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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 A PREDICTED OCEAN CO-DESIGN WORKSHOP

"A PREDICTED OCEAN THEORY OF CHANGE (TOC) WORKSHOP CHANGING THE VIBE TO PREDICT SMOOTH SAILING IN THE WTA & ETP: A THEORY OF CHANGE APPROACH"

WTA - TECHNICAL WORKSHOPS SERIES
Report 2021 – 06

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TROPICAL AMERICAS A PREDICTED OCEAN CO-DESIGN WORKSHOP

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WTA TECHNICAL WORKSHOPS SERIES

REPORT 2021 - 06

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 – 06 as a contribution to the UN Decade of Ocean Science for Sustainable Development, Online meeting, 23 September, 2021

LIST OF CONTENT

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

Tropical Americas Predicted Ocean Co-Design Workshop

WTA - TECHNICAL WORKSHOPS SERIES report 2021 – 06

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

Virtual Meeting, September 23, 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/apo

A list of programs and initiatives that are relevant as per Annex 4. 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

The UN Ocean Decade is to harness and stimulate innovative ocean research, from co-design to co-delivery, to achieve a predictive ocean, as well as to contribute to the achievement of the 2030 Agenda for Sustainable Development. This virtual session of the UN Decade Ocean WTA series will result in a short regional discussion paper that will include recommendations on the enhancement of ocean prediction techniques. To contribute to this effort the topic chosen for this discussion is Changing the vibe to predict smooth sailing in the WTA & ETP: A Theory of Change approach.

These short regional discussions papers (in English and Spanish) will be prepared in close collaboration with the co-conveners of the regional session and contribute to the WTA Action Plan.

3. PARTICIPANTS

The workshop recorded attendance of 97 registered participants, coming from local, national, regional, and global MET 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 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, building-up a healthy and resilient ocean where marine ecosystems are mapped and protected.

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

An overview of the Ocean Decade was presented by the IOCARIBE Secretary. He described the steps in the preparatory phase that led to implement the Ocean Decade, emphasizing its mission and vision with transformative actions, equity, inclusion to strengthen knowledge and accelerate and ocean observation and data systems the delivery of outputs to needed at the regional and national scales. He referred to reports of the planning workshops that recognized the regional needs, highlighting the main decisive actions of the last 12 months including the Decade Implementation Plan, the Call for Ocean Decade Programs and Contributions, the series of workshops for the co-design, co-delivery, the first set of sixty-plus officially endorsed Ocean Decade Action, the first International Ocean Decade Conference marks the Ocean Decade kick-off. He enforced the need of National Committees and exemplified with 3 of these in the region, explained the financing mechanisms options to be explored by nations in the region.

Mr Albert Martis, Second Vice President WMO, deliver a key talk “From Global to Local Opportunities”, at the Opening of the Workshop. He highlighted the longstanding importance of the ocean for the WMO activities, and noted that the **WMD 2020**, was devoted to: The ocean, our climate and weather. He shares with the participants his views on the WMO vision in this regard, as well as the status of the newly established Joint WMO-IOC Collaborative Board (JCB), as a mechanism for improvement and coordinate the work on ocean – atmosphere and marine related matters, including marine safety services and met-ocean forecasting.

❑ Part 2 - Panel / Situation Analysis

Discussion of current status of regional ocean observations and modelling, including discussion of current successes and concerns.

Julio Morell, University of Puerto Rico Oceanographer, co-founder and Executive Director of CARICOOS, the US Integrated Ocean Observing System Regional Association for the Caribbean Region gave a presentation entitled "Status, Needs, and Opportunities"

The region hosts multiple institutions who collect data and issue operational forecast on essential ocean & weather data. These include government, academia and intergovernmental organizations which host high level expertise. Although the oceanic domain relatively well covered in terms of observation by several programs (Pirata, TAO, Tsunami network, ARGO float et al.) most of the nearshore observing capability is concentrated to the north of the region.

The region is included in a suite of global and (some) regional scale numerical ocean, weather and climate forecast models. These provide for nesting and development of regional forecast models at scales adequate for stakeholder needs at the regional and sub regional spatial scales.

Outstanding needs:

- A **need assessment** and prioritization effort
- A **regional** accessible data base
- **Coastal Observations** at representative locations
- **Forecast models** with the required resolution for filling observation gaps and meeting user needs
- **A digital platform** for disseminating user-friendly data products

Carl Gouldman is the Director if the US Integrated Ocean Observing System, IOOS, the Global Ocean Observing System Regional Alliance for the United States and presented on aspects of IOOS relevant to this Workshop.

Important points in the presentation included:

IOOS has nested structures; It is [the US] part of the global GOOS system, and is organized around GOOS principles; it consolidates the activities of numerous US agencies and interests in ocean observing and forescasting; IOOS is implemented as a mix of National Programs and 11 Regional Associations that improve participant diversity and closer links to stakeholders and the co-design process.

