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Intergovernmental Oceanographic Commission

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT

2021-2030

WESTERN TROPICAL ATLANTIC

TROPICAL AMERICAS CO-DESIGN TECHNICAL WORKSHOP

"CAPACITY DEVELOPMENT: 1. THE DEEP-SEA"

WTA - TECHNICAL WORKSHOPS SERIES

Report 2021 – 03

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WTA TECHNICAL WORKSHOPS SERIES

REPORT 2021 - 03

English only

This document presents the summary results of the technical workshop series convened in accordance with the Western Tropical Atlantic Action Plan for the UN Decade of Ocean Science for Sustainable Development 2021-2030 (The Ocean Decade), for the seven societal outcomes, held during the period of July-October 2021, in accordance with the Regional Western Tropical Atlantic Planning Group Action Plan. The results of this regional session will be consolidated as a discussion paper by the co-conveners of the regional session, which can contribute to the Western Tropical Atlantic Action Plan including the Eastern Tropical Pacific.

For bibliographic purposes this document should be cited as follows:

Western Tropical Atlantic Technical Workshop Series Report 2021 – 03 as a contribution to the UN Decade of Ocean Science for Sustainable Development, Online meeting, 19 August, 2021

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THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT 2021-2030
WESTERN TROPICAL ATLANTIC

Tropical Americas Co-Design Technical Workshop
"Capacity Development: 1. The Deep-Sea"

WTA - TECHNICAL WORKSHOPS SERIES report 2021 – 03

Co-hosted by IOC of UNESCO Sub-Commission for the Caribbean and Adjacent Regions-IOCARIBE and the International Seabed Authority.

Virtual Meeting, August 19, 2021

1. BACKGROUND

This document presents the summary results of the technical workshop series convened in accordance with the Western Tropical Atlantic Action Plan for the UN Decade of Ocean Science for Sustainable Development 2021-2030 (The Ocean Decade), for the seven societal outcomes, to be held during the period of July-September 2021, in accordance with the Regional Western Tropical Atlantic Planning Group Action Plan.

The meeting documents and the copies of the presentations are available at the below workshop website:

http://iocaribe.ioc-unesco.org/webinarseries/cd

The full list of UN Endorsed Programmes and Contributions can be accessed at

https://oceandecade.com/resource/166/Results-of-the-first-Call-for-Decade-Actio ns-No-012020)

2. INTRODUCTION AND CONTEXT

A recommendation from the Ocean Decade Regional Planning Meeting is that Capacity Development in the Western Tropical Atlantic region should be at the forefront of the implementation actions. The IOC Capacity Development Strategy, 2015–2021 identified it as the spark that will make possible that nations profit from ocean scientific research to achieve sustainable development and prosperity in the region. It is also explicitly recognized in the Action Plan adopted by the Assembly of the International Seabed Authority (ISA) in support of the United Nations Decade of Ocean Science for Sustainable Development adopted in December 2020 (ISBA/26/A/4, ISBA/26/A/17), which operationalizes the vision set out by the 168 Members of ISA in the ISA Strategic (ISBA/24/A/10) and High-Level Action Plan (ISBA/25/A/15) for 2019-2023.

The deep ocean in the Western Tropical Atlantic and Eastern Tropical Pacific regions deserves consolidated strengthening of international cooperation for exploration and scientific understanding, which can be effectively facilitated by the rapid advancement of technologies for ocean observations and monitoring. Emerging needs for ensuring sustainable development of deep-sea resources and the protection of vulnerable deep-sea ecosystems further call for cross-sectoral and multi-level partnerships among countries as well as competent intergovernmental organizations, such as International Seabed Authority.

The United Nations Decade of Ocean Science for Sustainable Development seeks to transform how ocean science achieves long-lasting impacts, offers opportunities for robust capacity development, and benefits people's life through stimulating innovative ocean research. A key avenue for this is to ensure co- design for co-delivery and meaningful capacity building opportunities. To that end, critical attention needs to be placed on maximizing synergies, within existing strategic frameworks and strategies adopted by competent intergovernmental organizations with a view to effectively contribute to the achievement of respective mandates and ultimately meet the objectives of the 2030 Agenda.

This virtual session of the UN Decade Ocean Western Tropical Atlantic series seeks to address the importance of deep ocean capacity development and ocean literacy needs in the region through a series of dialogues among relevant stakeholders. In particular, the workshop will build on the mandates of ISA tasked by the United Nations Convention on the Law of the Sea and the strategic actions undertaken through the ISA Marine Scientific Research Action Plan in support of the UN Decade of Ocean Science for Sustainable Development as well as the Decision of the ISA Assembly on a programmatic approach to capacity development (ISBA/26/A/18).

It will also draw on the wide range of experience and lessons learnt by ISA and its members in implementing unique and innovative capacity-building/development schemes over the last 27 years in the exploration of mineral resources, environmental baseline studies and deep-sea research. It is expected that as part of the outcomes of the discussion to be held during the workshop, participants will have an increased awareness of the existing opportunities and mechanisms through which individuals from the Western Tropical Atlantic and Eastern Tropical Pacific regions can build and develop their capacities in deep-sea research related disciplines. It will also provide for the opportunity to discuss how strengthened capacities could support informed decision-making, develop robust ecosystem-based management measures, and contribute to the existing efforts engaged at the international and regional levels to foster cooperation for enhanced participation in marine scientific research activities.

The workshop strives to identify priority issues and recommendations for the development of regional actions to build capacity in ocean data access, information, and knowledge; of specialized research and observation equipment; promote training; and collaboration to participate in ocean science activities to benefit from discoveries of new species and ocean resources.

The results of this regional session will be consolidated as a discussion paper by the co-conveners of the regional session, which can contribute to the Western Tropical Atlantic Action Plan including the Eastern Tropical Pacific.

3. PARTICIPANTS

The workshop recorded attendance of 137 registered participants, coming from local, national, regional, and global ocean specialists, ocean scientists, transdisciplinary researchers, producers of ocean data, products and services, policy makers, UN partners, business and industry, government representatives, NGOs and other key stakeholders from the regions involved in national and regional ocean and marine related matters. **Annex 1.**

4. OUTCOMES AND FINDINGS

The Outputs and findings of the Tropical Americas Co-Design Technical Workshop "Capacity Development: 1. The Deep-Sea" was summarized at the end of the workshop by Dr. Elva Escobar as Co-Chair WTA Capacity Development WG and ISA secretariat, represented by Jihyun Lee (Director of Office of Environmental Management and Mineral Resources, ISA).

The experts recognized the importance to

- Be innovative and creative
- Train more students
- Bring the experts to local communities and promote adequate long-term investment for deep sea research
- Provide financing and funding to set more labs, need to stay in-country
- Network to increase research capacity

Best practices for collaboration

- Importance of existing networks
- Opportunities in Ocean Decade endorsed programs
- Recognize the importance of early career ocean professionals in benefits for the region
- Standardization of methods through best practices

The sessions and discussions identified four capacity building themes

- Access to data, information and knowledge
- Enhanced access to existing and new technology and equipment
- Accelerate and deep sea training
- Strengthen collaboration and networking

Government-industry partnerships with science should be conducive to longer-term collaboration

- Fill knowledge gaps
- Strengthen capacity though inclusive international participation
- More science that responds to priorities and needs identified to benefit ocean-dependent people

5. PROGRAMME HIGHLIGHTS AND WAY FORWARD

The agenda for the meeting as per **Annex 2**. Three question polls were submitted to the consideration of the participants. The results of the answers as per **Annex 3**.

