

# 50 REEFS LANDSCAPE ASSESSMENT

Progress, Lessons Learned,  
and Future Opportunities



Vibrant Oceans  
Initiative 

A program of Bloomberg Philanthropies

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# EXECUTIVE SUMMARY



## The 50 Reefs Approach to Coral Conservation

To preserve coral reefs and the valuable social and ecological services they provide, in 2018 [a group of scientists coordinated by the University of Queensland used a Modern Portfolio Theory \(MPT\) framework](#) to identify a suite of coral reefs that, in absence of other impacts, are likely to have a better chance of surviving the projected outcomes of climate change. Known as the 50 Reefs project, multiple donors, non-governmental organizations (NGOs), national and local governments, and academic partners have since prioritized coral conservation investments and on-the-ground activities at these coral reef regions.

To understand the impact of 50 Reefs-inspired conservation efforts to date, Bloomberg Philanthropies' [Vibrant Oceans Initiative](#) (VOI) worked with [Blue Earth Consultants](#) (Blue Earth), a Division of ERG, to perform a landscape assessment of conservation motivated by the 50 Reefs study, as well as complementary activities to-date. Blue Earth conducted interviews with representatives from NGOs and funding organizations, including VOI grantees, funders supporting activities in 50 Reefs geographies, and organizations implementing activities that are directly informed by the 50 Reefs study. This report summarizes Blue Earth's landscape assessment, discusses the impacts of conservation efforts inspired by 50 Reefs, and identifies opportunities for VOI and its partners moving forward.

## The Impact and Benefits of the 50 Reefs Approach

The use of MPT to guide conservation investments and efforts is novel. The original 50 Reefs scientific study<sup>1</sup> synthesized over one million models of vulnerability into a clear framework to inform prioritization of coral reef investments and actions. Collectively, the 50 Reefs study has resulted in

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<sup>1</sup> Beyer, H.L. et al., 2018. Risk-sensitive planning for conserving coral reefs under rapid climate change. *Conservation Letters*, 11 (6).

at least **26 implementing organizations and eight funders** conducting projects in over **60 reefs** that range across **more than 40 countries**.<sup>2</sup> Conservation efforts inspired by 50 Reefs include bottom-up interventions paired with national policy reforms that collectively support implementation of on-the-ground and institutional actions to address five threats: fishing impacts, non-point source pollution, wastewater pollution, coastal development, and climatic stress. Moreover, the conservation benefits achieved by 50 Reefs-inspired work **extend beyond ecological outcomes and include critical social, economic, health, and nutrition benefits for human communities**. By working with non-traditional conservation partners—such as public health agencies and ministries—organizations operating in the 50 Reefs geographies have demonstrated some of the interlinkages between ecosystem and community health and well-being, as well as the great gains that can be made when working across sectors on critical issues such as water quality and pollution. Additionally, many of the organizations working in the 50 Reefs have begun to demonstrate the **importance of considering equity in achieving coral conservation benefits**—from ensuring small-scale fishers have the necessary access to their coral resources to elevating the roles and leadership of women in fishing and coastal communities.

### Benefits of the 50 Reefs Framework

- Provides a **clear, science-based framework** to prioritize investments in coral reef conservation.
- Acts as a **communication tool** to galvanize support for threatened coral reefs around a shared strategy.
- **Increases global attention and investment** in coral reef conservation.

### Impact Highlights

- Advancement of new fisheries policies and marine protected area (MPA) designations.
- Development of tools to integrate traditional knowledge into MPA and fisheries management.
- Improvements in and strengthened compliance with water quality regulations.
- Identification and remediation of leaking septic systems to decrease wastewater pollution to coral reefs.
- Ongoing research in multiple geographies regarding thermal tolerance of highly resilient coral species.



<sup>2</sup> Note that the total number of implementing organizations and funders mentioned here is based off the findings of this landscape assessment and is not necessarily an exhaustive list of all entities funding or implementing coral reef conservation work.

# Opportunities Moving Forward

The robust science of the original 50 Reefs study, as well as the on-the-ground impacts achieved by a diversity of organizations and funding partners that were inspired by this approach, represent a tested framework and set of tools that have a high likelihood of achieving conservation benefits. The approach, however, is not without its limitations. Many interview respondents noted, for instance, that factors such as the lack of some coral reef regions (e.g., the Mesoamerican Barrier Reef,<sup>3</sup> parts of Micronesia) and the limited incorporation of local knowledge in the original selection process and portfolio represent opportunities to strengthen the approach moving forward. While the original study aimed to prevent reefs from disappearing by seeking the optimal places for preserving “coral cover” as a measure of abundance, with the development of new models and datasets there is an opportunity to prioritize other features of conservation (e.g., biodiversity) to add additional sites. Furthermore, the successes of organizations working in 50 Reefs geographies have often been hard-earned and paired with substantial challenges—including natural disasters, the global COVID-19 pandemic, political turmoil and even assassinations, competition for ever-scarcer funding to support long-term conservation, and difficulties sharing information across organizations working in the 50 Reefs geographies.



Given that threats to coral reefs are only increasing, a strong, science-based prioritization approach to guide investments—like that which originated from the 50 Reefs study—remains a critical need. Moving forward, 50 Reefs coral conservation efforts present multiple opportunities for organizations working on an array of different topics and applying diverse interventions. VOI, other investors, and implementing organizations have many potential avenues to pursue as they identify their coral conservation priorities and determine areas for investment most aligned with their organizations’ missions and priorities. Specific activities VOI and others could consider moving forward include:

1. **Advancing the message** of a strategic approach to coral reef conservation and climate change inspired by the 50 Reefs approach in order to mobilize the ongoing efforts of the funding community, NGOs, and other partners.
2. **Refining the science** behind 50 Reefs, deepening engagement with the scientific community and expanding knowledge, as well as revisiting the portfolio of candidate priority reefs.
3. **Strengthening and expanding the network** of organizations working to advance coral conservation in the identified geographies and sharing information and ideas among these organizations.
4. **Building and disseminating the tools** (e.g., through a strengthened 50 Reefs network) needed for organizations to achieve on-the-ground social, ecological, and policy impacts in the prioritized coral reef geographies.

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<sup>3</sup> Note that the Mesoamerican Barrier Reef was not included in the initial 50 Reefs prioritization efforts likely due to high storm intensity and ocean warming in this area that make the reef a suboptimal candidate for preserving coral cover. Additionally, other reefs such as those in parts of Micronesia may have been absent from the initial portfolio due to the way the model’s optimization criteria, which aimed to prevent reefs from disappearing by seeking optimal places for preserving “coral cover” as a measure of abundance.