US Regional Associations adjacent and relevant to the WTA region include CARICOOS (www.caroccos.org), SECOORA (www.secoora.org) and GCOOS (www.gcoos.org).

IOOS uses standard observing technologies (buoys, high-frequency radar, shore-based stations, ocean gliders, ships, water level gauges) and encourages applications of new technologies.

IOOS recognizes the value of high-level investment in data management, standards, quality, and open access. This includes data sharing, dissemination of ocean observing best practices, and training.

An example of an IOOS supported NOAA product available globally, including the WTA region, is the ExtraTropical Storm Surge and Tide Operational Forecasting System (ESTOFS), available at https://cera.coastalrisk.live.

Panel discussion with two speakers and moderator Doug Wilson.

Q: to Julio Morell – If you are a state, or country, or group of countries, what are some immediate things you can do to have a significant impact on your own ability to predict the ocean around you?

A: Nesting forecast models (as in CARICOOS) provides use to many stakeholders, can fill in where observations are not available, and provide a platform for further growth.

Q: What is an example of where you have applied those models to impact stakeholders?

A: For maritime sector (critical for island economies) provide forecasts for waves and currents at Port entries for use by port pilots; forecast rip currents and breaking waves for tourism sector.

Q: to Carl Gouldman – What are some first steps toward achieving a Predicted Ocean on a Regional Scale?

A: Start with one useful product; show success; grow from there. (e;g;, ESTOFS model)

Comments from Carl Gouldman (for participants): Dedicated resources for sustained observing are always a factor holding us back (even in US). Building a shared digital platform for collaboration and sharing can help.

Julio Morell: Needs assessments is critical. Find better ways to communicate possibilities to the wider population that can benefit from a Predicted Ocean.

Moderator restating needs assessment question – For citizens who use and need the ocean, if you could know anything about its present and future state, what would that thing be – and how would you use the information? Asked to Miro Board users (*what were responses?)*

Miro input on barriers: Lack of sustainable operations; lack of human and technical resources; limited technical capabilities; lack of low-cost observing technologies; lack of standards in data and practices; lack of authoritative observation design; lack of agreement among responsible partners; lack of recognition of social, economic, political conditions; lack of funding; lack of authoritative observation design; lack of clarity and benefits to potential consumers; lack of social interest and participation in ocean and coastal observation.

Moderator Summary:

Technologies exist within the region, mostly provided, and operated by larger economies (US, MX, EU), providing observations and forecasts at a coarse regional resolution. Based on user needs assessments – "What do you need to know (about the present and future state of the ocean)? What would you need to act on that knowledge" – it would be beneficial to pick one or two of those and begin to use them to (1) directly address needs (2) widely distribute participation, products, and capacity.

There are also clearly quite a few barriers that must be addressed, and doing so will be the major challenge to an observing and prediction system.

❏ **Part 3 – Lightning Talks / Stakeholders needs**

Two presentations on the private sector were received to provide highlights on the stakeholders needs and response to What are funders or program participants expecting to get from their investment in ocean data/modeling.

❏ **Part 4 - Lightning Talks / Funding Ideas**

Mr Markus Repnick – WMO – Patrnerships Director.

The Systematic Observations Financing Facility, or SOFF, seeks to provide technical and financial assistance to countries to generate and exchange basic observational data. This is critical for improved weather forecasts and climate services needed to boost resilience to more extreme weather and to adapt to climate change impacts.

A successful first Funders Forum on 24 March underscored the groundswell of support for the creation of SOFF, with declarations from leaders of the United Nations and development and climate finance agencies in the Alliance for Hydromet Development, as well as beneficiary countries and the meteorological community.

As a priority, the SOFF will support Least Developed Countries and Small Island Developing States which face the most serious shortfalls in observations. This has knock-on effects for the rest of the globe as it undermines the quality and reliability of global forecasts. Investments to close gaps in data-sparse regions will have disproportionately high returns, with a potential 1:25 returns.

❏ **Part 5 – Panel / Pathway of Change**

Goal: Discuss and achieve a broad shared understanding of the conditions which need to be in place to enable/deliver change when moving between different levels (barriers/enablers/risks). Who and what needs to change in order to achieve hose long-term changes, who needs to do what differently? Under what condition will it work? What transformative solutions do we require to help overcome to

better improve / enhance / sustain, the existing ocean observations system in place for the region and globally, and how could they be implemented throughout the Ocean Decade (2021-2030)? How can we improve the arrangements on data exchange (Met-Ocean-Other variables) and to facilitate an open access to the data and information for the Ocean by 2030?

Chip McCreery is the Director of the NOAA Pacific Tsunami Warning Center and played a significant role in the development of the Caribbean Tsunami Warning System.

