



ProBleu

**Promoting ocean and water literacy
in school communities**

Call HORIZON-MISS-2022-OCEAN-01

Deliverable D3.5

ProBleu Catalogue of Teaching Aids

Lead Beneficiary: Plymouth Marine Laboratory

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Preface

This document provides an overview of the essential features and capabilities of the ProBleu Catalogue of Teaching Aids (hereafter referred to as 'Catalogue', or in full where appropriate). Additionally, it presents a high-level analysis of usage statistics from the release date to March 2026.

Summary

The ProBleu Catalogue of Teaching Aids is a free, open-access online platform hosting ocean and water literacy resources for teachers and educators across the EU and beyond. Developed by Plymouth Marine Laboratory as part of the EU Horizon Europe ProBleu project, the Catalogue offers slides, worksheets, videos, simulations and curated external links, organised into thematic Resource Bundles and Science Stories that connect classroom learning to real scientific research. Its functionality was co-designed with teachers through two workshops.

An automated translation feature makes all editable materials available in the 27 EU languages, from which individual users can make further edits and re-share. Since its public launch in November 2024, Catalogue usage has continuously increased, with particularly strong uptake in Türkiye, Spain and the UK. Resources have been added continually since launch, and presently the most downloaded materials cover such diverse topics as plastic pollution, citizen science and biodiversity. In May 2025, the Catalogue joined the UNESCO-IOC Blue Thread network, recognising its contribution to global ocean literacy.

1 Overview of the ProBleu Catalogue of Teaching Aids

1.1 What is ProBleu Catalogue of Teaching Aids?

To facilitate the achievement of its objectives to increase water and ocean literacy in school communities across the EU and Associated countries, to support and grow the Network of European Blue Schools and advance the goals of EU Mission "Restore our Ocean and Waters by 2030", ProBleu has deployed an online community-driven catalogue of ocean and water literacy teaching aids, available at <https://probleu.pml.space>. The Catalogue hosts educational materials that can be reused by teachers and educators to create lessons tailored to their specific requirements. The Catalogue includes slides, worksheets, spreadsheets, videos, dynamic simulations and lists of external resources combined into thematic packages referred to as Resource Bundles, of which Science Stories are a specific case. The Catalogue uses AI technology to automatically translate materials shared in editable formats into the 27 official EU languages.

All the resources shared through the Catalogue are free to browse, download, reuse, remix and reshare under Creative Commons licensing. Registered users can upload materials and create

their own bespoke Resource Bundles. Materials provided by the Catalogue were developed and shared by schools via ProBleu-funded projects, by scientists engaged in the ProBleu consortium, as well as by external organisations involved in water and ocean literacy and outreach.

The Catalogue was co-designed with teachers across two workshops, ensuring its functionality reflects real classroom needs. In May 2025, the ProBleu Catalogue joined the Blue Thread network, UNESCO-IOC global initiative for Ocean Literacy in Action, which recognises ProBleu commitment to promoting ocean literacy and fostering sustainable stewardship of the ocean.

Functionality of the online platform hosting the ProBleu Catalogue has now been fully developed. Its continued use by teachers and educators means that new teaching materials are still being added, and its user-base continues to grow.

1.2 Navigating the Catalogue

The landing page for the Catalogue is found either through the main project website <https://probleu.school/> (Menu: Resource Catalogue) or directly through <https://probleu.pml.space>. This will take the user to the landing page as shown in Figure 1.

The overview below refers to the English language version of the catalogue. The language can be changed from the dropdown 'Language' menu bar.  Accessibility options are found by clicking on the icon in the top left.

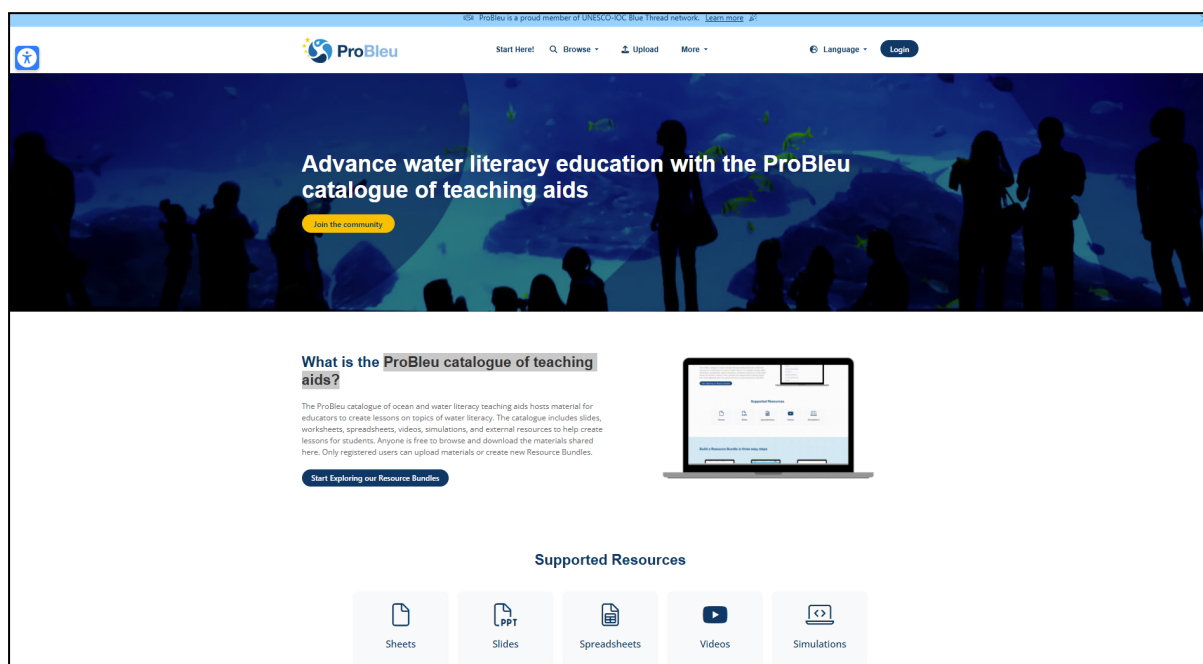


Figure 1. The landing page of the ProBleu Catalogue of teaching aids.

