



WMO matters for coordination with CGMS space agencies

Presented to CGMS-51 Plenary session

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Presentation outline

- The Nineteenth World Meteorological Congress (Cg-19) outcomes
 - Strategic Initiatives
 - Early Warning for All (EW4All)
 - Global Greenhouse Gas Watch (G3W) – See Lars Peter's talk CGMS-51-WMO-WP-01
 - Cryosphere Services
- Data Policy Implementation
 - Core Satellite Data Workshop
 - Plans for the WMO Consultative Meeting on High-level Policy on Satellite Matters
 - INFCOM-3 session
- PSTG follow on - INFCOM Task Team on Polar and Cryosphere Space (PCS-TT)
- WMO Position on the WRC-23 agenda

Congress Outcomes



Elections

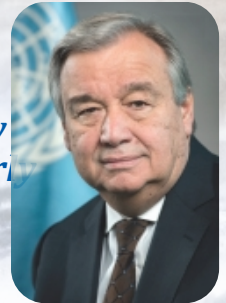
- Professor A. Celeste SAULO as the Secretary-General
- Dr Abdulla AL MANDOUS (United Arab Emirates) as President
- Mr Daouda KONATE (Côte d'Ivoire) as First Vice-President
- Mr Eoin MORAN (Ireland) as Second Vice-President
- Dr Mrutyunjay MOHAPATRA (India) as Third Vice-President
- Executive Council

**Early
Warnings
for All**

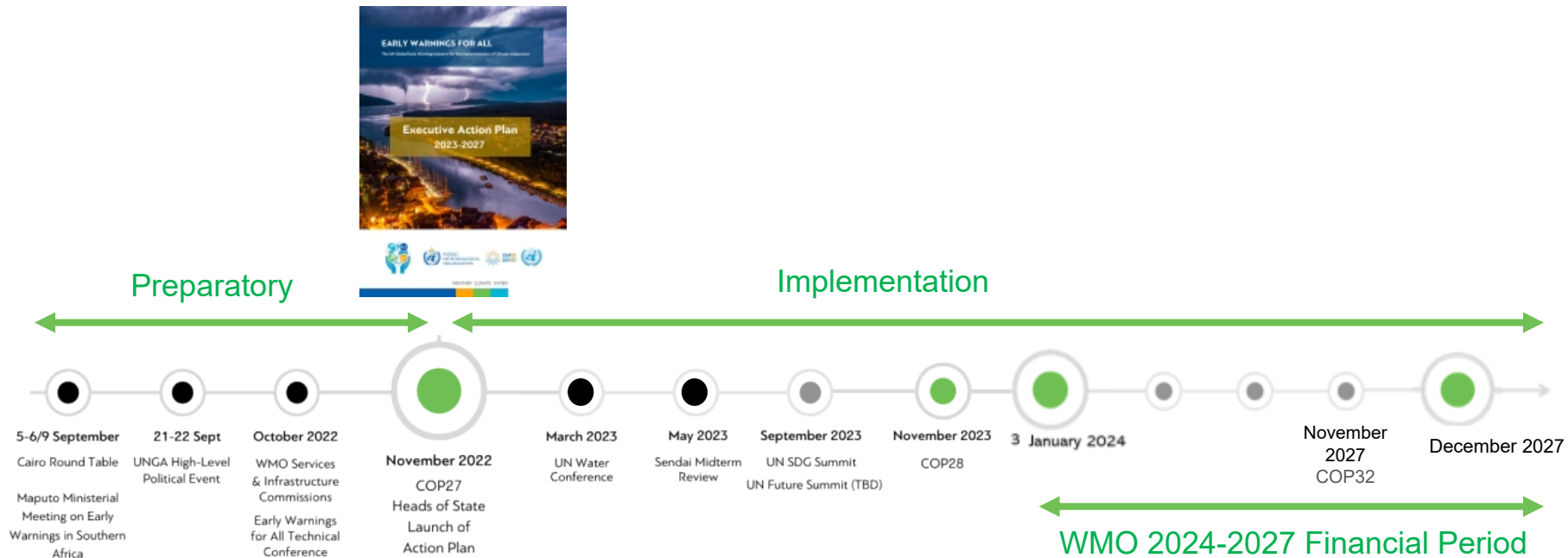
One Request

"Today I announce the United Nations will spearhead new action to ensure every person on Earth is protected by early warning systems within five years."

