

DBCP-38, Geneva, Nov 4 2022

WMO Unified Data Policy

(Cg-Ext(2021)/Resolution 1)



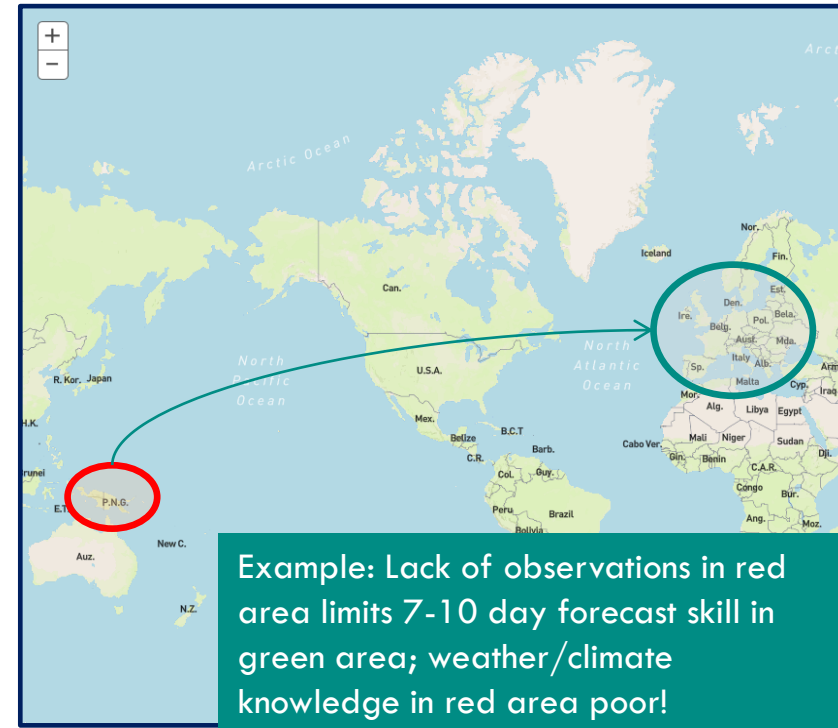
WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

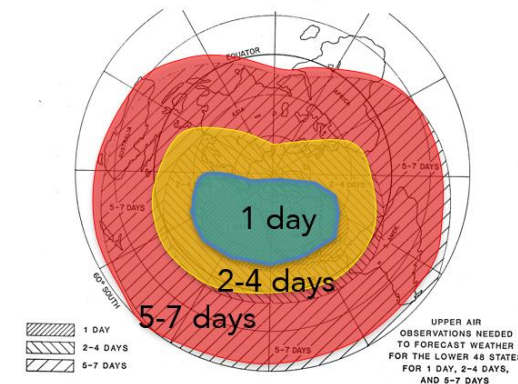
Lars Peter Riishojgaard, WMO Secretariat

“Weather and climate know no boundaries”

- Lack of observations limits ability to monitor, understand and predict weather and climate, **both locally and globally**;
- Weather prediction beyond 3-4 days **for any location on the globe** requires exchange of observations world-wide.
- Lack of observations will initially lead to poor quality of model data locally; over time this will spread globally.
- *“In meteorology, ignorance knows no boundaries”*

