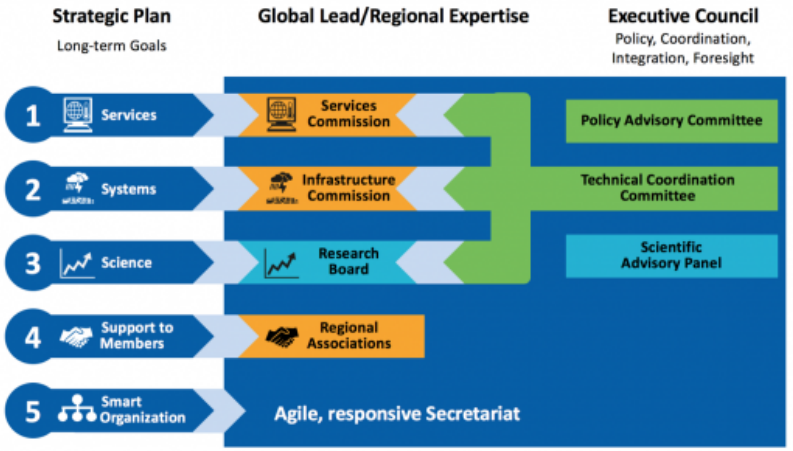


WMO Plenary Presentation

Constituent Body Reform, Coordination with CGMS, Major Initiatives

Presented to CGMS-48
(Plenary Session, Agenda Item 3)

Coordination Group for Meteorological Satellites

CGMS

Contents

- Status of WMO Reforms
- Impacts of COVID-19 on observing systems
- Status of Vision 2040
- Major initiatives
  - Data Policy
  - GBON and SOFF
  - WICAP
- Space Programme Status
  - Oscar/Space
- Upcoming events

WMO Constituent Body Reform

VISION 2030

By 2030, we see a world where all nations, especially the most vulnerable, are more resilient to the socioeconomic consequences of extreme weather, climate, water and other environmental events; and underpin their sustainable development through the best possible services, whether over land, at sea or in the air ***(and in space)***

OVERARCHING PRIORITIES

Preparedness for, and reducing losses from hydrometeorological extremes	Climate-smart decision-making to build resilience and adaptation to climate risk	Socioeconomic value of weather, climate, hydrological and related environmental services

CORE VALUES

Accountability for Results and **Transparency**	**Collaboration** and **Partnership**	**Inclusiveness** and **Diversity**

LONG-TERM GOALS

1 Services	2 Infrastructures	3 Science & Innovations	4 Member Services	5 Smart Organization
Better serve societal needs	**Enhance Earth system observations and predictions**	**Advance targeted research**	**Close the capacity gap**	**Strategic realignment of structure and programmes**

STRATEGIC OBJECTIVES

FOCUSED ON 2020-23

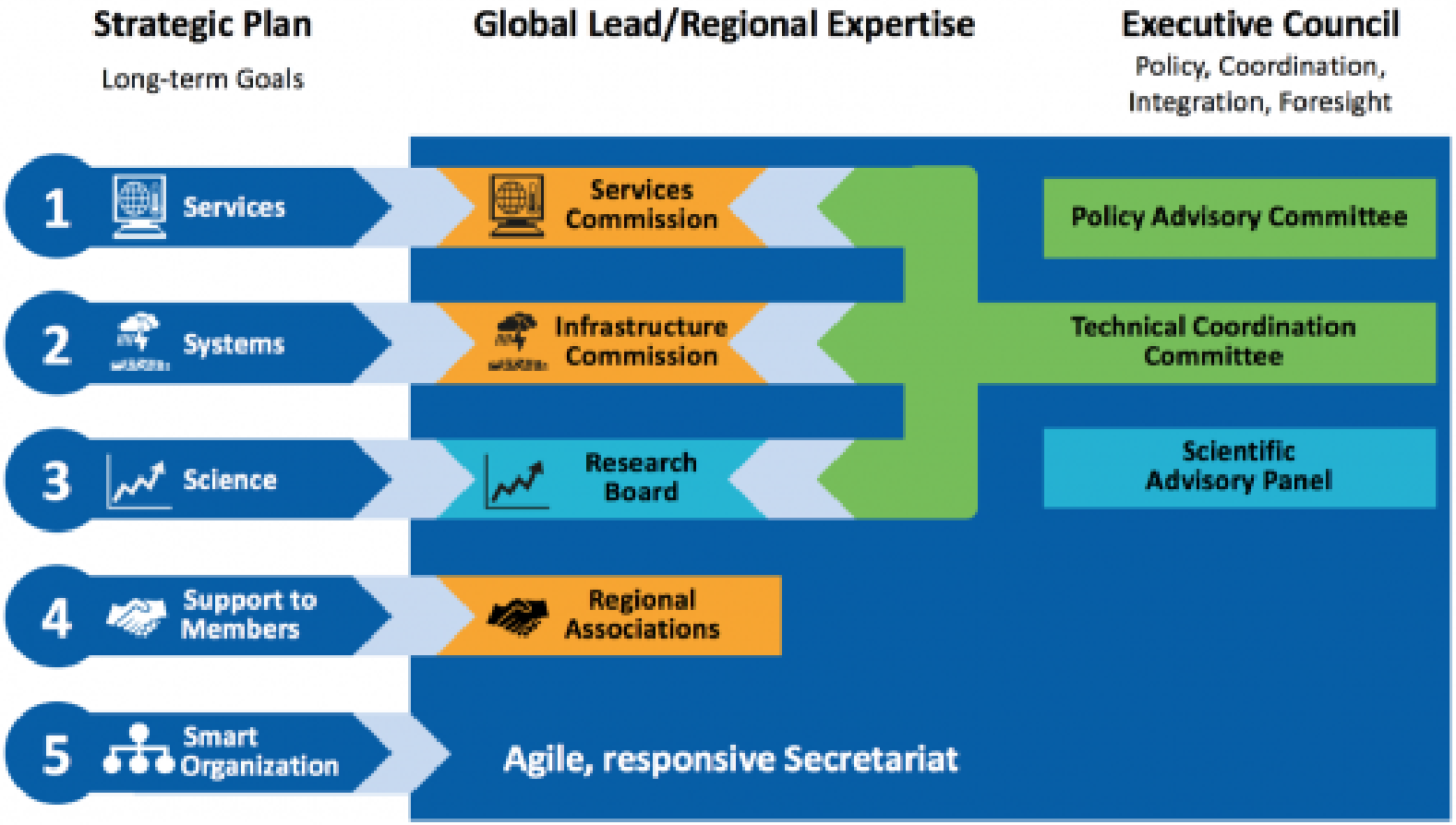
• Strengthen **national multi-hazard early warning/alert systems** • Broaden provision of **policy- and decision-supporting climate, water** and **weather services**	• Optimize **observation data acquisition** • Improve access to, exchange and management of **Earth system observation data and products** • Enable access and use of **numerical analysis and prediction products**	• Advance **scientific knowledge of the Earth system** • Enhance **science-for-service value chain** to improve predictive capabilities • Advance **policy-relevant science**	• Enable developing countries to **provide** and **utilize essential weather, climate, hydrological** and related **environmental services** • Develop and sustain **core competencies** and **expertise** • Scale up **partnerships**	• Optimize WMO **constituent body structure** • Streamline WMO **programmes** • Advance **equal, effective** and **inclusive participation**

