



World Meteorological Organization

Working together in weather, climate and water

# WMO Integrated Global Observing System (WIGOS)

**--Progress report to CGMS-41**

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World meteorological Organization (WMO)



# Outline

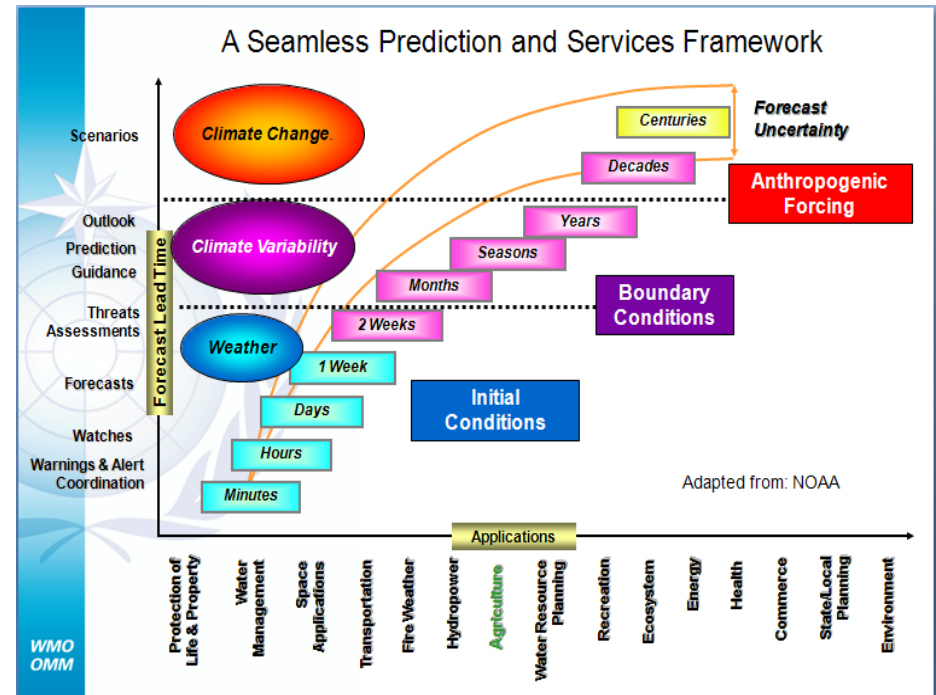
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- WIGOS Key Activity Areas and Major Progress
  - WIGOS needed contribution from CGMS and members
  - Summary
-

□ WMO Cg-16 (2011) decisions to Implement

# WMO INTEGRATED GLOBAL OBSERVING SYSTEM (WIGOS)

The key word is **Integration**: promote synergy among systems  
 The whole is more than the sum of the parts--Aristotle



## 1. What is WIGOS



Need an Integrated Global Observing System to meet all requirements in a cost-effective manner

# WIGOS: A future observing framework for WMO





# Four levels of bodies are contributing to WIGOS development

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1. Inter-Commission Coordination Group on WIGOS (ICG-WIGOS): Overall WMO Coordination Mechanism engaged by all Technical Commissions, guided by EC focal points and EC & Congress sessions
  2. Technical Commissions—Technical lead on WIGOS implementation (CBS & CIMO)
  3. Regional Associations and Members: engagement at Regional and National levels.
  4. Secretariat Team, coordinated under the WIGOS Oversight Board (SG, DSG, Directors)
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## ICG-WIGOS & Task Teams

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- **ICG-WIGOS & Task Teams:**
    - TT-WIGOS Implementation Plan (March 2012) ,
    - TT-WIGOS Regulatory Material (Nov 2012; June & Nov 2013)
    - TT-WIGOS Metadata (WMD) (March 12-15, 2013)
  - **ICG-WIGOS-2 (March 18-22, 2013):**
    - Updated WIP, and made new decisions to establish Task Team on Quality Management
    - Reviewed Regional WIGOS Implementation Plans and progress
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# Outline

- *WIGOS Key Activity Areas and Major Progress*
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1. Respond to WIGOS RRR  
process requirements