Goals of a [Tsunami] warning system

- Save Lives – focused on useful and timely warnings
- Reduce Property Damage (especially supporting critical infrastructure)
- Institutionalize (because events are rare and often localized)

Proposed improvements to Tsunami Warning System:

- Increase *direct* observations – positive detections for faster and more accurate observations
- More (ALL) Tsunami-Ready coastal communities
  Sources identified – modelled – inundation forecasts – evacuation routes mapped
  Community Outreach, exercises, regular reviews

Scott Glenn is Professor of Oceanography at Rutgers University, and founder of the Rutgers U Center for Ocean Observing Leadership (RU COOL). The presentation focused on the Co-Development of the Mid-Atlantic Bight Ocean Observing System as an example for the WTA Region.

Theory of Change approach to developing Pathways to Success

Identified Barrier (to change)	->	Pathway to Success
Transition from Research to Research and Operations	->	Identify Environmental Drivers, est. R2O-O2R
Transition from technology focus to User Needs focus	->	Adopt 2009 Framework for Ocean Observing
Establish inclusive structure across political boundaries	->	Adopt GOOS, IOOS, Framework for trusted Best Practices
Pilot Projects to accelerate the co-development process	->	Long term pairing of data users and data providers for R2O
Transition from observations to forecast products	->	Invest in data assimilative model and gap-filling data
Transition local observations to coordinated networks	->	Distributed field team with unified data QC, flow and access
Transition from single-use to multi-use observations	->	Developed Mid-Atlantic Integration Matrix Approach
Transition to diversified funding	->	Form academic, government, industry, foundation partnerships
Establish a new workforce	->	Develop training programs, establish training centers
Engage the public	->	Leverage local resources and agencies

There are presently quite a few GOOS Observing System components presently active in the Caribbean. These can be used and improved/expanded/augmented as desired to contribute to an Observation and Prediction system and serve as regional framework. Including:
Drifting buoys - Gliders - HF Radar Networks - ARGO Floats - Operational Global / Regional Models

Need to use needs assessments to continue co-development program that can utilize these resources.

Joaquin Tintoré is Co-Chair of Coast Predict, a collaborative international Program endorsed by UN Decade of Ocean Sciences, co-designed with GOOS, dedicated to “improving improving our understanding of the coastal area processes using a multi-disciplinary and integrated approach… for knowledge based and sustainable management.”

Presentation: “Revolutionizing global coastal observing and forecasting, co-designing the needed infrastructure, and offering open and free access to coastal information”

There are active participants in Coast Predict from the region and opportunities for more to become involved.

The Coastal Ocean is **where the people live** and is this critical to predict. A key driving element of CoastPredict i**s the focus on the many common worldwide features of the coastal ocean** that we need to understand for sound and sustainable management.

CoastPredict Basic Principles:

- Have a clear stakeholder engagement plan
- Have at least three areas of ocean implementation and study (relocatable solutions are essential), one of which is a developing country
- Include data management and best practices for open access data
- Provide end-to-end demonstrations
- Multi-national, multi-disciplinary, and diversity-balanced groups
- Make an effort to use new methodologies and technologies within the different aspects of the project
- Include a plan for after-the-project continued development1 of the basic information infrastructure upgrades and solutions/services with adequate public/private partnerships
- Include capacity building and ocean literacy activities

Coast Predict High Level Objectives:

- A predicted global coastal ocean
- Upgrade to a fit-for-purpose oceanographic information structure
- Co-design and implementation of an integrated ocean and coastal observing and forecasting system adhering to best practices and standards, designed as a global framework and implemented locally

Strategic Implementation plan in Six Focus Areas in 10 World Ocean Areas where core projects will be developed.

Integrated Ocean Observing approach (multi-platform). Observations and forecast models

Including Urban Oceanographic forecasting for impact applications]

What is transformative about CoastPredict?

- Innovative multi-disciplinary ocean technologies and fit for purpose observing system in the Global Coastal Ocean.
- Innovative numerical modeling, data assimilation and data science tools, including Coastal Earth System Modeling
- Coastal solutions and services
- A virtual information / digital infrastructure
- A new Global Coastal Ocean Network

Desired Coast Predict Decade Outcomes

- Integrated knowledge of the global coastal ocean from events to climate (Advancing Knowledge)
- The design and implementation of integrated river/estuarine/coastal/open ocean observing and modelling multidisciplinary system (Integrated Observing and Prediction)

- Improved coastal marine forecasting and extended range predictive capabilities for the coastal zone (accurate predictions from hours to decades ahead)
- The development of methods for trusted data/information exchange and interoperability across the value chain and adoption as best practices (open and free access to coastal information Innovative and sustainable applications for coastal solutions/services that directly benefit local populations, including well-being and human health (solutions)
- Increased equitable education and capacity for observing and forecasting in the global coastal ocean (capacity building)
- Strong engagement of early career ocean professionals and promotion of education, training, and research under principles of diversity, equity, and inclusion (education, no one left behind)

Coast Predict is part of GOOS framework along with many other organizations, will have to meet COORDINATION challenge. www.coastpredict.org

Questions from moderator:

Q: McCreery, speak to importance of local ownership of observing systems

A: Important, for instance tide gauges can be multipurpose and support local interests (maritime, coastal zone, etc) in addition to tsunami warning system component. Some countries also support deep ocean sensors. Countries need to develop capacity to use and maintain systems for sustainability.

