

GCOS Status and Plans

**ESA CCI
Co-location Meeting**

4 February 2014

**Carolin Richter, Director, GCOS Secretariat,
c/o WMO, Genf, Schweiz**



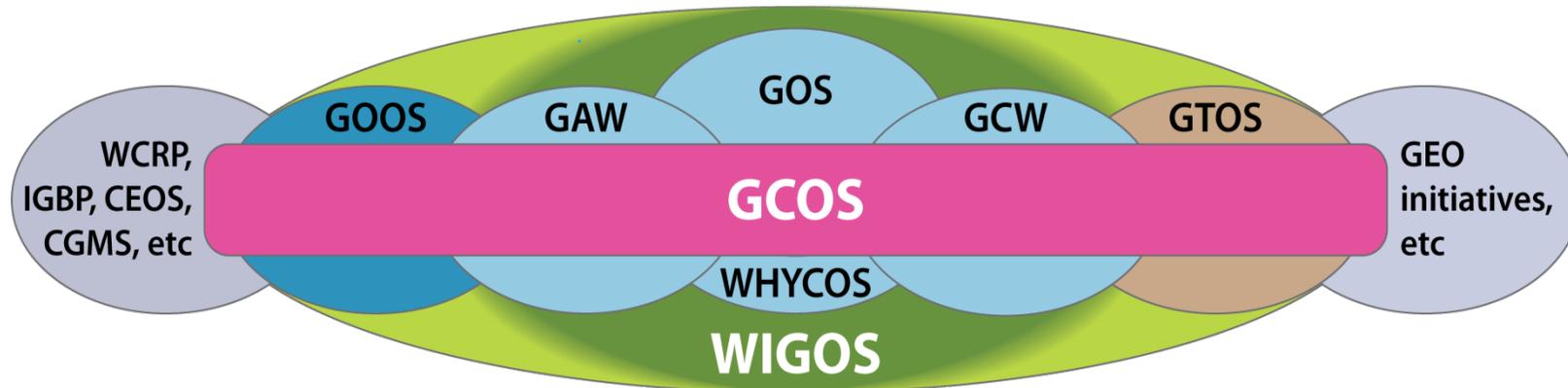
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GCOS Status and Plans

- **Concept (refreshing your memory)**
- **Programme Structure (news on GCOS panels)**
- **News on the GCOS Programme Review by WMO, UNEP, IOC of UNESCO and ICSU**
- **Concept of Essential Climate Variables (ECVs)**
- **Next steps in assessing the adequacy of global observing systems for climate**

GCOS Concept

Oceans – Atmosphere – Land – Cryosphere – Hydrosphere – Carbon Cycle



- the WMO **observing systems** (e.g. WIGOS – GOS, GCW, GAW)
- the IOC-led co-sponsored **Global Ocean Observing System** (GOOS)
- the FAO-led co-sponsored **Global Terrestrial Observing System** (GTOS)
- observational elements of **research programmes** (WCRP, IGBP, etc.)
- **network systems** contributing climate observations, data management or products (GTNs, GOFC-GOLD, etc.)
- which together form our overall global observing system for climate, and the climate-observing component of the **Group on Earth Observation System of Systems** (GEOSS)

