

A tool to help build resilience and adaptive capacity into marine protected area management in the face of a changing climate

The Issue

The world's marine protected areas (MPAs) and other effective area-based conservation measures (OECMs) provide marine ecosystems respite from human impacts, hereafter the use of MPAs will refer to both MPAs and OECMs. The plant and animal communities that find refuge within these areas provide a Noah's Ark of sorts for the biodiversity of the Ocean.¹ Through larval dispersion and spill over effects, protected plant and animal communities within MPAs can support the more heavily impacted and often degraded environments that surround them.² MPAs are therefore likely to play an important role in helping all marine ecosystems cope and adapt to the diverse effects of climate change.^{1,3}

However, despite their potential to mitigate local stressors, MPAs remain susceptible to the wide-ranging global impacts of a rapidly changing climate.^{1,3} The changing climate poses many potentially compounding threats that extend beyond the control of MPA managers. MPAs will need to build resilience and adaptive capacity to thrive in a changing climate.

When planning for climate change, MPA managers and staff should focus on resilience and adaptive capacity, implementing specific adaption actions to reduce vulnerabilities and mitigate impacts.⁴ As climate change affects each MPA uniquely, tailored strategies are essential. While tools exist to support best practices under changing conditions, there is a lack of tools to help MPA practitioners consider in depth how climate change relates to MPA management and the importance of intentionally strengthening MPA resilience through management practices in the face of the climate crisis.

How the Programme Addresses Resilience Based Management?



Figure 1: The Climate Change Resilience and Adaption Planning Tool (CC-RAPT) contributes to the governance components of resilience based management.

CC-RAPT provides a framework to assess management actions addressing climate change impacts. This assessment will allow comparison over time and to other MPAs, helping to build political support and strengthen the capacity of managers to implement resilience-based management principles. CC-RAPT provides MPA managers with a framework to assess their use of vulnerability assessments and reflect on if they have effectively included these into plans and policies. Repeat use of the tool will inform on opportunities for adaptive management. It is hoped that through implementation of the lessons learned through the process of completing the tool, that the legal and policy frameworks needed to reduce impacts and promote sustainable use will be strengthened. CC-RAPT encourages reflection on if, and how, MPA managers and staff have informed national programs, policies, and incentives to build resilience and adaptive capacity.

Actions Taken

The Climate Change Resilience and Adaption Planning Tool (CC-RAPT) for MPAs and OECMs was developed by the International Union for Conservation of Nature (IUCN) World Commission on Protected Areas (WCPA) Climate Change Specialist Group to support the managers of MPAs in considering the various impacts of climate change as they work to improve their short and long-term management. Government organisations, First Nations and Indigenous Peoples, NGO's and regulators may also find this self-reflection tool useful. CC-RAPT is available in English and Spanish.

CC-RAPT is laid out in an online narrative and excel spreadsheet that leads managers through the process of evaluating how their management actions are addressing the potential threats to their MPA through a series of questions. It is intended to build-upon and support existing management strategies and assessments, while encouraging a more holistic and detailed understanding of how climate change will impact a specific MPA. CC-RAPT is intended to identify the strengths in ongoing management and governance, along with areas for improvement, to assist in building climate resilience for each MPA. The results of the tool can then be used to initiate climate informed research, management, and collaboration. CC-RAPT will also direct you to resources that can support operationalizing outcomes for your specific MPA.

How it works?

The tool requires users to assign a score (1-5) for targeted questions about climate change impacts and responses. Each category of questions includes a "tools/ resources/examples" section with links to key references. This assists users to answer the questions whilst learning from the experience of other MPAs in the process.

CC-RAPT begins with a preliminary worksheet that asks questions about the degree to which the physical and ecological impacts associated with climate change are affecting the MPA. The main assessment then asks questions about how these impacts are being addressed in five different categories:

- I. Management-Relevant Monitoring, Science and Access to Information
- II. Assessing Vulnerability to Climate Change
- III. Resilience, Adaptive Capacity, and Adaptation
- IV. Mitigation and Blue Carbon
- V. Climate Education and Outreach

The core purpose of the tool is to provide MPA managers with an opportunity to reflect on management best practices under changing climate conditions. The completion of CC-RAPT will also produce a numeric overall score providing managers with an indication of how well their current practices are managing for climate change pressures. Gaps identified through this self-reflection process are hoped to trigger management interventions. Repeat usage of the tool can be used to track progress over time and inform adaptive management.



