monaco ocean week

18 | 22
MARCH 2024

monaco ocean week

"Monaco Ocean Week offers a unique opportunity for dialogue, networking, innovation and transparency."

HSH Prince Albert II of Monaco

Bringing together individuals from diverse backgrounds to create common solutions together, addressing environmental issues without separating them from the human development needs, thinking about our immediate future while bearing in mind the long and very long-term prospects... Those ambitions, which guided us in 2010, are still relevant, I think, today. […]

There used to be just a few enthusiasts who advocated for the sea, a few ad hoc initiatives to protect exceptional ecosystems and endangered species. Now there is a global movement. And there is growing awareness of the fact that the Ocean is not just another piece of the puzzle for our future, but that it holds within it, most of the keys that will determine this future, from the climate to biodiversity, from food to health, from peace to the economy.

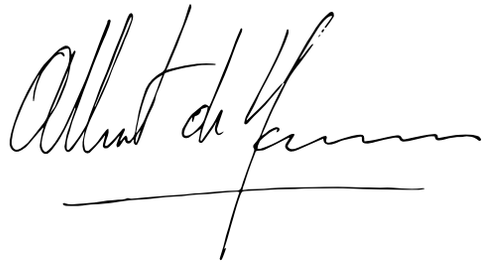
These changes have materialized through several key moments over the past fifteen years, moments of which we should be proud. […]

Of course, this progress has not yet been enough to reverse the trend of degradation – and sometimes even destruction – of our Ocean which prompted the creation of the Monaco Blue Initiative. On the contrary, for fifteen years these disturbing trends have continued, year after year, and the findings of scientists are still extremely alarming.

However, we are no longer powerless in the face of this sad and dramatic news. We have the knowledge gained from our experience, new tools, and even greater resources. […]

This is the imperative today that brings us here together, as it has for the last fifteen years: to pool our knowledge, our experience, our resources, our energy, our associations, our institutions, our businesses, in clear support of the Ocean and the sea.

Excerpt from the address by HSH Prince Albert II of Monaco, during the 15th edition of the Monaco Blue Initiative on 18 March 2024.



HSH Prince Albert II of Monaco

THE MONACO OCEAN WEEK 2024

A week of events to protect the ocean

THE DNA OF MOW

A platform for cross-disciplinary exchange: political decision-makers, the scientific community, international organisations, banks, investment funds, entrepreneurs, local and international experts, public authorities, philanthropists, NGOs, associations, the media, etc.

6
Days

45
Events

+1000
Participants

85
International partner institutions

5
Signing of partnership agreements

KEY OBJECTIVES

RAISING AWARENESS of the climate-ocean-biodiversity nexus

ADVANCING ocean knowledge

ACCELERATING innovative solutions

ENCOURAGING the development of a sustainable and regenerative blue economy

BUILDING a common and inspiring vision

SPECIAL THEME DAYS

INNOVATION • CONSERVATION • SCIENCE

BLUE ECONOMY AND FINANCE • SUSTAINABLE FASHION

SUSTAINABLE YACHTING • LAW • YOUTH

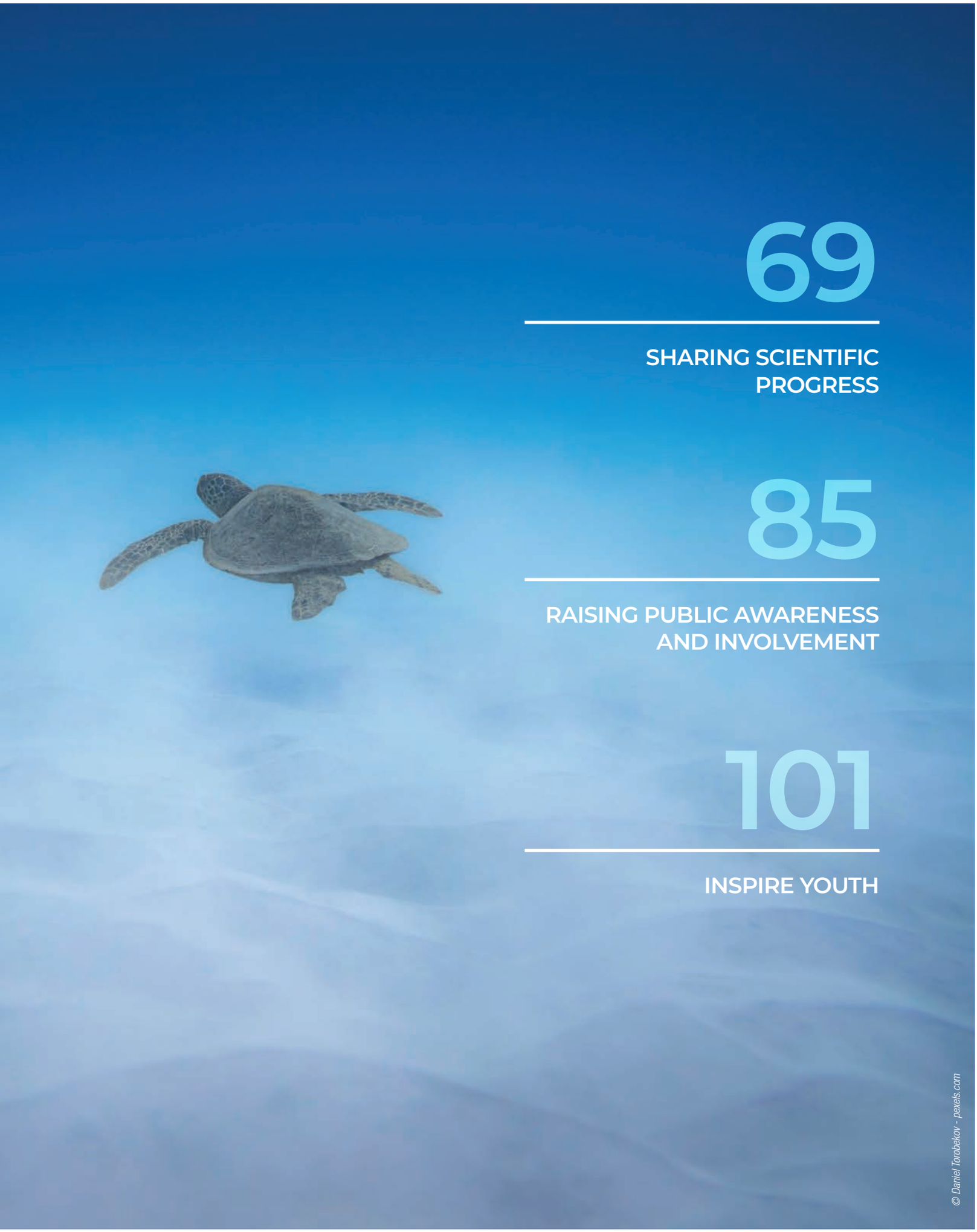
IMPACTS

Many ocean initiatives were created thanks to the event and the networking.

Key commitments were sealed over the years, such as the Monaco Manifesto for the Ocean, the Sanctuary Pelagos headquarters' agreement or the *Natural Marine World Heritage in the Arctic Ocean* publication's launch.

In 2024, a series of events were organised in preparation for the United Nations Ocean Conference (UNOC) 2025.

SUMMARY



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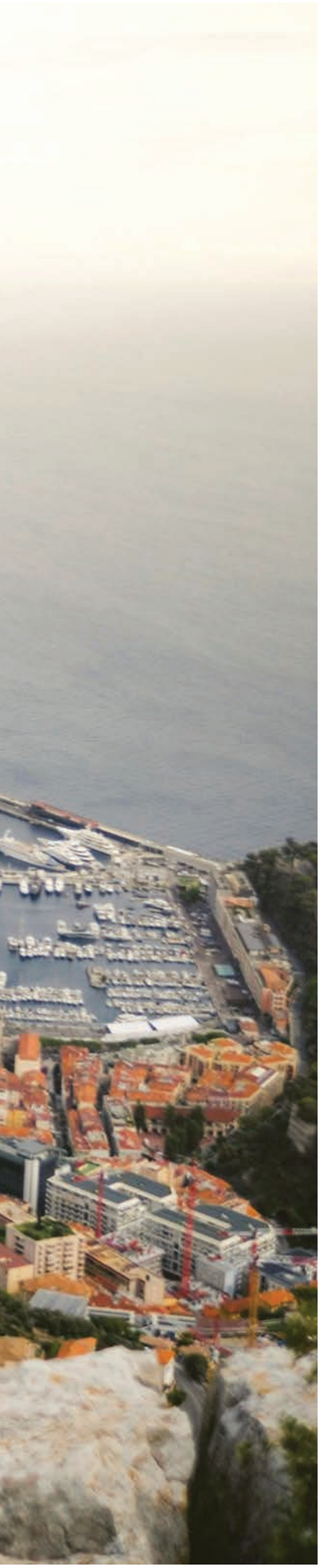

09

STRENGTHENING OCEAN GOVERNANCE

MONACO BLUE INITIATIVE

Global ocean governance: the big review

Held under the high patronage of HSH Prince Albert II of Monaco, the 15th edition of the Monaco Blue Initiative reviewed the global movement tackling the major ocean issues since 2010. Drawing on the lessons learned from the progress and the setbacks, it set out the urgent action needed to face emerging challenges in the coming decade.

Monaco Ocean Week opened on 18 March 2024 in the Conference Room of the Oceanographic Museum of Monaco. A host of high-level panellists, including senior civil servants and political figures, took part in the latest edition of this leading event. Representing the global ocean community were more than 160 participants from Africa, Asia, North and South America, Australia, Europe, the Middle East and the island countries of the Indian Ocean, Caribbean and South Pacific.

One of the main messages of the review is that the ocean has better recognition and protection today, as evidenced by the achievement of decisive milestones such as the IPCC Special Report on the Ocean and Cryosphere, BBNJ Agreement, Kunming-Montreal Global Biodiversity Framework, WTO Agreement on Fisheries Subsidies and the creation of marine protected areas (MPAs) to help achieve the 30x30 target. Discussions also focused on emerging challenges, such as protecting the Southern Ocean, deep-sea mining and the effective management of MPAs.

During HSH Prince Albert II of Monaco's welcome address to open the 2024 edition of the Monaco Blue Initiative, an event co-hosted by the Prince Albert II of Monaco Foundation and the Oceanographic Institute, he spoke about the chapter in history being written for the ocean: *"In 15 years, our determination has strengthened and the battle for sea and ocean protection has not only changed in scale, it has also changed in nature. There used to be just a few enthusiasts who advocated for the sea, a few ad*

HSH Prince Albert II of Monaco alongside Dr Mahlet Naomi Mesfin (USA), Minister Jean-François Ferrari (Republic of Seychelles) and Bud Darr (Swiss group MSC).

hoc initiatives to protect exceptional ecosystems and endangered species. Now there is a global movement. And there is growing awareness of the fact that the ocean is not just another piece of the puzzle for our future, but that it holds within it most of the keys that will determine this future, from the climate to biodiversity, from food to health, from peace to the economy." After listing the pivotal steps forward made in terms of international commitments and law, the Sovereign Prince nevertheless acknowledged that *"this progress has not yet been enough to reverse the trend of degradation – and sometimes even destruction – of our ocean. On the contrary, for 15 years these disturbing trends have continued, year after year, and the findings of scientists are still extremely alarming"*. The Head of State urged the ocean community to redouble efforts to make the voice of the ocean heard at upcoming international meetings and confirm the urgency to take action based on acquired knowledge.

In addition to the three Monaco Blue Initiative panel discussions, the programme featured speeches from representatives of the governments of the Seychelles, China, Portugal, Belgium and Greece, who took turns to review the ocean-positive shift their respective countries have made.

Jean-François Ferrari, the Minister for Fisheries and the Blue Economy of the Republic of Seychelles, corroborated the content of the Monegasque Prince's speech and stated that *"the Seychelles has accomplished a lot in terms of ocean conservation and sustainable development in a short time"*. He added, *"more than two thirds of our archipelago's economy depends on the surrounding ocean and is vulnerable to pollution, overfishing and the devastating effects of climate change"*. The Seychelles Marine Spatial Plan now covers the entire 1.37 million square kilometers of the country's exclusive economic zone, including the Joint Management Area shared with Mauritius, and is built on an inclusive, collaborative approach that brings together all stakeholders. *"This has enabled the country to fulfil its national and international commitments as we have already exceeded the 30x30 target,"* pointed out the Minister from the Indian Ocean.

Mobilising the expertise of the key stakeholders in ocean conservation and governance, the blue economy and finance, politics and civil society, the Monaco Blue Initiative once again offered an invaluable space for discussion and collaboration that heralded an ocean-positive future.

China, highlighting the country's significantly expanded mangrove area and burgeoning blue economy (marine renewable energies, seawater desalination, marine biopharmaceuticals, etc). Reminding the audience that only 3% of the global ocean is in highly or strictly protected areas, Enric Sala, National Geographic Explorer-in-Residence, pointed out the inadequate level of protection offered by certain MPAs, some of which (he cited the United Kingdom) are authorising highly destructive bottom trawling.

SESSION 1.
OCEAN PROTECTION AND GOVERNANCE: SUCCESS STORIES, LESSONS LEARNED, FUTURE GOALS

Significant progress in ocean protection and governance has definitely been made since the first gathering of the Monaco Blue Initiative in 2010: marine protected area coverage has more than tripled, awareness of ocean issues and their link to the climate has grown and international treaties for biodiversity, the high seas and plastic pollution have been agreed.

Despite these important steps, the ocean's health continues to deteriorate. Seawater is warming, causing new episodes of mass coral bleaching and numerous other harmful impacts. Marine resources, exploited to their biological limits, are in danger, making ecosystems vulnerable and threatening the livelihoods and rights of coastal populations. The science shows in no uncertain terms that ocean governance and protection today are inadequate and must be improved, accelerated and expanded. This panel session considered the lessons learned from past successes and failures, to guide more effective action in the future.

The need to accelerate, intensify and implement conservation measures more effectively emerged as crucial. *"China continues to strengthen the protection and restoration of marine ecosystems"*, said Sun Shuxian, Vice Minister of the Ministry of Natural Resources and Director General of the State Oceanic Administration of the People's Republic of

Improved science, recognising and integrating Indigenous and local knowledge and practices, and strong partnerships, coalitions and alliances are also essential for multilateral ocean governance. David Obura, Chair of the Intergovernmental Platform on Biodiversity and Ecosystem Services, described these as *"the factors of success that have driven the huge increase in commitment around ocean protection"*. Minna Epps, Director of the International Union for Conservation of Nature (IUCN) Global Marine and Polar Programme, explained that coinciding with the looming threat of deep-sea mining in the high seas, the High Seas Treaty sets a framework for establishing MPAs beyond national jurisdiction and imposing environmental impact assessments of new activities in the high seas. However, *"the science on these ecosystems and the risks of interfering with the largest carbon sinks on the planet is still lacking. Bottom trawling should serve as a warning: if its impacts had been known 50 years ago, it would never have been allowed"*, Epps added.

"As a maritime country, Portugal cooperates with other countries and institutions in the field of ocean sciences and is developing monitoring technologies to measure key ocean variables. Supported by the European Union, Portugal's National Recovery Plan also engages with the private sector to fund ocean regeneration projects."

António Costa Silva, *Minister of the Economy and Maritime Affairs, Portugal*

The panellists also called for an end to perverse incentives and particularly harmful fisheries subsidies. Mahlet Naomi Mesfin, Deputy Assistant Secretary for Oceans, Fisheries, and Polar Affairs at the US Department of State's Bureau of Oceans and International Environmental and Scientific Affairs, stressed the importance of eliminating harmful fisheries subsidies. *"Billions of dollars in annual government subsidies are creating perverse economic incentives and are a major driver of illegal, unreported and unregulated (IUU) fishing and overfishing,"* she said, noting that 90% of the world's fish stocks are fished at or beyond their sustainable limits, with 20% of catches coming from IUU fishing. Mesfin added that the United States was one of the first countries to accept the WTO Agreement – comprising various multilateral trade agreements and related legally-binding instruments – and supports new restrictions on subsidies that contribute to overfishing.

SESSION 2.
THE ROLE OF THE PRIVATE SECTOR IN THE SHIFT TOWARDS A SUSTAINABLE AND REGENERATIVE BLUE ECONOMY

"Economic stakeholders are part of the solution," said Bud Darr, Executive Vice President, Maritime Policy and Government Affairs, Mediterranean Shipping Company (MSC) Group (Switzerland). This set the tone for the second panel discussion, which highlighted the growing recognition of marine ecosystem conservation objectives by private sector ocean stakeholders. The industry can no longer ignore the scale, scope and cost of the threats to ocean health and climate stability. The panellists from shipping, offshore energy, fisheries, aquaculture and blue finance shared their views and examples of their efforts to promote a blue economy that regenerates marine ecosystems and is more respectful of the communities that rely on them. Among the main recommendations they made was encouraging companies to take voluntary measures, including in the absence of regulatory obligations. Central to discussions were championing inclusiveness and a new approach to investment. Anne-Laurence Roucher, Deputy CEO of Mirova, called in particular for *"changing investors' mindsets by adding impact as a third pillar of the traditional risk and return investment model"*.

"The European Union aims to move from 2% to 25% renewable energy from the sea. That means quite a congested maritime space, which is why we need maritime spatial planning. We can use a digital twin to facilitate this mission, which will have the world's largest investment programme in the sector. Significant progress has been made by Member States, with new concepts such as 'Mariparks' creating multi-use areas from the planning and design phase."

***Charlina Vitcheva**, European Commission's Directorate-General for Maritime Affairs and Fisheries*

Sylvie Goulard, Co-Chair of the International Advisory Panel on Biodiversity Credits, presented the global initiative to create new financial products for nature, launched by France and the United Kingdom in June 2023, to help countries, project leaders and the private sector achieve the Global Biodiversity Framework targets.

In addition, tried-and-tested offshore oil and gas experience and technology is being leveraged to develop more sustainable marine energies, explained Francesco Prazzo of holding company SBM Offshore, which is designing and building floating wind farms.
Lastly, a combination of incentives and regulatory obligations is required to drive change, especially in the fields of shipping (the MSC Foundation has established a super coral nursery in the Bahamas) and fisheries. Olivier Le Nézet, President of the French National Marine Fisheries and Aquaculture Committee (CNPMEM), drew attention to the EU's exemplary management in this field and the need to replicate their model in other seas around the world. *"Climate change is also altering the geopolitics of resource exploitation,"* Le Nézet explained. *"The challenge lies in ensuring that resource exploitation is sustainable for the ocean as well as for populations."*

SESSION 3.
THE ROLE OF THE MEDITERRANEAN SEA IN ACHIEVING 30X30

"The Mediterranean Sea contributes substantially to regulating climate patterns and maintaining biodiversity. At the same time, the Mediterranean Basin has immense potential for the blue economy sector", said Christos Stylianides, Minister of Maritime Affairs and Insular Policy of the Hellenic Republic, in his opening keynote address. To overcome the multiple challenges facing this area characterised by intense activity and significant socio-economic and geopolitical disparities, collaborative marine spatial planning based on rigorous science is vitally important. *"Working together to address common challenges at sea, such as threats to biodiversity and the freedom of navigation, illegal and unregulated fishing, environmental degradation and cross-border crime, is the only way forward. Our vision for the Mediterranean Sea is one of hope, resilience, and shared prosperity"*, concluded the Greek Minister after presenting the GR-Eco Islands project, a governmental initiative aimed at turning the Greek islands into sustainable models of energy autonomy, digital innovation and ecological mobility.

The Mediterranean's future depends partly on innovative projects like these that are contributing to the effective protection of 30% of the world's land, waters and seas by 2030. This session explored the conditions for ensuring the success of 30x30 in the Mediterranean, spotlighting the role of marine spatial planning and economic stakeholders.

The panellists agreed on the importance of effective, sustainable marine spatial planning in the Mediterranean. The sea is bordered by 22 coastal states with overlapping exclusive economic zones, which leads to disagreements that hamper cooperation, explained Karmenu Vella, Advisor in the Maltese Ministry of Foreign and European Affairs and Trade. Working from robust scientific data to improve the management and effectiveness of existing MPAs and create additional high-quality MPAs should be the priority, commented François Houllier, CEO of Ifremer. Meanwhile, Dona Bertarelli, Co-Chair of the Bertarelli Foundation, highlighted the disparity that, *"some countries have 18 categories of marine protected area, while the IUCN Guidelines only defines 6 categories of protection"*. *"Scaling up requires the regional imbalance to be corrected"*, said the moderator, Maher Mahjoub, pointing out that 97% of MPAs are currently located in the northern Mediterranean. *"Marine spatial planning is an important tool for achieving target 3 of the Global Biodiversity Framework, particularly in a context requiring cross-border cooperation"*, he suggested.

The panellists unanimously agreed on the need for better gathering of and more efficient sharing of data, less polarisation and more cooperation between environmentalists and economic stakeholders and improved communication about the economic benefits of marine protection, among other topics. They also called for the prompt ratification of the WTO Agreement on Fisheries Subsidies adopted in June 2022, which clamps down on harmful subsidies given by governments to the fishing sector, and for the protection of key ecosystems, such as seagrass meadows, which provide numerous services, including climate change mitigation.

OCEAN UPDATES

The final session of the conference provided updates on ongoing multilateral processes and upcoming events: the final stretch for the legally binding international treaty on plastic pollution that could enter into force by 2025; the hot topic of the ratification of the WTO Agreement on Fisheries Subsidies, which needs further ratifications and a better balance between countries in the North and South; and the ambitions of the 9th Our Ocean Conference in Athens in April 2024 and of the UN Ocean Conference (UNOC) in Nice in June 2025, which Olivier Poivre d'Arvor, Special Envoy of the President of France for UNOC, spoke of as potential nightmares. But in light of the growing mobilisation of the ocean community, the scenario of a broken world and a ruined ocean is already fading, suggested Olivier Wenden and Robert Calcagno, senior representatives of the Prince Albert II of Monaco Foundation and the Oceanographic Museum, in their closing speeches.

During the Monaco Blue Initiative, the French Organising Committee of UNOC 2025, the Prince Albert II of Monaco Foundation and the Oceanographic Institute of Monaco officially confirmed their partnership to co-host the Blue Economy and Finance Forum by signing a Memorandum of Understanding. The forum, a UN Ocean Conference Special Event, will be held on 7 and 8 June 2025 at the Grimaldi Forum Monaco, in advance of the UN Ocean Conference 2025. The agreement was signed by Olivier Poivre d'Arvor, Olivier Wenden (Prince Albert II of Monaco Foundation) and Robert Calcagno (Oceanographic Institute) in the presence of HSH Prince Albert II of Monaco.

PELAGOS FORUM

A new chapter for the Pelagos Sanctuary

The second Pelagos Forum, supported by the Prince Albert II of Monaco Foundation, brought together over 100 stakeholders involved in protecting the Pelagos Sanctuary for cetaceans and who shared the ambition for the reserve to become a global model for marine conservation.

"More than 100 of us have come here from France, Italy and the Principality to exchange ideas and shape the future of the Pelagos Sanctuary", said Philippe Mondielli, Scientific Director of the Prince Albert II of Monaco Foundation, as he opened this day-long event at the Monte-Carlo Bay Hotel & Resort on 19 March 2024. Scientists and fishers gathered alongside representatives from government agencies, intergovernmental organisations and Mediterranean conservation groups to write a new chapter in their collective efforts to protect migratory species that cross international borders. Although on paper it is the largest marine protected area in the Mediterranean, the Pelagos Sanctuary is actually a patchwork of areas with varying levels of protection. Participants applied their knowledge and expertise to four critical topics identified at last year's forum: increasing the sanctuary's highly protected areas, improving sustainable fishing practices, reducing noise pollution and promoting sustainable tourism.

INSIGHT

"A central theme emerged from this event: improving MPA management in the Pelagos Sanctuary. Protecting these cradles of biodiversity, these marine nurseries, is not only an environmental obligation, it is a moral imperative, our duty to future generations."
***Pierre-Jean Clausse**, European Climate Pact Ambassador in France*

TACKLING THE CHALLENGES TOGETHER

"The Pelagos Agreement plus the recent BBNJ Treaty gives us a three-country agreement to protect a large section of our ocean and the pelagic ecosystem of the Mediterranean, potentially setting an example for other open seas and cross-border areas inhabited by migratory species, such as the Coral Triangle in South-East Asia", explained Purificació Canals, President of MedPAN, the Mediterranean network of marine protected area managers. This view was echoed by Alessio Satta, Executive Director at WWF Mediterranean, who stressed that despite the problems to be solved, *"we set an example to other seas around the world"*. Next, Laurence Boetti-Forestier, Regional Councillor for Cross-Border Relations, noted that the region is *"a model for environmental planning in Europe"*, boasting a zero plastic initiative, Clean Harbours certification and the recently established Parliament of the Sea, among other achievements. Geoffroy Chatelard, Head of Wealth Management Marketing at UBS Monaco & Iberia, described the area, whose waters span three neighbouring countries (France, Monaco and Italy) and are home to eight species of Mediterranean marine mammals, as "our garden".

Twenty-five years after the Pelagos Agreement first came into existence, defining the area for conservation and establishing a framework for its cross-border governance, a series of opening talks at the forum reflected on the current situation and reaffirmed the main conservation goals in what Maher Mahjoub, Director of the IUCN Centre for Mediterranean Cooperation, described as *"an exceptional marine environment and sanctuary of biodiversity, from plankton to cetaceans"*. He pointed out the sanctuary's designation in 2002 as a Specially Protected Area of Mediterranean Importance (SPAMI) under the Barcelona Convention, *"so that it may safeguard habitats that are crucial to endangered species, as an area of scientific, aesthetic, cultural and educational value"*. In addition, noted Viola Cattani, Deputy Executive Secretary of the Pelagos Agreement, it *"has fostered other important initiatives, like the creation of a Particularly Sensitive Sea Area that stretches from north-east Spain to north-west Italy, covering the Pelagos Sanctuary. This official PSSA designation in 2023 was a significant step forward"*.

FOUR PRIORITY TOPICS

The opening talks were followed by collaborative workshops for participants to share their views and approaches, build a common vision of the future and agree on concrete action, and sometimes solutions. The forum highlighted a number of critical challenges, inspirational ideas and opportunities, including:

1/ Improving marine protected area management in the Pelagos Sanctuary: using these MPAs as a testing ground for marine spatial planning and regulations, empowering managers to issue fines and introducing innovative monitoring technologies;

2/ Building a sustainable fishing industry by banning trawling, establishing a no-take corridor in the Pelagos Sanctuary based on scientific data, introducing a moratorium on certain species and encouraging efforts to rebuild fish stocks (for example, using artificial reefs made from organic materials);

3/ Alleviating noise pollution by immediately introducing speed limits (< 10 knots) in territorial waters (within 12 nautical miles of the coast), equipping boats with 'black boxes', a ground-breaking way to monitor and analyse noise pollution, distributing navigation charts that clearly mark the boundaries of the Pelagos Sanctuary and recommend speed limits, and creating a network that includes the recreational and competitive sailing communities;

4/ Leveraging sustainable tourism to devise new funding mechanisms, such as eco-taxes levied on tourist activities (as seen in Greece and the Seychelles) or payments for ecosystem services.

These productive discussions on tomorrow's challenges underlined our collective responsibility for protecting an exceptional marine environment which, despite seeing intense human activity, provides a home to almost every species of marine mammal found in the Mediterranean.

INTERVIEW

Hélène Labach

Marine biologist specialising in the common bottlenose dolphin and Director of MIRACETI, a Mediterranean association formed through the merging of three pre-existing organisations and now recognised for its extensive, multidisciplinary expertise in the study and conservation of cetaceans.

What has the Pelagos Sanctuary achieved in its 25-year history?

The Pelagos Sanctuary is a pioneering area that has expanded our knowledge of Mediterranean cetaceans and enabled targeted regulations to be introduced, like the ban on approaching the mammals within a distance of 100 meters in French marine protected areas, a measure that has been extended to all territorial waters in the Mediterranean. The sanctuary was also the driving force behind measures like the High Quality Whale-Watching Certificate developed by ACCOBAMS, the agreement on the conservation of cetaceans in the Mediterranean Sea and Black Sea. Furthermore, under French biodiversity law, it is now mandatory for all vessels over 24 meters long entering the Pelagos Sanctuary or Agoa Sanctuary in the French West Indies more than 10 times a year to have an anti-collision system installed. Another measure instigated by the Pelagos Agreement is the ban on or limiting of offshore speedboat racing in different parts of the sanctuary.

Cetacean research in the sanctuary has developed significantly. Here at MIRACETI, we frequently carry out work in the sanctuary, which since the 2000s has generated much scientific research and fostered measures to preserve and protect cetaceans.

How would you define the unique impact of the Pelagos Sanctuary?

The Pelagos Sanctuary acts as a catalyst for projects, either directly or because it attracts investors and project leaders. As a result, more projects are developed within the sanctuary, which then inspire and benefit neighbouring regions. Certain conservation measures were piloted inside the sanctuary before being rolled out nationally. But once measures have been implemented at national or regional level, the sanctuary's role in driving regulation becomes less obvious. This is particularly true because no specific regulations govern the sanctuary itself, as it is not strictly speaking a marine protected area or national park. The term 'sanctuary' is misleading: people hear 'sanctuary' and imagine a place where everything is banned, whereas it is actually a three-country agreement. So the sanctuary's impact is considerable, but not always visible.

The Pelagos Initiative, launched in 2021, also announced a new call for projects focusing on climate change and its impact on the Pelagos Sanctuary, in partnership with the UBS Optimus Foundation, UBS Monaco and the Prince Albert II of Monaco Foundation.

What are some of the future challenges facing the Pelagos Sanctuary?

The sanctuary has many long-term stakeholders: a secretariat, NGOs, marine protected areas (MPAs) and private-sector initiatives, for example. The ingredients are all there. What we need now, I think, is greater cooperation and coordination between the different stakeholders and entities. Cooperation is often too irregular and limited to particular projects. The framework needed to foster long-term action and lasting cooperation is lacking. The secretariat of the Pelagos Agreement facilitates interaction between the three signatory countries, but not enough between stakeholders. The will and the initiatives are there. We have to stop them operating in isolation and start sharing the same goals. That's our main challenge going forward, I think, and a forum like this, where stakeholders can come together, exchange ideas and develop partnerships, is a step in the right direction.

We also need stricter management of human activities in the sanctuary, with greater coordination between the three countries, as set out in the agreement. It must be done legally and we must also encourage local stakeholders – for example whale-watching tour operators, tourism and fishing industry players, commercial shipping companies and MPA managers – to voluntarily make the switch to more virtuous practices.

Can you tell us about MIRACETI's flagship programme to protect cetaceans in the Pelagos Sanctuary?

We set up the Explore Pelagos project with the support of the Pelagos Initiative. Its aim is to protect cetaceans in the Pelagos Sanctuary by improving knowledge of the populations it is home to, flagging conservation priorities and disseminating scientific data to inform conservation and public awareness initiatives. The idea is to get all the relevant stake-holders on board and working together. MIRACETI conducted a three-week scientific expedition in the Pelagos Sanctuary in October 2023, making four stopovers along the way (in Monaco, Genoa, Bastia and Sainte-Maxime). Data on cetacean species and human activities in the area was collected on the way. Round-table discussions were held with many local stakeholders during the stopovers to explore key cetacean conservation issues and needs in the region and the prospects for collaborative action. Outreach activities for children and the general public were also organised. Finally, a documentary on the expedition was produced and will be widely distributed to explain the challenges of cetacean conservation in the Pelagos Sanctuary.

MIRACETI has also run the TURSMED programme in French Mediterranean waters since 2018, in partnership with the French Biodiversity Agency. It aims to strengthen the role of MPAs in monitoring and protecting common bottlenose dolphins by developing standardised scientific monitoring techniques, a shared database and a tool to assess cetacean conservation needs. These tools help MPA managers in the French Mediterranean identify and prioritise protection measures in their area, regardless of how much information or data they possess. The programme could serve as an inspiration to the entire Pelagos area.

