The Ocean and Climate Nexus

• The ocean plays a key role in regulating the climate system producing oxygen, storing carbon, and absorbing anthropogenic heat. In turn, changes in the climate have significant impacts on the ocean, and coastal zones including ocean warming, acidification, deoxygenation, sea level rise, altering currents and oceanographic conditions, all of which have accelerated significantly in recent years, and all of which have significant impacts on peoples and economies.

• The wide range of impacts arising from climate change on the oceans and on peoples and economies in 183 coastal and island nations demands urgent action and investment to protect marine environments and peoples and economies and should be addressed at all levels of policymaking both for the survival of planetary health and for human well-being.
Oceans Day at the UNFCCC COP 21 Paris
December 4, 2015, Rio Conventions Pavilion, Le Bourget

The Oceans Action Event at COP 22
Oceans Action Day at COP 22 Marrakech, part of the Global Climate Change Agenda
12 November 2016 • Blue Zone (9:30–21:00)

COP 23 OCEANS ACTION DAY PROGRAM
Marrakech Partnership for Global Climate Action
23rd Session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change, Bonn, Germany

Oceans Action Day
Saturday, November 11, 2017 — 10:00 AM to 7:30 PM

Oceans Action Day at COP 24
December 8, 2018, International Congress Centre, COP 24, Katowice, Poland
Toward a Strategic Action Roadmap on Oceans and Climate: 2016 to 2021

Central Role of Oceans in Climate

Mitigation

Adaptation

Displacement

Financing

Capacity Development

Policy Recommendations on Oceans and Climate for Consideration at UNFCCC COP 22 and Beyond

Prepared with the support of:

Part of the Global Strategic Action Initiative on Oceans and Climate
Assessing Progress on Ocean and Climate Action: 2016-2017
A Report of the Roadmap to Oceans and Climate Action (ROCA) Initiative

Lead authors: Meredith Kier and Billiana Cicin-Sain, Global Oceans Forum and University of Delaware
With contributions from: Tarah Bahri, Food and Agriculture Organization of the UN; Milian Balgis, Global Oceans Forum; Dorothee Herre, IUCN; Peter Jonmeyr-Kake, IEEEA; Lisa Levin, Scripps Institution of Oceanography; Atsushi Sunami and Miko Markawa, OPRI-Japan; Carol Turley, Plymouth Marine Laboratory; Philippe Viallette, World Ocean Network; Manjo Yierme, Global Oceans Forum; John Vzedin, Duke University; Andrea Welber, European Commission

COP 23 Version for Comment
This report is issued as an interim version for consideration and comment the UNFCCC COP 23, Bonn Germany, especially at the Oceans Action Day at COP 23, part of the Marrakech Partnership for Global Climate Action

A final version will be following COP 23
Comments may be sent to Dr. Billiana Cicin-Sain, Global Ocean Forum, billiana.cicin-sain@globaloceans.org

ROCA Leadership

Initial Partners

Supported by the Oceano Azul Foundation, Portugal, and the Ocean Policy Research Institute of the Sasakawa Peace Foundation, Japan

Assessing Progress on Ocean and Climate Action: 2018
A Report of the Roadmap to Oceans and Climate Action (ROCA) Initiative

Authors: Billiana Cicin-Sain, Alexis Maxwell, Milian Balgis, Meredith Kier, Brian Cortes, Vanessa C.S. Knecht, Global Oceans Forum and University of Delaware; Carol Turley, Plymouth Marine Laboratory; Tarah Bahri, FAO; Dorothee Herre, IUCN; Kirsten Isensee, IOC, UNESCO; Peter Ricketts, Acadia University and Coastal Zone Canada; Atsushi Sunami, Miko Markawa, Mananori Kohyabushi, OPRI, Sasakawa Peace Foundation, Japan; John Vzedin, Duke University and ROCA; Torsten Thiele, Ocean Trust

*Coparticipants are participating in their informal capacities

COP 24 Version for Comment
This report is issued as an interim version for consideration and comment at the UNFCCC COP 24, Katowice Poland, especially at the Oceans Action Day at COP 24

A final version will be issued following COP 24
Comments may be sent to Dr. Billiana Cicin-Sain, Global Ocean Forum, billiana.cicin-sain@globaloceans.org

ROCA Leadership

Initial ROCA Partners

Supported by the Oceano Azul Foundation, Portugal, and the Ocean Policy Research Institute of the Sasakawa Peace Foundation, Japan
The IPCC Special Report on Global Warming of 1.5°C (2018)

--An outcome of the UNFCCC COP21, SIDS nations push for “1.5°C to stay alive”

--A landmark report with far reaching implications for all climate change action and with special relevance to oceans and coasts
The predicted impacts of climate change are coming much earlier than expected. We will most likely reach a warming of 1.5°C as early as 2030 and no later than 2052, posing immediate threats to peoples and ecosystems around the world, especially in 183 coastal countries and SIDS.