Part 1. Welcome / Overview

The workshop "*Deep-sea capacity development needs in the WTA and the ETP for the ocean we want*" workshop, convened by IOCARIBE and IOC, was structured in five Parts. Part 1 started with the opening remark by Dr. Arthur E. Paterson, Program Manager, Office of International Activities, Office of Oceanic and Atmospheric Research, NOAA; the welcome remark by Alm. Ariel Troisi Co-Chair WTA Capacity Development WG. Presentations on the Objectives of the Meeting were jointly delivered by Dr. Elva Escobar as Co-Chair WTA Capacity Development WG and ISA secretariat, represented by Jihyun Lee (Director of Office of Environmental Management and Mineral Resources, ISA). Two short videos and the first poll followed.

Dr. Escobar, a research scientist from the Institute of Marine Sciences and Limnology at the Universidad Nacional Autónoma de Mexico underscored the importance of capacity development (CD) in the WTA and ETP regions. She highlighted the opportunity to seek dialogue and synergies with ongoing projects, Ocean Decade endorsed programs and early career ocean professionals to strengthen decision making, foster cooperation for discovery and scientific research in the region. She underlined the importance of CD in deep ocean research and its link to climate change and m noted the regional technological resource capability challenges to gain access to resources to work below 200 meters. She highlighted how paucity of scientific information and the fragmented governance limit informed decision-making and capacity to participate in ocean science activities in areas beyond national jurisdiction (ABNJ). She invited the audience to consider that a transformative change in capacity development requires investing in people and building infrastructure, ownership, and long-term support. This could be achieved through the networking of experts, institutions and the access to scientific data, tools and best practices, and develop local expertise with lasting benefits. She introduced her co-chair Dr. Jihyun Lee, Director of Office of Environmental Management and Mineral Resources, ISA.

ISA secretariat, represented by Jihyun Lee (Director of Office of Environmental Management and Mineral Resources, ISA), provided the context for the workshop by highlighting the mandates of ISA on marine scientific research in the international seabed area beyond national jurisdiction (Area), provided by the UN Convention on the Law of the Sea. She highlighted the scientific contribution by ISA contractors, through their exploration activities, using the example of ISA database (DeepData), which provides a global repository of all environmental and resources-related data submitted by contractors from their exploration activities in past decades. Building on this concrete scientific basis, ISA has developed an Action Plan in support of UN Decade of Ocean Science for Sustainable Development, which was adopted by the Assembly in December 2020. This Action Plan identified six Strategic Research Priorities, which will provide a useful framework for discussing potential areas of collaboration and partnerships at this workshop, together with ISA's programmatic approach for capacity development, adopted by the Assembly in December 2020.

An overview of the UN Decade of Ocean Science for Sustainable Development was described by a short video followed by ISA's Video on the MSR in the Area.

Dr Escobar invited the audience to participate in the first Participant Poll **(Annex 3**).

Part 2. Ongoing CD Programs in the WTA and the ETP regions Panel

This panel focused on addressing the following questions:

- How important is developing capacity in your country? Why?
- What does your country require to strengthen deep sea capacity building with regional or sub-regional IOC communities and local networks?
- What is the most critical capacity development needed to build deep ocean science capacity in your country?

Dr. Sharon Herzka, CICESE, Mexico moderated the panel, focusing on the importance of capacity building in each of the panelist's countries (Argentina, Dr. Ana Carolina Ronda, Costa Rica, Dr. Jorge Cortés; and Trinidad and Tobago, Dr. Judith Gobin), to identify conditions that favor achieving this capacity develop through addressing the most critical needs. Commonalities emerged regarding the panelist's views, including the need for:

a) involving and training local scientists through collaborative efforts with colleagues from more developed countries that have the know-how and access to the expensive infrastructure required for deep sea research.
b) adopting best practices in support of those collaborations, which includes mandatory participation of local scientists in research efforts and investing in local infrastructure.
c) prioritizing training of young scientists through hands-on involvement in regional research efforts.
d) increasing the availability of permanent positions in academia or industry to allow for long-term capacity building and avoid emigration to other countries. Local scientific communities would benefit from international support before national governments to expand the availability of permanent positions.
e) implementing laboratories focused on modern genetic approaches to the study of the deep sea; and
f) developing trust among stakeholders and sectors for enhanced co-design and co implementation and promoting scientific literacy.

Dr. Ana Carolina Ronda, CONICET-Instituto Argentino de Oceanografía (IADO/UNS),

Dr Ana Carolina Ronda presented about the benefits of her at-sea training experience under ISA's Contractor Training Programme in an international research campaign in relation to her personal and academic objectives. She highlighted the importance and benefits of such deep ocean related capacity-development opportunities offered by ISA for professionals, particularly for those from developing States, in the deep ocean research as well as related sectors. She highlighted the importance of knowledge obtained through seabed research. Dr Ronda also emphasized on the benefits from interacting with international experts during the campaign and promoting the development of short and long-term collaborative projects. Challenges associated with deep ocean research investigations in developed countries were also discussed in her presentation.

Dr. Jorge Cortés, Universidad de Costa Rica, UCR, Costa Rica emphasized that developing nations have an extremely limited capacity to study their deep regions because of the lack of equipment, research vessels, funding, and trained researchers. He underlined those countries in the ETP depend on developed

nations' research institutions, their navy (if there is one) or on commercial enterprises (if there are any) which may limit the interest of local scientists or governments. It is because of these constraints that participation of local scientists, not only as observers but as researchers in the cruises, sample analysis and publications must be mandatory. There are scientists in the region that can participate and contribute to the advancement of knowledge who can also inspire transmit their experience to the rest of the country, in their own language for their own national context. This has a powerful positive effect on the public, government and fellow research community support and engagement. colleagues. Realizing what these countries have within their Exclusive Economic Zones will set in motion policies to promote its study, protection, conservation, and national pride of their natural heritage. In summary, we need more regional capacity building in Central America and the developing world in general, more regional scientists and students in research and exploration expeditions, and more funding for participation in the collection of samples, analysis, and publication.

Judith Gobin, University of West Indies, UWI, Trinidad & Tobago recognized that capacity building is critical in order to sustain the knowledge and improvements in terms of marine sciences and deep-sea research especially. Small islands generally have low numbers of related job offerings and often "trained" marine scientists get elevated to administrative posts or leave; in effect there is an "internal brain drain"! In the deep seas, we are only just beginning to make strides, thanks to the EV Nautilus's expeditions- for the first time 2 local Caribbean scientists (J.Gobin and D.Amon) participated. She informed that deep sea science is also expensive! Our needs list is long- ship-time, access to a research vessel, AUVs and ROVs fitted with high-definition cameras, high- tech acoustic & sampling devices etc. Our critical needs for capacity building (scientific and technical) include education & institutional strengthening, buy-in from policy and decision-makers, innovative and creative responses in respect of financing and funding. Grant/project funds should support capacity building "in-country" – this is true capacity building! The "train the trainer" model should be applied where more scientists are trained as opposed to funding 1 or 2 PG students. Finally, we need to strengthen existing regional hubs (eg. IOC, ISA, CARICOM, UNESCO) towards improving our deep-sea scientific research capacity. There is no need to reinvent the wheel.

