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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 SAFE OCEAN CO-DESIGN WORKSHOP

"BREAKING DOWN THE SILOS FOR MORE EFFECTIVE MULTI HAZARD EARLY WARNING"

WTA - TECHNICAL WORKSHOPS SERIES
Report 2021 – 01

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WTA TECHNICAL WORKSHOPS SERIES

REPORT 2021 - 01

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 – 01 as a contribution to the UN Decade of Ocean Science for Sustainable Development, Online meeting, 8 July, 2021

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

Tropical Americas Safe Ocean Co-Design Workshop
"Breaking down the Silos for More Effective Multi Hazard Early Warning"

WTA - TECHNICAL WORKSHOPS SERIES

Report 2021 – 01

Hosted by IOC of UNESCO Sub commission for the Caribbean and Adjacent Regions-IOCARIBE as regional coordinating body for The Ocean Decade.

Virtual Meeting, July 8, 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.

Workshop repository with presentations and documents:

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

Appendix 4 includes a list of programs and initiatives that are relevant to MHEWS. The full list of UN Endorsed Programmes (28) and Contributions (33) can be accessed at **https://oceandecade.com/resource/166/Results-of-the-first-Call-for-Decade-Actio ns-No-012020.**

2. INTRODUCTION AND CONTEXT

(CHRISTA VON HILLEBRANDT-ANDRADE, CHAIR OF THE SAFE OCEAN WORKING GROUP)

In the April 2020 Western Tropical Atlantic (WTA) UN Ocean Decade planning event, 98.5% of the participants agreed that a multi hazard approach was required to save life and protect livelihoods now, during and after disasters.

In November 2020 and January 2021 the WTA and Eastern Tropical Pacific Co-Design workshops, the participants highlighted the challenges for engaging multi-stakeholders. These concepts and priorities are also core to the Ocean Decade Implementation Plan.

Therefore, the organizers chose the title “Breaking Down Silos for More Effective Multi Hazard Early Warning” for the Safe Ocean workshop. Through trans-sectoral dialogues, the objective was to facilitate transformative actions across silos enhancing a Multi Hazard approach.

A picture of the Silo Art trail in Australia (Figure 1), which captures a group of painted silos, was chosen by the Chair of the WTA Safe Ocean Working Group (SOWG) to capture the multi hazard approach. By reimagining the landscape - a path towards a safe ocean and coastal communities will emerge. If action is not taken now, paraphrasing Sharleene Dabreo the Permanent Secretary of the British Virgin Islands, “The oceans will continue to cry and our people continue to die”.

Figure 1. Silo Art Trail in Sea Lake of the Wimmera-Mallee, Australia (painted by Joel Fergie & Travis Vinson) as photographed by Julie Powell (https://juliepowell2014.wordpress.com/2019/11/20/wimmera-mallee-silo-art-sea-lake/)

3. PARTICIPANTS

The workshop recorded attendance of 226 registered participants, coming from local, national, regional, and global disaster risk reduction 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. Annex 1.

4. OUTCOMES AND FINDINGS

“Breaking down the Silos for More Effective Multi Hazard Early Warning (MHEW)”

The aim of the workshop was to facilitate and contribute to identify opportunities, challenges, barriers and favourable conditions to support co-design, co-production and co-delivery of Integrated Multi Hazard Warning System and Services in the Tropical Americas to achieve the objectives of the Decade.

As a result this short regional discussion paper, with the recommendations and guidance for the enhancement and development of MHEWS, has been produced for adoption and endorsement through the Ocean Decade Governance bodies and mechanisms. The short regional discussion paper has been prepared in close collaboration with the co-conveners of the session and with the support of a regional consultant (hired by IOC), Edgard Cabrera. This short regional paper will be posted on the Decade website and will be used in the preparation of regional actions.

This report highlights priority issues and recommendations identified in the meeting for the development of regional actions as well multi-stakeholder participation.

The workshop was structured to:

- Explore Integrated MHEWS enhancement and development using the Co-Design Concept
- Identify the main benefits, challenges and opportunities for MHEWS;
- Discuss capacity development and resource needs, both in terms of academic outputs and in terms of formal and informal training activities for non-academic partners, including best practices and co-design incorporating traditional and local knowledge.
- Complement the work being done by informal stakeholders’ platforms, including those involved in developing decade actions,
- Inform ongoing reflections among stakeholders involved in existing regional partnerships;
- Catalyse discussions on coordination structures such as the Stakeholder Platforms, Communities of Practice, National Coordination Committees and the Global Stakeholder Forum.

5. PROGRAMME HIGHLIGHTS AND WAY FORWARD

The agenda for the meeting is included in Annex 2.

Three question polls were submitted to the consideration of the participants (The results of the answers are in Annex 3). According to the polls, more 71% of the participants were very familiar or familiar with the Ocean Decade. The participants overwhelmingly (68.6%) suggested that Multi Hazard Early Warning Actions had to consider all four components: Risk Knowledge, Monitoring and Warning, Warning Dissemination and Communication and Response Capability. In order to secure the feasibility of multi-hazard early warning the four most important aspects that should be treated in a potential regional programme for the Western Tropical Atlantic Region (in order of preference) were:

1) Improving data collection and sharing

2) Developing capacity building activities

3) Supporting disaster risk governance at the national level (or regional) – need to verify survey results

4) Exploring financing mechanisms (very closely followed by Enhancing inter institutional cooperation)

❏ **Part 1.** Welcome/Overview to brief the participants on the technical administrative matters for the workshop, objectives, and UN Ocean Decade Overview

❏ **Part 2** -Key Note on Integrated Multi Hazard Early Warning Systems and Services (Dr. Raul Salazar, Chief of the UN Office of Disaster Risk Reduction (UNDRR) Office for the Americas and Caribbean)