# Observational Requirements under WIGOS Framework

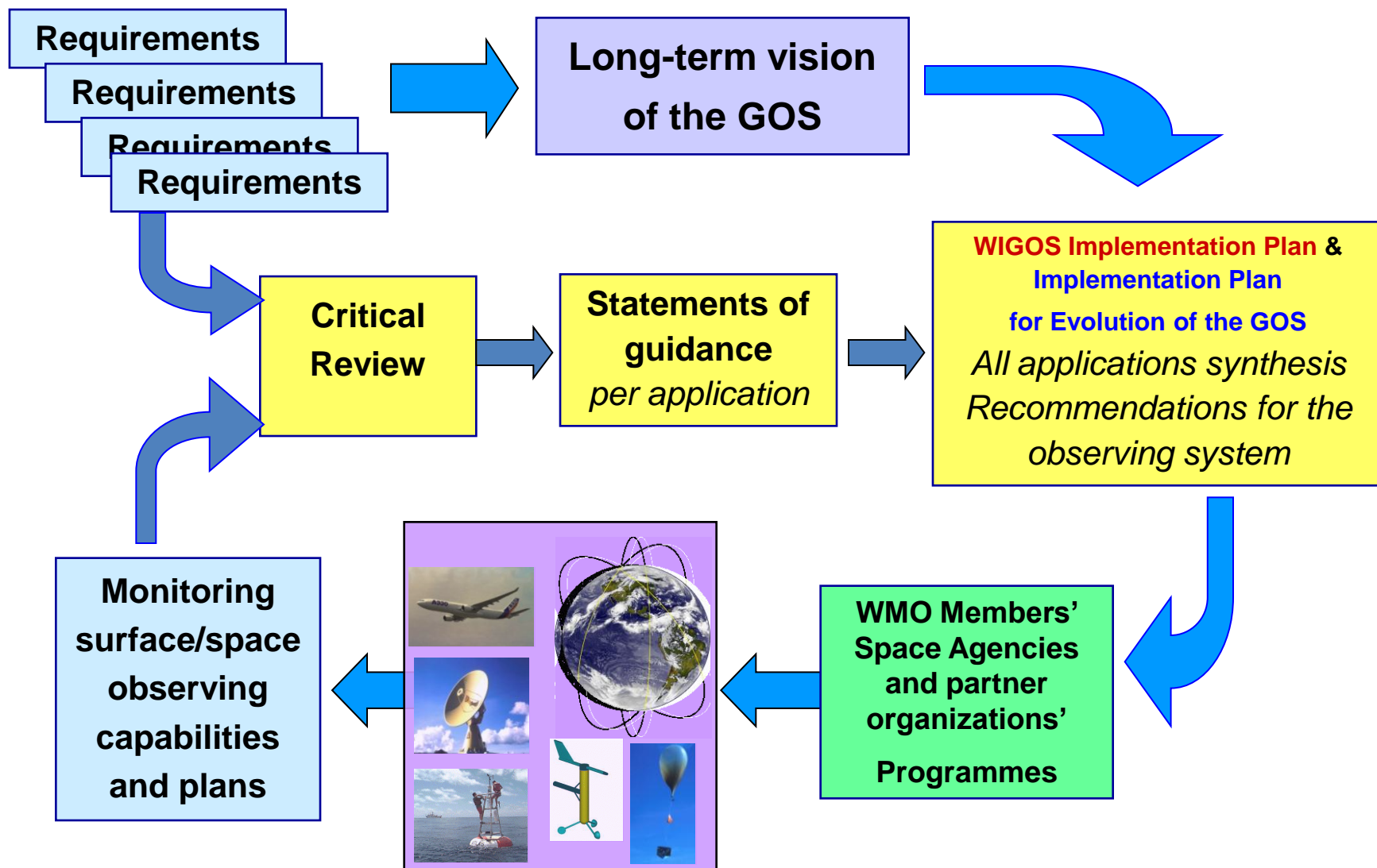
## Inclusion requirements of

- Weather, DRR
- Climate (GFCS, GAW, Ocean.),
- Water (WHYCOS,..)
- Environment (GAW, Health)
- Research
- Cosponsored systems

