Pacific Economic Cooperation Council

France Pacific Territories Committee

PECC International Hybrid Seminar

"The deep sea: the state of play in Asia-Pacific"

13-14 June 2023, Noumea, New Caledonia

Summary

By Luc Billi & Marc Reverdin

*On 13-14 June 2023 the France Pacific Territories Committee (FPTPEC) organized an international PECC seminar in New Caledonia on the issue of the deep seabed in Asia Pacific under the presidency of **Pascal Lamy**, FPTPEC chair. The seminar was introduced by the PECC Co-Chairs **Richard Cantor**, USPECC chair, and **Zhan Yongxin**, CNCPEC chair and brought together 34 international experts and decision makers.*

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Introduction

The global economy's need for critical materials, which are essential for satisfying growing worldwide demand and enabling the energy transition in the face of climate change, has led more and more players to take an interest in the deep seabed. The deep seabed harbors abundant mineral resources could indeed limit the risk of shortages caused by the extinction or mismanagement of existing resources, or even offset a deterioration in the geopolitical context that could disrupt supply chains. For many economies with large exclusive maritime zones rich in mineral resources, this also represents an interesting promise of development and of growth; with this in mind, some of them have already issued permits for commercial exploitation of the deep seabed.

The Asia-Pacific region is particularly concerned by this drive to explore and possibly, in the short term, exploit deep-sea mineral resources. The two shores of the Pacific Ocean link the world's two largest and most dynamic economic groups, around the USA and China. At the same time, it is in the Pacific Ocean, and in particular in the Clarion-Clipperton zone, that studies aimed at the commercial exploitation of oceanic mineral resources are most advanced. Last but not least, the region is home to a number of island economies, some of which are keen to make a quick profit from the little-known or as yet hard-to-exploit resources in their exclusive economic zones.

However, beyond the technical challenge of mining at great depths, numerous environmental and societal parameters will have to be considered by the economies on both sides of the Pacific and beyond before embarking on the path of large-scale exploitation of these ocean mineral resources.

With a view to shedding responsible light on deep-sea exploration and exploitation, the PECC's France Pacific Territories Committee (FPTPEC) conducted an in-depth examination of the technical, environmental, and societal issues involved, at a seminar that brought together 34 experts from the Asia-Pacific region in Noumea, the capital of a territory renowned for its mining expertise. The seminar provided public and private decision-makers with an overview of the challenges involved around the deep seabed.

Main findings and recommendations

1/ The lack of knowledge about the deep seabed was the main observation made during the seminar. It is this observation that has prompted some territories, such as New Caledonia, to adopt a moratorium on all forms of deep-sea mining. The most uncertain impact at this stage seems to be on deep-sea marine biodiversity, whose systemic role in food chains and climate is still insufficiently understood. The oceans and seabed are interconnected spaces that link the inhabitants of a global community, who today face challenges that call for global cooperation. Faced with these challenges, it is crucial to strike a balance between exploiting and protecting the deep-sea environment.

- **Against this backdrop, participants were unanimous in their call to invest massively in scientific research.**

2/ On technology, even before considering the development of new technologies to exploit the oceans, there is an urgent need to refine existing exploration and data collection technologies, which are not yet capable of delivering a complete vision of the deep seabed, and therefore of enabling government decision-makers to take decisions with all the necessary insight.

- **Efforts to develop innovative and non-intrusive exploration technologies must be continued and expanded.**

3/ Despite progress in ocean governance following the adoption of the High Seas Treaty (BBNJ) on 19 June 2023, the legal framework surrounding the deep seabed still appears very fragile and volatile, which should prompt a cautious approach to legal matters, including possible recourse to the moratorium formula. There are many stakeholders with different interests and priorities, which does not facilitate sustainable governance of these areas. The future of human flourishing therefore depends not only on serious consideration of sustainability issues, but also on the ability to make the right choices when trade-offs are required between competing sustainability objectives.

- **Efforts to clarify the legal framework for the deep seabed must be pursued, particularly in the implementation of the BBNJ treaty.**

4/ This must also involve a specific mobilization of the international community around the oceans, as called for by Costa Rica and France, who will co-chair the United Nations Conference on the Oceans in 2025 and propose the creation of an International Panel for the Sustainability of the Oceans (IPOS), built on the model of the Intergovernmental Panel on Climate Change (IPCC).

- **The proposal to set up an International Panel for the Sustainability of the Oceans (IPOS) should be supported at a multilateral level.**

5/ It also seems essential to involve local populations as closely as possible, whose way of life, as well as their economy and culture, are closely dependent on the health and preservation of marine ecosystems. Furthermore, the balanced approach of these local communities, which allows for the sustainable exploitation of natural resources, can also serve as a compass to guide public decision-making.

- **Sustainable use of the oceans cannot be envisaged without the contribution of traditional local communities.**

Summary of discussions

Introduction and keynotes

Doriane Sanchez Lebris, President of the FPTPEC's Caledonian section, opened the seminar by emphasizing the importance for New Caledonia of hosting this type of event, which offers an excellent opportunity to promote the territory and foster its regional integration. As an **Oceanian territory,** New Caledonia is well placed to host these exchanges on deep-sea issues, in the hope that they will lead to concrete recommendations that can be implemented soon.

Pascal Lamy, Chairman of the FPTPEC, reminded us that the challenges of the deep seabed, which have local, national, regional and international implications, **require a complex compromise between environmental protection and economic opportunities**. With New Caledonia planning to adopt a 10-year moratorium on seabed exploration and exploitation, **a coalition of parties to the UNCLOS led by France** has recently been established in **favor of banning seabed exploitation beyond national jurisdiction**. However, in the Pacific, certain countries have a different approach, **favoring the economic prospects of exploration and exploitation**, while seeking to **reconcile these interests with Oceanic culture and traditions**. This complex issue therefore gives rise to a diversity of opinions, also within the European Union and its member states, which are in discussion to determine their position. However, considering the different facets of this complex problem should allow to find a common path for the future.

