



COMPREHENSIVE MARINE CONSERVATION

Protect ecosystems

Empower populations

UNIVERSITÉ CÔTE D'AZUR



Proceeding of the Monaco Ocean Week conference

March 24, 2023, Monaco Yacht Club

April 2023



Comprehensive conservation what is that?

Comprehensive marine conservation aims to protect marine ecosystems while also empowering coastal populations. The two objectives are intertwined, as the health and resilience of marine ecosystems are closely linked to the well-being of the populations that depend on them.

Protecting marine ecosystems involves a range of strategies, from regulating fishing and aquaculture practices to establishing marine protected areas and reducing pollution. These measures are crucial for preserving biodiversity and maintaining the ecosystem services that support coastal economies and livelihoods. Science shows that well managed Marine Protected Areas work, to protect, restore ecosystems and associated ecosystem services.

At the same time, comprehensive conservation recognizes that coastal communities are often the stewards of marine resources, and their participation is essential for successful conservation efforts. **Empowering coastal populations** involves providing them with the tools and knowledge to manage their own resources sustainably, as well as engaging them in decision-making processes related to conservation. This can take many forms, from supporting community-based conservation initiatives to providing training and education on sustainable fishing and aquaculture practices.

Comprehensive conservation seeks to create a balance between the needs of marine ecosystems and the needs of coastal communities, recognizing that these two objectives are mutually reinforcing. By protecting marine ecosystems, we can ensure the long-term viability of coastal economies and the livelihoods of those who depend on them. And by empowering coastal populations, we can build more resilient communities that are better able to adapt to the challenges of a changing climate and a rapidly evolving ocean environment.



above
traditional fisherman on Paradise Beach, Puducherry, India
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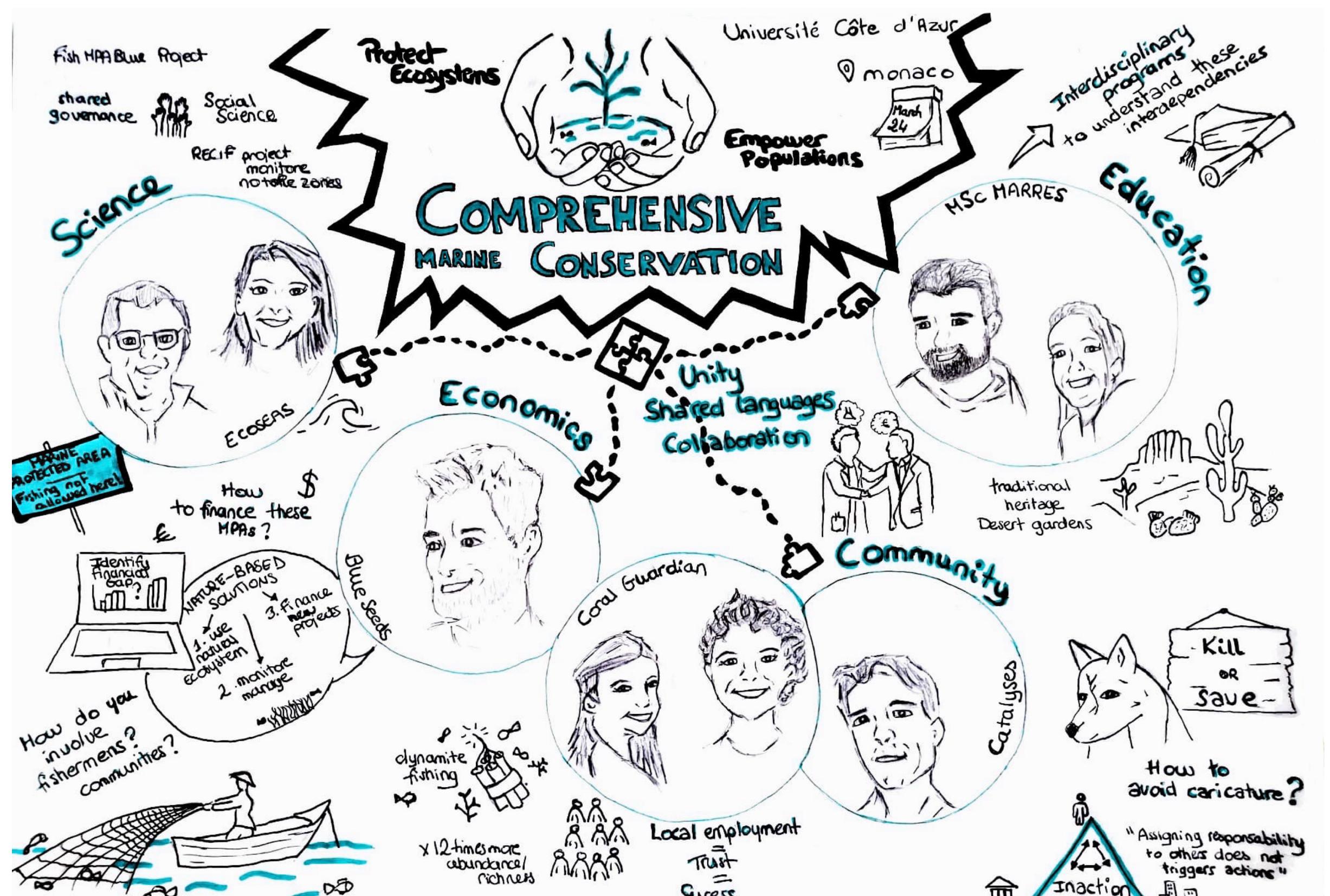
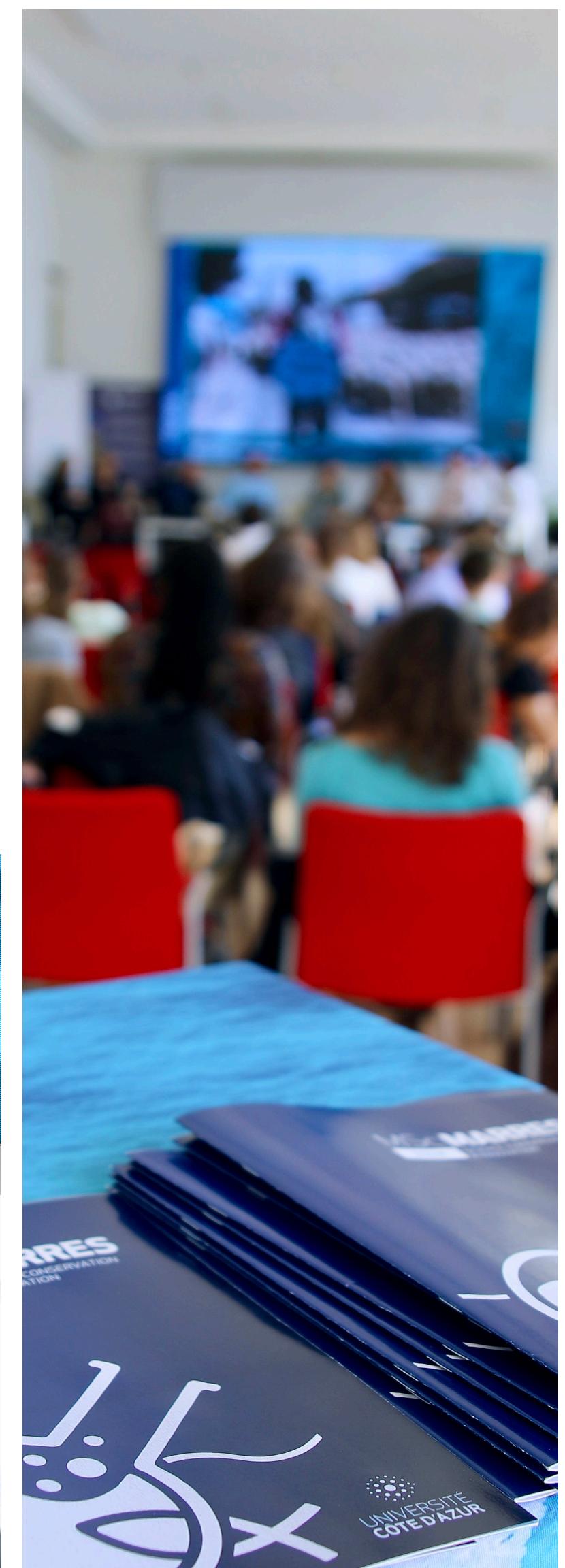
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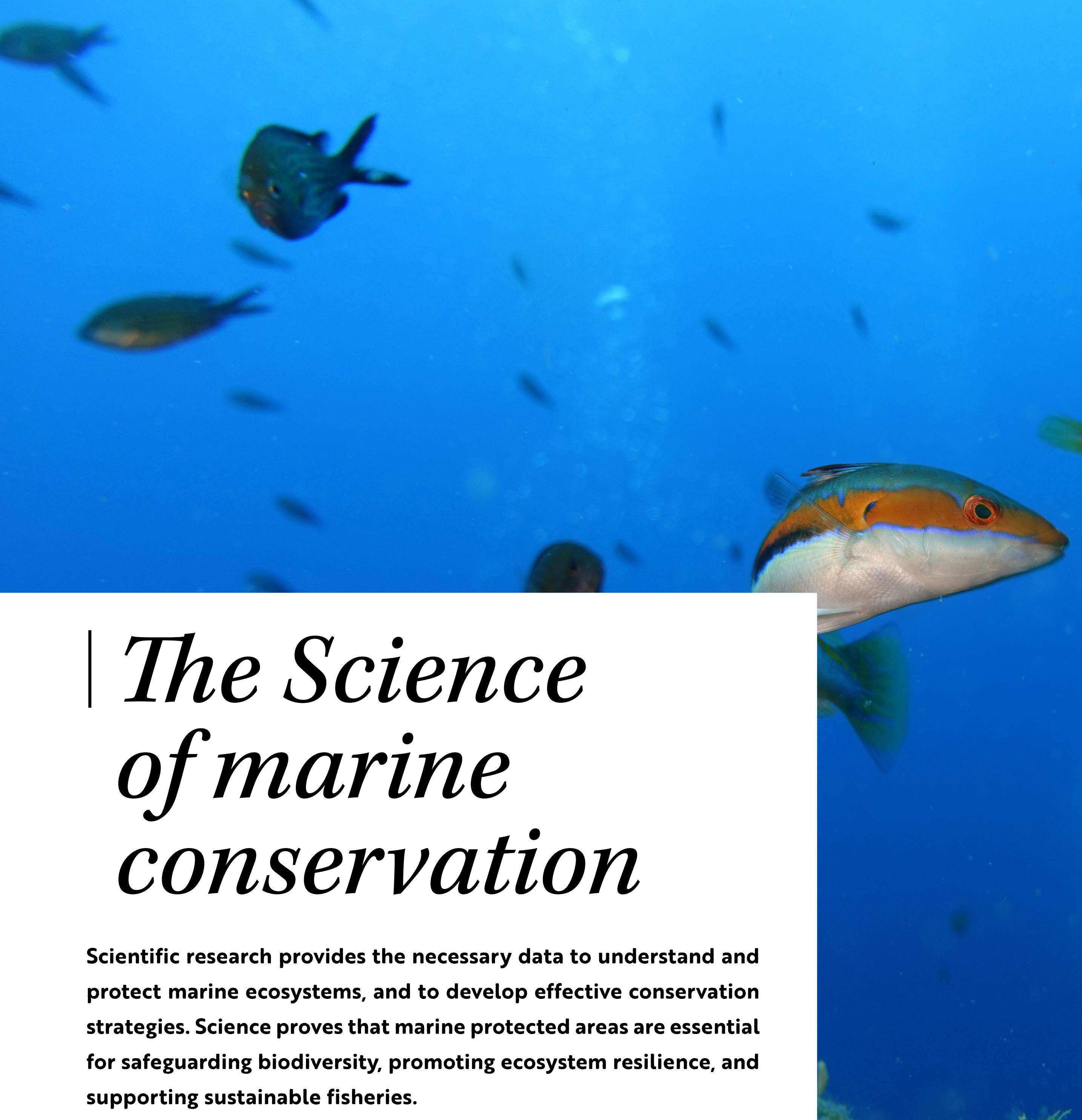
The conference Monaco Ocean Week 2023