The principal GCOS bodies are the

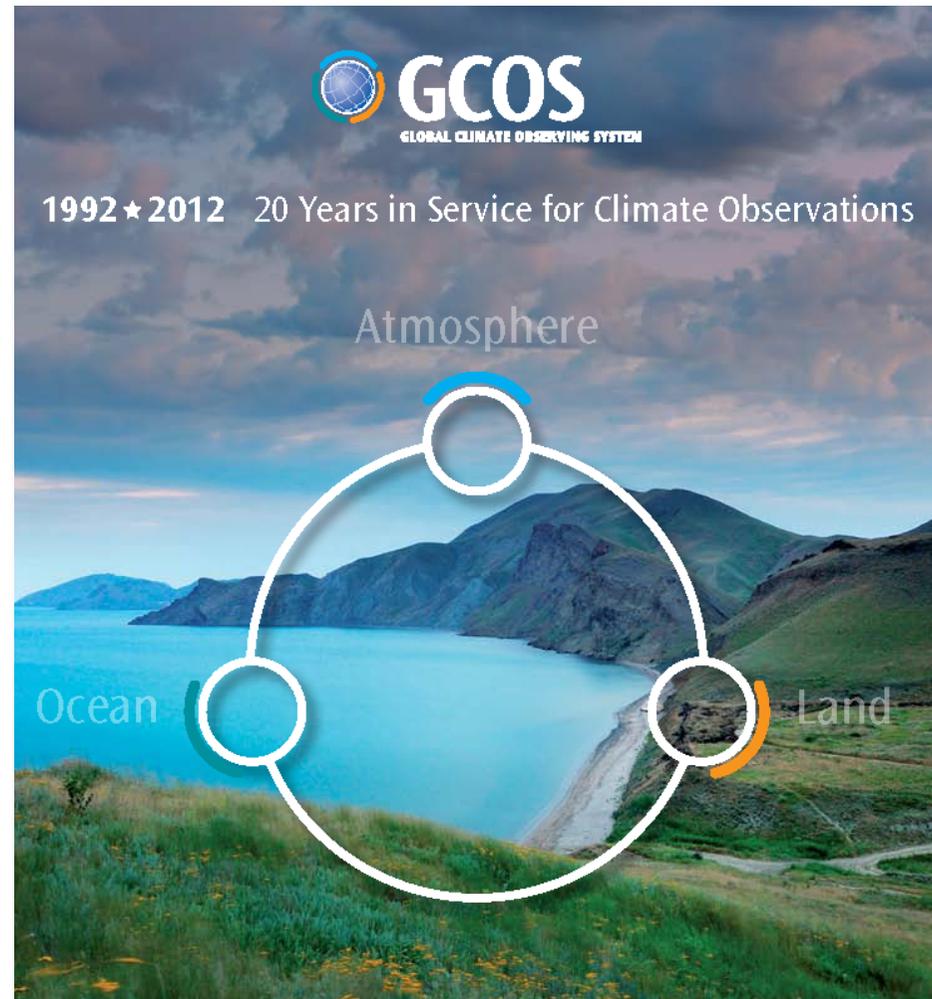
Steering Committee

and the three panels for **Atmosphere,**

Oceans and

Land

it established, which are all co-sponsored by WCRP.



Atmospheric Observation Panel for Climate (AOPC)

Platform for discussions on the climate-components of existing research and operational atmospheric observing systems and the related programmes, including important cross-cutting links to the World Climate Research Programme (WCRP) as well as to the Global Atmosphere Watch (GAW) Programme.

It has the most direct interaction with WMO programmes (Space, Observation) and Technical Commissions (Climate, Basic Systems);

Focus is on the GCOS Surface Network (GSN), the GCOS Upper-Air Network (GUAN) and the GCOS Reference Upper-Air Network (GRUAN).

The Panel in its future sessions will continue to advise explicitly on climate-observing elements of the WMO Integrated Global Observing System (WIGOS), and seek to ensure that there is full cooperation between GCOS, WIGOS and WIS as they develop.

Links to OOPC on observations required to calculate air-sea fluxes and governing/influencing processes.

Chairman Adrian Simmons (UK) stepping down in 2014

- **Next meeting of AOPC-19: 9-11 April 2014, JRC, Ispra, Italy**

Terrestrial Observation Panel for Climate (TOPC) - co-sponsored by GTOS

Co-sponsored by FAO, Secretariat of GTOS is non-functional at FAO; new arrangements are needed

Dr. Riccardo Valentini (Italy) has handed in his resignation as the Chairman of the Global Terrestrial Observation Network (GTOS) Steering Committee in March 2013. The GTOS Secretariat, formally hosted at FAO in Rome, Italy, has been without staff support for more than a year.

Strong partnerships with the Global Terrestrial Networks (GTNs) on lakes, permafrost, glaciers, rivers, and hydrological issues.

Future link to OOPC on requirements focusing on observations in the coastal zone.

Preparation of a joint workshop of GCOS and GOFCC-GOLD on 'Observations for Climate Change Mitigation' from 5 to 7 May 2014 in Geneva, which will focus on engaging REDD+ experts, the agriculture mitigation community, representatives from the climate modelling and integrated impact assessment community, etc.

- Koni Steffen (Switzerland) Chair since 2013
- **Next meeting of TOPC-16: 10-11 March 2014, JRC, Ispra, Italy**

Ocean Observations Panel for Climate (OOPC) - co-sponsored by GOOS

Reactivated following GOOS reorganization; support now based in GCOS Secretariat, the OOPC Technical Secretariat has moved to GCOS at WMO headquarters.

