

Copernicus Evolution and Applications with Sentinel Enhancements and Land Effluents for Shores and Seas



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Title	Dissemination/Exploitation and Communication Plan
Lead Author	Marc Mestres
Contributors	Manuel Espino, Agustín Sánchez-Arcilla
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1.- INTRODUCTION

This document presents a Dissemination/Exploitation and Communication strategy for the H2020 project CEASELESS. The document is divided in five main sections that outline the project's approach, give an overview of target groups, describe the dissemination/exploitation and communication tools used by the partnership, and present a series of monitoring actions to assess the efficiency of the CEASELESS dissemination strategy.

2.- OVERALL APPROACH TO DISSEMINATION

2.1. Objectives of the project

The sustainability of valuable coastal resources and infrastructures is threatened by the pressures of an increasing population and use of the coastal area. To tackle this problem from an integral standpoint, it is fundamental to have the capacity to analyse, understand and predict the different processes that play a role in the coastal system. This is now possible due to the existence of a large amount of information provided by the high-resolution numerical models available in the CMEMS (Copernicus Marine Environment Monitoring Service) catalogue combined with *in situ* and remote observations. However, although these data seem sufficient when applied to the open sea, they are generally lacking when used in the coastal zone due to several factors (domain asymmetry, varying bathymetries, misrepresented continental discharges, or specific processes such as wave diffraction, for instance).

With this in mind, the CEASELESS project aims to contribute to the development of the coastal dimension of CMEMS by taking advantage of the superior quality and quantity of meteo-oceanographic information provided by Copernicus, combining the high-resolution data from the Sentinel family of satellites with field observations and state-of-the-art numerical models. This will provide an unprecedented capacity to analyse and predict coastal meteo-oceanography, including explicitly the linkage between the marine domain and the emerged coast through the land boundary condition. This aim is structured into 5 specific objectives:

- 1) Development of processing tools for HR remote sensing and modelled data to validate the numerical models
- 2) Preparation of data repositories for an efficient quality and uncertainty assessment and storage/retrieval of regularly updated meteo-ocean fields
- 3) Adaptation of protocols for "local" assimilation of anisotropic/non-linear shallow water processes in directionally asymmetric domains.
- 4) Development of a proof-of-concept to assess the operational potential of the proposed coastal evolution of Copernicus based on its technical and economic viability.
- 5) Contribution to performance limits and good practice criteria for the combined exploitation of remote sensing measurements, numerical fields and *in situ* observations within a future Coastal Service in CMEMS.

2.2. Communication goals

The main aim of the CEASELESS transfer strategy is the dissemination of the project's results at different levels, going from the scientific communities to the general public. Such a transfer will

help generate criteria and requirements to steer the project's research towards the high-resolution coastal products as expected by the targeted end-users.

In addition to the overall objectives of CEASELESS, a number of specific communication objectives can also be identified:

- 1) To improve the confidence and social awareness of the proposed CMEMS coastal service
- 2) To enhance the two-way cooperation between service providers and coastal stakeholders and users
- 3) To encourage the use of scientific-based knowledge in the development and implementation of coastal management policies
- 4) To promote the development of new business opportunities in the coastal zone
- 5) To transfer the knowledge acquired to new generation via educational applications

This outreach plan will address in general all public and private parties with interests in the coastal zone, providing a level of knowledge of high-resolution measurements and modelling near the coast, seldom found in coastal forums.

3.- TARGET GROUPS

Following the objectives stated in the previous section, it is imperative to identify the relevant target groups to develop an understanding of their needs and to orient the dissemination activities towards their priorities, in order to maximize the uptake and use of the results generated by CEASELESS. Up to 5 different target groups have been defined within the project:

3.1. Scientific community

This group includes public and private universities and research centres working in the coastal zone which might benefit from the high-resolution numerical products developed in CEASELESS. It encompasses members from the oceanographic and meteorological communities, and also from the modelling community. It also includes coastal observatories, in particular those belonging to the Hydralab and Jerico networks, the general group of users of Copernicus products, and other research projects that might relate to the CEASELESS topic. In the project, we are specifically addressing the oceanographic and remote sensing communities through the EGU/AGU meetings, for instance.

3.2. Public sector

This group includes politicians at local, regional, national and international levels involved in the formulation, implementation, monitoring and evaluation of coastal zone policies, but also other public entities with responsibilities in the coastal area such as harbour authorities, maritime safety agencies, public environmental agencies, search-and-rescue agencies and others. We have established links with the corresponding groups in the 4 CEASELESS pilot sites.

