

1 **Advancing Government Action on Ocean Acidification: A Roadmap for OARS**
2 **Outcome Seven**

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4 **OARS Outcome 7: Develop strategies and solutions to enable countries and regions to include**
5 **measures to reduce ocean acidification in their respective policy and legislation.**

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27 **1. OARS Outcome 7 and how it contributes to the OARS objectives and to the Ocean Decade**

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29 The Ocean Acidification Research for Sustainability (OARS) Programme is an endorsed programme of the
30 UN Decade of Ocean Science for Sustainable Development. The programme “aims to provide systematic
31 evidence of the impacts of ocean acidification on the sustainability of marine ecosystems, enhance
32 ocean acidification capacity, increase observations of ocean chemistry changes, enhance the
33 communication to policy makers and communities by providing the information needed to mitigate and
34 adapt to ocean acidification and to facilitate the development and evaluation of strategies to offset
35 future impacts.¹”

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37 The OARS program is structured around seven complementary outcomes which are designed to provide
38 systematic evidence of the impacts of ocean acidification (OA) on the sustainability of marine

A Note from the Authors:

The goals of OARS can only be achieved through coordinated action at local to global scales. While the authors of this white paper have endeavored to set a vision for Outcome 7, success will be found only if the global ocean acidification community works together to shape and implement this shared vision. Therefore please consider the objectives here a guiding framework and a list of possible actions for members of our community to take, but not as a strict roadmap or top down process.

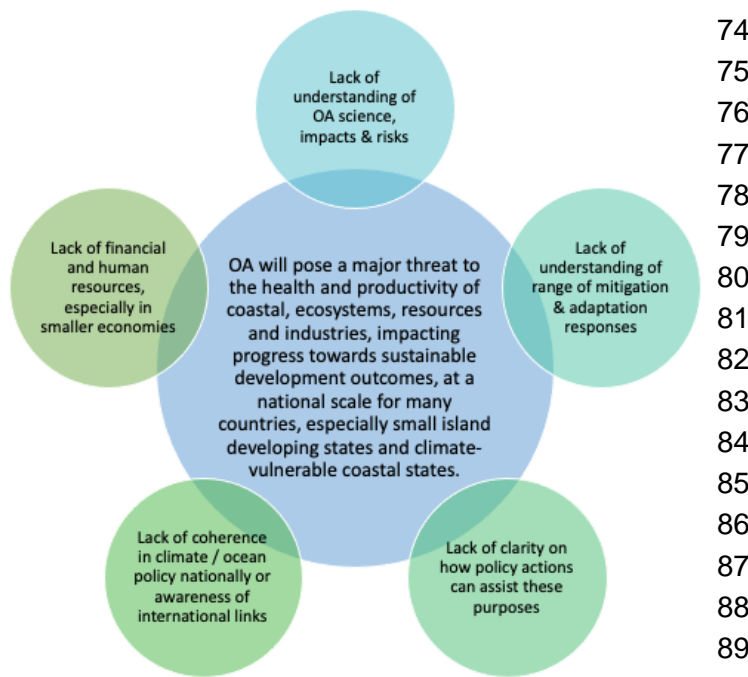
¹“GOA-ON Decade Programme OARS.” GOA-ON. Accessed August 26, 2022. <http://www.goa-on.org/oars/overview.php/overview.php>.

39 ecosystems, enhance ocean acidification capacity, increase observations of ocean chemistry changes,
40 enhance the communication to policy makers and communities by providing the information needed to
41 mitigate and adapt to OA, and to facilitate the development and evaluation of strategies to offset future
42 impacts. This paper is focused on Outcome Seven: Develop strategies and solutions to enable countries
43 and regions to include measures to reduce ocean acidification in their respective policy and legislation.
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45 OARS outcome 7 is charged with developing strategies and solutions that enable countries and regions
46 to include measures to reduce OA in their respective management, legislation, and policy frameworks.
47 However, the development of adequate OA policy and legislation is hindered by: (a) lack of
48 understanding of the relevant science and how to evaluate related impacts and risks; (b) lack of
49 understanding of possible response options, including mitigation and adaptation actions; (c) lack of
50 clarity on how policy actions can assist; (d) lack of coherence in and between national climate and ocean
51 policy; (e) lack of understanding of how OA policies support the implementation of international
52 climate/ocean frameworks and commitments, and (f) lack of financial and human resources and
53 capacity, especially in smaller economies.
54

