UNIVERSITÉ CÔTE D'AZUR

Université Côte d'Azur at UNOC3

A University Fully Committed to Scientific Diplomacy for the Ocean

UN OCEAN CONFERENCE NICE 2025 FRANCE

A rich scientific, academic and cultural programme rooted in the local area and university campuses

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CONFÉRENCE DES NATIONS UNIES SUR L'OCÉAN NICE 2025 FRANCE

Introduction

UNOC3 in Nice: A Major Opportunity for the Region and Université Côte d'Azur
After New York (2017) and Lisbon (2022), the hosting of the third United Nations Ocean Conference (UNOC3) in Nice represents international recognition of the role the city and its region can play in global dynamics. Holding this summit in a coastal city like Nice — which, although not a capital, has world-class infrastructure — highlights the importance of grounding these discussions in territories directly affected by major risks such as coastal erosion, flooding, or tsunamis.
The ocean, only recently added to the multilateral agenda, is central to climate stability: it serves as a climate regulator, a reservoir of biodiversity, a source of resources, and a space for circulation and connection between peoples. In the face of increasing threats — overexploitation, pollution, sea level rise, erosion — it is essential to better integrate ocean-related issues into public policy, particularly those addressing climate.

A High-Profile Event for Université Côte d'Azur
For Université Côte d'Azur, this conference offers a unique opportunity to showcase its scientific expertise, innovative training programs, and partnerships on maritime issues, connecting them with international priorities. The co-organization by France and Costa Rica is particularly meaningful for the university, which is actively engaged in collaborations with several Costa Rican universities on topics such as ocean governance, Marine Protected Areas, sustainable fisheries, and coastal vulnerability.

Strong Mobilization of the Scientific and Academic Community
Université Côte d'Azur's involvement in UNOC3 fully reflects its commitments to sustainability, scientific diplomacy, and supporting public decision-making. As a key player in bridging science and society, UniCA aims to generate concrete, research-based solutions, co-developed with stakeholders and adapted to both local and global realities.
Hosting the event in Nice enables broad participation from the university community: scientific and administrative staff, as well as students, are highly engaged in making these two weeks a true global laboratory for sustainable ocean and planetary futures.

Diplomatic Presence (Blue Zone) and Local Engagement (Green Zone)…
Through actions such as scientific talks and presentations, meetings, official UNOC3 side events, film debates, and more, Université Côte d'Azur will be active throughout the conference period.

Across the University Campuses …
A wide range of events will be held on the university's campuses — don't miss the program!

And After UNOC!
Université Côte d'Azur's UNOC3 activities will be showcased at the closing event, which will take place at the Grand Théâtre of the Château de Valrose.

+ 50 Scientific contributions from our Researchers during UNOC3	**+ 60** Student involved (Presentations, Volunteering though Engagement Center)	**+ 50** Co-organized events across the Territory in connection with UNOC3	**+ 20** Research projects related

Programme highlights around UNOC3

Université Côte d'Azur is heavily involved in UNOC3 from April to July 2025, within the UNOC3 discussion spaces—Blue Zone (diplomatic area, access by accreditation) at the Port of Nice and Green Zone open to the public throughout the city – as well as on its campuses and across the city. Here are some key highlights to remember. See **full program** in Annex.

June 3–6: Strong Presence of Université Côte d'Azur Scientists at the One Ocean Science Congress (OOSC)

Université Côte d'Azur is an official partner of the One Ocean Science Congress, the main scientific event held ahead of the diplomatic summit. Numerous **researchers and PhD students** will participate to present their work and scientific findings.

June 5 & 6: Two UNOC3-Accredited Green Zone Side Events on Campuses

Université Côte d'Azur is organizing two official UNOC3 events in the public-access Green Zone. The major conference **"What Dialogue for a Sustainable Future? Strengthening Ocean Health through Scientific Cooperation, Capacity Building and the Science–Policy Interface"** takes place on June 6 at the Théâtre du Grand Château de Valrose. Held between the One Ocean Science Congress and the UNOC3 diplomatic conference, this event will bridge science and policymaking through the critical role of universities. French and Costa Rican projects will illustrate the contribution of academia to ocean governance and the science–policy dialogue. More information

Simultaneously, an event will be held on June 5–6 at the **Mediterranean Institute for Risk, Environment and Sustainable Development (IRMEDD)** to explore themes of sustainability and well-being. More information

June 7 : Co-organization of the International Forum of Marine Universities and Participation in the Summit of Coastal Cities and Regions

Two official events take place on June 7: Université Côte d'Azur **co-organizes the International Forum of Marine Universities** (IFMU) at the Centre Universitaire Méditerranéen. This forum aims to reinforce scientific cooperation, joint training, and collective advocacy for ocean protection. Additionally, representatives from Université Côte d'Azur will actively participate in the **Summit of the Coalition of Coastal Cities and Regions**, sharing scientific insights with public decision-makers. More information

June 13: Co-organization of Events in the Official Diplomatic Zone (Blue Zone) during UNOC3 (June 9–13)

Université Côte d'Azur is present throughout the diplomatic conference in the official Blue Zone (accreditation required), represented by a delegation of **eight members**. On **June 13**, the university **co-organizes two side events**, where two of our scientists will present their expertise—especially regarding the role of universities in bridging science and public action. More information here and here. The university's leadership team will also be highly engaged throughout the UNOC3.