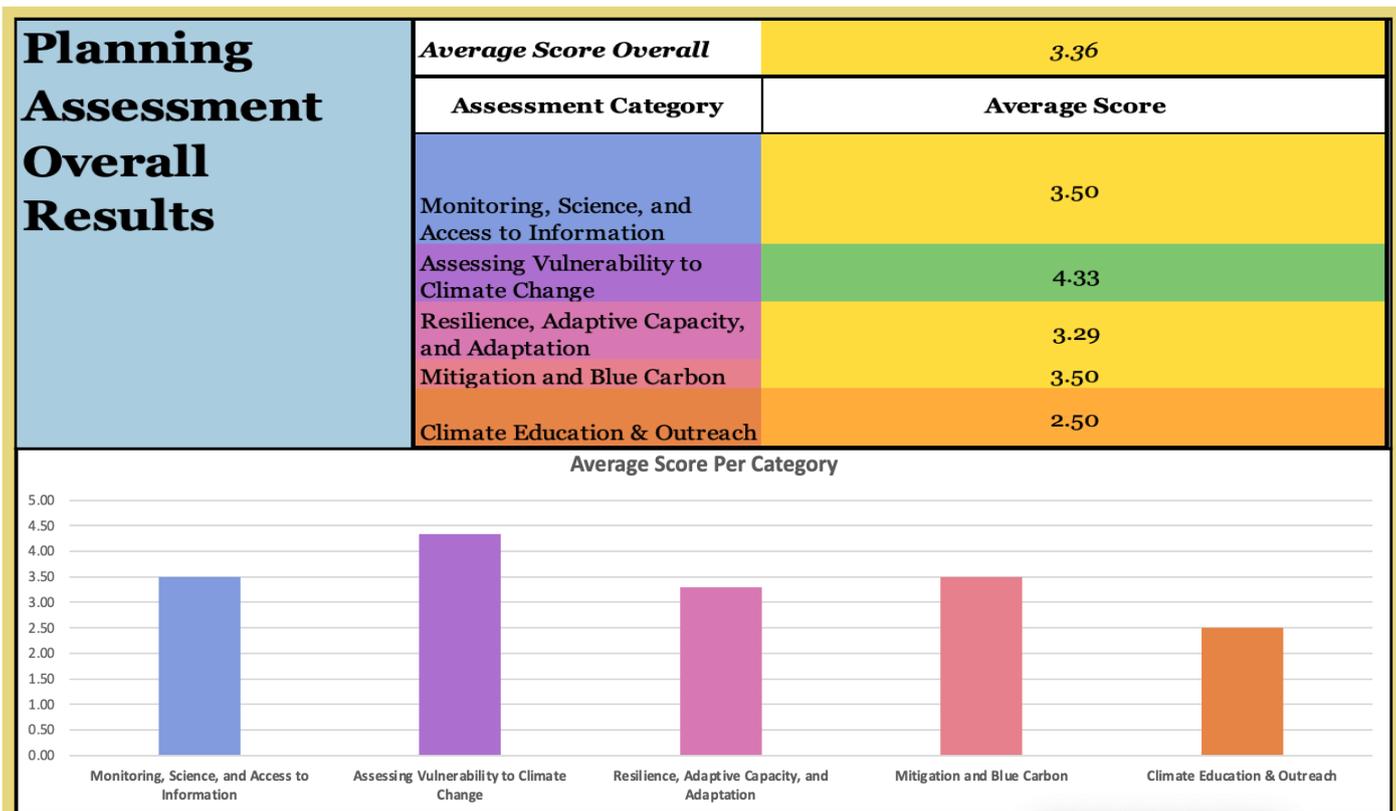


Figure 2: An example of the overall results summary from the CC-RAPT worksheet

How Successful Has It Been?

The tool was released in 2023 and is still in its infancy. It was piloted by two MPAs before its release, with positive feedback. It is envisioned that the tool will be utilised to support including more resilience and adaptive principles into MPA management. The sharing of results will allow MPAs to learn from the different approaches taken to lessen impacts of climate change, and the positive outcomes and challenges faced in doing so.

While this tool initially focuses on the ecological aspects of MPA management, future versions aim to address social aspects, which are a critical part of collaborative management.

Key Challenges and Lessons Learnt

The tool is able to be utilised regardless of the level and quality of information and knowledge

available to a user, though ideally quantitative and location specific oceanographic/physical and ecological data would be used to inform assessments. The absence of data does not preclude the use of this tool. The narrative component of CC-RAPT includes a list of resources that can provide helpful information and context when using the tool.

The two MPAs that piloted CC-RAPT provided feedback along with advice for other users. Examples of advice include:

- Completing CC-RAPT in a group with experts and partners might foster the most productive discussions.
- The tool can produce different results depending on the scale at which it is applied. Hence, large and spatially diverse MPAs should consider the scale at which they will use the tool and how that shapes their findings.

Resilience refers to the capacity of a system to resist and recover, to “bounce back” from an impact or change and return to a healthy state.

Adaptive capacity refers to the ability of a system to adjust to the changing climate and its associated effects.

Lead Organisations

National Oceanic and Atmospheric Administration,
USA

International Union for Conservation of Nature



Additional Resources

Access CC-RAPT in [english](#) or [spanish](#).

CC-RAPT builds upon existing management tools including:

- [Protected Area Management Effectiveness Tracking Tool \(METT\)](#)
- [Integrated Management Effectiveness Tool \(IMET\)](#)
- [MPA Resilience Self Assessment Tool](#)
- [Rapid Assessment and Prioritisation of Protected Area Management \(RAPPAM\) methodology](#)

This tool also complements existing climate change resources for protected areas, such as:

- [MPA Adaptation Toolkit](#)
- [Climate Adaptation Methodology for Protected Areas](#)
- [Climate Vulnerability Index](#)



References

- 1 Ziegler S, Johnson J, Brooks R et al. (2023) Marine protected areas, marine heatwaves, and the resilience of nearshore fish communities. *Sci Rep* 13, 1405 (2023)
- 2 De Leo G, Micheli F (2015) The good, the bad and the ugly of marine reserves for fishery yields. *Philos. Trans. R. Soc. B Biol. Sci.* 370, 20140276
- 3 Mellin C, MacNeil A, Cheal A, Emslie M, Caley M (2016) Marine protected areas increase resilience among coral reef communities. *Ecology Letters* 19(6):629-637
- 4 Mcleod E, Anthony K, Mumby P et al. (2019) The future of resilience-based management in coral reef ecosystems, *Journal of Environmental Management* 233:291-301