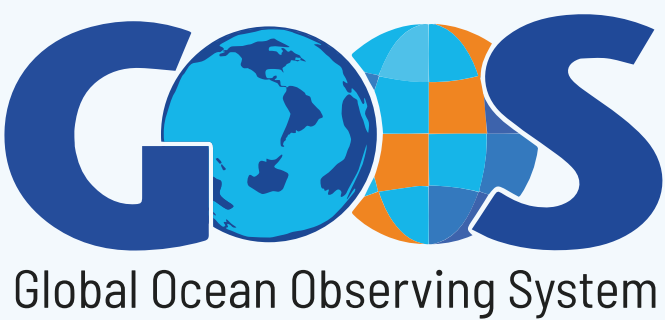


# Essential Ocean Variables (EOVs)

## Monitoring the state and health of the ocean

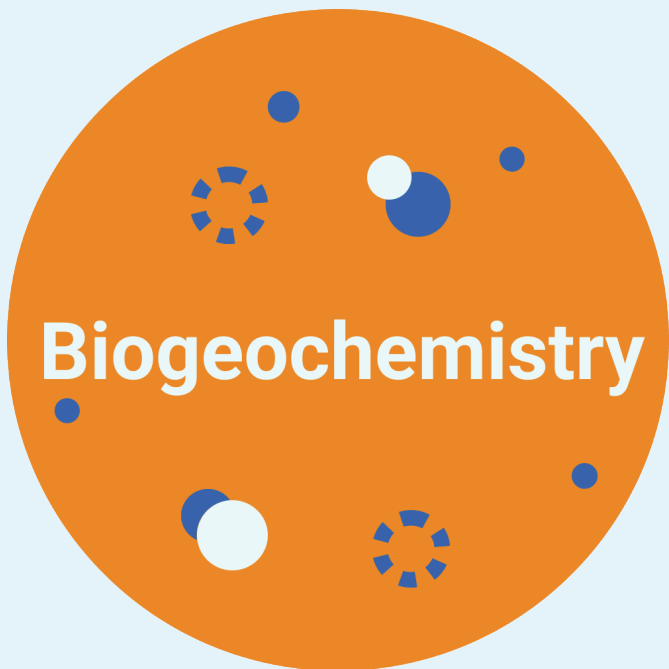
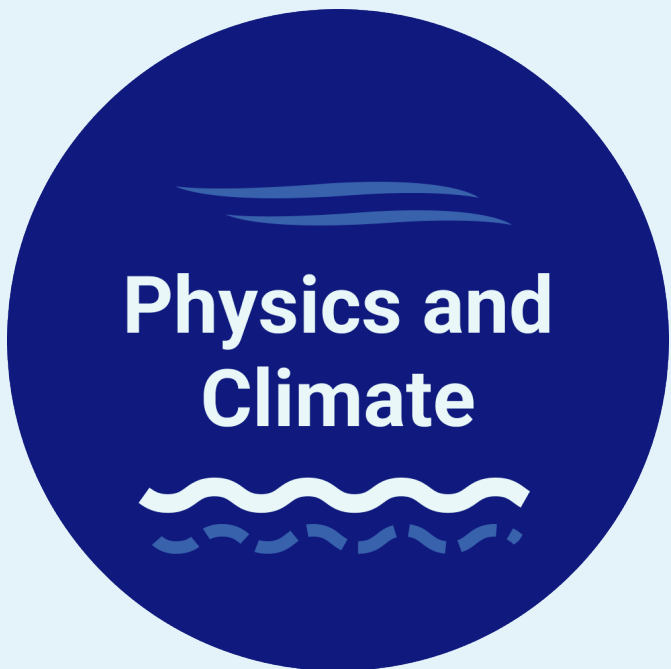
EOVs are the minimum set of ocean variables needed to understand the state of the ocean and the variability of important oceanic processes. They provide information to manage activities that benefit society. EOVs are defined and standardised by the **Global Ocean Observing System (GOOS)**.



