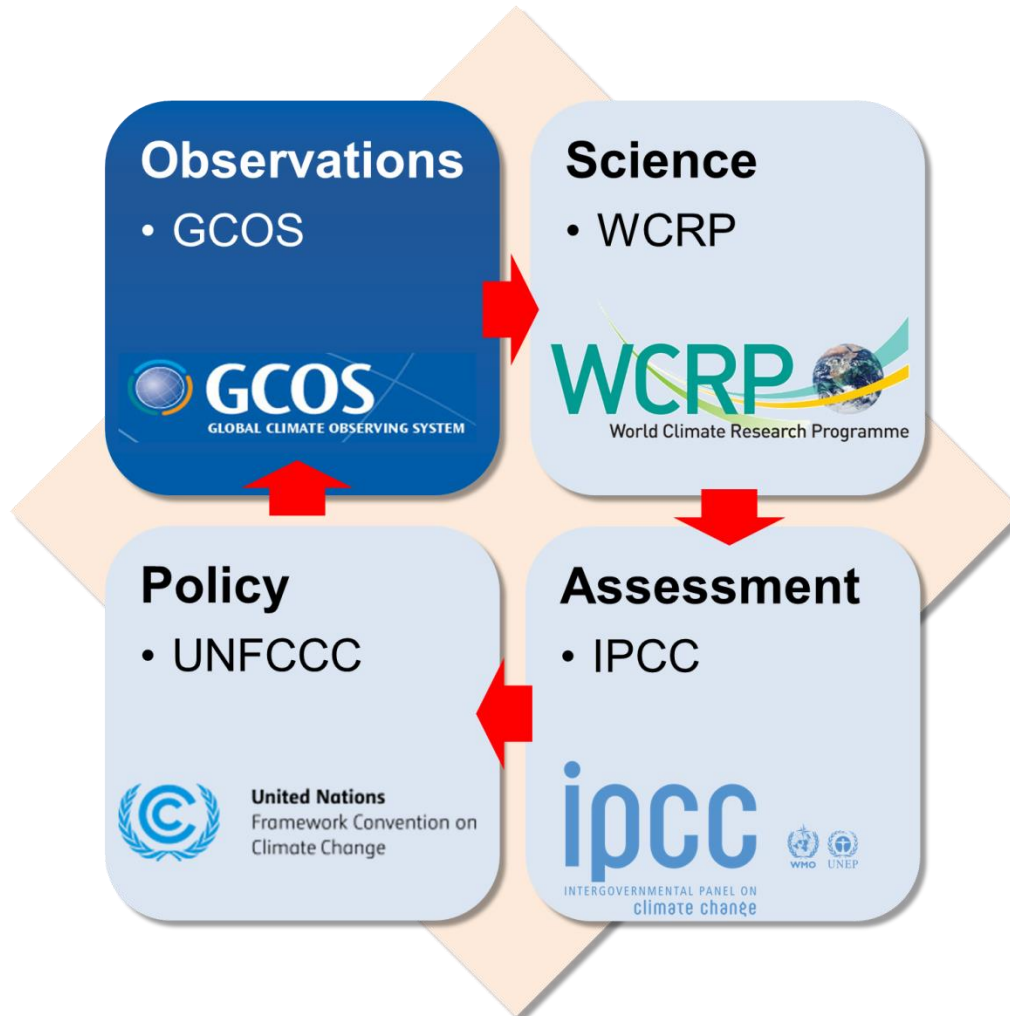

Global Climate Observing System (GCOS) New findings & Emerging needs

UNFCCC SBSTA44, RD 8, Bonn, Germany

Carolin Richter, Director, GCOS Secretariat

19 May 2016

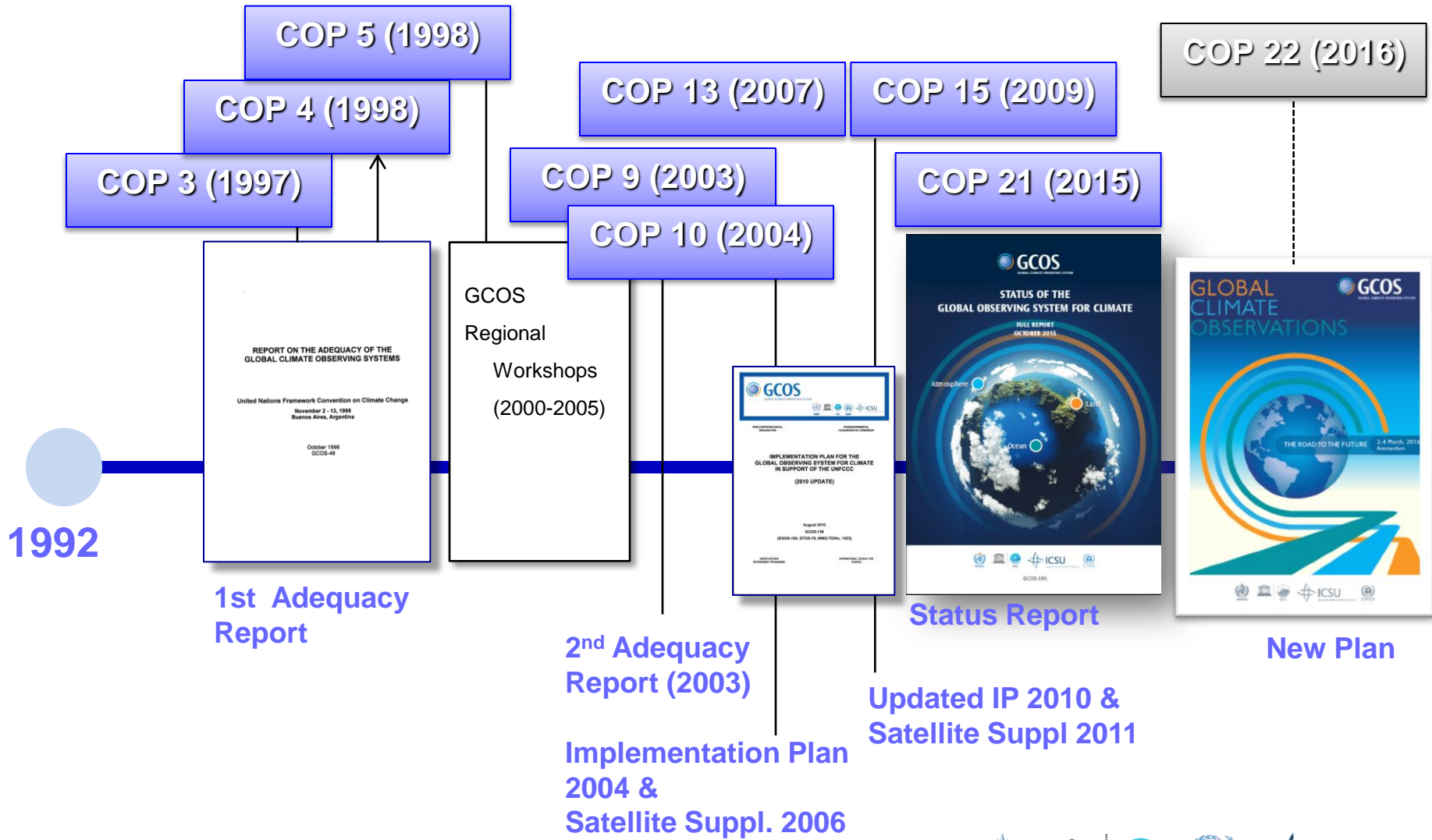






GCOS GCOS & SO UNDER THE CONVENTION

GLOBAL CLIMATE OBSERVING SYSTEM



ICSU
International Council for Science

NEW GCOS Implementation Plan (2016)

- ❑ The new implementation plan is envisaging broadening its scope to global Earth`s environmental cycles, i.e., energy, carbon and water, and *inter alia* taking into account Sustainable Development Goals, climate services, climate indicators and relevant outcomes of discussions during COP21.
- ❑ It will advise on new requirements for measures needed for adaptation to a changing climate, and measures to mitigate climate changes.
- ❑ The new plan will lay out a new strategic approach to further implement the Global Climate Observing System and will introduce a section on cross-cutting disciplines and on scientific and technological challenges.