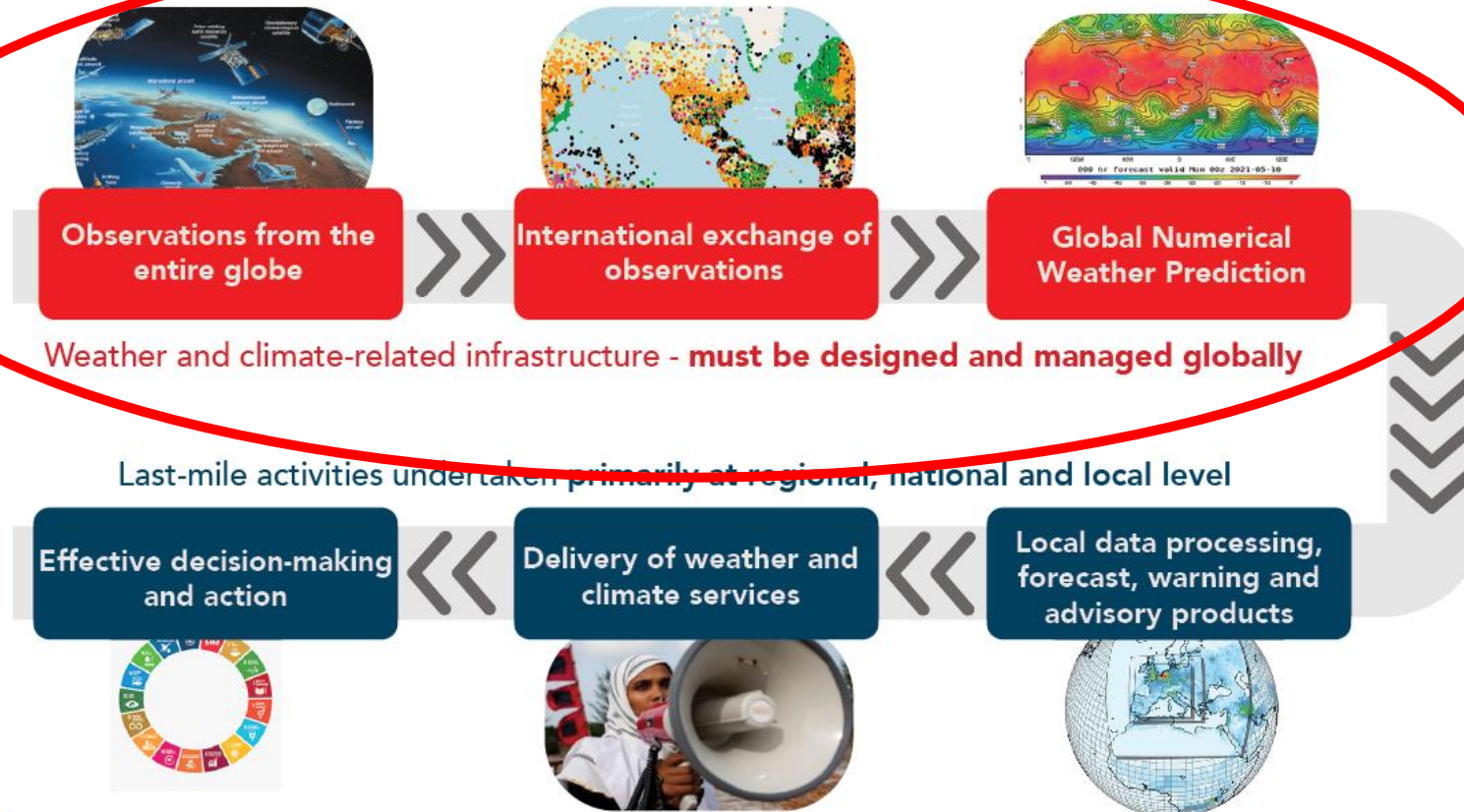


Example: Required areal coverage of observational data for weather prediction over the United States for different ranges



Successful application of weather and climate services depends on a functioning meteorological value chain

Global meteorological infrastructure



WMO OMIM

International exchange of data is one of WMO's most important activities;
(WMO Convention, Article 2)

Five steps to successful implementation

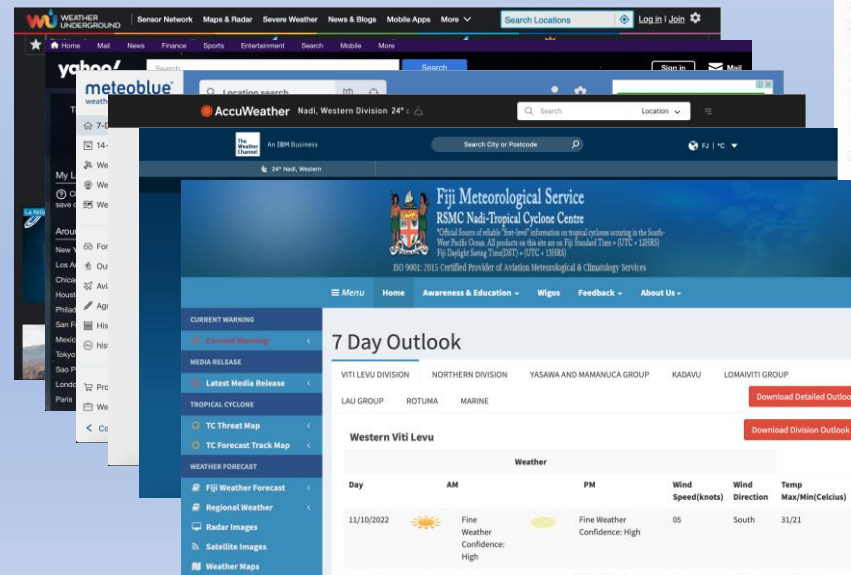
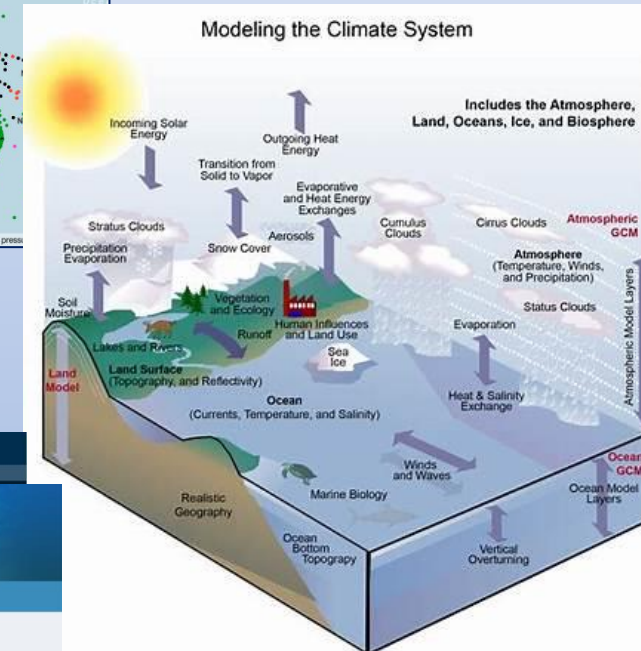
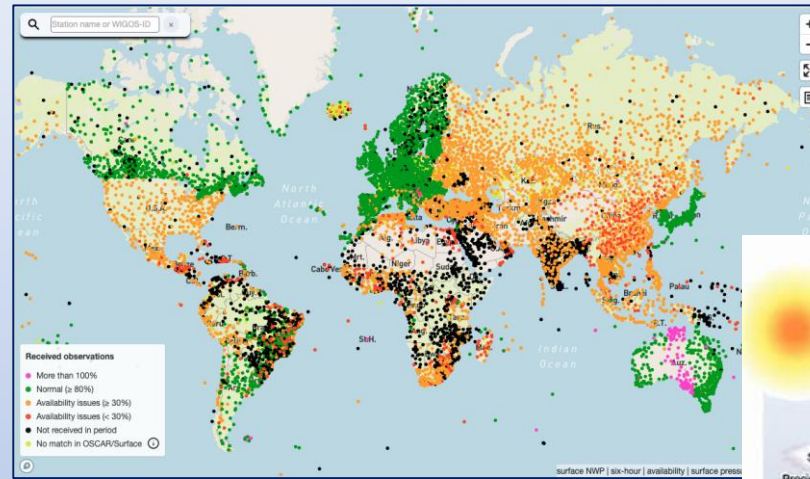
- I. Requirements and gap analysis;**
- II. Outreach and advocacy** – analyzing and explaining benefits of data exchange to stakeholders;
- III. Data policy – general commitment of Members to exchange certain data for certain purpose(s);**
 - *E.g. WMO Res. 40, 25, 60; new draft WMO Unified Data Policy Resolution;*
- IV. Regulatory material** – agreement on specifics of data exchange (what, when, where, how, ...);
 - *E.g. GBON provisions, approved by the Infrastructure Commission in Nov 2020;*
- V. Financial and technical support, capacity dev. where needed;**
 - *E.g. SOFF (observational data exchange), CREWS (services, “last mile”)*