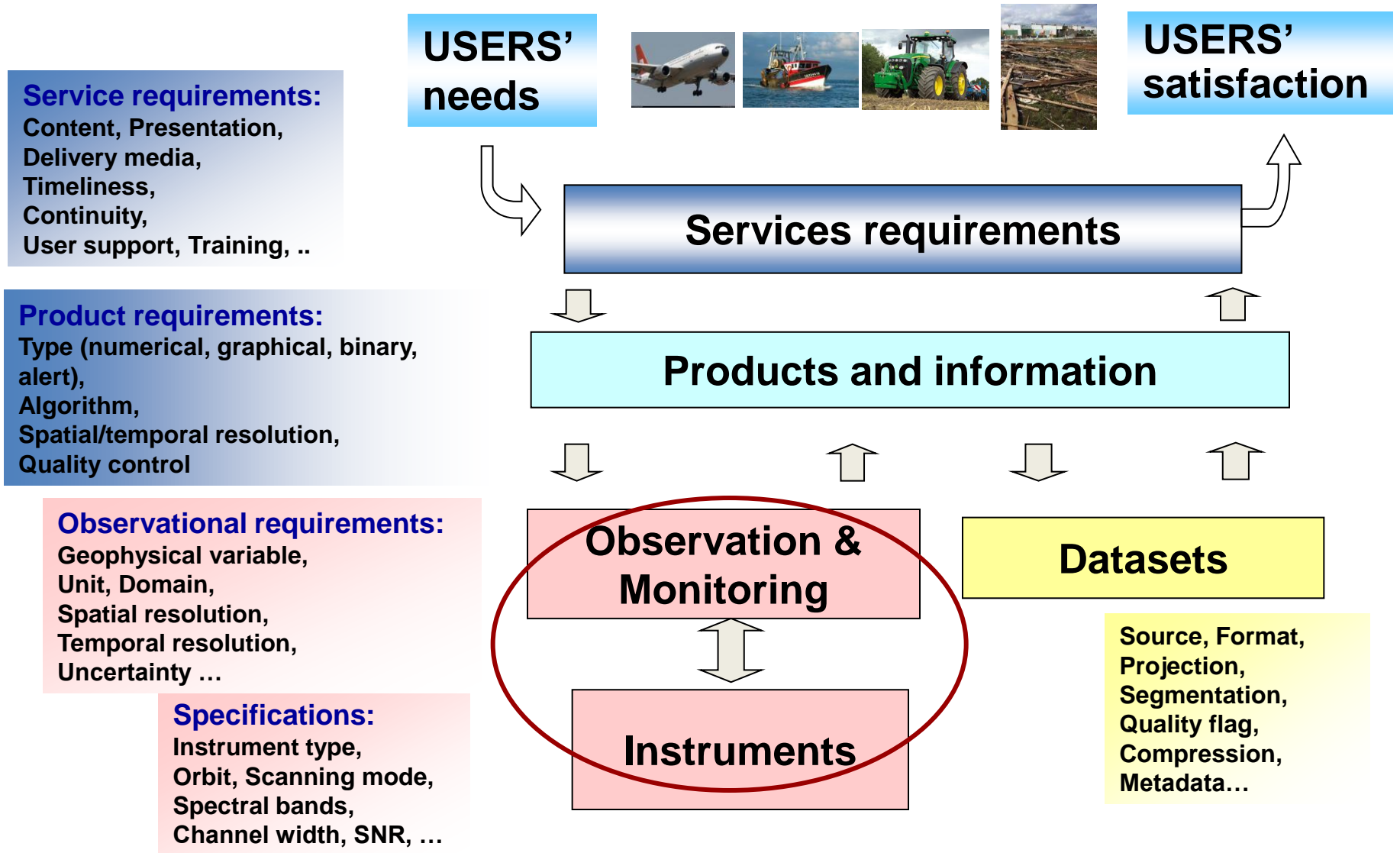
## WIGOS Space component

- From weather satellite to WIGOS space component
- CGMS new baseline with greatly enhanced global satellite constellations to meet WWW, GFCS, GAW, WHYCOS, GCW etc .. Operational requirements.
- Challenges to enhance greatly space and ground capabilities

# WMO Standard Practice: Rolling Review of Requirements



# RRR process: for documenting and **interpreting new user requirements**





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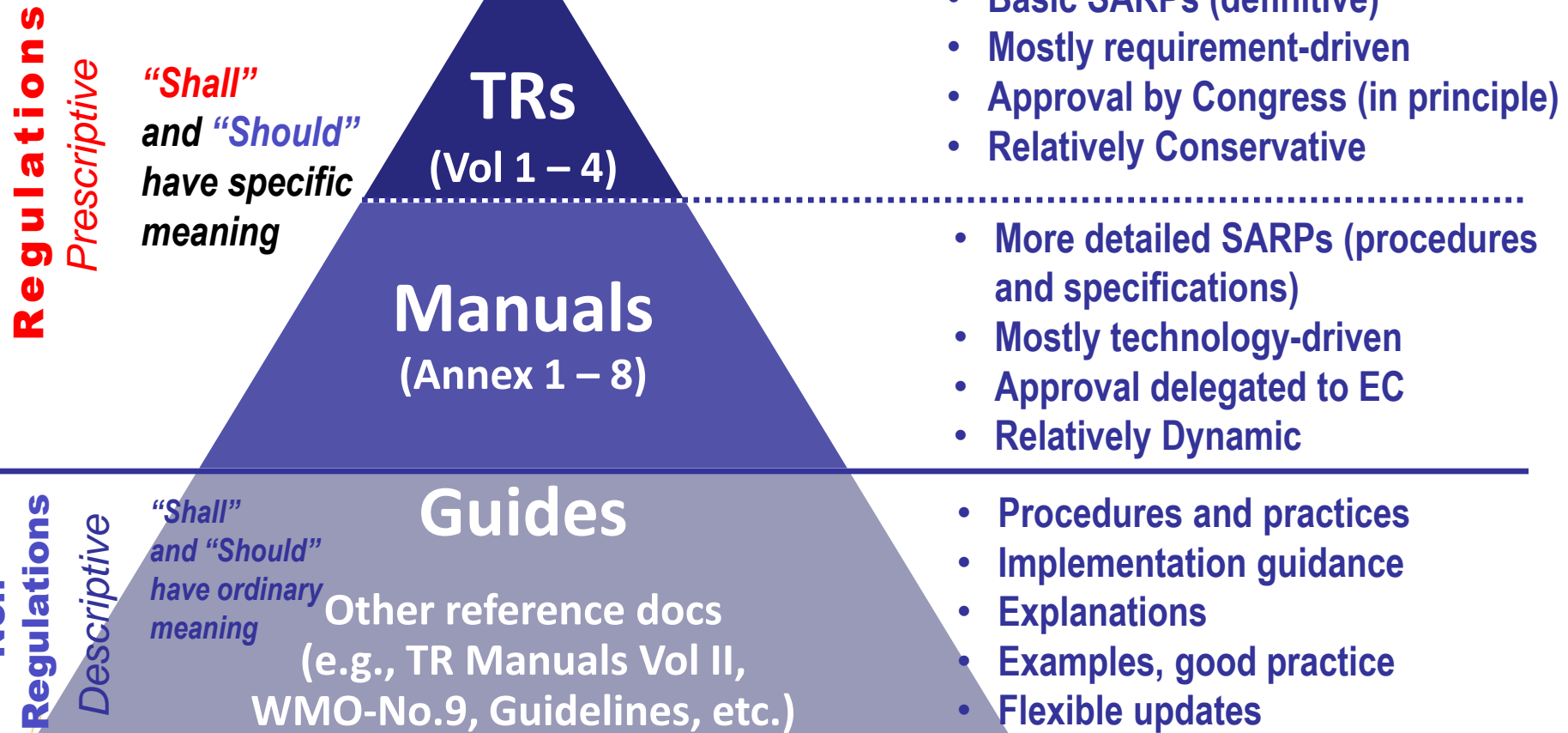
## 2. Contribute to new WMO Technical Regulation (WIGOS section) and WIGOS manual

Respond to WMO consultation process  
before Congress 17 (2015)

