



# IMBeR

Integrated Marine Biosphere Research

## Developing an Action Plan for the Ocean



## Lessons from a global emergency


**COVID-19  
Crisis:  
Lessons for  
Recovery**

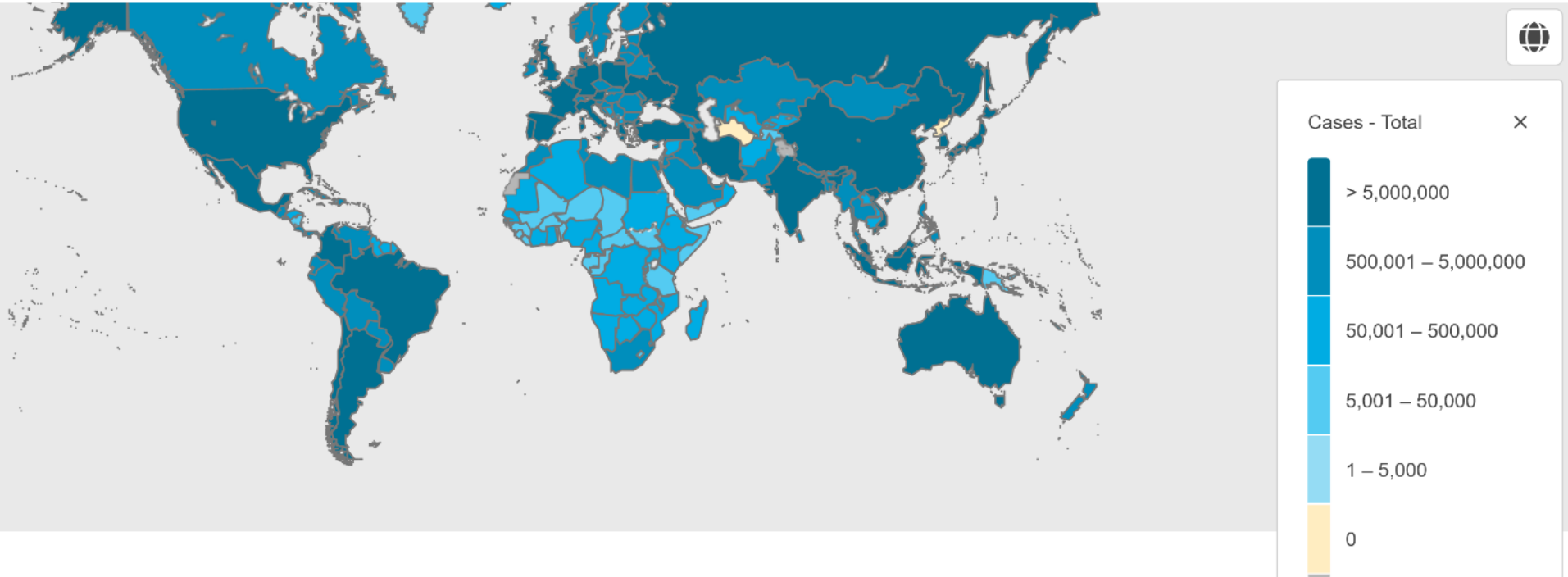
What can we learn from existing research on the long-term aspects of disaster risk and recovery?

Roger Few  
Vandana Chandra  
Mark Tobochnik  
Johanna Forster

Carole White  
Teresa Arriaga  
Clare Shelton

School of International Development,  
University of East Anglia, UK

 The British Academy  
COVID-19: Shape the Future



## The Global Pandemic Has Shown We Need an Action Plan for the Ocean

*Eugene J. Murphy<sup>1\*</sup>, Carol Robinson<sup>2</sup>, Alistair J. Hobday<sup>3,4</sup>, Alice Newton<sup>5</sup>, Marion Glaser<sup>6</sup>, Karen Evans<sup>3</sup>, Mark Dickey-Collas<sup>7,8</sup>, Stephanie Brodie<sup>9</sup> and Marion Gehlen<sup>10</sup>*

Started as a bottom-up activity – threats and risks of ocean change.

Proposed as a potential for a synthesis activity in the Strategy Group.

Discussed with wider SSC and included representatives from GCs and IMECaN



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## Action Plan for the Ocean



### ***Ocean sustainability - the urgent need for an Action Plan for the Ocean***

- Ocean is changing - affecting ecosystems and human communities across the world.
- Optimistic scenarios - major ocean and ecosystem changes in coming decades.
- Planning and preparing for ocean change is an urgent priority.
- Policy responses require coordinated action across multiple scales.
- Systematic approach needed - strategies for mitigation and adaptation
- Coordinated activity - local to global scales.
- An inclusive approach - diverse perspectives - across scientific disciplines and societies across the world.