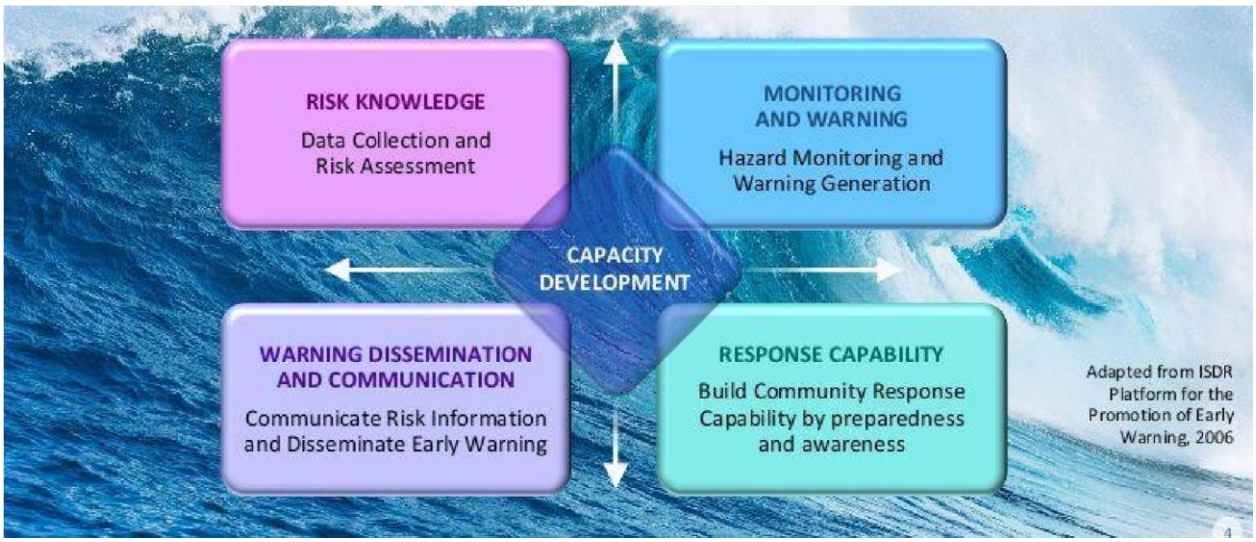


Figure 2. The main elements of a Multihazard Early Warning System.

The UN Decade of Ocean Science for Sustainable Development:

- The Decade is an opportunity to improve the understanding of the impacts of ocean related risk and in the complex interaction of different natural, political, human and economic systems. It could provide evidence- based knowledge to build prevention mechanisms for risk-informed sustainable development, including through MHEWS which includes the four key elements of: risk knowledge, monitoring and warning service, dissemination and communication, and response capability.

- The Sendai for Disaster Risk Reduction is aligned with Sustainable Development Goals and COP 21.

Recommendations for Breaking down the Silos for Effective MHEWS include:

- Systemic approach to MHEWS
- Better share and link data
- Improve disaster risk governance
- Coordinate actions
- Engage on political discussions and forums aiming to improve risk-informed sustainable development at the regional, national and local levels.

❑ **Part 3 –** Trans Sector Dialogue on Integrated MHEWS.

The dialogue allowed the identification of needs and potential contributions of the diverse governance sectors, and discussion to four break-out groups.

The question to be considered in the breakout groups was:

What transformative solutions does your stakeholder group require to help overcome the barriers and enhance Multi Hazard Early Warning and how could they be implemented throughout the Ocean Decade (2021-2030? Consider risk knowledge, monitoring and warning, warning dissemination and communication, response capability, resources and/or partnerships.

❏ **Break out groups** –

❏ TRADITIONAL/INDIGENOUS KNOWLEDGE -

There was an acknowledgement that traditional and indigenous communities are often not engaged in scientific based activities and this should be addressed. Traditional groups are located in very diverse geographical regions, from highlands to the coast. Given that the focus is on a Safe Ocean there should be an effort to identify those traditional and indigenous knowledge communities that interact and are affected by the ocean conditions. It was also suggested that solutions need to be found that are appropriate and translated and communicated in a style that is more culturally appropriate.

❏ LOCAL AUTHORITIES AND CIVIL SOCIETIES ORGANIZATIONS

The discussion of local authorities and civil societies was framed on the experience of responding to Hurricanes Eta and Iota in the San Andres Islands in 2020 with a focus on the role of the Colombian Navy. Tsunami activities were also discussed.

There was a consensus that the role played by Local Authorities and local civil organizations are fundamental for reducing vulnerability in the face of potentially disastrous natural events. It is necessary to introduce in research activities, new or significantly improved processes that allow local Authorities to deliver to the community "Technological services" that manage to consolidate the presence of the State as an agent of integral regional development, in terms of transformation and growth in the management of risk. Technological innovation can provide local authorities with expeditious means for risk management within their areas of jurisdiction.

Civil society organizations, focused on integrating knowledge through academia, can achieve innovation which facilitates a paradigm shift in the local authorities from reacting to goals that allow its prevention.

Training opportunities that go beyond response, but also including mitigation alternatives, were esteemed necessary to focus also on disaster prevention.

Once the local problem has been identified to achieve a safe ocean, it is necessary to build a program that allows the generation of knowledge at the local level on topics such as computer code programming, or spatial and numerical modelling, so that, through the training of young students, local authorities may have enough tools to plan prevention. Local authorities need to strengthen the capacity to generate forecasts and local early warnings that can contribute at the national level to an adequate comprehensive risk management.

Local authorities need to have technicians who can adequately understand the warnings issued by national and regional bodies, not only on the scientific aspect, but also in the language in which they are written. In many cases, regional communications are only available in the mother tongue of the organisms that generate them. Civil society organizations as well as other national institutions can contribute a lot in the generation of mechanisms that allow the technicians in charge of receiving and disseminating alerts have the information in their language or the ability to understand it.

Local authorities and civil organizations, in coordination with national authorities, have a preponderant role in the objective of bringing scientific knowledge closer to the understanding of local communities, for which it is necessary to create specific programs that allow the appropriation of knowledge through educational institutions at all levels. Local authorities that have professionals trained in disaster risk management can generate the necessary governance to strengthen the perception of security in the population in the face of national government decisions aimed at reducing the vulnerability of communities at risk.

Civil society organizations, supported by local and national authorities, can exert a strong influence in reducing the vulnerability of communities, through the implementation of an institutionalized program of response to potentially catastrophic events, including simulacrums and simulations, both during the day such as in the nights, and the training for youth and adults.

❏ NATIONAL ORGANIZATIONS/AGENCIES AND INSTITUTIONS – SIDS and Central America

The main take away from participants was the lack of effective communication between National Organizations and vulnerable communities.

The response from National Organizations/ Agencies should not be stratified by socio-economic status as those who are most vulnerable will always be at a disadvantage.

Strengthening disaster management plans to include health issues will improve National response capabilities and reduce economic losses.

National response to hazards and natural disasters should not be tied to economic ability, therefore capacity development is necessary for National Organizations to adapt various methods of communication and form partnerships with local and non-governmental organizations (NGOs), in order to reach affected communities in the event of a disaster.

Information on the hazards affecting the Caribbean and Latin America region are well known, however they are not linked to the risks and vulnerabilities of each State. With the advent of climate change and the occurrence of increasing natural disasters, the region needs a hurricane/cyclone early warning system which is inclusive of other geophysical hazards, like seismic and volcanic crisis.