- **Communication: need for a comprehensive set of relevant climate indicators**
- **Integrated observing systems: satellite and *in situ* observations**
- **Core in-situ networks remain fragile**
- **Closing carbon, energy and water cycle to completely monitor the climate system**
- **Climate research to exploit the full potential of global climate observing systems to innovate and stimulate climate services**
- **Include chemistry and biology in models due to advances in new sensor technologies**
- **Stress the economic benefit of investing in observations**
- **Make systematic observations and knowledge available to users**

New Implementation Plan 2016 – Draft ECV Table

Domain	Essential Climate Variables (draft table under discussion – to be endorsed by GCOS Steering Committee in October 2016)
Atmospheric (over land, sea and ice)	<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 and spectral radiance).</p> <p>Composition: Carbon dioxide, Methane, and other long-lived greenhouse gases, Ozone, Aerosol, and Precursors</p>
Oceanic	<p>Physics: Temperature, Sea Surface Temperature, Salinity, Sea Surface Salinity, Currents, Surface Currents, Sea Level, Sea State, Sea Ice, <i>Ocean Surface Vector Stress (new)</i>, <i>Sensible and Latent Heat fluxes (proposed/emerging?)</i></p> <p>Biogeochemistry: Ocean Carbon, Nutrients, Oxygen, Tracers, <i>Non-CO2 Greenhouse Gases (Nitrous Oxide)</i></p> <p>Biology/Ecosystems: Ocean Colour, Phytoplankton, (plus additional emerging?)</p>
Terrestrial	<p>Hydrology: River discharge, Anthropogenic water use, Groundwater, Lakes, Soil Moisture</p> <p>Cryosphere: Snow cover, Glaciers, Ice sheets and Ice shelves, Permafrost,</p> <p>Biosphere: Albedo, Land cover (including vegetation type), Fraction of absorbed photosynthetically active radiation (FAPAR), Leaf area index (LAI), Above-ground biomass, Soil carbon, Fire disturbance, Land Surface Temperature, Anthropogenic GHG fluxes</p> <p>While Land latent and sensible heat flux is not yet a flux a review will examine the feasibility of this being a global ECV</p>

New: Aerosols and Precursors

New: clear distinction between physics – bio-geochemistry – biology and ecosystems; heat fluxes

New: clearer emphasis on biosphere; land surface temperature; GHG fluxes

UNFCCC NEEDS FROM PARIS AGREEMENT

UNFCCC	Needs	
Adaptation	Meteorological data e.g. Temp, precipitation, wind, humidity Ecosystem status e.g. Ocean colour, Land cover, soil moisture Coastal zone e.g. Sea level, sea state, topography, subsidence Ocean acidity, Glaciers, Dust, Snow water equivalent...	Also need high resolution local data. Gaps exist in vulnerable areas
Mitigation	Land cover (e.g. forest monitoring to support REDD+) GHG emissions	Many forest monitoring activities exist
Transparency	GHG emissions, Land cover, above ground biomass Atmospheric composition	Validation of emission inventories
Global Stock Taking	GHG emissions, temperature, precipitation Glaciers, Ice Sheets, Sea Ice Land cover/vegetation Ocean heat content, acidity & colour, sea level Atmospheric composition,	Monitoring needs unclear
Public Awareness	Temperature, sea level, ocean heat content, summer arctic sea ice extent, glacier mass balance, snow cover, specific humidity ...	Indicators to be decided
Capacity Building	GCOS Cooperation Mechanism currently focussed on meteorological data	Extend to terrestrial area?



Adaptation

- GCOS is including adaptation in its new Implementation Plan.
- Needs include a combination of global observations together with local and regional data and projections.



Mitigation

- Observations of forests and land use change support mitigation efforts such as REDD+



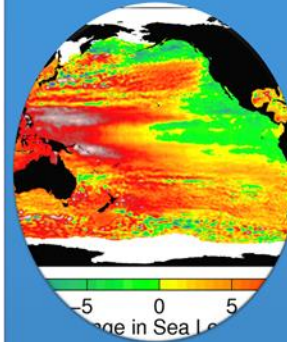
Global Stocktaking.

- Information on overall effect of actions should be supplied to the global stocktaking - climate observations will play an important role.



Transparency of Action

- Observations of atmospheric composition will be able to support improved reporting as networks develop.



Public awareness

- GCOS is planning to develop a list of indicators to better communicate the full impact of climate change



Capacity Development

- The GCOS Cooperation Mechanism is helping parties to improve their observations through practical support to equipment, people and communications

Paris Agreement

The new GCOS Implementation Plan

GCOS is preparing a new Implementation Plan to present to SBSTA at COP22/MOP12 in Marrakech in November 2016. To ensure this plan takes account of the widest range of opinion and support there will be a public review of the draft document in July 2016. You are welcome to distribute the draft widely to relevant experts to ensure a wide review.

New Implementation Plan

Review Period

JULY 2016 (for 6 weeks)

Details will be given at:

gcos.wmo.int