Coordination Group for Meteorological Satellites

See https://library.wmo.int/index.php?lvl=notice_display&id=21525

CGMS

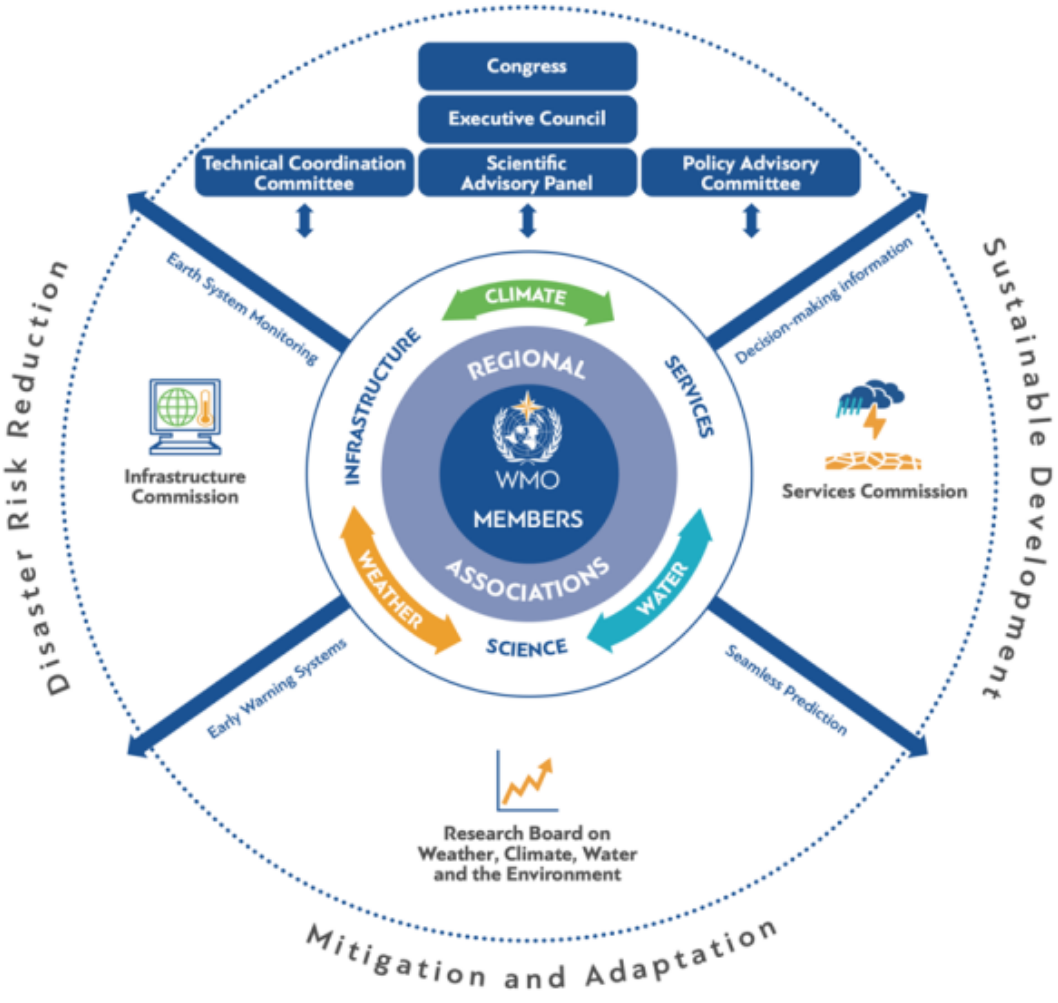
WMO Constituent Reform



Coordination Group for Meteorological Satellites

CGMS

WMO Constituent Body Reform



Coordination Group for Meteorological Satellites

CGMS

INFCOM Standing Committees and Study Groups

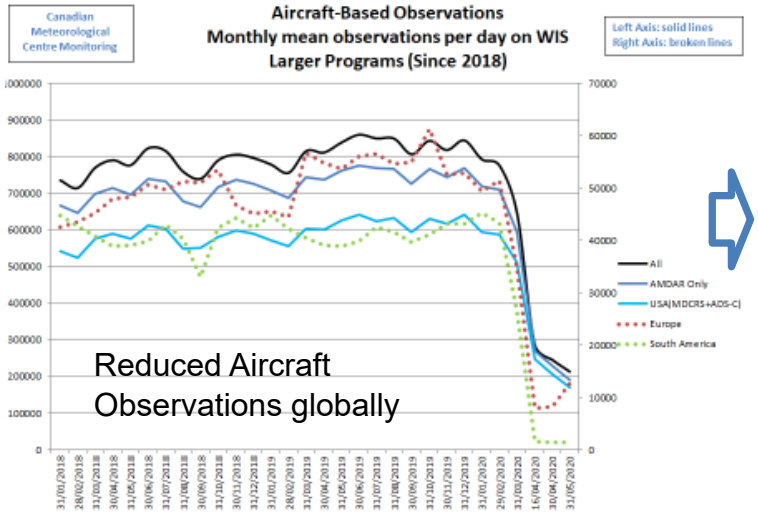
a) Standing Committee on **Earth Observing Systems and Monitoring Networks** (SC-ON) ,
b) Standing Committee on **Measurements, Instrumentation and Traceability** (SC-MINT) ,
c) Standing Committee on **Information Management and Technology** (SC-IMT) ,
d) Standing Committee on **Data Processing for Applied Earth System Modelling and Prediction** (SC-ESMP) ,
e) Study Group on **Data Issues and Policies** (SG-DIP) ,
f) Study Group on **Ocean Observations and Infrastructure Systems** (SG-OOIS) ,
g) Study Group on **Cryosphere Crosscutting Functions** (SG-CRYO) ,
h) Study Group on **Implementation of the Global Basic Observing Network** (SG-GBON)
i) Joint Study Group on the **Global Climate Observing System** (JSG-GCOS)

INFCOM Expert Teams

- Expert Teams on **Space Systems and Utilization** (ET-SSU)
- Joint xpert Team On **Earth Observing Systems Design And Evolution** JET-OSDE)
- Expert Team on **Radio Frequency Coordination** (ET-RFC)
- Proposed Expert Team on **Space Weather** – to be confirmed

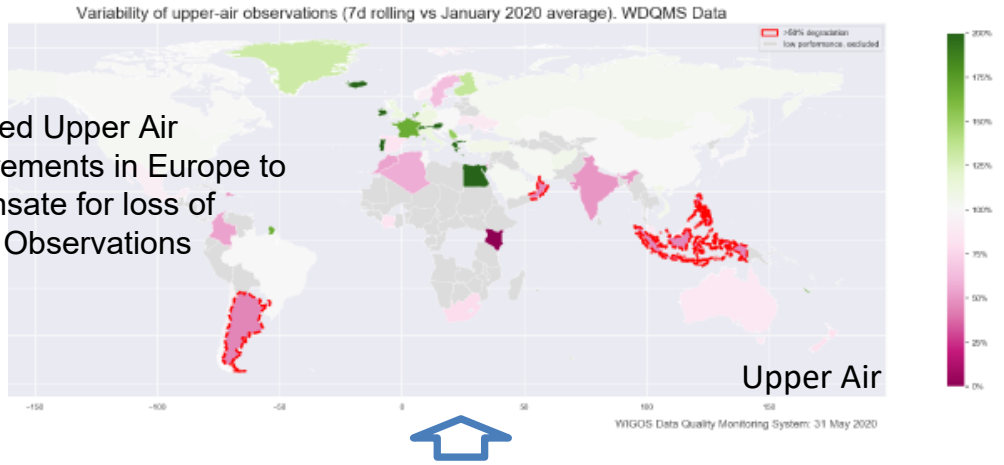
Monitoring of Observing Networks

