



European
Commission

THE 'STATE OF MARINE BIODIVERSITY MONITORING' WORKSHOP SYNTHESIS

'The State of Marine Biodiversity Monitoring in Europe' workshop took place online from June 4 to June 6, 2024, as part of the marine biodiversity monitoring harmonisation study¹, launched by the European Commission, co-implemented by the study team and the European Commission's Joint Research Centre (JRC), and managed by the European Climate, Infrastructure and Environment Executive Agency (CINEA). This collaborative study between the study team, the JRC, and relevant stakeholders, aims to analyse the state of marine biodiversity monitoring and to recommend ways forward towards a better future set-up, acknowledging existing initiatives and stakeholder needs. The study, concluding in December 2024, is part of a wider activity led by the European Commission to improve marine biodiversity monitoring across European marine waters.

The workshop enabled a large-scale review and consolidation of the preliminary study findings focusing on the identified challenges and gaps in marine biodiversity monitoring methodologies and current data pathways.

The workshop had around 160 participants registered from **21 EU countries and 5 non-EU countries** (Tunisia, UK, Iceland, Norway, Australia), with a diverse expertise in species, monitoring methods, and data pathways and structures established to collect and share marine biodiversity monitoring data and information.

The main findings of the workshop that emerged from the discussions and participants interventions are summarised below.

DATA COLLECTION

The five key challenges on data collection identified during the workshop are:

- ❖ **Unclear monitoring efforts:** Uncertainty regarding what is being monitored, when and where. This point was highlighted in several presentations and discussed in some national contexts due to fragmented or absent observation data.
- ❖ **Complexity of species and environments:** Diverse methods and expertise are necessary for monitoring different species and environments, each with their inherent limitations and field uncertainties. This issue was discussed in various discussions on species groups and invited presentations, emphasising the need for more coordination and technological development, while also pointing to a lack of taxonomic expertise.
- ❖ **Lack of standardised protocols:** Inconsistent application of methods across time, regions, and species. Differences in (or lack of) methodological standards, assessment methodologies, and threshold values at the national level were emphasised.
- ❖ **Misunderstood policy needs:** Several presentations highlighted a general lack of understanding of policy requirements (e.g., indicators and threshold values defining the good state of species populations). Additionally, there is a clear need for optimising marine biodiversity programmes and addressing the diverse reporting deadlines and periods.
- ❖ **Insufficient long-term funding:** A recurring theme throughout the workshop was the lack of sustained funding for monitoring programmes.

¹ https://joint-research-centre.ec.europa.eu/scientific-activities-z/marine-biodiversity/marine-biodiversity-monitoring_en

The potential solutions for developing harmonised data collection strategies involve two complementary approaches, depending on feasibility:

1. Regional standardisation of protocols, methods and guidelines for data collection in the field (with some ongoing efforts already initiated):

- **Develop region-specific protocols, methods, and guidelines that align with policy needs and produce data compatible with common frameworks** (EBV², EOVS³). The successful inter-regional protocol for marine turtles serves as a model.
- **Establish standardised protocols at the level of taxonomic groups**, incorporating both traditional and innovative techniques. **Citizen science** should be integrated where feasible. **Intercalibration and common minimum standards are essential.**
- Standardised protocols and guidelines should:
 - Incorporate **common minimum requirements** covering what, when, where, and how to monitor, while allowing monitoring programs to supplement these basic protocols based on their specific needs;
 - Facilitate the **temporal alignment of data series**, e.g. historical vs new timeframes and between Member States;
 - Take into consideration the **seasonality** of populations and ecosystems;
 - **Be agreed** by the community of experts; and
 - **Be published** (e.g. Ocean Best Practices System - OBPS).

2. Developing automated tools that can accept data collected in different ways:

- Converting varied field data into a standardised output format, despite differences in environmental conditions and local expertise (e.g., marine turtle data).
- Ensuring output aligns with common frameworks like Darwin Core for seamless reporting and analysis.

DATA PATHWAYS

The five key challenges on data pathways identified during the workshop are:

- **Lack of structural funding dedicated to harmonisation** (as opposed to funding dedicated to individual structures, including new ones).
- **Gap in understanding between scientists and data managers communities**, particularly regarding the use of data and metadata standards.
- **Insufficient data sharing:** Data is not shared effectively beyond the national level or is shared without proper metadata:
 - Limited accessibility to primary (raw) data as well as incomplete reporting of monitoring and assessment results from Member States was emphasised by the European Commission Directorate-General for Environment and EMODnet Biology.
 - A cultural change in data management is urgently needed. Data management is often overlooked within institutions, with data sharing rarely recognised as a key 'metric of success'. Consequently, valuable raw data remains locked in national repositories, underutilised and untapped.
- **Lack of knowledge on existing data and metadata standards.** Despite a wealth of existing data and metadata standards, researchers often lack awareness of these resources. This knowledge gap leads to data that is incompatible with standard formats, requiring time-consuming reformatting or expert intervention.

2. EBV : Essential Biodiversity Variables

3. EOVS : Essential Ocean Variables



➤ **Interoperability/data exchange issues:** Incompatibility between different data structures (due to the different and unlinked data formats and conventions). There is a clear need for data structures to communicate together and be interoperable.

The five priorities to address these challenges are:

- 1. Strengthening data management capacity:** Invest in adequate funding and human resources, including data scientists, and incorporate data management into research training.
- 2. Mandating data sharing:** Implement national and European policies requiring data sharing, especially for publicly funded projects.
- 3. Recognising data sharing as a 'metric of success':** Promote a culture of data sharing by rewarding researchers for data contributions and integrating data sharing into performance metrics.
- 4. Harmonising data standards:** Consolidate existing standards through mapping, translation, and collaborative efforts between data scientists and researchers. Darwin Core was suggested as the most widely used and flexible standard.
- 5. Building a federation of data structures:** Develop a federated data infrastructure, similar to the Ocean Data and Information System - ODIS, to connect and interoperate diverse data sources.