It was also noted that communication, when it occurs should be effective and clearly understood by target groups and the example of evacuation orders for St Vincent due to the La

Soufriere volcano was cited as most people misunderstood the gravity of the situation and left their homes with nothing. We therefore need to build different channels of communication between Leaders and the public to ensure the correct information is disseminated to vulnerable communities especially those most affected.

❏ REGIONAL ORGANIZATIONS/AGENCIES AND INSTITUTIONS

- Recognized barriers to all elements of the EWS, the cascading effects of residual or secondary hazards and need to break down the silos e.g. July 2021 in SVG dual warnings issued for Tropical Storm Elsa and post eruption lahars at La Soufriere volcano.
- Damage/destruction of equipment by hazard impact which decreases or eliminates the capacity for monitoring and warning during particular or subsequent events
- Inadequate resources to support elements of EWS
- Regional Level well poised to buttress local level because of the good understanding of the science and capacity to produce information and assessments. Significant investment in scientists for tsunamis and other hazards can be leveraged from global to regional level to national level, but regional level is key and particularly critical for Caribbean given the nature of hazards faced (weather related: hurricanes, floods, and others as tsunamis) and the potential for progressive or simultaneous impacts at the regional level and cost efficiencies for accessing specialized technical expertise through personnel, given the limited fiscal space in Caribbean SIDs and LLCs.

What are the innovative things that can be addressed at the regional level vs. local level, national level or by indigenous/traditional people?

A. Risk Knowledge:

1. Critical to warn community and enhance their capacity through campaigns which build awareness, as well as through exercises and simulations
2. Knowledge transfer to be pursued in communities of practice and communities themselves regarding methodologies and approaches for specific hazards and transfer to other hazards

B. Monitoring and Warning:

- Sourcing and maintaining operational monitoring systems has been traditionally focused at country-level but this is particularly challenging e.g. for tsunamis, challenges were exacerbated by COVID-19. Can regional level facilities be developed/pursued for training and repair?

C. Resources and/or Partnerships:

- Sustainability of funding to support monitoring and warning - much of work is project driven by technical regional agencies but innovative approach for integration of financing into the global pool for the greater good can lead to sustainability with respect to funding

- Processes to focus on bringing communities together
- Approaches such as the CDEMA-led Regional Multi-Hazard Early Warning System (RMHEWS) Consortium to advance solutions to address the complexity associated with MHEWS, and have a forum for key actors to address this. Within the RMHEWS various sectors are integrated and opportunities for finance harmonization pursued. Some achievements to date - Road map and a 6 stage process to strengthen national capacities
- Development of CDEMA-led coordination cells/groups for COVID-19 and SVG Volcanic eruption helped to manage the particular hazards and also cascading impacts, supporting the overall Regional Response Mechanism
- Interchange of scientists from different countries for multi-hazard systems and also interface with indigenous people has brought critical benefits and partnership within the Southeast Pacific Regions

❑ **Part 4** How Science is Addressing Safe Ocean, links between science and decision makers/disaster risk reduction community –

❑ **Keynote**

MHEW Challenges and Opportunities from the La Soufriere Volcano, Saint Vincent, and Grenadines Volcanic Eruption (Dr. Richard Robertson, Volcanologist, Seismic Research Center).

Dr. Robertson highlighted that the response to the eruption was facilitated by a large team of local, regional and international scientists in coordination with national emergency management authorities and government officials. Given the rapid evolution of the crisis and impact, it also required the acquisition and assimilation of large amounts of real time data. These data had to be interpreted along with previous studies and historical activity. Capacity at the local thru regional level is essential to quickly ramp up response and for the building and maintenance of MHEWS. Data, real time data, is key to understanding and reducing the uncertainties and facilitating decision making. Land use planning needs to consider exposure to multiple hazards, not only is there a need to build back better but also less exposed. Communities at the local level need to be engaged and involved, public education and outreach were key in the response. An integrated approach to warning that is sufficiently resourced will be key to reducing the risk and impact from hazards.

❑ **Lightning Talks** – The presentations focused on the opportunities and gaps for integration of different ocean hazards into a MHEWS framework, considering for each hazard the following question:

What transformative ocean science solutions and actions have been proposed to reduce the risk from the hazard and advance Integrated Multi Hazard Early Warning for a Safe Ocean by 2030?

The selected hazards were chosen based on a pre-event survey conducted among stakeholders to identify the hazards that would be the focus of the virtual workshop and initial Multi Hazard work. An infographic (Figure 3) was generated for easier visualization of the broad array of hazards and priorities.

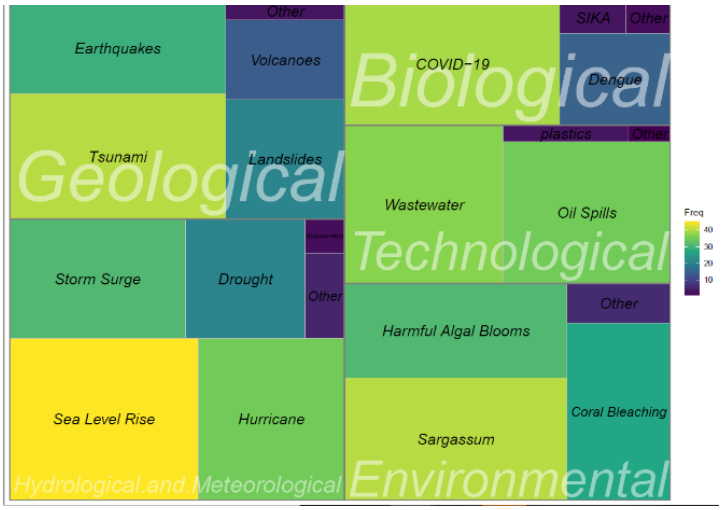


Figure 3. Infographic based on the survey that was completed by 70 safe ocean stakeholders from the Western Tropical Atlantic and Eastern Tropical Pacific.

According to the survey, the hazards that should be given greatest priority in the development of actions for the UN Decade are:

- ❏ **Sea Level Rise (Climate Change)**
- ❏ **Sargassum Influx**
- ❏ **Tsunami**
- ❏ **COVID 19**
- ❏ **Waste Water**
- ❏ **Hurricanes**
- ❏ **Oil Spills**

<u>Sea Level Rise (PatriciaChardón-Maldonado, CARICOOS, Puerto Rico)</u>

Sea level rise, one of the most damaging aspects of a warming climate, threats more than 600 million people living in low-lying coastal zones. A major challenge for managing impacts and implementing effective mitigation and adaptation strategies for coastal areas affected by future sea level rise is our limited capacity to predict sea level change at the coast. As the depth of coastal waters increases, due to erosion and rising sea levels, many of the coastal processes will be modified, for example: ocean waves will break closer to the coast increasing the overtopping of natural and artificial coastal protection, in other words accelerating the dynamic and morphological responses of the coast; tides, surges and river

discharges will be altered implying changes to extreme sea levels and amplifying flooding frequencies. The interaction of these and many other processes will increase the vulnerability of coastal and marine habitats, human settlements and coastal communities.