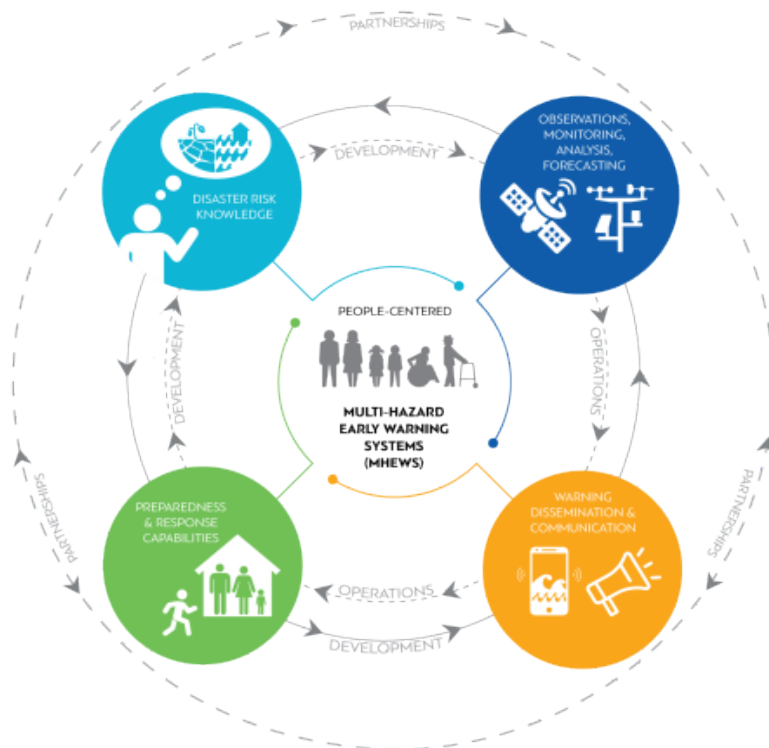

António Guterres, Secretary-General of the United Nations, 23rd March 2022



Timeline




Added Value of the Initiative to the Members


Disaster risk knowledge
Systematically collect data and undertake risk assessments

- Are the hazards and the vulnerabilities well known by the communities?
- What are the patterns and trends in these factors?
- Are risk maps and data widely available?



Detection, observations, monitoring, analysis and forecasting of hazards
Develop hazard monitoring and early warning services

- Are the right parameters being monitored?
- Is there a sound scientific basis for making forecasts?
- Can accurate and timely warnings be generated?



Preparedness and response capabilities
Build national and community response capabilities

- Are response plans up to date and tested?
- Are local capacities and knowledge made use of?
- Are people prepared and ready to react to warnings?



Warning dissemination and communication
Communicate risk information and early warnings

- Do warnings reach all of those at risk?
- Are the risks and warnings understood?
- Is the warning information clear and usable?



WMO



IFRC
FICR



UNDRR
UN Office for Disaster Risk Reduction



WORLD
METEOROLOGICAL
ORGANIZATION



Global Meteorological Infrastructure

Global meteorological infrastructure
designed and coordinated by INFCOM



Specific responses needed by the space agencies

INFCOM/TT-EW4All - Task Team on EW4All:

- INFCOM is planning three work streams:
 - **Satellite products/applications, including nowcasting products;** NWP products and surface-based observations using the RBON design process.
 - **Mapping of existing products/applications against priority hazards and by region (RA-I and -VI, RA-II and -V, RA-III and -IV)**
 - Looking for recommendations for additional products/applications

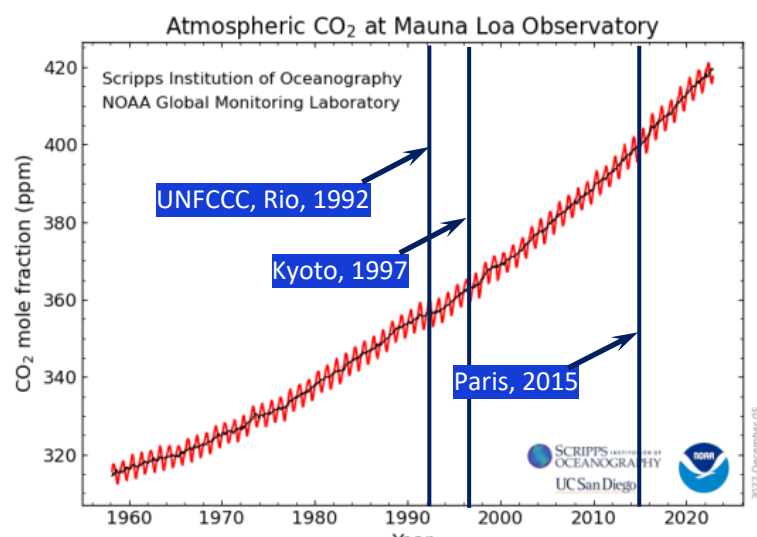
SERCOM/SC-DRR/ET-EWS: Expert Team on Early Warning Services

