

The Global Observing System for Climate

# GCOS Update for ICM-9

GCOS Secretariat, WMO



ICSU  
International Council for Science



2016

GCOS IP - New in the IP

Improve monitoring of Global Climate Cycles

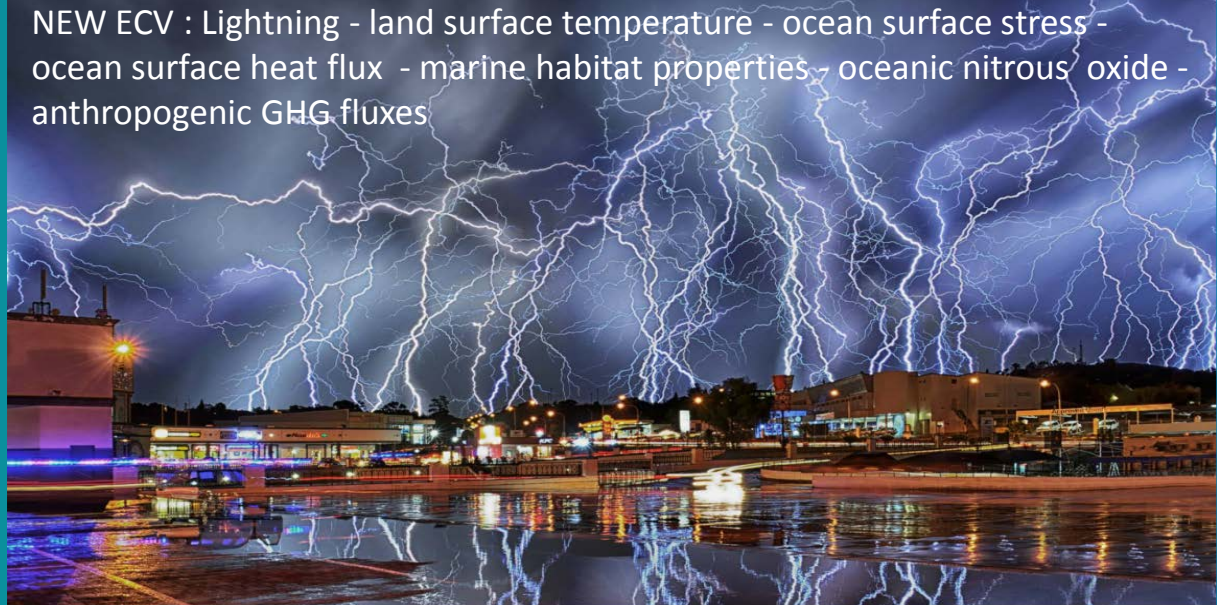
WATER  
CARBON  
ENERGY

Adaptation and Mitigation



NEED FOR  
HIGHER  
SPATIAL AND  
TEMPORAL  
RESOLUTION  
EVEN THE  
SMALLEST  
PIXEL IS  
TOO LARGE

NEW ECV : Lightning - land surface temperature - ocean surface stress -  
ocean surface heat flux - marine habitat properties - oceanic nitrous oxide -  
anthropogenic GHG fluxes



GCOS Cooperation Mechanism



Emphasis on more help for networks in  
developing countries

## Actions in the IP

**20 General, Cross-cutting Actions**

**40 Atmospheric Actions**

**57 Ocean Actions**

**72 Land Actions**



<http://www.wmo.int/pages/prog/gcos/>

## Implement actions related to atmosphere of Implementation Plan:

1. Establish and monitor ECV requirements
2. Review of ECV Observation networks
3. Coordinate GCOS networks (GSN, GUAN, GRUAN)
4. Promote cross-cutting issues with other science panels
5. Establish Task Team on:
  1. GCOS Upper Air Network
  2. GCOS Reference Surface Network
  3. Use of weather radar data for climate needs
  4. Lightning

# IP actions for GRUAN

## A15: Implementation of Reference Upper-Air Network

Action	Continue implementation of GRUAN metrologically traceable observations, including operational requirements and data management, archiving and analysis and give priority to implementation of sites in the tropics, South America and Africa
Benefit	Reference-quality measurements for other networks, in particular GUAN, process understanding and satellite cal/val.
Who	Working Group on GRUAN, NMSs and research agencies, in cooperation with AOPC, WMO CBS and the Lead Centre for GRUAN
Time frame	Implementation largely completed by 2025
Performance indicator	Number of sites contributing reference-quality data streams for archival and analysis and number of data streams with metrological traceability and uncertainty characterization; better integration with WMO activities and inclusion in the WIGOS manual.
Annual cost	US\$ 10–30 million

## A23: Measure of water vapour in the upper troposphere/lower stratosphere

Action	Promote the development of more economical and environmentally friendly instrumentation for measuring accurate in situ water-vapour concentrations in the UT/LS
Benefit	Improved UT/LS water vapour characterization, water-vapour CDRs
Who	NMSs, National measurements institutes, HMEI and GRUAN
Time frame	Ongoing
Performance indicator	Number of sites providing higher-quality data to archives
Annual cost	US\$ 10–30 million

## 4 Task Teams were established during AOPC 22

### 1. GCOS Upper Air Network (GUAN):

Study the relationship between GUAN and the broader GOS radiosondes networks.

(Responds to A5,A13,A14 and A15 of GCOS IP)

- Document the benefits of GUAN.
- Review and update the requirements of the GUAN in terms of availability, scheduling, balloon burst height, required quality.
- Monitor the use of BUFR reporting and the associated metadata for GUAN.
- Document requirements and propose a process for retaining original radiosonde measurements (raw data).