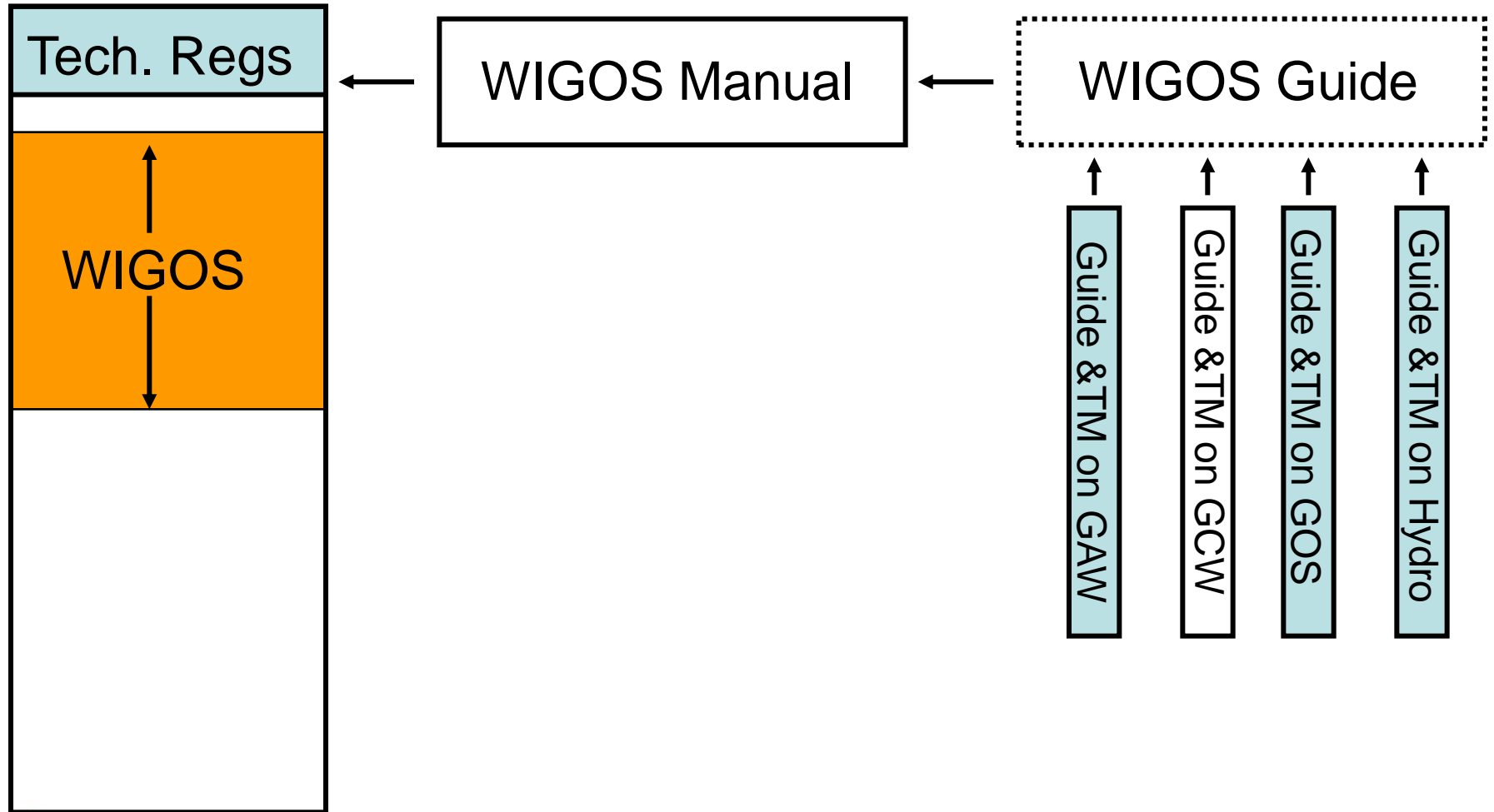
**WG III**

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# WMO Technical Regulations: Composition & generic concept



## 2. Outcome of ICG-WIGOS-2: WIGOS Regulatory material - new proposal



# DRAFT STRUCTURE OF WIGOS SECTIONS IN WMO TR - OUTLINE

## 1. INTRODUCTION

### 1. Purpose of WIGOS

### 2. WIGOS component observing systems

1. Global Observing System (GOS)
2. Global Atmosphere Watch (observing component of GAW)
3. WMO Hydrological Observations
4. Global Cryosphere Watch (observing component of GCW)