UNOC3 Opening & Closing Events

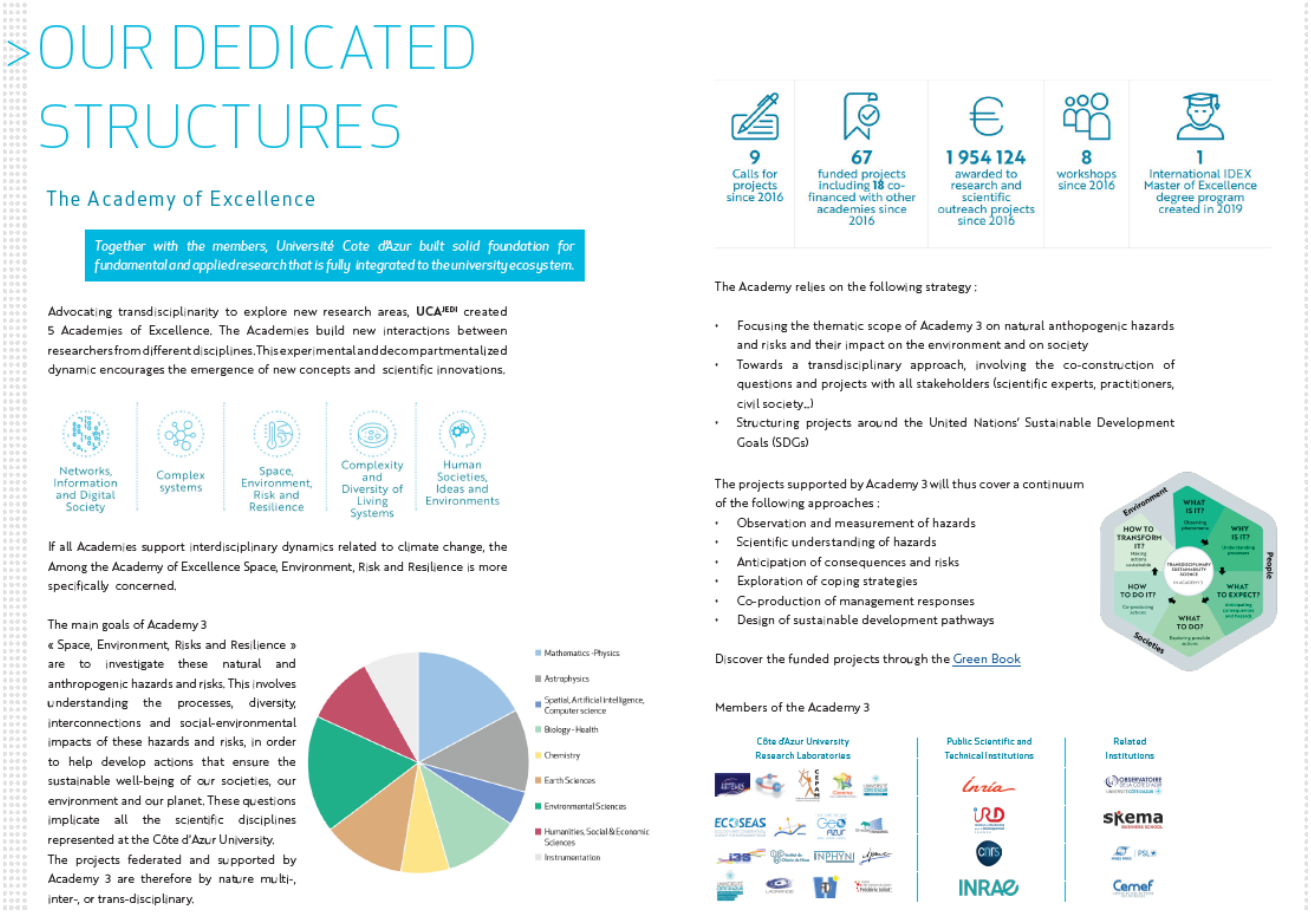
Ocean Science Festival: Fostering Dialogue Between Science and Society. Ahead of UNOC3, Université Côte d'Azur co-organized the **Ocean Science Festival** from May 3 to 5. This public event aimed to bring science closer to citizens through engaging programming on key ocean issues. It embodies the ambition to connect science, local communities, and broader audiences while raising awareness about ocean protection. More information

UNOC3: What Comes Next? – Closing Event with UniCA Delegation

Université Côte d'Azur will conclude its UNOC3 involvement with a major event on **July 2** at the **Théâtre du Grand Château de Valrose**. More information coming soon.

Our research activity: An Integrated Approach to Major Environmental Challenges

Because ocean-related issues cannot be separated from those of water, biodiversity, natural hazards, or current territorial dynamics, Université Côte d'Azur embraces a systemic and interdisciplinary approach to understanding and addressing environmental challenges and risks. This vision is reflected in research projects, educational programs, and innovations that bridge scales and disciplines, engaging scientists, students, and partners around a shared ambition: to support the transitions necessary for the sustainability of our societies and ecosystems.



IFR Marine Ressources: a dedicated Research structure

The Institut Fédératif de Recherche (IFR) Ressources Marines (MARRES) is a dynamic, trans-disciplinary research structure at Université Côte d'Azur that brings together players working in the field of marine resources. The IFR MARRES aims to structure research between the various disciplines in this field within Université Côte d'Azur, in order to create new synergies to support and develop collective and ambitious research on Marine Resources. This objective is articulated around the global missions and activities of research, conservation, innovation, education and scientific culture carried out by the member research units with and for society and the marine environment.

As such, by combining in a synergic way various discipline such as ecology, biology (including biomedicine), chemistry, physics, mathematics, geology, law, economics, as well as human and social sciences, the IFR creates a dynamic entity that evaluates and valorises marine resources in a holistic way. Because of its multidisciplinary nature, IFR MARRES is in close contact with local authorities, and socio-economic actors and is involved in several regional, national, and European networks.

At the level of the site, nine research laboratories are involved in the IFR:

Ecology and Conservation Science for Sustainable Seas
Director: Pr Cécile SABOURAULT
Themes 100% marine resources - Ecology, Ecotoxicology, Conservation, Integrative Management

Research Group in Law, Economics and Management
Director: Dr Jackie KRAFFT
Law - Plastic waste. Economy - Deep-sea mining, circular economy, acceptability.