# 1

## 50 REEFS: PROTECTING THE WORLD'S MOST VALUABLE CORAL REEFS



### The Science of 50 Reefs

Coral reefs are among the most biodiverse ecosystems on the planet. Reefs provide valuable services such as coastal protection, food, and livelihoods to communities in tropical and subtropical regions. Additionally, over one million plant and animal species rely on coral reefs for food and habitat.<sup>4</sup> Global climate change and associated rising ocean temperatures, however, are decimating corals and the species that rely on them. While international efforts like the Paris Climate Agreement<sup>5</sup> are working to fight climate impacts at a global scale, even if the international community meets the Paris Agreement's targets, 70 to 90 percent of today's corals are likely to disappear by mid-century.<sup>6</sup>

To strengthen the resilience and survival of coral reefs, a group of scientists, conservationists, and funders used Modern Portfolio Theory (MPT; see box)<sup>7</sup> as a decision support tool, to identify bioclimatic units (BCUs, or ~500km<sup>2</sup> areas in the Beyer et al. 2018 study). The selected BCUs will be least exposed to increased heat stress and cyclones in the future. Additionally, larval connectivity between the BCUs and surrounding reef

#### Modern Portfolio Theory (MPT)

MPT is an investment framework that recommends choosing negatively correlated investments to reduce risk while maximizing returns.

In conservation planning, MPT suggests focusing efforts in areas that will respond to climate change in different ways. By prioritizing efforts in this way, MPT can help account for the inherent uncertainty in climate projections.

4 Hoegh-Guldberg, O. et al., 2018. Securing a long-term future for coral reefs. *Trends in Ecology & Evolution*, 33(12), pp.936–944

5 Conferences of the Parties, Adoption of the Paris Agreement, Dec. 12, 2015. U.N. Doc. FCCC/CP/2015/L.9/Rev/1 (Dec. 12, 2015).

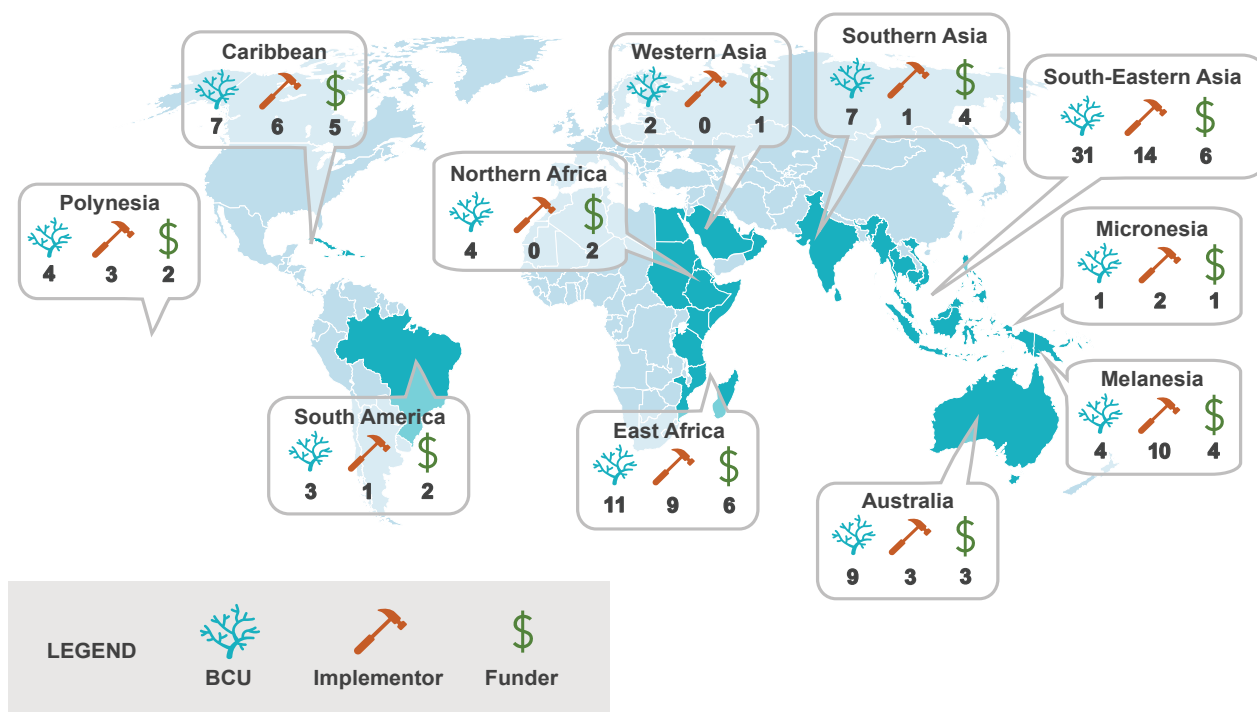
6 Hoegh-Guldberg et al., 936–944.

7 Beyer, H.L. et al., 2018. Risk-sensitive planning for conserving coral reefs under rapid climate change. *Conservation Letters*, 11 (6).

areas will position them well to repopulate other reefs following disturbances.<sup>8</sup> While the geographic, environmental, socioeconomic, and political variances in the target countries that host BCUs (see Table A-1 in Appendix A) necessitate applying tailored actions, common threats facing the reefs provide an opportunity for a shared strategy and solutions among conservation groups and funders.<sup>9</sup> This coordinated conservation prioritization approach is known as the 50 Reefs Initiative.

## A Multi-Partner Approach

Multiple donors, non-governmental organizations (NGOs), national and local governments, and academic partners used the 50 Reefs approach to prioritize coral conservation investments and activities, including Bloomberg Philanthropies' [Vibrant Oceans Initiative](#) (VOI). Collectively, there are at least 26 implementing organizations and eight funders that perform work directly under or inspired by the 50 Reefs approach. Out of 83 total BCUs,<sup>10</sup> implementing organizations are working in over 60 BCUs that range across more than 40 countries (Figure 1), and funders are supporting projects in all regions. (Note that the total number of implementing organizations and funders mentioned here is based off the findings of this landscape assessment and is not necessarily an exhaustive list of all entities funding or implementing coral reef conservation work.)



**Figure 1. Map of coral reef conservation implementing organizations and funders working on 50 Reefs efforts. (Sources: document review and interviews.)**






<sup>8</sup> Hoegh-Guldberg et al., 936-944.

<sup>9</sup> *Ibid.*

<sup>10</sup> The BCUs that VOI considers a part of the 50 reefs data set include a combination of portfolios developed by the paper's authors in advance of the paper's publication (there was some overlap between the portfolios).









Conservation motivated by 50 Reefs advances bottom-up interventions paired with national policy reforms to support implementation of various on-the-ground and institutional actions to address the five threats summarized in Table 1 below.

**Table 1. The five threats addressed by 50 Reefs.**

Threat Addressed	Example Interventions
 <b>Fishing impacts</b>	Marine reserves, fishing gear modifications, size and catch limits, limits on industrial fishing, outreach and education, rights-based management.
 <b>Non-point source pollution</b>	Ridge to reef protected areas, best practice land use management, catchment restoration, strengthening of environmental laws, capacity strengthening for legal action, plastic recycling schemes.
 <b>Wastewater pollution</b>	Wastewater treatment infrastructure, protection of coastal vegetation for natural filtration, strengthening environmental laws, capacity strengthening for legal action, cross-sectoral collaboration.
 <b>Coastal development</b>	Eco-engineering of infrastructure, best practice management for dredging, ballast water treatment facilities, marine biodiversity offset policies, capacity strengthening for legal action.
 <b>Climatic stress</b>	Protection of herbivores, climate-smart marine spatial planning, reef restoration with climate-smart corals, assisted evolution, adoption of climate change policies, outreach and education.

