

**Liaison with Validation users for the SDGs-EYES
Uptake Webinars
*Platform Guidelines***

**Sea Surface Acidity and Marine Water
Eutrophication**

Authors

**Monica Miguel-Lago, Francesca Piatto, Laurine Tertre (EARSC)
Tomas Lovato, Dmitry Kondrik (CMCC)
Alessandro d'Anca, Jishnu Jeevan (CMCC)
Stefano Natali, Simone Mantovani (SISTEMA)**

GUIDELINES

This document proposes clear and concise guidelines explaining how users can test the platform's tool. These guidelines cover both back-end and front-end instructions, as well as practical use cases for the tool.

1. Introduction

A brief explanation of the platform's purpose and its relevance to SDG monitoring and reporting.

The SDGs-EYES platform will support users to monitor and report on the SDGs indicators selected in the project and develop new indicators based on them. Two usage modes of the platform corresponding to two different types of users will be available:

1. Consultation mode: non-expert users will be allowed to explore the new indicators developed by the different pilots.
2. Exploitation mode: expert users will be able to:
 - a. login the development environment, use (not modify) the existing algorithms, run owned algorithms, upload owned data, generate owned indicators, also based on the existing ones
 - b. execute from remote the indicators (through standard interfaces) and retrieve the results.

2. Platform's Role in Supporting SDG Indicators

How the platform supports specific SDG indicators and how it can be used to monitor them

The platform allows users to choose specific years and geographic parameters (such as region, province, and municipality) to calculate and visualise SDGs indicators. Through interactive maps/graphs, users can explore the SDG indicators. The platform also offers data downloads in common file formats (e.g. vector and CSV), providing convenient access and further processing of data.

3. Pilot Overview

Introduction of the pilot (and indicators), outline of its objectives, and explanation of how it aligns with specific SDGs. It also includes instructions on how to interpret and customize data visualizations and export data for reporting.

	Sea Surface Acidity and Marine Water Eutrophication
Objectives	Marine ecosystems around Europe have been significantly altered by centuries of human exploitation and their ability to provide key ecosystem services is decreasing with an uneven intensity. The growing population density along coastal areas has required a massive increase in the development of infrastructure, with a detrimental effect on the water quality conditions of several regional seas. This overimpose to the human-related increasing carbon dioxide emissions into the atmosphere which is expected

	<p>to significantly alter seawater temperature and acidity conditions thus impacting the marine ecosystems functionalities.</p> <p>This pilot case will focus on the provision of relevant information to monitor the present and recent past conditions of marine systems at the regional scale for the occurrence of eutrophic conditions and the evolution of seawater acidification. The Pilot area for demonstrating the indicators is the North Sea region.</p>
Alignment with SDGs (which SDG indicators are being calculated, which variables)	<p>The Pilot will provide spatiotemporal information on the evolution of the following indicators of SDG14:</p> <p>SDG 14.3 on the impacts of ocean acidification by implementing the EU indicator 14_50 to evaluate the changes over time of the seawater acidity;</p> <p>SDG 14.1 on the reduction of marine pollution of all kinds by implementing the EU indicator 14_60 to identify marine waters affected by eutrophication.</p>

Specific Guidelines for Use Cases: It provides a practical scenario for users to engage with the platform. It outlines the steps for monitoring and reporting, as well as the workflows for the pilot, from data access to figure generation and feedback submission.

Sea Surface Acidity and Marine Water Eutrophication	
27th February 2025	
<p>Data Access: Instructions on accessing data containing the values of eutrophication annual index and pH difference values between chosen years or months in aquatic environments based on respective satellite and reanalysis data, indicating the state of eutrophication and acidification .</p> <p>Visualization: Step-by-step guidance on visualizing the maps representing the annual eutrophication index or pH changes for the chosen period and domain.</p> <p>Analysis: Generate datasets and maps showing potential eutrophication areas, and acidification trends over time in addition to generation of NetCDF files containing the resultant values for further analysis both by experts and non-experts.</p> <p>Scenario: Users can select specific domains or timeframes for detailed analysis of spatiotemporal patterns or eutrophication/acidification sources.</p>	