International and European Law Laboratory
Director: Pr Anne MILLET-DEVALLE
Law of the sea, environment, MPAs, marine and genetic resources

MSc MARRES
science | conservation | valorization of marine resources
Director: Pr Christophe MOCQUET

Institute of Chemistry of Nice
Director: Pr Uwe MEIERHENRICH
Natural Marine Products (Isolation, Synthesis and Valuation), bio sources materials, pharma & radio-ecology

Institute for Research on Cancer & Aging, Nice
Director: Pr Eric GILSON
Cnidarian stress-response, regeneration, aging & longevity

Master
Droit de la mer &
des activités maritimes
Director: Pr Jean-Christophe MARTIN

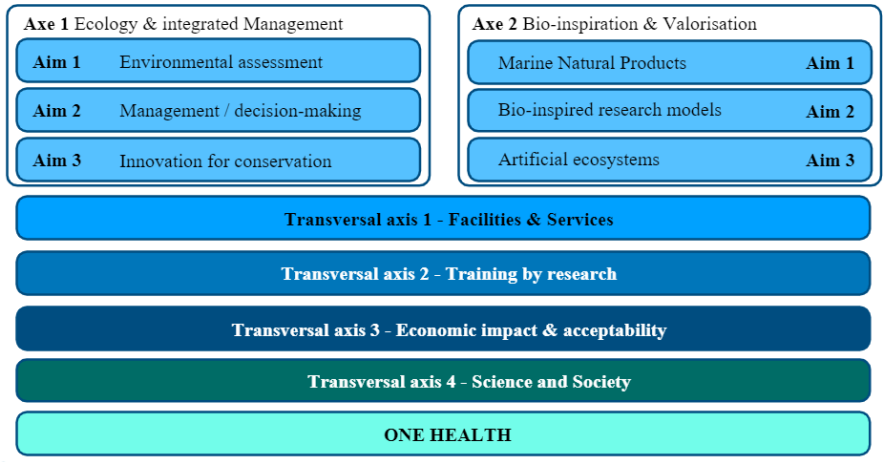
National Institute for Research in Digital Science and Technology
Director: Dr Maureen CLERC
Design, model, analyze, control and optimize artificial ecosystems to contribute to environment preservation

Laboratory of Cultures and Environments (Prehistory, Antiquity and Middle Age)
Director: Dr Isabelle Thery
Evolution of marine ecosystems and their exploitation, interaction human societies and marine ecosystems

Earth - Ocean - Space
Director: Boris MARCAILLOU
Interactions between the subsoil and the water column, chemistry of the water and benthic communities.

International Associated Laboratory: Response of organisms and populations to environmental stress
Directors: Pr Paola FURLA (UCA) & Dr Dorota CZERUCKA (CSM)
Foster collaborations between the (CSM) & UCA structured in three axes

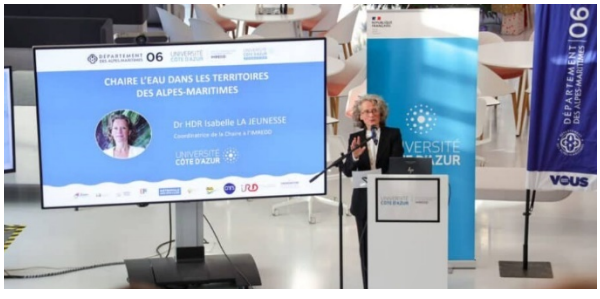
Together they work on the topic of integrated management and sustainable development of marine resources for health and wellbeing.



Our Chair "One Water": A Chair Rooted in Territorial Challenges

Our Chair on Water related matters is coordinated by Isabelle la Jeunesse (Université de Tours, détachement ESPACE UniCA CNRS), in relations with Département des Alpes-Maritimes, and organized around three main pillars (governance, resource & environment, uses) and thematic working groups: Water Sobriety and Transformation of Uses; Water and Territorial Cohesion: History and Law; Observation and Knowledge of Water Resources; Water in the Middle and Upper Countryside. The Chair stands out through its collective commitment and its ability to bring together a wide network of stakeholders around water management challenges. IMREDD, Université Côte d'Azur, the Université Côte d'Azur Foundation, the Alpes-Maritimes Department, the Métropole Nice Côte d'Azur, the Sophia Antipolis Urban Community, the Cannes Pays de Lérins Urban Community, the Riviera Française Urban Community, the Pays de Grasse Urban Community, the Alpes d'Azur Community of Communes, and the Pays des Paillons Community of Communes are all key players in climate adaptation strategies, combining local expertise and a collaborative vision to address the specific needs of the Alpes-Maritimes region.

More information here and here



Focus: Our France-Costa Rica Chair on Socio-Environmental Challenges, a facilitator for bilateral projects

As UNOC3 is co-organized by France and Costa Rica—two countries highly engaged in ocean-related issues and its role in climate regulation—we would like to highlight that Université Côte d'Azur also hosts a France-Costa Rica Chair on Socio-Environmental Challenges, funded by Idex and coordinated by Elisabeth Cunin (URMIS, IRD). This Chair supports collaborative projects between our university and Costa Rican universities, strengthening scientific and academic partnerships between the two nations.

Our research projects

Lauch of the project Improving sustainability of the small-scale fisheries in marine protected areas of mediterranean (FISHMPABLUE 2 plus)

Université Côte d'Azur contribution to the Design and implement assessment of Marine Protected Areas ecological and fisheries effectiveness Summer School. The summer school was organised within the FishMPABlue2-Plus project and held in Crete, Greece, from the 6th to the 10th of June 2022. Ten students, each one working in a Mediterranean Marine Protected Area, were welcomed at the summer school. During the summer school, the lecturers, researchers, and professors focused the training on how to design and implement monitoring activities to assess Marine Protected Areas ecological and fisheries effectiveness. Particularly, students have obtained information on the use of methodologies and techniques of environmental (underwater visual census, baited underwater videos), economic (assessment of catches and their economic value) and social (questionnaires on benefits for local fishers) monitoring aspects of small-scale fisheries in MPAs through theoretical a practical session.

Still in in 2022 in the framework of FishMPABlue2-Plus, Université Côte d'Azur oversaw drafting the French Coaching and Support Strategy for the marine reserves of Pequerolle and Cap Martin which included:

- The creation of the local Governance Cluster
- The adoption of a Governance Tool kit for improving the sustainability of the small-scale fisheries (SSF). This Tool Kit was developed in a previous project, Université Côte d'Azur also contributed to.

Simultaneously other colleagues oversaw drafting the the strategies for Italy, Greece, Croatia protected areas.