This document is the report of the conference "Comprehensive conservation: protect ecosystems, empower populations", part of the Monaco Ocean Week 2023 which took place on 24 March 2023 at the Yacht Club de Monaco.

Organised by the **Université Côte d'Azur**, with the partnership of **BlueSeeds** and **Coral Guardian**, this conference was structured as a panel combining scientific, social and economic aspects to achieve comprehensive conservation, with the following headlines:

- 1 - The science of marine conservation
- 2 - How to make marine conservation more efficient
- 3 - A success story in Indonesia
- 4 - Social acceptability: a parallel on land
- 5 - Interdisciplinarity in Education to create sustainable solutions





The Science of marine conservation

Scientific research provides the necessary data to understand and protect marine ecosystems, and to develop effective conservation strategies. Science proves that marine protected areas are essential for safeguarding biodiversity, promoting ecosystem resilience, and supporting sustainable fisheries.

Universities as providers of solutions

Since 2020, **Université Côte d'Azur** has been rebuilding itself to create new territorial ecosystems, with a focus on marine resources. The university brings together expertise in research, innovation and education with stakeholders such as local authorities, businesses and NGOs. One of the initiatives is a **federal research institute for marine resources**, which brings together different areas of expertise, including marine ecology, biology and chemistry, together with law, management and economics. The transdisciplinary framework allows for innovation and the development of new strategies to protect and conserve marine ecosystems, involving working with businesses and local authorities.

They also use a **science diplomacy strategy** to provide science-based evidence to policy makers and stakeholders, including participation in climate change and biodiversity conferences. Through partnerships with other universities around the world in higher education clusters such as U7+, Université Côte d'Azur aims to position universities as providers of solutions to global socio-environmental problems. The most recent example was COP27 in Egypt, where they were the IPCC partner university in the science pavilion. 11 scientists actively participated in the conference to provide scientific evidence to the decision makers.