Why is monitoring the common bottlenose dolphin in the Mediterranean particularly important in terms of cetacean conservation?

The common bottlenose dolphin is one of two cetacean species listed in Annex II of the EU Habitats Directive, for which countries must designate special areas of conservation (SAC). In the Mediterranean, it is the only species with this status, which enables MPAs to implement protection measures that benefit all marine life. Also, common bottlenose dolphins are primarily found in continental shelf waters, so they are abundant near the coast. Since most MPAs are coastal, these dolphins are the main cetacean there.

Does the Pelagos Sanctuary set an international example?

Nowhere else in the world can you find an area of this size dedicated to protecting cetaceans, governed by three countries and containing waters beyond national jurisdiction. So yes, you could say it sets an international example. ■

MARINE PROTECTED AREAS

Roadmap for 2030

Hosted by MedPAN, the Mediterranean marine conservation community met to take joint action to tackle the challenges facing the Mediterranean Sea under the banner “Because marine protected areas are everyone’s business”.

From NGOs and scientists to international organisations and local initiatives, all the stakeholders on the ground count in the management of marine protected areas (MPAs), a central concern at Monaco Ocean Week. Even though the Barcelona Convention and the European Union respectively provide Mediterranean countries with a regional framework and sub-regional cohesion, the implementation of policies, strategies and actions to protect the marine environment varies considerably across the region. In addition, MPA coverage in the Mediterranean varies significantly from one country to another and between the northern and southern shores. The effective management of these marine protected areas, which is exacerbated by Mediterranean, European and international marine biodiversity conservation targets, remains a challenge.

THE MEDITERRANEAN SITUATION

In 2012, the Mediterranean Marine Protected Area Forum community developed the first MPA roadmap for the region to create a common agenda. In 2021, an update led to a new roadmap for the coming decade. The real value of this publication is that it becomes a ‘living document’ that helps achieve the targets and outcomes set at international and regional level, not least other effective area-based conservation measures (OECM) in the Mediterranean.

The ‘Road to 2030’ MPA roadmap features a set of objectives, along with the recommendations, strategies and actions needed to achieve them, the aim being to mobilise, align and coordinate efforts by all the different stakeholders to meet marine conservation targets. The future of one of the world’s hotspots – in terms of biodiversity abundance, economic activities, anthropogenic pressures and climate change impacts – is at stake. To mobilise the support of the key stakeholders, a new call for commitment will be announced soon.

“The creation and management of MPAs doesn’t rely on a personal vision but a collective one. The roadmap enables us to hear every stakeholder’s opinion”, said Purificació Canals, President of MedPAN, in her opening address at the meeting held at the Oceanographic Museum on 21 March 2024.
The first panel discussion assessed the Mediterranean situation: different protocols, specific action plans (such as those spearheaded by the SPA/RAC to manage vulnerable species), MPA categories (national status, Natura 2000, Pelagos Sanctuary), collaboration tools, etc. *“Since 2016, there has been no change in strictly protected marine protected areas, which represent only 0.04% of seas. The target is 10% of seas strictly protected by 2030”*, noted Susan Gallon, Scientific Manager at MedPAN. Feedback from several MPAs was then presented.

EXPLORING SOLUTIONS AND AVENUES FOR 2030

"A minority of MPAs are effectively financed and managed," noted Romain Renoux, Executive Director of The MedFund, a sustainable financial mechanism that currently supports 20 MPAs in 9 Mediterranean countries with funding exceeding 6 million euros and intends to double its targets by 2030.

The roadmap also includes attracting new stakeholders – like Nice City Council, which is planning a new marine protected area all along the city's coastline, from the mouth of the Var River to the Cap de Nice, that will therefore tackle the human-driven pressures of coastal developments like Nice airport and port. *"The planned zone will also encompass an offshore area flanked by the Var and Paillon submarine canyons, which are already in the Pelagos Sanctuary. We see this project as a testing ground for SDG 14,"* explained Aurore Asso, Councillor at Nice City Council. *"We are using the science-based Systematic Conservation Planning approach and taking time to establish the project within civil society, through a long process of consultation"*, she continued, before mentioning the hope of seeing the return of angelsharks to the aptly named Bay of Angels.

The urban marine reserves of Larvotto and Spélugues in Monaco, which are managed by the Monegasque Association for the Protection of Nature (AMPN), are also engaged in the new roadmap: *"We value links with other Mediterranean MPAs"*, said Jacqueline Gautier-Debernardi, Director of AMPN, which works actively with the Principality's stakeholders, raising awareness in hotels, organising participatory science initiatives, studying ecosystem services and so on.

The Mediterranean Posidonia Network aims to protect 100% of Posidonia seagrass by 2030. *"40% of Posidonia is in MPAs. To protect it outside those areas, we need to convince policy-makers. Our goal is to have an inclusive network"*, explained Frédéric Villers, Mediterranean Coastal Uses Officer at the French Biodiversity Agency, closing the MPA meeting's second panel discussion. ■

SPOTLIGHT

INSPIRING COURSE OF ACTION ON THE MOROCCAN COAST

Houssine Nibani, President of the Association for Integrated Resource Management (AGIR), presented the progress made in achieving conservation objectives in Al Hoceima National Park in Morocco, part of which extends out to sea (19,000 hectares). *"We have a sufficient amount of skilled human resources on the ground. We are working on several target species, including the osprey, octopus and seagrass meadows. We have involved artisanal fishers as guardians and observers of these vulnerable species. They are even asking to help implement no-take zones. We also have the support of the Med-Nasse women's cooperative, who make traditional fish traps. But monitoring illegal trawling near the coast creates many problems, including the safety of our eco-guards."*

© Med MPA forum

SPOTLIGHT

10 YEARS OF ACTION IN THE CAP D'ADGE MPA

"We have links with other local council services. The Cap d'Adge MPA, 310 hectares of which are highly protected off the coast of this town that has 30,000 inhabitants, is seen as one element of a global management project", explained the town's Director of the Marine Environment, Renaud Dupuy de la Grandrive, as he presented their offices located in a floating building containing boats, technical and diving equipment and a meeting room, among other spaces. Their work includes the scientific monitoring of Posidonia seagrass, coralligenous habitats, cetaceans and seabirds, reef restoration, awareness raising and environmental education.


© Renaud Dupuy de la Grandrive

LEGAL ROUND-TABLE

What rights for the poles and seabed?

The legal panel event hosted by the Prince Albert II of Monaco Foundation has gathered momentum and is now firmly established as a forum for debate on the law applicable to global ocean and environmental issues. For the second edition, experts focused on the poles and the deep seabed.

On 22 March 2024, during Monaco Ocean Week, international experts representing the legal community came together for the legal round-table event held at Monaco Yacht Club. In his welcome address, Olivier Wenden, Vice-President and CEO of the Prince Albert II of Monaco Foundation, stressed the importance of involving the legal community, which is rarely invited to participate in the main ocean conservation meetings: *"When it comes to addressing all the challenges we face in meeting the 2030 and 2050 targets, we cannot do without them"*.

MANAGING POLAR TOURISM

With polar tourism booming due to to leisure pursuits such as cruises, kayaking, kitesurfing, skiing, hiking and whale-watching, what are the dangers and how are these activities likely to be regulated in the future? The risks, not just for biodiversity and safety, but also for local populations and scientists on polar missions, have not yet been adequately assessed. *"We must improve the way these activities are regulated by involving the communities and scientists who live in those territories"*, recommended Anne Choquet-Sauvin, Lecturer and Researcher in Law at the University of Western Brittany and Chair of the French National Arctic and Antarctic Research Committee, adding: *"Some tour operators are proposing to bring scientists on board to carry out scientific activities in unexplored regions; we have to be cautious"*. Especially in Antarctica, a vast natural reserve which *"is opening up to tourism, but which is no less fragile as it is 99% wilderness"*.

A NEW FRAMEWORK

"In the future, we will definitely have to introduce the idea of limitation. If you want to protect the Antarctic, particularly from industrial threats, you really have to bring in limitation measures, and perhaps consider the territory as a legal entity", warned Kees Bastmeijer, Professor of Arctic and Antarctic Studies and Director of the Arctic Centre at the University of Groningen (Netherlands). *"We are only looking 10 to 15 years ahead in the Antarctic at the moment, but we should be considering the impacts over 7 generations, as the Indigenous populations do."*

In addition, a legal framework centred on biodiversity would take fully into account the various species that inhabit the environment, just as anti-discrimination laws do in human societies. *"Moving away from an anthropocentric view of the world is nothing new; on the contrary, it represents a return to Indigenous wisdom"*, added Bastmeijer. Moreover, *"we have to take into consideration climate change and its impact on the migration routes of species such as whales"*, said Margaret Williams, Senior Fellow, Arctic Initiative at Harvard Kennedy School, Belfer Center for Science and International Affairs (USA), who talked about the possibility of creating *"sanctuaries of silence"* for polar species.

"This small area of the globe, which provides planet-wide ecosystem services (atmospheric and ocean currents, etc) faces significant risks", summarised Inge Relph, Co-Founder and Executive Director of Global Choices, referring to the Arctic.

"Putting greater emphasis on regulating activities within the polar regions is an essential strategy for the conservation and protection of the global environment", concluded the round-table's moderator, Andrew Heinrich, Professor in the School of International and Public Affairs at Columbia University (USA), before calling for the universal adoption of the precautionary principle: *"Potentially dangerous practices are coming along and spreading so quickly that we are unable to assess the impacts in real time. In the absence of scientific certainty, we must uphold and more fully embrace the precautionary principle in all laws relating to the poles".*

IDENTIFYING APPROPRIATE LEGAL TOOLS

Moratoria, licences and permits, marine protected areas, international conventions and organisations, bilateral treaties and national legislation were among the legal tools examined by the round-table, which proved to be a debate on applied law, not just on legal doctrine. "*The reality of the way in which laws are applied in practice – and of course the impact of political will on their ability to be promulgated in the first place – are equally important considerations in deciding which tool to use"*, noted Andrew Heinrich. The panel members then stressed the need for inclusiveness in the legal approach to these environments, particularly the Arctic where the Indigenous peoples should be an integral part of the decision-making process. It is also important to involve the sizeable community of researchers in governance issues, as mentioned by Johanna Ikävalko, Director of the Arctic Centre at the University of Lapland (Finland).

SPOTLIGHT

THE APPROACH OF INDIGENOUS COMMUNITIES

"Alaskan cruises attracted 1.6 million tourists last year, involving more than 250 ships. The first problems identified in my community are water quality, waste management, overcrowding on our buses, and also the impact on cetaceans in their feeding grounds. We don't have coastguards. We need to set up a monitoring system. Next year, rangers will be monitoring these areas, but we need more support. We have been regulating our activities for hundreds of years. It's very difficult to deal with these rapid changes. Often people start taking action when it's too late. If there was a permit system in place, it would lessen the impact on communities. Some operators are in agreement, others not. My people must have environmental representation at governance level. We have been living in Alaska for 10,000 years and we are thinking about how best to protect the Arctic for the next 10,000 years."

Judith Daxootsú Ramos, Assistant Professor, University of Alaska Southeast (USA)

INTERVIEW

How do we reach agreement on the use of deep ocean resources? At a time when seabed mining is raising significant geopolitical, financial, scientific, industrial and military questions, the ocean floor is an emerging topic in the world of international law and the law of the sea. This was the theme of the masterclass given by ***Virginie Tassin Campanella****, attorney-at-law (Paris and Zurich bar), Founder and Managing Director of international marine law firm VTA Tassin and Editor of the* Routledge Handbook on Seabed Mining and the Law of the Sea *(2024). This pioneer and expert in the field gives her insights into these questions that are crucial for the future of part of the ocean that has long fallen under the radar where the law is concerned.*

In law, we often lag behind. What is the situation with the deep seabed?

It so happens that in the case of deep-sea mineral resources we are ahead of the game! These resources have not yet begun to be mined, but the law has been developed in advance. At the end of World War II, coastal states started laying claim to the mineral resources in the seabed close to their shores. It started in 1945 with US President Truman, then a number of Latin American countries followed suit. Given the growing interest in seabed resources, mainly oil, the international community developed an international legal framework to regulate access to mineral resources and so promote peace.

When people grasped the potential of new mineral resources in the 1970s, the states involved renegotiated an agreement – the 1982 United Nations Convention on the Law of the Sea (UNCLOS) – this time covering all parts of the ocean, including those beyond national jurisdiction. A new marine area encompassing the deep seabed was created, known simply as the 'Area', where the resources are the common heritage of humanity. In this area shared by all, individual states have no jurisdiction or sovereign rights, either over the seabed or its resources. States have therefore always been ahead of the game: they incorporated as yet unexploited resources into international law.

Is the notion of 'ecological damage' part of this legal mechanism?

Absolutely, except that in the law of the sea, we don't refer to 'ecological damage'. Damage to the marine environment and its resources, as defined by UNCLOS 1982, takes into consideration 'substantial pollution of or significant and harmful changes to the marine environment'.

What is the next step as far as the law pertaining to the deep sea is concerned?

When the 1982 Convention was adopted, the principle of the common heritage of humanity, as defined in the Convention, was highly contested by developed nations and there was widespread concern surrounding the ratification of the Convention. An agreement relating to the implementation of that Convention was drawn up in 1994. This agreement changed a lot of things, in particular the balance of power within the International Seabed Authority. There is an urgent need to resolve the legal challenges posed by the implementation of that agreement.

More generally, huge challenges relating to the way the law of the sea will be applied in conjunction with other branches of law and rights are looming. There is, for example, the human right to a healthy environment; also in environmental law, there are

mechanisms requiring the agreement of Indigenous peoples and local communities, for example to access or use marine genetic resources on the continental shelf; and there can be overlaps between climate law and the law of the sea. The law of the sea is set to evolve due to the coexistence of other laws that are equally important. We are only just discovering how these areas of law interact. At this point in time we are seeing an increasing diversity of stakeholders and issues and the growth of seabed operations. The future of the law of the sea will be marked by these complementarity challenges.

Where are we up to in terms of implementation?

Currently, there are plans to commence mining operations on the continental shelf in the Area in the short to medium term. I remain convinced that the continental shelf will provide the most benefit for mineral resource mining from a financial point of view. But we don't yet know how to go about sharing any financial benefits fairly: no clear payment mechanism has been adopted to date, either for operations on the continental shelf or in the Area. We are at the pre-operational stage where diverging interests and rights are being asserted, whether by the operators or Indigenous communities (claiming cultural rights over the seabed). Society is questioning the environmental impact and economic justification, how the value of the resources will be determined, what mining methods will be used, how the resources will be redistributed, etc.

What minerals are involved when we talk about deep-sea mining?

We need to be very careful with this term because it doesn't specify where exactly the activities take place. It usually includes mineral resources, but not always. The term generally applies to three types of mineral resources: 1/ polymetallic nodules (which just have to be picked up); 2/ hydrothermal sulphides (which have to be extracted). These minerals are discharged from 'chimneys' in subduction zones, where specific organisms have developed; this leads to a conflict of interest between mineral extraction, exploitation of biodiversity and conservation; 3/ ferromanganese crusts (concretions that require blasting).

When we talk about the risks associated with deep-sea mining, we often talk about nodules. In reality, the extraction of sulphides and ferromanganese involves even greater environmental risks.

Are hydrocarbons not included in those categories?

To date, oil and gas can't be extracted in the common heritage of humanity area, but only from the seabed under national jurisdiction, as is the case for diamonds, sand, phosphates, etc. That could change.

What jurisdiction applies to ecological damage caused by deep-sea mining activity?

For the environmental impact on the water column, the regime of the high seas or of the EEZ is applicable. The seabed comes under a different legal regime. Between 12 and 350 nautical miles from the shore, the regime of the continental shelf applies. Beyond national jurisdiction, the regime of the Area applies. In all cases, the marine environment enjoys a broad spectrum of protection and conservation obligations and the recently adopted BBNJ[1] Agreement will have a role to play.

Will the next step be to harmonise these approaches?

The BBNJ Agreement supports an ecosystem approach and erases the artificial separation between the continental shelves and the Area, and between the water column and the seabed. The environmental impact research it requires is applicable across borders, which will allow for greater consistency in the protection and conservation of the marine environment. ■

1.The Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction, adopted in 2023.

TOWARDS IPOS

Creating a new science–policy mechanism

A workshop organised by the Ocean Sustainability Foundation (OSF), which is hosted by the CNRS Foundation, to design an effective gateway between ocean sciences and policy action on a global scale.

How can policy-makers make informed decisions to ensure a sustainable blue future? Key global ocean governance stakeholders gathered at the Oceanographic Museum on the morning of 19 March 2024 to discuss plans for co-designing IPOS (International Panel for Ocean Sustainability), a transdisciplinary interface between ocean knowledge and policy. The question of how to achieve this collaborative challenge together was already being asked by experts meeting in Monaco three years ago for the very first IPOS workshop and at past editions of Monaco Ocean Week. One of the major issues facing this emerging platform is integrating and consolidating the insights and perspectives of a host of different high-level stakeholders on the international stage against such a fragmented backdrop. Its goal is to bridge the gap between ocean knowledge and decision-making. Olivier Wenden, Vice-President and CEO of the Prince Albert II of Monaco Foundation, sees IPOS as a key player over the coming years in achieving the ambitious targets of 30x30, the BBNJ Agreement and the Global Plastics Treaty: *"We need more transdisciplinary horizontal discussions between existing organisations, which IPOS is crucial for"*. Denis Allemand, Director of the Monaco Scientific Centre, shared the inspiring example of the bluefin tuna, which has been saved from extinction thanks to the coming together of scientific expertise and policy-making.

The event, held with the support of the Oceanographic Institute, Prince Albert I of Monaco Foundation, the Prince Albert II of Monaco Foundation and the Monaco Scientific Centre, provided the opportunity to review the IPOS ecosystem, drawing attention to the latest progress and the difficulties encountered. The hosts presented the plans for co-designing this new gateway connecting ocean knowledge and policy for a sustainable ocean. They also spoke about the pilot projects that IPOS wants to implement in crucial fields such as deep-sea mining, offshore wind, small-scale fisheries and the co-creation of an 'ocean indicator' to underline the initiative's added value. Three panel discussions then took a deep dive into key questions about the future of IPOS.

INSIGHT

"We are not just envisioning a sustainable ocean. We want to create the pathway to achieve it."
***Tanya Brodie Rudolph**, international ocean lawyer and research fellow (South Africa)*

RESHAPING THE OCEAN SCIENCE–POLICY INTERFACE

Opening the first panel, Loreley Picourt of the Ocean & Climate Platform emphasised the importance of a two-way dialogue between scientists and policy-makers. Emerging values, such as inclusiveness and demand-driven governance, have been identified and these will guide the co-design of IPOS. Charlina Vitcheva (DG MARE, the European Commission's Directorate-General for Maritime Affairs and Fisheries) stressed the importance of acting on the best available science when making policy decisions. Peter Haugan shared some useful examples of how experts can engage with heads of state and policy-makers, highlighting the need to provide concrete recommendations for achieving a sustainable ocean.

Minna Epps (Director of the Global Marine and Polar Programme, IUCN) spoke of IPOS's role as an intermediary, making complex science accessible to policy-makers, and underlined the importance of making consultation and inclusiveness integral to the mechanism from the outset.

RECONCILING EFFECTIVENESS AND LEGITIMACY

With time of the essence for ecosystem restoration, as Patricia Ricard (Paul Ricard Oceanographic Institute) pointed out, reconciling international agendas, policy mandates and regional schedules must be at the heart of the process. Laura Pereira (University of the Witwatersrand) put forward the idea of creating a centralised knowledge system, providing access to not just academic science, but also other sources like marginalised voices, the humanities and the arts. The need for better access to knowledge for Global South negotiators was highlighted by Charles Goddard *(Economist Impact)*. In addition, private sector engagement must be based on precise indicators and global standards that deliver on ocean sustainability, emphasised Erik Giercksky (UN Global Compact).

MAXIMISING COOPERATION WITH EXISTING INITIATIVES

The last panel focused on the future governance, hosting structure and legal organisation of IPOS. Ashok Adicéam (French government) highlighted the responsibility of governments at the science-policy interface and the need to ensure that IPOS has the support of a large number of countries by the UN Ocean Conference 2025 (UNOC), following the example of EU leaders and 2025 conference co-hosts, France and Costa Rica. Henrik Enevoldsen (IOC-UNESCO) underlined that effectiveness, legitimacy and acceptance will always depend on the social contract IPOS has with member states. David Obura (IPBES) stressed the importance of maintaining independence between governance and science to ensure that policy is relevant, not restrictive. Hans-Otto Pörtner (Alfred Wegener Institute) suggested that IPOS focus on regional data to fill gaps in sustainability assessment. Geneviève Pons (Jacques Delors Institute) shared the experience of the Starfish mission to restore the ocean, proposing an international transdisciplinary approach for IPOS.

Participants agreed unanimously on one priority: the co-design of this ocean platform needs to enter an acceleration phase. ■

GREAT BLUE WALL

Towards an Afro-Pacific Blue Economy

The round-table event hosted by the Great Blue Wall initiative during Monaco Ocean Week provided a unique platform to pave the way for new Afro-Pacific partnerships for a regenerative blue economy.

Bringing together multi-sectoral experts from across the Afro-Pacific, this event laid the foundations for impact-focused collaborations, as well as for projects and new policies prioritising blue justice and the regenerative blue economy. Held at Monaco Yacht Club on 19 March 2024 with the aim of accelerating procedures, the event showcased the insights behind the Great Blue Wall initiative from both the African continent and the Global South: the shared ambitions regarding conserving critical blue ecosystems, transforming economies and empowering coastal populations.

How can the role of the 'Tropical Majority' and stakeholders from the Global South, who manage vast ocean territories, be strengthened? How can the transition from traditional blue economy models to regenerative, equitable practices be fostered? Moderated by Alexis Grosskopf, CEO and co-founder of OceanHub Africa (the first pan-African ocean impact incubator and accelerator in Africa), this event provided a platform for fostering extensive Afro-Pacific cooperation and facilitating dialogue and leadership in regenerative ocean management. Following a presentation of the Great Blue Wall Initiative, two round-table sessions on the regenerative blue economy centred on fisheries and on building a framework for this new kind of economy.

PROFILE

The Great Blue Wall is a West Indian Ocean-born, African-driven response to the triple planetary crisis. Launched in 2021, its aim is to unlock unprecedented nature-based recovery efforts by implementing procedures for socio-ecological, economic and political resilience. Its objective is to create a connected network of regenerative seascapes linked by a living 'blue wall' that acts as a regional ecological corridor formed of conserved and restored critical blue ecosystems such as mangroves, seagrasses and corals. This buffer against the impacts of climate change and biodiversity loss will also shelter coastal communities who can become guardians of the ocean.

THE CHALLENGE OF SUSTAINABLE FISHING

The discussions featured a variety of views and revealed the disparity in resource allocation in fisheries. A key theme emerged: while the panellists agreed on the disconnect between global policy and the realities experienced by local communities, they upheld the African continent's potential to change its economic models.

They also highlighted the essential role of small-scale fishing, which remains the cornerstone of the blue economy. However, these fisheries are often neglected in favour of large-scale operations and are faced with various challenges that call for better sector management at local and global level, including co-developing management plans, strengthening international cooperation, withdrawal of fishing subsidies, channelling funds into transformative interventions, accessible banking systems and creating financial structures that empower communities.

The panellists also recognised that transparent finance mechanisms and fair trade rules are essential for a thriving blue economy, before addressing the recurring topic of integrating traditional knowledge, accumulated over generations, into ocean conservation efforts.

The human-caused element of ocean changes filled the discussions that looked beyond economics to consider the negative impact the upcoming elections may have on environmental policy, and the growing pressure on coastal areas due to climate change and population displacement.

INSIGHT

"Think like an ocean, act like a person."
***Meriwether Wilson**, co-Director of the Edinburgh Ocean Leaders programme*

A FRAMEWORK FOR A REGENERATIVE BLUE ECONOMY

The second round-table identified some key entry points for preparing for the future and changing the blue economy into a nature-positive blue economy, including the importance of 'science for all', strengthening private-sector dialogue, stimulating nature-based policy innovation (the Philippines was given as an example) and creating incentives to turn knowledge into action.

The panel concluded by outlining a roadmap for moving forward that listed a number of recommendations:

- empowering local communities (education, resources, representation at negotiations, training, etc);
- fostering sustainable blue businesses in order to create a robust blue economy that operates within the ocean's ecological boundaries (boosting mariculture investments, exploring seaweed farming, developing ecotourism initiatives, etc);
- planning for the long term by integrating climate change considerations and taking into account the impact on future generations (assessing environmental impact, prioritising mangrove restoration projects, creating marine protected areas, etc);
- building a global network (fostering collaboration between scientists, policy-makers, businesses and NGOs to share knowledge, resources and best practice).

This multi-pronged approach, addressing both the economic and social aspects of ocean health, embraces a future in which innovation and collaboration can catalyse a thriving blue economy. By working together, African and Pacific countries can harness the potential of the blue economy to create a future in which environmental sustainability and economic prosperity go hand in hand. Collaborative effort will require strong leadership, commented Meriwether Wilson. And by investing in the next generation of scientists, researcher João Canning Clode (MARE-Madeira) went on to say, *"African and Pacific nations can ensure a bright future for their communities"*. ■

Aerial view of the mangrove forest in the Saloum Delta National Park, Joal Fadiout, Senegal
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ADVOCACY

Let's Be Nice to the Ocean

NATIONS UNIES
CONFÉRENCE SUR LES
OCÉANS

What if protecting the ocean became the norm rather than the exception? The Let's Be Nice to the Ocean initiative convened experts and long-standing ocean advocates to brainstorm ways to preserve and restore the health of our seas in preparation for the third UN Ocean Conference (UNOC), scheduled to take place in Nice in June 2025.

This round-table discussion held in the Novotel's conference room on Wednesday 20 March 2024 focused on the proposals put forward in the 'Let's Be Nice to the Ocean' report, published in November 2023 on a digital platform of the same name. Participants were also invited to examine civil society initiatives and outreach opportunities, and identify the next steps on the road to UNOC 2025. The key question was: how can we create a more mindful world that takes greater care of the ocean?

"Making ocean protection the norm rather than the exception is very much in line with what we are trying to achieve", declared Olivier Wenden, Vice-President and CEO of the Prince Albert II of Monaco Foundation, in his opening speech. He reaffirmed the Foundation's commitment to protecting the ocean and called for a bold and innovative approach to addressing the current challenges.

Moderated by Rémi Parmentier, coordinator of the Let's Be Nice to the Ocean initiative and Director of the Varda Group, and Loreley Picourt, Executive Director of the Ocean & Climate Platform, the discussion covered a wide range of topics linked to the ocean Protection Principle, a paradigm shift presented in the report.

André Abreu of the Tara Ocean Foundation stressed the importance of the work accomplished since the Rio+20 Summit in 2012, which has created a more fertile space for ocean and climate protection. Nevertheless, he cautioned, *"more funding and inputs are needed for the proposed transformation and for innovative science to support new ocean governance models"*.

Purificació Canals, President of MedPAN, the Mediterranean network of marine protected area managers, noted the importance of creating a permanent space in which managers and stakeholders can work together to ensure marine ecosystems are effectively protected.

Vincent Doumeizel, Senior Advisor on Oceans to the UN Global Compact, highlighted the potential of seaweed to solve multiple crises, growing food insecurity and environmental challenges. He called for a "seaweed revolution" requiring investment and appropriate regulations to make the industry viable in the long term.

"We need a diversity of voices and perspectives", added Minna Epps (IUCN). She stressed the importance of including everyone's views in conservation efforts, noting that organisations from Asia and the Pacific were under-represented in the civil society survey carried out by the Varda Group and the Ocean & Climate Platform in 2023 at the request of France and Costa Rica.

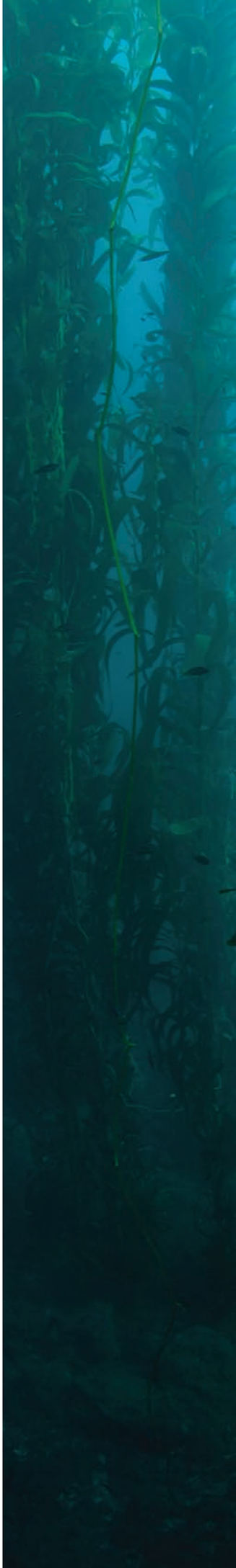
The participating specialists included Guillermo Ortuño, a marine ecologist and contributor to the Let's Be Nice to the Ocean initiative. He called for urgent action to adapt current regulations to the realities of the ocean, in particular to protect migratory species. Francis Staub, from the International Coral Reef Initiative, stressed that much more needed to be done to protect coral reefs, with just under 40% of them located in protected and conserved marine areas[2], recommending drawing on international legal instruments. Another topic addressed during the event was the protection of the Earth's global systems and 'special systems'.

2. Sources: Habitats Ocean+ Platform, 2023.

Finally, the possibility of harnessing art and sporting achievement to encourage public engagement and reconnect more people to the ocean was also raised.

In her closing remarks, renowned marine biologist Dr Sylvia Earle, President of the Rolex-supported initiative Mission Blue and National Geographic Society Explorer-in-Residence, said, *"our prosperity depends on understanding where we fit in, and how we treat our blue planet."*
Addressing the question of how they planned to present their proposals at the plenary session of UNOC 2025, the moderators wrapped up the event by presenting the roadmap for the Let's Be Nice to the Ocean initiative, which aims to foster concerted, innovative action to preserve a vital planetary ecosystem. ■

"Our prosperity depends on understanding where we fit in, and how we treat our blue planet."
***Sylvia Earle**, President of the Rolex-supported initiative Mission Blue and National Geographic Society Explorer-in-Residence*



A COALITION CHAMPIONING SEAWEED

Seaweed: the road to UNOC 2025

The Global Seaweed Coalition organised a high-level think tank session in partnership with The Earthshot Prize and the Oceanographic Institute of Monaco to identify the main seaweed-related commitments to be secured in the run-up to UNOC 2025.

Previously at Monaco Ocean Week, the Global Seaweed Coalition focused on raising public awareness of the potential and benefits of the nascent seaweed industry. This year, the coalition, which operates under the auspices of the UN Global Compact, wants to move beyond advocacy to action and commitments. Motivating this, of course, is the third UN Ocean Conference (UNOC), scheduled to take place in Nice in June 2025.

To lay the groundwork for this pivotal moment, a newly launched working group met at the Oceanographic Museum on 21 March 2024 to identify and unlock seaweed opportunities and leverage next year's UNOC to secure concrete, sustainable action that will boost the sector on its upward trajectory. The participating experts explored a variety of avenues, including commitments by companies, public, private and blended financing, state support for the green transition, investments from asset managers and support from the general public.

DRIVING CHANGE

Discussions focused on the key drivers of sustainable growth in the seaweed industry, as well as how they can increase the positive impact of algae on ocean health and climate change. Seaweed offers sustainable alternatives to many products. From the fashion industry to food and packaging, sector stakeholders have the power to drive change by adopting sustainable, seaweed-based alternatives in their supply chains. Companies can also reduce their environmental footprint by substituting carbon-intensive or plastic-based materials and ingredients with seaweed replacements.