Marine Protected Areas (MPA) aim to protect and conserve marine biodiversity. In order to reduce human impact on marine habitats and species, some activities are thus limited or even prohibited, like fisheries, diving, or tourism related activities. But in addition to the ecological benefits of marine protected areas, socio-economic ones should also be taken into account for MPA management. For example, some fishermen have incomes depending only upon their small-scale fisheries (SSF). In order to integrate these aspects all together within MPA management, the FishMPABlue project was launched. In the first part of the project, a SSF analysis was carried out within and around Mediterranean MPA, which enabled the development of a "toolbox" proposing different governance measures to improve the socio-

economic and environmental sustainability of MPA. In the second part (FishMPABlue 2), 11 pilot MPA from 6 countries where selected across the Mediterranean, in which local governance clusters (LGC) gathering MPA managers and fishermen were created. They were asked to choose some measure from the toolbox to apply it. A field study of the MPA was carried out before and after the application of the measures, to assess their efficiency and feasibility. This revealed that MPA have a positive socio-economic effect when co-management occurs between managers and fishermen.

Now, the new part of the project, called FishMPABlue 2 Plus, aims to transfer the governance toolbox approach to 11 new Mediterranean MPA from 5 countries. Two French MPA are involved: Cap d'Ail marine reserve and Pequerolle marine reserve; and ECOSEAS laboratory is the project promotor for this French part. Our objectives are to create LCG for these MPA and to have them engaged to adopt some measures from the toolbox by June 2022.

The project in funded by the Cohesion policy of the European Commission under the Interreg Scheme.

The RECIF project: with and for the community

It is now well known that Mediterranean ecosystems are facing threats from climate change and human pressure. Implementing protected areas, in which destructive activities are limited or prohibited, is a mean to slow down the loss of biodiversity. Special Areas of Conservation (SAC) are one kind of marine protected areas. These areas are sites designated under the EU Habitats Directive, as part of the Natura 2000 network, aiming to provide conservation measures to species and habitat of importance. The RECIF project assessed throughout 2022 the effectiveness of these areas, by realising a monitoring in 8 SAC located in Alpes-Maritimes (06) and Var (83), France. This assessment was a starting point for the development of a historical dataset about the effect of coastal seafloor protection on communities' diversity, particularly fish stocks. Furthermore, the RECIF project included 20 fishermen in experimental fishing activities and awareness raising workshop regarding the management of marine protected areas for a sustainable fishery.

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The RECIF project aims to assess the effectiveness of these areas, by realizing a monitoring in 8 SAC located in Alpes-Maritimes (06) and Var (83), France. Evaluation studies of ichthyologic fauna diversity, fish density and biomass distributions, and catches from small scale fisheries will be realized by underwater visual census and experimental fisheries. Observations will be done within each SAC, at its periphery and at a distance from it (control). This will enable us to define, for the most recent areas, a starting point for a historical dataset about the effect of coastal seafloor protection on communities diversity, particularly fish stocks. For areas already

established for a long time, a standardized monitoring will be initiated. We will undertake this biodiversity inventory plan for each SAC and during two campaigns, in Spring and Fall.

The project in funded by the Cohesion policy of the European Commission under the FEAMP Scheme.

Functional diversity of artificial nurseries in port areas and their trophic connectivity with adjacent ecosystems.

Coastal grey artificial structures can greatly modify communities and ecosystem functioning, often decreasing biodiversity and enhancing biological invasions. The artificialisation of these habitats does not allow real measures of restoration. However, it is possible to ameliorate biodiversity and functioning and reconcile these systems with nature. The private company Ecocean (https://www.ecocean.fr/home/) has designed artificial nurseries called Biohut in order to facilitate the recruitment of fishes in ports.

The aim of this thesis is to improve the understanding of trophic relationships within these nurseries and with the surroundings and make hypotheses about the role of Biohut in influencing trophic connectivity of these areas. We will use bulk stable isotopes (SI) in order to establish trophic connections and define the trophic role of these Biohut. We will also sample for species and functional diversity in order to improve knowledge about the role of Biohut in imporving port reconciliation.

This PhD thesis is funded by the ANRT (association national recherche technologie) with the CIFRE program.

ECOMED - A study on the accumulation of Posidonia oceanica wrack as a possible nature based solution for coastal erosion.

It is well assessed that Posidonia oceanica wrack accumulating on sandy beaches are important elements for contrasting erosion. The definition of nature-based solution includes that changes do not only enhance the target ecosystem service, but also contribute to enhance biodiversity and more broadly different ecosystem services. This project aims at understanding the ecological role of wrack to provide habitat and food to fishes and invertebrates inhabiting sandy shores.

In addition, despite their ecological importance, wrack continues to be removed from the beach under tourism pressure that requires « clean » beach. Beach grooming is followed by beach nourishment and has consequences for the beach and the surf zone. A second objective of the project is thus improving ocean literacy for young generations by proposing ad-hoc education activities to students from middle and high school. We work in tight collaboration to different school professors and propose field activities followed by discussion in class to improve wrack acceptability.

The project is funded by the Conseil Régional PACA Sud.

CONVOST - Etat de CONservation de la végétation marine et risque OSTreopsis.

Large brown algae marine forests represent a key ecosystem, but are threatened by human impacts. As a consequence, regime shifts resulting in less complex communities are widespread. The entity, mechanisms and potential consequences of this phenomenon are still poorly known. For example, recent studies suggest benthic dinoflagellates blooms may be

linked to the decrease in complexity of macroalgae, their preferred substrate.