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# Action Plan for the Ocean



## ***An Action Plan for the Ocean***

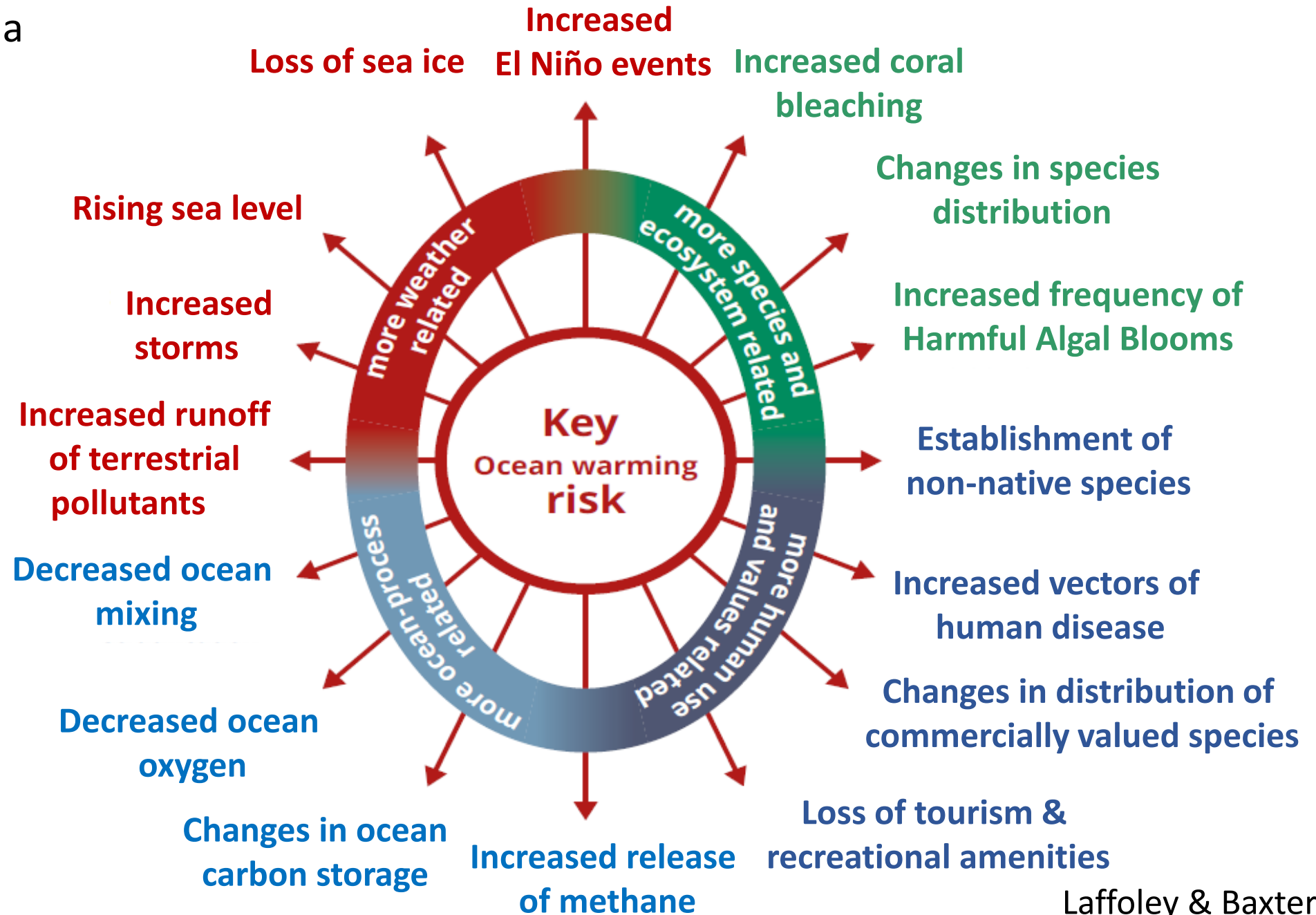
*Alongside increased awareness and focus on threats to the ocean.*

- The challenge: bring together our understanding of the oceans and the impacts of change and prepare and plan for inevitable change.

*Scientific advice is needed to help policy makers plan for change.*

- Policy makers need clear presentation of potential changes and associated uncertainties and policy options.
- Risk-based planning encompassing local, regional and global is required.