To get the most benefit from the Catalogue, the users, especially those interested in uploading their own teaching materials, are advised to start with the 'How to use this catalogue' section accessible through the 'Start Here!' menu item (<https://probleu.pml.space/en/new-starters/>). This section provides plain-language answers to commonly asked questions about the Catalogue and its functionality. If the user requires further assistance, links to the contact page are provided, allowing them to get in touch with the Catalogue development team.

The entire content of the ProBleu Catalogue is accessible through the 'Browse' menu item, which offers six distinct options for exploration of the teaching materials:

- Science Stories, collections of interactive ready-to-use resources featuring real scientists and their work (access via Browse -> Science Stories, or directly through the following link: <https://probleu.pml.space/en/science-stories>).
- Resource Bundles, collections of resources exploring a variety of water and ocean-related topics, developed by ProBleu-funded schools, scientists and ocean literacy enthusiasts (access via Browse -> Resource Bundles, or directly through the following link: <https://probleu.pml.space/en/bundles>).
- Users can explore Resource Bundles by topics via menu Browse -> Topics, or directly via the following link: <https://probleu.pml.space/en/topics>. The Catalogue subdivides Resource Bundles into 15 topics, which act like keywords, so that a bundle may appear under several topics if its content spans multiple areas.
- All materials of the Catalogue, categorised by type: Slides, Sheets, Spreadsheets, Videos, Simulations (access via Browse -> All Materials, or directly through the following link: <https://probleu.pml.space/en/contents>).
- A collection of external links to websites on water and ocean literacy (access via Browse -> External Links, or directly through <https://probleu.pml.space/en/external-contents>).
- ProBleu Ocean Explorer tool that allows to investigate various model-derived properties of European regional seas (access via Browse -> Ocean Explorer, or directly through the following link: <https://probleu.pml.space/en/ocean-explorer/>).

All the above-mentioned options are briefly described in the next section.

2 Essential components of the Catalogue

2.1 Science Stories

ProBleu Science Stories are interactive, ready-to-use collections of thematic resources featuring real scientists and their work, offering educators and students first-hand perspective on ocean challenges and exploration, bridging the gap between research and educational communities.

ProBleu Catalogue offers the following Science Stories:

- Science at Sea: A morning on the Research Vessel Plymouth Quest

- The Ocean in a Changing Climate
- Exploring Biodiversity with Plymouth Marine Laboratory
- An Ocean of Plastic: The Ocean needs you!
- Discover Ecosystem Modelling with a Plankton Ecologist
- Water Chemistry with Plymouth Marine Laboratory
- Restoring Waterways Science Story (see Figure 2).
- Guardians of the Sea: How the Kaikōura community came together to protect the ocean

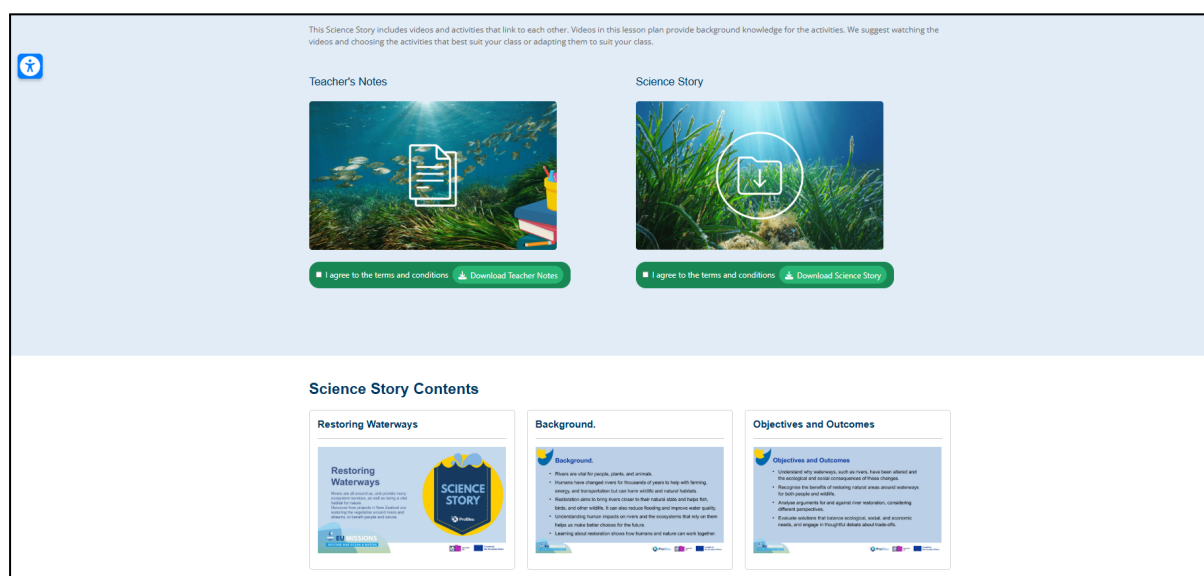


Figure 2. Screenshot of the Catalogue page with the Restoring Waterways Science Story (<https://probleu.pml.space/en/bundle/231/>), showing downloadable Teacher's Notes and Science Story packs, as well as first three slides of the contents.

Further information on the ProBleu Science Stories, along with recommendations for their use in the classroom are available in ProBleu deliverable D3.4 ProBleu Science Stories (Kenworthy et al, 2025).

2.2 Resource Bundles

ProBleu Resource Bundles are collections of slides, worksheets, videos and materials in other formats combined into packages focused on specific water and ocean literacy topics and themes (Figure 3). ProBleu Science Stories are special cases of Resource Bundles (see Section 2.1). Registered Catalogue users can upload their own Resource Bundles and remix elements of the existing ones to create custom versions that fit their teaching needs.