Richard Cantor, Chairman of the USPECC and Co-Chairman of the PECC, set out the international context for deep seabed mining. In July 2023, **the International Seabed Authority's regulations on deep-sea mining** are due to be presented, and many countries and entities have high hopes of a substantial outcome. For the United States, the deep seabed has been the subject of renewed interest in recent years, as demonstrated by **the U.S. Inflation Reduction Act and the rising demand for minerals needed for the green transition**. As a result, the stakeholders involved in these issues are numerous and have diverse interests and priorities, which does not facilitate sustainable governance of these areas. The future of human flourishing therefore depends not only on serious consideration of sustainability issues, but also on **the ability to make the right choices when trade-offs are required between competing sustainability objectives**.

Yongxin Zhan, Chairman of the CNPEC and Co-Chairman of the PECC, recalled that the oceans and seabed are **interconnected spaces** that link the inhabitants of a global community who today face unprecedented challenges and call for **global cooperation**. In the face of these challenges, it is crucial to strike **a balance between exploitation and protection of the deep-sea environment**. As such, countries' efforts must focus on adopting **a holistic approach to seabed conservation and management**, and following the international regulations that will result from ongoing negotiations on the exploitation of seabed resources.

Jérémie Katidjo Monnier, Member of the Government of New Caledonia, in charge of ecological transition and the Coral Sea Natural Park, emphasized the importance attached by political leaders to implementing sustainable management of the oceans, and in particular the seabed. In New Caledonia, this concern has led to the **adoption of a moratorium on the**

exploration and exploitation of mineral resources. This moratorium, which will be voted on shortly, aims to protect New Caledonia's marine heritage, which is **distinguished by its unique biodiversity and remarkable geo-diversity**. This measure is also in line with other initiatives taken at national level, such as **a resolution by the French National Assembly** and a **moratorium voted by the Assembly of French Polynesia** in December 2022.

Louis Lefranc, France High Commissioner for New Caledonia, underlined the importance of the seminar's theme and location. The seabed is now considered one of humanity's ultimate frontiers and has **a direct impact on the balance and ecosystems of our planet**. What's more, it's a subject on which the French State and the New Caledonian government **complement each other** in their support for the ban on all exploitation of these areas. The choice of New Caledonia as the venue for the seminar is also significant because of the significant resources available for developing knowledge of the deep seabed, notably through research initiatives such as the Deep Seabed Research Program (PEPR) and the IRD's Collective Scientific Assessment.

Session 1: Deep-sea governance and legal framework: can we really get everyone to agree?

*The first session of the seminar, moderated by **Geneviève Pons**, brought together experts and actors involved in the governance and legal framework of the deep seabed. **Olivier Poivre d'Arvor** opened the session by recalling France's commitment to a complete moratorium on deep-sea mining in the name of the precautionary principle, even though the regulatory framework for the deep seabed appears incomplete, as emphasized by **Virginie Tassin Campanella** (Switzerland) for the high seas, and **Mazlan Madon** (Malaysia) for the continental shelf. This conservative approach was also highlighted by **Xiangxin Xu** (China), who emphasized the priority given by China to scientific research, without committing to a moratorium on exploitation at this stage. **Francis Vallat** (France) concluded the session by outlining the global challenges facing world governance, emphasizing the notion of the ocean as a common good of mankind.*

In his introduction, **Olivier Poivre d'Arvor**, Special Envoy of the President of the French Republic for the 2025 United Nations Conference on the Oceans, stressed the importance of protecting the oceans and seabed**.** He highlighted France's radical position in favor of a moratorium on deep-sea mining, underlining **the dangers posed by climate change and rising sea levels to marine ecosystems and coastal populations**. He also mentioned international efforts to regulate deep-sea mining, but stressed the lack of scientific knowledge about the deep sea and the risks it represents. In conclusion, he called for **a precautionary approach** and **the protection of these areas as the common heritage of mankind**.

Virginie Tassin Campanella, a Swiss lawyer specializing in the law of the sea, then highlighted the existence of **two distinct legal regimes**. The first is **the continental shelf regime** within national jurisdiction, granting **sovereign and exclusive rights** to the coastal state for the exploration and exploitation of resources. The second regime, overseen by the International Seabed Authority *(ISA)*, is **that of the Area** beyond national jurisdiction. This regime is based on **common ownership** and aims to guarantee **equal access and shared benefits to the common heritage of mankind. In order to** carry out exploration or exploitation activities in this area, **a permit** must be obtained **from the IAMF**. Despite the environmental protection and pollution prevention obligations imposed on States by these regimes, many grey areas remain in their implementation and interpretation, contributing to the **legal instability surrounding ocean governance**. It is therefore essential that States redouble their efforts to implement existing rules, develop environmental policies and strengthen international cooperation in order to overcome differences of interpretation and tensions.

Dr. **Mazlan Madon, a** Malaysian geologist and member of the Commission on the Limits of the Continental Shelf, then focused on the legal regime of the continental shelf, in particular **the setting of outer limits beyond 200 nautical miles**. Under UNCLOS, coastal states have the right to define these limits when the margin of their continental shelf extends beyond 200 nautical miles from the baselines. To do so, they must submit information to **the Commission on the Limits of the Continental Shelf** (CLCS), which examines the data and makes recommendations. For a coastal state, the determination of these limits is **a means of extending its sovereign rights to** explore and exploit the resources present in these zones. Since 2001, the CLPC has received around a hundred requests from coastal states, and has **issued recommendations for around 36% of them**. However, the CLPC faces challenges due to **the**

increasing complexity of requests and **the amount of scientific and technical data provided by coastal states, which** has resulted in a doubling of the time taken to review requests since 2014. Despite these difficulties, the CLPC strives to issue as many recommendations as possible. In the Asia-Pacific region, for example, of the 93 requests received by the CLPC, 25 were submitted by coastal states from this region.

