

STATUS OF THE ARCHITECTURE FOR CLIMATE MONITORING FROM SPACE

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Contents

- I. Climate Architecture Background
- II. Cg-18 Resolution
- III. Cg-18 Climate Architecture Event



I. Climate Architecture Background



Background

- Discussions on the development of an “Architecture for Climate Monitoring from Space” were initiated by Jim Purdom and Tillmann Mohr around 2005-2009
- Aimed to engage “R&D space agencies” in the same way as operational space agencies were engaged in weather monitoring
- Led to Resolution 19 (Cg-XVI) of World Meteorological Congress in 2011



Resolution 19 (Cg-XVI)

ABRIDGED FINAL REPORT OF SIXTEENTH CONGRESS

Resolution 19 (Cg-XVI) - DEVELOPMENT OF AN ARCHITECTURE FOR CLIMATE MONITORING FROM SPACE

THE CONGRESS,

Noting:

- (1) Article 2 of the Convention of the World Meteorological Organization,
- (2) Resolution 5 (Cg XIV) - WMO Space Programme,
- (3) Resolution 30 (Cg-XV) - Towards enhanced integration between WMO observing systems,
- (4) Paragraph 9.2.5 of the *Abridged Final Report with Resolutions of the Fifteenth World Meteorological Congress (WMO-No. 1026)* reaffirming the Executive Council decisions to provide full support for the GEO process and resulting GEOSS and to support its implementation to the maximum extent possible within the WMO mandate,
- (5) Resolution 3 (Cg-XVI) - Global Observing System,
- (6) Resolution 48 (Cg-XVI) - Global Framework for Climate Services,

Considering:

- (1) The benefits that have been achieved through the coordinated, collaborative and cost-effective approach to the planning and operation of an end-to-end system for weather observations, modelling, analysis and forecasting,
- (2) The increasingly important role that space-based observations are playing in the long-term monitoring of the Earth's environment,
- (3) The substantial investment that Members have made in Earth-observation satellites to monitor and study weather, water, climate and related natural disasters,
- (4) The importance of long-term, sustained and coordinated observations of the Earth's climate, climate change and variability for the world's population, and particularly those at most risk,
- (5) The benefits in efficiency, sustainability and cost-effectiveness that could be achieved through increased coordination of efforts among all parties involved in the planning and implementation of space-based observational capabilities and related operational processing activities for climate monitoring,
- (6) The underpinning role that observations will play in the Global Framework of Climate Services (GFCS),
- (7) The importance of integration of ground-based and space-based observations in the successful implementation of the WMO Integrated Global Observing System (WIGOS),

WMO Resolution 19 (Cg-XVI) of 2011, requested WMO to

- “to develop an architecture ... for climate monitoring as a component of the future WIGOS and GFCS, for consideration by Congress”,
- as a “major initiative of the WMO Space Programme”, and
- “in coordination with satellite operators, CEOS, CGMS, GCOS, GEO and WCRP”.



Res 19 (Cg-XVI) Concept Document

- A Concept Document was annexed to the resolution, describing the key-components of an end-to-end architecture