3.3. Private sector

This group will benefit from the CEASELESS projects via the downstream applications resulting from the development of the coastal dimension in Copernicus. Potentially, it includes all economic

sectors with interests in the coastal zone. These may comprise companies selling operational or modelling services, engineering firms, insurance companies, marine consultancies, businesses related to renewable energies, companies working in the maritime transport sector (logistics, harbour, navigation, risk), to name but a few. We have established contact with the renewable energy, coastal management, harbor operations and aquaculture sectors.

3.4. General society

This group includes the general public living and using the coastal fringe (whose hinterland may reach most of the EU due to, for example, transport or tourism supported by the coastal zone), particularly in the area in which the CEASELESS study cases are defined, and also NGOs operating at national, regional and local levels, and local associations. The working topic of the NGOs might vary between the different sites, and will be specific to the country or locality.

3.5. Media

Media are significant agents in transferring both the project and its output to a general audience. In order to ensure the visibility of CEASELESS, and given its international scope, the dissemination activities within the project may target media at local, regional, national and European levels, and include print media, TV/radio media, and online and social media. In this aspect, we are promoting the project in the media of the pilot site countries, but also in some international media such as the BBC.

4.- DISSEMINATION AND COMMUNICATION TOOLS

Several dissemination/communication tools are envisaged to reach the target groups and to transfer information about the CEASELESS project and its results. These tools include

- Project website
- Project leaflet and poster
- Project folder
- Publicly available deliverables
- Scientific publications
- Transfer meetings
- Impact briefs
- Education courses
- Media releases

4.1 Project website

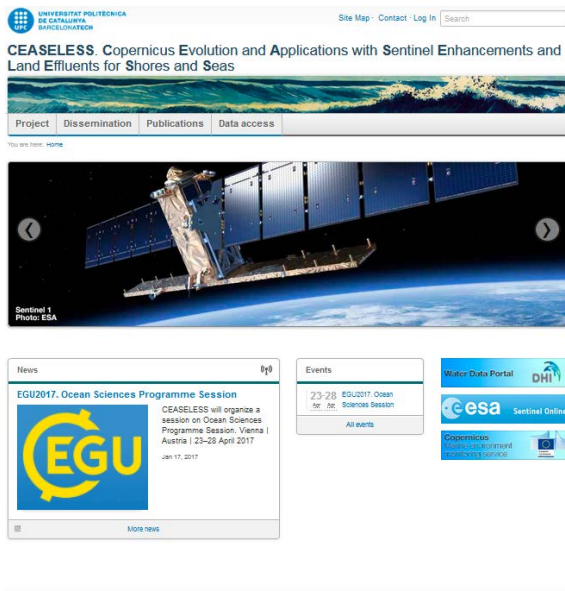
The project's website (<http://ceaseless.barcelonatech-upc.eu>) is hosted at the UPC server and is managed exclusively by the UPC team, which collects and uploads all material provided by project partners and other eventual contributors.

The website serves as a central point for information about CEASELESS, and is intended to provide frequent updates with information that is up to date and relevant. For this, the interaction between all partners and with the general public is essential.

The website is structured in 4 main sections, each having one or more subsections:

- The **Project** section describes the main characteristics and objectives of the project, and includes a **Partners** subsection, with links to the partner’s official websites, and a **Contributions** subsection through which users can contribute material (news, events, images, publications, etc.) they feel could be posted on the site.
- The **Dissemination** section contains informational and promotional material related to CEASELESS. The section is divided into subsections **Image Gallery**, **Posters and Brochures**, and **Press Releases**.
- The section on **Publications** hosts administrative and scientific documents generated by the project. This includes papers published in journals and conference abstracts and presentations (in **Papers**), but also the project’s deliverables (in subsection **Deliverables**).
- Finally, the **Data Access** section describes the procedure to be followed to access the data generated and/or used during the project.

The following figures show some screenshots of the official CEASELESS website.



CEASELESS website

4.2 Project leaflet and poster

A large size poster and a small leaflet have been designed in line with the project’s visual identity with the aim of widely promoting CEASELESS. The leaflet describes the need for the project and its objectives, and shows the distribution of pilot cases. It also provides a list of the project’s partners. Both the poster and the leaflet are shown below.





