

BRIEF FOR FUNDERS Towards Responsible Investment in Ocean-Based Climate Actions



Festo Lumwe. CC BY 2.0

Challenges for Ocean-Based Climate Actions

Research has shown that deprioritizing or ignoring questions of governance and equity can pose risks to the overall success of ocean-based climate actions.

Social, ecological and climate risks are often overlooked

Many governance systems remain unprepared to manage the complexity of marine interventions and urgent pace of science and implementation.¹ Premature deployment could leave stakeholders, rightsholders, and ecosystems vulnerable to unintended consequences and weak oversight.² Concerns exist about a number of potential risks associated with ocean-based climate actions, such as ecological harm, community exclusion, trade-offs with other climate solutions, or reduced incentive to tackle root causes like emissions.³ However, in many cases these are not systematically addressed in project design or evaluation.⁴ Without inclusive and fair processes for anticipating and managing these risks, interventions can contribute to injustices or compromise long-term outcomes.⁵

Input of public institutions, stakeholders, and rights-holders is insufficient

Many ocean-based climate actions are designed and tested by scientists and technologists, with diverse funding sources and motivations – including scientific discovery and commercial interest. In many cases, input from Indigenous Peoples, local communities, or public institutions has been limited.⁶ This lack of engagement can erode public trust and miss opportunities for the development of context-sensitive interventions that align with local values, aspirations, and knowledge systems.⁷

Tenure and benefit-sharing are central to ocean and climate justice

Secure tenure, legal recognition, and inclusive benefit-sharing arrangements are critical for effective and equitable ocean-based climate action.⁸ Yet only a small fraction of global climate and marine funding supports tenure-strengthening or Indigenous-led initiatives.⁹ Unrealistic and burdensome funding processes alongside a lack of tenure recognition make it difficult for Indigenous Peoples and local communities to meaningfully engage with – or resist – new interventions.¹⁰ In some contexts, ocean-based climate actions can undermine existing tenure rights.

Responsible governance is possible – but must be intentional


Frameworks for socially responsible governance, such as participatory design, ethical review, and accountability mechanisms¹¹ exist, but are often underused in ocean-based climate actions.^{12, 13, 14, 15, 16} Responsible governance requires ongoing resourcing, capacity building, and deliberate design.¹⁷ Coordinated effort across scientists, investors and policymakers can overcome siloed approaches, harness the optimism of new interventions, and drive more responsible transformation of climate-affected marine systems.¹

Developing strategies to sustain human and ecosystem functioning as Earth overshoots 1.5°C of global average warming is an urgent international challenge. The scale and intensity of change are triggering a host of novel ocean-based climate actions - including coral restoration, assisted evolution, and ocean alkalinity enhancement. However, marine governance systems and the comprehensive assessment of effectiveness and impact of ocean-based climate actions on people and ecosystems need to keep pace with the technological development.¹ This brief offers practical strategies for funders who want to ensure their investments support long term success of climate goals and also contribute to justice, resilience, and inclusive decision-making in marine ecosystems.

Ocean-based climate actions – what’s emerging?


There is a surge of new investment in ocean-based climate actions across tropical, temperate and polar systems. Actions range from experimental technological solutions (such as ocean alkalinity enhancement) to challenging societal decisions (such as offshore oil and gas moratoria, offshore wind zoning, and coastal adaptation planning). While technological efforts are well-intentioned, they frequently focus narrowly on metrics - such as tons of carbon removed or scale of financial return - and can overlook important social and equity considerations. Technological hype can also overshadow important societal decisions - such as ocean energy laws and zones and marine adaptation plans - which also require concerted investment and action. Responsible ocean-based climate actions are not only essential for promoting fairness and justice but also play a vital role in ensuring the long-term success and legitimacy of climate solutions.