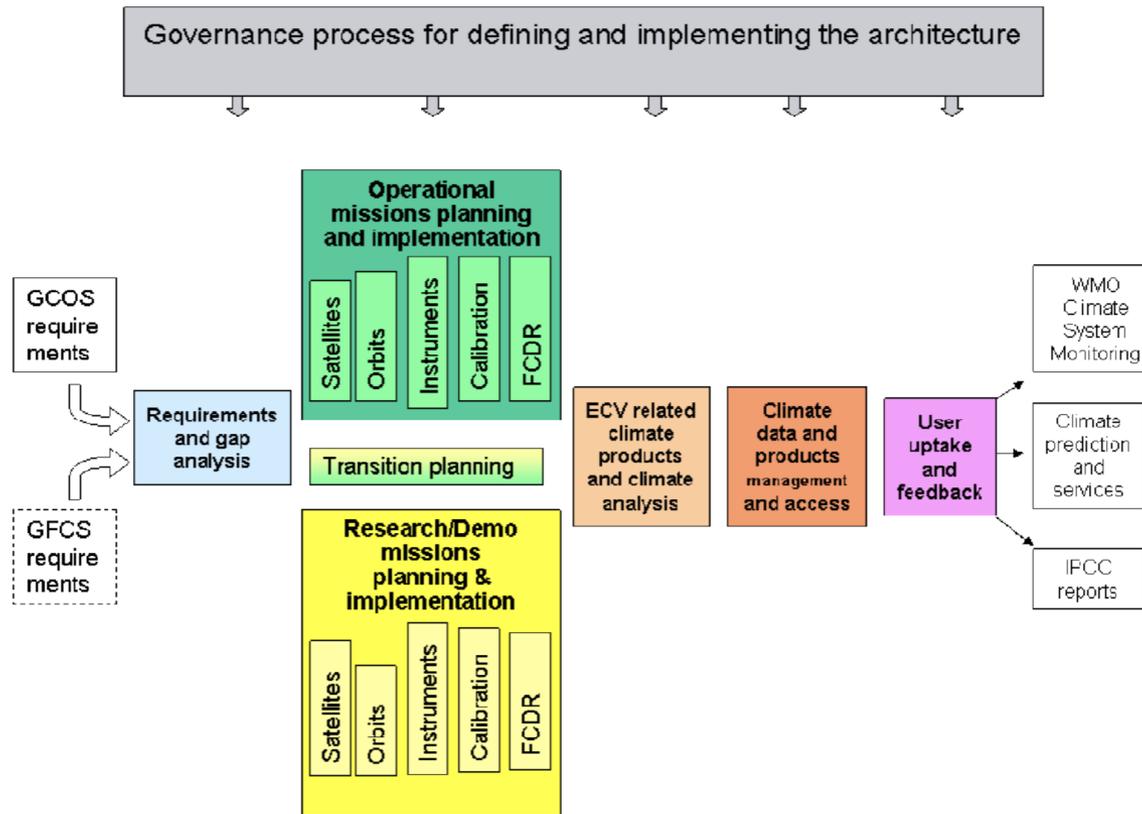


Figure 1: Key components of an end-to-end architecture



Achievements 2011-2015

- 2011: Report on “Strategy Towards an Architecture for Climate Monitoring from Space” (CEOS, CGMS, WMO)
- 2013: Establishment of CEOS-CGMS Working Group on Climate (WGClimate)
- 2015: Report on “Satellite for Climate Services: Case Studies for Establishing an Architecture for Climate Monitoring from Space”
- First CEOS-CGMS Inventory of Essential Climate Variables (ECVs)
- OSCAR/Space listing relevant EO satellites/missions for gap analysis



Cg-XVII in 2015

World Meteorological Congress Cg-17 (2015)

- 4.2.2.23 Congress underlined the importance of the continued development of the Architecture for Climate Monitoring from Space as a key WIGOS contribution to GFCS Observation and Monitoring component, and it requested the Executive Council and ICG-WIGOS to actively monitor and coordinate this development. Congress noted that WMO is an active member of the joint working group on climate established by CEOS and CGMS, with the major responsibilities for coordinating the development of the physical Architecture for Climate Monitoring from Space in the partnership with all relevant space agencies and satellite operators.
- 4.2.4.16 As suggested by the Consultative Meetings on High-level Policy on Satellite Matters, Congress underscored the need for the satellite operators and the Secretariat to pursue the development of the Architecture for Climate Monitoring from Space with a view to ensure seamless continuity of climate monitoring satellite programmes, comparability of measurements, provisions for continuity and contingency, and traceability to reference standards. Congress further encouraged satellite operators to pursue a dialogue with WCRP and GCOS in order to address the grand science challenges of WCRP in an end-to-end integrated approach.



Developments Since 2015

- WGClimate ECV Inventory 2.0 and Gap Analysis, Action Plan
- Development of WIGOS and Vision for WIGOS in 2040
WMO
- WMO Paper "Concept for the physical view of the architecture for climate monitoring from space"
- 2030 Agenda for Sustainable Development and Paris Climate Change Agreement - Integrated Global Greenhouse Gas Information System (IG3IS) – need for operational monitoring
- CEOS/CGMS AC/VC Whitepaper on CO₂ and CH₄ monitoring
- Shift from research to operational missions
- Copernicus System – operational Greenhouse Gas (GHG) mission aimed for 2025
- WMO Governance and Constituent Body Reform and WMO Earth System Approach



Climate Monitoring Architecture Status

- Many elements of the architecture for climate monitoring from space are already in place today:
 - GCOS (Requirements)
 - CEOS/CGMS Working Group Climate (ECV Directory)
 - WIGOS/CGMS Baseline
 - Gap Analysis Processes (WMO RRR, CGMS-Vision)
 - Users increasingly identified
 -
- Need for a holistic description of the architecture in response to Resolution 19 (Cg-XVI) to be presented to Cg-18



II. Cg-18 Resolution



6 February – WMO Workshop



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Please visit our public website:
<http://public.wmo.int>

Home

Architecture for Climate Monitoring from Space

PROGRAMMES > Space > Architecture for Climate Monitoring from Space

Commission for Basic Systems / OPAG on Integrated Observing Systems

Workshop on the WMO Role in the Architecture for Climate Monitoring from Space

Date: 6 February 2019, 9:00 - 17:00
Venue: WMO HQ, Geneva, Room "8 Jura " (8th floor)