**OCEAN RISK** is a function of **hazard**, **exposure** and **vulnerability**

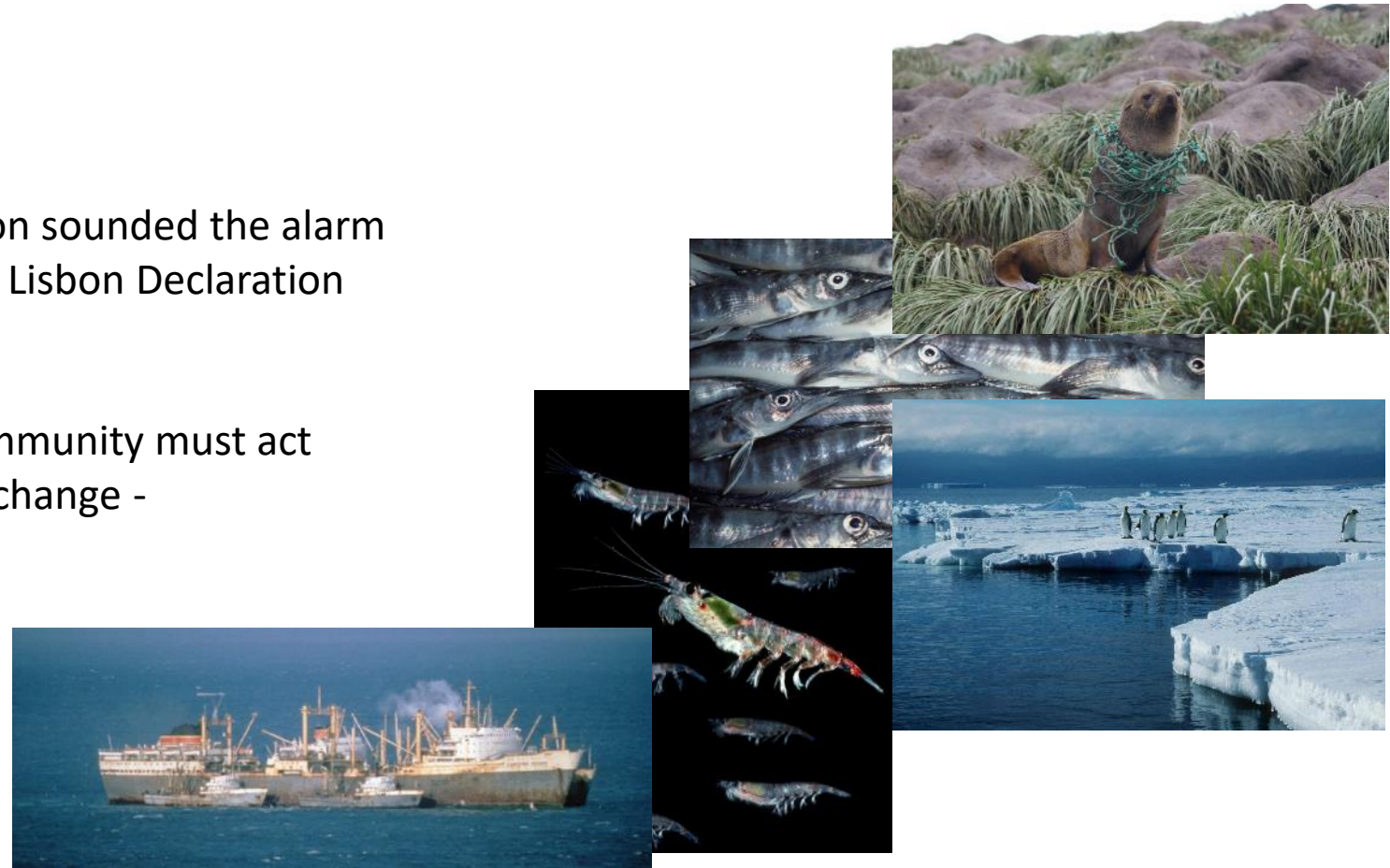




### Ocean sustainability

The United Nations Ocean Conference in Lisbon sounded the alarm over the 'global emergency' facing the oceans Lisbon Declaration July 2022

High Level Panel - The international ocean community must act now if we are to mitigate and adapt to ocean change - (<https://oceanpanel.org/the-agenda/>).





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# Action Plan for the Ocean



***IMBeR scientists have proposed a three-component process to develop an Action Plan for the Ocean***

## The Global Pandemic Has Shown We Need an Action Plan for the Ocean

Eugene J. Murphy<sup>1\*</sup>, Carol Robinson<sup>2</sup>, Alistair J. Hobday<sup>3,4</sup>, Alice Newton<sup>5</sup>, Marion Glaser<sup>6</sup>, Karen Evans<sup>3</sup>, Mark Dickey-Collas<sup>7,8</sup>, Stephanie Brodie<sup>9</sup> and Marion Gehlen<sup>10</sup>

 **frontiers**  
in Marine Science

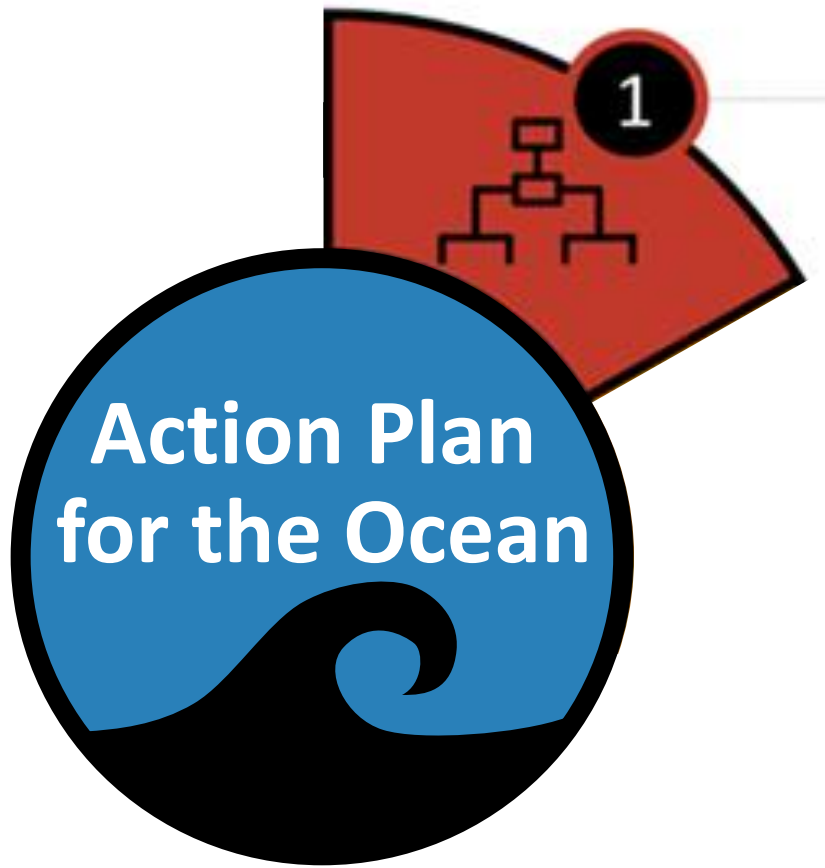
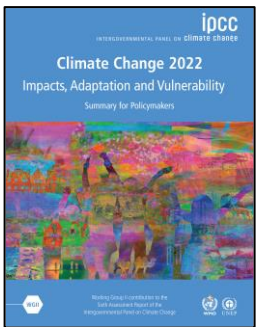
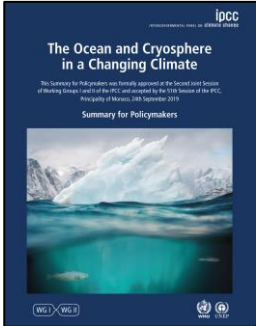
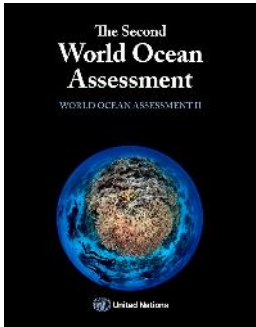
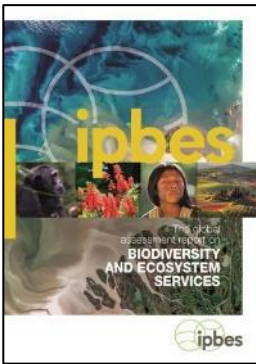
OPINION  
published: 08 December 2021  
doi: 10.3389/fmars.2021.760731

## Correspondence

### Ocean sustainability: act before it's too late

The United Nations Ocean Conference in Lisbon in June sounded the alarm over the global emergency facing the oceans. The international ocean community must act now if humanity is to mitigate and adapt to ocean change. The time left to respond to this emergency before changes to the oceans become irreversible is running out, and the associated costs to society are increasing. A coordinated global strategy is urgently needed that is flexible, scalable, responsive to ocean changes and applicable in different

contexts (see E. J. Murphy *et al. Front. Mar. Sci.* 8, 760731; 2021). International assessments of ocean change and future risks already provide the information we need to rank the risks and identify the actions necessary. As members of the Integrated Marine Biosphere Research project, we are coordinating activity for developing such a plan, and invite the community to participate (see [go.nature.com/3enbmaa](https://go.nature.com/3enbmaa)). Success will depend on equity, inclusivity and diversity of engagement.