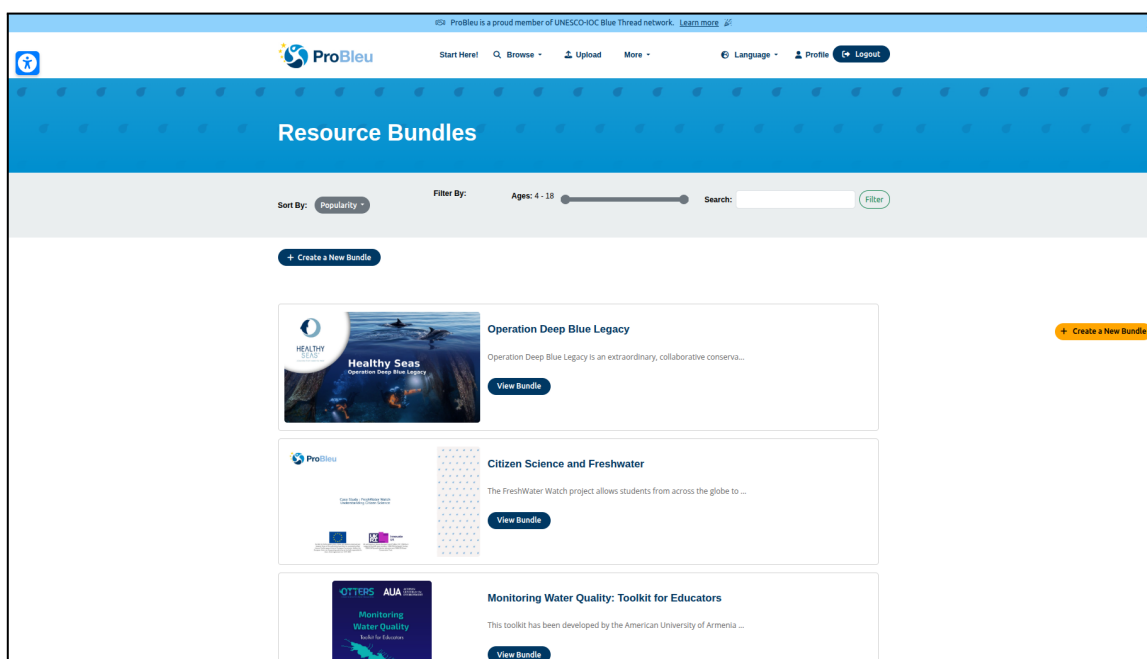


Figure 3. Screenshot of the Catalogue page showing most popular Resource Bundles (https://probleu.pml.space/en/bundles?sort=popular&items_to_display=9). Menu options allow sorting bundles by popularity, time of upload and last edit, as well as by target age. A search bar is also available.

2.3 Topics

The ProBleu Catalogue subdivides all available Resource Bundles into 15 topics (Figure 4). Some of the topics (Cultural Heritage, Sustainable Resources, Ecosystem Services) were added following user requests to better reflect the scope of their materials. Topics are assigned during the upload process, and each bundle can belong to multiple topics. The list of topics is as follows:

1. Biodiversity
2. Citizen Science
3. Climate
4. Cultural Heritage
5. Deoxygenation
6. Ecosystem Services
7. Freshwater
8. Nutrient Pollution
9. Ocean
10. Ocean Chemistry
11. Ocean Currents
12. Ocean temperature
13. Plastic Pollution
14. Sustainable Resources
15. Weather

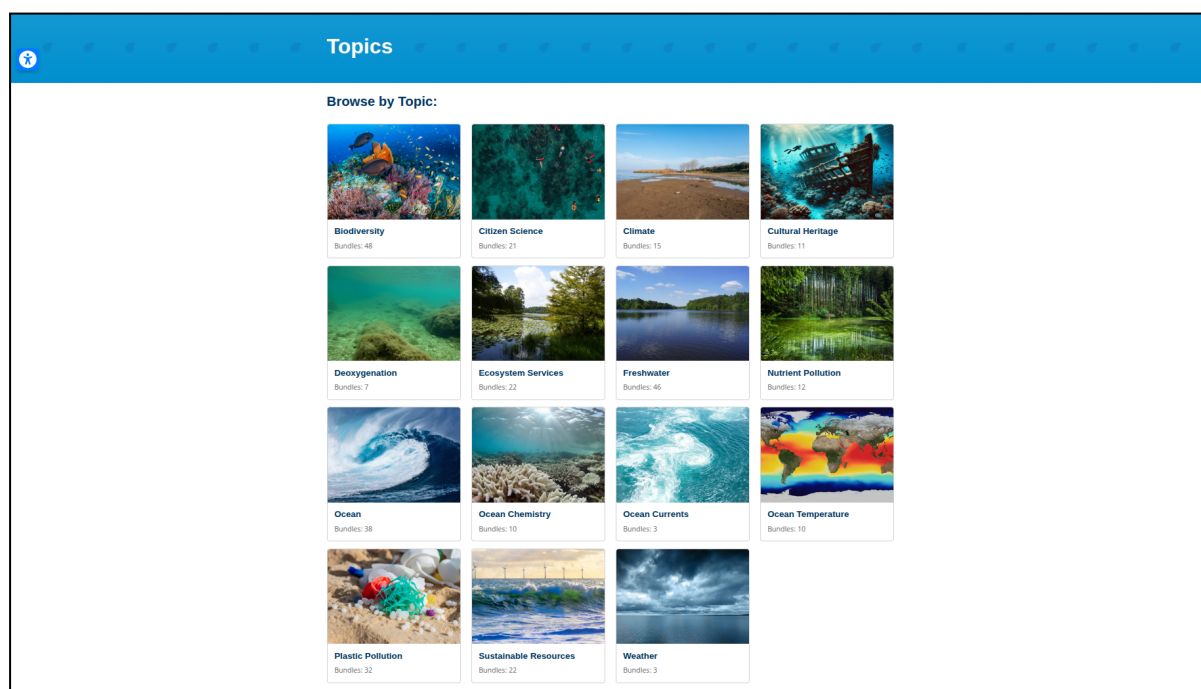


Figure 4. Screenshot of the Catalogue page offering users to browse materials by topic (<https://probleu.pml.space/en/topics>), indicating the number of Resource Bundles available under each topic.