A variety of ocean-based climate actions are being proposed across tropical, temperate and polar systems




Technological carbon dioxide removal & solar radiation management

Modification of ocean water and reflection of sun’s radiation to enhance CO2 uptake and shade or cool water e.g. ocean alkalinity enhancement, electrochemical CO2 removal, marine cloud brightening




Biological carbon dioxide removal

Creation or restoration of carbon sinks from natural marine resources e.g. seaweed aquaculture, microalgae cultivation



Assisted biological adaptation


Modification of marine species and ecosystems to better tolerate climate change e.g. assisted evolution, assisted migration



Climate finance & markets


Creation of new finance, markets, products, jobs and incentives for ocean-based climate actions. e.g. blue carbon, low carbon products






Marine & coastal restoration

Repair of a climate-impacted marine ecosystem or population e.g. coral gardening, mangrove planting




Socio-institutional capacity building

Enabling communities and organisations to make ocean-based climate decisions and redress climate impacts. e.g. anticipatory science, adaptation planning, marine climate rights



Renewable energy creation

Creation of new low-carbon energy sources from natural marine resources e.g. offshore wind farms, ocean thermal energy conversion



Emissions avoidance schemes

Control of carbon emissions at marine source. e.g. offshore oil and gas moratoria

Five Pathways for Responsible Investment in Ocean-based Climate Actions

Philanthropists, investors and policymakers have a unique opportunity to ensure ocean-based climate actions are designed for success. Key principles can include:

	Embed governance readiness into investment decisions	Ensure funding assessments cover not only technical feasibility, but also whether a project demonstrates transparent, inclusive, and accountable governance. Include clear mechanisms for Indigenous Peoples and community leadership opportunities, ethical deliberation, and cumulative impact assessment.
	Support rights-based and tenure-secure interventions	Invest in projects that deliberately and meaningfully strengthen Indigenous Peoples and local community tenure over marine resources and ensure they have long-term empowerment in decision-making. Respect customary and legal tenure as a foundation of ocean and climate justice and long-term stewardship.
	Fund co-designed, locally led initiatives	Support initiatives that have early, and ongoing engagement with local contexts. Ensure initiatives are co-developed with Indigenous Peoples and local communities, not where they are simply consulted post-design. Include resourcing for Indigenous Peoples and community partners, iterative engagement processes, culturally grounded methodologies and free, prior and informed consent processes.
	Invest in social and ethical capacity	Build project teams with interdisciplinary capacity to navigate trade-offs and build inclusive governance. Engage and fund knowledge leadership from Indigenous Peoples and local communities, social scientists and ethics advisors, to enable more reflexive and responsive projects. Include social and ethical capacity building in intervention evaluation criteria.
	Advance climate, ecological and social goals	Invest in projects which advance climate, ecological and social benefits. Ensure projects have a clear, locally grounded theory of change and transparent evidence base. Make certain social benefits are inclusive and responsive to the aspirations of Indigenous Peoples and local communities.

References

1 Morrison T.H., Pecl G., Nash K., Hughes T., Cohen P., Layton C., Brown K., Lovelock, C., Lemos, M.C., Adger N.W., Lawless S., Muir B., Gurney G., McLeod, E., Mills K., Fairweather-Morrison, I., Phillips M., Sullivan A., Hilmi N., McHugh L.H., Pradhan S., Streit R., Niles N., Ogier, E. (2025) Governing novel climate interventions in rapidly changing oceans. *Science*, 389(6759), eadq0174. [science.org/doi/10.1126/science.adq0174](https://doi.org/10.1126/science.adq0174)

2 American Geophysical Union (2024). Ethical framework principles for climate intervention research. agu.org/ethicalframeworkprinciples

3 Nawaz, S., Peterson St-Laurent, G., & Satterfield, T. (2023). Public evaluations of four approaches to ocean-based carbon dioxide removal. *Climate Policy*, 23(3), 379–394. doi.org/10.1080/14693062.2023.2179589

4 Ogier, E. M., Pecl, G. T., Hughes, T., Lawless, S., Layton, C., Nash, K. L., & Morrison, T. H. (2025). Novel marine-climate interventions hampered by low consensus and governance preparedness. *Nature Climate Change*, 15, 375–384. doi.org/10.1038/s41558-025-02291-4

5 Lawless, S., Ogier, E.M., Streit, R., Gurney, G.G., Cohen, P.J., Gruby, R., Pradhan, S. and Morrison, T.H. (2025). Promoting socially responsible governance of new marine climate intervention. *Cell Reports Sustainability*. 2 (6): 100366. doi.org/10.1016/j.crsus.2025.100366