55 This outcome, therefore, will work with governments and relevant stakeholders to close these gaps and
56 support the ongoing development and adoption of management approaches, policies and legislation
57 that help governments understand, account for, address and minimize the causes and impacts of OA.
58 The **vision of OARS outcome 7** is wide adoption and implementation of effective OA policy and
59 legislation with sustained resourcing in a diverse range of countries. This vision is supported by the
60 implementation of the following five pillars (Figure 1):
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- 62 1. The latest science is understood by policymakers and referenced in international, regional,
63 national, and sub-national level government / intergovernmental outputs (e.g. laws, policies,
64 strategies, briefings, media, etc.).
- 65 2. Implementation of national inventories of OA impacts on different national assets.
- 66 3. Policy practitioners are engaged with each other across jurisdictions and policy areas and share
67 an understanding of how to develop and implement OA policy.
- 68 4. OA policy frameworks are integrated with national and international ocean policies, climate
69 policies, development strategies, and other relevant policy / governance structures.
- 70 5. Sustained funding is available for implementation of OA policy and related activities, including
71 monitoring of OA and its impacts.
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Figure 1. Pillars of the OARS outcome 7.

92 Achieving this vision will require inputs from all other outcomes of OARS. A detailed description of how
93 the outcomes of OARS will work together to achieve this vision can be found in section 4 of this paper.

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95 **2. Preliminary list of key outputs and products**

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97 In order to address and eliminate the current constraints hindering meaningful policy action (Figure 2),
98 we recommend a set out key outputs that will strengthen the science to policy feedback loop and provide
99 frameworks and structures to reduce barriers.

100

- 101 1. A range of written and visual products that clearly articulate the latest science are available in
102 policy-relevant formats (e.g., regional vulnerability assessments, summaries of expected change
103 and potential impacts).
- 104 2. A framework to create national inventories of assets (e.g., particular ecosystems and economic
105 activities) affected by OA, with links to existing sustainability, climate and biodiversity
106 frameworks at policy-relevant scales guiding future ambition and action.
- 107 3. A network of policy makers, including bilateral and multilateral connections, particularly focused
108 on south-south relationships and cooperations.
- 109 4. Comprehensive guidance, legal templates, samples, and training in OA policy frameworks that
110 integrate with national ocean policies, national climate policies, national development
111 strategies, or other existing policy structures of relevance.
- 112 5. A series of engagements to raise awareness with funding bodies on the need for OA policy and
113 monitoring for climate adaptation and resilience building, and the need to ensure funds are
114 allocated for these purposes.

115 **3. Example activities to support outputs**

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117 Delivering the above outputs will require locally, regionally, and internationally coordinated activities. The
118 following list of example activities is not meant to be exhaustive, but rather illustrative of the types of
119 activities we recommend are undertaken.

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121 Example Activities:

122 1. Training for policymakers on designing OA policy and integrating with international and national
123 frameworks.

124 2. Production and/or collation of templates, guidance, and samples of OA policy frameworks.

125 3. Analysis of legal frameworks at local, regional, and national scales to enable effective policy
126 integration.

127 4. Engagement activities to raise awareness with funding bodies on the need for OA policy, OA
128 monitoring, and the relation between OA and existing climate and biodiversity funding
129 strategies.

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131 Specific policy goals related to regional and country priorities will also guide activity planning and
132 selection. Activities such as the ones listed above are already being conducted by several bodies,
133 including The International Alliance to Combat Ocean Acidification, The Ocean Foundation, and The
134 Commonwealth Blue Charter. Examples of their specific efforts can be found in boxes 1, 2, and 3, below.