- WMO has been improving the monitoring of the status of observations and access to the data
- WMO's WIGOS Data Quality Management System (WDQMS, https://wdqms.wmo.int)
  - Provides information on the status of reporting of observations in near-real time
  - WMO and GCOS are extending this to include the GCOS Climate Networks, the GCOS Surface Network (GSN) and the GCOS Upper Air Network (GSRN)
  - Work is also underway to provide similar information on ocean observations to complement the work of JCOMMOPS
- Updates at https://public.wmo.int/en/media/press-release/covid-19-impacts-observing-system
- WMO is coordinating global monitoring and working with Members to identify risks
- GCOS will include the impacts of COVID-19 in their upcoming revision of the status report

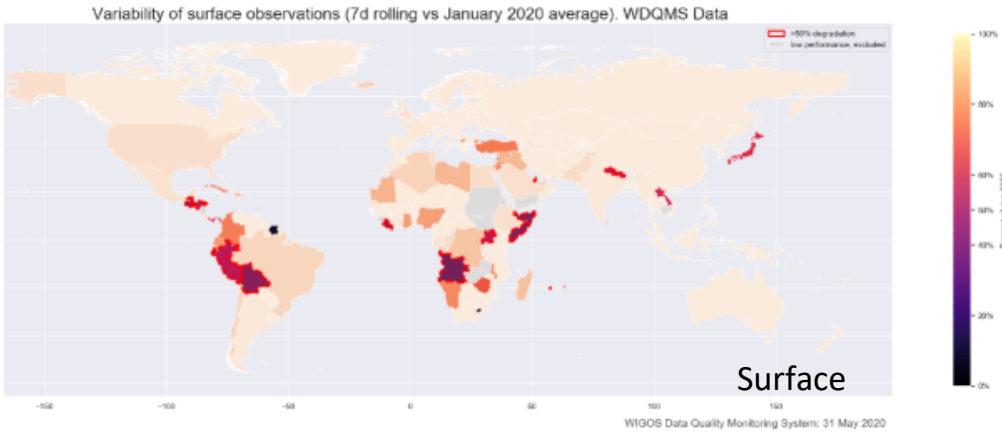


Increased Upper Air measurements in Europe to compensate for loss of Aircraft Observations

Impact of COVID-19 on climate observations



Reduced Observations in some countries with manual observations



Other Surface Observations

It is difficult to quantify the impact on other observations (e.g. cryosphere, biosphere), as these are not (yet) monitored daily

Surface observations are being interrupted where they are made manually and there is a slow degradation of automatic measurements where maintenance and calibration cannot be performed.

e.g. the Long-Term Ecological Research programme (LTER) in the US, noted that this might lead to the first interruption in more than 40 years at some sites.

