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SUMMARIES

Participants of the Monaco Blue Initiative 2017 - Monaco

The Monaco Blue Initiative (MBI) is a platform for discussion on ocean management and conservation bringing together actors from government and policy circles, international organisations, civil society, science and the private sector. Launched in 2010 by H.S.H. Prince Albert II of Monaco, MBI is co-organised by the Oceanographic Institute and the Prince Albert II of Monaco Foundation. Its members meet annually to discuss the complex interactions and possible synergies between marine conservation and socio-economic development.

Introduction words by H.E.Mr Bernard Fautrier, Vice-President and CEO, Prince Albert II of Monaco Foundation and Robert Calcagno, CEO, Oceanographic Institute, Foundation Albert I, Prince of Monaco.

The 8th edition of MBI took place in Monaco in April 2017 in a context of new awareness of marine issues globally, amid talks at the UN on the biodiversity of areas beyond national jurisdiction, a special Oceans Action Day at COP22 in Marrakech, and publication of the IPCC's report on oceans and the cryosphere.

This new awareness both vindicates MBI's longstanding efforts to highlight these issues and propels its future development. This year's MBI developed new perspectives by linking issues that have been historically separate, such as climate change and marine protected areas, and aquaculture within MPAs.

The high seas session identified ways to advance protection and sustainable management of marine biological diversity beyond national jurisdiction using existing tools, without waiting for a UN agreement. These tools, which include UNESCO's World Heritage Convention and the extension of exclusive economic zones in the Mediterranean, can and should be used right now.

Aquaculture, if responsibly designed and managed, can assist marine protected areas by mitigating the effects of climate change and overfishing while providing livelihoods and food security. The IUCN published its special report on the subject during this year's MBI. Some of the most promising models are community-based projects using a circular economy approach; these should be assisted and scaled up.

MPAs can assist in climate change mitigation and adaptation by protecting environments that serve as carbon sinks, while improving ecosystem and species resilience. MPAs can also serve as laboratories for monitoring impacts. MPA designation and management should systematically integrate the issue of climate change alongside with pollution and biodiversity considerations; the same applies to MPA networks.

Sustainable fisheries and aquaculture in the Mediterranean can help reconcile food security and poverty reduction goals with those of conservation. Integrated management is necessary, as is investment to modernise fishing fleets, particularly in the south. Small-scale fishers can contribute knowledge and help monitor impacts of climate change, working hand-in-hand with scientists and MPA managers. Finally, consumers have a key role to play in the demand and valorisation of local, sustainably caught and farmed fish.

The 2017 edition saw record attendance by over 120 participants of a very high level and of great diversity, from scientists working in the field on community-based conservation and aquaculture to policy-makers and small fisheries representatives. It featured keynote speeches by H.S.H. Prince Albert II of Monaco, French Environment Minister Ségolène Royal and her Italian counterpart Gian Luca Galletti and European Environment Commissioner Karmenu Vella.

Participants hailed from Europe, the UK, the Americas, North and West Africa, the Indian Ocean, the Caribbean and the Middle East. Alongside government and policy figures, organisations represented included the IUCN, the FAO, MedPAN and other regional Marine Protected Areas Networks, the Ocean Elders, WWF, UNESCO's World Heritage Marine Programme, Blue Ventures, the Aquaculture Stewardship Council and universities, as well as actors from the aquaculture, pharmaceutical and fishing industries.

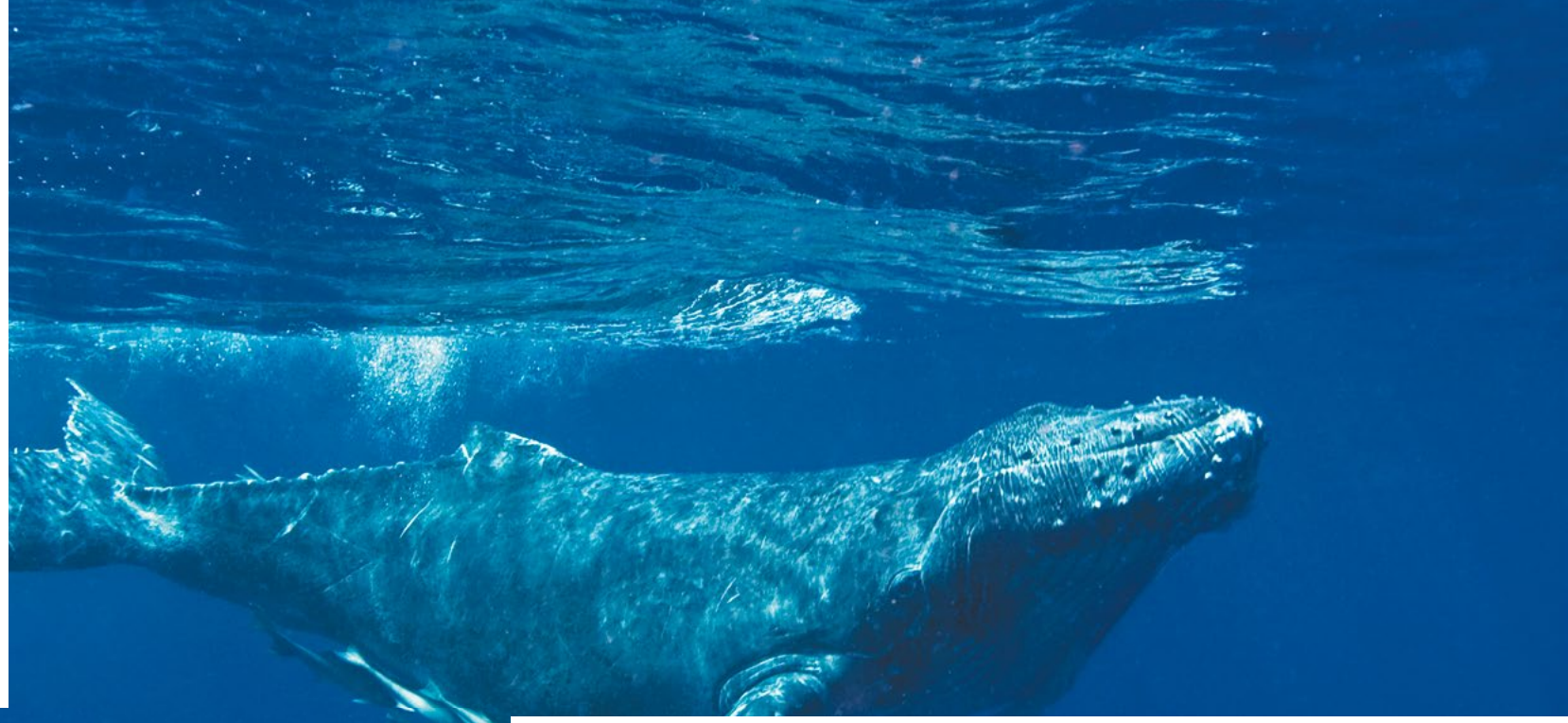
The breadth and depth of MBI participants reflect the forum's commitment to a balanced approach to management and conservation of marine resources. In the words of marine ecology professor and UN Environment Programme consultant Gérard Pergent, this edition of the Monaco Blue Initiative "has led to particularly fruitful exchanges not only at the scientific level, but especially with stakeholders, decision-makers and managers, particularly on marine protected areas." These exchanges will continue at next year's MBI in Edinburgh, Scotland.

TABLE OF CONTENTS

SESSION 1

The high seas

Moderator:
Sebastian Troeng, Senior VP for Marine Conservation, Conservation International
Pascal Lamy, President emeritus, Jacques Delors Institute
Tullio Scovazzi, Professor of International Law at the University of Milano-Bicocca
Fanny Douvere: Coordinator of the Marine Programme, UNESCO World Heritage Centre
Sandra Bessudo, President and Founder of the Fundación Malpelo of Colombia



THE CONTEXT

Ensuring responsible stewardship of the High Seas – marine areas beyond national jurisdiction – requires facing difficult legal, geopolitical, environmental and economic challenges. The slow progress of discussions at the UN on a new legally binding instrument to manage high seas biodiversity – taking place this week in New York – highlights these difficulties. Today's the opening panel took a closer look at these challenges and possible approaches.

Setting the stage, session moderator **Sebastian Troeng** called the high seas "the world's final frontier of exploration," constituting 40% of its surface. Early explorers saw the high seas as an inconvenience between them and the conquest of riches, but our recognition of their importance has evolved significantly, even since the first MBI in 2010, he said. That year marked the creation of the first marine protected area in waters beyond national jurisdiction. Today's panellists are also explorers, seeking to expand knowledge of the high seas and to determine how to collectively improve their management. We must stop this cycle of degradation of the oceans, and particularly overfishing, said **Pascal Lamy**, a former member of the Global Ocean Commission. Unsustainable fishing is the direct result of overcapacity, much of which is due to ill-conceived subsidies, he affirmed. While subsidies artificially reduce costs, the result is that we pay for our fish twice: first at the fish counter, and again as taxpayers.

Technically it would be easy to halt subsidy-related overfishing; politically it is more complicated. The world is divided into two camps: the friends of fish and the friends of fishers, and the battle between them at the international level is fierce, Lamy stated. There is progress: thanks to US State Department diplomacy, Japan has accepted discipline within the Trans-Pacific Partnership that it had never before accepted at the multilateral level, he said. The EU has also finally shifted towards the friends of fish rather than those of fishers.

This is good news, and proves there is a process underway.

The lack of public awareness of the oceans, and particularly of the high seas, is a major obstacle to their protection, Lamy indicated. We need to work more resolutely to progress from awareness and empathy to action. If we do not, much of what we're trying to do will be in vain. Public concern for the high seas is a pre-condition for creating the momentum to reconcile what are often conflicting political, scientific, legal and economic realities, he concluded.