While guided by a cohesive body of scientific work, an array of funders and NGOs are implementing the resulting conservation efforts independently across the BCUs and related to the five threats, as shown in Table 2 below. By not espousing a one-size-fits-all solution, this approach fosters collective and tailored solutions that meet local needs. However, the non-federated approach can also result in challenges with collaboration and knowledge sharing across organizations, in addition to difficulties measuring and comparing the success of interventions. Despite these potential challenges, 50 Reefs provides a strong foundation for channeling large-scale, targeted funding to support protection and preservation of vital coral reef ecosystems.

**Table 2. Threats to coral reefs addressed by identified implementers and funders.**  
 (Sources: document review and interviews.)

Threats to Coral Reef					
					
Regions 	10	9	10	9	11
Implementors 	18	10	3	5	8
Funders 	6	2	2	2	4

## Report Purpose

To inform development of this report, VOI worked with [Blue Earth Consultants](#), a Division of ERG, to perform a landscape assessment of conservation motivated by the 50 Reefs study, as well as complementary activities to date. Blue Earth conducted 17 interviews (including five group interviews) with 28 informants representing NGOs and funding organizations (see Appendix B for a full list of informants). Organizations interviewed consisted of VOI grantees, funders supporting activities in 50 Reefs geographies, and organizations implementing activities that are directly informed by 50 Reefs. Interviews focused on topics such as the existing landscape of activities related to 50 Reefs, planned future efforts, gaps in the existing landscape of work, and opportunities for the future. The following sections provide an overview of some of the funders and NGOs<sup>11</sup> currently working in 50 Reefs geographies and the types of interventions in which they are engaged, a discussion of lessons learned since the original 50 Reefs study, and opportunities for future activities and interventions in the 50 Reefs geographies.

<sup>11</sup> Note that the implementing organizations and funders presented in this report are based off the findings of the landscape assessment and this is not necessarily an exhaustive list of all entities funding or implementing coral reef conservation work.



# 2

## FINANCING CORAL CONSERVATION: 50 REEFS FUNDER SUPPORT













The landscape assessment identified eight funders (see Table 3) financing coral reef conservation activities that address five key threats. These funders range from global-scale funds such as the United Nations' Global Fund for Coral Reefs, which relies on national contributions, to smaller funds with a species-specific focus such as the Shark Conservation Fund, which operates as a funder collaborative. While some are more geographically focused than others, collectively, these funders support activities in all 50 Reefs BCUs except for those in Somalia and the Persian Gulf.<sup>12</sup> Table 3 below highlights the eight funders identified through this assessment, their target geographic regions, focal threats, example interventions used or supported, and examples organizations the funder supports. Information in Table 3 is based on document review, web-based research, and interviews with the highlighted funders.

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<sup>12</sup> Funders identified in this landscape assessment are funding activities in all 50 Reefs BCUs, including some of the reefs that none of the organizations identified and reviewed as part of this landscape assessment are working in currently (due to volatile socio-political conditions).





**Table 3. Funders supporting activities in 50 Reefs geographies as identified through the landscape assessment. Note that this is not necessarily an exhaustive list of all funders supporting activities in 50 Reefs geographies.**

50 Reefs Funders and Related Activities		
 <p><b>Bloomberg Philanthropies</b> Vibrant Oceans Initiative A program of Bloomberg Philanthropies</p>	Target geographies	Australia
	Threats addressed	
	Example interventions	Marine protected area (MPA) implementation, small-scale fisheries governance improvements, sustainable agriculture, water quality regulations, climate campaigns
	Example organizations funded	Wildlife Conservation Society (WCS), Australia Marine Conservation Society, Blue Ventures, Rare, Critical Ecosystem Partnership Fund
 <p><b>BLUE ACTION FUND</b></p>	Target geographies	Eastern Africa, Melanesia, Southern Asia, South-Eastern Asia
	Threats addressed	
	Example interventions	Sustainable livelihoods, MPA establishment and strengthening, pearl and seaweed farming, supply chain investments, sustainable financing training
	Example organizations funded	Island Conservation, Fauna & Flora International, WCS, WILDTRUST
 <p><b>GLOBAL FUND FOR CORAL REEFS</b></p>	Target geographies	Fiji, the Philippines, Kenya, Tanzania, Solomon Islands, Belize, Mexico, Honduras, Guatemala, Papua New Guinea, Bahamas, and Maldives
	Threats addressed	
	Example interventions	Sustainable fisheries management, MPA co-management, sustainable aquaculture, working with the sugarcane industry for best agricultural practices, blue carbon
	Example organizations funded	Coral Reef Rescue Initiative (CRRI) and World Wildlife Fund (WWF), The Nature Conservancy (TNC), WCS, United Nations Development Programme (UNDP)

50 Reefs Funders and Related Activities		
	Target geographies	Caribbean, Eastern Africa, Melanesia, Polynesia, South America, Southern Asia, South-Eastern Asia,
	Threats addressed	
	Example interventions	MPA and fisheries management, establishment of new MPAs, coordination with local NGOs to leverage capacities and advance complementary goals
	Example organizations funded	Pew Charitable Trusts, WCS, Hawaii Community Foundation, Mesoamerican Reef Fund, Global Fishing Watch, Oceana
	Target geographies	South-Eastern Asia
	Threats addressed	Data not readily available <sup>13</sup>
	Example interventions	Data not readily available
	Example organizations funded	WCS, Rare
	Target geographies	Australia, Caribbean, Eastern Africa, Southern Asia, South-Eastern Asia
	Threats addressed	
	Example interventions	Fisheries management actions such as quotas, spawning area protection, legal policy changes
	Example organizations funded	Multiple small NGOs in developing countries, Japan Wildlife Conservation Society

<sup>13</sup> Note that representatives from the Paradise Blue Initiative Fund and Tiffany and Co. Foundation did not participate in interviews and therefore information in this table regarding the Fund and Tiffany and Co. Foundation may not be as complete as they are for other funders.

## 50 Reefs Funders and Related Activities

 <p>THE TIFFANY &amp; CO. FOUNDATION</p>	Target geographies	Caribbean, Eastern Africa, Melanesia, Polynesia, South America, Southern Asia, South-Eastern Asia
	Threats addressed	
	Example interventions	MPA and fisheries management, establishment of new MPAs, coordination with local NGOs to leverage capacities and advance complementary goals <sup>13</sup>
	Example organizations funded	Pew Charitable Trusts, WCS, Hawaii Community Foundation, Mesoamerican Reef Fund, Global Fishing Watch, Oceana
 <p>PAUL G. ALLEN FAMILY FOUNDATION</p>	Target geographies	Australia, Caribbean, Eastern Africa, Micronesia, Northern Africa, Western Asia
	Threats addressed	
	Example interventions	Tracking thermal tolerance code, scaling up reef restoration, selective coral breeding for thermal tolerance and replanting
	Example organizations funded	Hawaii Institute of Marine Biology, Australian Institute of Marine Science, Queensland University of Technology

# 3

## STRENGTHENING ON-THE-GROUND CONSERVATION: 50 REEFS IMPLEMENTING ORGANIZATIONS



The landscape assessment identified 26 implementing organizations—including 16 international organizations and 10 local or regional organizations—implementing an array of coral reef conservation interventions to combat the five threats (see Table 1 above) in the 50 Reefs target geographies. While implementing organizations operate in most BCUs, there are 18 BCUs (out of 83 total) where the identified organizations are not implementing work, including BCUs in Australia, South America, Eastern and Northern Africa, and Southern and Western Asia. In most cases, work is not occurring in these BCUs likely due to unfavorable political conditions or lack of capacity for on-the-ground implementation of coral conservation actions.