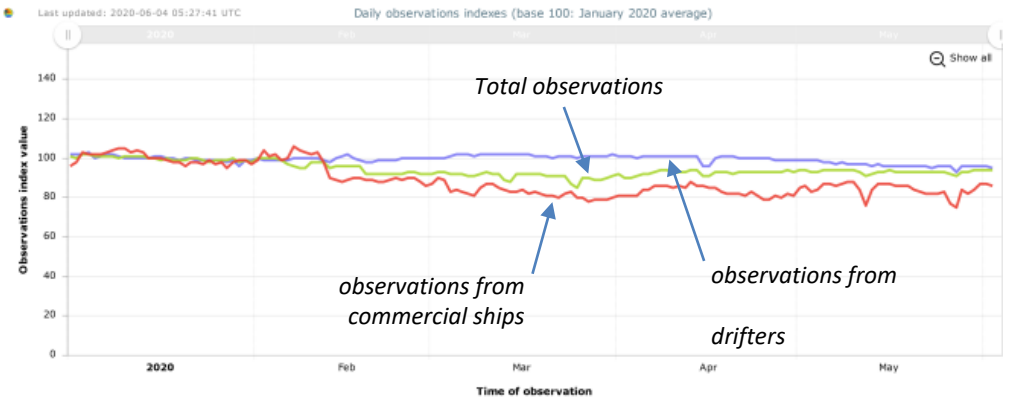
Coordination Group for Meteorological Satellites

CGMS

GOOS survey on COVID -19 impact on the observing system

Limited immediate impact on data flow

- **GLOSS:** maintaining function
- **SOT-ASAP:** decreased data but maintaining function
- **SOT-SOOP:** data stream is impacted in the near term
- **SOT VOS:** data flow decreased (~15%)
- **Argo:** deployments impacted
- **DBCP Drifters:** maintained for now
- **OceanSITES:** major risks appear to be unfolding, complex
- **DBCP Moored buoys:** some data flow affected
- **OceanGliders:** heavily impacted in the near term, uncertainty remains
- **GO-SHIP:** major impacts to long established observing lines



Lessons learned:

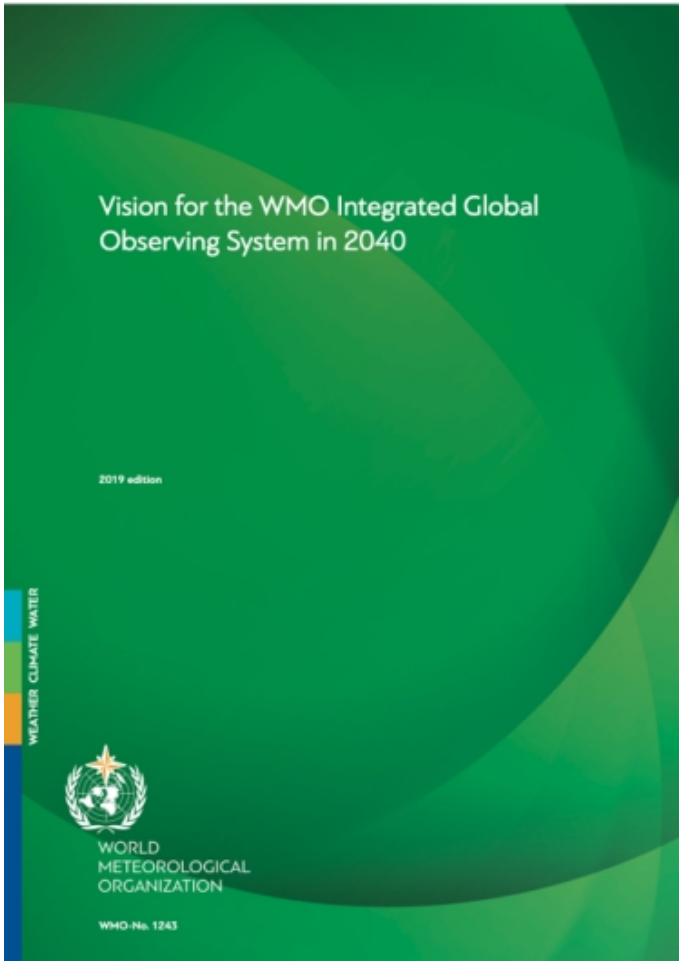
- Autonomous platforms and sensors are key
- Need increased international cooperation, sharing of resources such as ship-time
- Prioritize sustained observations can allow them to operate under different conditions

(Slide courtesy Toste Tanhua, GOOS SC Chair)

Coordination Group for Meteorological Satellites

CGMS

WIGOS Implementation Status



- Describes the space- and surface based observing networks we desire to operate by 2040
- The space-based component consists of four subcomponents:
  1. Backbone system with specified orbital configuration and measurement approaches
  2. Backbone system with open orbit configuration and flexibility to optimize the implementation
  3. Operational pathfinders, and technology and science demonstrators
  4. Additional capabilities (e.g. contributions by commercial operators)