There is a marked difference between keeping to a 1.5°C scenario versus a 2°C scenario. Under a 1.5°C scenario, very adverse impacts may be avoided (displacement of millions of people due to sea level rise, increased frequency and intensity of storms, death of coral reefs).

Limiting global warming to 1.5°C will require "rapid and far-reaching" transitions in land, energy, industry, buildings, transport, and cities.
Implications of the IPCC 1.5ºC Report

Amjad Abdulla, Alliance of Small Island States and IPCC Board member noted: “….I have no doubt that historians will look back at these findings as one of the defining moments in the course of human affairs. I urge all civilized nations to take responsibility for it by dramatically increasing our efforts to cut the emissions responsible for the crisis and to do what is necessary to help vulnerable people respond to some of the devastating consequences we now know can no longer be avoided.”
US 2018 Climate Change Report

--Other reports evoke a number of points raised in the IPCC 1.5°C report

--For example, the US Climate Change report (November 2018) examines developments at a national level in the United States

--The US Report underlines that negative impacts of climate change are not a hypothetical future scenario but are already causing damages to US lives and livelihoods ……through a combination of ocean warming, sea level rise, ocean acidification, coastal erosion, more intense storm surge, and an increased number of heavy precipitation events
Agenda for Action

1. Approach the Oceans and Climate Issues in an Integrated Manner

2. Constantly Monitor and Assess the Impacts of Climate Change on the Oceans and on Coastal Areas and Peoples

3. Mobilize National and International Policy Responses to the Oceans and Climate Nexus
1. Address the Ocean and Climate Nexus in an Integrated Manner

- Ocean and climate issues should be addressed at all levels of policy (national, subnational, international) as an inter-related “package” of issues including *inter alia*:
  
  --Recognizing the central role of oceans in climate
  --Mitigation (e.g., ocean energy, Blue Carbon, reduce air emissions from ships)
  --Adaptation
  --Blue Economy
  --Population displacement
  --Financing
  --Capacity development
2. Constantly Monitor and Assess the Impacts of Climate Change on the Oceans and on Coastal Areas and Peoples
Troubling Trends

Ocean warming 2015, 2016, 2017 warmest years on record

Unprecedented tropical storms in 2017 and 2018

Tropical coral reefs unlikely to survive at current emission rates

Weakening Atlantic circulation
Troubling Trends Cont.

Continuing loss of Arctic sea ice

Acidity of the global ocean increasing 30% relative to pre-industrial times

Reduction in fish catch by 30% in tropics by 2050 with 1.4 billion people at risk
For SIDS the threat of sea level rise is four times the global average. Some face submergence and trillions of dollars in losses.

Increased population displacement due to environmental disasters and climate change–140 million people could be displaced by 2050.
Encouraging Policy Responses

70% of Nationally Determined Contributions address ocean and coastal issues

Increased commitment by the International Maritime Organization (IMO) to reduce 50% of emissions from shipping by 2050

Worldwide restoration of lost Mangroves resulting in avoided emissions

Increased effort of the Renewable Energy Agency (IRENA) in building energy independence for Small Island Developing States
Encouraging Policy Responses Cont.

World Bank 1 billion USD commitment to advance the sustainable oceans and Blue Economy agenda in developing countries

World’s largest offshore wind facility in the United Kingdom

New financing initiatives like the Blue Natural Capital Financing Facility (BNCFF) have emerged

The Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF) have increased adaptation projects and programs
Encouraging Policy Responses Cont.

Our Ocean Conference in Bali, Indonesia, resulted in 48 tangible and measurable commitments specifically regarding the blue economy.

The European Union has maintained investment supporting an All-Atlantic Ocean Research Alliance, with research teams from the Arctic to the Antarctic.