"Just as seaweed needs an entire ecosystem to grow and live, our research and financing work is done as a team", explained Vincent Doumeizel, Senior Advisor on Oceans to the UN Global Compact. He added that cooperation and collective action are essential if we are to generate positive change for the ocean and meet the UN Sustainable Development Goals.

MAKING SEAWEED ATTRACTIVE TO INVESTORS

"We do not only need equity from private investors, we also need de-risking mechanisms, public money, grants and technical assistance", commented Adrien Vincent, Senior Advisor to the Global Seaweed Coalition and founder of Albatros Advisory. He was joined by Cyril Gomez from the Oceanographic Institute of Monaco, who stressed the need to identify projects with strong key performance indicators capable of inspiring lasting confidence in investors.

As investors are not sufficiently familiar with the characteristics of seaweed companies, it is difficult to attract private investments. Non-profit initiatives like the Global Seaweed Coalition help to bridge this gap between business owners and investors. Supply contracts and co-investment models can help de-risk investments and shore up seaweed companies.

"There is a role for patient capital", said Anuradha Bajaj, Director of Innovation Marketplace and Investment at The Earthshot Prize. *"These are new technologies and new markets. The typical five-to-seven-year venture capital structure does not always work for seaweed companies. It is too short a timeline. Having catalytic capital, which can (a) help fund and underpin some of the early-stage risks and (b) be patient going up to 10 years, is what will make a big difference."*

The high-level working group identified six priority areas (investments, demand, policy and regulations, innovation, outreach and science) as well as the key stakeholders and milestones to focus efforts on in order to successfully prepare for UNOC 2025, which will mark a major step towards achieving the international end-of-decade targets. ■

"The UN Ocean Conference in 2025 is a perfect opportunity to put the seaweed agenda under the spotlight and mobilise action."

***Adrien Vincent**, Senior Advisor to the Global Seaweed Coalition*

AN EXTRAORDINARY HABITAT

Saving Posidonia is everyone's business

A panel discussion hosted by the Mediterranean Posidonia Network (MPN) on Wednesday 20 March 2024 explored ways to coordinate efforts to improve Posidonia seagrass protection and pave the way for a sustainable funding mechanism at the UN Ocean Conference in 2025.

A working session co-organised by the French Biodiversity Agency's European and International Relations Division and Mediterranean Coast Delegation – both members of the MPN's board – was followed by a public discussion on the future of Posidonia meadows at the Oceanographic Museum of Monaco as part of Monaco Ocean Week.

ROADMAP TO FINANCE POSIDONIA PROTECTION BY 2030

The expert panel discussion centred on the findings and conclusions of a technical workshop held in Marseille in November 2023, which explored blue carbon funding mechanisms to protect seagrass meadows in the Mediterranean. Panel members recommended a series of solutions based on sustainable funding mechanisms, identified the next priority steps and highlighted strategies to strengthen cooperation across the Mediterranean.

ENSURING LONG-TERM PROTECTION

The International Union for Conservation of Nature stressed the importance of harnessing existing mechanisms like the Blue Carbon Accelerator Fund to support blue carbon initiatives. It also recommended working alongside Mediterranean partners and specific donor countries.

The MedFund highlighted its already active role in Posidonia conservation through the expansion of marine protected areas. It cautioned against duplicating existing mechanisms while calling for close collaboration with national authorities. MedPAN identified current gaps in conservation and recommended including a focus on capacity building and avoiding duplication of effort. BlueSeeds called for a change of narrative to communicate the importance of Posidonia and stressed the urgent need to create a unified fund. Finally, the WWF Mediterranean Marine Initiative set out the next steps in implementing the Roadmap and recommended determining the precise financial needs of all countries in order to alleviate the pressures on Posidonia meadows.

All parties agreed on the need for a coordinated, strategic approach to ensure the long-term protection of Posidonia in the Mediterranean.

This expert panel will provide strategic support for the implementation of the Mediterranean Posidonia Network Roadmap 2030 alongside other regional initiatives to protect Mediterranean seagrass. Adopting such an integrated approach will enable the network to tackle the critical challenges facing Posidonia meadows while encouraging regional cooperation and long-term conservation action. This pioneering initiative to save Posidonia is backed by the Mediterranean Commission on Sustainable Development established by the Barcelona Convention. ■

IN FIGURES

Posidonia meadows[1]:

- are home to over 400 species of plants and 1,000 species of marine animals,
- protect beaches by reducing wave energy by 20%,
- limit coastal erosion,
- sequester 5 tons of carbon per hectare per year: the carbon stocks held in dead meadows are 10 times higher than those found in forest soils.

A highly valuable resource:
Seagrass meadows are worth 50,000 euros per hectare per year, which is 3 times more than coral reefs and 10 times more than rainforests.[2]

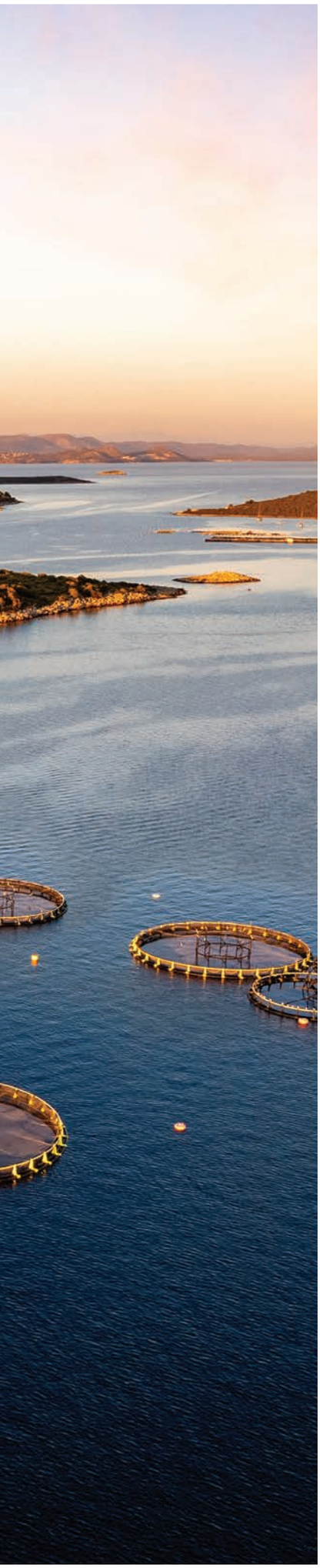
Seagrass beds in French Mediterranean waters cover 80,000 hectares, 10% of which are dead meadows that store carbon. Across the Mediterranean as a whole, Posidonia covers more than 2 million hectares, 900,000 of which are in Tunisia.[3]

1. C F Boudouresque et al, *Protection and Conservation of Posidonia Oceanica Meadows* (Tunis: RAMOGE and SPA/RAC, 2012, 1–202).
2. Robert Costanza et al, 'The Value of the World's Ecosystem Services and Natural Capital', Nature (1997).
3. Data calculated using ESRI ArcGIS©, in Luca Telesca et al, 'Seagrass meadows *(Posidonia oceanica)* distribution and trajectories of change', *Scientific Reports* (5, 12505, 2015) and 'MAPAMED, the database of marine protected areas in the Mediterranean' (MedPAN & SPA/RAC, 2021).

PROFILE

Posidonia oceanica meadows are an emblematic habitat found exclusively in the Mediterranean sea, where they can be likened to the Amazon rainforest for the role they play. Protected in France since 1976, and now in Europe and internationally, this seagrass species acts as a vital habitat for marine life and provides nursery grounds for fish populations.

- Underwater photo showing the impact of yachting on Posidonia meadows -
© Laurent Ballesta / Andromède Océanologie



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ACCELERATING BLUE FINANCE AND ECONOMY

ROUND-TABLE ON THE BLUE ECONOMY

Shipping and the triple planetary crisis

Blue economy experts attended a two-day workshop at the Monaco Scientific Centre to discuss the green transition of this key sector of the global economy.

There was a new subject up for debate at this year's round-table on the blue economy, held as part of Monaco Ocean Week. International experts in public policy and ocean science met on 19 and 20 March 2024 to discuss and work towards common minimum standards in ocean conservation, in particular for maritime traffic. This intense two-day event was jointly organised by the Monaco Scientific Centre, the Prince Albert II of Monaco Foundation, Philanthropy Cortés Solari, the MERI Foundation and Velux Fonden. Participants at the high-level workshop separated into four groups to examine the challenges facing countries as they attempt to make shipping more sustainable and reduce its impact on the climate, biodiversity and pollution.

DRAFTING A POLICY BRIEF

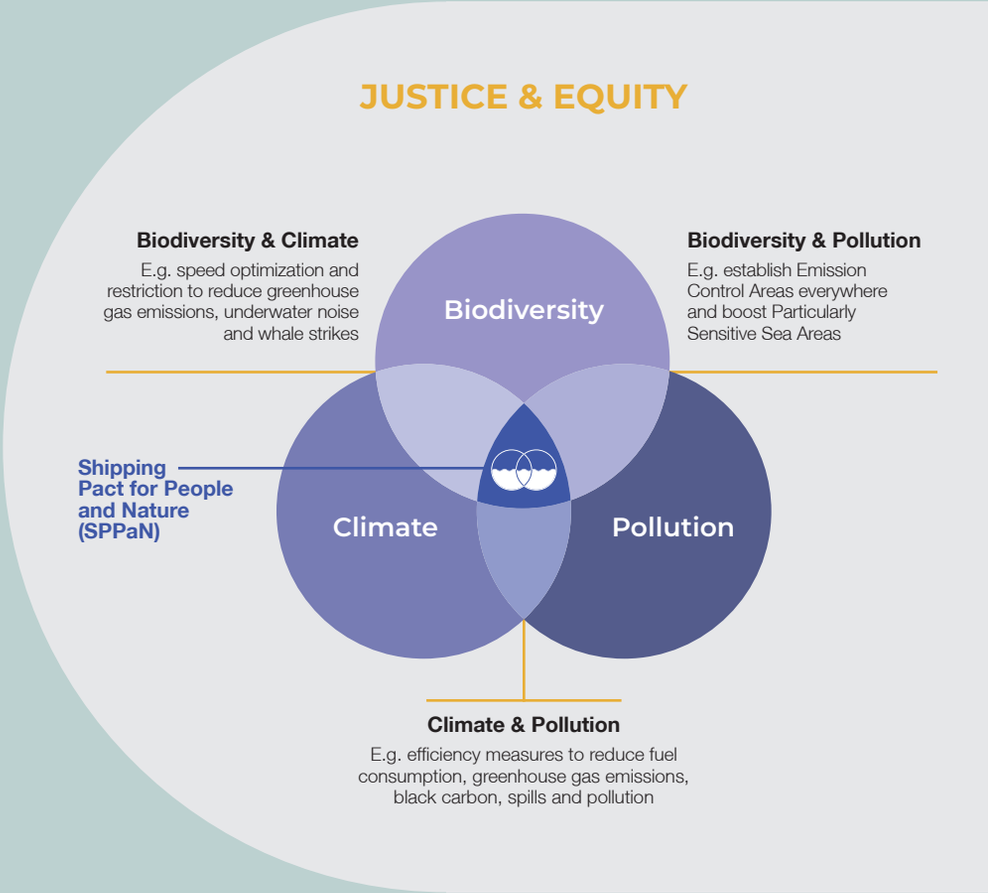
The workshop at Monaco Ocean Week resulted in concrete recommendations linked to four themes: science and the environment; institutional and social matters; economics and finance; and technology. The points raised and recommendations made by each group are currently being compiled by the organising team and will form the basis of a solid policy brief to be presented at COP 29 in Baku in November 2024.

SHIPPING TRADE: A NEW ERA ON THE HORIZON?

"While the growth in maritime transport is vital for world trade, it has become a double-edged sword, exacerbating the triple planetary crisis of climate change, pollution and biodiversity loss", noted Patrick Rampal, President of the Monaco Scientific Centre. To address the complex link between shipping and the triple planetary crisis, COP 28 in Dubai last year announced the launch of the '2030 Shipping Pact for People and Nature' (SPPaN). This historic pact underlines the need to decarbonise maritime transport, not only to reduce its environmental footprint but to usher in a sustainable era for the shipping trade. Marine pollution, caused mainly by shipping activities, presents a huge challenge to our collective aspirations for a sustainable future. While shipping is comparatively less polluting than other modes of transport, there is considerable room for improvement. Nathalie Hilmi, Section Head of Environmental Economics at the Monaco Scientific Centre, pointed out that *"moving towards decarbonisation requires concerted efforts to explore innovative solutions and adopt cleaner, safer fuels, heralding a new sustainable era for maritime transport. Yet many obstacles lie ahead, from technological constraints to economic viability and public acceptance. Addressing these challenges requires a collaborative spirit that draws on the collective wisdom of stakeholders across all sectors, in every geographical area."*

PROFILE

The World Bank defines **the Blue Economy** as "the sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem health". Making this a reality requires cross-border collaboration and unprecedented partnerships, which are particularly crucial for Small Island Developing States (SIDS) and the Least Developed Countries (LDC).



ANTI-POLLUTION MEASURES AND TECHNOLOGIES

Human activities such as shipping have led to increased underwater noise, negatively impacting marine animals and ocean ecosystems in both offshore and coastal habitats. Measures to limit ship speeds can lower noise levels, reduce the risk of colliding with marine animals and cut greenhouse gas emissions. International conventions are in place to regulate rubbish, oil, air and wastewater pollution from ships.

Decarbonising the shipping industry is crucial for cutting global greenhouse gas emissions, with alternative fuels like hydrogen and liquefied natural gas seen as promising solutions. Various technological innovations and operational practices are being explored to reduce fuel consumption and transition towards cleaner sources of energy for ships.

Finally, panellists noted that significant investment and policy adaptations will be needed if we are to radically decarbonise maritime transport and adhere to international agreements. ■

IN FIGURES

The ocean is the cornerstone of world trade, with over 90% of international goods carried by sea.

INSIGHT

"Ocean conservation needs to be approached in a global, worldwide and accelerated manner. This requires a systemic change in governance, with leadership that approaches territories and their threats holistically, integrating environmental, cultural, social and economic dimensions. The challenge is to bring together policy-makers from different sectors to work on this common problem."
***Francisca Cortés Solari**, Executive President of Philanthropy Cortés Solari*

INNOVATION AND FINANCE

A decarbonised maritime industry – tomorrow's reality?

130 experts from the maritime industry were brought together by Blumorpho, a company delivering innovations for a sustainable economy, to tackle the major challenge of decarbonising the sector.

How can attractive opportunities for collaboration and investment be created to build a greener, more resilient maritime industry? How can positive change be catalysed and carbon emissions reduced across an entire industry? These were the questions explored at the insightful event focusing on innovation, financing and sustainable solutions, held at Monaco Yacht Club on 21 March 2024 during Monaco Ocean Week. Blumorpho's Financing Maritime Innovation and Infrastructure for Climate and Ocean initiative brought together leading stakeholders in the maritime industry, including shipowners, innovative companies, institutions, investment funds and shipyards. *"The need for alternative fuels, optimised practices and efficient innovations in carbon sequestration, storage and use is a complex equation to solve"*, said Géraldine Andrieux, President of Blumorpho and MD of The Hive Climate AI, in her opening address.

INSIGHT

"We are convinced that attractive collaboration and investment opportunities will emerge to achieve net zero by 2050."
***Géraldine Andrieux**, President of Blumorpho and MD of The Hive Climate AI*

INNOVATION AND FINANCING: THE NEXT STAGE?

In the maritime industry, *"innovation is driven almost exclusively by the necessity to reduce carbon footprint"*, noted François Tison of 360 Capital Partners, listing the targets in the transition to net zero by 2050 – a topic also discussed in relation to the global merchant fleet by Émilie Espanet of the New Energies Coalition. *"Shipping as an investment asset class is developing quickly"*, explained Sylvain Pagès of AltfinPartners. However, capital needs are increasing to meet the ever stricter targets of the International Maritime Organization (IMO) and banks are limited in their lending capacities. For that reason, alternative financing is needed, which is leading to more and more shipping investment funds being set up. Leading funds are already showing the way, such as Eurazeo, a dedicated 200 million euro platform, and financial players like Julius Baer.

Many solutions are emerging, in addition to clean propulsion, creating investment opportunities in the innovative companies supporting the maritime transition. Twenty start-ups and scale-ups in the maritime and decarbonisation field were selected by Blumorpho to present their solutions and discuss them with experts.

BLUMORPHO

PROPULSION AND ENERGY

Although the ultimate solution to decarbonisation does not exist, a range of alternative energy sources do: new fuels, wind propulsion (an option already implemented by shipowners like Zéphyr & Borée with Canopée, a ship fitted out by a start-up called Ayro), hydrogen propulsion in dual-fuel set-ups (which Compagnie Maritime Belge (CMB) has opted for), methanol, etc. Faced with the challenge of significant additional costs, Babis Tsamkosoglou, representing shipowner Purus, shared his experience, then commented, *"a combination of carbon tax schemes and government grants for low-carbon practices is the right way to start giving the right value to these green and low-carbon practices their just worth." "Opting for cheaper, less environmentally friendly alternatives today may seem appealing in the short term but will pose greater underlying risks for investors and the environment in the long run"*, added Joana Foglia, a sustainable finance and blue economy expert at Blumorpho.

CARBON CAPTURE AND SEQUESTRATION

To meet the targets set by the IMO, decarbonisation must happen at every stage of the value chain: infrastructure (TechnoCarbon), optimising port operations (GridMatrix), carbon-neutral fuel production (Aerleum) and retrofitting vessels with carbon capture systems (Carbon Clean). Solutions also focus on carbon sequestration. Gigablue's innovation facilitates carbon sequestration in deep waters using bio-geochemistry and its ocean intelligence platform to identify optimal sequestration areas globally.

IN FIGURES

The global merchant fleet

- Less than 1% **of the world's** 100,000 merchant ships **use alternative fuels,**
- 28 billion US dollars **per year would be needed to decarbonise ships by 2050, and up** to 90 billion US dollars **to develop the infrastructure needed for 100% carbon-neutral fuels.**

(sources: UNCTAD, 'Technology and Innovation Report 2023'; Getting to Zero Coalition, 'A Strategy for the Transition to Zero-Emission Shipping', 2021)

DATA AND ENVIRONMENTAL REPORTS

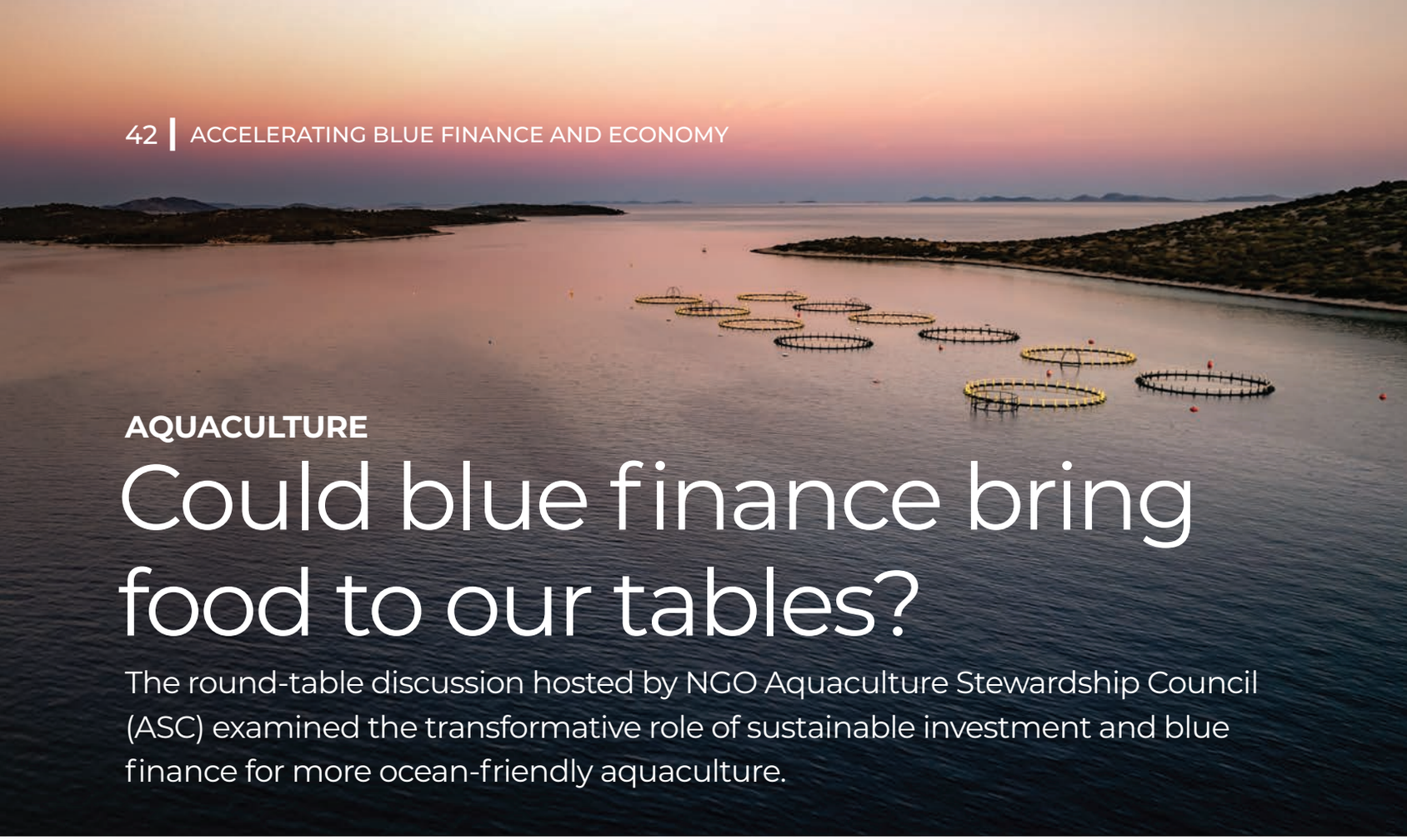
"Maritime companies will need to present strong data to prove their commitment to the transition and secure their financing", said Sylvain Pagès of AltfinPartners. Environmental reporting and scientific data collection are therefore key for the sector's green transition. According to Francis Vallat, Founder and Honorary President of the Cluster Maritime Français, *"There's no longer any choice: the ocean is under attack, poisoned and sick, and needs to be better understood if it is to be protected and then cured. Otherwise, humanity is doomed… Sentinels like SeaOrbiter are no longer just a possibility, they are a necessity"*.

This gathering of key cross-sector experts marked a first step in highlighting the importance of innovation, investment and environmental regulation in the maritime industry, and was one in a series of blue economy round-table events at Monaco Ocean Week. Organised to address the key challenge of decarbonising the maritime industry over the coming decade, the event showed the need for a multifaceted approach geared towards 2050. ■

MONACO'S SHIPPING COMMITMENT

"Monaco has had its own fleet of merchant ships and naval vessels dating back to the 12th century," noted Sébastien Knecht de Massy, President of the Monaco Chamber of Shipping, which has over forty members that between them manage over a thousand ships, including tankers, bulk carriers, cruise vessels and cable layers. *"It is evident that we must comply with the new European Carbon Tax legislation and that banks will not finance operations without a clear environmental strategy to reduce greenhouse gas emissions,"* he added.

Romain Ciarlet, Executive Director and Secretary General of the Prince Albert II of Monaco Foundation, advocated for an inclusive, global approach, entailing stringent regulations, fostering innovation and making substantial investments on a large scale: *"Shipping impacts ocean climate and biodiversity. Built on a commitment to preserve the global ocean, the Foundation can catalyse positive change through its philanthropic endeavours, impact investments and awareness actions, and thereby contribute to the transition towards a more environmentally responsible shipping industry."*



AQUACULTURE

Could blue finance bring food to our tables?

The round-table discussion hosted by NGO Aquaculture Stewardship Council (ASC) examined the transformative role of sustainable investment and blue finance for more ocean-friendly aquaculture.

With the *Blue Transformation Roadmap* of the United Nations Food and Agriculture Organisation (FAO) predicting a 35% increase in aquaculture production by 2030[3], the environmental impacts of this thriving industry could also intensify, worsening the triple planetary crisis we are facing. Could responsible aquaculture and blue foods have a key role to play in guaranteeing food security by 2050? The sector needs to be monitored and assessed to enable financiers to make efficient, sustainable blue investments. The findings of a recent study by the Certification and Ratings Collaboration (CRC) show that the data on the sustainability status of both farmed and ocean-harvested seafood are seriously lacking. Almost 45% of wild fisheries and 30% of the world's aquaculture producers are being assessed either insufficiently or not at all.

Without the necessary data or transparency, how can we have trust, instil a sense of responsibility and transform these industries in order to minimise or mitigate the impacts?

How can we develop blue finance in the sector when climate change-driven threats such as rising water temperatures are increasing? The round-table discussion held at the Oceanographic Museum of Monaco on 20 March 2024, moderated by Bertrand Charron, Global Director of Research & Insights at the Aquaculture Stewardship Council (ASC), welcomed panellists to share their views on these questions.

PROFILE

The Aquaculture Stewardship Council (ASC) is an NGO that runs the world's leading certification programme for sustainably and responsibly farmed seafood.

3. Report adopted at the close of the FAO Regional Conference for Asia and the Pacific, held in Colombo (Sri Lanka) in February 2024.

FINANCIAL MECHANISMS

The first session of the round-table focused on the financial mechanisms involved and the associated issues. Christian Lim, Managing Director of SWEN Capital Partners' Blue Ocean fund (a venture capital fund worth 170 million euros), outlined the role of blue finance in the transformation of aquaculture and fisheries, as well as the function of innovation and technology: *"Impact investments need banks and insurance funds at international level. We also need to join forces with corporate investors"*. Although sustainable blue investments are focused on specific areas of impact, they all subscribe to the general principle of not causing 'significant harm' and even having a positive impact on ocean health. The aquaculture sector *"is seeing growth; whereas it was non-existent five years ago, it now amounts to 1 billion euros"*, continued the panellist, drawing attention to the question of market returns for venture capital investments, which need to be based on *"three key characteristics, namely sustainability, product performance and competitive pricing"*.

TRANSPARENCY AND COLLABORATION

"We have a duty to be transparent and report on our company's social and environmental impacts", stressed Estelle Brennan, Head of Sustainability at Labeyrie Fine Foods. When asked about the role of civil society and the advantages of having a 'social permit' in order to operate, she replied: *"We need to value the social aspects more and not forget that behind the key performance indicators and data are people"*. Another guiding principle for companies and their partners is collaboration, which is essential throughout the value chain to ensure consistency in data collection so that the challenges of sustainability are fully understood.

BOLDNESS AND CIRCULARITY

"Countries like France are too dependent on imported seafoods. We need to ramp up domestic production. And there is no better time to support sustainable aquaculture", stated Jérémie Cognard, co-founder and CEO of Agriloops, following a highly engaging roadshow he undertook to raise millions of euros for his aquaponic farm. The entrepreneur has developed a patented technology based on in-depth lifecycle analysis to farm prawns without the use of antibiotics in a land-based facility, using up to 90% less water and recycling the wastewater as fertiliser to grow a variety of fruit and vegetable crops. This winning solution, based on transparency and process simplification, has won over sustainability-focused investors.

The panellists agreed that sustainable growth in blue finance is possible and that data and performance transparency is essential in order to instil confidence in the long term. Finally, solutions can only come from dialogue between all key stakeholders: innovators, financiers, businesses, NGOs, certification bodies and consumers. A world in which aquaculture plays a key role in providing food and social advantages while minimising negative impacts on the environment could be on the horizon. ■

"A verifiable track record and data are necessary to demonstrate why investing in sustainable aquaculture is an obvious choice."
***Christian Lim**, Managing Director of SWEN Capital Partners' Blue Ocean venture capital fund*

***Bertrand Charron**,*
Global Director of Research & Insights at the Aquaculture Stewardship Council (ASC)

CONSERVATION CHALLENGES AND OPPORTUNITIES

The transformative potential of blue philanthropy

Leading environmental philanthropists gathered in Monaco to share their experiences of ocean conservation and the lessons they have learned over the years.

What difficulties did they encounter and what lessons have they learned from supporting local projects of national importance?

What links exist between the public sector, private sector and civil society? How can we ensure conservation action has a lasting impact? These were the questions addressed by panellists during a round-table discussion in the meeting room at Monaco Yacht Club on 19 March 2024 – the first in a series of dialogues held with the aim of creating an international platform of philanthropy leaders committed to conservation.

A diverse group of stakeholders (representatives from philanthropic organisations, UN agencies and government bodies, industry leaders, civil society members and eminent academics) met to discuss their common goal of protecting the health and integrity of the ocean. Faced with the imminent threats posed by climate change, biodiversity loss and pollution, accelerating progress on international agreements has never been more urgent.

THE CONTEXT

According to the UNEP, conserving and protecting 30% of the ocean will cost between 9 and 12 billion dollars per year – 9 to 10 times more than current expenditure on marine protected areas worldwide. In this context, environmental philanthropy can act as a catalyst, not only in financial terms but by fostering partnerships that lead to national and international agreements on climate change and the environment, bringing us closer to achieving the targets set for protecting land and sea.

PHILANTHROPISTS LAY THEIR CARDS ON THE TABLE

HSH Prince Albert II of Monaco set the tone for the event in his call for action by stressing the vital role of ocean conservation in safeguarding the well-being of present and future generations. He hailed the important contribution of philanthropy to marine conservation and welcomed the IUCN's newest Patron of Nature, eminent Chilean conservationist Francisca Cortés Solari.

Next, Enric Sala, renowned National Geographic Society Explorer-in-Residence, provided valuable insight on the urgency of creating marine protected areas: *"These sanctuaries provide a vital refuge for marine life to flourish and ecosystems to recover"*, he commented, echoing the views of many environmentalists around the world.

Throughout the event, panellists engaged in detailed discussions about the challenges and opportunities facing philanthropic organisations and the private sector in their efforts to advance marine conservation. *"Environmental philanthropy is crucial for meeting marine conservation goals, not only in financial terms but for its ability to connect different worlds and take risks that other sectors cannot"*, explained Francisca Cortés Solari, Executive President of Philanthropy Cortés Solari and the MERI Foundation, illustrating the transformative potential of environmental philanthropy. She argued that catalysing change requires strategic partnerships and innovative approaches that can maximise impact and help achieve conservation targets.

COLLABORATIVE, COMPREHENSIVE APPROACHES

Mahir Aliyev, Regional Coordinator of the United Nations Environment Programme (UNEP), drew attention to the need for the different sectors to work together to tackle the triple planetary crisis of climate change, biodiversity loss and pollution. He described practical ways to leverage the unique strengths of philanthropy, government agencies, businesses and civil society to achieve significant progress.

Abdallah Mokssit, Secretary of the IPCC, highlighted the crucial link between science and policy in developing effective conservation strategies: *"It is important to have evidence-based decision-making and interdisciplinary cooperation to create global solutions to complex environmental challenges"*.

Daniela Picco, Executive Director of the MSC Foundation, shared her views on the power of networks and partnerships to accelerate progress towards climate and environmental agreements. Supporting local conservation initiatives of national importance and overcoming obstacles play a leading role in guaranteeing sustainable, long-term action. *"Business interest in sustainability and the potential of financial innovation can bring about positive change"*, commented Ramzi Issa, pioneering architect of the Environmental, Social and Governance (ESG) debt-swap market at UBS, offering a unique perspective on the private sector's role in promoting environmental management.

"Philanthropy is indispensable for fostering scalable solutions and implementing conservation measures more swiftly", said Susana Salvador, Executive Secretary at ACCOBAMS.

