ProBleu

Promoting ocean and water literacy in school communities

Call HORIZON-MISS-2022-OCEAN-01

Deliverable D2.1

ProBleu pipeline for Blue Schools

Lead Beneficiary: Earthwatch
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Summary

D2.1 ProBleu pipeline for Blue Schools is a roadmap for all project activities, and establishes a detailed procedure for supporting schools to become part of the Network of European Blue Schools.

The pipeline covers nine key actions, carried out over the lifetime of the project: (1) Understanding the existing Network; (2) Reaching out to current Blue Schools; (3) Connecting with primary and secondary schools outside the Network; (4) Improving the process of joining the Network; (5) Aligning Blue School projects to the Mission; (6) Growing the Network; (7) Maximising the impact of Blue School projects; (8) Engaging school communities through open schooling; and (9) Maintaining the Network.

Of these actions, **Aligning Blue School projects to the Mission** is of particular importance. Inclusivity is a key theme in ProBleu, and a goal of this deliverable is to convert the jargon-heavy targets of the Mission into accessible language appropriate for school teachers and students; complete with example project topics across school subjects that could be used to carry out projects in line with these Mission targets. This alignment forms part of the knowledge repository that will be a key output of the ProBleu project.

List of Abbreviations

KPI: Key Performance Indicator

Mission: Mission Starfish 2030: Restore our Ocean and Waters by 2030

MPA: Marine Protected Areas

Network: Network of European Blue Schools

SDG: Sustainable Development Goal

UN: United Nations

1. Introduction

Worldwide, progress in reaching good environmental status in inland and marine waters is slow. The needed generational change in the role of society in actively looking after the health of water resources can be achieved through the expansion of ocean and water literacy in schools. The *Network of European Blue Schools* (Network), established under the EU4Ocean Coalition for Ocean Literacy, has improved ocean and water literacy; however, this network needs to grow and be supported. ProBleu will expand and support the Network of European Blue Schools, attracting a wide diversity of new members, improving ocean and water literacy across school communities, and contributing to the Sustainable Development Goals (SDGs), in particular to protect marine and freshwater ecosystems and biodiversity, and to prevent and eliminate pollution.

The objectives of work package 2 **(WP2) Pipeline to support and accelerate the growth of the Network of European Blue Schools** are to design a pipeline to guide schools through the process of accreditation as Blue Schools, more specifically to: (1) encourage accreditation in the Network of European Blue Schools; (2) reduce barriers to the process; and (3) to co-create, with schools funded through the ProBleu calls, pathways towards increased impact and achievement of the objectives of Mission Starfish 2030: Restore our Ocean and Waters by 2030 (which shall be referred to as “the Mission” and is described fully in section **1.1.2 Mission Starfish** below).

This deliverable, **D2.1 ProBleu pipeline for Blue Schools**, includes:

- a review of how schools can establish Blue School projects;
- a detailed plan of how schools can become accredited in the Network of European Blue Schools through ProBleu;
- methods by which schools can collaborate with other schools and organisations;
- ideas about how schools will contribute to the achievement of the Mission Starfish objectives;
- a common reference which will ensure that the activities of all WPs are aligned and contribute to the same end-goal;
- a plan of interactions between WPs and their contributions.

Ultimately, this document is to be used as a roadmap for all project activities, establishing a detailed procedure for supporting schools.

1.1 Background

1.1.1. The Network of European Blue Schools

The Network of European Blue Schools is an initiative of EU4Ocean, the European Ocean Coalition that connects diverse organisations, projects and people contributing to water literacy and the sustainable management of the ocean. A European Blue School recognises the importance of the waters (both the ocean and freshwater) in its education activities by taking up the Find the Blue challenge. Schools that take up the Find the Blue challenge shall

identify a water-based topic relevant to their students, and collaborate with their pupils to create a school project. By completing the Find the Blue challenge, schools will receive the European Blue School certification and become part of the international network.

1.1.2. Mission Starfish

Mission Starfish 2030: Restore our Ocean and Waters by 2030 has five overarching objectives for 2030 (European Commission, 2020):

1. Filling the knowledge and emotional gap
2. Regenerating marine and freshwater ecosystems
3. Zero pollution
4. Decarbonising the economy to protect our ocean, seas and waters
5. Revamping governance

Across these objectives, a set of 17 ambitious, concrete and measurable targets has been defined. These are listed in Table 1 as they are presented in Mission Starfish 2030: restore our ocean and waters (Publications Office, 2020). In **section 2.5 Aligning Blue School Projects to Mission Starfish,** ProBleu presents these targets and what the Mission hopes to achieve by 2030 in plain language which is understandable to everyone.

Table 1: ***Mission Starfish objectives and targets***

Objective		Target
Filling the knowledge and emotional gap	1	Each European is a citizen of our ocean and waters.
	2	Marine and freshwater observation is streamlined and accessible to all via a digital twin of the ocean and all waters.
Regenerating marine and freshwater ecosystems	3	30% of EU waters are highly to fully protected.
	4	Active regeneration of 20% of degraded habitats
	5	Re-naturalise rivers and waters
	6	End overfishing
Zero pollution	7	Zero plastic litter generation
	8	Eutrophication of European seas and waters is halted.
	9	Zero spill
	10	Underwater noise is regulated and reduced.
Decarbonising the economy to protect our ocean, seas and waters	11	Climate-neutral waterborne transport
	12	Support the energy transition through renewable low-impact ocean energy
	13	Zero-carbon aquaculture
	14	A thriving blue biotech
	15	Climate-neutral blue tourism

Revamping governance	16	An integrated and participatory EU system of ocean and water governance
	17	EU leadership for effective global ocean governance

1.1.3 ProBleu "sister" projects

In addition to ProBleu, two other projects have been funded under call HORIZON-MISS-2022-OCEAN-01-08; SHORE (EmpOweR Students as the agents of cHangE) and BlueLights. ProBleu will work independently from these "sister" projects, but collaborate with them to maximise dissemination of all projects' outputs. Further detail of the collaboration with the sister projects is given in **2.9.2. Collaboration with the Network of European Blue Schools and sister projects (SHORE and BlueLights)**.

2. The ProBleu Pipeline

The following pages describe the actions of the ProBleu pipeline which guides schools through the process of accreditation as Blue Schools.

Table 2 details the key actions of the pipeline, when they occur within the timeline of the project, and how often they are anticipated to occur; developed from Ceccaroni *et al*., 2023.

Table 2: ***The key actions of the ProBleu pipeline***

Action	When	How often
Understanding the existing Network	M1-12	Once
Reaching out to current Blue Schools	M6	Once
Connecting with primary and secondary schools outside the Network	M6-M30	Call cycles
Improving the process of joining the Network	M10	Once*
Aligning Blue School projects to the Mission	M10-30	Call cycles
Growing the Network	M5-36	Call cycles
Maximising the impact of Blue School projects	M10-30	Call cycles
Engaging school communities through open schooling	M10-35	Throughout
Maintaining the Network	M10-36	N/A

* Improving the process of joining the Network may be actioned more than once following call cycles as part of an iterative process of improvement based on feedback from educators.

Several actions are related to the call cycles. This is depicted in Figure 1.

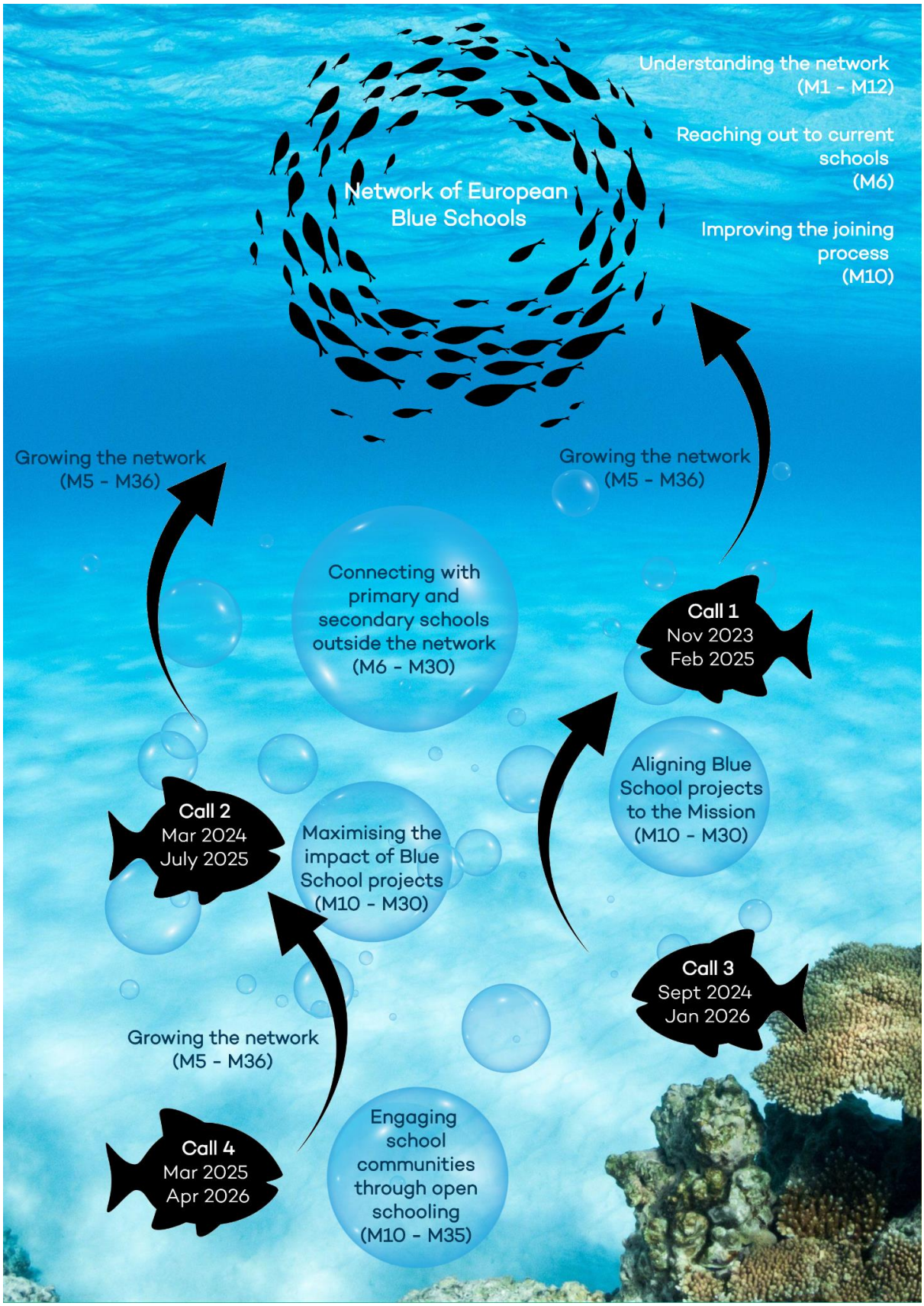

Figure 1: ***The ProBleu pipeline***

2.1. Understanding the existing Network of European Blue Schools

The first process of understanding the existing Network of European Blue Schools is detailed below. A future deliverable **D2.2 Evaluation of the Network of European Blue Schools**, produced in **M12** of the project, will build on this initial evaluation, which consists of the following elements:

- The process of joining the Network
- A review of existing Blue Schools
- A review of teaching resources

2.1.1. The process of joining the Network

Currently, schools have to carry out the following six steps to become Blue School:

1. Teachers must create an EU login: https://webgate.ec.europa.eu/cas/login
2. Teachers must request access to the community of European Blue Schools: https://maritime-forum.ec.europa.eu/
3. Teachers must complete the online application form: Application to become a European Blue School (Page 1 of 5) (office.com) which consists of the following fields:
    - Teacher
        - First name of applicant teacher
        - Last name of applicant teacher
        - E-Mail of applicant teacher
        - School level
        - How many students are directly involved in the project?
    - School
        - Name of school
        - Country
        - City
        - Website URL of school
        - Coastal (<20 km inshore)/Inland location

        - Sea basin
    - GPS coordinates of the city
        - Latitude
        - Longitude
    - The Blue project
        - Name of the project (English)
        - Name of the project (native language)
        - URL(s) of the project (if applicable)
    - Compliance with the European Blue Schools Criteria
        - Develop a project with interlinked activities
        - Produce a clear output
        - Involve all students
        - Collaborate with a local partner
        - Identify the partners involved in the project
        - Communicate to the community
        - Provide authentic learning experiences
        - Work in a multi-disciplinary manner
        - Mobilise beyond the classroom
        - Foster a land-sea interaction
        - Bring in a European dimension
        - Summary of the project
        - Starting date of the project
        - End date of the project
        - Is the project linked to school curricula?
        - If yes, to which subjects is it connected to?
        - Is the project being developed in any other kind of school programme/certification? If so, please specify

- Does the project address one of the following topics?
- Participant consent for storage and future use of data
- Participant code of conduct

4. The Network reviews the application
5. Teachers must alter the project to fulfil five compulsory criteria. These criteria are listed below as described on the Maritime Forum, but in **section 2.4.1. Clarifying Blue School Criteria** they are re-defined by the ProBleu project to ensure clarity.
    - **Consist of interlinked activities**: A project should consist of several complementary activities under the umbrella of one central topic. Students should be enabled to gain more in-depth knowledge and skills by working for an extended period to explore and investigate a water-related topic, question or problem.
    - **Produce a clear output**: The initiative should encourage students to be active learners and develop a product, object, event or service that can be exhibited or used as a tool for communication.
    - **Involve all students**: Students should play an active role in all phases of the project. The teacher should facilitate learning and guide students to become independent workers, allowing them to show what they can do.
    - **Collaborate with a local partner**: Collaborative work is crucial to success. Projects should invite an expert, marine scientist, NGO, science centre, maritime company or government body to help facilitate the project's creation, implementation and communication.
    - **Communicate project results**: Through projects, students are enabled to improve their communication skills and feel more engaged with their local community by talking about the project in a meaningful and informed way, starting with their social environment.
6. Projects are approved

There are additional steps in which (7) a webpage of the project is automatically generated on the Maritime Forum, (8) teachers are granted access to all projects, resources, fora and trainings, and (9) the webpage must be periodically updated to maintain the certification. The complete process is depicted in Figure 2.