Cécile Sabourault

Professor of Marine Biology and Vice President for International Affairs at Université Côte d'Azur, Cécile is also director of the laboratory ECOSEAS. She works on ecology of marine communities and develops new tools for biodiversity monitoring (environmental DNA, biomonitoring using artificial intelligence). She is also interested in sustainable fishing and marine protected area management. univ-cotedazur.fr



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conference on comprehensive marine conservation at the Science Pavilion during COP27, Sharm El Sheik, November 2022
© Saranne Comel

below
monitoring dive during the RECIF project
© Benoit Derjard

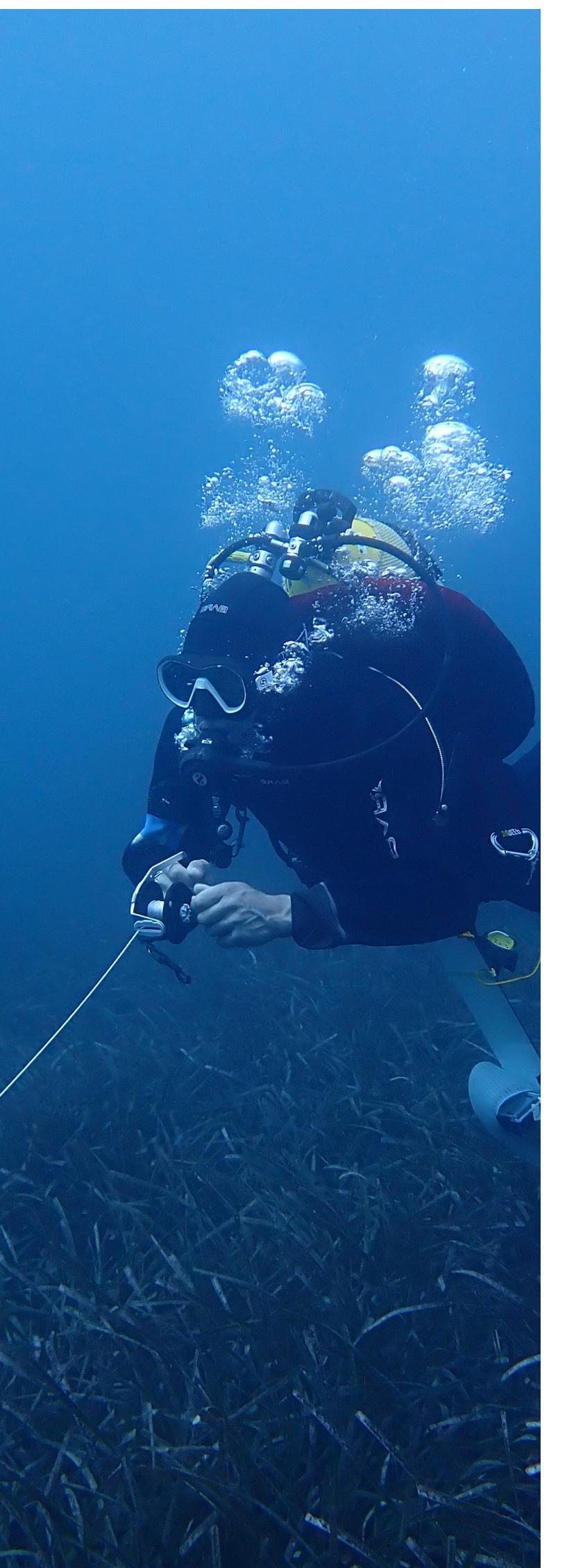
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dialogue with the fishermen around Nice
© Benoit Derjard

Science at work

At Université Côte d'Azur, researchers from the ECOSEAS lab develop monitoring programs to better understand the effect of Marine Protected Areas (MPAs) on the ecosystem and the fishermen.

RECIF aims to standardise the monitoring of eight no-take zones along the French coast. It evaluates the **spillover effect** and the impact of artificial reefs in these zones. RECIF also aims to establish a **dialogue with fishermen** to understand their needs and lay the foundations for future cooperation. The project uses three methods to monitor the zones: the classic in-water visual census, experimental fishing, and environmental DNA analysis. It has involved a large sampling effort, with over 500 dives and experimental fisheries carried out. Around 110 species have been identified from 60 DNA samples analysed. The aim of the project is to repeat the monitoring on a regular basis to get an idea of the **evolution of biodiversity and biomass** in the no-take zones and around.

FishMPABlue is another project at ECOSEAS following a '**bottom-up**' approach involving all stakeholders, including fishermen, diving clubs and tourism. The project aims to increase the biodiversity and quality of ecosystems in MPAs, leading to larger fish and crustaceans, which can **increase the income of artisanal fishermen**. FishMPABlue provides a toolbox of 12 management measures for MPA stakeholders. In the first phase, 31 Mediterranean MPAs were analysed and in the second phase, 11 MPAs from five different countries were recruited. The expected results of the project are to **improve the management of MPAs** and to increase biodiversity and ecosystem quality. The final step of the project, the FishMPABlue+ version, aims to transfer the toolkit to 11 new MPAs in the Mediterranean.