Xiangxin Xu, a Chinese researcher at the Center for Polar and Deep Ocean Development at Shanghai Jiao Tong University, then presented China's position and practices regarding the deep seabed and its legal framework. China participates in the UNCLOS consultation process and plays an influential role in the development of the Mining Code as a key member of the IAMF Council. Its activities in the deep seabed **are mainly focused on scientific research,** particularly **into polymetallic nodules**. At this stage, it has not yet submitted an application for commercial exploitation. China does not support a moratorium on deep-sea mining, considering that it is **legitimate for a state to carry out such activities beyond its national jurisdiction in** accordance with UNCLOS.

In conclusion, Francis Vallat (France), founder and honorary chairman of the French Maritime Cluster, stressed the need for universal governance to ensure sustainable development. It is crucial to preserve the ocean and coordinate the actions of the various players. Civil society must work in coalitions and dialogue to find realistic solutions, recognizing the impacts on ecosystems. Transparency and commitment to ecosystem preservation are essential, as is the **promotion of universal rules**. The creation of a new coordinating body at the forthcoming UN Ocean Conference**, IPOS**, will facilitate this global coordination. Respect for the ocean as humanity's common good is paramount in this new deep-sea era.

Session 2: The Pacific Islander approach: what if the deep sea had a soul? Exploring the cultural dimension.

*The second session of the seminar, moderated by **Dominique Chu Van**, highlighted the cultural dimension surrounding the issue of the deep seabed. Indeed, as showed by **Jean-Yves Poedi**, representative of the Customary Senate of New Caledonia, and **Josine Tiavouane** (New Caledonia), representative of a local NGO, there is a deep symbiosis between man and nature within traditional communities in the region. What's special about this symbiosis is that it offers the possibility of sustainable exploitation of the resources offered by nature, but always according to a principle of balance that appears fundamental. In the same spirit, **Alex Herman** (Cook Islands) shared the Cook Islands' approach, which closely involves local communities in defining its seabed doctrine. The role of youth education was highlighted during the session by the screening of a video clip entitled "Le Mystère de l'Abysse", produced by three students from the Lycée Willama Haudra in Lifou.*

Jean Yves Poedi, Ambassador for the Sea and referent for New Caledonia's Customary Senate, with linguistic support from **Josine Tiavouane** (New Caledonia), a member of the NGO Conservation International, shared the holistic and multidimensional cultural vision of the Kanak people with nature. This vision is based on **the concept of balance**, which integrates human as part of nature. Thanks to this balance, these peoples have been able to survive through time and integrate fully into the environment that surrounds them. Incorporating this vision into the decision-making process - for example, in the management of the Coral Sea Natural Park, as suggested by the Kanak Customary Senate to the New Caledonian government - could pave the way for sustainable use of these areas. **This balance is also reflected in the Kanak people's relationship with the ocean**, which is perceived as a means of exchange and communication with the other peoples of the insular Pacific. Moreover, in Kanak culture, there is no boundary between land and sea, and vice versa.

Alex Herman, (Cook Islands), Commissioner of Seafloor Minerals for the Cook Islands, shared the Cook Islands' approach of closely involving local communities in defining its doctrine towards deep-sea exploration and eventual exploitation. At present, **exploration activities are the only ones permitted,** due to the lack of data and information to make an informed decision on mining. The Cook Islands have therefore adopted **a precautionary approach, with the support of local communities, to preserve the ocean**. All this work relies on 3 essential pillars of the community: the Government, traditional chiefs and religious authorities. Regulatory authorities and stakeholders, including civil society representatives, work in coordination to ensure transparency and accountability. The communities' main concerns are governance, the protection of their way of life and environment, and the responsible management of the revenues generated. **Regular consultations are held to address these concerns and adapt policies accordingly**. Finally, **these activities have a direct economic impact on local populations**, generating jobs, training opportunities and community programs specifically designed for their benefit.

Session 3: Twenty thousand leagues under the sea: how can one live at the bottom of the ocean? Biological resources and knowledge of the ecosystems.

*The third session of the seminar, moderated by **Lionel Loubersac**, brought together five renowned speakers, each contributing their expertise in the field of deep-sea biological resources. The session was opened by **Laureen Mullineaux** (USA), who presented the findings of a unique ecosystem present on inactive hydrothermal formations in the deep eastern Pacific. **Kim Picard** (Australia) discussed the use of Bathymetry in seabed mapping and its importance for opportunities in multidisciplinary oceanographic research. **Kevin Mackay** (New Zealand) then presented his project to map 100% of the seabed by 2030. **John Parianos** (Cook Islands) then shared his current knowledge of the ecosystems present on the Cook Islands seabed, and outlined the initiatives planned. Finally, **Karine Olu** (France) concluded the session by outlining the contributions of the ScinObs observatory project in New Caledonia to the challenges of understanding seamount ecosystems.*

Laureen Mullineaux (USA), American biological oceanographer at Woods Hole Oceanographic Institution, introduced session 3 by highlighting the importance of the presence of living faunas in mineral seabed habitats. Studying these faunas could help us better understand the importance of these ecosystems to global biodiversity, and their vulnerability to mining in particular. In this respect, an international research team recently discovered a unique ecosystem on inactive hydrothermal springs on the East-Pacific Ridge. The fauna is dominated by small gastropods, some of which may be new to science and found only on inactive sulfides. If it turns out that the food web supports a community of grazing animals present only on inactive sulfide features, this **will challenge the current paradigm and potentially change our perception of the role of these ecosystems** in deep-sea biodiversity and productivity. Findings from international research such as this can help shape policies for the sustainable use of deep-sea mineral resources, reconciling the needs of society with the preservation of a healthy ocean and its faunas.