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136 **4. Key inputs to support activities and outputs**

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138 The design and implementation of effective ocean acidification policy will require guidance and input from
139 the science community at the scale of the policy being designed. Policies will need to consider the
140 projected *timing, scale, and scope* of impacts as well as the potential *risks* associated with inaction and
141 *options* to reduce risks.

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143 Therefore, the outputs of all other OARS Outcomes will be important inputs towards achieving Outcome
144 7. This is particularly true for Outcome 2 (Science to Action), Outcome 4 (Biology Impacts), Outcome 5
145 (Future Projects), the engagement generated through Outcome 6 (Public Awareness), and the data
146 developed through Outcome 1 (Data Quality) and Outcome 3 (Observing Strategies).

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148 While inputs will be required at the specific scales of each policy, we believe a set of standardized products
149 and tools would serve as general inputs to Outcome 7. For example, we recommend the creation of policy-
150 relevant scientific syntheses produced regularly at specified scales (e.g., international, basin-specific,
151 convention-specific).



152 Figure 2. UN frameworks whose mandates support, and are enhanced by, OA management and policy
153 development. *Source:* OA Alliance.

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155 We believe many of these inputs are already in development or that the structure to acquire such inputs
156 exists. For example, at the international level, UN climate- and ocean-related frameworks, such as the
157 Convention on Biological Diversity and the Sustainable Development Goals are beginning to integrate OA
158 monitoring, research, mitigation, and adaptation. Figure 2 describes the relevant UN frameworks whose
159 mandates support, and are enhanced by, OA management and policy development. Specifically, they
160 include UN Environment Assembly, UNFCCC Ocean and Climate Change Dialogue and Global Stocktake,
161 UN Decade of Ocean Science for Sustainable Development and the UN 2030 Sustainable Development
162 Agenda.

163
164 There are also existing agencies and bodies working at the science-policy interface. Those groups work
165 to provide countries with the latest scientific information relevant for ocean acidification at national and
166 regional levels include the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) and
167 the International Atomic Energy Agency (IAEA), both of which support GOA-ON and OARS with the aim
168 to provide data and information addressing the challenges countries experience due to ocean
169 acidification. More international partnerships, the status and trends of ocean acidification, as well as
170 challenges, opportunities, areas for future collaboration including all stakeholders in the field of ocean
171 acidification action are listed in the background document of the Interactive Dialogue 3 for the UN
172 Ocean Conference 2022.²

² https://sdgs.un.org/sites/default/files/2022-05/ID_3_Ocean_acidification_deoxygenation_warming.pdf

173 **5. Key enablers of success**

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175 Coordinating the delivery of activities and production of outputs will require human resources.

176 Therefore, a key enabler of achieving Outcome 7 will be funding explicitly allocated to this coordination.


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178 While the outputs of each OARS outcome will enable success, Outcome 6 will particularly enable policy
179 activities. A broader public base engaged in and interested in addressing ocean acidification will increase
180 interest in implementing policies.

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182 The most important enablers, however, are the broader ocean acidification community and the policy
183 makers at local and national level, which are taking the final decisions about the adoption of ocean
184 acidification sensitive legislation and its enforcement. Conversations at the science/policy interface need
185 to be happening at all scales. Scientists should be communicating with policymakers in their regions to
186 ensure their findings are incorporated into planning processes, and to identify areas of collaboration.
187 Essentially, outcome 7 can only be achieved when scientists and policymakers take coordinated
188 approaches at regional and international scales, particularly as novel and potentially wide-reaching
189 mitigation and adaptation strategies (such as marine carbon dioxide removal) are explored.

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The International Alliance to Combat Ocean Acidification (OA Alliance) brings together governments and organizations from across the globe dedicated to taking urgent action to protect coastal communities and livelihoods from the threat of ocean acidification and other climate- ocean impacts.

Facilitated through the OA Alliance, national, subnational, regional and tribal governments are proactively responding to the impacts of ocean acidification as they create OA Action Plans to effectively promote solutions and advance knowledge into action.