The CEASELESS large-size poster



The CEASELESS leaflet

The project folder is an evolving dissemination and communication element that summarizes the most important aspects of CEASELESS. During the first year, it contains only the project folder, but it will be enriched progressively in the following years with summary progress reports (yearly), news about scientific advances (years 2 and 3), application and demo briefs (year 3) and policy briefs (year 3). This folder will allow the public to acquire a quick but general view of the project and its most relevant outcome.

4.4 Publicly available deliverables

A large number of the deliverables foreseen in the project proposal will be openly accessible to the general public. These deliverables, listed below, will be made available throughout the duration of the project *via* the CEASELESS website

Number	Deliverable name	Delivery date (month)
1.1	Collection of Sentinel-1/2/3 and <i>in situ</i> data for the considered study cases	24
1.2	Validated Sentinel fields for the set of met-ocean variables considered	27
1.3	Framework to combine Sentinel-1/2/3 products with numerical fields/ <i>in situ</i> data	27
1.4	New Sentinel hydro-morphodynamic coastal products	30
2.1	Multiple data/variable assimilation as a function of grid and scale	18
2.2	Assimilation impact as function of variable/domain/discretization/data	27
2.3	Framework for coastal system memory assessment	30
3.1	Improved sea-surface boundary layer parameterization for coastal phenomena	21
3.2	Impact from bathymetric and boundary updating in a potential CMEMS extension	27
3.3	Error generation/limitation (satellite/numerical/ <i>in situ</i> data) for CMEMS candidate applications	33
4.1	Structured set of coastal products as candidates for integration into CMEMS and into the working protocol of selected users	18
4.2	Verification framework with documented performance/error for models and observations	21
4.3	Informed set of coastal products with application limits and operational requests as a function of coastal typology	27
4.4	Proof-of-concept for integration of products into CMEMS with good practice criteria for a coastal service	30
5.1	Critical analysis of coastal risk forecasting (and assessment products) for integration into CMEMS/selected users protocols	30
5.2	Critical analysis of coastal resource forecasting (and assessment products) for integration into CMEMS/selected users protocols	33
5.3	Critical analysis of coastal routing/harbour exploitation forecasts for integration into CMEMS/selected users protocols	33
7.1	Project web page	3
7.2	Project folder + leaflet + poster	4
7.4	Updated project forms with yearly summary and calendar page	12/24/36

List of publicly available deliverables

4.5 Scientific publications

Quality publication of CEASELESS results in scientific journals is a key element in the dissemination of the project to scientific and commercial targets. It is foreseen to submit papers to the best-established journals in the main fields of knowledge active in CEASELESS. It is also expected to generate a set of six co-authored papers centred on the scientific analysis and exploitation of the high-resolution data sets generated within the project, dealing with topics such as data retrieval, coupling, assimilation or transformation, plus a set of more focused papers (one per partner) supplementing the co-authored ones.

On the other hand, the commercial side of the project will be addressed through an additional set of six papers focused on the commercial uses of the high-resolution data sets and products, covering the main project applications, i.e., mitigation of coastal risks, assessing environmental impact, renewable energy, resource exploitation, safe management of coastal waters and integrated coastal zone management.

Targeted journals for these papers include *Journal of Remote Sensing of the Environment*, *Environmental Modelling and Software*, *Applied Meteorology and Climatology*, *Coastal Engineering* or *Applied Ocean Research*, amongst others.

In addition to journal publications, CEASELESS will also be present in the best established international meetings and conferences in the main fields of knowledge of the project, and in the main sectors represented by the CEASELESS applications, through the presentation of communications that, in the latter case, might be jointly authored with commercial downstream users. These meetings might include EuroGOOS, Coastal Dynamics or EWEA-WaveEc in the EU, and the ICCE or the Global Marine Renewable Energy Conference at a worldwide scale.

4.6 Information and transfer meetings

Over the course of the project, CEASELESS will organize several meetings to bring together all the actors involved or potentially interested in the project to share information and to promote dialogue and engagement. These meetings can be broadly classified into two groups:

- Scientifically-oriented events with institutions from the EU and/or other countries not represented in the partnership to promote the coastal dimension in CMEMS.
- Copernicus service-oriented meetings, designed to improve the connectivity of the CEASELESS products with the Copernicus services. These include yearly meetings with core Copernicus centres to present the partnership's need from Copernicus and the project's feedback to Copernicus in order to improve the development of the CEASELESS coastal products, regular meetings with Copernicus providers to adjust the CEASELESS products to the current or planned service architecture, and regular CEASELESS presentations to the initially selected Copernicus users to achieve an incremental introduction of the CEASELESS products into the CMEMS catalogue.