Following the presentations delivered in pre-recorded video, the meeting exchanged their views as follows, focusing on the set of questions provided by the organizers:

What does your country require?

- Adequate financial resources and collaboration opportunities, as undertaking deep sea science is expensive
- Access to deep sea samples and RV in the region
- Biodiversity and taxonomic expertise; determination of species, ew technologies, DNSA
- Marine technology (analyses): marine genomics, laboratories, powerful molecular tools for Marine Genetic Resources discovery, high tech equipment (sampling and analyses)
- Computational/analytical skills, big data storage

What are best practices for increasing collaboration in the region?

- Need to engage with local scientists as co-scientists and not service providers
- Countries should participate in regional collaborative activity and demand they are trained on equipment and analyses they are used in-country
- Need to also think about long term collaboration
- Move away from programs with large outside donors. Request majority funds stay in-country. This is capacity building

How can local communities better work with regional/national governments and communicate best practices?

- Collaborate with international partners (e.g., industry) who are already working in-country. Work through larger organizations to elevate the voice of local communities.
- Mobilize outside scientists to responsibly contact local scientists and engage their participation. Require expeditions to include local scientists/stakeholders.
- Invest in early career professionals leaves them without much work in-country. ECOPs look internationally because of a lack of opportunity. Need more local positions for young scientists. Need to practically attempt to train more people.
- Build awareness among local institutions. Engage academic institutions.

What are 1-2 of the most critical issues in your country regarding capacity building?

- We are very limited with respect to marine genetic resources and analysis. Most of our analysis has to be done overseas.
- Need to train more people in-house to sustain long term country engagement.
- Facilitate trust among sectors/stakeholders and literacy. Without literacy we all speak a different language.

At the end of the first panel the audience was invited to participate in the second poll: (**Annex 3**).

Part 3 Ocean Decade Endorsed Programs Panel:

This panel focused on addressing the following specific questions:

- How can your programs contribute to deep ocean capacity building in the WTA and ETP region?
- How will your program measure the success of capacity building along the Decade?

Moderator Denisse Flores, ICML UNAM, introduced the five speakers who provided important insight on how to engage regionally in the Decade programs. The list of the endorsed programs can be found at the following link: https://www.oceandecade.org/resource/166/Announcement-of-the-results-of-the-first-endorsed-Decade-Actions-following-Call-for-Decade-Actions-No-012020. Network construction, collaborative alliances, and multidisciplinary/ inclusive teams (at regional, gender and educational levels) can strengthen capacity building with research, program design and long-term activities, to create and use deep sea knowledge in benefit to the local communities.

Dr. Sonakshi Mishra, Programme Management Officer, ISA, provided an insight to the role of the International Seabed Authority (ISA) in deep ocean capacity development. ISA's duty to design and implement mechanisms for capacity building in accordance with its mandate under the United Nations Convention on the Law of the Sea in relation to marine scientific research, protection of the marine environment and effective integration of developing States was highlighted. The different capacity-building programs and initiatives of ISA were described, from which more than 500 individuals have been reported to have benefitted. These include, inter alia, the Contractor Training Programme, the Internship Programme, the Endowment Fund for Marine Scientific Research, Information Workshops, the Joint Training Research Centre including several initiatives under the Voluntary Commitments registered at the 2017 UN Ocean Conference such as the Women in Deep-sea Research project and the Secretary-General Award for Excellence in Deep-sea Research. Ms Mishra highlighted that around 30% of the placements under the Contractor training programme and the Internship programme have been awarded to nationals of the Latin America and the Caribbean group, many of which come under the Western Tropical Atlantic (WTA) and the Eastern Tropical Pacific (ETP) region. It was also noted that since its inception in 2018, the recipients of the Secretary-General Excellence Award for Deepsea Research have been all nationals of the Latin America and the Caribbean group. Ms Mishra highlighted the decision of the Assembly of the ISA on the implementation of a programmatic approach to capacity development that was adopted in December 2020 and which was further complemented by the adoption of ISA's Action Plan for Marine Scientific Research in support of the UN Decade of Ocean Science for Sustainable Development. It was noted that a dedicated strategy on capacity development is currently under preparation that will be implemented with partners from civil society, academia, private sectors and other intergovernmental

Dr. Katy Croff Bell, President, Ocean Discovery League, and a National Geographic Explorer, introduced the Ocean Discovery League as a new nonprofit organization dedicated to removing barriers to exploration of the deep sea in collaboration with communities historically excluded from the field She recognized that deep sea capacity is a high priority for the UN Decade of Ocean Science for Sustainable Development, and acknowledged that there is no way to measure change over the coming decade. She

shared with the audience an initiative that is underway, the Global Deep Sea Capacity Assessment, that aims to establish a baseline assessment of the technical and human capacity for deep sea exploration and research in every coastal country with deep ocean. The survey, in 4 languages, should help create a network of collaborators interested in developing systems for increasing access to the deep ocean low-cost deep-sea sensors, easy-to-use video analysis tools, and training programs. This online effort is the result of collaboration with numerous researchers and community leaders with whom she developed questions exemplified in her presentation. Her preliminary results include 200 complete surveys from 96 countries, which accounts for 69% of all countries with deep oceans in the world, 21 developed countries, 36 developing countries including 23 small island developing states, which is a larger number than the one obtained in the Global Ocean Science Report, released early this year. In the region this survey has input from 12 Caribbean countries, 6 from Central America and 7 from South America, still many countries and territories are missing and looking forward to deep ocean capacity development expands in the coming years.

Dr. Frank Müller, USF, Marine Life 2030: Standardized Biodiversity Data for Society described in his presentation the UN Ocean Decade endorsed Programme "Marine Life 2030: A Programme of the UN Decade of Ocean Science for Sustainable Development". This program seeks collaborations across communities, disciplines, and regions to build global knowledge of marine life for local action in the Ocean Decade. Marine Life 2030 will establish the globally coordinated system to deliver actionable, transdisciplinary knowledge of ocean life to those who need it, promoting human well-being, sustainable development, and ocean conservation. Join us to implement the framework to unite existing and new programs into a global, interoperable network, transforming the observation and forecasting of marine life for the future for the benefit of all people. He informed that the ocean we want hosts abundant and diverse life that supports humanity's needs for food, natural products, and good livelihoods. He emphasized that management of marine living resources relies mainly on proxy variables like temperature, salinity, and topography -- generally without measuring biology itself. Also underlined that existing data on ocean species are inadequately coordinated, undigitized, of varying quality, and largely inaccessible. Part of the issue is that marine biodiversity science and observations are poorly linked to users and communities. He stressed that Marine Life 2030 is an open networking program to address these challenges. The science we need to achieve the ocean we want requires transformations in technology, in the culture of science, and in the scale and nature of coordination. We invite everyone to work with this and other Ocean Decade Programs and convene stakeholders around the world to co-design, coordinate and finance sustainable marine life observation and applications. (He provided the link to the Ocean Decade Programme proposal: https://marinebon.org/assets/Marine_Life_2030_UN_Ocean_Decade_request_for_endorsement_20210115.pdf)

Leslie Smith, Project Director for the Deep Ocean Observing Strategy, informed that the Deep Ocean Observing Strategy (DOOS; www.deepoceanobserving.org) is a GOOS Project and a UN Ocean Decade Endorsed Programme implementing a globally integrated network of systems that can observe the deep ocean effectively in support of strong science, policy and planning for sustainable oceans. It is a coalition of international deep-ocean stakeholders from science, management, government, and industry for areas within and beyond national jurisdiction. She recognized that with recent funding from the U.S. National Science Foundation, DOOS seeks to identify approaches to address key scientific questions and societal needs, specify observing requirements with input from modelers and other data users, design and

evaluate appropriate observing systems, and implement demonstration projects. She highlighted that a component of this effort is the Deep Ocean Early-career Researchers (DOERs) program that is actively seeking members, in particular those from developing countries, indigenous communities, and under-represented minorities.

