The MPA Technology Workshop:

Channelling **conservation technology** into **marine protected** area design and management

LOCATION: UNIVERSITY OF ENGINEERING AND TECHNOLOGY (UTEC), LIMA, PERU

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[The conservation technology network]

Context and rationale:

Marine protected areas (MPAs) are a proven tool in protecting our ocean when effectively and equitably implemented, allowing biodiversity to thrive while supporting coastal livelihoods[1].
The value of MPAs were internationally recognised in 2022 through the Kunming-Montreal Global Biodiversity Framework target to protect 30% of our ocean by 2030 (or achieve '30x30')[2].
Four years on from that landmark biodiversity agreement, just 10% of the entire ocean is officially protected, and of that, only 3.5% is highly protected from destructive fishing activity[3].
To meet the 30×30 target, a rapid scaling of both the number and quality of MPAs is required over the next four years.

Conservation technology has immense potential to accelerate and enhance MPA outcomes, when equitably and sustainably integrated into MPA design and management. In recent years, conservation technology has rapidly advanced, with innovations across both hardware and software expanding the possibilities for the global conservation sector[4]. However, systematic constraints impede the integration of cutting-edge technology within marine conservation efforts. Understanding the barriers restricting the integration of conservation technology into MPA design will be critical to build frameworks and solutions which support cross-sector collaboration and embed conservation technology tools with MPA processes.

This workshop brought together MPA professionals, technology providers, experts and funders to identify how conservation technology can be better integrated into MPA design and management to ensure smart, fair and cost-effective ocean protection.

OBJECTIVES

1. Identify the challenges and constraints facing MPA professionals and technology providers which limit the adoption of technology into MPA design.
2. Pinpoint practical strategies and opportunities to support the increased integration of technology into MPA design.
3. Enhance knowledge-sharing between MPA professionals and technology providers to accelerate collaboration.

To meet the **30×30 target**, a **rapid scaling** of both the **number and quality of MPAs** is required over the next four years.

1 Lester, S.E., Halpern, B.S., Grorud-Colvert, K., Lubchenco, J., Ruttenberg, B.I., Gaines, S.D., Airamé, S. and Warner, R.R., 2009. Biological effects within no-take marine reserves: a global synthesis. *Marine Ecology Progress Series, 384, pp.33-46.*

2 CBD., 2022. Kunming-Montreal Global Biodiversity Framework. Convention on Biological Diversity.

3 Marine Protection Atlas (MPAtlas)., 2026. *The MPA Guide.*

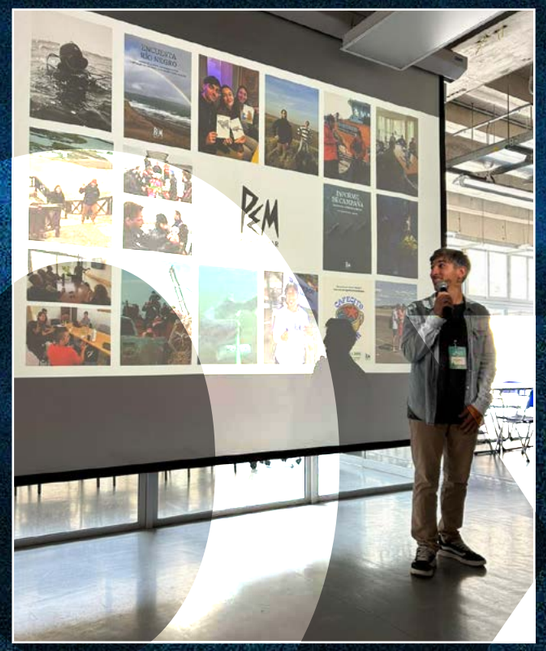
4 Speaker, T., O'Donnell, S., Wittemyer, G., Bruyere, B., Loucks, C., Dancer, A., Carter, M., Fegraus, E., Palmer, J., Warren, E. and Solomon, J., 2022. A global community-sourced assessment of the state of conservation technology. *Conservation Biology,* 36(3), p.e13871.