International assessments of ocean change and future risks already provide the information we need to rank the risks and identify the actions necessary.

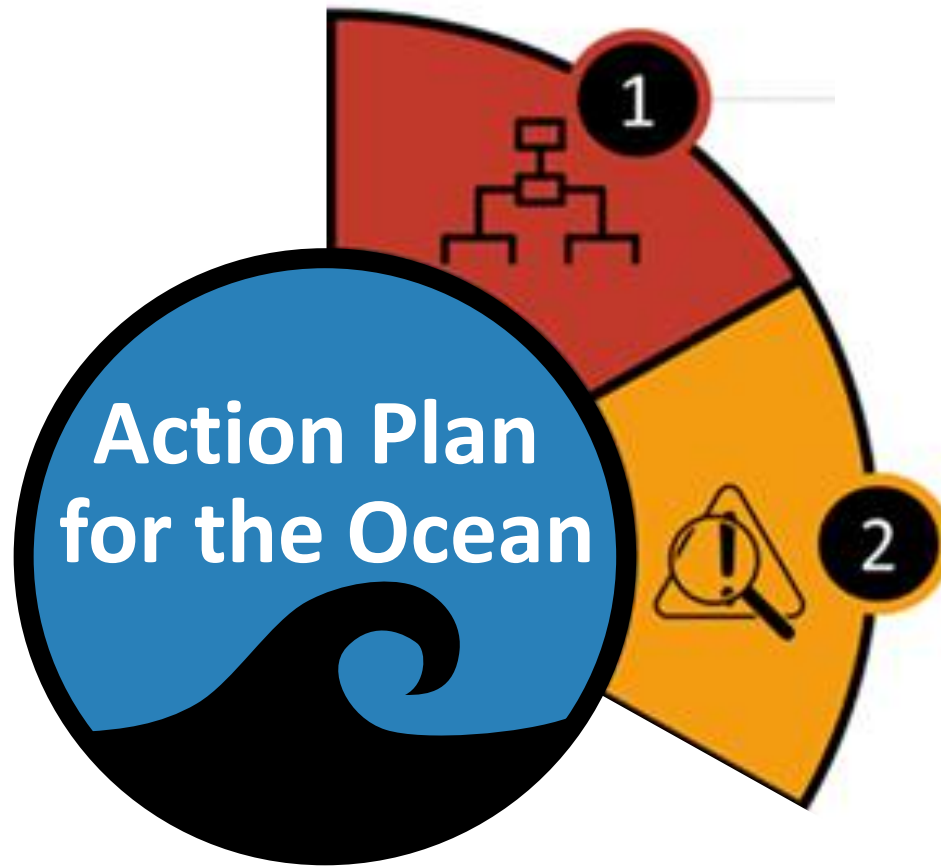
**RANK RISKS**  
 Develop a coherent framework to assess and rank risk related to a changing ocean.



Maltby et al., 2022  
 Murphy et al., 2021







### **RANK RISKS**

Develop a coherent framework to assess and rank risk related to a changing ocean.

### **IDENTIFY ACTIONS**

Use science to identify possible actions in response to risks, taking account of uncertainties.



### **RANK RISKS**

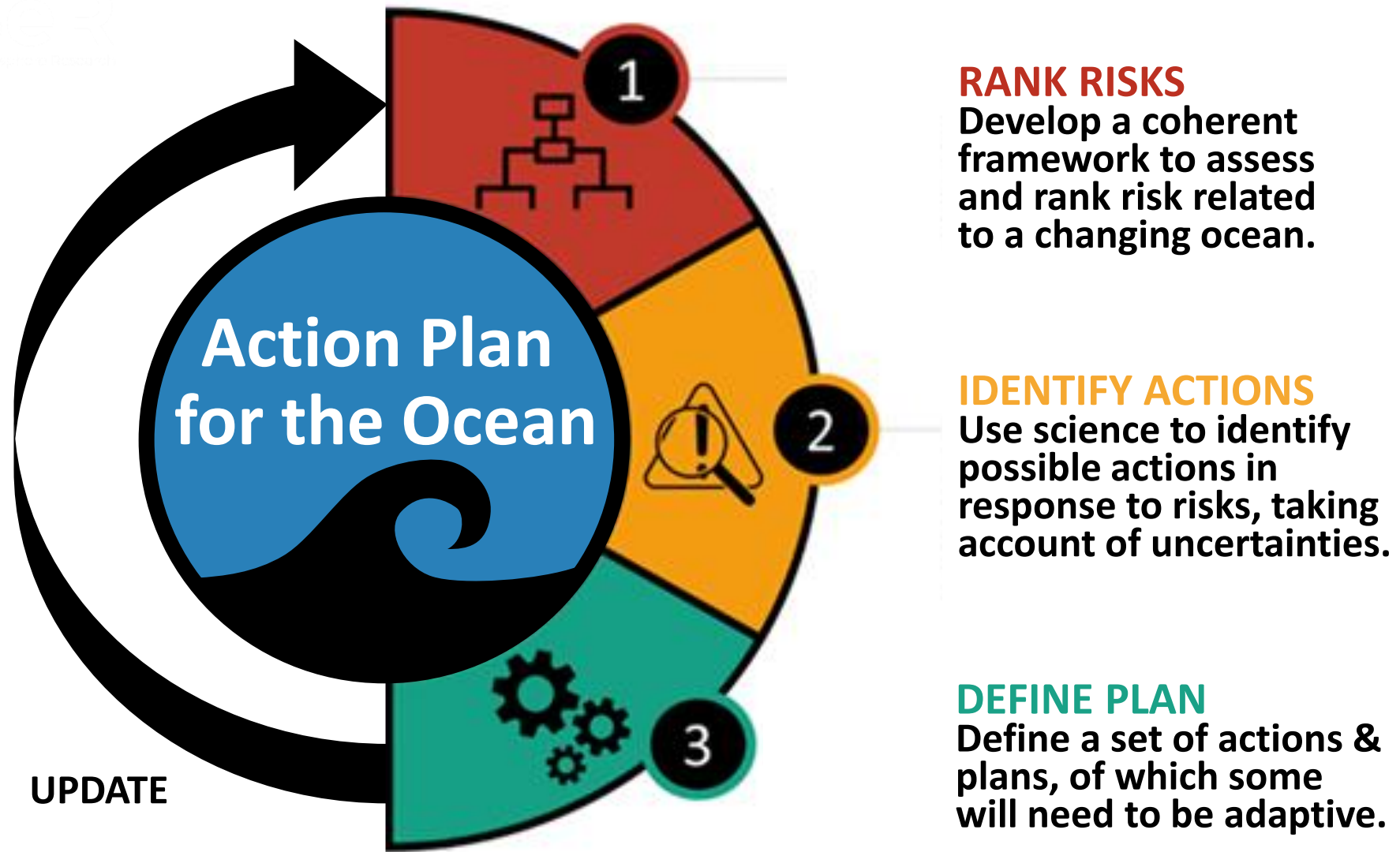
Develop a coherent framework to assess and rank risk related to a changing ocean.