ALL DOCUMENTS AND PRESENTATIONS

Agenda Item Related Working Documents for Discussion

- 1 Welcome and Organization of the Session [[Provisional Agenda](#), [Invitation Letter](#)]
- 2 [WMO Role in the Architecture for Climate Monitoring from Space \(WMO\)](#)
- 3 [WGClimate and Architecture for Climate Monitoring from Space \(Chair WGClimate\)](#)
- 4 [SCOPE-CM and Architecture for Climate Monitoring from Space \(Chair SCOPE-CM\)](#)
- 5 Discussion of Draft Consensus Paper on the Architecture for Climate Monitoring from Space ([Paper](#), [Presentation](#)) (All)
- 6 Preparation of Climate Event at the 18th World Meteorological Congress (Cg-18)

Programme Overview
→ [Space-based GOS](#)
→ [Data Access & Use](#)
→ [Awareness & Training](#)
→ [Space Weather](#)
Regional Activities
Information Resources
Partners

[CGMS](#)
[GOS](#)
[WIGOS](#)
[WIS](#)
[OSCAR Database](#)

See <http://www.wmo.int/pages/prog/sat/meetings/Climate-architecture-workshop.php>



Resolution for Cg-18



World Meteorological Organization
WORLD METEOROLOGICAL CONGRESS
Eighteenth Session
Geneva, 3 to 14 June 2019

Cg-18/Doc. 6.1(3)
Submitted by:
Secretary-General
15.III.2019
DRAFT 1

AGENDA ITEM 6: EARTH SYSTEM OBSERVATIONS AND PREDICTIONS

AGENDA ITEM 6.1: WMO Integrated Global Observing System

WMO SPACE PROGRAMME

DRAFT RESOLUTIONS

Draft Resolution 6.1(3)/1 (Cg-18)

**STATUS OF THE
ARCHITECTURE FOR CLIMATE MONITORING FROM SPACE**

THE WORLD METEOROLOGICAL CONGRESS,

Recalling Resolution 5 (Cg-XIV) – WMO Space Programme, which initiated a new major WMO Space Programme as a cross-cutting programme to increase the effectiveness and contributions from satellite systems to WMO Programmes,

Recalling Resolution 19 (Cg-XVI) – Development of an Architecture for Climate Monitoring from Space, which requested WMO to develop the architecture for climate monitoring from space as:

- (1) A component of the future WMO Integrated Global Observing System (WIGOS) and the Global Framework for Climate Services (GFCS), for consideration by Congress,
- (2) A major initiative of the WMO Space Programme and as an important component of WIGOS and in coordination with satellite operators, the Committee on Earth Observation Satellites (CEOS), the Coordination Group for Meteorological Satellites (CGMS), the Global Climate Observing System (GCOS), the Group on Earth Observations (GEO) and the World Climate Research Programme (WCRP),

Recalling further

- (1) The Abridged Final Report with Resolutions of the Seventeenth World Meteorological Congress (WMO-No. 1157), paragraph 4.2.4.16, in which Congress underscored the need for the satellite operators and the Secretariat to pursue the development of the Architecture for Climate Monitoring from Space with a view to ensure seamless continuity of climate monitoring satellite programmes, comparability of measurements, provisions for continuity and contingency, and traceability to reference standards,
- (2) Resolution 1 (EC-68) – WMO support to the Paris Agreement, in which Executive Council decided to further address provision of reliable, long-term, high-quality observations of global atmospheric composition changes through the revised GCOS Implementation Plan, Global Atmosphere Watch (GAW) and related information on trends and distribution of greenhouse gases in the atmosphere and through the Integrated Global Greenhouse Gas Information System (IG3IS),

- Workshop held at WMO on 6 February 2019
- Agreed on title, scope and elements of a Draft Resolution
- Preparation of Draft Resolution for Cg-18
- Submitted for review at WGClimate-10



Scope and Purpose

- Title “Status of the architecture for climate monitoring from space”
- Audience: WMO Congress (high level)
- Paper Length: ~4-5 pages
- Purpose
 - Respond to resolution 19 (Cg-XVI) and inform Cg-18 on progress made.
 - “to provide the basis for ... processes and capabilities to be implemented, and activities to be pursued, in order to monitor climate from space in a globally coordinated and efficient framework”.
 - Reflect consensus of all relevant stakeholders on the status of the architecture for climate monitoring from space as of 2019.
 - Provide a basis for agreeing on and planning the next necessary steps towards full implementation of the architecture.
 - Describe the WMO role in the architecture for climate monitoring from space.