Fanny Douvere then told the panel about the UNESCO World Heritage Convention's potential as a tool to protect high seas areas without waiting for new legislation. The WHC today applies to only half of our planet. Though it has 49 marine sites such as the Great Barrier Reef and the Galapagos Islands, none are in the high seas. When the WHC was created, no one was thinking about areas beyond national jurisdiction, but legal and policy experts have now concluded that this Convention does apply to the high seas, she said. This offers us a tremendous, untapped opportunity: we have a universally ratified (191 countries) UN Convention protecting places of outstanding universal value that does not need to be renegotiated in order to include areas beyond national jurisdiction! she exclaimed.

The WHC has selected five potential high-seas sites that meet World Heritage criteria: the Costa Rica Thermal Dome, a critical habitat for many endangered species; the White Shark Café, the only known North Pacific white shark gathering point; the Sargasso Sea; the Lost City Hydrothermal Field, and the Atlantis Bank, a sunken fossil island in the Indian Ocean.

Using the WHC as a tool to create high seas protected sites does not conflict with ABNJ negotiations underway at the UN, and could provide a real catalyst, Douvere suggested. It could also make a much broader public aware of the high seas by connecting these new World Heritage Sites with places everyone has heard of and cares about, like the Serengeti or the Taj Mahal. The WHC has 40 years of experience, a well-honed process and an applicable Convention. So today it's more a technical question of meeting with our experts to create the guidelines for nominating high-seas sites and protecting them. That should not be too complicated, she affirmed. [For more information see the report: World Heritage in the High Seas]

International legal expert **Tullio Scovazzi** then gave an eye-opening exposé as to the legal complexities of coastal spaces and high seas in the Mediterranean, sometimes referred to as the "Harlequin" or patchwork sea. The "patches" off the shores of the 23 Mediterranean countries vary greatly as to their extent and nature, and may or may not have specific status under the UN Convention on the Law of the Sea (UNCLOS).

Alongside Maritime Internal Waters between two points of national land, there are Territorial Seas (usually extending to 12 nautical miles offshore), 24-n.m. Contiguous Zones established for fiscal, customs, sanitary, immigration and underwater cultural heritage purposes, and Exclusive Economic Zones (EEZ). In addition, some coastal states have proclaimed sui generis zones for protection (Italy and Slovenia) or fishing (Algeria, Libya, Malta and Tunisia), while Croatia has established a zone mixing both objectives.

While neither type of zone is mentioned in the UNCLOS, they are not prohibited either, Scovazzi indicated, and encompass only some of the rights of an EEZ. The sui generis fishing zones are situated at greatly varying distances from shore, with Algeria claiming waters between 32 and 52 nautical miles out, Libya 62, and Malta 25, for instance. Tunisia claims a fishing zone by depth, limited to 50 meters.

The delimitation of maritime boundaries is a problem, as few have been agreed. Just eight coastal states – Cyprus, Egypt, Israel, Lebanon, Morocco, France, Spain and Syria – have established the exclusive economic zones to which they are entitled, with two more having adopted legislation for their future establishment (Libya and Tunisia).

We should not view countries' claiming their EEZs as something negative – on the contrary, Professor Scovazzi asserted. Today's jurisdictional vacuum caused by the persistence of high seas and zones of uncertain status hinders effective governance. But if all Mediterranean states claimed their EEZs, no high seas would be left, as no zone is more than 200 miles from land. This would establish a clear jurisdictional basis on which to build stronger regional cooperation on resource management and common environmental concerns, he affirmed. It would also eliminate the need to extend to the Mediterranean the future regime on marine biodiversity beyond areas of national jurisdiction (BBNJ) currently being negotiated at the UN.

However, these negotiations are a major opportunity to build a more advanced legal framework for the protection and sustainable exploitation of BBNJ, Scovazzi indicated. A new UNCLOS implementation agreement could enable the establishment of a network of high seas MPAs. Genetic resources are another crucial aspect of talks, as their exploitation in the high seas currently takes place in a legal vacuum. Ideally, the new framework would extend to genetic resources what Scovazzi called "the revolutionary concept of the common heritage of mankind", which today under UNCLOS only applies to mineral resources in ABNJ, he noted.

We then heard from the Fundación Malpelo's **Sandra Bessudo**, who provided insight into the realities of managing biodiversity in the high seas. The Malpelo Fauna and Floral Sanctuary is one of the existing UNESCO World Heritage marine sites. Its collaborative management mobilizes experts from the entire Eastern

Tropical Pacific region, from Ecuador to Mexico, and even France, with Clipperton Island, she noted. They cooperate on scientific research and satellite and acoustic telemetry of several shark species.

Her experience at Malpelo has made it clear that without international cooperation and communication, it is very difficult to make concrete decisions on the conservation of biodiversity. Each geographic region should have scientific networks to provide information to decision-makers to enable them to put effective measures in place, Bessudo asserted. She heads one such international group, MigraMar, which conducts and shares scientific research to better protect Eastern Pacific migratory species. Its work has permitted a number of shark species to be declared as endangered species at the IUCN but also in CITES.

Without protecting the high seas, MPAs in territorial waters cannot be effective, Bessudo declared. Our tracking shows how these animals migrate through national jurisdictions and high seas alike – they don't recognize borders. Galapagos sharks tagged near Clipperton were tracked by satellite as far away as Hawaii, while hammerhead sharks tagged on Malpelo passed through the Galapagos and on to French Polynesia, she noted. We have to make people understand the high seas are crucial to biodiversity.

Illegal fishing is a big problem, as enforcement of protected areas is very difficult in international waters. Large industrial ships circumvent restrictions by launching small boats to pillage protected areas before returning to waters beyond national jurisdiction, Bessudo told the panel. Pollution, with large ships dumping waste or toxic products, is also rife in the high seas. International cooperation is essential to fight this, and as a member of the UN (though not UNCLOS), Colombia can play an active role, she concluded.

The floor was then opened to comments. **Philippe Vallette** of Nausicaa expressed disagreement with Pascal Lamy's remark. "I don't think we can oversimplify to this extent, between friends of fish or friends of fishermen. The whole challenge is precisely not to set one against the other, because we need fishermen practicing sustainable fishing," Vallette said. His organization together with two other European aquariums developed consumer awareness tool Mr. Goodfish, which is targeted to the public, but with the support of fishermen. The Prince Albert II of Monaco Foundation coordinates its development in the Mediterranean region.

Mr. Lamy agreed that progress would require a coalition of governments, civil society organizations and business working together. Closer tracking would also help, he suggested: "The day fishermen accept having transponders on their boats as Sandra [Bessudo] has on her sharks, things will get a lot better."

François Simard of the IUCN supported the view that one need not wait until all is clearly delineated in the Mediterranean. The Greek-Turkish maritime conflict is not about to be resolved, he said, but the Aegean Sea must be protected, whatever its high-seas status, under existing mechanisms like the CGPM or the Barcelona Convention. We should reinforce cooperation among states and act now, rather than wait for a better legal status, he stated.

Professor Scovazzi agreed, adding that there already exists a protocol under the Barcelona Convention for establishing Mediterranean specially protected areas, or SPAMI, even in the high-seas, undelineated zones. In answer to a question regarding floating cities, he said they would be considered ships required to operate under a flag and the laws of the country in whose waters they float. If anchored to the seabed, however, they would come under the jurisdiction of the state holding claim to that part of the continental shelf.

Sylvia Earle suggested higher values should govern our policy towards the oceans than mercantile or even food security ones. The ocean serves humanity by keeping our life support system intact, governing climate, governing temperature, and containing the majority of life forms, she said. The high seas should be protected, and only exploited once it has been demonstrated that we will do no harm.

Jean-Michel Cousteau grew up with fishermen in the Mediterranean and has watched many go out of business, while seeing entire species disappear. Early humans hunted and gathered until there was nothing left, and then we became farmers, he noted. We don't farm carnivores like lions and jaguars, because it takes too much meat to make them. But we farm salmon, one pound of which requires 8-10 lbs of wild fish. That's absurd, he said. If we farmed herbivorous fish on land, it could provide many livelihoods and enable us to feed undernourished populations at a much lower cost. Sebastian Troeng added that oysters and mussels could also be sustainably farmed, as "you don't even need to feed them – they can filter-feed."

Lisa Speer of the NRDC came to Monaco straight from UN preparatory committee meetings on BBNJ. She described the talks as "extremely painful – like watching paint dry," and asked panelists to expand on how these areas might gain protection without waiting for an agreement under the Law of the Sea.

Fanny Douvere reiterated that the World Heritage Convention represents an incredible opportunity to solve part of the problem. We need to think specific place-based, because that's the Convention's strength. The heart of the WHC is that nearly every country in the world subscribes to the idea of shared responsibility for each other's world heritage. Putting that together with a universally ratified convention is a very powerful way to move forward, she said.

Tullio Scovazzi added that the problem with any agreement is it's only binding on states party to it, so there can be free riders. These third parties don't accept the burdens of protection but take advantage of its benefits, for instance by fishing in areas where protection is boosting stocks, he warned. This is why a framework agreement at the UN global level is so important for enabling protected areas on the high seas.
The word freedom generally has positive connotations, Scovazzi explained, but in the seas, it has a negative one of lack of regulation, of first-come, first-served, to the sole advantage of the few developed and powerful states with the necessary technical and financial means. The idea of a common trust exists for mineral resources of the seabed, but in UNCLOS negotiations, states did not accept Malta's proposal to extend that to fish. We could envisage such a development in the future, he suggested.

It is clear from today's interventions that we won't be able to achieve our sustainable development goals unless the high seas are protected and well-managed, moderator Sebastian Troeng declared. This will require a concerted effort by all stakeholders and actors, taking into account environmental, social, economic, legal and political factors. It's going to be slow and painful, so it's important to do all we can to build awareness of, excitement about and commitment to protecting the Earth's final frontier, our High Seas, he concluded.