Priority hazards as per SG's presentation at the Senior Advisory Board:

- Heatwaves
- Floods
- Tropical cyclones – multi-hazards: wind, rain, storm surge, high wave...
- Drought
- Other priority hazards identified by Regions/Nations

WMO's Global Greenhouse Gas Watch (G3W)

Progress toward reducing net anthropogenic GHG emissions under the Paris Agreement continues to be slow, in part because the assessment of the effectiveness of mitigation action does not take into account its impact on atmospheric greenhouse gas concentrations.



Internationally coordinated, global, top-down monitoring of greenhouse gas fluxes will help support the efforts of the Parties to the Paris Agreement meet their targets



WMO Greenhouse Gas Monitoring Symposium, 30.01-01.02 2023
Consensus Statement authored by 170 participants (excerpt):

- There is an urgent need to {...} develop global, internationally coordinated GHG monitoring to help accurately quantify greenhouse gas sources and sinks
- WMO {...} is uniquely positioned to play a significant role in advancing this
- Recognizing the urgency, we therefore call on WMO, {...}, to take ownership via
 - Convening experts and stakeholders across Un, international programs,
 - Leading the development of an initial concept for an integrated framework {...}

WMO's Global Greenhouse Gas Watch (G3W)

Global Greenhouse Gas Watch (G3W): Top-down monitoring of GHG fluxes building 60+ years of World Weather Watch experience and observing expertise of GAW

Key components

- Integrated global observing system (both surface- and space-based)
- Near-real time international exchange of all observations;
- 24/7 operational GHG modeling (multiple model systems), converting observations into flux estimates;
- Routine internationally coordinated intercomparison and verification of model output;

Primary output

- Time-continuous global fields of CO₂, CH₄ and N₂O concentrations;
- Consolidated, top-down, monthly estimates of GHG fluxes at (initial) global 100 by 100 km resolution (1 by 1 km will become possible);

Users of GGMI output

- Parties to the Paris Agreement (Global Stocktake);
- Regional and local users, e.g. via IG3IS;
- Participants in voluntary carbon markets, ;
- Scientific community working on GHG budgets;
- IPCC, for emissions pathways, future scenarios;

Timeline:

- *COP27/SBSTA-57; nearly all Parties expressed very strong support for this;*
- *WMO Greenhouse Gas Monitoring Symposium, Jan-Feb 2023; very strong support from the research community;*
- *WMO Executive Council (Feb-Mar 2023); green light for Congress proposal;*
- **19th World Meteorological Congress, May -June 2023; Goal: Intergovernmental agreement to develop G3W;**
- Development starting this year - pilot capabilities already exist in Europe, the US, Japan, ..., international coordination and (especially) exchange of observations is missing; this is where WMO can help;
- *Multi-party operational capability at 100 x100 km within five years;*
- *Operational capability at 1x1 km within 10 years, if adequately resourced;*

Core Satellite Data Workshop – Updated Approach

- 4-7 December 2023 in Geneva, Switzerland at the WMO building.
- Stakeholder consultations framed primarily in terms of importance of the satellite data for global NWP and nowcasting
 - To get common view of Core satellite data definition for NWP and nowcasting.
 - To develop an initial list of Earth system data to be exchanged as core data.
 - To finalize WIGOS regulatory material establishing the commitment to providing core satellite data.
- Target audience: space agencies, NWP and data assimilation community members, including global processing centers, regional experts/technical coordinators, private sector
- Will seek endorsement from CM in February and INFCOM 3 in April followed by Executive Council and finally WMO Congress for the decision by WMO members
- Status update will be presented in CGMS-52

Plans for the WMO Consultative Meeting on High-level Policy on Satellite Matters

- First week in February 2024; 1 or 2 days (TBC)
- Geneva, Switzerland at the WMO building
- A high-level dialogue between the satellite operators and WMO representatives
 - The last CM was CM-14 23rd June 2018 (at the occasion of EC-70) – 5 years ago!
 - The CM session was normally held every two years (Resolution 10, EC-66)

Plans for the WMO Consultative Meeting on High-level Policy on Satellite Matters

- Vision of the space-based observing system
- Data policy considerations for satellite data, including core data definition
- Socio-economic benefits of satellite programmes
- Dialogue with private sector
- Satellite support to WMO major strategic priorities, currently:
 - Climate and GHG Monitoring
 - Early Warning for All
 - Earth System Modelling