### **IDENTIFY ACTIONS**

Use science to identify possible actions in response to risks, taking account of uncertainties.

### **DEFINE PLAN**

Define a set of actions & plans, of which some will need to be adaptive.



Murphy et al., 2021



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# Action Plan for the Ocean



## An IMBeR-led Action Plan for the Ocean

We seek to assemble an integrated interdisciplinary ocean community to develop and implement an Action Plan for the Ocean. This activity will:

- Develop international capacity in integrated analyses and risk-based development of ocean actions.
- Build on current activities, drawing on expertise and inputs from established programmes and bodies.
- Provide a forum for the global ocean community to engage in the development of an Action Plan.

## Correspondence

Ocean sustainability: act before it's too late

Nature | Vol 609 | 22 September 2022



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# Action Plan for the Ocean



## IMBeR Support Funding Proposal

*October 2022*

*Eugene Murphy<sup>1</sup>, Carol Robinson<sup>2</sup>, Alistair Hobday<sup>3</sup> and on behalf of the Ocean Action Plan Team<sup>4</sup>.*

<sup>1</sup>British Antarctic Survey, Cambridge, UK. <sup>2</sup>Centre for Ocean and Atmospheric Sciences, University of East Anglia, Norwich, UK. <sup>3</sup>CSIRO Oceans and Atmosphere, Hobart, Tasmania, Australia. <sup>4</sup>Murphy *et al.* 2022.

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### **Title: Developing an Action Plan for the Ocean**

Ensuring a healthy and sustainable ocean in the future requires urgent planning and preparation for inevitable change. The scale of the challenge is global and requires engagement from experts in multiple disciplines and with diverse perspectives from societies across the world. To generate the required options for action, IMBeR scientists have initiated the development of a risk-based *Action Plan for the Ocean* (Murphy *et al.* 2021, 2022). We plan to generate an internationally supported programme to develop and implement an *Action Plan for the Ocean*. We are requesting IMBeR support to seed development of the next stage of that activity.



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## Action Plan for the Ocean



### An IMBeR-led Action Plan for the Ocean

**Goal: *To develop the capacity and framework for an IMBeR-led plan for understanding ocean risk and preparing and planning responses to change.***

Aim to develop an integrated interdisciplinary ocean community to plan and implement an Action Plan for the Ocean.

The proposal is for support for the first stage of this activity:

- *Develop international capacity in integrated analyses and risk-based development of ocean actions.*
- *Provide a forum for the global ocean community to engage in the development of an Action Plan.*
- *Plan for and undertake an international workshop to develop the Action Plan process (2023/24), including seeking supporting co-funding.*



# IMBeR

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## Action Plan for the Ocean



### **Ocean sustainability: act before it's too late**

To develop the Action Plan we propose a series of activities over the next 18 months:

**1. *IMBeR Discussion Meeting.*** *Online half-day meeting.*

Scoping and planning workshop => plans and ideas and identify key individuals, groups, projects and bodies. Involving SSC, RP, WG, IMECaN - small number of invited experts in relevant science areas.

**2. *Capacity development and workshop preparation.***

On-line scoping exercise targeted on key individuals and groups to develop plans for the international workshop. With IMECaN leaders we will develop a session/meeting- focus on ocean risk and planning the development of an Action Plan.

**2. *An international workshop to develop the Action Plan process.*** *Hybrid meeting.*

*The purpose of the workshop will be to produce an outline proposal and roadmap for the development of an internationally supported programme.*

# Developing capacity





# Ocean sustainability and risk – other relevant activities and groups

Featured: Read the 2022 Sustainable Tourism Report and Accompanying Expert Perspectives →



English | SUBSCRIBE

The Ocean's Importance About The Agenda Action & Impact Areas of Opportunity Publications News

## What is the Ocean Panel?

The High Level Panel for a Sustainable Ocean Economy (Ocean Panel) is a unique global initiative by serving world leaders that is working to build momentum towards a sustainable ocean economy in which effective protection, sustainable production and equitable prosperity go hand-in-hand.