Figure 2: ***How schools currently register to become a Blue School***

2.1.2. A review of existing Blue Schools

As part of **D2.2 Evaluation of the Network of European Blue Schools,** all previous and existing Blue Schools will be analysed, including an evaluation of to what extent these projects contribute to achieving the Mission objectives. The purpose of this is to better understand the ways in which school projects - across all disciplines - can relate to the objectives of the Mission; ensuring that art, history or drama teachers are as empowered to run a Blue School Project as science or geography teachers. An example evaluation is included here. Note that the initial information included in the analysis relates to the application process detailed in **section 2.1.1 The process of joining the Network**

School information

- School name: Liceul Teoretic "Carmen Sylva"
- City: Eforie Sud
- Country: Romania
- Sea basin: Black Sea
- Region: Coastal

Project information

- Project name in native language: "Carmen Sylva", scoala albastra
- Starting date of the project: 11/10/2021
- End date of the project: 11/10/2023
- Level of education: Senior High School
- Categories: Healthy Ocean
- Background / issue: The abundance of green and red algae that have severely degraded the beach area. Our hypothesis is that we are witnessing an accentuated process of eutrophication.
- Methods: Teams of students from our high school will collect weekly water samples from the Black Sea and Techirghiol lake. The analysed parameters will be: temperature, pH, conductivity, salinity, dissolved oxygen, nitrates, nitrites, ammonium, phosphates.
- **Alignment to the Mission: Eutrophication of European seas and waters is halted**

2.1.3. A review of teaching resources

D2.2 Evaluation of the Network of European Blue Schools will also appraise existing tools, frameworks and guidance produced by school networks and education initiatives related to freshwater, oceans, and any other relevant domains in terms of their ability to support the sustainability of the Network; and review existing learning methodologies (challenge-based learning, design thinking, science shops) and their relevance to Blue Schools' learning processes. Table 3 lists a number of example resources that are being evaluated by ProBleu.

Table 3: ***Teaching resources for ocean and freshwater literacy***

Topic	Resource name	Resource type	Link
Physical oceanography	Measuring water colour	Workshop	http://citclops.eu/water-colour/measuring-water-colour
Physical oceanography	Measuring water fluorescence	Workshop	http://citclops.eu/fluorescence-/measuring-water-fluorescence
Physical oceanography	Measuring water transparency	Workshop	http://citclops.eu/transparency/measuring-water-transparency
Physical oceanography	Eye on Water App	App	https://www.eyeonwater.org/
Marine biology	Les praderies de posidònia, un ecosistema sota l'aigua	Teaching unit	http://www.escolesblaves.cat/wp-content/uploads/2018/01/escolesblaves_posidonia.pdf

Marine biology	The Deep Sea	Infography	https://neal.fun/deep-sea/?fbclid=IwAR1ciYacXFy95HRHR3C1_QvR4vnUQxKLHKYFiYQQOPUDP1SC_zJN37hzQP8
Marine biology	Propostes didàctiques	Teaching units	https://elmarafons.icm.csic.es/#
Marine biology	Plancton	App / Infography	https://plancton.science
Physical oceanography	Material didáctico	PDF, videos, presentations...	https://petitsoceanografs.icm.csic.es/elementor-692/
Marine biology	La mar de medusas	Teaching unit / Board Game	https://icmdivulga.icm.csic.es/la-mar-de-medusas/
Marine biology / Physical oceanography	El océano en casa	Blog	https://icmdivulga.net/oceano-en-casa/
Physical oceanography	¿Qué está pasando en el Ártico y cómo nos afecta?	Video	https://www.youtube.com/watch?v=62N37SS8ZVU
Geology	Descubre los volcanes	Web / Infography	https://descubrelosvolcanes.es/
Physical oceanography	Absorption, Scattering and the Color of the Ocean	PDF	https://misclab.umeoce.maine.edu/documents/BossOPN.pdf
Physical oceanography	Meteorology: An Educator's Resource for Inquiry-Based Learning for Grades 5-9	PDF	https://www.nasa.gov/pdf/288978main_Meteorology_Guide.pdf
Physical oceanography	Clarity of the Sea	Video	https://www.youtube.com/watch?v=72Gm8L1K0kA
Physical oceanography	Teaching Physical Concepts in Oceanography	PDF	https://tos.org/oceanography/assets/images/content/teaching_phys_concepts.pdf
Physical oceanography	Hands-On Oceanography	Teaching units	https://tos.org/hands-on-oceanography
Physical oceanography	How Clear Is the Water?	Teaching unit	https://www.nps.gov/lacl/learn/education/classrooms/upload/teacher-manual-how-clear-is-the-water.pdf
Physical oceanography	Project WET. Water education today	interactive e-books, eLessons, videos and more	https://www.projectwet.org/
Physical oceanography	Aprender explorando	Interactive games web	https://www.aprenderexplorando.org/
Marine biology / Physical	Encounter Edu	Web / Video / Teaching resources	https://encounteredu.com/

oceanography			
Marine biology / Physical oceanography	EO-PI: EXPLORING THE SCIENCE BEHIND EARTH OBSERVATION	Teaching units / Computer code	https://sites.google.com/view/eoscience/home
Physical oceanography	NASA Climate kids	Teaching resources / videos	https://climatekids.nasa.gov/menu/ocean/
Physical oceanography	NASA resources for educators	Teaching units	https://climate.nasa.gov/for-educators/
Marine biology / Physical oceanography	Pusa the Seal Workbook	Workbook	https://sisu.ut.ee/sites/default/files/adrienne/files/baltic_sea_pusa_the_seal_workbook.pdf

2.2. Reaching out to current Blue Schools

Engaging current Blue Schools provides an opportunity to showcase the resources that will be developed by the project in **WP3 Accessible teaching support for ocean and water learning**. It will also involve promoting the concept of twinning and clustering; whereby existing Blue Schools collaborate with schools that are yet to be accredited.

Following a meeting between members of the ProBleu consortium and EMSEA (on the 10th of November, 2023), the following action plan has been developed to reach out to current Blue Schools:

- ProBleu will send EMSEA all of the dissemination material related to the calls.
- This material will be distributed to teachers via the Network's mailing list and newsletter, as well as via the Network's private Facebook group.
- ProBleu will also present the project's aims, resources and funding at a teacher networking event on the 7th of December 2023.

2.3. Connecting with primary and secondary schools outside the Network

2.3.1. Emailing schools

In addition to the broader communication activities through the ProBleu website and social media content, the project has begun to build a database of eligible schools in order to directly email relevant parties about funding opportunities and the European Network of Blue Schools process. The contact details for each school have been sourced through online searches, with only generic emails used (admin@, secratary@ etc.) to ensure privacy and data protection guidance is followed.

Over the time of the project, and across the four funding calls, this database will grow following the schedule Table 4.

Table 4: *Database schedule*

Call/timing	No. of schools	Country threshold
Preparation for call 1 (Oct 2023)	500	At least 10 per each eligible country
Preparation for call 2 (Feb 2024)	1000	At least 20 per each eligible country
Preparation for call 3 (Aug 2024)	2500	At least 50 per each eligible country*
Preparation for call 4 (Feb 2025)	5000	At least 100 per eligible country*

** Where possible. For instance in the Faroe Islands or Luxembourg, there might not be 50+ schools eligible to target*

Each of the schools will be emailed on three occasions during the funding call process (approximately once a month), to ensure a balance between raising awareness, without becoming a nuisance or 'spamming'. Each email will have new information, so as not to become repetitive. The timing and context of each email is as follows (an example of the first email can be found in the

Annex):

- **First email** - an invitation to sign-up for more information (released 4 weeks before call opens)
- **Second email** - announcement that the call is open, with a link to the application process (released on the day the call opens)
- **Third email** - a reminder that the call is coming to an end, so applications need to be completed (a week before the call closes)

To increase the chances of engagement with the emails, each is translated into one of the first languages of the countries targeted. This has been done through online translation services, and whilst not perfect the emails are constructed in such a way that the text is simple, with additional checks for several languages carried out by partner representatives (Spanish, Italian, Lithuanian) to ensure the quality of translations.

At the time of writing, our response rate from this approach has been ~ 14% (70/500 schools; with additional sign-ups through other dissemination channels). Whilst it is not expected that this will necessarily translate into 70 completed funding applications, it does raise awareness of ProBleu and the network, and also increases the chances of receiving more applications in following calls. It also ensures engagement with the call across all the countries targeted, reaching a broader and more diverse audience than the “typical” audience often reached through traditional communication channels.

As a final step to increase the visibility of ProBleu actions, and when possible, connections will be made with the schools’ social media accounts (Twitter, Instagram and so on). This will not only alert the schools to the existence of ProBleu, but also will increase the chance of reciprocal ‘following’, broadening the reach of ProBleu posts and communications.

2.3.2. ProBleu Ambassadors

ProBleu will create a network of ProBleu ambassadors (in the European Union and associated countries) to support the activities of the ProBleu project, raise awareness about the funding available to schools, and support schools in becoming members of the Network.

ProBleu will put out an open call for ambassadors who will act as the local representatives and promote ProBleu, its resources, and funding opportunities in their respective countries or regions.

Ambassadors will be from a range of backgrounds and expertise to become part of the ProBleu network: researchers, educators, policy makers, community champions, and industry leaders with expertise in education, public engagement, open science, community action, and other related fields with a focus on marine and freshwater topics.

In return, ambassadors will be in the unique position of being part of a growing network, giving them access to a range of opportunities: peer learning, increased visibility, involvement in ProBleu events, training and capacity-building opportunities, and access to project insights, resources and findings.

A plan for the recruitment of ProBleu ambassadors will be written following the first call. This will allow the recruitment of ambassadors to be targeted towards countries and regions which have not yet been successfully engaged with the ProBleu calls. It will also allow further time to establish collaboration with EU4Ocean and the sister projects so that any synergy around similar ambassador campaigns in the other projects can be fully exploited.

2.3.3. Dissemination through Scientix

Coordinated by European Schoolnet (EUN) - which ProBleu subcontracts - Scientix is a European education community that aims to promote and support a Europe-wide collaboration among Science, Technology, Engineering and Mathematics (STEM) teachers, education researchers, policy makers and other educational stakeholders to support teachers' innovative practices and inspire students to pursue careers in STEM subjects. The community counts on more than 1,000 Scientix Ambassadors which are educators from across the world committed to improving STEM education and supporting colleagues.

The simplest support EUN offers to STEM projects – such as ProBleu - is offering light dissemination through Scientix.

