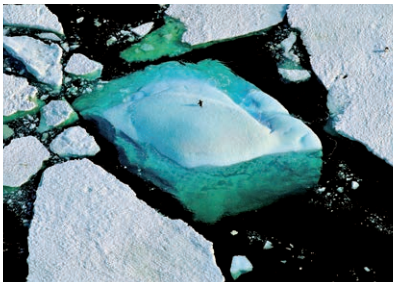
Ocean & Climate Initiatives Alliance

MEASURING PROGRESS ON OCEAN AND CLIMATE INITIATIVES:

AN ACTION-ORIENTED REPORT






"A united ocean action for a global climate agenda"

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Author: Loreley Picourt, Head of Initiatives, Ocean and Climate Initiatives Alliance
With the contribution of: Claire de Courcy-Ireland and Victor Brun
With the help of: IRENA (Peter Journeay-Kaler, Roland Roesch); MEdPAN (Chloë Webster); MPA-ADAPT (Maria Del Mar Otero); Ocean and Climate Platform (Steering Committee); T-MEDNET (Joaquim Garrabou, Nathaniel Bensoussan).
Graphic design: Elsa Godet, www.sciencegraphique.com
Suggested citation: Picourt, L., de Courcy, C. and Brun, V. *et al.*, (2017), *Measuring Progress on Ocean and Climate Initiatives: An Action-Oriented Report*, OCEAN AND CLIMATE PLATFORM.

ACKNOWLEDGEMENTS

Leading partners:
Ocean and Climate Platform; French Agency for Biodiversity (AFB); Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) and French Ministry for Ecological and Inclusive Transition.

List of member initiatives:
African Package for Climate Resilient Economies; Blue Belt; Climate Risks and Early Warning Systems (CREWS); Deep Ocean Mitigation and Adaptation (DOSI-DOOS); European Maritime Regions Facing Climate Change; Global Coral Reef Partnership of UN Environment and Regional Seas; Global Ocean Acidification Observing Network; International Alliance to Combat Ocean Acidification; International Coral Reef Initiative; Lighthouses Initiative (IRENA); MPA-ADAPT; MPAs Climate Change Sentinels; Navigating a Changing Climate; Ocean, Climate and Human Mobility; The Global Mangrove Alliance; The International Blue Carbon Initiative; T-MEDNet; Small Islands Organization (SMILO); West Africa Coastal Area Management Program (WACA).

November 2017

FOREWORD

The oneness of Ocean and Climate is the fundament in which we exist. The Ocean gives us life, oxygen to breathe, and rain to replenish the land upon which our food supplies depend.

The fundament is changing. While the world is facing up to the challenges of Climate Change, we must also address the realities of Ocean Change. Accumulated human activities have created the rise in greenhouse gases that is causing warming atmospheric temperatures, resulting in corresponding warming of the Ocean, deoxygenation and acidification. At the same time, sea levels are rising inexorably, marine and coastal ecosystems are being degraded, unsustainable fishing practices persist, and marine pollution is reaching unconscionable levels.

Restoring Ocean's health and safeguarding its many gifts, requires us all to collaborate and invest our energies, solutions and resources into sustaining the balance and integrity of the Ocean. We must constantly remind ourselves that the Ocean is the source of all life, and that to ensure a stable future for humankind, Climate Action and Ocean Action are the two great demands of the 21st Century.

Since the 21st Conference of the Parties of the United Nations Conference on Climate Change, which resulted in the inclusion of the Ocean in the Paris Agreement and the subsequent Global Climate Action Agenda, we have galvanized international attention. The Ocean Conference, held at the United Nations in New York in June 2017, brought forth a universal call for action in support of the Ocean.

These are the years for action and implementation. These are the years of inclusivity, with communities of action partnering up the scientific community, non-governmental organisations, intergovernmental organisations, the private sector and States in a common endeavor to conserve and sustainably manage the resources of the Ocean.

It is laudable that the Ocean and Climate Initiatives Alliance gives emphasis to the need for cooperation and unity in achieving greater impact for Ocean and Climate Action. While respecting the intrinsic nature of each initiative, OCIA brings together actors from all sectors and is founded on a strong science-based approach to adaptation and mitigation. OCIA provides an open, inclusive and collaborative platform to share these objectives, highlight solution-oriented initiatives and catalyse action.

OCIA member initiatives are working to enhance scientific knowledge, support on-the-ground action, strengthen international and national mobilisation, and significantly raise consciousness of Ocean and Climate interlinkages. The Climate-Ocean nexus is absolutely critical for us all. Understanding it better requires greater resourcing of, and attention to, the underlying science, heeding findings, and applying responsible solutions to identified problems.

Everyone should know that there is a plan to save the Ocean, one that all Member States of the United Nations adopted in 2015. I refer to Sustainable Development Goal 14, and urge all to be familiar with it and work towards its implementation

Peter Thomson, *UN Special Envoy for the Ocean*

EXECUTIVE SUMMARY

The first Report of the Ocean and Climate Initiatives Alliance on "*Measuring Progress on Ocean and Climate Initiatives: An Action-Oriented Report*" provides an overview of ocean-based solutions for climate change adaptation and mitigation within the framework of the Global Climate Action Agenda. The report presents a comprehensive analysis of actions led by international initiatives to move from political momentum to implementation of action through multi-stakeholder partnerships. The present report maps advances made by initiatives on ocean and climate action and identifies the future roles of OCIA in ensuring effective and multilateral cooperation.

Context

Climate change will have major impacts on the ocean, its ecosystems, maritime activities and coastal populations. Simultaneously, the ocean is a source of adaptation and mitigation solutions. In light of this ambivalent observation, a strong international coordinated mobilisation of State-actors, the scientific community and civil society arose around the ocean and climate thematic prior to the United Nations Framework Convention on Climate Change COP21 and until COP22. This momentum led to the integration of the ocean into the Paris Agreement at COP21 and followed a year later by the inclusion of the ocean into the Global Climate Action Agenda at COP22. Within this context of broad mobilisation, the Ocean and Climate Platform advocated to expand the scale of action by bringing together all ocean and climate actors within an international alliance. The Ocean and Climate Initiatives Alliance was launched on 22 February 2016, with the support of the Intergovernmental Oceanographic Commission of UNESCO and France.

The Ocean and Climate Initiatives Alliance

The Ocean and Climate Initiatives Alliance is fully integrated in the Global Climate Action Agenda, which aims at supporting engagement of non-party actors and creating the necessary tools to achieve the goals of the Paris Agreement. By uniting parallel and ongoing initiatives under a joint action framework, OCIA intends to drive momentum for concrete ocean-based solutions in the implementation of mitigation and adaptation measures. OCIA is actively working to contribute to the 2030 Agenda for Sustainable Development, especially to reinforce ocean resilience by working to meet the UN Sustainable Development Goal 14 – to conserve and sustainably use the oceans, seas and marine resources for sustainable development. OCIA brings together 19 initiatives, involving 272 members, including 90 member states, with on-the-ground projects operating in 38 countries.

Thematic Coverage

The OCIA Report provides an overview of 7 themes to highlight the diversity of ocean and climate actions: Ocean acidification; Marine protected areas; Marine ecosystem resilience; Coasts and coastal populations; Climate change and migrations; Sustainable islands and Small Island Developing States and; Science.

Method and Survey Analysis

The sample in this research was designed to represent a heterogeneous group of initiatives in all parts of the world with clear significance in terms of contributions to climate mitigation and adaptation. Data was obtained from surveys to identify, for each initiative: Background information; Objectives; Results; Measuring progress and; Expectations from OCIA. 13 initiatives responded to the survey and constituted the database for further analysis.

The analysis of the surveys shows that all initiatives have started to adopt multiyear strategic plans, some have been approaching the implementation of their initiative on an ad-hoc and incremental basis. Analysis of the internal outputs, external outcomes and impacts shows a strong emphasis on outreach, capacity-building and knowledge management and development. There is more variation in the approaches to monitor and evaluate progress. All initiatives rely on a strong scientific-basis and contribute to enhancing our understanding of ocean functions and climate change. Finally, the analysis identifies institutionalised linkages with policy-makers in the respective regions of the initiatives, with contributions to national plans embedded in the overall objectives.

Conclusions and Recommendations:

The OCIA Report sets out to provide an overview of the ocean and climate initiatives under the Global Climate Action Agenda, with an emphasis on progress since COP21 in December 2015. The Report presents key achievements made by OCIA initiatives, including key adaptation and mitigation impacts, and contributions to enhancing scientific understanding of ocean and climate interlinkages.

Building on the analysis and the inputs from OCIA initiatives, the Report concludes with three strategies for the continuation of the Ocean and Climate Initiatives Alliance at COP23, in Bonn, and beyond, including:

- Shaping a universal ocean language
- Providing complementarity between creation of scientific knowledge and policy-making
- Strengthening communication around specific ocean issues

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INTRODUCTION

The ocean is instrumental in regulating the climate system[1,2]. Diverse mechanisms interact with one another to produce ocean circulation, which in turns, absorbs and transports heat, carbon, nutrients and freshwater all around the world[3]. The ocean absorbs more than 25 % of the anthropogenic CO_2 and 93% of the excess heat emitted annually into the atmosphere[4,5]. When the planet gets warmer, the ocean stores most of the energy received[6].

Covering 71 % of the globe, the world ocean is a complex ecosystem which provides essential services for the maintenance of life on Earth. The ocean is host to very stable and homogeneous biodiversity hotspots. For instance, in coral reef ecosystems, over a thousand different species can be found per square meter[7]. However, marine biodiversity is considerably altered by the cumulative effect of local stressors (i.e. pollution, over-fishing, tourism, etc.) and global stressors (i.e. ocean warming and acidification). It is estimated that 29% of fish stocks are fully- or over-exploited[8]. By 2100, if no significant change occurs, "more than half of the world's marine species may stand on the brink of extinction[9]".

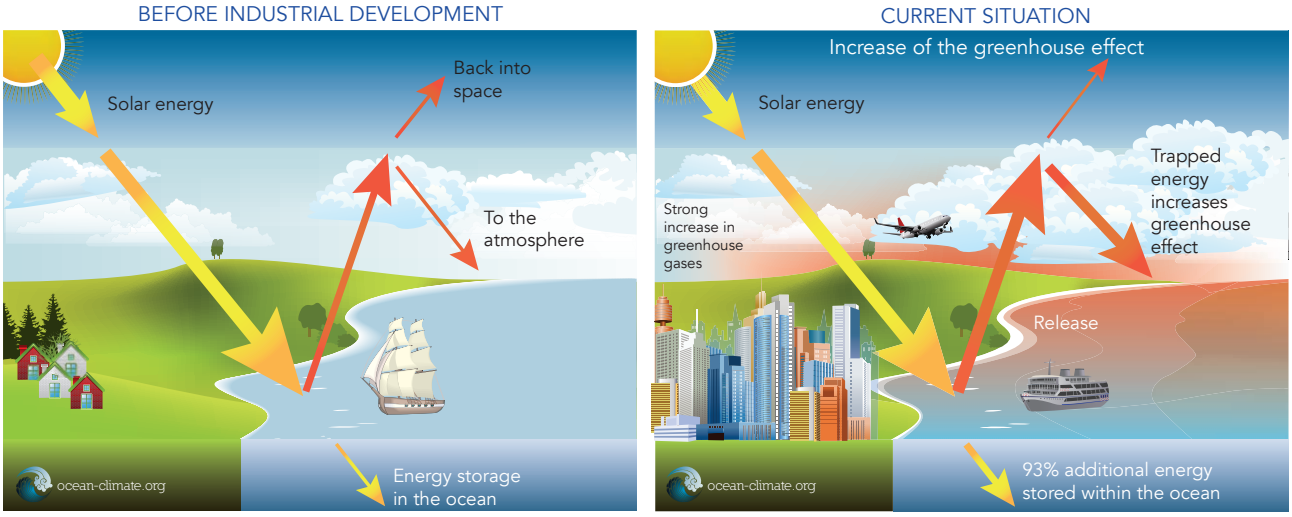

Fig.1 – Impacts of increases in greenhouse gases (GHGs) since the Industrial Revolution. As the concentration of GHGs increases, more energy from solar radiation is trapped into the atmosphere, causing a rise in its temperature. However, most of this additional energy is stored in the ocean, thus greatly mitigating the rise in the atmosphere's temperature.

Additionally, climate change is affecting the phytoplankton, which absorbs CO_2 and produces a high amount of the oxygen on Earth through photosynthesis. These mechanisms are increasingly disturbed by the rapid changes

[1] IPCC (2014), Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, p. 151.
[2] Bopp, L. & Levy, M. (2017), The ocean, a key component in the climate system, in The Ocean Revealed, Change [Euzen, A., Gaill, F., Lacroix, D. & Cury, P. (eds.)].CNRS Edition CNRS, p.24
[3] OCP, (2016), THE INTERACTIONS BETWEEN OCEAN AND CLIMATE, 6 factsheets for the general public,p.4.
[4] IOC/UNESCO, IMO, FAO, UNDP (2011), Facts and figures on marine biodiversity, A Blueprint for Ocean and Coastal Sustainability. Paris: IOC/UNESCO.
[5] Rhein M. et al., (2013), Observations: Ocean. In Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.
[6] OCEAN AND CLIMATE, (2016), p.6.
[7] *Ibid*
[8] Boeuf, G. (2016), Ocean and Climate, 2016- Scientific notes, Second Edition, Tome2, p.30.
9 IOC/UNESCO, IMO, FAO, UNDP (2011).

in the chemical composition of seawaters, caused by growing CO_2 emissions[10]. Marine biodiversity is essential to the health of the ocean and its ability to provide vital services for the livelihoods of coastal communities[11]. These extremely diverse ecosystems contribute to sustainable development and sustainable ocean-based economies. Yet, the impacts of climate change are threatening the ocean, by contributing to rising the sea levels, exacerbating ocean acidification and coastal erosion, bleaching of coral reefs, and increasing global water temperatures. Moreover, it is estimated that 22.5 million people are displaced annually by climate or weather-related disasters, and these figures are expected to increase in the future[12]. All these impacts are detrimental to affected communities and individuals' livelihoods, wellbeing, health, safety and food security.

The Global Climate Action Agenda supports the engagement of non-party actors and creates the necessary tools to achieve the goals of the Paris Agreement. It aims to build upon existing initiatives, support emerging ones and encourage the inclusion of these actions into Nationally Determined Contributions (NDCs), as they become the framework for climate action[13]. The Ocean and Climate Platform (OCP) is fully committed to furthering the understanding of the intricate relationship between ocean and climate. OCP aims to highlight the need to safeguard the ocean by enlightening on the ability of its ecosystems to adapt[14] to and mitigate[15] climate change. OCP created the Ocean and Climate Initiatives Alliance (OCIA), a project to strengthen international and multi-stakeholder cooperation around ocean-based solutions to climate change. OCIA is fully integrated into the GCAA objectives, notably to "ensure a durable connection between the Convention and the many voluntary and collaborative actions"[16] developed around the world.

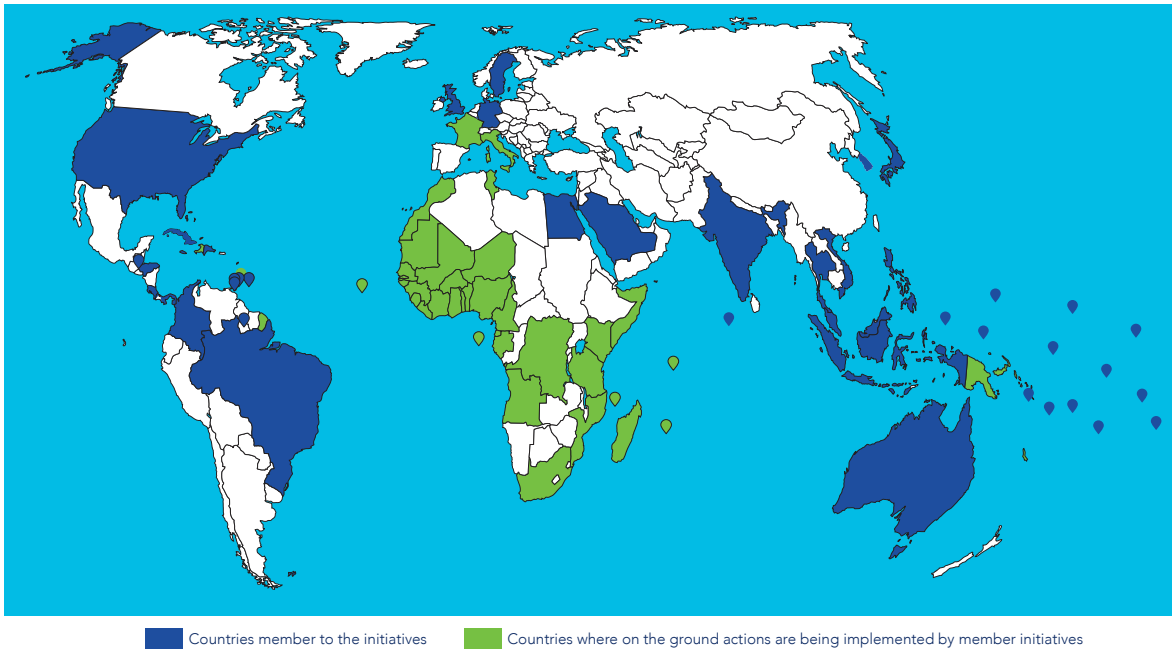

Fig.2 – Geographical representation of OCIA members and operations.