Of the 26 organizations reviewed in the landscape assessment, these organizations are working with at least 115 partners that support or implement complementary efforts. While the landscape assessment is not an exhaustive survey of organizations and funders in the coral conservation field, the number of partners identified highlights the breadth of additional work occurring by organizations not highlighted in the report. As shown in Table 4, implementing organizations reviewed in the landscape assessment range from international NGOs such as The Nature Conservancy (TNC) and Wildlife Conservation Society (WCS) to smaller local-scale or regional NGOs such as the Indonesia Locally Managed Marine Area Foundation. Implementing organizations identified include:

- Twenty VOI grantees.
- Six 50 Reef partner or aligned organizations.
- At least 115 implementation partners (e.g., national, regional, and local nonprofits, government agencies, and others).

**Table 4. International, local, and regional implementing organizations working in 50 Reefs geographies as identified through the landscape assessment. Note that this is not necessarily an exhaustive list of all implementing organizations working in 50 Reefs geographies. See Table 6 for additional details on selected organizations.**

Type of Organization	Name of Implementing Organization	
<b>International Organizations and Partnerships</b>	Blue Nature Alliance	National Oceanic and Atmospheric Administration Coral Reef Conservation Program
	Blue Ventures	Oceana
	Climate Council	Rare
	Conservation International	TNC
	Coral Reef Rescue Initiative	Wild Earth Allies
	Critical Ecosystem Partnership Fund	WCS
	Environmental Defense Fund	WILDTRUST
	International Union for the Conservation of Nature	World Wildlife Fund
<b>Local or Regional Organizations</b>	Australia Marine Conservation Society	Fiji Locally Managed Marine Area Network
	Bahamas National Trust	Indonesia Locally Managed Marine Area Foundation
	Bahamas Reef Environmental Education Foundation	Institut des Récifs Coralliens du Pacifique
	Coral Triangle Center	Sea Sense
	Centre de Recherches Insulaires et Observatoire de l'Environnement (CRIOBE)	NatureFiji-MareqetiViti

**Table 5. Threats to coral reefs and types of interventions used by identified implementing organizations and funders. (Sources: document review and interviews.)**














Types of Intervention	Threats to Coral Reef				
					
Capacity strengthening	✓	✓	✓	✓	✓
Policy and regulation	✓	✓	✓		✓
Livelihoods and markets	✓			✓	✓
Watershed management		✓	✓		
Restoration and mitigation		✓	✓	✓	✓

Table 5 illustrates the types of interventions that NGOs and funders are implementing or supporting in 50 Reefs geographies. Notably, NGOs and funders are supporting or conducting capacity strengthening efforts in relation to combatting each key threat. Capacity strengthening can be one of the most important interventions to implement as local communities require capacity to continue implementing conservation and management actions, even after funders or NGOs have completed a project. Interventions to support capacity strengthening include examples such as:









- **Supporting advocacy for new laws to protect local fisheries and the livelihoods of native fishers:** The Bahamas National Trust (BNT), TNC, and Bahamas Reef Environmental Education Foundation (BREEF) supported a law that, once implemented, will help protect Bahamian fisheries and the livelihoods of its native fishers. BNT, TNC, and BREEF are also advocating for the designation and implementation of MPAs with the aim of protecting 20 percent of the Bahamas’ marine and coastal resources.
- **Supporting development of community-based management programs:** Rare is developing replicable governance models for marine reserves with managed access that can be applied across sub-national seascapes in Indonesia, and the Philippines to deliver benefits to coastal communities while also protecting the reef ecosystems.
- **Improving water quality through stronger regulations and incentives:** WCS’s Watershed Interventions for Systems Health program in Fiji aims to reduce land-based pollution through catchment management and replacement of problematic septic systems.
- **Promoting agricultural best practices to reduce non-point source pollution:** Conservation International is generating complementary support and influence to inform strategies for the primary Indonesian government agencies, most notably the Ministry of Environment and Forestry, to curb pollution from sedimentation and runoff from degraded land.
- **Advocating for stronger commitments from national governments to renewable energy and climate resilience projects to address climatic stress:** The Australia Marine Conservation Society, World Wildlife Fund (WWF), and the Climate Council’s Queensland climate campaign is advocating for the Queensland government to commit to a minimum of four significant renewable energy, energy efficiency, and/or climate resilience projects to protect the long-term health of the Great Barrier Reef by reducing Australia’s emissions and increasing resilience.

**Table 6. Implementing organization spotlight.** The table below highlights some NGOs identified through the landscape assessment that represent a range of NGOs operating at various levels in different geographies, but this is not an exhaustive list of NGOs implementing activities in 50 Reefs geographies.

Example Implementing Organizations and Related Activities		
	Target geographies	Australia
	Threats addressed	
	Example interventions	Water quality improvements through regulations and incentives, fisheries management, climate campaign, gill net fishing reduction
	Example partner organizations	WWF-Australia Climate Council
	Target geographies	Caribbean
	Threats addressed	
	Example interventions	National fisheries policy, MPA creation and enforcement, fisheries and livelihood protection
	Example partner organizations	BREEF, TNC
	Target geographies	Eastern Africa, South-Eastern Asia
	Threats addressed	
	Example interventions	Harvest control rules, gear restrictions, community- and rights-based management, pollution management
	Example partner organizations	WCS, WWF, Sea Sense
	Target geographies	Caribbean, South-Eastern Asia
	Threats addressed	
	Example interventions	Capacity strengthening and technical assistance, land-sea management, working with local fishing communities to represent their interests more effectively, protection of fish assemblages and communities
	Example partner organizations	WWF, Oceana, Ocean Conservancy, local NGOs



## Example Implementing Organizations and Related Activities

	Target geographies	Melanesia
	Threats addressed	
	Example interventions	MPAs, locally managed marine areas, periodic closures, harvest control rules, gear restrictions, policy changes, watershed and pollution management, reef restoration
	Example partner organizations	WCS, WFF, NatureFiji-MareqetiViti
	Target geographies	Melanesia, Micronesia, Polynesia
	Threats addressed	
	Example interventions	Building the Rāhui (protected area) Forum and Resource Center's structure and networking capacity, managing rāhui sites for resilience, knowledge sharing, environmental site assessments, community-based fishery management
	Example partner organizations	TNC Global Fisheries, French Polynesia DRM, regional municipalities, members of the management committees of existing rāhui
	Target geographies	South-Eastern Asia
	Threats addressed	
	Example interventions	Expansion and acceleration of implementation of managed access with reserves, strengthening financial literacy and resiliency of communities in target geographies, climate change vulnerability assessments, Fish Forever campaign
	Example partner organizations	Philippines Coral Bleaching Watch, local and national governments, other NGOs
	Target geographies	Caribbean, Eastern Africa, Melanesia, Southern Asia, South-Eastern Asia
	Threats addressed	
	Example interventions	Harvest control rules, spatial management, MPA Framework Capacity Assessment, targeted forest protection along riparian waterways, watershed and pollution management, sustainable blue economy
	Example partner organizations	AusAID, Conservation International, Coral Reef Rescue Initiative, Council of Chiefs of Lau Province (Fiji), Indonesia Ministry of Environment and Forestry, Rare, WWF, Zanzibar Fisheries, Marine Resources Research Institute

# 4

## THE IMPACT OF 50 REEFS: CONSERVATION BENEFITS, GAPS, AND LESSONS LEARNED

The implementing organizations and funders undertaking work related to 50 Reefs have strengthened coral reef conservation and advanced innovative approaches that are broadly applicable to coral reefs beyond the 50 Reefs BCUs. These successes, however, have sometimes been hard won and have come with considerable challenges. This section highlights findings from Blue Earth’s retrospective analysis of the work happening in 50 Reefs geographies related to the successes and impacts, challenges and lessons learned, potential gaps to address, and opportunities recommended by informants for refining and strengthening the approach moving forward.