1. When tagging scientix through social media, reposting when the topic is relevant
2. ProBleu has been included in the Scientix projects repository (https://www.scientix.eu/projects/project-detail?articleId=1641895; Scientix will publish news on behalf of the project through communication channels
3. Once ProBleu has signed up to be a partner of the STEM Discovery Campaign, the project logo will also appear in the information on the campaign

The calls will be disseminated through news, newsletter and social media channels of Scientix, reaching ~10,000 educators who visit Scientix each month.

In 2025, ProBleu will become a Scientix Partner Project. During this period ProBleu will become a STEM Discovery Campaign supporting partner: where EUN help give the project more visibility through competitions, awards, events, and dedicated dissemination campaigns; as well as - if of interest to teachers engaged by the project - creating professional development opportunities for educators (e.g. through co-designing a MOOC).

2.3.4. Dissemination through other networks

Led by OCT, this action involves reaching out to smaller local and regional networks - such as teaching associations - reviewing the success of this process and then extending the actions out where successful to other regions and, if applicable, countries.

All partners will be proactive in engaging teachers and schools at relevant events and tracking the dissemination of the project in a shared document. The results of this networking will be

reported in **D6.4 "Blue Schools and ocean and freshwater potential future partnership analysis"**.

2.4. Improving the process of joining the Network

As described in **section 2.1.1. The process of joining the Network**, the current steps are:

1. Creating an EU login: https://webgate.ec.europa.eu/cas/login
2. Requesting access to the community of European Blue Schools: https://maritime-forum.ec.europa.eu/
3. Completing the online application form: Application to become a European Blue School (Page 1 of 5) (office.com)
4. Altering the project to fulfil five compulsory criteria (1) interlinking activities; (2) production of a clear output; (3) involvement of all students; (4) collaboration with a local partner; and (5) communication of project results.
5. Updating the automatically generated webpage

2.4.1. Simplifying the steps to becoming a Blue School

Following a meeting between ProBleu and EMSEA (10th November 2023), ProBleu understands that The Maritime forum has been undergoing some modifications. Initially, teachers have required a login *before* they applied to the Network; subsequently, teachers had to login *after* they applied. Currently, the Maritime still has the option of a log in, but it is not clear what features this will provide for teachers.

The Network has discussed a fast-track process whereby projects funded through ProBleu are considered as having a "quality label" that enables them to be accredited by the Network without having to duplicate efforts. However, this depends on ProBleu using an application form that has the same fields as the Network's application form. For the first round of calls the ProBleu application form is not the same as the Network's application form. Earthwatch will analyse the overlap between these two forms and facilitate either a modification for the next round of calls, or will complete the Network's form on behalf of schools using information from their ProBleu application so that teachers do not have to do both.

Beyond these actions, ProBleu will develop a Value Proposition Canvas - created by the corporate development company, Strategyzer - to gather teacher and school experiences and better understand how to simplify the process of joining the Network. The WP2 team has created a User Profile (adapted from the Strategyzer Customer Profile) for **teachers**, the main target audience of the Network. A corresponding, general Value Proposition has also been completed for the Network as it currently stands and how the ProBleu project might improve it as a starting point for discussion.

The Value Proposition Canvas indicates the jobs, gains and pains of target users, and the products, gain-creators and pain-relievers of the services being developed or provided.

Teachers have a **job** to do; that is, to improve ocean and water literacy. From becoming a Blue School, they **gain** accreditation to the Network, recognition and publicity for the school, and individually can develop their careers. However, the **pains** of becoming a Blue School included the complicated application process, limited resources available and the lack of clarity as to how teachers from across all disciplines and departments can carry out these projects.

ProBleu will provide **products and services** in the form of funding, resources and co-design. ProBleu will provide **gain-creators** through funding for projects, resources and teaching aids to facilitate impactful projects, and promote student inclusivity through the use of local languages and neurodiversity tools. To **relieve pains**, ProBleu will simplify the process for joining the Network and utilise clear communication channels to answer teachers' questions. This is summarised in Figure 3, below.

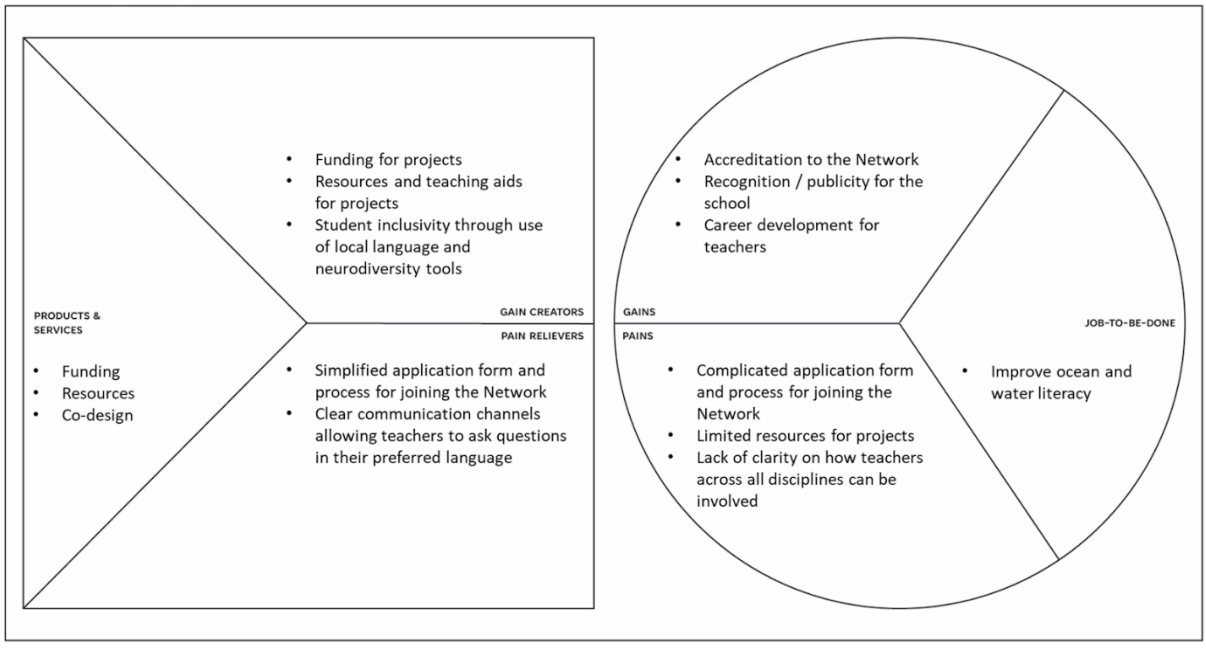

Figure 3: *ProBleu Value Proposition Canvas*

The next step for WP2 is to validate the User Profile through a series of semi-structured interviews with teachers. These interviews will also help to elicit user jobs, pains and gains which have not already been captured in the user profile, improving the process of joining the Network of European Blue Schools.

2.4.1. Clarifying Blue School Criteria

Section 2.1.1. The process of joining the Network described the five criteria as defined on the Maritime Forum. ProBleu interprets these project criteria as follows.

1. Consist of interlinked activities: A project should consist of several complementary activities under one central topic related to Mission Starfish. Students should be enabled to gain more in-depth knowledge and skills by working for an extended period to explore and investigate a water-related topic, question or problem.

To receive ProBleu funding, projects may have different durations and organise different types of activities. There will be three lump sum categories (up to 2 500€, 5 000€ and 10 000€) of projects, corresponding to small, medium and large-scale projects. Regardless of the lump sum category, the maximum duration of the projects is the one stipulated in each call. The minimum duration is 3 months.

The complete stipulations for ProBleu funding are extensively detailed in **D4.1 Procedures to evaluate the submitted educational proposals**.

2. Produce a clear output: The initiative should encourage students to be active learners and develop a product, object, event or service that relates to the objectives of the Mission and can be used as a tool, exhibited, or used for communication purposes. Example projects are provided in **section 2.5 Aligning Blue School Projects to Mission Starfish**.

3. Involve all students: All students must play an active role in all phases of the project (appropriate for age and department). Projects may consist of a combination of the following phases:

- Background research
- Identifying a topic
- Definition of project activities
- Design and development of equipment for the project
- Collecting data
- Analysing data
- Monitoring in ways other than collecting data
- Engaging other students and teachers
- Training other students and teachers
- Sharing of outputs (including publications and arranging project events)
- Assessment of project impacts
- Acting on the results of the project
- Closure or handover of the project

The teacher should facilitate learning and guide students to become independent workers, allowing them to take ownership of the project and its outputs.

4. Collaborate with a local partner: Projects must invite an external individual or organisation to help facilitate the project's creation, implementation and communication. These include, but are not limited to individual experts in ocean or freshwater, research scientists (in ocean,

freshwater, or education), organisations such as science centres, freshwater or maritime related companies, NGOs or government bodies.

5. Communicate project results: By engaging in Blue School projects, students should gain the knowledge, skills and confidence to be empowered to communicate about the ocean or freshwater environments. Students are to be encouraged to engage with their local community - at a level that is appropriate for student age - by talking about the project in a meaningful and informed way, starting with, for example, their social environment.

2.5. Aligning Blue School Projects to Mission Starfish

A key aim of ProBleu is to ensure that school projects align to the Mission objectives and support their implementation. This does not mean that every project has to *contribute directly towards achieving the Mission* - although some projects *might* contribute - but that they do need to *centre on a topic addressed by the Mission* and, as a minimum, raise awareness and improve understanding of that topic. In this way, ProBleu is aligned to the Mission Implementation Plan (European Commission, 2021) and in particular the cross-cutting enabler for the Mission toolkit "Public mobilisation and engagement: Citizen participation, engagement, co-creation, activation, training and education".

The following pages detail:

- The 17 targets of Mission Starfish
- The specific sub targets for 2030 as detailed by the European Commission, 2020
- ProBleu's interpretation of the Mission, involving a conversion of these jargon-heavy worded targets into language which is more appropriate for school teachers and students. Where percentages are used in the sub targets, ProBleu makes these optional inclusions, depending on the age of the school children
- Example projects focussing on different subjects and aligned to these indicators are introduced as inspirational starting points.

This information will be provided as guidance within ProBleu's knowledge repository (see **section 2.7 Maximising the impact of Blue School projects**).

Target 1: Each European is a citizen of our ocean and waters

Subtarget 1.1: Literacy and knowledge about the water system are compulsory elements in all science curricula in primary and secondary schools throughout the EU

ProBleu interpretation: The water system is a compulsory part of the curriculum in primary and secondary schools

Example subjects and projects:

Music Project: "Rhythms of the Rain"

Students compose a musical piece inspired by the sounds of water, incorporating elements like rainfall, flowing rivers, and ocean waves. The project involves creating a score, practising musical notation, and performing the composition for the school community.

Literature Project: "Water Tales Anthology"

Students collaborate on writing a collection of short stories, poems, or essays centred around water, exploring themes such as conservation, pollution, or personal experiences with water. The final compilation is shared within the school community.

Science Project: "H2O Explorers"

Students conduct hands-on experiments and research projects to understand the scientific principles behind water purification, conservation, and the water cycle, presenting their findings to the school community; for example, by placing a shallow dish of water in a sunny location, covering it with plastic wrap, and observing the water cycle processes over time.

Subtarget 1.2: 50 percent of Europeans have participated in events organised by the pan-European ocean literacy coalition (EU4Ocean)

ProBleu interpretation: [50% of] Europeans should take part in EU4Ocean events (including events associated with, or endorsed by EU4Ocean). The European Ocean Coalition (EU4Ocean) is a project funded by the European Commission.

Example subjects and projects:

Science Project: "Oceanography Quest"

Students engage in hands-on experiments and research to explore oceanographic concepts, culminating in the organisation of an educational event / science fair where they share their knowledge and encourage participation in EU4Ocean initiatives.

History Project: "EU4Ocean Time Travellers"

Students investigate the historical context of European attitudes towards the ocean, creating a timeline of key events and societal changes. They then organise an event that combines historical storytelling with ocean literacy to raise awareness and increase participation

Art Project: "Waves of Expression"

Students create a collaborative art installation that visually represents the impact of EU4Ocean initiatives, using various artistic mediums such as sculpture, painting, and multimedia. The project aims to evoke emotions and inspire reflection on the importance of ocean literacy.

Subtarget 1.3: At least 50 percent of the European blue workforce has been upskilled or re-skilled

ProBleu interpretation: The 'blue economy' covers traditional sectors such as fisheries, extraction of oil and gas, maritime transport and coastal tourism, as well as new, fast-growing industries such as offshore wind, ocean energy and blue biotechnology. [50% of] The blue workforce needs to gain new skills to be able to contribute to the newer industries.

