

# AOPC Update

*WDAC 6<sup>th</sup> Session – 22 March 2017*

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## Main Objectives:

1. **Assessing the current state of the global observing system** for climate, and identifying its gaps and inadequacies and designs to ensure long-term monitoring;
2. **Advocating and promoting** the establishment and enhancement of **the systems** required to provide long-term and consistent data; securing the implementation of designated GCOS networks;
3. **Promoting** the transfer and accessibility of **data to the user community**.
4. **Identifying measurable key variables** that control the physical, biological and chemical processes affecting climate, and are indicators of climate change;
5. **Coordinating activities** with other global observing systems, panels and task groups to ensure the consistency of requirements with overall programmes.

- Responsible for overseeing “their” actions
- Panels have flexibility in how to do this BUT there should be consistency in the outputs and timeline



## **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. Establish Global Reference Surface Network**
- 5. Promote the use of weather radar data for climate needs**
- 6. Promote cross-cutting issues with other science panels**

# AOPC and the Implementation Plan

## 40 Atmospheric Actions:

### Actions have been grouped:

- ☐ Ongoing
- ☐ Atmospheric composition
- ☐ Satellite
- ☐ Data and in-situ observations
- ☐ Actions for later

## Approach for the Atmospheric Actions:

- Each action is assigned to one panel member with the relevant expertise who is the responsible leader for this action.
- In order to monitor progress, a matrix will be available online and will be regularly updated by the responsible leader.



GCOS will introduce a mechanism review for requirements which will include a series of public reviews in order to include the broader scientific community and make the process transparent.

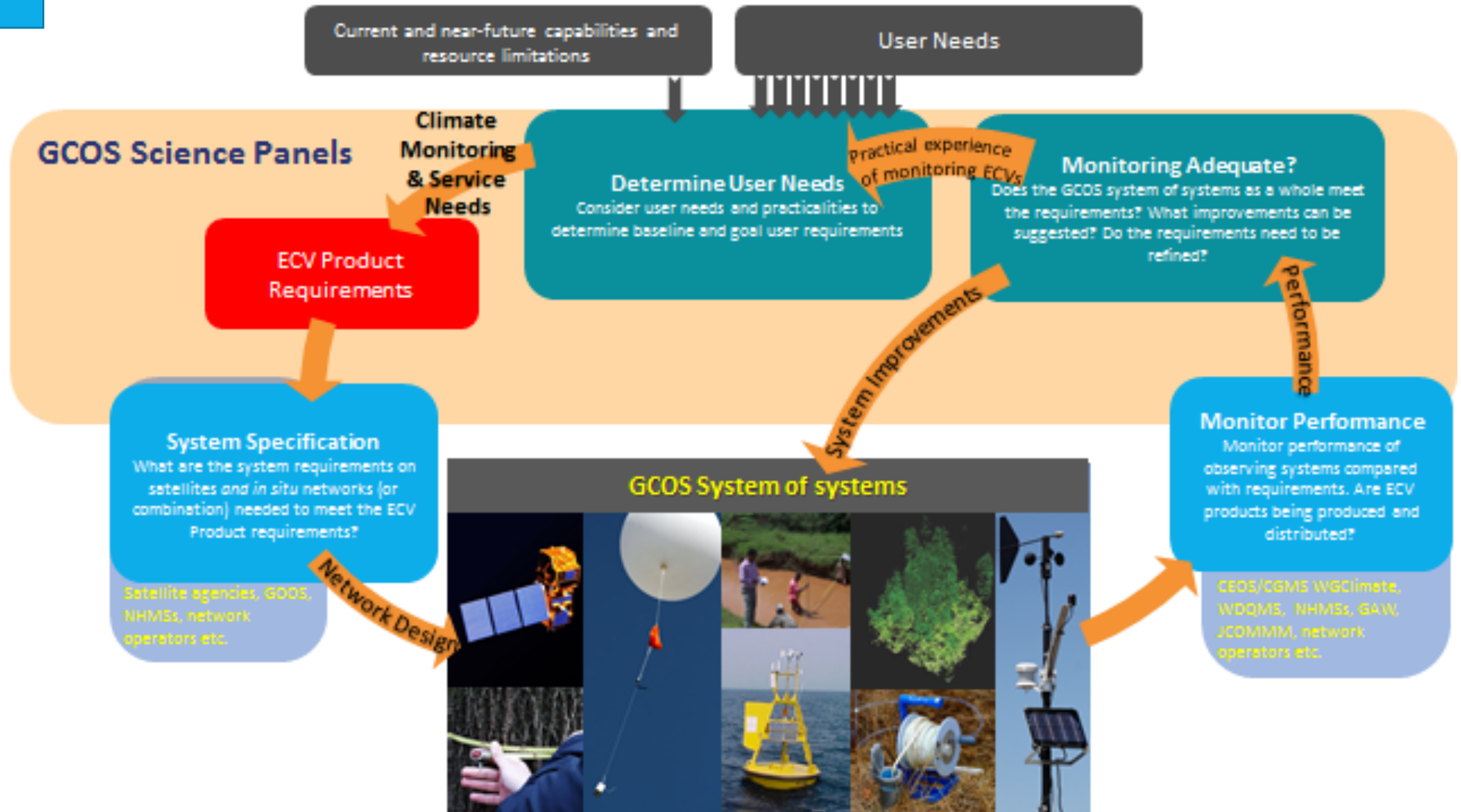
During the next AOPC meeting the following 3 topics on ECV requirement will be discussed:

- Radiosondes launches
- Atmospheric composition: Requirements from IP need to be made consistent with the ones from GAW.
- Clouds: what do we have now  
comments to the IP about what is missing  
how do we plan to address this topic in the future

## ECV: Cloud Properties

ECV	Product	Frequency	Resolution	Required measurement uncertainty	Stability (per decade)
Cloud properties	Cloud amount	3 h	50 km/NA	0.01–0.05	0.01/decade
	Cloud-top pressure	3 h	50 km/NA	15–50 hPa	3–15 hPa
	Cloud-top temperature	3 h	50 km/NA	1–5 K	0.25 K/decade
	Cloud optical depth	3 h	50 km/NA	10%	2%
	Cloud water path (liquid and ice)	3 h	50 km/NA	25%	5%
	Cloud effective particle radius (liquid + ice)	3 h	50 km/NA	1 $\mu\text{m}$ ;	1 $\mu\text{m}$ /decade

- **From comments to the IP:** vertical distribution of clouds needs to be monitored.
- **Plan:** Invite an expert at next AOPC meeting to start the process of defining a new ECV.
- Cooperation with the scientific community to improve the monitoring of clouds.
- **Open questions:** What should the additional property for ECV cloud be? Would vertical structure this be adequate?





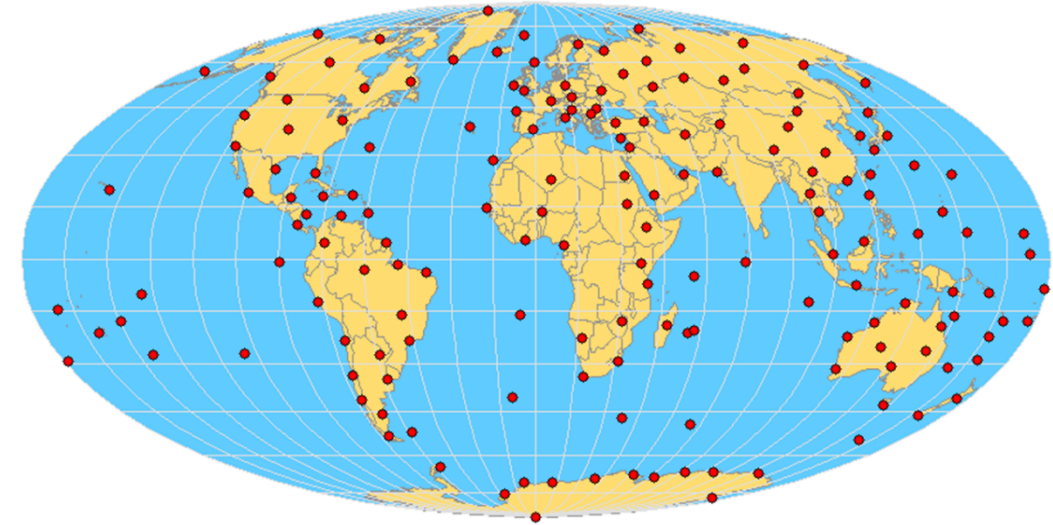
**GCOS Surface Network (GSN)**

**GCOS Upper Air Network (GUAN)**

**GCOS Reference Upper Air Network**

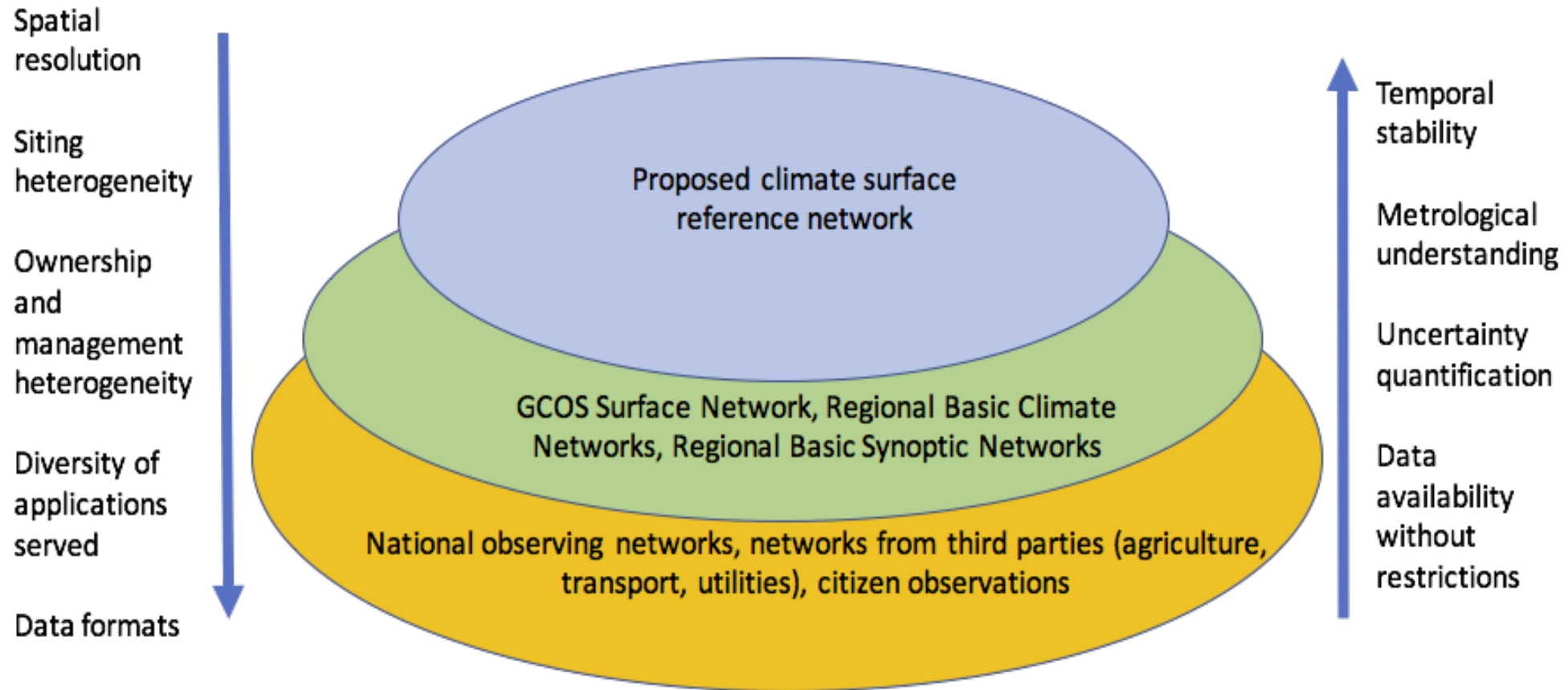
**GCOS Upper-Air Network**

(171 Stations)



→ GUAN and GSN Managed and supported by the GCOS Network Manager Tim Oakley

→ GRUAN Lindenberg (DWD)



Accurate, metrologically traceable, with long term stability and well characterized uncertainties

**Expected benefits:**

- Development of a more accurate and detailed understanding of the climate related processes:
  - *improved local and regional forecasting and projections (vital for adaptation)*
  - *improved attribution of changes/specific events to anthropogenic or natural causes*
  - *improved validation of down-scaled and large-scale models*
  - *improved understanding of the water, energy and carbon cycles*

- improved understanding of extreme events
- improved measurements also at non-reference sites
- test and develop new techniques and equipment
- a valuable data set for the calibration and validation
- of satellite observations.
- Reference sites would provide desirable locations to base future field campaigns

Paper on the rationale about a surface reference network and how to implement will be submitted to a journal

**Next steps to be discussed at AOPC meeting (27-31 March 2017)**

- GCOS establishes a working group that includes both atmospheric and terrestrial experts, representatives of GRUAN, GCW and WMO WIGOS and CHy
- identify the initial partners as well as pilot sites to assess costs and needs
- Paper on the rationale about a surface reference network and how to implement will be submitted to a journal

AOPC has asked a task team of experts to suggest a way forward in Using Radar Data for Climate Monitoring.

Results of this initial study will be presented at next AOPC meeting.