Overview:

The workshop was organised and coordinated by Blue Marine Foundation, a marine conservation NGO with a mission to ensure the effective protection of 30% of the ocean by 2030, and WILDLABS, the world's leading conservation technology network with a mission to accelerate the adoption and scaling of technologies for conservation impact.

Organised over one full day, the workshop brought together over 45 MPA professionals, comprising NGO and government representatives, working on MPA projects across all phases of area designation – from pre-commitment to implementation and adaptive management. Among the MPA professionals surveyed before the workshop, there was varied knowledge and experience with conservation technology tools, but attendees were eager to expand their understanding and learn more about them (Figure 1). Joining the MPA professionals were over 25 technology providers, experts and funders, bringing expertise across a diverse range of technology tools relevant to MPA design.

Through scene-setting talks, technology and MPA lightening talks and expert panel discussions, attendees had the opportunity to learn from other attendees at the workshop and build an understanding of the experience and expertise of others in the room. This included dedicated time for informal networking and project-specific consultation between MPA and technology communities. Two breakout sessions explored: 1) the challenges and constraints restricting the integration of technology into MPA design; and 2) the opportunities and solutions to support the increased integration of technology into MPA design. During breakout sessions, participants were divided into six groups that were mixed by background and experience, allowing for balanced discussion from both MPA and conservation technology perspectives.



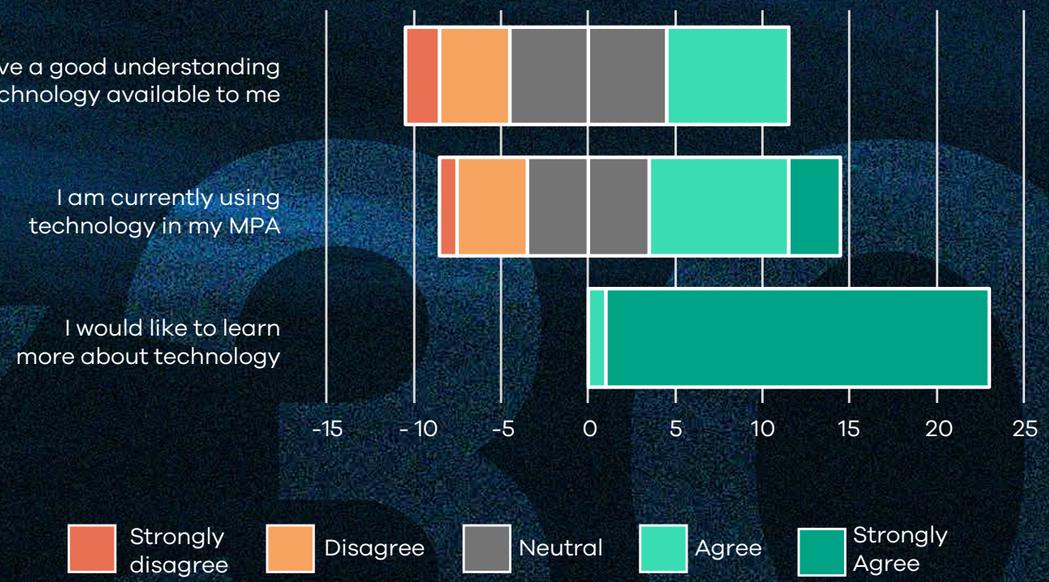


Figure 1. Pre-workshop understanding and openness to conservation technology tools from attending MPA professionals.

Major discussion themes:

Each breakout session used facilitated discussion to highlight the challenges and opportunities around integrating conservation technology within MPA design and management. The following cross-cutting themes and next steps emerged from these breakout group discussions.