Example subjects and projects:

Mathematics Project: "Skills by the Numbers"

Students track and analyse the percentage increase in the European blue workforce's skills over time, creating charts and graphs to showcase the upskilling or re-skilling progress.

Geography Project: "Mapping Blue Skills"

Students research and map the geographical distribution of upskilled and re-skilled workers in the European blue workforce, exploring how different regions contribute to the overall goal.

Science Project: "The Science of Skills Enhancement"

Students investigate the scientific aspects of skill development, exploring cognitive processes and educational methodologies to understand how effective upskilling and re-skilling programs contribute to the workforce's capabilities.

Target 2: Marine and freshwater observation is streamlined and accessible to all via a digital twin of the ocean and all waters

Subtarget 2.1: Global digital twin of all oceans and waters is operational

ProBleu interpretation: A digital twin is a virtual representation of an object or a system. By 2030, a digital twin of all oceans and waters across the globe should be working.

Example subjects and projects:

Science Project: "Digital Ocean Explorer"

Students delve into the science behind creating a digital twin of oceans and waters, exploring concepts of data collection, modelling, and simulation. They design their mini digital twin project, collecting data on local freshwater over time using citizen-science tools, such as FreshWater Watch kits, and presenting their findings to the school community.

Geography Project: "Mapping the Digital Seas"

Students use geographical techniques to understand the global scope of the digital twin of oceans. They create interactive maps that showcase the areas covered by the digital twin, exploring how this technology aids in studying and managing our world's water systems.

Information and Communications Technology (ICT) Project: "Ocean Data Odyssey"

Students design and develop an interactive platform or application that utilises the global digital twin of oceans and waters. The project involves coding, data integration, and user interface design, providing a user-friendly tool for exploring and understanding the intricate details of our planet's water systems.

Subtarget 2.2: Global marine and freshwater observation is streamlined: all data collected is pooled centrally and made accessible to all

ProBleu interpretation: Make it easier to keep track of what's happening in the oceans and rivers. All the information collected is put together in one place so everyone can see it.

Example subjects and projects:

Ethics Project: "Water Guardians' Dilemma"

Students explore ethical considerations related to centralised water observation. They analyse the potential benefits and risks of making data accessible to all, considering issues such as privacy, environmental justice, and responsible data use. The project culminates in a presentation that discusses the ethical principles guiding water observation practices.

Science Project: "Data Dive Expedition"

Students engage in scientific inquiry, exploring various methods of marine and freshwater observation. They collect data, learn about data standardisation, and contribute their findings to a centralised database; for example, the European Open Science Cloud (EOSC). The project concludes with a presentation on the importance of streamlined observation.

Languages Project: "Water Words Unite"

Students explore the linguistic diversity of terms related to water observation in different languages. They create a multilingual glossary or a series of educational materials that promote understanding and collaboration in the context of global water data. The project aims to celebrate linguistic diversity while fostering a common language for water-related discussions.

Subatarget 2.3: Global high-resolution ocean forecasting and regional ocean climate services are operational to support climate change adaptation at coastal scale

ProBleu interpretation: Using tools to predict how the oceans will behave in the future, to better prepare for changes caused by climate change.

Example subjects and projects:

Science Project: "Ocean Forecast Explorers"

Students delve into the science behind high-resolution ocean forecasting, exploring the technology and methods used to predict ocean behaviour. They create informative materials, such as presentations or infographics, to explain the importance of accurate ocean forecasting for climate change adaptation.

Geography Project: "Coastal Climate Atlas"

Students focus on the regional aspects of ocean climate services, creating a coastal climate atlas that showcases the impact of climate change on specific regions. The project involves researching and mapping coastal areas, emphasising the need for tailored climate services for effective adaptation.

Economics Project: "Climate Resilience Investment"

Students analyse the economic aspects of utilising ocean forecasting and climate services for coastal adaptation. They explore potential investments, cost-benefit analyses, and economic opportunities arising from climate-resilient practices. The project aims to highlight the economic rationale behind implementing such services for long-term sustainability.

Subtarget 2.4: The European seabed is fully and coherently mapped in high-resolution

ProBleu interpretation: A detailed map of the ocean floor around Europe

Example subjects and projects:

Science Project: "Seabed Cartographers"

Students explore the scientific methods and technologies used to map the European seabed in high resolution. They engage in hands-on activities or simulations to understand the mapping process and create educational materials explaining the significance of detailed seabed mapping.

Art Project: "Seabed Symphony"

Students express the beauty and diversity of the fully mapped European seabed through various art forms. They create paintings, sculptures, or digital art pieces inspired by the detailed underwater landscapes, fostering a creative connection between art and marine exploration.

Ethics Project: "Mapping with Morals"

Students explore the ethical considerations surrounding the detailed mapping of the European seabed. They critically examine the potential impact on marine ecosystems, biodiversity, and indigenous communities. The project encourages students to propose ethical guidelines and considerations for responsible seabed mapping practices.

Subtarget 2.5: 50 percent of DNA of life in our ocean and waters is fully sequenced and publicly available

ProBleu interpretation: Half of the DNA code for the living things in our oceans is worked out and shared with everyone

Example subjects and projects:

Science Project: "DNA Detectives"

Students delve into the science of DNA sequencing, exploring - and using, if appropriate - the methods used to sequence the DNA of life in oceans and waters. They create informative materials or presentations to explain the significance of DNA sequencing for understanding marine biodiversity.

Ethics Project: "Genetic Transparency"

Students explore the ethical implications of publicly sharing DNA data from marine life. They analyse potential benefits and risks, considering issues such as conservation, privacy, and the responsible use of genetic information. The project aims to foster ethical discussions surrounding genetic transparency in marine research.

Physical Education (PE) Project: "Marine Fitness Expedition"

Students combine physical activity with marine awareness. The project involves organising coastal clean-ups, water-based fitness activities, or coastal hikes while emphasising the importance of DNA sequencing and biodiversity in marine life. The goal is to promote physical well-being alongside environmental consciousness.

Target 3: 30% of EU waters are highly to fully protected

Subtarget 3.1: 30 percent of EU-waters are highly to fully protected, with concrete management plans and forming a network of MPAs co-managed by local communities

ProBleu interpretation: [30% of] EU-water highly to fully protected from human activities.

Example subjects and projects:

Geography Project: "MPA Explorer Atlas"

Students create an atlas highlighting the geographical distribution of Marine Protected Areas (MPAs) in EU waters. They research and design maps that showcase the areas under protection, emphasising the importance of preserving marine ecosystems.

Languages Project: "MPA Multilingual Stories"

Students interview local communities near MPAs, collecting stories in multiple languages about their connection to and role in protecting these areas. They compile these narratives

into a multilingual collection, promoting cultural understanding and celebrating the collaborative efforts for marine conservation.

Science Project: "EcoGuardians Simulation"

Students engage in a science-based simulation, role-playing as environmental scientists and local community members. They design concrete management plans for virtual MPAs, emphasising ecological sustainability and community involvement. The project aims to develop a deeper understanding of the complexities of marine conservation.

Subtarget 3.2: Total water abstraction has decreased by 50 percent and groundwater abstraction has decreased by 20 percent

ProBleu interpretation: Water use decreased [by 50%], and taking water from the ground reduced [by 20%]

Example subjects and projects:

Science Project: "Aquatic Ecosystem Balance"

Students investigate the scientific implications of reduced water abstraction on aquatic ecosystems. They conduct experiments, study biodiversity changes, and present their findings on how these reductions contribute to maintaining a healthier balance in aquatic environments.

History Project: "Flow of Progress: Water Conservation Through Time"

Students delve into the historical context of water abstraction, tracing the evolution of water management practices over time. They create a timeline that highlights key moments, policies, and technological advancements. The project aims to contextualise contemporary conservation efforts within the broader historical narrative of water use.

Economics Project: "Water Conservation Impact Analysis"

Students conduct an economic analysis of the 50% reduction in total water abstraction and the 20% decrease in groundwater abstraction. They explore the cost-benefit aspects, considering factors such as investment in conservation measures, economic impacts on local communities, and potential long-term benefits for industries. The project concludes with a presentation on the economic implications and sustainability of water conservation measures

Target 4: Active regeneration of 20% of degraded habitats

Subtarget 4.1: 20 percent of degraded seabed habitats have been regenerated through removal of pressures, blue reforestation, ecological engineering and full ecosystem-based management of local activities

ProBleu interpretation: [20% of] Damaged ocean areas are restored by stopping harmful activities, planting underwater forests, and managing local activities in a way that helps the whole ecosystem

Example subjects and projects:

Science Project: "Habitat Restoration Explorers"

Students delve into the scientific principles behind seabed habitat regeneration, exploring the ecological processes involved. They create informative materials, such as presentations or posters, to explain the methods of blue reforestation, ecological engineering, and ecosystem-based management used in habitat restoration. Where possible, and in collaboration with experts, they implement appropriate methods in their local areas.

Geography Project: "Rejuvenated Seabed Maps"

Students create maps showcasing the locations where seabed habitats have been regenerated. The project involves geographical analysis, map design, and the presentation of before-and-after scenarios, emphasising the positive impact of habitat restoration on local ecosystems.

Languages Project: "Voices of the Seabed"

Students collect and share stories related to the regeneration of seabed habitats. They conduct interviews with scientists, conservationists, and local communities, translating and presenting these narratives in multiple languages. The project emphasises linguistic diversity in conveying the importance of marine ecosystem renewal.

Subtarget 4.2: Ecosystem-based services and naturebased solutions have been scaled up by at least 20 percent to improve resilience from sea level rise, floods and coastal erosion

ProBleu interpretation: The use of nature-based solutions and services has been increased [by at least 20%] to better protect us from rising sea levels, floods, and the land getting worn away at the coast. Nature-based solutions involve working with nature, as part of nature, to address societal challenges, supporting human well-being and biodiversity locally

Example subjects and projects:

Science Project: "Resilient Ecosystem Explorations"

Students investigate the scientific aspects of ecosystem-based services and nature-based solutions, exploring how they contribute to resilience against sea level rise, floods, and coastal erosion. They create informative materials or presentations to explain the ecological principles behind these strategies. Where possible, and in collaboration with experts, they implement appropriate methods in their local areas using a citizen-science approach.

Geography Project: "Eco-Resilience Chronicles"

Students explore the geographical dimensions of ecosystem-based services and nature-based. The project involves researching and presenting case studies that highlight how specific geographic factors - climate zones, biodiversity hotspots, coastal morphology - influence the success and implementation of these strategies in different regions.

Art Project: "Resilient Horizons Exhibition"

Students express the concept of increased resilience through sea level rise, floods, and coastal erosion using various art forms. They create paintings, sculptures, or multimedia installations that reflect the harmony between nature-based solutions and the environment, fostering awareness and appreciation for the artistic side of ecological resilience.

Target 5: Renaturalise rivers and waters

Subtarget 5.1: 30 percent of Europe's rivers are de-dammed.

ProBleu interpretation: Remove dams from [30% of] rivers in Europe

Example subjects and projects:

Economics Project: "Rivers and Resources Analysis"

Students analyse the economic implications of river de-damming. They explore factors such as the impact on local economies, changes in water resource management, and the economic benefits and drawbacks of de-damming projects. The project aims to understand the economic rationale behind de-damming initiatives.

Geography Project: "De-dammed Rivers Expedition"

Students plan and execute a virtual or field expedition to explore rivers where de-damming has taken place. They create multimedia presentations, documenting the geographical features, local communities, and environmental changes associated with de-damming.

Science Project: "River Restoration Lab"

Students conduct scientific experiments to understand the ecological impacts of dam removal on rivers. They explore water quality through the use of FreshWater Watch citizen-science kits, sediment transport, and biodiversity changes before and after de-damming, presenting their findings through experiments and reports.

Subtarget 5.2: 30 percent of surface water bodies suffering hydro-morphological pressures are restored

ProBleu interpretation: Fix [30% of] places where water above ground (including the ocean) was having problems because of man-made changes like dams.

Example subjects and projects:

Science Project: "Aquatic Ecosystem Renaissance"

Students conduct scientific experiments to analyse the hydro-morphological changes in restored surface water bodies, exploring the impact on biodiversity and water quality using citizen science methods and tools including FreshWater Watch.