[10] OCP, (2016), THE INTERACTIONS BETWEEN OCEAN AND CLIMATE, 6 factsheets for the general public, p.5.
[11] IOC/UNESCO, IMO, FAO, UNDP (2011).
[12] UNFCCC (2017), Human health and adaptation: understanding climate impacts on health and opportunities for action, Subsidiary Body for Scientific and Technological Advice, p.9.
[13] UNFCCC (2016), High Level Champions Climate Action Roadmap, Global Climate Action Agenda: Climate Champions Release Detailed Roadmap, p.1. available at http://newsroom.unfccc.int/media/658505/high-level-champions-climate-action-roadmap.pdf
[14] Adaptation: Individual or collective measures that aim to reduce vulnerability of natural and human systems by adopting practices that will help cope with climate changes (OCP, 2016, p.18).
[15] Mitigation: Any action that stabilizes the concentrations of greenhouse gases in the atmosphere at a level that prevents irremediable consequences for the survival of ecosystems and humans alike (OCP, 2016, p.18).
[16] UNFCCC (2016), p.1

The vision for the future of policy, science and on-the ground actions has been created by the Roadmap to Oceans and Climate Action (ROCA) Initiative and the Ocean and Climate Initiatives Alliance working together. Progress on implementation will be reported at COP 23, through two complementary reports from ROCA and OCIA summarising progress on ocean and climate in the last year. The ROCA report on Measuring Progress focuses on changes within the broader international, regional, and national policy spheres and on major developments in climate and ocean science and monitoring.

The OCIA Report "Measuring Progress on Ocean and Climate Initiatives: An Action-Oriented Report" first introduces the international context in which OCIA was created, the vision of OCIA and its objectives. Secondly, it presents a synthesised overview of the 7 themes of action addressed by the initiatives. The third section presents the quantitative method used, i.e. surveys, to conduct an in-depth analysis for each initiative. It further describes the findings of the study, according to the initiatives' objectives, results, contributions to national plans and progress monitoring. The last section highlights the concrete achievements of key initiatives, especially regarding adaptation, mitigation and enhancing scientific understanding. Finally, it draws conclusions for the future strategy of the Ocean and Climate Initiatives Alliance, including: Shaping a universal ocean language; Providing complementarity between creation of scientific knowledge and policy-making; and Strengthening communication around specific ocean issues.

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I – INTRODUCING THE OCEAN AND CLIMATE INITIATIVES ALLIANCE

1. The Ocean in International Climate Dynamics

Climate change will have a major impact on the ocean, its ecosystems, maritime activities and coastal populations. Simultaneously, the ocean is a source of adaptation and mitigation solutions. In light of this ambivalent observation, a strong international coordinated mobilisation of State-actors, the scientific community and civil society arose around the ocean and climate thematic prior to the United Nations Framework Convention on Climate Change (UNFCCC) COP21, in Paris, and until COP22, in Marrakech.

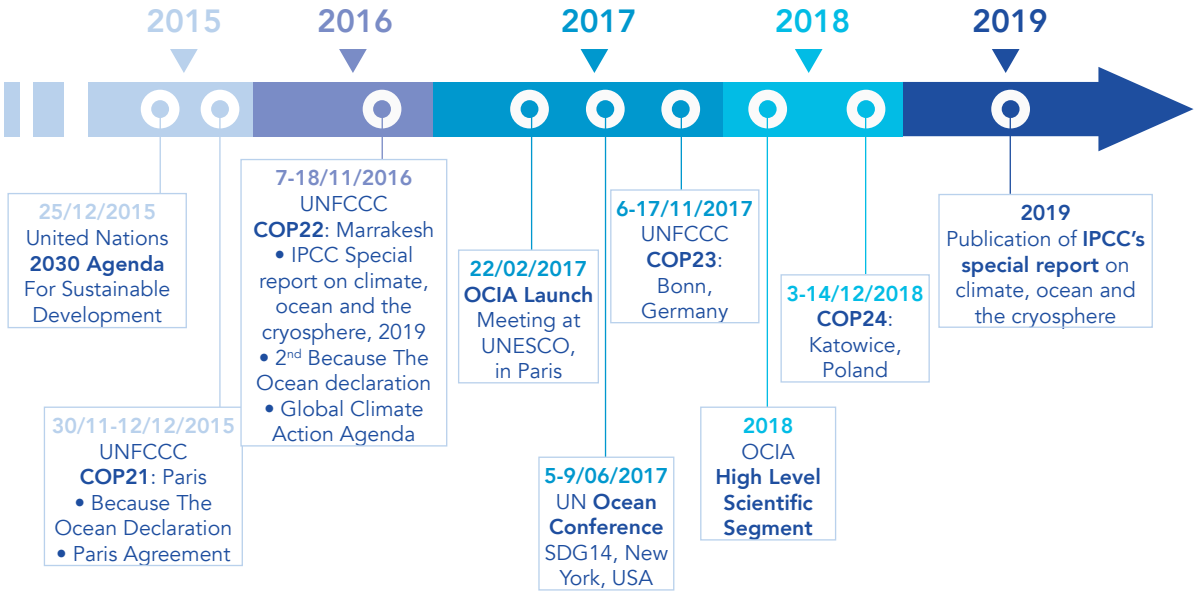

Fig.3 – Key milestones in the evolution of OCIA

The Ocean and Climate Platform, OCIA's cradle and co-founder, was established from an alliance of non-governmental organisations and research institutes, with support from the Intergovernmental Oceanographic Commission UNESCO (IOC-UNESCO), during the World Oceans Day 2014. It was created to highlight scientific expertise and support ocean and climate issues advocacy before politicians, decision-makers and the public[17]. During COP21, the Ocean and Climate Platform emphasised the importance of a "*healthy ocean, a protected climate*" to stress how the ocean was affected by climate change, and more importantly to show the ocean was part of the solution against climate change. This momentum led to the integration of the ocean into the Paris Agreement at COP21, notably in the Preamble of the final text "noting that it is important to ensure the integrity of all ecosystems, including oceans"[18]. It was followed a year later by the inclusion of the ocean in the Global Climate Action Agenda at COP22, as well as the launch, in 2019, of a Special Report on the ocean and the cryosphere by the Intergovernmental Panel on Climate Change (IPCC).

[17] OCEAN AND CLIMATE, (2015), Policy recommendations, p.1-8.
[18] United Nations (2015), Adoption of the Paris Agreement, Paris Agreement Preamble, p.2.

The objective of OCP was to integrate the ocean into the climate regime, i.e. mitigation, adaptation, solutions, financing and science. The political momentum reached at COP21 led to greater ambitions for the ocean and climate agenda, with the launch of numerous initiatives at COP22. The President of COP21, Ségolène Royal, strongly advocated to expand the scale of action by bringing together all ocean and climate actors. This idea was further supported, in principle, by the 2nd Because the Ocean Declaration, signed at COP22, which recognised the need to foster and develop new bridges to work with non-state actors on the role of the ocean, both in the Global Climate Action Agenda and in the implementation of the Paris Agreement[19]. Additionally, COP22 saw the launch of the Roadmap to Oceans and Climate Action (ROCA) – a multi-stakeholder initiative to advance the oceans and climate agenda, especially in the United Nations fora, and at the national level in all countries[20].

ROADMAP TO OCEANS AND CLIMATE ACTION (ROCA)

- **The ROCA – an influencing framework:**

The ROCA works to implement the Strategic Action Roadmap on Oceans and Climate: 2016-2021, which provides a vision for action regarding oceans and climate in the next five years, addressing six oceans and climate issue areas: the central role of oceans in regulating climate, mitigation, adaptation, displacement, financing, and capacity development. Ongoing collaboration between members of the ocean and climate policy community has facilitated a more cohesive agenda and developed clear markers for progress in both effective policy-making and on-the-ground action.

- **Leading organisations:**

Global Ocean Forum, IOC-UNESCO, Ocean Policy Research Institute of the Sasakawa Peace Foundation (Japan) and Oceano Azul Foundation (Portugal).

- **The ROCA – Deliverables ahead of COP23:**

1) The first Annual Report on Measuring Progress on the Roadmap to Oceans and Climate Action, reviewing major developments taking place in the six major themes of the Roadmap from a global policy perspective;

2) A review of the NDCs in collaboration with the Scripps Institution of Oceanography, reviewing whether their consideration of oceans is adequate and proposing methods to support their effective implementation;

3) A financial tracking mechanism, in collaboration with Duke University, to track and report on the flow of public finance to oceans and climate issues; and

4) A proposal for a knowledge management mechanism to capture and exchange knowledge and best practices relevant to the six themes of the Roadmap.

The Paris Agreement acknowledges the importance of ensuring the integrity of all ecosystems, including the oceans. The Marrakesh Partnership for Global Climate Action is instrumental in identifying the necessary partnerships to secure protection of the ocean and marine biodiversity as one of the key challenges for climate change policies and actions on the international agenda. To better understand the impacts of climate change on ocean resilience, biodiversity must be fully integrated into decision-making. At the international level, the Aichi Targets 10 and 11 of the Convention on Biological Diversity (CBD) directly address marine biodiversity loss. Target 10 calls for decreasing anthropogenic stressors on coral reefs and other vulnerable ecosystems by 2015 to allow them to maintain their integrity and functioning[21]. Target 11 calls for protecting 10% of coastal

[19] Second Because the Ocean Declaration, Marrakech COP22, 14 November 201
[20] Cicin-Sain, B. et al. (2016), Toward a Strategic Action Roadmap on Oceans and Climate: 2016 to 2021, (Washington DC : Global Ocean Forum 2016), p.54.
[21] CBD (2011), Aichi Biodiversity Targets, Strategic Plan for Biodiversity 2011-2020.

and marine areas by 2020, "especially areas of particular importance for biodiversity and ecosystem services, which should be conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes"[22].

> *Having achieved our first objective, which was to get the political support and agreement that ocean can and should be addressed within the UNFCCC… it is now time to move into much more operational and solution-oriented mode, moving forward of the cutting edge of science and ensuring that advantages are available to all.*
>
> **Vladimir Ryabinin**, IOC-UNESCO, Executive Secretary, at OCIA launch meeting, February 2017

2. Vision and Objectives of the Ocean and Climate Initiatives Alliance

On 22 February 2017, the Ocean and Climate Platform, together with IOC-UNESCO and France, launched the Ocean and Climate Initiatives Alliance at UNESCO Headquarters, in Paris. Since climate urgency requires ongoing mobilisation of all, OCIA was designed to consolidate and coordinate the concrete actions of individual partnerships to address ocean and climate interlinkages and ensure the involvement of local communities[23].

> *We must share this expertise, our knowledge and our capacity of action in order to be even stronger and more efficient.*
>
> **Eric BANEL**, OCP, President, at OCIA launch meeting, February 2017

[22] *Ibid*
[23] OCP (2017),1st MEETING OF THE OCEAN AND CLIMATE INITIATIVES ALLIANCE, Paris, 22 February 2017.

By uniting parallel and ongoing initiatives under a joint action framework, OCIA aims to drive momentum for concrete ocean-based solutions in the implementation of mitigation and adaptation measures.

The core objectives of OCIA include:
1. Identifying synergies between international initiatives and acting as a catalyst for progress;
2. Ensuring that civil society's voice is heard in the international fora (UNFCCC, Global Climate Action Agenda, SDG14…); and
3. Reducing the knowledge gap on ocean and climate and stimulating scientific awareness.

Within this context of broad mobilisation, 19 initiatives have already come together as part of OCIA. The coalition counts 272 members, including 90 countries, with operations in 36 countries (Annex I) around 8 themes of action, 3 regional focuses and 2 inter-disciplinary themes (Figure 4).

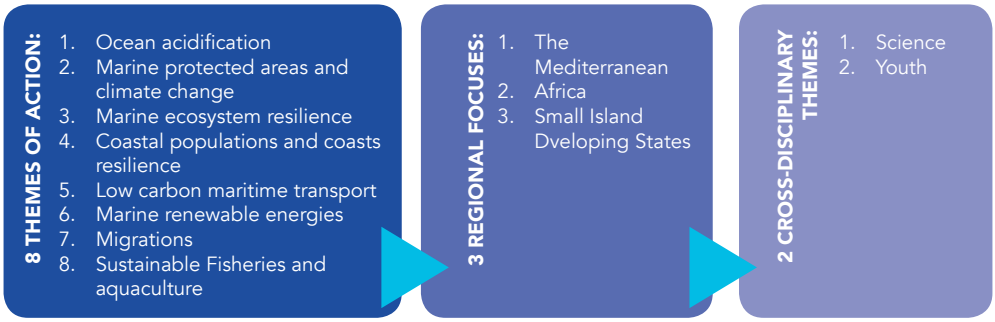

Fig.4 – Thematic coverage of the Ocean and Climate Initiatives Alliance

OCIA is actively working with ocean-related international and regional communities to contribute to the 2030 Agenda for Sustainable Development. OCIA is committed to reinforcing ocean resilience by working to meet the UN Sustainable Development Goal (SDG) 14 - to conserve and sustainably use the oceans, seas and marine resources for sustainable development. In that regard, OCIA participated in the UN Ocean Conference (5-9 June 2017, in New York), co-hosted by the Governments of Fiji and Sweden. On this occasion, OCIA pledged to federate ocean initiatives in order to integrate the Global Climate Action Agenda.

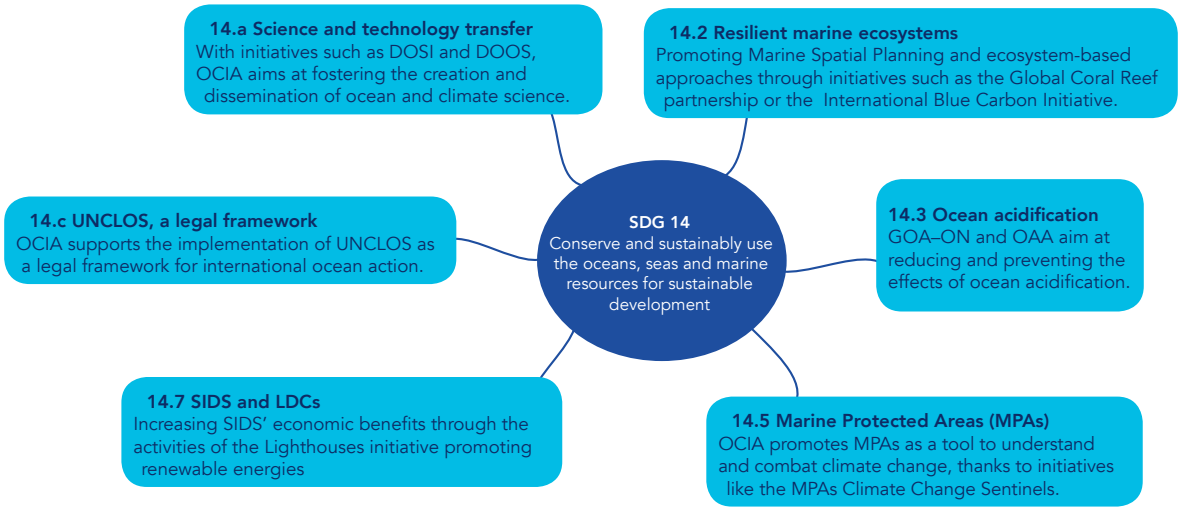

Fig.5 – Contribution of OCIA to the SDG 14

A Note from the Scientific Committee of the Ocean and Climate Platform:

CYCLONES AND CLIMATE CHANGE

After the dramatic consequences of hurricanes Harvey, Irma, Maria and Jose, this year in 2017, understanding the origins of such extreme events is of growing importance. What is the nexus between cyclones, the ocean, and climate change?
Tropical cyclones, also called hurricanes in the North Atlantic Ocean[1], are violent perturbations, or atmospheric depressions. The "eye" at the centre of the cyclone, is a calm 30-60km wide zone. It is surrounded by a "wall", an area struck by diverse phenomena: strong winds (up to 300 kilometres per hour); as well as a rise in the sea level, and strong swells which, added to strong rainfalls, causes severe floods.