Due to a restructuring of the Global Ocean Observing System (GOOS) that follows the Framework for Ocean Observations (FOO), GOOS has – similar to the structure of GCOS – three expert panels for ocean physical observations (OOPC), biogeochemical observations (IOCCP), and biological observations (formed in November 2013).

New Terms of Reference and Work Plan following OOPC-XVI in Washington, September 2013.

OOPC will expand its focus to coastal oceans/shelf areas, and the deep ocean.

2013/2014 – coordination of the Tropical Pacific Observing System (TPOS) workshop, organized by NOAA and JAMSTEC, that will be held at Scripps Institute from 27-30 January 2014, and will discuss the potential of existing (i.e. Argo, satellite observation) and new technologies (i.e. profiling floats, gliders) in the region.

- Mark Bourassa (US) and Toshio Suga (Japan) co-Chairs since 2013
- **Next meeting of OOPC-17: 22-24 July 2014, Barcelona, Spain**

GCOS Expert Panels & related interactions

WCRP Data Advisory Council (WDAC)

- Otis Brown (US), includes panel chairs, CEOS, CGMS and IGBP; important for advancing joint interests
- **Next meeting: 6-7 May 2014, Galway, Ireland**

CEOS, CGMS and WMO Space Programme

- engagement continues to be active, e.g. on architecture for monitoring from space

The sponsor's review of GCOS

The sponsors of GCOS have set up a Review Board:

- to assess the Programme's mandate and objectives, and the added value it provides to sponsors' members and the EO community
- taking account of developments since the sponsors' MoU on GCOS was agreed in 1998, including
 - establishment of GEOSS, GFCS, WIGOS, PROVIA, Future Earth, ...
 - evolving requirements and capabilities for observations and products
- meeting in March and October 2013
- reporting in final form in April 2014

The GCOS programme and the ECVs

The GCOS programme

- assesses and communicates overall requirements
- advises on and supports implementation, and reviews progress
- reports principally to its sponsors and by invitation to the parties to the UNFCCC

Developed the concept of the Essential Climate Variables (ECVs)

- providing a long-term organisational basis for GCOS assessments
- providing a basis for national reporting under the UNFCCC
- providing a basis for responses such as the ESA Climate Change Initiative

The GCOS at 20 years: the origin, achievement and future development of the Global Climate Observing System

John Houghton,¹ John Townshend,² Kirk Dawson,³ Paul Mason,⁴ John Zillman⁵ and Adrian Simmons⁶

¹Former Chief Executive of the UK Meteorological Office (Joint Scientific and Technical Chairman 1992–1995)
²Department of Geography, University of Maryland, USA (Joint Scientific and Technical Chairman 1995–1998)

comprehensive observation of the entire atmosphere-ocean-land climate system. This inspired the vision for an integrated Global Climate Observing System (GCOS).

The GCOS was formally established in 1992 as an international, interagency, interdisciplinary framework for meeting the full range of national and international needs for climate observations. Its goal is to provide comprehensive information on the total climate system, involving a multidisciplinary range of physical, chemical and biological properties and atmospheric, oceanic, hydrologic, cryospheric and terrestrial processes. It is co-

needs of Parties to the UNFCCC, a specific Convention-focused Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC' was finalized in 2004 and updated in 2010, and a series of Regional Action Plans (RAPs) for GCOS implementation for ten separate groups of developing countries was prepared over the period 2001–2006. The 2009 Third World Climate Conference (WCC-3) identified the GCOS as an essential element of the new GCOS and its further development in support of climate services worldwide is an important focus of the GCOS Implementation Plan called for by

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The concept of Essential Climate Variables in support of climate research, applications, and policy