Geography Project: "Waterscape Revival Expedition"

Students plan and execute a field expedition to document the restoration of surface water bodies, creating a comprehensive geographical report on the changes in landscapes, ecosystems, and human interactions over an extended period.

Mathematics Project: "Hydro-Morphological Trends Analysis"

Students use mathematical models to analyse trends in the restoration of surface water bodies, creating statistical models and visualisations to showcase the progress and variations in hydro-morphological improvements.

Target 6: End overfishing

Subtarget 6.1: The most destructive fishing practices like bottom trawling and other activities causing seabed habitat loss or degradation are phased out

ProBleu interpretation: The most harmful ways of fishing, like dragging big nets along the ocean floor, are stopped to protect the homes of underwater animals and plants.

Example subjects and projects:

Ethics Project: "Sustainable Fisheries Symposium"

Students organise a symposium exploring the ethical considerations of phasing out destructive fishing practices, inviting experts to discuss environmental stewardship, fostering ongoing ethical discussions within the school community.

History Project: "Evolution of Fishing Practices"

Students delve into the historical context of destructive fishing practices, tracing the evolution of regulations and societal attitudes towards sustainable fishing. They create a timeline and conduct interviews to document the historical narrative of phasing out these practices, fostering an understanding of the socio-cultural changes over time.

Science Project: "Ocean Conservation Research"

Students conduct scientific research to understand the impact of destructive fishing practices on seabed habitats, propose alternative methods, and monitor changes over several months to contribute to ongoing marine conservation efforts.

Subtarget 6.2: The level of incidental catches of protected and non-target species has decreased by 80 percent

ProBleu interpretation: Reduced accidental catches of both protected and unintended animals [by 80%]

Example subjects and projects:

Mathematics Project: "Statistical Trends in Bycatch Reduction"

Students use statistical analysis to examine trends in the reduction of incidental catches, creating mathematical models to illustrate the success rate of mitigation efforts.

Music Project: "Harmony of the Seas"

Students compose a musical piece inspired by the theme of reducing incidental catches, using elements of rhythm and melody to convey the idea of harmony between fishing practices and marine conservation. The project involves ongoing rehearsals and performances over several months to promote awareness through music.

Science Project: "Ecosystem Health Monitoring"

Students design and implement a long-term monitoring project to assess the health of ecosystems impacted by reduced incidental catches. They collect data on biodiversity, water quality, and habitat conditions, analysing trends over several months to evaluate the overall ecological response to bycatch reduction efforts.

Subtarget 6.3: All catches are fully controlled at landing and all vessels above 12 meters are equipped with CCTV

ProBleu interpretation: Check all caught fish when they come ashore, and big fishing boats [over 12 metres] have cameras on board to keep an eye on things

Example subjects and projects:

Science Project: "Smart Surveillance Technologies"

Students explore the scientific aspects of implementing technologies such as CCTV and other control systems to monitor catches, investigating their effectiveness in ensuring sustainable fishing practices, and presenting their findings over several months.

Mathematics Project: "Catch Monitoring Analytics"

Students use mathematical modelling and statistical analysis to evaluate the data collected from controlled landings, assessing catch trends, and proposing predictive models for future monitoring strategies over an extended period.

Information and Communications Technology (ICT) Project: "Smart Fishing Tech Symposium"

Students organise a symposium focusing on the ICT solutions employed in controlling catches, inviting experts to discuss the impact of technology on sustainable fishing practices, fostering ongoing discussions within the school community over several months.

Target 7: Zero plastic litter generation

Subtarget 7.1: All plastics on the EU-market are reusable or recyclable

ProBleu interpretation: All the plastic things we use in Europe can be used again or turned into something new through recycling

Example subjects and projects:

Science Project: "Plastic Material Innovation"

Students explore scientific advancements in plastic materials, investigate the development of reusable or recyclable plastics, and conduct experiments to understand the properties and environmental impact of these materials.

Economics Project: "Sustainable Market Economics Symposium"

Students organise a symposium discussing the economic implications of transitioning to reusable or recyclable plastics in the EU market, inviting experts to explore market trends, consumer behaviour, and long-term economic sustainability, fostering ongoing economic discussions within the school community over several months.

Art Project: "Plastic Metamorphosis Exhibition"

Students express the concept of sustainable plastics through various art forms, creating sculptures, paintings, or mixed-media installations that portray the transformation from traditional plastics to reusable or recyclable materials. The project involves ongoing artistic exploration, fostering awareness through creativity.

Subtarget 7.2: All single-use plastics are banned worldwide

ProBleu interpretation: We've stopped making and using plastic items that are only meant to be used once, everywhere in the world

Example subjects and projects:

Languages Project: "Plastic-Free Advocacy Campaign"

Students develop a multilingual advocacy campaign against single-use plastics, creating informative materials, presentations, and events to raise awareness and promote sustainable alternatives, fostering ongoing language-based discussions within the school community over several months

Science Project: "Environmental Impact Assessment"

Students conduct scientific research to assess the environmental impact of the worldwide ban on single-use plastics in their local area, studying changes in pollution levels, biodiversity, and ecosystems.

Geography Project: "Plastic-Free Culture Exploration"

Students explore the cultural dimensions of transitioning away from single-use plastics, investigating how different societies adapt to and embrace the global ban. The project involves qualitative research, interviews, and presentations highlighting the cultural shifts toward sustainability.

Target 8: Eutrophication of European seas and waters is halted

Subtarget 8.1: Losses of nutrients into the environment are reduced by at least 50 percent and the use of fertilisers is reduced by at least 20 percent

ProBleu interpretation: Cut down the amount of plant nutrients entering the marine and freshwater environment by half, and use [20%] less fertilisers, too.

Example subjects and projects:

Geography Project: "Sustainable Agriculture Practices Showcase"

Students create a showcase of sustainable agriculture practices that contribute to the reduction of nutrient losses. The project involves ongoing geographical analyses, case studies, and presentations to illustrate the adoption and impact of these practices in different regions.

Art Project: "Nutrient Harmony Exhibition"

Students express the concept of balanced nutrient management through various art forms. They create paintings, sculptures, or multimedia installations that symbolise the harmony between agriculture and the environment, fostering awareness and appreciation for sustainable nutrient practice

Science Project: "Nutrient Cycling Innovations"

Students explore and experiment with innovative nutrient cycling techniques to reduce nutrient losses into the environment. They design experiments to measure nutrient levels in soil, water runoff, and plant tissues, showcasing the effectiveness of these innovations in nutrient management. For example, students could implement composting methods to recycle organic matter and measure nutrient levels in the compost and surrounding soil and waters.

Subtarget 8.2: Use and risk of chemical pesticides and the use of more hazardous pesticides is reduced by 50 percent

ProBleu interpretation: Make sure to use [50%] fewer chemicals that keep bugs away from plants, and the ones used are less harmful

Example subjects and projects:

Geography Project: "Agricultural Sustainability Case Studies"

Students investigate the geographical aspects of nutrient reduction in agriculture, examining case studies from different regions where nutrient losses have been successfully minimized. The project involves ongoing geographical analyses, mapping, and presentations to illustrate the global impact of sustainable agricultural practices.

Mathematics Project: "Optimising Fertiliser Application"

Students use mathematical modelling to optimise fertiliser application, considering factors such as soil types, crop requirements, and environmental impact. They develop predictive models and present their findings over several months, demonstrating how precision agriculture can reduce fertiliser usage while maintaining crop yields.

Science Project: "Nutrient Management Innovations"

Students explore scientific methods to reduce nutrient losses into the environment, conducting experiments and trials on innovative nutrient management techniques. For example, setting up experimental plots with and without cover crops and measuring nutrient levels in the soil and water runoff (using FreshWater Watch kits) to assess the effectiveness of cover crops in retaining nutrients.

Subtarget 8.3: 100 percent of urban wastewater is subject to tertiary (advanced) treatment

ProBleu interpretation: All the dirty water from cities goes through an extra special cleaning process to keep it really clean before it goes back into nature

Example subjects and projects:

Science Project: "Advanced Wastewater Treatment Innovations"

Students explore and experiment with advanced wastewater treatment technologies. They can set up small-scale treatment systems, incorporating processes like membrane filtration, UV disinfection, and advanced oxidation to simulate tertiary treatment. The project involves monitoring water quality parameters and presenting the effectiveness of advanced treatment over several months.

Language Project: "Wastewater Chronicles - Advocacy through Communication"

Students engage in a language-based project to raise awareness about advanced wastewater treatment. They create informative materials such as articles, brochures, and presentations in multiple languages, aiming to educate the community about the importance of tertiary treatment in maintaining water quality. The project involves ongoing communication efforts, encouraging language diversity in promoting sustainable wastewater practices.

Economics Project: "Cost-Benefit Analysis of Advanced Wastewater Treatment"

Students conduct a comprehensive cost-benefit analysis of implementing advanced wastewater treatment in urban areas. They analyse the economic implications, considering initial investment, operational costs, and long-term benefits such as improved public health and environmental conservation.

Subtarget 8.4: All waste waters from ships operating in the European waters is delivered to treatment plants on land

ProBleu interpretation: Ships in European waters take their dirty water to special treatment plants on land instead of releasing it into the sea

Example subjects and projects:

Science Project: "Marine Water Quality Monitoring"

Students monitor the water quality in European waters before and after the implementation of the policy requiring all ship waste waters to be delivered to land-based treatment plants. They analyse parameters such as nutrient levels, pollutants, and microbial content.

Geography Project: "Land-Based Treatment Facilities Mapping"

Students create maps illustrating the geographical distribution of land-based treatment facilities for ship waste waters in European waters. The project involves ongoing geographical analyses, mapping, and presentations to showcase the infrastructure and impact on marine environments over an extended period.

Languages Project: "Maritime Waste Management Communication Campaign"

Students initiate a multilingual communication campaign to raise awareness about the policy requiring ships to deliver waste waters to land-based treatment plants. They create informative materials, presentations, and events in multiple languages, fostering ongoing language-based discussions within the school community over several months.

Target 9: Zero spill

Subtarget 9.1: 50 percent of ships operating in the EU are granted the EU Green shipping label

ProBleu interpretation: Half of the ships in the EU are given a special label [the EU Green shipping label] that shows they're doing a great job at being eco-friendly

Example subjects and projects:

Science Project: "Eco-Friendly Ship Technologies"

Students explore and experiment with eco-friendly technologies implemented on ships, aiming to meet the criteria for the EU Green shipping label, for example designing and testing solar panels or wind turbines to generate renewable energy for onboard use. They analyse the environmental impact of these technologies, tracking changes in emissions and fuel efficiency

Geography Project: "Marine Sustainability Case Studies"

Students investigate and analyse case studies of marine sustainability initiatives worldwide. The project involves researching and presenting in-depth analyses of specific programs, policies, or projects that contribute to marine sustainability. Emphasis is placed on the geographical context, regional impact, and the effectiveness of these initiatives.

History Project: "Evolution of Maritime Regulations"

Students delve into the historical development of maritime regulations and policies, tracing their evolution from ancient seafaring traditions to modern international agreements. The project involves researching key events, treaties, and milestones that have shaped maritime regulations. Students present their findings in a historical timeline, exploring the societal, economic, and environmental motivations behind the establishment of maritime rules and conventions.

Subtarget 9.2: Waste and container loss from the shipping sector operating in the EU is reduced by at least 75 percent

ProBleu interpretation: Cut down on the amount of trash and containers that are lost from ships in the EU [by at least 75%]

Example subjects and projects:

Science Project: "Smart Packaging Solutions"

Students explore and experiment with innovative packaging materials designed to reduce container loss and waste from the shipping sector. They assess the durability, environmental impact, and effectiveness of these materials in preventing losses during transportation

Geography Project: "Sustainable Shipping Routes"

Students investigate and map sustainable shipping routes within the EU, considering factors such as weather patterns, currents, and potential obstacles. The project involves ongoing geographical analyses and presentations to illustrate how optimised routes contribute to reducing container loss and waste.

Economics Project: "Cost-Benefit Analysis of Sustainable Shipping Practices"

Students conduct a comprehensive cost-benefit analysis of implementing sustainable shipping practices, focusing on the economic implications of reducing container loss and waste. The project involves ongoing economic assessments, presentations, and policy recommendations over several months.