How do cyclones form?
Several factors are necessary to the forming of cyclones: strong and homogeneous winds in altitude (up to 15km), high humidity and sea surface temperature higher than 26°C in the 60 metres upper layer. This temperature causes great water evaporation from the ocean to the atmosphere. For instance, in the case of Irma, sea surface waters (on average warmer by 0.5 to 2°C in most of the tropical North Atlantic Ocean) caused particularly important evaporation. The situation for Harvey, Maria and Jose was comparable. Heat received at the surface is then transformed in mechanical energy, higher in altitude. When this source of energy is not available anymore, the cyclone dissipates. Cyclones weaken when they penetrate in the land, as they are not fuelled by warm water and therefore humidity and energy anymore.

What nexus can we establish with climate change?
Regarding the link between these hurricanes and climate change, scientists remain prudent. Warmer sea surface temperatures tend to generate longer and more intense cyclones[2]. However, this causal link can be only established based on a high number of cyclones: on average, these extreme disasters might be more frequent and intense as planetary temperature increases[3]. Harvey, Irma, Jose and Maria occurred during the same year. They are not numerous enough and too recent to be designated as a direct consequence of climate change.
2016 for instance, was characterised by temperatures warmer than during 2017 in the tropical Atlantic[4]. Despite a situation that seems more favourable to cyclones intensification, only two force-4 or -5 cyclones were recorded during the whole season. More time and a finer analysis will then be necessary to establish and measure such a link. Yet, these events draw our attention to the question of a potential link between climate change and natural disasters. Irma, Harvey, Jose and Maria must be considered in that context and we should retain the hypothesis of climate as a probable factor. At the same time these catastrophes have to be seen as an example of what the future can hold.

Victor Brun, Xavier Capet, Françoise Gaill, Sabrina Speich and Gilles Reverdin

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[1] "Cyclone" is a generic term. We call them hurricanes in the North Atlantic, in the Gulf of Mexico, and in the east of the North Pacific; they are called typhoons in the west of the North Pacific and in the South China Sea.
[2] Kerry, E. (2005), "Increasing destructiveness of tropical cyclones over the past 30 years", Nature 2005.
[3] IPCC (2014), p. 51
[4] NOAA Physical Oceanography Division (PHOD) of AOML, Sea surface temperature area index and sea surface temperature area index residuals time series.

II – PRESENTING THE THEMATIC COVERAGE OF OCIA

1. Ocean Acidification

The ocean and its reliant ecosystems are major carbon sinks. They capture CO_2 from the atmosphere, representing about a quarter of human-produced emissions each day[24]. While some of this CO_2 is incorporated by organisms and stored in the deep sediments, the rest remains in the water column, thus making it more acidic. Once absorbed, CO_2 reduces the pH of the ocean, hence transforming it and changing the acidity conditions of the water[25]. Acidification can only be solved by reducing carbon emissions. While the Paris Agreement has set the path, solutions must be developed to increase the resilience of ecosystems and communities impacted by ocean acidification.

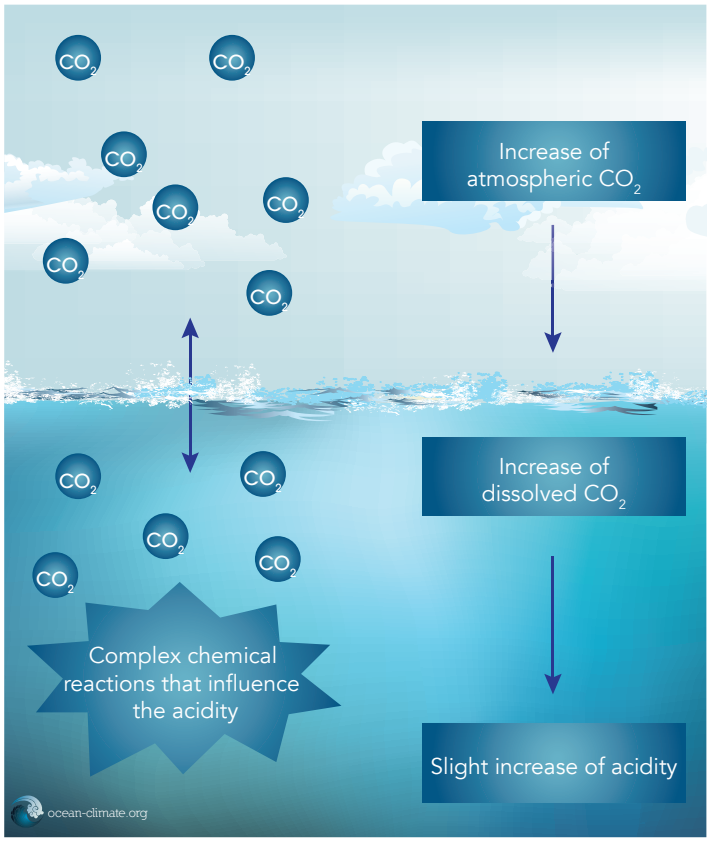

Fig.6 – **Simplified graph of ocean acidification.** When dissolved in the ocean, atmospheric CO_2 makes it more acidic and therefore threatens numerous marine species and ecosystems.

FIGURES:

The ocean has absorbed a third of the CO_2 emitted since the Industrial Revolution[26], resulting in a 26% increase in its acidity, and it is expected to further increase by 150% by 2100[27].

In 2007 and 2008, a wide loss of oysters occurred in Northern American Pacific states. The International Alliance to Combat Ocean Acidification (OAA) stressed it was "some of the earliest and clearest impacts of increased acidification in West Coast marine waters[28]".

The consequences of ocean acidification are already visible. In the years to come, ecosystems with great cultural and economic values might disappear. For instance, more acidic conditions make it harder for corals to form their calcareous structures. Acidification, combined with rises in the temperature, cause stress and can result in coral bleaching – i.e. when corals expel the algae (zooxanthellae) with which they are in symbiosis, potentially causing their death[29]. Many organisms that live within shells suffer from ocean acidification, such as mussels and oysters, among others. A decline in their populations

[24] Gattuso, J.P. & Hansson, L. (2015), *Scientific notes: Ocean Acidification*, OCEAN AND CLIMATE 2015, p.27.
[25] *Ibid*, p.22.
[26] Doney, S.C., et al. (2009), *Ocean acidification: The other CO_2 problem*. Annual Review of Marine Science.
[27] Gattuso, J.P. & Hansson, L., (2015), p. 27.
[28] The International Alliance to Combat Ocean Acidification (2016), Background, Available at URL: https://www.oaalliance.org/background.
[29] Planes, S. (2017), The fate of the coral reefs in The Ocean Revealed, Change [Euzen, A., Gaill, F., Lacroix, D. & Cury, P. (eds.)].CNRS Edition CNRS, p. 96-97.

could impact many more organisms, especially through the trophic chains. It is essential to understand and fully consider the intricate relationships within and between marine organisms and ecosystems[30]. Threats to these organisms and corals will eventually impede on the functioning of the whole marine ecosystem. From small-scale fisheries to industrial productions, millions depend on the well-being of these ecosystems to support their livelihoods.

Understanding the extent and multiple consequences of ocean acidification still requires global efforts and cooperation to be strengthened. The source of acidification, anthropogenic CO_2 emissions, must be controlled. International negotiations and regional, national and local actions must grow momentum and persevere to reduce the cause of ocean acidification. The response must be global, ranging from observation and data sharing to finding innovative ecosystem adaptation techniques. Since many impacts of ocean acidification remain partly unknown and difficult to monitor, research efforts must be supported to encourage the development of innovative solutions to increase ecosystem resilience.

International initiatives aim at understanding and preventing ocean acidification and its effects, with action taken at several levels: observation, data and knowledge sharing, policies and awareness raising. The Global Acidification Observation Network (GOA-ON) is improving our understanding of ocean acidification conditions and of ecosystem responses, as well as acquiring and exchanging data and knowledge necessary to optimise modelling. The International Alliance to Combat Ocean Acidification (OAA) is bringing together an international network of governments and organisations to develop Action Plans and address ocean acidification and other threats from changing ocean conditions.

2. Marine Protected Areas and Climate Change

The International Union for the Conservation of Nature (IUCN) defines a protected area as "*a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural value*"[31]. Since the ocean is a physicochemical and biological carbon pump, MPAs not only maintain vital ecosystems, they contribute to reducing and storing atmospheric concentrations of CO_2. While further research is needed, existing results show that benefits from MPAs are multiple and can be even greater when organised in networks (i.e. PISCO studies on the global state of science in marine reserves and MPAs)[32]. Their integration into broader climate action frameworks, and multi-scale policies, will help maintain these services.

[30] Gattuso, J.P. (2015), *A short summary of the current knowledge on ocean acidification*, IUCN Bridging the Gap Between Ocean Acidification Impacts and Economic Valuation: Regional Impacts of Ocean Acidifcation on Fisheries and Aquaculture, p. 19-21.
[31] Simard, F., et al. (2016). Marine Protected Areas and Climate Change: Adaptation and Mitigation Synergies, Opportunities and Challenges. Gland, Switzerland: IUCN, p.15.
[32] Partnership for Interdisciplinary Studies of Coastal Oceans. 2007. The Science of Marine Reserves (2nd Edition, International Version). www.piscoweb.org. 22 pages.
Partnership for Interdisciplinary Studies of Coastal Oceans. 2007. The Science of Marine Reserves (2nd Edition, United States Version). www.piscoweb.org. 22 pages.
Partnership for Interdisciplinary Studies of Coastal Oceans. 2008. The Science of Marine Reserves (2nd Edition, Latin America and Caribbean). www.piscoweb.org. 22 pages.
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Partnership for Interdisciplinary Studies of Coastal Oceans and University of Nice Sophia Antipolis. 2016. The Science of Marine Protected Areas (3rd edition, Mediterranean). www.piscoweb.org. 22 pages.

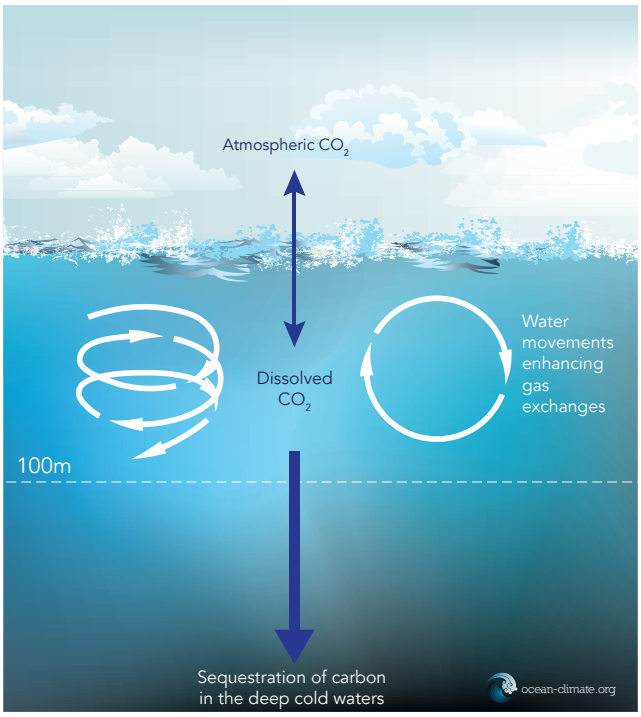


Fig.7 – **Physical carbon pump.** Carbon is captured in the ocean through physical and chemical processes, and sequestered in the deep ocean.

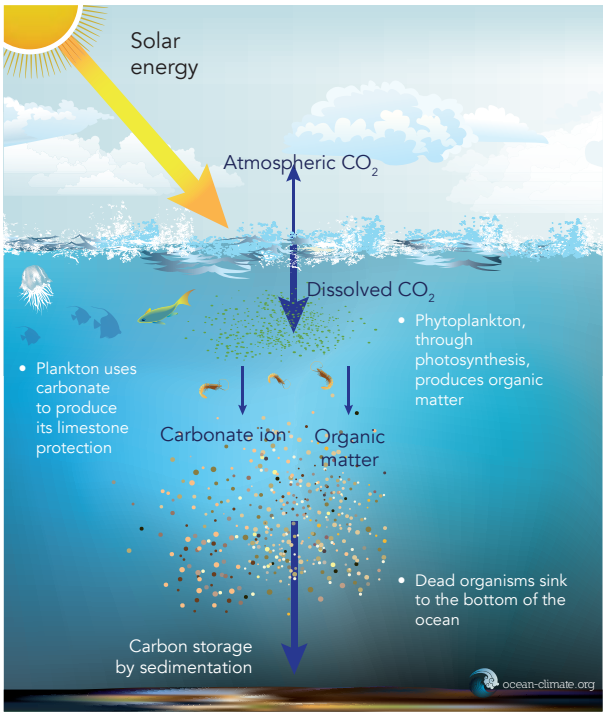


Fig.8 – **Biological carbon pump.** Phytoplankton produces organic matter through photosynthesis, and absorbs CO_2. Some of this organic matter, containing carbon, sinks to the bottom of the ocean allowing a carbon storage by sedimentation.

FIGURES:

According to the objectives of the SDG 14 and Aichi Target 11: 10% of the ocean should be included into MPAs by 2020[33]. Currently, with over 10,000 MPAs worldwide, only 4% of the global ocean is under a protection designation, and only 1.5% is covered by strict and permanent MPAs[34].

MPAs can increase the resilience of the ocean and its ecosystems to climate change[35]. Networks of MPAs can bring together different parties to find and implement the "most appropriate management measures to increase or maintain ecosystem resilience"[36]. MPAs can be key sentinels of climate change, laboratories to monitor the effects of climate change, and areas where to develop new management tools, and showcase concrete examples of adaptation strategies. There is a need to include more actors in MPA planning, including by bringing fisheries into the "knowledge, consultation and collaboration" process to ensure adaptive management[37]. MPAs should be based on an ecosystem approach and boast a new research agenda on the impacts of climate change on ocean ecosystems[38]. Traditional ecological knowledge from fishermen and observations from other sea users must be integrated into the research and monitoring efforts.

[33] UN General Assembly (21 October 2015), *Transforming our world: the 2030 Agenda for Sustainable Development*, A/RES/70/1, Available at: http://www.refworld.org/docid/57b6e3e44.html
Convention on Biological Diversity, (October 2011), Strategic Plan for Biodiversity 2011-2020, including Aichi Biodiversity Targets Available at: https://www.cbd.int/sp/
[34] Simard, F., Laffoley, D. op. cit., p. 9.
[35] Cicin-Sain, B. et al., op. cit., p.54.
[36] Simard, F., Laffoley, D. op. cit., pp 14.
[37] Lefevbre, C. (2016), *Scientific Notes: Coral reefs and climate change*, OCEAN AND CLIMATE, Second edition, Tome 2, p.65.
[38] Cicin-Sain, B. et al., op. cit., p.54.

The Tangier Declaration, for an effective MPA network in the Mediterranean Sea, recommends to "Strengthen and develop the role of MPAs as a marine spatial management tool in supporting ecosystem-based adaptation and mitigation to climate change" (Strategic Objective 5)[39]. The destruction of habitats, such as sea-grass and reefs, threatens the carbon storage capacity of marine ecosystems. Although the capacity for storing and sinking carbon is higher in some marine ecosystems than on land, the Paris Agreement only refers to protecting and sustainably managing forest carbon stocks in its Article 5[40]. Given that "healthy, productive and resilient oceans are critical for poverty eradication, access to sufficient, safe and nutritious food, livelihoods, economic development"[41], there must be a shift in how international negotiations reflect on the links between biodiversity, especially marine, and climate change. Since the ocean and seas do not follow legal and political boundaries, there is a critical need for regional frameworks of action for MPA networks management. Additionally, due to some ecological areas being critical for the life cycle and key life stages of certain species, a network approach is highly recommendable.

The MPAs Climate Change Sentinels – an initiative launched by France and IUCN – demonstrates that MPAs should be at the centre of research on climate change, through an integrated network of MPAs and by mobilising MPA managers to observe, monitor and define standards on following the impacts of climate change on ocean ecosystems. MPA-ADAPT is an EU Interreg MED project, which aims to develop collaborative and site-specific adaptation plans for MPAs to enhance their resilience to climate change impacts. It also aims to incorporate vulnerability assessments and nature-based adaptation planning into their existing management framework, and provide guidance to implement and test climate-change approaches. T-MEDNet is a regional observation network to track and assess climate change effects in the coastal and littoral areas of the Mediterranean Sea: firstly, by spreading the acquisition of long-term and high-frequency oceanographic time series (temperature profiling 0-40m); and secondly, through long-term partnership between marine scientists and MPA managers, and by combining physical and biological climate change indicators.

3. Marine Ecosystem Resilience

Coral reefs, mangroves, seagrass meadows and salt marshes, among many others, are considerably under threat from human-induced climate change. These ecosystems not only support human activities, such as fishing and tourism, and hold moral, cultural and aesthetics values; they play a critical role in absorbing CO_2 and adapting to climate change. Home to the richest and most diverse biodiversity of our ocean, they act as buffers against sea-level rise and increased storm intensity[42]. Protecting and restoring these blue carbon ecosystems, along with evaluating their benefits, represent a critical opportunity to combat climate change.