2.4 All materials

Users can access all the individual slides, worksheets, spreadsheets, video and dynamic simulation links through the 'All Materials' menu of the Catalogue, and then follow the dropdown menu for each type of material (Figure 5). Registered users have access to advanced options that allow them to select individual elements and combine them into custom bundles.

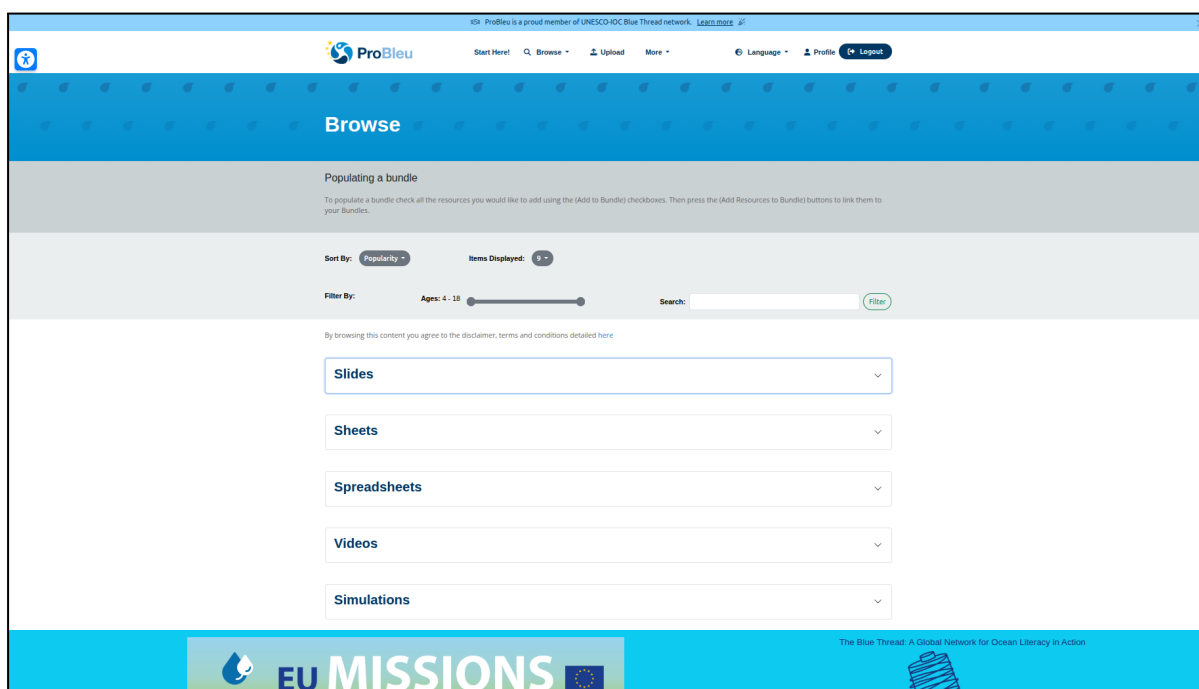


Figure 5. Screenshot of the Catalogue page leading to all individual components of uploaded teaching materials (https://probleu.pml.space/en/contents?sort=popular&items_to_display=9). Users can sort these by popularity, upload and latest modification date as well as target age, choose the number of items displayed on the screen, as well as search by keyword.

2.5 External Links

The Catalogue provides a facility to upload weblinks to external resources (Figure 6). Each weblink is accompanied by a short description and is categorised into one or more topics, along with an indication of suitable age and providing search keywords, allowing coupling of these weblinks to Resource Bundles. The web links can point to existing websites with teaching materials and useful information for educators, or to materials created by ProBleu-funded schools as part of their projects.

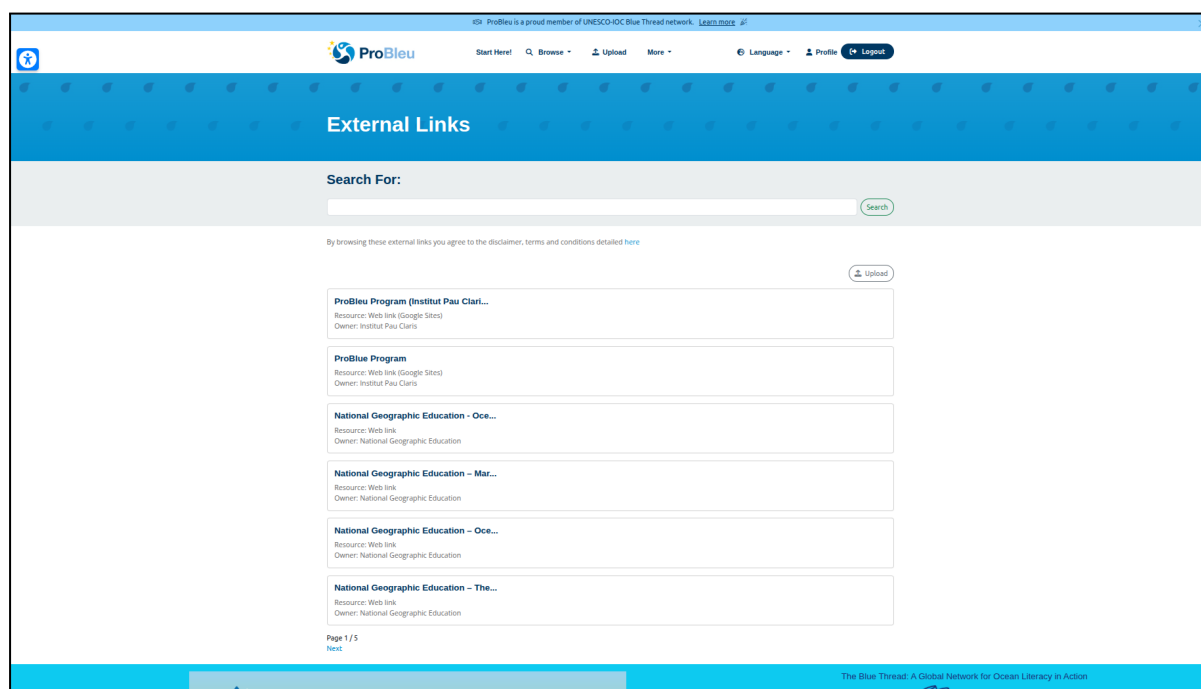


Figure 6. Screenshot of the Catalogue page providing a facility to upload and browse links to external water and ocean literacy websites (<https://probleu.pml.space/en/external-contents>). Examples of existing educational websites (National Geographic Education) and those created as part of ProBleu school projects are shown.