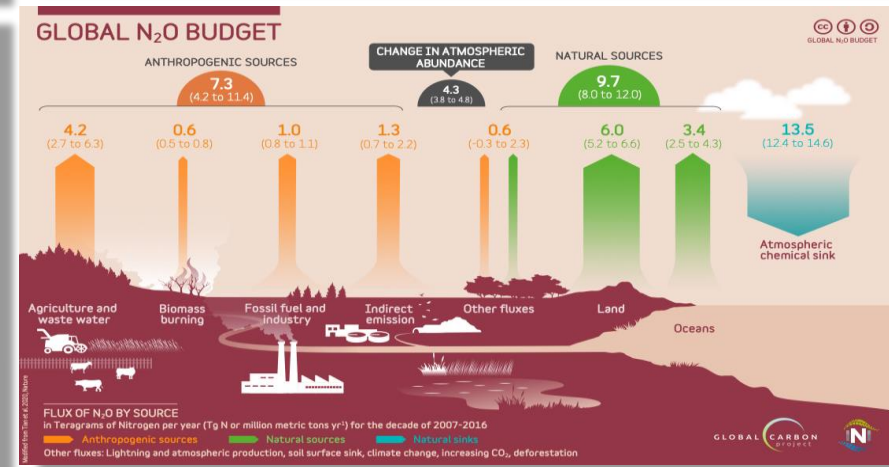
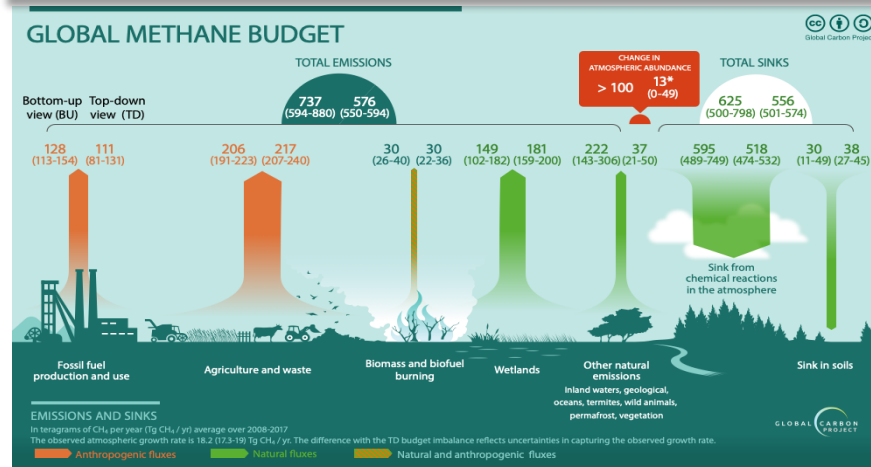
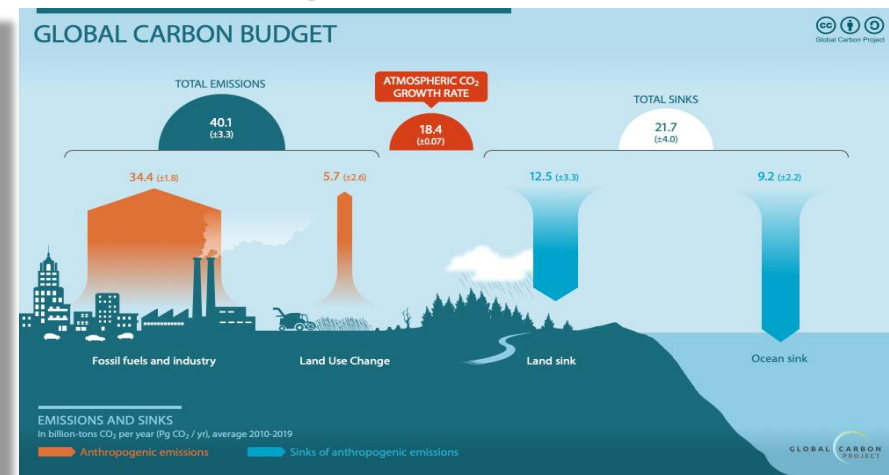
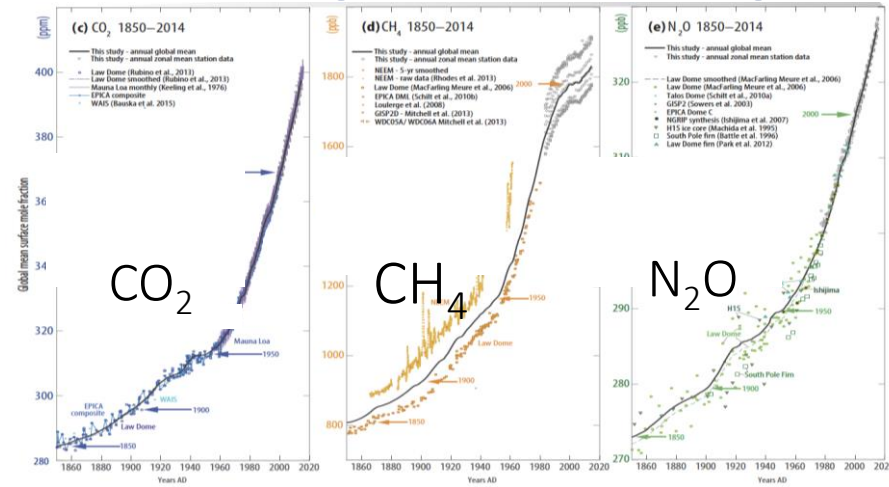
WMO OMM