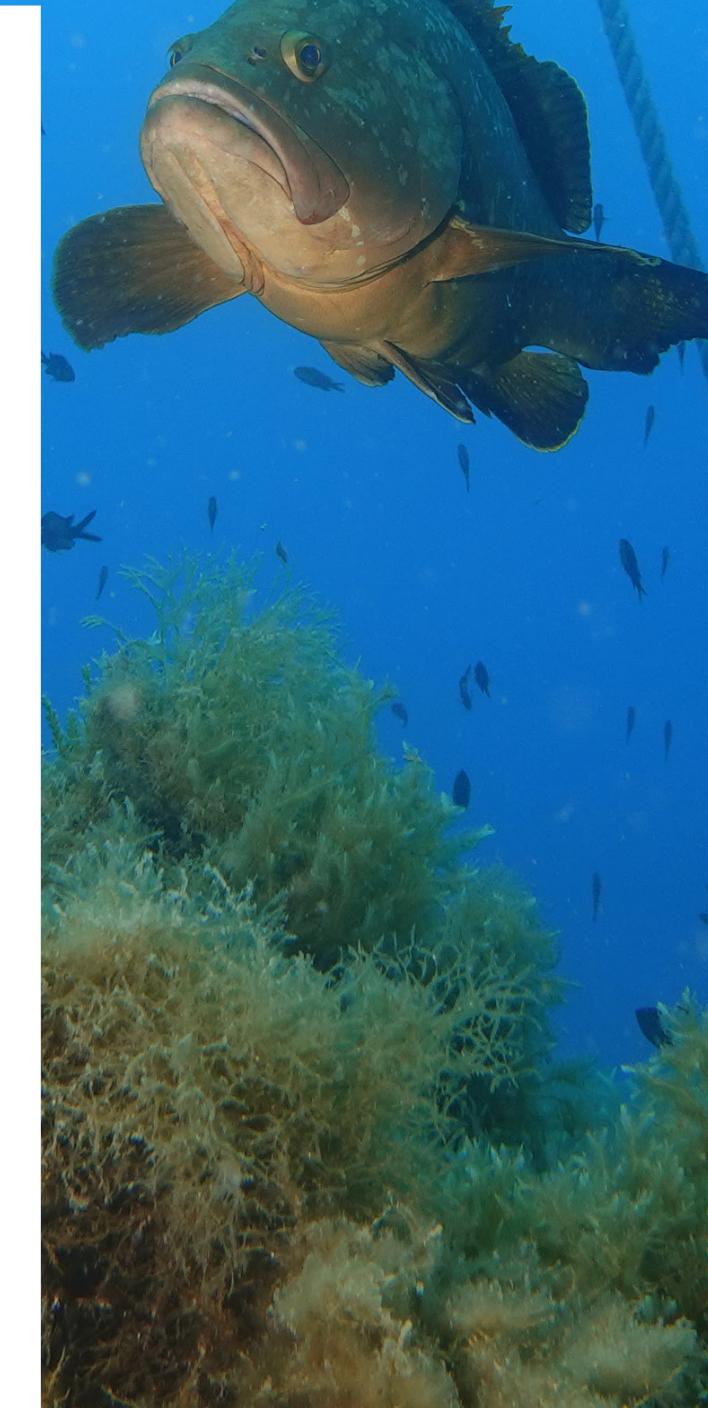
Benoit Derjard

CNRS researcher since 1995, Benoit has long worked in the fields of cell and molecular biology, before joining ECOSEAS in 2018 to contribute to the preservation of the marine environment. He now uses the skills acquired in the past for the benefit of marine ecology projects. In particular on the definition and management of Marine Protected Areas (MPAs) and the conservation of Posidonia beds using citizen science ecoseas.unice.fr



How to make conservation more efficient?

The sustainability and socio-economic benefits of marine protected areas, although too often overlooked, are essential for conservation. Timothée presented some of BlueSeeds' ongoing projects that involve working with local stakeholders who live and work near marine protected areas.



Engaging all stakeholders

In recent years, the importance of effective marine conservation has become increasingly clear. A commonly suggested solution to the problem of declining marine biodiversity is the establishment of marine protected areas (MPAs). However, it is essential to understand that **effective management** is critical to the success of these areas.

Establishing a marine protected area and hope for the best is not enough. **The involvement of local communities and fishermen is crucial for its success.** Marine protected areas provide benefits to surrounding communities, not just to the fishing industry. As a result, it is essential to keep the environment healthy, as a degraded environment offers reduced ecosystem services, for example by deterring visitors. I like to use the metaphor of a goose laying golden eggs to illustrate the importance of protecting the ocean and its resources.

BlueSeeds is a young organization working on financing solutions for marine conservation. It was founded by Thomas Binet to address the **financial gap** for marine protected areas in the Mediterranean.



Timothée Cook

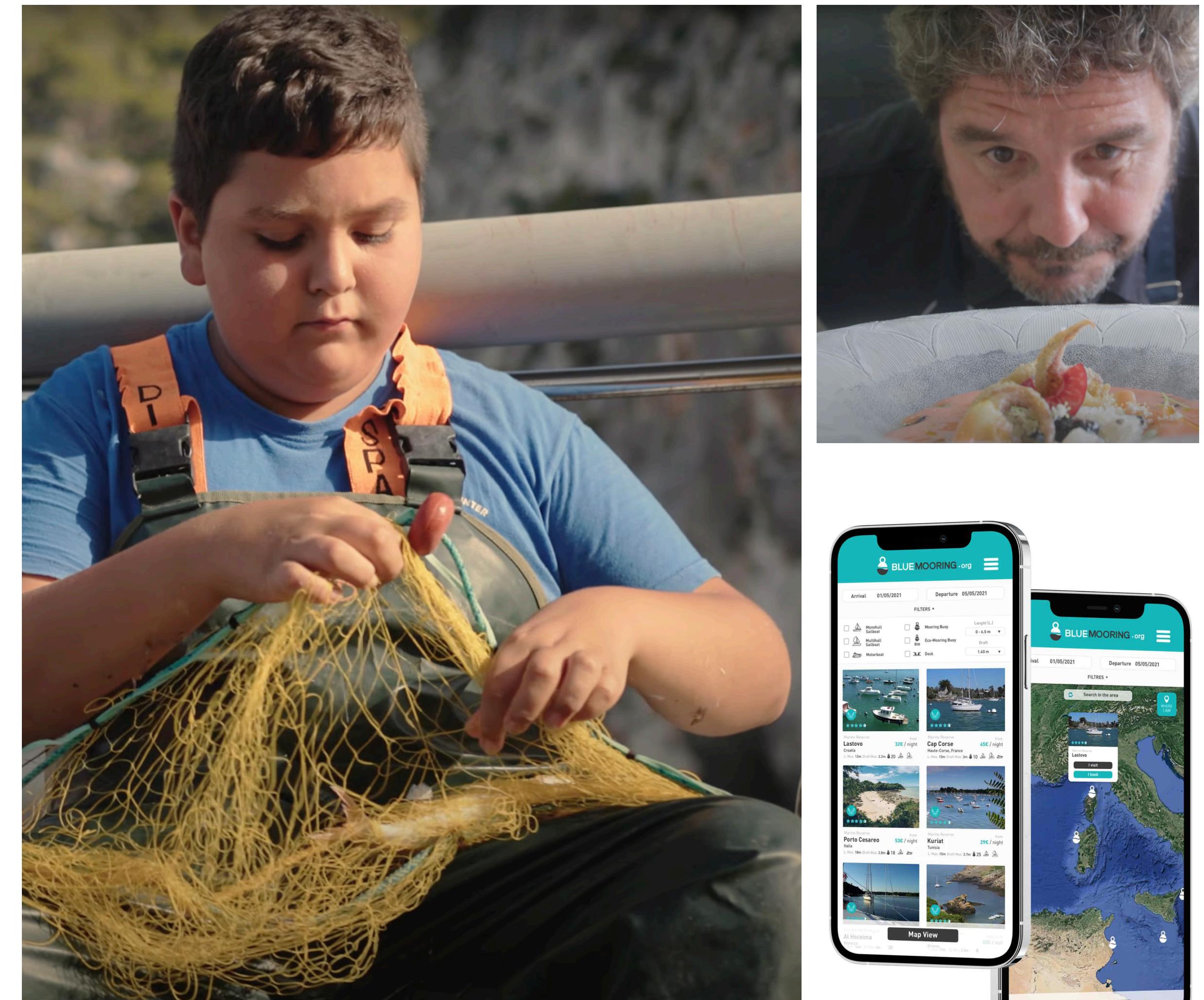
Timothée has a doctorate in marine biology and is a research associate at the University of Cape Town. He worked on the ecology of top predators, especially sea birds, has an experience lecturing at the university level and working for an NGO promoting sustainable fishing practices. Today, Timothée works at BlueSeeds as its science officer, training managers of marine protected areas and researching solutions to increase effectiveness of marine conservation blueseeds.org



The organization helps protected area managers identify this financial gap and **develop management solutions** for their activities. BlueSeeds has produced a guide to funding mechanisms for marine conservation projects. The solutions they have implemented in the Mediterranean include entry fees for MPAs and an application called BlueMooring, which helps managers of mooring zones in MPAs.