[39] Tangier Declaration (2016), *Contributing to achieve the Aichi Targets and the Sustainable Development Goals through an Effective Marine Protected Area Network in the Mediterranean Sea*, p.1 & p.14.
[40] Adoption of the Paris Agreement, op. cit., Article 5 p.23.
[41] General Assembly (14 November 2014), Resolution 69/15 SIDS *Accelerated Modalities of Action (SAMOA)* Pathway (14 November 2014) p. 13 Oceans and Seas, p.13 paragraph 53.
[42] Causse, C. et al. (2016) Ocean, Environment, Climate change and Human Mobility *International Organisation for Migration and Ocean and Climate Platform*, p. 5.

FIGURES:

Coral reefs represent only 0.2% of the ocean surface and are home to 30% of its known marine species[43]. However, estimates show that 20% of the world's coral reefs have been lost and another 20% degraded[44]. Today, 75% of the world's coral reefs are threatened by a combination of local sources (e.g. overfishing, coastal development, pollution) and thermal stresses (e.g. rising ocean temperature, acidification). This number is expected to increase to 90% by 2030 and almost 100% by 2050[45]. Moreover, the ecological benefits of coral reefs represent US$ 30 billion yearly[46], and directly support 500 million people for fishing[47].

In the past half century, we have lost 50% of mangroves, with 20% lost from 1980 to 2005[48]. At current conversion rates, 30-40% of tidal marshes and seagrasses and nearly 100% of mangroves could be lost in the next 100 years[49].

Marine and coastal ecosystems are home to numerous plant and animal species, which all produce various useful services for humans. For instance, mangroves help retain friable, or crumbly, soil on the coast, and therefore help prevent coastal erosion. They are also natural barriers to water currents, and as such constitute a favoured habitat for the birth and development of many species of fish[50]. When degraded, these ecosystems release a significant amount of carbon dioxide - estimated to be equivalent to the United Kingdom's annual carbon emissions[51]. Coastal blue carbon ecosystems can store a particularly high amount of carbon in the biomass of plants and soils – up to six meters deep[52] for up to a millennium – therefore releasing high amounts of CO_2 when degraded or lost.

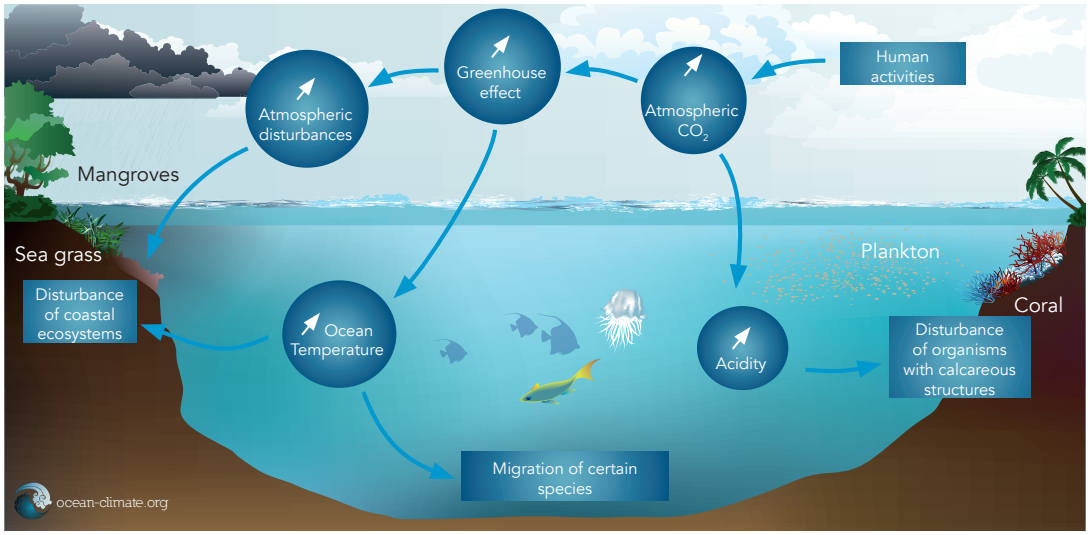


Fig.9 – **Consequences of increased CO_2 on ecosystems.** Consequences of an atmospheric increase in CO_2 are multiple, and remain for the most part difficult to understand. They might range from an increase in extreme natural events, to the displacement of species, including marine species, loss of biodiversity, rise in ocean acidity causing disturbances to organisms with calcareous structures.

[43] Lefevbre, C., op. cit., p.34.
[44] IOC/UNESCO, IMO, FAO, UNDP, op. cit., p.16.
[45] Burke, L., et al. (2011), Reefs at risk revisited. World Resources Institute: Washington, DC p.20.
[46] Cicin-Sain, B. et al., op. cit., p.24.
[47] IOC/UNESCO, IMO, FAO, UNDP, op. cit., p.16.
[48] Spalding M, et al. (2010), World Atlas of Mangroves(version 1.1). A collaborative project of ITTO, ISME, FAO, UNEP-WCMC, UNESCO-MAB, UNU-INWEH and TNC, London (UK): Earthscan, London, p.319. available at URL: data.unep-wcmc.org/datasets/5.
[49] Pendleton, et al., op. cit., p.2.
[50] OCP (2016), p.10.
[51] Pendleton L, et al. (2012) Estimating Global "Blue Carbon" Emissions from Conversion and Degradation of Vegetated Coastal Ecosystems. PLoS ONE 7(9): e43542. doi:10.1371/journal.pone.0043542 p.2.
[52] The Blue Carbon Initiative, *Coastal ecosystems: Why sound management of coastal ecosystems matters for greenhouse gas emissions and climate change*, p.3.

The quality of these services depends on the resilience of each ecosystem and its level of protection. When an ecosystem is degraded, it delivers fewer services. Yet, these ecosystems are crucial to the fight against climate change. They constitute a safe haven for fish to reproduce and provide adaptation benefits by acting as nurseries for their offspring[53]. Moreover, these ecosystems contribute to protecting communities and environments against storms, sea-level rises and coastal erosion. Healthy coastal ecosystems play a mitigation role against climate change, especially by capturing carbon for their development. For instance, mangroves, seagrass beds and salt marshes store at least ten times more carbon than continental forests when they develop by capturing carbon in their calcium skeleton[54].

Despite being critically endangered, these ecosystems remain often neglected in national and international policy-making processes[55]. For ecosystems to keep supplying many services, we need to preserve them, i.e. to protect biodiversity and reduce to a minimum the human impact on ecosystem functions. Ecosystem restoration remains a priority to improve storage of carbon excessively released into the atmosphere and requires ambitious policies[56]. The Global Ocean Forum Roadmap 2016-2021 calls for 'coastal adaptation', by restoring mangroves and reefs, and for the inclusion of ecosystem-based adaptation[57] in National Adaptation Plans (NAPs)[58], with a coherent and global view of ecosystem services and interactions within and between ecosystems.

Voluntary initiatives are blooming across the globe to ensure the inclusion of marine ecosystem services into mitigation and adaptation strategies, while highlighting the importance of maintaining their integrity and well-being. The Global Coral Reef Partnership (GCRP) and the International Coral Reef Initiative (ICRI) are working on integrating coral-reef in international dynamics and supports informed decision-making by the public and private spheres. The International Blue Carbon Initiative (IBCI) and the Global Mangrove Alliance underline the need to conserve coastal ecosystems, not only for blue carbon purposes, but also for ensuring adaptability and resilience to a changing climate.

4. Coasts, Coastal Populations and Climatic Resilience

With a changing climate, sudden onset events and climate-related disasters are bound to increase in frequency and magnitude[59]. Combined with unsustainable production, resource overexploitation and urbanisation, the impacts of climate change will be disastrous on coasts and coastal communities, especially the most vulnerable ones. Despite international cooperation efforts, the number of people affected by disasters has considerably increased in the last decade. Disaster risk reduction and frameworks for loss and damages must be developed to improve adaptation measures, early warning systems and resilient buildings. Since extreme climatic events disregard national frontiers, regional programs must be developed to integrate, among others, maritime spatial planning in their strategies.

[53] OCP (2016), p.10.
[54] *Ibid.*
[55] Global Mangrove Alliance, *The Critical Role of Mangroves* p.1 Available at URL: https://mangroveallianceorg.files.wordpress.com/2017/07/global-mangrove-alliance_strategy.pdf
[56] OCP (2016), p.10.
[57] Ecosystem-based adaptations is the "sustainable management, conservation and restorations of ecosystems to assure the continued provision of vital services that help people adapt to the adverse effects of climate change" (Cicin-Sain, B. et al., p.40).
[58] Cicin-Sain, B. et al., p.52.
[59] IPCC (2014).

FIGURES:

Fisheries directly provide 4 billion people with essential protein intakes and are a major source of income for many countries across the globe[60]. In tropical areas, fish availability is projected to fall by up to 40% by 2055 due to anthropogenic climate change[61].

The Global Ocean Forum identifies fourteen Western African countries in which fisheries-related jobs are expected to drop by 50%[62]. If adaptation measures are not enhanced in coastal cities, loss costs could go up as high as US$ 1 trillion per year in defence against floods[63].

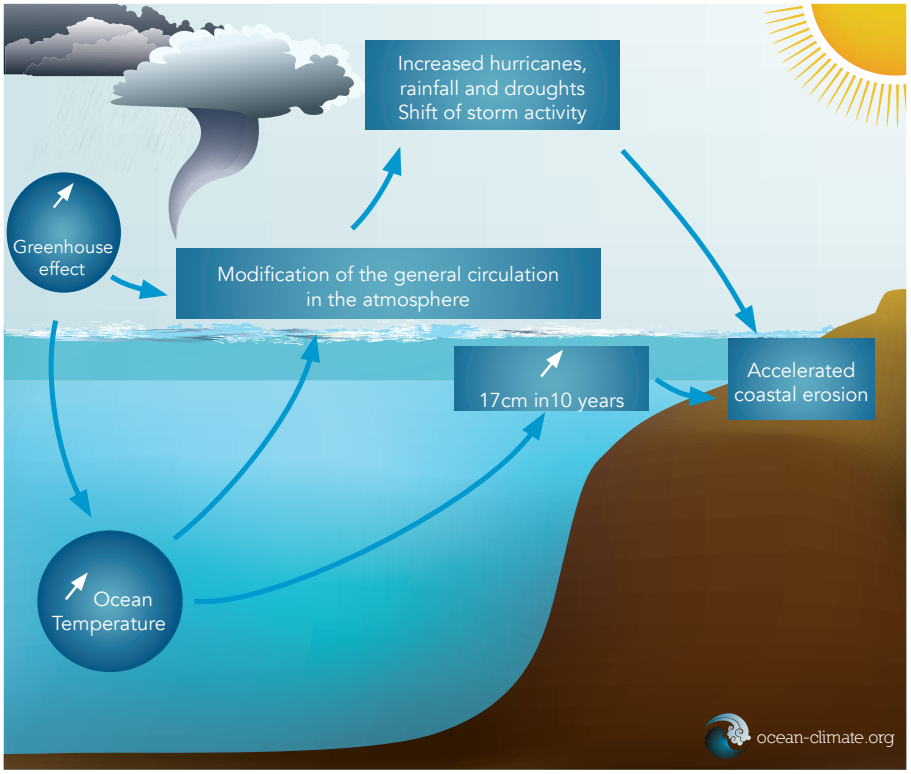


Fig.10 – **Physical consequences of increases in CO_2.** An increase in atmospheric CO_2 concentrations might have dangerous physical consequences threatening ecosystems and human populations: greenhouse effect, sea-level rise, a rise in ocean temperature or an acceleration of erosion for example.

The Global Ocean Forum Roadmap 2016-2021 identifies three domains of action for climatic resilience of coastal populations and environments: Fisheries, Coastal cities and Coastal and island populations[64]. However, in developing countries, Least Developing Countries (LDCs) and Small Island Developing States (SIDS), a rapid and uncontrolled urbanisation, as well as growing populations and limited environmental governance, are causing tremendous alterations of coastal areas. The international community must underline the responsibility of developed nations to share knowledge and skills to "countries that are the most exposed

[60] Cicin-Sain, B. et al. (2016) Toward a Strategic Action Roadmap on Oceans and Climate : 2016 to 2021, Washington DC : Global Ocean Forum. p.14.
[61] Cheung, W.W.L., et al. (2010), Large-scale redistribution of maximum fisheries catch potential in the global ocean under climate change. Global Change Biology, Volume 16, Issue 1, Pages 1–495.
[62] Cicin-Sain et al., op. cit., p.24.
[63] *Ibid.*, p.19.
[64] *Ibid.*, p.15.

to climate disruption"[65]. Appropriate adaptation measures, building on long-term and integrated coastal management and supporting technology transfers, are critical to safeguard vulnerable coastal communities. The need for sea level observation has increased with the attraction to coastal zones for the development of human activities. The indication of water levels along coasts has become crucial, because it allows, among other things, to better understand and quantify climate change effects, and to attempt preventing coastal extreme phenomena[66].

Within UNFCCC negotiations, the Warsaw international mechanism calls for parties to intensify the place of early warning systems within Intended Nationally Determined Contributions (INDCs)[67]. It is further strengthened in the Paris Agreement with the Article 8 provisions on loss and damages, in which parties recognise the importance of addressing loss and damages associated with climate change and define areas for cooperation between parties[68]. Moreover, the Sendai Framework for Disaster Risk Reduction 2015-2030 calls for urgent measures to "anticipate, plan for and reduce disaster risk"[69], using a people-centred approach. It identifies the key advances that have been made in the past decade in reducing local impacts of disasters, raising awareness, and creating national and international tools for action and cooperation, such as the Global Platform for Disaster Risk Reduction[70].

Building on these transnational frameworks, international initiatives are supporting vulnerable communities to adapt to climate change, by promoting cooperation to enhance technology-sharing and capacity building in LDCs and SIDS.The Climate Risks Early Warning System (CREWS) initiative is working on increasing the availability of Early Warning Systems and meteorological services in countries most prone to disasters.

5. Climate Change and Migrations

An environmental refugee is defined as a "person displaced owing to environmental causes, notably land loss and degradation and natural disaster"[71]. With sea levels rising and increases in magnitude and frequency of environmental disasters[72], concerns about climate-induced displacements are growing, especially in least developed and developing countries. Solutions must be found through transversal and inclusive cooperation. Mitigation and adaptation measures must encompass building resilience and, if necessary, supporting the communities in their migrations, arrival and integration in new countries. International initiatives aim to increase knowledge, raise awareness and support concrete actions to address these displacements and find solutions, from coastal ecosystem protection to creating channels for migrations and psychological support for displaced populations.

[65] Climate Risk & Early Warning Systems, CREWS initiative (September 2015), Foreword, p.3.
[66] OCP (2016), p.8.
[67] Warsaw International Mechanism for Loss and Damages associated with Climate Change Impacts, (COP19, November 2013).
[68] Adoption of the Paris Agreement, Conference of Parties, Twenty-first session 30 November to 11 December 2015, Article 8 p.26.
[69] United Nations- Sendai Framework for Disaster Risk Reduction 2015-2030, p.9 paragraph 5.
[70] *Ibid.*, p.17 paragraph 28.c.
[71] OECD (2001), Glossary of Statistical Terms (2001), available at https://stats.oecd.org/glossary/detail.asp?ID=839.
[72] IPCC (2014).

FIGURES:

According to the Sendai Framework, 144 million people were displaced by disasters between 2008 and 2012[73], with an average of 27 million people displaced each year[74].

The Global Report on Internal Displacements of 2016 estimates that twice as many people are displaced by weather related disasters than by conflicts and violence[75]. The International Organisation for Migration (IOM) estimates that up to 200 million people could be displaced by 2050 due to various environmental changes[76].

The fifth IPCC report states that "climate change over the 21st century is projected to increase displacement of people"[77]. The Global Ocean Forum has identified a "protection gap" under which climate-induced displacement falls, in between the migrant and refugee status but without a clear definition[78]. There are still many lingering gaps which should be addressed, including the lack of an international law framework specific to environmental displacements, and of a commonly agreed definition on loss and damages within international climate negotiations. A comprehensive response to the issue should consider nature-based solutions to adaptation through conservation and restoration of coastal ecosystems that play a key role as buffer zones[79]. It should further identify the need to protect and support the populations by better planning and management of displaced populations, awareness raising and long-term plans by countries.

The Sendai framework for disaster risk reduction is central to more efficiently address the impacts of disasters on vulnerable populations and to limit climate-induced displacements, notably through heightened international cooperation[80]. It promotes enhanced local actions for disaster preparedness, response and recovery[81]. Recommendations from the Global Ocean Forum and the International Organisation for Migration are to strengthen the protection of displaced persons, under the Sendai Framework, by investing in capacity building, and anticipation capabilities, as well as through the rebuilding and recovery phase after disasters[82]. Finally, the international community must be ready to channel increasing international migrations.