Emergence of private-sector finance, such as corporate climate bonds.
3. Mobilize National and International Institutions on the Oceans and Climate Nexus

- **National level:** Decarbonization of national economies, move to alternative sources of energy, address the impacts on coastal and island communities and economies

- **International level:**
  - Act within the UNFCCC and in other international fora
  - But difficult to advance the oceans and climate issues in UN fora given separate authorities on oceans, climate, biodiversity, etc.
Within the UNFCCC

A step by step approach was identified in 2018 to develop a vision and agenda related to the oceans and climate nexus for the period 2019-2021

1. Consider two IPCC Reports and their implications for mitigation and adaptation related to oceans and coastal and island populations

2. Consider points related to oceans and coasts in the Paris Rulebook and in the Global Stocktake

3. Support the ocean content and ambition of Nationally Determined Contributions (NDCs)

4. Enhance Ocean financing to support nations in addressing the multiple and difficult challenges they are facing, and systematic understanding of the existing patterns of financial flows
How to Achieve an Ambitious Outcome at the UNFCCC on the Oceans and Climate Nexus?

• **Possible modalities:** A COP25 Agenda Item to “Facilitate the Coordination of Measures on Oceans, Coastal Zones, and Climate Change”? Development of a Work Programme? Requests to SBSTA/SBI to assess the issues and develop a coordinated approach? Other?

• **Briefing memo on a possible Agenda Item** option on the coordination of measures on oceans and climate
  • draft language for the request of an Agenda Item
  • why the Agenda Item would be useful
  • possible modalities for the requested action
  • possible evolution of the process at COP25 and beyond
  • lessons learned from other cases
Why Is Bold Action Needed Now?

• Relevant scientific reports—including the Intergovernmental Panel on Climate Change (IPCC) AR5 report and the IPCC special report on global warming of 1.5°C (SR1.5)—have clearly documented the vulnerability of marine ecosystems and coastal zones to climate change, and the subsequent impacts to coastal and island communities around the world.

• While there is some discussion/work in various bodies and processes of the UNFCCC on the oceans and climate nexus, these are largely of a piecemeal nature and do not add up to a whole, and do not correspond to the magnitude and importance (environmental, social, and economic) of the oceans and climate nexus.
What Needs to be Addressed Within the UNFCCC

The combined impacts of climate change on oceans, coasts, islands, peoples, and economies must be addressed through an integrated perspective, including, inter alia:

-- Recognition of the central role of oceans in climate and the implications of possible changes in this role

-- Accounting for ocean-based mitigation approaches while securing environmental integrity (such as reduction of GHG emissions from ships, renewable energy, blue carbon)

-- Deploying a wide variety of adaptation measures to safeguard people, economies, infrastructure in coastal and island areas, especially based on ecosystem approaches and integrated coastal and ocean management institutions and in collaboration with disaster risk agencies

-- Fostering low carbon blue economies and coordinating with SDG14 activities

-- Addressing the issues of human displacement, with appropriate legal frameworks and financial support
What Needs to be Addressed Through the UNFCCC

--**Providing adequate financing** to support the needed mitigation and adaptation actions
--**Building the capacity and education needed** to address the implications of all aspects of the climate and ocean nexus
--**Promoting coordinated Research and Observations**, how nations can cooperate more effectively to understand ocean and climate change interactions and their societal implications
--**Addressing Technology Transfer**, what systems can be shared and how can technology be disseminated that can help ocean adaptation and mitigation
--**Encouraging the inclusion of oceans in Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs) and in Biennial Transparency Reports (BTRs)**, how Parties can include oceans in their NDCs, NAPs, and BTRs, and integrate these with the Enhanced Transparency Framework of the Paris Agreement
Within Other UN and International Fora

Work and discussions on the oceans and climate nexus taking place in the context of the UNFCCC must also be synchronized and coordinated with oceans and climate initiatives in other UN fora

--2019 UN Secretary General’s Climate Summit

--2020 projected UN Ocean Conference

--Release of the IPCC Report on Ocean and the Cryosphere, September 2019

--Work on the *Decade of Ocean Science for Sustainable Development*

--Implementation of Agenda 2030 (especially Goal 14 (oceans) and Goal 13 (climate change))

--UN negotiations on BBNJ

Increased informal efforts led by specific nations

--Our Ocean Conferences in Norway in 2019, and Palau in 2020
The IPCC Ocean and Cryosphere Report

• The IPCC Report on the Ocean and Cryosphere, to released in September in Monaco, will give us a key opportunity to focus the world’s attention on the effects of climate change on oceans and coasts and how we address these impacts

• Efforts underway to bring key journalists and key scientists together to interpret and widely disseminate the findings
In Conclusion

• We must do our work with a great sense of urgency. A changing climate and continued loss of biodiversity in our oceans and coasts, is a powerfully negative combination that threatens our planetary survival and our human well-being.