Because research is critical to finding effective solutions, BlueSeeds also conducts research projects, such as on **blue carbon finance** and mangrove conservation in the Mediterranean and West Africa..

To conclude, BlueSeeds is heavily involved in **training MPA managers** and staff in financial planning, financial strategies, and effectiveness to provide people with the knowledge and skills needed to effectively manage and protect our oceans.



previous page
dusky grouper at Cap Roux
© Sylvain Roblet

above and below left
a Greek fisherman and his son
accompanied to sustainable
small-scale fisheries
© Together for the Med

below right
Jordi Jacas, chef in Spain, cooking fish
from local small-scale fisheries
© Together for the Med

bottom right
BlueMooring app developed
to help managers of
mooring zones in MPAs.
© BlueSeeds



A success story in Indonesia

Coral Guardian initiated a conservation project in 2015 on Hatamin Island to address reef destruction caused by dynamite fishing. The project involved locals in coral restoration and protection, and a monitoring program was established to measure its impact and build stakeholder confidence.

Building trust with communities

In recent years, Coral Guardian has been focusing its efforts on Hatamin Island, located in Indonesia, which is a tiny island that falls within the **Coral Triangle**. This area covers less than 2% of the world's marine area, yet is home to an astounding 76% of tropical coral species. Over 200 million people call this area their home, with **95% of them residing near the coast** and heavily relying on the ecosystems for their livelihoods, such as fishing, tourism, and other economic needs.

Nobody could deny the crucial importance of marine biodiversity for local communities in the area, and the **ever-growing threats** that are posed by human activities. Rising sea temperatures, pollution, poor land-use management, and destructive fishing practices such as dynamite fishing are just a few of the critical issues that need to be addressed in the region.

As part of the effort to combat these problems, Coral Guardian works with a local non-profit organization called WES. Together, they developed in 2015 a project to address the degradation of the island's coral reefs and the threat to local livelihoods. The team began by meeting with the fishing community on Hatamin Island and gathering testimony from fishermen about the challenges they were facing. They highlighted the problems of the **impact of dynamite fishing, anchoring on the reef, and the need for a marine protected area**.



Coco Tamlyn

Coco is the director of Coral Guardian. Having studied socio-political ecology in London, she did her thesis on the socio-political context of poaching in militarised conservation programmes in Kenya. Following numerous experiences contributing to social and environmental projects around the world, she then specialised in communication and outreach programmes on the protection of coral ecosystems. coralgardian.org



Florina Jacob

Currently field and scientific project manager at Coral Guardian, Florina is an ecologist passionate about coral reefs' conservation and science. After her undergraduate studies on Ecology in Colombia, she worked on coral restoration projects in the Caribbean, on tourism impacts on coral reefs as well as in science communication. She joined the Coral Guardian team two years ago when she was a MARRES student. coralgardian.org

During their initial conversations with the villagers, Coral Guardian found that their trust was very low due to previous projects that had excluded them. However, with the approval of the local chief and certain villages, they **began to build trust** with the community and initiate the project to restore the reef and secure local livelihoods.

They worked hard to ensure that the villagers were fully part of the project and that their voices were heard throughout the process. Testimonies collected by Coral Guardian's team show how the community started to **recognize the importance of preserving the ecosystem**, as for instance, one interview with a fisherman who used to catch 30 kg of fish a day, but only caught 3 to 4 kg in 2015 before the restoration began. Over time, they were able to show the community the **benefits of the project**, starting by the outstanding return of fish biodiversity, helping improve their livelihoods, but also developing local skills and competence on coral protection.

Despite the challenges, Coral Guardian worked hard to build trust with the villagers and protect the area's marine biodiversity. Four years after the start the local communities started to protect the area, it has been **officially recognized as an MPA by the government** in 2019.



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coral transplantation on Hatamin island by Coral Guardian's local team
© Martin Colognoli

below
local fisherman from the
Seraya Besar community
© Martin Colognoli

Securing and monitoring

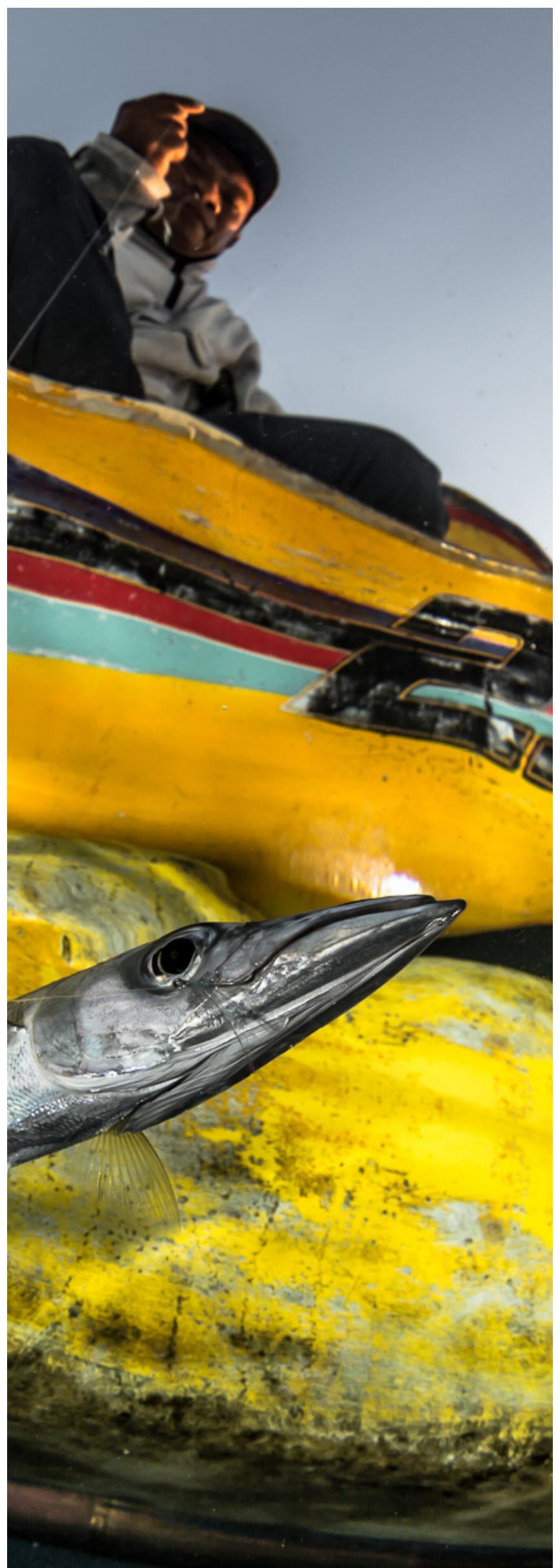
In the pursuit of conservation activities and the preservation of Hatamin Island's ecosystem, **funding is crucial**. It was important to secure salaries to local team members who were originally full-time fishermen in the village. In the early stages, community members have been carefully selected to join the team, promoting in parallel the project locally. The presence and cohesiveness of the local team was crucial to the development of the project, especially in the collaboration between the Indonesian and French teams. The **local team has been stable for almost three years** and has developed new skills and interests alongside the conservation efforts.