2.6 Ocean Explorer

ProBleu Ocean Explorer Tool is an interactive tool that helps to obtain data from numerical models to investigate various properties of European shelf seas: Mediterranean, Baltic, Black Seas and North-West European Shelf (including North Sea, Irish Sea, Celtic Sea). By clicking on a point on a map, users can download time-series of surface or near-bottom Chlorophyll-a, pH, temperature, salinity and/or oxygen (Figure 7). These data can be consequently explored using spreadsheets (Excel, LibreOffice) or imported into Python or R for statistical analysis and plotting. A detailed description of the tool is provided in ProBleu Deliverable D3.2 Digital teaching aids to assess the state of ocean and freshwater resources (Lessin et al, 2024). The current version of the tool has been extended to allow exploration of future model scenarios (1930-2100).

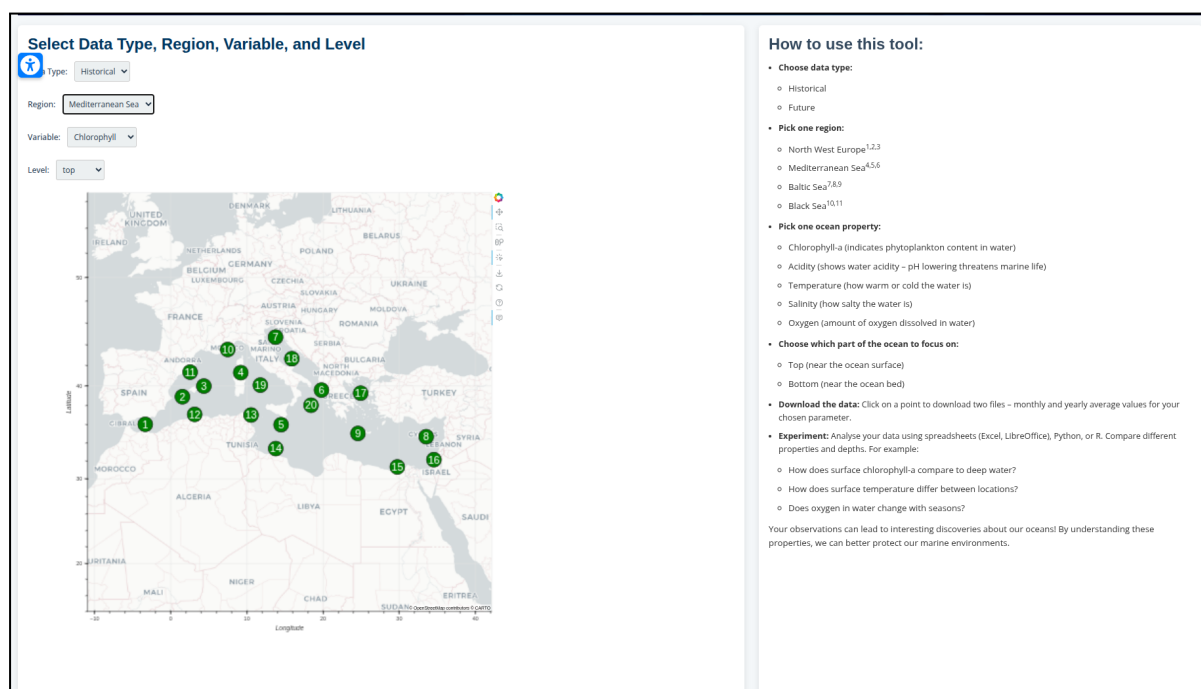


Figure 7. Screenshot of the catalogue page with ProBleu Ocean Explorer Tool (<https://probleu.pml.space/en/ocean-explorer/>), offering a selection of stations in the Mediterranean for exploration of their properties (left) and a concise user guide (right).

3 Catalogue usage statistics

The ProBleu Catalogue of Teaching Aids was made available in November 2024. The release was accompanied with news items on project partner organisations' websites, social media posts and emails to schools funded in the first round of ProBleu funding calls. Since then, the Catalogue usage, both in terms of user registrations, content uploads and downloads, has continuously increased.

3.1 Registered users

The timeline of cumulative user registration request approvals is shown in Figure 8. The number of registered users started to grow in November-December 2024 immediately after the Catalogue went public, while promotion efforts led to accelerated rates of registration approvals in January-February 2025, followed by a steadier growth up to December 2026. After a short winter break in registration requests, the user base again returned to a steady growth phase. The period of fastest uptake with users corresponds to activity in the ProBleu funding calls, as well as those of sister projects, for school projects to support entry into the Network of European Blue Schools.