THEME 1:

Building connections and alignment across MPA and conservation technology communities

There was a clear disconnect between technology providers and MPA practitioners. MPA professionals often lack awareness of available technologies or guidance on how to select appropriate proven tools for their MPA context and navigate a complex technology market, while technology providers can have limited understanding of real-world MPA contexts and operational needs. This misalignment can lead to a disconnect between solutions and users, with tools often built without sufficient end-user involvement, resulting in poor project fit and low rates of implementation success. This also contributes to limited visibility, discoverability, and long-term accessibility of low-cost and open-source tools, many of which remain fragmented across platforms, poorly documented, and difficult for practitioners to adopt. There is a need for affordable, robust technologies which are designed around real MPA needs and the on-ground perspectives of MPA professionals.

A major opportunity lies in improving how MPA professionals discover, compare, and access conservation technology. This could be supported through a central platform that brings together marine conservation technologies, case studies and training resources, which facilitate informed technology comparison and matchmaking across MPA and technology sectors. Such a platform would need to include transparent information around technology performance, costs, and project applicability, while also securing its own sustained funding to ensure content remains up to date. Stronger communication between the technology and MPA communities and increased use of existing platforms (such as The Inventory, WILDLABS' wiki-style discovery platform for conservation technologies) would further enable greater alignment between MPA and conservation technology communities. The role of NGO intermediaries to translate and contextualise technology for governments and end users, while also providing direct implementation support, was also highlighted as critical to informing technology decision making, particularly in low resource MPA contexts.

Next steps:

- Develop and maintain a central, trusted platform to help MPA professionals to discover, compare, and select conservation technology tools, building on existing tools such as 'The Inventory'.
- Support intermediaries to translate technology options into MPA relevant contexts and provide hands on implementation support.
- Encourage end-user consultation and stakeholder co-design as a standard practice in conservation technology development and pilots within MPA contexts.
- Improve the visibility, interoperability, and long-term support for low-cost and open-source conservation technologies, while establishing partnerships and procurement pathways that enable MPA professionals to access and effectively leverage appropriate tools.

THEME 2:

Creating best practice protocols and developing mechanisms for shared learning

There is no shared resource for replicating successful technology use across MPAs, with practitioners lacking field tested case studies, best practice guidance, and systematic documentation of both successful and unsuccessful technology deployments. Despite the need for shared learning being widely recognised as essential, and some important progress already made in the High Seas context[5], mechanisms to support this remain underdeveloped. There is a clear need to improve the documentation and curation of successful and unsuccessful examples of technology use within MPAs. The creation of a 'blueprint', which combines case studies with practical templates and clear processes for integrating technology into MPA planning and operations, would reduce duplication, manage risk, and support the efficient scaling of successful conservation technology tools. Consolidating globally agreed best practices would also ensure long term, fit for purpose technology adoption and enable technology tools to be deployed for optimal conservation impact.

Limited interoperability and weak knowledge transfer between regions and sectors further hinders coordination on transboundary challenges and enforcement, leading to the duplication of efforts across disciplines and geographies. Strengthening practical exchange, collaboration and knowledge transfer between MPA and technology sectors is a major opportunity. This could include enabling hands on peer exchange between MPA professionals, through the sharing of equipment and the creation of peer-to-peer working groups, communities of practice and structured buddy systems between lower and higher capacity organisations. Regular opportunities for interaction through in-person events, webinars and newsletters could help improve connections between MPA and conservation technology communities to share lessons learned and improve cross-sector communication.

Next steps:

- Develop a globally-recognised best practice blueprint for integrating conservation technology within MPA design and management, which includes real-world case studies of successful and unsuccessful technology deployments.
- Establish and reinforce global communities of practice and peer to peer exchange mechanisms, exploring buddy systems, equipment sharing and regional working groups.
- Schedule and share existing regular knowledge exchange touchpoints through webinars, newsletters, in person and online convenings, and accessible platforms that document and disseminate user experiences.
- Evaluate and adapt resources through ongoing collection and updating of evidence on technology performance, implementation challenges, and conservation outcomes.