These breakthroughs in scientific research cannot be achieved without the systematic exploration and mapping of the seabed. **Kim Picard** (Australia), head of Geoscience Australia's National Seabed Mapping Section, emphasized the role of bathymetry in this knowledge challenge, particularly regarding the interrelationships between bathymetry/morphology and deep-sea biodiversity. The depth of the seabed poses several technical and scientific challenges when representing it on a flat map, particularly in terms of data acquisition and processing, as well as decisions on resolution, projections and representation. Bathymetry provides a better understanding of the morphology of the seabed, the geophysical and oceanographic processes that govern it, and the ecosystems and resources it supports. To facilitate data sharing for scientific research**, the GEBCO** (General Bathymetric Chart of the Ocean) program was created in 1903. Under the auspices of the **International Hydrographic Organization** (IHO) and **UNESCO's Intergovernmental Oceanographic Commission** (IOC), it compiles and distributes bathymetric data for scientific use. Coupled with technological advances such as multibeam sonars and lidar sensors, GBECO opens new possibilities for mapping the oceans with a scale and accuracy that are essential **for improving our understanding of the marine environment**. Finally, the collection of participatory bathymetric data by civil society **also plays a significant role in global ocean mapping efforts**. These combined efforts are increasing our understanding of the ocean floor, helping to improve the conservation and sustainable management of the oceans and their living heritage.

Continuing the topic of seabed exploration, **Kevin Mackay** *(New Zealand)*, marine geologist, in charge of the Data Center for the South and West Pacific region of the Nippon Foundation's Seabed 2030 project, presented **the Seabed 2030 project**, which aims to map 100% of the seabed by 2030. Today, almost a quarter of the world's ocean has already been mapped, but there's still a long way to go, particularly in the deep sea. In the current phase of the project, the focus is on mapping areas that have not yet been explored, using innovative tools such **as drones and autonomous submersibles**. As **Seabed 2030** will not be carrying out the surveys itself, a collaboration between the scientific community and the commercial sector is encouraged to achieve the goal of mapping the entire seabed.

To illustrate the benefits of ocean mapping, **John Parianos** (Cook Islands), Technical Director of the Cook Islands Marine Minerals Authority, presented the seabed mapping work carried out in the Cook Islands, highlighting geological features such as abyssal plains, submarine plateaus and mountain ranges. Studies have revealed that carbonaceous organic particles are the main source of food for animals living deep on the seabed. He also highlighted the variations in the amount of food depending on the region, with food-rich areas such as New Zealand and New Caledonia, while other areas have very limited amounts of food, known as "ultra oligotrophic". For a better understanding of these areas and sustainable management, **it is necessary to collect more data on the marine fauna of the seabed**. It is therefore essential to develop collaboration between scientific research and commercial seabed exploration, by facilitating simplified research permits and providing locally equipped vessels, as is the case in the Cook Islands.

To conclude the session, **Karine Olu** (France), a researcher in deep-sea benthic ecology at the French Research Institute for the Exploration of the Sea (Ifremer), presented the ScinObs (Science, Innovations and Underwater Observatories) project launched by Ifremer in collaboration with Japan. The aim of this project is **to develop and deploy innovative multidisciplinary observation systems to answer scientific and societal questions**. The observatory is deployed in the Coral Sea Natural Park and comprises a network of mooring-type observations including autonomous and detachable moorings, as well as benthic stations, in order to cover the entire area and study the ecosystem diversity it contains. These resources enable biological, geological, chemical and hydrodynamic processes and interactions to be monitored. They aim, for example, **to better study seamounts**, key structures in the coupling between benthic and pelagic compartments that **are essential for understanding the effects of climate change on deep-sea ecosystems**. The long-term, multi-disciplinary observation provided by this project is crucial to the management of the park, to preserve ecosystem services beneficial to humankind and sustainable development. The project is also an example of **bilateral cooperation between two countries** - France and Japan - since it is being carried out in collaboration between Ifremer and Jamstec.

Following these three presentations, discussions highlighted the fundamental importance of gaining a better understanding of the deep sea, and in particular of the relationships between abiotic and biotic factors, so as to be able to anticipate the management and preservation of these environments. For example, by drawing up probability maps for the presence of particular ecosystems, which is a specific subject for research and development. Given the unknowns involved and the sheer volume of work to be carried out, achieving this knowledge will be facilitated by bringing together, better coordinating and complementing institutional exploratory campaigns and those carried out by private operators.

Session 4: Journey to the center of... the sea: what technological challenges? Exploration techniques and technological infrastructures.

*The fourth session of the seminar, moderated by **Elodie Leguéré**, focused on deep-sea technology issues. The session was introduced by **Christopher Gyges**, a member of the New Caledonian government, who described New Caledonia's very high ambitions in terms of regional technological infrastructure. In a two-part presentation, **Laurent Mingoual*** (New Caledonia) *and **Antoine Queval*** (France) *presented the submarine cable projects underway in the region and the importance of close collaboration with the scientific community. **Jérôme Aucan*** (New Caledonia*) then highlighted the ocean's role in CO2 regulation, underlining the importance of developing appropriate technologies in the ocean environment to combat climate change. Finally, **Jean-Marc Sornin (France)** brought the session to a close, presenting several innovations in the extensive and non-intrusive exploration of the ocean depths.*

In his introduction to the session, **Christopher Gyges**, member of the New Caledonian government responsible for the digital economy and the marine economy, presented the maritime cluster project, which aims **to position New Caledonia as a benchmark in the Pacific** for maritime services, research, innovation and business support. This project, born of a desire for economic diversification, began with a vast operation to clean up Numbo Bay, New Caledonia's main center of maritime activity, which was polluted by numerous wrecks. This operation enabled the development of expertise in the treatment of end-of-life vessels, paving the way for the creation of a patrol boat dismantling industry, positioning New Caledonia as the first overseas territory working in this field. The maritime cluster will also focus on other sites **to promote research and innovation through major deep-sea projects**. This is the case, for example, with the **project to install an intelligent cable between Vanuatu and New Caledonia**. Ultimately, New Caledonia aims to become a key player in the development of submarine cables and data management.