Why did Congress-18 decide to reopen the issue of WMO data policy?

1. Concerns about persistent insufficient observational data coverage
2. Need to move toward integrated Earth system modeling
3. Opportunities and challenges related to the growing role of the private sector



1. Operational greenhouse gas monitoring



Uncertainties of natural sources and sinks are in many cases much larger than in anthropogenic emissions; i.e. overall GHG budgets remain uncertain

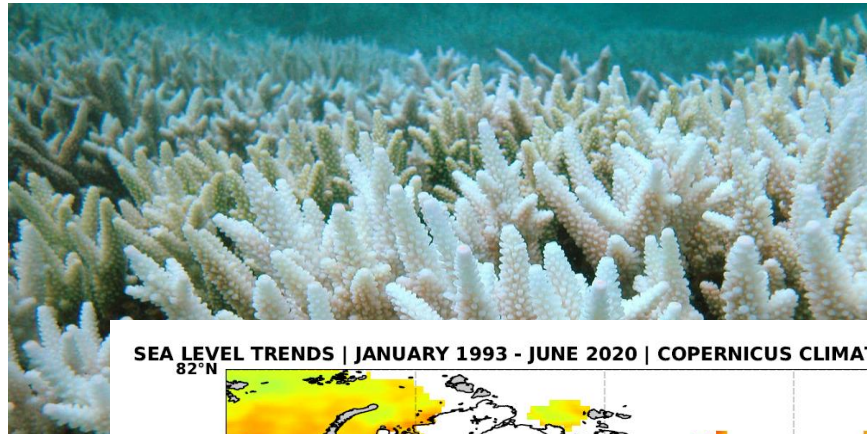
C. Fuller, WMO Climate Policy Advisors Meeting, 3/2022: *The atmosphere does not care how much carbon we pump into it; what matters for climate is how much carbon is in the atmosphere, not how it got there!*

This means that in order to take effective mitigation action and understand and monitor its impact, we need to understand the entire carbon budget