Monitoring, both social and biological, has been built into the project from the very beginning. Protocols were adapted to the local context to make sense to the team, and they understood the data and results. It shows that not only fishermen **visitation around the marine reserve has increased**, but also there has been an increase in fish diversity with a **huge return in biodiversity due to habitat restoration**. The success of the project is not a final point but an ongoing process that requires close and honest communication with the local team.

Pushing the boundaries

The learned lessons at Hatamin island are now used by Coral Guardian to collaborate with more coral protection projects around the world.

Deep CORE has been launched in a **very different context** in Spain in 2020. First, an MPA had already been established in a top-down approach, with no enforcement and poor acceptance. Acting as a catalyst, the federative project brings together different stakeholders in the area, such as NGOs and dive centres, to work towards restoration and conservation. Second, the targeted species, *Dendrophyllia ramea*, is found between 30 to 40 metres deep and therefore requires technical diving, unlike the shallow-water ecosystem of the Indonesian project, where restoration actions are made on snorkelling and apnea. Coral Guardian is now trying to **recreate a 'bottom-up' dynamic** by putting pressure on the authorities to enforce the conservation measures that have been decided.



Social acceptability: A parallel on land

Because they may restrict individual freedom, environmental measures may be difficult to accept. A parallel can be drawn here with the return of the wolf and the establishment of a national park in the mountains. Another example is the involvement of businesses in the ecological transition by raising awareness of the costs of inaction.

A wolf in the sheepfold

After years of absence, the first wolves came back naturally from Italy to the French Alps, in the Mercantour National Park. Their presence was discovered in 1993, it was 30 years ago. Since then, there has been a **polarisation** of the various interest groups. People from Paris initially managed the consequences of the return, creating a **top-down pressure** that was badly received by many local people, especially the shepherds.

It has been then crucial **listening to the concerns and perspectives of sheep owners and shepherds**, involving their representatives (professional syndicates and federations) in some of the processes. What was key at this point was their cooperation to understand and communicate as much about the painpoints than the positive effects of the protection measures and tools, rather than imposing solutions from « parisian offices ».

In a similar way, the creation of the **Mercantour National Park** faced resistance from some local people who felt excluded from the decision-making process. Acceptance of the park has been slow, and years later some people are still reluctant about its presence and its rules. However, a law in 2006 facilitated acceptance by **better integrating the economic, social and cultural development** of the area into the park's management plan.



Florent Favier

With a master's degree in communication, Florent started working in 2000 as a communication officer on the return of wolves in France. He was then recruited by the Mercantour National Park to develop its communication department. In 2016, he moved to the Oceanographic Institute in Monaco as digital strategy officer. Since 2021, he has been an independent consultant for various clients and their ecological projects, fostering the power of collective intelligence catalyses.eu



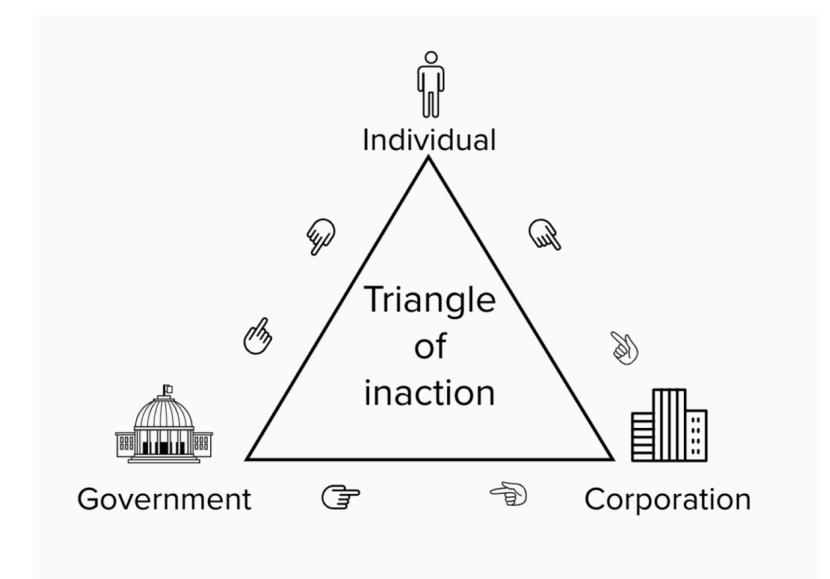
Involving the private sector

The concept of **the triangle of inaction** (Pierre Peyretout) is often used to explain the failure of democracy to find the means to solve a concrete problem: the citizen, the public authorities and the private sector each feel constrained in their own actions by the (real or perceived) inaction of the other two.

It is therefore crucial (and possible!) to improve the involvement of the business sector in environmental protection efforts. A collaborative approach should not only raise awareness of the importance of environmental protection, but also help companies develop a **roadmap for changing business models** and communication strategies, as the NGO Convention des Entreprises pour le Climat is successfully demonstrating this in France.

However, there are challenges in reconciling economic development with environmental protection. Some companies can be accused of **greenwashing** when they start getting involved. For many of them, we could speak of involuntary greenwashing, where they use misleading information to create a false impression of environmental responsibility. To help them make informed choices, we need to provide them with accurate and transparent information.

Businesses should see **sustainable development as a viable long-term strategy**. Businesses can benefit from investing in environmental protection. It leads to increased public trust, better brand reputation and new business opportunities. This is something that companies in the sustainable tourism sector have understood by working closely with conservation organisations to promote eco-tourism and sustainable practices.



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© Staffan Widstrand / WWF

above left
In 2012, a hundred Provençal shepherds demonstrated in Brignoles with five hundred ewes to highlight the threat they face from increasing wolf numbers in the region.
© Frank Muller

above right
pro-wolf public demonstrations
©AFP - Jean-Philippe KSIAZEK

below
convention des entreprises pour le climat (corporate climate convention)
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Interdisciplinarity in Education

to create sustainable solutions

Collaboration between scientific and socio-economic actors is crucial for ocean conservation, but communication barriers exist due to differing languages and ways of thinking. To foster interdisciplinary solutions, education programs, especially in higher education, should prioritize interdisciplinarity.

A student's perspective

"The importance of 'intersectionality' in any field of science, particularly in conservation efforts, cannot be overstated. I must admit that I had no understanding of intersectionality when I first entered the field of biology, but I have come to realize that it plays a prominent role in any field of science. My previous lack of awareness meant that I was living in a bubble, and that I saw the conservation of the planet as a one-way street."

My personal experience as a botanist in the Chihuahuan Desert has had a major impact on how I view intersectionality today. I learned that conservation efforts must be rooted in respect for the **ecological heritage and traditional knowledge of communities**, especially in the face of environmental crises. When I arrived in the Chihuahuan Desert, I had no idea how to propagate native plants or keep them alive in the scorching heat of the desert. Instead of pretending to know what I was doing, I decided to listen to the people of the community and their stories of ecological heritage and traditional knowledge. I listened to their concerns about where and what to plant, as well as their tips on how to keep plants alive in the desert. In this way, I was able to **build a strong relationship with the community** and preserve the desert's native flora.