Following this, **Laurent Mingoual** (New Caledonia), Submarine Cable Project Manager at OPT-NC, and **Antoine Queval** (France), Business Development Director at Alcatel Submarine Networks, discussed the economic importance of submarine cables for the region's digital development, as well as their role in scientific surveillance. Indeed, the digital development of the region enabled by these cables **translates into increased bandwidth and strengthened connectivity between countries in the region**. New Caledonia, for example, recently strengthened its connections with the Fiji Islands to avoid potential economic disruptions. Furthermore, these cables can be described as intelligent, meaning that they incorporate sensors such as seismometers, accelerometers, and pressure transducers, enabling earthquake detection, sea level measurement and climate change monitoring. The TAM-TAM project between Vanuatu and New Caledonia aims **to develop the digital sector while improving knowledge of the marine environment.** In-depth understanding of the marine environment is essential to anticipate economic challenges and promote sustainable development in the submarine cable sector.

Next, **Jérôme Aucan** (New Caledonia), Head of the Pacific Community Centre for Ocean Sciences (PCCOS), underlines the crucial role of the ocean in CO2 regulation. In the face of global warming, the **challenge of reducing and capturing greenhouse gas emissions** has become a priority. In this challenge facing humanity, **the ocean is our greatest ally**, absorbing between 20% and 30% of CO2 emissions through its biological carbon pump, but research is

needed to boost this capacity. The use of macro-algae and iron fertilization are some of the techniques being explored, but **there is a significant lack of knowledge in this field**, and some techniques carry risks. It has therefore become essential to develop technologies and sensors to better understand the species, their role, distribution, and concentration in the ocean, as well as the natural flow of carbon to the depths.

Closing the session, **Jean-Marc Sornin** (France), CEO of Abyssa, highlighted technological advances in seabed mapping. Traditionally, underwater surveys were carried out using scientific instruments embarked on surface vessels. However, thanks to technological advances, pressure-resistant instruments have been developed, with multiple functionalities such as data measurement, storage and sharing, as well as increased autonomy. The ABYSSA team, dedicated to mapping and characterizing the seabed, as well as monitoring its evolution, **uses autonomous underwater vehicles** (AUVs) equipped with acoustic, optical, and physicochemical sensors to gather information at altitudes of less than 100 meters above the seabed, with consistently high resolution. ABYSSA is also working on an innovative concept called "So Magical", comprising a "leader" AUV and a group of "follower" AUVs guided by the leader AUV via an acoustic link. This multi-scale approach could **provide detailed maps and solve a variety of problems in these vast, little-explored marine areas**.

Session 5: The Ocean at the heart of global issues: what role for the Asia-Pacific at the United Nations Ocean Conference (Nice, June 2025)

*This fifth and special session on the role of Asia-Pacific in the United Nations Oceans Conference (UNOC) to be held in Nice in 2025, organized by France and Costa Rica, enabled Ambassador **Olivier Poivre d'Arvor** (France) to present the objectives of the conference and send a message of mobilization to the Asia-Pacific scientific community. As a major initiative for the conference, **Françoise Gaill** (France) presented the project to create an international panel for ocean sustainability (IPOS), which will put science at the heart of the definition of public ocean policies, following the approach promoted respectively by **Jérôme Aucan** (New Caledonia) and **Sefanaia Nawadra** (Fiji) in the Pacific, but also by ambassador **Rena Lee** (Singapore) in the context of the new international agreement on the high seas. With this in mind, **François Houllier** (France) announced the holding of "One Ocean Science", as a prologue to the UNOC, a preparatory forum bringing together the international scientific community for 3 days in Nice, just prior to the UN Conference, and was supported in particular by Hide **Sakaguchi** (Japan), President of Japan's largest oceanographic foundation and deep-sea expert.*

Pascal Lamy, President of the France Pacific Territories Committee Economic Committee (FPTPEC), introduced the session by underlining **the importance of the Asia-Pacific region** when it comes to ocean-related issues, both in terms of climate and economic and security aspects, given the dependence of many regional economies on the ocean and the cultural link that many local communities maintain with it, two aspects which he felt should be given an appropriate place at the 2025 UN Ocean Conference.

Olivier Poivre d'Arvor (France), Special Envoy of the President of the French Republic for the 2025 United Nations Conference on the Oceans, complemented Pascal Lamy's remarks by recalling the **intense maritime economic activity of the region**, thanks in particular to the maritime trade routes crucial to global trade, the wealth of resources in these areas, and the central role played by the region's emerging economic powers in contributing to the security and governance of these areas. He underlined **the responsibility that derives from the major role played by these States** in preserving the oceans, in particular by encouraging States to make concrete commitments to achieve the objectives of the Paris Agreement. The United Nations Conference will pursue a number of objectives, including **the establishment of new financial mechanisms**, **improved scientific knowledge of the oceans and the mobilization of all stakeholders**. The urgency of action requires a collective commitment to create a world where oceans prosper and prosperity is shared.

Françoise Gaill (France), then took the floor to present the IPOS (International Panel for Ocean Sustainability) project, which aims to create an international panel for ocean sustainability modeled on the IPCC, in order **to reinvent the interface between science and policy for the oceans**. IPOS proposes a bottom-up approach, using innovation labs for ocean sustainability and building an open-access ocean knowledge platform. Aligned with the United Nations Decade of Ocean Sciences, the project aims to identify the knowledge needed for sustainable development of the oceans. Among its priorities, IPOS aims to enhance the value of the ocean and the extraction of its resources. The project has already published its concept, lobbied the EU and plans to launch IPOS at UNIC 2025. Françoise Gaill invites the region's

experts to get involved and take part in the events to be held next year, particularly in the Asia-Pacific region.