5 Cremers, K., Rochette, J., Gordon, Q. and Oliveira Pinto, A. (2026) *Leveraging emerging technologies for monitoring, control and surveillance of high seas marine protected areas: A practical guide.* Paris: IDDRI.

THEME 3:

Ensuring consistent, participatory and effective capacity building to support technology adoption

Limited organisational capacity, including time, staffing, and technical skills, is a major challenge constraining the implementation of conservation technology within MPA design. High staff turnover can further disrupt continuity, especially when compounded by weak documentation and onboarding processes that make it difficult to retain institutional knowledge. As technology tools and MPA teams evolve, training shouldn't be treated as a one-off activity and must be sustained, adapted and embedded into MPA processes over time. Sustained trust-building and feedback loops between technology end-users, providers, and project partners through peer-to-peer learning is critical to successful deployment and long-term technology adoption.

Effective technology uptake is strengthened when local and Indigenous communities are actively involved, but this requires deliberate support, empowerment, and ongoing investment. Training must therefore be tailored to diverse user groups and skill levels and be delivered in accessible formats, including virtual sessions, regional workshops, and practical how to resources. Long-term success also depends on training-of-trainers approaches, which equip local practitioners, NGOs, and community leaders to independently deliver, adapt, and sustain training over time. Language barriers remain a significant challenge, with many tools and materials available only in English or inadequately translated, reducing usability and confidence for communities and end-users. Remote troubleshooting and technical support

can also be challenging due to connectivity constraints, equipment failures, with specialist expertise often limited when reliant on external or overseas providers. Building local capacity for ongoing troubleshooting, maintenance, and training delivery would reduce reliance on external expertise, while also building ownership and agency within MPA networks and communities.

Next steps:

- Shift from one off training to ongoing capacity building and training-of-trainer frameworks, which are embedded within long-term MPA operational plans and budgets.
- Purposefully and intentionally involve local and Indigenous communities in conservation technology training, monitoring and decision-making.
- Develop multi level offline-capable training materials that are tailored to different MPA stakeholders and available in local languages.
- Build local troubleshooting and technical support capacity and reduce reliance on external experts.

THEME 4:

Building holistic funding mechanisms to support adoption and scaling

A major constraint facing the integration of conservation technology into MPA design is fragmented, short-term, and siloed funding that makes long-term MPA project planning and sustained conservation technology operations difficult. While many initiatives have been adequately funded, some existing funding mechanisms do not align with the scale, duration, or costs required for sustained technology deployment, leading to reactive and piecemeal conservation technology use. High upfront costs for technology equipment and the associated deployment costs present major implementation barriers, while ongoing maintenance costs and software licences are rarely covered in traditional grant funding. The true cost of 'free' or low-cost technologies is also unclear for end-users, adding complexity to budgeting and decision-making. Demonstrating return on investment to governments and funders for conservation technology use is a further challenge, alongside ensuring funding accessibility for smaller or remote MPAs which can have limited access to resources.

Addressing these challenges requires funding that supports not only technology upfront costs, but also the ongoing implementation costs associated with capacity building, operational support and user-centred tailoring to specific MPA contexts. This could be facilitated by extending funding timelines to enable flexible, full lifecycle investment in technology adoption rather than short-term cost coverage grants. Furthermore, increasing engagement with the private sector and exploring novel sustainable revenue models, such as nature credit frameworks or tourism partnerships, could be another option to support technology tools over time. The pooling of resources between organisations and sectors on regional scales could also increase localised accessibility to conservation technology tools, while also amplifying funding efficiency and reach. In the long-term, reducing total implementation costs while clearly demonstrating impact will be essential to unlocking continued financing for conservation technology use with MPA design. Future investments should prioritise projects which are scaling and deploying successfully proven conservation technologies, while ensuring that the innovation of new technologies is aligned line with conservation needs and market demands.