Pilot 3: Sea Surface Acidity and Marine Water Eutrophication	
Data Access	<p>The eutrophication index workflow is based on the methodology distributed and supported by Eurostat. In the framework of the project it is calculated from both satellite (GlobColour) and reanalysis (NWS MFC) daily datasets on chlorophyll concentration and beam attenuation coefficient (Kd) available from the Copernicus Marine Service.</p> <p>The acidification is presented by the values of the monthly and annual difference between two chosen temporal points of the pH values and derived values of H⁺ concentration, calculated from reanalysis monthly data (NWS MFC).</p> <p>Along with the visualisation of the maps, the project platform and its UI provides the users with possibility to download the resultant annual index values as a NetCDF dataset.</p>

Visualization	The main purpose of the UI interface integrated to the project platform is to show the respective maps of the eutrophication and acidification indicators, thus providing the opportunity to the decision makers and general public to perform the visual analysis in a simplified manner, without the need in computational or programming skills.
Analysis	On the basis of the maps provided by the UI, the users can make conclusions of the state of the water quality in terms of the ongoing acidification and eutrophication in the whole North Sea, its specific subregions and for different periods of time.
Scenario	By selecting the specific domains or timeframes in the UI and, in the case of eutrophication, by choosing between available input data sources (satellite/reanalysis) the end-users can create their own scenarios tailored specifically for the region and the period of their interest and perform the detailed analysis of spatiotemporal patterns or eutrophication/acidification sources.

4. Navigating the Platform

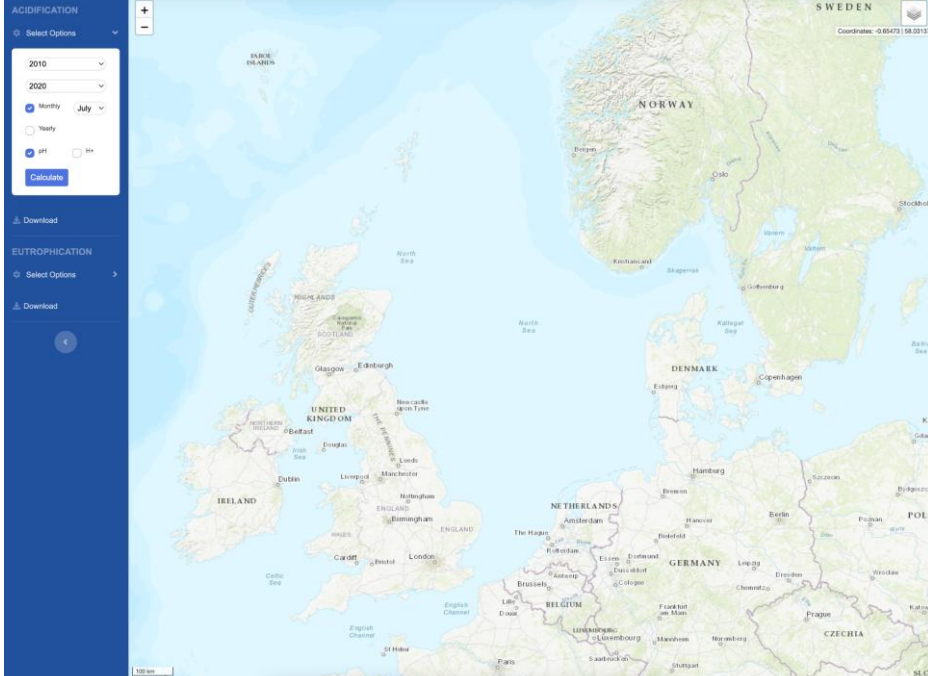
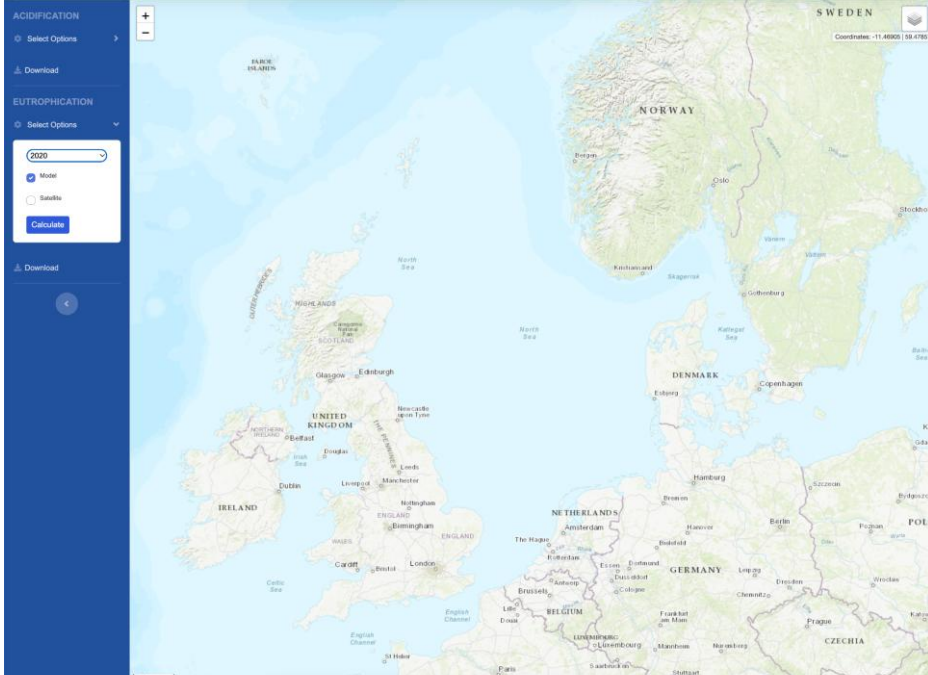
Step-by-step instructions on using the platform: logging in, accessing the dashboard, selecting relevant SDG indicators, and utilizing platform features. A detailed description of the platform can be found here.

