

Report to WGCV-36 on Climate on Space Week February 2013 including CEOS-WGClimate

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WGCV-36 Meeting

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Climate on Space Week

from 18-22 February 2013 in Geneva (CH)

- **Climate Monitoring Architecture**
- **CEOS Working Group on Climate (CEOS-WGC)**
- **SCOPE-CM Steering Group Meeting**



CLIMATE MONITORING ARCHITECTURE



Why do we need a Climate Monitoring Architecture?

Main "needs/usage scenarios" have emerged for a climate monitoring architecture:

- Assist in promotion of a common understanding of the implementation implications of meeting the various space-related climate monitoring requirements (e.g. from GCOS)
- To support an assessment of the degree to which the currently implemented systems meet the requirements (and the generation of an action plan to address identified shortfalls/gaps/duplication)
- To improve our understanding of the end-to-end information flows and dependencies (i.e. from sensing through to decision-making)



Badgeless joint activity by CEOS, CGMS, WMO

- EC – Mark Dowell, Chair
- ESA – Pascal Lecomte
- EUMETSAT – Jörg Schulz, Robert Husband
- JMA – Yoshihiko Tahara
- NASA – Richard Eckman (Eric Lindstrom)
- NOAA – John Bates, Suzanne Hilding, Chuck Wooldridge, (Mitch Goldberg)
- INPE – (Daniel Alejandro Vila)
- WMO – Jerome Lafeuille, Barbara Ryan, Tillmann Mohr, Hye Jin Lee

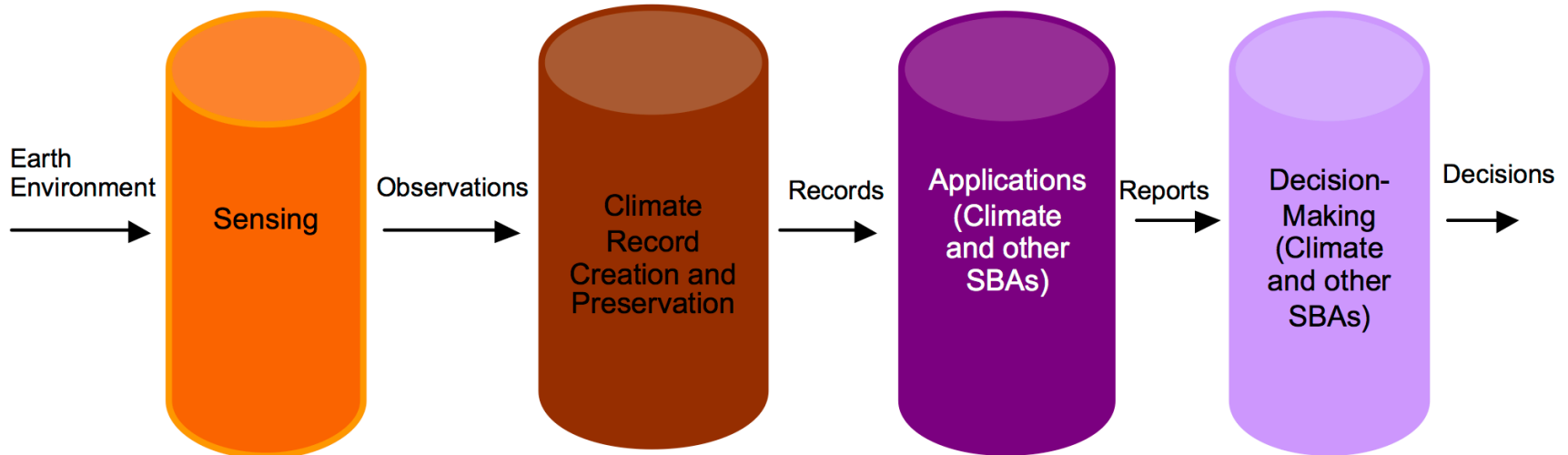
- Review Group: GCOS, GEO, WCRP, (CEOS-WGC)