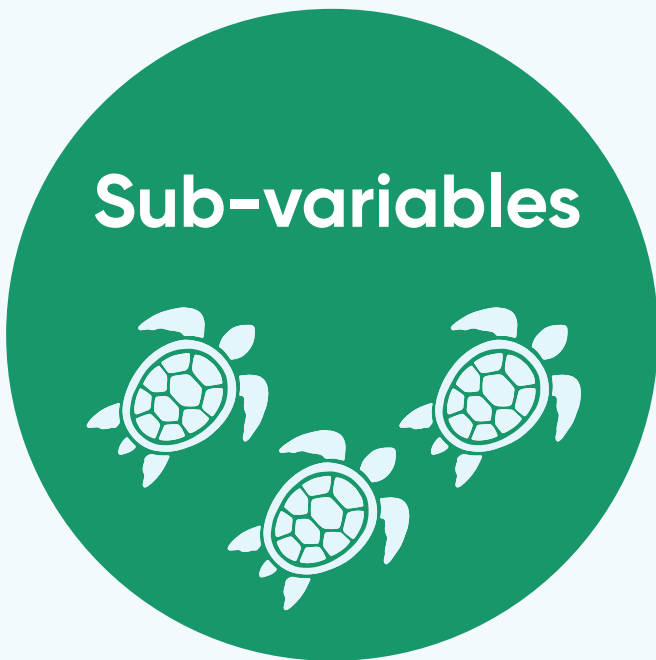
EOVs focus on **three** main delivery areas:



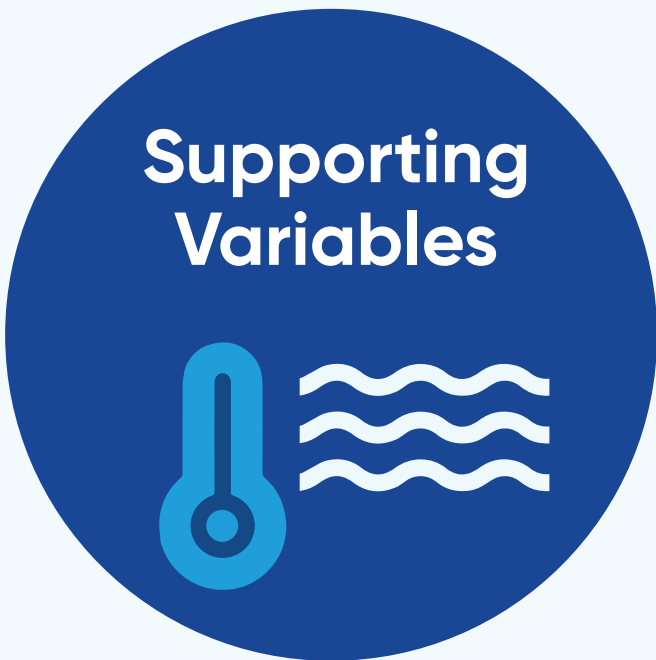
EOVs are grouped by discipline and are overseen by **three** GOOS expert panels:



EOVs can be described by **three** key elements:



**Basic measurements for estimating the main EOV (e.g., counting marine turtles)**



**Additional measurements offering context (e.g., measuring water temperature for understanding environmental conditions affecting turtles)**



**Outputs calculated from the sub-variables and other relevant information (e.g., visible changes in turtle population using turtle count and water condition)**

**EOVs make it easy to measure and compare ocean data from all corners of the world!**

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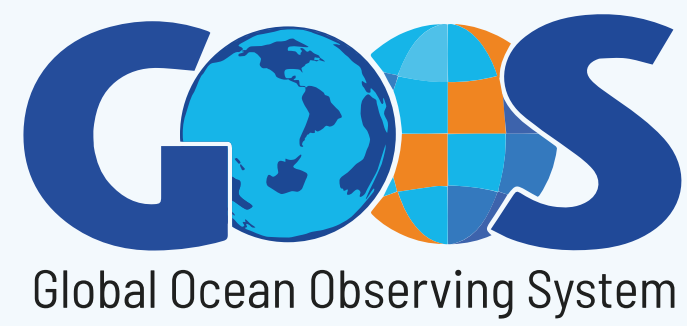