There is an urgent need for mitigation and adaptation planning to limit forced displacements and maintain livelihoods by pondering the effects of climate change on jobs, health, security, agriculture and other sectors. The "Ocean, climate and human mobility" initiative, a partnership between the International Organisation for Migration and the Ocean and Climate Platform, offers an innovative mechanism for addressing issues raised by changes in the oceans and human migration.

[73] United Nations Headquarters, (2015) *Sendai Framework for Disaster Risk Reduction 2015-2030*, United Nations Office for Disaster Risk Reduction p.4 paragraph 4.
[74] Global Estimates 2014 : People Displaced by disasters (September 2014), *Norwegian Refugee Council, Internal Displacement Monitoring Centre*.
[75] Bilak, A. et al. (2016) Global report on internal displacement, *Norwegian Refugee Council, Internal Displacement Monitoring Centre*.
[76] Causse, C. et al. (2016) Ocean, Environment, Climate change and Human Mobility *International Organisation for Migration and Ocean and Climate Platform*.
[77] IPCC (2014).
[78] Cicin-Sain, B. et al. (2016) op. cit p.50.
[79] Causse, C. et al. (2016) op. cit, p. 5.
[80] United Nations Headquarters, (2015) *Sendai Framework for Disaster Risk Reduction 2015-2030*, United Nations Office for Disaster Risk Reduction, p.18 paragraph 28.
[81] *Ibid.*, p. 21 paragraph 33.
[82] Cicin-Sain B., et al. (2016) op. cit p.53.

6. Sustainable Islands and Small Island Developing States

Islands are particularly vulnerable to climate change and the consequences it already has on global temperatures, sea-level rises and extreme weather events. For islands and coastal areas, the threat does not stop at being submerged by the ocean. It also implies the risks of greater saltwater contamination of crops, hence making the soils a lot less productive. For SIDS, the 2-degree Celsius cap for global warming is not sufficient to maintain livelihoods and ensure the survival of all communities and ecosystems. SIDS must be a priority for action by developing local plans for marine spatial planning, increasing resilience and, putting in place long-term adaptation strategies that include ecosystem based adaptation.

FIGURES:

Already rising by 3 millimetres every year[83], it is estimated that, under a business-as-usual scenario, sea levels might rise by 1 meter by 2100, and 3 meters by 2300[84]. Despite producing only 0.03% of global CO_2 emissions[85], Pacific Islands are among the most vulnerable countries to climate change effect.

The World Bank notes that only 14% of the Overseas Development Aid going towards SIDS address climate change impacts and natural disasters, despite an increasing number of extreme weather events and increasingly impacted communities[86].

SIDS are comprised of fifty-eight island states located across the globe[87]. Despite having very different demographics, sizes and development statuses, SIDS share many common challenges including: high energy costs, dependence on energy imports, vulnerability to climate change and natural disasters, and high costs of building resilient infrastructures[88]. Access to foreign direct investment is a central issue for SIDS. The Global Ocean Forum Roadmap 2016-2021 further recommends the creation of a financial tracking mechanism for funds going into SIDS (and other vulnerable LDCs and developing countries)[89]. Such a mechanism would allow decision-makers to have a clear and transparent vision on current funding flows and identify gaps in finance as well as develop new financial tools for mitigation and adaptation.

The SIDS Accelerated Modalities of Action (SAMOA) pathway urges actors from across the world to support SIDS on their path to sustainable development[90]. It addresses issues ranging from education, tourism and jobs to building resilience, international cooperation, climate change and issues related to ocean health. It calls for support in improving monitoring, access to international climate finance, technical assistance for enhancing resilience, mainstreaming policies in relation with disaster risk management etc. The SAMOA pathway refers specifically to the importance of healthy ocean ecosystems to have resilient coasts and coastal populations[91].

[83] Church, J.A. et al. (2013), *Sea Level Change*. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
[84] Cicin-Sain, B. et al., op. cit., p. 16.
[85] *Ibid.*
[86] OECD, World Bank (2016). Climate and Disaster Resilience Financing in Small Island Developing States. Washington, DC: World Bank. Executive summary, p.ix.
[87] UN-OHRLLS (2017), Small Island Developing States: Country profiles.
[88] OECD (2016), Factsheet Financing for development : the case of Small Island Development States (2016), Organisation for Economic Cooperation and Development.
[89] Cicin-Sain, B. et al. (2016), op. cit., p.16.
[90] United Nations General Assembly (15 December 2014), 69/15 SIDS Accelerated Modalities of Action (SAMOA) Pathway p. 29 paragraph 117.
[91] *Ibid.* p. 13 paragraph 53.

Initiatives and projects around the world are on the move to support SIDS and other islands. The International Renewable Energy Agency (IRENA) launched the Lighthouses initiative on 23 September 2014 at the New York Climate Summit in cooperation with SIDS and development partners to address the barriers to renewable energy deployment in islands, and help SIDS achieve a sustainable transition to renewable energy. The Small Islands Organisation (SMILO) initiative focuses on islands smaller than 150 km² and aims to strengthen the capacities of stakeholders to protect island environments by implementing improved waste management, developing renewable energies, and focusing on an integrated approach to issues of water, sanitation and protecting biodiversity, among others.

7. Science

The ocean, despite being the largest ecosystem on the planet, remains unexplored and unknown on many levels. Developing and disseminating a better comprehension of the ocean, and its specific ecosystems, is vital to preserve the functions and benefits it provides to humans. OCIA aims at using existing interfaces and tailoring new bridges to link researchers, civil society and policy-makers. For action to be based on the best available science, it is fundamental for a global political strategy to be designed targeting ocean science in the first place.

FIGURES:

The ocean provides 99% of habitat space by volume[92]. Ocean science accounts for <0.04 to 4% of total research and development expenditures[93] (Figure 11).

IOC-UNESCO initiated an *International Decade of Ocean Science* to be held between 2021 and 2030. This decade must be regarded in the international framework of the SDG14, especially target 14.3 – to minimise and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels – and target 14.A – to increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular SIDS and LDCs.

The *Global Ocean Science Report* (GOSR) made a first assessment of "where and how existing ocean science capacities are empowering society, sustaining the environment and generating knowledge to conserve our ocean"[94]. It stresses the need to, first, understand and map research capacities, themes and findings. Once the knowledge gaps are identified, relevant research capacities must be deployed and managed accordingly. This dynamic scheme of information and action requires continuous exchanges between science and policy, and must include society as a whole.

[92] E. Ramirez-Llodra et al, (2010), Deep, diverse and definitely different: unique attributes of the world's largest ecosystem, Biogeosciences Available at URL: https://www.biogeosciences.net/7/2851/2010/bg-7-2851-2010.pdf.
[93] IOC-UNESCO. 2017. Global Ocean Science Report - The current status of ocean science around the world. L. IOC-UNESCO, Paris, UNESCO Publishing. Valdés et al. (eds), Paris, UNESCO Publishing. Available at http://unesdoc.unesco.org/images/0025/002561/256197e.pdf.
[94] *Ibid.*

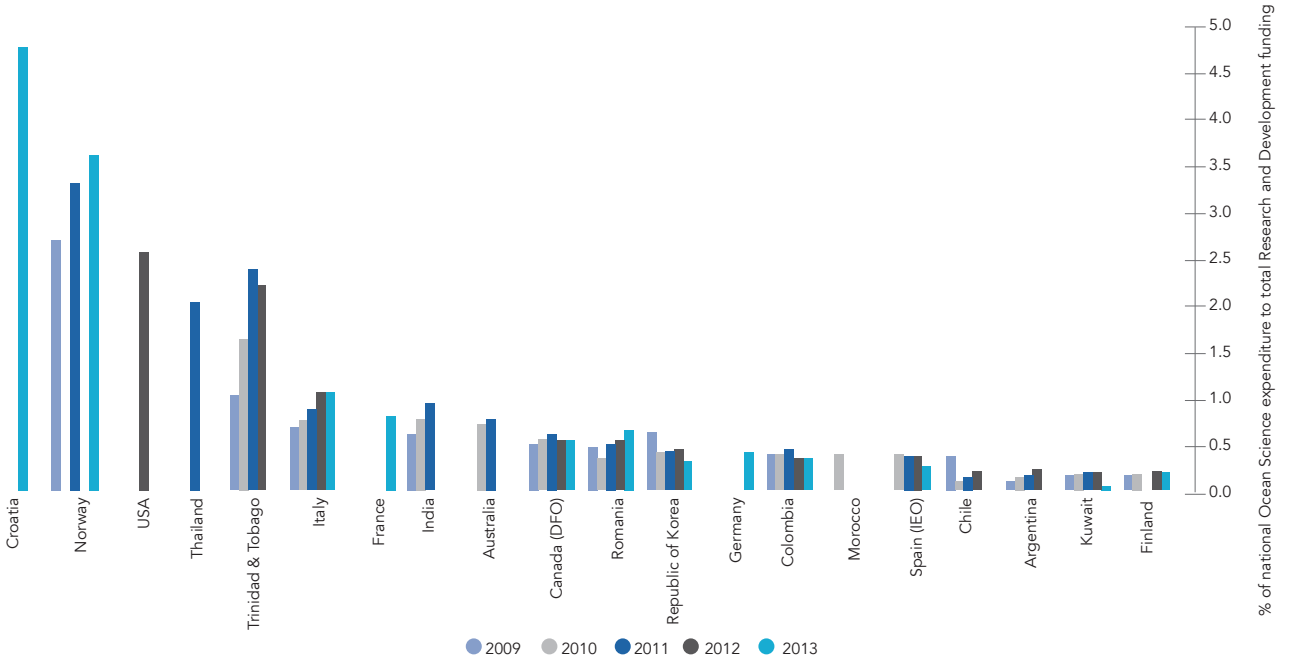


Fig.11 – National expenditure in ocean science as a percentage of national research and development (R&D) expenditure for 20 countries which answered the GOSR questionnaire and provided information regarding national governmental funding for ocean science[95].

Additionally, in June 2017, UNESCO launched an initiative on "*Ocean Literacy for All*" to promote the understanding of ocean functions and inter-linkages with human societies[96]. The aim is to ensure citizens make "systematically informed and responsible decisions related to ocean stewardship and the use of ocean resources"[97]. Ocean science must be understood in a holistic and integrated way: acting for ocean science, requires a global coordination of all matters at stake, including research budgets, infrastructures, means of disseminating science in schools and universities and policy-making.

All OCIA initiatives either create, disseminate or depend on ocean science for their action and advocacy. Dedicating a specific space to an end-to-end coverage of science, in the OCIA framework, aims at promoting more efficient action. OCIA is working closely with scientific actors and in the framework of the International Decade of Ocean Science. From science taught at school to in-depth research, every step is important in designing future ocean science. For instance, the "Deep-Ocean Climate Mitigation and Adaptation" initiative, led by the Deep Ocean Stewardship Initiative (DOSI) and Deep Ocean Observing Strategy (DOOS), is an interface between science and policy applied to the understanding and management of the deep ocean. Highly valuable and for the most part unexplored, the deep ocean is extremely important for climate mitigation and calls for adaptation measures. This can only be achieved with extensive and proper knowledge of the mechanisms of the deep ocean. To this purpose, observation is needed first. Then, the initiative promotes awareness raising and political action.

[95] UNESCO (2017), Global Ocean Science Report—The current status of ocean science around the world, UNESCO Publishing, Paris.
[96] United Nations Ocean Conference (2017), Voluntary Commitments. Available at URL: https://oceanconference.un.org/commitments/?id=15187.
[97] IOC-UNESCO. 2017. Global Ocean Science Report - The current status of ocean science around the world. L. Valdés et al. (eds), Paris, UNESCO Publishing. Available at http://www.unesco.org/new/en/media-services/single-view/news/ocean_literacy_for_all_un_ocean_conference_inspires_global.

III – QUALITATIVE ANALYSIS OF THE INITIATIVES' ACTION PLANS

This section first presents the qualitative method used to analyse the initiatives. Secondly, all the initiatives, who took part in the OCIA survey, are presented. Thirdly, it provides a comprehensive analysis of the survey findings.

1. Qualitative Method: Survey Analysis

The sample in this research was designed to represent a heterogeneous group of initiatives in all parts of the world with clear significance in terms of contributions to climate mitigation and adaptation, using five indicators:

- Advancing scientific understanding of ocean functions and the relationship it holds with human activities;
- Taking actions to reduce the impacts of climate change on ocean functions and preserve marine ecosystems;
- Increasing the resilience of coastal environments and communities from the consequences of a changing climate;
- Building coordinated efforts to address the interlinkages between ocean and climate at the local, regional and international levels;
- Expanding public awareness and understanding of ocean services for decision-makers and civil society.

The construction of the database involved a selection of initiatives, data collection analysis, by surveying 13 initiatives using secondary materials, and the systematic storage of information, according to themes, to facilitate the analysis. The entire database comprises 13 initiatives, under 7 themes and across 90 countries – the country-count was established according to a country's membership and support for the different initiatives.

The themes were defined by the Convention of the Ocean and Climate Initiatives Alliance, at its launch in February 2017. While originally, 13 themes were selected, this research presents the 7 themes for which initiatives were identified or responded to the survey: 1) ocean acidification, 2) marine protected areas and climate change, 3) marine ecosystem resilience, 4) coasts and coastal populations climatic resilience, 5) migration, 6) sustainable islands and small island developing states and, 7) science. Similarly, while OCIA counts 19 initiatives in total, this study presents results for the 13 initiatives which responded to the survey.

Data was obtained from surveys, sent between February and September 2017, to identify, for each initiative: Background information; Objectives; Results; Measuring progress; and, Expectations from OCIA (Table 1). The purpose was to understand the different steps in developing an action plan or development strategy for each initiative. Objectives were assessed for short- and long-term, to include priorities for 2017 (i.e. UNFCCC COP23), 2020, 2030 (i.e. 2030 Agenda for Sustainable Development) and 2050. Results were evaluated in terms of internal outputs (i.e. coalition building, knowledge development, membership growth, etc.), external outcomes (i.e. publications, outreach, recommendations, on the ground action etc.), impacts (i.e. influence in the climate regime, long-term achievements, etc.), contribution to national plans and NDCs, and the structure of each initiative (i.e. governance, dedicated scientific committee and source of funding). Progress was defined by the monitoring and implementation tools developed to measure achievements (i.e. monitoring procedures, report and centralisation of activities, direct feedbacks, data collection tools, certification, achieved objectives). Given the diversity in nature of each initiative, the definition of progress had to encompass a wide range of deliverables. Finally, expectations regarding the purpose of OCIA were collected to draw conclusions for the future strategy of OCIA to best respond to the needs of its members. Follow-up phone interviews were conducted with initiatives wishing to share their last updates and results.

SURVEY QUESTIONS
1- Background information about the initiative
2- Objectives
Q1: What is the overall objective of the initiative? To what needs, which stakeholders and what problematic does it answer?
Q2: What are your objectives/ priorities by COP23 or for 2017 in terms of capacity building, knowledge development and science, influencing policymaking and on the ground actions?
Q3: What are your needs and objectives for the end of 2018?
Q4: How is your initiative internally developing/ growing (signatories, partners...)?
Q5: Following themes in question 2, what are your quantitative/ qualitative objectives for: 2020? 2030? 2050? PS: If these objectives cannot be defined as of now, please explain why (initiative still in the building process, lack of scientific knowledge or predictions on the topic etc.)
3- Initiative results
Q6: What results have been achieved since the beginning of the initiative for the following criteria: Internal outputs; External outcomes; Impacts
Q7: How does your initiative contribute to national plans such as nationally determined contributions or other subnational plans?
Q8: What is the governance system of the initiative?
Q9: Is there a dedicated scientific committee within the initiative? On which scientific information is your initiative based?
Q10: From what funding does the initiative benefit? How is the funding expected to evolve?
4- Measuring progress
Q11: What tools do you use or are you planning to use for monitoring and measuring progress of the initiative?
5- Initiatives alliance
Q12: What would help you deliver and scale-up your activities in 2017 and beyond? How can OCIA contribute?
Q13: If you have any additional feedback, questions, document you wish to share with us, please feel free to add them here

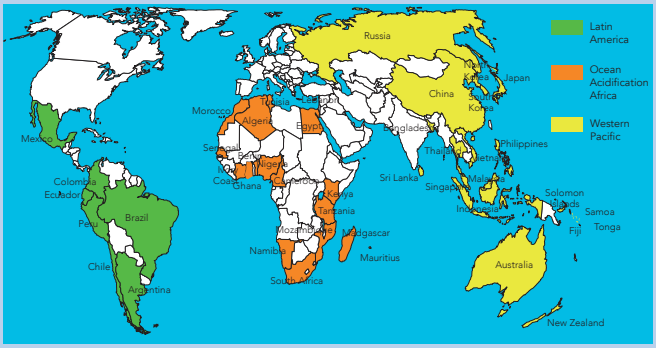
Table 1 – Sample questions used in the OCIA survey

The data collected was then analysed to identify the synergies between the initiatives and across different themes, and to extract recommendations for the future role of OCIA in coordinating international ocean and climate initiatives. The initiatives and analysis findings are presented in the following sections.