Strategy Report on a Climate Monitoring Architecture

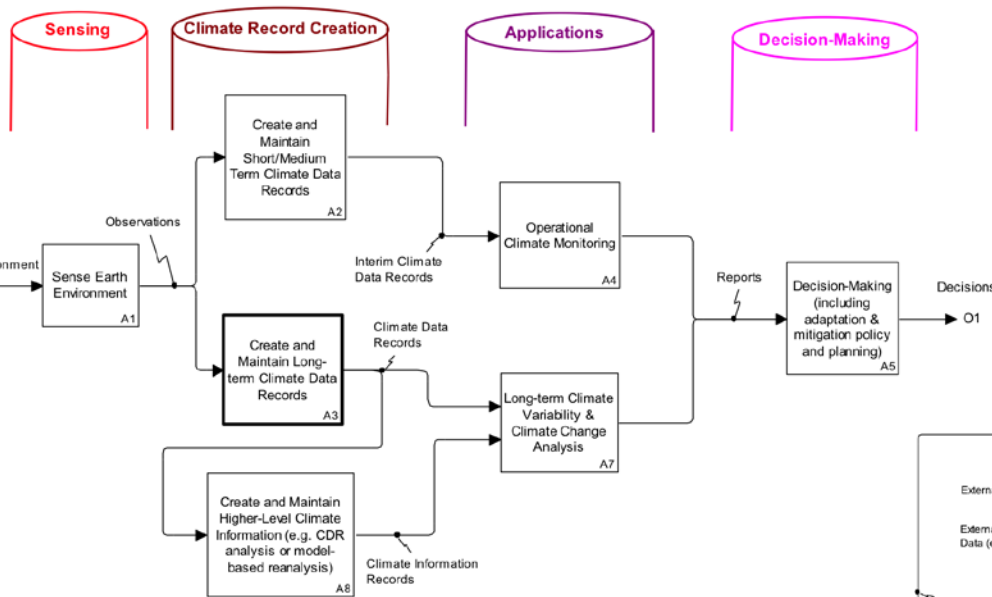
1. Executive Summary and recommendations
2. Introduction, Objectives & Targets
3. Climate Monitoring Principles, Requirements & Guidelines
4. State of the Art
5. Beyond research to operations
6. Climate Architecture definition
7. Mechanisms for Interaction
8. Roadmap for way forward
9. Recommendations

This strategy document is also seen as a foundations for the GFCS Monitoring and Observation Pillar