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# Biology & Ecosystem Essential Ocean Variables (BioEco EOVs)

BioEco EOVs were identified by the **Global Ocean Observing System (GOOS)** to meet needs for understanding and forecasting marine life. They provide a framework for coordinating ocean observations, ensuring globally comparable and combinable data.

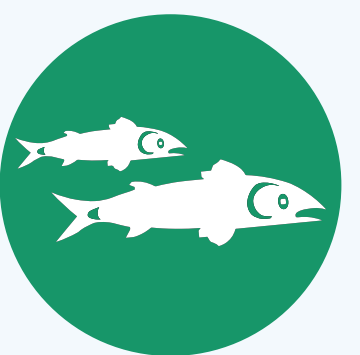





**Phytoplankton**  
Diversity and biomass




**Zooplankton**  
Diversity and biomass




**Fish**  
Abundance and distribution




**Sea Turtles**  
Abundance and distribution




**SeaBirds**  
Abundance and distribution




**Marine mammals**  
Abundance and distribution




**Ocean sound**  
Cross-disciplinary




**Corals**  
Cover and composition



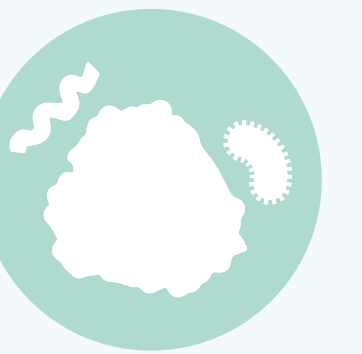
**Seagrass**  
Cover and composition




**Macroalgal canopy**  
Cover and composition



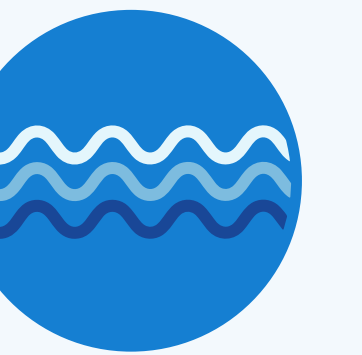
**Mangrove**  
Cover and composition



**Microbes**  
Diversity and biomass (Pilot)

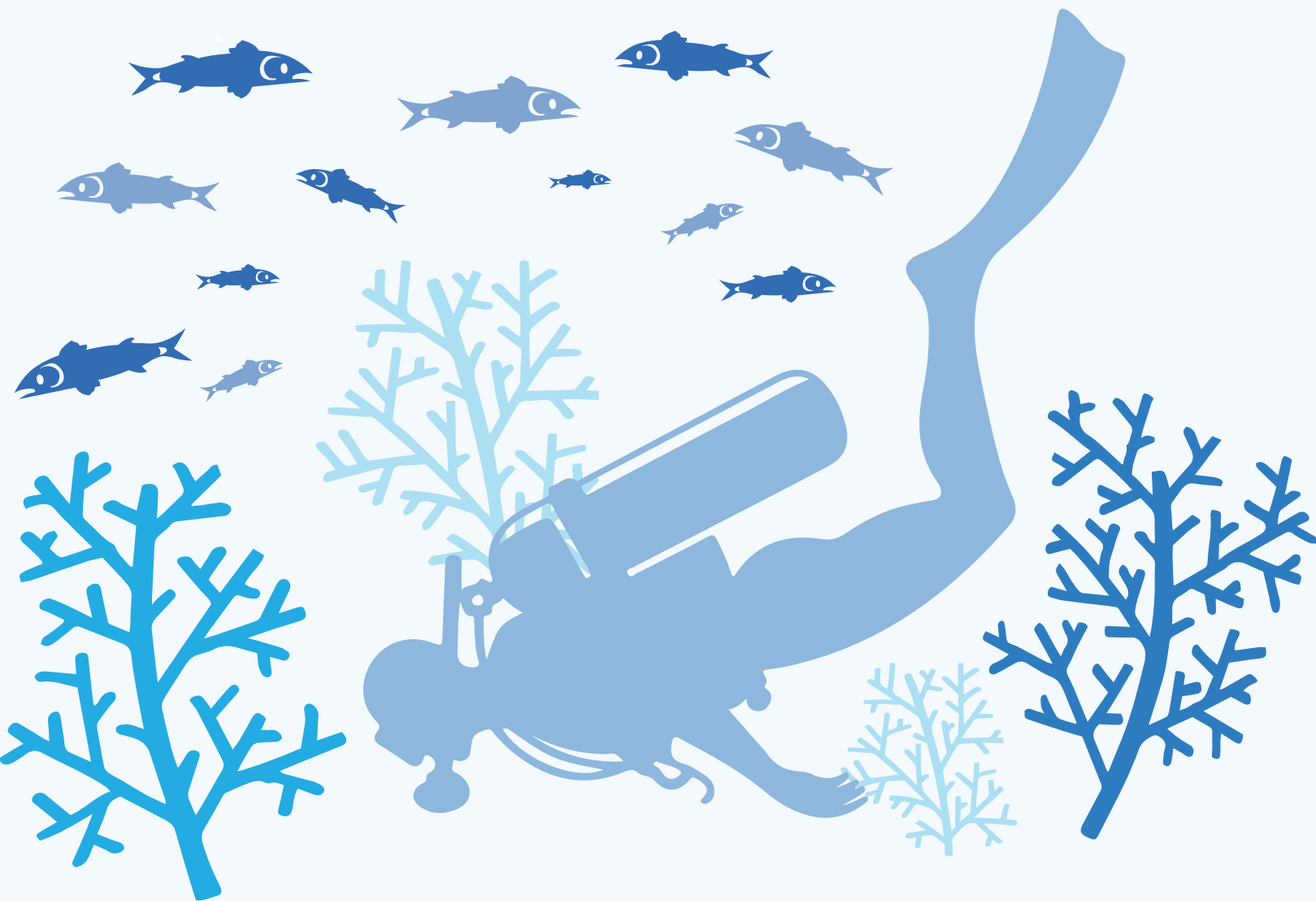