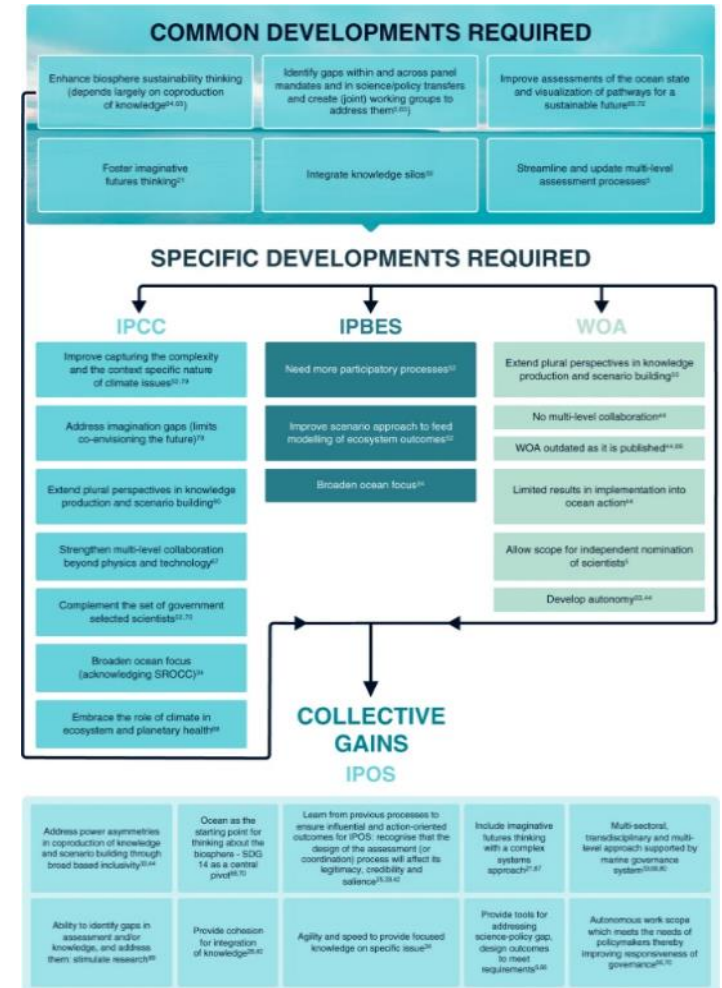
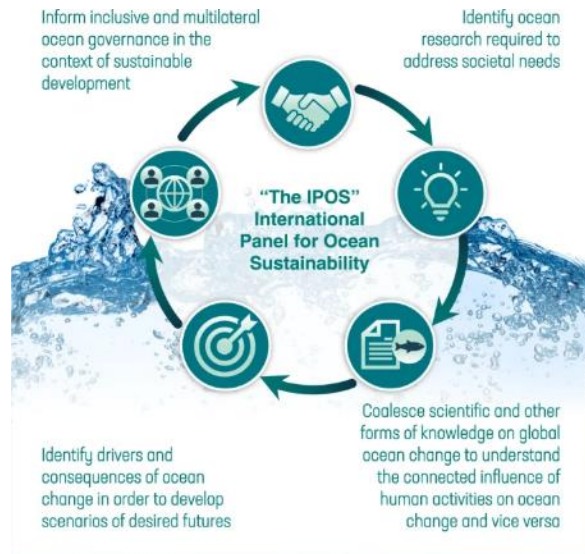
Since launching in 2018, 17 world leaders have joined together to realise the mission of sustainably managing 100% of the ocean area under national jurisdictions.

LEARN MORE

 Anthony Albanese Prime Minister of Australia LEARN MORE	 Justin Trudeau Prime Minister of Canada LEARN MORE	 Gabriel Boric President of Chile LEARN MORE	 Fiji LEARN MORE	 Emmanuel Macron President of France LEARN MORE	 Nana Addo Dankwa Akufo-Addo President of Ghana LEARN MORE	 Joko Widodo President of Indonesia LEARN MORE	 Andrew Holness Prime Minister of Jamaica LEARN MORE	 Fumio Kishida Prime Minister of Japan LEARN MORE	 William Ruto President of Kenya LEARN MORE
 Andrés Manuel López Obregón President of Mexico LEARN MORE	 Hage G. Geingob President of Namibia LEARN MORE	 Jonas Gahr Støre Prime Minister of Norway LEARN MORE	 António Costa Prime Minister of Portugal LEARN MORE	 Rishi Sunak Prime Minister of the United Kingdom LEARN MORE					

<https://oceanpanel.org/>

# Ocean sustainability and risk – other relevant activities and groups



npj | ocean sustainability

[www.nature.com/hnpjoeansustain](http://www.nature.com/hnpjoeansustain)



PERSPECTIVE OPEN

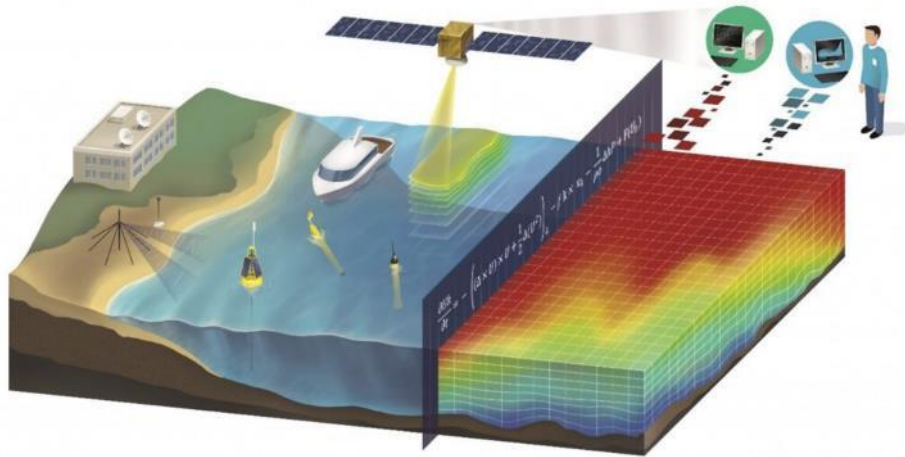
## An evolution towards scientific consensus for a sustainable ocean future