### Benefits, Successes, and Impacts of 50 Reefs

The use of MPT to prioritize conservation investments and efforts is novel. A key benefit of the MPT, and one that sets the approach apart from other conservation frameworks, is that it rigorously deals with uncertainty. Accounting for uncertainty is a necessary element of any long-term planning framework—especially one that is climate-related—given the inherent uncertainty in climate projections. The 50 Reefs framework synthesizes over one million models of vulnerability into a clear framework to inform prioritization of investments and actions.

Considering the complex impact that climate change is having and will have on coral reefs, the wide array of threats facing coral reefs around the globe, and the limited conservation funding available, organizations must often make tough decisions about which reefs to focus on. According to interview respondents, 50 Reefs fills this critical need by **providing a clear framework to strategically prioritize investments in coral reef conservation in a changing climate**. Given ongoing climate impacts and the uncertainties in how corals will respond to changing ocean conditions, respondents stressed that 50 Reefs provides a **strong, science-based approach** that can help organizations make choices regarding the areas and actions that have the strongest potential to succeed. A few respondents also spoke to the power of 50 Reefs as a **communications tool** to galvanize support for threatened coral reefs and mobilize implementing organizations and funders around a shared strategy.

In discussing successes that have stemmed from the last four years of work under the umbrella of 50 Reefs, respondents spoke to two main themes:

- **Increased awareness of and investment in coral reefs:** Building on the benefit of 50 Reefs as a communications tool, over half of respondents highlighted that 50 Reefs has increased global attention and investment in coral reef conservation. The globally coordinated and compelling message regarding the need to safeguard climate refuges spurred new partnerships and funder interest, in addition to elevating the socio-ecological importance of coral reefs.
- **On-the-ground impacts and institutional changes:** Respondents highlighted how efforts of the implementing organizations working on 50 Reefs-related projects have resulted in multiple on-the-ground benefits, such as the establishment of new MPAs and fisheries management protocols, strengthening of sediment and sewage management systems, and ongoing development of local, national, and international tools to combat climate change and strengthen coral reef protection. Table 7 below highlights a few examples of impacts stemming from 50 Reefs' work.

### Benefits of the 50 Reefs Framework as Noted by Respondents






- Provides a clear, science-based framework to prioritize investments in coral reef conservation.
- Acts as a communication tool to galvanize support for threatened coral reefs around a shared strategy.
- Increases global attention and investment in coral reef conservation.



*There's honesty in [the 50 Reefs] approach. We can't save everything, [so we need to] prioritize what has the best chance to survive.... There's power in prioritization where [organizations can] take a holistic approach."*  
– Interview respondent



Table 7. Highlights of 50 Reefs' impacts in response to the five threats.

Threat Addressed	Impact Highlights
 <p><b>Fishing impacts</b></p>	<ul style="list-style-type: none"> <li>■ <b>Bahamas:</b> Advancement of revised national fisheries policy and plans for declaration of new MPAs; strengthened enforcement of fisheries regulations.</li> <li>■ <b>Cuba:</b> Establishment of a new MPA in northwest Cuba.</li> <li>■ <b>French Polynesia:</b> Development of tools to integrate traditional rāhui knowledge into current management; community-based workshops, modeling, and management planning with local groups.</li> <li>■ <b>Kenya and Tanzania:</b> Support for the establishment of a trans-boundary conservation area on the southern border of Kenya and northern border of Tanzania, which will include sustainable community fisheries activities.</li> </ul>
 <p><b>Non-point source pollution</b></p>	<ul style="list-style-type: none"> <li>■ <b>Australia:</b> Improvements in water quality in Queensland through strengthened compliance with existing regulations and an increase in public investment to reduce nitrogen and pesticide pollution.</li> <li>■ <b>Fiji:</b> Targeted forest protection along riparian waterways and installation of sediment catchment devices.</li> <li>■ <b>Indonesia:</b> Collaboration with Ministry of Environment and Forestry to curb pollution from sedimentation and degraded runoff.</li> <li>■ <b>Philippines:</b> Protection and sustainable management of mangroves.</li> </ul>
 <p><b>Wastewater pollution</b></p>	<ul style="list-style-type: none"> <li>■ <b>Fiji:</b> Surveying of catchments that drain into a Vatu-i-Ra reef to identify leaking septic systems, outreach and education regarding septic system improvements, and replacement of problematic septic systems.</li> </ul>
 <p><b>Coastal development</b></p>	<ul style="list-style-type: none"> <li>■ <b>Indonesia:</b> Collaboration with villages to allocate funding from national village fund for appropriate coastal design infrastructure.</li> <li>■ <b>Philippines:</b> Implementation of campaigns focused on how to secure land and community docking of boats; secured landing areas and permanent docking for small-scale fishers.</li> </ul>
 <p><b>Climatic stress</b></p>	<ul style="list-style-type: none"> <li>■ <b>Multiple BCUs:</b> Ongoing research regarding thermal tolerance of highly resilient coral species; selective breeding for corals with heat resistance and thermal tolerance.</li> <li>■ <b>Multiple BCUs:</b> Integration of climate impacts into work on local stressors (e.g., incorporating thermal tolerance into the process of repositioning MPAs); implementation of local climate vulnerability assessment and resilience planning processes.</li> </ul>



## Strengthening Capacity for Fisheries Management by Empowering Local Communities

To address the threats of fishing impacts to coral reefs in some of the 50 Reefs geographies, Rare's [Fish Forever program](#), funded in part by VOI, seeks to empower communities, revitalize coastal marine habitats, and secure the livelihoods of those who rely on reef fisheries through strong governance, local leadership, and community-based management. In developing the Fish Forever program, Rare drew on the 50 Reefs study and subsequent conversations with VOI about priorities stemming from the study to inform the development and scale of interventions in their target geographies, as well as in the Fish Forever program as a whole. Currently, Rare is implementing Fish Forever in 50 Reefs geographies in Indonesia, Mozambique, and the Philippines.