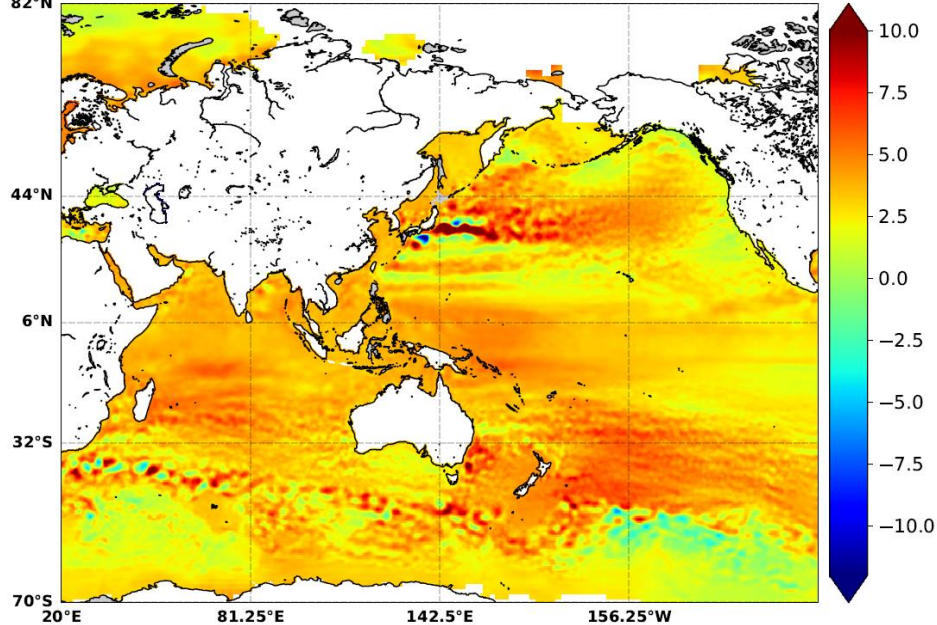


WMO

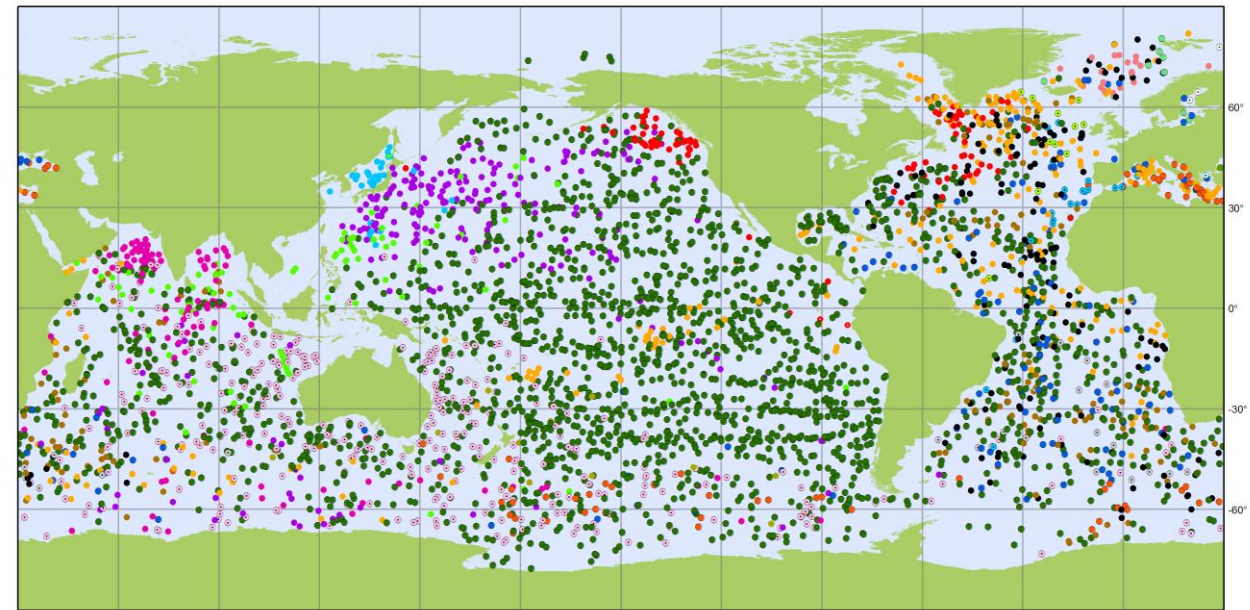
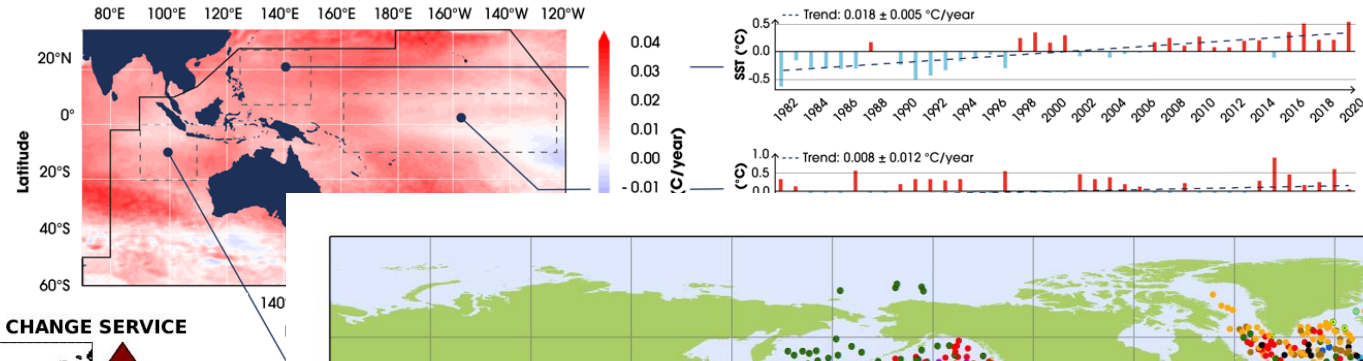
2. Importance of ocean activities to WMO and vice versa



SEA LEVEL TRENDS | JANUARY 1993 - JUNE 2020 | COPERNICUS CLIMATE CHANGE SERVICE



Sea Surface Temperature change over the period 1982-2020



Argo

National contributions - 3966 Operational Floats
Latest location of operational floats (data distributed within the last 30 days)

January 2020



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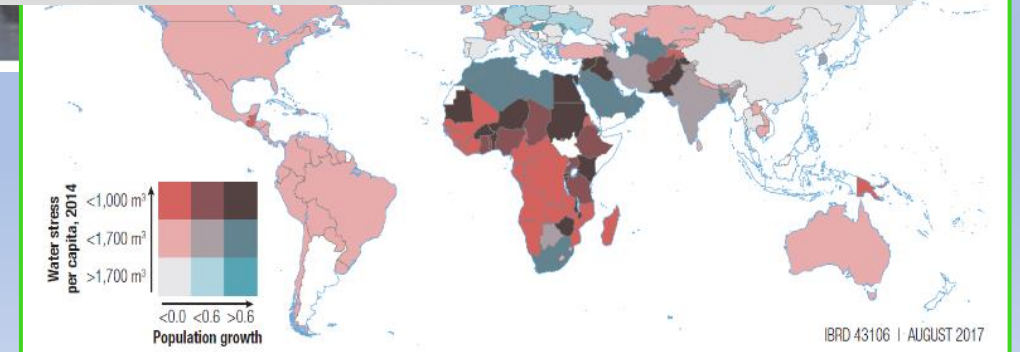
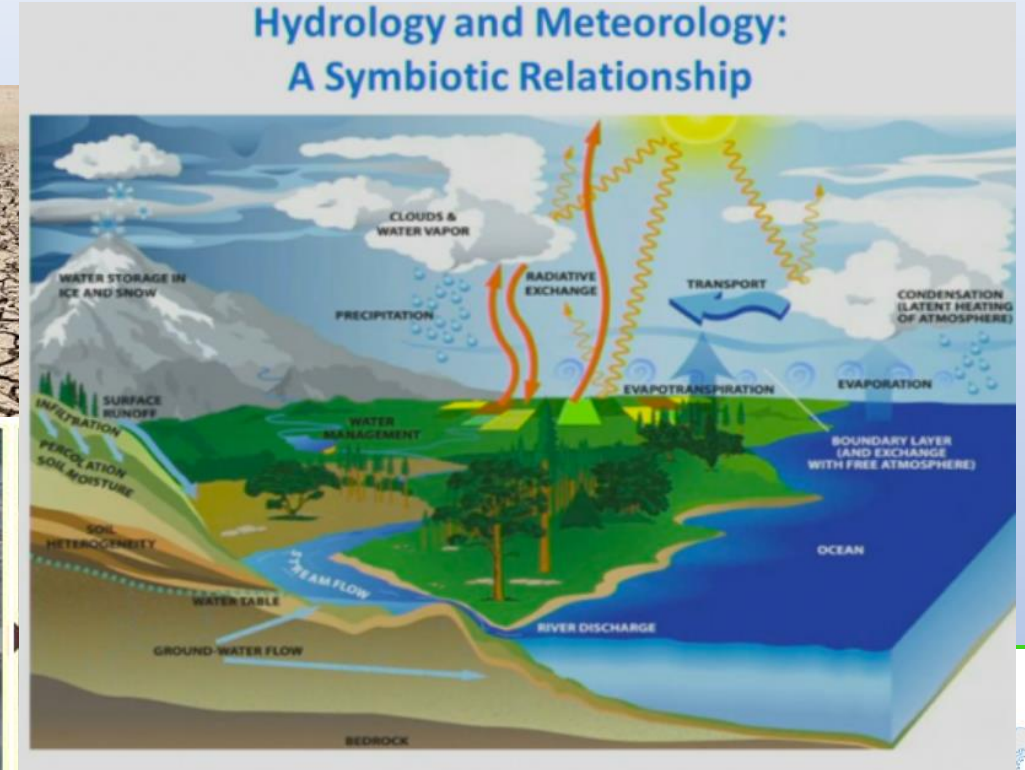
3. The inextricable links between hydrology and meteorology