Françoise Gaill<sup>1,2</sup>, Tanya Brodie Rudolph<sup>3</sup>, Lara Lebleu<sup>1</sup>, Denis Allemand<sup>4</sup>, Robert Blasiak<sup>5,6</sup>, William W. L. Cheung<sup>7</sup>, Joachim Claudet<sup>8</sup>, Leopoldo Cavaleri Gerhardinger<sup>9</sup>, Nadine Le Bris<sup>10</sup>, Lisa Levin<sup>11</sup>, Hans-Otto Pörtner<sup>12</sup>, Martin Visbeck<sup>13</sup>, Anna Zivian<sup>14</sup>, Pierre Bahurel<sup>15</sup>, Laurent Bopp<sup>16</sup>, Chris Bowler<sup>17</sup>, Frédérique Chlouz<sup>18</sup>, Philippe Cury<sup>19</sup>, Didier Gascuel<sup>20</sup>, Sylvie Goyet<sup>21</sup>, Nathalie Hilmi<sup>4</sup>, Frédéric Ménard<sup>22</sup>, Fiorenza Micheli<sup>23</sup>, Lauren Mullineaux<sup>24</sup>, Rémi Parmentier<sup>25</sup>, Marie-Alexandrine Sicre<sup>26</sup>, Sabrina Speich<sup>16</sup>, Olivier Thébaud<sup>27</sup>, Torsten Thiele<sup>28</sup>, Martha Bowler<sup>1</sup>, Philippe Charvis<sup>29</sup>, Raphael Cuvelier<sup>1</sup>, François Houllier<sup>30</sup>, Sarah Palazot<sup>1</sup>, Francis Staub<sup>31</sup> and Olivier Poivre d'Arvor<sup>32</sup>

# Ocean sustainability and risk – other relevant activities and groups



**2021  
2030** United Nations Decade  
of Ocean Science  
for Sustainable Development



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A UN Decade Collaborative Centre for the ocean prediction we need

Save the date | 11 & 12 January 2023

**Ocean Prediction** | UN DECADE COLLABORATIVE CENTRE

KICK-OFF MEETING | ONLINE EVENT

MERCATOR OCEAN INTERNATIONAL

**Ocean Prediction Decade Collaborative Centre kick-off meeting**  
11 Jan 2023 - 12 Jan 2023

The poster features a background image of ocean waves. At the bottom, there are logos for the German government, UNESCO, and the UN Decade of Ocean Science for Sustainable Development.



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# Action Plan for the Ocean



## Ocean sustainability and risk – other relevant activities and groups

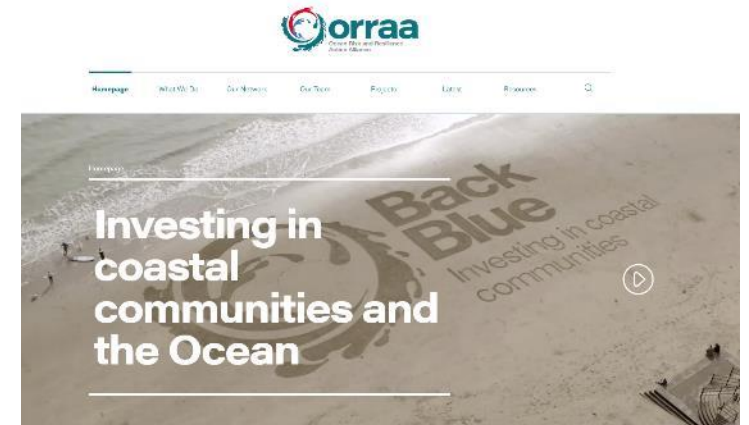
Ocean Risk Reports Reports • About • The Research team

Explore the latest knowledge on emerging ocean risks, and their implications on the resilience and human wellbeing on small island developing states (SIDS) and coastal least developed countries (LDCs).



Indicator-based tools for assessing ocean risks and vulnerabilities <https://oceanrisk.earth/>

[Learn more](#)

ORRAA  
Ocean Risk and Resilience Action Alliance

Investing in coastal communities and the Ocean

<https://oceanriskalliance.org/>



ORRAA  
Ocean Risk and Resilience Action Alliance

Assessing the Global Value at Risk in the Global Blue Economy

# Ocean sustainability and risk – other relevant activities and groups



Perspective

## Adapting risk assessments for a complex future

Emmy Wassénus<sup>1,2,3,\*</sup> and Beatrice I. Crona<sup>1,2,3</sup>

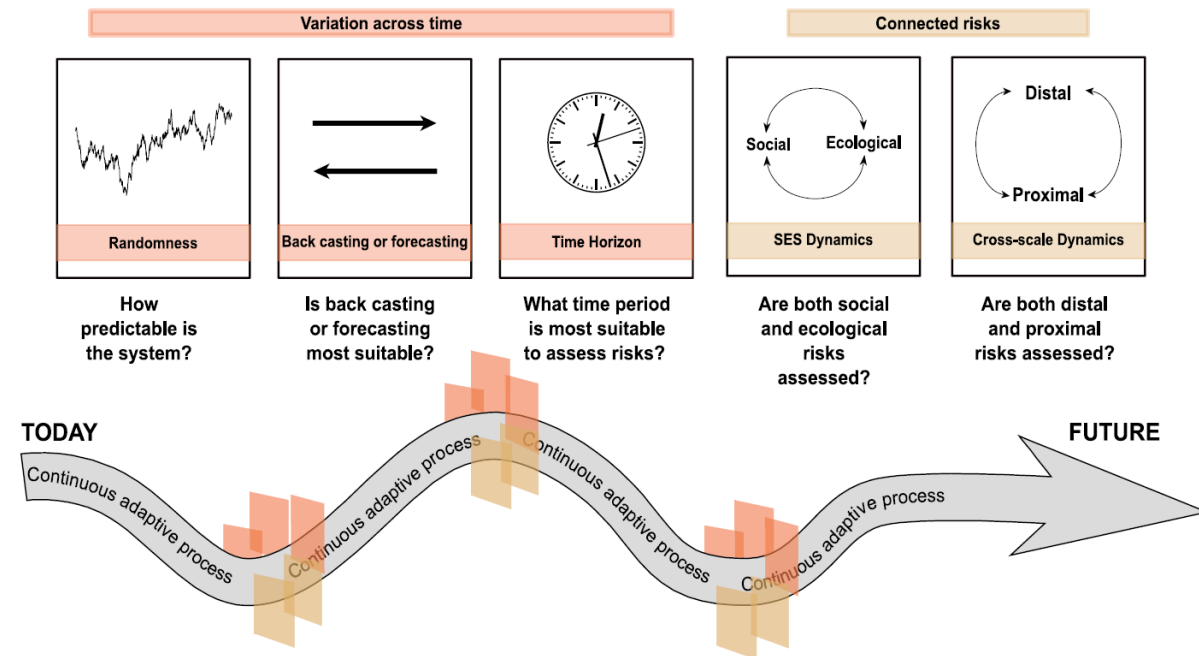
<sup>1</sup>Global Economic Dynamics and the Biosphere, The Royal Swedish Academy of Sciences, Stockholm, Sweden