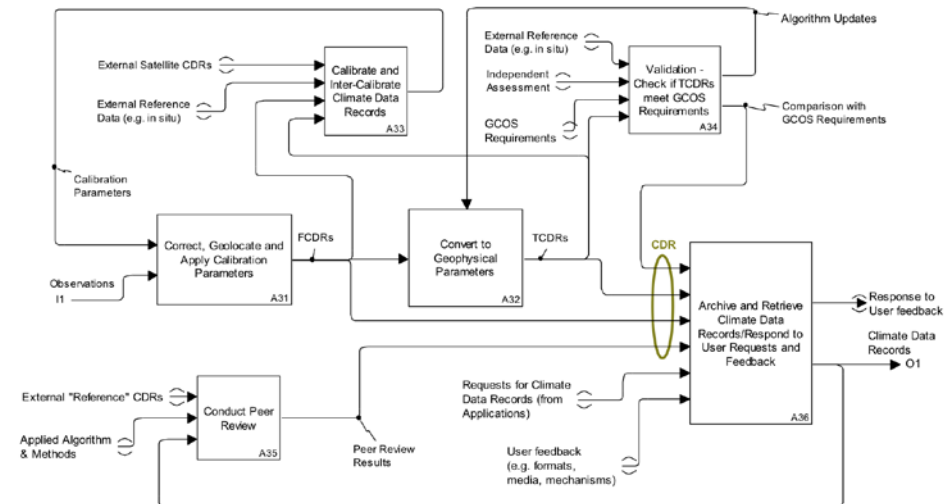


Logical representation



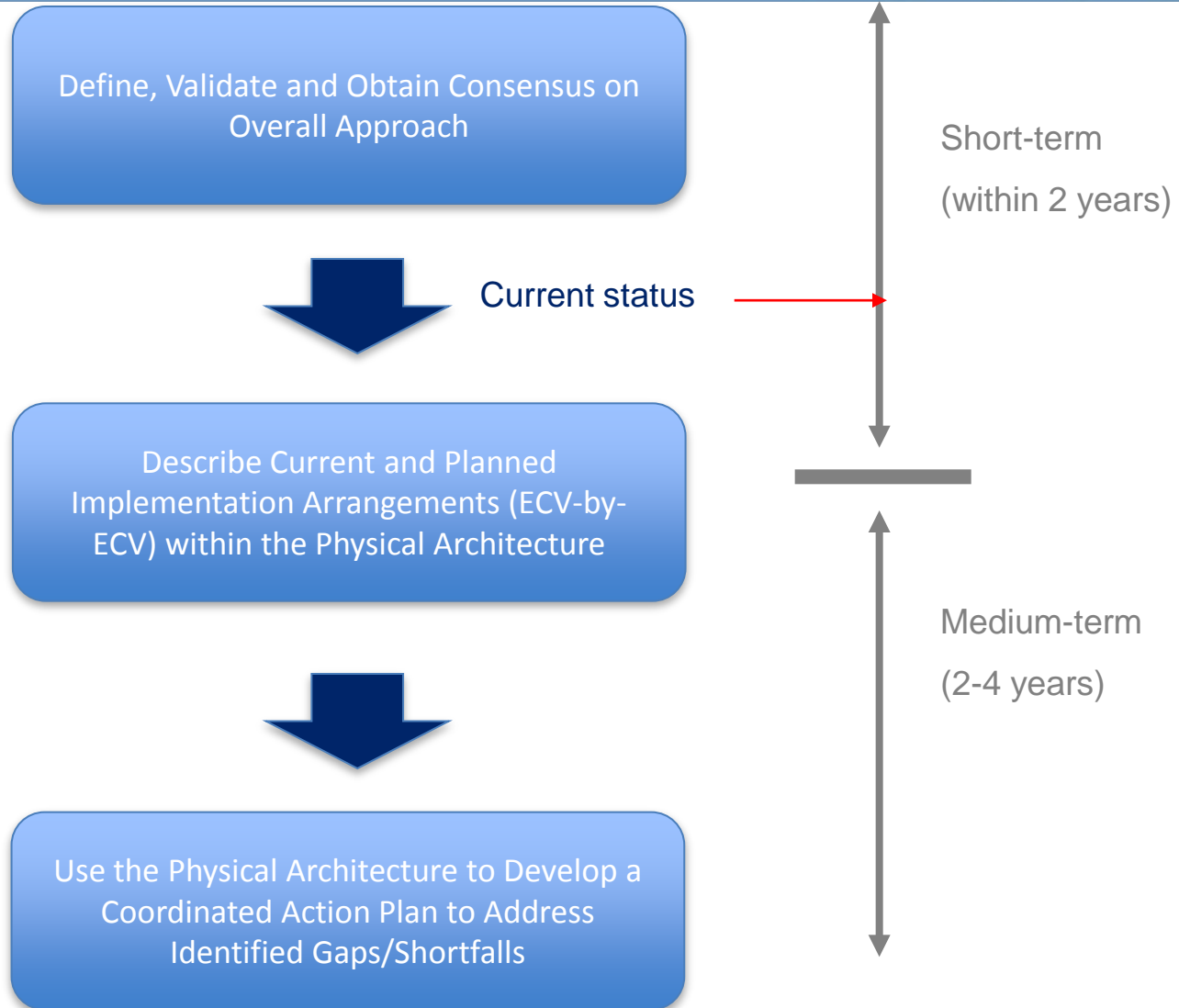
Traceable to GCOS Guidelines and GCOS Climate Monitoring Principles

Traceable from ECV Inventory and physical representation of Climate Monitoring Architecture





Way Forward





CEOS – WORKING GROUP ON CLIMATE



- Review and assess, on behalf of CEOS, the generation of Fundamental Climate Data Records (FCDRs) and derived Essential Climate Variable (ECV) climate products supported by Member space agencies, complementary with existing entities and roles,
 - ...
 - Undertake an analysis, of the extent to which the current status of production of satellite climate records meets the GCOS requirements, including an analysis of the consistency of definitions of ECVs
- ➔ Review and **assess**, on behalf of CEOS, the generation of Fundamental Climate Data Records (FCDRs) and derived Essential Climate Variable (ECV) climate products supported by Member space agencies, complementary with existing entities and roles.



What need to be done ?

Data Assessment of ECV Products and time series with respect to GCOS requirements

- **Creation of an ECV inventory in cooperation with CGMS and WMO**
- **Discussion about assessment: Who can contribute?**

CEOS Internal

1. **Virtual Constellations**
2. **Working Groups
(particularly WGCV)**

CEOS External

1. **WCRP-WDAC**
2. **GEWEX & SPARC**
3. **Scientific Groups
associated with VCs
(e.g. IOCCG)**



- 1. Identify expert groups (e.g. WCRP/GCOS Letter)**
- 2. Define best practices (NOT Space Agencies)**
- 3. Joint VC (WG) & expert group assessment teams**
- 4. Make sure they have Adequate Resources**
- 5. Identify appropriate body(ies) to review assessments**



GENEVA, 12 May 2010

Dear Colleague,

We are writing because we believe that your organization can help to strengthen the international expert groups that, through scientific analysis, intercomparison and review of data records, prepare the ground for world-class climate science and sound decision-making.