Fish Forever implements **on-the-ground and institutional interventions** that will help strengthen conservation and protection of coral reefs, such as:

- Working with communities and governments at the national, provincial, and local levels to **create networks of community-led, no-take marine reserves** that replenish and sustain fish populations and protect critical habitat, as well as establishing managed access areas that provide fishing communities clear rights to fish in certain areas. Fish Forever also helps local fishers create plans for fishing grounds designed for their optimal, sustainable uses.
- Supporting local communities' development of **community-based conservation approaches and regulated, sustainable fisheries practices and management**. Community fisheries management is supported by **data collected by local fishers** and disseminated with the help of Fish Forever. These data are critical tools in regulating fishing behavior and adaptively managing marine reserves and fishing regulations, informing household budgets, and measuring the success of conservation and management practices.
- Supporting establishment of **community savings clubs and access to formal**



*"In our interventions, we try to hit all of the small-scale fisheries. [We are] working across seascapes within protected areas and [outside of] protected areas to get better adoption of sustainable approaches [that are] replicable." – Interview respondent*



**financial services and offering financial literacy trainings to ensure community financial resilience.** Improving financial literacy of women in these communities is especially important to building community financial resilience, and it also advances social and gender equity in the community. These tools and trainings are helping communities gain direct benefits from their local fisheries, therefore securing resilient, sustainable futures for fishing communities.

- Mitigating non-point source pollution by protecting and ensuring **sustainable management of mangroves.**
- Working with village governments to allocate funding from national village funds to **encourage design of sustainable infrastructure** and developments that will not have negative impacts on the watershed and reefs.

## Improving Human and Environmental Health Through Pollution Reduction and Management

WCS conducts many efforts inspired directly by the 50 Reefs conservation approach with funding from VOI. WCS is a key partner of VOI and uses the 50 Reefs study and approach to prioritize on-the-ground and institutional conservation efforts. WCS also draws on the VOI and 50 Reefs network to connect and promote science, monitoring, and advocacy efforts in the 50 Reefs geographies. While WCS addresses a range of threats to coral reef health, recent campaigns in Fiji to improve water quality, as well as human and environmental health, have achieved exceptional success. Water quality is a pervasive threat to reefs around the world and improving water quality calls for better implementation and enforcement of current policies, in addition to development of new large-scale water quality management programs.

To combat **non-point source and wastewater pollution**, WCS implements **on-the-ground** and **institutional interventions** such as:

- Placing **sediment socks** in areas of high runoff or erosion to create a raised barrier.



*“[We take a] grassroots approach, [there is] no one-size-fits-all. [We need to] understand the needs of communities and leaders and codesign actionable programs [to] come up with things that have buy-in and the potential to meet needs on the ground.”*

*- Interview respondent*



Sediment socks catch and build up sediment, therefore preventing runoff and creating areas that could support revegetation.

- Using **revegetation** to stabilize slopes and reduce runoff and non-point source pollution by organizing plant nurseries with local communities.
- Conducting **targeted forest protection along riparian waterways** to prevent future erosion events that would contribute to runoff.
- **Surveying catchments that drain into Fiji’s Vatu-i-Ra seascape** to identify problems where there may be leaking septic tanks.
- Implementing **outreach and education** programs about the appropriate types of septic systems to **prevent leakage and wastewater pollution**, as well as supporting **replacement of problematic septic systems** to preserve water quality and combat wastewater pollution.
- Mounting **informational campaigns** to emphasize the connection between **poor water quality and human health issues**, such as typhoid, dengue fever, and others, to raise awareness of non-point source and wastewater pollution and inspire behavior changes. WCS is also emphasizing human **health and food web interactions**, such as the negative effects of ingesting fish that have bioaccumulated pollutants (due to wastewater or non-point source solution), and has been effective in mobilizing support for water quality improvement efforts.



*“We work almost exclusively in [countries where] governance systems [are] almost always lacking, sometimes in deeply fundamental ways... [There is] everything from total corruption and illegality to zero regulatory oversight and enforcement.”*

*– Interview respondent*



# Challenges Experienced in Implementing 50 Reefs–Inspired Work

While funders and implementing organizations interviewed identified many successes stemming from their 50 Reefs–related efforts, they also spoke extensively about the challenges that they experienced through political and institutional setbacks due to the global COVID-19 pandemic. Respondents highlighted four main challenges that undermined the impacts of their work:

- **Enabling conditions:** Many of the reefs where respondents work and which were identified in the original 50 Reefs study are in countries with weak governing systems that lack regulatory oversight, making it difficult to promote compliance and enforce regulations that could help mitigate the five threats their conservation efforts are focusing on, like policies for improved fisheries management, sustainable coastal development, and MPA network establishment and enforcement. Furthermore, some implementing organizations working in the target geographies have struggled with a range of political issues such as abject corruption of government agency and private sector partners, frequent political turnover, and limited agency resources, knowledge, and capacity to implement their mandates.
- **Disasters and emergencies:** Many respondents highlighted the difficulties COVID-19 imposed on their 50 Reefs–inspired efforts. Beyond the pandemic, natural disasters and ecological events—such as hurricanes, [stony coral tissue loss](#), and heat stress (i.e., mass coral bleaching) events—were also a setback to respondents’ work. A few respondents also spoke to major political upheaval, including assassinations of high-level political officials, that resulted in delays or a cessation of planned activities.
- **Funding:** Reflecting a common problem in environmental conservation, respondents highlighted difficulties in finding funding to support on-going, sustained coral conservation activities in 50 Reefs geographies and related to the five threats, such as long-term monitoring and MPA and fisheries management, enforcement, and strengthening capacity. Respondents suggested that even with the increased funder interest in coral reef conservation generated through 50 Reefs, the lengthy timeframe required to demonstrate the benefits of interventions to coral reefs sometimes makes it difficult to gain the interest of prospective new funders. A couple of respondents also noted that the prioritization of geographies for investment in the 50 Reefs project can lead to increased competition among NGOs for limited funding and a lack of investment and advancement of conservation activities in reefs not part of the portfolio. As a potential solution to this competition, respondents suggested having more open calls for funding proposals and increasing transparency in how projects are chosen for investment.
- **Information sharing:** Some respondents perceived a lack of sharing successes, lessons learned, and transferrable strategies among organizations working in the 50 Reefs geographies. Respondents also noted that if organizations implement knowledge sharing networks in the regions where they work, those networks tend to fall apart when a funding or implementing organization finishes their work in an area. They stressed that sharing and publicizing successes and lessons learned could help leverage complementary work and strengthen partnerships, resulting in increased on-the-ground impacts.

Despite challenges experienced, respondents had multiple suggestions regarding strategies to overcome these roadblocks and achieve conservation benefits. Emergent themes all related to **strengthening social capital** among local communities and partners regionally, nationally, and internationally. For instance, respondents spoke to the importance of **building partnerships and trust** with in-country partners, noting that practitioners must use community-based approaches that consider local nuances, conditions, and



the time needed to establish productive relationships. One respondent also suggested considering expanding coral reef conservation investments beyond reefs that are the worthiest of saving from a scientific perspective, to include those that are also the most critical to human well-being. Implementing conservation through a human well-being lens could also be a useful tool to promote buy-in from funders and governments. Respondents also mentioned tools like **conferences, learning exchanges, and publicly available learning products** highlighting success as potential strategies to increase transparency and promote information sharing and leveraging of ideas among partners.