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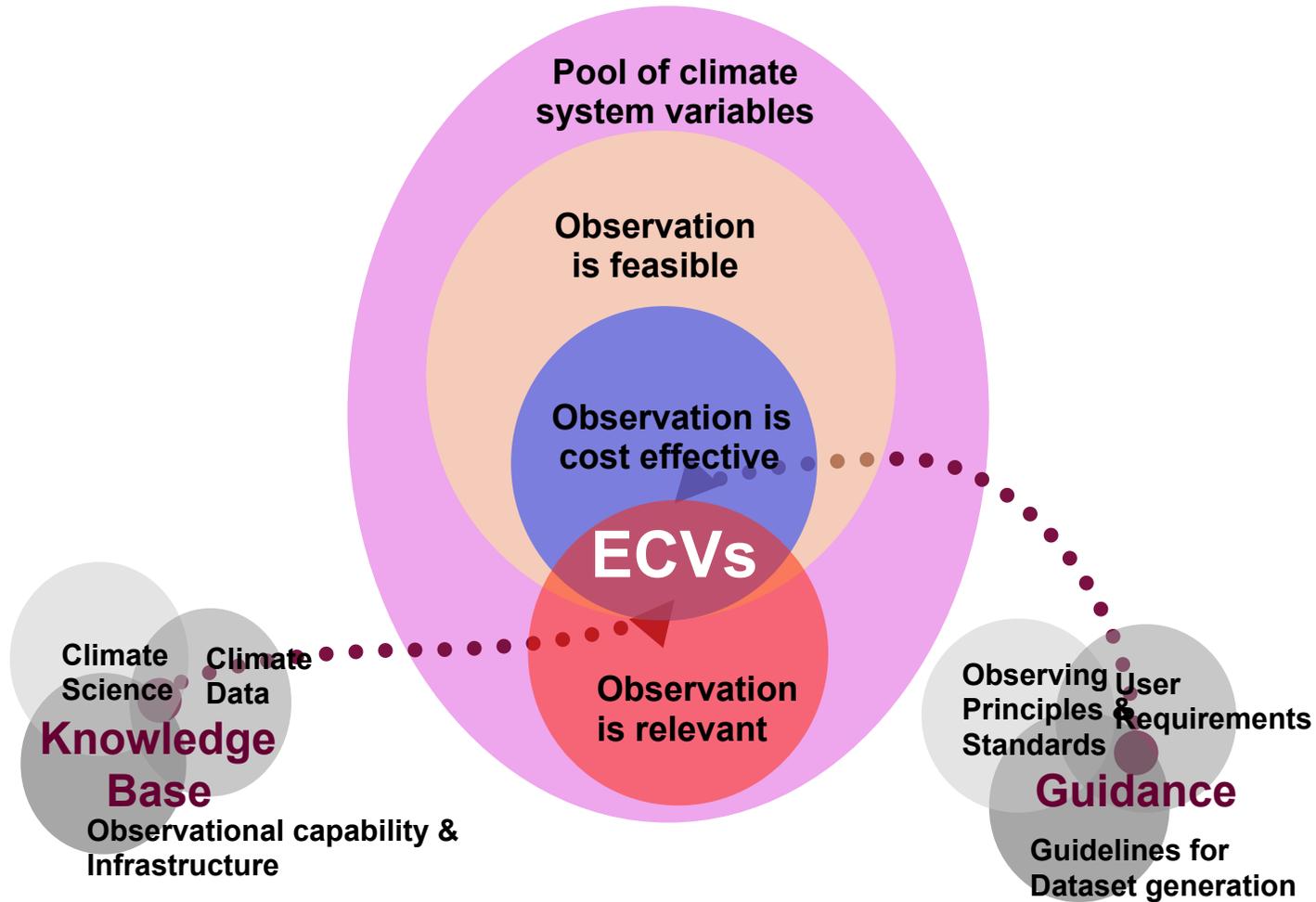


To appear in **Bull. Am. Meteorol. Soc.**,
with references to Swiss national GCOS
programme, **CATCOS** and **WGMS**