2. The Initiatives

1) Global Ocean Acidification Observation Network (GOA-ON)

Overall information



Members: 392 Members: scientists and international organisations.
Leading organisations: IOC-UNESCO, IAEA
Location: Global (Three regional hubs: Ocean Acidification Africa, Latin America, Western Pacific).

Description

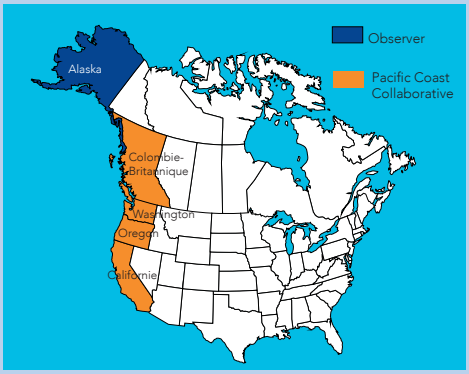
GOA-ON, founded in 2012, is a scientific network on Ocean Acidification (OA), with the aim to increase awareness among policymakers for the threat of OA, and its interplay with other climate change related stressors, e.g. ocean warming, ocean deoxygenation; implement mitigation measures; and increase scientific capacity.

Goals

- Improve our understanding of global OA conditions
- Improve our understanding of ecosystem response to OA
- Acquire and exchange data and knowledge necessary to optimise modelling for OA and its impacts

2) International Alliance to Combat Ocean Acidification (OAA)

Overall information



Members: 35 Members: International Organisations, Governments, NGOs, Private sector
Leading organisation: The Pacific Coast Collaborative addresses environmental issues and climate change as a region (created in 2008).
Location: Global

Description

The OA Alliance assists members in developing and implementing individual jurisdiction action plans to respond to local threats of ocean acidification, and will actively seek inclusion of ocean acidification mitigation and adaptation commitments in future UNFCCC negotiations.

Goals

- Advance scientific understanding of ocean acidification
- Reduce the causes of acidification
- Protect the environment and coastal communities from impacts of a changing ocean
- Expand public awareness and understanding of acidification
- Build sustained support for tackling this global problem

3) MPAs Climate Change Sentinels:

Overall information

Members: 6 Members: international organisations
Leading organisations: AFB, IUCN and WCPA
Location: Global

Description

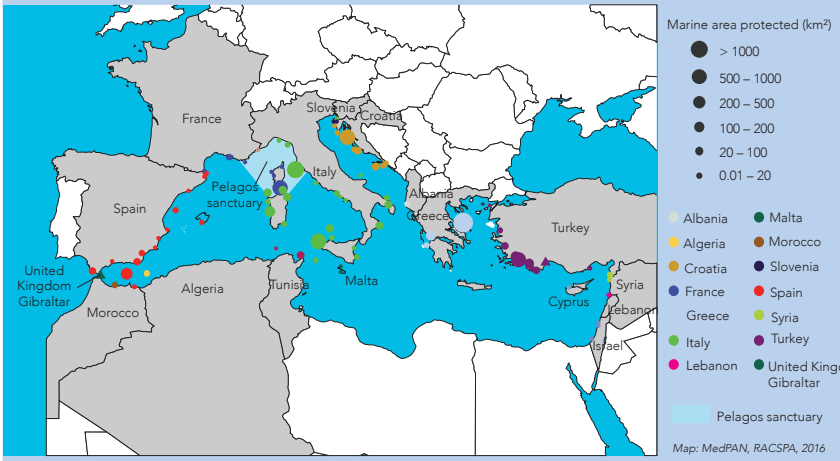
MPA Climate Change Sentinels are an international pilot scheme for observation and action by marine protected area managers to combat climate change.

Goals

The initiative aims at promoting MPAs as observatories and laboratories of climate change by:
- Involving all MPAs networks
- Mobilising all MPA managers to observe the impacts of climate change to define further actions to be taken
- Defining a protocol of observation and action for MPA managers

4) MPA-ADAPT

Overall information



2016 Assessment of Mediterranean Marine Protected Areas

Members: Partners: Management bodies of MPAs, International conservation organisation and National research Centers from Italy, Croatia, France, Spain with local and regional administrations.
Leading organisations: IUCN, Spanish National Research Council
Location: Mediterranean

Description

MPA-ADAPT mainstreams climate change adaptation into Mediterranean MPAs. It brings together 5 MPAs, two research centers and regional and national institutions to improve the dialogue between actors to develop site-specific adaptation plans.

Goals

- Develop collaborative and site specific adaptation plans for MPAs
- Incorporate vulnerability assessments and nature-based adaptation planning into MPA management framework
- Provide guidance to implement and test climate change approaches

5) T-MEDNET

Overall information

Locations where T-MedNet is conducting data collection

Members: Universities, research and oceanography institutes, marine reserves and protected areas, NGO's, local and regional administrations.
Leading organisation: Spanish National Research Council
Location: Mediterranean

Description

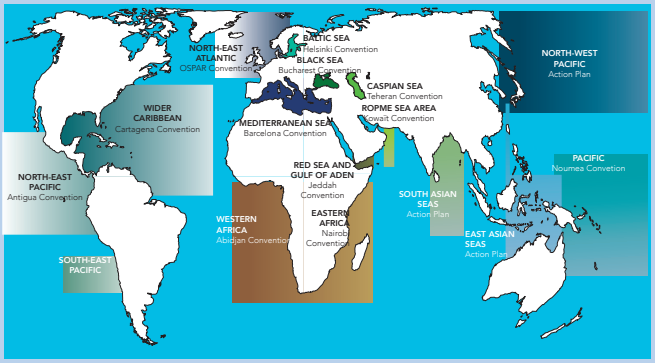
T-MedNet is an initiative aiming to promote and assess climate change warming effects on marine coastal-littoral ecosystems at Mediterranean scale. It aims to spread the acquisition of long-term and high frequency oceanographic time series through partnerships between scientists and MPA managers and to combine physical and biological climate change indicators.

Goals

- International cooperation for climate change observation and sharing information and expertise to track and assess warming signals
- Raising awareness and update information available for decision makers
- Sustaining the development of local and regional adaptive management strategies to tackle climate change impacts on coastal marine biodiversity

6) Global Coral Reef Partnership (GCRP)

Overall information



Map: Global Coral Reef Partnership

Members: Partners: NGO's, IOs, multistakeholder partnerships and foundations
Leading organisation: UN Environmental Program
Location: Global

Description

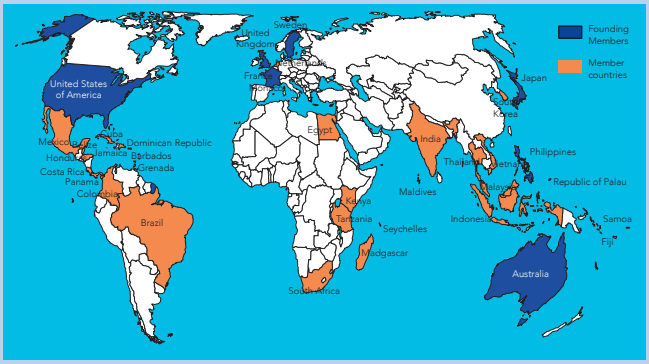
The partnership develops and tests methods, tools and policy frameworks for ecosystem-based management of coral reefs, and facilitates their regional and national adoption through provision of technical and policy support, implementation of demonstration projects and capacity development.

Goals

- To secure coral reef benefits in a changing climate, by supporting and enabling decision making across public and private sectors (informed by current science and sound data on coral reef status and trends; climate change vulnerability; ecosystem service values and human dependence)
- To protect coral reef biodiversity, build climate resilience of reefs as well as dependent industries and communities, and make coral reefs a part of sustainable development/a blue economy

7) International Coral Reef Initative (ICRI)

Overall information



Members: 60 members
Leading organisations: Governments of France (2016-2018 secretariat)
Location: Global

Description

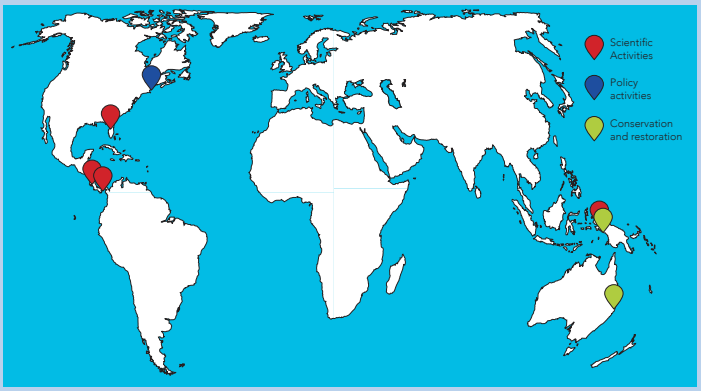
ICRI is a partnership among states, intergovernmental organisations and non-governmental organisations striving to preserve coral reefs and related ecosystems. The ICRI Secretariat is hosted by ICRI Members on a voluntary basis and rotates every 2 years. As of June 1st, 2016 until May 2018, the ICRI secretariat is chaired by France.

Goals

- Highlight the contribution of coral reefs, mangroves and seagrasses to mitigate and adapt to climate change and its impacts
- Encourage financing for projects and initiatives that help protect and restore coral reefs, mangroves and seagrasses
- Increase knowledge on the role of coral reefs and related ecosystems in interactions with the climate and the ocean, and their effects on ecosystems

8) International Blue Carbon Initiative (IBCI)

Overall information



Map: Conservation/Restoration Activities (2017) International Blue Carbon Initiative

Members: 30> Members: international organisations, governments, research institutes, NGOs
Leading organisations: Conservation International, IUCN, IOC-UNESCO
Location: Global

Description

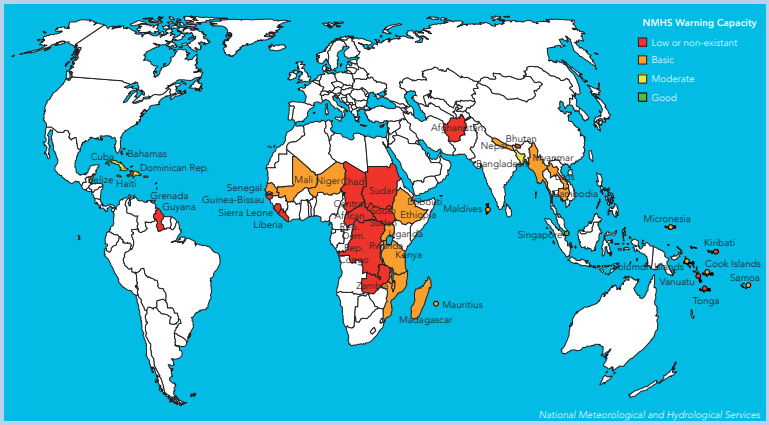
The Blue Carbon Initiative is a coordinated, global program focused on mitigating climate change through the conservation and restoration of coastal and marine ecosystems.

Goals

- Policy working group: creates framework for policy and management maximizing carbon conservation
- Science working group: develops methods to assess blue carbon stocks and emissions, supporting scientific research on the role of coastal blue carbon ecosystems and climate change mitigation
- Science-policy collaboration favours a comprehensive approach, encouraging national-level accounting of blue carbon ecosystems' stocks and emissions as well as local and national capacity building to protect and manage coastal ecosystems

9) Climate Risks and Early Warning Systems (CREWS)

Overall information



Status of Early Warning Systems in selected Small Island Developing States and Least Developed Countries

Members: IOs & Governments, ACP countries
Leading organisations: World Meteorological Organisation, World Bank GFDRR, UNISDR
Location: LDCs and SIDS globally

Description

The CREWS initiative aims to significantly increase the capacity of Least Developed Countries (LDCs) and Small Island Developing States (SIDS) to generate and communicate effective, impact-based, multi-hazard, gender-informed, early warnings and risk information.

Goals

- Global System Integration
- Modernisation of Regional Agencies
- Strengthening national and sub-national capacity building

10) Ocean, climate and human mobility (IOM-OCP)

Overall information

INTERNATIONAL ORGANIZATION FOR MIGRATION
IOM·OIM
THE UNITED NATIONS MIGRATION AGENCY

ocean-climate.org

Members: 2 Members: IO and NGO
Leading organisations: International Organisation for Migration (IOM) and Ocean and Climate Platform (OCP)
Location: Global

Description

IOM and the Ocean and Climate Platform launched an innovative partnership in 2016 to combine their efforts and respective expertise to address key issues and links between changes in the ocean and climate, and human migration.

Goals

- To improve the knowledge base on this topic
- To raise political awareness and encourage action to address these issues at the global, regional and national levels
- In the long run to develop concrete solutions and programmes

11) Small Islands Organisation (SMILO)

Overall information

Members: 8 Members: NGO, Regional organisations, Governments
Leading organisations: NGO Small Islands Organisation
Location: Mediterranean, W. Africa, Indian Ocean

Description

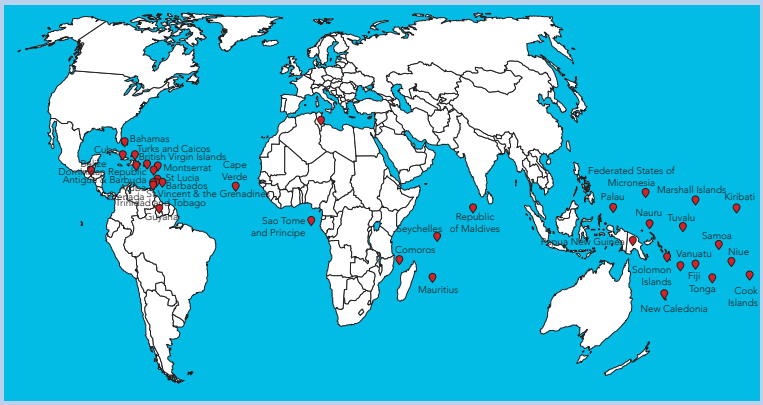
SMILO, scoping small islands (i.e. < 150 km²), aims at strengthening capacities of stakeholders in island environments. It focuses on: proper waste management, renewable energies, water and sanitation, biodiversity and ecosystems protection (both terrestrial and marine), natural heritage promotion.

Goals

The development phase 2017 – 2020, focusing on 15 pilot islands will adopt the following roadmap:
• Local assessments carried out on each island to set up specific goals and objectives (2017-2018) and specific expertise on islands, tailored to local needs (2017-2020)
• Audit sessions carried out by independent experts and peers, to assess compliance of islands with standards of SMILO ecolabel (starting 2018)
• All along, communication and lobbying campaigns to promote islands as sustainable development pioneers (2017-2020)

12) Lighthouses Initiative (IRENA)

Overall information



SIDS where projects have been or are being conducted by the Lighthouses

Members: 36 SIDS partners and 19 additional partners
Leading organisations: IRENA
Location: Global

Description

The Lighthouses initiative offers a framework for SIDS to move to a structured, holistic, sustainable approach to renewables. The initiative considers all elements of a transition to renewables (policy, market frameworks, technology options, project development, financing and capacity building). IRENA serves, supports and facilitates interactions between SIDS and other partners and assesses if the initiative is on track to deliver on its goals.

Goals

• Accelerate the deployment of renewable energy on islands
• Maximise the use of indigenous, clean and abundant renewable energy resources, requiring a structured, holistic approach to ensure long-term sustainability
• Capture invaluable lessons for the rest of the world

13) Deep Ocean Climate Mitigation and Adaptation (DOSI-DOOS)

Overall information	
DOSI DEEP-OCEAN STEWARDSHIP INITIATIVE; DEEP OCEAN OBSERVING STRATEGY	**Members:** Two scientific networks (GOOS/IOC and INDEEP) **Leading organisations:** Deep Ocean Stewardship Initiative (DOSI) and Deep Ocean Observing strategy (DOOS). **Location:** Global, international waters.
Description	
The Deep Ocean Climate Mitigation and Adaptation initiative brings together deep-sea scientists across disciplines to raise awareness about the importance of the deep ocean for climate mitigation and adaptation by strengthening and coordinating observation of the deep ocean.	
Goals	
• Strengthen coordinated efforts for deep ocean observations. • Support knowledge transfer across disciplines targeting industry, policy makers and the civil-society. • Fully integrate the deep ocean in international negotiations (SDG14, BBNJ and others).	

3. Findings

The OCIA initiatives are a balanced and regionally representative sample of ocean and climate action undertaken worldwide. These multi-stakeholder partnerships involve governments, international agencies, NGOs, scientific institutions, private sector, and subnational authorities to advance the ocean within the climate agenda. The types of actors involved are represented as follow: 23% of member organisations are non-governmental organisations, 22% are research institutes, scientific coalitions and universities, and other actors, such as international organisations, regional agreements, the private sector and public institutions each represent between 6% and 12% of total participation (Figure 12).

Fig.12 – Representation of the different stakeholders involved in OCIA

The comprehensive analysis of the findings follows the structure of the survey: I – Objectives; II – Results; III – Measuring Progress; IV – Expected role of OCIA. A summary is presented in Table 2.