• The time to act is now, not tomorrow. As the very young people exemplified by young Helga of Sweden have said—"Your lack of action is denying us our future." This just cannot be.
Acknowledgements--COP 24 and 2018 Progress Report Support


**Progress Report 2018 Contributors:** Biliana Cicin-Sain, Alexis Maxwell, Miriam Balgos, Meredith Kurz, Brian Cortes, Vanessa C.S. Knecht, Global Ocean Forum and University of Delaware; Carol Turley, Plymouth Marine Laboratory; Tarub Bahri, FAO; Dorothee Herr, IUCN; Kirsten Isensee, IOC, UNESCO; Peter Ricketts, Acadia University and Coastal Zone Canada; Atsushi Sunami, Miko Maekawa, Masanori Kobayashi, OPRI, Sasakawa Peace Foundation, Japan; John Virdin, Tibor Vegh, Duke University and ROCA; Torsten Thiele, Ocean Trust
Avoided Impacts: Guiding AMBITION in mitigation and adaptation

Hans-O. Pörtner,
CLA Ocean Systems AR5 WGII Ch. 6
AR5 Synthesis Report
Co-Chair IPCC WGII AR6
Impacts of global warming: Where do we want to go?

At 1.5°C compared to 2°C:

- Clear differences in climate and extremes between today, a 1.5°C and a 2°C warmer world
- Less impacts from extreme weather where people live
- By 2100, global mean sea level rise will be around 10 cm lower .... but will continue for centuries
- 10 million fewer people exposed to risk of rising seas, ...less coastal ecosystems exposed
Where do we want to go?

At 1.5°C compared to 2°C:

- Smaller reductions in yields of maize, rice, wheat and sorghum
- Global population exposed to water stress is up to 50% less, also less water stress for ecosystems
- Up to several hundred million fewer people exposed to climate-related risk and susceptible to poverty by 2050
- Lower impact on biodiversity and species
  - High risk of losing 70-90% of warm water coral reefs and their services to humankind, even higher at 2°C
Vulnerable ecosystem identified in AR5 and SR1.5

Warm water coral reefs under various pressures

Even in a 1.5°C warmer world.... high risk of losing 70 to 90% of coral reefs and their services to humankind; ... even higher losses at 2°C

Verons 2009
Large changes in community composition expected driven by local invasions and losses.

Drivers of change: Warming and velocity.

+2°C

RCP4.5 versus 8.5

+4°C

Garcia-Molinos et al. 2017 NCC
Where do we want to go?

• At 1.5 and even more so at 2°C, there is disproportionately high risk for Arctic, dryland regions, small island developing states and least developed countries.

At 1.5°C compared to 2°C:

• Lower risks for health, livelihoods, food security, water supply, human security and economic growth.

• A wide range of adaptation options can reduce climate risks; less adaptation needs at 1.5°C.
Impacts and risks associated with the Reasons for Concern (RFCs)

Confidence level: M, medium; H, high; VH, very high

IPCC SR1.5, 2018
...half a degree matters... every bit of warming matters....
... for ecosystems, biodiversity and humankind

Impacts and risks for selected natural, managed and human systems

Confidence level: M, medium; H, high; VH, very high

IPCC SR1.5, 2018
ADAPTATION and MITIGATION measures can bring their own risks: Different pathways and mitigation strategies have variable needs for negative emission technologies, e.g. BECCS, Bioenergy and Carbon Capture and Storage.

Delayed emissions reduction may increase the need for BECCS....

Risks for ecosystems, biodiversity, food security.
Impacts of adaptation and mitigation measures guiding choices

Ambitious emissions reductions would have...

• Co-benefits for
  • Human health
  • Reduced competition for land (BECCS)
  • Food security for humankind
  • Ecosystem restoration and carbon storage (soils and biomass, blue carbon)
  • Biodiversity conservation
1.5°C facilitates reaching SDGs: Multiple synergies between mitigation and adaptation technologies
The Paris agreement provides a sense of urgency: Overcoming societal inertia, political paralysis and inaction in transformation....

Feasibility at various levels:

- Keeping warming to 1.5 according to the laws of chemistry and physics ---- yes
- Technologies to support mitigation and adaptation measures ---- yes
- Redirection of financial flows ---- yes (stopping fossil fuel subsidies)
- Informed policy leading and directing societal transformation ---- may be .....?

