

Developments within GCOS

Agenda item #24

Jean-Louis FELLOUS
GCOS Space Rapporteur



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GCOS encompasses the climate components of:

- the WMO observing systems (WIGOS: GOS, GAW, WHYCOS, ...)
 - 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, ...)
 - other systems contributing climate observations, data management or products
- which together form our overall global observing system for climate, and the climate-observing component of the GEO System of Systems



The GCOS program:

- assesses and communicates overall requirements
- advises on implementation and reporting
- reviews and promotes progress

covering the observations, transmission and management of data, establishment of fundamental climate data records and the formation of products from them



GCOS
GLOBAL CLIMATE OBSERVING SYSTEM

1992 ★ 2012 20 Years in Service for Climate Observations

Atmosphere

Ocean

Land





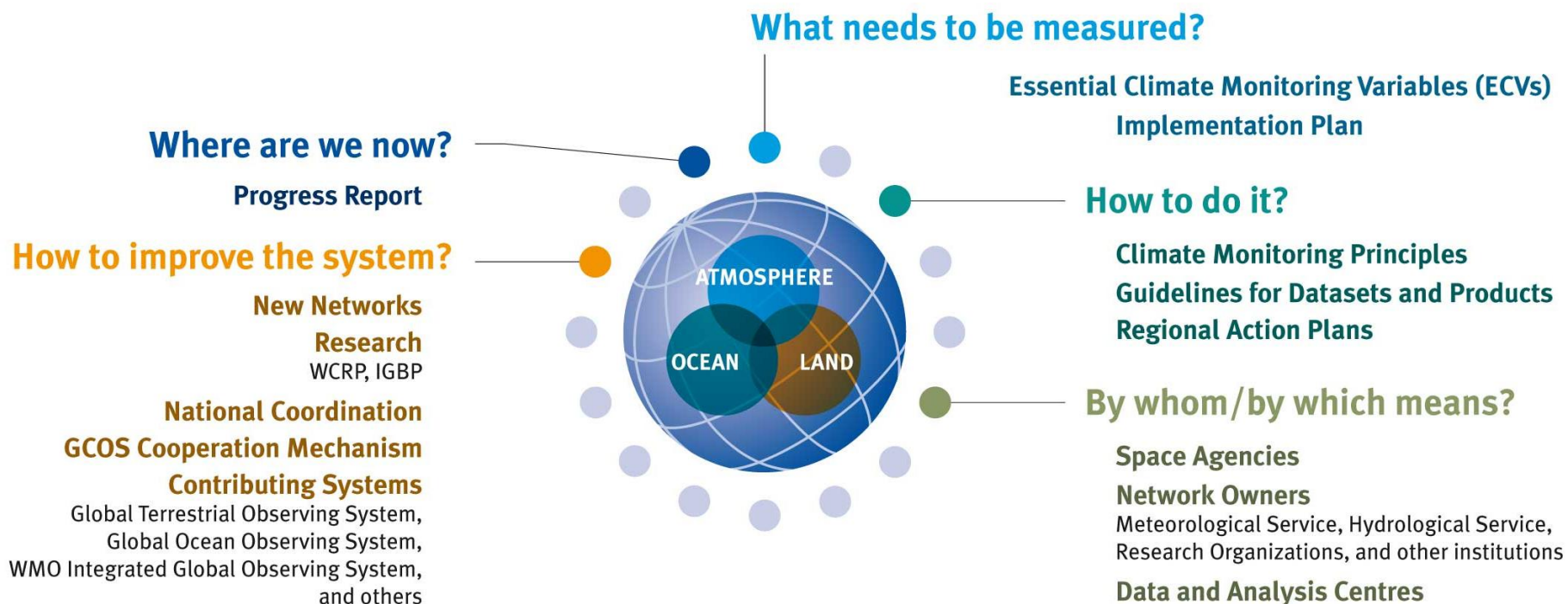
GCOS functions through contributions from:

- **NMHSs, other national institutions and regional agencies**
 - to the observing systems, including to baseline and reference atmospheric networks (GSN, GUAN, GRUAN, ...), following GCOS principles and guidelines
 - operating monitoring centres, an analysis/archive centre, lead centres, ...
 - supporting the GCOS Cooperation Mechanism and regional activities
 - coordinating their specific national GCOS activities
- **Secretariats of contributing observing systems, related Technical Commissions, space-agency coordinating bodies, expert groups, ...**
- **GCOS bodies:**
 - the Programme Director and staff at WMO
 - the Steering Committee
 - co-sponsored Panels for Atmosphere, Ocean and Land, and their working groups
 - Also working through representation on the WCRP Data Advisory Panel