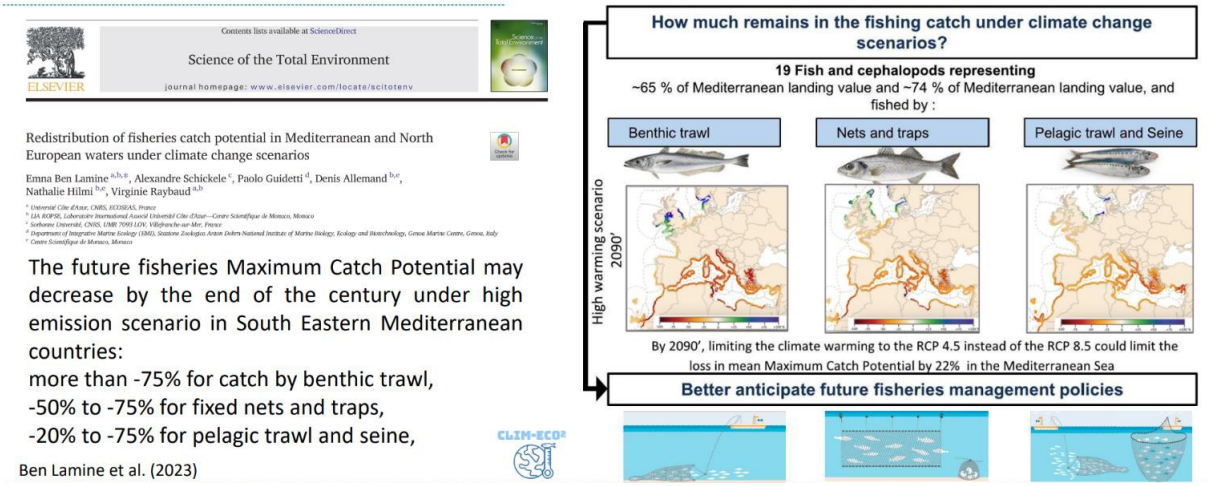
The project CONVOST aims at assessing (i) the conservation state of marine forests in the Natura2000 sites, using models, (ii) the link between macroalgal community complexity (i.e. Cystoseria forests, turfs and barrens) and Ostreopsis blooms and (iii) verify the feasibility of producing Ostreopsis blooms risk maps, using a modeling approach. The project is carried out in collaboration with local authorities in charge of Natura2000 sites management (i.e. Cote d'Azur metropolis, NCA, and Antibes Juan-les- Pins municipality).

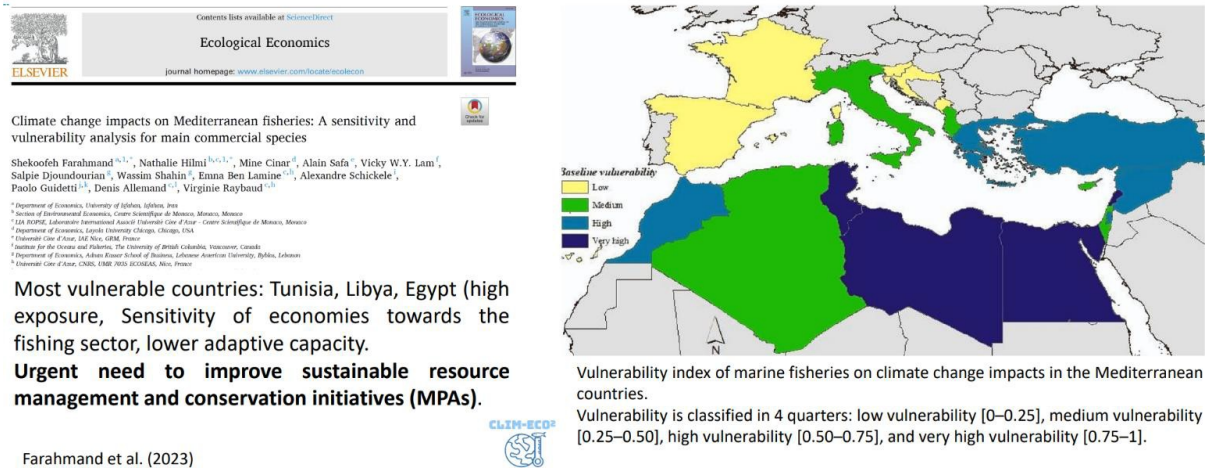
The results of the CONVOST project will allow a better knowledge on the effects of human impacts on marine vegetation, and their potential indirect implications, potentially producing useful tools for the coastal zone management.

CLIM-ECO² CLIMate-driven reshaping of Mediterranean fisheries: ECOlogical and ECOnomic assessment.

Anthropogenic climate change is already affecting marine ecosystems worldwide, but it has been shown that some areas will be more affected than others. Among them, the Mediterranean Sea is considered as a hotspot of both climate change and biodiversity. During the 21st century, Mediterranean fisheries may be deeply affected by climate change, which may accelerate the expansion of warm-water fishes and emphasise the decline of colder-water species that will not be able to move to cooler places. Stocks of exploited Mediterranean fish may therefore be significantly altered by global change during the 21st century. Conversely, other species (e.g non-indigenous species) could expand their range if temperature rises and offer new business opportunities. CLIM- ECO² will provide the first joint ecological and economic assessment of the effects of climate change on Mediterranean fisheries, which will allow countries bordering this sea to better anticipate and adapt to adverse consequences. Understanding how climate change is likely to alter the fisheries income of Mediterranean countries is essential for the future well-being of neighboring populations. The anticipation of climate-induced range shifts in Mediterranean exploited fish aims to predict and minimise the risk of error in long-term investment strategies. Specific recommendations to move toward a basin-scale sustainable management plan of Mediterranean resources in the context of global change will be provided. Set within a context of overexploitation of many of the world's fisheries, policy makers urgently require information and analysis to guide investments and initiatives in climate change mitigation and adaptation.

The Project is funded by the Fondation Prince Albert II de Monaco.





Vulnerability index of marine fisheries on climate change impacts in the Mediterranean countries.
Vulnerability is classified in 4 quarters: low vulnerability [0–0.25], medium vulnerability [0.25–0.50], high vulnerability [0.50–0.75], and very high vulnerability [0.75–1].

SeaChanges

SeaChanges is an international doctoral training network spanning archaeology and marine biology, which supports 15 fully-funded PhD projects across seven institutions in six countries. The network takes a long-term perspective on human exploitation of marine vertebrates, with projects covering species from herring to sperm whale, timescales from decades to millennia, and all of Europe's seas and beyond.

Groupers (Epinephelus) are a keystone taxon for the rocky shorelines of the Mediterranean Sea. As such, they are crucial to conservation efforts, especially in Marine Protected Areas (MPAs). Mediterranean Groupers are under increasing anthropogenic pressure, especially caused by overfishing and habitat loss. Assessment and management strategies, however, typically lack the long- term ecological perspective required critically to assess ecological baselines. Groupers were fished in the Mediterranean throughout the Holocene. Their relative abundance in the archaeological record increases at times of increased urbanisation and elite trade, for example during the Late Bronze Age (1600-1200 BC), and systematic exploitation takes place from the Greek colony period (750 BC) onwards. Their archaeological record has unfulfilled potential to define variation in groupers' status under distinct environmental conditions and exploitation intensity through time. Archaeological grouper bones can provide catch intensity, catch size, and trophic level data from zooarchaeological and nitrogen and carbon isotopic analyses.