Subtarget 9.3: All ports have facilities to receive waste and wastewaters from ships

ProBleu interpretation: Every port has places where ships can drop off their trash and dirty water to keep the water around the ports clean

Example subjects and projects:

Science Project: "Port Waste Management Systems"

Students investigate and experiment with various waste management systems implemented in ports to receive waste and wastewaters from ships. They analyse the efficiency of these systems in treating different types of waste and preventing environmental contamination.

Geography Project: "Sustainable Port Practices"

Students explore and document sustainable practices adopted by ports worldwide for receiving waste from ships. The project involves ongoing geographical analyses and presentations to showcase how different ports contribute to environmental sustainability and waste management.

Ethics Project: "Port Wastewater Management Ethics"

Students examine ethical considerations surrounding port wastewater management, including the impact on the environment and communities. They delve into case studies highlighting ethical dilemmas related to waste treatment, disposal, and potential consequences.

Subtarget 9.4: The release of micro-pollutants (pesticides, pharmaceuticals, biocides, PFASes) into wastewater treatment plants has been reduced by 50 percent

ProBleu interpretation: Half as much chemical pollution enters wastewater treatment plants, where water is cleaned

Example subjects and projects:

Science Project: "Micro-Pollutant Reduction Strategies"

Students investigate and experiment with various strategies to reduce the release of micro-pollutants into wastewater treatment plants. For example, testing the effectiveness of different filters in capturing microfibers released during laundry using common fabrics (e.g., mesh, cotton) to create filters and simulate washing conditions.

History Project: "Evolution of Wastewater Treatment Practices"

Students explore the historical development of wastewater treatment practices, focusing on the treatment of micro-pollutants such as pesticides, pharmaceuticals, biocides, and PFASes. Examine key historical events, technological advancements, and policy changes that influenced wastewater treatment.

Geography Project: "Micro-Pollutant Reduction Case Studies"

Students investigate and analyze specific case studies from different geographical regions where the reduction of micro-pollutants in wastewater treatment plants has been successful; focusing on the methods, policies, and community initiatives that contributed to the 50 percent reduction.

Target 10: Underwater noise is regulated and reduced

Subtarget 10.1: Underwater acoustic emissions are reduced by at least 50 percent

ProBleu interpretation: Reduce underwater noise pollution by half

Example subjects and projects:

Science Project: "Innovations in Underwater Acoustic Emission Reduction"

Students explore and experiment with various technologies designed to reduce underwater acoustic emissions. They can investigate the impact of different materials, designs, or sound-absorbing technologies on acoustic emissions in underwater environments.

Music Project: "Harmony in the Depths"

Students compose original pieces of music inspired by the concept of reduced underwater acoustic emissions. Encourage them to incorporate sounds that mimic the peaceful and harmonious underwater environment, avoiding disruptive or intense elements.

History Project: "Silencing the Seas: Historical Perspectives on Underwater Acoustic Emissions"

Students explore the historical context of underwater acoustic emissions, focusing on the development of technologies and human activities that contributed to sound pollution in the seas

Subtarget 10.2: Noise impact mitigation measures have been defined in each European marine region and continental subaquatic environment

ProBleu interpretation: Ways to make underwater areas in Europe quieter, so it's not too noisy for underwater creatures, have been decided.

Example subjects and projects:

Geography Project: "Mapping Noise Mitigation Measures in European Marine Regions"

Students investigate the noise mitigation measures defined in each European marine region and continental subaquatic environment. Explore the policies, technologies, and initiatives aimed at reducing noise impact.

Drama Project: "The Silent Seas: A Theatrical Exploration"

Students collaborate on writing a theatrical script that explores the challenges of noise pollution in marine environments and the effectiveness of mitigation measures. Students can then perform the play for the school community, incorporating elements of drama, storytelling, and environmental advocacy.

Science Project Example: "Underwater Acoustic Emission Reduction Experiment"

Students design experiments to investigate the scientific principles behind reducing underwater acoustic emissions. They explore the physics of sound absorption, dispersion, or the use of different materials to dampen sound underwater.

Target 11: Climate-neutral waterborne transport

Subtarget 11.1: 100 percent of propulsion engines of leisure boats, fishing vessels and ferries and other short-sea shipping are converted to non-fossil propulsion

ProBleu interpretation: All the engines in boats used for fun, fishing, and short trips in Europe are now powered by something other than fossil fuels.

Example subjects and projects:

Economics Project: "Sustainable Transition in Maritime Economies"

Students research the economic implications of transitioning all propulsion engines to non-fossil alternatives in leisure boats, fishing vessels, and short-sea shipping. Analyse the costs, benefits, and potential economic opportunities for businesses and industries involved.

Science Project: "Clean Propulsion Technologies for Maritime Vessels"

Students investigate and experiment with various clean propulsion technologies suitable for leisure boats, fishing vessels, and short-sea shipping. This can include electric propulsion, hydrogen fuel cells, or hybrid systems.

History Project: "Navigating the Seas of Change: Evolution of Maritime Propulsion"

Students delve into the historical evolution of maritime propulsion technologies, exploring the development of engines for leisure boats, fishing vessels, and short-sea shipping. Investigate key innovations and their impact on the maritime industry.

Subtarget 11.2: CO2 emissions from the shipping sector operating in the EU are reduced by 45 percent

ProBleu interpretation: Ships in the EU produce [45%] less carbon dioxide.

Example subjects and projects:

Science Project: "Greening the Seas - Mitigating CO2 Emissions in the Shipping Sector"

Students design experiments to explore and analyse various technologies and strategies aimed at reducing CO2 emissions in the shipping sector operating in the EU. This may involve investigating simplified models of alternative fuels, energy-efficient propulsion systems, or emission-capturing technologies. For example, a model boat could be powered using traditional fossil fuel versus alternative fuel and its speed, fuel consumption, and emissions measured.

Economics Project: "Economic Impacts of CO2 Reduction in Maritime Transport"

Students research and analyse the economic implications of reducing CO2 emissions in the shipping sector; exploring the costs and benefits for businesses, considering factors such as fuel expenses, regulatory compliance, and potential market advantages.

Art Project: "Visualising Sustainable Shipping"

Students express the concept of reduced CO2 emissions in the shipping sector through artistic forms such as paintings, digital art, or sculptures. They can depict the environmental benefits and the beauty of a more sustainable maritime future.

Subtarget 11.3: 50 percent of vessels older than 20 years are dismantled and recycled in Europe

ProBleu interpretation: Take apart and recycle half of the ships in Europe that are more than 20 years old.

Example subjects and projects

Geography Project: "Mapping the Sustainable Ship Recycling Landscape in Europe"

Students conduct research on ship recycling facilities in Europe, mapping their locations and assessing their sustainability practices. Analyse data to identify regions where sustainable dismantling and recycling are most prevalent.

Languages Project: "Communicating Sustainability in Ship Recycling"

Students create multilingual awareness materials to communicate the importance of sustainable ship recycling. This can include brochures, posters, and digital content in various European languages

Science Project: "Evaluating Materials for Sustainable Shipbuilding"

Students investigate sustainable materials suitable for shipbuilding, such as recycled metals, composite materials, or bio-based alternatives. Analyse the properties, durability, and environmental impact of these materials.

Subtarget 11.4: 100 percent of European ports are carbon-neutral and provide electricity at berth.

ProBleu interpretation: All the ports in Europe are using clean energy and giving ships power while they're docked, without adding to carbon emissions

Example subjects and projects

Science Project: "Carbon Neutrality in Port Operations"

Students investigate the scientific aspects of achieving carbon neutrality in port operations. Explore renewable energy sources, energy-efficient technologies, and emissions reduction strategies employed by carbon-neutral ports.

Economics Project: "Economic Impact of Carbon-Neutral Ports"

Students research and analyse the economic implications of European ports transitioning to carbon neutrality. Consider initial investments, operational costs, and potential economic benefits for port communities and industries.

History Project: "Navigating the Evolution of European Ports"

Students explore the historical evolution of European ports, tracing their development from early trading posts to modern carbon-neutral facilities. Create a detailed timeline highlighting key milestones, technological advancements, and policy changes that influenced port operations

Target 12: Support the energy transition through renewable low-impact ocean energy

Subtarget 12.1: At least 35 percent of the EU energy mix is covered by clean, low-impact, renewable ocean energy (wind, wave, tidal, thermal and salinity gradient energy)

ProBleu interpretation: Obtain [at least 35% of] our energy in Europe from the power of the ocean, like using wind, waves, and tides.

Example subjects and projects:

Science Project: "Harnessing Ocean Energy for a Sustainable Future"

Students explore the various forms of ocean energy, including wind, wave, tidal, thermal, and salinity gradient energy. Conduct experiments to understand the scientific principles behind each energy source and analyse their efficiency.

Economics Project: "Economic Viability of Ocean Energy Integration in the EU"

Students research and analyse the economic aspects of integrating ocean energy into the EU's energy mix. Consider factors such as initial investment, operational costs, and the potential economic benefits of clean, renewable ocean energy.

Languages Project: "Energy Transitions in Multilingual Narratives"

Students develop multilingual narratives that narrate the histories of energy transitions in the EU, focusing on the integration of clean ocean energy. Present the narratives through written stories, audio recordings, or multimedia presentations in various European languages.

Target 13: Zero-carbon aquaculture

Subtarget 13.1: The consumption of low trophic aquaculture (e.g. algae, shellfish, other invertebrates) from European waters, and seas has increased by 70 percent

ProBleu interpretation: Eat more algae and the smaller sea animals like shellfish, and other tiny creatures from European waters.

Example subjects and projects

Science Project: "Investigating the Rise of Low Trophic Aquaculture in European Waters"

Students explore low trophic aquaculture, focusing on algae, shellfish, and other invertebrates. Conduct experiments to understand the scientific principles behind sustainable cultivation practices and analyze the factors contributing to the increase in consumption.

Economics Project: "Economic Implications of Growing Low Trophic Aquaculture"

Students research and analyse the economic aspects of the increasing consumption of low trophic aquaculture in European waters. Consider factors such as market demand, production costs, and the economic benefits for the aquaculture industry.

Ethics Project: "Balancing Aquaculture Growth with Environmental and Ethical Considerations"

Ethical Dilemma Analysis: Students examine the ethical considerations associated with the rapid growth of low trophic aquaculture. Explore dilemmas related to environmental impact, resource conservation, and the welfare of aquatic ecosystems.

Target 14: A thriving blue biotech

Subtarget 14.1: The EU is the world leader in blue biotech.

ProBleu interpretation: The EU is the best in the world at using science and technology to understand and use resources from the ocean

Example subjects and projects

Science Project: "Exploring Blue Biotechnology Advancements in the EU"

Students delve into the field of blue biotechnology, focusing on the EU's leadership in this area. Explore scientific advancements, innovations, and breakthroughs in marine biotechnology.

Economics Project: "Economic Impact of EU's Blue Biotech Leadership"

Students research and analyse the economic implications of the EU being a world leader in blue biotechnology. Consider market trends, job creation, and the global competitive advantage of European biotech companies.

IT Project: "Building a Digital Platform for Blue Biotech Knowledge Sharing"

Students work on designing and developing a digital platform that facilitates knowledge sharing in the field of blue biotechnology. The platform could include databases, forums, and interactive features to connect researchers, professionals, and enthusiasts.

Subtarget 14.2: The market value of Blue Biotech has reached 200 billion euros

ProBleu interpretation: The ocean science and technology business in the EU is worth 200 billion euros

Example subjects and projects:

Maths Project: "Mathematical Models for Market Growth Prediction"

Students use mathematical models to predict the future growth of the Blue Biotech market. Analyse historical data, consider influencing variables, and create models that project the potential economic trajectory of the industry.

Science Project: "Innovations in Blue Biotechnology: From Lab to Market"

Students explore recent scientific innovations in blue biotechnology, focusing on breakthroughs that have contributed to the industry's growth. They design experiments to replicate and understand key advancements.

IT Project: "Digital Showcase of Blue Biotech Innovations"

Students create a digital showcase to present the scientific innovations in blue biotechnology. This can include interactive presentations, animations, and multimedia elements to effectively communicate complex scientific concepts to a broad audience.

Target 15: Climate-neutral blue tourism

Subtarget 15.1: 100 percent of marinas are carbon neutral and provide electricity at berth

ProBleu interpretation: All the marinas in Europe are using clean energy and giving boats power while they're docked, without adding to carbon emissions

Example subjects and projects

Languages Project: "Multilingual Guides for Sustainable Boating Practices"

Students create multilingual guides and educational materials for boaters on adopting sustainable practices. This involves translating information about carbon-neutral marinas, renewable energy usage, and eco-friendly boating practices.