SCIENCE, THE CORNERSTONE OF PHILANTHROPY

Are we, as a society, equipped to achieve sufficient levels of cooperation and cross-sectoral effort? Science can support philanthropy by providing the means to align stakeholders around common, consensual solutions based on scientific evidence.
Moncef Ziani, from the Union of Economic and Social Councils and Similar Institutions of Africa, drew attention to the urgent need for conservation action in Africa and called for effective mechanisms to monitor and evaluate the impact of philanthropic initiatives and guarantee their long-term performance.
"Only through concerted action can we solve the interconnected challenges facing our planet", commented Assunção Cristas, Portugal's former Minister of Agriculture and the Sea. She emphasised the role of philanthropy and the private sector in driving transformative change via a multi-dimensional approach to conservation.
At the end of the session, Minna Epps, Director of the IUCN Global Marine and Polar Programme, spoke of the funding challenges facing the new BBNJ Agreement.

The event highlighted the need to continue growing blue philanthropy, fostering collaboration and taking action. Organisations, philanthropic entities and stakeholders across all sectors were invited to join the global effort to protect the ocean for generations to come. ■

INSIGHT

"It is essential we work together to mobilise resources and advance marine conservation goals. Scientific research and approaches based on precise data play a crucial role in shaping decision-making."
***Minna Epps**, Director of the IUCN Global Marine and Polar Programme*

EXPLORATION AND YACHTING

The spirit of adventure at the 13th Environmental Symposium

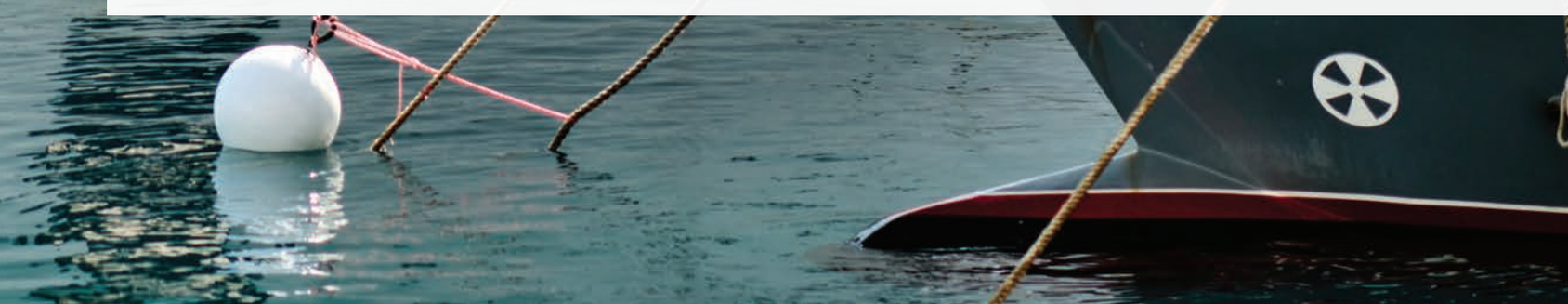
Held in partnership with The Explorers Club of New York under the banner 'A Day of Exploration', Monaco's 13th Environmental Symposium welcomed around 150 land and sea explorers from the United States for the first time.

ACROSS THE WATER

On Thursday 21 March 2024, Monaco Yacht Club (YCM) teamed up with The Explorers Club to host a one-day symposium devoted to exploration, which concluded with the 4th YCM Explorer Awards by La Belle Classe Superyachts. A tailored programme was curated for the large American delegation, including a J/70 one-design sailboat regatta; sailing YCM's flagship, the 15-meter JI *Tuiga* (1909); the inauguration of the first Explorer Dock attended by YCM General Secretary, Bernard d'Alessandri, and The Explorers Club Executive Director, William Roseman; visiting a fleet of seven explorer yachts in the YMC Marina; and the christening ceremony of M/Y *King Benji* (46 meters).

UNITED BY EXPLORATION

Several offshore racing personalities joined the busy, sea-focused day, including Jean-Pierre Dick and Boris Herrmann, skipper of IMOCA *Malizia-Seaexplorer*, who is taking part in the next Vendée Globe. *"It's important to have them here, because we need to know more about the ocean. These ambassadors help raise awareness and deepen our understanding of the marine environment,"* said Bernard d'Alessandri, YCM General Secretary, in his opening address at the La Belle Classe Superyachts Environmental Symposium, which welcomed around 15 renowned explorers to the stage. *"The Club shares a rich history with Monaco,"* began Richard Garriott, President of The Explorers Club of New York, whose Board of Directors HSH Prince Albert II of Monaco is a member of. *"Following on from Prince Albert I, several generations of Grimaldis have belonged to this Club, carried its flag in the field during expeditions and won its highest distinctions. Some of our members have walked on the moon and reached the summit of Mount Everest, but our roots are firmly anchored in the ocean."*



HSH Prince Albert II of Monaco surrounded by Bertrand Piccard and Mike Horn. In the foreground Bernard d'Alessandri and Olivier Wenden.

A collaboration agreement was signed between the Prince Albert II of Monaco Foundation and the Yacht Club of Monaco around the Monaco Energy Boat Challenge to launch a competition open to universities around the world rewarding, on July 6, 2024, the best technological solution applicable to yachting combining energy efficiency and carbon reduction .

UNWAVERING COMMITMENT

"To be a good explorer, you have to be humble," said American Victor Vescovo, the first person to have reached the deepest points of the world's oceans, as his opening remark. Among the explorers present were Josh Gates, Barry Clifford, Carl Allen, Captain Maiwenn Beadle, Nico Vincent and artist James Prosek. Many of them have demonstrated unwavering commitment to their craft – not least Emmanuelle and Ghislain Bardout, the couple behind the Under The Pole expedition programme. *"We sold everything we owned to buy our expedition boat."* The aim being to reveal the underwater world to the public, improve their own understanding of the ocean and above all alert people to the urgent need to protect it. *"Fishing is one of the biggest threats,"* noted Rachel Graham, who works with traditional fishers and sector partners in several tropical countries to identify and implement win-win solutions that balance the well-being of coastal communities with the sustainable use of resources and the conservation of endangered marine wildlife and their essential habitats. Liaising with local communities is key, explained Tommy Allen, whose work revolves around building new types of boats: *"No matter what we work on or what we find, too often we forget the human factor. The Indigenous populations I meet embody ecology, they are the environment."*

KNOWLEDGE, THE KEY TO PROTECTION

According to Nina Jensen, CEO of REV Ocean, the largest research expedition vessel (REV) currently under construction, which will be available for scientists, NGOs, policy-makers, innovators, engineers and stakeholders in the maritime sector, *"less than 10% of the oceans have been explored. The idea with this boat is to save life in the oceans and it's not just about the boat, but also the people on board."*

Many of the speakers have made rare discoveries, either at sea or in space. *"We collected a large number of samples that enabled us to discover the chemical composition of certain rocks on Mars,"* said Nina Lanza, Team Lead for Space and Planetary Exploration at Los Alamos National Laboratory. Explorers share with scientists the ability to observe, analyse and listen to the nature around them, as Michel André, bioacoustician at the Technical University of Catalonia BarcelonaTech, explained.

Dealing with the unknown is a constant in exploration: *"Panic paralyses, but fear is a thermometer that keeps you alert,"* said legendary American astronaut Kathy Sullivan. *"Exploration is not just about going into the unknown, it is also about exploring a better quality of life. The impossible must be achieved. Every time we have a choice to make, let's go into the unknown,"* declared Bertrand Piccard, who this year is celebrating the 25th anniversary of his non-stop round-the-world balloon flight and is now a champion of innovation. ■

THE 4TH *YCM EXPLORER AWARDS*

BY LA BELLE CLASSE SUPERYACHTS 2024

The Symposium concluded with the award ceremony that since 2019 has been recognising shipowners for their outstanding efforts to protect the marine environment, through both their yacht design and sailing. This year saw four winners with a focus on innovation, science and discovery, adventure and environmental ethics. Awarded by a jury of professionals, the prizes were presented by HSH Prince Albert II of Monaco, President of Monaco Yacht Club, alongside Richard Wiese, President Emeritus of The Explorers Club, Mike Horn and Bertrand Piccard. *"They are acutely aware of the environment and are playing, and will play, a crucial role in marine exploration by providing invaluable support to scientists and local communities,"* commented the Sovereign Prince.

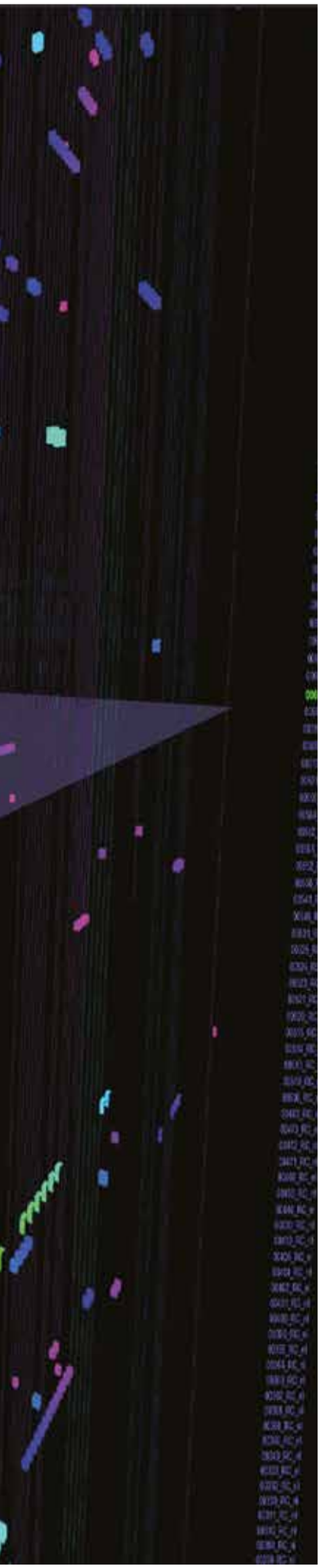
1. ***S/Y CACHALOTE*** (26 m) was the winner of the Technology & Innovation category. The yacht was also awarded a 4-star SEA Index® rating. Launched in 2020 by YCM and Crédit Suisse, this reference has become the benchmark for measuring the CO_2 emissions of pleasure craft, supporting shipowners who are committed to more sustainable yachting.

2. ***M/Y ARCHIMEDES*** (68 m) won the Science & Discovery Award.

3. ***M/Y GIGI*** (49 m) was the winner of the Adventure & Environmental Ethics category.

4. The Judges' Favourite Award this year went to ***M/V LATITUDE*** (47 m).

Project for a station to capture CO2 from the sea using electrodialysis technology (Captura)
© Courtesy of Chenqxiang Ciang/Captura



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SUPPORTING INNOVATION

OCEAN INNOVATORS PLATFORM

Catalysing innovation

The 6th Ocean Innovators Platform, organised by the Prince Albert II of Monaco Foundation, returned to promote a new slate of innovative solutions for a sustainable and regenerative blue economy. A highlight of Monaco Ocean Week 2024.

Is ours an age of crisis or opportunity? Innovators are reframing the narrative and working actively to conjure up a more ocean-positive, sustainable and inclusive world that values humans and non-humans alike.
A dynamic group of entrepreneurs, investors and major stakeholders from around the world gathered at Monaco Yacht Club on 20 March 2024 to discover the cutting-edge technologies and innovative solutions and approaches showcased at the Ocean Innovators Platform.

This year's event highlighted themes like combatting plastic pollution, improving aquaculture practices, effectively managing marine protected areas, and ocean exploration. Boasting a high turnout, the platform also fostered collaboration among this new breed of stakeholder, whose sights are set on developing a sustainable, resilient even, blue economy.

"We need innovation in order to change mindsets. If we fail, let's be humble enough and say we failed. That's what innovation is all about. We need to accelerate and scale up this transition", stressed Olivier Wenden, Vice-President and CEO of the Prince Albert II of Monaco Foundation, in his opening speech.

"Entrepreneurship and investment are converging. We must invest responsibly if we want to make a positive impact on the world", added Gérald Mathieu, head of Barclays Private Bank, Europe & Middle East and CEO of Barclays Monaco.

STEM THE FLOW OF PLASTIC FOR A CLEANER FUTURE

Given the severity of plastic pollution, limiting it before it reaches our oceans seems the most effective way of tackling this urgent environmental issue. Some of the most promising innovators in the field presented initiatives like alternative materials, waste-collection systems and digital apps during the panel discussion and in the exhibition area. Solutions like these promise to have a significant, wide-reaching impact on the marine environment and local communities.

"We need to strike a balance between a material's performance, its price, which can be kept reasonable by reusing existing raw materials, and its recyclability. We need to persevere. Bringing about a paradigm shift in the industry takes time, often an entire decade", explained Billy McCall, CEO and co-founder of Kintra Fibers. The company hopes to seamlessly transition the textile industry with its new synthetic fibre that is 100% bio-based, biodegradable and produced on the same equipment as standard polyester.

Given that rivers are the main source of ocean plastic pollution, SEADS, a start-up created in Jakarta in 2018 and since relocated to Europe, has developed innovative waste-collection systems known as 'blue barriers' that can be installed in rivers to effectively intercept macro- and micro-waste before it reaches the ocean. *"This solution fits into the local, circular economy and could generate plastic credits"*, said Fabio Dalmonte, Founder and Managing Director of SEADS, who hopes to expand into Asia.

"We want to build a system where there is coordination between government, local communities and recycling centres. Our mobile app ensures this coordination between all these parties", explained Tayba Hatimy, Co-founder and Executive Director of Baus Taka Enterprise, who has developed a smart digital system for sustainable, high-quality waste management solutions. The app was launched in Mombasa County in 2021 and the company is now ready to expand to other areas of Kenya following a highly successful digital campaign: *"We are having an exponential impact on local communities and the fight against plastic waste. We work closely with women and girls, who accumulate points to become eco-champions."*

SPOTLIGHT

CARBIOS: LEADING THE WAY IN PLASTIC CIRCULARITY

Emmanuel Ladent, CEO of Carbios, reflected on the journey of this French biotech company founded in 2011, which has developed the world's first industrial-scale biorecycling process. Inspired by nature, Carbios specialises in designing and developing enzyme-based processes to break down plastics. Despite the challenging road from research to industrial process, Carbios is currently constructing a biorecycling plant in Longlaville, a success story hailed by the French president, Emmanuel Macron.

"Depolymerisation of plastics using enzymes is really the future of recycling. And we are the only company in the world to master this technology. Thanks to several years of R&D to optimise our enzymes, we can now depolymerise 95% of waste in 24 hours. The enzyme-based technology developed by Carbios will offer new competitive environmental solutions for a circular approach to managing the lifecycle of plastics and textiles.
We really had to prove our technology before going industrial. L'Oréal investing in Carbios was the first big step; then other brands and investors followed suit. It's a long journey for investors, but this technology has a long future. In 2024 we'll sell the first licences for our technology to industrial firms, who can then build and run their own plants."

POWERING PROGRESS IN AQUACULTURE THROUGH TECHNOLOGY

With over 50% of the world's seafood now sourced from aquaculture, this rapidly growing sector plays a pivotal role in global food security by supporting livelihoods and alleviating the pressure on wild fish stocks. But as the industry expands, it creates pollution and threatens resources. The urgent need to adopt a regenerative approach to aquaculture is no longer in any doubt.

The fourth panel of the day saw experts explore innovative solutions that not only minimise the environmental impact of aquaculture but, in the words of Christo du Plessis, CEO of aquaculture firm Matorka, *"also enhance productivity and resilience in the industry"*. He presented his company's pioneering land-based fish farm in Grindavík, Iceland, where production of Arctic char (a freshwater fish native to the region) is fully integrated with the natural ecosystem and self-sustaining. It aims to become carbon neutral thanks to clean geothermal electricity and carefully controlled sustainable diets for the fish.

Sven Jørund Kolstø, CEO of OptoScale, presented the connected technology developed by his company to offer real-time measurements of fish weight and health status, equipping salmon producers with the tools they need to guarantee fish welfare, reduce costs, lower their environmental footprint and optimise operations. *"Entrepreneurs must create sustainable businesses to attract investment without regret"*, concluded the panellist. This view was echoed by Alessandro Romano, CEO of Ittinsect, who described his company's journey from developing a sustainable, high performance aquaculture feed by extracting proteins from novel raw ingredients (insects, microalgae and agricultural by-products) to seeing the first fish fed on his product come to market: *"The blue economy is a virtuous circle at every level, from production to sales, and supermarkets are an important link in the chain for investors."*

INSIGHT

"To ensure that strategic investments guide the transition to a blue economy, the idea is to innovate hand in hand, build partnerships, harness science and cultivate transparency so that we can invest in this industry sustainably. According to the UN Food and Agriculture Organization (FAO), aquatic food production will continue to grow and is projected to increase by 15% by 2030. Ensuring that aquaculture production is sustainable from an environmental, social and economic point of view, while minimising its impact on ecosystems, guaranteeing social equality and adapting to the consequences of climate change is an enormous challenge and we must make sure it's done right, through blue investments."

Stéphanie Rakels
Chief Development Officer at AquaSpark

Finally, Robin Millington, Founder and CEO of Planet Tracker, a non-profit, sustainable finance think tank, warned that *"we need huge investment to transition to a regenerative aquaculture system, but this is a longer-term play. It may not be profit tomorrow; it may not be profit this month. But if we don't start this transition, we're not going to be where we need to be in time to meet the needs of the growing population."* She then voiced a crucial question: *"What is the risk of inaction? With the investment community, if you're just doing a pure play on finance, you're not asking yourself that question. We need to model that risk."*

"*There's been a rapid increase in the amount of capital invested in climate-friendly blue feeds in the last 10 years and huge growth in the number of companies entering the aquaculture sector more widely*", said Aly Rose, Ocean Lead at CREO Syndicate, a non-profit organisation working with over 200 global investors to catalyse capital into climate and sustainability solutions for the transition to decarbonisation. Understanding the impacts of (over)fishing is undoubtedly driving investor interest in the sector.

"High quality bathymetry is indispensable to understand ocean phenomena, from the response to oil spills to sustainable management of fisheries, and to improve the safety of navigation. Saildrone's technology, which uses uncrewed surface vehicles, is set to become a gold standard, helping us meet our collective goals to map the oceans in a way that is affordable and respects the environment."

***Brian Connon**, Vice-President of Ocean Mapping at Saildrone*

"Change takes time. Although Capricorn has been in the business for 20 years and 'only' has 40 partners, they are all sincerely motivated to make a real change towards sustainability and understand that patience is golden."

***Jérôme de Bontin**, former Chairman of AS Monaco football club and Partner at Capricorn Investment Group*

LEVERAGING ADVANCED TECHNOLOGIES FOR EFFECTIVE, COST-EFFICIENT MANAGEMENT OF MARINE PROTECTED AREAS

Creating more marine protected areas (MPAs) is crucial if we are to meet the ambitious target of protecting 30% of land and seas by 2030. But managing MPAs effectively is a huge challenge, with many remaining nothing more than 'paper parks'. From state-of-the-art monitoring systems to data-based conservation strategies, companies are offering cutting-edge solutions to overcome these obstacles, reshaping the landscape of marine conservation and ensuring the long-term sustainability of our oceans.

DATA COLLECTION:

"We're blind underwater, but now thanks to the development of innovative terrestrial and submarine monitoring systems that integrate sensor and robotics networks – a sort of 'underwater internet' – we can imagine transforming marine big data into a cloud, allowing us to access information in real time", explained Chiara Petrioli, CEO of WSense, a deep tech company founded at Sapienza University in Rome, where Petrioli is Professor in the Department of Computer, Control and Management Engineering.

"The idea is to develop a fleet of surface vessels to increase monitoring, protection and data collection in marine areas, and on a large scale", said Neil Tinmouth, Co-founder and CEO of ACUA Ocean, which focuses on scalable technologies.

Nick Wise, CEO and Founder of OceanMind, described how this non-profit organisation helps authorities enforce maritime regulations more effectively and supports intelligence-led, risk-based law enforcement through satellite surveillance, training and knowledge transfer.

INVESTMENT:

"Investing in marine protected areas is essential – a nature-based solution that benefits local community members first and foremost", advised Anna Draganova, Director of Pollination, an investment and advisory firm specialising in climate change, who also noted an increase in the issuance of blue bonds.

"Your technologies are really key as we need to improve MPA monitoring, which can be quite expensive, to create better MPAs that protect biodiversity and fish stocks, and support carbon sinks", explained Romain Renoux, Executive Director of The MedFund, a financial mechanism that now supports 20 MPAs in 9 Mediterranean countries and connects investors, scientists and conservation stakeholders.

At the final panel of this day dedicated to innovation, speakers concluded that the solution lies in collectivism, in innovation that fertilises action, and perhaps more diverse action, as illustrated by the ocean-impact accelerators present, such as OceanHub Africa and the Solar Impulse Foundation, whose representative, Pierre Vigor, noted that *"we're still using technologies from the past, but we need ones designed for the future"*. Stephen Murphy, Founder of ClimateImpact, stressed the power of storytelling: *"We need to elevate the voice of innovators, engineers and entrepreneurs advocating for the climate. And don't forget that innovation comes from entrepreneurs, not big companies. So we need to connect entrepreneurs with investors."* This view was echoed by Daniela Fernandez, Founder of Sustainable Ocean Alliance, who underlined the *"importance of this close connection between finance and innovation"*, a critical ingredient for the world of tomorrow. ■

CUTTING-EDGE RESEARCH

Ocean-based solutions to abate climate change

The ocean, which covers 70% of the Earth's surface, is suffering from acidification, seawater warming and oxygen loss, but could it also play a vital role in climate change mitigation? Experts were invited to share their views on the thorny subject of marine carbon dioxide removal at an event held at Monaco Yacht Club on 19 March 2024, hosted by OACIS, a Prince Albert II of Monaco Foundation initiative. This half-day meeting delved into the latest research on the subject. The first panel explored the nature-based solution of protecting and restoring blue carbon ecosystems, while the second panel looked at ocean alkalinity enhancement, an emerging technological solution in which alkaline substances are added to seawater to enhance its ability to absorb carbon. In the face of concerns about the feasibility, transparency and ethics of such approaches, experts from the worlds of science, economics, conservation, politics and business debated their potential advantages and disadvantages.

Mangrove being restored in Xiamen (China)
© Jean-Pierre Gattuso (CNRS)

THE CONTEXT

The ocean absorbs a quarter of all human-induced CO_2 (26 million tonnes a day). As CO_2 dissolves in seawater it lowers the pH, increasing the acidity and decreasing the number of carbonate ions, the essential building blocks used by marine plants and animals to construct their skeletons, shells and other calcareous structures. There has been a 30% rise in ocean acidity in the past 250 years and the phenomenon is continuing to grow.

OACIS

Ocean Acidification and other ocean Changes – Impacts and Solutions (OACIS) is an association launched by the Prince Albert II of Monaco Foundation in 2013. It helps coordinate and support research to improve understanding of the biological and environmental impacts of ocean acidification and other climate stressors. It also fosters research into ocean-based solutions like alkalinity enhancement to inform policy-making. The scientific community, including IPCC researchers, will directly benefit from the research supported by OACIS.

INTER
VIEW

Jean-Pierre Gattuso

CNRS Senior Research Scientist at Villefranche Oceanography Laboratory, an elected member of the European Academy of Sciences and co-author of several IPCC reports. He also edited and co-authored the 'Guide to Best Practices in Ocean Alkalinity Enhancement Research', published during COP 28 in Dubai in November 2023.

Ocean alkalinity enhancement seems to be gaining ground. Is it a type of geoengineering?

Some people class it as geoengineering; others limit that term to solar radiation modification. Don't forget that we've been doing what can be described as geoengineering since the Industrial Revolution: we take fossil carbon out of the earth and put it into the atmosphere, totally deregulating our climate. We're conducting a geoengineering experiment on a planetary scale.

The effectiveness of alkalinity enhancement remains unproven, but it involves adding an antacid to seawater for two reasons: to counteract acidification and boost the ocean's capacity to absorb CO_2 without increasing its acidity. It speeds up the natural process that sequesters CO_2 away from the atmosphere for 8,000 to 10,000 years. That process is reproduced by dissolving an alkaline substance, such as limestone or olivine, into seawater to enable it to store large quantities of CO_2 long term and in a chemically neutral form.

These alkaline substances can be added in the form of mineral powders extracted from rocks and shipped to targeted areas of the ocean. They can also be added as liquids (sodium carbonate, sodium hydroxide or magnesium hydroxide), discharged either off the coast or further out at sea from a boat.

Are certain areas of the ocean better suited to this solution?

Ideally, the water being enriched with these alkaline materials should stay on the surface as long as possible to give the ocean time to absorb CO_2 from the atmosphere and store it in a chemically neutral form. If alkaline materials are added in an area where the surface water immediately sinks deep into the ocean, it won't be in contact with the atmosphere and will be unable to absorb CO_2. So the area needs to be carefully chosen.

Have studies been conducted to assess the impact on marine ecosystems?

There's a lot of uncertainty around the carbon footprint of this solution and the impact of introducing huge quantities of alkaline materials on marine organisms and ecosystems. At the moment impact studies are conducted in the laboratory, sometimes using so-called 'mesocosms', essentially tanks placed on the ground or giant test tubes deployed in the ocean. So far no negative impacts have been found, but the first papers on the consequences for marine life were published in 2023. It's too early to draw conclusions.

And unfortunately not enough laboratories are investigating the subject. There are no research programmes in France, for example, just one in Germany and several in America. Many more start-ups have entered the field, attracted by the prospect of selling carbon credits, and are studying and developing solutions. Scientists are a little concerned that research is lagging behind private industry, when it should be the other way around! We should first establish that these solutions actually work and don't harm living organisms before moving on to trials and large-scale implementation. But there is no supervision at all. It's almost the Wild West.

If a start-up was ready tomorrow, could it launch an initiative?

Yes. There's one called Running Tide, which has received a permit from the Icelandic government to run its operations there.

You oversaw the publication of the 'Guide to Best Practices in Ocean Alkalinity Enhancement Research'. What are its main recommendations?

The guide[4] underlines the need for proper controls and full transparency when conducting experiments and publishing data, just as we do in the research world. The problem is that companies are under no obligation to do so. Private industry is less transparent.

Are other ocean-based solutions to climate mitigation emerging?

I wholeheartedly support restoring blue carbon ecosystems, which is risk-free. We called them "no-regret measures" in an assessment published in 2018, meaning that even if they make a minimal contribution to climate mitigation, there's no doubt their many other benefits (such as protecting biodiversity and preventing coastal erosion) make them absolutely essential to carry out.

As for technological processes like alkalinity enhancement and ocean fertilisation to stimulate photosynthesis, I don't endorse any. I endorse research. That's why we published a guide to best practices last year, to promote best practices in research, not implementation.

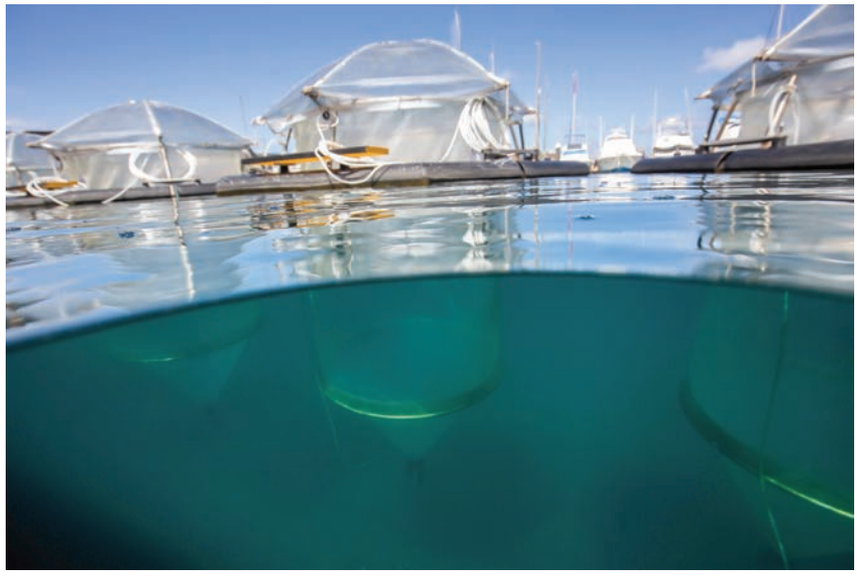
Reducing carbon emissions is incredibly hard. Many people are trying to find technological solutions. Some companies are banking heavily on carbon capture and storage so they can continue using fossil fuels. But even if ocean-based solutions exist, are found to be effective and have no major impacts, we will still need to reduce carbon emissions. We currently emit 40 billion tonnes of CO_2 each year. At best, and this echoes IPCC recommendations, technological solutions will be able to store between 1 and 10 billion tonnes of carbon dioxide annually from 2050.

Is there greater consensus about protecting and restoring blue carbon ecosystems?

Experts at Monaco Ocean Week all agreed on the benefits and absence of risk associated with blue carbon. Discussions with the audience showed that local authorities are keen to take action and are searching for the best solution, particularly when it comes to restoring Posidonia meadows. Nature-based solutions raise the question of funding models, with many philanthropic organisations now supporting the restoration of these marine ecosystems.

The problem is that blue carbon ecosystems, just like forests, can disappear. A Posidonia meadow can be destroyed, for example, or a mangrove forest cut down to make way for shrimp farms, releasing additional carbon into the atmosphere. So we must be cautious about delivering carbon credits. In 2015 there was a mass dieback of mangroves in Queensland, north-eastern Australia, when an El Niño event caused sea levels to drop for several weeks, depriving the trees of water. Some 40 million trees died. Imagine if that had been a restored mangrove. We would have sold carbon credits when in reality carbon had been released back into the atmosphere. ■

4. A Oschlies, A Stevenson, L T Bach, K Fennel, R E M Rickaby, T Satterfield, R Webb and J-P Gattuso (eds), 'Guide to Best Practices in Ocean Alkalinity Enhancement Research', Copernicus Publications, State of the Planet, 2023.



Mesocosms used by GEOMAR researchers to study the effects of alkalinisation on plankton. © Michael Sswat, GEOMAR Helmholtz Centre for Ocean Research Kiel

SCIENCE 3.0

Is a new vision of the ocean in sight?

Experts explored using digital technology such as 3D visualisation to transform scientific research during a workshop at Monaco Ocean Week.

Incorporating advances in technology into scientific research has led to an explosion in oceanographic data. The challenge now is interpreting it. With that in mind, the Mediterranean Science Commission (CIESM), the International Hydrographic Organization (IHO) and Monaco Scientific Centre invited international experts to a workshop on 3D data-processing tools and their role in facilitating the interpretation of scientific data, held from 19 to 21 March 2024 as part of Monaco Ocean Week. Creating 3D maps and high-resolution marine data visualisations are just some of the possibilities open to researchers, who are increasingly hopeful of capturing the ocean in all its complexity. Could this be the dawn of a new understanding of this cryptic environment?

The CIESM and Monaco Scientific Centre signed a framework agreement during the event to strengthen cooperation between the two marine research institutions.

Below Laura Giuliano, Director General of the CIESM alongside Patrick Rampal, President of the Monaco Scientific Centre.

FROM VIDEO GAMES TO SCIENTIFIC MODELLING

These digital tools that borrow from video game design have already gained attention in the medical imaging sector and are beginning to inspire researchers in ocean science fields such as geology and physical oceanography. New technologies like this could overcome the limitations of mathematical models, whose ability to simulate ocean environments using scientific data is often limited by the vast range of spatio-temporal scales and variables that are more or less interlinked.

EXPLORING EXTREME ENVIRONMENTS

Keen to expand their knowledge, researchers at the CIESM, IHO and Monaco Scientific Centre ventured deep into the most incomplete, therefore least explored, oceanographic datasets, which nonetheless hold clues to the origins and limits of life. This data was collected at deep-sea mineral-microbe interfaces, where microscopic living organisms interact with minerals on and below the ocean floor. These interfaces are particularly enlightening in so-called 'extreme' environments, which are affected by ocean floor tectonics and hostile to most known lifeforms. There, micro-organisms transform mineral matter, meticulously shaping the Earth's surface and contributing to biogeochemical cycles that make life on our planet possible.
But the study of these geo-microbiological processes in extreme environments is still in its infancy. Scientific data is beginning to emerge, but it is often patchy and obscure. Harnessing 3D visualisation software could help fill the gaps and advance our knowledge.

