



MARITIME FORUM

Cluster story: Ocean Health and Observation

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A healthy ocean is a fundamental prerequisite for a thriving blue economy. Data and observation are of the essence to achieve and maintain good environmental status. The EMFF has funded several projects addressing environmental concerns such as marine litter, oil spills, chemical pollution, etc.



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This column was launched in 2021 to present stories about important economic activities of the blue economy. To date, it has covered [renewable energy](#) [1], [algae and blue bioeconomy](#) [2], [fishing and aquaculture](#) [3], [tourism](#) [4] and [maritime transport](#) [5], [all of which](#) can boost growth and jobs across the EU.

This edition presents an overview of ocean health and observation. Although monitoring of the ocean is a fundamental activity, it might be far-fetched to call it an economic activity. Granted, there are companies whose primary business is to collect ocean data or to build devices that help researchers collect data, or even to come up with solutions to remedy the perils posed by hazardous events such as oil spills. However, their overall revenue is dwarfed by the revenues of sectors such as tourism and transport. After all, why would protecting and observing the environment be a matter of economic significance?

In answering that, as this column shows, a healthy ocean is a fundamental prerequisite for a thriving blue economy: would tourists keep flocking to a beach that is not safe for swimming? Who would eat shellfish contaminated with human sewage? How easily would a local community deal with a port that is a major source of pollution? The list goes on ...

Without a doubt, if humans continue contaminating the ocean, the economy will go down with it. Thus, with this goal in mind, the European Commission committed to having EU marine waters achieving [Good Environmental Status](#) [6] by 2020. Resolving to make every effort to protect the marine environment doesn't necessarily require a strong environmental conscience. In fact, any rational entrepreneur should come to the same conclusion out of ... pure selfishness.

So, how does one establish whether the ocean is healthy? Data and observation are of the essence. The European Commission acknowledged the importance of reliable data on the state of the ocean long ago, by funding two far-reaching initiatives: the European Marine Observation and Data Network ([EMODnet](#) [7]) and Copernicus Marine Environment Monitoring Service ([CMEMS](#) [8]). Thanks to these initiatives, the EU is now at the forefront of ocean observation and marine data sharing.

Further, in 2017, the European Maritime and Fisheries Fund (EMFF) launched a call for proposals dedicated, among other things, to "environmental monitoring and restoration" and "marine litter". As listed below, quite a diversified set of interesting projects has ensued.

Environmental concerns. Projects such as [SEA Wave](#) [9], [WESE](#) [10] and [SafeWAVE](#) [11] focus on the environmental concerns around the development of wave energy technology. Ironically, even clean energy can produce adverse environmental impacts - which signifies the importance of having a system in place that can both monitor and prevent them.

Marine litter. Several projects are focused on minimising the litter of abandoned fishing nets. [BLUENET](#) [12] introduced a programme for recycling abandoned, lost or discarded fishing and aquaculture gear. Its overarching idea was to recover and recycle fishing nets and aquaculture long-line ropes, under the motto "locally wasted, locally recovered". [NetTag](#) [13] on the other hand aimed to reduce and prevent marine litter derived from fisheries by working directly with fishers through an integrative preventive approach. The work included the use of acoustic systems to help fishers localise and recover their lost gear, and the promotion of best practices on the management of fishing waste on board. [OCEANETS](#) [14] developed an ICT tool to locate, monitor and quantify abandoned fishing nets, and validated a recycling technology to obtain products for the textile industry from them. [MarGnet](#) [15] promoted a holistic approach, combining actions to tackle the problem of abandoned fishing gear at all phases, from reduction and prevention to removal and recycling. [AQUA-LIT](#) [16], which focused on litter from aquaculture, devised preventive measures aimed at reducing litter from the aquaculture industry, proposed mechanisms for recycling the collected plastic waste, and analysed what policies would have to be adapted or put in place to underpin these actions.

Munitions. Unexploded munitions are another threat to the marine environment. Recognizing this, projects such as [BASTA](#) [17] and [ExPloTect](#) [18] are working with state-of-the-art technologies and adapting them to detect explosive compounds and chemical warfare agents in seawater.

Hazardous events. Fixing what's broken is pivotal to ocean health. It should come as no surprise that

there are EMFF-funded projects working on that as well. [SpilLESS](#) [19] addresses the problem of oil spills and their profound and devastating impacts on marine wildlife and environment. The project set up an innovative “blue lab” for work on native microbial consortia with bioremediation capacity, and uses unmanned vehicles for *in situ* release of microorganisms and nutrients.

Chemical pollution. Originating from human activity, mercury pollution presents one more threat to the marine environment. [MER-CLUB](#) [20] aims at delivering a mercury clean-up system based on microbial bioremediation. This delivery calls for introducing marine microorganisms that hold genetic potential for detoxification and decontamination, although they have not yet been exploited to their full potential. Using recent advances in environmental genomics and cell sorting, MER-CLUB identifies microorganism strains with potential for bioremediation in sediments from the Baltic Sea, the Mediterranean Sea and the Atlantic Ocean.

Microalgal forest loss. Much to any ocean lover’s dismay, a massive loss of macroalgal forests is occurring throughout the Mediterranean Sea. Even worse, this loss has gone largely unnoticed, creating a situation that will require more sophisticated tools and knowledge to bring about change. Macroalgal forest ecosystems play a key role in enhancing coastal primary productivity and supporting complex food webs, and they are integral to the delivery of a multitude of goods and services. [AFRIMED](#) [21] is undertaking novel laboratory and field-based experiments to boost restoration efforts and, at the same time, aims to increase awareness of the problem.