The nature of coastal sea level variations is complex and multifaceted. Successful efforts to monitor and predict sea level must acknowledge this complexity and deal with the challenges. To improve and add confidence to projections of future sea level in order to reduce the risk from this hazard and to advance the Integrated Multi-Hazard Early Warning for a Safe Ocean by 2030 we could:

1. First and foremost, provide the necessary sea level services for all regions of need by boosting international collaboration and cooperation between research centers, national agencies, local authorities, scientific community, and society. We need to boost a trans-disciplinary approach. We need to ensure that sea level products are accessible to everyone and are used correctly to facilitate adaptation and mitigation measures.

2. Develop new and affordable technologies for sea level observations on both coastal and global scales (e.g., low-cost tide gauges, coastal altimetry).

3. Improve sea level projections and predictions, involving model enhancement and exploration of new assimilation schemes and downscaling techniques.

Sargassum Influx (Emily Smail, Blue Planet, USA)

The Sargassum Information Hub (https://sargassumhub.org/) is a growing Trans-Atlantic partnership aimed at supporting the monitoring and management of impacts of sargassum on coastal communities in the tropical Atlantic. The Hub was started through a partnership between IOCARIBE, GEO Blue Planet, the AIR Centre and AtlantOS and is expanding to include IOC-AFRICA, CERMES, UNEP and other partners. We are working to improve monitoring tools and to understand stakeholder needs.

Tsunamis (Michael Angove, USA)

The UNESCO IOC Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems has identified two main challenges: (1) deadliest tsunamis strike FAST and tsunami alerts are issued within 5 minutes, but since they are usually based on preliminary seismic analysis alone large uncertainties exist and thus risk of Over Warning … Under Warning … NO Warning and (2) Most coastal communities are not ready to respond, thus people die.

The TOWS Decade tsunami program proposes to (1) Increase direct tsunami observations by integrating more sensors from the deep ocean, land and sky to positively detect and then FORECAST the wave FASTER and (2) all coastal communities get Tsunami Ready so PEOPLE will KNOW what to DO when SECONDS count

COVID-19 (Tshewang Dorji. Panamerican Health Organization, Colombia.

The GEO-HUB COVID-19 Information System for the region of the Americas and dashboard has been developed by PAHO and very effective for the sharing of the status of COVID-19. Using GIS technology it has been possible to integrate other hazards that pose a risk at the regional level, for example hurricane track. Another promising initiative is the Epidemic Intelligence from Open Sources (EIOS). It involves collaboration between various public health stakeholders around the globe and brings together new and

existing initiatives, networks and systems to create a unified all-hazards, One Health approach to early detection, verification, assessment and communication of public health threats using publicly available information.

Wastewater (Jose Galizia Tundisi. Universidade do Norte do Brazil)

Was not able to participate in the event.

Hurricanes (José María Rubiera Torres, Cuba)

Disaster Risk Management is a Multidisciplinary and Comprehensive concept. Every place that may present a danger of coastal flooding of any kind, especially Storm Surge in Hurricanes, must have Hazard, Vulnerability and Risk studies carried out. These support decision-making by local authorities, as well as the forecasters to get an idea of impact given the event. Mitigation also plays an important role, and each mitigation requires that studies be carried out and updated. All this has to be complemented by a Forecast System that takes into account the most up-to-date knowledge and models, with the appropriate timelines for prevention, effective forecasts and a Civil Protection System that responds accordingly at National, Regional and Local levels.

But, in addition, it is essential to convince people that there is a danger, that the risk is true, and that measures have to be taken. Therefore, Public Information, and the introduction of the Impact Based Forecast (IBF), carried out by Specialists who are gifted in communication techniques, and who with simple words and without technicalities carry the message to everyone, emanating confidence with their message. , is something truly essential, because it represents the “Trigger for Action.

Oil Spills (Claudia Magalhaes, Ministry of Science, Technology and Innovation, Brazil)

Brazil shared the experience in 2019 with a very large oil spill which affected 2500 km of coastline and 11 states. They had no response plans to respond to this type of disaster. The Military focused on containing the spill at sea. Through existing and new projects, the Ministry focused on Science for solutions. NGO’s were engaged and especially helpful working with communities and identifying effective low cost solutions, like using coconuts for clean-up. Partnerships at the national and international level were very important, NOAA for example shared their solutions and lessons from the Deep Water Horizon spill. Dr. Magalhaes stressed the importance of seeking scientific solutions, including an air, land and sea coastal and ocean observing system that includes physical, chemical and environmental variables and serves multiple applications.

❑ **Part 5 .**Showcase of a Decade Action -

Coast - Predict – (Giovanni Coppini - Euro-Mediterranean Centre on Climate Change CMCC, Italy)

Operational oceanography is providing to many users solutions (services and products) dealing with several SDGs and societal and scientific challenges. Oceanographic products from global and regional and downscaled sub-regional, national forecasting services are transformed and provided to users, private companies, public users and stakeholders and citizens through adding-value chains (down-

streaming) that consider development of specific solutions, advanced visualization, usage of multi-channel technological platforms, specific models, and algorithms.

Example of operational oil spill simulation was presented for the accident in 2020 in Mauritius.

Furthermore, CoastPredict initiative for the UN Ocean Decade contributes to the UN Ocean Decade objective by improving our understanding of the coastal area processes using a multi-disciplinary and integrated approach and focusing on the many common worldwide features of the coastal ocean that we need to understand for knowledge based and sustainable management. The major science challenge is to advance the understanding of the role played by the coastal ocean in the global ocean dynamics, from short time scale events to climate.