The platform offers two user-interaction modalities:

- **Pilot Frontends.** Dedicated frontend prototypes developed on the needs of the stakeholders to be consumed by the stakeholders are made available to demonstrate the capabilities of the new indicators.
- **Laboratory.** This is an environment where the indicators are developed, tuned, and finalised. Practically it is a Jupyter lab¹ environment with direct access to the datasets and can exploit the computational resources. The final code is stored on the project repository to be optimised and dockerized for execution.

Pilot Frontend (Consultation mode)	
Step-by-Step Process	The user accesses the UI via the website or directly by entering the url Sea Surface Acidity and Marine Waters Eutrophication
Logging-in	The user enters credentials to access the UI and is redirected to the UI
Accessing the dashboard	The UI presents a selection menu on the left and a map in the middle displaying the results
Selection of SDG indicators	Acidification: The user enters the reference year and the year of interest, and selects the aggregation of the results (yearly or monthly) and one of the variables (pH or H ⁺). If the monthly option is chosen, the user also chooses the month of interest. Then the user clicks on the “Calculate” button.

¹ Jupyter-based python instance to provide access to Pilot material, including shared data and re-executable notebooks

	
	<p>Eutrophication: The user chooses the year of interest from the dropdown menu and the type of input data (Model or Satellite). Then the user clicks on the “Calculate” button.</p> 
<p>Platform features</p>	<p>The result is displayed on the map. It is possible to zoom in and out. Acidification: The user will see the chosen variable (pH or H+) difference between the chosen year of interest and the reference year. If “monthly” is selected, the map will show the difference for the chosen month only.</p>

ACIDIFICATION

Select Options

2010
2020

Monthly Sept

Yearly

Model Satellite


Calculate

Download

EUTROPHICATION

Select Options

Download



Eutrophication: The user will see the map of potentially eutrophic and oligotrophic areas based on the chosen input data: model or satellite.