TOWARDS A NEW UNDERSTANDING OF LIFE?

The three-day workshop was attended by around 20 researchers from 8 countries working in a variety of fields, including microbiology, molecular biology, (bio) geochemistry, bioinformatics, geomorphology and law. Their wide-ranging discussions centred on defining mineral-microbe interfaces, choosing key parameters and which digital modelling and visualisation tools could provide a detailed picture of these marine environments by filling the missing data gaps.

The conclusions reached during this extended round-table workshop are encouraging. Researchers left with a blueprint for developing the new 'video game' that will help them visualise the secret world of microbes in extreme ocean environments. The workshop concluded with the hope of improving knowledge about microbial processes in these hostile environments. This could change our understanding of how life first appeared on Earth, provide clues to the existence of life on other planets and advance knowledge in biotechnology, which uses micro-organisms to perform chemical transformations. ■

INSIGHT

"Competitive data analytics are based on the best IT technologies, but only data science pipelines can bring reliable insights."
***Laura Giuliano**, Director General of the CIESM*

RISING WATERS

Is coastal resilience within our grasp?

The Sea'ties initiative and its partners hosted a session at Monaco Ocean Week addressing the urgent issue of adapting coastal cities to rising sea levels – a crucial subject for this Mediterranean event.

Members of the Ocean & Climate Platform's Sea'ties initiative gathered alongside representatives from Entreprises pour l'Environnement, the Stimson Center and the UN Global Compact Ocean Stewardship Coalition at the Novotel on 20 March 2024 to address the alarming prospect of rising sea levels.

According to a report by the Intergovernmental Panel on Climate Change (IPCC), the increase has accelerated over the 20th century and sea levels could rise by more than one meter by 2100 unless there is a drastic cut in greenhouse gas emissions. Without immediate, appropriate action this global phenomenon will trigger permanent land loss, floods, coastal erosion and extreme weather events, potentially putting the health, safety and livelihoods of coastal communities at risk, threatening critical infrastructure and causing significant economic disruption. This high-level event on an environmental and social issue of global significance highlighted the need for a coordinated response involving all stakeholders, including the private sector.

COASTAL CITIES ON THE FRONTLINE

How can coastal regions be redesigned to cope with rising sea levels? There is no longer any doubt about the urgent need to adapt coastal cities to withstand the current and future impacts of sea level rise. Panellists called for increased cooperation between sectors and for innovative solutions. Despite the progress in climate change mitigation, coastal regions still have a long way to go in adapting effectively: business and regulatory incentives are weak, funding is insufficient and there is little coordination between stakeholders. Local authorities face incredibly complex, long-term challenges.

The panel discussion at Monaco Ocean Week acted as a forum where leaders from various coastal cities around the world could share their experiences. First to take the floor was Tyller Williamson, Mayor of Monterey, California, who admitted that *"we need to start some difficult, uncomfortable conversations with our communities in order to meet their needs and reduce inequality."* This view was echoed by Burcu Kanbal, Project Manager at Kusadasi City Hall, who warned that *"rising sea levels don't respect borders. We need to work with our neighbours and peers to adapt"*. Mathieu Kayser, Deputy Mayor of Biarritz, followed, stressing the need to build capacity, secure targeted funding and foster international cooperation. As the event progressed, it became clear that community engagement and environmental justice are essential if cities are to successfully adapt, highlighting the need for educational activities to overcome local resistance to the necessary measures.

Photo: Güvercinada Island, near Kusadasi city center of Kusadasi, was opened to visitors in 2013 following restoration and landscaping work carried out by the municipality.

PRIVATE SECTOR INVOLVEMENT

Industry is already investing in research and development to deal with the impacts of sea level rise on infrastructure. *"We must balance short-term industrial imperatives and activities with long-term future-proofing"*, warned Frédéric Busin, Regional Manager for Provence-Alpes-Côte d'Azur at EDF (French energy provider). Initiatives like ADAPT, he argued, which aim to equip nuclear power plants to withstand coastal hazards and other impacts of climate change, can boost resilience in critical sectors through systemic approaches. If concrete local strategies are to emerge, there must be a collaborative exchange of knowledge on local climate services, data and models developed by the private sector and research institutes.

For insurance companies, understanding and mitigating risk through improved spatial planning is essential. *"Curbing pollution, uncontrolled coastal urbanisation and destructive practices will help keep ecosystems healthy, enabling them to boost coastal resilience"*, declared Aurélie Fallon Saint-Lo, Head of P&C Underwriting and Business Strategy for Climate and Sustainability at the AXA Group. She pointed out that many homes around the world are not insured against coastal risks. Initiatives like Altitude by AXA Climate and Ma Commune en Action can help address this situation. It is important to note that marine and coastal ecosystems form a first line of defence and must be protected. With this in mind, AXA XL is working to reduce pollution and maintain the Good Environmental Status (GES) of marine ecosystems through its partnerships with the Centre for Documentation, Research and Experimentation on Accidental Water Pollution (CEDRE). AXA Climate, for its part, is developing parametric solutions to protect mangroves and coral reefs.

OVERCOMING OBSTACLES

Laurent Nauche, Managing Director of the Civil Engineering France Division at Vinci Construction, added that efforts to adapt to sea level rise face many obstacles, such as public opposition to certain measures, financial constraints and regulatory hurdles. He called for regulations to be modernised to adequately reflect the increased frequency and severity of extreme weather events to enable the development of ambitious adaptation strategies.

Lina Hansson, Initiatives Coordinator and Co-Secretary for the Monaco Blue Initiative at the Prince Albert II of Monaco Foundation, concluded the event by encouraging those present to continue seeking systemic solutions to the issue and inviting them to reconvene in 2025 at the third UN Ocean Conference and the Blue Economy and Finance Forum, due to be held in Monaco. ■

IN FIGURES

- **The global sea level has risen 25 cm since 1900,**
- **Sea level rise is accelerating and set to reach 60 to 110 cm by 2100, or double the previous rate,**
- **One billion people will be vulnerable to coastal risks by 2050,**
  Source: IPCC Special Report on the Ocean and Cryosphere (2019)
- **Without radical, progressive adaptation measures, coastal flooding could cause direct annual losses amounting to between 0.3 and 9.3% of world GDP by 2100.**
  Source: Jochen Hinkel et al, 'Coastal Flood Damage and Adaptation Costs Under 21st Century Sea-level Rise', Proceedings of the National Academy of Sciences 111 (2014): 3292–3297.

SMART YACHT

Moving towards intelligent, connected yachting

The second edition of Monaco Smart Yacht Rendezvous aimed to showcase the sustainable solutions and new technologies on offer to an industry increasingly focused on the life cycle of its yachts. This networking event was part of a dedicated yachting day at Monaco Ocean Week, held under the banner 'Monaco, Capital of Advanced Yachting'.

On 21 and 22 March 2024, Monaco Yacht Club hosted the latest edition of Monaco Smart Yacht Rendezvous, a forum for innovators to showcase their creations, supported by the Prince Albert II of Monaco Foundation and prestigious partners including UBS, Sindalah, Wider Yachts and superyacht refit yard MB92.

This event organised by M3 (Monaco Marina Management) brings together the entire yachting ecosystem, including shipyards, designers and innovators. It aims to facilitate the energy transition and promote sustainable solutions in an industry undergoing rapid change. *"Sailing towards a sustainable horizon in the yachting industry requires not only wind and sails, but also innovation and collective commitment, from design to disassembly"*, declared José Marco Casellini, CEO of Monaco Marina Management (M3), in his opening speech.

INNOVATORS AT THE READY

From a traction kite designed by Yves Parlier at his start-up Beyond the Sea to an AI-powered VR headset developed by Coreod Space, innovative solutions are flourishing. Fifty start-ups and scale-ups made it through the selection process to exhibit at this annual event and be featured in its e-catalogue. Their innovations had been examined by an international jury with expertise covering every aspect of the yacht's life cycle, from R&D through to construction, use and disassembly.

Guillaume Perben co-founder and CEO of Composite Recycling in discussion with the explorer Mike Horn.

"All those involved in the industry must be at the forefront of technological progress in order to make the shipping world more sustainable", stated Bernard d'Alessandri, General Secretary of Monaco Yacht Club, who called for an industry-wide commitment. As explorer Mike Horn summed up after viewing the innovations on show, *"we need start-ups, we need ideas, we need the young generation to change the mistakes of the past."*

A PRODUCTIVE NETWORKING SESSION

This two-day event provided a new opportunity for key industry players to interact and form fruitful partnerships. Participants shared their expertise at workshops dedicated to imagining the smart yacht of tomorrow. The solutions and technologies discussed at these Smart Think Tank sessions will be compiled in an open-source report published in May. It is hoped they will help innovators come up with concrete, achievable solutions to make the yachting industry more environmentally conscious. *"This event will help fundamentally transform the yachting industry by linking innovation and sustainability, ensuring excellence goes hand in hand with environmental responsibility. We need the industry to be an integral part of the equation"*, said Olivier Wenden, Vice-President and CEO of the Prince Albert II of Monaco Foundation.

PROMOTING SYNERGY

Three round-table discussions featuring industry heavyweights highlighted the way environmental, economic and operational factors are shaping yachting's energy transition.

The first topic was the impact of new engine technologies, propulsion systems and fuels. Discussions focused on hydrogen following a presentation of the existing solutions by Michel Delpon, Emmanuel Macron's hydrogen ambassador for France 2030. The second talk explored ways to foster a circular economy and create synergy within the industry to make yacht design and maintenance more efficient, sustainable and innovative. The final discussion focused on industry regulations and incentives to address the challenges that lie ahead, in particular the application of rules designed to protect the coastal environment and marine resources. ■

THE SMART INNOVATIVE YACHT AWARDS 2024

At the event, the international jury of around 20 industry professionals and investors chose two winners for their promising innovations:

- **the start-up Composite Recycling** which proposes to make yachting sustainable: *"We recycle the composite materials used in boats and wind turbines so they can become new boats, creating a closed loop for each of the components"*, explains Guillaume Perben, co-founder and CEO.

- **the scale-up Greenboats**, which has developed *"fibres that can compete with glass fibre and, better still, are lighter. It offers panel solutions that can be seamlessly integrated into production lines at major shipyards to reduce their carbon footprint"*, explains the company's Business Developer, Loris Schimanski, who partnered with Boris Herrmann and Team Malizia, founded by Monaco Yacht Club Vice-President, Pierre Casiraghi.

This event co-organised by M3, Monaco Yacht Club and its partners was a highlight of Monaco Ocean Week, shining a light on industry innovations and getting the entire maritime ecosystem interacting, from yacht companies to port infrastructures.

GREENBOATS Materials Composition / © Felix Diemer

IN VOGUE

Ocean-positive fashion

On 22 March 2024, the first panel discussion on sustainable fashion organised by the Prince Albert II of Monaco Foundation provided an overview of the changes needed and already underway in a sector that has a strong impact on the ocean.

The panel event held at Monaco Yacht Club brought together three experts in front of a public audience to dive into the creative, yet problematic, world of fashion. The discussion began by addressing the sensitive topic of the environmental footprint of the fashion industry, the second most polluting sector in the world. In the era of fast fashion, how can we significantly reduce its impact? The all-women panel explored several avenues, including reducing clothing consumption, using AI to regulate production and creating sectors based on social and environmental justice.

Moderated by Nadège Massé, Director of Communications at the Prince Albert II of Monaco Foundation, the panel then considered some of the emerging solutions for a more sustainable and ethical industry, including slow fashion, which is based on fair practices and minimal impact, and new storytelling. Monaco Ocean Week participants left the event feeling inspired, and hopeful that our relationship with the ocean can be painstakingly repaired.

© Runa Ray

TAKING A STEP TOWARDS ENVIRONMENTAL JUSTICE

Indian environmentalist and fashion designer **Runa Ray** *champions circularity and Indigenous techniques through her organisation Fashioning for Social Environmental Justice, her own nature-inspired fashion designs and her involvement with international bodies (she is an Educational Member of the International Union for Conservation of Nature and the United Nations Ocean Decade).*

"From the people who grow the textile fibres to the wearer, the garment production and supply chain is vast and interconnected: from farmers to garment manufacturers, via dyers and natural fibre producers, to the consumer. Understanding where garments come from is essential if we are to respect them more. Fashion is also slowly standing up for environmental justice and we hope to see more collaboration between local communities, fashion houses and schools to create a responsible textile sector and move towards a more transparent, zero-waste system. I would also like to see designers take ownership of the textile sourcing process, work with local communities and workers in fragile areas, invest in locally-led adaptation initiatives and in so doing drive new economic growth at the same time as maintaining human dignity."

CHAMPIONING SLOW FASHION

Marisa Selfa, *CEO, Ocean Born Lifestyle at Ocean Born Foundation in Spain, 100% of whose profits are donated to ocean restoration and protection initiatives, supporting four of the United Nations Sustainable Development Goals.*

"Fashion has a bad reputation, but I think it's a wonderful industry and it all depends on how we use it and make it evolve. The first thing to change would be the intensive use of resources, especially water. For instance, 2,700 litres of water is used to produce a simple cotton t-shirt on average. That's what a person drinks in 3 years!

The second thing would be to reduce the industry's carbon emissions; fashion alone is responsible for 10% of the planet's CO_2 emissions – the same amount as all air and sea traffic put together. Our clothing and accessories production has doubled since 2000. But the world's population hasn't doubled. Fast fashion is gaining momentum, with production increasing by around 20% each year. Social media has a large part to play in this trend. This absurd cycle of overconsumption is creating a very problematic situation.

In fashion, being sustainable is no longer enough. We need to find a way to have a positive impact on the planet and take into account the entire product lifecycle, including end of life. New business models are entering the market, such as second-hand clothing, which eliminates the need for new resources, as well as hand-made fashion and local production."

CHANGING THE NARRATIVE

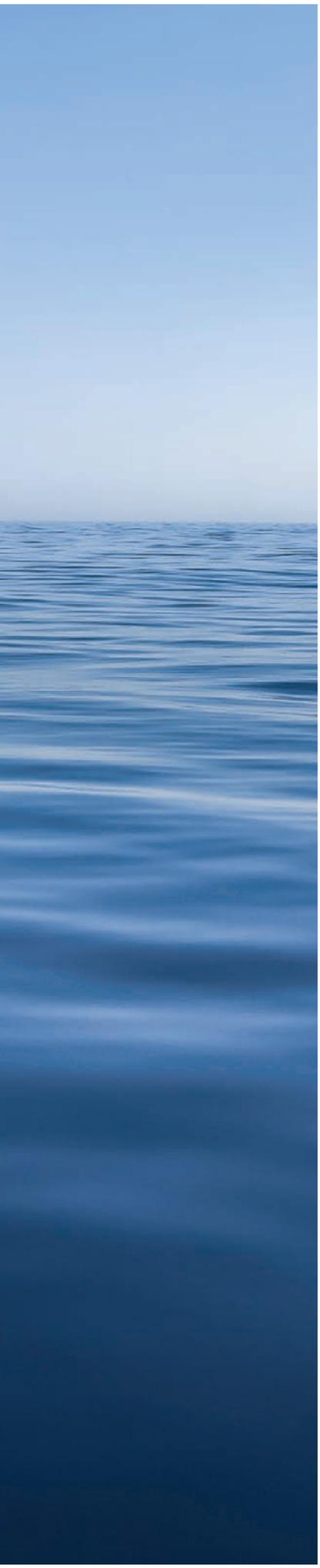
In these times of overproduction and overconsumption, **Georgia-Rae Taylor**, *Sustainability Strategy Director at British consultancy Eco-Age Limited, dreams of a circular fashion industry that values sustainability and ethics as much as creativity and innovation.*

"Promoting slow fashion, introducing strict regulations on production quotas, using technology for better stock management and changing consumer behaviour are tools that can halt overproduction.

However, greenwashing is one of the biggest threats to the sustainability movement: when brands boast about their good performance in this area, they often give a false impression of reality. This can be avoided by improving understanding of business impacts, developing solid, credible targets and a holistic sustainability roadmap, and communicating better with consumers.

Storytelling is at the heart of the Eco-Age Limited approach, as it shows how people are impacted by fashion choices and inspires change. We need to champion a new narrative that emphasises sustainability, ethical production and the value of quality."

© Greg Lecœur



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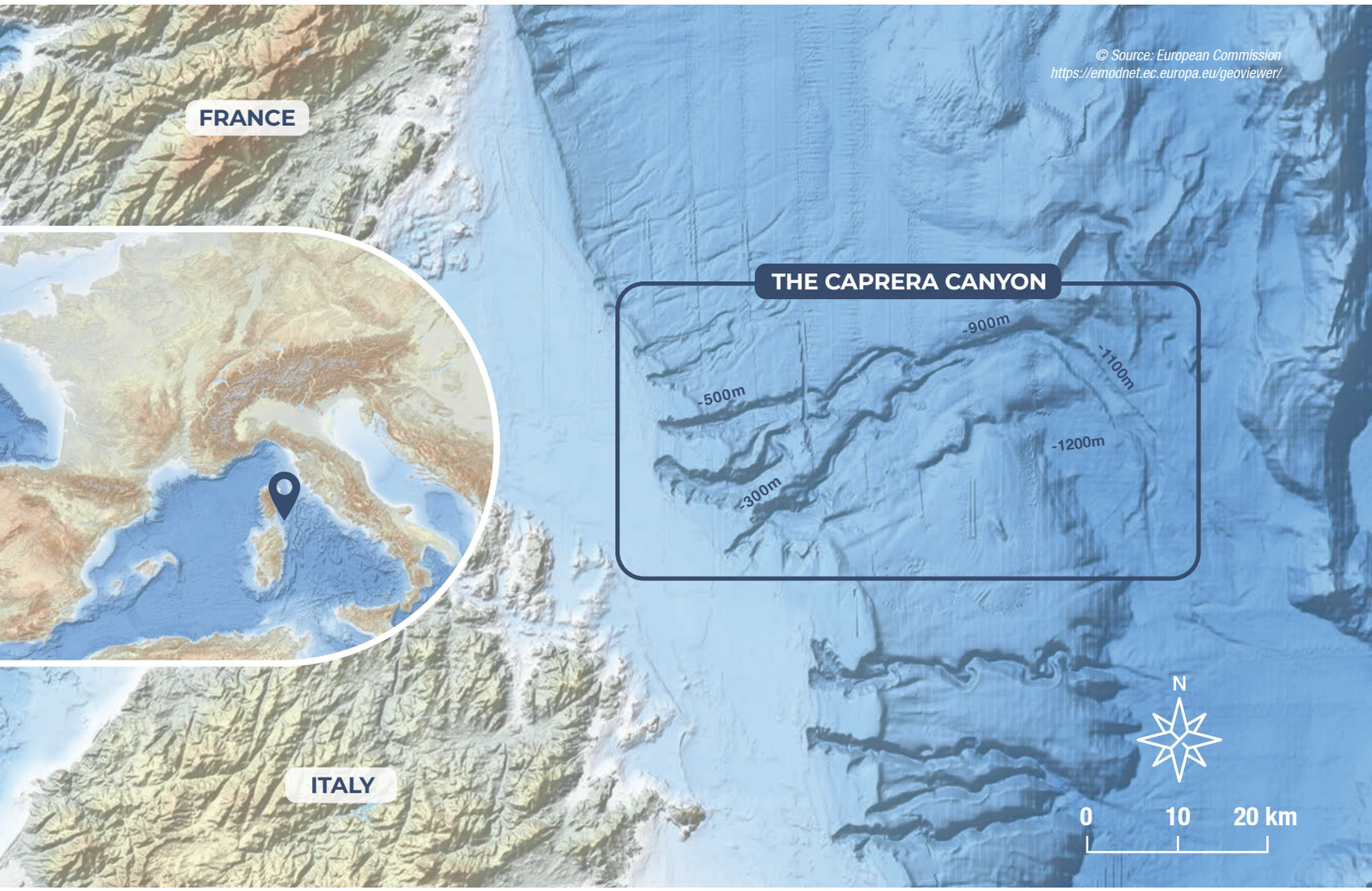
SHARING SCIENTIFIC PROGRESS



THE CAPRERA CANYON

New hope for the Mediterranean

A victory for marine conservation: the Caprera Canyon, in northeastern Sardinia, has just joined the global network of more than 140 Hope Spots, critical areas for the health of the ocean.

At the center of one of the most pressurized seas in the world, the Tyrrhenian Sea, lies the largest system of underwater canyons in this Mediterranean region. This deep canyon, home to seven of the eight species of cetaceans usually present in the western Mediterranean, is now part of a global network of "Hope Spots" for biodiversity. The culmination of a sustained commitment led by the Italian organization One Ocean Foundation since 2019. This non-profit organization operating at the international level for the protection of the marine environment has in fact maintained its constant commitment to research and marine surveillance of the area located 20 miles from the coast. Representatives of this foundation chose Monaco Ocean Week to announce the recognition of the Caprera Canyon as a new Hope Spot by Mission Blue, a global initiative for the conservation of marine biodiversity established by the famous oceanographer Sylvia Earle.

The official announcement therefore took place on March 19, during a special event organized as part of Monaco Ocean Week at the Monaco Yacht Club. "*This recognition allows us to continue our actions in favor of the protection of this site with an even greater commitment and in collaboration with national and international entities and institutes, in accordance with the latest indications from the European community, which underline the importance of the protection and restoration of biodiversity,"* says Riccardo Bonadeo, President of One Ocean Foundation, in introduction to the event. *"Together, we are committed to implementing innovative solutions that address the challenges facing our ocean, leveraging research, education and community engagement to make a tangible impact,"* continues Bernard d'Alessandri, Secretary General of the Yacht Club de Monaco, with whom One Ocean Foundation signed a memorandum of understanding in October 2023, consolidating the common commitment to ocean conservation and sustainable marine practices.

Bernard d'Alessandri, Secretary General of the Yacht Club de Monaco, accompanied by Jan Pachner, Secretary General of One Ocean Foundation.

A CANYON WITH AN IMPORTANT ROLE IN THE MARINE ECOSYSTEM

"Underwater canyons like that of Caprera are immense fissures several hundred meters deep, key structures for the functioning of marine ecosystems," introduces Ginevra Boldrocchi, scientific coordinator of One Ocean Foundation and researcher at the University of Insubria. These zones make possible a series of fundamental functions such as the upwelling phenomenon, which involves the rise of deep water rich in nutrients favoring life in the water column: growth and reproduction of phytoplankton and photosynthetic algae, which constitute the base of the entire trophic chain and from which cetaceans benefit.

"The Caprera Canyon has extremely important ecological value because most of the species we study appear to use the area as a feeding and breeding site. Despite its undeniable ecological value, the canyon – like most of the Mediterranean – is subject to numerous anthropogenic threats," warns Jan Pachner, Secretary General of One Ocean Foundation, specifying that the canyon is located at the crossroads of intense maritime routes, east-west and north-south. He adds that *"marine mammals, in particular, are subject to accidental capture, collisions with ships due to heavy maritime traffic, as well as acoustic, chemical and plastic pollution."*

A MAP OF ECOSYSTEMS

Visual monitoring, environmental DNA sampling, underwater acoustic monitoring... The scientific projects carried out by One Ocean Foundation include a series of innovative and pioneering activities made possible thanks to the support of important research centers such as the University of Milan -Bicocca. The latter analyzes environmental DNA samples to monitor the presence of specific substances, in particular indications of the presence of rare species such as the monk seal and Cuvier's whale. *"We consider it essential to prioritize the protection of cetaceans and their habitat, particularly in the Mediterranean. Thanks to an innovative and non-invasive interdisciplinary approach nourished by international collaborations, we have been committed in recent years to ensuring the protection of this precious ecosystem,"* continues Ginevra Boldrocchi, supporting her presentation with maps and scientific results.
"We need to understand their language in order to write the scenario of life within the canyon which is not the only one but which is one of the most productive in this region", summarizes the Italian oceanographer Sandro Carniel associated with the acoustic monitoring project.

Next goal? Create a marine protected area in order to sustainably preserve the marine vitality of the site. An event which undeniably sows a note of hope. ■

A HOTSPOT FOR MARINE MAMMALS

The underwater canyon off the coast of Sardinia is home to 7 of the 8 species of cetaceans usually present in the western Mediterranean, including the most endangered species, such as the discreet Cuvier's beaked whale, the Risso's dolphin, the fin whale and the sperm whale, but also other marine mammals such as the monk seal, one of the most endangered pinnipeds on the planet.

Risso's dolphin *(Grampus griseus)*
©Luca Bittau, Founder and President of Sea Me sardinia

"We are so lucky to be this generation capable of change: everywhere nature is declining but we can act, and these Hope Spots give us reasons to hope. We have a lot to learn from cetaceans, which are the largest inhabitants on the planet.
Humans almost eliminated the whales, which found themselves on the brink of extinction. An intergovernmental agreement made it possible to turn things around. Today, the biggest threats to these large marine mammals remain collisions, noise pollution and lack of food, not to mention drift nets, which have nothing to do with the fishing nets of yesteryear woven with natural and biodegradable materials. This is why we do not want 'paper parks' for Hope Spots, but strong levels of protection," confides the famous oceanographer Sylvia Earle, at the origin of this network of Hope Spots. Coming to support One Ocean Foundation, the scientist was awarded a One Ocean Foundation medal during the event.

SOLUTIONS #FORCORAL

Impactful initiatives for saving the coral reefs

The International Coral Reef Initiative (ICRI) brought together the coral reef community to showcase solutions to help deliver the Coral Reef Breakthrough.

This working session held on 19 March 2024 at Monaco Yacht Club brought together around a hundred participants eager to deliver the Coral Reef Breakthrough, a global convening mechanism to save coral reefs. Innovators, scientists, investors and private sector stakeholders took part in the event hosted by the International Coral Reef Initiative (ICRI) in partnership with the Global Coral Reef Fund, the Coral Research & Development Accelerator Platform (CORDAP), the Ocean & Climate Platform and the Prince Albert II of Monaco Foundation.

A NARROW WINDOW FOR ACTION

Over the past 15 years, the world has lost 14% of the coral on its reefs. Corals are integral to sustaining the planet's vast interconnected network of marine biodiversity. Given the ever-increasing pressures of climate change and many human-driven threats, the window for protecting these vital ecosystems is rapidly closing. As we approach the fourth global coral reef bleaching event, *"We must step up resources and actions to halt local and global drivers of decline, as well as implement cost-effective solutions to enable the survival and recovery of resilient coral reefs on a global scale and support local communities"*, stated Olivier Wenden, Vice-President and CEO of the Prince Albert II of Monaco Foundation, following the screening of a video featuring ICRI experts discussing the topic, 'What if coral reefs disappeared by 2050?'.

"In the context of the current climate and biodiversity crisis, we very much hope that this call to action will help state and non-state stakeholders achieve the global targets and develop ambitious action plans and financial investments to secure the future of coral reefs," said Francis Staub, ICRI Global Coordinator, during his talk on the Coral Reef Breakthrough. The Breakthrough is a clear example of the ongoing efforts of ICRI, which has strived to protect coral reefs since it was founded in 1994. *"2024 marks an important year for the Initiative, which boasts 101 members today,"* noted Francis Staub. Stopping the drivers of loss, accelerating restoration, expanding the area of coral reefs under effective management and bridging the funding gap are the four global targets of this vital initiative and which the event was organised around. The targets go beyond the Kunming-Montreal Global Biodiversity Framework and help countries implement their national and international commitments.

This Monaco Ocean Week event featured a series of talks about the action being taken to meet the Coral Reef Breakthrough goals, highlighting the innovative solutions making a difference.

FOUR INTERCONNECTED TARGETS FOR IMPACTFUL ACTION

HALTING THE DRIVERS OF LOSS

including land-based sources of pollution, destructive coastal development and overfishing.

Talk by **Yabanex Batista**, *Deputy Director, UN Global Team, UN Global Fund for Coral Reefs*

DOUBLING THE AREA OF CORAL REEFS UNDER EFFECTIVE PROTECTION

and strengthening resilience-based coral reef conservation efforts by aligning with global targets, including 30x30.

Talk by **Nicolas Pascal**, *Executive Director, Blue Alliance Marine Protected Areas*

ACCELERATING RESTORATION

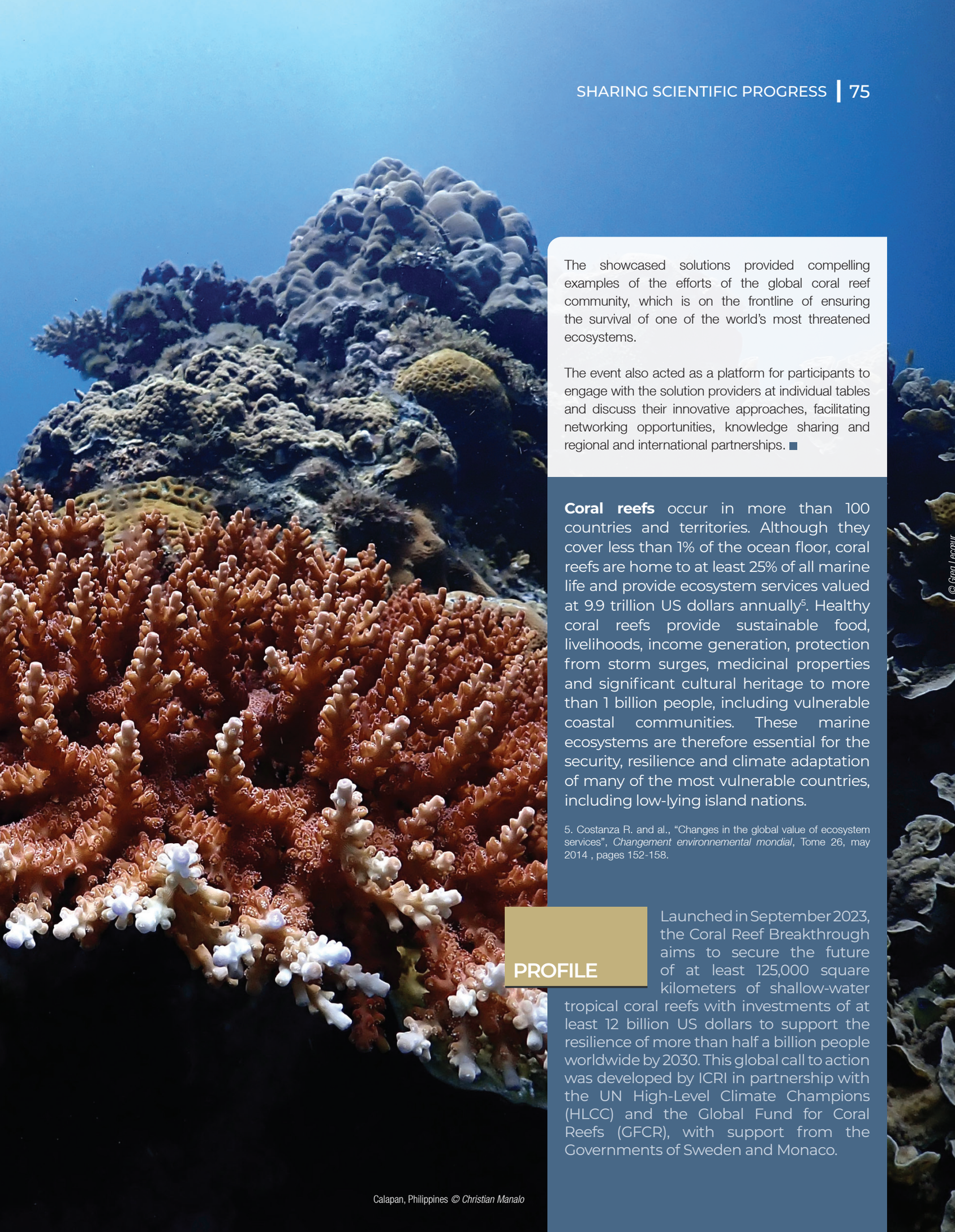
by helping to develop and implement innovative large-scale solutions to support coral adaptation to climate change and to impact 30% of degraded reefs by 2030 globally.

