WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

DATA BUOY COOPERATION PANEL

DBCP STRATEGY (2022-2027)

SEVENTEENTH EDITION

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NOTES
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This publication is available in pdf format, at the following link:

https://www.ocean-ops.org/dbcp/doc/DBCP%20Strategy

FOREWORD

The Drifting Buoy Cooperation Panel (DBCP) was established in 1985, jointly by the World Meteorological Organization (WMO) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO, as a means of enhancing cooperation, coordination and information exchange among the operators and users of drifting buoys, specifically meteorological and oceanographic agencies from both the research and operational domains. The aim was to improve both the quantity and quality of drifting buoy data available on the Global Telecommunications System of the WMO, in support of the major programme requirements of the two Organizations. The Panel appointed a full-time Technical Co-ordinator in 1987, using funds provided voluntarily by Panel member countries, and in 1992 its Terms of Reference were widened to reflect its work in co-coordinating all forms of ocean buoy deployments.

Since its establishment, the Panel has achieved great success in achieving its initial objectives. At the same time, this period has also seen remarkable advances in buoy and communications technology, as well as greatly enhanced and expanded user requirements for buoy data, in particular in support of global climate studies, ocean state estimation and weather forecasting.

In recognition of these new developments and expanding requirements, and in the context of the implementation plans and requirements of the Global Ocean Observing System (GOOS) and the Global Climate Observing System (GCOS), the Panel agreed in 2019 on the need for a revised DBCP Strategy, which would provide a framework enabling members to respond appropriately to future developments. The DBCP Executive Board prepared a draft of the DBCP Strategy 2022-2027 and it was reviewed, revised and approved by the Panel during the 2020 intersessional period. The strategy document is also made available through the DBCP website at:

https://www.ocean-ops.org/dbcp/doc/DBCP%20Strategy

PREFACE TO SEVENTEENTH EDITION, November

It is intended that the DBCP Strategy is a document that reflects the evolution of the DBCP's aims and aspirations within the changing environment of oceanography and marine meteorology. This edition particularly takes note of the eighteenth World Meteorological Congress decisions that are relevant to the Panel’s activities, including the WMO constituent body reform, WMO unified data policy and the WMO Global Basic Observing System (GBON).