Nikita Rose

After completing a bachelor's degree in environmental science in New York, Nikita joined MSc MARRES to become involved in ocean protection. In parallel, she developed an international experience in the rehabilitation of mammals, birds and reptiles, and she worked as a botanist to propagate native flora. She believes that society, history, economics, and politics play an important role in the preservation of our planet, and even more so of the ocean. app.univ-cotedazur.fr/marres

Protecting ecosystems and the planet requires recognising the multidisciplinary threads that weave together environmental crises. **Environmental crises cut across social, economic, political, cultural and gender lines.** Therefore, intersectionality must be a fundamental consideration when advocating for the protection of both people and the planet. Every person, population and community is different, and protecting ecosystems means protecting the people who depend on them. Success can only be achieved by recognising these intersections and building unity and recognition. As a student, I am proud to be part of a generation that is beginning to acknowledge these intersections. I am also proud to attend a university that teaches and discusses intersectionality."



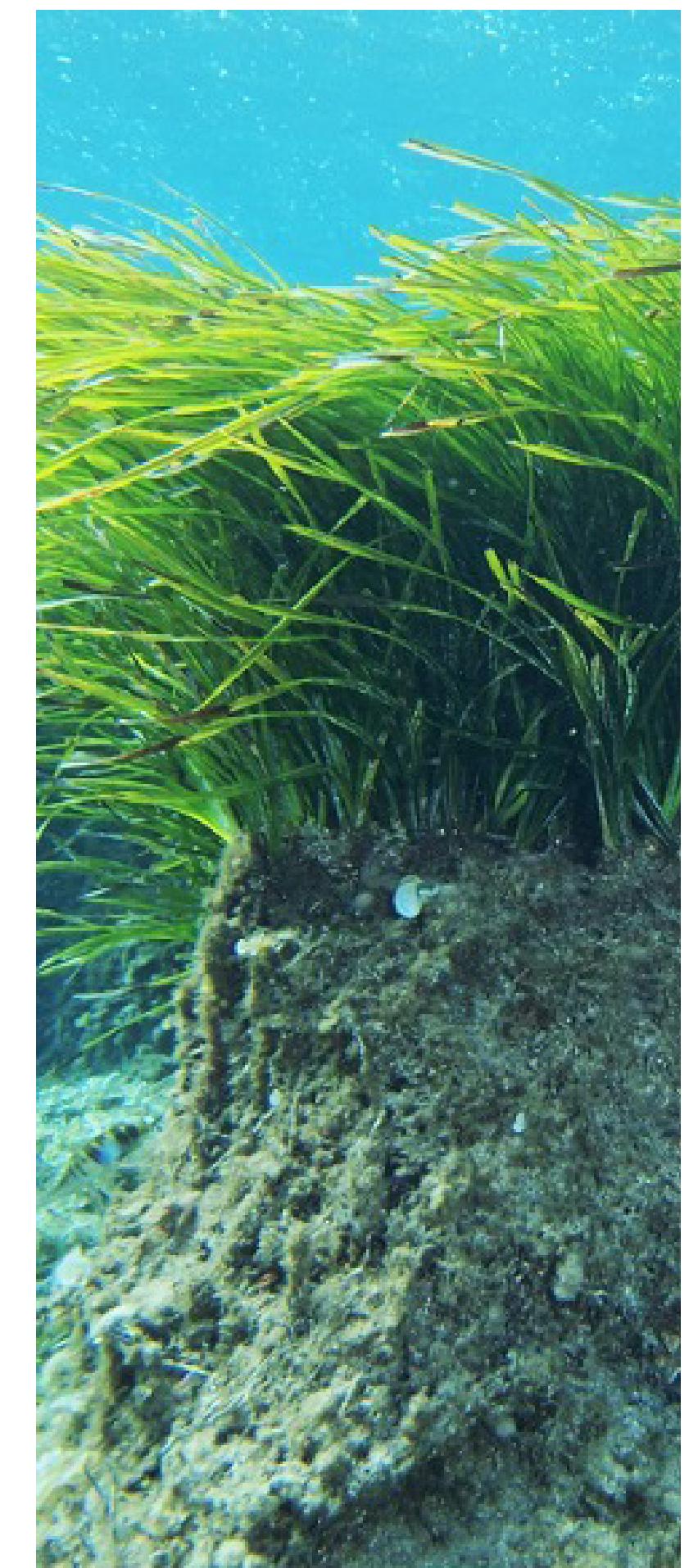
Fostering a common language

The history of sustainable development began in the US in the 1960s and 1970s with new legislation to protect the environment. One of the early pioneers of this concept was economist Kenneth Boulding, who recognized that the Economy could not work in isolation. He introduced the concept of the **Spaceship Economy**, which recognises that value creation together requires and negatively impacts environmental resources.

Now, the UN's **Sustainable Development Goals** (SDGs) make it possible to better organise sustainable development by highlighting the interconnectedness of our actions. **All issues being interlinked, it is impossible to address one without addressing the others.** Protecting ecosystems on land and underwater, as well as tackling climate change, requires social changes and addressing issues of equity and food security. We need science and socio-economy to work together.

Moreover, **marine ecosystems provide countless services to people.** Seagrass ecosystems are an excellent example, providing nurseries for fish and a barrier to coastal erosion. But it is not only what ecosystem services provide now that is important. It is also what they can provide in the future. In particular, they sequester an astonishing amount of carbon, making them an essential part of the planet's regulatory system.

Demonstrating the importance of interdisciplinary collaboration in marine conservation, two former MARRES students created BlueLeaf, a start-up to protect the Mediterranean seagrass *Posidonia oceanica*. They are working with **scientists to better understand the process of carbon storage and with economists to find ways to finance** the protection measures using the concept of ecosystem services.