ESR 13 will employ ZooMS, metrics, and stable isotope analyses of recent and archaeological groupers to reveal the long-term ecological history of groupers in the eastern Mediterranean, from prehistoric times to the Late Roman Period in comparison with modern data from MPAs. Training in rocky reef ecology will be provided via secondment at ECOSEAS Lab (Univ. Cote d'Azur);; ZooMS and stable isotopes via secondment at York.

The project is funded by the European Commission under the Marie Skłodowska-Curie actions (MSCA), Innovative Training Networks (ITN) programme.

CAVOBIOME.

Marine caves have particular ecological conditions with reduced organic matter for resident organisms. The fish Apogon imberbis may have a crucial trophic role in connecting caves with external habitats as it moves outside caves at night to feed and come back to caves during the day.

The CAVOBIOME project aims at explaining the functional role of A. imberbis in Mediterranean marine caves, by characterizing i) the diversity of microbial communities associated with A. imberbis (metataxonomy), ii) the nature and origin of organic matter in faecal pellets and cave sediment (ecological tracers), iii) the chemical seascape of the cave and potential chemical cues (metabolomics), if possible in cultivated organisms, and iv) potential new antimicrobial agents.

This project provides a better understanding of the trophic role of A. imberbis in marine caves and help to optimize management and conservation measures for these unique ecosystems.

The project is funded by the Academy of Excellence Compexity and Diversity of the Living.

MedPlage.

Posidonia oceanica is a fundamental specie for Mediterranean coastal ecosystems. As for other seagrass, it supports biodiversity and several ecosystem services. Once leaves fall, they decay within the meadow or are washed ashore where they deposit as beach cast. Posidonia detritus can greatly contribute to the ecology of the beach as source of nutrition for beach shredders and decomposers or be washed back to the sea, where it can enter marine coastal food webs. In time, Posidonia detritus accumulates and forms the so-called “banquettes a posidonie that are important elements to protect beaches from erosion. Posidonia beach casts are considered as beach nuisance and they are often removed to increase tourism. The project aims at increasing the awareness about the importance of Posidonia detritus, with a special regard to education programs for students. It also aims at collecting empirical information about the fate and the ecological role of beach casts

The project is funded by the Fondation de France.

Algal Forest Restoration In MEDiterranean sea.

Macroalgal forest ecosystems play a key role in enhancing coastal primary productivity, supporting complex food webs and are integral to the delivery of a multitude of goods and services. However, massive losses of marine forests occurred and are still occurring all over the Mediterranean. AFRIMED aim to implement and promote a protocol to effectively restore macroalgal forests in the Mediterranean and maximise the delivery of conservation, societal

and economic benefits. Objectives will be achieved by 1) Collecting information to prioritise restoration efforts; 2) undertaking experiments to maximise restoration success 3) delivering methods to replicate and upscale restoration efforts; 4) promoting cooperation with private and public sectors, enhancing mutual learning and raising awareness; 5) highlighting ecosystems services and socio- economic benefits; 6) identifying the governance frameworks to optimise delivery and effectiveness of restoration and benefits provided to society.

This project has received funding from the European Union's EMFF program.

Marine noise in the Ligurian Sea: from systematic signal analysis to the impact on marine species.

The undersea environment has long been depicted as a silent world. Research carried out in the last decades, however, has raised a growing awareness about sounds and noises as important components of the marine environment. The marine noise consists of biotic (sounds mainly produced by invertebrates, fish, and marine mammals), Abiotic (reflecting physical features of the marine environment, such as breaking waves, currents moving over reefs), and anthropogenic sounds (produced by sonar, seismic prospecting, drilling, recreational and fishing vessels, cargo and cruise ships), the sum of them being referred to as soundscape. This project will characterize the marine noise in selected locations of the Ligurian Sea in order to i) identify and discriminate the various sources of noise, and ii) to understand the response of marine organisms (juveniles fish and whales) to anthropogenic noise. To develop these innovative approaches, we propose original interactions between UCA laboratories (enriched with external collaborations) involving acousticians and specialists in complex scene analysis, marine geophysicists, biologists, ecologists.

The project was funded by the Academy of Excellence Space, Environment, Risk and resilience.

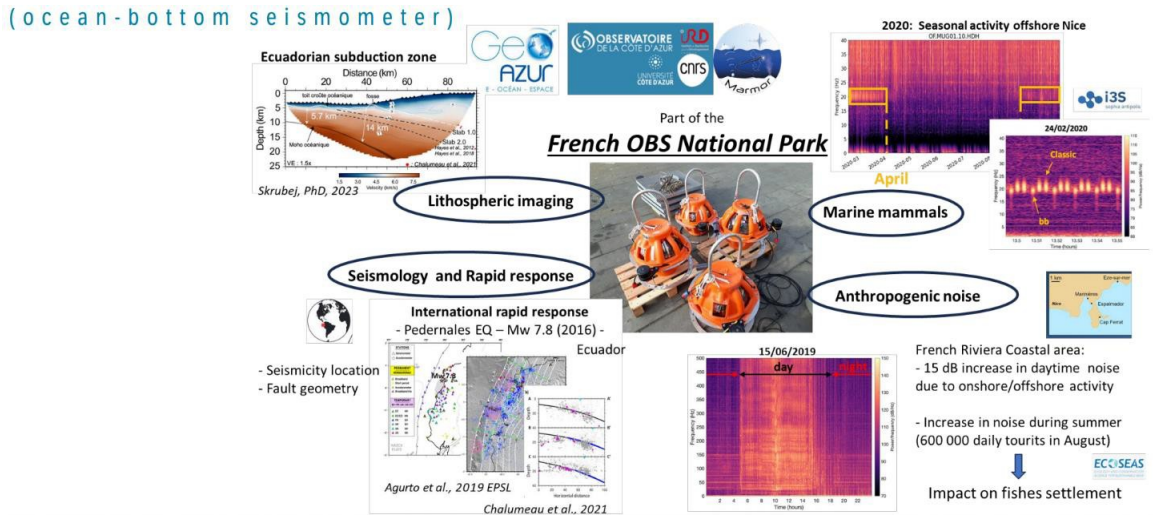
3DHyper - Multi-year monitoring of 3D printed artificial reefs in the Larvotto Marine Protected Area (Principality of Monaco) using a hyperspectral camera

Habitat destruction is one of the main causes of the decline of marine biodiversity and fisheries resources. Artificial reefs (ARs) can be considered as tools to restore habitats if their 3D complexity is close to that of natural environments. The use of concrete as a traditional building material for ARs generally does not allow for such complexity. Moreover, the chemical additives used in the concrete manufacture can have adverse effects on biofilm and macrofouling.