Data. Access to timely, accurate and comprehensive data is an increasingly important issue. [OCEANMET](#) [22], established to reduce costs related to data acquisition, increase accuracy of forecasts and enable SMEs to step into new ocean-related markets, has demonstrated the technical and commercial feasibility of setting up networks of buoys equipped with optimised inertial sensors to generate better wave data. [FLEETUSV](#) [23], scheduled to be completed in August 2022, is set to launch an innovative, high-performing and low-cost unmanned vessel that caters to the ocean data collection sector. According to project promoters, the main advantages of such a vessel are the lower risk to human life and reduced CO₂ emissions.

More info on ocean health and observation

Project name	Start date	End date	Total budget in €	EU contribution in €
Strategic Environmental Assessment of Wave energy technologies (SEA Wave [9])	01/11/2018	31/12/2021	956,763	764,646
Wave Energy in Southern Europe(WESE [10])	01/11/2018	31/10/2021	929,606	743,687
Streamlining the Assessment of environmental effEcts of WAVE energy (SafeWAVE [11])	01/10/2020	30/09/2023	1,893,370	1,514,696
Creating new life for discarded fishing and aquaculture gears to prevent marine litter generation (BLUNET [12])	01/01/2019	30/06/2021	688,364	550,691
Tagging fishing gears and enhancing on board best-practices to promote waste free fisheries (NetTag [24])	01/01/2019	30/06/2021	493,061	394,450
Technological approaches for circular economy solutions in terms of prevention, recover, re-use and recycle of fishing gears to obtain added-value products in the textile industry (OCEANETS [14])	01/01/2019	30/06/2021	532,575	426,090
Mapping and recycling of marine litter and Ghost nets on the sea-floor (MarGnet [15])	01/01/2019	31/12/2020	611,792	489,434
Preventive Measures for Averting the Discarding of Litter in the Marine Environment from the Aquaculture Industry (AQUA-LIT [16])	01/01/2019	31/12/2020	587,250	469,800
Boost Applied munition detection through Smart data inTEgration and AI workflows (BASTA [17])	01/12/2019	30/11/2022	1,247,046	997,637
Ex-situ, near-real-time exPlosive compound deTEction in seawater (ExploTect [18])	01/12/2019	30/11/2022	1,098,914	879,130
First line response to oil spills based on native microorganisms cooperation (SpilLESS [19])	01/02/2017	31/01/2019	368,175	294,540
MERcury CLean-Up system based on Bioremediation by marine bacteria (MER-CLUB [20])	01/11/2019	30/04/2023	1,044,889	851,058
Algal Forest Restoration In the MEDiterranean Sea (AFRIMED [21])	01/01/2019	31/12/2022	1,858,354	1,486,111
Cost-Efficient Oceano-Meteorological Data Service For Reliable Real-Time Information And Marine Forecast (OCEANMET [22])	01/12/2018	31/03/2021	962,048	625,332
Future of the Ocean Data Collection Market: Commercialisation of the novel Low-cost, Efficient, High-performing Autonomous Unmanned Surface Vessel (FLEETUSV [23])	01/09/2020	31/08/2022	2,442,061	1,709,443

Projects from other programmes

[EU4OceanObs](#) [25] (SFPI)

[COLUMBUS](#) [26] (H2020)

[EuroSea](#) [27] (H2020)

[SeaDataNet](#) [28] (H2020)

[Blue Cloud](#) [29] (H2020)

[JERICO-S3](#) [30] (H2020)

Useful links

[Clean and healthy oceans](#) [31]

[EU Biodiversity Strategy](#) [32]

[Marine Strategy Framework Directive](#) [33]

[EMODnet](#) [7]

[EuroGOOS](#) [34]

[CMEMS](#) [35]

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[4] <https://webgate.ec.europa.eu/maritimeforum/en/node/7054>

[5] <https://webgate.ec.europa.eu/maritimeforum/en/node/7077>

[6] https://ec.europa.eu/environment/marine/good-environmental-status/index_en.htm

[7] <https://emodnet.ec.europa.eu/en>

[8] <https://marine.copernicus.eu/about>

[9]

<http://www.emec.org.uk/projects/ocean-energy-projects/environmental-monitoring/sea-wave-strategic-environmental-assessment-of-wave-energy-technologies/>

[10] <https://wese-project.weebly.com/>

[11] <https://www.safewave-project.eu/>

[12] <http://www.bluenetproject.eu/>

[13] <http://net-tag.eu/>

[14] <http://oceanets.eu/>

[15] <http://www.margnet.eu/>

[16] <https://aqua-lit.eu/>

[17] <https://www.basta-munition.eu/>

[18] <http://exploTECT.eu/>

[19] <https://spilless.ciimar.up.pt/>

[20] <https://mer-club.eu/>

[21] <http://afrimed-project.eu/>

[22] <https://www.oceanmet.net/>

- [23] <https://xocean.com/technology-3/>
- [24] <https://nettag.ciimar.up.pt/?lang=en>
- [25] <https://www.eu4oceanobs.eu/>
- [26] <https://www.columbusproject.eu/>
- [27] <https://eurosea.eu/>
- [28] <https://www.seadatanet.org/>
- [29] <https://blue-cloud.org/>
- [30] <https://www.jerico-ri.eu/projects/jerico-s3/>
- [31] https://ec.europa.eu/oceans-and-fisheries/ocean/clean-and-healthy-oceans_en
- [32] https://ec.europa.eu/oceans-and-fisheries/ocean/marine-biodiversity/marine-biodiversity-objectives_en
- [33] https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm
- [34] <https://eurogoos.eu/>
- [35] <https://marine.copernicus.eu/it>