IT Project: "Digital Monitoring System for Carbon Footprint in Marinas"

Students work on developing a digital monitoring system that tracks and displays the carbon footprint of marinas. This IT solution can provide real-time data on energy usage, emissions, and the effectiveness of sustainability measures.

Science Project: "Sustainable Solutions for Carbon-Neutral Marinas"

Students investigate sustainable technologies and practices that can be implemented in marinas to achieve carbon neutrality. They analyse the environmental impact of these solutions, considering factors such as energy sources, waste management, and ecosystem health.

Subtarget 15.2: 50 percent of tourism resorts and accommodation are converted to low CO2 emission and low CO2 consumption

ProBleu interpretation: Half of the places where people stay when they're on vacation in Europe use less and produce less carbon dioxide, making them better for the environment.

Example subjects and projects:

Science Project: "Measuring and Reducing Carbon Footprint in Tourism Resorts"

Students investigate the carbon footprint of tourism resorts, exploring the energy sources, transportation, and waste management systems. They propose and implement strategies to reduce the carbon emissions associated with resort operations.

Economics Project: "Economic Viability of Low CO2 Emission Resorts"

Students conduct a cost-benefit analysis of converting tourism resorts to low CO2 emission practices. They explore the economic implications, potential savings, and market advantages of adopting sustainable measures.

Art Project: "Visualising Sustainable Tourism Practices"

Students express the concept of sustainable tourism through artistic forms. They create visual representations, posters, or multimedia presentations that highlight the beauty and importance of low CO2 emission resorts.

Target 16: An integrated and participatory EU system of ocean and water governance

Subtarget 16.1: A European Ocean and Water Agency is fully established

ProBleu interpretation: A special group in Europe that takes care of everything related to the oceans and waters [a European Ocean and Water Agency] is set up.

Example subjects and projects:

Science Project: "Ecological Impact Assessment of the European Ocean and Water Agency"

Students delve into the establishment of the European Ocean and Water Agency, studying its potential ecological impact on marine and freshwater environments. They analyze the agency's goals, policies, and potential positive and negative effects on ecosystems.

IT Project: "Digital Platform for Ocean and Water Data Integration"

Students design and develop a digital platform that integrates data related to European oceans and waters. This IT project aims to streamline data collection, analysis, and accessibility for the European Ocean and Water Agency.

Languages Project: "Multilingual Communication for Water Conservation"

Students create multilingual communication materials to raise awareness about the European Ocean and Water Agency's initiatives. They develop content in various languages to reach diverse communities and promote water conservation.

Target 17: EU leadership for effective global ocean governance

Subtarget 17.1: The BBNJ Treaty is enforced [UN]

ProBleu interpretation: The Biodiversity Beyond National Jurisdiction (BBNJ) Treaty, a special agreement from the United Nations about the ocean, is being followed and put into action.

Example subjects and projects:

History Project: "Evolution of International Ocean Governance with the BBNJ Treaty"

Students explore the historical context leading to the development and enforcement of the BBNJ (Biodiversity Beyond National Jurisdiction) Treaty. They investigate the key events, negotiations, and global cooperation that shaped the treaty's implementation.

Languages Project: "Translating the BBNJ Treaty for Global Understanding"

Students translate the BBNJ Treaty into multiple languages to ensure global accessibility and understanding. This language-focused project aims to break down barriers and facilitate international cooperation through clear communication.

Science Project: "Monitoring Biodiversity Changes Post-BBNJ Treaty"

Students conduct scientific studies to monitor changes in biodiversity in areas covered by the BBNJ Treaty. They analyse data to assess the impact of the treaty on marine ecosystems and the effectiveness of conservation measures.

Subtarget 17.2: IUU fishing is eradicated globally [UN]

ProBleu interpretation: Illegal, unreported, and unregulated (IUU) fishing around the world stops, thanks to efforts coordinated by the United Nations

Example subjects and projects:

History Project: "The Global Journey to Eradicate IUU Fishing"

Students explore the historical timeline leading to the global eradication of IUU (Illegal, Unreported, Unregulated) fishing. They investigate key events, international collaborations, and the evolution of policies that contributed to the success of the eradication efforts.

Science Project: "Evaluating the Ecological Impact of IUU Fishing Eradication"

Students conduct scientific studies to assess the ecological impact of eradicating IUU fishing globally. They analyse data on fish populations, marine ecosystems, and biodiversity to understand the positive effects of the eradication efforts.

Ethics Project: "Ethical Implications of Global IUU Fishing Eradication"

Students delve into the ethical considerations surrounding the global eradication of IUU fishing. They explore dilemmas related to social justice, international cooperation, and the rights of communities dependent on fishing.

Subtarget 17.3: International ban on all activities causing seabed habitat loss and degradation takes effect [UN]

ProBleu interpretation: Across the world, we stop any activities harming the homes of seabed animals, making sure it stays safe and healthy.

Example subjects and projects:

History Project: "The Road to a Global Ban on Seabed Habitat Destruction"

Students explore the historical events, negotiations, and international collaborations that led to the establishment and enforcement of the global ban on activities causing seabed habitat loss and degradation. They examine key milestones and diplomatic efforts.

Science Project: "Monitoring Seabed Recovery Post-Ban"

Students conduct scientific studies to monitor the recovery of seabed habitats following the global ban. They analyse data on marine life, biodiversity, and ecosystem health to assess the positive ecological impact of the ban.

Drama Project: "Theatrical Performance on Protecting Seabed Habitats"

Students collaborate to write a theatrical script that dramatises the importance of protecting seabed habitats and the journey to achieving a global ban. They then perform the play, incorporating elements of storytelling, emotion, and advocacy for environmental conservation

Subtarget 17.4: International UN agreement on protection and management of major rivers is concluded and all major rivers of the globe have an internationally supported management plan and national/international commission (EU sponsored set-up and is member of boards of key rivers linked to EU territories, such as Nile, Amazonia, Congo)

ProBleu interpretation: The United Nations has made a deal to protect and take care of the biggest rivers in the world. Each major river now has a plan, and there's a group with people

from different places, including the EU, to make sure everything goes well for rivers like the Nile, Amazonia, and Congo.

Example subjects and projects:

Science Project: "Scientific Assessment of River Ecosystems Post-Management Implementation"

Students conduct scientific studies to assess the ecological impact of the implemented river management plans. They analyse data on water quality (using citizen science methods and tools such as FreshWater Watch kits), biodiversity, and ecosystem health to evaluate the effectiveness of the plans in preserving river ecosystems.

Physical Education Project: "River Conservation Fitness Challenge"

Students engage in physical activities focused on raising awareness about river conservation. This could include activities like community clean-ups, nature walks along riverbanks, or even water-based sports emphasising the importance of protecting rivers.

IT Project: "Digital Platform for Global River Conservation"

Students work on developing a digital platform that serves as a hub for global river conservation efforts. The platform could include features such as interactive maps, data visualisation tools, and collaboration spaces for international organisations, researchers, and communities.

Subtarget 17.5: New international standards for harbours, ports and shipping are enacted [IMO]

ProBleu interpretation: [The International Maritime Organization (IMO) has created] New rules that everyone around the world follows to make sure harbours, ports, and ships are safe and work well together.

Example subjects and projects:

Science Project: "Technological Innovations for Safe and Sustainable Shipping"

Students focus on researching and implementing technological innovations that align with the new international standards. This project integrates science by exploring advancements in navigation, fuel efficiency, and safety measures to enhance sustainability in shipping.

History Project: "Evolution of International Maritime Standards"

Students explore the historical development leading to the enactment of new international standards for harbours, ports, and shipping. They investigate the evolution of standards, the role of the International Maritime Organization (IMO), and the global collaboration that shaped maritime regulations.

Literature Project: "Narratives of the Sea: Exploring Maritime Themes in Literature"

Students engage in the study and creation of literature inspired by maritime themes. They analyse existing maritime literature, exploring narratives of the sea, and then craft their own stories or poems reflecting the significance of the oceans and shipping.

Subtarget 17.6: All EU bilateral trade agreements condition market access to elimination of IUU fishing and fulfilment of international fisheries agreements

ProBleu interpretation: The EU has made deals with other countries for trading, and a rule is that they can only trade if they stop illegal fishing and follow the global agreements about fishing.

Example subjects and projects:

Economics Project: "Sustainable Fisheries in Bilateral Trade Agreements"

Students investigate the economic implications of incorporating conditions related to the elimination of IUU (Illegal, Unreported, Unregulated) fishing and adherence to international fisheries agreements in EU bilateral trade agreements. They analyse the impact on market access, trade balances, and the sustainability of fisheries.

History Project Example: "Evolution of Fisheries Conditions in Trade Agreements"

Students explore the historical development of conditions related to fisheries in EU trade agreements. They examine how these conditions have evolved over time, reflecting changes in international fisheries management and environmental awareness.

Science Project: "Monitoring Sustainable Fisheries Compliance"

Students design and implement a scientific study to monitor and assess the compliance of fisheries with sustainable practices as outlined in EU bilateral trade agreements. They collect data on fish populations, fishing methods, and environmental impacts to evaluate adherence to the specified conditions.

Subtarget 17.7: All maritime surveillance activities of EU agencies and Member States are coordinated and joint surveillance operations in EU and international waters are carried out

ProBleu interpretation: All the teams in the EU that keep an eye on the seas work together and join forces for big missions in both EU waters and other parts of the world.

Example subjects and projects:

Information and Communications Technology (ICT) Project: "Integrated Maritime Surveillance System"

Students work on designing and developing an integrated maritime surveillance system that facilitates coordination among EU agencies and Member States. The system could include

real-time data sharing, advanced analytics, and communication tools to enhance joint surveillance efforts.

Geography Project Example: "Mapping Maritime Surveillance Zones"

Students engage in geospatial analysis to identify and map maritime surveillance zones in EU and international waters. This project integrates geography by examining the geographical factors influencing surveillance operations and the distribution of maritime activities.

Science Project: "Enhancing Maritime Surveillance Technologies"

Students focus on researching and developing advancements in maritime surveillance technologies. This could involve exploring the integration of artificial intelligence, satellite imagery, or underwater sensors to enhance the efficiency and accuracy of surveillance systems.

2.6. Growing the Network of European Blue Schools

Growing the Network is associated with four important Key Performance Indicators (KPIs):

- An increase in the Network of European Blue Schools to ten times the size it had at the beginning of the project
- At least 100 school projects funded and successfully implemented
- At least 300 twinned applications submitted
- At least four calls for students and school projects' funding.

Growing the Network will involve funding at least 100 school projects, and providing educational resources to up to 400 schools (targeting 1300 educators and 30,000 students). Reaching these schools will depend on disseminating project resources; particularly the cascade funding led by **WP4 Financial support for student and school projects.**

The funding process is detailed in a number of deliverables in WP4, including **D4.1 Procedures to evaluate the submitted educational proposals** and **D4.2 Call 1. Documentation and evaluation**.

2.6.1. Twinning

ProBleu aims to promote twinning and cooperation between the funded school projects, and among the Network more broadly. This is explicitly encouraged through the funding calls delivered in WP4. The first call encourages "collaborative approaches with other schools" and "twinning among schools from different locations". Schools are also asked directly about twinning in the application form:

*"**Do you intend to cooperate with other schools? If so, which schools, and how do you intend to cooperate?** Guidelines: If you intend to have twinning activities and/or liaise with schools that are members or applicants to the NEBS, please describe it here. [Maximum 1000 characters, including spaces]"*

Cooperation and twinning is included in the evaluation criteria for projects. It is one of four criteria in the third evaluation dimension "Criteria defined by Horizon Europe" (this dimension counts for 30 of the total 100 points). Cooperation and twinning is defined in the evaluation criterias as follows: "the project entails a proposal for cooperation and/or twinning with other schools, in particular with the NEBS and those aspiring to become accredited members of the NEBS."

Given its prominence in the call, application, and evaluation, it is hoped that many schools applying for ProBleu funding will find opportunities for twinning and cooperation with other schools without direct support from the project. However, it is possible that some schools will not be able to find appropriate schools to partner with or may be limited in the scope of their partnership (for example, only twinning with schools in their local area or partnering with schools that consider a similar marine or freshwater topic to them). It might therefore be beneficial for ProBleu to directly arrange twinning between schools (in addition to the partnerships already formed between schools at the application stage). For example, it could be interesting for schools to be partnered with schools in another country or region, or twin with schools looking at a different topic. These partnerships will be harder for schools to arrange by themselves and can be facilitated by ProBleu.