Dr. Nick Higgs, Director Cape Eleuthera Institute, presented the Ocean Decade endorsed programme Challenger 150. He recognized that many countries in the Western Tropical Atlantic lack the human and financial capacity to study and manage their deep ocean environment. The Challenger 150 programme is a global scientific cooperative developed to act as a vehicle for coordination of deep-sea research towards a set of common objectives. Dr. Higgs and Dr. Escobar coordinate efforts for this programme in the Western Tropical Atlantic region. They hope to build a community of local scientists and stakeholders who can help with co-designing the deep-sea science that we need for our countries' sustainable development. His vision of success is that this community of regional stakeholders becomes fully integrated into the global community of deep-sea scientists helping to design and conduct scientific programs that build capacity in this region.

Following the presentations delivered in pre-recorded video, the meeting exchanged their views as follows, focusing on the set of questions provided by the organizers:

1. Can you please emphasize the capacity building elements of your endorsed projects?

The three panelists that were present responded:
The Law of the Sea Convention mandates collaboration to address capacity development, protection of the marine environment and transfer of technology. A range of capacity building initiatives can be adopted by our program which must focus on long-term capacity building. You can find more information on our website, including training opportunities, workshops, and a range of other programs.

During the Decade we want to establish a platform to discuss things we do not typically discuss. Information sharing is critical. We are trying to enhance collaboration with different groups to identify standards for biodiversity of the sea in both shallow and deep waters. We want to compare measurements within different seabed locations. Measurements of biodiversity make it impossible to share information and know how life is changing in the deep sea. One of our interests is to understand how the deep sea is changing due to climate change or human activity.

We focus on essential ocean variables and how to standardize best practices and disseminate to people. We recently received funding from NSF to create a network of networks of stakeholders involved in deep sea research. This offers a platform to discuss deep ocean observing priorities and how to address them. We also have a program for early career professionals with an emphasis on underrepresented communities. We have travel funds available to help support people working on these initiatives.

At the end of the second panel the audience was invited to participate in the third poll: (**Annex 3**).

Part 4. What is needed? Next steps Panel

This panel focused on addressing the following specific questions:

- How will deep ocean capacity development help achieve “the ocean we want”?
- What are the expected next steps including deadlines and outputs to address deep sea capacity development in the region?
- Under what conditions do institutions, policies, and programs foster human benefits from oceans and contribute to achieving the SDGs?

Director of ISA, Jihyun Lee, moderated the panel “What is needed? Next steps”. Four panelists contributed to the context of their projects on the needs and future steps to strengthen capacity development in the Western Tropical Atlantic and the Eastern Tropical Pacific regions. The panel started with 3 min prerecorded presentations by panelists followed by an open forum focusing on key questions.

Mr Hank Hedge, Geologist, Ministry of Transport and Mining, Mines and Geology Division, Jamaica presented on the experience and benefits as a former trainee under ISA’s capacity building program and training opportunities and the importance of capacity-building. He focused on his experience as a trainee under ISA’s Contractor Training Program that provides opportunities, including at-sea training, on an annual basis for young professionals from developing States in various fields, particularly the marine and geosciences. He highlighted the benefits from the training program, where the two most significant to him are the exposure and experience gained since his training, through opportunities to represent ISA as fellow trainee as well as delegate for Jamaica in international fora. He recalled his 7-week training with Japan Oil, Gas and Metals National Corporation (JOGMEC) in Japan and in the Pacific Ocean under ISA’s Contractor Training Programme that helped him to develop his skillset, knowledge, and competence as a Geologist, and exposed him to technologies, techniques and methodologies used at sea to gather the most accurate scientific information, with benefits to his role in Jamaica. Mr Hegde shares his knowledge and experience at national level through various capacity building initiatives, including presentations on deep seabed exploration activities. He explained how his training experience could also contribute to his government in becoming the sponsoring State, by sponsoring the contractor, Blue Minerals in 2019, to be awarded its first contract in 2021 for exploration of polymetallic nodules in the Clarion Clipperton Zone. He highlighted the importance of continuous capacity building to support access to deep sea mineral resources, promoting industrial opportunities, economic growth and sustainable development, and exploration and future exploitation activities. He recognized the importance of gaining economic growth and stability through the implementation of new ocean management policies that will boost the country’s expertise and foster partnerships with private entities supporting in the sustainable development of a sustainable and inclusive ocean economy.

Mr. Mark Haver, Chair of the Sustainable Ocean Alliance Youth Policy Advisory Council reported that as youth, they recognize the tremendous potential that comes with understanding the deep sea and promoting capacity development to ensure it is managed sustainably. Through Sustainable Ocean Alliance's Youth Policy Advisory Council, they are elevating youth demands for ocean action through their Global Blue New Deal, where the ocean policy agenda has been crowdsourced from youth globally. One of the key principles of the Global Blue New Deal is calling for greater stakeholder engagement by including youth and local communities in the management of ocean resources. Especially with respect to

the deep sea, he recognized that “we cannot manage what we do not understand.” First, with ~20% of our seafloor mapped, we must promote public-private-civil society partnerships to support ocean research, innovation, and the Seabed 2030 project. Secondly, we must support formal ocean literacy curricula to enhance informed decision-making of a new generation of ocean leaders by 2030.”

Dr. Luisa Fernanda Dueñas Montalvo, Universidad Nacional de Colombia, reported that deep sea research in Colombia has been gaining strength for the last 20 years, particularly for the Caribbean region. Since deep-water exploration is complex and very expensive, industry technology resources can be harnessed for knowledge generation. The Anadarko Colombia Company, a hydrocarbon corporation, used an ROV to tow cameras for a visual evaluation of the seabed between 500 and 4,000 m in the Colombian Caribbean, and opened the images for a scientific collaboration. Based on the images, two ecosystems were recognized, cold seeps and soft bottoms, and all the megafauna were identified by a wide network of nearly 30 national and international experts. More than 13 peer-reviewed publications, 2 books, 43 new-species reports for Colombian waters, and 893 data reports are part of these results. This case represents an important productive partnership between the industry and the scientific community. The results have been achieved thanks to the wide and open scientific collaboration between different public and private, national, and international actors.