### 3. Collaboration with co-sponsored and non-WMO observing system

### 4. Governance and management

## 2. COMMON ATTRIBUTES OF COMPONENT SYSTEMS

### 1. Requirements

### 2. Design, planning and evolution

### 3. Instrumentation and Methods of Observation

### 4. Operations

### 5. Observational Metadata

### 6. Quality Management

### 7. Capacity Development

## 3. COMMON ATTRIBUTES SPECIFIC TO THE SURFACE-BASED SUB-SYSTEM OF WIGOS

## 4. COMMON ATTRIBUTES SPECIFIC TO THE SPACE-BASED SUB-SYSTEM OF WIGOS

## 5. OBSERVING COMPONENT OF THE GLOBAL ATMOSPHERE WATCH (GAW)

## 6. OBSERVING COMPONENT OF THE GLOBAL CRYOSPHERE WATCH (GCW)

## 7. GLOBAL OBSERVING SYSTEM (GOS) OF WMO

## 8. WMO HYDROLOGICAL OBSERVING SYSTEM



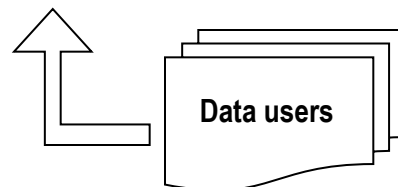
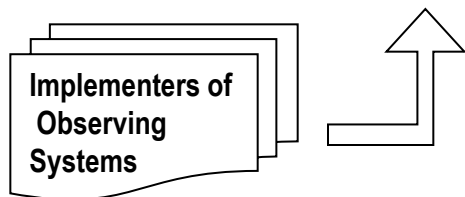
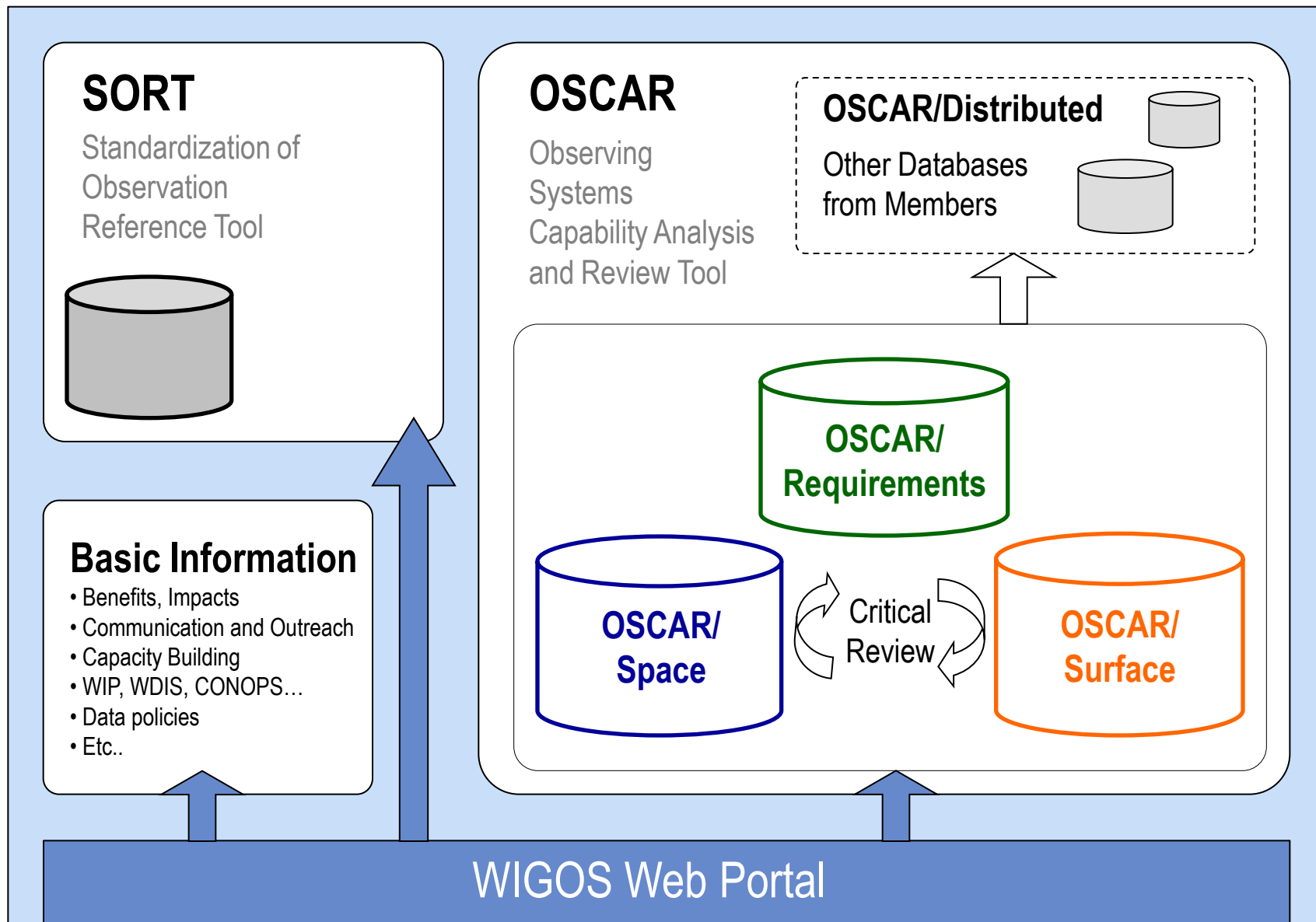
### 3. Contribute to the quality management, standardization and data management areas

- CGMS contribution to the development of:
  - WIGOS Quality Management guidance, mechanism, practices and procedures (WG I, II & IV)
  - WIGOS-Space Metadata and data representation (WG II & IV)
  - Satellite products standardization (WG II)
  - Review and revision of ICG-WIGOS documents on above items (all WGs)









