



NEWSLETTER

DECEMBER 2024

<https://one-blue.eu>



The increasing number of potentially harmful pollutants in the marine environment calls for more accurate analytical techniques combined with fast and cost-effective approaches.

In this context, analytical techniques based on high-resolution mass spectrometry can provide the profile of contaminants in a sample with suitable sensitivities. New toxicological approaches, such as effect-directed analysis (EDA), provide integrative responses to the effects of complex environmental samples. Also, new sensing technologies for unmanned monitoring of contaminants open a rapid and cost-effective window for more efficient online monitoring.

Since January 2024, ONE-BLUE coordinated by Spanish National Research Council (CSIC), has been developing new technologies, concepts, and procedures for marine monitoring while carrying out different sampling campaigns covering the Mediterranean, Atlantic and Arctic Oceans to fill the gaps of knowledge of contaminants of emerging concern (CECs) in the marine environment, as well as assess the combined effects with climate change.

Examples of the latest results are reported in this Newsletter.

We believe that ONE-BLUE's scientific and technical achievements will notably increase our current knowledge of CECs in marine compartments, and the new procedures and technologies will significantly help implement new EU policies.



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Every project has a beginning...

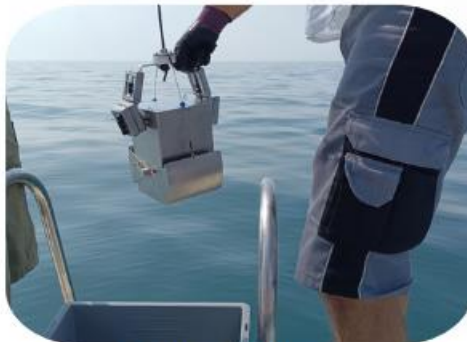


The Mediterranean case study

Led by NATIONAL RESEARCH COUNCIL-WATER RESEARCH INSTITUTE (CNR-IRSA), it will cover different areas, including the Spanish coast, Tyrrhenian Sea, Adriatic Sea, Ionian Sea, and Aegean Sea. Until now, the UNIVERSITY OF PADOVA (UNIPD) has collected 31 samples (seawater and sediments) from the **Adriatic Sea** in collaboration with CNR-IRSA. About 73 blood and feather samples from Scopoli's shearwater chicks were collected by UNIVERSITY OF MILAN (UNIMI) from various colonies across the Mediterranean Sea, including **Tremiti, Maddalena, and Linosa** (Italy), the **Balearic Islands** (Spain), as well as **Skyros and Paros** (Greece), and finally 30 biota samples (fish, mussels, langoustines, and cuttlefish, and microbial communities) from the **Mediterranean Spanish coast** have already been sampled by CSIC. Finally, the sampling campaign in the Aegean Sea is planned for next January.



*Prof. Dr. Sara Valsecchi
CNR-IRSA
(Mediterranean case study
leader)*



SC in the North Adriatic Sea



Researchers at the Veneto coast



*Researchers looking at chicks into
cavities in the cliffs on Tremiti islands*



Blood and feather samples from **Scopoli's shearwater chicks** were collected from various colonies across the Mediterranean Sea, including **Tremiti, Maddalena, and Linosa** (Italy), the **Balearic Islands** (Spain), as well as **Skyros and Paros** (Greece).

In Italy, we successfully carried out the sampling in colonies on Maddalena and Linosa islands, collecting blood and feather samples from 17 and 30 individuals, respectively. Additionally, we were able to collect samples from 12 individuals from another colony located at Porto Conte (Sardinia, Italy). Colonies were visited, and chicks were collected from their nests.

Sampling in the Tremiti islands was less successful, with samples collected from only 4 individuals. In Greece, we successfully carried out the sampling in colonies on Skyros and Paros islands, collecting blood and feather samples from 10 and 4 individuals, respectively. In Spain, we successfully performed sampling in colonies on the Balearic Islands, where blood and feather samples were collected from chicks.