Jérôme Aucan (New Caledonia), Director of the Pacific Committee Center for Ocean Science (PCCOS), then shared the efforts made to integrate ocean sciences within the Secretariat of the Pacific Community (SPC) and coordinate activities between the various divisions. Its aim is to provide Pacific Island governments and communities **with better oceanographic data to make informed decisions** for the protection and sustainable management of ocean resources. It emphasizes integrated portion management, a concept developed during a participatory workshop bringing together several of the region's stakeholders. Three key pillars were identified: improved science to support decision-making, the establishment of national ocean laws and policies, and the inclusion of Pacific traditional and cultural knowledge. Based on these pillars, the *Integrated Ocean Management* program was created for a ten-year period.

Sefanaia Nawadra (Fiji), Director General of Pacific Environment and the South Pacific Regional Environment Program, then took the floor to talk about the importance of strengthening and developing scientific capacity in the field of oceanography. He spoke of the cooperation between his organization and others, notably **the Secretariat of the Pacific Community** (SPC), to examine a wide range of oceanographic issues and complement each other's work. **Science has a vital role to play in preserving the oceans** and must be **at the service of policy** by providing rigorous information to support negotiation processes. To this end, a project on the status of climate science in the Pacific will soon be launched in Fiji. In addition, he insists on the need to create a panel of oceanography experts similar to the IPCC to advance discussions on ocean issues.

Rena Lee, Singaporean Ambassador and President of the Intergovernmental Conference for an Agreement on the Conservation and Sustainable Use of Marine Biological Diversity beyond Areas of National Jurisdiction (the BBNJ Agreement), spoke about the content of this agreement, also known as the **High Seas Treaty**, which aims to cover all areas beyond national jurisdiction, including the seabed. The agreement, signed on 19 June 2023, will provide for the sharing of benefits arising from the use of marine genetic resources and digital sequence information. It will also offer area-based management tools, environmental impact assessments, and capacity-building efforts for developing countries. Rena Lee calls for international cooperation to ensure rapid ratification of the agreement so that **it can enter into force**. Once it has entered into force, the challenge of implementation will be addressed at the United Nations Conference on the Oceans in 2025.

François Houiller (France), President of Ifremer, then announced the preparation of One Ocean Science, organized as a prologue to the UNOC by CNRS and Ifremer in partnership with IOC/Unesco, which will bring together the world's scientific community to provide a state of knowledge on the ocean. The objectives of the event are to explore ocean-related challenges and solutions, to assess the ocean's potential to contribute to major transitions such as the energy and food transition, and to formulate science-based recommendations for fully integrating the ocean into sustainable development goals. In this type of event, it is essential to encourage the inclusion of a wide range of players and the commitment of all countries, including those without access to the ocean.

Hide Sakaguchi (Japan), President of the Ocean Policy Research Institute of the Sasakawa Peace Foundation, recalled the leading role of Asia-Pacific in the United Nations Ocean

Conference. He spoke of the **spiritual bond and economic dependence of the region's inhabitants on the ocean**, emphasizing its ecological and tourist importance.

Concluding the session, **Olivier Poivre d'Arvor** emphasized **the vital role of science in the run-up to the United Nations Conference on the Oceans**. The conference will provide an opportunity to place the ocean at the heart of the international political agenda, and to foster effective coordination and governance to address ocean-related challenges. He also stressed the importance of involving citizens and harmonizing cultural perspectives as essential elements in the Pacific.

Session 6: A bottomless problem: what to do with the mineral resources at the bottom of the oceans? Issues relating to the exploitation of deep-sea mining resources.

*The fifth session of the seminar, moderated by **Fabien Trotet**, focused on mineral resources in the deep seabed, and highlighted a diversity of complementary approaches among the four experts involved. The difficulty of mastering all the parameters relating to deep-sea mining was highlighted in particular by **Alain Liger** (France), who called for caution in basing any serious project on scientific data. This science-based approach is particularly necessary in the Clarion-Clipperton zone, where the greatest number of projects are concentrated, as **Ian Lipton (**Australia) explained. But it is also essential to provide for governance, assessment and consultation mechanisms designed to involve local populations as fully as possible, and to take account of all environmental requirements, as **John Parianos**, representing the Cook Islands, which has already granted several commercial exploitation permits, emphasized. In conclusion, **Pierre-Jean Bordahandy** (France) also stressed the importance of governance, but also of the economic viability of projects, which is not guaranteed, bringing with it a number of risks, including that of ignoring site rehabilitation challenges.*

Alain Liger (France), former Secretary General of the Strategic Metals Committee, introduced the session by discussing the various aspects of mineral resource knowledge. In the seabed, three main types of mineral deposits have been identified: massive sulfide deposits, cobalt-rich crusts and polymetallic nodules (manganese nodules). Although mining companies use various techniques to identify and estimate these deposits, they encounter difficulties in exploration and delineation activities, particularly for massive sulfides. Notidis, for example, has encountered difficulties in delineating massive sulfide deposits. On the other hand, the assessment and quantification of nodule fields is comparatively easier and more feasible thanks to advances in sampling techniques. Given that the seafloor environment is still largely unknown and hostile to man, baseline studies are recommended to establish acceptable consequences and mitigate the potential environmental impacts of deep-sea mining.

Next, **Ian Lipton** (Australia), President of the Carbon Accounting Company, shared his expertise on polymetallic nodules present in the Clarion Clipperton Zone (CCZ), located in the northeastern Pacific Ocean. Polymetallic nodules are rock formations rich in manganese, iron, nickel, copper and cobalt, essential metals for battery manufacture and electricity transmission. The CZC is home to around 30 billion tonnes of these nodules, mainly due to its undersea relief of north-facing ridges and valleys. As a result, these nodules form slowly on the ocean floor, absorbing metals from seawater over a period of millions of years. **Several research organizations are actively studying scenarios for exploiting these nodules, in order to analyze the most efficient mining methods**. Current proposals involve the use of self-propelled collection machines that pick-up nodules from the ocean floor with minimal environmental impact. However, despite interest in these nodules due to growing demand, it is crucial to make informed decisions based on scientific data, reconciling economic development with environmental impacts.