Next steps:

- Emphasise funding models that cover full lifecycle costs associated with technology deployment within MPA design, including costs associated with hardware, maintenance, licences, training and staff time.
- Align investment strategies between funders to develop coordinated, multi-institutional financing models that can bridge innovation, adoption, scaling, and long-term operation of conservation technology use within MPA contexts.
- Prioritise the adoption and scaling of successful conservation technology tools while ensuring that any new tools are developed in line with conservation priorities and informed by a clear understanding of market needs.
- Engage the private sector and explore novel revenue models such as tourism partnerships and nature credit frameworks to sustain technology use over time.
- Improve funding efficiency, reach and minimise regional duplication by exploring technical resource-sharing models across geographies and sectors.

THEME 5:

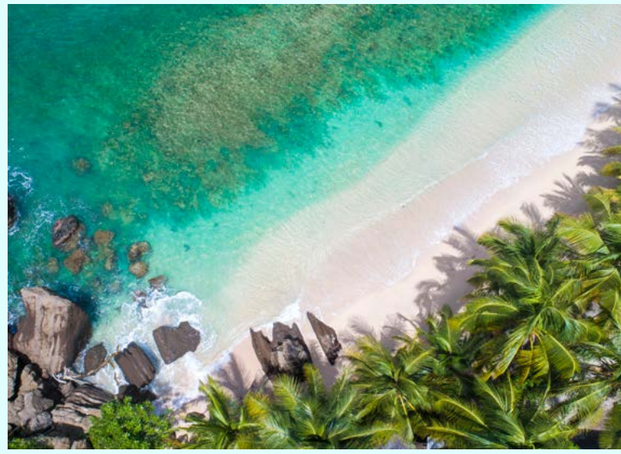
Ensuring data are translated into action for MPA governance

While conservation technology data can provide valuable insights, it's vital that these data can be effectively leveraged within ocean governance frameworks to address MPA needs. Although data underpins MPA decision-making, persistent issues related to ownership, sovereignty, trust, interoperability, and translation for governance limit the value of such data. Data are also dispersed across multiple platforms and can lack global standardisation, meaning they are often difficult to analyse, with low interoperability between technology tools. The absence of standard indicators, real time data, reference libraries (specifically for eDNA), and clear analytical workflows further undermines the use of data for monitoring, evaluation, and policy implementation.

Addressing these challenges requires standardised indicators, interoperability of systems, and shared data standards across geographies. Moreover, clear governance, transparent data practices, and formal ownership agreements are essential to enable responsible data sharing while respecting user rights. Improving interoperability, simplifying data flows, leveraging open-source approaches, where appropriate, and explicitly linking data to policy and management decisions will be critical in turning data gathered through conservation technology use into tangible MPA action. This can be achieved by clearly incorporating conservation technology within MPA governance frameworks and ensuring a policy setting which enables actionable data outputs and effective data-to-action workflows.

Next steps:

- Integrate conservation technology tools within MPA governance frameworks and design data workflows that clearly link outputs to policy, planning, and decision making.
- Support discovery and coordinated adoption of indicators and data standards within MPA monitoring and improve interoperability between tools, platforms, and datasets.
- Define clear data governance protocols when working with conservation technologies, which champion access, sovereignty, trust and traceability.
- Improve accessibility and uptake of open source and low cost data solutions



Other discussion themes:

The themes below were not broadly discussed among breakout groups, but were noted in relation to more localised and specific discussions.

THEME 6:

Building political will to support conservation technology use

A changing political landscape can make it difficult for long term conservation technology adoption. Furthermore, technology scepticism and data concerns can deter the use of technology tools. This can lead to conservation technology use being delayed or sidelined and reinforces the need to proactively build awareness around technology adoption and better embed technology within MPA policy and planning processes.