Many weather- and climate related disasters manifest themselves hydrologically

1. Droughts

2. Floods

3. Access to water



Main building blocks for policy update

Resolution 40

Meteorological and related data

12th WMO Congress in 1995

Getting outdated;

Guidance from Infrastructure Commission and Executive Council: Address the weaknesses of the existing data policy resolutions; take the best from them, and build on it to strengthen the data exchange between WMO Members

Resolution 25

Hydrological data and products

13th WMO Congress in 1999;

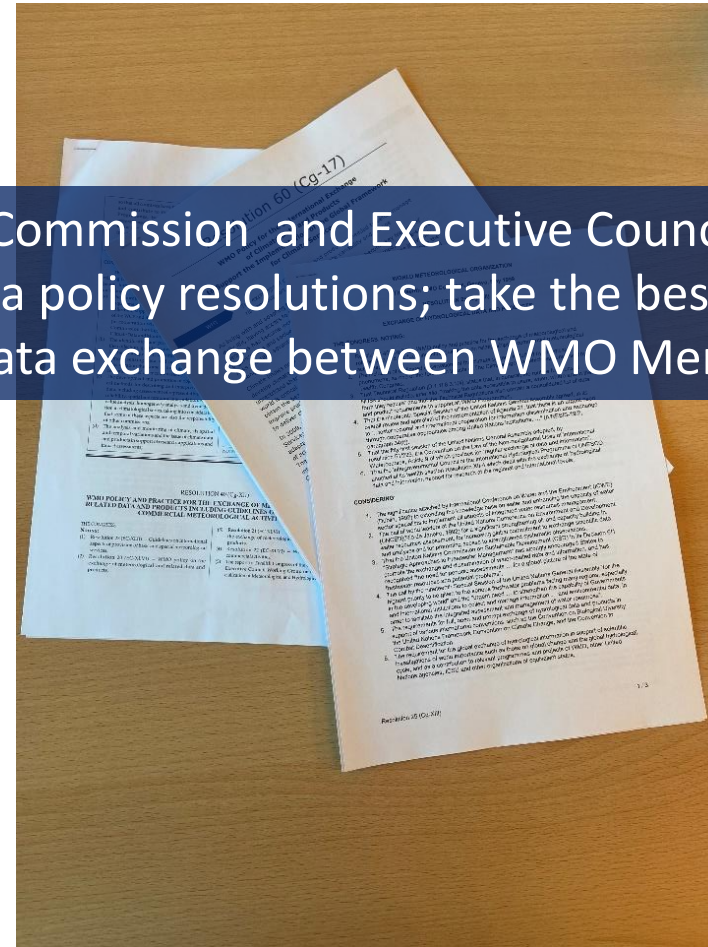
Never fully implemented;

Resolution 60

Climate data and products

17th WMO Congress in 2015;

Deemed unimplementable as is;



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Cg-Ext(2021), Resolution 1

{The Congress ...}

Agrees to have one unified data policy for all WMO domains and disciplines;

Decides that the scope of the data policy shall cover Earth system data exchanged among Members under the auspices of the WMO Convention and decisions of Congress, {...}

Adopts the following policy on the international exchange of Earth system data:

As a fundamental principle of WMO and in consonance with the expanding requirements for its scientific and technical expertise, WMO commits itself to broadening and enhancing the free and unrestricted international exchange of Earth system data;

Agrees further to maintain a two-tiered approach to the international provision and exchange of Earth system data via the following practice :

1. Members shall provide on a free and unrestricted basis the core data that are necessary for the provision of services in support of the protection of life and property and for the well-being of all nations, at a minimum those data described in Annex 1 to this resolution {...}
2. Members should also provide the recommended data that are required to support Earth system monitoring and prediction activities at the global, regional and national levels {...}



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“Free and unrestricted exchange”

- **What does it mean?**

- Per Annex 4: ***“Free and unrestricted means available for use, re-use and sharing without charge and with no conditions on use¹”;***