Q: Glenn, what is a good demonstration or pilot program to convince countries or organizations that they want to participate in an observing and forecasting system (including data sharing)?

A: Engage in contributing to producing regional scale products of local importance. Demonstration projects collecting distributed data sets over full region. Would like to see a focus on larger scale glider data collection program. Important information and good way to demonstrate importance of shared data and interoperability across EEZs (research to operations).

Q: Tintoré, What are some easily transferable assets and resources developing within CoastPredict that could be applied in the region?

A: Must build one or two good examples to engage users. Example – Search and Rescue. Another example is forecasting extreme events. Gliders are a powerful tool for heat content (hurricanes). CoastPredict wants to integrate elements of observing and forecasting, focus on common elements.

Daniel Facilitator comments – questions on Miro Board:

1) How we initiate data sharing?
2) Developing opportunities that support regional cooperation
3) How might we acquire better access to technology throughout the region
4) How to acquire capabilities we are lacking

Moderator – how do we begin implementation process (bootstrap problem – want to engage users with results but don't want to go too far without a strategy)

Moderator Summary

Again, we are reminded that the components of an observing and forecasting system are around us and we need to prove their utility to regional stakeholders and embrace their use. Templates for implementation exist as well, along with willing partners. There is a need to apply existing tools to the regional issues, and there is also a need to develop better (less expensive, simpler, multi-

purpose) tools that support smaller economies. A way forward (in parallel with more in-depth user assessments): Pick a clear, common need (extreme events?) and develop appropriate observing and prediction tools as demonstrations.

❑ Part 6. Panel / What should we measure?

Questions addressed focus on the type of information needed to track and analyze the change process as it evolves and to learn throughout implementation? How do we define success?

Presentation: Emma Heslop, Program Specialist, Global Ocean Observing System "GOOS Measuring Success: What information do we need to track and analyse; how do we define success?"

The topic ¨what should we measure¨ is broad and the answers were specific to the workshop discussions, and should be as far as possible around impact – particular to the project or the question

Moving from operational oceanography and climate to include bio-eco observing systems

The workshop was introduced to the status of the Global Ocean Observing System today – maps of observations – GOOS Strategy including the importance of the value chain – and the two areas of GOOS approaching this: Observing System Co-Design and the GOOS Observation Coordination Group.

GOOS 2030 Strategy – Value chain approach, connecting OBSERVATIONS through DATA MANAGEMENT for use in ANALYSES and MODELS to create APPLICATIONS

Ocean Observing Co-design (an Ocean Decade project of GOOS)

User focused co-design process – end-to-end, value chain based including providers AND users,

Having as a core concept use of area 'exemplars' (extreme events, carbon budgets, reinsurance, etc.)

Notes to remember:

- What to measure should be as far as possible around impact – particular to the project or the question
- We can measure things working backwards up the value chain from impact
- Don't measure too many things - keep your focus and enable you to investigate apparent low performance
- moving to Essential Ocean Variable based observing structure
- Looking at one 'delivery' area – e.g. GCOS climate, RRR mainly operational services
- Coverage is only one metric – best practices used, latency, and impact are also important
- Measure across succinct range of different but condensed points – including having a mechanism check impact

Panel: What should we measure?

Panelists: Glenn, Wilson, Heslop. Moderator: E. Cabrera.

Questions/Comments from Moderator:

- There is a strong regional need to improve marine ocean observation and prediction systems to improve management, decision-making and governance.
- Capacity building activities in national and regional institutions and enhancement of the cooperation, coordination and coherence of strategies and activities among partners is required.
- Availability of ocean data is playing an increasingly key role in the improvement of critical weather and marine related services.
- The UN decade of ocean science for sustainable development is a great chance to lift cooperation between the key agencies, programmes, and projects to improve ocean data delivery in the Wider Caribbean region and beyond (Tropical Americas).

A: Glenn: GOOS Report cards great for perspective, sharing best practices.

Important to take an Earth System Science approach to observing and modeling, predicting, including linked ocean-atmosphere interactions

Ocean Decade provides a great opportunity for coordination between many entities in ocean observing and forecasting; how can we improve that cooperation in the region and strengthen regional alliances? There are both common regional and more local applications; we need to take advantage of and expand available modelling capabilities.

Observing programs and training/capacity building: Observing systems need local ‘stamp; and capability to sustain. Training often available but undersubscribed (lack of awareness).

A: Wilson: Asks where is our OCEAN SOFF (SOFF is WMO program to improve land-based meteorological observations, especially in developing states? (Reply By Heslop below).

Caribbean is observationally under sampled. Needs to be strategically addressed, directed towards products and utilization of data by models for improved predictions.