Today, there is an unprecedented demand in many socio-economic sectors for relevant climate information for climate change adaptation, mitigation and risk management. Decision-makers expect this information, including related uncertainties, to be based on sound science and trustworthy data. Ensuring transparency, traceability and good scientific judgment in the generation of data records that underpin climate research and climate change monitoring has therefore become imperative.

The ICSU and UN-sponsored Global Climate Observing System (GCOS) and the World Climate Research Programme (WCRP) enjoy a long-standing partnership in the international coordination of climate science and monitoring. GCOS has, since 1992, worked closely with climate scientists and other climate information users (e.g., Parties to the UN Framework Convention on Climate Change (UNFCCC)) to ensure that their needs for high-quality data are addressed by all global Earth observing systems in the atmosphere, in the oceans, on land, and in space. Over the past three decades, WCRP has been successful in fostering the understanding and prediction of the Earth's climate system by engaging world-class climate scientists in measuring, modelling and analyzing the climate system for the benefit of science and society. WCRP also coordinates and supports the development of climate scenarios and climate model experiments and projections that are used in environmental assessments such as the Ozone, IPCC, etc. These efforts depend increasingly on long-term climate observations and records that your organization has been instrumental in establishing over the past few decades.

Since their creation, GCOS and WCRP have promoted the need for well-supported and systematic scientific data stewardship for climate data records, e.g., through advocating the provision of sufficient metadata and the publication of analyses using climate data records in the open literature (cf. Annex II). A number of international scientific groups, some quite independent of GCOS and WCRP, have been tasked by their sponsors to support these goals, many of them with an excellent track record (cf. Annex I).

However, there is currently no systematic international approach to ensure transparency, traceability and sound scientific judgment in the generation of climate data records across all fields of climate science and related Earth observations, and there are no dedicated sustained resources in place to support such an objective. For example, there are currently eight sea-ice concentration products produced by different organizations globally that differ significantly in providing an estimate of sea-ice extent and concentrations, mostly due to differences in methodology and not the variability or dynamics of underlying phenomenon. It is very confusing and frustrating for the non-experts as to which one of these products they can use in their research and analysis, and the necessary documents to

ECV Sea Surface Temperature	GCOS/WCRP OOPC WG SST & Sea Ice WCRP/GCOS WOAP GHRSSST JCOMM DBCP JCOMM SOOP
ECV Ocean Surface Salinity	WCRP CLIVAR GSOP SMOS and Aquarius/SAC-D science teams Argo Steering Committee JCOMM SOOP
ECV Sea Level	JCOMM GLOSS CEOS OST Ocean Surface Topography Science Team
ECV Sea State	JCOMM Expert Team on Wind, Waves and Storm Surges
ECV Sea Ice	WCRP CliC ASPeCt Expert Group GCOS/GOOS/WCRP OOPC WG SST & Sea Ice JCOMM Expert Team on Sea Ice IICWG
ECV Surface Current	JCOMM DBCP CEOS OST CEOS OSVW
ECV Ocean Colour	IOCCG IOCCP CEOS OCR



- **Ultimately existence of an assessment should be indicated in the ECV Inventory but assessment itself would remain independent**
- **Need to also be clear on differences between system metrics (e.g. maturity matrix) and data assessments – two orthogonal axes.**
- **Desirable roles/responsibility:**
 - **Someone to provide “blueprint”/protocol for assessments, i.e. WCRP-WDAC (benefitting from experience with GEWEX, SPARC) – but with input for external expert groups**
 - **Domain specific competence/scientific bodies (e.g. GHRSSST, IOCCG, OST-ST, OSVW-ST) together with CEOS VCs undertake individual assessments**
 - **CEOS WGClimate to ensure assessment have resources, where appropriate thorough CEOS member agencies**
 - **GCOS/WCRP Panels to provide review of assessments**



- **~220 entries so far good representation across domains**
- **Much more response on past/current than on planned/future**
- **Potential for gap analysis to distinguish what is being observed but not used**
- **Initial quality control underway assessing completeness, consistency checks (incl. with MIM), domain experts broad overview**



Thank you for your attendance!!