Plans for INFCOM-3

- INFCOM-3 will be 15-19 April 2024;
- SERCOM-3: 4-9 March 2024
- Easter: 31 March 2024
- Ramadan: 10 March to 8 April 2024
- EC-78: 24-28 June 2024, the documents deadline of 25 May 2024

Cg-19 Cryosphere day

Cg-19: new Strategic Objective 1.5: Accelerate the development of integrated systems and services to address global risks associated with irreversible changes in the cryosphere and downstream impacts on water resources and sea level rise

Cg-19: Resolution (3.2(3)): High-level priorities to address global and regional impacts of changes in the cryosphere:

- *Including action: Sustain advocacy for critical satellite observations and data over polar and high mountain regions to support risk monitoring and assessments and the development of necessary services.*

INFCOM2: Closing the gap on the integration of cryosphere in the Earth system approach of WMO:

- *agreed to ensure the continuity of sustained engagements with the space agencies that operate cryosphere observing missions,*
- *focus on the acquisition and distribution of cryosphere satellite datasets, in support of scientific research and for advancing their use for operational applications.*

WMO/INFCOM Proposed Task Team on Polar and Cryosphere Space

WMO role in coordinating with Space Agencies on cryosphere (polar and high mountains) observations:

- 2007/08: International Polar Year – Space Task Group: planning, processing, archiving of EO legacy datasets,
- 2011-2020: Polar Space Task Group, EC-PHORS: acquisition and distribution of fundamental satellite datasets and products
- 2022: INFCOM2 – agree to establish TT – coordination for advancing access to space-based cryosphere observations,
- 2023: Working Group II recognizes the need for advancing space-based observations for cryosphere, polar and high-mountain areas and recommends WMO to continue the proper mechanism to foster such activities.

Draft Mandate and Terms of Reference:

- WMO working with representatives of
 - CGMS (Bojan Bojkov, Thorsten Markus)
 - CEOS (Maria Berdahl)
- Final approval by President INFCOM
- Reflect WMO strategic objectives embracing a holistic Earth System approach
- Under the remit of INFCOM GCW and SC-ON (through ET-SSU)
- Engage Space Agencies, WMO structures, WMO co-sponsored programmes, partners (WCRP, GCOS, IICWG, SCAR, etc.)

(WMO/INFCOM) Proposed Task Team on Polar and Cryosphere Space

Mandate (within the framework of the INFCOM/Global Cryosphere Watch)

Act as a consultative mechanisms between WMO Members and Space Agencies (through CEOS and CGMS) on the acquisition, distribution, and application of cryosphere satellite datasets,

Address WIGOS 2040 vision and the WMO RRR process as applicable to cryosphere, for scientific research and advancing their use for operational applications (NWP, hydrological and climate projections, etc..)

Foster consultations on products requiring multi-agency coordination and acquisition planning: SAR and high-resolution imagery

Provide feedback to Space Agencies on observational priorities, on opportunities for optimization the use of and evolution of international constellations

Enable coordination on the development of requirements for ground-based observations (cal/val)

Roadmap:

- 10.2023: agreement of AG-GCW and SC-ON chairs,
- 11.2023: CEOS Plenary,
- 11.2023: approval INFCOM President,
- 12.2023: member nominations
- Q1 2024: 1st meeting,
- 04.2024: INFCOM3

WMO Position on the WRC-23 agenda

- The World Meteorological Organization (WMO), through its Expert Team on Radio Frequency Coordination (ET-RFC), has developed the Position Statement on the World Radiocommunication Conference 2023 (WRC-23) agenda. It contains the positions on 21 agenda items of WRC-23 that are of prime interest or concern to WMO members and was adopted by the 19th World Meteorological Congress in Geneva in May 2023.
 - Continuity of sea surface temperature (SST) measurements, which is currently under a significant threat due to the planned massive deployment of communication systems, especially International Mobile Telecommunications (IMT), in the 6/7 GHz frequency range (WRC-23 Agenda Item 1.2, annex 2 of the document).
 - The recognition of space weather in the context of the ITU Radio Regulations to ensure the protection of space weather sensor operations in the future (WRC-23 Agenda Item 9.1 Topic A).

To be considered by CGMS:

- CGMS Members to respond to a data call on the existing products/applications against priority hazards (EW4All).
- CGMS Members are invited to attend the Core Satellite Data Workshop (Dec 2023) and the WMO Consultative Meeting on High-level Policy on Satellite Matters (Feb 2023)
- WMO invites CGMS Members to contribute to consultations on Proposed Task Team on Polar and Cryosphere Space