Some observational gaps may be addressed by improving available technology and making more accessible to a wider set of observers. This includes improving at all levels: measurements, sustainability, data delivery, utility and accessibility of products.

How do we develop implementation ‘toeholds’ to start demonstration and pilot projects that can provide foundation for a wider system?

A, Emma: Links to GOOS, WMO, co-design processes exist and need to be promoted and implemented.

(‘pull’ from users (states) might be useful rather than ‘push from organizations)

GOOS and SOFF are discussing something like an ‘OCEANS SOFF’ that could expand basic necessary observations.

Ocean Decade is a real opportunity for providing support and group should look programs that are being developed (e.g., GOOS ‘Observing Together’ program and many others)

Summary of discussion and findings

- Components of an observing and forecasting system exist within the region providing observations and forecasts at a coarse regional resolution. Templates for implementation exist as well, along with willing regional and external partners.
- Need basic user needs assessments – "What do **you** need to know about the present and future state of the ocean? What would you need to act on that knowledge" – it would be beneficial to pick one or two of those and begin to use them to (1) directly address needs (2) widely distribute participation, products, and capacity?
- There are also clearly quite a few barriers that must be addressed in terms of technical capacity, resources, and political barriers, and doing so will be a major challenge to developing an observing and prediction system.
- There is a need to apply existing tools to the regional issues, and there is also a need to develop better (less expensive, simpler, multi-purpose) tools that support smaller economies. A way forward (in parallel with more in-depth user assessments): Pick a clear, common need (extreme events?) and develop appropriate observing and prediction tools as demonstrations.
- Observations/models/products should be multipurpose and support local interests.
- Countries need to develop capacity to use and maintain systems for sustainability.
- Barriers to surmount: Lack of sustainable operations; lack of human and technical resources; limited technical capabilities; lack of low-cost observing technologies; lack of standards in data and practices; lack of authoritative observation design; lack of agreement among responsible partners; lack of recognition of social, economic, political conditions; lack of funding; lack of clarity and benefits to potential consumers; lack of social interest and participation in ocean and coastal observation
- A major job will be identifying applicable funding and partnering opportunities and mechanisms and steering them towards the region. To do that there must be an infrastructure in place for them to contribute towards.

Recommendations

- Build Systems using Decade Programs as well as other existing, ongoing, applicable opportunities.
- Use GOOS 2030 Strategy - Value chain approach, connecting OBSERVATIONS through DATA MANAGEMENT for use in ANALYSES and MODELS to create APPLICATIONS
- Include Demonstration projects collecting distributed data sets over full region; broad glider coverage for example, can promote data sharing and trans-boundary observations
- Take opportunities to promote model downscaling / nesting for local applications
- Need to consider a regional structure for planning and implementation

❑ Part 7. Closing session

The WG Chair summarized the main ideas presented by panellists and digested the suggested next steps for the regional work on Predicted Ocean and acknowledged the Secretariat of IOC UNESCO IOCARIBE recognizing the great work and support.

Way Forward

The APOWG will be to prepare a proposal for a regional decade action, in close collaboration with other WTA working groups, and relevant stakeholders, form private, public, and academic sectors. This task will have the support of a regional consultant.

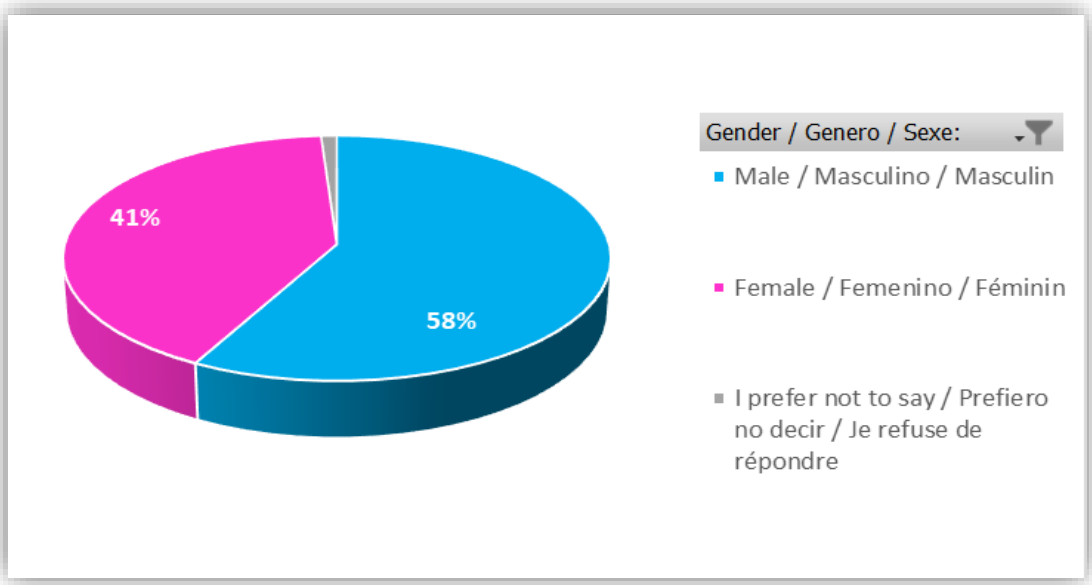
❑ **WTA WG Webinar Series Update** (Annex 4)