Following on from Ian Lipton's presentation on polymetallic nodules, **John Parianos** (Cook Islands), Technical Director of the Cook Islands Marine Minerals Authority, addressed the issue of exploration permits granted by the Cook Islands government to three commercial groups. The government has taken action by publishing a mineral resource estimate in

accordance with the JORC code, which requires a full assessment and reasonable prospects of economic extraction. It should be noted that seabed minerals belong to the people of the Cook Islands and are **regulated by the government in close collaboration with traditional chiefs and religious institutions**. The mineral resources report highlights various aspects, such as the marine environment, social and governmental structures, laws, technical solutions, metal values, and production costs. To ensure a balanced approach, the Cook Islands government has put in place **a comprehensive social engagement plan and environmental assessment requirements.** Although the Cook Islands is currently focusing on marine research, it is clear that future commercial development will require technical, financial, environmental, and social support, as well as transparency and thorough consultation.

Concluding the session, **Pierre-Jean Bordahandy (France**), Professor of Law at USP Vanuatu and IMO representative for Tuvalu, addressed the cross-fertilization between the exploitation of deep-sea mineral resources and the preservation of the environment. There are concerns about the risks inherent in this activity, but **the right decision-making process can help mitigate them**. However, **processes are not equivalent to science** and must be constantly re-evaluated in the light of science if risks are to be managed effectively. **The independence of science is essential**, and a transparent and independent governance structure is needed to ensure the identification of risks and scientific solutions. The responsibility of governments and industry, as well as the volatility of metal prices, also points to be taken into consideration, particularly as regards the challenge of rehabilitating sites in the event of a fall in the profitability of this activity.

Session 7: The vertigo of safeguarding: today preservation, tomorrow... restoration? The need to understand to better protect.

*The sixth session of the seminar, moderated by **Pascal Lamy**, highlighted the fragility of the ocean, while at the same time emphasizing its essential role on many levels, particularly in biological terms, given the still poorly understood role of deep-sea micro-organisms, which could play a crucial role in the oceanic food chain, as emphasized by **Hide Sakaguchi** (Japan) and **François Lambert** (France). For **Eudes Riblier** (France), this situation underpins a compelling moral obligation to protect, which applies to all players: to States, which must not only protect but also restore, as **Raphaëlle Danis** (New Caledonia) explained; to companies, whose responsibility must be highlighted, as **Paul Holthus** (United States) emphasized; and finally, to regional organizations such as the European Union, which can support scientific research around the oceans, as **Geneviève Pons** (France) presented.*

Opening the session, the President of the French Institute of the Sea, **Eudes Riblier** (France), emphasized the recognition of the ocean as a global common, and the urgent need for action to preserve it. The United Nations Convention on the Law of the Sea recognizes deep-sea mineral resources beyond national jurisdiction as **a common heritage of mankind**, while the general principles of the new BBNJ agreement emphasize the preservation of marine biodiversity on the high seas as a common good. It is crucial **to reject the utilitarian vision of the ocean** and **to emphasize the profound link between mankind and the ocean as a source of life**. Relying today on possible future restoration capacities must not be used as a pretext for neglecting current preservation efforts which, in reality, should be our priority since restoration efforts are generally more costly and less effective. It is therefore urgent to reduce our impact and **make science-based decisions to avoid further damage**. Humanity has a moral and ethical obligation to do better and must take collective action to protect and work together to protect and preserve the ocean as a global common.

Paul Holthus (USA), CEO of the World Ocean Council (WOC), then presented the essential role of companies in understanding the ocean depths and promoting sustainable practices notably through the organization of which he is president. The WOC brings together the world's private ocean sector across a wide range of activities, including shipping, tourism, offshore energy and ports. Its aim is to promote corporate responsibility towards the oceans by creating value for responsible companies. Through the organization of summits, such as the **Sustainable Ocean Summit** (SOS) and the **World Blue Finance Summit** (BlueFIN), the WOC brings together players from the business and financial industries to discuss sustainable development and the responsible use of the oceans. In particular, it has emphasized the importance of synergies and economies of scale in dealing with ocean issues, as well as the stability and predictability required in ocean operations. The WOC also collaborates with international organizations and bodies such as the **Group on Earth Observations** (GEO), the **International Hydrographic Organization** (IHO) and the **International Seabed Authority** (ISA), to achieve its objectives. Thus, through its activities and its SMART Ocean-Smart Industries program, the WOC is helping to promote corporate responsibility for the oceans at, and to create value for responsible companies working in the field of seabed preservation and restoration.

Hide Sakaguchi (Japan), President of the Ocean Policy Research Institute of the Sasakawa Peace Foundation, then stressed the importance of **understanding the biodiversity and**

dynamics of ocean ecosystems. He highlighted the paradox that areas of low biodiversity, such as the deep sea, may have high levels of micro-organism activity, while areas of high biodiversity may have lower levels of micro-organism activity, implying that an impact on these micro-organisms could have irrevocable consequences on the food chain. Therefore, prior to any deep-sea mining activities, it seems essential to **carry out in-depth studies to fully understand the relationships between different organisms**, from micro-organisms to larger marine species. To achieve this, collaboration in scientific research must be strengthened to inform policy decisions.

François Lambert (France)**,** Director General of the École Nationale Supérieure Maritime, then highlighted several key aspects of deep-sea preservation. First and foremost, preservation of the deep seabed involves promoting the conservation of fragile ecosystems, notably by **considering the potential consequences of deep-sea mining on the marine food chain**. Disruption of the food chain would result in a loss of associated biodiversity. In addition, these extraction activities must not be carried out **to the detriment of indigenous populations, marginalizing them and thereby causing social and environmental injustice**. Finally, the promotion of decarbonization must above all involve innovation, reduction, reuse, and recycling, which means developing sustainable alternatives to limit our dependence on marine resources. These key points highlight the need for a balanced approach that preserves both the marine environment and the communities that depend on it.