Next steps:

- Develop clear communication and storytelling showing how technology supports policy goals and enforcement, leveraging pilots and demonstrations to build the trust of implementing agencies.
- Identify and engage political and institutional champions early to sustain support through changing political contexts, understanding and addressing concerns in the process.

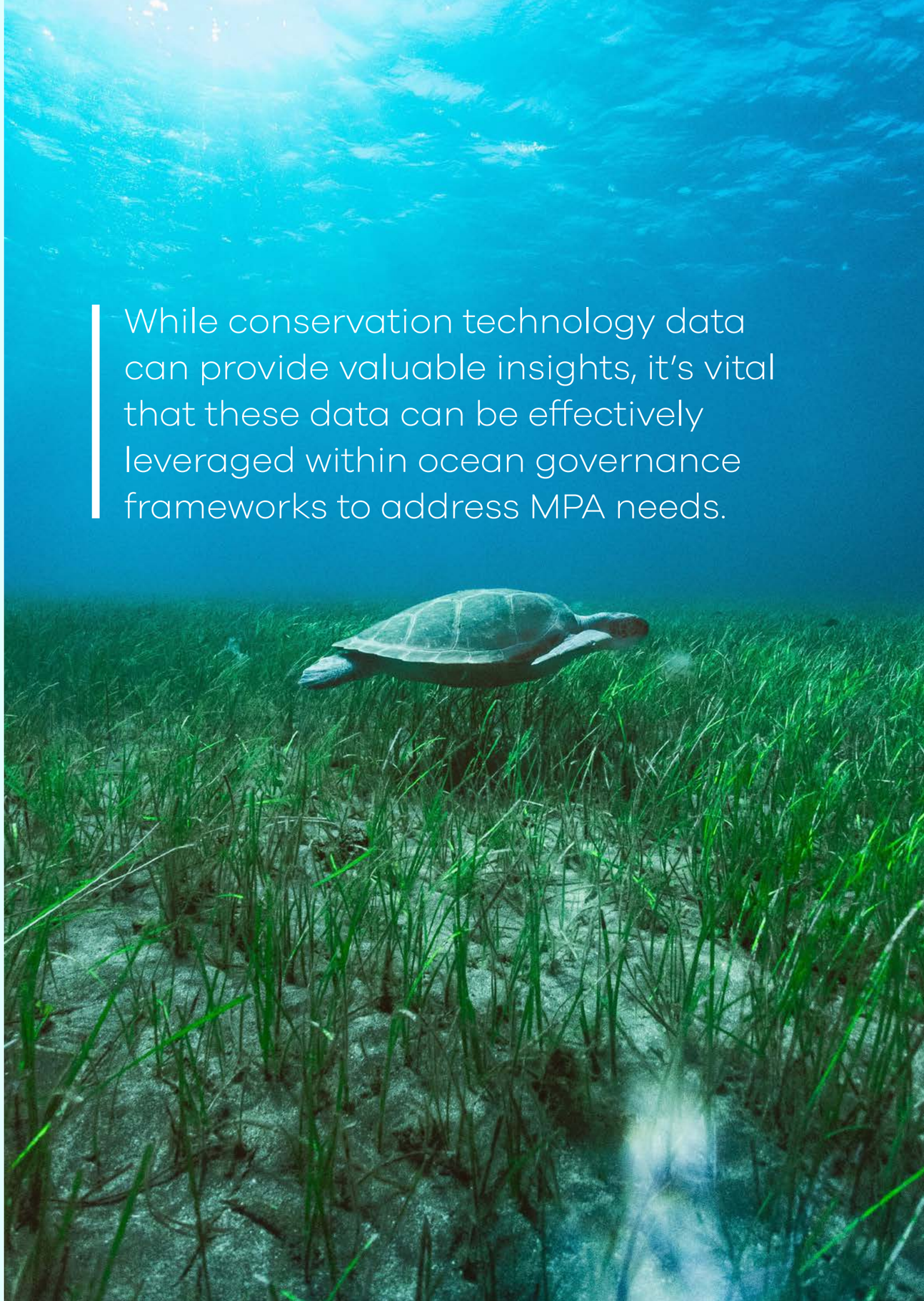
THEME 7:

Hardware vulnerability and losses

Physical technology infrastructure is vulnerable to theft and damage when deployed at sea, with risks increasing costs of technology deployment and discouraging technology use for MPA practitioners. This is especially problematic in remote MPAs where hardware replacement and repair is considerably more challenging compared to coastal areas.

Next steps:

- Budget for redundancy, insurance, and replacement from the outset of technology use.
- Explore community based stewardship models to help protect deployed equipment.
- Prioritise durable, modular, and locally repairable hardware.



While conservation technology data can provide valuable insights, it's vital that these data can be effectively leveraged within ocean governance frameworks to address MPA needs.

Building connection & alignment across sectors

- Develop a central platform for conservation technology discovery and decision making.
- Provide practical support for technology adoption and implementation.
- Encourage end-user and stakeholder led technology design.
- Improve access to affordable and open source conservation technologies.

Sharing best practices and learnings

- Develop a best practice blueprint for conservation technology in MPAs.
- Establish global communities of practice and peer learning networks.
- Facilitate knowledge sharing through events, platforms, and communication channels.
- Ensure continuous learning and improvement through evaluation of tools and use cases.

Ensuring consistent and participatory capacity building

- Ensure long term capacity building and training of trainers.
- Include local and Indigenous communities within training and decision making.
- Create accessible, stakeholder tailored training resources in local languages.
- Build local technical support and troubleshooting capacity.

Creating holistic funding mechanisms

- Emphasise financing that support full technology lifecycle costs.
- Coordinate funding models for technology innovation, adoption, and scaling.
- Prioritise investment in proven technologies while aligning development with conservation priorities.
- Explore private sector partnerships and sustainable revenue models.
- Support resource sharing to improve funding efficiency and reduce duplication.

Turning data into action

- Integrate technology into MPA governance and decision making.
- Standardise data frameworks and improve interoperability across systems.
- Develop data governance which supports access, sovereignty, trust, and traceability.
- Support the adoption of open source and low cost data solutions.

Building political support

- Ensure strategic communication to build trust and support for conservation technology.
- Support political and institutional champion engagement for long term adoption and sustainability.

Hardware vulnerability and losses

- Plan and budget for technology resilience and replacement.
- Explore community stewardship to protect technology investments.
- Prioritise durable, modular, and repairable technology tools.

Final remarks:

Blue Marine and WILDLABS would like to express our sincere gratitude to all attendees for making this workshop such an inspiring and constructive day. Your time, energy and enthusiasm were truly acknowledged and greatly appreciated. By bringing together the MPA and conservation technology communities, this workshop opened a valuable space for dialogue and collaboration between sectors. Feedback from attendees was overwhelmingly positive and we look forward to seeing how the ideas and connections formed during the day continue to develop going forward. The organising team remains on hand to support attendees as conversations progress and you can expect to hear from us as we action some of the next steps identified throughout the day.

If you have any further reflections, insights, or inputs in response to this report, please don't hesitate to get in contact with **Jake Edmiston (jake@bluemarinefoundation.com)** or **Henry Rees (henry.rees@wildlabs.net).**

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Attendee list:

The individuals listed below participated in the workshop and contributed to discussions, group exercises, and knowledge sharing sessions that informed the outcomes summarised within this report.

Table 1. The names and organisational affiliations of workshop attendees. Asterisk (*) indicates workshop facilitators.