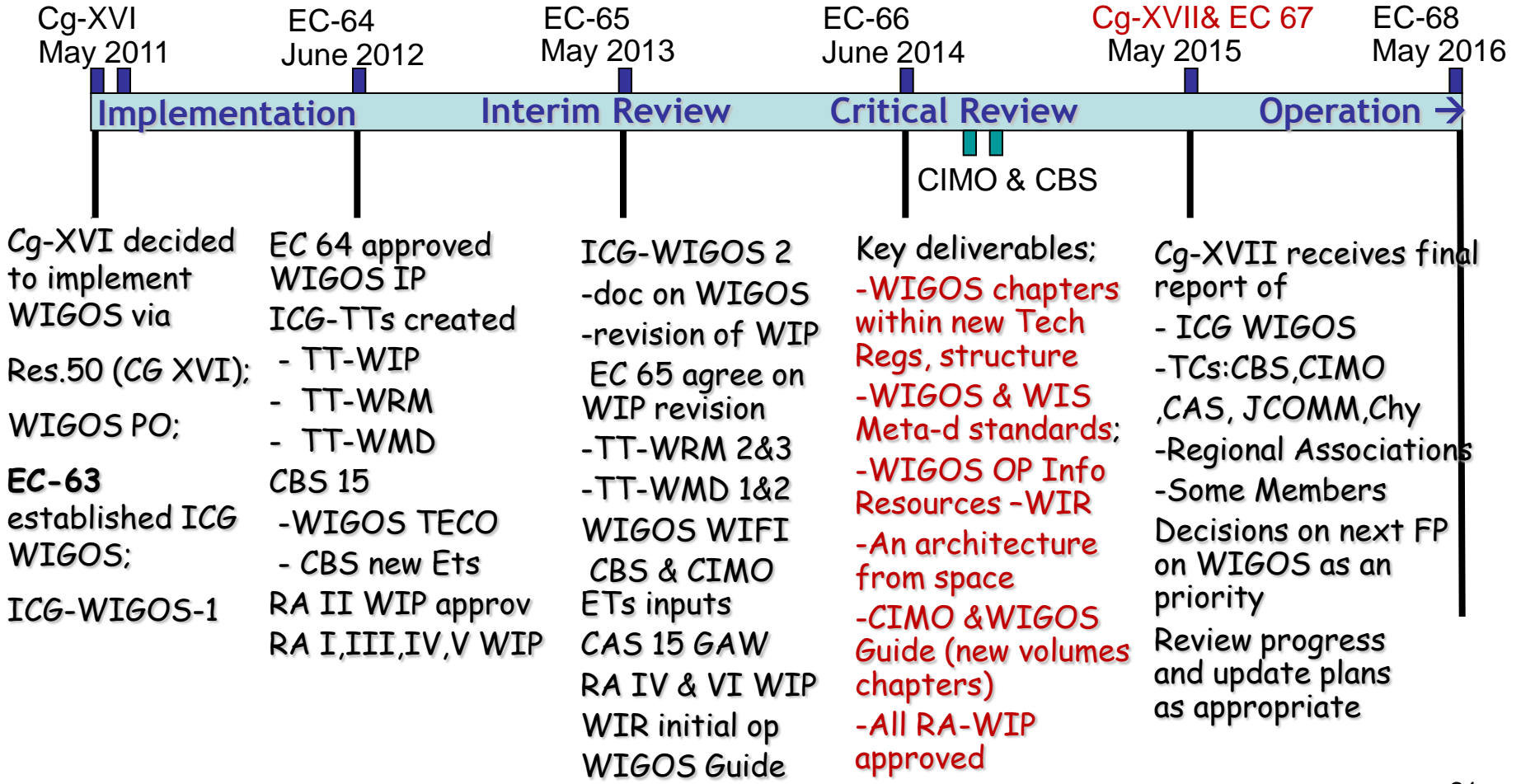
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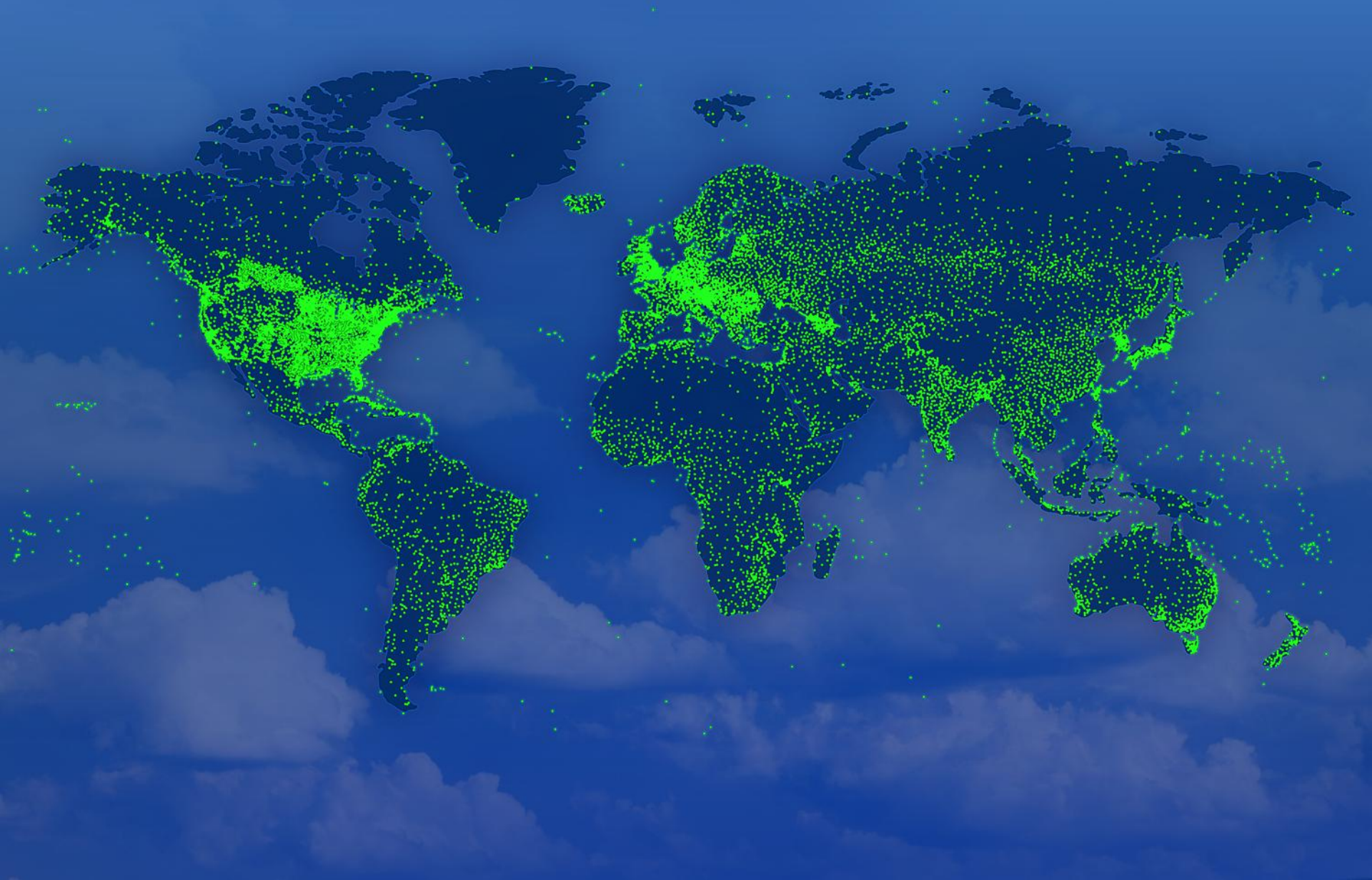