Dr Luciana Genio, Environmental Analyst, ISA highlighted the need for sharing deep-sea knowledge on habitats, ecological patterns, and processes, as well as knowledge relating to environmental impacts, whether this information is obtained from the Area or within national jurisdictions, in order to provide for a comprehensive and holistic understanding of deep-sea ecosystems and their benefits to human society. She also emphasized the need to increase capacity on collection, access and use of deep-sea data. In particular, she highlighted developing methods, approaches and technologies for sampling and data analysis, as well as information systems such as digital data platforms and long-term storage facilities, for enhancing the use of deep-sea data and samples and increasing the understanding of deep-sea environment at local, regional, and global scales. Lastly, She underlined the role of ISA member States for the implementation of International Seabed Authority (ISA) Action Plan in support of UN Decade of Ocean Sciences for Sustainable Development, adopted by the Assembly in December 2020. She highlighted opportunities for fostering synergies and adequate resource mobilization through collaborative efforts among all relevant stakeholders, for example, including through the Sustainable Seabed Knowledge Initiative and other activities currently being developed by ISA.

Following the presentations delivered in pre-recorded video, the meeting exchanged their views as follows:

- Noting many issues, challenges, and emerging initiatives, which were highlighted by the previous panels regarding the deep-sea research in this region, this panel focused on discussing the concrete steps of engaging collaboration and partnerships at regional and global scales, including capitalizing on ISA’s work on MSR, such as data availability from deep-sea exploration as well as various capacity building opportunities.

- **Importance of strategic partnerships**.

ISA has a very long history of deep-sea exploration by contractors that have contributed to data compiled in DeepData as well as MSR opportunities to various research institutions, in different regions around the world. In particular, on-board training programs offered by contractors and other research opportunities will provide useful basis for future collaboration with professionals and practitioners from this region. In addition to public accessibility of all the environmental and biodiversity data through DeepData in the ISA website, efforts are being made to better optimize the use of samples that are collected through the exploration activities by contractors. Training opportunities can be offered at various stages, including collection of samples, analysis of samples in the laboratories, data processing, etc. Likewise, technology innovations for biodiversity observation and environmental monitoring are important aspects for future collaboration and trainings.

- **Regional and national collaborations.**

Using the example of Colombia, the panel member highlighted the need for regional-scale collaboration with relevant international organizations, such as ISA and IOCARIBE as well as national-scale collaboration among relevant research institutions, universities, industries etc. In particular, the valuable experience in a panel member from Colombia of collaborating with Oil and Gas Industry was highlighted, which provided critical opportunities for local scientists to undertake their research. The importance of standardized approaches for sampling and analysis was underlined, as a topic for future collaboration and training.

- **Youth group's strategy for addressing plastic pollution in the deep-sea.**

The panel member highlighted the importance of preventing plastic pollution at the source, through an adaptable waste management system. Priority should be given to Inclusive engagement of the next generation scientists and policy makers to support deep-sea research.

- **National-level training of trainers.**

Building on the experience from ISA training on deep-sea research and the exploration of mineral resources, efforts are being made to contribute to local school and public for their awareness building and increasing knowledge on deep-sea and its resources.

Part 5. Closing Session, Summary and Call to Action

Dr. Escobar acknowledged the Secretariat of IOC UNESCO IOCARIBE recognizing the great work and support. She expressed appreciation for the interpretation support that was instrumental in maintaining the communication with the audience, moderators, and panelists. She acknowledged the International Seabed Authority for co-hosting and co-coordinating this event and contributing with valuable contributions. Joseph Naughton's assistance taking notes of our dialogue was much appreciated. She highlighted that the Deep-Sea Capacity Development workshop was inclusive in diverse geographic participation, genders, generations (with 75% of the panelists being who may represent early career marine professionals), cultures and knowledge involving the deep-sea themes both from sciences and humanities. She encouraged that all future actions related to deep sea capacity development address equity and inclusiveness as part of the Decade principles.
She summarized the main ideas presented by panelists and digested the suggested next steps for deep sea capacity building, ocean literacy and transfer of technology. Section 4 of this report on Outcomes and Findings lists these next steps.

Director of ISA, Jihyun Lee, summarized on the next steps, highlighting that through various presentations, it was noted that undertaking deep-sea research in this region has been constrained due to limited access to/availability of research vessels, samples, data, adequate technologies (for sampling, analysis and data processing), funding and experts. Participants noted, however, various emerging initiatives, including the endorsed programmes by UN Decade, which address, *inter alia*, capacity baselines, standardized biodiversity data, network of network for ocean observation, and regional deep-sea research projects, based on the approach of "co-design" and "co-delivery". In order to effectively facilitate the implementation of these initiatives for deep-sea research in the region, it was suggested that consolidated efforts need to be made to "co-align", "co-operate" and "co-implement" them within the context of ISA's Action Plan in support of UN Decade of Ocean Science for Sustainable Development, which is supported by legal and institutional framework of the UN Convention on the Law of the Sea, ISA Endowment Fund for MSR, Deep Data, and various existing collaborative initiatives on MSR with ISA members, contractors and scientific institutions, such as ISA's Sustainable Seabed Knowledge Initiative.

Mr Arthur E. Paterson thanked the co-chairs for their summary of meeting highlights and next steps.
He announced IOCARIBE's remaining Decade Workshops:

- August 31: Next Steps to Success for a Clean Ocean in 2031
- September ?: A healthy and Resilient Ocean and a Predicted Ocean
- October ?: A Sustainably Harvested and Predicted Ocean.

He invited the audience to join the regional Ocean Decade co-design process; to help build regional capacity, restore and conserve the environment, and create a sustainable ocean economy.
He thanked everyone for joining the workshop.

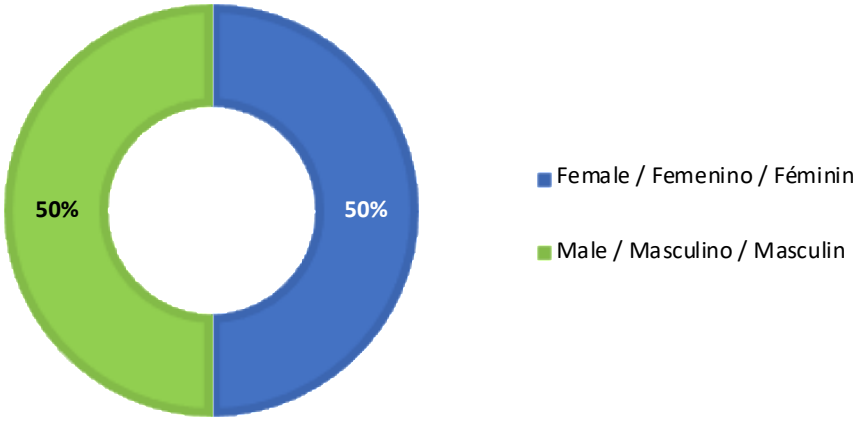
As she adjourned the meeting, Dr. Escobar again thanked Dr. Lee and the ISA Secretariat, acknowledging ISA's 20-year effort to build a new generation of multidisciplinary professionals in deep sea research.