Coordination Group for Meteorological Satellites

See https://community.wmo.int/vision2040

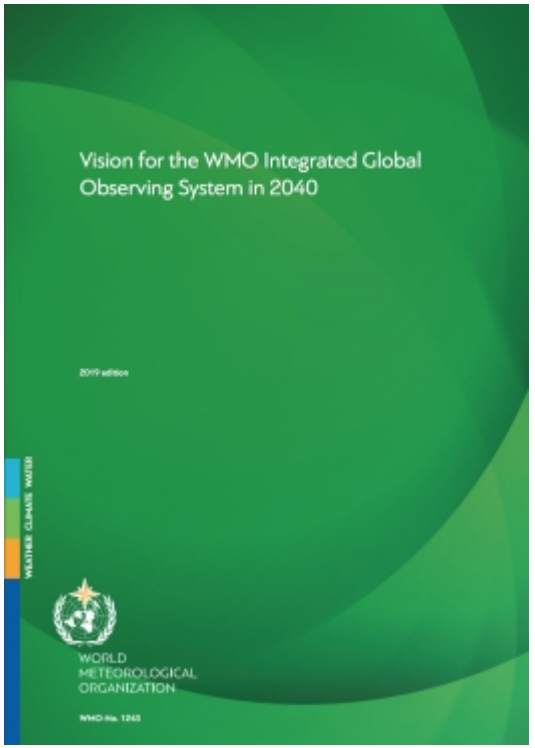
CGMS

WIGOS Vision 2040 Implementation

- WMO plans a consultancy to develop a high-level plan
  - Guidance on the Evolution of the Global Observing Capabilities in Response to the WIGOS Vision 2040
  - Guidance on the development of a national implementation strategy for the Vision of WIGOS 2040
  - Capacity development opportunities and guidance based on Systematic Observations Financial Facility (SOFF) and Country Support Initiative (CSI)
  - Communication Plan on the need to respond to Vision for WIGOS in 2040

Implementation of WIGOS Vision 2040

- WMO welcomes updated CGMS baseline and CGMS contributions towards implementation of the Vision for WIGOS in 2040
- WMO Members rely on space-based observing system operated by CGMS Members
- Request received from RA-II to assure continuation of IODC



Coordination Group for Meteorological Satellites

CGMS

- What observing networks are required
- Resolution 40 (Annex)
- Global Basic Observing Network (GBON)

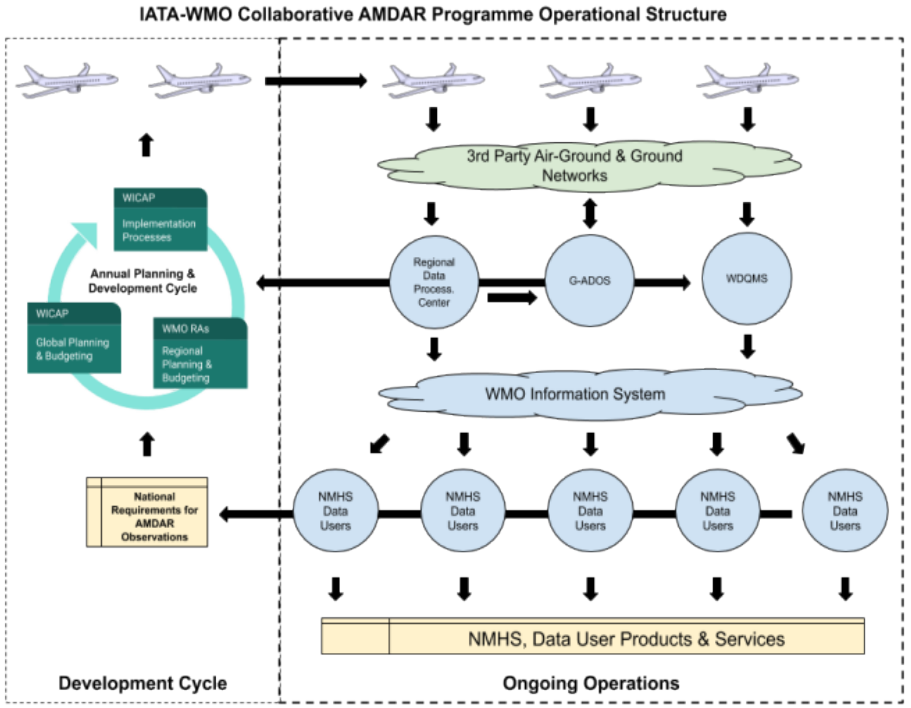
- What data is shared
- Intellectual property
- Resolution 40, 60, 25

- Capability gaps
- Capacity gaps
- Funding limitations
- Systematic Observations Funding Facility (SOFF)

WMO-IATA Collaborative AMDAR Programme (WICAP)

- Working Arrangement established between IATA and WMO on AMDAR Program
  - 2017 - to develop concept of operations and principles for future collaboration
  - 2020 update - to cover collaborative development of AMDAR – WICAP

- Roles of organizations
  - WMO
    - Requirements for data and coverage
    - Operation and resourcing of regional programs
    - Reception, management and use of data
  - IATA
    - Airline and aviation business case and promotion of benefits of participation
    - Technical process for onboard implementation
    - Data policy, licensing and aviation utilization
- Benefits
  - Formalised data policy
  - Coordinated expansion over data-sparse areas including turbulence and water vapour monitoring
  - WMO Regional approach can halve cost of program operation and data comms costs
  - More effective and efficient partnership with new airlines – expect increase 40 -> ~80