Regular exploitation workshops and a training session (in year 3) are also foreseen to introduce the CEASELESS products efficiently into CMEMS and into the working routines of the end-users.

4.7 Impact briefs

Succinct (1-2 pages) and easy-to-read documents shall be issued regularly to expose the projects developments to a wider audience. These impact briefs will summarize important facts and advancements from CEASELESS, and will be focused mostly, but not exclusively, on the studied pilot sites, the new methodologies developed within the project, and their application for end-users needs.

4.8 Education courses

Since some of the partners in the project are public Universities, it is natural that the dissemination strategy should have a strong educational component. The transfer of the project's results to new generations of scientists and policy makers will be done through the development of educational applications linked to CEASELESS "fusion" products within the University courses and theses. In this sense, the project development and outcome can be easily introduced in the Erasmus Mundus Master in Coastal and Marine Engineering and Management (CoMEM, offered by the UPC together with 4 other European universities) or the DTU Summer School on Remote Sensing for Wind Energy.

4.9 Media releases

Press will be invited to "open days" or "demonstration days" organized by the partners at their respective centres in order to present the project results to general users and interested parties. During these open meetings, information on the project and its current output will be provided in a non-scientific format in order to reach a wider audience. Short press releases shall be issued whenever a project deliverable or a particular event related to the project is thought to deserve a high-level of public attention.

5.- THE INTERNATIONAL TRANSFER AND ADVISORY BOARD

The project also foresees the establishment of an International Transfer and Advisory Board (ITAB). Its main goals are to follow the project's advances, promote steering, and team-up with national and international ongoing activities related to the project, looking for new opportunities in the future coastal CMEMS. The ITAB will enhance the visibility of the project in front of representatives from the scientific world and the Copernicus community, satellite data providers (EUMET SAT/ESA, for instance), coastal observatories and meteo-ocean institutions, and members of the applications sector. In addition to expanding the reach of the project, this will also contribute to a rich feedback to CEASELESS.

Although it is expected to grow and adjust during the development of the project, initially the ITAB will be formed by representatives from

- a) private companies with interests in the coastal zone (renewable energy and aquaculture sectors),

- b) public companies (Port Authorities of pilot sites) and Copernicus,
- c) relevant research institutions from the EU (CNRS) and 3rd countries (CICESE in Mexico, FIO in China, USGS in the USA)
- d) the government at various levels (in the pilot sites)
- e) supranational organizations (Joint Research Centre, ESA/Eumetsat)
- f) Universities in Africa (Eduardo Mondlane Univ, Maputo, Mozambique), South America (San Francisco Univ., Quito, Ecuador; Federico Santa Maria Univ., Valparaíso, Chile) and Australia (Swinburne Univ.).

6.- MONITORING OF THE DISSEMINATION ACTIVITIES

The efficiency of the communication and dissemination activities outlined above must be evaluated in order to determine if the expected impact of the project is been attained. For this, several actions are foreseen:

- a) Events involving third parties (meetings with Copernicus, end-users, data providers, stakeholders) will be qualitatively evaluated immediately after their celebration by means of a questionnaire submitted to the participants enquiring about the organisation, content and material of the event, and about their general appreciation of the meeting. A quantitative evaluation considering the number of participants and the number of presentations given, for instance, will also be done.
- b) The use of the project's website will be monitored using a series of performance indicators such as the total number of visits, the total number of unique visitors, the average visitors and pages viewed per day, average visit duration, the number and type of downloaded files, etc.
- c) Internal evaluation of the execution of the dissemination plan will be done to determine if the communication strategy is occurring as planned, and to identify eventual weaknesses that can be avoided. This will be done through a regular contact with all the project partners to assess the general and the "local" dissemination activities being carried out and will assess, for instance, if the dissemination strategy is being followed, which foreseen activities have not been done, or if the dissemination activities have been effective considering the goals defined in this plan.
- d) External evaluation of the dissemination activities will be done to examine their impact on the target groups. Elements to be considered here might include the number and impact factor of scientific publications, number and "quality" of scientific meetings attended, number of website visits, website section with most traffic, number of document downloads, number of people from the target groups reached, amongst others.
- e) Scientific impact of the project will be monitored taking into account the number of presentations in national and international conferences, and the number of papers published. In the latter case, the impact factor of the journals and the number of references generated will also be considered.

The careful analysis of these dissemination monitoring indicators will provide the possibility of altering the present dissemination and communication plan to better integrate the views and experiences of the different target groups into the CEASELESS dissemination activities.