Geneviève Pons (France), Managing Director and Vice-President of the Brussels based Europe Jacques Delors think tank, continued the session by presenting the Starfish mission launched by the European Union to restore and protect the ocean by 2030. This mission is based on **five key objectives**: **eliminating pollution, bridging the knowledge and emotion gap, reorganizing governance, regenerating marine and freshwater ecosystems, and decarbonizing oceans, seas and waters**. To achieve these goals, it is crucial to strengthen our understanding and knowledge of the seabed through scientific advances. These areas contain many resources that must be preserved and protected, because of their contribution to underwater biodiversity and their potential for human health. For example, **deep-sea corals have anti-inflammatory and anti-cancer properties**, as do other marine organisms with valuable anti-cancer and analgesic properties. In short, a better understanding of the ocean and its resources is essential to ensure their protection and harness their potential for the benefit of society.

Raphaëlle Danis (New Caledonia), co-founder of Thanks for Her, brought the session to a close with a warning about the ticking time bomb represented by underwater wrecks leaking oil. World War II wrecks, with their badly corroded hulls, are in danger of spilling massive quantities of toxic hydrocarbons into the oceans and onto coastlines. Scientists are concerned about the environmental, economic and health consequences of this pollution. **Experts predict an increase in massive spills in the coming years**, which could lead to decades of devastating oil spills. To remedy this situation, Thanks For Her proposes solutions to combat underwater pollution by **raising public awareness, mobilizing skills and using innovative techniques.** The costs of preventive wreck clean-up are lower than those of post-spill rehabilitation, and it is necessary to prioritize the most dangerous wrecks for effective intervention. **States need to step up their cooperation to set up monitoring and leak detection systems.** Pooling resources and forging alliances between responsible and financial players will play a key role in solving this global problem.

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Annex - full list of participants (alphabetical order)

- **Ashok Adicéam**, Principal Councelor of the UN Ocean Conference France 2025
- **Jérome Aucan**, Head-Pacific Community Centre for Ocean Sciences
- **Pierre-Jean Bordahandy**, Professor of Law at USP Vanuatu and IMO representative for Tuvalu
- **Raphaelle Danis**, Co-founder of Thanks for her
- **Françoise Gaill**, President of the Ocean Sustainability Foundation
- **Christopher Gyges**, Member of the Government in charge of the Digital Economy and the Economy of the Sea
- **Alex Herman**, Seabed Minerals Commissioner
- **Paul Holthus**, CEO of the World Ocean Council
- **François Houiller**, President and CEO of Ifremer
- **Jeremie Katidjo Monnier**, Member of the Government of New Caledonia - in charge of the ecological transition and the Coral Sea Natural Park
- **Geoffroy Lamarche,** Chief Science Adviser to the Parliamentary Commissioner for the Environment
- **François Lambert**, Director General of Ecole nationale supérieure maritime
- **Pascal Lamy,** Chair, France Pacific Territories National Committee for Pacific Economic Cooperation (FPTPEC)
- **Rena Lee**, Ambassador for Oceans and Law of the Sea Issues and Special Envoy of the Minister for Foreign Affairs of Singapore, President of the Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction
- **Louis Lefranc**, France High Commissioner in New Caledonia
- **Pierre Yves Le Meur**, Anthropologist and Research Director at IRD-SENS
- **Alain Liger**, former Secretary General of the Strategic Metals Committee
- **Ian Lipton**, President of the Carbon Accounting Company
- **Kevin Mackay**, Marine geologist, Head of the South and West Pacific Data Center for The Nippon Foundation-Seabed 2030 Project
- **Mazlan Madon**, Doctor of Geology, Member of the Commission on the Limits of the Continental Shelf
- **Laurent Mingoual**, Submarine Cable Project Manager at OPT-NC
- **Lauren Mullineaux**, Biological oceanographer at Whoods Hole Oceanographic Institution
- **Valelia Muni Toke**, Anthropologist and Research associate at IRD-SeDyl
- **Sefanaia Nawadra**, Director-General of the Secretariat of the Pacific Regional Environment Programme
- **Karine Olu**, Researcher in deep-sea benthic ecology, Ifremer
- **John Parianos**, Technical Director Cook Islands Seabed Minerals Authority
- **Kim Picard**, Director of the National Seabed Mapping section at Geoscience Australia
- **Jean Yves Poedi**, Ambassador of the Sea and referent for the Customary Senate
- **Olivier Poivre d'Arvor,** French Ambassador for the Poles and Maritime Issues
- **Geneviève Pons**, Director General and Vice President of Europe - Jacques Delors

- **Antoine Queval**, Business Development Director at Alcatel Submarine Networks
- **Eudes Riblier**, President of the French Institute of the Sea
- **Hide Sakaguchi**, President of Ocean Policy Research (OPRI) of the Sasakawa Peace Foundation.
- **Jean Marc Sornin**, CEO Abyssa,
- **Virginie Tassin Campanella**, Founder & Managing Director of VTA Tassin, Attorney at law (Paris/Zürich), Vice President of Scientific Council of INDEMER (Monaco)
- **Peter Thomson**, United Nations Secretary-General's Special Envoy for the Oceans
- **Josine Tiavouane**, Member of Conservation International,
- **Jocelyn Trainer**, Research Assistant for the Energy, Economics, and Security Program at Center for New American Security
- **Francis Vallat**, Founder and Honorary Chairman of the French Maritime Cluster
- **Xiangxin Xu**, Research at the Center for Polar and Deep Ocean Development, KoGuan School of Law, Shanghai Jiao Tong University
- **Zhan Yongxin**, PECC Co-Chair, CNCPEC Chair