<sup>2</sup>Stockholm Resilience Centre, Stockholm University, Stockholm, Sweden

<sup>3</sup>Sustainable Finance Lab SWEDEN, Stockholm, Sweden

\*Correspondence: [emmy.wassenius@kva.se](mailto:emmy.wassenius@kva.se)

<https://doi.org/10.1016/j.oneear.2021.12.004>



**Figure 2. Five challenges for assessing sustainability risks in complex systems**

The challenges are grouped into two overarching domains, variation across time, and connectivity of risks. SES stands for social-ecological systems. The arrow represents a pathway toward the future. Colored boxes along the arrow represent the five challenges and illustrate that these five challenges will need to be addressed at multiple points in time and be part of a continuous adaptive process.

# Ocean sustainability and risk – other relevant activities and groups

Climate Risk Management 35 (2022) 100411



Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

## Climate Risk Management

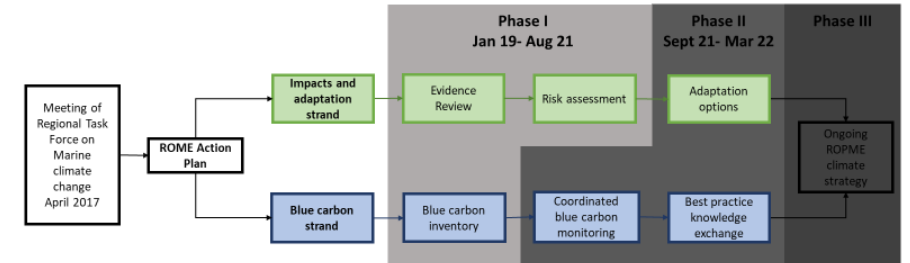
journal homepage: [www.elsevier.com/locate/crm](http://www.elsevier.com/locate/crm)



## Marine climate change risks to biodiversity and society in the ROPME Sea Area

K.M. Maltby<sup>a,1,\*</sup>, E.L. Howes<sup>a,2</sup>, S. Lincoln<sup>a</sup>, J.K. Pinnegar<sup>a,b</sup>, P. Buckley<sup>a</sup>, T.S. Ali<sup>c</sup>, B. Al Balushi<sup>d</sup>, A. Al Ragum<sup>e</sup>, H.S.A. Al Shukail<sup>d</sup>, C.O. Balmes<sup>f</sup>, R. Ben-Hamadou<sup>g</sup>, M.R.G. Claereboudt<sup>h</sup>, R.J.E. Mamiit<sup>i</sup>, H.A. Naser<sup>j</sup>, M.R. Shokri<sup>k</sup>, W.J.F. Le Quesne<sup>a</sup>

## Marine Climate Change Regional Action Plan (RAP)



Centre for Environment Fisheries & Aquaculture Science



## ROPME: Regional Organisation for Protection of the Marine Environment



- Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates

- Arabian / Persian Gulf & northern Indian Ocean

Centre for Environment Fisheries & Aquaculture Science



## 12 most severe risks (in order)...



Centre for Environment Fisheries & Aquaculture Science





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## Action Plan for the Ocean



***Link to IMBeR Grand Challenges and priority research areas.***

The development of an Action Plan for the Ocean was initiated as an IMBeR synthesis activity and has involved SSC scientists involved in each of the Grand Challenges (GCs).

As such it encompasses priority research areas associated with all three of the GCs. Understanding, modelling and projection, societal links and governance

It will require GC Champions, the IMBeR SSC and IMECaN and wider IMBeR community colleagues to be closely involved in the development of the activity.



# IMBeR

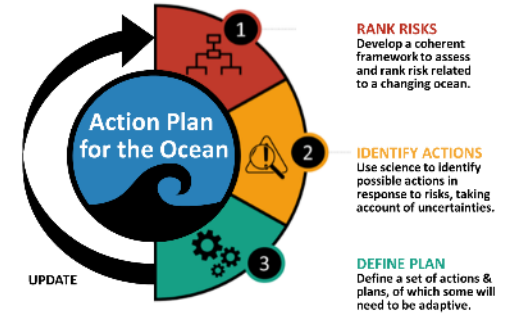
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## Action Plan for the Ocean



### Next steps

- Develop an integrated ocean community
- Develop capacity
- Targeted workshop



## IMBeR - Action Plan for the Ocean



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Research. Innovation. Sustainability.



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## Action Plan for the Ocean



### **Discussion meetings – involving original group members and additional new SSC and IMECaN members**

Discussed development of the Action Plan,  
current activities and future plans.

#### ***IMBeR Discussion Meeting.***

Setting up the SSC discussion meeting

#### ***Capacity development and workshop preparation.***

Scoping exercise and IMECaN links – what is required?

***An international workshop to develop the Action Plan process.***

*Thank you to those involved:*

*Derek Armitage, John Claydon, Mark Dickey-Colas,  
Karen Evans, Marion Gehlen, Marion Glaser,  
Alistair Hobday, Laura Kaikkonen, Alice Newton,  
Carol Robinson, Becca Shellock, Micaela Trimble,  
Nireka Weeratunge*



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## Action Plan for the Ocean



### *Summary – next steps*

- *Plan for a wider IMBeR SSC and IMECaN meeting that would include input from across IMBeR.*
- *Develop capacity and ideas for gaining input from the wider ocean science community.*
- *Development of the international workshop – including exploring funding options.*
- *Involvement from SSC, RPs, WGs, IMECaN and all groups associated with IMBeR would be extremely valuable.*
- *This is potentially a long-term legacy activity of IMBeR that could also be part of the future of IMBeR (3.0).*
- *Please do get in touch if you have any questions.*

**Thank you**



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**Action Plan  
for the Ocean**



**Thank you**