- **Background**

- Programs and systems such as WIGOS, WIS, GCW, GAW, S-GDPFS, that include both users and data providers outside the NMHSs, cannot be implemented via a “closed” data exchange;
- Socioeconomic benefits of open data exchange demonstrated in many studies; it is how we ensure maximum impact of our data, including protection of life and property;
- Emergence of global NWP as core underpinning capability is driving the need for unrestricted global exchange of both observations and model output;
- Research and operational communities are inextricably linked; two-way data exchange is essential;
- Private sector now major data user and data provider; clear rules needed for public and private sectors to thrive and benefit mutually;

¹Requests for attribution not considered a condition; attribution recommended



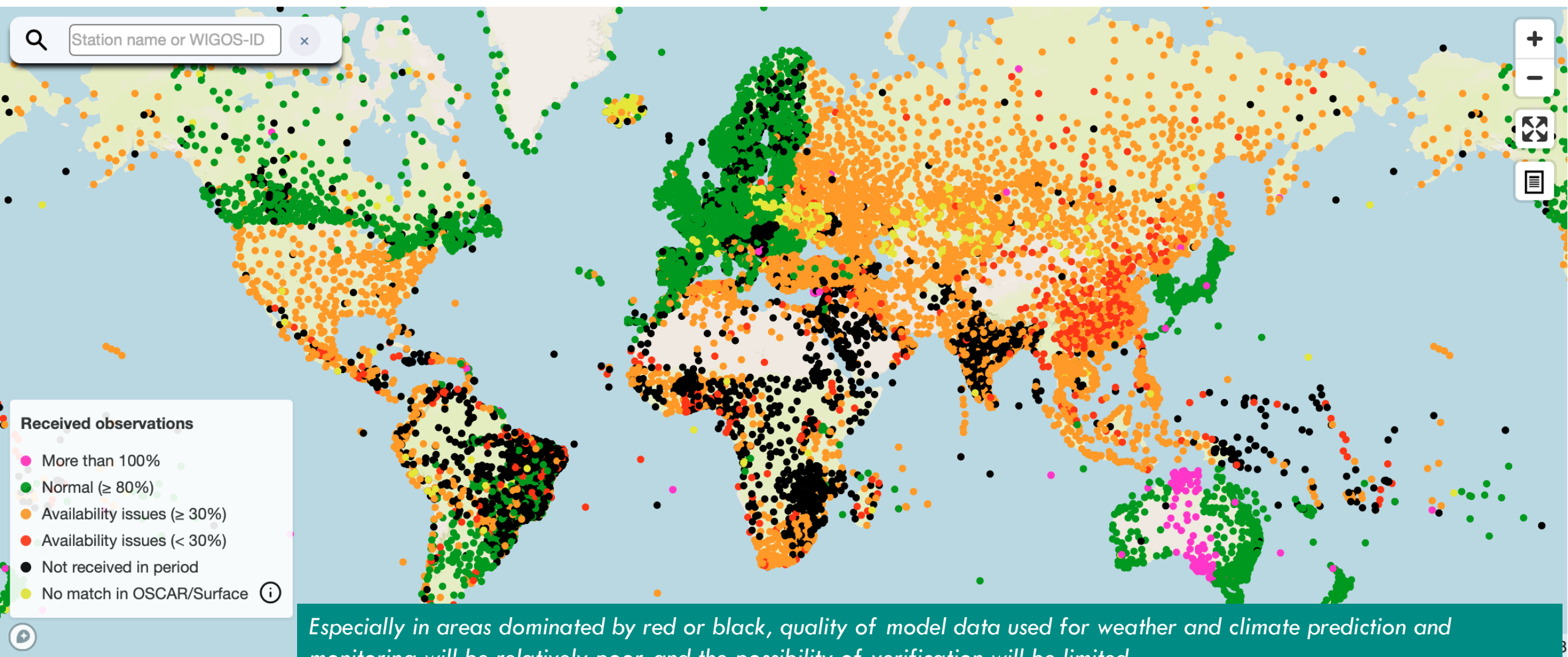
The WMO Global Basic Observing System (GBON)

an example of "core data" under the WMO Unified Data Policy



WMO OMM

The persistent problem of insufficient observational data coverage



Why do we keep struggling to get the observations we need?

WMO Convention and Paris Agreement implicitly assume that observations is solely a national responsibility