SESSION 2
Aquaculture and MPAs

Moderator:
Doris Soto, Senior Scientist, Interdisciplinary Center for Research on Aquaculture, Chile
François Simard, Deputy Director, Global Marine and Polar Programme, IUCN
Thierry Chopin, Scientific Director, Canadian IMTA Network
John White, Development Director, Aquaculture Stewardship Council
Kitty Brayne, UK Conservation Programmes Manager, Blue Ventures

THE CONTEXT

Aquaculture is growing rapidly in response to the world's growing demand for fish at a time of depleted wild stocks, but when practiced irresponsibly it also threatens marine ecosystems. Marine protected areas are one of the most effective means of preserving such ecosystems. The panel examined how aquaculture could be conducted in a sustainable way alongside or within MPAs, and in some cases even contribute to their role in restoring marine environments to healthy functioning.

Doris Soto recalled that human pressure on fisheries can hinder marine protected areas' effectiveness. Often, users have no alternative livelihood, which sustainable aquaculture could provide, she suggested. Aquaculture makes up half of all fish consumed worldwide today, and is growing rapidly. The challenge is to develop aquaculture in ways that assist MPAs while providing a crucial protein source and livelihoods.

François Simard's organization has worked for several years on reconciling humans and the environment, and on framing MPAs as something that can contribute by providing both economic and ecosystem benefits. The IUCN just published a paper on potential synergies between aquaculture and MPAs and how they can work together to reconcile friends of fish and friends of fishing. [Link to download: IUCN Report: Aquaculture and Marine Protected Areas]

Aquaculture is diverse, ranging from seaweed to fish and shellfish, and so are MPAs, which are divided into six categories depending on their objectives. In MPAs where economic activity is allowed, aquaculture can help MPAs restore damaged or depleted coral and fish stocks while providing livelihoods and food security for local

communities. In the future, new MPAs may integrate an aquaculture component from the start. Integrated multi-trophic aquaculture has the potential to contribute to ecosystem services within an MPA and should be seen as positive, he said.

Farming non-native species within an MPA is a thorny issue, but with proper care, it's possible, Simard said, citing the example of Mayotte. Our aim is to bring together the MPA and aquaculture communities using available tools such as the ecosystem approach, marine spatial planning and integrated coastal management, he explained. MPAs aren't the only tools that can help us achieve sustainable development goals; the certification of best practices by the Aquaculture Stewardship Council is also very important.

Thierry Chopin provided an overview of integrated multi-trophic aquaculture (IMTA) and its potential in MPAs to help make ecosystems and local economies sustainable. IMTA mimics and takes advantage of nature's trophic relationships within a circular economy approach, in which coproducts (waste) from fed fish provide nutrients to other organisms. It requires neither irrigation nor deforestation, and is very flexible, which makes it easy to select the appropriate species for the particular MPA being designed, he explained.

IMTA can also provide jobs in coastal communities without displacing populations, provide local nutrition security and improve socio-economic resilience. At the same time it can perform important ecosystem services including climate change mitigation: seaweed, for example, is a net producer of oxygen and can restore habitats, sequester carbon and locally reduce acidification, Chopin noted.

As a multi-crop model incorporating fish, seaweeds and invertebrates, IMTA has built-in diversification, reducing economic risk. But to measure its true value we have to consider extractive species not just for their biomass and food trading value but also for ecosystem services rendered. Everyone talks about carbon tax or credits; it's about time we talked about nitrogen and phosphorus credit or tax, he said.

Today IMTA's development is hindered by obsolete policies and regulations. The same is sometimes true for MPAs, so if we team up together we'll be able to validate both concepts by developing concrete examples, Chopin said.

Thanks to a contact made at last year's Monaco Blue Initiative, Chopin's organization is partnering with Janaina Kimpara of EMBRAPA to combine marine and freshwater IMTA in Brazil. The local community uses nutrient-rich waters from fish farming to fertilize their land. Alongside seaweed aquaculture, eco-tourism and cosmetic products, the program provides diverse, quality food for local populations, he said.

In very different climatic and geopolitical conditions, Chopin is involved in developing IMTA in the UNESCO biosphere reserve of the Iroise Sea in Brittany, France. The regulatory framework is also different, which will allow us to do a comparison of IMTA models in very different MPAs, he added. Next, **John White** of the Aquaculture Stewardship Council highlighted the potential role of certification in developing aquaculture sustainably in and around MPAs.

When done badly, aquaculture is very damaging to the environment and biodiversity and conflicts with the objectives of Marine Protected Areas, but when done well, it can reinforce them, he said. The linkage between fish farms and MPAs has a real physical sense; while MPAs have legal boundaries, their waters are porous. All farming operations can have an impact on water quality, species and habitats within MPAs.

The ASC's certification and labelling program tackles many of the hazards of

aquaculture. It currently has 8 standards covering 12 of the world's most commercially prized species, defining and promoting environmental and social responsibility within them, thus helping move the whole industry forward. The standards are based on scientific knowledge and best practices; to the extent the objectives are aligned with those of MPAs, certification can make a significant difference, White asserted.

Development of standards for new species will also help: together with the Marine Stewardship Council, ASC is developing a seaweed standard that should be completed this year, as well as a sea bass – sea bream standard. Even more important is their work to promote a sustainable aquaculture feed standard, he said. This addresses some of the key problems around the current lack of sustainability of many plant and land animal feed ingredients, but especially that of marine ingredients.

Looking ahead, we must encourage more positive integration between spatial planning of MPAs at the macro level and fish farmers' efforts to improve practices, White affirmed. We must encourage consumers, retailers and the food service sector to buy more responsibly produced seafood, and do so ourselves, only buying fish with an MSC or ASC label, while encouraging more farms to seek ASC certification to show they're operating responsibly. Certifiably responsible aquaculture is good for MPAs; it is good for fish, good for farmers, and good for the future, he concluded.

Kitty Brayne leads conservation programs for UK-based social enterprise Blue Ventures. She shared her practical experience in the Indian Ocean developing community-based aquaculture models as a catalyst for local marine conservation.

Coastal Malagasy, who are among the most disadvantaged communities in the world, depend on the sea for livelihoods and food, getting some 99 percent of their protein from seafood. They have seen catches plummet over recent decades due to overfishing, and are extremely vulnerable to the effects of climate change, Brayne explained.

Blue Ventures is helping them to set up Locally Managed Marine Areas (LMMAs), coastal protected areas where communities manage fisheries and other resources for long-term benefits. Communities where LMMAs have provided tangible benefits are very enthusiastic, but success depends on finding ways to help overcome the opportunity cost communities face in implementing conservation measures, she said.

One way is to diversify livelihoods while reducing dependence on the sea. Aquaculture is very promising, but we need low-cost, low-technology models that have a low impact on the environment, are resistant to shocks from disease or weather and that fishers can implement with limited supervision, Brayne added.

Blue Ventures is developing two models of community-based aquaculture in Madagascar. In partnership with a local seafood buyer, they adapted the common seaweed-farming model to Madagascar, integrating it into LMMAs. With proper technological oversight, it has a lot of potential to be scaled up around those coastlines, Brayne affirmed. One very positive aspect is its involvement of women. Although the product isn't particularly high-value, it can be cultivated in many places and provides an important revenue buffer to households, making them more resilient.

Blue Ventures' other project is the world's first community-based aquaculture trial of sea cucumbers, a much higher-value model. Sea cucumbers are vital to the health of marine ecosystems but are being massively overharvested in the wild to supply demand in Asia, Brayne explained.

Again with private-sector partners, Blue Ventures developed a ranching model where community members grow sea

cucumbers in the sea in front of their villages, bringing in significant revenue. It is a model that can be scaled and replicated around the world, and can have an effect on both ecosystem health and incomes, she said.

Many community-based aquaculture projects with good intentions fizzle out after a few years due to disease, over-reliance on donor funding or poor management of markets, she noted. It takes time and a major shift for fishers who've fished for generations to become farmers and entrepreneurs, and requires strong supervision, training and support. Partners must help alleviate the risks communities take when adopting new models and ensure them long-term benefits. This includes helping them cut a fair deal when operating in value chains that span continents, Brayne added.

At the same time, we must harness these models as catalysts for conservation. It is often export markets that are driving unsustainable exploitation of wild fisheries, but if we can capture those markets to bring revenues to conservation measures, there is a huge potential for this model to be scaled up worldwide, she affirmed.

Nearly one and a half billion people live around our tropical coastlines. They have the most to lose from overexploitation and climate change, and the most to gain from sustainable management. Marine conservation will only achieve the necessary scale if it engages and provides benefits to local communities. Aquaculture is an important tool to catalyse that, but building the social structures to manage and make it autonomous in the long run will take time and investment, Brayne noted. We encourage the conservation and development communities, policy makers, donors and investors to get involved and take promising models like community-based aquaculture to scale.

Doris Soto highlighted the need for a minimum of data to support aquaculture's integration with MPAs. That includes

information about bathymetry, nutrient flow, carrying capacity, biology and hydrodynamics. These case studies and pilots are very relevant but we should not believe this is easy, Soto suggested.

Replying to a question about the economic viability of IMTA, Thierry Chopin said that while IMTA's biological value was well-demonstrated, economic proof would require new regulations placing a value on ecosystem services. So far, extractive species' price is based only on their biomass value. Potentially high-value, non-food applications of IMTA are being developed – Chopin's organization is working on one seaweed extract for cosmetic use and another that shows promise as a treatment for Parkinson's disease, he noted.

Generally speaking, it won't be the big salmon companies that will take up IMTA, but innovative small and medium-sized companies seeking to differentiate themselves to get a higher price premium. That's where IMTA's economic value is, Chopin affirmed.

Doris Soto suggested thinking about landscape integration at a larger scale through aquaculture management areas. Many salmon farms are looking into integration with coastal fisheries or neighbouring mussel farmers. This is important for future economic valuation and even the certification of certain areas, she noted.