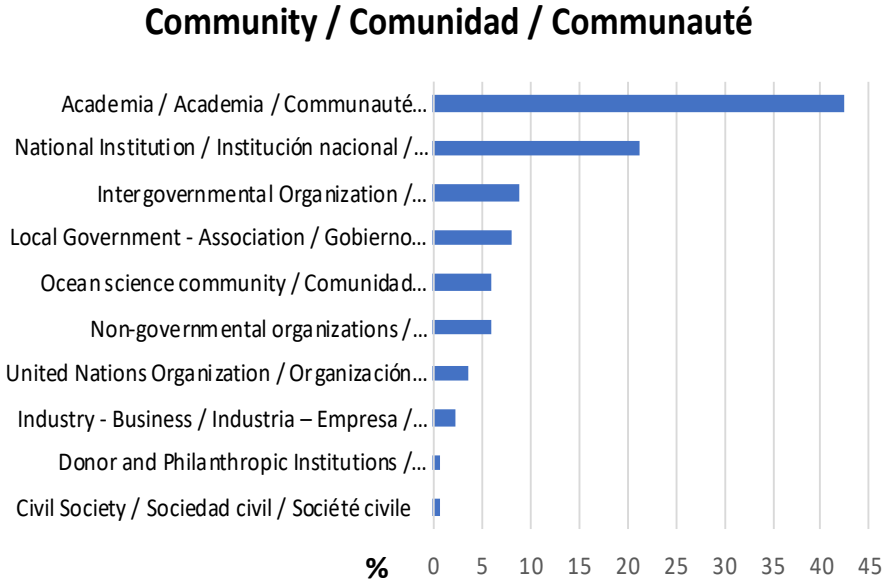
6. ANNEX 1

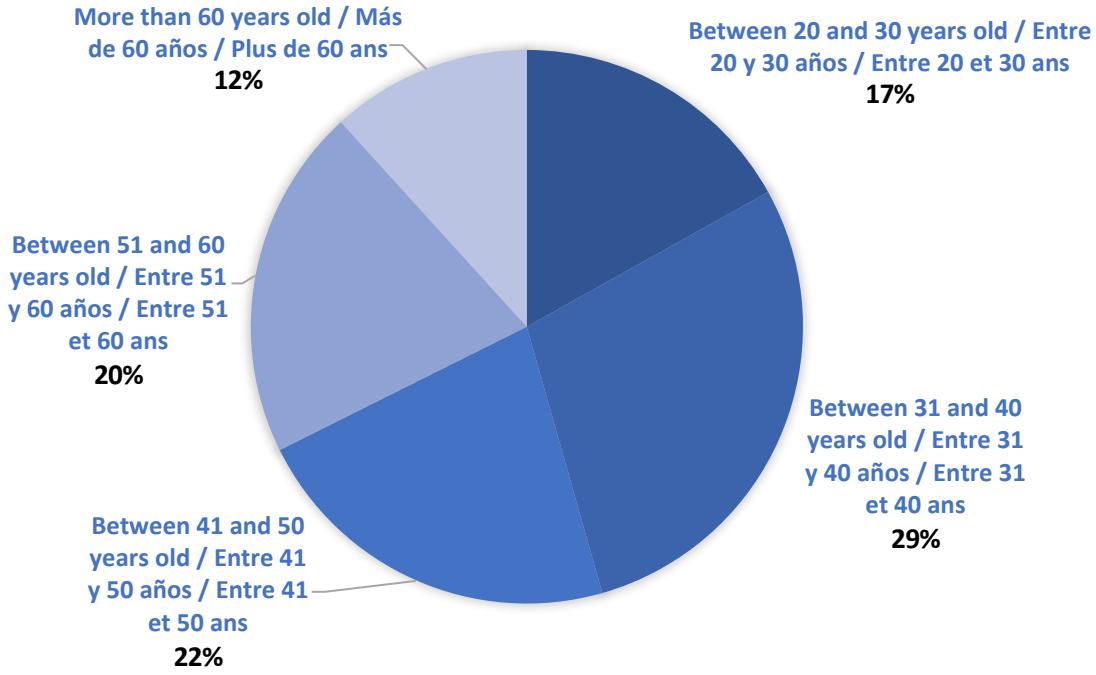
LIST OF PARTICIPANTS

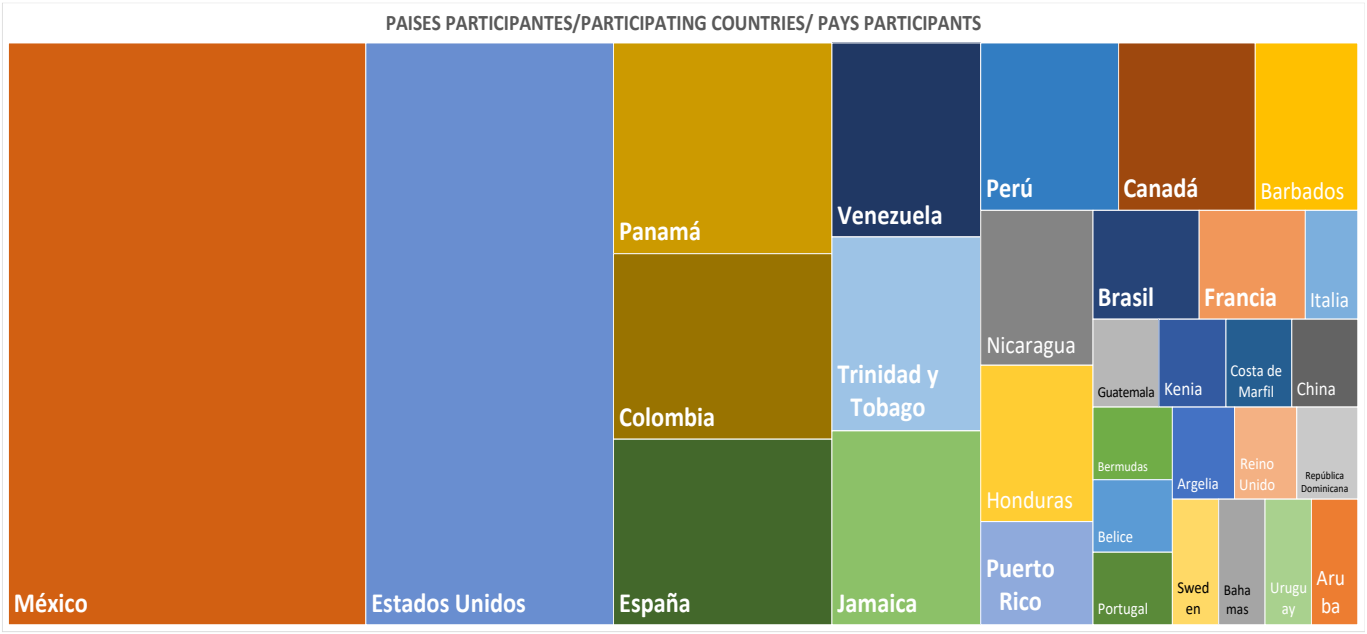
Workshop Participants

The workshop recorded attendance of 137registered participants, mostly from the Academia, with an equal gender, generation distribution and geographically diverse






More than 60 years old / Más de 60 años / Plus de 60 ans
12%
Between 20 and 30 years old / Entre 20 y 30 años / Entre 20 et 30 ans
17%
Between 51 and 60 years old / Entre 51 y 60 años / Entre 51 et 60 ans
20%
Between 31 and 40 years old / Entre 31 y 40 años / Entre 31 et 40 ans
29%
Between 41 and 50 years old / Entre 41 y 50 años / Entre 41 et 50 ans
22%