# – WIGOS Roadmap



Prepare for CG XVII

# Thank You



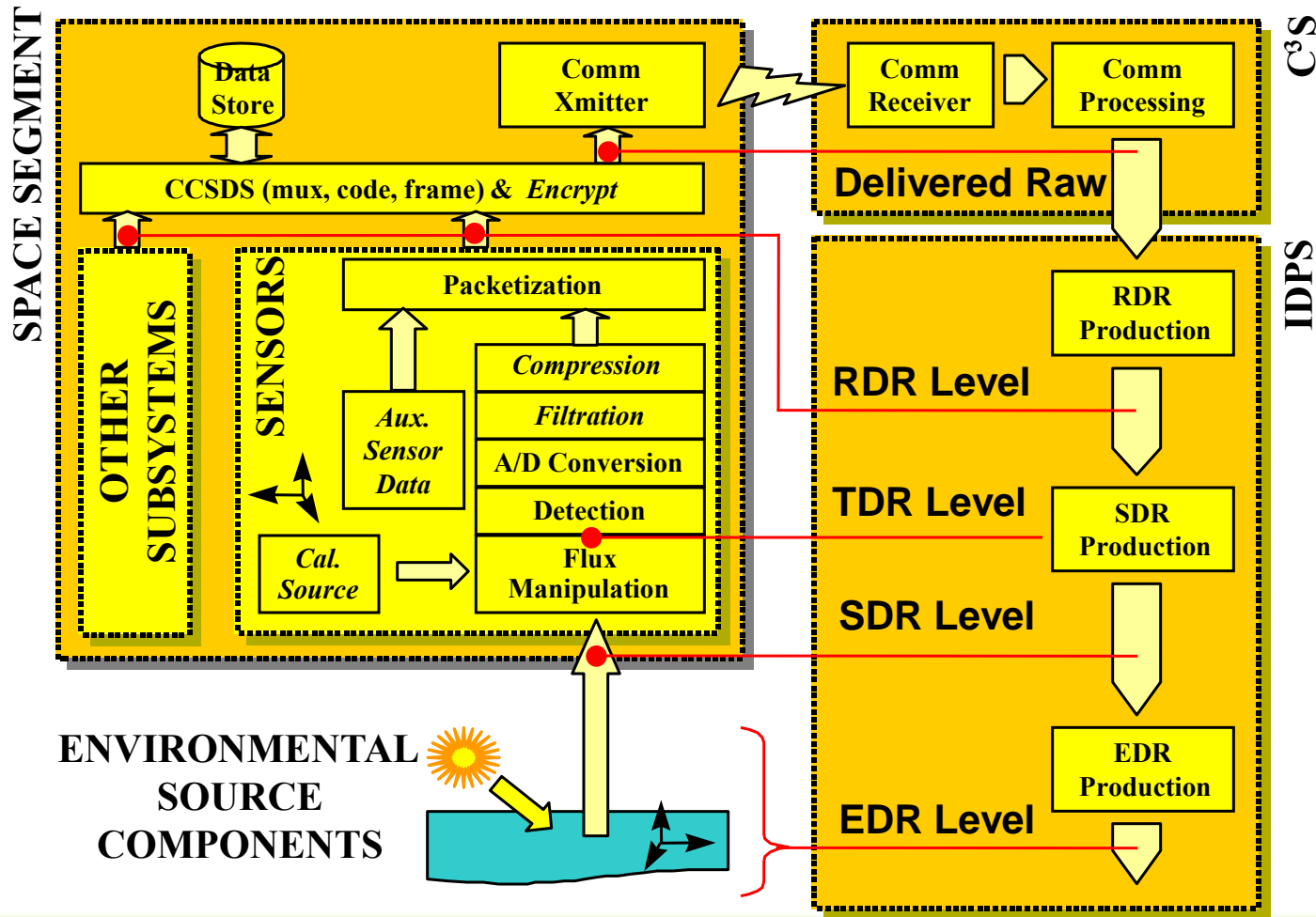


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# Backup slides for Q&A

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# Satellite products delivered at multiple levels all with quality indicators





# WIGOS Information Resource Components

- **Portal:**
  - General WIGOS information
  - Basic documents
- **SORT:** Standardization of Observation Reference Tool
  - WIGOS relevant Standards and best practices – **need contribution from all relevant organizations and programmes**
- **OSCAR:** Observing Systems Capabilities Analysis and Review Tool
  - Network design and planning
  - Tool for Rolling Requirements Review Process
  - Sub-components
    - **OSCAR/Requirements:** Observational user requirements
    - **OSCAR/Space:** Space-based observing systems capabilities
    - **OSCAR/Surface:** Surface-based obs. systems capabilities
    - **OSCAR/Distributed:** Relevant distributed information systems



## **CBS-XV: Inter-Programme Expert Team on WIGOS Framework Implementation Matters (IPET-WIFI)**

- Address integration aspects of WIGOS (WIP);
- Provide technical advice, guidance, practices, etc. for WIGOS Framework Implementation
- Priority:
  - WIGOS Regulatory Material;
  - WIGOS metadata;
  - WIGOS Quality Management Framework;
  - WIGOS Operational Information Resource;
  - WIGOS standards and best practices;