Responding to a question on how existing aquaculture can be engaged in sustainability, Soto said Chile is working on that. In some places salmon farms can no longer exist unless they change their behaviour. Aquaculture management areas and better integration with fisheries can help, as could a different, ecosystemic approach to aquaculture on the part of government. Because of environmental degradation and public perception, it's slowly happening, she said.

Citing fish farms in waters that are to become MPAs in Scotland and Mayotte, François Simard said that while coexistence implies a change of behaviour and practice, aquaculture doesn't necessarily have to leave. But it is necessary to communicate and work together to determine what environmental impact it has with regard to MPA objectives and transform the farming activity accordingly, he affirmed.

Zafer Kizilkaya from the Mediterranean Conservation Society noted that while Turkey is the biggest farmed finfish producer for the EU, Turkish law forbids aquaculture in MPAs. Aquaculture is confined to a couple of bays, where farms force growth by feeding three or four times a day. This has attracted so many wild fish that a fleet of purse seiners camps around the area to catch it, further depleting a resource drastically threatened by overfishing. There should be monitoring and some buffer zone around the farms to prevent this catch, he said.

François Simard noted that Turkey manages aquaculture, tourism and MPAs separately, taking a very segmented approach. "It doesn't work," he said. Aquaculture zones should be managed according to their impact on the whole ecosystem. It's best to do this in an integrated way, through marine spatial planning, he suggested.

In her previous work at the FAO, Doris Soto recalls efforts with Turkey some eight years ago to take a marine spatial planning and ecosystem approach to aquaculture, guided by risk assessment and moving farms off the coast. Even fishermen ended up satisfied, because they were fishing more or supplementing incomes by taking out tourists, she recalled, "so you have to consider all socioeconomic, environmental and governance aspects to develop an appropriate plan."

Sandra Bessudo warned that cage aquaculture in natural habitats can be very dangerous to ecosystems when it involves non-native species, citing the invasion of Columbia's waters by Caribbean species farmed by a neighbouring country. The starting point for governments should be that farming non-native species in natural habitats is inappropriate, she said.

Soto agreed, noting that tilapia farming in Colombia, while providing livelihoods for many, represents the same danger from an exotic species. "We must insist on risk assessment before management," she added.

Thierry Chopin said there is plenty of good work to be done with local species, and that we must change our attitudes as we learn.

In Brazil, an IMTA project combining fish and shrimp has demonstrated that shrimp, previously seen as a fed species, can actually feed on the coproduct from farmed fish and the vegetation fertilized by it.

Summing up the session, Doris Soto said aquaculture can assist marine protected areas in a number of ways, including mitigating the effects of climate change and overfishing while providing alternative livelihoods. To enable this, we need to mimic ecosystem functioning while developing integrated long-term management plans that address environmental, socioeconomic and governance objectives. Training, participation, transparency and risk assessment are crucial, supported by local knowledge and sound data to ensure that aquaculture at a minimum does not harm MPAs, and ideally helps them achieve their objectives.

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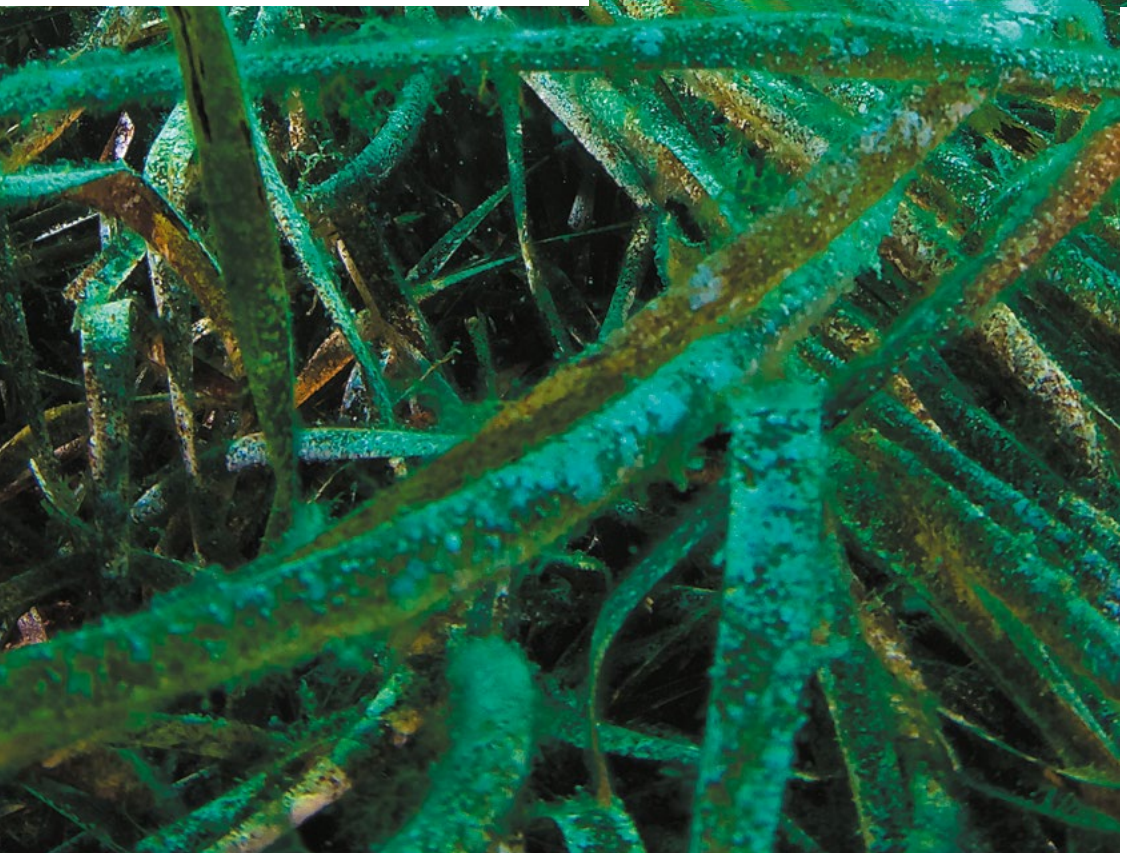
SESSION 3

Marine Protected Areas and Climate

Moderator:
Dan Laffoley, Marine Vice Chair, IUCN's World Commission on Protected Areas
Paolo Guidetti, Director, ECOMERS Laboratory, University of Nice
Gérard Pergent, Coastal Ecosystems Director, University of Corsica
Christophe Lefebvre, Oceans Advisor, French Biodiversity Agency
Purificació Canals, President, MedPAN



THE CONTEXT

The role of Marine Protected Areas in improving biological resistance to climate change is now recognized. Less well-known is MPAs' potential in climate change mitigation – marine ecosystems such as seaweed or seagrass beds can act as carbon sinks and anti-acidification mechanisms – which increases the importance of their multiplication and effective management. Significant effort is now being invested in this work, which was a key focus for the 2016 Mediterranean MPA Forum in Tangiers, and now forms a main element of the 2020 MPA roadmap.

Moderator **Dan Laffoley** began by noting the IUCN's recent publication on ocean warming. Oceans bear the brunt of the greenhouse effect, having absorbed 93 percent of it since 1955, which has affected ocean ecosystems, species and even the remote deep seas. Alongside environmental consequences, ocean warming holds risks for the economy and human health and well-being, Laffoley noted [For more information, see the report: https://www.iucn.org/content/explaining-ocean-warming].

The Mediterranean Sea is changing two to three times faster than other oceans because of climate change, and much faster than previously thought. In light of that we need to use all available tools for increasing resilience and protecting biodiversity, and the best tool we have in the face of the changing ocean climate is marine protected areas, he said.

Paolo Guidetti highlighted the impacts of climate change on biodiversity. Warming of Mediterranean waters has made this sea the one most invaded by non-native species. Overfishing of predator species, which reduces biological barriers to invasion, and

poor disposal of ballast waters and aquariums, directly introducing invasive species, have exacerbated the phenomenon.

These non-native fish are modifying Mediterranean ecosystems and reducing their resilience, Guidetti said. Invasive herbivorous fish have reduced underwater seaweed forests in the eastern Mediterranean into barren, rocky deserts. Small fish can no longer shelter there during their early growth stages, making them vulnerable to predators.

We need better knowledge of invasive species, and also to encourage fishers and restaurants to capture, sell and serve them. This tactic works, Dan Laffoley commented, noting that Colombia has been so successful with a program headed by chefs to get people to eat lionfish that they now have difficulty sourcing them locally.

With political will and better scientific knowledge, effective solutions can be found, Guidetti indicated; MPAs are particularly relevant as a tool in the Mediterranean. They allow restoration and conservation of healthy ecosystems and native predators like grouper, which can act like a defending army to combat invasive species. MPAs do not function in isolation; the larva of one species within an MPA can travel on currents and help species flourish outside the MPA or even in another, more distant MPA. We know there are biological connections but we need more research to be able to really map and demonstrate them. Finally, MPAs won't be able to perform their role without proper funding and staffing, lest they be mere "paper parks," he concluded.

Gérard Pergent then offered his perspective on MPAs' role as carbon sinks to mitigate climate change. Marine vegetation such as seaweed, mangrove, seagrass and kelp beds makes up just 0.5 percent of the oceans' surface, but absorbs more than half the carbon dioxide. Unfortunately vegetation is regressing everywhere, threatening its ability to perform this ecosystem service; its degradation can also cause these carbon sinks to become emitters of carbon, he warned.

In the Mediterranean, the endemic seagrass posidonia can play a major role in climate change mitigation. It is unique in the way it absorbs CO2, equivalent only to mangrove, Pergent explained. Like peat bogs, posidonia beds can be very thick – up to 8 meters deep, with dense, matted roots that decompose so slowly they can trap CO_2 for thousands of years.