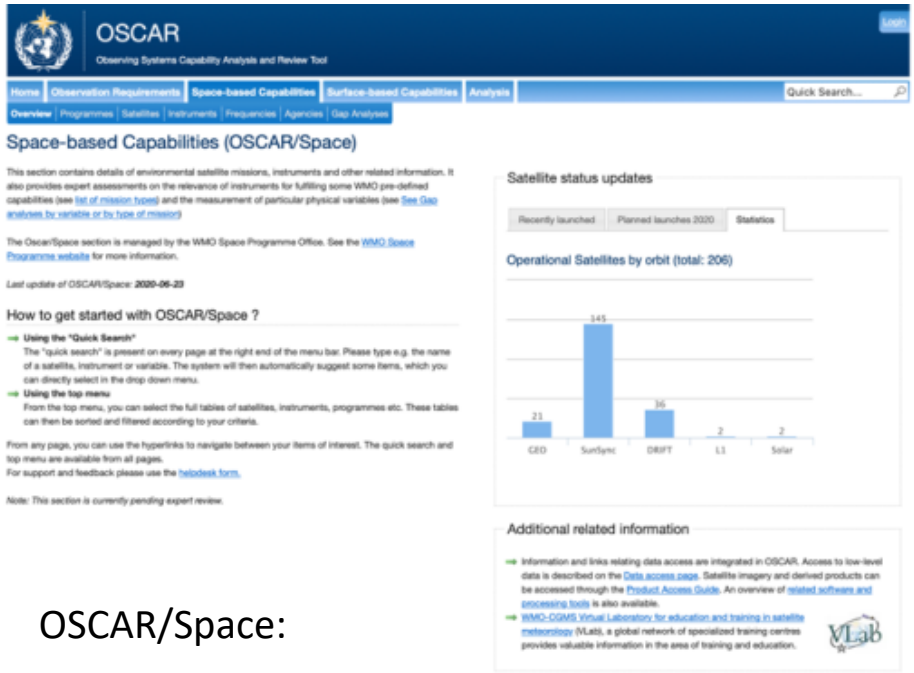


WMO OMM

OSCAR/Space Development and Maintenance

- WMO has established a framework for continuing OSCAR/Space development
- IT company contracted to further develop OSCAR/Space
- **Phase 1:** upgrades to the OSCAR/Space technical stack – presently in user acceptance testing.
- **Phase 2:** upgrades to OSCAR/Space to make it compliant with WIGOS metadata records - to be kicked off in Q2/2020

- Continuous content maintenance with the support of O/SST (OSCAR Space Support Team)



OSCAR/Space:

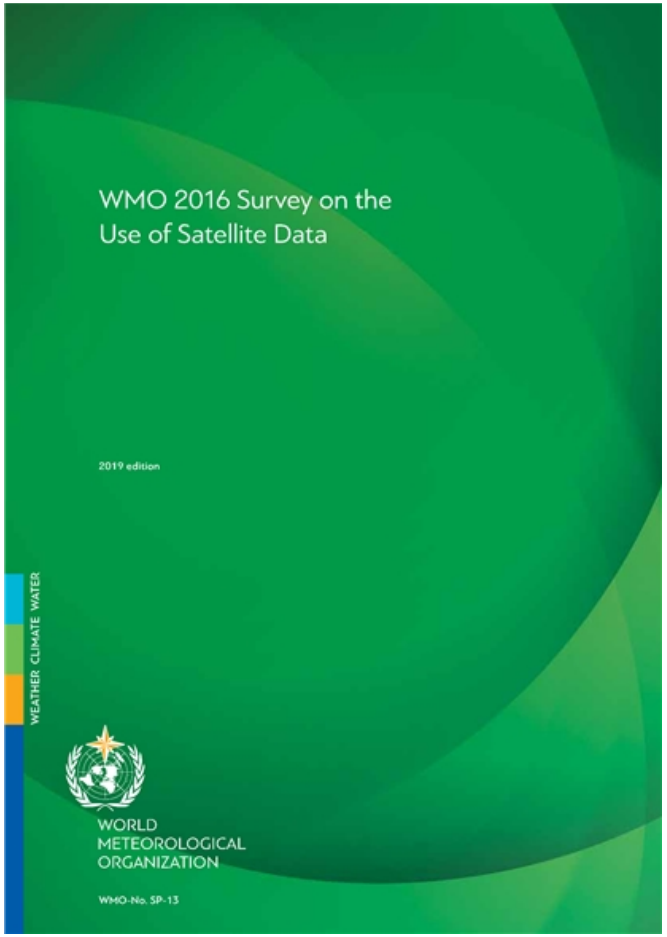
- 770 satellites
- 1000 instruments: 650 for Earth Observation and 350 for Space Weather.
- Around 4000 individual content edits annually
- On average 200 user visits per day

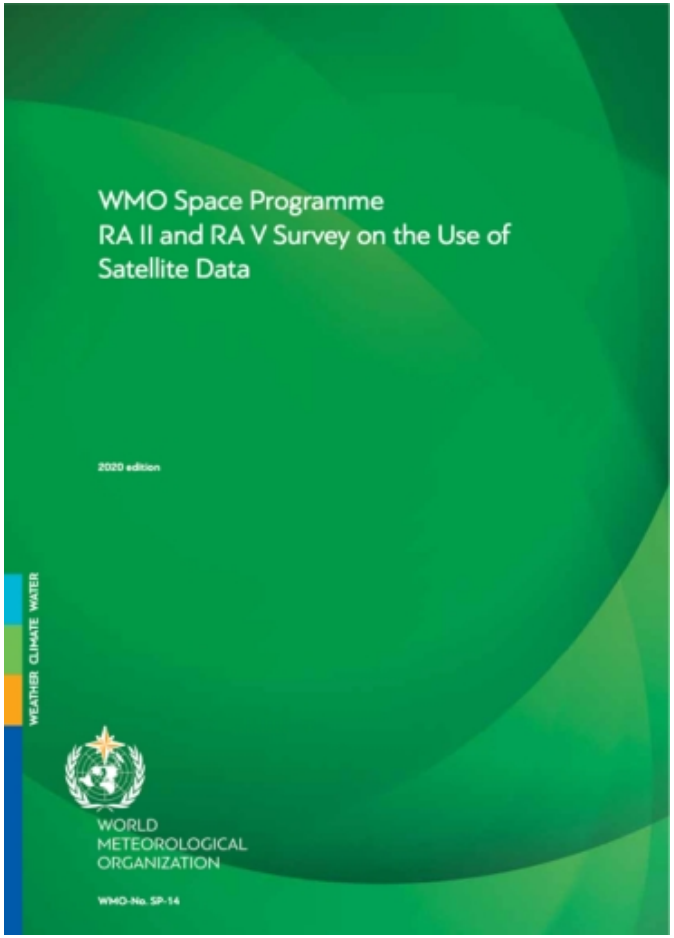
Coordination Group for Meteorological Satellites