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RECORD OF CHANGES

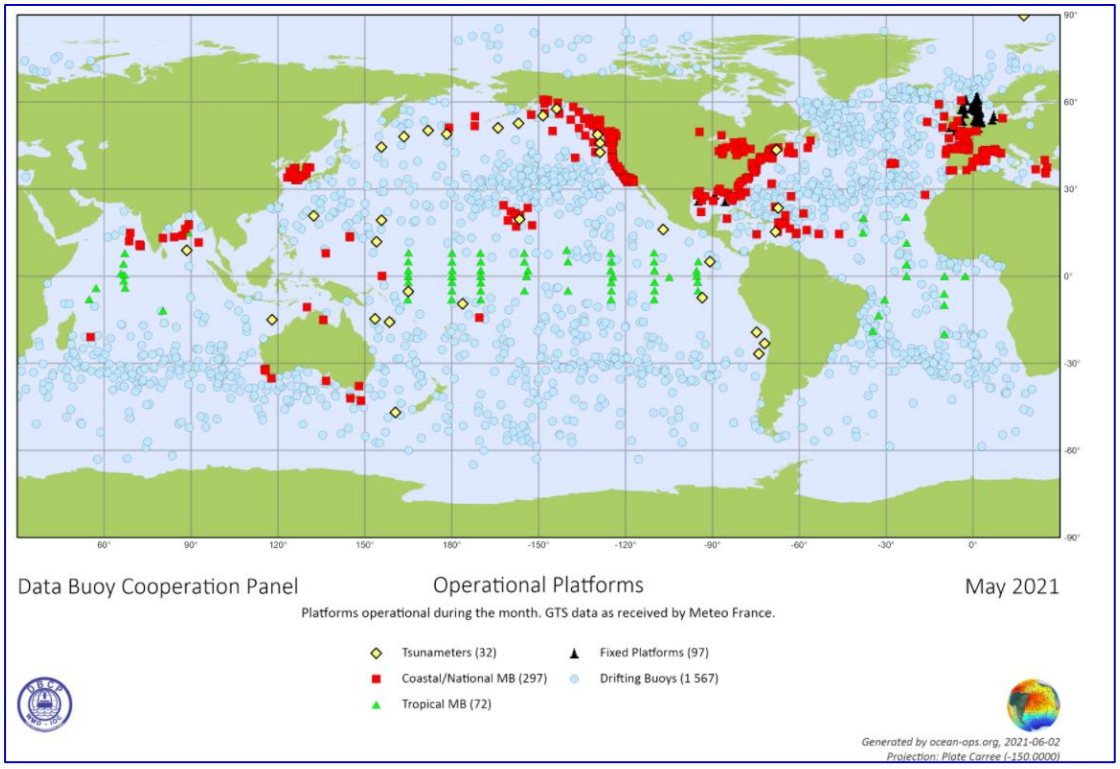
Version No	Date	Change
A	Oct. 1997	First draft
1.0	Oct. 1998	First release
2.0	Oct. 2000	Revised and updated to take account of JCOMM and developments in satellite communications
2.1	Oct. 2001	New references, graphics and textual changes
3.0	Oct. 2002	New section 3.4, updated Annexes E and F
4.0	Oct. 2003	Add paragraph 8.13, update Annex F
5.0	Oct. 2004	Updated paragraphs 2.1, 3.5, 3.8, 4.1, 4.2 and 7
6.0	Oct. 2005	Updated Intro, paragraphs 3.5, 3.8, 6.1, 6.2, 8.13
7.0	Oct. 2007	Substantial changes to include new initiatives for the Panel such as pilot projects, task teams, user workshops, training courses and other outreach activities
8.0	Oct. 2008	Consideration of WMO and IOC strategic planning; updated paragraphs 4.1, 4.2 and contact details
9.0	Oct. 2010	Consideration of the outcome of OceanOBS'09 and JCOMM-III, as well as the requirements of the developing GFCS, and new GCOS-IP 2010 update
10.0	Oct. 2011	Consideration of outcome of WMO 16th Congress and IOC 26th Assembly
11.0	Oct. 2012	Consideration of the outcome of JCOMM-IV
12.0	Oct. 2013	Consideration of the WIGOS Framework Implementation Plan and outcome of DBCP-29
13.0	Oct. 2014	Consideration of recent WIGOS developments and outcome of DBCP-30
14.0	Oct. 2015	Consideration of decisions of the seventeenth World Meteorological Congress
15.0	Oct. 2016	General updating throughout document
16.0	Oct. 2018	General updating throughout document
17.0	Nov. 2021	Major update to reflect changes in user requirements, emerging needs and governance reforms, etc.

THE DBCP STRATEGY 2022-2027

VALUE STATEMENT

The Data Buoy Cooperation Panel (DBCP) is an international expert panel that facilitates global coordination of the deployment and operation of data buoys, in all oceans and their coastal seas (Fig. 1). The data from these platforms measure critical climate and weather variables and in doing so, underpin operational services that protect us from extreme weather events, help us to understand and adapt to the changing climate and deliver science for improved knowledge of the oceans and their role and impact on the Earth system. All of this helps support resilience and sustainability in economies around the world while at the same time contributing to global efforts to address the grand challenges facing our oceans and our planet.

Figure 1. The global coverage of buoys coordinated through the DBCP



The DBCP focuses on observations at the air-sea interface and the upper ocean (from the surface to 15-20m depth) using both Lagrangian drifting and fixed moored buoys. This focus has been achieved through a collaboration built upon scientific expertise, trust and a strong global partnership of operational meteorological and oceanographic agencies, scientific institutions, engineers

and manufacturers.

The DBCP has a proud and successful history spanning four decades, including its strong track record in capacity development and in being the first Global Ocean Observing System (GOOS) network to meet its design target (Fig. 2)

Figure 2. Meeting the GOOS network design target - the launch of the Global Drifter Program's 1250th drifter on 18 September 2005, deployed in the ocean off Halifax, Nova Scotia, Canada.

The DBCP will continue to play a leading role - in close partnership with the scientific and operational global ocean observing community[1] and its user communities - in helping to realize key elements of the World Meteorological Organization (WMO) 2040 vision for the global observing system, the Intergovernmental Oceanographic Commission (IOC) of UNESCO (United Nations Educational, Scientific and Cultural Organization)-led UN Decade of Ocean Science for Sustainable Development, the GOOS 2030 Strategy and much more.