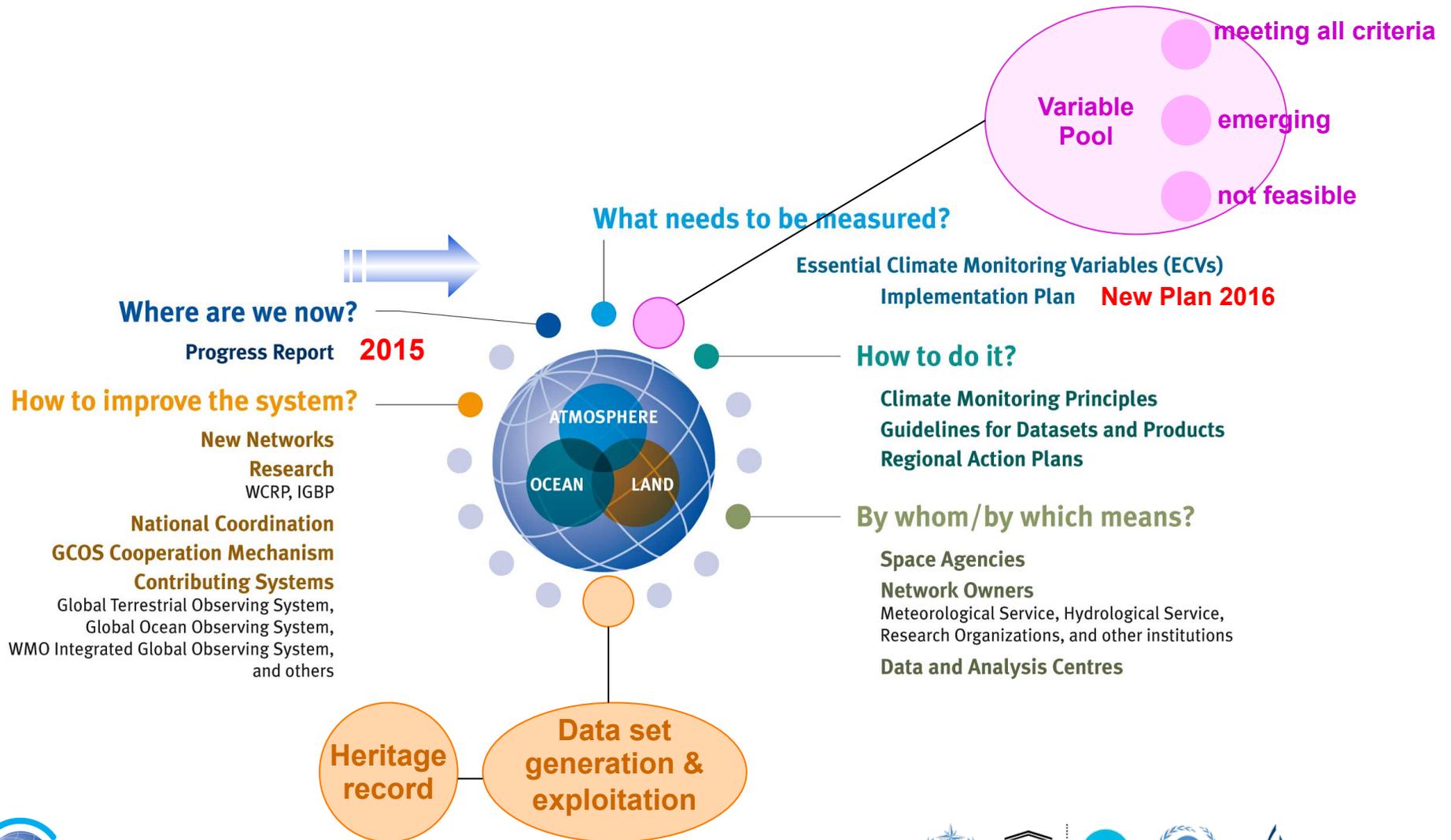


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Concept for Essential Climate Variables (ECVs)



Continuous improvement and assessment cycle



GCOS Continuous Improvement & Assessment Cycle

The GCOS programme has started the process for:

- a 2015 report on the progress and status of climate observation
- a new “Implementation Plan” in 2016, which should identify:
 - continuing and new requirements, including a restatement of the rationale for the list of ECVs and possible amendment of the list
 - the adequacy of present arrangements for meeting the requirements
 - the additional actions needed, with indicative costs, performance indicators and potential agents for implementation
- statements of specific requirements for products
 - from both *in situ* networks and the space-based component
 - and from integration of the data provided by both

either embedded in the main Plan or as separate supplement(s)

Input to the new assessment

Content will be based on various inputs, including from:

- 2011 WCRP Conference and 2013 SPARC Data Workshop
- 2013/2014 IPCC Fifth Assessment Report
- 2013/2014 national reporting to UNFCCC on systematic observation
- 2014 EUMETSAT/WCRP Climate Symposium
- WMO (GFCS, WIGOS), IOC (GOOS) and post-2015 GEO planning
- CEOS/CGMS/WMO initiatives (Architecture, Inventory of datasets)
- other assessments of requirements (GEO, ESA CCI)
- assessments by GCOS/WCRP panels
- dedicated GCOS workshops
- an open review

Global Observing Systems for Climate