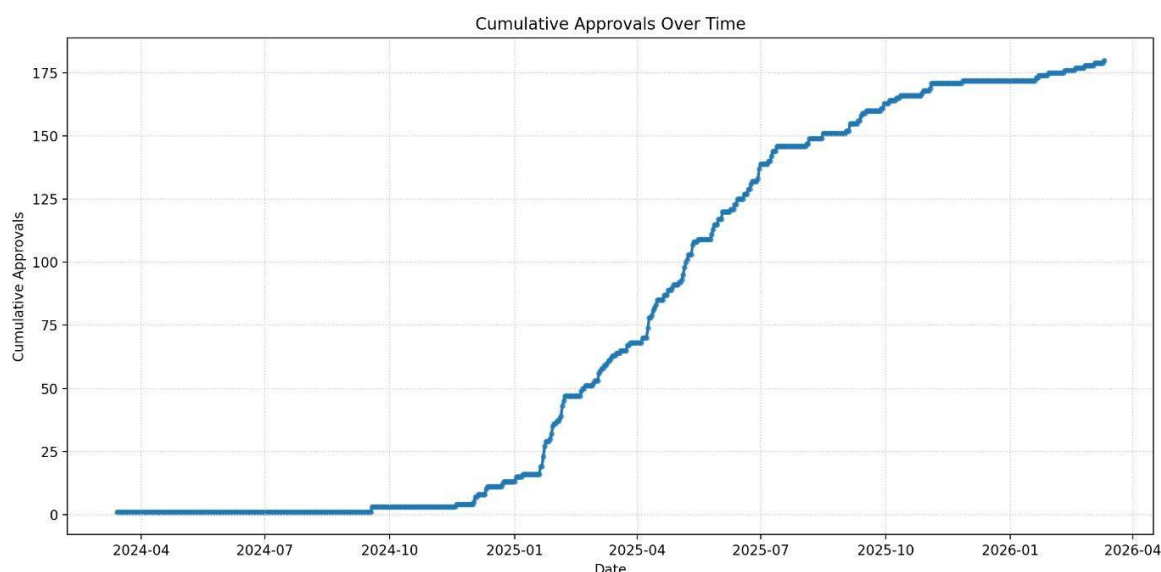


Figure 8. Cumulative Catalogue user registration request approvals.

The highest number of approved registrations originated from Türkiye (25 users), Spain (22) and the United Kingdom (12). Among EU member countries, the second highest number of users is from Greece (11), and third highest is from Portugal (10). Among non-EU countries, the third highest number of requests came from North Macedonia (5). Figure 9 shows the total number of approved registration requests by country, while figure 10 provides a separate view of EU (left) and non-EU countries (right).

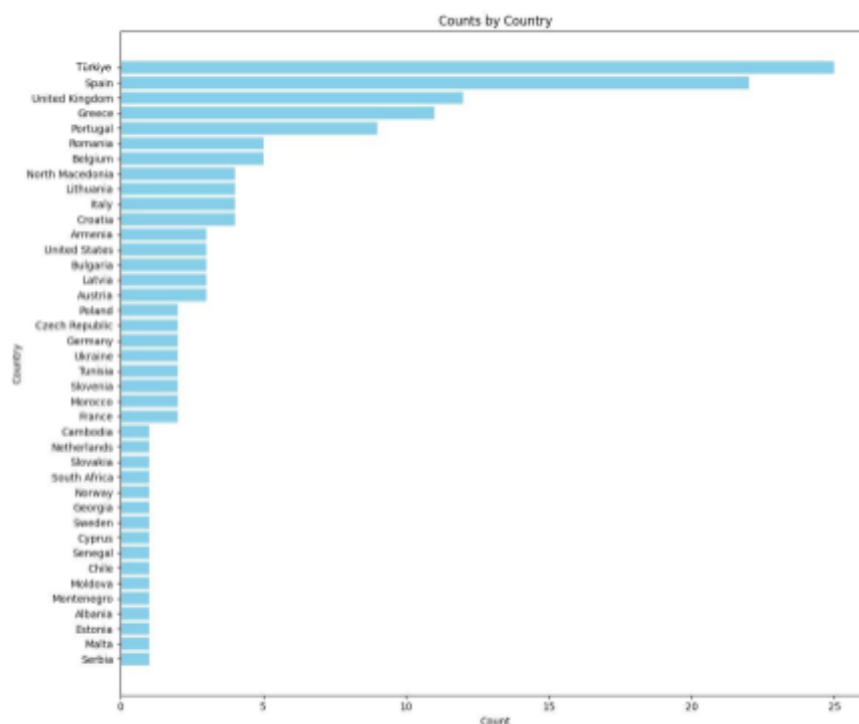


Figure 9. Total number of approved Catalogue user registration requests by country.