Reference of this Task Team in Tim Oakley's talk

## 2. GSRN (GCOS Surface Reference Network):

### Expected benefits:

Development of a more accurate and detailed understanding of the climate related processes:

Improved understanding of extreme events

Improved measurements also at non-reference sites

Test and develop new techniques and equipment

Valuable data set for the calibration and validation of satellite observations.

Reference sites would provide desirable locations to base future field campaigns

## 3. Use of weather radar for climate studies:

### Expected benefits:

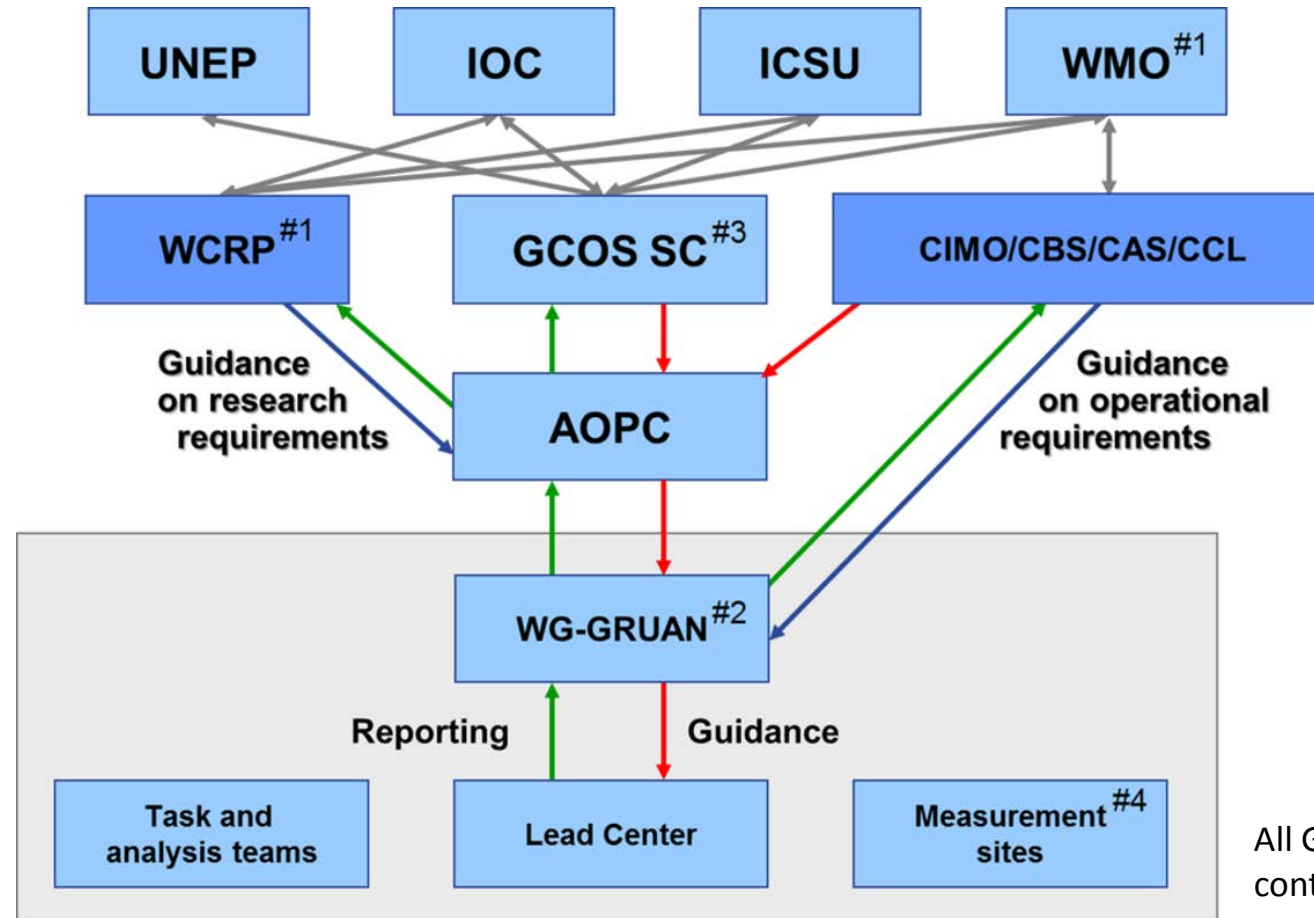
Value of radar for climate monitoring is high for convective precipitation with high spatial and temporal variations, which cannot correctly be captured by rain gauge networks. Relevance in locating dry areas.

## 4. Lightning:

New ECV. AOPC to engage a Task Team to write a position paper on lightning that should then be peer reviewed.

# Structure of GRUAN

Organizational diagram for GRUAN management and oversight



All GRUAN measurement sites are contributed by Members of WMO

UNEP-United Nations Environment Programme  
IOC-UNESCO's Intergovernmental Oceanographic Commission  
ICSU-International Council for Science

WCRP-World Climate Research Programme - identifies scientific and research requirements for GRUAN, while WMO identifies operational requirements.



### **Important meetings:**

- GCOS Steering Committee: Hangzhou, China, 25-29 September 2017
- AOPC 23: Japan (tentative), 16-22 April 2018

### **Proposal:**

- Summary report of ICM within 3 months
- Working meeting within next 6 months

# The Global Observing System for Climate

# Thank you

[gcos.wmo.int](http://gcos.wmo.int)



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