BOTTLE NECK
For minimizing impacts and associated risks

Every bit of warming matters
Each year matters
Each choice matters
Political and societal will matters
Thank you for your attention

For more information:
Website: http://ipcc.ch/
IPCC Secretariat: ipcc-sec@wmo.int
IPCC Press Office: ipcc-media@wmo.int

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http://www.slideshare.net/ipcc-media/presentations
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https://www.flickr.com/photos/ipccphoto/sets/
https://vimeo.com/ipcc
Science Addressed in the IPCC Special Report on The Ocean and Cryosphere in a Changing Climate

Dr Carol Turley OBE, Plymouth Marine Laboratory

SBSTA 50, June 2019
2007: AR4 WGII Ocean acidification mentioned for the first time, 2 pages for ocean ecosystems + coral reef box (Lead Author)

2011: IPCC Expert Workshop on the *Impacts of Ocean Acidification on Marine Biology and Ecosystems* (Lead Author)

2014: AR5 Ocean and ocean acidification received far greater attention (2 Chapters in WGII) (Review Editor)

2018: SR1.5: – Special Report on Global Warming of 1.5°C

2019: SROCC: Special Report on the Ocean, Cryosphere and Climate Change (Review Editor)

2021: AR6 Assessment, due 2021
Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC): the process

- **December 2015 (COP21):** Proposal to IPCC for a Special Report on the Ocean & Climate
- **April 2016:** IPCC Panel agrees to prepare a Special Report on climate change and the oceans and the cryosphere
- **December 2016:** Scoping Meeting hosted by Monaco for experts to the draft the outline for the report
- **March 2017:** IPCC Panel approved the outline of the Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC) under the joint scientific leadership of Working Groups I and II with support from the WGII Technical Support Unit
Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC): the process

- **October 2017 – March 2019**: 4 x Lead Author Meetings (Fiji, Ecuador, China & Russia)
- **4 x Drafts** (first internal)
- **3 x External Reviews** (by Experts and Governments)
- **14 June - 9 August 2019**: Final Draft out for Final Government Review
- **20-23 September 2019**: 51st Session of the IPCC: Approval of the Summary for Policymakers, accepting the underlying Report – in time for COP25
Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC): the process

An objective assessment by experts, of the latest literature, since AR4 and SR1.5, to assess the current state of the Ocean environment, societal vulnerability and what actions can be taken to mitigate and adapt to these aspects of human-induced climate change.
Special IPCC Report on the Ocean and Cryosphere in a Changing Climate (SROCC): the Chapters

Summary for Policymakers
Technical Summary

- **Chapter 1**: Framing & Context of the Report
- **Chapter 2**: High Mountain Areas
- **Chapter 3**: Polar Regions
- **Chapter 4**: Sea Level Rise & Implications for Low Lying Islands, Coasts & Communities
- **Chapter 5**: Changing Ocean, Marine Ecosystems, & Dependent Communities
- **Chapter 6**: Extremes, Abrupt Changes & Managing Risk
- **Cross-Chapter Boxes**: Including Low Lying Islands & Coasts
IPCC SR1.5: Risk level assessed between 1.5 and 2°C

Current *NDCs deliver over 3°C warming

<table>
<thead>
<tr>
<th>Coastal and marine organisms</th>
<th>Global mean surface temperature change relative to pre-industrial levels (°C)</th>
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<tbody>
<tr>
<td>Seagrasses (mid latitude)</td>
<td>H</td>
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<tr>
<td>Mangroves</td>
<td>H</td>
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<tr>
<td>Warm water corals (high latitude)</td>
<td>VH</td>
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<tr>
<td>Pteropods (mid latitude)</td>
<td>M</td>
</tr>
<tr>
<td>Bivalves (mid latitude)</td>
<td>M</td>
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<tr>
<td>Krill (high latitude)</td>
<td>M</td>
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<td>Finfish</td>
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</tbody>
</table>

SROCC will go further, include more ecosystems: including the deep ocean, sandy beaches, rocky reefs, estuaries and kelp forests
It is clear: ocean is at the frontline of climate change

... multiple impacts often occurring at the same time and place

- Islands and coasts as well as open and deep ocean
- Multiple hazards that comprise compound or sequential characteristics
- Community vulnerability & exposure to compound risk & cascading impacts
- Adaptation & mitigation choices/actions
- Local to global Governance options & policy choices

In one unique assessment – SROCC 20-23 September 2019
It is clear: ocean is at the frontline of climate change
... multiple impacts often occurring at the same time and place

Directly relevant to CO₂ emissions and the UNFCCC [Article 2, UNFCCC]

- Islands and coasts as well as open and deep ocean
- Multiple hazards that comprise compound or sequential characteristics
- Extreme & abrupt changes
- Community vulnerability & exposure to compound risk & cascading impacts
- Adaptation & mitigation choices/actions
- Local to global Governance options & policy choices

- In one unique assessment – SROCC 20-23 September 2019
The Ocean and the UNFCCC: Why it should it be included in the implementation of the Paris Agreement

- The ultimate objective of UNFCCC:
  
  "to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.
  