Elements

- Reflect background history.
- Confirm importance of the architecture.
- Describe architecture and its status.
- Reflect, acknowledge and appreciate achievements.
- Recognize contributions of all stakeholders.
- Request continued support of space agencies.
- Endorse its continued implementation.



Roadmap for the Resolution

- Final review by WGClimate-10
- Seek acknowledgement at CEOS-SIT-34
- Seek acknowledgement at CMGS-47
- Seek endorsement by Cg-18



Timeline for the Resolution

- Today (6 February 2019)
 - Provide advice and input on first draft of consensus paper
- SCOPE-CM Meeting (7-8 February 2019)
 - Discuss and agree on future role of SCOPE-CM
- IPET-SUP-5 (11-13 February 2019)
 - Present, receive advice and input, refine paper
- WGClimate (18-22 March 2019)
 - Review paper
- Document Deadline for Cg-18 (1 April 2019)
- CEOS-SIT (2-5 April 2019)
- CGMS-47 (20-24 May 2019)
- Cg-18 (3-15 June 2019)
 - Endorse



III. Cg-18 Climate Architecture Event



Proposed Cg-18 Climate Event

- Decision 35 (EC-70):
 - “(3) To request the Secretary-General to invite the CEOS-CGMS Joint Working Group on climate to give a demonstration of the architecture for climate monitoring from space at the Congress-18.”
- Support endorsement of the Architecture Resolution at Cg-18
- Number of Cg-18 parallel events strictly limited
- WMO aiming to meet requirements of Decision 35 (EC-70)
- Dates considered: 6-7 June 2019



Tentative Workplan - Calendar



Cg-18 الوفاق 文件 Documents (in English) Documents (en français) Документы Documentos Information Documents

Tentative Workplan

Search this site

Session Information

Online Registration

Tentative Workplan

Presentations

FINAC

Hydrological assembly

3 June - 9 June 2019

	3 MONDAY	4 TUESDAY	5 WEDNESDAY	6 THURSDAY	7 FRIDAY	8 SATURDAY	9 SUNDAY
			PE - Meteorological Technology World Expo 2019, Public-private dialogue (Palexpo)				
7				CC/PE - Hydrological Assembly (CICG - Room 2)			
8							Legend:
9							P-1 = Plenary item 1
10	P-1.1 - Opening of the Congress (open) - TBD CICG - Room 1	In-depth discussions on key Congress resolutions CICG	P-3 - Strategic Plan and Budget 2020-2023 CICG - Room 1	P-5.1 - Multi-hazard early warning systems CICG - Room 1	P-6.1 - WMO Integrated Global Observing System CICG - Room 1	CC - Committee on constituent body reform (open) - TBD CICG - Room 2	PE = parallel event CC = Congress Committee
11	P-2 - Reports by the President and the Secretary-General CICG - Room 1	In-depth discussions on key Congress resolutions CICG	P-9.4 - Public-private engagement CICG - Room 1	P-5.4 - Weather information and services			
12	P - Introduction of key resolutions CICG - Room 1	Information for delegations on the conduct of Congress CICG - Room 1		CC - Coordination Committee (closed)	CC - Committee on budget 2020-2023 (open) - TBD CICG - Room 2	Regional consultations	
13			PE - Public-private dialogue Palexpo	PE - Public-private dialogue Palexpo	CC - Public-private engagement (open) - TBD	Regional consultations	
14							
15	In-depth discussions on key Congress resolutions CICG	In-depth discussions on key Congress resolutions CICG	P-4 - Governance review - constituent body reform CICG - Room 1	P-5.2 - Climate information and services CICG - Room 1	P-6.2 - WMO Information System CICG - Room 1		
16	In-depth discussions on key Congress resolutions CICG	In-depth discussions on key Congress resolutions CICG			P-6.3 - WMO Global Data Processing and Forecasting System		
17	Group photo	CC - Coordination Committee (closed) CICG - Room 1	P-9.3 - Amendments to the General Regulations CICG - Room 1	P-5.5 - Integrated weather, climate, hydrological and environmental services			
18	Secretary-General's reception (open) CICG	Receptions will be announced in due time	Events at Palexpo		Receptions will be announced in due time		
19							
20							
21							

Sign In



Proposed Agenda Cg-18 Climate Event

1.	Welcome and Introduction	WMO (SG or ASG)	5 mins
2.	Architecture for Climate Monitoring from Space (Overview presentation)	CEOS/CGMS WGClimate	15 mins
3.	Using Essential Climate Variables (ECVs)/Climate Data Records	Head of Copernicus Climate Change Service	15 mins
4.	Space Agency Planning	CEOS/CGMS WGClimate	15 mins
5.	Conclusions	EUMETSAT (SG) and WMO (SG or ASG)	5 mins



Thank you

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