WHAT THE DBCP DOES

Since 1985, as a joint body of the WMO and the IOC, the DBCP has played a fundamental role in coordinating several national programs that form the drifting buoy and moored buoy components of the GOOS, World Weather Watch, the World Climate Research Programme, the Global Climate Observing System

[1] The satellite ocean observing community and the Ocean Coordination Group (OCG) networks which include the Argo programme, OceanSITES, the Ship Observations Team (including the Voluntary Observing Ships scheme (VOS), the XBT Ship of Opportunity Programme (SOOP) and the Automated Shipboard Aerological Programme (ASAP)), the Global Sea Level Observing System (GLOSS), the Animal-based Observing System (AniBOS), OceanGliders, the Global Ocean Ship-based Hydrographic Investigations Program (GO-SHIP) and the capabilities provided through OceanOPS.

and the WMO Integrated Global Observing System.

Because of global collaboration through the DBCP, the quantity, quality and timeliness of atmospheric and oceanographic data in all ocean areas is increased and ultimately improves global and regional forecasts of weather and ocean conditions and contributes to climate studies and oceanographic research.

The aims of the DBCP are to:

1. Identify, understand, review, analyse and standardize user requirements for buoy data (e.g. from drifters, met-ocean buoys, wave buoys and tsunameters)
2. Facilitate collaboration that leads to coordination of deployment programmes to meet network and user requirements
3. Support information exchange
4. Encourage technology development
5. Improve the quantity and quality of buoy data distributed on the WMO Information System (WIS) which includes the Global Telecommunication System (GTS)
6. Initiate and support working groups targeting areas of focus
7. Liaise with relevant international/national bodies, science teams and programmes in ocean observing and data applications.

USER-CENTRED OBSERVATIONS COORDINATED THROUGH THE DBCP

The DBCP facilitates and helps harmonize the deployment of a number of different types of buoys from many national programmes from countries that participate in WMO activities: drifting buoys globally, the Tropical Moored Buoy Array (TMBA) in the Pacific, Atlantic and Indian Oceans, tsunami buoys and many of the national moored buoy networks that are operated along coastlines (Fig 1).

The different buoy networks have a range of capabilities and deliver a variety of observed variables which in turn serve a wide range of operational users and science applications, as illustrated in the tables below.

Table 1. Observations capabilities from DBCP coordinated platforms now and over the next 10 years

Measured variables	Drifting Buoys	TMBA	Tsunami buoys	National/ coastal moored buoy arrays
Air pressure	52%	21%	<1%	61%
Air Temperature and/or humidity	<1%	92%		64%
Wind speed and/or direction	<1%	88%		69%
Waves	<2%			89%
Sea surface temperature	92%	All		All
Near surface salinity	16%	80%		3%
Near-surface current	~60%			
Sea level			All	
Sub-surface temperature	0.2%	97%		6%
Sub-surface salinity		80%		
Sub-surface current		20%		6%
Bottom temperature			<1%	
Bottom salinity				
Near-surface biogeochemical ocean variables		<10%		
Bottom biogeochemical ocean variables		<10%		

Key: Numbers represent percentage of each platform measuring a particular variable as of October 2020. Green – proven capability; Amber – emerging capability expected to develop and roll out over the next five years; Blue – potential capability on 5 to 10 year horizon.

Table 2. Users and applications of observations from current DBCP platforms

Use/application	Drifting buoys	TMBA	Tsunami buoys	National/ coastal moored buoy arrays
Global NWP				
Regional NWP				
Nowcasting, very short-range forecasting				
Seasonal to climate prediction				
Satellite calibration/ validation		For SST		For waves & SST
Climate monitoring				For regional marine climate
Climate & ocean science				
Global ocean models				
Regional/coastal ocean models				
Tsunami warning				

Key: Green – important/critical for use/application; Amber – used in application but of secondary importance.

OUR VISION AND MISSION

Vision

A flagship surface ocean observing panel of global standing recognized for its significant contributions from drifting and fixed moored buoys to ocean and climate science, weather, ocean and earth system prediction, sustainable development, safety, well-being and prosperity.

Mission

To facilitate the collection of essential and trusted observations from data buoys at the air-sea interface and the upper ocean as part of an integrated, resilient and sustainable global observing system that serves the current and emerging needs of society - all day, every day.