Marine protected areas can play a very important role in protecting these ecosystems and their carbon capture function. Because posidonia beds are also important as nurseries and biodiversity reserves, many are already protected within the Mediterranean; 80 percent of posidonia in the waters off Corsica are within MPAs. This helps prevent their destruction by trawlers or boats anchoring within them, which cuts into root mats, releasing stocked CO_2.

There should be measures to protect posidonia beds even outside MPAs, throughout the Mediterranean, Pergent affirmed. We also need to reinforce their effectiveness by restoring damaged beds and planting new ones. MPAs can act as laboratories and information centres on oceans and climate change, both for the public and professionals. Finally, Mediterranean-wide networks are very important for improving scientific knowledge. One example is the water temperature monitoring network TEMEDNET, which tracks changes for the whole basin. This would be impossible for a national program, he noted.

Christophe Lefebvre, Ocean Advisor for the French Biodiversity Agency, then addressed policy aspects of building a coherent, resilient network of Mediterranean MPAs designed both for biodiversity and as natural infrastructure for climate change adaptation and mitigation. Political shifts are taking place: climate change emerged in recent New York negotiations on biodiversity beyond national jurisdiction as a key argument for getting states to commit to MPAs in the High Seas. This recognition of oceans' role in climate change mitigation is entirely new in political dialogue, he noted.

Any effective MPA network requires coherent regional policies. These must include sectorial policies such as those related to fishing, but also new protocols integrating the issue of climate change alongside pollution and biodiversity. Parties to the negotiations recognize this, Lefebvre said. Article 7.7 of the Paris Accord on reinforcing regional cooperation to improve action for climate change adaptation by sharing information, best practices, needs and priorities is very appropriate for the Mediterranean.

Developing an MPA network requires scientific knowledge and ensuring that all sectorial activities in the Mediterranean take the climate issue into account when considering their own policies; the Barcelona Convention needs to determine the proper governance system to enable that, Lefebvre said. Most important is marine spatial planning, which is crucial to finding a convergence between those practicing extractive and other activities in the sea and

those seeking to protect and manage it in an integrated way. Mediterranean Network of Marine Protected Areas President **Purificació Canals** noted that work is already being done to link MPAs and climate in the region, led by MedPAN. Last year's 2nd Mediterranean MPA forum in Tangiers integrated this new focus into its 2020 roadmap to strengthen MPAs' role as a marine spatial management tool supporting ecosystem-based adaptation and mitigation to climate change.

Managers must also deal with impacts of climate change on MPAs, not all of which are obvious. Data assessments to evaluate impacts and incorporate follow-up are necessary; MedPAN is close to completing a status report on posidonia, which is the main habitat in Mediterranean MPAs, she said.

What MPA managers do is conditioned by policy at the highest level. Monaco initiated a report at the IPCC on oceans and climate change with a chapter specifically devoted to marine ecosystems, nature-based solutions and MPAs. The report will allow us to bring concrete elements of this debate to the highest political level, which could help us a lot, Canals said.

The most innovative element of their network is joint action and strategy on nature conservation in a sea largely characterized by strife and problems, she said, noting that MedPAN works together with the Regional Activity Centre for Specially Protected Areas (RACSPA) and other partners including ACCOBAMS, the IUCN, the WWF, and the General Fisheries Commission.

If management is done properly, it will increase climate change mitigation but also adaptation capacity – posidonia plays a clear

and important role in coastal and fisheries protection. One of our roles is to make managers aware of all the ecosystem services their MPAs are performing, so that they can communicate that to the public. To achieve the goal of protecting 10 percent of waters – which means not just designating MPAs, but managing them effectively – it is crucial to link them with socio-economic benefits, Canals noted.

We hope that carbon funds soon will be made available for management of MPAs, similar to the UN's REDD mechanism providing incentives to countries to halt deforestation. Initially, climate change discussions were just focused on energy and industrial activity. Then we incorporated forests and now is the time to incorporate the ocean and MPAs as important tools not just with regard to risk, but to managing the marine space overall.

MedPAN would like to work on this with other networks beyond the Mediterranean. I'm happy to see colleagues here from the MPA networks of the Caribbean, West Africa and North America, who face the same challenges, she noted. We are discussing common strategies, because this is not just a Mediterranean problem – there's only one ocean.

From the audience, **Marta Cavallé** of the Low Impact Fisheries of Europe emphasized the importance of collaborating with fishers, who can share their traditional and first-hand knowledge on climate change. They are out in the sea every day. They notice how currents have changed or disappeared, and they may be the first to see new species in their nets, she said. They can and want to contribute, because they are scared.

They could help with monitoring, allow their vessels to be used as floating laboratories and generally collaborate with scientists and MPA managers to improve knowledge.

Paolo Guidetti strongly endorsed this view, noting that both as a child and as a scientist he had learned a great deal from fishermen, who know and observe a great deal. No scientist or decision-maker is in closer contact with the sea than they are, every single day, and we must use them as sentinels. Guidetti suggested that small fishermen in the Mediterranean are themselves an endangered species.

"We must save them, because if they disappear we will lose an important component of cultural diversity which, like biodiversity, is subject to erosion," he said. It would be a huge loss, because Mediterranean cultural diversity is our identity and our heritage. We should involve artisanal fishermen at every level, he affirmed.

The Mediterranean is a microcosm of the world, Mission Blue President **Sylvia Earle** stated. If we can use MPAs there to get to a better place, it could serve as inspiration for what could work on a much wider scale. The whole world is changing in ways that threaten our future – it's not just about fish, she said. The knowledge is there about global warming and acidification, but we're taking tiny baby steps where we need an overarching view of how to protect the integrity of the ocean as a whole.

Purificació Canals stressed the need to share knowledge to grow management capacity in the climate change context and transform science into action. We must use MPAs as observatories enabling scientists to distinguish between climate change impacts and other impacts outside MPAs such as overexploitation. Showing that good management can protect ecosystems effectively is the only way we can extend MPAs, even if it's a very slow process, and one that requires investment, she suggested.

Climate change can be an opportunity to demonstrate how complex nature is and how much we rely on its good management. We need to protect the whole system – not just MPAs – to ensure we have enough surface of well-managed ocean to guarantee Earth's basic functioning, she said.

Christophe Lefebvre noted that a lot of MPAs are paper parks. Designating new MPAs to achieve the COP 15 biodiversity objective of 10 percent of the oceans isn't the problem – it's effectiveness. We must identify best practices and communicate about what works in MPAs and what kind of MPA we should aim for towards 2020-2030, while integrating the climate change component. We have a clear postulate, that MPAs preserve the value of ecosystems which perform biodiversity, climatic and economic services. We need to underline that it's not just a "naturalist" approach but also an economic one, if we want to attract the support of economic actors, he advised.

Scottish National Heritage Advisor **John Baxter** noted Scotland's carbon absorption potential in the form of salt marshes, seagrass and 4,000-year-old marl beds. The country has been auditing the total blue carbon stored in its marine environment and in its MPA network, and is coming up with some amazing figures, he said. This has made officials and elected representatives take MPAs' potential much more seriously than "just" biodiversity. Going forward, blue carbon potential should be a key factor in identifying areas in which to establish MPAs and in designing their management, he suggested.

Martin Attrill of Plymouth University's Marine Institute told participants about his work with the Prince Albert II of Monaco Foundation on a modelling tool to predict ecosystem services MPAs can deliver, and their value, at different levels of management. This model can incorporate variables like climate or aquaculture to see how they'll affect ecosystems within MPAs. While it currently applies to the UK, with the proper data it can be used for the Mediterranean, and should be a valuable tool, he said.

In conclusion, Dan Laffoley noted that the scale of change in the ocean due to climate change and other human activity is unprecedented. The Mediterranean faces particular challenges as an enclosed sea, but offers opportunities for action to build resilience in marine ecosystems using MPAs in an integrated approach mobilizing all sectors. Greater ambition and a sense of urgency are needed to accomplish this, he said, ending with a quote from 17th-century English poet Edward Young: "Be wise today, 'tis madness to defer".

SESSION 4

Sustainable Fisheries and Aquaculture in the Mediterranean

Moderator:
Kristian Teleki, Senior Marine Adviser at the Prince of Wales' International Sustainability Unit and Director for Global Engagement at Ocean Unite.
Manuel Barange, Director, Fisheries and Aquaculture Policy and Research Division, FAO
Abdelmalek Faraj, Director of Morocco's National Institute of Fisheries Research
Philippe Cury, Senior Scientist and Europe Representative of IRD (Institut de Recherche pour le Développement)
Marta Cavallé, Mediterranean Coordinator, Low Impact Fisheries of Europe

THE CONTEXT

Despite efforts by EU and other Mediterranean countries to establish an effective policy framework and ensure the compliance of fishers, more than 85% of the assessed stocks in the Mediterranean are still considered overfished. New thinking, management, investments and technology are needed to enable fisheries and aquaculture to become sustainable and maintain ecosystem services, while generating employment and meeting market demand. The panel examined the issues and ways to achieve this shift.

Kristian Teleki sketched the Mediterranean situation with a few figures. It is bordered by 21 countries on three continents and crossed by one-third of global shipping each year, while 250 million people live along its coastline. Some 30 percent of the Mediterranean's 10,000-20,000 species are endemic, but today are threatened by ocean acidification, land-based pollution, overfishing, invasive species and the degradation of coastal habitats.

Mediterranean fisheries are worth $2.4 billion annually and directly employ about 500,000 people, mostly through small-scale fisheries. The changing economic, social, political and cultural landscape around the Mediterranean adds further layers of complexity, Teleki noted.

Global demand for sustainable seafood has grown tenfold over the past decade, and ten times faster than the demand for conventional

seafood. The Prince of Wales' organization has examined the challenges involved in the transition to sustainable fisheries in a June 2016 report [ISU Report: Taking Stock]. The question for panellists is, how do we connect Mediterranean fisheries and aquaculture with broader sustainable development goals?