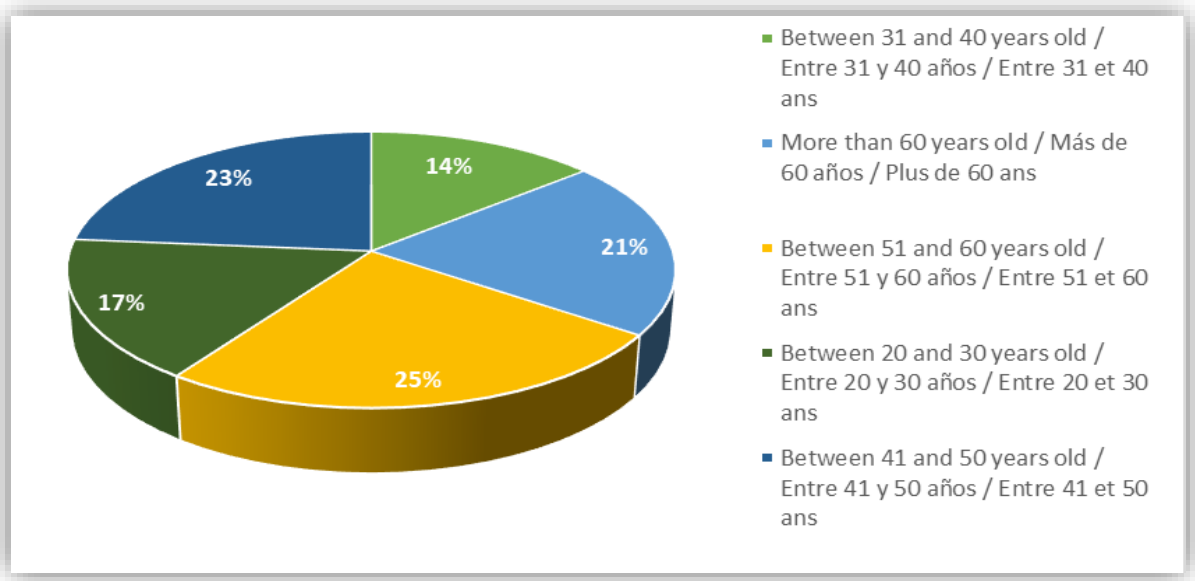
The IOCARIBE Representative thanked the chair for the summary of meeting highlights and next steps. He announced the forthcoming IOCARIBE's workshop series and future activities under the Ocean Decade, as per Annex 4.

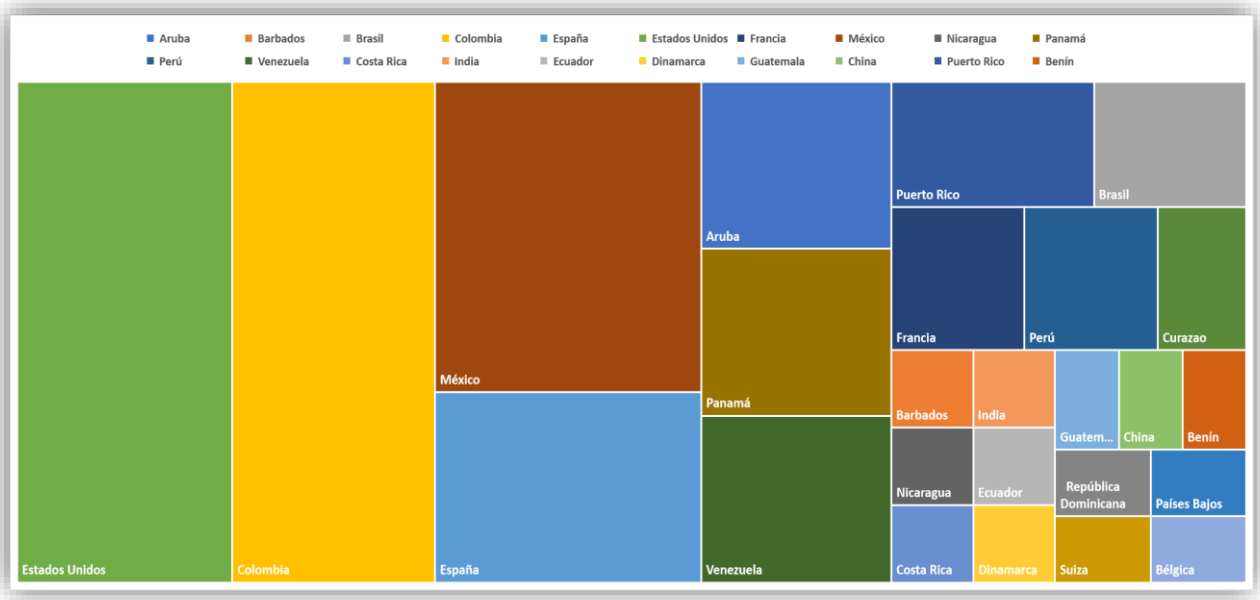
6. ANNEX 1

WORKSHOP PARTICIPANTS

The workshop recorded attendance of 97 registered participants, mostly from the Academia, with a balanced gender, generation distribution and geographically diverse.