**Atmosphere (AOPC) and Land (TOPC) Panels have met this past year
Change in GOOS governance delayed Ocean (OOPC) Panel meeting
Panels keep observing-system performance under review**

- still many positives, despite funding pressures
- concerns include:
 - some *in situ* network deterioration, real or threatened, including reductions in atmospheric composition measurements and maintenance of moored buoys
 - real or potential gaps or delay in provision of several types of satellite data, including altimetry, limb sounding, reference measurement and basic meteorological measurement from polar orbit





Adequacy assessment

- Second report on adequacy of global observing system published in 2003

Implementation Plan

- primarily in support of UN Framework Convention on Climate Change (UNFCCC)
- detailed statement of actions that need to be undertaken by identified “agents of implementation” to address inadequacies
- first published in 2004, with Satellite Supplement in 2006

Progress assessment

- report on progress against 2004 Plan published in 2009
- led to revision of Implementation Plan in 2010, and Satellite Supplement in 2011

Process

- prepared by editors and SC/Panel chairs based on input from workshops
- drafts are subject to open review
- presented to UNFCCC for consensus response of parties to the convention



ECVs are physical variables, or groups of related variables, for which provision of sustained observations and/or derived datasets is feasible, and that are important for meeting UNFCCC and other climate requirements

<p>Atmospheric</p>	<p>Surface: Air temperature, wind speed and direction, water vapour, pressure, precipitation, surface radiation budget</p> <p>Upper-air: Temperature, wind speed and direction, water vapour, cloud properties, earth radiation budget (including solar irradiance)</p> <p>Composition: Carbon dioxide, methane, and other long-lived greenhouse gases, ozone and aerosol, supported by their precursors</p>
<p>Oceanic</p>	<p>Surface: Sea-surface temperature, sea-surface salinity, sea level, sea state, sea ice, surface current, ocean colour, carbon dioxide partial pressure, ocean acidity, phytoplankton</p> <p>Sub-surface: Temperature, salinity, current, nutrients, carbon dioxide partial pressure, ocean acidity, oxygen, tracers</p>
<p>Terrestrial</p>	<p>River discharge, water use, groundwater, lakes, snow cover, glaciers and ice caps, ice sheets, permafrost, albedo, land cover (including vegetation type), fraction of absorbed photosynthetically active radiation (FAPAR), leaf area index (LAI), above-ground biomass, soil carbon, fire disturbance, soil moisture</p>



An ECV is not a dataset or product. A dataset, climate data record or product that relates to an ECV may be called an ECV dataset, an ECV data record or an ECV product

ECVs were first identified as such in the 2nd Adequacy Report, stemming from the original GCOS concept of “Principal Observations”. Subsequent GCOS-IP and Satellite Supplements were structures around requirements for observing and deriving data products for the ECVs

ECVs were recognized by UNFCCC CoP in responding to the Adequacy Report and IP. CoP requested Parties to report on their programs for contributing observations of the ECVs to the international community

ECVs have been increasingly recognized since then, e.g. in the ESA Climate Change Initiative (CCI) and the European FP7 Calls & Projects

2010-IP revised the list of ECVs (unlikely to change until next IP revision)

Concept is spreading: Essential (Ocean, Biodiversity) Variables



GCOS is involved in a number of partnerships and collaborations

- GCOS maintains close connection with CEOS and its Working Group on Climate
- GCOS is invited by CGMS to report regularly to its Plenary
- GCOS is participating in the Climate Monitoring Architecture activity
- GCOS acts, together with EUMETSAT and ESA, in favor of establishing an ECV data inventory
- GCOS and WCRP are eager to possibly hold a second workshop on the ECV data inventory, following the first GCOS-WCRP-ESA workshop on this topic, held in 2010 in Frascati

GCOS celebrated its 20th anniversary at WMO on 29 June 2012, in the presence of a large number of representatives of its sponsors and partners, including official space agency representation (ESA, EUMETSAT), and many of its visionary initiators