  [Article 2, UNFCCC Convention]

- The ocean is clearly part of the "climate system" defined by the UNFCCC as:
  
  "totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions"

- The UNFCCC therefore has responsibility for GHG impacts on the ocean
The Ocean and the UNFCCC: Why it should it be included in the implementation of the Paris Agreement

- 2007- present: IPCC includes the ocean in all its assessment and coverage increasing

- 2010: Ocean Acidification was mentioned in the Cançun Agreement (outcome document from UNFCCC COP 16) as a “slow onset event”

- 2015: the ocean and its ecosystems included in the preamble of the PA

- Some nations are more concerned about ocean impacts than other climate indicators

- 2018: Four ocean measures becomes part of WMO’s ‘Global Climate Indicators’ (ocean acidification, sea level, ocean heat and surface temperature)

- A challenge for hosts of COP25 & 26: Adopt the WMO Global Climate Indicators into the implementation of the Paris Agreement (under the ‘global stocktake’ mechanism) to they would become other measures to inform policy choices on emission limits and adaptation strategies and ensure its greater consideration in the development of NDCs.
So what do we need to do?
Nations need to take the ocean into account and to:

- **Take unprecedented action** on greenhouse gas emissions over next 10 years to achieve net-zero emissions by 2050

- **Include the ocean** in the implementation of the Paris Agreement via **inclusion ocean change measures in the Global Stocktake**, ocean NDCs and funding ocean actions

- **Preserve carbon sinks** such as peatlands, mangroves, sea grass meadows, salt marshes and even our shelf sea sediments

- **Reduce other stressors** such as pollution and poor management and through **smart MPAs**

- **Increase international collaborative efforts on observation of ocean change** so that society and policy makers are forewarned and forearmed

Network of 506 scientists from 83 countries. All welcome: www.goa-on.org
Thank you
ct@pml.ac.uk

More information see: www.oceansofimpact.global
How to Translate Ocean Science Into UN System Action

Addressing the IPCC Findings Relevant to the Ocean and Climate Nexus
Bonn UN Climate Change Conference June 2019 (SB 50) – Tuesday, June 25, 2019, 18:30 to 20:00, Berlin Room

Kirsten Isensee
Programme Specialist
IOC-UNESCO
k.isensee@unesco.org
Role of Science?
Article 4 (‘Commitments’)
[All Parties shall:]

(d) Promote sustainable management, and promote and cooperate in the conservation and enhancement ... of sinks and reservoirs of all greenhouse gases ..., including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems

(g) Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies

Role of Ocean Science to help Member States to fulfil this role - IOC’s uniquely singled out mandate on ocean science (research and observation) and promotion of international cooperation in ocean science
Article 5 (‘Research and Systematic Observation’)

[Parties shall:]

(a) Support and further develop, as appropriate, international and intergovernmental programmes and networks or organizations aimed at defining, conducting, assessing and financing research, data collection and systematic observation, taking into account the need to minimize duplication of effort;

(b) Support international and intergovernmental efforts to strengthen systematic observation and national scientific and technical research capacities and capabilities, particularly in developing countries, and to promote access to, and the exchange of, data and analyses there of obtained from areas beyond national jurisdiction; and

(c) Take into account the particular concerns and needs of developing countries and cooperate in improving their endogenous capacities and capabilities to participate in the efforts referred to in subparagraphs (a) and (b) above.

- World Climate Research Programme
- Science in the areas of ocean acidification and de-oxygenation (GOA-ON, GO₂NE)
- Global Climate Observing System - Global Ocean Observing System
- Capacity development programme in ocean science
Article 9 (‘Subsidiary Body for Scientific and Technological Advice’)

[SBSTA shall:]

(d) Provide advice on scientific programmes, international cooperation in research and development related to climate change, as well as on ways and means of supporting endogenous capacity-building in developing countries.