The use of large 3D printers allows the construction of ARs much more complex than traditional ARs. In addition, the use of a natural material such as dolomite sand removes the constraints related to the admixtures of concrete. The collaboration between Boskalis (Netherlands), ECOSEAS laboratory, and AMPN (Association Monégasque pour la Protection de la Nature) allowed the immersion in November 2017 of six experimental 3D ARs in the Larvotto MPA (Monaco).

The macrofouling monitoring on the 3D ARs will be carried out using an underwater hyperspectral camera initially developed by the Max Planck Institute in Bremen (Germany) and improved and marketed by PlanBlue. This innovative technique has never been used in the Mediterranean.

Profiling floats that land on sea and carry hydrophone



Data acquisition and treatment

Biological control of artificial ecosystems: modelling, control and optimization

Biocore: an academic research team
(Inria, INRAE, Sorbonne Université, CNRS)
Head: Olivier BERNARD
Contact: Olivier.bernard@inria.fr

Topics:
- Modelling, optimization of microalgae production
- Designing innovative processes for microalgae production
- Combining wastewater treatment with microalgal biomass production
- Directed evolution to enhance organisms performance
- Biofuel production from microorganisms

Synergies

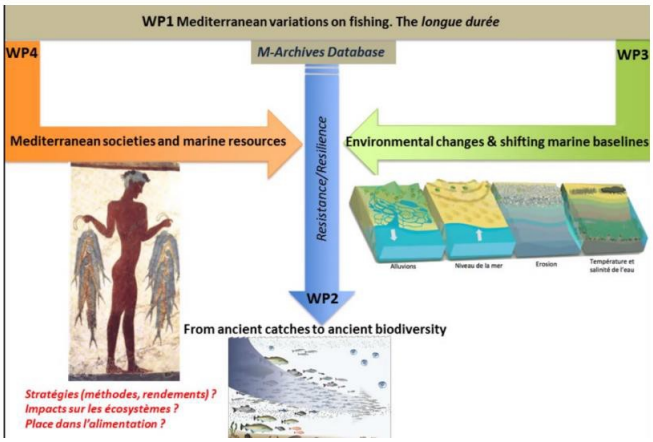
Contact: Jean-sebastien_Deschenes@uqar.ca
Areas of research :
- Development of new bioprocesses using microalgae (phytoplankton)
- Production of omega-3 rich oils (nutraceuticals)
- Production of third-generation biofuels
- Valorisation of all production
- Modelling (development of process dynamics models)
- Observation (development of virtual sensors to estimate non-measurable variables) of processes

Modelling the past and the future

EU ERC project MERMAID

Marine Ecosystems, Animal Resources and Human Strategies in Ancient Mediterranean: Integrated Studies on Natural and Societal Resilience

Looking to the Mediterranean past to understand the resilience of marine ecosystems today



Other projects

Researchers of Université Côte d'Azur also develops projects related to water, risks, and other ocean related themes. To find out more, here are links to project webpages:

- BENTOX+ - Université Côte d'Azur
- COREXPLORE - Université Côte d'Azur
- CORAL – Université Côte d'Azur
- AC-DC – Université Côte d'Azur
- DEEP-BLUE - Université Côte d'Azur
- PROMAB - Université Côte d'Azur
- MARFOR-SPOT - Université Côte d'Azur
- PEEWAN - Université Côte d'Azur
- MARE - Université Côte d'Azur
- FORESEE - Université Côte d'Azur
- StS-SEALEX - Université Côte d'Azur
- NDMH - Université Côte d'Azur
- AFSTORM - Université Côte d'Azur
- SUPER-MOUV - Université Côte d'Azur

Other Université Côte d'Azur Highlights

Contribution to the Resilience Campaign: a once in a lifetime opportunity for UniCA's students

About 50 international scientists, led by Jean-François Ternon (IRD researcher at UMR MARBEC) boarded, in April 2022, the research vessel Marion Dufresne, from Reunion Island, to study the interactions between ocean physics and biology at "small scale" (~10km). The scientists studied oceanic fronts on the edge of eddies in the Mozambique Channel and on the east coast of South Africa. The RESILIENCE cruise is part on the long term established scientific collaboration between the teams of Prof Mike Roberts from Nelson Mandela University and the IRD in South Africa, which both actively contribute to the cruise organisation and its achievements. On this occasion the Resilience oceanographic cruise welcomed a « floating university ». Indeed, twenty masters' students from three French universities, including from the MSc MARRES offered by Université Côte d'Azur, all members of the Network of Marine Universities (RUM) joined the scientific team of the RESILIENCE cruise as part of the Floating University. The objective was for the students, from various disciplines, to get involved in the research conducted during RESILIENCE (chemistry, biology, marine ecology or conservation) and to give them a chance to experience a real-life scientific expedition, close to the researchers, thereby benefiting from their

expertise and accompanying them in their daily activities at sea. The students were supervised by a lecturer and a research engineer from Université Côte d'Azur who was dedicated to pedagogical supervision, the coordination of the master students' activities, in harmony with the
scientific team and the crew.

Université Cote d'Azur researchers on national television to warn of the disappearance of brown algae an essential biodiversity component

A France 3 television crew followed scientists from the Ecoseas laboratory as they studied forests of cystoseires, endemic brown algae in the Mediterranean, which are locally threatened with extinction. Essential to marine biodiversity, the loss of these forests is transforming ecosystems into veritable deserts. On the rocks of Saint- Jean-Cap-Ferrat, researchers are working to re-implant young algal shoots, grown in vitro in the laboratory, in their natural environment, to restore the lost forests.

