, the FORCOAST platform input data will account for data format standardization.

The FAIR (Findability, Accessibility, Interoperability and Reusability) data principle is followed as much as possible by FORCOAST DMP. The data generated by the platform will be promoted by giving visibility to the FORCOAST project. Consistency in the generated data, in terms of naming and versioning, will be targeted. In principle, FORCOAST will operate in a subscription-based model, which will account for both open and non-open (customized) data (accessible to active subscribed users). The available data, accessed from the FORCOAST platform, will be provided homogeneously, in standard formats. The FORCOAST platform will continue to deliver information service products even after the project end-date, expanding the available data as time passes.

The cost for the management of the data, the accomplishment of the FAIR principles and subsequent resources to make the appropriate data publicly accessible have been included in *Work Package 6 – Innovation Management, Exploitation and Business Planning*. Data management labour is overseen by Deltares and led by Eigen Vermogen Van Het Instituut Voor Landbouw-En Visserijonderzoek (EV ILVO).

Whenever possible, one of the DIAS cloud storage services will be used, which will further benefit the accessibility of the data.

Deliverable D8.1 - POPD Requirement No.1 complements the present deliverable regarding ethical aspects. An updated version of this Data Management Plan deliverable will be provided at the end of the project (April 2022).

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1 Data Summary

In FORCOAST, data are both inputs for the different project case studies (pilots) and the platform comprising all the pilots, as well as products obtained from the platform. The purpose of the former type of data is to feed the platform, and after being processed, analysed and interpreted, the latter type of data is obtained, that can be used straight away as information source or as input for further post-processing. The end-product to be obtained at the end of the process is reliable water quality and met-ocean information targeting the wild fishery, bivalve mariculture and oysterground restoration sectors.

The whole project is based around the usage, processing, fusion, integration and analysis of data to obtain useful and meaningful information for the sectors FORCOAST aims for. Different types of datasets for various sources are used in the project. Some examples are from Earth Observation sources (including, but not limited to Copernicus products such as CMEMS, including the Additional datasets), in-situ monitoring, external data providers (i.e. EMODnet), external forcings (boundaries) and biology data (laboratory and field). The formats of the pilot input data may vary depending on the source, however, the FORCOAST platform input data will account for data format standardization (i.e. NetCDF-CF) to provide homogeneity to the process, ensuring its continuity over time. This standardization will be reflected as well in the output information that will be able to be retrieved from the platform, which will have consistent formatting, improving consistency and thus user experience.

Data re-usability can be approached from both the input and output data. Regarding input data, datasets on a European level that contain valuable parameters for different pilots are expected to be used by these. An inventory and detailed description of the different Earth Observation datasets used per pilot is present in Deliverable *D3.1 – Sector-specific Marine Information Requirements Including Physico-Chemical Threshold for Biological Processes Relevant to Targeted Sectors*.

The size of the output data that can be obtained from the FORCOAST platform may vary depending on the spatial and time resolution, beginning and end date/time and number of parameters, among others. On the other hand, input data size is restricted by the computational capability and storage of the different pilots and of the central FORCOAST service, as well as the capacity offered by the DIAS service where the system will be deployed.

Overall, the data retrieved from FORCOAST will mainly be useful to the fishery, restoration and mariculture users in the pilot areas, as well as other ones that can be incorporated into the platform in the future due to flexibility, integration and user-oriented focus of the project.

2 FAIR Data

In this section, the different aspects regarding the compliance of FORCOAST data management within the FAIR (Findability, Accessibility, Interoperability and Reusability) principles are treated.

2.1 Data Findability

The data generated by the platform will be promoted by giving visibility to the FORCOAST project and the service it provides since the service is how the users can have access to the desired information and associated data. The discoverability of FORCOAST will be ensured by following marketing and

external communication approaches that are developed by the different tasks of *Work Package 7 – Marketing and Communication*. These include online promotion in different media such as Twitter or LinkedIn, participation in events such as symposia or workshops, production and distribution of marketing material and development and updating of a specific project website among others.