Satellite Supplement to 2010 Implementation Plan published Dec 2011

- placing emphasis on requirements for products

GCOS highly values CEOS coordinating space-agency response just sent to UNFCCC

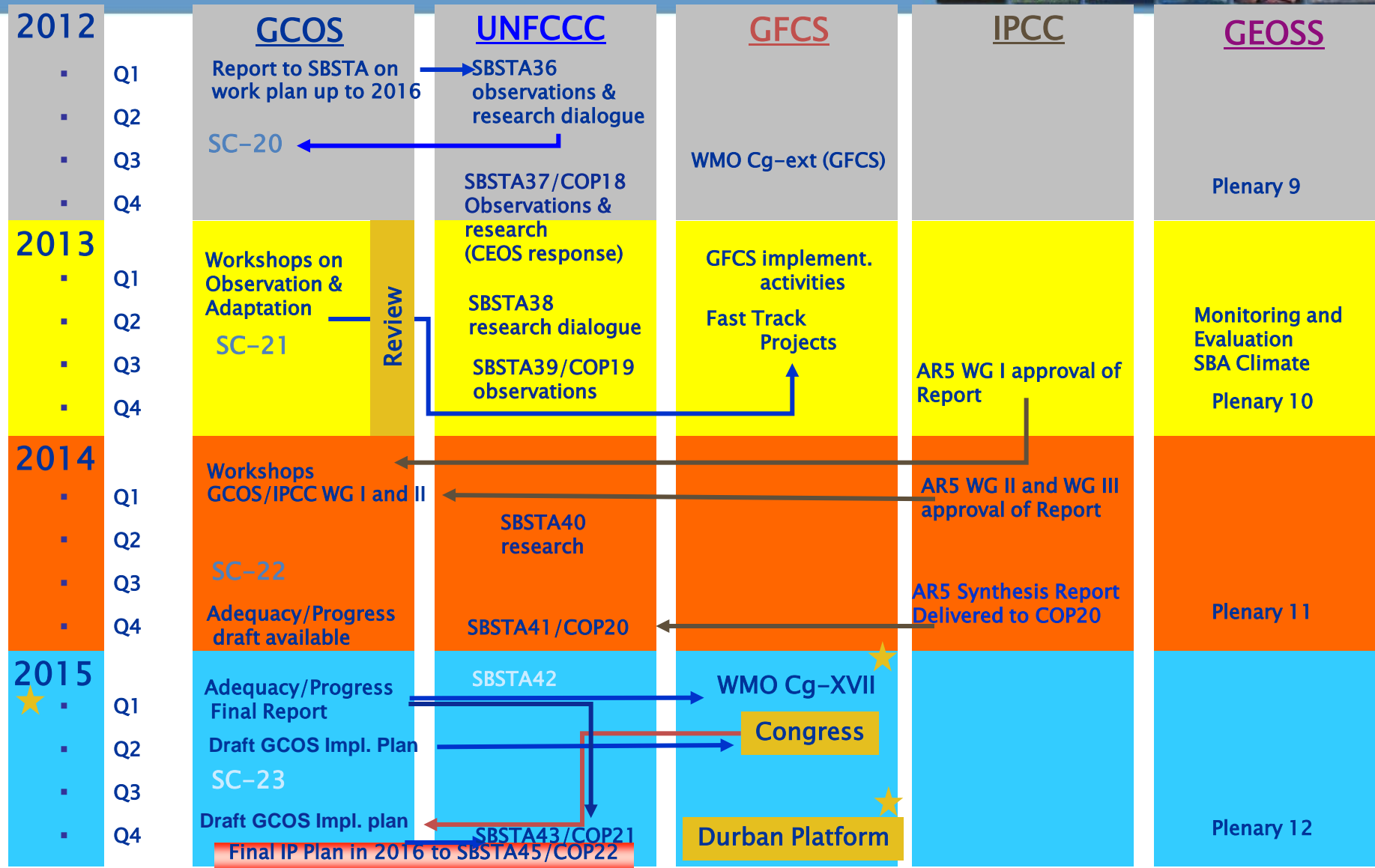
GCOS contributed to plan for Observation & Monitoring component of GFCS

GCOS mapped out a proposal for next assessment cycle

- liaising with UNFCCC
- reviewing data needs for adaptation and service provision (2012-2013), linking with GFCS, UNEP and other initiatives
- assessing general progress and adequacy (2013-2015), taking account of uncertainties identified by the IPCC 5th Assessment process
- formulating new Implementation Plan (2015-2016)

Future activities will be subject to the outcome of a Sponsors' review of the programme to be held over coming 12 months

Timetable for delivering the adequacy/progress report and new IP





The 26th CEOS Plenary – Bengaluru, India - 24-27 October, 2012