Surface Reporting Horizontal Resolution by Country

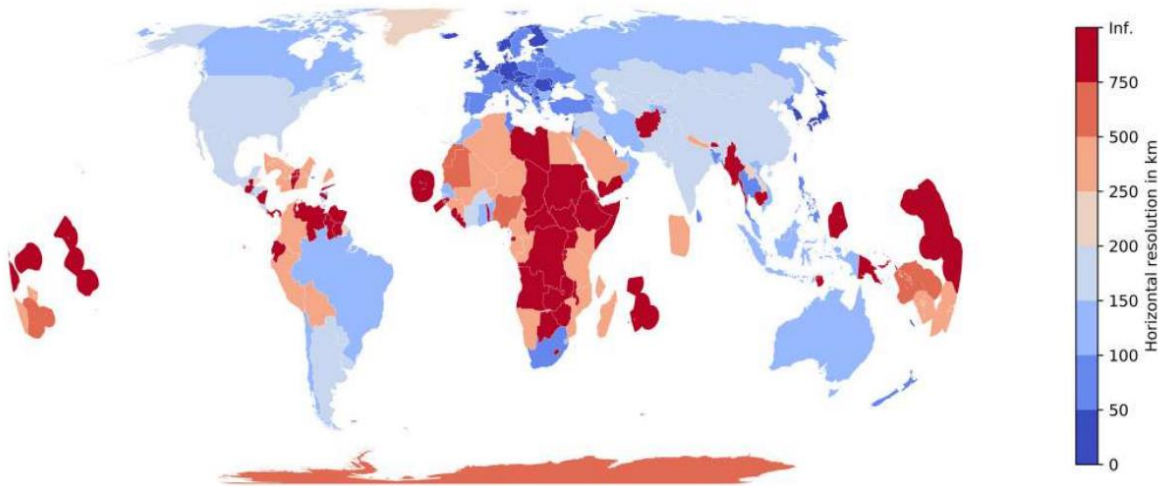
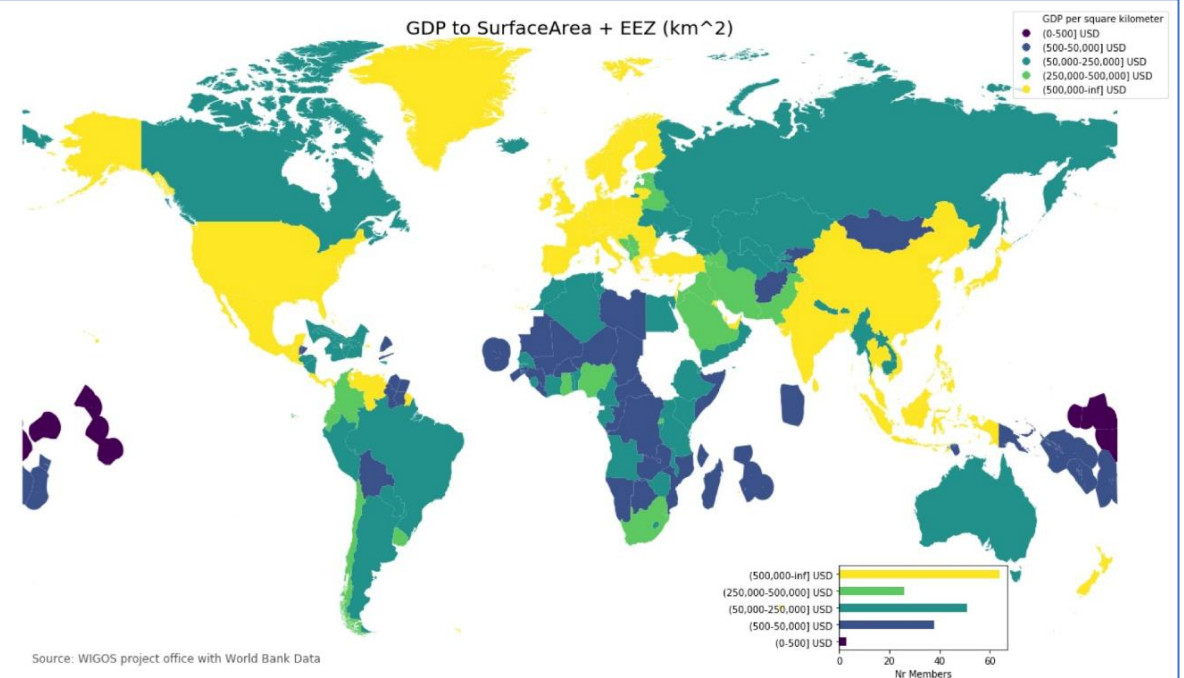


Figure 2 This map shows the horizontal resolution of surface observations in different countries based on stations actively reporting in January 2020. Source: WMO Secretariat.

GDP to SurfaceArea + EEZ (km²)



Source: WIGOS project office with World Bank Data

- **Ability to observe (left panel):** Observing systems in countries depicted in red fail to meet minimum observations requirements for weather and climate analysis and prediction
- **Ability to pay (right panel):** Affordability of observing responsibility (GDP/km² of surface area) of countries in yellow up to ten million times higher than for countries in dark blue



GBON regulations approved by WMO Congress in October 2021 (*effective on January 1, 2023*)



- GBON regulations establish commitment of all WMO Members to acquire and transmit in real time certain observations at fixed minimum horizontal density and at fixed minimum time frequency;
- GBON provides critical input to weather prediction and climate analysis needed for disaster preparedness, climate adaptation, etc.
- SOFF has as its sole purpose to provide technical and financial support to the implementation and operation of GBON where it is most needed



Implementation of GBON will be monitored using data from the WIGOS Data Quality Monitoring System (WDQMS; shown); GBON (and SOFF) metrics of success are simple and unequivocal: “green dots on the map”

The Systematic Observations Financing Facility (SOFF)

Financial mechanism supporting GBON implementation and operation

- **A global initiative to address a foundational problem in a systematic manner** – missing surface-based observations from developing countries
- **A dedicated and innovative financing mechanism** established by WMO, UNEP and UNDP as a UNMPTF
- **Will provide grants and technical assistance** to achieve sustained GBON compliance, with a focus on LDCs and SIDS
- Legal agreements signed, initial funding secured (50M USD as of November 2022); SOFF will be starting preparatory phase shortly;
- ***SOFF remit is aligned with GBON; does not (yet) extend into the high seas, but in marks a break-through in decoupling the density of observations from the local availability of resources;***

WMO Data Policy and Ocean Observations

- Operators of ocean observing systems are largely in compliance with WMO data policy: Data are normally freely and openly available;
- Open issues:
 - How can the WMO Unified Data Policy best be used to strengthen the ocean observing system(s)?
 - Should we attempt to include marine observations in GBON?
 - The case in terms of impact is strong;
 - Not easy to regulate for the observing remits in the high seas;
 - How do we deal with observations in EEZs?
 - Observing remit is clarified for GBON, but does this apply generally?
 - What about 3rd party observations (e.g. ships of opportunity)?