Talk by **Rory Jordan**, *Deputy Director, CORDAP*

SECURING INVESTMENTS FROM PUBLIC AND PRIVATE SOURCES

of at least 12 billion US dollars by 2030 to conserve and restore these crucial ecosystems.

Talk by **Geoff Chapin**, *CEO of Carbonwave*



Calapan, Philippines © *Christian Manalo*

The showcased solutions provided compelling examples of the efforts of the global coral reef community, which is on the frontline of ensuring the survival of one of the world's most threatened ecosystems.

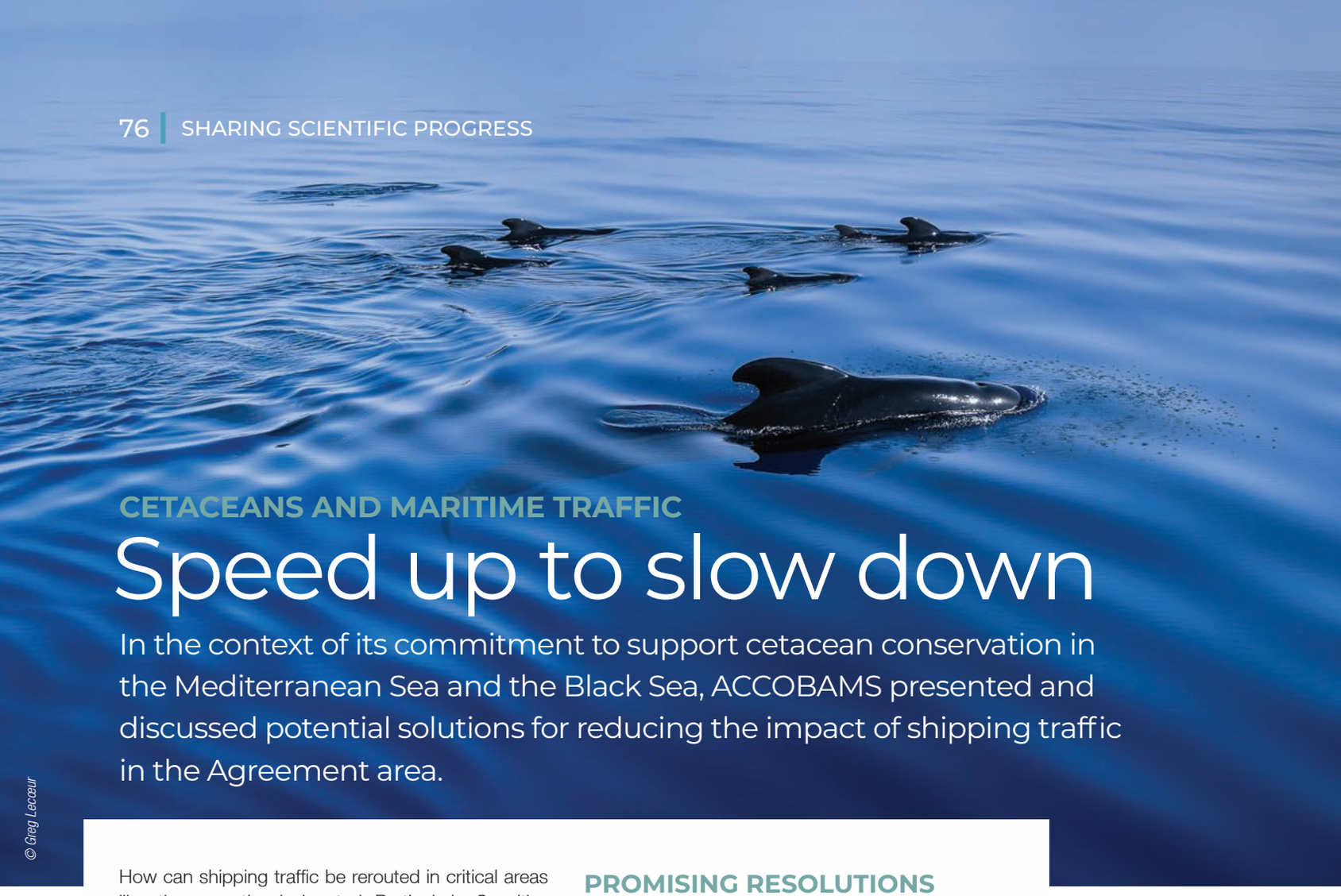
The event also acted as a platform for participants to engage with the solution providers at individual tables and discuss their innovative approaches, facilitating networking opportunities, knowledge sharing and regional and international partnerships. ■

Coral reefs occur in more than 100 countries and territories. Although they cover less than 1% of the ocean floor, coral reefs are home to at least 25% of all marine life and provide ecosystem services valued at 9.9 trillion US dollars annually[5]. Healthy coral reefs provide sustainable food, livelihoods, income generation, protection from storm surges, medicinal properties and significant cultural heritage to more than 1 billion people, including vulnerable coastal communities. These marine ecosystems are therefore essential for the security, resilience and climate adaptation of many of the most vulnerable countries, including low-lying island nations.

5. Costanza R. and al., "Changes in the global value of ecosystem services", *Changement environnemental mondial*, Tome 26, may 2014 , pages 152-158.

PROFILE

Launched in September 2023, the Coral Reef Breakthrough aims to secure the future of at least 125,000 square kilometers of shallow-water tropical coral reefs with investments of at least 12 billion US dollars to support the resilience of more than half a billion people worldwide by 2030. This global call to action was developed by ICRI in partnership with the UN High-Level Climate Champions (HLCC) and the Global Fund for Coral Reefs (GFCR), with support from the Governments of Sweden and Monaco.



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CETACEANS AND MARITIME TRAFFIC

Speed up to slow down

In the context of its commitment to support cetacean conservation in the Mediterranean Sea and the Black Sea, ACCOBAMS presented and discussed potential solutions for reducing the impact of shipping traffic in the Agreement area.

How can shipping traffic be rerouted in critical areas like the recently designated Particularly Sensitive Sea Area (PSSA) in the north-west Mediterranean? How can we work with shipping companies and port authorities to improve understanding of and manage ship collisions with cetaceans? On 21 March 2024, in the Salle Princesse Alice at the Oceanographic Museum, eight speakers and ambassadors focused on reducing the ecological footprint of shipping, including ship strikes and noise pollution. Hosted by ACCOBAMS (Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area), the event considered the issue from all sides, from data collection on the ground to policy-making and conservation efforts.

The event opened with an account by photographer Greg Lecœur, who has been devoting his time to capturing the living world of the Mediterranean since he had an unexpected, pivotal encounter with a group of pilot whales around his small six-meter boat. Having documented the interaction between large boats and marine mammals as part of a Pelagos Initiative expedition, the photographer was preparing to immerse himself in the sea again to record plankton migration, another phenomenon relating to the lifecycle of cetaceans.

PROMISING RESOLUTIONS

Helping shipping traffic reduce its ecological footprint in the marine area covered by the Agreement was the topic addressed by Susana Salvador, ACCOBAMS Executive Secretary, who began by showing a map identifying the habitat of fin whales and sperm whales, which are particularly vulnerable to ship strikes. *"It's also a very sensitive sea in terms of noise pollution,"* she explained, going on to present all the noise-based resolutions that have been adopted by the Agreement's 24 member states following years of negotiations. One of them, Resolution 7.13, puts forward separating shipping and cetacean routes. Regarding the next steps, ACCOBAMS will continue its advocacy role at international ocean meetings. *"We want to take these resolutions and speak to different segments of the maritime industry in Barcelona, Marseille, Monaco, Nice and Genoa, supported by Greg Lecœur's expedition"*, concluded Salvador.

IN FIGURES

7 resolutions on noise and 2 resolutions on ship strikes have been adopted by the 24 ACCOBAMS member states.

A QUESTION OF SPEED

Simone Panigada, Chair of the ACCOBAMS Scientific Committee and President of the Tethys Research Institute, presented data showing the upward trend of ship speeds and the dramatic increase in the number of collisions. The Mediterranean is crossed by 200,000 merchant ships and 1 million cruise ships each year, representing 30% of global maritime traffic. *"The crucial factor is speed,"* commented Panigada, who believes that despite the problem worsening, a significant number of stakeholders are getting on board.

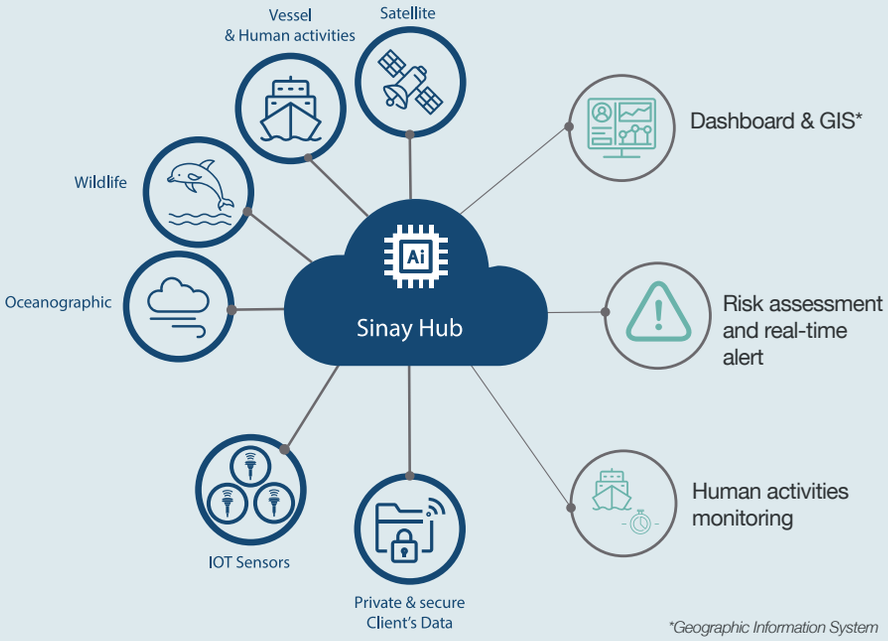
INNOVATIVE RESEARCH

Anthony Sladen, a CNRS researcher at GEOAZUR, whose pioneering work includes using seafloor telecom cables as sound sensors, presented the results of a trial carried out in 2021 as well as plans for a cable in the Ligurian Sea, which would open up the potential to acoustically monitor cetaceans and ships over hundreds of kilometers.

Aurore Morin, Campaign Officer at the International Fund for Animal Welfare, presented a solution by Blue Speeds that could result in a 5 to 10% reduction in ship speeds. She also recommended *"better organisation of shipping traffic to deal with increased navigation times,"* which would make it possible to reduce port waiting times. *"We are working with shipping companies and the European community,"* Morin added. The revision of the EU Marine Strategy Framework Directive could include a requirement obliging countries to reduce port waiting times, which would enable member states to force ports and shipping companies to adapt.

Finally, Nicolas Entrup, Director of International Relations at OceanCare, reported on progress made in the private sector, in particular rerouting ships and reducing their speed. *"There are still areas where it is not possible to reroute boats, plus the habitat of cetacean populations is not fixed. To reduce the risk of collisions, speed recommendations are needed. Imposing speed limits across Europe for a start will reinvent the concept of commercial competition. If no one can go faster…"*

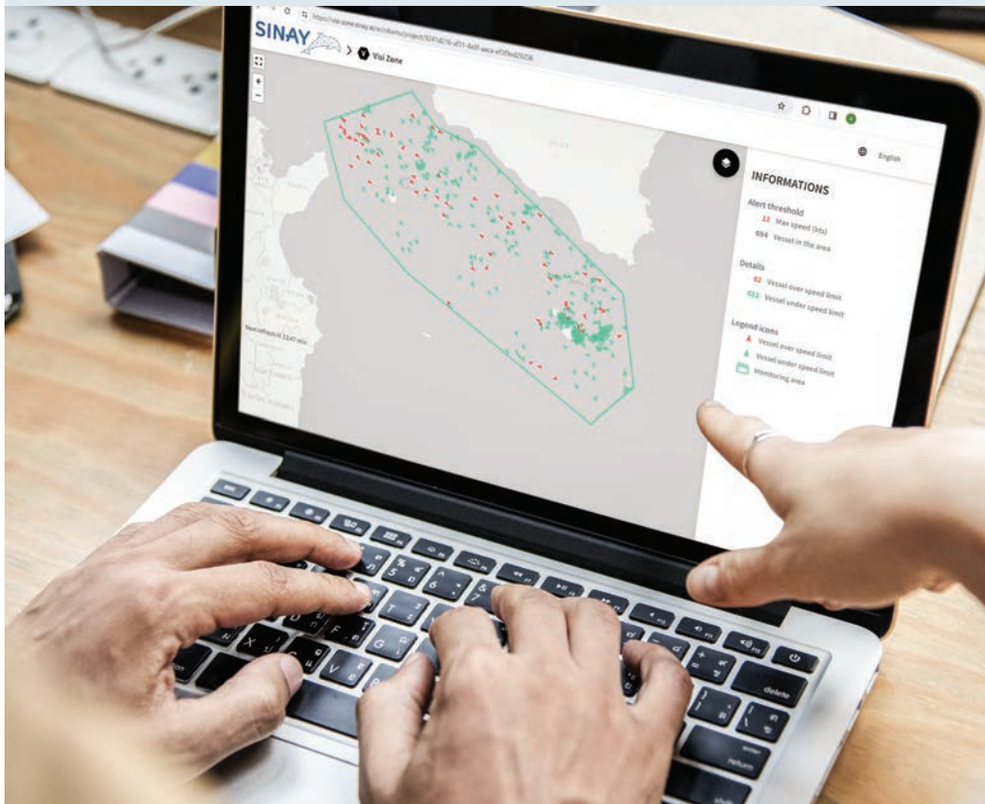
- NETCCOBAMS technology -
© Maylis Salvias - Alessio Maglio



*Geographic Information System

USING DIGITAL TOOLS

The presentation about NETCCOBAMS, a digital tool developed by ACCOBAMS, focused on data provided by the Joint Noise Working Group (JNWG), a European underwater noise advisory group. "*We have developed a new piece of software that can be used by protected areas like Particularly Sensitive Sea Areas (PSSA), enabling them to see the speed of boats in real time,"* explained Alessio Maglio, Project and Business Manager at SINAY and consultant for ACCOBAMS. Boats exceeding the recommended speed limit show in red, while those travelling below the limit are green. *"Slowing down reduces three factors that are harmful to cetaceans: the risk of pollution, underwater noise and carbon emissions."* ACCOBAMS is working alongside various NGOs to coordinate this policy-making process. ■



CETACEANS IN THE MEDITERRANEAN

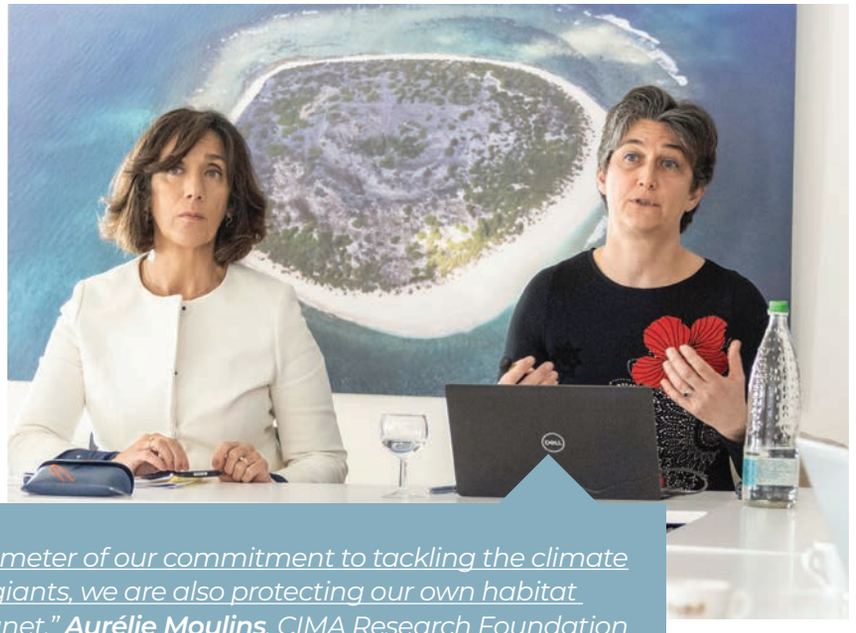
Better understanding equals better protection

Following its first monitoring survey in 2018, ACCOBAMS organised an event to report on the current state of knowledge on cetacean distribution in the wider Mediterranean region.

The ACCOBAMS Survey Initiative (ASI), launched in 2018, provided the first ever data on the conservation status of cetacean populations in the Mediterranean Sea and Black Sea. *"These aerial and vessel-based surveys mobilised a great deal of observers and resources, providing essential data on the distribution and abundance of cetaceans"*, noted Ayaka Amaha Öztürk, Vice-Chair of the ACCOBAMS Scientific Committee. Maps were created using the data and made freely available on NETCCOBAMS, the data-sharing platform set up by ACCOBAMS.

"The aim of that first survey was to estimate the absolute abundance, without bias, of different species of cetaceans in order to implement spatial conservation measures. The data gave us a reliable baseline for comparing future changes in the monitored parameters", explained Simone Panigada, Chair of the ACCOBAMS Scientific Committee. With a new ASI survey set to begin in 2025, he mentioned the environmental policy obligations in the wider Mediterranean region. Improving knowledge of cetaceans in the ACCOBAMS area (the Black Sea, Mediterranean Sea and contiguous Atlantic area) helps states with jurisdiction over these waters fulfil their marine conservation commitments and priorities.

The main goal of the event held at the Oceanographic Museum on 20 March 2024 was to highlight the need to pursue survey and monitoring activities across the region, building on the expertise and human network developed through the ASI. *"Understanding the cumulative impact of human activities on ecosystems and their biodiversity remains a challenge, because our knowledge of the reference conditions, the baselines, is currently insufficient"*, noted Aurélie Moulins from CIMA Research Foundation, a partner institution. The work carried out by the ACCOBAMS teams nonetheless provides up-to-date information on how cetaceans are adapting to human activities at sea. ■



"The future of cetaceans is a barometer of our commitment to tackling the climate crisis. By protecting these ocean giants, we are also protecting our own habitat and the fragile balance of our planet." ***Aurélie Moulins****, CIMA Research Foundation*

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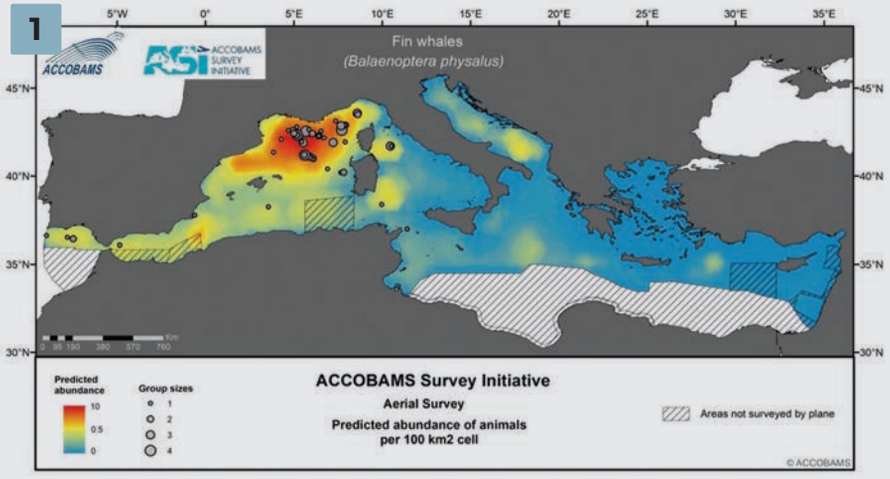

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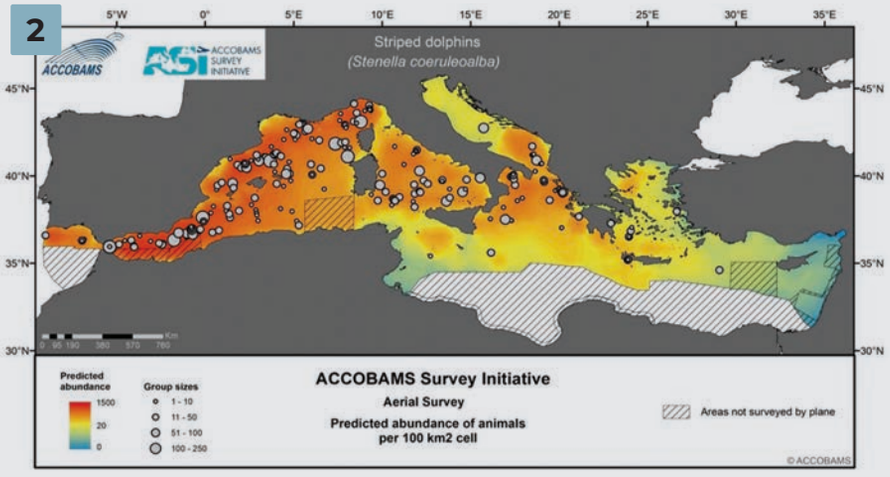

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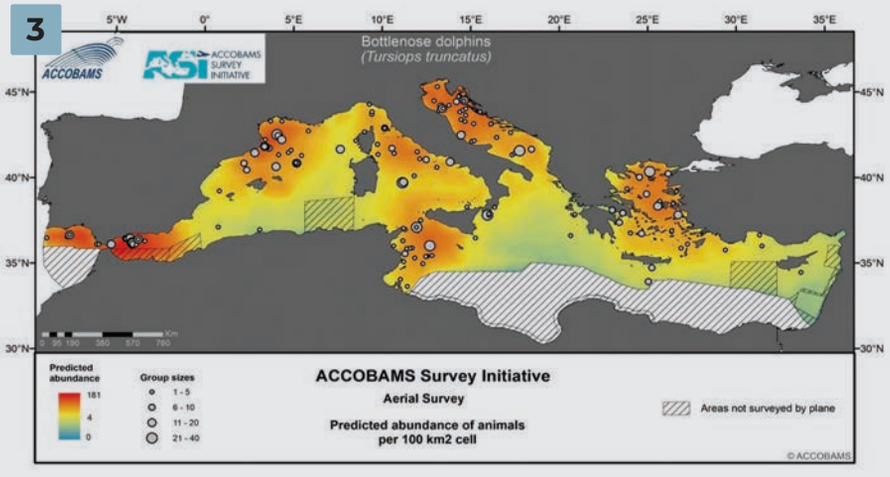


Key findings from the first ACCOBAMS survey:

1 **FIN WHALES**
(1,700 individuals, CV[6] 28%), found mostly in the north-western part of the Mediterranean in the summer. This information is crucial for protecting a species at serious risk from vessel strikes;

2 **STRIPED DOLPHINS**
(425,000 individuals, CV 14%), the most common cetacean in the Mediterranean, although the species shows a strong preference for the western part of the basin, no doubt due to the greater availability of food there;

3 **COMMON BOTTLENOSE DOLPHINS**
(76,000 individuals, CV 21%), a coastal species mainly observed over the continental shelf across the whole of the Mediterranean, but with high concentrations in the Strait of Sicily, the Adriatic Sea and the Aegean Sea.

6. The lower is the value of the coefficient of variation (CV), the more accurate is the estimate.

The data gathered enabled the IUCN Red List conservation status of cetaceans in the ACCOBAMS area to be assessed:

- **The status of the striped dolphin and common bottlenose dolphin** improved from Vulnerable to Least Concern,
- **Mediterranean fin whales**, on the other hand, went from Vulnerable to Endangered,
- **Rough-toothed dolphins** were classed as Near Threatened,
- **Risso's dolphins and Cuvier's beaked whales**, previously listed as Data Deficient, were reclassified respectively as Endangered and Vulnerable.

OCEAN ACIDIFICATION

Developing simplified, shareable methodologies

World experts in ocean acidification convened at a workshop to develop improved methodologies for monitoring the phenomenon and carrying out chemical analyses.

The workshop organised by the IAEA (International Atomic Energy Agency) Ocean Acidification International Coordination Centre (OA-ICC) was held on 21 and 22 March 2024 at the IAEA Marine Environment Laboratories in Monaco. This two-day event, organised as part of Monaco Ocean Week, focused on the importance of strengthening and standardising procedures for studying the global phenomenon of ocean acidification.

Ocean acidification can vary greatly, particularly in coastal regions, due to factors like freshwater input from rivers, human impacts (such as industrial emissions and pollution) and biological processes (like algal photosynthesis and respiration and seasonal variations). These fluctuations limit our understanding of how ocean acidification impacts local and regional biodiversity and the resilience of ecosystems and key wild-caught and farmed species. Filling these gaps in our knowledge is crucial, as recommended in UN Sustainable Development Goal 14.3, which calls on nations to *"minimise and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels"*. High-quality data is indispensable to support informed decision-making and long-term policies.

THE CONTEXT

There has been a 40% increase in global ocean acidity since the pre-industrial era. This rise, known as ocean acidification, is caused when the ocean absorbs excess carbon dioxide from the atmosphere, lowering the pH of seawater and modifying its chemical composition. This phenomenon poses a significant threat to marine life, in particular coral reefs, molluscs and plankton, all of which play a vital role in marine ecosystems, providing essential ecosystem services.

SIMPLIFIED PROCEDURES

One priority is to ensure that ocean acidification is monitored. This is a potentially costly and painstaking task as it involves measuring multiple parameters, such as pH and total alkalinity, with great precision. But implementing consistent, affordable monitoring techniques across the globe is challenging due to a lack of technological capability. Developing simplified procedures would enable more researchers and communities around the world, including in developing regions, to measure acidification and its consequences, and in turn adapt to and mitigate its current and future effects.

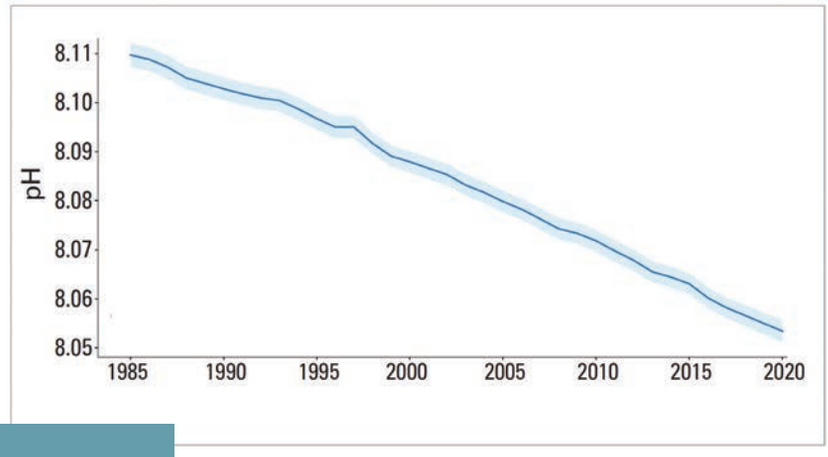
A GUIDE TO BEST PRACTICES

The aim of the workshop was for the diverse group of scientists present, all of whom are committed to tackling ocean acidification, to finalise the "Practical Best Practices for Ocean Acidification Monitoring" guide. This document contains simplified procedures for measuring key chemical variables like total alkalinity, pH and carbon dioxide concentrations in seawater. Other features include guidance on laboratory safety and ocean sampling procedures, and data collection sheet templates. Jana Friedrich, head of the Radioecology Section at the IAEA Marine Environment Laboratories, underlined the importance of *"practical, widely-accepted methods that can be applied consistently in order to track ocean acidification and assess its impacts".*

Future editions of the guide will also include procedures and methods for investigating the effects of ocean acidification on marine organisms. Experts at the workshop created a decision tree to help users solve complex questions relating to data requirements for acidification monitoring in the context of devising adaptation measures. This tool is designed to help define research objectives, data requirements and appropriate monitoring techniques and procedures. *"Developing practical tools like decision trees can equip researchers to tackle the local and regional impacts of ocean acidification effectively"*, noted Sam Dupont, a marine biologist at the University of Gothenburg.

The first edition of the "Practical Best Practices for Ocean Acidification Monitoring" guide will be published online by the end of the year and represents an important step forward for all stakeholders tackling ocean acidification worldwide. ■

- World average oceanic pH -



IN FIGURES

The pH of seawater dropped from 8.11 in 1985 to 8.05 in 2021. Since the pre-industrial era (i.e. 1750), ocean acidity has increased by 40%.

(Source: 'Ocean Acidification', Copernicus Marine Environment Monitoring Service (CMEMS, marine.copernicus.eu))

MONACO EXPLORATIONS

Indian Ocean expedition: final report on the horizon

As part of Monaco Ocean Week, the advisory committee of the Indian Ocean expedition, undertaken by Monaco Explorations in October and November 2022, met at the Oceanographic Museum on 19 March 2024 alongside lead researchers from the mission and representatives from the Seychelles and Mauritius.

The aim of this meeting between committee members, lead researchers and representatives from the Seychelles, Mauritius and Monaco was both scientific and diplomatic: to give an update on how research is progressing and confirm the publishing schedule for the findings and final report, which is expected by the governments of France, the Seychelles and Mauritius in December 2025.

After welcome remarks by the Director of Monaco Explorations, Xavier Prache, Bernard Georges, Chairman of the Seychelles Islands Foundation, and Dass Bissessur, Director of the Hydrocarbon/Mineral Exploration Unit of Mauritius, stressed their countries' keen interest in the expedition and its findings. They expressed their hopes that it would lead to conservation efforts and sustainable management practices for the entire South-west Indian Ocean region. One of the aims of the expedition, in addition to advancing and widely disseminating research on a little-explored region, is to provide governments and policy-makers with robust scientific data on the health of the region's waters, with a special focus on the Saya de Malha Bank, a jointly governed area in the high seas.

Next, Carl Gustav Lundin, Chair of the Expedition Advisory Committee, invited the individual project leaders, all from prestigious research institutions, to take the floor. They presented the conclusions of their legal research and scientific studies since the interim report was published. Committee members were particularly interested in the results of studies conducted around the Saya de Malha Bank. ■

PROFILE

This **2-month expedition covered 18,500 kilometers** and saw an international team of researchers set sail on one of the largest research vessels in service, *SA Agulhas II*, on loan from the South African government. The research conducted in the Western Indian Ocean focused on the Saya de Malha Bank, located on the Mascarene Plateau, the Aldabra Atoll and St Brandon archipelago.

IN FIGURES

- **8 international research programmes on board,**
- **150 participants from 20 different countries,**
- **1,000 species collected,**
- **150 articles in the national and international press,**
- **500 visitors welcomed on board during stopovers.**

SPOTLIGHT

The Saya de Malha Bank supports one of the world's largest seagrass meadows, spanning some 40,000 square kilometers. It is home to little-known ecosystems which, despite being remote and difficult to access, have been weakened by intense fishing. As a fully submerged, shallow-water bank, Saya de Malha is described as an 'invisible island'. Its location beyond national jurisdiction means that it is only partly protected by the United Nations Convention on the Law of the Sea, as an extension of the continental plateau jointly governed by Mauritius and the Seychelles, and limited to the resources on and in the seabed. The knowledge gathered during this expedition could help determine a protective status for the area and identify what management measures are possible under the High Seas Treaty, adopted in 2023 and known as the BBNJ Agreement.

- **A biodiversity inventory of 2,500 samples** indicating a wealth of benthic life, much of it endemic, and **the promise of discovering new species.**
- **18 drifting buoys** have enabled scientists to model the **ocean currents active in the area** and their influence on biological connectivity between larval production sites in the region and the areas where species mature.
- **29 BGC Argo floats** have been deployed in a little-studied area and are sending data about profiles recorded at depths of between 0 and 2,000 meters every 10 days. These physical, chemical and biological variables provide a vital window into the evolving health of the ocean and its response to climate change. They can be accessed in real time by the entire scientific community.