ACIDIFICATION

Select Options

Download

EUTROPHICATION

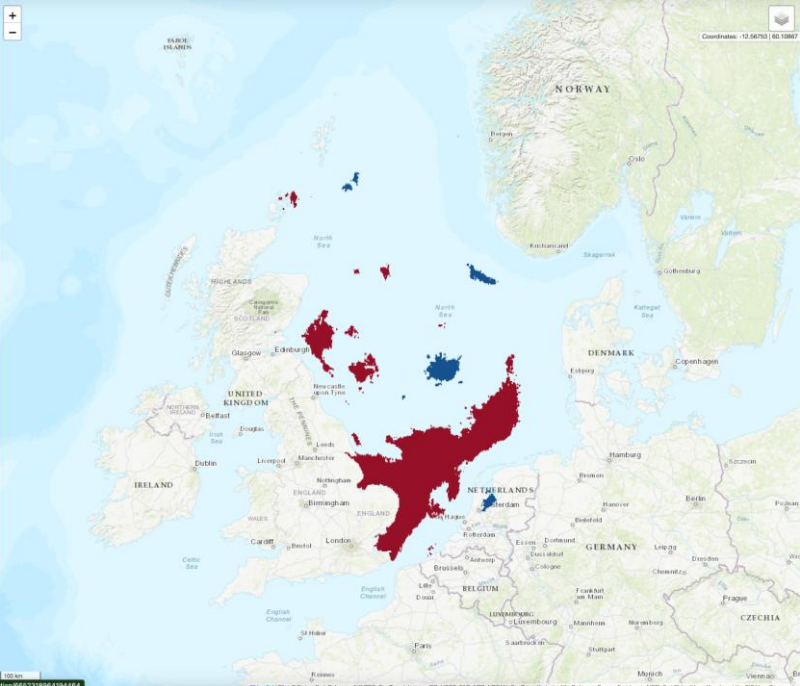
Select Options

2020

Model Satellite

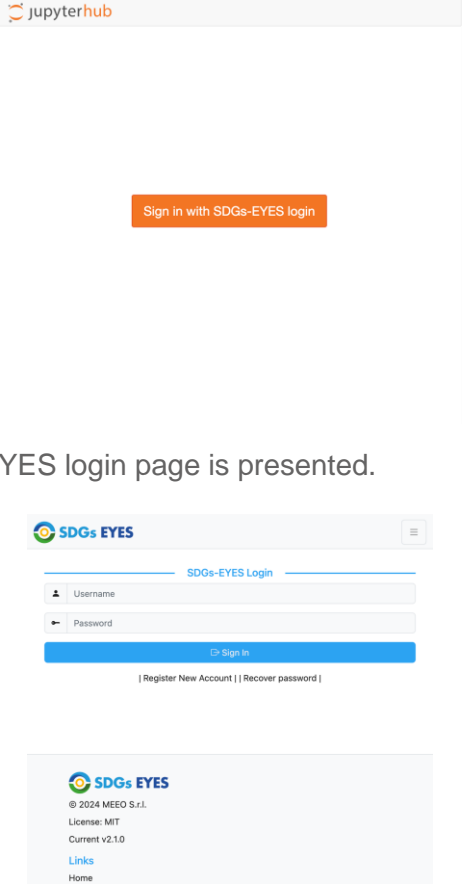
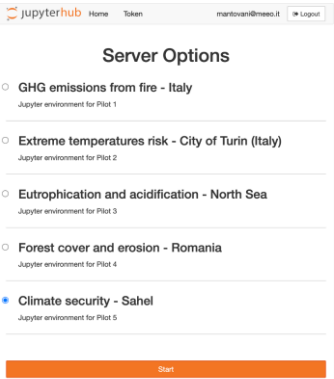
Calculate

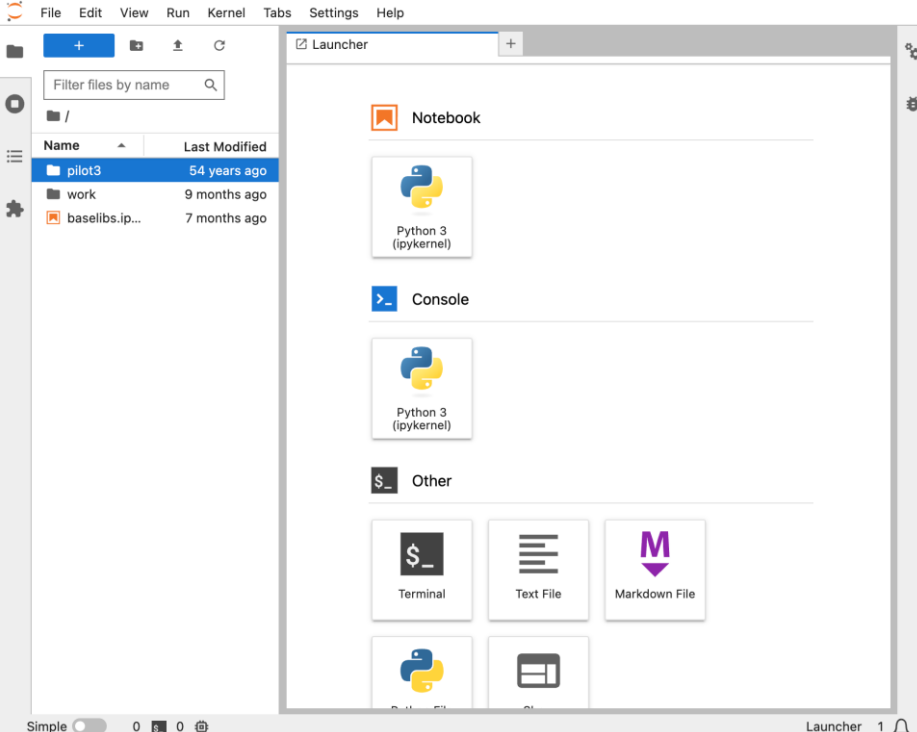
Download



The download button allows the user to download the results in netcdf format.