## New 50 Reefs Opportunities Identified by Informants

As described throughout this report, from on-the-ground conservation impacts to raised visibility of coral reef conservation, 50 Reefs has resulted in many successes. The approach, however, is not without its limitations. Over half of respondents, for instance, noted that even with the robust criteria used to select the BCUs, important coral reef regions are not represented in the current portfolio. Respondents highlighted regions—such as the Mesoamerican Barrier Reef and Micronesia—that are known to have resilient and in-tact reefs and the enabling conditions to support long-term conservation. These regions were absent from the original 50 Reefs portfolio due to the optimization criteria in the model, which aimed to prevent reefs from disappearing by seeking the optimal places for the preservation of “coral cover” as a measure of abundance. Some of the reefs not included may have been suboptimal candidates for preserving coral cover due to increasing storm intensity and rapid ocean warming in their BCUs. The model favored reefs with a high risk of exposure and relied on a threshold model informed by degree heating weeks, as well as the size (500 km<sup>2</sup>) of the original 50 BCUs. In other words, application of the 50 Reefs criteria-based framework is intended to produce a specific prioritization of reef BCUs but is not intended to diminish the conservation priorities for other reef areas outside the scope of this framework. Informants felt these gaps in coverage underscore the need to pair the global analysis from the original 50 Reefs scientific studies with regional and local ecological and social knowledge from scientists, managers, and stakeholders in coral reef regions to inform future conservation and prioritization efforts. This is in fact consistent with the original 50 Reef study (Beyer et al. 2018, Hoegh-Guldberg et al 2018). There is also an opportunity to favor a different aspect of conservation—such as



*“Any model output has strengths and limitations. How do you take this great foundation and complement it with additional science to gap fill it and make sure you are including critical areas...where you have strong enabling conditions, community, support, political will, and NGOs to support conservation?”*

*– Interview respondent*



## Monitoring the 50 Reefs Impacts

Though it can take years to demonstrate impacts of conservation actions on coral reefs, organizations are working to identify social, well-being, and ecological indicators that capture both short- and long-term impacts. Respondents highlighted efforts to strengthen monitoring, such as identifying indicators (e.g., changes in coral disease) with faster response time or working with communities to strengthen capacity for monitoring. Additionally, open-source platforms like the [Marine Ecological Research Management AID](#) (MERMAID)—a collaboration between WCS, WWF, and Sparkgeo—are helping empower local scientists and managers to collect and share simple indicators like live coral coverage for their reefs.

biodiversity—and adjust the model to prioritize the drivers of biodiversity and select additional sites to target this goal.

Respondents also noted additional threats and priorities within the 50 Reefs BCUs that they hope to address moving forward. Major themes included:

- **Address invasive species and disease:** A majority of respondents felt the five threats addressed in the 50 Reefs approach represent the most important factors impacting coral reefs. Additional threats that respondents suggested highlighting moving forward included emerging coral diseases (such as the current stony coral tissue loss disease in the Caribbean) and invasive species, both of which are often exacerbated by changing climate conditions and other local stressors.
- **Improve monitoring:** While notable efforts exist to conduct ongoing reef monitoring (see box), some respondents highlighted the need to strengthen monitoring systems and better demonstrate the progress, success, and failures of management interventions. A few respondents noted that they are collaborating with local partners to develop frameworks and conduct trainings that will provide partners with tools to help implement simple and cost-effective monitoring.
- **Increase opportunities for sustainable, diversified financing:** Another common gap that arose was

## Potential New Partners Recommended by Respondents

### Funders:

- Dalio Philanthropies
- Ford Foundation
- Green Climate Fund
- KfW Development Bank
- Oceankind
- Ray Dalio Foundation
- Swiss Re Group
- U.S. Agency for International Development
- Waitt Foundation

### Implementing Organizations:

- Conservation Finance Alliance
- Interamerican Association for Environmental Defense
- International Coral Reef Initiative
- Local governments and communities

the need for collaboration across multiple sectors and non-traditional partners (e.g., private sector insurers, coastal businesses, tourism operators) to develop long-term financing structures and opportunities for alternative livelihoods. Respondents stressed the importance of solutions that could help create economic security for communities and funds that will last in perpetuity to support ongoing conservation actions.

- **Promote knowledge sharing:** Sharing information regarding ongoing efforts, approaches used, progress, and lessons learned could help organizations leverage and align their efforts, therefore strengthening the overall conservation benefit to reefs. Respondents shared strategies they are beginning to consider and use—such as local government agency liaisons, convenings of local and regional partners, fellowship programs, and more—to strengthen knowledge sharing, foster cross-pollination of ideas, and demonstrate the potential of the 50 Reefs approach to new partners. (See box on the previous page for a list of potential new funding and implementing partners highlighted by respondents.)
- **Strengthen management capacity and effectiveness:** Almost three-fourths of respondents discussed the need to strengthen local capacity for management of fisheries, MPAs, and other coastal zone regulations. Multiple respondents stressed the importance of continuing the long-term efforts occurring in many regions to improve local management structures, empower local communities to protect their resources, and ensure increased compliance with existing regulations.



# 5

## THE NEXT PHASE OF CORAL CONSERVATION: OPPORTUNITIES MOVING FORWARD



Since identification of the 50 Reefs portfolio, at least 34 funders and implementing organizations have invested in and conducted activities either motivated by or complementary to the 50 Reefs approach. From strengthening fisheries management to improving water sanitation systems, organizations have demonstrated the potential to make tangible, on-the-ground improvements to strengthen coral reef protection. In many instances, however, successes have been hard-earned and paired with substantial challenges. Natural disasters, the global COVID-19 pandemic, political instability, and competition for funding to support long-term conservation have forced funders and implementing organizations to search for creative solutions to sustain their efforts and create durable outcomes. As threats to coral reefs persist and increase, the 50 Reefs approach to geographic prioritization and conservation remains a critical, coordinated effort to help save these valuable ecosystems. VOI and its partners have many potential avenues to pursue as they develop their next phase of conservation and identify coral conservation priorities moving forward. Drawing on information presented in this report, Blue Earth identified a set of recommendations for VOI to consider, which include:

1. **Advancing the message** of a strategic approach to coral reef conservation and climate change inspired by the 50 Reefs approach in order to mobilize the ongoing efforts of the funding community, NGOs, and other partners.
2. **Refining the science** behind 50 Reefs, deepening engagement with the scientific community and expanding knowledge, as well as refining the portfolio of candidate priority reefs.
3. **Strengthening and expanding the network** of organizations working to advance coral conservation in the identified geographies and sharing information and ideas among these organizations.
4. **Building and disseminating the tools** (e.g., through a strengthened 50 Reefs network) needed for organizations to achieve on-the-ground social, ecological, and policy impacts in the prioritized coral reef geographies.