The naming of the produced data will be consistent, indicating the space and time domain of the data as well as the parameters that are contained. Following the same philosophy, the keywords of each dataset will relate to its content. For example, data which contains information about phosphate concentration derived from Earth Observation techniques could be tagged with the labels 'water quality', 'Earth Observation', 'water nutrients', 'phosphate' and the area where it is applicable. The version retrieved by the user will be reflected, indicating the changes with respect to previous ones.

2.2 Accessibility of the Data

The FORCOAST project is framed under Copernicus Market Uptake. At the end of the project lifetime, a product which provides water quality and met-ocean information services will be operational and marketed as such. In order to cover the cost of the platform infrastructure and equipment needed to maintain it operationally beyond its completion date (thus having a real positive impact in the targeted sectors), a source of revenue has to be set-up. A subscription-based platform is the main proposed idea to support this concept. This way, users can subscribe to the services more interesting for their activities. There is the possibility of having the aforementioned one as 'premium' service while some basic functionalities, information and data can be accessed freely. Thus, the later ones would be openly available while the former ones would work on a paid basis.

Access will be granted to FORCOAST users via personal (or business) account with its respective username and password. After login, the data of interest (alongside the rest of the functions) will be accessible through a customized user dashboard.

Data will be retrievable on demand from the FORCOAST platform. The platform will be in principle a web-based application. For data access the purpose, as well as for the rest of the platform functions and use, a user manual will be elaborated (*Deliverable D5.6 – Platform User Manual*), which will be accessible via the FORCOAST platform and website.

2.3 Interoperability of the Data

The data that will be available to access from the FORCOAST platform will be provided homogeneously, in standard formats (i.e. CSV) to be able to use them easily for subsequent purposes, uses and operations. In principle, no new vocabulary will be introduced, making use of the standard water quality and hydrodynamic terms and variables the pilot users require.

2.4 Data Reusability

Data obtained from FORCOAST will be open. However, this will only apply to the general open data and not to the 'premium' data obtained through subscription, which will be limited for use of the user/company that is getting the offered services. Reuse of data after the end of the project is permitted and particularly interesting for water parameter trend analysis purposes.

Data quality will be assured via the platform validation tasks, embedded within *Work Package 5 – Service Operationalisation, Demonstration and Validation*. The different services will provide data that

will be validated for the different use cases, comparing it with other sources, ensuring the quality of the delivered products.

The FORCOAST platform will continue to deliver information service products even after the project end-date. For this reason, up-to-date data will remain usable (and reusable) for the foreseeable future as long as the components making the platform functional keep on receiving and ingesting data input from the different sources and the platform remains viable.

3 Allocation of Resources

The cost for the management of the data, the accomplishment of the FAIR principles and subsequent resources to make the appropriate data publicly accessible have been included in *Work Package 6 – Innovation Management, Exploitation and Business Planning*. Data management labour is overseen by Deltares and led by Eigen Vermogen Van Het Instituut Voor Landbouw-En Visserijonderzoek (EV ILVO).

The economic costs associated with long term management have been allocated in the project as well, which will keep on with the same practices as to when data is produced during the project period. It has been determined that the subsequent production and use of FORCOAST data will have a significant positive impact on the activities of the FORCOAST sectors users.

4 Data Security

The FORCOAST service will be deployed in one of the DIAS (Data Information Access Services) platforms, available from five different providers. This way, not only access to Copernicus data information, additional commercial satellite and non-space datasets is ensured, but also allows for cloud file processing and hosting, enabling a safe environment for the data. Whenever possible, the cloud storage service will be used, making the retrieve and recovery of data for the project safer and improving the accessibility. However, limitations in terms of the capacity of the storage the project is subscribed for are needed to be taken into account.

5 Ethical Aspects

For the specific purpose of retrieving information about the ethic requirements within this project, please refer to *Deliverable D8.1 - POPD Requirement No.1*, which complements the present deliverable.

6 Other

An updated version of this Data Management Plan deliverable will be provided at the end of the project (April 2022), which will include implementation, reflections, and problems encountered regarding data management within FORCOAST.