See https://www.wmo-sat.info/oscar/spacecapabilities

CGMS

Satellite Data Use Surveys



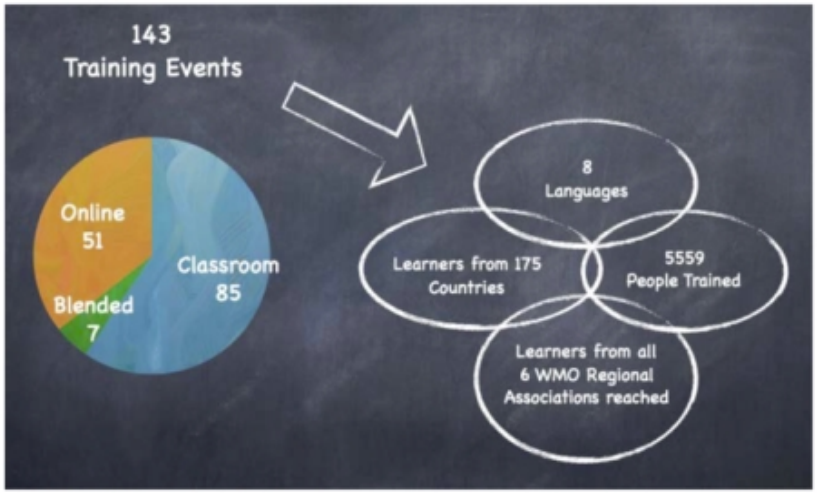


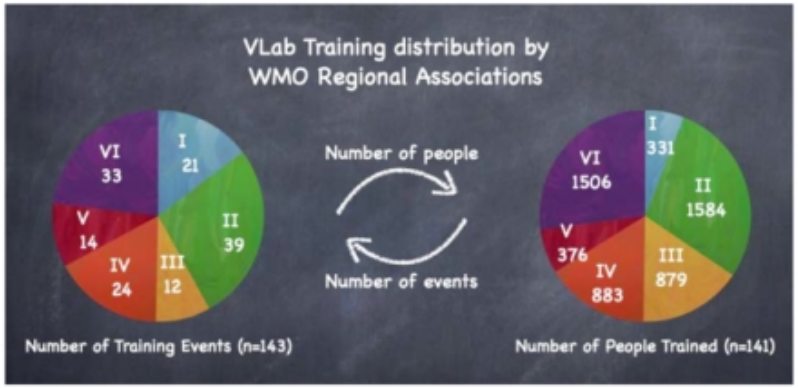
Coordination Group for Meteorological Satellites

See https://library.wmo.int/index.php?lvl=notice_display&id=20787 and https://library.wmo.int/index.php?lvl=notice_display&id=21723

CGMS

Virtual Laboratory for Training and Education in Satellite Meteorology



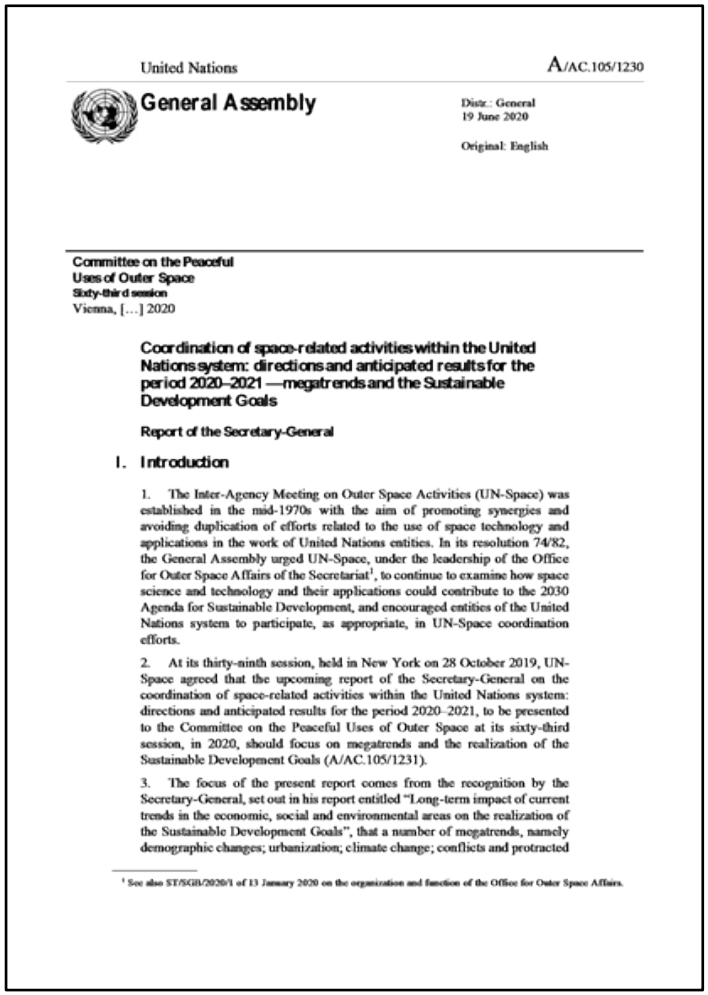


Coordination Group for Meteorological Satellites

See https://www.wmo-sat.info/vlab/

CGMS

WMO and UN-Space



United Nations A/AC.105/1230

General Assembly

Distr.: General
19 June 2020

Original: English

Committee on the Peaceful
Uses of Outer Space
Sixty-third session
Vienna, […] 2020

Coordination of space-related activities within the United Nations system: directions and anticipated results for the period 2020–2021 —megatrends and the Sustainable Development Goals

Report of the Secretary-General

I. Introduction

1. The Inter-Agency Meeting on Outer Space Activities (UN-Space) was established in the mid-1970s with the aim of promoting synergies and avoiding duplication of efforts related to the use of space technology and applications in the work of United Nations entities. In its resolution 74/82, the General Assembly urged UN-Space, under the leadership of the Office for Outer Space Affairs of the Secretariat[1], to continue to examine how space science and technology and their applications could contribute to the 2030 Agenda for Sustainable Development, and encouraged entities of the United Nations system to participate, as appropriate, in UN-Space coordination efforts.