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7. ANNEX 2

AGENDA

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

Tropical Americas Predicted Ocean Co-Design Workshop

WG3 A Predicted Ocean Theory of Change (ToC) Workshop

Changing the vibe to predict smooth sailing in the WTA & ETP: A Theory of Change approach.

DATE of the event: 23, September 2021 at 0900 Colombia Time (1000 AST, 1400 UTC).

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

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

Register at: http://iocaribe.ioc-unesco.org/webinarseries/apo/regapo

Simultaneous interpretation will be provided: English, Spanish and French

Programme

Main purpose

The virtual session will contribute to the transformative actions and solutions that will be proposed for a Predictive Ocean ToC Workshop: *Changing the vibe to predict smooth sailing in the WTA & ETP: A Theory of Change approach.* Zoom will be the main platform for the webinar, and Miro will be used as support. Results of the discussions will be the basis for the webinar*, which* will be held on 23 September 09h00 Cartagena de Indias - Colombia (10h00 AST, 14h00 UTC).

Duration: 2.5 hours

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

Rationale

The UN Ocean Decade is to harness and stimulate innovative ocean research, from co-design to co-delivery, to achieve a predictive ocean, as well as to contribute to the achievement of the 2030 Agenda for Sustainable Development. This virtual session of the UN Decade Ocean WTA series will result in a short regional discussion paper that will include recommendations on the enhancement of ocean prediction techniques. To contribute to this effort the topic chosen for this discussion is Changing the vibe to predict smooth sailing in the WTA & ETP: A Theory of Change approach.

These short regional discussions papers (in English and Spanish) will be prepared in close collaboration with the co-conveners of the regional session and contribute to the WTA Action Plan.

Cartagena Time	ITEM
09:00 – 09:35 **1400-1435UTC**	**Part 1** **Introduction** **Moderator:** Marck Oduber
09:00 – 09:03	**Welcome and objectives** **Marck Oduber,** WG3 Leader, Aruba
09:03 – 09:06	**Overview of Ocean Decade** **Cesar Toro,** Head of IOC of UNESCO Subcommission for the Caribbean and Adjacent Regions-IOCARIBE, Colombia
09:06 – 09:10	**Key-Note** **Albert Martis,** Keynote expert speaker, Second Vice-President of WMO, Director Meteorological Service, Curaçao
09:10 – 09:35	**Poll Question #1 & 2** **Introduction on Theory of Change and Miro Platform** **Daniel Corsen,** Facilitator, D&I Business Support, Curaçao

09:35 – 10:12 **1435-1512UTC**	**Part 2** **Panel** **Situation Analysis** **Moderator:** Douglas Wilson
09:35 – 09:50	**KEY TALKS** *During these talks, the current status of ocean observation and modeling will be reviewed. We will look into current success and things that are working well and then problems, frustrations, mistakes, and concerns.*
09:35 – 09:40	**Julio Morell,** CARICOOS, University of Puerto Rico, USA
09:40 –09:45	**Carl Gouldman,** NOAA, Director IOOS, USA
09:45- 09:50	**Alain Muñoz Caravaca**, Nuclear Physics Engineer, Cienfuegos Environment Studies Centre, Cuba
09:50 – 10:00	**Discussion on Session – Round Table** Daniel Corsen, Facilitator, D&I Business Support, Curaçao Julio Morell, CARICOOS, University of Puerto Rico, USA Carl Gouldman, NOAA, Director IOOS, USA Alain Muñoz Caravaca, Nuclear Physics Engineer, CEAC, Cuba

10:00 – 10:12 **1500-1512UTC**	**Part 3** **Lightning Talks** **Stakeholders needs** *What are funders or program participants expecting to get from their investment in ocean data/modeling.* **Moderator:** Marck Oduber
10:00 – 10:05	**Isabel Houghton,** Sofar Ocean Technologies, USA
10:05-10:12	**Jorge Ridderstaat,** University of Central Florida, Rosen College of Hospitality Management, USA

10:12 – 10:28 **1512-1528UTC**	**Part 4** **Lightning Talks** **Funding ideas** **Moderator:** Marck Oduber
10:12 – 10:22	**John Hanus,** European Commission, DG Research & Innovation, Horizon Europe, Belgium
10:22 – 10:24	**Eliza Northrop,** Senior Associate, Policy Lead – Sustainable Ocean Initiative, WRI, UK
10:24 – 10:28	**Markus Repnik,** Director Development Partnerships, WMO, Switzerland **Poll Question #3**