Name	Organisational affiliation
Jake Edmiston*	Blue Marine Foundation
Nicki Du Plessis*	Blue Marine Foundation
Sofia Regalado*	Blue Marine Foundation
Henry Rees*	WILDLABS
Talia Speaker*	WILDLABS
Elsa Carla De Grandi*	Fauna & Flora
Chelsea Smith*	Fauna & Flora
Irina Dioguardi*	Fauna & Flora
Max Bello	Blue Marine Foundation
Leslie Hickerson	Nature Foundation Sint Maarten
Frida Lara Lizardi	ORGCAS
Erik Boman	St Eustatius National Parks Foundation
Agustín Loureiro	Mar Azul Uruguayo
Rafael Almeida Magris	Unaffiliated attendee
Patricio Merino Santander	Fundacion Area Marina Protegida Pitipalena Añihue
Philip Hahn	Sint Eustatius National Parks Foundation
Daniel Caceres Bartra	Sustainable Ocean Alliance
Erick Ross Salazar	MigraMar
Kai Wulf	Saba Conservation Foundation
Julio Manuel Chamorro Solis	Mar de Juan Fernández
Sebastián Yancovic Pakarati	Koro Nui o te Vaikava - Rapa Nui
Sebastian Garcia	Por El Mar
Ignacio Cueto	Fundación Patagonia Azul
Sergio Andrés Gonzales De Paz	Sustainable Ocean Alliance
Mariana Cassini	Fundación Rewilding Argentina
Armand Kelly	Aruba Conservation Foundation
Jason Francisca	STINAPA
Stefanie Torres La Torre	Sustainable Ocean Alliance Peru
Stacey Mac Donald	Caribbean Cetacean Society
Enrique Medina Sanchez	Sustainable Ocean Alliance Peru
Ignacio María Gutierrez Galvan	Fundación Rewilding Argentina
Gabriela Vinueza	Osa Conservation
Jonathan Delance	Ministry of Environment Dominican Republic
Thelma Alcantara	Ministry of Environment Dominican Republic
Alison Wiggins	Barbados Marine Spatial Plan (Coastal Zone Management Unit)
Eduardo Barros González	Cape Horn International Centre - OMORA Foundation
Felipe Ladino	Fundacion Malpelo
Ingrid Mabel Ulloa Collantes	SERNANP
Cesar Mauricio Zamora Ramos	SERNANP
Cussui Koyur Segura Cuéllar	SERNANP
Eliana Rosa Peña García	SERNANP
Daniela Valencia Talavera	SERNANP
Catalino Castillo	SERNANP
Lloyd Lee	Oceankind
Mariko Powers	Oceankind
Gregg Casad	WildAid Marine
Rodrigo Oyanedel	MARFUTURA
Aden Ip	eDNA Collaborative
Carolina Pantano	Por El Mar
Javier Naretto	Costa Humboldt
Jimpson Dávila	Peruvian Society for Environmental Law
Juan Riveros	Oceana
Mark Schrope	Schmidt Marine Technology Partners
Jordan Steward	Ai2 (EarthRanger & Skylight)
Virgil Zetterlind	ProtectedSeas
Samantha King	ProtectedSeas, Anthropocene Institute
Matthew Mckown	Conservation Metrics, Inc.
Abram Fleishman	Conservation Metrics, Inc.
Matt Pickett	Oceans Unmanned
Valentina Platzgummer	ChatMPA
Brendan Tougher	ProtectedSeas Marine Monitor (M2)
Vasco Chavez-Molina	Conservation International
Kalindi Fonda	Wildlife.ai & Nature Venture
Jorge Mardones Sanchez	Patagonia Underwater
Ana Lucía Yapur	Environmental Resources Management
Ernesto Bustamante Velarde	Peruvian Society for Environmental Law
Daisuke Nakahara	Maston, Nakahara & Associates
Sarah Maston	Maston, Nakahara & Associates
Audrey Loobey	FIshSounds
Filippo Varini	Unaffiliated attendee

Note: Participant names and affiliations are included with their permission. Any omissions or corrections should be communicated to the report authors.

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