2. At its thirty-ninth session, held in New York on 28 October 2019, UN-Space agreed that the upcoming report of the Secretary-General on the coordination of space-related activities within the United Nations system: directions and anticipated results for the period 2020–2021, to be presented to the Committee on the Peaceful Uses of Outer Space at its sixty-third session, in 2020, should focus on megatrends and the realization of the Sustainable Development Goals (A/AC.105/1231).

3. The focus of the present report comes from the recognition by the Secretary-General, set out in his report entitled "Long-term impact of current trends in the economic, social and environmental areas on the realization of the Sustainable Development Goals", that a number of megatrends, namely demographic changes; urbanization; climate change; conflicts and protracted

[1] See also ST/SGB/2020/1 of 13 January 2020 on the organization and function of the Office for Outer Space Affairs.

- WMO contributes to annual reports of the UN Secretary General on the coordination of space-related activities within the UN System
- 2020-2021: Megatrends and Sustainable Development
- WMO mentioned 37 times

See https://www.unoosa.org/oosa/en/ourwork/un-space/index.html

Important Events

- 28 Sept to 2 Oct 2020 - WMO Executive Council 72nd Session
- 23 Oct – Stakeholder Consultation on on satellite data and WMO Data Policy
- 9 to 13 November 2020 - Joint Session of Infrastructure and Services Commission and Research Board
- 16 to 19 November – WMO Data Conference
- April 2021 – Extraordinary Executive Council
- Mid 2021 – Extraordinary Congress

CGMS Contributions to WMO Trust Funds

- WMO-CGMS VLab Trust Fund
  - CGMS Members are invited to contribute to the VLab Trust Fund
  - Contributions essential for continuing the funding of the VLab Technical Support Officer and for sustaining VLab activities
- WMO Space Programme Trust Fund
  - CGMS Members are invited to contribute to the WMO Space Programme Trust Fund
  - Contributions essential for continuing the maintenance and upgrading of OSCAR/Space

Key issues of relevance to CGMS:

- Take note of WMO Constituent Reform.
- Take note of new Governance Structures.
- Take note of WIGOS developments.
- Take note of key initiatives
- Take note of calendar of events
- Take note of WMO Space Programme activities.

To be considered by CGMS:

- CGMS Agencies to contribute experts
- CGMS support to VLab Trust Fund
- CGMS support to WMO Space Programme Trust Fund
- Request to CGMS to help ensure IODC coverage
- Participation and support for upcoming events

Thank you
Merci

Dr Anthony Rea
Director Infrastructure Department, WMO
area@wmo.int

Coordination Group for Meteorological Satellites

CGMS

OSCAR/Space development work Phase 1

- In addition to functionality improvements, a main goal of the ongoing development work is to upgrade the OSCAR/Space technical stack
  - Upgrade the CakePHP framework, MySQL and related plugins and libraries, including jquery, to the latest supported versions
  - Make an analysis of virtual development, deployment and operations platforms (e.g Docker, Kubernetes, Heroku, Jelastic cloud) and migrate the OSCAR/Space platform to it

Task	Task description
1.	Upgrade the OSCAR/Space (AS-IS) technological stack
2.	Implement the Satellite Status "Presumably Inactive"
3.	Not to display in the Gap Analysis the variables not processed in OSCAR/Space
4.	Add the Sorting Criteria of the instruments in the Gap Analysis by variable
5.	Implement filters to show the Gap Analysis by variable by specific instrument or instruments
6.	Correct the Satellite Status Update in OSCAR/Space
7.	Implement OpenSearch APIs to display OSCAR/Space content in a browser
8.	Develop permanent URL schema for the satellites and instruments in OSCAR/Space

OSCAR/Space development work Phase 2

- The main theme for the next development phase is to make OSCAR/Space compliant with WIGOS metadata records.
- The implementation plan will be based on the work conducted by ICG/WIGOS Task Team on the WIGOS Metadata and will integrate WIGOS metadata records into the OSCAR/Space database

Task	Task description
1.	Make OSCAR/Space compatible to use WIGOS metadata records
2.	Update OSCAR/Space satellite classification in line with groups identified in the Vision for WIGOS in 2040 (WMO-No. 1243) and to update the satellite status page at http://www.wmo.int/pages/prog/sat/satellitestatus.php.
3.	Extend Gap Analysis to support WIGOS displaying only current and planned satellites, selecting the orbit type (GEO, sun-synchronous, in six GEO sectors, in three ECT ranges, drifting in low or high inclination, at L1, in HEO, other) and including specific filters like for example status, ECT, drifting, longitude
4.	Introduce filtering in Gap Analysis to match granularity between the instrument naming convention in OSCAR/Space and WIGOS Vision
5.	User interface update to improve the usability of OSCAR/Space including new look and fell, as well as, improved features in content editing and bug fixes.

WMO Constituent Reform

- WMO Members nominated Experts through the WMO Experts Data Base
- Technical Commissions (INFCOM, SERCOM) and Research Board established
- Standing Committee and Expert Teams established under the Technical Commissions
- Discussions with co-sponsored programmes (GCOS, JCOMM/JCB)