10:28 – 10:30 **1528-1530UTC**	**BREAK** VIDEOS of UNESCO/IOC/DECADE

10:30-11:00 **1530-1600UTC**	**Part 5** **Panel** **Pathway of Change** **Moderator:** Douglas Wilson
10:30-10:45	**KEY TALKS** *During these talks we will discuss and achieve a broad shared understanding of the conditions which need to be in place to enable/deliver change when moving between*

	different levels (barriers/enablers/risks). Who and what needs to change in order to achieve those long-term changes, who needs to do what differently, Why is it thought that change will happen that way, so if X changes, will Z happen? Why? Under what condition will it work? What transformative solutions do we require to help overcome to better improve / enhance / sustain, the existing ocean observations system in place for the region and globally, and how could they be implemented throughout the Ocean Decade (2021-2030)? *How can we improve the arrangements on data exchange (Met-Ocean-Other variables) and to facilitate an open access to the data and information for a Transparent and Accessible Ocean by 2030?*
10:30 – 10:35	**Charles McCreery,** NOAA, Director PTWC (Pacific Tsunami Warning Center), USA
10:35 – 10:40	**Scott Glenn,** RUCOOL, Rutgers University, USA
10:40 – 10:45	**Joaquin Tintoré Subirana,** Co-Chair CoastPredict, SOCIB, Spain
10:46-11:00	**Discussion on Session – Round Table** Daniel Corsen, Facilitator, D&I Business Support, Curaçao Charles McCreery, NOAA, Director PTWC (Pacific Tsunami Warning Center), USA Scott Glenn, RUCOOL, Rutgers University, USA Joaquin Tintoré Subirana, Co-Chair CoastPredict, SOCIB, Spain

11:00-11:15 **1600-1615UTC**	**Part 6** **Panel** **What should we measure?** **Moderator**: Edgard Cabrera
11:00-11:10	**KEY TALK** *During these talks, we will dwell on what information do we need to track and analyze the change process as it evolves and to learn throughout implementation? How do we define success?*
11:00– 11:05	**Representative,** IOC/GOOS IOC-UNESCO
11:10-11:15	**Discussion on Session – Round Table** Daniel Corsen, Facilitator, D&I Business Support, Curaçao Representative, IOC/GOOS/UNESCO Scott Glenn, RUCOOL, Rutgers University, USA Douglas Wilson, Caribbean Wind LLC

11:15 – 11:30 **1615-1630UTC**	**Part 7** **CLOSING SESSION** **Moderator:** Marck Oduber
11:15 – 11:25	**Is our ToC plausible, feasible, and testable?** **Daniel Corsen,** D&I Business Support, Curaçao
11:25 – 11:29	**Update on upcoming Decade workshops** **Cesar Toro,** Head of IOC of UNESCO Subcommission for the Caribbean and Adjacent Regions- IOCARIBE, Colombia
11:29 – 11:30	**Closing remarks** **Marck Oduber,** WG3 Leader, Aruba

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, to secure the feasibility of ocean information and services which is the more important aspect that should be treated in a potential regional programme for the Western Tropical Atlantic Region?

a) Improving information access system for data sharing and interoperability
b) Enhancing inter institutional cooperation
c) Developing capacity building activities
d) Exploring financing mechanisms
e) Mobilize constituencies for national policy and community decision-making processes

POLL #3

In your opinion, on which of the core elements of ocean observation and data exchange, the UN Ocean Decade should focus its efforts in order to reduce the asymmetries between countries in the region and SIDS to obtain ocean information?

a) Ocean observation knowledge
b) Open access to data, information, and open source technologies
c) Specific products and services tailored
d) Dissemination and communication
e) All of them

9. ANNEX 4

UN Endorsed Programmes and other Programmes of Interest to The Predicted Ocean Working Group – For Cooperation and Interaction

The list of programs and initiatives that are relevant (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-Actions-No-012020).

The following are a list of programs and initiatives that are relevant:

- ❏ UN Decade Programme Ocean Best Practices
- ❏ UN Decade Endorsed Program – Coast Predict - Observing and Predicting the Global Coastal Ocean
- ❏ UN Decade Endorsed Program, The Nippon Foundation-GEBCO Seabed 2030 Project, a component is MACHC, Meso America and Caribbean Hydrographic Commission/IOCARIBE
- ❏ USA Decade Contribution - Committee on Earth Observation Satellite - Coastal Observation, Practices
- ❏ 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 though the communities for tsunamis UNESCO/IOC Tsunami Ready Programme;‘
- ❏ Coastal Flooding - Inundation Forecast Initiative in the Caribbean – RAIV, WMO WTA WG Accessible and Transparent
- ❏ Ocean Observing Co-Design: evolving ocean observing for a sustainable future
- ❏ Observing Together: Meeting Stakeholder Needs and Making Every Observation Count
- ❏ Ocean Practices for the Decade

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