DRIVERS OF OUR STRATEGY

The global ocean is a vital planetary 'organ' of the Earth system, critical to sustaining life on our planet. It provides us with more than half the oxygen we breathe, absorbs 20-30% of our global carbon emissions, and impacts the lives and livelihoods of billions of people. One has only to consider that the intensity and duration of almost every severe weather event - tropical cyclones, droughts, bushfires and floods - has its origins either in or over the ocean. Keeping our eyes focused on the ocean is therefore of paramount importance.

In addition, the global ocean is central to tackling the grand challenges facing our society, including food and energy security for a growing population, climate variability and change, pollution, health risks, biodiversity conservation, access to resources and disaster risk reduction, including safety of life at sea and in coastal regions. Understanding the need for ocean observations in meeting these challenges is critical to allowing the DBCP to respond with impact and value.

At present the ocean and its coastal seas are experiencing ever-growing levels of distress, caused by a range of factors including plastics, overfishing, invasive species, harmful algal blooms, marine heatwaves, de-oxygenation, ocean acidification and eutrophication from land-river run-off. Awareness of these environmental issues is at an all-time high and societal concern demands our attention.

Understanding the ocean's behaviors and function therefore continues to be essential to improving prediction, policy and decision-making in social, economic and environmental domains across the world. In particular, such understanding is underpinned by advances through science, innovation, and technology in government, academic and commercial sectors, advances which

will transform the DBCP's ability to make a difference over the coming years.

Knowledge of the ocean environment, cultivated by indigenous communities around the world, is rightly being recognized as an integral part of our growing understanding of the ocean. Inclusive and diverse partnerships with these important communities, and many others, will be vital for the DBCP going forward.

In response to all of this, significant international initiatives are underway that provide a once-in-a-generation opportunity for the global community to commit to a sustainable future for our oceans and planet. Chief among them are the UN Sustainable Development Goals, the Paris Agreement, the Sendai Framework for Disaster Risk Reduction and the UN Decade of Ocean Science for Sustainable Development.

For these reasons, the WMO and the IOC are calling upon the global ocean observing community to step up and provide the coordination and leadership required to ensure that these commitments to a sustainable future are met.

The DBCP hears this call with a strategy that charts a course of impact and value over the next five years and beyond, in partnership with, and as an integral part of, the evolving global ocean observing community.

OUR FOCUS

Our strategy is founded on six pillars of success, each of which will be realized by strategic objectives and targeted actions:

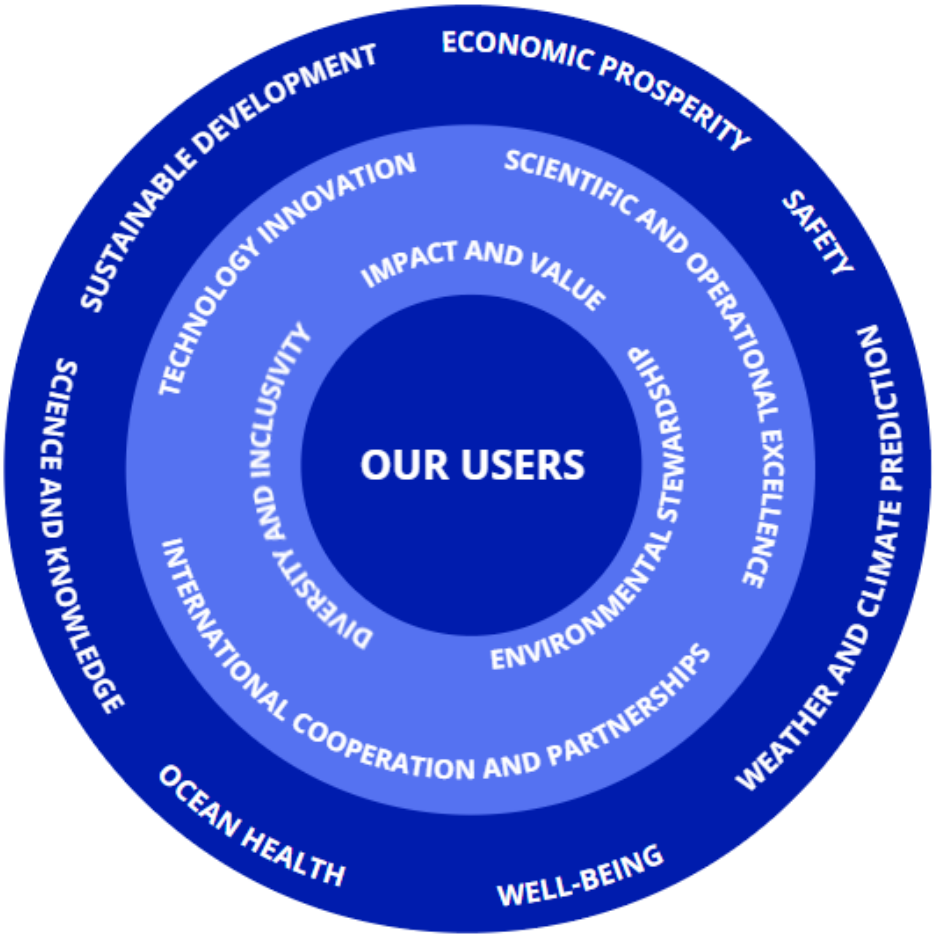
Pillar 1. Impact and value

Strategic Objective: Engage in activities for advancing ocean science and understanding that have measurable and profound benefits for our existing and growing global, regional and local partners and users.

Actions
We will:

1.1 Focus on understanding our users' needs along the value chain and deepen our relationships with them.

1.2 Promote evaluations, such as observations impact studies, which seek to maximize user benefits through optimizing observing system design, in collaboration with other sustained global ocean observing networks and the satellite and modelling communities.



1.3 Promote the use of data from ocean buoys among DBCP members, partners and other users for scientific research into air-sea interaction, ocean circulation, extreme events, and climate, ocean, weather and earth system prediction.

1.4 Contribute to and provide leadership in both scientific understanding and technology development that deliver new knowledge and applications to address greatest user needs.

1.5 Identify priority users and ensure they are represented in the Panel.

1.6 Derive and report on metrics and key performance indicators based on user impact and value, in partnership with other global ocean observing networks and through WMO and GOOS processes.

1.7 Drive a culture of continuous improvement to grow and sustain time series of essential ocean and climate variables (including biogeochemistry) that underpin responses to societal grand hallenges.

1.8 Follow and promote international data-sharing practices consistent with WMO and IOC data principles[2] to make our data freely available to maximize impact and value for our users.

Pillar 2. Scientific and operational excellence

Strategic Objective: Develop outstanding people, science, systems and streamlined processes that together efficiently deliver fit for purpose ocean observations to our users.

Actions

We will:

2.1 Promote in our members and our partners the development and adoption of the skills and science-based knowledge needed to sustain and grow our network to meet user needs.

2.2 Standardize our processes in coordination with other global ocean observing networks to enhance clarity, transparency and efficiency in the use of data, metadata, operational methods and science-based approaches.

2.3 Adopt, define, and promote best practice in the lifecycle of our data from measurement - through its use and reuse - to archiving.

2.4 Actively pursue the highest levels of safety in everything that we do.

Pillar 3. Technology innovation

Strategic Objective: Provide leadership to enhance impact, reliability and value by fostering and building lasting partnerships with other ocean observing communities, scientists, engineers and industry that are working to create new measurement capabilities and practices in data buoy observations.

Actions

We will:

3.1 Encourage research and development activities which are prioritized to meet defined user needs.

3.2 Establish and maintain a DBCP expert group for continuously scanning the external environment to identify, assess and benefit from emerging technologies.

[2] including the FAIR (Findable, Accessible, Interoperable and Reusable) principles

3.3 Establish partnerships that help us to hasten and enhance delivery to our users.

3.4 Extend the breadth of our measurement capability, such as for biogeochemical and biological variables, where the opportunities exist and the user demand is high.

Pillar 4. Environmental stewardship

Strategic Objective: Promote technologies and practices that reduce the environmental impact of our operations.

Actions

We will:

4.1 Establish a task team focusing on environmental impacts to develop, review and promote principles and best practices that minimize our impact on the environment.

4.2 Work with our ocean observing network partners to baseline and continuously review our environmental impact.

4.3 Report on the plans, actions and progress to reduce our environmental impact.

Pillar 5. International cooperation and partnerships

Strategic Objective: Work collaboratively with our users and ocean observing partners to promote, coordinate and deliver valued, resilient, long-term sustainable ocean observations through education, capacity development and outreach programmes.