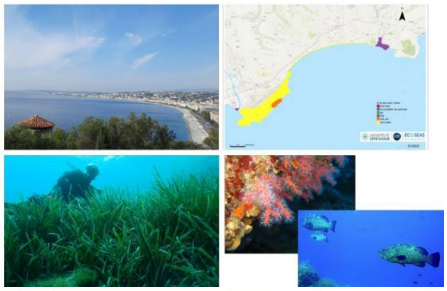
Ces scientifiques tentent de sauver les algues brunes de Méditerranée
youtube.com

From biodiversity to socio-ecology: creation of a new urban Marine Protected Area

Creation of a new urban Marine Protected Area in the bay of Nice (city project) by 2025

- Diverse habitats: sandy shores, rocky shores, seagrass meadows, canyons
- Biodiversity: endemic heritage species
  - Red coral (*Corallium rubrum*)
  - Posidonia (*Posidonia oceanica*)
  - Dusky grouper (*Epinephelus marginatus*)
- Adopt a Systematic Conservation Planning framework
  - A co-construction project (with a scientific committee, interdisciplinarity: ecology, economy, geography, law, sociology)
  - Engage all stakeholders (local communities, small-scale fisheries, companies, policy makers)

5th largest city in France, 2nd airport in France



A University-Led Project for Sustainable Water Management on Campuses

Université Côte d'Azur is actively engaged in addressing the water cycle upstream of discharge into seas and oceans, particularly by preventing water pollution and runoff on its campuses. A flagship initiative is underway on the **Trotabas campus**, focusing on the sustainable management of rainwater. This project involves students and is carried out in close collaboration with the Nice Côte d'Azur Metropolis, as part of its "permeable cities" strategy. The university also took part in the 1st Journée Azuréenne de l'Eau, demonstrating its commitment to developing local solutions aligned with both national and university-level strategies for integrated and sustainable water resource management. More information

Breakthrough Discovery by Researchers from Université Côte d'Azur and the ICN: A Promising Marine-Derived Compound to Enhance Cancer Treatment

Following a collaboration with Olivier Thomas's chemistry team at the ICN, we discovered that a small molecule extracted from a Mediterranean sponge collected in the bay of Villefranche-sur-Mer is capable of inhibiting the chemotherapy efflux activity of the Patched protein and enhancing the effectiveness of anti-cancer treatments, particularly against melanoma. Stéphane Azoulay, also at the ICN, has developed the chemical synthesis of this molecule and is currently working on its optimization to make it a drug candidate.

Our goal is to develop a drug from this sponge-derived molecule to improve the efficacy of cancer therapies and reduce the risk of recurrence. This project illustrates the significant therapeutic potential of Mediterranean sponges, like many other marine organisms—an additional reason to ensure their protection.

Monitoring the Ocean with Cutting-Edge Technology

Since September 2024, the Ligurian Sea Distributed Acoustic Sensing Observatory (LIDO) has been operating via a repurposed submarine telecom cable between Monaco and Savona (Italy). This innovative observatory monitors cetacean activity within the Pelagos Sanctuary, ocean circulation patterns, maritime traffic, and natural hazards—offering a unique window into real-time ocean dynamics in a critical marine biodiversity zone.

Optical fiber cables are being utilized to enable dense, large-scale passive acoustic monitoring of Marine Protected Areas, greatly improving the protection and understanding of these vital ecosystems. More information

Our Academic curricula and trainings

By transitioning from multidisciplinarity to transdisciplinarity, Université Côte d'Azur offers its students the opportunity to personalize their training and adjust their skills to their professional projects.

In this context, the Graduate Schools (EURs) are designed to bring synergy, support training through research and ensure continuity between the master's, the PhD programmes and the laboratories.

ARTS AND HUMANITIES

DIGITAL SYSTEMS FOR HUMANS

ECONOMICS AND MANAGEMENT

LIFE AND HEALTH SCIENCES

LAW, POLITICAL SCIENCE AND MANAGEMENT

HEALTH SCIENCE ECOSYSTEMS

SCIENCES OF SOCIETY AND THE ENVIRONMENT

FORMAL, PHYSICAL AND ENGINEERING SCIENCES

Furthermore, the development of Institutes and the existence of an engineering school, Polytech Nice Sophia has also supported the development of programmes to support the training of young generations.

A dedicated training offer: MSc in Ocean Science, Conservation and Innovation (MARRES)

[More information on the MSc MARRES]

Master's in Law of the Sea and Maritime Activities

The "Law of the Sea and Maritime Activities" track provides students with a comprehensive legal understanding of contemporary maritime issues, which are attracting growing interest. The program offers a cross-disciplinary approach combining international and European law, enriched with perspectives on national implementation.

More information on the masters programme

Other masters' programmes related

- HYDROPROTECH
- Water Engineer
- MSc Environmental Hazards & Risks Management – RISKS
- MSc AIR
- CONTRASTE: A generalist Master's program in Environmental Management, allowing students to specialize based on their career paths and professional focus)

Innovation: Supporting the creation of blue start-ups

Examples of start-ups

innov&sea	impact of sunscreen products on marine ecosystems	UNIVERSITÉ CÔTE D'AZUR Pauline Cotinat		https://innovandsea.com/
EverSea	A platform to connect marine conservation projects with investors	Lionel Pourchier		https://www.eversea.blue/
inalve	Microalgae production (bifilms) for sustainable aquaculture	MÉTROPOLE NICE CÔTE D'AZUR Blue Innovation Challenge		https://inalve.com/en/
BiOceanOr Biology For Ocean	Bio-guided services (biology & AI) to support sustainable aquaculture			https://www.bioceanor.com/
/de.es/ × Ifremer	Underwater operations (µ-AUVs swarm) and cloud-native data processing (AI)			https://fr.linkedin.com/company/de%CE%B5s
Pollustock	Design and manufacture of anti-pollution and anti-waste solutions			https://pollustock.com/

ANNEX. General Programme

RESEARCH ACADEMIA INNOVATION INTERNATIONAL