It might also be interesting to explore the feasibility and benefits of twinning or partnership between ProBleu schools and blue schools from the existing Network or from the other sister projects (SHORE and BlueLights). Such a partnership might be different from the twinning encouraged in the ProBleu funding calls because ProBleu and the sister projects and Network might have different topics or project structures which make direct twinning more difficult. Nevertheless, if the initial twinning and partnership established in ProBleu is successful and the schools have appetite for further collaboration then the concept of cooperation between schools could be extended to include the sister projects and the Network.

The extent to which schools require ProBleu's support in facilitating twinning will be evaluated following the first funding call (WP4). Plans for future funding calls will be adapted based on the number of applications in the first call containing twinning. For example, further support may be given in future funding calls to help schools find other schools to partner with, or the process may even be adapted so that schools are matched with other partner schools by ProBleu *after* they have been funded. There is also the possibility to develop an online "matchmaking" forum, for schools to find other schools which could support or complement their work. This section of the pipeline will therefore be reviewed and updated following the evaluation of the first ProBleu call to ensure that twinning and cooperation between schools remains a central element in the Blue School projects supported.

2.7. Maximising the impact of Blue School projects

The main aim of ProBleu is to improve ocean and water literacy in school communities. To maximise the impact of ProBleu, the project must enable Blue School projects themselves to be impactful. ProBleu will improve impact through a **knowledge repository** that will provide both a **catalogue of existing Blue School projects** and a catalogue of **resources**, including FAIR and inclusive **teaching aids**.The impact of the ProBleu Blue Schools will be monitored throughout the project. Actions and lessons learned from particularly impactful schools will be shared with other schools and educators to try and encourage and replicate this success in other areas.

Specifically, the knowledge repository will consist of the following elements, which will be updated throughout the project lifetime.

2.7.1. Guidance on joining the Network

Based on findings described in **section 2.4 Improving the process of joining the Network**, this guidance will help new schools reach accreditation.

2.7.2. A catalogue of existing Blue School projects

This will be designed to support learning and ocean and water literacy, rather than a blueprint for replicating or furthering a project. In order to design such a catalogue, the interview process with teachers (detailed in **section 2.3.2 Improving the process of joining the Network** above) and ongoing feedback forms following the funding calls will also be used to establish what types of information would be most useful to educators. This catalogue will be added to throughout the lifetime of the project.

2.7.3. Other relevant projects

The current teaching handbook provided by the Network gives examples of projects which may improve ocean literacy. These will be organised and tagged so that they can be more easily searched and accessed.

2.7.4. Lesson plans and templates

Through collaboration with teachers, ProBleu will develop and store lesson plans, including expected learning outcomes, that can provide the background information from which projects can be developed. As part of the financial support to third parties, funded schools will be required to share their learning resources and contribute to the knowledge repository, adding to the portfolio of the project throughout its lifetime.

2.7.5. Digital and practical teaching aids

PML will provide the possibility to explore complex data in desktop spreadsheet software like Excel, and will generate ready-to-use map figures, which can be linked to traditional lessons

or to virtual ocean-journeys. Earthwatch will make available its FreshWater Watch programme and CSIC its MINKA platform and their linked activities.

2.7.6. Guidance to incorporate digital and practical teaching aids into existing Blue School activities

Precise guidance to help Blue Schools incorporate the teaching aids, regardless of the nature of their Blue School activities will be developed and made available.

2.7.7. Guidance for aligning projects with Mission Starfish

See **section 2.5. Aligning Blue School Projects to Mission Starfish**.

2.7.8. Co-design guidance

The project will develop guidance on how to use a co-design approach in implementing school projects. This approach is in particular relevant for open schooling, where schools will team up with local partners. The guidance will provide recommendations and best practice cases on how educators work together with communities to create solutions, advance knowledge, foster critical thinking, encourage democratic engagement. It will introduce the features and the elements of the co-creation process for schools to easily apply this approach in practice.

2.7.9. Design thinking guidance

The design-thinking methodology employs a student-centred and practice-oriented approach by encouraging students' out-of-the-box thinking, creativity, brainstorming of innovative ideas, and creation of prototypes. Guidance for this method will be available within the knowledge repository. This guidance will provide step-by-step explanation of all 5 design thinking phases: (1) Empathise, (2) Define, (3) Ideate, (4) Prototype and (5) Test and resources related to design thinking frameworks. This approach is the most useful to tackle problems that are complex and undefined.

2.7.10. Challenge-based learning guidance

Project will provide the support on how to use the challenge-based methodology, which applies a multidisciplinary approach to encourage students to develop a deeper understanding of real-world problems, work in teams, and use creativity to reach the solution, for it to be based on their prior knowledge and innovative at the same time.

2.7.11. Open schooling and collaboration guidance

The fourth criteria for a Blue School project is that it must collaborate with a local partner. This leads to the use of an Open schooling approach that includes stakeholders into the process of teaching/learning. An extensive list of organisations that schools may wish to collaborate with is beyond the scope of ProBleu. Nevertheless, ProBleu can provide examples of successful collaborations, and guidance / templates on how schools can reach out to suitable

partners. ProBleu also will develop and offer a list of innovative, practical resources based on methodologies of Open Schooling.

2.7.12. Twinning guidance

See **section 2.6.1. Twinning**.

2.7.13. Impact assessment tools guidance

Methods for assessing ocean and water literacy. Furthermore, any Blue School project with a citizen-science component will be encouraged to use the MICS (measuring the impact of citizen science) platform to assess the impacts of their project across science, society, the environment, the economy and governance.

2.7.14. Inclusivity guidance.

This guidance also will discuss recommendations regarding diversity and inclusivity through geographic coverage (at least 30 countries), languages (at least 30 languages) and functional diversity (at least 10% of teaching material and activities accessible to any kind of special need).

2.8. Engaging school communities through open schooling

Open Schooling can be defined as "*an approach in which purposeful collaborations are built between schools and their wider communities. Families, experts and other stakeholders collaborate with teachers and students to address relevant local challenges, contribute to community development, and promote an active global citizenship attitude. Open Schooling offers students the opportunity to learn together in the real world, and widens their horizons to learn from people other than their teachers*" (Make it Open, 2021).

Opening up education is an important item on the European policy agenda for many reasons. Firstly, it can help to increase the scientific literacy of school students (and society more broadly). Furthermore, it helps to promote other "soft" skills such as communication, teamwork and critical thinking. Open Schooling also provides a framework to introduce societal and environmental challenges into the school curriculum. Overall, it helps to promote active citizenship among school students and their communities.

ProBleu actively adopts and encourages open schooling methodologies. All schools must collaborate with local partners in order to achieve the fourth criteria for a Blue School project. **Open schooling and collaboration guidance (section 2.7.11)** will be provided in the knowledge repository, enabling schools to form connections and collaborate more easily. Similarly, the knowledge repository will also contain guidance on how schools can "Twin" with current members of the Network to create more impactful projects.

Engaging with the wider community will also utilise the dissemination campaigns detailed in **D6.1 Plan for the exploitation, dissemination and communication of results (PEDCR)**. Specifically, the objectives of the dissemination are:

- To **exchange experience** with projects and groups working in the field in order to join efforts, minimise duplication and maximise potential.
- To **disseminate the fundamental knowledge**, methodologies and technologies developed during the project.
- To **pave the way for a successful commercial and non-commercial exploitation** of the project outcomes.

2.9. Maintaining the Network

2.9.1. The ProBleu legacy

ProBleu goes beyond aligning schools to the Mission, and also connects to Mission lighthouses, Blue Parks and UN Sustainable Development Goals (SDGs).

Mission Starfish supports regional engagement and cooperation through area-based "lighthouses" in major sea/river basins: Atlantic-Arctic, Mediterranean Sea, Baltic-North Sea, and Danube-Black Sea. Mission lighthouses are sites to pilot, demonstrate, develop and deploy the Mission activities across EU seas and river basins. As part of dissemination activities, ProBleu will highlight how particularly impactful Blue School projects can be considered example lighthouses. ProBleu will also facilitate a mutual sharing of resources - including the FAIR catalogue of teaching aids - as well as communication materials and channels.

ProBleu will also highlight how Blue Schools contribute to the SDGs. **SDG6, clean water and sanitation**, aims to protect and restore ecosystems, prevent and eliminate pollution and make the blue economy circular; **SDG14, life below water**, aims to conserve and sustainably use the oceans, seas and marine resources, and the education aims of **SDG4, quality education**, target oceanic, coastal and inland waters. The activities of the ProBleu project are anticipated to contribute to each of these three SDGs; and the legacy of Blue School projects is that they too will have individual and collective impacts on these targets.

Part of maintaining the Network will also depend on the dissemination and exploitation actions detailed in **D6.1 PEDCR**. In the short term, targeting the education and wider school community should lead to the growth of the Network of European Blue Schools. In the medium term, reaching academics, businesses and industry will increase interest and potential investment in the Network, as well as ocean and freshwater literacy more generally. In the long term, targeted dissemination to policy makers should result in changes to environmental and education policy, improved water literacy and the health of our water resources.

2.9.2. Collaboration with the Network of European Blue Schools and sister projects (SHORE and BlueLights)

ProBleu will directly support schools (through funding calls, teaching materials and guidance) to become accredited members and participate in the Network of European Blue Schools. As such, the maintenance of ProBleu's outputs is closely related to the ongoing maintenance of the Network and the activities of SHORE and BlueLights (the sister projects). Discussion is still ongoing on the best way to structure and formalise this relationship. Options being explored include a legal Memorandum of Understanding or a less formal statement of intent. The aim is to establish a framework for cooperation between each project (accounting for each project's respective objectives and approach). Such an agreement will help provide a common understanding of how the projects can best work together and will facilitate each project in adapting its work to align (where possible) with the efforts of the other projects. This process will also help to clarify how best to sustain the outputs from the ProBleu project and whether they are best preserved as an individual "ProBleu legacy" or as a collective "Network of European Blue Schools legacy". The optimum solution might vary depending on the output. For example, after the end of the project, the schools funded through ProBleu will be best supported by the existing Network. However, it might not make sense to host the FAIR catalogue of teaching aids within the existing Network structure depending on the capacity and priorities of the organisations involved. Discussion and collaboration with the Network, EU4Ocean, SHORE and BlueLights will continue throughout the ProBleu project duration ensuring that a clear maintenance and sustainability plan is in place by the end of the project and that the pipeline can be adjusted accordingly to ensure a strong project legacy.

3. Conclusions

The ProBleu pipeline outlines how schools interact with the ProBleu project and with each other, in their efforts to contribute to the objectives of Mission Starfish and become part of the Network of European Blue Schools. The pipeline covers nine key actions, carried out over the lifetime of the project: (1) Understanding the existing Network; (2) Reaching out to current Blue Schools; (3) Connecting with primary and secondary schools outside the Network; (4) Improving the process of joining the Network; (5) Aligning Blue School projects to the Mission; (6) Growing the Network; (7) Maximising the impact of Blue School projects; (8) Engaging school communities through open schooling; and (9) Maintaining the Network.

At this early stage of the project, some of the details around these actions are yet to be finalised; and will likely be iteratively developed throughout the lifetime of the project. Nevertheless, this deliverable can be considered a blueprint to ensure all partners are aligned with ProBleu's methods and goals.

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Annex

A.1 First email to schools database

SUBJECT

[To European countries] European call to fund school projects on ocean and water education
[To non-European countries] Call to fund school projects on ocean and water education in schools outside the European Union

MAIN TEXT

Dear teachers,

The European Union has made funding available to improve education related to the sustainability of oceans and inland waters in primary and secondary schools.

We present here the ProBleu initiative, a project funded by the European Union dedicated to improving education related to the sustainability of oceans and inland waters in schools not only across Europe but also in 18 non-European countries. Thanks to ProBleu, schools will have the opportunity to request funding of up to 10,000 euros for projects that can last up to 11 months.

OPENING OF FUNDING NOTICE NOVEMBER 2023:
The first round of financing will open in November 2023, with projects to be implemented between 1 April 2024 and 28 February 2025 (maximum 11 months). This may be a good opportunity to receive funding to make a significant impact on ocean and inland water sustainability education in your school community.

To ensure you receive updates and detailed information on the application process, register here: https://forms.office.com/e/KimpnDhL39

Regards,

The ProBleu team