Actions

We will:

5.1 Foster collaboration and leverage partnerships where they meet greatest user needs.

5.2 Build on our leadership and experience in capacity development to assist countries in regions of greatest need.

5.3 Grow membership of our panel by developing outreach materials and channels for communication and engagement.

5.4 Establish fit for purpose mechanisms to exchange knowledge and to monitor our progress against relevant international agendas.

Pillar 6. Diversity and inclusivity

Foster an environment which respects and encourages diverse points of view, relishes creativity, and welcomes membership from all parts of the world.

Actions

We will:

6.1 Diversify our representation across gender, age, culture and geography through targeted actions.

6.2 Ensure that the make-up of both our Executive Board and leadership of working groups reflects the diversity of our community.

6.3 Cultivate productive relationships with indigenous communities to benefit from shared knowledge and experiences of the ocean environment.

IMPLEMENTING OUR STRATEGY (P = Plan, D = Deliver, CI = Continuous Improvement)

Success Pillar	ID	Action	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027
Impact and Value	1.1	Understand users	P	D	CI	CI	CI
	1.2	Network evaluations	P	P	D	D	CI
	1.3	Promote data use	P	P/D	D	CI	CI
	1.4	Scientific leadership	P	D	D	CI	CI
	1.5	Identify priority users	P	D	CI	CI	CI
	1.6	Metrics and KPIs	P	P/D	D	CI	CI
	1.7	Grow and sustain time series	P	P	D	CI	CI
	1.8	Data sharing practices	P	D	CI	CI	CI
Scientific and Operational Excellence	2.1	Skills and knowledge	P	D	CI	CI	CI
	2.2	Standardize processes	CI	CI	CI	CI	CI
	2.3	Best practices and data life-cycle	P	P	D	CI	CI
	2.4	Actively pursue safety	P	D	D	CI	CI
Technology Innovation	3.1	User prioritized R&D	P	P	D	CI	CI
	3.2	Scan external environment	P	D	CI	CI	CI
	3.3	Establish partnerships	P	P	D	CI	CI
	3.4	Extend measurement types	P	P	P	D	D
Environmental Stewardship	4.1	Establish task team and principles	P	D	CI	CI	CI
	4.2	Baseline our impact	P	D	CI	CI	CI
	4.3	Report on progress	P	D	CI	CI	CI
International Cooperation and Partnerships	5.1	Foster collaboration	P	P/D	D	CI	CI
	5.2	Capacity development	D	CI	CI	CI	CI
	5.3	Grow membership	P	P	D	CI	CI
	5.4	Knowledge exchange mechanisms	P	P	CI	CI	CI
Diversity and Inclusivity	6.1	Diversify our representation	P	D	CI	CI	CI
	6.2	Diversify leadership appointments	P/D	D	CI	CI	CI
	6.3	Cultivate relationships with indigenous communities	P	P	D	CI	CI

MEASURING OUR SUCCESS

Impact and Value

- The number and impact of scientific publications underpinned by DBCP data and projects.
- The number and types of users engaged in our Panel, working groups and decision-making, including co-design of the evolving DBCP network
- Levels of trust and satisfaction from our users and partners
- The level of uptake from our users
- The extent to which our users take advice from the DBCP in their tactical and strategic decisions.
- The impact of buoy data on products, such as ocean and weather forecasts.

Scientific and Operational Excellence

- Meeting and surpassing user requirements
- Benchmarking against peer-reviewed international/best practice standards
- The speed of delivery from concept to user acceptance to operations

Technology Innovation

- Adoption and/or assessments of emerging technologies
- Number of partnerships that have delivered innovative technology solutions.

Environmental Stewardship

- Baseline and rolling reviews of environmental impact of DBCP operations.
- Improvements to environmental footprint recognized beyond DBCP.

International Cooperation and Partnerships

- Number of capacity development workshops (and participants), together with measures of their in-country impact

- Growth in Panel membership to build sustained resilience in ocean observing.
- The number and positive impactful outcomes of collaborative activities.

Diversity and Inclusivity

- A diverse and inclusive panel, benchmarked against the community.
- Establishment and growth of relationships with indigenous and youth communities.