**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.

**Challenges:** quality, homogeneity, traceability. Data availability.

## **Proposed way forward:**

### **A. Assess the present situation**

- a. Ensure all key players are involved (climate monitoring and weather radar communities)
- b. Updated requirements of the climate monitoring
- c. Existing national and international archives, their extent and quality

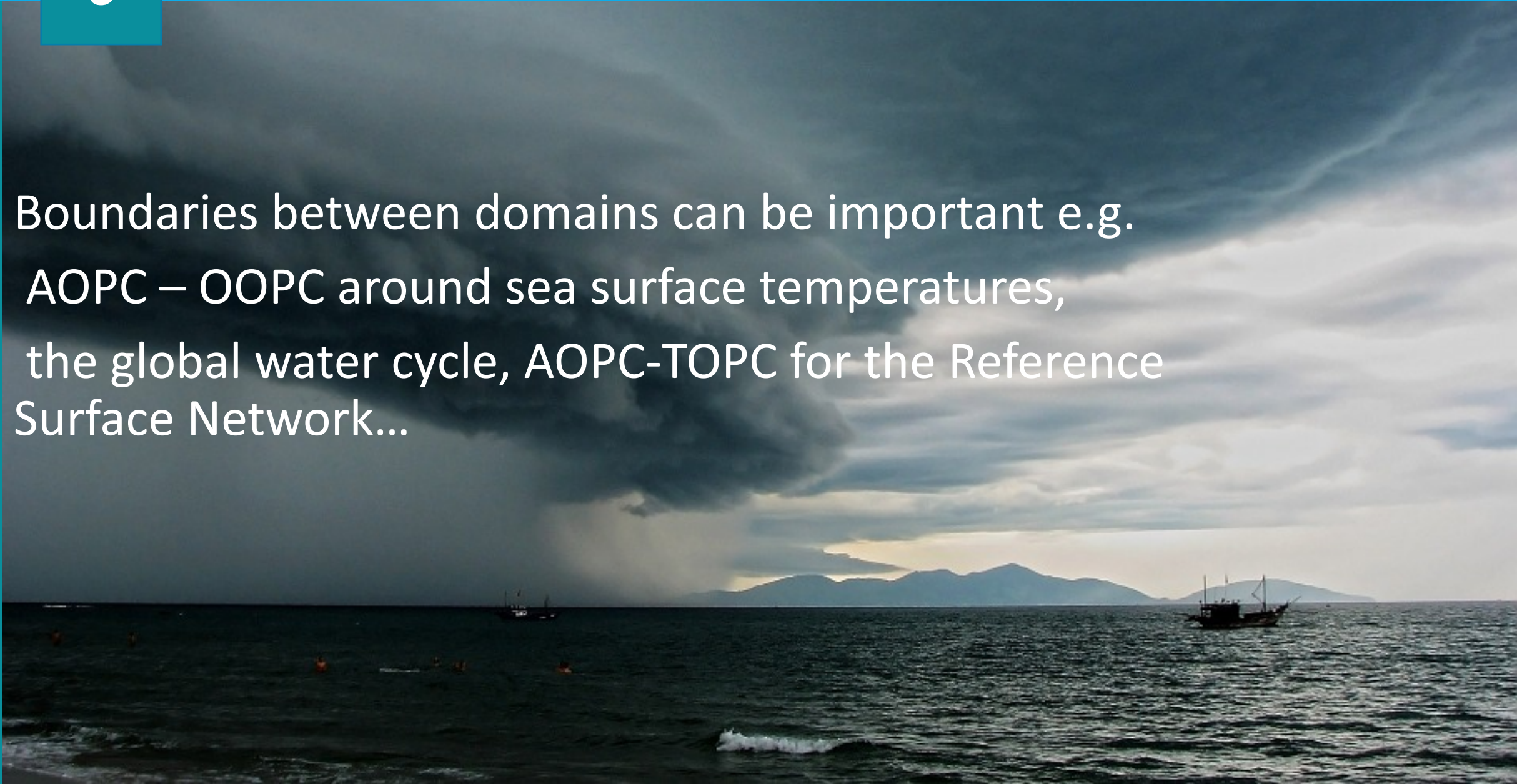
### **B. Suggest procedures for old data**

### **C. Define recommendations for future activities**

- a. Data acquisition (metadata needs for climate purpose)
- b. Quality assessment (Define best practices)
- c. Archiving (international archive? Recommendation for national processes?)
- d. Metadata (what to document, where to publish: OSCAR, WMO radar database, others? new definitions)



Boundaries between domains can be important e.g.  
AOPC – OOPC around sea surface temperatures,  
the global water cycle, AOPC-TOPC for the Reference  
Surface Network...



# Thank you!

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