Initiatives	Internal outputs	External outcomes	Impacts	Measuring progress	Scientific committee	NDCs contribution	Governance	Funding
GOA-ON	Yes	Yes	Yes	Yes	Yes	Yes	Co-chaired by two scientists, supported by organisations and programs	No sustained funding
OAA	Yes	Yes	Yes	No	No	Yes	Supported by the Pacific Coast Collaborative jurisdictions	From philanthropic foundations
MPA CC sentinels	Yes	Yes	No	No	No	Yes	Coordinated by the French Agency for Biodiversity	No sustained funding
MPA-ADAPT	Yes	Yes	Yes	Yes	Yes	Yes	Coordinated by project leader and Steering Committee	Part of Interreg MED Program (2016-2019)
T-MEDNet	Yes	Yes	Yes	Yes	Yes	Yes	Coordinated by the Institute of Marine Sciences in collaboration with local/regional actors	From the Interreg MED Program (2016-2019)
GCRP	Yes	Yes	Yes	Yes	Yes	Yes	UN Environment hosts the Partnership Steering Committee	As part of UN Environment's budget
ICRI	Yes	Yes	No	No	No	No	Chaired by France	No sustained funding
IBCI	Yes	Yes	Yes	Yes	Yes	Yes	Co-organized by CI, IOC and IUCN	From leading partners
CREWS	Yes	Yes	Yes	Yes	Yes	Yes	Steering Committee	From countries
IOM–OCP	Yes	Yes	No	No	No	Yes	Partnership IOM-OCP	No
SMILO	Yes	Yes	Yes	Yes	Yes	Yes	Coordinated by SMILO (NGO)	From EU and FFEM
LIGHTHOUSES	Yes	Yes	Yes	Yes	No	Yes	Coordinated by IRENA	From IRENA Member states and development partners
DOSI-DOOS	Yes	Yes	Yes	Yes	Yes	Yes	DOSI Working group and DOOS Steering Committee	From the Arcadia Foundation and NASA

Table 2 – Table summarising the survey findings for all the initiatives

1) Objectives

Results from the survey analysis show that all the initiatives had short-term objectives to achieve by COP23, with a strong emphasis on raising awareness and building coalitions. The analysis shows that 9 out of 13 initiatives set targets for 2020; 4 initiatives set goals for 2030 and only 2 initiatives developed their vision up to 2050. For example:

• BY COP23:

GLOBAL CORAL REEF PARTNERSHIP	
• Initiate at least three projects applying **downscaled climate model projections** of coral bleaching conditions and guidance on resilience assessments in coral reef planning and management processes.	• Implement projects to reduce pressures from diving and snorkelling in key coral reef climate refuge in the Philippines, by expanding the **Green Fins initiative** spatially based on downscaled climate model projections of coral bleaching conditions.

• BY 2020:

CREWS	MPA-ADAPT
• Launch projects to **strengthen early warning systems** in a significant number of countries where funding gap remains, among the 104 LDC and SIDS, and a funding goal of 100 M USD.	• Implement **adaptation strategies** to enhance resilience to climate change impacts at Mediterranean scale.

• BY 2030:

T-MEDNET	
• Build-up Mediterranean sub-regional (e.g. based in eco-regions) climate change **data centres network**. These centres will be responsible of training activities, database updates, define main communication targets and establish the dialogue mechanisms adapted to local and sub-regional stakeholders in each sub-region.	• Promote **international research projects** to (i) improve our ability to develop accurate **warming scenarios in coastal areas** (downscaling tools) and **extreme events** such as heat-waves; and (ii) **modelling tools devoted to reliable early warning systems to climate change impacts.**

• BY 2050:

DOSI-DOOS
• Develop a full **value chain for operational and sustained observations**, including generation of products and ecosystem health indicators and their incorporation into deep ocean and environmental protection, legislation, and management.

2) Results

All the initiatives taking part in the survey analysis have developed **internal outputs**, with a strong focus on membership growth and governance structuring. For instance:

OAA	GOA-ON	ICRI
• **Membership** has grown to 35 members since its creation in September 2016.	• Launched **Pier2Pier**, a scientific mentorship program with an adaptive and self-driven approach to capacity development.	• **Ad Hoc Committee** to highlight and promote the contribution of coral reefs, mangroves and seagrasses to attenuate climate change and its impacts.

All initiatives have produced **external outcomes**, especially scientific publications, media articles, policy briefs and action plans. For example:

IBCI	OAA	GOA-ON
• Published technical brief, publications and guidelines on blue carbon ecosystems. • Organised worldwide scientific and policy working groups.	• Developed a **Call to Action** and an **OA Action Plan Toolkit** to address the environmental and economic threat posed by ocean acidification.	• Created a **data portal** building on the existing global oceanic carbon observatory network of repeat hydrographic surveys, time-series stations, floats and glider observations, and volunteer observing ships.

The analysis shows that 10 out of 12 initiatives have produced **long-term results** and/or **exerted influence** in the international fora. Most of the initiatives have successfully pushed forward specific ocean-related issues, which were previously overlooked or ignored, including:

IOM-OCP	OAA
• Submitted a joint **concept note** to the IPCC for a chapter on "Human Mobility" as part of the forthcoming report on "Oceans and Cryosphere". • Brought 'Migration' into the agenda of the **UN Oceans Conference** (June 2017).	• **Influenced the World Ocean Summit** agenda to include an emphasis on climate change policy and financial risk.

All initiatives contribute to **national plans**, such as NDCs or other subnational plans. All initiatives, whether they are supported by governments or not, have developed close collaboration with local, regional and/or international policy-makers to share information and improve decision-making. For instance:

MPA-ADAPT	SMILO	LIGHTHOUSES
• Cross-border collaborative and coordinated approach to adaptation is in line with the **UNFCCC's National Adaptation Plan** process and the **EU Strategy on Adaptation to Climate Change** • Contributes to advancing progress on commitments toward meeting **Aichi Target 11.** • Gathers feedback for further development of the **IUCN Green List of Protected Areas** and its Global Standard for the marine environment. • Contributes to National Plans and Strategies on Adaptation of Climate change, from **Spain, Italy, Croatia and France.**	• By testing local actions on islands promoting resilience, that can then be replicated and scaled-up at national scale, other territories, and globally, in application of **Aichi targets, CBD**, and other conventions, such as the Barcelona Convention. • Partners involved locally on islands are encouraged to include in their governance bodies (i.e., "local SMILO committees") representatives of the national level, so that they can closely interact.	• Contributes directly to the development of national plans by assisting SIDS with development of **comprehensive national energy roadmaps** and with various models, case studies and reports aimed directly at assisting government policy makers in developing plans that support the deployment of renewable energy.

3) Measuring progress

The study shows that 9 out of 13 initiatives have developed strategies and/or tools to measure their progress. Most of the initiatives evaluate their progress using the number of objectives achieves (e.g. publications, memberships etc.). Only 3 initiatives have developed concrete mechanisms or tools to monitor their progress, including:

SMILO	LIGHTHOUSES
• Through **eco-labelling process**, to constantly check compliance with a series of standards that have been defined thanks to close interaction with island stakeholders. • Tracking is ensured locally, on islands, by a specific **Participative Committee.**	• The SIDS Lighthouses ***Quickscans*** offer a tool for quick data collection and analysis to assess progress.

CONCLUSIONS

The OCIA Report set out to provide an overview of the ocean and climate initiatives under the Global Climate Action Agenda, with an emphasis on progress since COP21, in December 2015, in Paris. The report reviewed the context in which the ocean grew considerable momentum and was integrated into the Paris Agreement and the GCAA. The creation of OCIA, by the Ocean and Climate Platform, was presented within the context of broad mobilisation and the Sustainable Development Goals. The thematic coverage of OCIA was presented to highlight the diversity of ocean-based actions led by member initiatives at the local, regional and international levels. The alignment of ocean and climate initiatives with the Paris Agreement was reviewed by analysing the objectives, results and progress monitoring for the OCIA members.

1. Building on the Momentum: Achievements of OCIA Initiatives since COP21

COP21 was determinant for the ocean community, especially with the integration of the ocean in the final text of the Paris Agreement. Following the inclusion of the ocean in the Global Climate Action Agenda at COP22, in Marrakech, all the initiatives taking part in the OCIA have capitalised in a significant manner from COP21 and COP22 to either continue implementing their initiative as planned or scaling up through bringing in new partners and investments. A number of initiatives have emerged to highlight the critical interlinkages between ocean health and a changing climate.

KEY ACHIEVEMENTS SINCE COP21 INCLUDE:

LIGHTHOUSES INITIATIVE (IRENA)		
Since the launch of the Caribbean Portal at COP21, the **Lighthouses Initiative** (IRENA) has registered 19 projects.	Representing a combined capacity of **396 MW**.	And an investment volume of **$ 1 billion**. Two islands were selected to receive $45 million funding from the Abu Dhabi Fund for Development.

GLOBAL CORAL REEF PARTNERSHIP (UN ENVIRONMENT)		
Since COP21, the **Global Coral Reef Partnership** has launched dataset for the prioritization of coral reef management in the face of climate change.	Downscaled climate model projections **at a resolution of 4 km** for business as usual and successful mitigation scenarios and identifying climate refuges that are priorities for conservation planning, Marine Spatial Planning, and vulnerability assessments.	Total Budget for this partnership from 2015 to 2017 was **$3 million.**

INTERNATIONAL ALLIANCE TO COMBAT OCEAN ACIDIFICATION (OAA)	
OUR OCEAN 2016 (WASHINGTON DC):	OUR OCEAN 2017 (MALTA):
The Pacific Coast Collaborative announced the International Alliance to Combat Ocean Acidification, which will advance scientific understanding of ocean acidification, reduce the causes of acidification, protect the environment and coastal communities from impacts of a changing ocean, expand public awareness and understanding of acidification, and build sustained support for tackling this global problem. The Alliance will actively seek **inclusion of ocean acidification mitigation and adaptation commitments in the COP23** international climate agreement.	OAA has announced that **15 of its members will develop Ocean Acidification Action Plans** by June 2019 and that it will grow from its present 47 members to 60 members by June 2018.

2. Achieving Concrete Results: Ocean-based Solutions

The information collected in support of this report indicated that there are significant synergies in the manner of structuring and developing initiatives. Activities such as outreach, capacity-building and knowledge management and development can be found in almost all OCIA initiatives. There is more variation in the approaches employed by initiatives for implementation and measuring progress. Fewer initiatives put greater emphasis on developing a structured approach to monitoring progress.

The analysis showed there was considerable potential for ocean and climate initiatives to contribute to accelerating the objectives of the Paris Agreement, with the implementation of ocean-based adaptation and mitigation measures. Numerous initiatives have put a strong emphasis on policy-related outputs and outcomes, which has influenced the international agenda to bring the ocean forward. Additionally, a majority of initiatives were not only based on scientific expertise, they significantly contributed to reducing knowledge gaps on ocean functions and enhancing our understanding of climate change.

KEY ADAPTATION IMPACTS INCLUDE:

LIGHTHOUSES INITIATIVE (IRENA)		
The Lighthouses Initiative offers a framework for SIDS to move from developing projects in isolation to a holistic approach that considers long-term needs and covers all elements required for a **successful transition to renewables**.	Objectives: • Mobilising **US$ 500 million** • Deploy **100 MW of new solar PV** • Deploy **20 MW of new wind power** • Deploy significant quantities of hydropower and geothermal energy and marine energy projects • And ensure all participating SIDS put have renewable energy roadmaps in place.	**36 island partners:** Antigua & Barbuda, Aruba, Bahamas, Barbados, Belize, British Virgin Islands, Cape Verde, Cuba, Comoros, Cook Islands, Dominican Republic, Federated States of Micronesia, Fiji, Grenada, Guyana, Kiribati, Republic of Maldives, Republic of the Marshall Islands, Mauritius, Montserrat, Nauru, New Caledonia, Niue, Palau, Papua New Guinea, St. Lucia, St. Vincent and the Grenadines, Samoa, Sao Tome and Principe, Seychelles, Solomon Islands, Tonga, Trinidad and Tobago, Turks and Caicos, Tuvalu, Vanuatu.

CREWS	
The Steering Committee has approved **over 10 projects** across the globe: **Democratic Republic of Congo:** Strengthening hydro-meteorological services and early warning. **Niger:** Setting up of early warning system on floods and strengthening of food security warning mechanism **Mali:** Modernisation of hydrological and meteorological services, of warnings on flood and drought risks. **Burkina Faso:** Capacity strengthening for warning delivery on floods and drought risks. **Six insular states, Western Pacific:** Strengthening of hydro-meteorological services and early warning. **Papua New Guinea:** Project approved, pending funding. Regional project of capacity building in Western Africa, and regional project in the Caribbean Region (**Curaçao-Saint Martin, Sainte Lucia and Haïti**).	Expected outcomes: These projects are expected to increase the capacity of most vulnerable populations to be **informed in a timely manner**, and to facilitate their **preparation and protection** when an extreme climatic event covered by the warning system happens. Depending on projects, **hydro-meteorological services** are expected to improve the quality of service delivery, to strengthen technical and human capacities, to adopt long term plans on their organisational sustainability.

KEY MITIGATION IMPACTS INCLUDE:

BLUE BELT INITIATIVE		
The FEED ALGAE MOROCCO PROJECT	Cultivation of microalgae in raceway on an area of **8000 ha.**	**Expected outcomes:** Estimated annual production of **150,000 tons of dry algae per year**, this project will absorb **300,000 tons of carbon dioxide** and produce **150,000 tons of oxygen** per year. This will contribute to the mitigation of climate change (de-acidifying 9 billion tons of seawater / year). Also, the use of microalgae produced in fish farming will save **450,000 tons of pelagic fish each year.**

KEY SCIENTIFIC CONTRIBUTIONS INCLUDE:

T-MEDNET		
• **40 infrastructures** (vertical of data loggers installed at sea from surface down to 40m depth or more); • **12 Million quality checked T-samples;** • Longest continuous and high-frequency **coastal oceanographic T time series** acquired in the Mediterranean Sea: 15-20 years long, 5 series 10-15 years long, 15 series 5 to 10 years long and 13 series < 5 years; • The funding received since 2000 is EUR 464,000; • The funding needed to scale-up is ***EUR 650,000*** for 2018-2020.	• **242 points of observation** at standard depths, generally every 5m to maximum 67m depth; • **7 countries** involved: Spain, France, Italy, Croatia, Greece, Turkey, Tunisia; • **23 MPAs** and **16 research institutions involved;** • Launched a **collaborative web-platform** in 2009 to support the implementation of standardized protocols, database of T records and reports on T conditions in the Mediterranean Sea.	• Analyse past and present **marine coastal thermal regime** at relevant geographic and bathymetric resolution; • Building more **realistic warming scenarios** through model validation and guiding new implementation in complex and highly dynamic coastal areas; • Explore **biological responses to warming** at different organisational levels (populations, species, communities, ecosystems); • Support management and conservation actions to enhance the **resilience and adaptive capacity** to climate change impacts in Mediterranean coastal areas.

3. Moving Forward: The Future Strategy of OCIA

By acting as an interface between on-the-ground action, scientific research, policy-making and objectives of the Paris Agreement, OCIA advocates for the recognition and integration of ocean-based solutions into the international climate dynamics. Building on the inputs from OCIA initiatives, this report concludes with three strategies for the continuation of the Ocean and Climate Initiatives Alliance at COP23, in Bonn, and beyond.

Role 1: Shaping a Universal Ocean Language

Initiatives seek opportunities and partnerships to better understand and engage the most effective levers for impacting **ocean language** in international climate dynamics, including COP23. OCIA shall propose an approach to achieving improved ocean protection language, for instance, by placing science as a root-solution in the conception of concrete action.

OCIA shall contribute to **mapping the requirements of the Paris Agreement**, for instance, by interpreting the implications and identifying where the levers are for the initiatives.

Role 2: Complementarity Between the Creation of Science and Policy-Making

Initiatives would benefit from the support of the OCIA **Scientific Committee**. The Scientific Committee shall help initiatives define the best science to provide to the initiatives' managers, for example to help them with the management of their MPAs. The Scientific Committee shall also share what kind of knowledge is missing locally or regionally to understand climate change in addition of big regional data (e.g. on salinity, temperature, currents, invasive species etc.).

OCIA shall act as a platform to **share work and information** by interacting with the working group of specific initiatives to assist with the implementation of action plans; by attracting new actors wishing to promote their best practices or gain access to members' best practices; by participating actively in the initiatives' networks (workshops, conferences, and virtual platforms); by contributing through sharing of data and information on ocean-related activities.

OCIA shall provide access to its wide **network of experts**. The network of technical experts could support work on strengthening data collection and evidence, and on developing new methodologies for field assessments and practical solutions. OCIA shall also promote interactions with high-level political contacts.

