16th Observation Coordination Group (OCG-16)

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Data Buoy Cooperation Panel (DBCP)

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1. The key network successes

The DBCP made substantial progress in metadata management and data accessibility. The **implementation of a new shared metadata file by Météo-France** enhanced the easiness to go Machine-to-machine metadata exchange, reduce errors, and enhance standardization of buoy metadata. The success of **pilot activity for OSCAR/Surface metadata** and a notably **76% of operational drifters successfully submitted by OceanOPS to OSCAR** (as per October 2024), demonstrating a strong commitment to improving data completeness and traceability.

The implementation of the **WIS2.0 pilot for drifting buoys, hosted by LDL** marks an important step in moving buoy data dissemination from the GTS into the evolving WMO Information System (WIS2.0). Additionally, the **Global Data Assembly Center (GDAC) for moored buoys was successfully established within Coriolis and Copernicus**, providing a centralized hub to access moored buoy data.

Under the new Task Team on Data, Value and Impact of Buoys, members ensure that observational data remains relevant and accessible. The task team developed a **strategy to identify and categorize buoy data users**, improving engagement with operational agencies, climate researchers, and marine industries.

In alignment with its environmental stewardship goals, the Panel made significant progress in developing w**ooden buoys and bio-composite materials**, contributing to more sustainable ocean observing systems.

In 2024, the DBCP successfully organized a **capacity development training and scientific workshop** in Indonesia. Organized in collaboration with the Indonesian Meteorological, Climatological, and Geophysical Agency (BMKG), it focused on advancing ocean observations for weather forecasting and climate prediction in the western Pacific and Indian Ocean regions. The event gathered 39 onsite participants and approximately 200 online participants from 27 countries, which recorded the highest participation in a DBCP capacity development workshop to date. A post-workshop evaluation indicated high participant satisfaction, with attendees praising the

relevance and usefulness of the content, the quality of presentations, and the valuable opportunity to engage with international colleagues.

2. How has the network advanced across the OCG Network Attribute areas[1]

The following table shows how the DBCP is advancing across the OCG Network Attributes areas.

OCG Attributes	**DBCP advancement**
Global in scale	The DBCP prioritizes the **expansion of the global data buoy observing network**. Ongoing efforts to increase buoy density in sparse regions and promoting broader coverage of barometric pressure sensors.
Sustained observation	The DBCP prioritizes the longevity of data buoys, with routine quality control of buoy sensors with documented metadata and distributed data archives to ensure long-term reliability and availability of these high-quality observations.
Community of practice	The DBCP operates under a community-driven governance framework, bringing together experts and stakeholders to develop a multi-year strategy, implementation plans, and targets. This collaborative approach ensures that the DBCP remains aligned with its mission to provide reliable and effective services to the ocean observation community.
Delivers data that are free, open, and available in a timely manner	The DBCP continues to ensure that **buoy data is freely available** in near real-time through GTS and WIS2.0 as well as through online resources such as ERDDAP and also **accessible from DACs and GDACs**.
Observes one or more EOV or ECV	Continuing efforts to increase the integration of additional pressure and wave sensors into both

[1] https://oceanexpert.org/downloadFile/45372

	moored and drifting buoys, **enhancing the availability of Essential Climate Variables** for improved climate monitoring and forecasting.
Maintains network missions and targets	The DBCP continues to implement its strategic planning, optimize buoy deployments, ensure data quality, and foster international collaboration to support global ocean observations and maintain the global array.
Develops, updates, and follows Standards and Best Practices	DBCP develops, updates, and adheres to internationally recognized Standards and Best Practices to ensure consistency, reliability, and interoperability in ocean observations, enhancing data quality and usability for scientific research, operational forecasting, and climate monitoring. Standards followed by the community are documented in the Guide to Instruments and Methods of Observation (WMO-No. 8).

3. Future Plans[2] and Opportunities

In the network expansion, DBCP plan to increasing the tropical moored buoy array, particularly by adding pressure sensors, to **fully populate the Atlantic Tropical Array with Sea Level Pressure (SLP) measurements by the end of 2025**, contributing to better climate monitoring and operational forecasting. **The PIRATA moorings will also be upgraded,** with support from Météo-France, IRD, and PMEL, to enhance data collection and further support oceanographic research in the tropical Atlantic. There is also a strong commitment to **advancing new RAMA deployments**, which will contribute to better monitoring of the Indian Ocean's tropical and equatorial regions. And **in the Mediterranean, Météo-France** plans to **increase its network of moored buoys from 2 to 9**, expanding its coverage and improving the monitoring capabilities of this important marine region. Further, the DBCP will continue its efforts to **synchronize data to the GDACs and metadata into the OceanOps database**, ensuring greater consistency and accessibility of buoy data worldwide.

[2] Future plans on implementation, instrumentation, data management, test, new sensors, plan for new EOV/ECV observations, capacity development, etc.

On going operational testing of biodegradable and wooden buoys will also remain a priority, ensuring that this environmentally conscious technology can be reliably integrated into operational systems.

As the DBCP continues to enhance its global network, several exciting initiatives are underway to improve ocean observations and data accessibility. One of the major developments is the **further expansion of the WIS 2.0 nodes for ocean data**, which will enable more seamless integration of buoy data into the WMO Information System (WIS) and improve the global data distribution.