## The Message

The 50 Reefs study presented a novel prioritization framework that led to a strong, unifying global message for coral reef conservation that prioritized climate refuges with the best chance for corals to survive climate change. Given the concerted and coordinated conservation effort coral reefs need in order to survive increasing climatic stress, the vision provided by 50 Reefs is incredibly valuable. Moving forward, VOI has an opportunity to build upon and strengthen this conservation message, emphasizing the strategic focus on climate change, the science-based nature of the approach, and the on-the-ground conservation benefits it has achieved. Doing so will help mobilize the continued efforts of the funding community, NGOs, and other partners, particularly given the current political momentum to advance global goals for climate and biodiversity. In considering its upcoming coral conservation priorities, VOI could emphasize how the next iteration builds upon the existing momentum of 50 Reefs, particularly so as not to confuse partners with a sense that this is a new and separate program. A strategy refresh could also emphasize a refined and updated lens to complement the 50 Reefs approach that reflects the themes outlined in the below recommendations: the current state of the science, the priorities of the coral conservation community and 50 Reefs-inspired networks, and the tools needed to address the major threats 50 Reefs is tackling.



## The Science

The strong, science-based framework of 50 Reefs is an asset, both in terms of considering the factors that are integral in selecting reefs that can serve as climate sanctuaries, as well as for determining priorities for reef conservation. There is a clear opportunity for VOI and its partners to build on existing work to engage the scientific community in updating and applying recent science to refine a priority portfolio moving forward. Seeking feedback on any model findings and recommendations regarding a revised set of reefs with experts in the respective regions could also offer a critical opportunity to increase the amount of local knowledge incorporated into the prioritization process.



## The Network

The idea of a 50 Reefs Network of coral reefs that are least vulnerable to climate change and which are positioned to facilitate future coral reef regeneration—originally advanced in initial framing of the 50 Reefs approach—is one that is appealing to many in the coral conservation community. A 50 Reefs network has the potential to serve as a link to climate initiatives and ocean-climate policy momentum. It could also help create more transparency and cohesion surrounding coral conservation in the 50 Reefs geographies and beyond, even while maintaining the values of the non-federated approach. This coordination is already happening among funders and NGOs in some geographies (e.g., Indonesia, Tanzania), but there is an opportunity to expand beyond national-level coordination. The “network” does not have to be a highly formalized learning network with a prescribed set of meetings, membership, and an official secretariat. VOI could instead consider funding a simple set of tools related to the network, such as an online platform for disseminating information about the 50 Reefs approach and intermittent opportunities for those working under its umbrella to come together to exchange information on key topics (such as those discussed in a series of recent WCS-led workshops) and learn from each other. It could also be helpful to have an entity to serve in a coordinating capacity to assist in disseminating information at regular intervals—for example, helping compile and distribute updates from the diverse array of organizations inspired by the 50 Reefs approach (including those not directly funded by VOI) and coordinating topical meetings.



## The Tools

The non-federated approach of 50 Reefs has helped leverage effort and allowed implementing organizations to design interventions that best capitalize upon their strengths. Moving forward, however, sharing the frameworks and tools used by those implementing 50 Reefs work could be helpful for organizations working in—as well as beyond—the 50 Reefs geographies but who may not be as directly motivated by the approach. Resources and “how-to” documents that outline the types of interventions organizations are using—such as a guide on how to help communities develop sustainable financing strategies for community-based MPAs, or training on best practices for coral reef monitoring and related tools like MERMAID—could help scale efforts and strengthen the capacity of organizations undertaking coral conservation interventions. Many of these resources may already exist within organizations that are working in 50 Reefs geographies; a 50 Reefs network (as described above) could provide an opportunity for sharing and disseminating this type of information.

# APPENDIX A: REGION NOMENCLATURE FOR 50 REEFS GEOGRAPHIES

Table A-1. Region nomenclature for 50 Reefs geographies. (Source: [VOI BCU Region List.](#))

Region	BCUs	50 Reefs Countries
Australia	Eel-Northern GBR; Gallon-Northern GBR; GBR Central; Mackay-GBR; Mason-Northern GBR; Torres Strait; Van Diemen Gulf; Witsunday Reef 1—Southern GBR; Whitsunday Reef 2—Southern GBR	Australia
Caribbean	Bahamas; Central Bahamas; Cuba North/Bahamas; Cuba Northwest; Cuba South; Cuba Southeast; Hispaniola	Bahamas, Cuba, Dominican Republic, Haiti
Eastern Africa	Central Tanzania; Comoros/Mayotte; Kenya/Somalia; North Mozambique; Northwest Madagascar; SE Red Sea; Somalia; Southern Red Sea; Southern Tanzania; SW Red Sea; Tanzania/Kenya	Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mozambique, Saudi Arabia, Somalia, Tanzania, Yemen
Melanesia	Mine Bay; Solomon Islands; Vanua Balavu—NE Fiji; Vatu-i-Ra	Fiji, Papua New Guinea, Solomon Islands
Micronesia	Ralik Chain	Marshall Islands
Northern Africa	North Red Sea—Egypt I; North Red Sea—Egypt II; Sudan I; Sudan II	Egypt, Eritrea, Saudi Arabia, Sudan
Polynesia	Tahiti; Tuamotus Central; Tuamotus Northern; Tuamotus Southern	French Polynesia
South America	Abrolhos Bank; Maceio; Salvador	Brazil
South-Eastern Asia	Aceh; Banggai to Gulf of Tomini; Belitung; Bird's Head; Cendrawasih; Central Philippines; Central Sulawesi; Eastern Mindinao; Flores/Timor; Gulf of Boni; Gulf of Thailand; Gulf of Tomini; Halmahera; Karimunjawa to Kangean; Makassar; Mentawis; Mindinao to Cebu; North Sulawesi; Northern Papua; Obi Island; Palawan; Riau Islands; Sabah; Sabalana Islands; Simeulue to Nias; Singapore; South Papua; Sulu Archipelago; Sunda Strait; Takabonarate; Tanintharyi/Phuket	Cambodia, East Timor, Indonesia, Malaysia, Myanmar, Philippines, Thailand, Vietnam
Southern Asia	Lakshadweep; Lakshadweep North; Maldives North; Maldives South; Nicobar Islands; Rakhine Coast; Sri Lanka	India, Maldives, Myanmar, Sri Lanka
Western Asia	Central Red Sea; Persian Gulf	Oman, Qatar, Saudi Arabia, United Arab Emirates

# APPENDIX B: INTERVIEW RESPONDENT LIST

**Table B-1. Respondents interviewed by Blue Earth.**

BCUs	50 Reefs Countries
Melissa Wright	Bloomberg
Markus Knigge	Blue Action Fund
Jack Kittinger	Conservation International
Laure Katz	Conservation International
Eric Schwaab	EDF
Gabriel Grimsditch	GFCR/UNDP
Penny Stock	GFCR/UNDP
Pierre Bardoux	GFCR/UNDP
Jennifer Koss	NOAA
Adrian Arias	Oceans 5
Chuck Fox	Oceans 5
Seth Horstmeyer	Oceans 5
Courtney Cox	Rare
Lito Mancao	Rare
Rocky Sanchez Tirona	Rare
Steve Box	Rare
Stu Campbell	Rare
Lee Crockett	Shark Conservation Foundation
Lizzie McLeod	TNC
Ove Hoegh-Guldberg	University of Queensland
Anji Moraes	Paul G. Allen Family Foundation
Rebecca Ng	Paul G. Allen Family Foundation
Sarah Frias-Torres	Paul G. Allen Family Foundation
Caleb McClennen	WCS
Emily Darling	WCS
Simon Cripps	WCS
Stacy Jupiter	WCS
Gabby Ahmadia	WWF