© Mathys-Zeppelin-MonacoExplorations

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Examples of crustaceans, molluscs and nudibranchs collected on Malha's Saya Bank
© GrégoireMoutardier-MNHN-MonacoExploration

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RAISING PUBLIC AWARENESS & INVOLVEMENT

PUBLIC CONSULTATION

Debating the sea

The French National Commission for Public Debate held a conference at the Monaco Scientific Centre and highlighted the importance of their public consultation, which may feed into the marine spatial planning process.

"I represent a French institution and here in Monaco we're on international turf. So Monaco Ocean Week is an important opportunity for national and international approaches to marine spatial planning to be discussed", began Étienne Ballan, Regional Coordinator at the French National Commission for Public Debate (CNDP), during this two-part event on 20 March 2024.

DEMOCRACY AT WORK

The sea has been the focus of CNDP debates since 2021, when it was tasked with consulting the public over plans to build offshore wind farms in the Mediterranean. Public response during the consultation phase led the French government to plan a wider public debate on matters including national offshore wind development. With the five-month consultation process having ended in April 2024, the authorities responsible for energy, ecology and the sea must now respond to all the points raised, as with every public debate, but are not bound to comply with the CNDP's recommendations in their final decision.

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PROFILE

The **CNDP** is an independent authority that guarantees the public's right to information and to participate in the development of projects and policies impacting the environment.

The CNDP's website features an interactive tool called 'Faites l'expérience' ('try it yourself') that contains detailed information and expert views to help people form their own opinions (in French).

DID YOU KNOW?

DEBATING THE SEA: INITIAL PUBLIC FEEDBACK

The initial results of the national debate on offshore wind farms along the French coast were revealed at the 'La mer en débat' (Debating the sea) event in Monaco to an international audience:

- **Public turnout was high** in the 4 maritime regions consulted, in particular the French Mediterranean, which has 2,200 km of coastline;
- **There is strong public support for government plans** to place 10% of European waters under **high protection** by 2030;
- **Increased pressure from human activities** has been widely observed and is impacting marine life. **Yet in some places nature is resilient, with the sea recovering thanks to protection measures and local conservation efforts.** Areas of uncertainty remain, however, like the complex task of restoring hake populations and the declining growth of sardines;
- **Opinions are split on the offshore wind farms** planned predominantly along the western coast of France: while some see them as damaging to the environment, others believe they can benefit marine life and be used for aquaculture or designated areas of high protection;
- **There is opposition to offshore fishing regulations** within certain segments of the population, who believe the industry has already been the target of restrictions. In contrast, inshore fishing, when combined with marine protected areas, is presented as a rather good example of sustainable management practices;
- **Retreating coastlines** are perceived as **the number one threat** by French people;
- **Land-sea interactions**, which are fundamental to marine conservation, are currently resulting in visible and invisible pollution at sea;
- **Some marine protected areas are proving effective**, but some require full protection.

THE SESSIONS

SESSION 1: BALANCING HUMAN ACTIVITIES WITH CONSERVATION

The positive impact of marine protected areas (MPAs)

Jacqueline Gautier-Debernardi, Chair of the Monegasque Association for the Protection of Nature (AMPN), created almost 50 years ago, described the process of establishing Monaco's two pioneering urban MPAs and its Marine Education Area. She explained how the three reserves are jointly managed with a range of institutional, scientific and socio-economic partners. Reporting on the AMPN's monitoring of fish populations, Posidonia meadows, diverse habitats and human activities within the reserves, Gautier-Debernardi highlighted the importance of public education and citizen science.

Curbing coastal development

Frédérique Lorenzi from Menton-based organisation ASPONA described the increasingly artificial nature of the coastline along the French coastal town (66%) and the impact of human activities since the 1960s, which the French Coastal Law of 1986 and regional planning regulations have barely dampened. Local conservation efforts have led to several successful initiatives, such as Cap Martin being classified a Natura 2000 site and the protection of a 700-meter stretch of shoreline without seawalls. The current consequences of the redevelopment of Les Sablettes beaches in Menton (eutrophication of recreational water, sediment dredging, beach nourishment, reinforcement of seawalls, etc) have shown the high cost of coastal artificialisation. The possibility of introducing a biological rest period was also raised.

Beach refill © *Frédérique Lorenzi*

One of the winners of the “Man and the Sea” photo competition organised by Ramoge. © *Stoicescu Loana - Cannes*

IN FIGURES

- Over 130 public debates held since 2022,
- two-thirds of the projects were completely restructured following consultation

SESSION 2: INTERNATIONAL COOPERATION IN THE MEDITERRANEAN

Long-term initiatives as part of the RAMOGE Agreement

“The most important thing is that stakeholders know each other”, commented Florent Champion as he presented the activities undertaken since 1976 as part of RAMOGE, the Mediterranean agreement that covers an area from Marseille to La Spezia. These include integrated coastal management, scientific studies of marine species, deep-sea explorations, anti-pollution activities, particularly after the *Haven* oil spill, and educational campaigns. The overriding aim is to alleviate the pressures on marine ecosystems and address the consequences of climate change.

The only cross-border MPA established to protect marine mammals in the Mediterranean

Viola Cattani, Deputy Executive Secretary of the Pelagos Agreement, spoke about the dangers facing the Pelagos Sanctuary (87,500 square kilometers) and the 9 marine mammal species it is home to. The area is bordered by over 2,000 kilometers of coastline and is under intense human pressure. The main goal of the agreement is to strengthen multilateral cooperation between the three signatory states (France, Italy and Monaco) in order to provide the effective protection of marine mammals and their habitats from the direct and indirect consequences of human activities.

A Foundation committed to marine conservation

“The role of the Pelagos Initiative, which we launched in 2021 with WWF, IUCN and MedPAN, is to support joint conservation projects undertaken in the three signatory states of the Pelagos Agreement as part of its management plans”, explained Philippe Mondielli, Scientific Director at the Prince Albert II of Monaco Foundation. He also stressed the importance of coordinating efforts between Mediterranean stakeholders. ■

MEDITERRANEAN

Posidonia: strengthening ties within the ocean community

The RAMOGE Agreement held a conference devoted to restoring Posidonia seagrass meadows, inviting leaders of French, Italian and Monegasque initiatives to share advances in restoring this threatened marine flowering plant.

The event took place on 22 March 2024 in the conference room of the Oceanographic Museum of Monaco in the presence of the French and Italian ambassadors, representatives of Mediterranean biodiversity protection bodies and Posidonia specialists. Hosting the conference was an opportunity for Monaco Ocean Week to highlight the initiatives undertaken in the areas within the RAMOGE jurisdiction to restore a species that provides a vital marine habitat. The RAMOGE and Pelagos Agreements are leveraging this shared objective to strengthen cooperation between them, acting as a bridge between stakeholders from the three countries – France, Italy and Monaco – where their respective secretariats are based.

PROFILE

The RAMOGE Agreement, a cooperation agreement between France, Italy and Monaco dedicated to preserving the marine environment, is actively engaged in integrated coastal management, combatting pollution events and raising public awareness of the need to protect the environment.

WHY PRESERVE POSIDONIA SEAGRASS?

Protecting *Posidonia oceanica* seagrass meadows is fundamentally important for the protection of Mediterranean coasts. This marine plant endemic to the Mediterranean, which forms vast meadows up to 40 meters deep, provides a rich, vital ecosystem for the coastal marine environment. The species is nonetheless threatened by human activity, particularly boat anchoring, as well as factors such as pollution, coastal development and aquaculture.

Because the natural recolonisation of Posidonia is a very slow process, conservation measures or, failing that, restoration measures, are essential to maintain the health of these marine ecosystems and guarantee the long-term future of the ecosystem services it provides, including acting as a nursery for marine species, protection against coastal erosion and carbon sequestration.

MEMORANDUM OF UNDERSTANDING

The Secretariats of the RAMOGE and Pelagos Agreements, in the presence of HSH Prince Albert II of Monaco, officially concluded a Memorandum of Understanding that aims to establish the principles of active cooperation between the two Agreements: to facilitate the exchange and sharing of information and implement joint activities to preserve marine mammals and their habitats. The first joint initiative will involve hosting a workshop in autumn 2024 to raise awareness of marine litter, a problem that poses a major threat to biodiversity.

WHAT RESTORATION STRATEGY SHOULD BE ADOPTED?

Experts from the three countries presented the conservation and restoration initiatives carried out within the Agreement's jurisdiction. *"What determines that restoration efforts will be successful? Is it down to successful transplantation or actually restoring the ecosystem and the functions and services it provides?"* asked marine ecologist Christine Pergent-Martini, Lecturer at the University of Corsica Pasquale Paoli. She continued: *"We are still at the R&D stage of this question. Restoration is a long-term activity; it is costly and has to be part of a holistic approach, including from a climate change perspective"*.

Actions to promote Posidonia preservation were also discussed, such as publishing restoration guides and forming an alliance to involve businesses in seagrass conservation efforts.

A number of international research teams are trying out various restoration procedures in the Gulf of Sant'Amanza in Corsica in a bid to compensate for the loss of 17 hectares of seagrass meadows. They are trialling several ways of encouraging the marine plant to return, including propagation of cuttings using different fixing methods and types of support, and other planting techniques, to see which is the most effective.

On this site, as well as the Prado site off Marseille, one experiment took advantage of the mass flowering of the Posidonia seagrass meadows (which occurs about every 10 years) in 2022, and initiated a restoration project using 18,000 seeds collected from the shore. *"While the various restoration methods look promising, preserving and protecting the meadow remains the priority"*, said Gérard Pergent, Professor Emeritus at the University of Corsica Pasquale Paoli.

IN FIGURES

- **The Mediterranean boasts 2 million hectares of Posidonia seagrass meadows in 16 countries in the basin. Only 40% of those meadows are located in marine protected areas** *(source: WWF),*
- **Nonetheless, they have shrunk by between 10 and 30% during the last 100 years** *(source: Luca Telesca et al, 'Seagrass meadows (Posidonia oceanica) distribution and trajectories of change', Scientific Reports (5, 2015)),*
- **Posidonia seagrass meadows cover 20 to 50% of the coastal seabed and are home to more than 400 marine species, providing multiple marine ecosystem services.**

FEEDBACK ON PROJECTS IN THE MEDITERRANEAN BASIN

Projects presented included the Italian Marine Ecosystem Restoration project, which is active in five coastal locations, and the transplantation project following the sinking of the *Costa Concordia* cruise ship in 2012. More than 10 years after the accident and the subsequent clean-up operation, *"an experimental procedure of constant, systematic transplantation was carried out in an area of 2,100 square meters at a depth of between 10 and 23 meters. We achieved a density of around 30 Posidonia leaf bundles per square meter, which represents good progress, particularly since 2016, the third year after the initial transplantations"*, said Dr Edoardo Casoli, from the Department of Environmental Biology at Sapienza University Rome, adding that progress is monitored using photogrammetry.

The results of the active restoration of a damaged Posidonia seagrass meadow in the marine protected area of Larvotto, in Monegasque waters, were presented by Alexis Pey, President of Thalassa Marine Research & Environmental Awareness, who noted *"an 18% increase in the number of leaf bundles and a low mortality rate, coupled with the appearance of new branches"*. Thanks to this project conducted by the Monegasque Association for the Protection of Nature, new growth is beginning to fill in the gaps. *"The meadow should be restored to a healthy density before 2026, but this is not certain because the rhizomes can live off their reserves for five years"*, warned the biologist and marine ecologist, nevertheless.

The presentations and ensuing discussions provided an opportunity to examine the restoration process in more depth, compare approaches and identify knowledge gaps. Everyone acknowledged the shared commitment of stakeholders to protecting this precious Mediterranean ecosystem. ■

MEDITERRANEAN POSIDONIA NETWORK

The **Mediterranean Posidonia Network**, composed of scientists and representatives of marine protected areas, government departments and civil society, presented the directives relating to seagrass meadow restoration, whose main objectives concern developing structured guidelines. This includes several steps: assessing the need for restoration, planning, site selection, restoration, monitoring and evaluation measures, presenting case studies illustrating successful measures, particularly nature-based ones, as well as analysing unsuccessful experiences to identify the causes of failure. This approach supports the implementation of new Posidonia restoration projects based on extensive knowledge.

Cape Corsica and Agriate Marine Park © Gerard Pergent

Alliance Posidonia
Tous engagés pour une Méditerranée vivante et préservée

The **Posidonia Alliance**, an initiative spearheaded by the French Biodiversity Agency, highlighted its commitment to protecting Posidonia seagrass meadows and banquettes during Monaco Ocean Week. Actions include a study to understand the behaviour of yachters, a public action campaign and encouraging people to accept banquettes on beaches. It is an innovative and pioneering undertaking, involving all the marine environment stakeholders committed to taking action to protect Posidonia seagrass.

IN FIGURES

In 2024, 14 new projects from 9 countries joined the BeMed stakeholders network. 105 projects have been supported to date!

MICRO-INITIATIVES

The BeMed network expands its expertise

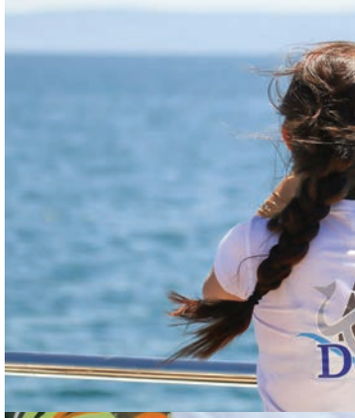
BeMed has revealed the 14 winners benefitting from its support for their initiatives to make the Mediterranean plastic-free.

Monegasque association Beyond Plastic Med (BeMed) continued its support for Mediterranean stakeholders striving to raise awareness of and reduce plastic pollution by issuing a call for micro-initiatives for the eighth consecutive year. The Mediterranean is one of the world's most polluted seas, with an alarming quantity of plastic dumped into its waters every day. BeMed's mission is to support the growing efforts of emerging local initiatives in the Mediterranean basin to mitigate this major environmental catastrophe.

This year, 14 new projects run in 9 Mediterranean countries are being funded by the organisation and have joined the BeMed network, whose purpose is to strengthen and amplify their contributions. The project leaders had the opportunity to present their initiatives at an online conference held on Friday 22 March 2024, when they discussed subjects such as drastically reducing single-use plastics, raising awareness among and training local stakeholders, citizens and young people, collecting waste data and innovations. The members of this active network are once again joining forces to provide sustainable, inclusive solutions, as well as to share best practice in tackling the plastic emergency. ■

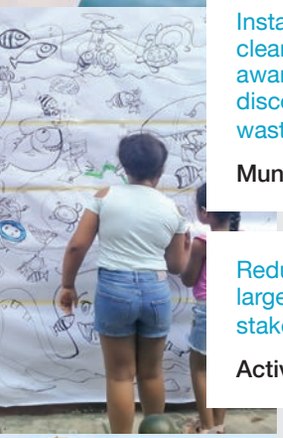
BEYOND PLASTIC MED

The **BeMed** network is present in 15 different countries, with a total of 105 projects supported to date. Hosted by the Prince Albert II of Monaco Foundation, this organisation tackling plastic pollution in the Mediterranean receives support from the Didier and Martine Primat Foundation, the Aether Fund of the Foundation for Future Generations and the Fonds Français pour l'Environnement Mondial for its call for micro-initiatives.





CONTAINING WASTE AND REDUCING SINGLE-USE PLASTICS



Installing waste bins, organising clean-up events and producing awareness-raising signs to discourage residents from throwing waste into rivers.

Municipality of Fushe Arrez - *Albania*

Reducing the use of single-use plastics at several sports events and strengthening the capacity of environmental protection organisations in four Egyptian coastal towns.

Banlastic Egypt - *Egypt*

Supporting Greek hotels and restaurants in reducing their use of single-use plastics and improving their waste management.

MedVenture - *Greece*

Reducing the use of single-use plastics at one of Albania's largest music festivals and sharing feedback with other stakeholders with a view to replicating the initiative.

Active Mobility - *Albania*

Supporting Montenegro's Environmental Protection Agency as a pilot institution in eliminating single-use plastics on their premises and producing a best practice guide.

Zero Waste Montenegro - *Montenegro*

CONDUCTING STUDIES AND SPREADING AWARENESS

Conducting a case study of 10 families to understand the impact of the children's awareness activities on the parents; producing a parents' guide.

Network for Children's Rights - *Greece*

Designing a card game to raise awareness of the consequences of plastic pollution, aimed at schools, organisations and sailing schools.

DelTa - *Italy*

Producing an awareness-raising podcast with and by young Sicilians; introducing awareness-raising sessions into school curriculums.

Associazione Ulisse ETS - *Italy*

Working with local stakeholders, in particular the HoReCa sector and the island's residents, to raise awareness of and mobilise support for the 3Rs (reduce, reuse, recycle) and make Tinos a zero-plastic waste island.

Social Cooperative Entreprise Kalloni-Kellia - *Greece*

Promoting and expanding the 'Bring Your Cup' movement, which encourages people to use their own cups when buying takeaway drinks, via private-sector support work and an ambitious communication campaign.

Cyprus Environment Foundation - *Cyprus*

INNOVATING, COLLECTING AND RECYCLING

Supporting the HoReCa sector in reducing their plastic footprint through 'Plastic-free Balearics' certification; converting waste such as broken parasols, diving suits and fishing nets into commercially viable objects.

Menorca Preservation Fund - *Spain*

Supporting Moroccan agriculture sectors in reducing their plastic waste.

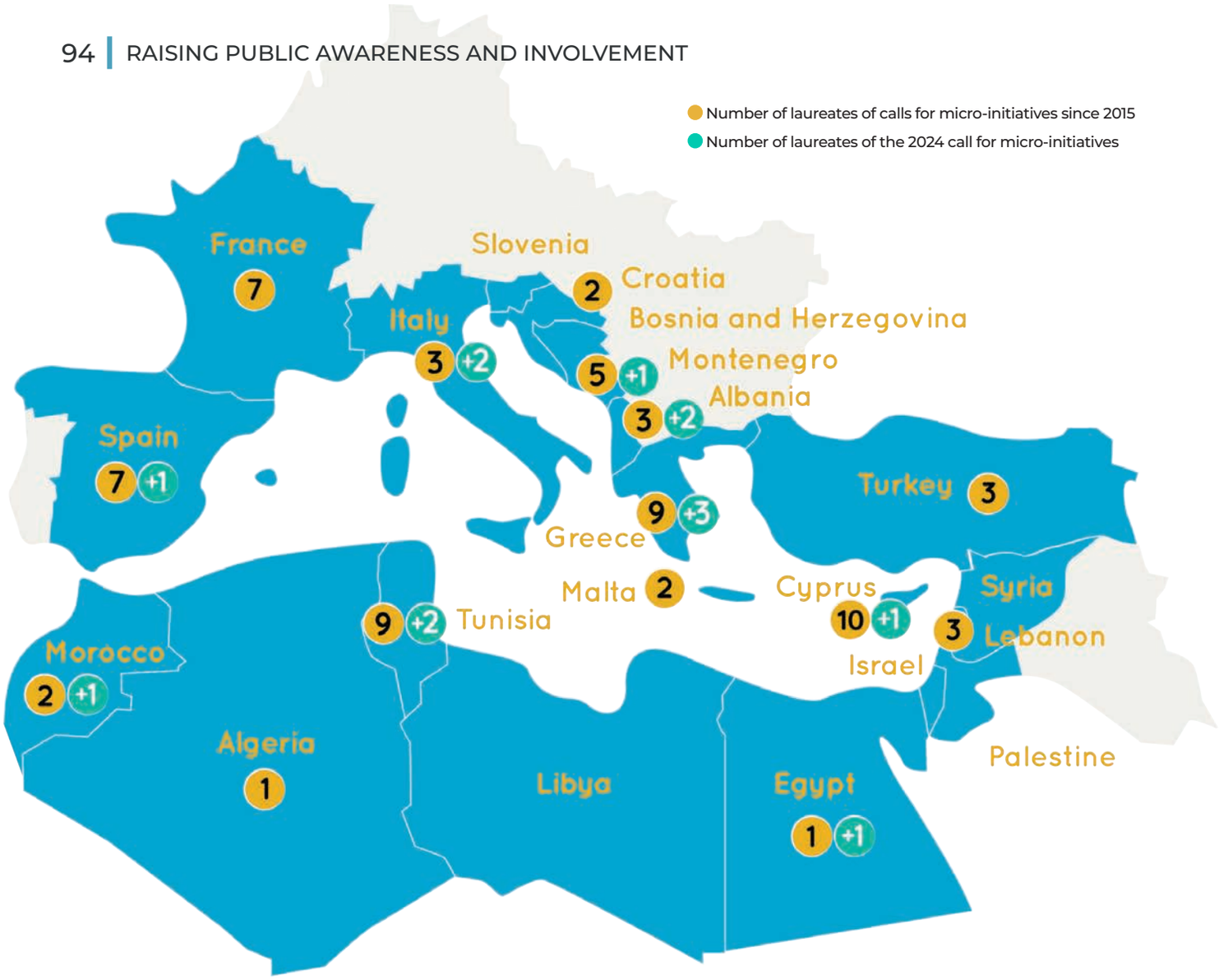
Engineering Business Leaders - *Morocco*

Organising sample collecting, beach clean-ups and artistic upcycling workshops to raise schoolchildren's awareness of plastic pollution.

TunSea citizen science organisation - *Tunisia*

Characterising plastic pollution, raising visitor awareness and improving waste management in the La Galite Archipelago.

Méditerranée Action Nature (MAN) - *Tunisia*



BEMED NETWORK

Collective power to deal with plastic pollution

The Community of Practice launched in 2022 by Beyond Plastic Med (BeMed) to tackle plastic pollution in the Mediterranean expanded further this year. The network's members came together once again for a collaborative cross-Mediterranean exchange.

Monaco Ocean Week 2024 provided the opportunity for the new project leaders selected as part of the 2024 call for micro-initiatives to join the Community of Practice that BeMed has been building for the past two years. In an online meeting during the event, one of four meetings held annually, network members shared experiences and worked on specific topics and problems. The idea behind this collaborative space is to make progress collectively and foster cooperation between the new and existing members of this community of Mediterranean stakeholders who are committed to tackling plastic pollution.

THREE CENTRAL AREAS OF CONCERN

This year, the topics discussed revolved around three themes: the end of life of plastic; raising awareness among users, residents and stakeholders; alternatives and changing models. The discussions proved fruitful and enabled initial connections and links to be made between members.

A SURVEY TO DEFINE WHAT'S NEXT

At the end of the meeting, a link to a survey was shared with all members of the network in order to collect information about the problems they are facing and the subjects they would like to explore in the coming year. The roadmap for the future work of the Community of Practice will be drawn up in the same spirit of collaboration to offer members optimum support.

NEXT EVENT

During the session, it was announced that the next meeting will be held in Athens in April on BeMed's Laureates Day. Members of the Community of Practice are invited to meet face-to-face once a year. In response to members' requests, the event will focus on storytelling, in the hope it will become a tool to help tackle the challenges encountered in the field. ■

THE ANIMAL FUND

From krill to cetaceans, a fragile balance

The Animal Fund, a loyal Monaco Ocean Week participant, returned with a new public education event on the decline in krill, which play a key role in the marine food chain and in locking away carbon in the ocean.

A conference warning of the pressures threatening krill, a vital species for ocean health, was held by The Animal Fund (TAF) on Wednesday 20 March 2024 at the Novotel in the presence of HRH The Princess of Hanover.

KRILL, AN ESSENTIAL LINK IN THE OCEAN, UNDER THREAT

Marianne Helene Rasmussen, a marine biologist and Director of the University of Iceland Research Centre in Húsavík, founded in 2008, reported a sharp decline in krill biomass due to overfishing and dramatic changes taking place in the world's oceans. Rasmussen cited rising sea temperatures, acidification and the shrinking of the tiny crustaceans' habitat: *"The southern limit of Arctic krill has shifted northward, but the northern limit is restricted by ocean currents and the polar front, causing an overall loss of habitat and decline in numbers."* The krill population in the Antarctic shifted southward during a recent period of warming in their primary habitat, a phenomenon already noted in the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate in 2019.

Scientists are also alarmed by the recent boom in krill fishing, particularly in the spawning grounds of the southern Antarctic. Soaring demand for krill from the aquaculture, food and cosmetic industries is putting the entire marine ecosystem at risk, particularly in polar waters.

Krill are a primary food source for species like seals, penguins, marine birds and whales, the latter of which plays a vital role in maintaining ecosystem balance (by fertilising waters, boosting photosynthesis, storing carbon, etc). *"Our goal is to highlight the critical need to end krill overfishing before irreversible damage is done"*, warned biologist Berit Legrand, Founder and President of TAF. Amid mounting calls for a temporary ban on krill harvesting, she stressed the need for sustainable fishing practices informed by more extensive scientific research into the ocean's complex biogeochemical processes. The conference was a chance to draw global attention to the importance of krill and to call for precautionary measures.

This event provided an excellent opportunity to broaden the general public's understanding of the causes of biodiversity decline and its impact on humankind. As ever, The Animal Fund stressed the crucial role played by whales, whose main food source is krill, in supporting biodiversity.

The Animal Fund (TAF) was founded in 2015 and has offices in five countries (Monaco, France, UK, Denmark and Norway). It champions the cause of marine animals around the world.

TALE OF AN ORCA

This engaging conference on the interdependence of all living things, from tiny crustaceans to humans, was followed by a screening of *Tahlequah the Whale: A Dance of Grief*, an award-winning animated short by American film-maker Daniel Kreizberg (given special mention at animation festival Animayo on the Spanish island of Gran Canaria). It tells the heart-breaking tale of a mother orca and her newborn calf, illustrating the plight of a vulnerable species increasingly exposed to various industry-driven threats. As well as highlighting the maternal instinct of these majestic mammals, the film portrays the cycle of marine life. By organising this event, The Animal Fund helped promote an intensely moving film that has garnered praise from the likes of Jane Goodall, the British ethologist and anthropologist famous for her pioneering research on the relationship between humans and animals.

Through the lens of both science and art, this public event at Monaco Ocean Week focused attention on the delicate balance of marine ecosystems and our responsibilities as humans. ■

"Education has always been a core part of our mission, which is why we work extensively with schools and universities. We have expanded into five countries over the past nine years and work closely with various partners and ambassadors to promote our work and message",
*explains **Berit Legrand**, founder of TAF*

The term *krill*, which refers to tiny crustaceans found in all the world's oceans in varying concentrations, is a Norwegian word meaning 'small fry of fish'. There are 82 known species of krill. These small organisms measure up to 6 cm and can live for 11 years. They live in swarms of up to 30,000 individuals per cubic meter. Blue whales can ingest up to four tonnes of krill per day. Antarctic krill *(Euphausia superba)* were placed on the IUCN Red List of Threatened Species in 2015.

IN FIGURES

- **455,000 tonnes of Antarctic krill were captured in 2020;**
  Source: The State of World Fisheries and Aquaculture 2022, part I, FAO report
- **the growth rate of Antarctic krill slows when temperatures rise above 0.5°C;**
  Source: A Atkinson et al, 'Natural Growth Rates in Antarctic Krill (Euphausia superba)', Limnology and Oceanography 51(2) (2006)
- **the embryonic developmental stage, of krill will be at risk by 2100 due to the projected increase in CO_2 concentrations in their habitat.**
  Source: S Kawaguchi et al, 'Risk Maps for Antarctic Krill Under Projected Southern Ocean Acidification', Nature Climate Change 3 (2013)

SPOTLIGHT ON THE OCEAN

Art, economics and science hand in hand to raise public awareness

On 19 March 2024, at the Monaco Innovation Runway, an event marrying art and science was held to inspire the general public, with the support of Monegasque innovation start-up incubator MonacoTech. The Monaco Ocean Week evening event began with a science conference hosted by Rachid Benchaouir, CEO and Founder of marine biotechnology company Coraliotech, which is supported by the Monaco Scientific Centre (CSM), during which speakers discussed topics in the fields of marine biodiversity, environmental economics, pollution and sustainable marine resources.

CSM Director Professor Denis Allemand drew attention to the role of marine ecosystems in maintaining complex food chains and climate regulation. During the second part of the conference, Nathalie Hilmi, Head of Environmental Economics at CSM, warned: *"Overfishing, pollution, habitat destruction and climate change not only threaten biodiversity but also undermine the economic stability of the communities who depend on it"*.

The danger of marine plastic pollution as a vector for bacteria, in particular Vibrio Parahaemolyticus, was presented using immersive 3D technology by Houda Ayari, a PhD student at the University of Paris 8's Laboratoire AIAC (art of images and contemporary art lab) whose applied research work is at the interface between art and science. Ayari's project, *Plastic Danger: from the Sea to the Plate*, features virtual reality and augmented reality visualisations of the scientific data available to help the public understand this phenomenon that can be harmful to human health.

Rachid Benchaouir then presented the eco-friendly technology used by Coraliotech to create active substances that are identical to the natural molecules of coral ecosystem organisms, without any impact on the natural environment, using the process of biomimicry.

The event closed with the private view of *Oceans en lumière*, an exhibition of paintings by Slaki, an artist based in Roquebrune-Cap-Martin who is inspired by these themes.

BOOK LAUNCH

Monaco and the Sea

"Following on from his book The History of Water in Monaco*, I am delighted to continue exploring the theme of water with the Scientific Director of the Prince Albert II of Monaco Foundation, Philippe Mondielli, who has teamed up with Professor Denis Allemand, Director of the Monaco Scientific Centre, to trace the history of the Principality's connections to the sea",* said Frédérique Mora, President of the François-Xavier Mora Foundation, in her opening address at the launch of the book Monaco and the Sea, published by Gilletta, which took place at Monaco Yacht Club on 20 March 2024 in the presence of HSH Prince Albert II of Monaco. The book's two co-authors then regaled guests at the evening event with their geologist's and marine biologist's knowledge of the Principality, which has the ocean in its DNA.

During their lively presentation, they took turns to share the key moments in this centuries-old history, from the area's unique geological story to the maritime history of the Princes of Monaco and the adventures of their early oceanographic expeditions, which kickstarted the movement for protecting the global ocean led by the Sovereign Prince today.

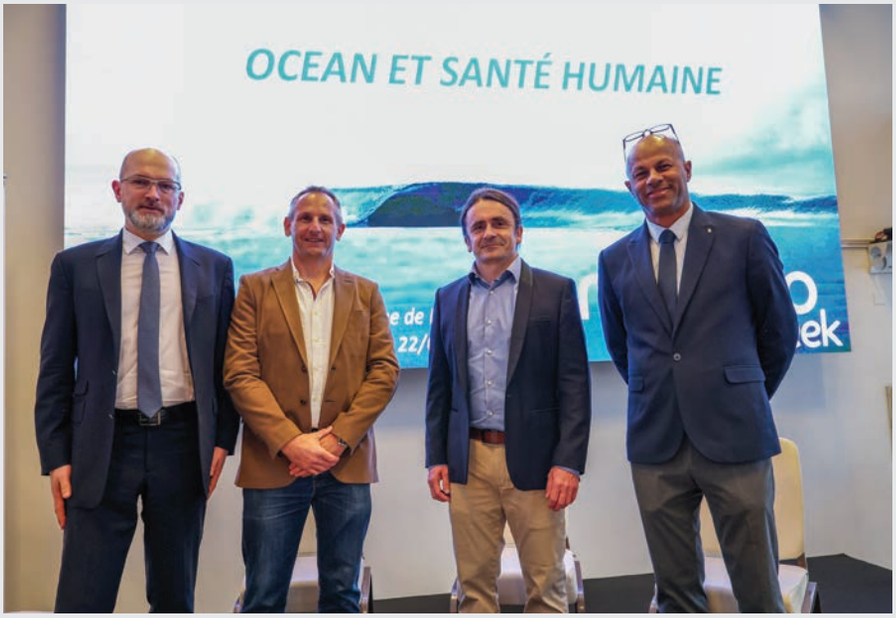
The book sheds light on many intriguing scientific facts, like the role of tectonics in the geography of a turbulent coastline, the land origins of Posidonia seagrass, the introduction of an invasive seaweed and the success story of the return of the bluefin tuna. We discover the first marine pollution awareness campaign from the 1960s, when a 'Message to the sea' was delivered at the foot of the Rock of Monaco. We learn why cetaceans frequent the area where the seabed was sculpted thousands of years ago. We witness the boom in red coral harvesting, delve into the inventory of fish species and feast our eyes on astonishing archive photos in what is already proving to be a benchmark publication.