# WIGOS Framework Implementation Plan

## CONTENTS

1. Introduction and Background
  2. **Key Activity Areas for WIGOS Implementation**
  3. Project Management
  4. Implementation
  5. Resources
  6. Risk Management
  7. Outlook
- Annexes

## KEY ACTIVITY AREAS

- 1) Management of WIGOS implementation
- 2) Collaboration with the WMO and co-sponsored observing systems
- 3) Design, planning and optimized evolution of WIGOS
- 4) Observing System operation and maintenance
- 5) Quality Management
- 6) Standardization, system interoperability and data compatibility
- 7) The WIGOS Operational Information Resource
- 8) Data discovery, delivery and archival
- 9) Capacity development
- 10) Communications and outreach



## Ex: From Space-based GOS to space-based WIGOS-document and meet GAW requirements

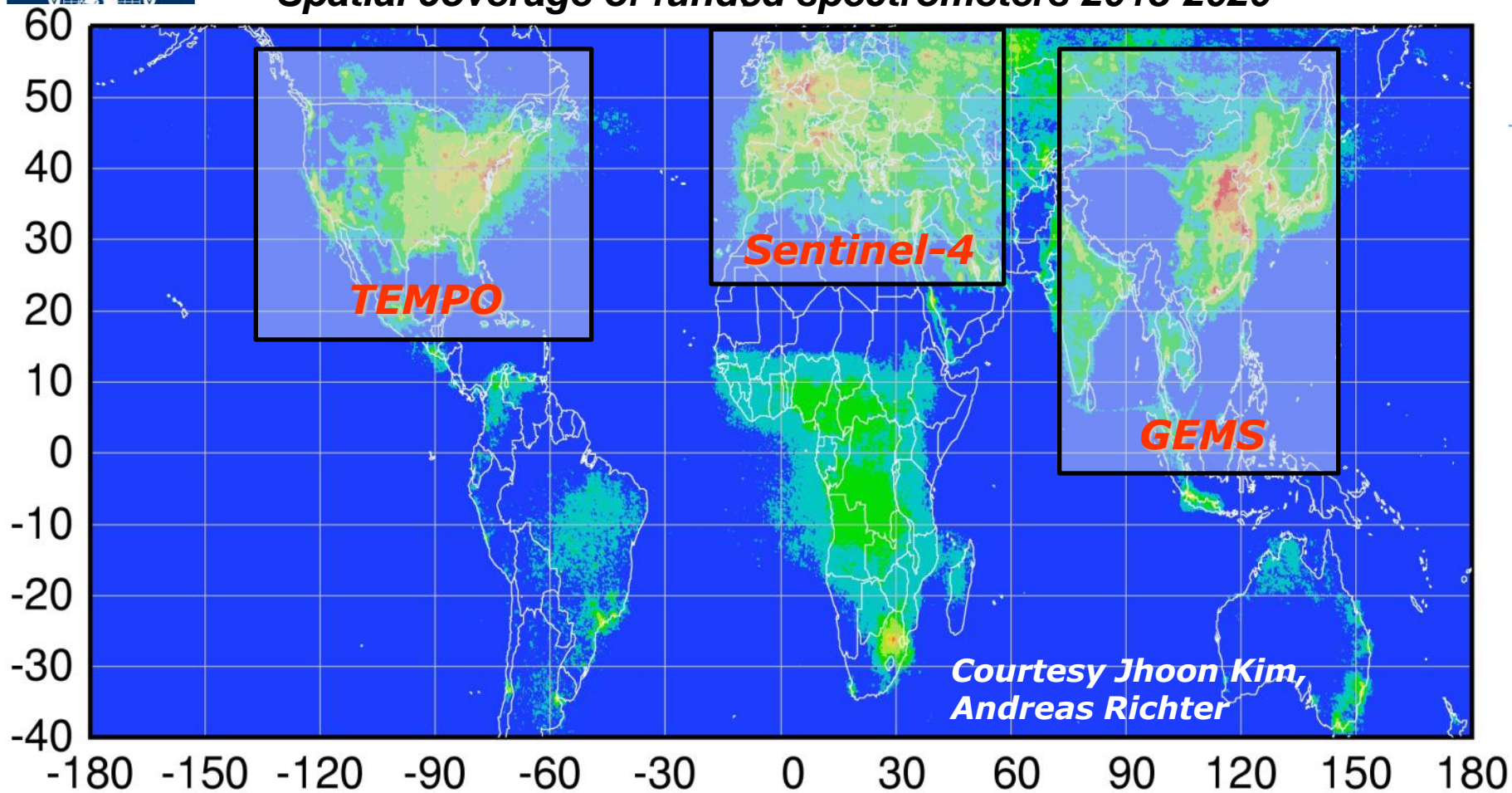
**Cg 16--3.2.3** Regarding satellite measurements of atmospheric chemical constituents and related physical parameters, Congress recommended for GAW to set up an ad-hoc Task Team to review the needs for GAW regarding satellite measurements.

Congress further recommended for this work to be done in coordination with the CBS Expert Team on Satellite Systems (ET-SAT) and the Expert Team on Evolution of the Global Observing Systems (ET-EGOS), the Committee on Earth Observation Satellites (CEOS) and the Coordination Group for Meteorological Satellites (CGMS) and also taking into consideration GCOS requirements and the vision for the GOS in 2025



# Geostationary pollution monitoring

*Spatial coverage of funded spectrometers 2018-2020*



## **Policy-relevant science and environmental services enabled by common observations**

- Improved emissions, at common confidence levels, over industrialized Northern Hemisphere
- Improved air quality forecasts and assimilation systems
- Improved assessment, e.g., observations to support United Nations Convention on Long Range Transboundary Air Pollution