Brussels, 5 June 2023

EuroGOOS Data Policy

Rationale and context

Operational oceanography brings various economic and societal benefits. It underpins significant decision and policy making in the marine domain, from weather forecasts to maritime activities, marine safety and climate modelling, and delivers vital services and information for a sustainable blue economy (EuroGOOS, 2016).

In 2021, the Intergovernmental Oceanographic Commission (IOC) of UNESCO recognizing the vital importance of timely, free, and unrestricted international exchange of oceanographic data for the efficient acquisition, integration and use of ocean observations gathered by the countries of the world, started the revision of its Data Exchange Policy. The new IOC Data Policy and Terms of Use were adopted by the 32nd session of the IOC Assembly in 2023[1].

In 2019, the European Open Data Directive entered into force, an implementing act on High Value Datasets EU directive, which includes Earth Observation and Environment data[2].

In 2021, the World Meteorological Organization (WMO) adopted a new Unified Data Policy[3] relating to the international exchange of meteorological, hydrological, and climate data between the 193 Member states and territories of WMO. The WMO policy distinguishes two types of data which are required for meteorological service provision and must be exchanged: (i) 'core' data, which must be freely available, and (ii) 'recommended' data, for which agreements can be needed (see table 1 here). All data collected by Global Ocean Observing System (GOOS) within the framework of Essential Ocean Variables (EOVs) and Essential Climate Variables (ECVs) are classed as core data that must be exchanged on a free and unrestricted basis.

Similarly in 2021, the International Council for Exploration of the Sea (ICES) revised its data policy and all data provided to ICES are considered to be public data under the Creative Commons Attribution Licence (CC-BY), unless otherwise explicitly specified as restricted data.

In 2022, the Southern Ocean Observing System (SOOS) revised its data policy with 13 statements for 'ethically open' and FAIR data[4].

In 2023, EuroGOOS developed a new data policy which requires its members' commitment to share core ocean data openly according to the FAIR principles and clear licences. By core in situ ocean data we mean, at least, the physical and biogeochemical Essential Ocean Variables (EOVs) which are

[1] IOC Data Policy and Terms of Use (2023)
[2] European legislation on open data (2019)
[3] World Meteorological Organization (WMO) Unified Policy for the International Exchange of Earth System Data (2021)
[4] SOOS Data Policy (2022)

necessary for the Copernicus Marine Service and the EuroGOOS Regional Operational Oceanographic Systems (ROOS), including coastal services, as well as the services delivered by the European Marine Observation and Data Network (EMODnet). This policy is the European implementation of the IOC Data Policy and Terms of Use.

EuroGOOS Data Policy terms of use and implementation, based on IOC Oceanographic Data Exchange Policy

Section 1. Preamble

The timely, free, and unrestricted international sharing of oceanographic data, metadata, and products is essential for a wide variety of purposes and benefits including the prediction of weather and climate, the operational forecasting of the marine environment, the preservation of life, economic welfare, safety, and security of society, the mitigation of human-induced changes in the marine and coastal environment, as well as for the advancement of scientific understanding that makes this possible.

Data, metadata, and products should be accessible, reproducible, interoperable, freely and openly shared with minimum delay and restrictions. Such sharing of data in both real-time and delayed mode facilitates scientific research and innovation.

Section 2. Purpose

The purpose of this Data Policy is to outline the requirements with respect to data sharing, access, preservation, and attribution to facilitate the broad use and reuse of data and information. This Data Policy requires EuroGOOS Members to share core marine data with the minimum possible delay and according to an open source licence. By core marine data we mean, at least, the physical and biogeochemical Essential Ocean Variables (EOVs) of the Global Ocean Observing System.

Section 3. Conditions of use

Data should be licensed under a minimally restrictive and voluntary common-use licence[5] that, under specific conditions, grants permission, ensures proper attribution and allows others to copy, distribute and make use of the data. Creative Commons Attribution Licence (CC-BY) licence is recommended.

Section 4. Access restrictions

Data and associated metadata should be made available with minimal restrictions on use unless there are valid reasons to restrict access. Legitimate reasons to restrict access to, and reuse of, data and associated metadata include, *inter alia*, privacy and confidentiality, protection of rare or endangered species, and national security.

Section 5. Data sharing policies of EuroGOOS Members

This Data Policy acknowledges the right of EuroGOOS Members and data originators to determine the terms of data sharing in a manner consistent with national jurisdictions, international conventions, and treaties, where applicable.

The EuroGOOS Members agree that the free circulation of Essential Ocean Variables (EOVs) is of major importance for science and safety, and therefore strongly encourage the circulation of data through open and free licence.

[5] For example: the Creative Commons family of licences https://creativecommons.org/about/cclicenses/

Section 6. FAIR principles

To support knowledge discovery and innovation both by humans and machines, data should meet FAIR Guiding Principles (Findable, Accessible, Interoperable and Reusable)[6] to the greatest extent practicable.

Section 7. Data availability and quality control

The core marine data (EOVs) should be made available with the least possible temporal delay, according to the following quality control (QC) requirements.

Available data should be formatted[7] and quality controlled[8].

There are two levels of QC that should be documented and traceable.

- Automated QC: for real-time data distribution (e.g., data circulated as soon as it is acquired after minimal checks of the data).
- Scientific QC and adjustment: for delayed-mode data distribution (e.g., data QC has been performed by a data scientist).

Section 8. Data Repositories

Data should be quality controlled, accompanied by metadata, and stored in an openly accessible data repository and made accessible and discoverable through a web interface and machine-to-machine protocols.

EuroGOOS Members shall, where possible, use their national oceanographic data centre, organised by SeaDataNet[9], or European/international observation networks data systems.

Section 9: Secure long-term data archives

To support long-term and secure archival, data should be submitted, to the best practicable degree, to International Oceanographic Data and Information Exchange (IODE)'s World Ocean Database (WOD), the Ocean Biodiversity Information System (OBIS), data centres linked to the World Data System (WDS), or their successors, as long-term secure archives for oceanographic data and associated metadata.

Section 10. Data and metadata sharing guidelines

EuroGOOS activities and subsidiary bodies, such as Task Teams and Working Groups as well as other Communities of Practice should develop and/or apply, where applicable, detailed data and metadata sharing guidelines that are consistent with this EuroGOOS Data Policy and Terms of Use.

[6] Wilkinson, M., Dumontier, M., Aalbersberg, I. et al. The FAIR Guiding Principles for scientific data management and stewardship. Sci Data 3, 160018 (2016). https://doi.org/10.1038/sdata.2016.18

[7] FAIR data formats such as Copernicus Marine in situ NetCDF or SeaDataNet ascii ODV

[8] Following quality control manuals such EuroGOOS DataMEQ QC or IQUOD QC manual

[9] https://www.seadatanet.org/

Section 11. Definitions

'Data' is a set of Ocean in situ values, symbols or signs (recorded on any type of medium) that represent one or more properties of a variable.

'Essential Ocean Variables' (EOV): a set of ocean in situ data as defined by GOOS (Global Ocean Observing System)[10].

'Metadata' is 'data about data' describing the content, quality, condition, and other characteristics of data that allows their inventory, discovery, evaluation or use.

'Timely' in this context means the distribution of data and/or products, sufficiently rapidly to be of value for a given application.

'**Product'** means a value-added enhancement of data applied to a particular application.

[10] GOOS Essential Ocean Variables