Scientist via intergovernmental bodies, such as IOC inform SBSTA and the UNFCCC as a whole and contribute to the operationalization of specific provisions of the Convention that relate to the work of SBSTA.
Preamble
Noting the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity, recognized by some cultures as Mother Earth, and noting the importance for some of the concept of “climate justice”, when taking action to address climate change

Articles 4 (nationally determined contributions – NDCs) and 6 (cooperation in the implementation of NDCs)

General ‘justification’
Blue Carbon activities, e.g. Blue Carbon Initiative, Nature based Solution, and the application and promotion of the IPCC Wetlands Supplement
Article 7 (cooperation for adaptation)

Para. 7: Parties should strengthen their cooperation on enhancing action on adaptation, taking into account the Cancun Adaptation Framework, including with regard to:

(c) **Strengthening scientific knowledge on climate, including research, systematic observation of the climate system and early warning systems**, in a manner that informs climate services and supports decision-making

- scientific and technical work in the area of research and systematic observations of multiple ocean stressors, marine spatial planning and ecosystem-based management
- Research in the areas of ocean acidification and de-oxygenation
- Global Ocean Observing System
- Early warning of tsunami events and other ocean hazards

Article 10 (technology)

Para 5: **Accelerating, encouraging and enabling innovation is critical for an effective, long-term global response to climate change and promoting economic growth and sustainable development.** Such effort shall be, as appropriate, supported, including by the Technology Mechanism and, through financial means, by the Financial Mechanism of the Convention, for collaborative approaches to research and development, and facilitating access to technology, in particular for early stages of the technology cycle, to developing country Parties.

- Capacity development programmes in ocean science
- The IOC Guidelines for the Transfer of Marine Technology
1 July 2019, IOC Assembly
Decision on Contribution of IOC to the UNFCCC
IOC-XXX, Dec.5.2
Promoting decision-making based on best available science: Blue carbon as a case

Mai FUJII
Research Fellow,
Ocean Policy Research Institute (OPRI),
Sasakawa Peace Foundation (SPF), Japan
SPF-OPRI: Ocean Policy think tank in Japan

Minato-city, Tokyo

**Mission:** Establishing ocean governance to make our ocean sustainable

**Comprehensive Ocean Policies**
- Research project on compiling and promoting comprehensive ocean policies

**Maritime Security**
- Promoting Maritime Security Cooperation
- Maritime Security Information Report
- Collection and dissemination of information on Island Studies

**Conservation of the Ocean Environment**
- Marine biodiversity conservation and resource use
- Research on adaptation measures for global warming and ocean acidification

**Arctic Ocean**
- Study on Effective International Cooperation to Arctic Governance

**Ocean Education**
- Project for enhancing ocean education in the Japanese school system

**Human Resource Development for Maritime Fields**
- Promotion of International Cooperation in Ocean Related Fields (WMU)

**Blue economy**
- Promoting blue economy

**Publicizing information on the Oceans**
- Publication of Ocean News Letter
- Hosting of Ocean Forum
- Publication of White Papers on the Oceans
Promoting decision-making based on best available science

Science-policy interfaces e.g. IPCC

Increased credibility/legitimacy of the produced and used knowledge

Enriched decision-making

UNFCCC/COP, CMP, CMA
UNFCCC/SB
IPCC/Plenary
IPCC/draft review
IPCC/LA meetings
Science Community

Policy (Policy-makers’ initiative)

(scientists’ initiative)
Science

©Wynanda I. van Enst (2018)
What is Blue Carbon?

Blue carbon is the carbon captured by living organisms in coastal (e.g., mangroves, salt marshes, seagrass meadow) and marine ecosystems, and stored in biomass and sediments. (IPCC SR1.5 Glossary p.543)
## Co-benefits of Blue carbon in IPCC SR1.5

Existing and restored natural coastal ecosystems may be effective in reducing the adverse impacts of rising sea levels and intensifying storms by protecting coastal and deltaic regions (medium confidence). (Chap.3, p.181)

<table>
<thead>
<tr>
<th>Poverty and development (1.1/1.2/1.5)</th>
<th>Food production (2.3/2.4)</th>
<th>Integrated Water Resource Management (6.3/6.5)</th>
<th>Ocean Acidification (14.3/14.1)</th>
<th>Conservation Of biodiversity Restoration Of land (15.1-15.4/15.9)</th>
</tr>
</thead>
</table>
| -save ecosystem services from mangrove in South-East Asia  
-provide employment (seaweed aquaculture)  
-etc | -save ecosystem services from mangrove including fisheries in South-East Asia  
-Increase income and well-being (greening aquaculture)  
-etc. | -can lead to coordinated management of water in coastal areas | -could buffer acidification in their immediate vicinity (mangrove) | -average difference of 31mm year in elevation rates between areas with seagrass and unvegetated areas  
-mangroves fostering sediment accretion of about 5mm a year |