DBCP continues effort to the **integration of buoy data into WIGOS tools, including the WDQMS and synchronization of platform metadata into OSCAR/Surface**. These initiatives will help manage the quality and reliability of global ocean observations of buoy data and metadata, which in the long-term streamlining data access. Alongside this, a **pilot project to improve metadata** will be launched, advancing the quality and consistency of metadata reporting from drifting and moored buoys.

With capacity development remains a cornerstone of the DBCP's mission, the upcoming **DBCP Capacity Development Workshop in 2025** is stressing on hands-on training, focusing to support the operational service of ocean observation in the Indian Ocean. The DBCP task team on wave measurements is also preparing for a **Wave Measurement Workshop**, where experts will come together to discuss the latest advancements in ocean wave measurement technologies and methodologies.

Finally, the outcomes of the 40th session will shape the future direction of the DBCP, including the decision to hold **offline annual meetings every other year**, with online session in between, keeping strong collaboration across the global buoy community. After a brief pause, the **DBCP newsletter**[3] publication has resumed by issuing the first publication in March 2025. Additionally, efforts will be made to **refresh the DBCP website** to enhance its usability and accessibility.

4. Challenges and Concerns

Several ongoing challenges need to be addressed to ensure the continued effectiveness of the global buoy network. **Vandalism** remains a significant concern, as it not only damages valuable buoy equipment but also disrupts the collection of critical ocean data.

[3] DBCP Newsletter Vol 1 No 1 March 2025

One of the key challenges facing the Data Buoy Cooperation Panel (DBCP) is the significant **lack of observational coverage in the Southern Ocean**, particularly south of 60°S. This region remains critically under-observed due to its remoteness, harsh environmental conditions, and logistical difficulties in deploying and maintaining buoys. The scarcity of buoy data in this area limits our understanding of critical ocean-atmosphere interactions, which are vital for improving climate models and weather forecasting. Addressing this observational gap is essential to enhance global ocean monitoring and ensure comprehensive data collection in one of the most dynamically important regions of the world's oceans.

Another pressing challenge is the **limited availability of ship time** for deploying and maintaining buoy networks. Ships are essential for accessing remote oceanic regions, but their availability is often constrained by high costs, competing scientific priorities, and logistical complexities.

5. Asks from OCG (Exec, networks, OceanOPS, and/or GOOS) and any priority topics that should be addressed at OCG-16

With the increasing opportunity to interact with OCG, no pending question from the DBCP at the time being.

6. Recent publications, articles, etc.
   Please refer to the annex.

Annex

List of recent publication (2024-2025)

Please note that this is not an exhaustive list. It includes only the publications reported by DBCP members who responded to our request for information regarding any publications they have authored or are aware of that are related to DBCP activities. We acknowledge that there are many more publications beyond those listed here.

1. Bessonova, Victoria, et al. "Global evaluation of wave data reanalysis: Comparison of the ERA5 dataset to buoy observations." Applied Ocean Research 157 (2025): 104490. https://www.sciencedirect.com/science/article/pii/S0141118725000781, DOI: https://doi.org/10.1016/j.apor.2025.104490.
2. Foltz, G. R., Eddebbar, Y. A., Sprintall, J., Capotondi, A., Cravatte, S., Brandt, P., ... & Yu, W. (2025). Toward an integrated pantropical ocean observing system. Frontiers in Marine Science, 12, 1539183, https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2025.1539183/full, DOI: https://doi.org/10.3389/fmars.2025.1539183.
3. Lunev E., Tolstosheev A., Bezgin A., Smolyanitsky V. Sea surface salinity drifting buoys based on SVT technology. // WMO Technical Conference on Meteorological and Environmental Instruments and Methods of Observation (TECO-2024), 23-26 September 2024, Vienna (Austria). IOM Report No. 144: https://library.wmo.int/idurl/4/69184
4. Newton, Jan & Wisdom, Sheyna & Iwamoto, Melissa & Carini, Roxanne & Watson, Jordan & Boulay, Sebastien & Mactavish, Duncan & Hagen, Jennifer & Schumacker, Joe & Rudolph, Dua & DeBrum-Kattil, Dolores & Tuaua, Pua & Brown, Eric & Burch, Scott & Jr, John & Evans, Jenny. (2024). Backyard Buoys: Meeting Needs of Coastal, Indigenous Communities Through Co-Design and Co-Production. Journal of Oceanography. 10.5670/oceanog.2025.105.
5. Patterson, R. G., Beja, J., Cronin, M. F., Edholm, J., McKenna, J., Palter, J. B., ... & Zhang, D. (2025). Uncrewed Surface Vehicles in the Global Ocean Observing System: A New Frontier for observing and monitoring at the air-sea interface. Frontiers in Marine Science, 12, 1523585. https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2025.1523585/full, DOI: https://doi.org/10.3389/fmars.2025.1523585.
6. Smolyanitsky V., Lunev E., Bezgin A. Advancing methods for monitoring thermal balance of sea ice during the North Pole - 41 expedition 2022/2024 based on Lagrangian profiling buoys. // WMO Technical Conference on Meteorological and Environmental Instruments and Methods of Observation (TECO-2024), 23-26 September 2024, Vienna (Austria). IOM Report No. 144: https://library.wmo.int/idurl/4/69184

7. Turton, J. D. (2024). The Met Office moored buoy network – sentinels for severe weather and extreme events. Journal of Operational Oceanography, 17(3), 207–216. https://doi.org/10.1080/1755876X.2024.2418487