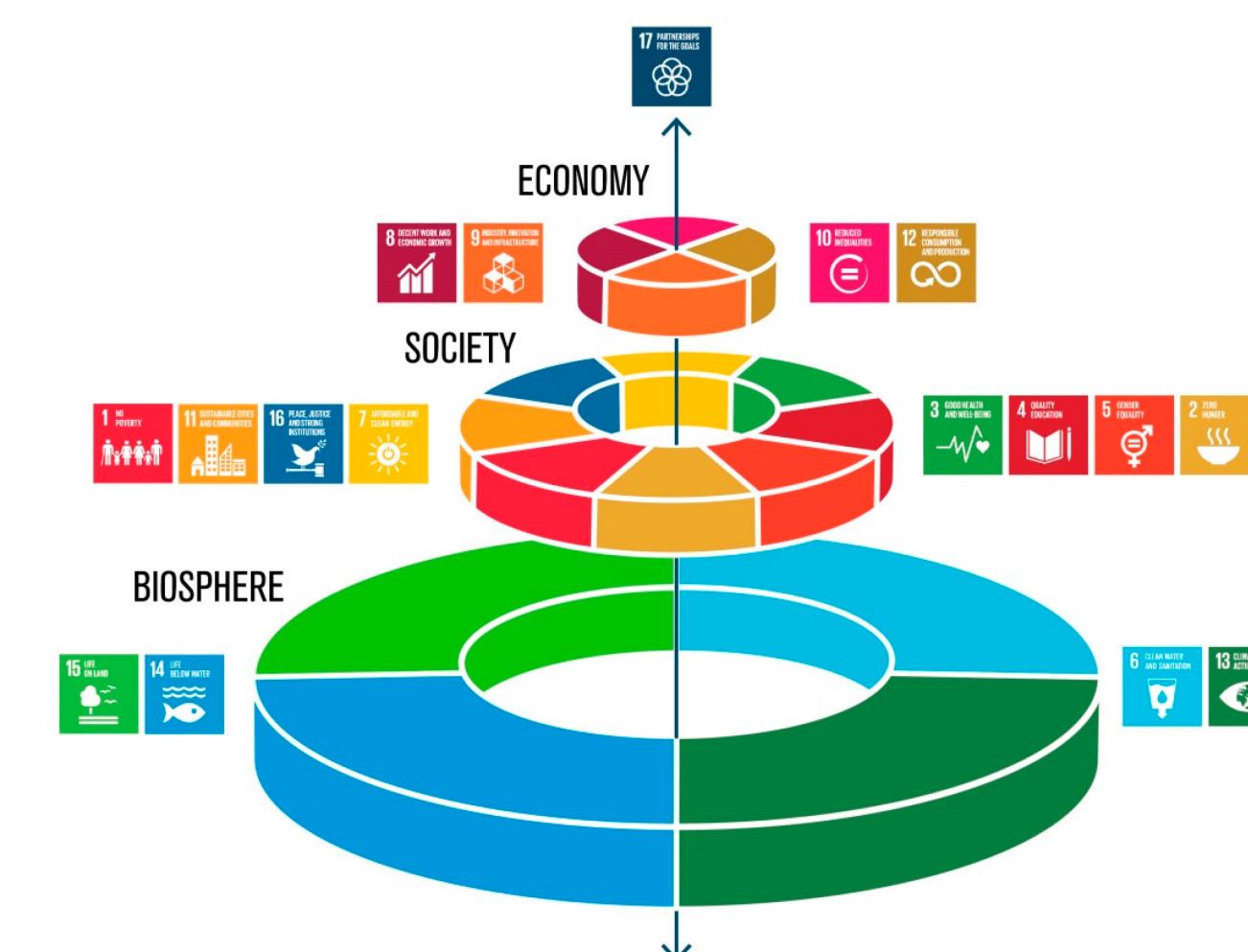


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2022 MARRES graduation ceremony
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top
plant propagation in the Chihuahuan desert
© Nikita Rose

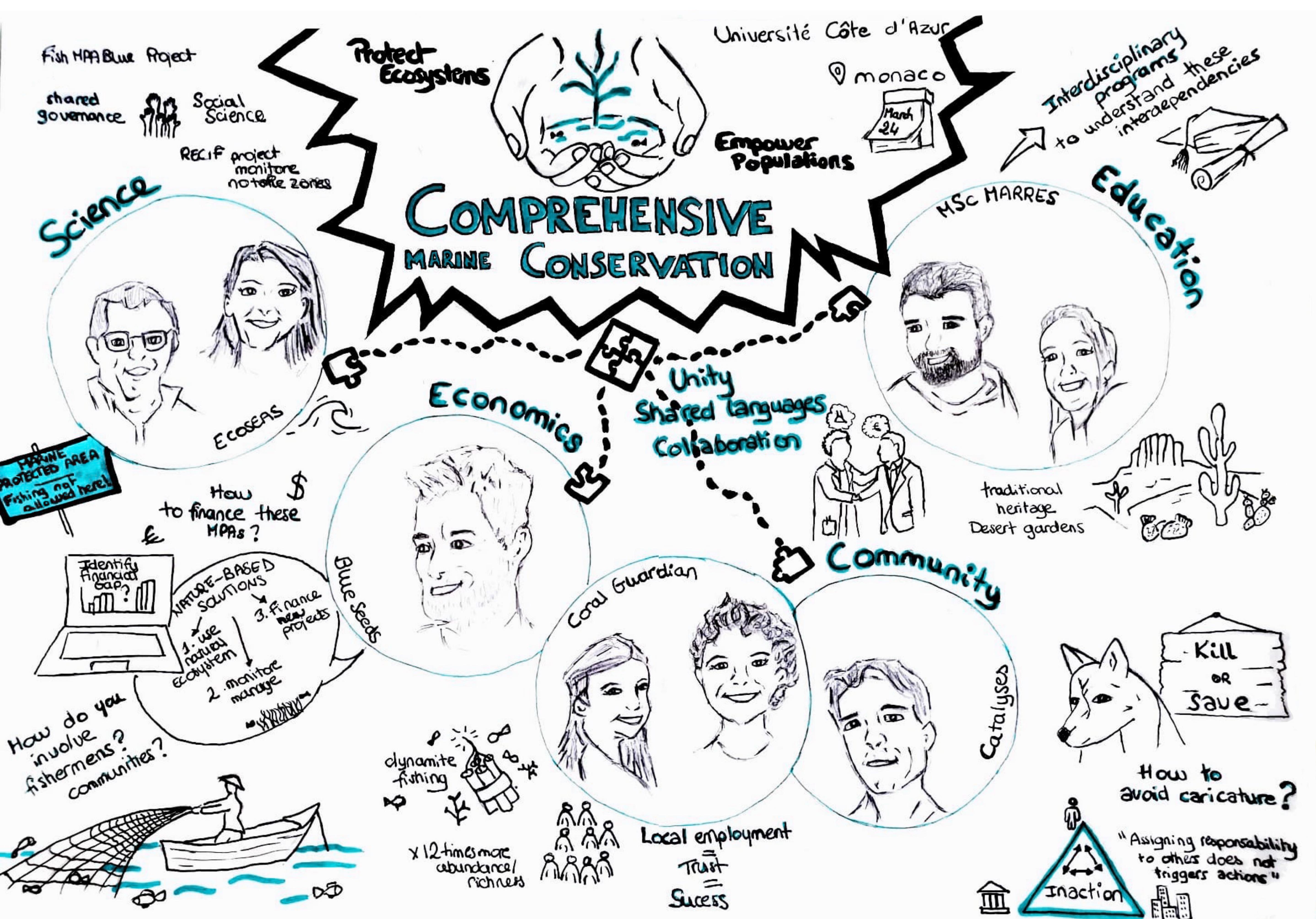
above
Posidonia meadows with a clear look at the matte (roots) sequestering carbon on the long term © GIS Posidone

below left
UN's Sustainable Development Goals
© Jerker Lokrantz



Christophe Mocquet

Director of the interdisciplinary and international program on marine resources (MSc MARRES) at Université Côte d'Azur, Christophe strives to bring together the scientific, environmental and socio-economic dimensions of the marine world to value and better protect its treasures. With a PhD in marine biology and environmental science, he has been promoting blue growth for sustainable development during 10 years in a business school and non-profit organizations. app.univ-cotedazur.fr/marres





video of the conference

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