Laboratory/Jupyter Lab (Exploitation mode, i.e., using your own workspace)	
Step-by-Step Process	The user accesses the SDGs-EYES Laboratory via the website or directly by entering the url jup.sdgs-eyes.adamplatform.eu

	 <p>Then the SGDs-EYES login page is presented.</p>
<p>Logging-in</p>	<p>The user enters credentials to access the SDGs-EYES Laboratory. To create a new account follow the Sign-Up procedure i.e. “Register New Account”</p>
<p>Selection of Pilot</p>	 <p>Then the “baseline” of the select Pilot is loaded and the user has access to data and material made available for the Pilot</p>

	
Execution	<p>Notice that (i) Users cannot modify the existing code, but can create a copy of it, modify and run it (ii) Users can upload owned data and run the code on them</p> <p>The Jupyter Notebooks are located in the “/work/pilot3-service/” directory within the respective folders along with a README.md and functions_description.md files that contain the detailed description of all the functions of both Acidification and Eutrophication workflows. The Acidification workflow Notebook can be found at the following path: “/work/pilot3-service/14_50_acidification/acidification_workflow.ipynb”. Similarly, the Eutrophication Notebook can be found at “/work/pilot3-service/14_60_eutrophication/eutrophication_workflow.ipynb”.</p> <p>For the detailed explanation of how to use the functions within the Notebooks, please refer to the “/work/pilot3-service/functions_description.md” file.</p> <p>Please note that the end user should be experienced with the Jupyter environment and Python programming language to be able to change the input/output directories in the workflow to be able to save their own results in a folder assigned to them.</p>

5. Testing

Information about the datasets.

	Sea Surface Acidity and Marine Water Eutrophication
<i>Input datasets</i>	Satellite (GlobColour) and reanalysis (NWS MFC) daily datasets on chlorophyll concentration and beam attenuation coefficient (Kd), reanalysis monthly dataset on pH (NWS MFC) available from the Copernicus Marine Service.
<i>Adjust relevant</i>	

<i>SDG indicator</i>	
----------------------	--

FEEDBACK

1. Feedback Mechanism

Generic: Validation users are encouraged to suggest improvements and provide feedback on the platform's usability. Feedback should cover aspects such as overall impressions of the new products, ease of data visualization, downloading, processing, and interpreting the data. Additionally, users can evaluate how well the new products meet their specific needs.

Platform usability	
Overall impression new products (exploitation)	
Visualization (exploitation)	
Downloading (exploitation-laboratory)	
Processing (laboratory)	
Interpreting data (exploitation)	
Expectation from needs (exploitation)	

Workflows & Methodology: (i) **Spatial and Temporal Resolution & Scale:** Users will be asked to provide feedback on the importance of the increased spatial and temporal resolution of the new products. Specifically, they will assess how the higher resolution improves their analysis and decision-making processes. (ii) **Focus on Specific Indicators:** Users will identify which specific activities (e.g., those related to the pilots) the new products were most helpful for. They will also indicate whether the new products provided insights that they were previously unable to obtain from other sources. (iii) **Access & Visualization:** Users will provide feedback on how easily they could access and visualize the data, ensuring that the platform is user-friendly and meets their expectations. (iv) **Future Use and Recommendations:** Users will be asked to give their thoughts on how they plan to use the platform in the future and provide recommendations for improvement based on their experience.

	Sea Surface Acidity and Marine Water Eutrophication
Spatial and Temporal	

Resolution & Scale	
Focus on Specific Indicator	
Access & Visualization	
Future Use	
Recommendations	

2. Support and Contact Information

Contact details for technical support, so SDGsEYES can elaborate a comprehensive FAQ section that addresses common issues and troubleshooting tips ensuring that users can quickly resolve problems and get assistance when needed.

Sea Surface Acidity and Marine Water Eutrophication

For the validation phase, should you encounter any problem in accessing, or retrieving any data, please contact (i) For the service: dmitry.kondrik@cmcc.it For Pilot Frontend (Consultation): alessandro.danca@cmcc.it or for the Laboratory (Exploitation - Using your own workspace) JupyterLab: natali@sistema.at and mantovani@sistema.at



Learn more about SDGs-EYES:
<https://sdqs-eyes.eu/>



The SDGs-EYES Project has received funding from the European Union's Horizon Europe Programme for research and innovation under project number 101082311.