**Benthic invertebrates**  
Abundance and distribution (Pilot)



**Ocean colour**  
Cross-disciplinary

**Good, consistent data is fundamental for making smart decisions that keep our oceans healthy and thriving.** When ocean observations are comparable, accessible, collected with care, and with accepted protocols, they can enable effective action, investment, and decision-making across ocean management, conservation, industry, and more, helping us sustainably manage our marine resources.



We have the science, the resources, and the information, but we need standardised, globally comparable data to make it useful for everyone.

**Your data is not just a byproduct of your research – it's the heart of it. Standardise and share your data to ensure it can have a real impact!**

Standardising data for EOVs is a global effort involving many dedicated organisations.

To learn more about EOVs and to contribute, please visit the GOOS website: [www.goosocean.org](http://www.goosocean.org)

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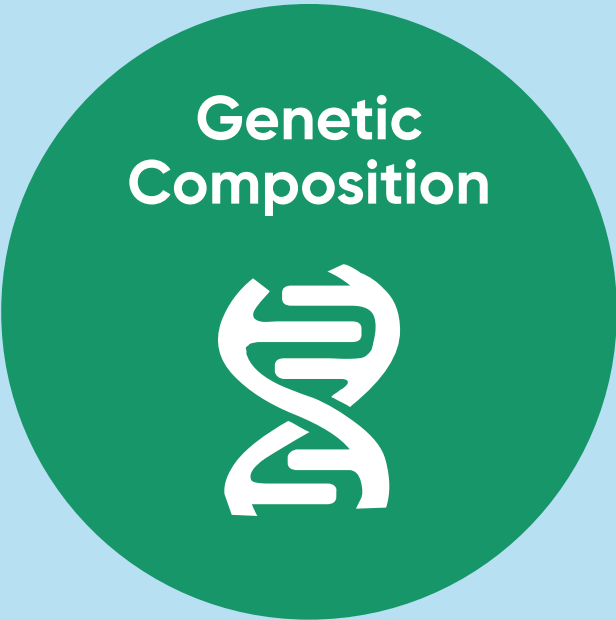
# Essential Biodiversity Variables (EBVs)