6 Tholan, B., Basurto, X., Cohen, P.J., Franz, N., Himes-Cornell, A., Govan, H., Fakoya, K., Akintola, S.L. and Aceves-Bueno, E., 2. (2024). Accounting for existing tenure and rights over marine and freshwater systems. *npj Ocean Sustainability* 3, 47. doi.org/10.1038/s44183-024-00084-4

7 Devi, A. (2023). How co-design can localize development programmes and reduce dependency: Examples from Pacific Island Countries. *Development Policy Review*, 41, e12763. doi.org/10.1111/dpr.12763

8 Pradhan, S. K., Cohen, P. J., Lawless, S. & Dean Fitz, K. (2024). Pathways toward Equitable Climate Resilience, Sustainable Fisheries & Tenure Security; A Brief for Funders. Zenodo. doi.org/10.5281/zenodo.12787752

9 Cannon, J. (2022). Despite Pledges, Obstacles Stifle Community Climate and Conservation Funding. *Mongabay News* news.mongabay.com/2022/11/despite-pledges-obstacles-stifle-community-climate-and-conservation-funding/

10 Fidali, K., Toamua, O., Aquillah, H., Lomaloma, S., Mauriasi, P. R., Nasiu, S., Vunisea, A. & Mangubhai, S. (2023). Can civil society organizations and faith-based organizations in Fiji, Samoa, and Solomon Islands access climate finance? *Development Policy Review*, 41, e12728. doi.org/10.1111/dpr.12728

11 Enrici, A., R. L. Gruby, M. M. Betsill, E. Le Cornu, J. E. Blackwatters, X. Basurto, H. Govan, T. Holm, S. D. Jupiter, and S. Mangubhai. (2023). Who's setting the agenda? Philanthropic donor influence in marine conservation. *Ecology and Society* 28(3):2. doi.org/10.5751/ES-14091-280302

12 UN Framework Convention on Climate Change (2022) High-quality blue carbon principles and guidance. oceanriskalliance.org/wp-content/uploads/High-Quality-Blue-Carbon-PG_FINAL_11.9.2022.pdf

13 Doney, S., K. Lebling, O.S. Ashford, C.R. Pearce, W. Burns, S. Nawaz, T. Satterfield, H.S. Findlay, N.D. Gallo, J.-P. Gattuso, P. Halloran, D.T. Ho, L.A. Levin, C. Savoldelli, P.A. Singh, and R. Webb (2025). Principles for Responsible and Effective Marine Carbon Dioxide Removal Development and Governance. oceanpanel.org/publication/marine-carbon-dioxide-removal/

14 Eger, A. M., Layton, C., McHugh, T. A., Gleason, M., & Eddy, N. (2022). Kelp restoration guidebook: lessons learned from kelp projects around the world. kelpforestalliance.com/TNC-KFA-Kelp-Guidebook-2022.pdf

15 Hughes, T. P., Baird, A. H., Morrison, T. H., & Torda, G. (2023). Principles for coral reef restoration in the anthropocene. *One Earth*, 6(6), 656–665. doi.org/10.1016/j.oneear.2023.04.008

16 Boyd, P.W., J.-P. Gattuso, M. Dai, L. Legendre, T. Satterfield, and R.M. Webb. (2025). The need to explore the potential of marine CDR with a One-Earth strategy: A guide for policy-makers. scholarship.law.columbia.edu/sabin_climate_change/241/

17 Ogier, E. M., Pecl, G. T., Hughes, T., Lawless, S., Layton, C., Nash, K. L., & Morrison, T. H. (2025). Enhance responsible governance to match the scale and pace of marine-climate interventions. *Nature Climate Change*, 15, 356–357. doi.org/10.1038/s41558-025-02292-3

Contact information

Governing Changing Oceans Working Group
governingchange.org/
tiffany.morrison@unimelb.edu.au

This Brief was produced by the Governing Changing Oceans Working Group. Please cite as: McHugh, L.H., Muir, B., Pradhan, S. K., Ogier, E., Cohen, P.J., Nash, K., Lawless, S., Mangubhai, S., Hilmi, N., Mills, K., Lovelock, C., Niles, N., Mohammed, E., Brown, K., Fairweather Morrison, I., Pecl, G., Adger, N., Gurney, G., Caldwell, M. and Morrison, T.H. (2025). Towards Responsible Investment in Ocean-Based Climate Actions. governingchange.org/