OA Action Plans include strategies for reducing carbon emissions and local land-based pollution, strengthening monitoring nearshore to better understand and predict local conditions, investing in adaptive measures in partnership with industry or seafood dependent communities, and advancing information sharing strategies that help policy makers respond.

By creating an OA Action plan—in whatever form is chosen and in keeping with existing capacity—climate and ocean policy leaders and managers explore the following important questions:

1. What species, economies, communities and cultures are currently or will be impacted by ocean acidification in my region?
2. Does my constituency know about this issue? Are there steps that my jurisdiction can take to raise awareness?
3. Is there anything that my government can do now that will make a difference?
4. How should my government prioritize actions that maximize our resources?
5. How does ocean acidification fit into existing management frameworks?
6. How does action on ocean acidification support existing high-level multilateral commitments?



The Ocean Foundation's International Ocean Acidification Initiative (IOAI) was founded in 2003 to ensure scientists, policymakers, and communities have access to the resources and tools required to monitor, understand, and respond to ocean acidification. The IOAI assists international, regional, national, and subnational governing bodies with developing legislation and other legal frameworks to address ocean acidification. In 2019 the IOAI published [*The Ocean Acidification Guidebook for Policymakers*](#). This guidebook compiles all existing legal frameworks that explicitly address or could be used to address ocean acidification. Each legal framework is annotated and guidance is provided for policymakers deciding how to construct their own legislation. The Ocean Foundation has also created template legislation and works with governments to customize this legislation to meet local needs and adhere to local policy structures. Additionally, The Ocean Foundation has worked with regional bodies such as The Cartagena Convention to introduce resolutions designed to enable regional coordination on ocean acidification. In addition to this policy work, The Ocean Foundation supports scientific capacity development through the provision of training, equipment, scholarship, and technical mentorship.



The Commonwealth Blue Charter

The Commonwealth Blue Charter is an agreement by the 56 Commonwealth member countries and adopted at the Commonwealth Heads of Government Meeting in London, April 2018. The Charter of the Commonwealth provides the underlying principles for the Blue Charter, ensuring that the Commonwealth takes a fair, equitable, inclusive, and sustainable approach to ocean economic development and protection. Under the Blue Charter, Commonwealth countries agree to actively cooperate to tackle ocean-related challenges and meet commitments for sustainable ocean development, with particular emphasis on the UN Sustainable Development Goals (SDGs), especially SDG 14 (Life Below Water). Implementation of the Commonwealth Blue Charter is through Action Groups, which work to unlock the power of all Commonwealth nations and guide the development of tools and training. Each Action Group is member driven and led by one or more Champion countries. To date, 16 countries have stepped forward to champion 10 Action Groups.

New Zealand champions the Ocean Acidification Action Group, with the goal of improving the capacity of Commonwealth countries to address the impact of ocean acidification, particularly in small-island developing states. The Action Group shares knowledge, experience and best practices on tackling ocean acidification, with particular focus on improving understanding of the impacts and drivers of ocean acidification (beyond carbon dioxide and with an emphasis on coastal systems); monitoring, modelling and forecasts; and mitigation, adaptation and resilience measures.

In February 2019, New Zealand hosted the Commonwealth Ocean Acidification Action Group Workshop in its role as Champion of the Commonwealth Blue Charter Action Group on Ocean Acidification. Scientific experts and observers were joined by 23 government officials from 17 Commonwealth countries. During this meeting, attendees discussed how to enhance Commonwealth members' ability to address the impacts of ocean acidification by identifying strategies for marine monitoring, capacity development, ocean literacy, governance, and management. Through these discussions, participants recognised that most available ocean acidification resources require technical expertise and implementation capacity that are not readily accessible to policymakers and often not available in Commonwealth countries. As a result they developed [A Policymakers' Handbook for Addressing the Impacts of Ocean Acidification](#). The Handbook addresses this gap by identifying and contextualizing existing resources to facilitate the identification and implementation of strategies to address ocean acidification.