Coast Predict outcomes and outputs will be:

1. Integrated and comprehensive knowledge of the global coastal ocean from short time scale events to climate, including impacts of societal drivers;

2. Integration of coastal and open ocean observing and modelling systems;

3. Improved, multidisciplinary and extended range predictive capabilities for the coastal zone;

4. Innovative and sustainable applications for coastal solutions/services.

NOTE.- UN Endorsed Programmes – and other programmes of interest to the Safe Ocean Working Group – For cooperation and interaction (Annex 3)

❏ **Part 6.** Summary and Call to Action

❏ **Summary**, the workshop laid the foundation for the preparation of the next actions for a safe ocean within the framework of the UN Decade with a focus on integration of assets and capabilities across the hazards and the transdisciplinary nature of effective early warning systems and services. The identification and integration of Social Capital will be especially important for the Small Islands States and Countries in the region. Challenges that will need to be overcome are the limited availability of accessible and high quality data and the opportunities to integrate cutting edge technologies, including satellite and submarine cables as well as local and traditional knowledge. The COVID - 19 pandemia has important best practices that can be applied to other hazards and risks. Most importantly is that the science is co-designed and generated and remains accessible and understandable from the local through regional levels.

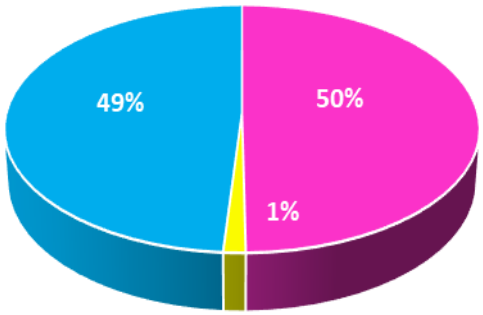
❏ **SOWG-** The main task for the SOWG will be to prepare a proposal for a regional decade action focusing on the enhancement and development of MHEWS for adoption and endorsement through the Ocean Decade Governance bodies and mechanisms. The proposal will be prepared in close collaboration with the SOWG and the other WTA working groups. This task will have the support of a regional consultant (hired by IOC).

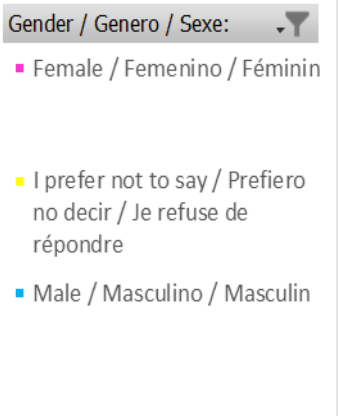
❏ **WTA WG** Webinar Series Update (Annex 4)

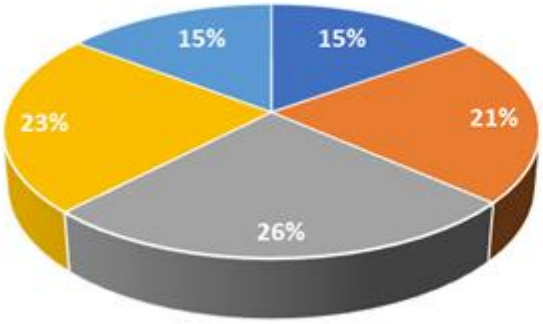
6. ANNEX 1

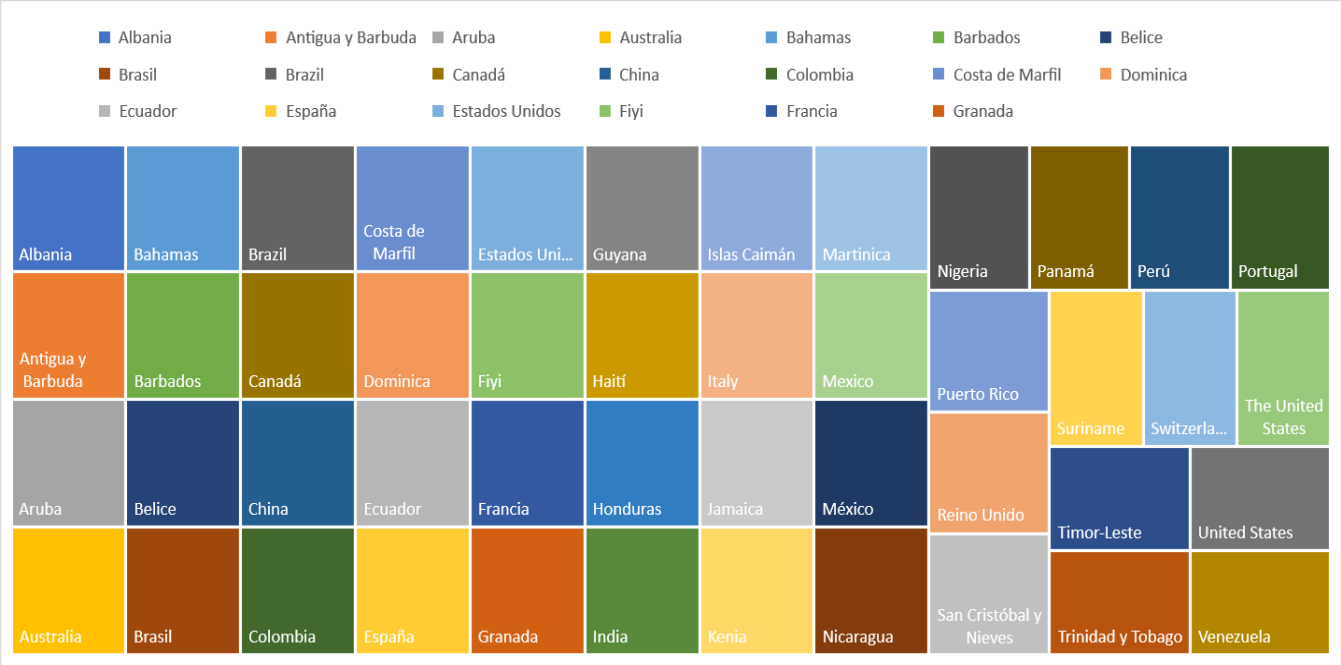
LIST OF PARTICIPANTS

The workshop recorded attendance of 226 registered participants, mostly from the Academia, with an equal gender, generation distribution and geographically diverse





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Colombia
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Kenia
Nicaragua
San Cristóbal y Nieves
Trinidad y Tobago
Venezuela

7. ANNEX 2

AGENDA

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

Tropical Americas Safe Ocean Co-Design Workshop

Breaking down the Silos for More Effective Multi Hazard Early Warning

Thursday, July 8 at 14h00 Colombia Time (15h00 AST, 19h00 UTC).

Hosted by IOC of UNESCO Sub commission for the Caribbean and Adjacent Regions- IOCARIBE

Virtual meeting by ZOOM platform
Simultaneous interpretation will be provided: English, Spanish, and French

Programme

The Oceans are Crying and People are Dying" (Sharlene DaBreo, 2020). We need to act with urgency to protect life and livelihoods from Ocean related threats. It means moving beyond business as usual, in terms of both actions and outcomes, for a true revolution in ocean science in support of long-lasting impacts. To meet its ambition, the UN Ocean Decade is to harness and stimulate innovative ocean research, from co- design to co-delivery, to achieve a safe ocean, as well as to contribute to the achievement of the 2030 Agenda for Sustainable Development.