## Using biodiversity observations to understand its status and trends

**EBVs** are biodiversity data tracked over time, mapped or calculated from basic measurements. Managed by the **Group on Earth Observations Biodiversity Observation Network (GEO BON)**, EBVs help monitor changes in biodiversity over time and space.

This **standard approach to evaluating change in biodiversity metrics** helps us understand changes over time and space using models and time series, and make better choices to protect our environment.

### EBV classes and EBV names:



- Genetic diversity
- Genetic differentiation
- Effective population size
- Inbreeding



- Species distributions
- Species abundances

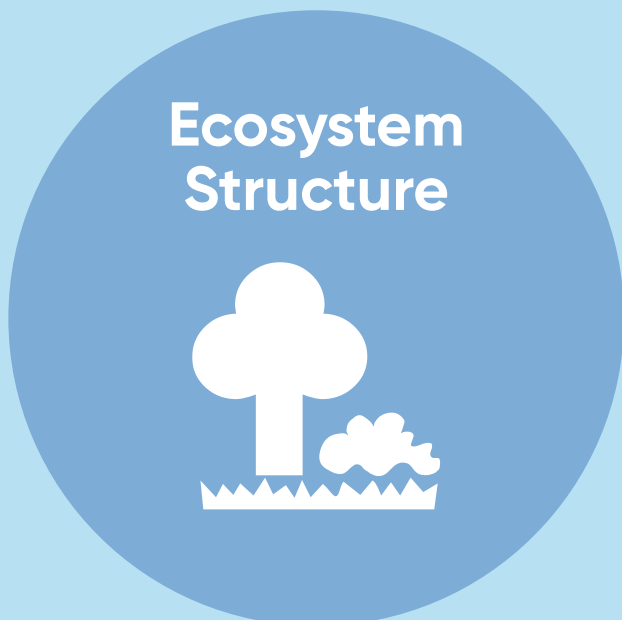
- Morphology
- Physiology
- Phenology
- Movement
- Reproduction



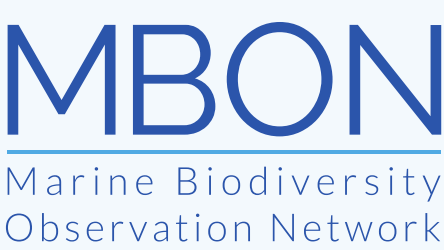
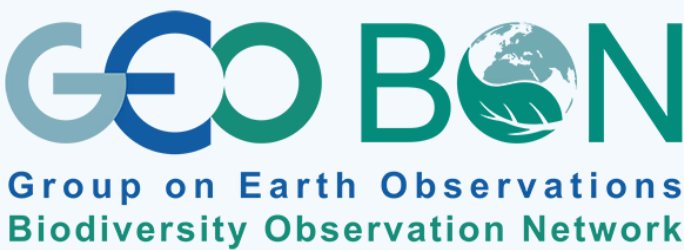
- Community abundance
- Taxonomic/phylogenetic diversity
- Trait diversity
- Interaction diversity



- Primary productivity
- Ecosystem phenology
- Ecosystem disturbances



- Live cover fraction
- Ecosystem distribution
- Ecosystem Vertical Profile



More information on the EBVs can be found on the GEO BON website [www.geobon.org](http://www.geobon.org)

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