Manuel Barange of the FAO has worked as a scientist for 25 years on climate change and fisheries and before that was a fisheries observer in the High Seas fleet. He rejected the notion of a dichotomy between friends of fish and friends of fishermen, and recalled that the 2002 World Summit on Sustainable Development defined sustainability as one stool with three legs: economic, social and ecological. You must look after all three, or the stool will fall, he said.

The FAO's perspective is that of food sustainability. We now must feed three times more people than when the FAO was founded in 1943. The laudable reduction in poverty and undernourishment has been accomplished by using more and more resources. The sustainability challenges facing fisheries today is very similar to those in land agriculture, which relies heavily on irrigation, using more water than is being replaced.

If we replaced the 10 kg of wild fish consumed per capita with the equivalent in land-based animal protein, growing it would require razing 19 rainforests, which is neither possible nor desirable. Sustainable fisheries are a necessary part of the world food equation, Barange asserted.

The FAO monitors 500 fish stocks continuously around the world and classifies them as overfished, full capacity (sustainable) or underfished. The rate of overfishing in the Mediterranean is double the world average. One of the major issues is illegal fishing, which is a cancer we need to stop.
Management has improved, Barange noted. The General Fisheries Commission for the Mediterranean develops annual management plans in different parts of the Mediterranean and in 2005 passed a ban on trawling at depths greater than 1,000 meters. In May 2016, the FAO approved the Port States Measures Agreement, or PSMA, a very powerful tool signed by the EU and 45 other countries, which gives port countries powers to inspect and deny entry to any vessel showing signs of illegal activity.

However, sustainability does not exist separately from the deep political, social and economic problems of the Mediterranean today. From 2015 to 2016, 1.6 million people crossed this sea looking for shelter, food, and new lives. Fisheries management requires policies and a lot of data, monitoring and enforcement. Setting up and maintaining such systems while trying to look after people fleeing war and famine is complex and very difficult.

The so-called green revolution in agriculture that helped triple global food production since 1960 relied heavily on chemicals. In the next decades we need a blue revolution, in which the oceans and coasts offer solutions by using resources sustainably and by developing aquaculture and coastal industries that support land as well, Barange concluded.

Kristian Teleki then shared an anecdote regarding the influence of other markets such as Asia. A Chinese colleague told him the Chinese market was losing its appetite for farmed fish, as they think it doesn't taste as nice as wild-caught species. The implications are terrifying, he said.

Abdelmalek Faraj then presented the Blue Belt Initiative launched at COP 22 in Morocco last year. Fisheries are in trouble, despite all the initiatives and governance strategies we have put in place. There is a huge gap between those who exploit the oceans and those fighting for their conservation, and governments and managers tie themselves in knots trying to satisfy both. We know what the solutions are. The problem is implementing them, he said.

The Blue Belt Initiative seeks to integrate fisher participation in sustainable management and offer them tools to enable its implementation. It has three aspects. First is oceanographic observation, the mechanisms for which Africa sorely lacks. We need to mobilize funds for monitoring these underserved regions while developing the user-observer concept to exploit the untapped resource of fishers' ocean knowledge, while making scientific information available to fishers, Faraj affirmed. An environmental and sanitary surveillance network is also needed to manage intense demographic development along the coast.

The second aspect is sustainable fishing: MPAs are important from a biological and climatic but also an economic standpoint, and we must communicate that. We also must transform the fleet. Europe has sold its old boats to the south and now we're overrun with boats that are very costly to operate, forcing fishermen to fish more and more to make a living. Innovative shipbuilding is underfunded, though it could also provide jobs and economic growth. We need more energy-efficient boats with less environmental impact and more effective, less destructive capture, he affirmed. Finally, local, sustainably captured fish needs to be valorised. Fish is the most traded agro-food product in the world; we must militate for the consumption of local fishing product, especially in the South.

The third aspect is aquaculture, especially micro-algae for use as biofuel and as feed to replace fishmeal for farmed fish. Farming micro-algae has passed the research stage; today a project in southern Morocco aims to produce up to 100,000 tons a year. We also aim to develop offshore seaweed farming, both for biomass but also as carbon sinks and ocean purifiers, Faraj noted.

All of these solutions exist. The Blue Belt Initiative hasn't invented something new; it just aims to put together the knowledge, expertise, and funding to enable Morocco and other African countries to implement solutions to assist climate change adaptation and mitigation and to transform constraints into economic opportunities, he concluded.

Philippe Cury of IRD works as a scientific director of the Euromarine Consortium that leads research on scenarios for marine ecosystems at the European level. He elaborated on the relevance of sustainable management of Mediterranean fisheries to achieving SDG targets (including SDG14).

Cury shared a few anecdotes to illustrate the situation, noting that pure statistics can be numbing and hard to visualize. A Croatian colleague working in the North Adriatic told him fishers there now catch more plastic debris than fish. Another researcher from the Atlantic Ocean came to the Mediterranean to study benthic habitats. After filming the whole Gulf of Lion, she came back flabbergasted, telling him: There's nothing to see – the seabed just looks like a highway, it's been trawled so much!

Lastly, Cury told of a fisheries economist who was studying small boats on the French Mediterranean coast near Narbonne. These boats have huge motors, to enable them to carry 5 kilometres of nets. Seeing a fishermen return to harbour at 8 AM, nets dry, the economist asked why. The fisherman said he hadn't been able to unspool his net, because there was no room: there were already too many there.

These are just stories, Cury said, but they illustrate the concrete reality of all these percentages on overfishing, pollution and habitat destruction in the Mediterranean. Fishing fleets must be redesigned and stocks restored. The sole encouraging example is bluefin tuna, thanks to the help of Prince Albert II and the establishment of quotas in 2008. They were largely respected; something as simple as that sufficed to reconstitute stocks within a few years, he noted.

MPAs should be developed in the context of climate change but also socioeconomic activity, and be located in sites, such as canyons, that protect large fish. Fishing must be repositioned with respect to SDG 14 – that of a healthy ocean – while connecting this goal to those of food security, climate justice and poverty reduction. There must be a strategic coherence between these goals. For that we need a lot of research, and a lot of thought, he concluded.

Marta Cavallé then offered the perspective of the small-scale fisheries her organization represents. LIFE is a network of small-scale fisheries around Europe born in 2015 of the recognition of the need for common action. It supports members while engaging them in socially, environmentally and economically sustainable activity and promotes their participation in policy building and management on the national and European levels. Our experience is that if we allow participation of small-scale fishers, co-responsibility arises, she said.
The Mediterranean could be the most sustainable fishery in the world, but it's not. We do not shirk our responsibility – there's much we can improve – but it's not fair to blame small-scale fishers as the key factor. Though they make up 80 percent of the sector in the Mediterranean, theirs only represents 20 percent of the catch, she noted. Until now small-scale fisheries have felt forgotten. We want to provide data, and to be integrated in management. We're happy the EU and GFCM have addressed our situation with the MedFish4Ever declaration and the GFCM mid-term strategy, which address key issues for us.

LIFE helps small fishers develop projects on the ground and we're amazed at the variety of solutions they've found. If small-scale fisheries are suitably supported and given suitable access to resources and participation, they can be part of the solution rather than a problem to be eliminated, Cavalle affirmed. The environment would not be the only beneficiary; there would be a contribution to communities' prosperity and security around the Mediterranean.

Sylvia Earle suggests the need for an attitude shift, away from an extractive attitude that views fish as a commodity to be consumed. With regard to land-based wildlife we've come to respect other values. At a time of such great understanding of natural systems – nutrient cycles, carbon capture, atmospheric chemistry – it is very frustrating to see we continue to be driven by old habits and laws from before we knew what we know now, she said. It's not illegal but legal fishing that worries me – we're taking 100 million tons a year, and we're talking about how to take more.

Manuel Barange insisted that fisheries can be sustainable, as they are in the US, where the tide has turned dramatically thanks to the very strict policy adopted there. In Europe, fisheries were unsustainable for many decades, but since about 2002, progress has been made; about 50 percent of stocks are now sustainable. Our mandate is not to say, "You won't touch it," because the world will touch it anyway, but to make it sustainable, he suggested.

Philippe Cury agreed fisheries could be sustainable with sufficient will, but also that attitudes need to change. Per capita fish consumption has gone to 20-21 kilos per year, up from 8 in the 1950s. Then, there were only 2-3 billion people; we're now 7 billion. This is the driving force: we're eating more and more fish. Fish is a wild animal – it should be a delicacy, whereas it has become a mass product like chicken, he said.

Pierre Erwes of Biomarine noted the innovative work in rock lobster aquaculture by Monaco-based Lagosta, which is developing pharmaceutical and other applications for rock lobster by-products together with Canadian partners. One by-product shows promise as a cancer treatment. So there are also reasons for hope with regard to the oceans, and industry can play a positive and sustainable role, he affirmed.

SESSION 5
Updates on topical issues

The Trust Fund for Mediterranean MPAs:

Xavier Sticker, French Ambassador for the Environment

The association for the sustainable financing of Mediterranean MPAs, M2PA, was established in 2015 to set up a trust-fund-type mechanism to help sustainably develop and improve the management of Mediterranean MPAs, Sticker recalled. It emerged from an initiative launched jointly by France, Monaco and Tunisia in Ajaccio, during the International Marine Protected Areas Congress (IMPAC3) in 2013.

In the Mediterranean, some 180,000 square kilometres – 7 percent – are protected via 1,231 MPAs. However, 90 percent of these are in the north, mostly in territorial waters in coastal areas. In the southern Mediterranean, the problem is one of funding.

The average MPA budget in the Mediterranean is 250,000 Euros, but this doesn't express the great disparity between north and south, Sticker explained, noting that while the French MPA of Port Cros spends €6 million annually, some MPAs in southern countries' waters have no budget whatsoever.

The Trust Fund, which is in its early days, is part of a global family of 70 environmental funds which mostly cover the Caribbean, South America or Africa. Not one has invested in the Mediterranean, Sticker said, and very few focus on an entire sea. M2PA's core group has now been joined by Morocco and Albania and is in talks with Algeria, Croatia and Spain. Its aim is to attract the political support of all Mediterranean countries.