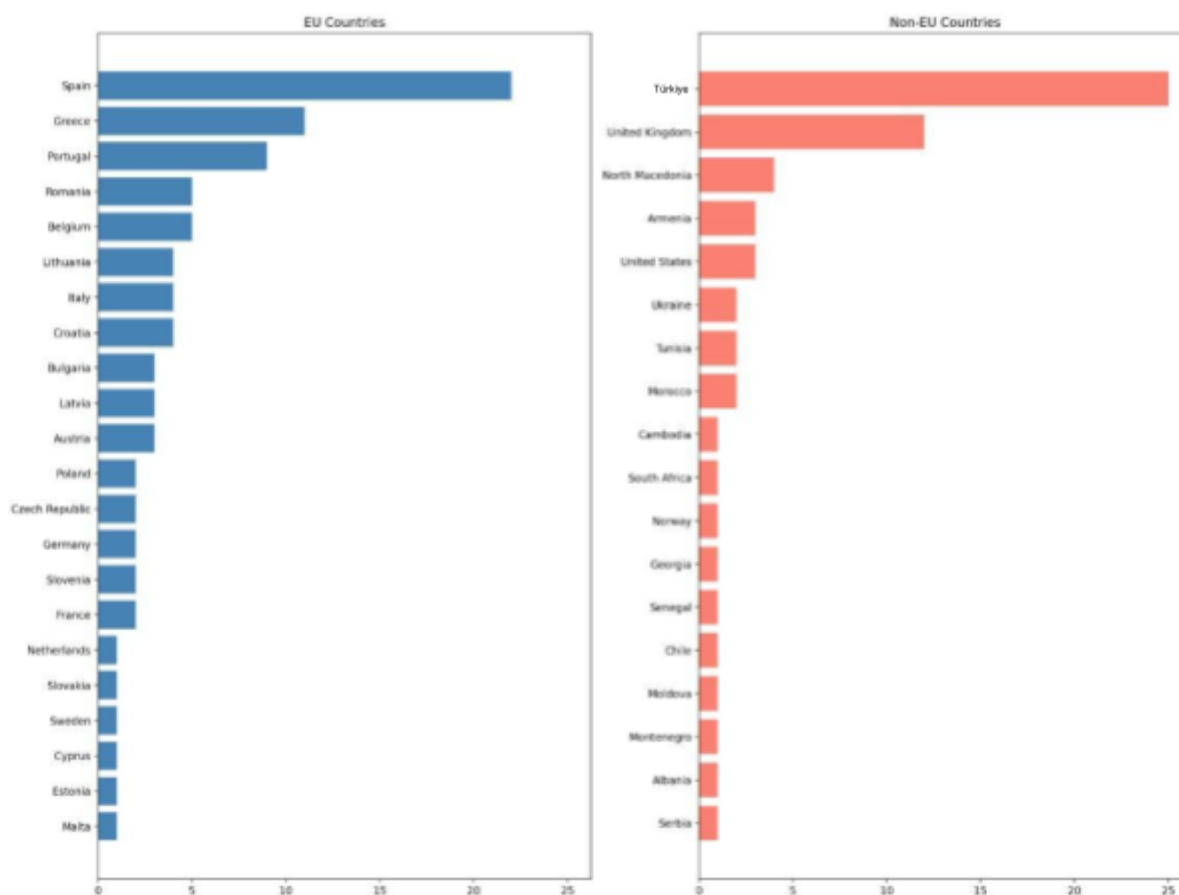


Figure 10. Number of approved Catalogue user registration requests from EU countries (left) and non-EU countries (right).

3.2 Resource uploads

The timeline of resource uploads to the Catalogue shows an initial spike in uploads around the Catalogue release time, driven by resources developed by project partners to provide initial examples for the follow-up uploads. Thereafter, the timeline can be divided into two distinct periods: a period of exponential growth until June 2025, followed by a more linear growth trend continuing into the present period (Figure 11).

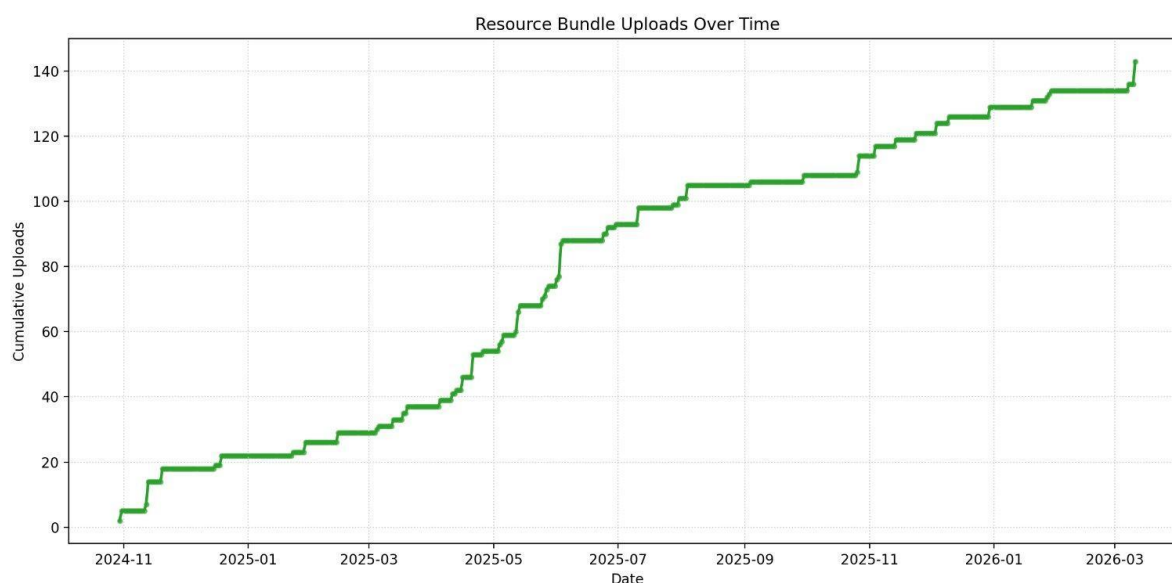


Figure 11. Timeline of resource uploads to the Catalogue.

3.3 Resource downloads

An overview of the most downloaded Resource Bundles hosted in the Catalogue is provided in Table 1. It must be noted that the total number of downloads does not fully reflect material usage, as some users may choose to browse materials online and take screenshots of only those elements they need, which is a common practice among teachers.

Table 1. Most downloaded Resource Bundles

Resource Bundle	Count	Link to the bundle
Plastic pollution	45	https://probleu.pml.space/en/bundle/84/
Citizen Science and Freshwater	36	https://probleu.pml.space/en/bundle/104/
Animation scripts	33	https://probleu.pml.space/en/bundle/111/
Seagrass Superhero - What is Seagrass?	26	https://probleu.pml.space/en/bundle/94/

Biodiversity Virtual Journey - Exploring Biodiversity with Plymouth Marine Laboratory	23	https://probleu.pml.space/en/bundle/124/
Save our Seabed - classification and food webs	21	https://probleu.pml.space/en/bundle/99/
Measuring temperature from space	20	https://probleu.pml.space/en/bundle/85/
Eutrophication	15	https://probleu.pml.space/en/bundle/80/
Operation Deep Blue Legacy	15	https://probleu.pml.space/en/bundle/143/
Freshwater heroes - Be a water detective with citizen science!	14	https://probleu.pml.space/en/bundle/103/

Downloads by country are presented in Figure 12. It must be noted that the figure reflects only activity by registered users who were logged in during the download. The highest number of bundle downloads originated from Türkiye (20), followed by the Czech Republic (6) and the United Kingdom (5).