This virtual session will result in a short regional discussion paper that will include clear recommendations and guidance for the enhancement and development of MHEWS. This could include the identification of priority issues and recommendations for the development of regional actions as well as on how we can foster multi-stakeholder participation. These short regional discussion papers (in English, Spanish, French or Portuguese) will be prepared in close collaboration with the co-convener of the regional session.

Cartagena Time	ITEM
14:00 – 14:20	**Part 1.** **Welcome/Overview**
14:00 – 14:03	**Technical Briefing** **Cesar Toro,** Head of IOC of UNESCO Sub commission for the Caribbean and Adjacent Regions- IOCARIBE
14:03 – 14:05	**Poll #1 on Familiarity with the Ocean Decade**
14:05 – 14:07	**Welcome** **Christa von Hillebrandt-Andrade** Manager, U.S. NWS Caribbean Tsunami Warning Program. EPG Member Interim UN Decade Advisory Board
14:07 – 14:10	**Objectives of the Meeting** Moderator: **Ada Monzón**. MET Broadcaster, CEO Ecoexploratorio Museum
14:10 – 14:20	**Overview of Ocean Decade** **Elva Escobar** EPG Member Interim UN Decade Advisory Board
14:20 - 14:35	**Part 2 -Key Note**
14:20 – 14:32	**Integrated Multi Hazard Early Warning Systems and Services** **Raul Salazar** UNDRR Regional Office Director for the Americas and the Caribbean
14:32 – 14:35	**Poll #2 and Q/A**

14:35 – 15:10	**Part 3** **Trans Sector Dialogue on Integrated MHEWS** **With Breakout sessions** Moderator: **Ada Monzón**.
14:35- 14:40	**Introduction to the Breakout groups.**
14:40 – 15:00	**Breakout Group 1: TRADITIONAL/INDIGENOUS KNOWLEDGE** Leader: **Lorenzo Sanford.** Kalinago Chief, Dominica Rapporteur: **Farah Nibbs.** University of Delaware. Research assistant **Breakout Group 2: LOCAL AUTHORITIES AND CIVIL SOCIETIES ORGANIZATIONS** Leader: **Luis Landazabal** Port Captain, Isla San Andrés/Providencia, Colombia Rapporteur: **Milton Puentes Galindo.** Adviser, Colombia. **Breakout Group 3: NATIONAL ORGANIZATIONS/AGENCIES AND INSTITUTIONS** Leader: **Michelle Forbes**. Ministry of National Security, Director. Saint Vincent & Grenadines. Rapporteur: **Azra Mallett**. **Breakout Group 4: REGIONAL ORGANIZATIONS/AGENCIES AND INSTITUTIONS** Leader: **Andria Grosvenor** CDEMA. Deputy Executive Director (Ag). Rapporteur: **Alison Brome.** UNESCO/IOC Caribbean Tsunami Information Center Programme Officer *Question to be considered in the breakout groups:* ***What transformative solutions*** *does your stakeholder group require to help overcome the barriers and enhance Multi Hazard Early Warning and how could they be implemented throughout the Ocean Decade (2021-2030)? Consider risk knowledge, monitoring and*

	warning, warning dissemination and communication, response capability, resources and/or partnerships.
15:00-15:15	**Report Back and discussion** The group leaders will report back to plenary (3 minutes per working group)

15:15 – 15:55	**Part 4** **How Science is Addressing Safe Ocean, links between science and decision makers/disaster risk reduction community** Moderator: **Pablo Mendez**. UPR.
15:15 – 15:20	**MHEWS Challenges and Opportunities from the La Soufriere Volcano, Saint Vincent and Grenadines Volcanic Eruption.** **Richard Robertson**. University of the West Indies Seismic Research Center
15:20-15:45 15:20 – 15:21	**Lightning Talks** **Opportunities and gaps for integration of different ocean hazards into a MHEWS framework** *For each action, the presenters will be asked (3 minutes each) to address:* *What **transformative ocean science solutions and actions** have been proposed to reduce the risk from the hazard and advance Integrated Multi Hazard Early Warning for a Safe Ocean by 2030?* **Moderator to introduce the lightning talks in a package and to present a slide with the infographics on the selected hazards as a result of the survey**
15:21 – 15:24	**Sea Level Rise (Climate Change)** **Patricia Chardon**. Caribbean Integrated Coastal and Ocean Observing System (CARICOOS), Puerto Rico, ECOPS.

15:24 – 15:27	**Sargassum Influx** **Emily Smail**. Executive Director & Head of US office, GEO Blue Planet Secretariat.
15:27 – 15:30	**Tsunami** **Michael Angove**. Lead, US NOAA Tsunami Program and Lead UN Decade Global Tsunami Programme
15:30 – 15:33	**COVID 19** **Tshewang Dorji.** Organización Panamericana de la Salud, PAHO, Colombia.
15:33 – 15:36	**Hurricanes** **José María Rubiera Torres.** Vicepresident WMO Hurricane Committee. CUBA
15:36-15:39	**Waste Water** **Jose Galizia Tundisi**. Universidade do Norte do Brazil. Professor
15:39-15:42	**Oil Spills** **Claudia Alves de Magalhães**. Brazil - Ministry of Science , Technology and Innovation - MCTI
15:42 – 15:55	**Discussion/Questions**
15:55 – 16:00	**Part 5.** **Showcase of a Decade Action** **Coast Predict – Marine Service Ocean** **Giovanni Coppini.** Director Ocean Predictions and Applications. CMCC- Centro Euro Mediterraneo sul Cambiamenti Climatici. Italy

16:00 – 16:10	**Part 6.** **Summary and Call to Action**

16:00 – 16:02	**Poll #3**
16:02 – 16:07	**Summary and Call for Action** **Farah Nibbs Dominica, ECOPS**
16:07 – 16:08	**Closing** Moderator**: Pablo Mendez**. UPR.
16:08 – 16:09	**SOWG-Next Steps** **Christa von Hillebrandt-Andrade –** Manager, U.S. NWS Caribbean Tsunami Warning Program. EPG Member
16:09 – 16:10	**WTA WG Webinar Series Update** **Cesar Toro,** Head of IOC of UNESCO Sub commission for the Caribbean and Adjacent Regions- IOCARIBE