The Sovereign with Denis Allemand, Frédérique Mora and Philippe Mondielli (left to right) at the launch of the book Monaco and the Sea *(published by Gilletta).*

HUMAN HEALTH

The benefits of the ocean

On the evening of 22 March 2024, the Monaco Scientific Centre and Monaco Yacht Club co-hosted a conference for healthcare professionals and the general public to explore the benefits provided by the ocean for our health and well-being.
Scientists and project leaders gave lively presentations on the beneficial effects of diving, including for post-cancer resilience, surf therapy, sailing and the Navicap challenge, and sea and lake swimming, among a raft of other benefits. The event concluded with a panel session and audience discussion.



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INSPIRE YOUTH

OCEAN LEADERS

Action-based leadership: navigating the highs and lows

For its fourth contribution to Monaco Ocean Week, the Edinburgh Ocean Leaders programme focused on the central theme of leadership and its pivotal role in driving positive change for our oceans.

On 19 March 2024, in two engaging panel talks in Monaco Yacht Club's meeting room, an inspirational group of ocean professionals presented their projects and ideas to Monaco Ocean Week participants and students from the International University of Monaco. Following an introduction by Sandy Tudhope, co-founder and co-director of the programme, the Ocean Leaders shared how their professional experience has led them to become impactful leaders, driving transformative change through concrete ocean conservation efforts.

LOCAL SOLUTIONS WITH GLOBAL IMPACT

During the first panel, ocean professionals from diverse regions, including Indonesia, Bangladesh, Madeira and Kenya, showcased locally and nationally focused projects with the potential to inspire global change. Discussions highlighted the significance of creativity, collaboration and communication as indispensable tools for overcoming obstacles in ocean leadership.

Alifa Haque, Assistant Professor at the University of Dhaka in Bangladesh, who is conducting resourceful shark research initiatives, highlighted the importance of humanising science and making it an inclusive field, for example by involving local fishers. João Canning Clode, a marine ecologist from the Portuguese island of Madeira, also advocates for democratising science by using low-cost technologies and overcoming the problems of limited funding. Willys Osore, Head Warden at Kiunga Marine Biosphere Reserve with the Kenya Wildlife Service, and Tasrif Kartawijaya of the Wildlife Conservation Society Indonesia emphasized the importance of active listening and conflict resolution in their endeavours for marine conservation and supporting the livelihoods of coastal communities.

IN FIGURES

- 32 ocean leaders,
- 25 countries.

"Let's be inclusive in our decisions – to enable new people to participate. We must move towards a more human-centred decision-making system that listens to the voices of others to identify new solutions," ***Barkha Mossaë,*** *Regional Regenerative Blue Economy Manager at IUCN Eastern and Southern Africa Office*

OCEAN LEADERSHIP IN FINANCE, POLICY AND BUSINESS

The second panel shifted the focus to leadership in ocean finance, policy and business. Addressing questions on obstacles and effective tools for ocean leadership, the panel of Ocean Leaders underscored challenges such as conflicting interests, social inequity and insufficient funding and knowledge in ocean business. *"In terms of developing public policy, the biggest challenges are access to data and the top-down approach to accepting, implementing and deploying solutions and innovations,"* explained Jhorace Tupas, Coastal and Marine Ecosystems Management Section Chief in the Department of Environment and Natural Resources–Biodiversity Management Bureau in the Philippines. Timothy Bouley, founder and CEO of BioFeyn, which provides biomedical technology solutions for aquaculture and agriculture, noted the role of storytelling among young entrepreneurs. Ocean Leaders Alexis Grosskopf, who works in South Africa, and Barkha Mossaë from Mauritius highlighted the significance of adhering to core values and cultivating robust networks as essential strategies for effective ocean leadership.

ROUND-TABLES – THE HIGHLIGHT OF THE OCEAN LEADERS EVENT

The event continued with three round-table sessions, during which the speakers and audience reflected on insights gained and items to action. Monegasque students had the opportunity to discuss and compare their points of view with the charismatic Ocean Leaders during constructive exchanges. *"This very interesting discussion brought together individuals and key figures from various backgrounds (both research and governance positions), all of whom had a personal motivation to bring about change for the ocean,"* concluded Bangladeshi professor Alifa Haque, who also highlighted the importance of cooperation, of building relationships with communities, of the need for proper collaboration between researchers and local communities and of securing sustainable investments. ■

PROFILE

Launched in 2020 by the University of Edinburgh and supported by the Prince Albert II of Monaco Foundation, **Edinburgh Ocean Leaders** is the only leadership programme designed specifically for early/mid-career ocean professionals. By supporting creativity, leadership, problem-solving and networking, the initiative aims to accelerate and amplify the visions and capacities of these talented people and their organisations, providing an enduring positive impact on the oceans.

© Marie Lefloch / Team Malizia

TEAM MALIZIA

Tell me about climate change

Skipper Boris Herrmann has the ocean in his DNA. Accompanied by the Team Malizia, he led an event for school children from the Principality of Monaco, attended online by a school in Lyon, to raise awareness about the impact of climate change.

If there wasn't any CO_2 on Earth, what would the average temperature of the planet be? Minus 80°C! And what happens if there is too much CO_2? On Friday 22 March 2024, in the conference room at the Oceanographic Museum, 170 primary and secondary school students were introduced to the inner workings of the ocean's climate machine, guided by two friends linked by the sea: Hermann, the skipper of the *Malizia-Seaexplorer*, a participant in the Vendée Globe, and Pierre Casiraghi, founder of Team Malizia and Vice-President of Monaco Yacht Club.

IDENTIFYING AND LOCATING CO_2

There is nothing like sailing the world's seas for studying and understanding the ocean. It is a way of being part of Monaco's marine history, Pierre Casiraghi told the children at the start of his talk. When they sailed around the world in The Ocean Race and when Boris Herrmann raced in the Vendée Globe in 2020, the team brought back valuable ocean data thanks to the IMOCA's onboard laboratory. Installed on Team Malizia's boat since 2018, this innovative piece of equipment collects data in remote and hostile areas, where oceanographic vessels do not normally venture. *"In May, in a region of the North Atlantic where there are strong winds, we measured a much higher concentration of CO_2 in the ocean than we usually do. And that's when it gets interesting – when we don't understand something,"* said Léa Olivier, oceanography researcher at the Alfred Wegener Institute for Polar and Marine Research in Germany, with a smile on her face. The young scientist worked on the data collected in remote seas by Team Malizia with one goal in mind: to understand the impact of carbon dioxide emissions on the largest ecosystem in the world. Their story of sporting endeavour combined with ocean exploration and scientific research captivated the young audience that had been invited to take part in the Monaco Ocean Week event in the context of Team Malizia's My Ocean Challenge initiative, an educational programme supported by the Prince Albert II of Monaco Foundation and the Intergovernmental Oceanographic Commission of UNESCO.

PROFILE

The onboard laboratory used by Boris Herrmann and his Team Malizia measures valuable ocean CO_2, temperature and salinity data in partnership with the Max Planck Institute for Meteorology, Helmholtz Centre for Ocean Research Kiel (GEOMAR) and French Institute for Ocean Science (IFREMER). The data is used by scientists all over the world to grow understanding of the ocean's role in climate change. During the 2020-2021 Vendée Globe, the *Malizia-Seaexplorer* collected the first full round-the-world tour's worth of ocean CO_2 data ever recorded.

HOW DOES THE OCEAN ABSORB CO_2?

The young oceanographer captured the children's attention with two science experiments that brought to life the global phenomenon of CO_2 absorption by the ocean and the effects of ocean acidification on marine life. One young participant was invited on stage, where they dipped a strip of pH paper into tap water. Another student blew into the water, introducing CO_2 via their breath, before dipping another piece of pH paper into it. Everyone observed a change in colour, proving the presence of the gas, one of the main causes of global warming, and that it decreases the pH levels of water. The experiment continued by adding acid to the water, to demonstrate how the ocean will be tomorrow if we do not reduce greenhouse gas emissions. The acidic solution was poured onto a piece of chalk, a type of limestone, and the children watched it dissolve. The same happens to the skeletons and shells of many marine species, including corals, shellfish and crustaceans. The experiments brought two very abstract phenomena affecting the world's oceans to life for the children.

THE OPEN SEA REQUIRES A CERTAIN STATE OF MIND

Develop a sports mentality towards the climate challenge. That is the message to the young generation from Boris Herrmann, who has already circumnavigated the world by sea six times. The renowned German skipper emphasised the resilience you have to demonstrate in offshore racing, especially for the most difficult race that his team and he are preparing for again, the Vendée Globe.

"We have to find a solution to every obstacle we encounter using what we have to hand on board. Our mast cracked during The Ocean Race. We almost gave up, but we attempted the impossible and fixed it. Then we managed to overtake the entire fleet of competitors and win that leg." Being as close to the elements as you can get, contending with the unexpected, heading into the unknown and making decisions in an environment as unpredictable as the ocean are some of the ways the open sea inspires Team Malizia, and which they share with young people. Taking on the major climate challenge suddenly seems possible.

DRAW CLIMATE CHANGE FOR ME

Then it was the turn of final-year pupils from École Saint-Charles primary school and second-year students from Collège Charles III high school to show their art projects on the theme of 'Making climate change visible'. The students made a paper circle symbolising the tonnes of CO_2 accumulated in the atmosphere, and the interconnectedness between all the elements of climate change. This was followed by a presentation on the problems caused by greenhouse gas emissions, the consequences of the problems and the potential solutions.

At the start of the event, Boris Herrmann had asked how many children in the audience wanted to become scientists. The answer was three. When he repeated his question at the end, a third of the young attendees raised their hands. Curiosity successfully awakened! ■

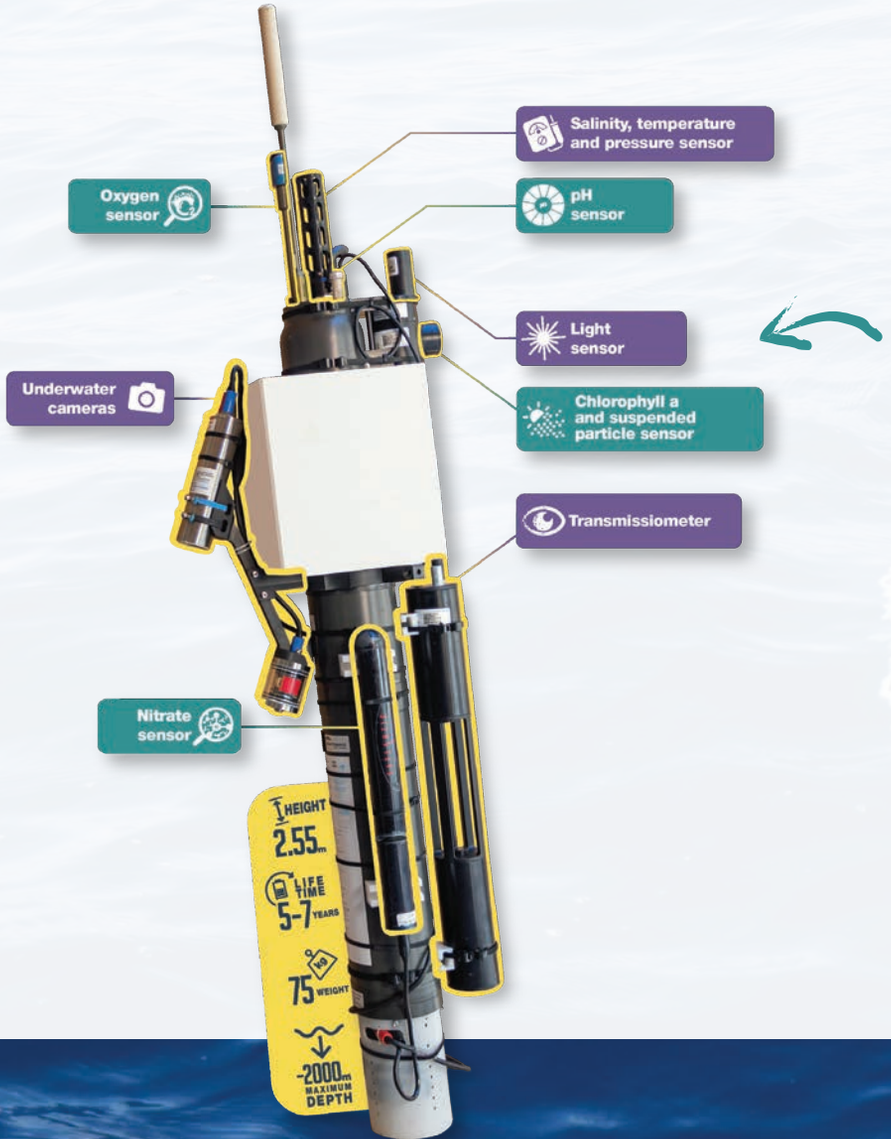
IN FIGURES

Since the My Ocean Challenge initiative was launched in 2018, Team Malizia has raised the awareness of more than 75,000 children around the world.

ADOPT A FLOAT

Secondary school students discover oceanography

Students from local secondary school Collège Charles III have adopted a profiling float that patrols the Atlantic Ocean collecting scientific data. This outreach programme run by Villefranche Oceanography Laboratory brings marine science right into the classroom.



The profiling float nicknamed 'College-CharlesIII-MC' was adopted by a class of first years at Collège Charles III secondary school in Monaco. Using an interactive map, the budding scientists can track the float's progress in real time as it drifts hundreds of kilometers away, off the Spanish coast. Since its launch on 14 June 2023, 'College-CharlesIII-MC' has been drifting around the Atlantic Ocean measuring water temperature, salinity, oxygen concentrations, chlorophyll and suspended particles.

It is part of a fleet of underwater robots deployed by international research programmes to monitor the global ocean. Using miniature sensors, they take a variety of measurements and send them to a database in real time, providing valuable data for ocean scientists. As well as being a vital tool for scientific observation, these floats are a modern educational tool that give classrooms a direct window into ocean science.

On Tuesday 19 March, the students took part in an ocean science workshop led by Manon Audax, Science Outreach Officer at Villefranche Oceanography Laboratory (LOV), giving them first-hand experience of the energy of Monaco Ocean Week. The aim of the session was for the pupils to understand the mechanisms driving ocean currents and how they influence our lives.

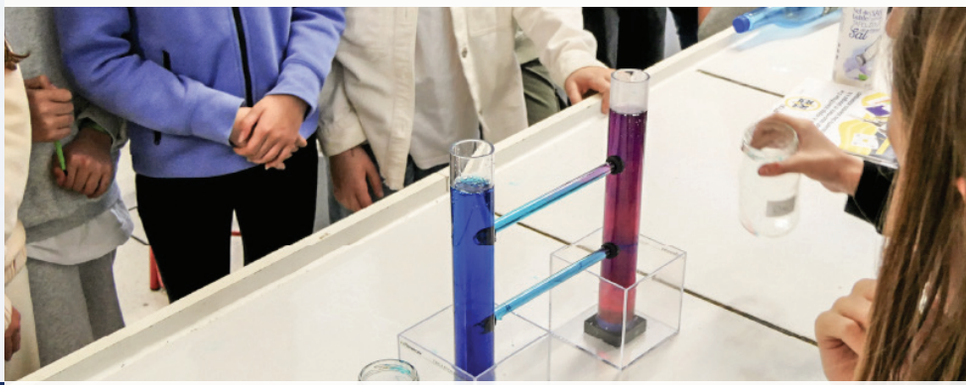
After studying the theory, the children got to work using the scientific method: ask a question, form a hypothesis, conduct an experiment, observe, analyse and write a conclusion. *"The first years listened to an engaging presentation on ocean currents that was adapted to their level. They enjoyed Manon's approach and their discussions, and loved getting stuck in and testing their hypotheses with her"*, commented the teacher who accompanied the class during this workshop designed to complement the school curriculum.

The Monegasque students have participated in the Adopt a Float programme since the beginning of the school year, alongside 90 other classes around the world (a total of almost 2,000 students and their teachers). This initiative enables young citizens to understand and deepen their connection with the ocean.

To officially adopt a profiling float, each class must give their robot a name and design a logo for it.

Students used the scientific method to understand the mechanisms driving deep ocean currents.

Nothing beats an experiment to explain how the temperature and salinity of water affect its density and flow patterns. Here, warm water (dyed red) stays at the surface, while cold water remains at the bottom. The conclusion? Warm water has a lower density than cold water.



How do global ocean currents work? Get your test tubes ready! The freezing, salty waters of the North Pole (in blue) sink deep to the bottom, while the warmer, less saline waters of the Equator (in red) rise towards the surface. The result is a global process known as thermohaline circulation.

IN FIGURES

- **90 classes participating,**
- **2,000 students and their teachers involved**

PROFILE

Adopt a Float is an educational programme run by the Culture Océan team at the Institut de la Mer de Villefranche (CNRS / Sorbonne University). It invites pupils around the world, from pre-school through to college, to learn about the ocean and the importance of studying it to better understand and protect it.

EDUCATIONAL GAMES

Living in harmony with cetaceans

Pupils from the École Saint-Charles, who are in charge of Monaco's Marine Education Area, took part in fun activities to find out more about Mediterranean marine mammals at an event organised by the AMPN and the secretariats of the ACCOBAMS and Pelagos agreements.

Final-year pupils at École Saint-Charles primary school, who are responsible for Monaco's Marine Education Area, studied the biology of fish and their habitats over the course of the 2023–2024 academic year. On 20 March 2024, as part of Monaco Ocean Week, three educational sessions were organised for the class by the Monegasque Association for the Protection of Nature (AMPN) and representatives of the ACCOBAMS and Pelagos agreements to boost their knowledge of marine biodiversity, specifically Mediterranean cetaceans and the pressures they face.

DISCOVERING LITTLE-KNOWN SOUNDS

What sounds travel through the ocean? Why are they essential to marine life? The first session began with the children gathered around 22 photos laid out on the floor, while listening to the sound of breaking waves through a speaker. The pupils were then immersed in the surprising sounds of a host of different animals. Each sound corresponded to an image, which sparked plenty of interaction. *"Human activities make a lot of noise and that stops animals from communicating,"* said one student. *"I didn't know marine animals made sounds to communicate and there were so many different sounds!"* exclaimed another.

A CARD GAME ABOUT PROTECTING CETACEANS

At this session, the leader shuffled some cards and distributed them to the eight participants. The pupils discovered five species of cetaceans, four types of ship and a collection of special cards: speed, noise pollution, plastic, collision, High Quality Whale-Watching®, marine protected areas, scientific research and fishing. Whale Risk is a card game aimed at raising awareness about environmental conservation and marine mammal protection with a focus on shipping traffic.

A STRATEGY GAME FOR THE SUSTAINABLE MANAGEMENT OF THE MARINE ENVIRONMENT

CETAMER turns its players into eco-ambassadors for cetaceans and the marine environment in the Ligurian Sea. What problems do humans and marine species come up against when they share the same space? *"How can we make sure human activities exist in harmony with cetaceans?"* the group of young participants asked themselves. The object of the game is to increase harmony levels as much as possible by completing various challenges (the game starts with the harmony level at just 25%). As if by magic, solutions emerge from the players as they work together to manage the marine environment in a sustainably, cetacean-friendly way!

PLAYFUL LEARNING

The École Saint-Charles honoured Ocean Week in school again this year by organising various educational activities centred on protecting marine species and their environment. The pupils were given access to a host of different tools throughout the week, including books, educational materials and interactive team games. In addition, the AMPN trialled new online games among different classes via the platform Genially: an AMPN Trivial Pursuit-style game about the marine environment and a snakes and ladders-style game with a marine species theme, featuring the concepts of human-caused pressures and marine protected areas. All tools for getting young people involved in the major issues facing the sea. ■

CAPTAIN'GAME

A fun and educational trail at Port de Fontvieille

The Government of Monaco offered a fun and educational outdoor trail during Monaco Ocean Week to raise public awareness of the environmental challenges faced by a port committed to preserving marine life.

A certified 'Clean, Biodiversity Active Harbour' since 2020 thanks to its efforts to protect local wildlife, Port de Fontvieille has set itself a host of conservation goals, including becoming a refuge for marine biodiversity. To this end, a series of highly effective Biohuts® has been installed in Monaco's ports through a partnership set up in 2014 between the Monaco Port Authority (SEPM), the Department of Maritime Affairs, the Department of the Environment and Ecocean.

These steel cages filled with oyster shells help restore marine ecosystems by acting as artificial nurseries that protect countless fish larvae from predators. Altogether, 79 nurseries have now been installed in Monaco's two ports, creating an ecological corridor. The initiative has proven very successful, as evidenced by the biannual monitoring reports produced by Biotope. These positive results have prompted the four organisations – joined in 2024 by Monaco Yacht Club – to extend their partnership until 2027.

"Captain'Game has been launched to promote this particular initiative, and more widely, to highlight Monaco's commitment to the environment", explained Estelle Gianforte, Division Manager at the Department of Maritime Affairs.

The new biodiversity-themed trail around the Fontvieille area was unveiled to the public during Monaco Ocean Week. Using a map, participants must locate 10 small card-punching stations made of recycled plastic and answer a question on an emblematic species or a conservation issue in Monaco. These include: How deep can the European shag (a species of cormorant) dive? The Saint Nicolas rocks just outside Port de Fontvieille are coralligenous. What are they made of? Dusky groupers have flourished in Monaco's waters since it was made a protected species in 1993, but what makes this fish special? How does Monaco safeguard its two marine protected areas, which are located in a heavily urbanised environment?

"Everyone who took part was really enthusiastic about the initiative and thought the trail was very informative", noted Matéo Planchon, Ecocean's sales manager for the Occitanie region, who ran a stand at the event. This sporty, fun trail for families and friends is available 7 days a week.

IN FIGURES

- 1 trail, 2,5 km long,
- 10 card-punching stations,
- Duration: approx. 2 hours.

Leaflets for the game are available from the harbourmasters' offices in the two Monegasque ports, the Oceanographic Museum, the Tourist Office and the Zoological Gardens.

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PARTNERS OF MONACO OCEAN WEEK

FONDATION PRINCE ALBERT II DE MONACO

THE PRINCE ALBERT II OF MONACO FOUNDATION

The Foundations is a not-for-profit organisation committed to advancing global health for present and future generations by co-creating initiatives and supporting hundreds of projects across the planet. The Prince Albert II of Monaco Foundation which works in three main geographical regions - the Mediterranean basin, the polar regions and the least developed countries - has already granted over €110 million to support more than 780 projects aimed at limiting the effects of climate change, promoting renewable energies, protecting the ocean, preserving marine and terrestrial biodiversity, managing water resources and combating deforestation.

www.fpa2.org

Gouvernement Princier
PRINCIPAUTÉ DE MONACO

THE MONACO GOVERNMENT

HSH the Sovereign Prince has made sustainable management of the seas, oceans and their resources a priority area of Monaco's national and international policy. The Monaco government works tirelessly to this end, and particularly within the framework of the 2030 Agenda for Sustainable Development adopted by the United Nations.

That is why the Government is now involved in events for Monaco Ocean Week supported by the Prince Albert II of Monaco Foundation, in which all Principality stakeholders are involved.

www.gouv.mc/Action-Gouvernementale/L-Environnement

OCEANO
INSTITUT OCÉANOGRAPHIQUE MONACO

OCEANOGRAPHIC INSTITUTE, PRINCE ALBERT I OF MONACO FOUNDATION

The Oceanographic Institute aims to raise awareness of the wealth and fragility of the oceans, and to promote sustainable management and thoughtful and effective protection. To do this, it mediates between scientific and socio-economic stakeholders, the general public and policy-makers. It carries out this mission by promoting the exceptional heritage of Prince Albert I and the exemplary commitment by HSH Prince Albert II of Monaco to: "Raise awareness, love and protect the oceans".

www.oceano.org

MONACO SCIENTIFIC CENTRE

The Monaco Scientific Centre (CSM) is an autonomous public Monegasque institution created in 1960 by Prince Rainier III. Its aim: to give Monaco the means to carry out scientific research and support the action of government and international organisations responsible for protecting and conserving marine life. The Centre attracts candidates from all over the world: since its move to new headquarters at Quai Antoine Ier in 2013, more than 50 specialists have arrived from 15 countries (Europe, the USA, Japan, Australia, New Zealand, Palau, Brazil, the Caribbean, Canada, Oman, Saudi Arabia...).

www.centrescientifique.mc

THE YACHT CLUB OF MONACO

Founded in 1953 by Prince Rainier and chaired since 1984 by HSH Prince Albert II of Monaco, the Monaco Yacht Club has 1,200 members from 60 nationalities. Home to some of the most prestigious private yachts in the world, the YCM now enjoys a unique position in the world of international yachting and sailing.

www.yacht-club-monaco.mc

MONACO TOWN HALL

The Town Hall is the oldest institution in Monaco, with over 650 people working in 19 municipal departments, in areas of expertise like the Environment and Sustainable Development. Deeply mindful of the environment, based on guidelines given by HSH Prince Albert II, the Monaco Town Hall has been committed to protecting the environment for many years; a commitment which is reflected in tangible and sustainable actions in the Principality.

www.mairie.mc

THE PELAGOS AGREEMENT

The Pelagos Sanctuary is a 87,500 km^2 marine area subject to an agreement between Italy, Monaco and France to protect its marine mammals. What makes the Pelagos Sanctuary unique is the fact that it is managed by three different authorities, and it includes coastal areas and international waters which form a huge ecosystem of major scientific, socio-economic, cultural and educational interest.

www.sanctuaire-pelagos.org

ACCOBAMS

ACCOBAMS (Agreement on the Conservation of Cetaceans in the Black Sea Mediterranean Sea and Contiguous Atlantic Area) is a cooperative body working to conserve marine biodiversity in the Mediterranean and Black Sea. Its primary objective is to reduce the threats to cetaceans in this geographic area, and improve our knowledge about these animals. ACCOBAMS is the first agreement binding countries from two sub-regions and allowing them to collaborate on a general interest topic.

www.accobams.org

THE RAMOGE AGREEMENT

The RAMOGE area includes the maritime areas of the Provence-Alpes-Côte d'Azur region, the Principality of Monaco and the Italian region of Liguria, forming a pilot area to prevent and combat marine pollution. The RAMOGE agreement is an instrument of scientific, technical, legal and administrative cooperation allowing French, Monegasque and Italian governments to carry out actions for integrated coastal management.

www.ramoge.org

THE MEDITERRANEAN SCIENCE COMMISSION (CIESM)

CIESM has supported multilateral research in the Mediterranean and the Black Sea since 1910, the date it was founded. It is a unique forum for scientific discussion and dialogue, bringing together thousands of researchers who, together, use the newest technologies and approaches to understand, monitor and protect a very exposed sea. The Commission is able to define the Mediterranean's priorities in terms of marine and environmental research with greater impartiality, consolidated by the political support of its 23 Member States.

www.ciesm.org

THE INTERNATIONAL HYDROGRAPHIC ORGANISATION (IHO)

The International Hydrographic Organisation (IHO) is the intergovernmental body responsible for ensuring that all seas, oceans and navigable waters are hydrographically surveyed and mapped through the coordinated efforts of national hydrography services. The IHO has been hosted by the government of Monaco since its creation in 1921 and currently has 93 member states worldwide.

www.iho.int

INDEMER: THE INSTITUTE OF THE ECONOMIC LAW OF THE SEA

The Institute of the Economic Law of the Sea, founded in 1985 as an approved Monegasque association, whose patron is HSH the Sovereign Prince of Monaco. Its primary goal: to carry out studies and research concerning legal, economic, social and environmental issues raised by the use of the ocean and the marine environment.

www.indemer.org

INTERNATIONAL ATOMIC ENERGY AGENCY

The IAEA Environmental Laboratories, located in Monaco and Seibersdorf, Austria, work with Member States to develop strategies for sustainable management of their land, marine and atmospheric resources. Together, they apply nuclear and isotope science to understand and mitigate the environmental impact of radionuclides, trace metals, organic contaminants (PCBs, hydrocarbons), as well as to study the impacts of climate change, habitat destruction and the loss of biodiversity. This includes inspecting and monitoring contaminants in the oceans, such as mercury or plastics, as well as biotoxins linked to microalgae, and studying how they are transferred to marine animals.

www.iaea.org

MONEGASQUE ASSOCIATION FOR THE PROTECTION OF NATURE (AMPN)

The Monegasque Association for the Protection of Nature (AMPN) manages two Marine Protected Areas (MPAs) in Monaco, which it created in 1976 and 1986.

It regularly develops monitoring and research programmes. This includes work carried out on 3D printed artificial reefs submerged in the Larvotto MPA. These lead to the development of innovative tools to protect or reinforce biodiversity. AMPN also created the Monaco Educational Marine Area for which it plays a central role. Its expertise contributes to its success, and guarantees that children can play their part in environmental protection.

www.ampn-nature-monaco.com

BEYOND PLASTIC MED - BEMED

With over 3 trillion microplastic particles, the Mediterranean is the most polluted sea in the world. Faced with this finding, the Prince Albert II of Monaco Foundation asked the Tara Océan Foundation, Surfrider Foundation Europe, and the MAVA Foundation to join forces and launch the Beyond Plastic Med (BeMed) initiative during the international conference “Plastic in the Mediterranean: what next?” which was held in Monaco in March 2015.

In January 2019, the Beyond Plastic Med (BeMed) association was founded and is now led by a large group, as the IUCN wanted to get involved alongside the founding members. As BeMed’s goal is to act at the source of the problem, the association aims to support and network stakeholders committed against plastic pollution in the Mediterranean, implement sustainable solutions, encourage the research of new alternatives and rally stakeholders and the general public through knowledge and sharing best practices.

www.beyondplasticmed.org

THE MEDFUND

ENVIRONMENTAL FUND FOR MEDITERRANEAN MARINE PROTECTED AREAS (MPAS)

The MedFund is an environmental trust fund based in Monaco, specifically dedicated to funding marine protected areas (MPA) in the Mediterranean. Founded in 2015 by Monaco, France and Tunisia with the support of the Prince Albert II of Monaco Foundation, MedPAN network and SPA/RAC, the MedFund realises the commitment by several Mediterranean countries and international environmental organisations who believe that immediate action is required to protect the future of the Mediterranean and its populations.

The environmental fund partially relies on an innovative funding mechanism which aims to capitalise a solid financial amount whose regular profits are reinvested sustainably in MPA support. Transparent and secure, The MedFund observes a responsible investment policy which helps address the issues of a new, more sustainable Mediterranean economy.

www.themedfund.org

OCEAN ACIDIFICATION AND OTHER OCEAN CHANGES – IMPACTS AND SOLUTIONS – OACIS

Ocean Acidification and other ocean Changes – Impacts and Solutions (formerly the Monegasque Association for Ocean Acidification - AMAO) is a Monegasque association founded in 2013 on the initiative of the Prince Albert II of Monaco Foundation to study the impact of climate change on the ocean, such as acidification, as well as potential solutions to mitigate its impacts. It is hosted by the Prince Albert II of Monaco Foundation.

OACIS involves several stakeholders: the Prince Albert II of Monaco Foundation, the Monaco Government, the IAEA environment laboratories, the Monaco Scientific Centre and Oceanographic Institute, as well as representatives from the International Union for Conservation of Nature (IUCN) and the French Scientific Research Centre (CNRS).

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