Extracted from SR1.5 Chap.5, Table5-2
Blue Carbon in UNFCCC

- **Convention Article 4.1(d)** “All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:

  (d)…Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems

- **Kyoto Protocol Article 3.3 and 3.4**

- **Paris Agreement Preamble**
  “Noting the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity…”

- **Paris Agreement Article 5(1)**
  “Parties should take action to conserve and enhance, as appropriate, sinks and reservoirs of greenhouse gases as referred to in Article 4, paragraph 1(d), of the Convention, including forests. “
Blue Carbon in IPCC Guidelines for national GHG inventories: 2013 Wetlands Supplement

2006 IPCC Guidelines for National Greenhouse Gas Inventories

Latest Findings

- macroalgal beds
- tidal flats
- coral reefs
- urban embayments
Blue Carbon in Japan

- The first estimate of Blue Carbon sink potential in Japan, by Working Group on blue carbon (March 2018)

1.73 to 6.79 million tonne CO2/year in 2013
2.04 to 9.1 million tonne CO2/year in 2030

- Establishment of expert committee on role of blue carbon to contribute to combat climate change under Ministry of Land, Infrastructure, Transport and Tourism (June 2019)

- “seeking the possibility of blue carbon as carbon sink” in Japan’s Long-term Strategy under the Paris Agreement (Cabinet decision, 11 June, 2019)
OPRI Blue Carbon Project

Objectives:

- Promote establishment of BC including seagrass and macroalgal beds as Japan’s (and eventually world’s) ocean policy package
- Follow domestic and international BC policy discussions and disseminate/share the useful information

Blue Carbon sequestration (PARI)

Co-benefits (OPRI-SPF)

Clam digging

Squid eggs
Blue Carbon side event at COP24

December 7, 2018
Blue Carbon: Linking the Latest Science and Policies
14:45 – 15:20 Japanese Pavilion
25528, The Ocean Policy Research Institute of Tokyo, Tokyo Metropolitan University, Conservation International, Global Ocean Forum, IUCN, IOC-UNESCO.
Details: Highlighting the latest science, this event will launch the book on Blue Carbon science and applications and discuss the implications for national and international policies.

December 11, 2018
Blue Carbon: Mangrove Rehabilitation and Coastal Resilience
11:00 – 12:30 Indonesian Pavilion
25529, Indonesia, Coordinating Ministry of Maritime Affairs, CPMI.
Details: Mobilizing a wide range of stakeholders to move toward real actions for the betterment of Indonesian coasts and people.

December 11, 2018
International updates on Blue Carbon Science and Knowledge
17:00 – 18:00 Korean Pavilion
25530, Korea Marine Environment Management Corporation, Government of Australia, BIOC.
Details: Sharing lessons from integrating the latest science into blue carbon inventories, national policies, and scientific priorities.
OPRI’s activity to support decision-making based on science.

Distribution of $\Omega$ (2100) for RCP8.5 (CMIP5).

Red area: $\Omega<1$

Marine Crisis Watch prototype.
Thank you

Photo: blue carbon project site (Yokohama-city)

Contact: m-fujii@spf.or.jp
Chile’s Vision on Ocean and Coasts for COP25
INCOME PRESIDENCY

Time for Action

CLIMATE ACTION DEPENDS ON ALL OF US

TIME FOR ACTION IS NOW
DECEMBER 2ND TO 13TH

- Greater levels of Ambition
- Paris Agreement Work Programme
- Time for implementation
- 7 priority topics: OCEAN
Chile and the oceans

Past Initiatives
- Ocean Pathways (Fiji)
- Friends of the Ocean
- ROCA
- Because the Ocean Declarations
- OA Alliance

- Participation in Our Ocean Conferences
- Because the Ocean Declarations
- 42% of Marine Protected Areas
- 7 of the 9 conditions of vulnerability to Climate Change
DISCUSSION SPACE

WORK UNDER THE CONVENTION

PARTY-DRIVEN

Vision

- Opportunity to bring the ocean topic to the discussion under the UNFCCC.
- Existing process related to ocean in the UNFCCC:
  - Nairobi Work Programme
  - WIM
  - Marraketch Partnership
With the consideration of:

1. Learning from previous experiences:
   - Gender-
   - Local communities and indigenous people-

2. Science as a fundamental piece for the process. IPCC Special Report on the Ocean and Cryosphere

3. Creating synergies with other international instances: SG Climate Summit, the PreCOP and the next Our Ocean Conference

4. Listening to the parties and the specialized groups.
TIME FOR ACTION