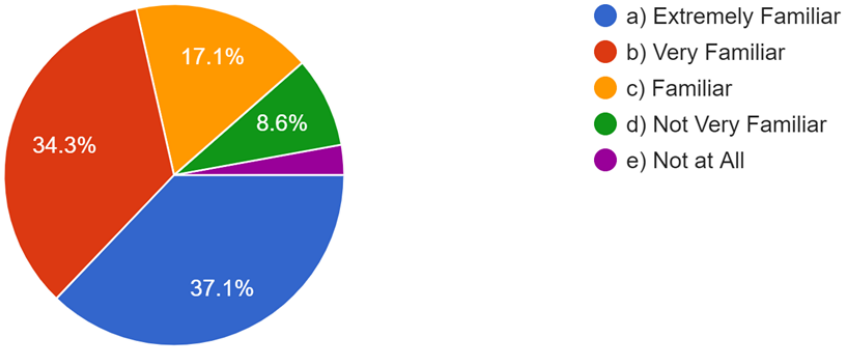
8. ANNEX 3

POLL QUESTIONS

POLL #1

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

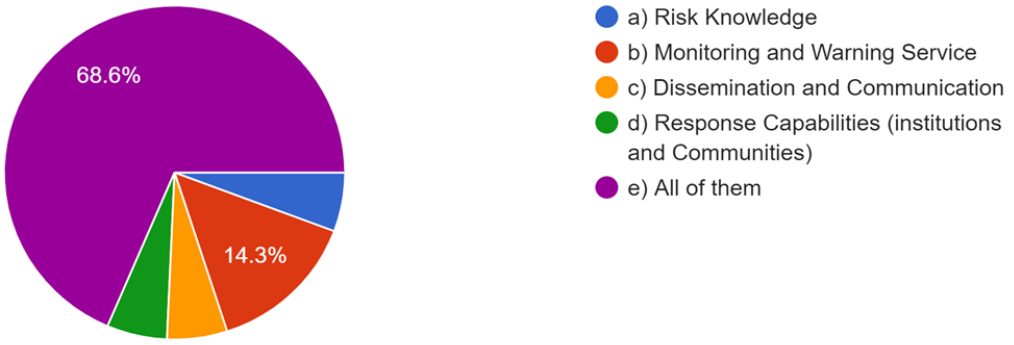
a) Extremely Familiar
b) Very Familiar
c) Familiar
d) Not Very Familiar
e) Not at All



POLL #2

In your opinion, on which of the core elements of early warning systems, the UN Decade of Ocean Science for Sustainable Development should focus its efforts in order to reduce the vulnerability to ocean and coastal hazards? [Select one]

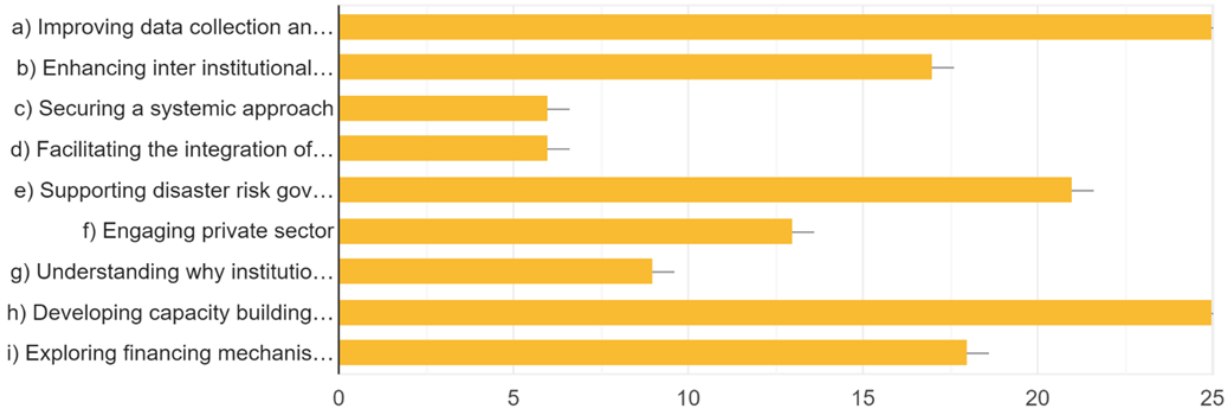
a) Risk Knowledge
b) Monitoring and Warning Service
c) Dissemination and Communication
d) Response Capabilities (institutions and Communities)
e) All of them



POLL #3

In your opinion, in order to secure the feasibility of multi-hazard early warning which are the four more important aspects that should be treated in a potential regional programme for the Western Tropical Atlantic Region? [Select Four]

a) Improving data collection and sharing
b) Enhancing inter institutional cooperation
c) Securing a systemic approach
d) Facilitating the integration of indigenous knowledge
e) Supporting disaster risk governance at the national level
f) Engaging private sector
g) Understanding why institutions and individuals do not act
h) Developing capacity building activities
i) Exploring financing mechanisms

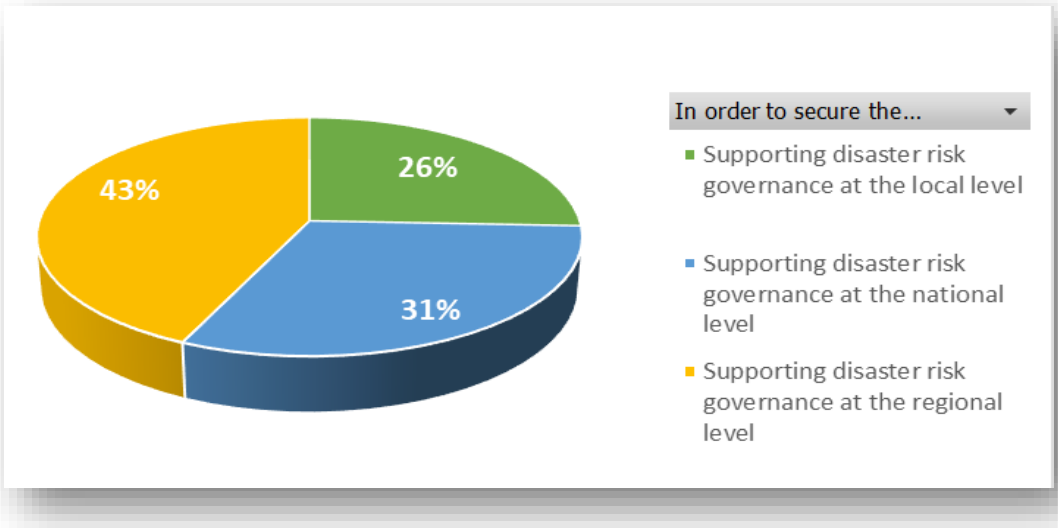


POLL #4 – LIGHTNING POLL

A follow-up lightning poll was conducted in early October 2021 among registered participants and the member of the WTA Safe Ocean Working Group. The purpose was to follow-up on an issue of governance, which was not addressed completely in the poll during the workshop. The participants were asked: In order to secure the feasibility of multi-hazard early warning, which of the three levels of disaster risk governance should be treated with a higher priority in a potential regional safe ocean programme for the Tropical Americas?

a) Supporting disaster risk governance at the local level
b) Supporting disaster risk governance at the national level
c) Supporting disaster risk governance at the regional level

149 people answered the poll. While Regional Frameworks were given a higher priority, the need for National and Local risk governance was also selected as important.