So far, M2PA has made two €30,000 grants to finance two pilot projects led by local agencies and NGOs, one

in Morocco's Al Hoceima National Park and the other in Tunisia's Kuriat Islands MPA. The fund seeks to invest not in high-profile initiatives such as creating new MPAs but in essential long-term needs like equipment, maintenance and scientific and technical monitoring, Sticker explained. The fund is auditing the needs of MPAs in detail, country by country. The principal – €1 million currently – will be placed in investment instruments allowing it to earn roughly 4 percent annually, which will be spent on projects.

The Principality of Monaco has contributed €500,000 and the Leonardo DiCaprio Foundation €400,000; the rest comes from other philanthropic organizations and the private sector. The Basel Zoo and Monaco's Oceanographic Museum donate a percentage of ticket sales to the fund. Several million Euros more are in the pipeline, to come from various international organizations, including the Global Environment Facility and its French counterpart, FGEF, he said. The objective is to raise €10 million by 2020 to reach the necessary critical mass to address the needs of the 70 percent of Mediterranean MPAs whose financial needs are not covered today.

This fund is open, participative and collaborative. Incentivization mechanisms are being studied to attract actors from sectors other than conservation, such as fishing or tourism. As awareness grows and the economic value of investing in MPAs and conservation become apparent, such actors will contribute because they will see it is in their best interest, Sticker predicted. He concluded the update with a call to MBI participants to contribute their expertise, imagination, communication and influence to help make this fund an effective platform and instrument in the blue economy of the Mediterranean.

IMPAC4 – The 4th International Marine Protected Areas Congress:

Felipe Paredes Vargas, Marine Conservation Specialist and IMPAC4 Coordinator, Ministry of the Environment, Chile.

Mr. Paredes Vargas briefed participants on this year's IMPAC4, which his country will host in La Serena-Coquimbo from September 4th to 8th, 2017 in partnership with IUCN and WCPA. La Serena is an appropriate venue as there are nearby MPAs with important populations of Humboldt penguins, whales and dolphins. IMPAC4 attendees will be offered field trips to see first-hand what Chile is doing with MPAs, he said.

Paredes Vargas invited all MBI participants to attend this event of four days of discussions on current trends and the challenges MPAs face. While usually MPAs evoke biodiversity and unique ecosystems like kelp forests or coral reefs, IMPAC4 will put people at the centre of the discussion, as they should be when we design and try to implement MPAs. Its motto is "Bringing the ocean and people together."

Each day will have a theme: coastal communities; MPA implementation; the role of indigenous peoples and women; and finally, our future vision for MPAs. More information can be found here: IMPAC4 website.

The day after the congress on Sept. 9th there will be a high-level segment for multilateral institutions and countries to produce a declaration on the future of MPAs. It will address how to protect biodiversity in areas beyond national jurisdiction, the oceans' role in climate regulation and how MPAs are being used to rebuild fisheries.

Mr. Paredes Vargas then gave a brief exposé on MPAs in Chile, which has thus far protected 13.6 percent of its waters under national jurisdiction, with one very large MPA accounting for most of that, the Nazca-Desventuradas Marine Park in Chile's offshore oceanic islands.

The government is also working with the indigenous peoples of Easter Island (Rapa Nui) to protect the entire EEZ there and to recognize their traditional fishing methods and grant them exclusive fishing rights. We need to make progress in Patagonia to protect unique ecosystems, he said, noting that Chile is now working on protecting fjords and channels that are home to one of the largest blue whale populations, as well as in the area between South America and Antarctica. In the north, we're working on some very important fishing areas.

Chile faces many challenges, especially in large MPAs, where it lacks the staff and funding necessary for effective management; community engagement is also very challenging, Paredes Vargas acknowledged. Chile is starting to work with children, and to recognize the importance of small-scale fishers for MPAs; there's a lot of work to do there.

Sometimes too many public sector agencies are involved; we need to integrate them and work towards a common vision as to how to designate and implement MPAs. Finally, the oceans are changing and we need to adapt, which requires data monitoring changes, providing feedback on management plans and building stronger policies and regulations, he concluded.

Keynote Speeches

France's Minister of Environment, Energy and Marine Affairs, Ségolène Royal began by briefing participants on progress made under the Paris Accord in her role as president of COP21, noting that this was the first time the ocean had been integrated into the action agenda.

"The ocean needs our collective mobilisation. Only a living, healthy ocean will be able to carry out its role in both climate regulation and in providing resources for humanity. It is as much part of the solution to climate change as it is affected by it," she said.

New initiatives under the ocean and climate agenda include the launch of an international coalition against single-use plastic bags to reduce ocean pollution from land-based sources as well as programs to combat West African coastal erosion, protect Indian Ocean coral and mangroves, and combat ocean acidification.

The commission of an IPCC special report on the ocean and climate change is another step forward, alongside programs to reduce greenhouse gas emissions in shipping, develop renewable marine energy and combat overfishing and pollution, with particular attention to the Mediterranean as a closed sea, Royal explained.

Furthermore, it is crucial that we ensure the success of negotiations underway at the UN General Assembly on a new global agreement on the conservation and sustainable use of biodiversity in the high seas, which represent two-thirds of our ocean, she added.

During her term as environment minister, France's protected marine area grew from 4% to 32%, representing 11 million square kilometres, Royal stated. She called for the creation –supported by the EU and Australia – of a vast Antarctic marine sanctuary of nearly one million km2 to act as a scientific reference zone for studying the long-term effects of climate change and human activity on biodiversity.

Royal outlined measures her government took for the Mediterranean, one of the world's richest but most complex and vulnerable seas. These include reducing emissions from shipping, developing offshore windfarms, ensuring precise, constant monitoring of fish stocks and imposing a moratorium on gas and oil exploration.

"The Mediterranean is our sea – mare nostrum, as it was called in ancient Rome. This common environmental heritage which is the source of the shared history of Europe, Asia and Africa must be preserved. We utterly depend on it," she concluded.

Karmenu Vella, European Commissioner for Environment, Maritime Affairs and Fisheries then updated the gathering on European Union action on oceans, and the importance of balancing science and emotion, or "head and heart."

Negative pressures on oceans and their biodiversity such as rising sea levels, eutrophication, acidification, marine litter and overfishing erode the very basis of sustainable growth, Vella stated. These are global issues, which do not recognise national borders.

Europe takes a regional approach, as witnessed by the recent signature by government ministers from both sides of the Mediterranean of a Declaration on Sustainable Fisheries, accompanied by new data commitments and management plans. Currently, 90% of Mediterranean stocks are overfished, he said.

Vella added that with Sustainable Development Goal 14, the global community vowed to protect oceans and use their resources sustainably; now we must deliver on our commitment. Hence the agenda on international ocean governance adopted today (April 3rd) by European Union ministers, with 50 measures.

The priority areas for action are:

- Improving and updating the international legal framework and ensuring more effective cooperation among regional or international bodies;
- Reducing human pressure on the oceans, with actions to address marine litter; to mitigate climate change impacts; to protect and restore marine ecosystems; to promote maritime spatial planning; to expand marine protected areas and to strengthen the fight against illegal fishing (the EU is already engaging with the WTO to ban harmful subsidies);
- To further advance work on ocean research by proposing a coherent ocean observation strategy for the European Union in 2018, with the goal of creating a global marine data network open to all.

Vella reminded MBI participants that the European Union will host the international Our Ocean Conference in Malta on the 5thand 6th of October this year. The conference brings together global ocean leaders from government, business and civil society to propose tangible action and review progress on previous commitments. The past three conferences have generated commitments worth more than 8 billion Euros and created nearly 10 million square kilometres of Marine Protected Areas, he noted.

Paraphrasing the Monaco Oceanographic Museum's mission statement, Vella concluded: "To know the ocean we need research and knowledge. To love the ocean we need passion. And to protect the ocean we need dedicated people like you and an ocean strategy such as the one we have launched."

Gian Luca Galletti, Italian Minister for the Environment, Protection of the Territory and the Sea, welcomed MBI's emphasis on marine protected areas, as Italy's protected marine habitats play a key role in the conservation and promotion of biodiversity while creating social wellbeing and long-term sustainable development.

Italy has 27 marine protected areas and two submerged parks, covering over 228,000 hectares of sea and 700 kilometres of coastline, and is a partner in the Pelagos Sanctuary for Mediterranean Marine Mammals, he noted. Among Italy's marine protected areas, ten have been designated Specially Protected Areas of Mediterranean Importance (SPAMI), including Pelagos. This is because these areas guarantee a high level of biodiversity conservation, both of habitat and of species, and because they have launched several important conservation initiatives, Galletti explained.

These protected areas follow a standardised management model to achieve regulatory objectives for protection and conservation of habitats while enhancing local development. Italy's effective model can be held up as an example for all Areas of Mediterranean Importance, Galletti suggested.

The benefits of Italy's protected areas are reverberating throughout the entire maritime sector: marine ecosystems have become much more resilient in the face of climate change with tangible benefits for fishing, biodiversity and tourism, he said. This has permitted a recovery of local economies, whether based on fishing or more environmentally sustainable business models, while maintaining local traditions. For each Euro invested to create protected marine areas, an average of three Euros are returned, Galletti affirmed.

Italy is at the forefront of implementation of the 2030 Agenda for Sustainable Development, as it holds the current Presidency of the G7. Galletti's ministry has many initiatives under way, such as the promotion of "natural capital" and self-sustaining eco-systemic services, he said.

Sustainable development, protection and valorisation of the seas and oceans will be at the centre of the global political agenda, first with the New York Conference on SDG 14 of the 2030 Agenda, on protection of the seas and oceans, and then in October for the Our Ocean Conference in Malta, Galletti noted. We must use both opportunities fully to give significant and tangible impetus to our commitments to guarantee a global system that can link wellbeing and growth with the environmental conservation of our planet, he concluded.