OCIA shall advise on possible **partnerships** among members of various initiatives, by sharing new ideas and proposals for specific joint activities and programmes at the global, regional or national level.

Role 3: Communication and Visibility

OCIA shall assist its members with the **expansion** of their initiatives, by contributing to supporting initiatives' implantation in Europe and globally, and helping initiatives to grow their membership to include additional countries and supporting members.

OCIA shall strengthen **communication on specific issues** related to the work of its initiatives, by promoting the importance of each action as a part of the answer for mitigation and adaptation solutions. OCIA shall emphasise on specific action in global outreach campaign to raise awareness to a broader audience. OCIA shall focus on available solutions, and seek to leverage public and private sectors as well as civil society. OCIA shall also disseminate information on initiatives through its website, newsletter and network, and attract new candidates.

One of the greatest challenges is **access to funding**. OCIA shall contribute in conducting a joint mapping exercise to identify possible donors and innovative funding sources, e.g. funding opportunities for limited-duration regional projects for targeted multidisciplinary observations addressing pressing scientific and societal.

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ANNEX I - LIST OF ALL OCIA PARTNERS

AFRICAN PACKAGE FOR CLIMATE RESILIENT ECONOMIES

Leading organisations: African Development Bank, World Bank, Food and Agriculture Organization
Non-state actors: WorldFish; WWF; IUCN; UNESCO
Member countries: Morocco; Tunisia; Benin; Capo Verde; Ivory Coast; The Gambia; Ghana; Guinea; Guinea Bissau; Liberia; Mauritania; Nigeria; Senegal; Sierra Leone; Togo, Angola; Cameroon; Equatorial Guinea; Gabon; Sao Tome & Principe; Comoros; Kenya; Madagascar; Mauritius; Mozambique; Seychelles; Somalia; South Africa; Tanzania
Countries where actions are being led on the ground: Morocco; Tunisia; Benin; Capo Verde; Ivory Coast; The Gambia; Ghana; Guinea; Guinea Bissau; Liberia; Mauritania; Nigeria; Senegal; Sierra Leone; Togo; Angola; Cameroon; Equatorial Guinea; Gabon; Sao Tome & Principe; Comoros; Kenya; Madagascar; Mauritius; Mozambique; Seychelles; Somalia; South Africa; Tanzania

BLUE BELT

Leading organisations: World Bank, FAO, INRH submitted by the Moroccan government
Member countries: Morocco
Countries where actions are being led on the ground: Morocco

CLIMATE RISKS AND EARLY WARNING SYSTEMS

Leading organisations: World Meteorological Organisation; World Bank; Global Facility for Disaster Reduction and Recovery; UN Office for Disaster Risk Reduction
Non-state actors: International Union for Telecoms; UN Development Program
Member countries: Australia; France; Germany; Luxembourg; Netherlands; Democratic Republic of Congo; Niger; Mali; Burkina Faso; Papua New Guinea; Haiti; St Lucia
Countries where actions are being led on the ground: Democratic Republic of Congo; Niger; Mali; Burkina Faso; Papua New Guinea; Haiti; St Lucia

DEEP OCEAN CLIMATE MITIGATION AND ADAPTATION

Leading organisations: Deep Ocean Observing System; Deep Ocean Stewardship Initiative
Non-state actors: Global Ocean Observing System; IOC-UNESCO; International Network for scientific investigation of the deep-sea ecosystems

EUROPEAN MARITIME REGIONS FACING CLIMATE CHANGE

Leading organisations: Conference of Peripheral Maritime Regions

GLOBAL CORAL REEF PARTNERSHIP OF UN ENVIRONMENT AND REGIONAL SEAS

Leading organisations: UN Environment
Non-state actors: Caribbean Environment Program; Abidjan Convention; Nairobi Convention; Regional Organisation for the Conservation of the Environment of the Red Sea and Gulf of Aden; South Asia Cooperative Environment Programme/ South Asian Seas; Coordinating body of the Seas of East Asia; SPREP; NOAA Coral Reef Conservation Program; Reef World Foundation; ECRE-Blue Finance; UNEP-World Conservation Monitoring Center; GRID-Arendal; International Coral Reef Initiative; Global Coral Reef Monitoring Network

GLOBAL OCEAN ACIDIFICATION OBSERVING NETWORK

Leading organisations: IOC-UNESCO; IAEA
Non-state actors: GOOS, IOCCP (International Ocean Carbon Coordination Project); GEO (Group on Earth Observation, GEOSS); NOAA; CSIRO; UNESCO; SCOR; OAiRUG; IGBP (International Geosphere and Biosphere Program); CSIRO.

INTERNATIONAL ALLIANCE TO COMBAT OCEAN ACIDIFICATION

Leading organisations: US State of Washington; Us State of Oregon; US State of California; Canada Province of British Columbia; France, Chile
Non-state actors: Nigeria Cross River State; City of Imperial Beach California; US State of New-York; Nisqually Indian Tribe; Canada Province of Quebec; Quileute Nation; Quinault Indian Nation; The Squamish Tribe; City of Vancouver Canada; Association Monégasque sur l'Acidification des Océans (AMAO); California Coast Keepers Alliance; California Ocean Science Trust; Center for Ocean Solutions; Hakai Institute; Hog Island Oyster Co., Intake Works LLC; J. Hunter Pearls Fiji; Joint Ocean Commission Initiative; Marine Stewardship Council; Monterey Bay Aquarium; The Nature Conservancy (TNC); Northwest Indian Fisheries Commission; Natural Resources Defense Council (NRDC); New Zealand Ocean Acidification Community; Ocean Networks Canada; Ocean Conservancy; Ocean Sanctuaries; Pacific Coast Shellfish Growers Association (PCSGA); Scripps Institution of Oceanography; Surfrider Foundation; Tanzania Fisheries Research Institute; Taylor Shellfish Farms; University Cote d'Azur France; University of Otago; Vigilent; We Mean Business; Washington Ocean Acidification Center (WOAC); WWF
Member countries: Chile; France; United Arab Emirates; Tuvalu; Iceland

INTERNATIONAL CORAL REEF INITIATIVE

Leading organisations:
Australia, France, Japan, Jamaica, the Philippines, Sweden, the United Kingdom and the United States of America
Non-state actors: NGOS: Blue Finance; Blue Ventures; Central Carribbean Marine Institute; Conservation International; Coral Cay Conservation; Coral Guardian; Fondation pour la Protection de la Biodiversite Marine; Great Barrier Reef Foundation; Interamerican Association for Environmental Defense; International Society for Coral Reef Studies; Marine Ecosystem Services Partnership; National Coral Reef Institute; Project AWARE Foundation; Reef Check Foundation; SeaWeb; The Coral Reef Alliance; the Nature Conservancy; The Reef-World Foundation; Wildlife Conservation Society; World Resources Institute; WWF; IGOS: IOC-UNESCO; Convention of Biological Diversity; International Union for Conservation of Nature; Ramsar Convention Secretariat; The World Bank; UNEP- World Conservation Monitoring Center; UNDP; UNEP. Regional Intergovernmental Organisation and regional seas: Coordinating Body of the Seas of East Asia; Regional Organization for the Conservation of the Red Sea and Gulf of Aden; Secretariat of the Pacific Community; SPREP; South Asia cooperative environment programme; Nairobi Convention; UNEP Caribbean Environment Programme. Coastal Oceans Research and Development in the Indian Ocean; Coral Reef Initiatives for the Pacific; Global Coral Reef Partnership
Member countries: Australia; Barbados; Belize; Brazil; Colombia; Costa Rica; Cuba; Dominican Republic; Egypt; Fiji; France; Grenada; Honduras; India (Ministry of Environment and Forests); Indonesia; Jamaica; Japan; Kenya; Korea; Madagascar; Malaysia; Maldives; Mexico; Panama; Philippines; Principality of Monaco; Republic of Palau; Samoa; Seychelles; South Africa; Sweden; Tanzania; Thailand; The Netherlands; United Kingdom; United States of America; Vietnam

LIGHTHOUSES INITIATIVE

Leading organisations: International Renewable Energy Agency (IRENA)
Non-state actors: Association of the Overseas Countries and Territories of the European Union; Clean Energy Solutions Center; Clinton Climate Initiative; ENEL; Indian Ocean Commission; Rocky Mountain Institute; Carbon War Room; SE4ALL; UN Development; Program; World Bank
Member countries: Antigua & Barbuda; Bahamas; Barbados; Belize; Cape Verde; Cuba; Comoros; Cook Islands; Dominican Republic; Federated States of Micronesia; Fiji; Grenada; Guyana; Kiribati; Republic of Maldives; Republic of the Marshall Islands; Mauritius; Nauru; Niue; Palau; Papua New Guinea; St Lucia; St Vincent and the Grenadines; Samoa; Sao Tome and Principe; Seychelles; Salomon Islands; Tonga; Trinidad and Tobago; Tuvalu; Vanuatu.

MPA-ADAPT

Leading organisations:
Spanish National Research Council; International Union for the Conservation of Nature Centre for Mediterranean Cooperation
Non-state actors: Spanish National Research Council; International Union for the Conservation of Nature Centre for Mediterranean Cooperation; Italian National Institute for Environmental Protection and Research (ISPRA); Public Institution Brijuni National Park; Marine Protected Areas Pelagie IslandsManagement Body Municipality of Lampedusa and Linosa; Corsican Agency for Environment; National Park of Port Cros; Portofino Marine Protected Area; United Nations Environment Program Mediterranean Action Plan; MedPan; Spanish Ministry of Agriculture and Fishery, Food and Environment, marine reserves of Spain; City of San Benedetto del Tronto, Regional National Park of Corsica; University of Malta

MPAS CLIMATE CHANGE SENTINELS

Leading organisations: French Biodiversity Agency; International Union for the Conservation of Nature; World Commission on Protected Areas
Non-state actors: MedPan; NOAA Office of Marine Sanctuaries; French Biodiversity Agency; International Union for the Conservation of Nature; World Commission on Protected Areas
Member countries: France (AFB)

NAVIGATING A CHANGING CLIMATE

Leading organisations:
PIANC (World Association for Waterborne Infrastructure) Think Climate Coalition
Non-state actors: International Association of Ports and Harbors; International Harbour Masters' Association; International Maritime Pilots Association; International Bulk Terminals Association; Inland Waterways International; Institute of Marine Engineering, Science & Technology; European Dredging Association; European Sea Ports Organisation; Smart Freight Center

OCEAN, CLIMATE AND HUMAN MOBILITY

Leading organisations: International Organization for Migration, Ocean and Climate Platform

THE GLOBAL MANGROVE ALLIANCE

Leading organisations: Conservation International; The Nature Conservancy; International Union for Conservation of Nature, Wetlands International; WWF
Non-state actors: WWF, International Union for Conservation of Nature, Wetlands International.

THE INTERNATIONAL BLUE CARBON INITIATIVE

Leading organisations: Conservation International; IOC-UNESCO; International Union for the Conservation of Nature
Non-state actors: CATIE Solutions for Environment and Development; Center for International Forestry Research; The Nature Conservancy; Conservation International; IOC-UNESCO; International Union for the Conservation of Nature; International Blue Carbon Partnership

T-MEDNET

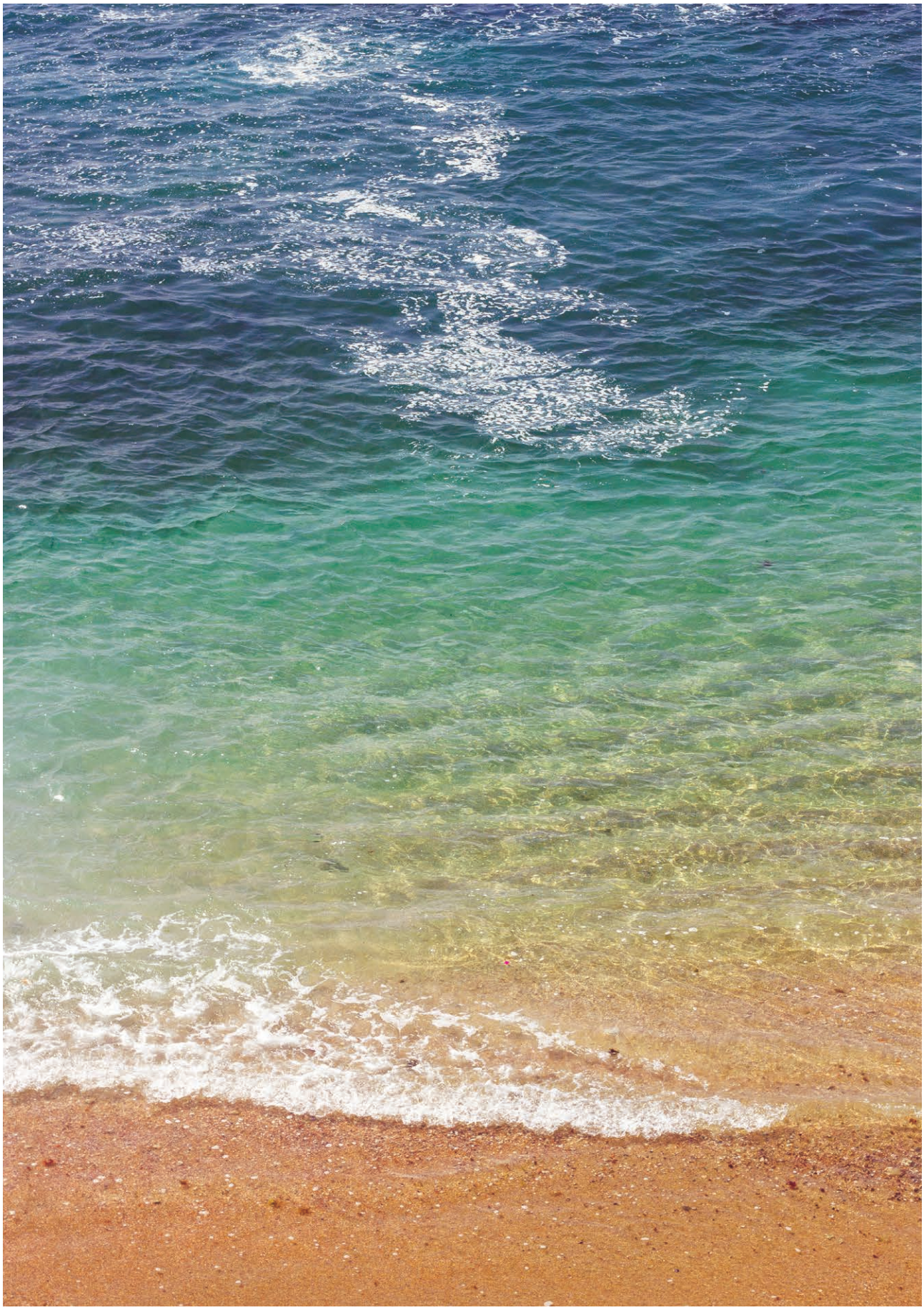
Leading organisations: Spanish National Research Council- Institute of Marine Science
Non-state actors: Universitat de Barcelona; Centre d'Estudis Acançats de Blanes; Instituto Espanol de Oceanografia; OSU Institut Pytheas; Ifremer LERPAC; Universita del Salento; Institut National Agronomique de Tunis; University of Zagreb; University of the Aegean; University of Istanbul; Secretaria General del Mar, Columbretes islands Marine Reserve; Parc Natural Cap de Creus; Natural reserve of Cerbères Banyuls; Agde MPA; Parc Marin de la Côte Bleue; Port-Cros National Park; Regional Natural Park of Corsica, Scandola; Office de l'Environnement de la Corse – Natural reserve of Bonifacio strait; Portofino MPA; Marine Protected Area Pelagie Islands – Municipality of Lampedusa and Linosa; Public Institution Brijuni National Park; Mediterranean Conservation Society

SMALL ISLANDS ORGANIZATION (SMILO)

Leading organisations: Small Islands Organization (NGO)
Non-state actors: Conservatoire du Littoral, French Facility for the Global Environment, Indian Ocean Commission, Global Island Partnership
Countries where actions are being led on the ground:
Italia; France; Tunisia; Guinea Bissau; Senegal; Cape Verde; Mozambique; Madagascar

WEST AFRICA COASTAL AREA MANAGEMENT PROGRAM

Leading organisations: World Bank
Non-state actors: West Africa Economic and Monetary Union; Nordic Development Fund; Africa Climate Investment; Readiness Partnership Trust Fund; World Bank
Member countries:
Benin; Ivory Coast; Ghana; Guinea Bissau; Mauritania; Nigeria; Senegal; Togo
Countries where actions are being led on the ground: Benin; Ivory Coast; Ghana; Guinea Bissau; Mauritania; Nigeria; Senegal; Togo



ocean-climate.org

United Nations
Educational, Scientific and
Cultural Organization

Intergovernmental
Oceanographic
Commission

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AGENCE FRANÇAISE
POUR LA BIODIVERSITÉ
ÉTABLISSEMENT PUBLIC DE L'ÉTAT