PAISES PARTICIPANTES/PARTICIPATING COUNTRIES/ PAYS PARTICIPANTS
México
Estados Unidos
Panamá
Colombia
España
Venezuela
Trinidad y Tobago
Jamaica
Perú
Nicaragua
Honduras
Puerto Rico
Canadá
Barbados
Brasil
Francia
Italia
Guatemala
Kenia
Costa de Marfil
China
Bermudas
Argelia
Reino Unido
República Dominicana
Belice
Portugal
Swed en
Baha mas
Urugu ay
Aru ba

7. ANNEX 2

AGENDA

The UN Decade of Ocean Science for Sustainable Development 2021-2030:

Capacity Development: 1. The Deep-Sea Co-Design Workshop

Capacity Development: 1. The Deep-Sea

Thursday, August 19 at 10h00 Colombia Time (11h00 AST, 15h00 UTC)

Co- hosted by IOC of UNESCO Sub commission for the Caribbean and Adjacent Regions- IOCARIBE and the International Seabed Authority

Web: http://iocaribe.ioc-unesco.org/webinarseries/cd

Register at: http://iocaribe.ioc-unesco.org/webinarseries/cd/regcd

Simultaneous interpretation will be provided: English, French, and Spanish.

Programme

Cartagena Time	ITEM
10:00 – 10:20	**Part 1** **Welcome / Overview**
10:00 – 10:03	**Briefing** **Arthur E. Paterson**, Program Manager, Office of International Activities, Office of Oceanic and Atmospheric Research, NOAA
10:03 – 10:06	**Welcome** **Ariel Troisi** Co-Chair WTA Capacity Development WG
10:06 – 10:14 10:06 – 10:09 10:09 –10:15	**Objectives of the Meeting** **Elva Escobar** Co-Chair WTA Capacity Development WG **Jihyun Lee**, Director of Office of Environmental Management and Mineral Resources, ISA

10:15 – 10:19	**Overview of Ocean Decade**
10:15 –10:17 10:17 – 10:19	Video UN Decade of Ocean Science for Sustainable Development ISA Video on MSR in the Area
10:19 – 10:20	**Poll #1 on Familiarity with the Ocean Decade**
10:20 – 10.55	**Part 2** **Panel: Ongoing CD Programs in the WTA and the ETP regions** **Questions to develop:** **How important is developing capacity in your country? Why?** **What does your country require to strengthened deep sea capacity building with regional or sub-regional IOC communities and local networks?** **What is the most critical capacity development needs to build deep ocean science capacity in your country?**
10:20 – 10:29	**Moderator: Sharon Herzka**, CICESE México [3 min prerecorded presentations by panelists with a summary of regional projects] **Ana Carolina Ronda**, CONICET-Instituto Argentino de Oceanografía (IADO/UNS), Argentina **Jorge Cortés,** Universidad de Costa Rica,UCR, Costa Rica **Judith Gobin,** University of West Indies, UWI, Trinidad & Tobago
10:29 – 10:55	**Question and answer session** **Poll #2 on perception of most important capacity development needs**

10:55 -11:25	**Part 3** **Panel: Ocean Decade Endorsed Programs** **Questions to develop:** **How can your programs contribute with deep ocean capacity building in the WTA and ETP region?** **How will your program measure the success of capacity building along the Decade?**
10:55- 11:04	**Moderator**: **Denisse Flores,** ICML UNAM [3 min prerecorded presentations by panelists with a summary of the endorsed program] **Sonakshi Mishra**, Programme Management Officer, ISA **Katy Croff Bell**, President, Ocean Discovery League, National Geographic Explorer **Frank Müller,** USF, Marine Life 2030: Standardized Biodiversity Data for Society **Leslie Smith,** Project Director for the Deep Ocean Observing Strategy, GOOS **Nick Higgs,** Director Cape Eleuthera Institute, Challenger 150
11:04-11:25	**Question and answer session** **Poll #3 on level of capacity in deep sea**

11:25 – 11:55	**Part 4** **Panel: What is needed? Next steps** **Questions to develop:** **How will deep ocean capacity development help achieve "the ocean we want"?** **What are the expected next steps in deep sea capacity development in the region, deadlines and outputs?** **Under what conditions do given institutions, policies, and programs foster human benefits from oceans and contribute to achieving the SDGs?**

11:25 – 11:34	**Moderator: Jihyun Lee**, Director, ISA [3 min prerecorded presentations by panelists with a summary of their projects and panel questions] **Hank Hedge**, Geologist, Ministry of Transport and Mining, Mines and geology Division, Jamaica **Mark Haver,** Chair of the Sustainable Ocean Alliance Youth Policy Advisory Council **Luisa Fernanda Dueñas Montalvo**, Universidad Nacional de Colombia, Colombia **Luciana De Melo Santos Genio,** Environmental Analyst, ISA
11:34 – 11:55	**Question and answer session**

11:55 – 12:00	**Part 5** **Closing Session** **Summary and Call to Action**
11:55 – 11:58	**Summary - Next steps** **Elva Escobar** Co-Chair WTA Capacity Development WG **Jihyun Lee,** Director, ISA
11:58 – 12:00	**Closing words and adjourn. WTA WG Webinar Series Update.** **Arthur E. Paterson**, Program Manager, Office of International Activities, Office of Oceanic and Atmospheric Research, NOAA

8. ANNEX 3

POLL QUESTIONS

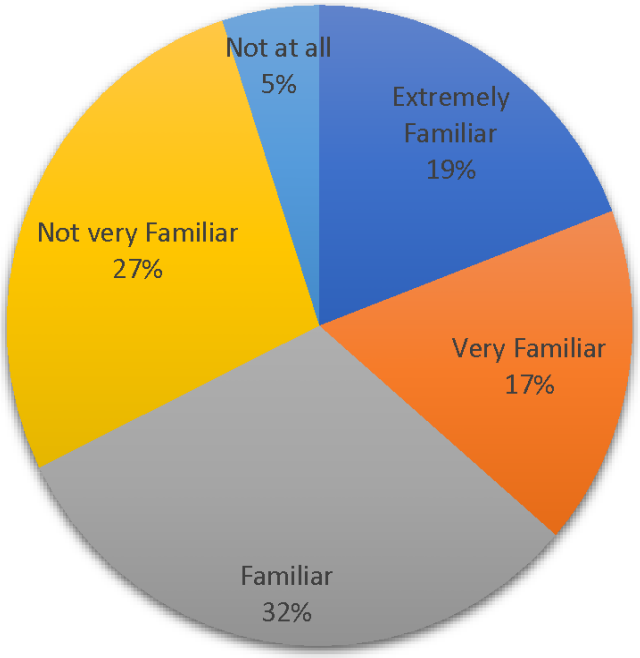
POLL 1

How Familiar are you with the UN Decade of Ocean Science for Sustainable Development?

a) Extremely Familiar
b) Very Familiar
c) Familiar
d) Not Very Familiar

e) Not at All

Response to Poll 1



POLL 2

In the context of the UN Decade of Ocean Science for Sustainable Development for which of the following Ocean Decade Challenges are in the greatest need for capacity building in your country?