9. ANNEX 4

UN Endorsed Programmes – And Other Programmes Of Interest To The Safe Ocean Working Group – For Cooperation And Interaction

The list of programs and initiatives that are relevant to MHEWS. A full list of UN Endorsed Programmes (28) and Contributions (33) can be accessed at https://oceandecade.com/resource/166/Results-of-the-first-Call-for-Decade-Actions-No-012020).

- The following are a list of programs and initiatives that are relevant to MHEWS -
  - UN Decade Programme Ocean Best Practices (Frank Muller-Kargar)
  - UN Decade Endorsed Program - Coast Predict, nadia.pinardi@unibo.it
  - UN Decade Endorsed Program - ForeSea, foresea2020@gmail.com
  - UN Decade Endorsed Program, Ocean Cities, an international network of cities in harmony with the marine environment, vsalvo@icm.csic.es
  - UN Decade Endorsed Program,The Nippon Foundation-GEBCO Seabed 2030 Project, enquiries@seabed2030.org - a component is MACHC - Meso America and Caribbean Hydrographic Commission/IOCARIBE
  - USA Decade Contribution - Committee on Earth Observation Satellite - Coastal Observation, Practices, paul.digiacomo@noaa.gov
  - UNESCO/IOC Decade Tsunami Programme, more quickly detect, measure, forecast and warn for tsunamis, even from the near-instant they form, and to enhance the preparedness of coastal communities for tsunamis though the UNESCO/IOC Tsunami Ready Programme;
  - US Digital Coast - NOAA on line tool to address issues commonly associated with a changing climate and a growing population. https://coast.noaa.gov/digitalcoast/
  - Coral Reef Restoration Project Built Coral Ecosystem in Antigua & Barbuda (Deborah Brosnan & Associates, PADI)
  - Language Facilitation – Response Capability, Institutional and at the Communities (Proposed by Milton Puentes)
  - ENGO (Oracabessa Bay Foundation). They have a very good coral restoration project underway as well as reintroduction of sea turtles. Here is a link to view pictures from the coral restoration project: https://www.seacology.org/project/oracabessa-bay/ - contact Azra Mallet
  - Oil Industry, Private/Industry Sector proposal? The NGOs Oceana, Rare and CI together and cooperatively, but independent from the government, did a wonderful job along the Brazilian coast, supporting the affected traditional communities during our 2019 oil spill

catastrophe, and they have a concrete proposal concerning preparation/response/mitigation of future incidents. The Director of Oceana in Brazil, and co-leader of this initiative, is Dr. Ademilson Zamboni. azamboni@oceana.org. From the US, the experience of Sea Grant dealing with oil disasters since the Deep Horizon platform, is a model to be adapted to each state's reality.

- CARICOOS Caribbean Regional Ocean Partnership (CROP) Portal A decision support tool integrates over 60 coastal and ocean data products and visualizations, from various sources, in support of regional coastal planning and resource management https://crop.caricoos.org/ ‘
- Coastal Flooding - Inundation Forecast Initiative in the Caribbean – RAIV, WMO WTA WG Accessible and Transparent Ocean
- All-Atlantic Ocean Research Alliance Forum – MIT initiative in Florida, which uses citizen science through apps to monitor floods and storms, significantly preventing deaths and other losses. This initiative was presented in the All-Atlantic Ocean Research Alliance Forum, sponsored, and organized by the European Commission, held from 6 to 7 Feb 2020 in Brussels. We were very much impressed with its quality.
- Mapping Eco-DRR Opportunities. The Opportunity Mapping tool By overlays global datasets on ecosystem distribution and hazard exposure, and highlights areas where ecosystem restoration and / or protection can be used to protect the greatest number of people globally. https://pedrr.org/global2/, https://pedrr.org/global2/
- RiskMap.us, is being piloted to enable both residents and emergency managers to obtain better information on flooding conditions in near-real time. Residents affected by flooding can add information to the publicly available map via popular social media channels. Residents and government officials can view the map to see recent flood reports to understand changing flood conditions. Tomas Holderness, a research scientist in the MIT Department of Architecture, led the design of the system. Has also been developed for India and Japan. https://news.mit.edu/2017/map-real-time-crowd-sourced-flood-reporting-hurricane-irma-0908#

10. ANNEX 5

WTA WG Webinar Series Update

WORKING GROUP	LEADER (S)	DATE/TIME (COT)	TITLE OF WEBINAR	UN PARTNER AGENCY
A safe ocean	Christa von Hillebrandt	**8th July**, 2021; 14:00 – 16:00	"Breaking down the Silos for More Effective Early Hazard Warning Services"	United Nations Office for Disaster Risk Reduction UNDRR
A transparent and accessible ocean	Albert Martis Edgar Cabrera	**29th July**, 2021 9:00 - 11:30	"A transparent Ocean with open information and technologies access"	World Meteorological Organization WMO
Capacity Development	Elva Escobar Ariel Troisi	**19th August** 2021 10:00-12:00	"Deep sea Capacity Development needs in the WTA and the ETP for the Ocean we want"	International Seabed Authority ISA
A Clean Ocean	Lorna Inniss	**31 de August** 2021 9:00-11:00	"The Year 2031, A Clean Ocean - Steps to Success"	UN Environment Programme UNEP Cartagena Convention
A healthy and resilient ocean	Francisco Arias	**9th September**, 2021 9:00-11:00	"Co-designing the path to sail the Decade of Ocean Science to reach the knowledge we need for the ocean we want in the WTA"	
A predicted ocean	Marck Oduber	**23rd September** 2021 9:00-11:30	"Changing the vibe to predict smooth sailing in the WTA and ETP: A Theory of Change approach"	World Meteorological Organization WMO
A sustainably harvested and productive ocean	Alejandro Acosta	**7th October** 2021 9:00 - 11:30	"Co-existing Opportunities and Synergies: Exploring Opportunities for a sustainably harvested and productive ocean in the WTA"	Food and Agricultural Organization FAO