



# WMO DATA CONFERENCE

EXCHANGE OF EARTH SYSTEM DATA  
IN THE 21<sup>ST</sup> CENTURY

16 - 19 NOVEMBER 2020  
VIRTUAL CONFERENCE

#WMOData

## Key Messages (preliminary) from the 2<sup>nd</sup> Stakeholder consultation (Research) 21 October 2020:

- Several communities across the different domains of the Earth System (atmosphere, atmospheric composition, ocean, climate, cryosphere) promote and adhere to FAIR Principles (**F**indable, **A**ccessible, **I**nteroperable, **R**eusable) and/or open access approaches.
- Updated WMO policy must endorse FAIR principles and support licenses to clarify access and usage rights
- Sustained funding of long-term observation programs with operational dependencies as public infrastructures, is a critical issue
- The research community does not always have easy access to or influence on the operational data (observations and model output) and data formats which hinders data interoperability, interpretation and advances in high-quality science
- Current WMO policy is well recognized in the research community, but missing clear guidance on licenses, this also relates to the terminology essential, additional, other data and data management
- There is a need to apply consistent data policies to all scientific data to the extent possible, to reduce barriers to interdisciplinary reuse and integration
- Much of the earth system data are primarily from the research community (atmospheric composition, ocean...), and funded as such
- The latency of data availability is generally slower in the research community which reduce their potential impact and benefit for operational services (e.g. assimilation in numerical prediction models)
- Duplication of data holdings across multiple repositories is an issue



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## WMO should establish “open by default” as a standard and as norm

- Open data policy is needed to facilitate science and maximize the value of data, efficiency and expanded capabilities as well as equity
- Exceptions are possible in cases where legislation, treaty, commercial interests etc. explicitly require restrictions
- FAIR Principles promoted by some parts of the research community do not explicitly encourage open data sharing [FAIR alone is not enough]
- Data access needs to be both technically open (i.e., available in a machine-readable standard format to be processed by a computer application) and legally open (i.e., explicitly licensed that allows commercial and non-commercial use and re-use without restrictions)
- Utilize open access licensing and labeling (machine readable) to facilitate legal interoperability
- Avoid customized licenses and restrictions that lead to complicated license “stacking”
- Implement Digital Object Identifiers (DOIs), etc. to facilitate transparency, traceability and attribution, especially between operational, research, and applications communities
- Registration and attribution are conditions that do not restrict access and reuse
- User-informed data management should be promoted and supported, including as a legacy of the research projects/programmes



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- Heupel: IMOS makes all data publicly available; no restrictions apply (acknowledgment of source is required); FAIR principles followed; no user registration required in order to use data; Attribution of data sources is a challenge difficult to resolve, but important for the research community
- Klausen: Policy for satellite data access typically open with minimal restrictions; more complicated for surface-based observations; GAW data policy require co-authorship in the case of publication with substantial use of data, data policy without data license does not ensure the intellectual property protection; GAW also needs access to weather data;
- Kristiansen: Observing capabilities lagging in polar areas; need for standards to drive data usability and interoperability, make data publicly available, develop interoperability standards, benefits of citizens observations for weather forecast; meteorological–computational science co-design thinking, harnessing opportunities in emerging technologies and interoperable systems for collecting observations and sharing data require for the benefit of R2O and O2R



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- Chen: access to the benefits of scientific activity is a fundamental human right; research data from public funding must be open; GEO has adopted the concept of "open data by default" with minimum restriction; there are important differences between public domain and open licensing approaches; non-WMO related example: rapid COVID-19 vaccine development would not be possible without open access to data