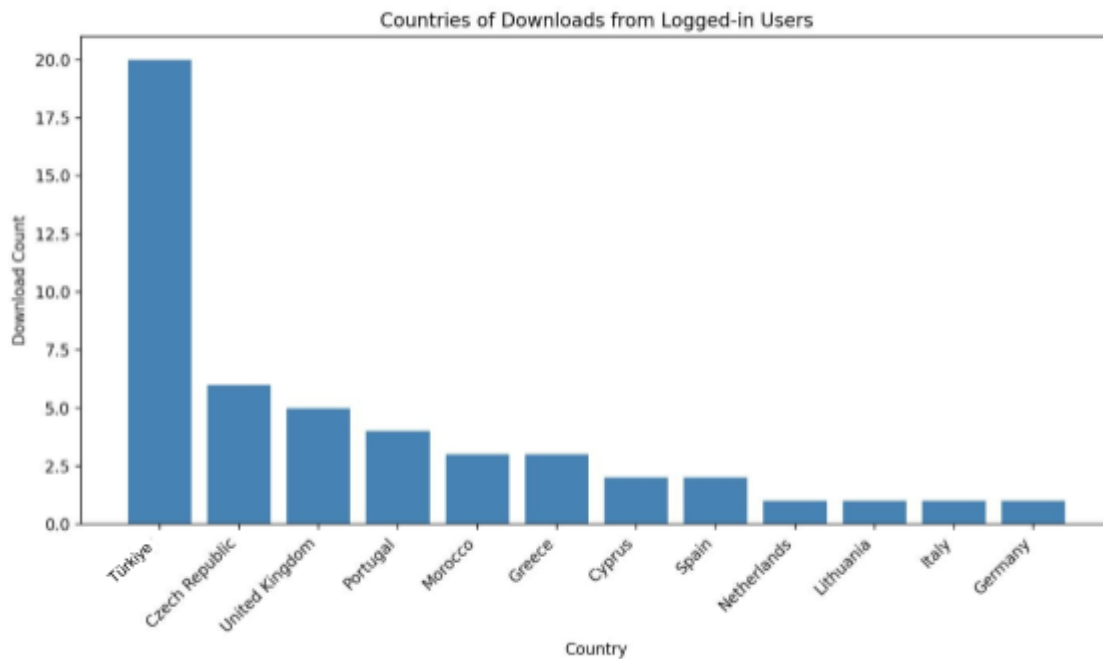


Figure 12. Countries of downloads from logged-in users

Most of the resources were downloaded in English. Figure 13 shows the number of downloads, where resources were requested in other languages. The most popular language was Spanish (23 downloads), followed by French (12) and German (7).

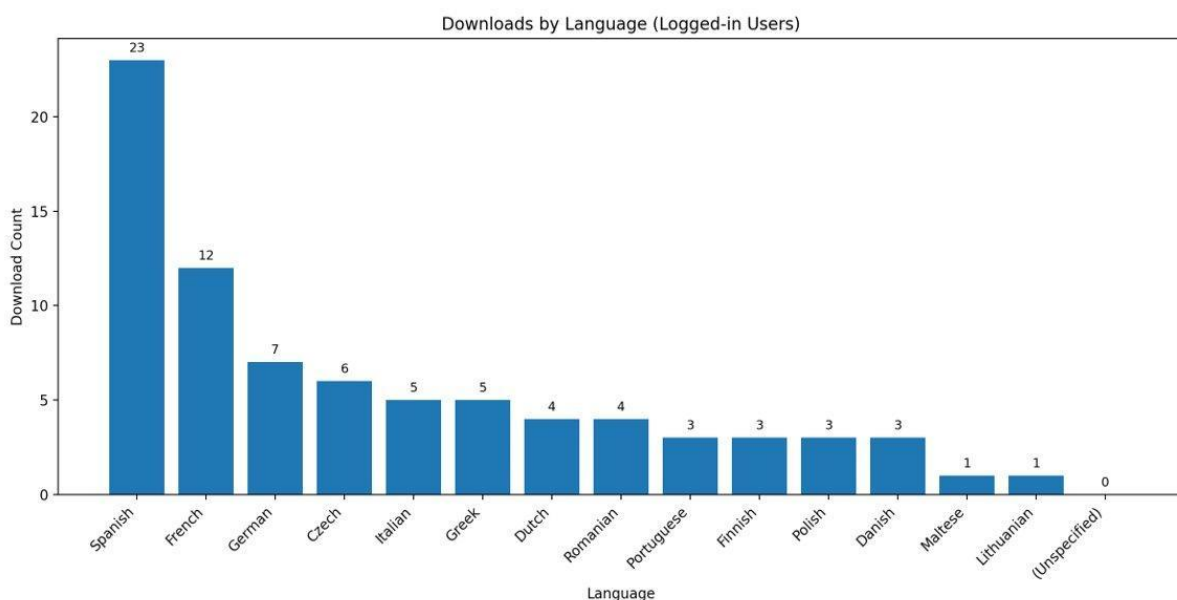


Figure 13. Resource Bundle downloads in non-English languages.

4 Future outlook

The ProBleu consortium is committed to maintaining access to the Catalogue for at least seven years beyond the project. We recommend that future projects and programmes aiming to make use of the Catalogue, make timely enquiries with the Catalogue maintainers to ensure that service continues uninterrupted. In particular, features which incur a cost beyond regular maintenance, such as automated translations and help-desking, will depend on continued funding.

Acknowledgements

We would like to thank all those who contributed to the development and growth of the ProBleu Catalogue of Teaching Aids: colleagues at Plymouth Marine Laboratory who have contributed to the Science Stories, including boat crews, lab managers, scientists and communications teams; students and staff of St Andrew's Church of England Academy who contributed to the Climate and the Ocean Science Story; all the teachers involved in ProBleu who dedicated their time and effort to the development of teaching resources they kindly shared through the Catalogue; our friends at Healthy Seas Foundation, EU-funded projects OTTERS and DaWetRest for contributing materials; Zachary Penman from the Department of Conservation in New Zealand, Gina Solomon and Larncé Wichman from Te Korowai o Te Tai ō Marokura and the Kaikōura Marine Guardians, Krista Van der Linde, Cetacean Research Programme Manager at Whale Watch Kaikoura Ltd, Greg Stanley from Environment Canterbury, and Craig Stenhouse from Clean Streams Karamea for their contribution to the development of Restoring Waterways, Whakahaumanu ngā awa Pākihi: The Braided River Revival Project, and Guardians of the Sea Science Stories.

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