Dr. Diego Rubolini conducting the sampling operation

The Atlantic case study



Dr. Maria Montserrat Sala
ICM-CSIC
(Atlantic case study leader)

Led by the Institute of Marine Sciences ICM-CSIC, it will cover the Irish and the Spanish coasts from Gibraltar Strait to Portugal, as well as the Portuguese Coast and the NO of the Spanish Coast.

The **Irish Coast** campaign has been completed, and DCU, in collaboration with the ICM-CSIC and IDAEA-CSIC, has collected 159 samples, including seawater, sediments and biota.



Researchers in the SC in the Irish Sea

ANALYSIS OF THE SAMPLES



Prof. Dr. Anna Kärman
Orebro University
(Harmonized analytical approaches leader)

The ONE-BLUE project investigates contaminants of emerging concern (CECs) in marine ecosystems to assess their levels, behaviour, and impacts on health and biodiversity under climate change influences. By harmonizing analytical methods, developing standardized testing protocols, and establishing robust QA/QC measures, the project ensures reliable and comparable data across laboratories. Findings aim to support regulatory frameworks, improve environmental monitoring, and guide policy updates on CECs at the EU and global levels.

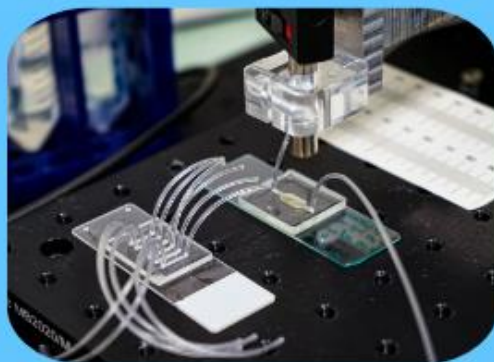
All analyses have been started and 3 types of studies are being carried out on all samples. The first results are now being collected in the CECs-MarineDB led by Venthic Technologies.

Target and non
targeted

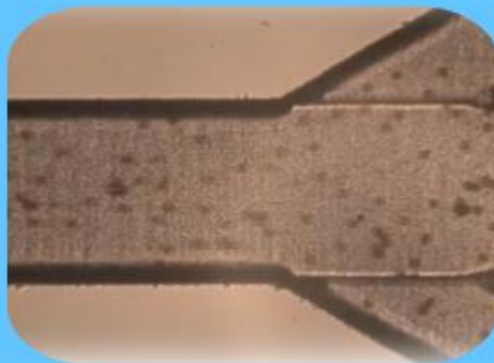
Ecotoxicological

NEW TECHNOLOGIES

In this first year, the partners INL and Cyric have started working on the **development of a covalent organic frameworks (COFs) and Surface-Enhanced Raman Scattering (SERS) autonomous in situ sensor system for the detection of antibiotics.**



Also, the MICRONIT and ITEFI-CSIC partners have been working to develop based on an advanced **ultrasonic system for sampling and enrichment of micro/nanoplastics from seawater** with sizes below 100 microns. The different requirements associated with sample type and particle size were brought together.



EVENTS AND DIFUSSION

In addition to starting with sampling campaigns and research, we have spread ONE-BLUE to various stakeholders thanks to **two webinars** organised by Finnova.



Among other disseminations, FC.ID and CNR-IRSA showcased ONE-BLUE in Lisbon and Milan during several activities framed within the European Researchers' Night, reaching a broad audience at both events. ONE-BLUE was also presented online at the CILAC Forum in Colombia by IDAEA and FINNOVA.



CNR-IRSA during the European Researchers nights



MICRO AND MESOCOSMS STUDIES



During October, IDAEA-CSIC launched its mesocosm studies, using mussels as the initial test organisms. These studies aim to **understand how climate change and contaminants of emerging concern interact within marine ecosystems.**

CECs concentrations in our studies are based on the substances most frequently detected in the environment, ensuring relevance to real-world scenarios.