Closing address of H.S.H. Prince Albert II of Monaco

Excellences,
Mesdames et Messieurs,
Chers amis,

Je voudrais tout d'abord vous remercier de votre présence ici, pour cette 8ème édition de la Monaco Blue Initiative. Et je voudrais vous remercier pour la qualité de vos interventions et de nos échanges, tout au long de cette journée. Je voudrais remercier Mme la Ministre de l'Environnement et de la Mer de la France, Mme Ségolène Royal, M. le Ministre de l'Environnement d'Italie, M. Galletti et M. Karmenu Vella, Commissaire européen pour les Affaires Maritimes et la Pêche, pour leurs interventions et les annonces qu'ils nous ont réservées.

Vous y avez tous contribué. Je veux donc vous dire ma reconnaissance, à vous tous qui avez fait l'effort d'être parmi nous aujourd'hui, certains venus de loin, pour que nous puissions aborder ensemble ces questions, et tenter de faire progresser ensemble la situation de nos mers.

C'est le grand pari de la Monaco Blue Initiative que de miser ainsi sur l'intelligence, les compétences et la mobilisation de personnalités issues d'univers différents. Et c'est sa force que de les réunir, pour qu'ensemble nous puissions agir plus efficacement.

Je veux aussi dire ma gratitude aux modérateurs qui ont fait tout au long de cette journée un travail remarquable.

Et je n'oublie pas les équipes des coorganisateurs de l'événement : celles de ma Fondation, bien sûr, mais également celles du Musée Océanographique de Monaco, qui nous accueille une fois de plus cette année.

Je veux enfin remercier notre partenaire Rolex, pour son soutien fidèle.

It is not easy to provide a rapid conclusion to such intense and fascinating debates. Because the main conclusions we reached over the course of the day have been very accurately reviewed, I do not need to refer back to them in detail. I would however like to take advantage of the time that is given to me to share a few thoughts that today's proceedings have sparked within me.

Firstly, we are presented with a series of positive opportunities, which we need to capitalise on.

Like me, you will have followed the progress that has been made in regard to sea issues over the course of this year. The work carried out at the United Nations on the biodiversity of areas beyond national jurisdiction, the holding of a special Oceans Action Day at COP22 in Marrakech, and the launching of the IPCC's interim report on oceans and the cryosphere, all bear witness to extremely positive developments.

The very fact that this Monaco Blue Initiative was held during our new Monaco Ocean Week allows us to be a part of this dynamic.

Indeed, this week, bringing together a wide variety of stakeholders and initiatives from Monaco and elsewhere, makes us aware of the sheer scale of the mobilisation. It also reveals the diversity of the initiatives that are being undertaken today, in numerous fields, to protect our seas, and, in this respect, I would encourage you, if you have not already done so, to support the Monaco Manifesto for the Oceans which has been established.

However, beyond this context, what I would like to take away from our discussions is the creativity shown and the wide variety of solutions that you have put forward. The proliferation of these initiatives testifies to the very widespread mobilisation, not only of governments and international organisations, but also of civil society.

Of civil society in all its diversity and richness, notably through the specific actions carried out by groups, as well as private businesses' capacity for invention.

This favourable context allows us to envisage action in the simplest, quickest, most determined and collective manner. It is always easier to make progress in a large group and when the winds are not blowing unfavourably.

But this relative dynamic also allows us to think in bolder ways.

The battle of ideas is always long. And moves through different phases. New ideas need to be put forward one by one, in order to allow them with time to become established.
But, we must also seize opportunities, make innovative proposals, when they are appropriate in their timing.

From this point of view, the new awareness that surrounds marine problems should encourage us to advance more ambitiously, to propose more wide-ranging and more innovative solutions.

For example, I refer to the issue of marine protected areas on the High Seas, which was mentioned several times today. The moment that the High Seas finally become a recognised issue for the future of our planet, and the moment that the beneficial effects of marine protected areas are agreed upon, it should be easier to convince people that this issue of marine protected areas on the High Seas is imperative.

We must succeed in convincing people about their advantages. We should be able to foster more projects. And, as we did today, we must also be able to link issues that were historically separated, such as climate change and marine protected areas.

The same applies to many subjects we have discussed today.
We need to build bridges between various management approaches and the conservation of the sea, between the various production requirements of humanity and the various environmental challenges.

We have to be able to demonstrate the positive impact of each solution, the fact that what is good for biodiversity is also good for humans, that what allows us to mitigate global warming also benefits local initiatives.

All this will allow us to increase the number of arguments and will make it easier to convince those who are still undecided.

Finally, I would like to finish by returning to something that is not only one of the recurring themes in this Monaco Blue Initiative, but also in my own actions to protect the environment: the need to combine local action with a global vision.

In order to tackle issues on a scale as enormous as that of the oceans, whilst retaining a specific operational goal, it is indeed essential to adopt both these approaches.

It is a practical requirement, because no efficient action can be carried out without knowledge and without an overall perspective.

But it is also a political requirement, because no efficient strategy can be implemented or prove its effectiveness, unless it is based on the actual situation on the ground.

No local actions can, on their own, mitigate global warming or restore endangered biodiversity.

However, all initiatives, no matter how incomplete, are essential.

This is what emerged for example from our discussions today about the case of the Mediterranean: faced with a physical reality, but also very diverse political, economic and social realities; faced with a region that is full of contradictions, often the only appropriate level of action is a very local one.

However, this must be included in a global view of this sea, of this region and its issues, in particular those linked to politics, the economy and social issues.

Reconciling these two approaches is not only the best way of acting effectively, but also the best way of raising our contemporaries' awareness, in helping them to orientate themselves in the face of complex issues.

And, above all, this is the best way of convincing them about how useful their action is, irrespective of the difficulties and limitations.

I believe that we should now, more than ever before, continue to work together, and to propose these two simultaneous approaches, the only ones that allow for truly pertinent action to benefit our seas.

C'est en tout cas en ce sens que je continuerai à agir, en conciliant les niveaux d'intervention, avec mon Gouvernement comme avec ma Fondation, en mêlant initiatives opérationnelles et actions de sensibilisation, et en essayant toujours de rechercher conjointement le progrès local et le progrès global.

A cet égard, je serai heureux de vous retrouver l'an prochain à Edimbourg, pour la 9ème édition de la Monaco Blue Initiative. Nous y serons accueillis par nos amis de l'Université d'Edimbourg, dans le cadre du partenariat établi avec Ma Fondation.

Ce sera pour nous l'occasion de prolonger ce dialogue au service des mers, et d'approfondir ensemble nos réflexions et nos pistes d'action.

Comme le disait le philosophe français Henri Bergson, « il faut agir en homme de pensée et penser en homme d'action ».

Au vu des échanges extrêmement féconds, concrets et profonds que nous avons eus aujourd'hui, je ne peux que vous faire confiance pour cela !

Je vous remercie.

"As with the 7th edition in Sao Paulo, I appreciated the 8th edition in Monaco for the presentations, discussions, and, as always, the incomparable atmosphere which is so conducive to meeting people, to high-quality discussion and to exceptional networking. I would like to express my appreciation to H.S.H. Prince Albert II of Monaco for his founding role, his passion, his perseverance, his support and for the pleasure of his company throughout these successive editions of MBI."

Dr Thierry CHOPIN,
Scientific Director and Professor of Marine Biology, Canadian Integrated Multi-Trophic Aquaculture Network, University of New Brunswick

"I thank you for your hospitality in Monaco during the Monaco Blue Initiative and congratulate you for the high quality of the conference."

Prof. Tullio SCOVAZZI,
Professor of International Law, University of Milano – Bicocca

"This edition of MBI was a great occasion for fascinating debates and contacts. It all was conducted with uncommon proximity, good humour, elegance and harmony. These few hours with you all in Monaco strengthen my conviction that in you I have the best of allies in serving our common ocean. I dare not thank H.S.H. the Prince directly, and entrust you with passing on my thanks for this wonderful assembly brought together around and thanks to him. And please receive my heartiest congratulations for the organisation of this initiative."

Mrs Nicole AUSSEDAT,
Campaigner,
The PEW Charitable Trusts

"I was attending MBI for the first time, and I was impressed by the remarkable quality of the presentations and discussions I attended, as well as by how stimulating and innovative participants' ideas were."

Mr Xavier Sticker,
Ambassador of France for the Environment

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Since its creation in 1906, the Oceanographic Institute is committed to sharing knowledge on the richness and fragility of the oceans, and promoting their sustainable management and efficient protection. For this, it acts as a facilitator between scientific and socioeconomic players on the one hand, and the public and decision-makers on the other. Through its crucial links with the scientific community and economic partners, the Oceanographic Institute develops a global vision of the Oceans' challenges, joining together the environmental, economic and social aspects. The Oceanographic Institute uses a wide range of communication tools covering all publics: the "Maison des Océans" in Paris and the Oceanographic Museum of Monaco for expert symposiums, public conferences and exhibits; editions; internet and social networks.

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PRINCE ALBERT II OF MONACO FOUNDATION

In June 2006, H.S.H. Prince Albert II of Monaco decided to set up his Foundation in order to address the alarming threats hanging over our planet's environment. The Prince Albert II of Monaco Foundation works for the protection of the environment and the promotion of sustainable development. The Foundation supports initiatives conducted by public and private organizations within the fields of research, technological innovation and activities to raise awareness of the social issues at stake. It funds projects in three main geographical regions: the Mediterranean Basin, the Polar Regions and the Least Developed Countries. The Foundation's efforts focus on three main sectors: Climate change and renewable energies, biodiversity, and integrated and sustainable water management together with the fight against desertification.

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The 9th Edition Monaco Blue Initiative will be held in Edinburgh on 8th-9th April 2018.
For any question, please contact the Secretariat of the MBI

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