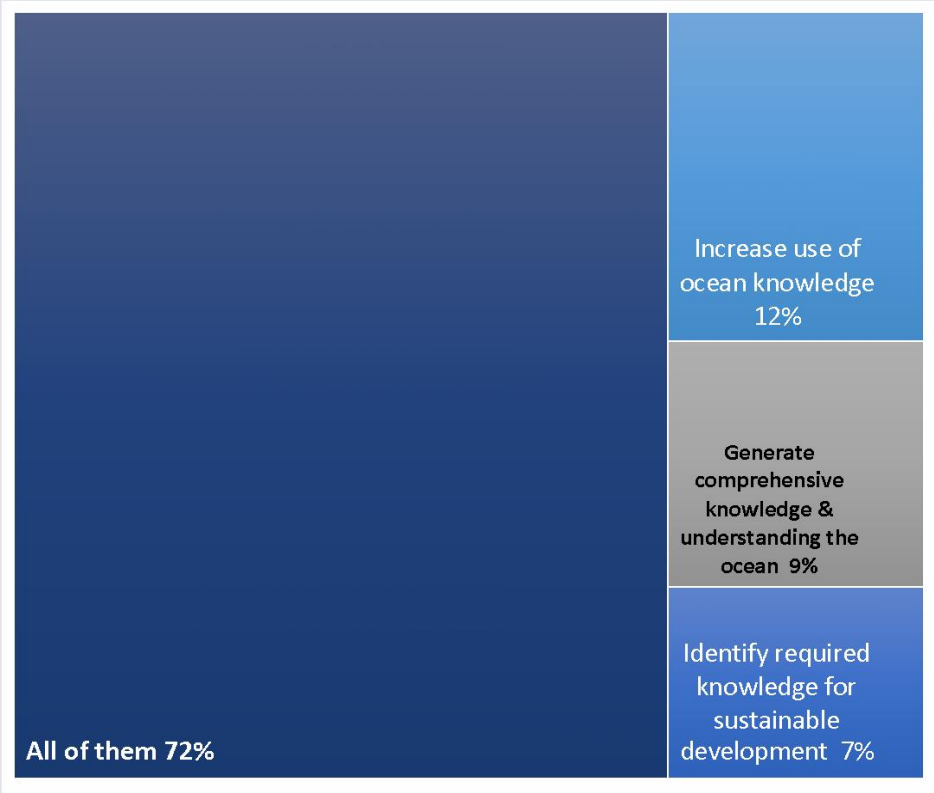
a) Identify required knowledge for sustainable development

b) Generate comprehensive knowledge and understanding of the ocean

c) Increase the use of ocean knowledge

d) All of them

Response to Poll 2



POLL 3

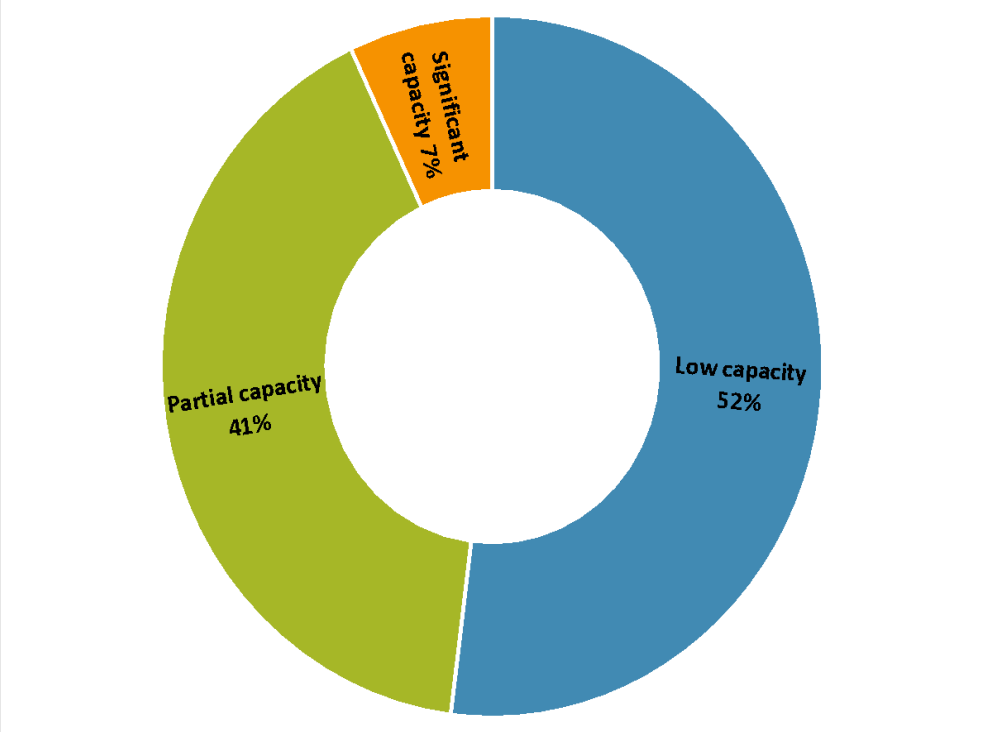
How would you rate the level of capacity available right now in your country in deep sea topics?

a) Low capacity

b) Partial capacity

c) Significant capacity

Response to Poll 3



9. ANNEX 4

UN Endorsed Programmes – and other programmes of interest to Capacity Development – for cooperation and interaction

The list of programs and initiatives that are relevant to MHEWS (the full list of UN Endorsed Programmes and Contributions can be accessed at https://oceandecade.com/resource/166/Results-of-the-first-Call-for-Decade-Actio ns-No-012020).

10. ANNEX 5

WTA WG Webinar Series Update

	WORKING GROUP	LEADER (S)	DATE/TIME	TITLE OF WEBINAR
	A safe ocean	Christa von Hillebrandt	**8th July**, 2021 14:00 – 16:00 COT	Tropical Americas Safe Ocean Co-Design Workshop "Breaking down the Silos for More Effective Early Hazard Warning Services"
	A transparent and accessible ocean	Albert Martis Edgard Cabrera	**29th July**, 2021 9:00 - 11:30 COT	A transparent Ocean with open information and technologies access
	Capacity Development	Elva Escobar Ariel Troisi	**19th August** 2021 10:00-12:00 COT	Deep sea Capacity Development needs in the WTA and the ETP for the Ocean we want
	A Clean Ocean	Lorna Inniss	**31th August** 2021 9:00-11:00 COT	The Year 2031, A Clean Ocean - Steps to Success
	A healthy and resilient ocean	Francisco Arias	**9th September**, 2021 9:00-11:00 COT	Co-designing the path to sail the Decade of Ocean Science to reach the knowledge we need for the ocean we want in the Western Tropical Atlantic and the Eastern Tropical Pacific
	A predicted ocean	Marck Oduber	**23rd September** 2021 9:00-11:00 COT	Changing the vibe to predict smooth sailing in the Western Tropical Atlantic: A Theory of Change approach
	A sustainably harvested and productive ocean	Alejandro Acosta	**7th October** 2021 9:00 - 11:00 COT	Co-existing Opportunities and Synergies: Exploring Opportunities for a sustainably harvested and productive ocean in the Western Tropical Atlantic (WTA)
	Kick-off Conference	IOCARIBE RPG WTA	**9th December**, 2021	WTA Ocean Decade Regional Kick-off Conference