

Recommendations from GCOS/WCRP Joint Panels Meeting, 18-22 March 2019, Marrakesh, Morocco

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**GLOBAL CLIMATE
OBSERVING SYSTEM**

KEEPING WATCH OVER OUR CLIMATE



The GCOS implementation plan has an aim to improve the monitoring of the 3 climate cycles

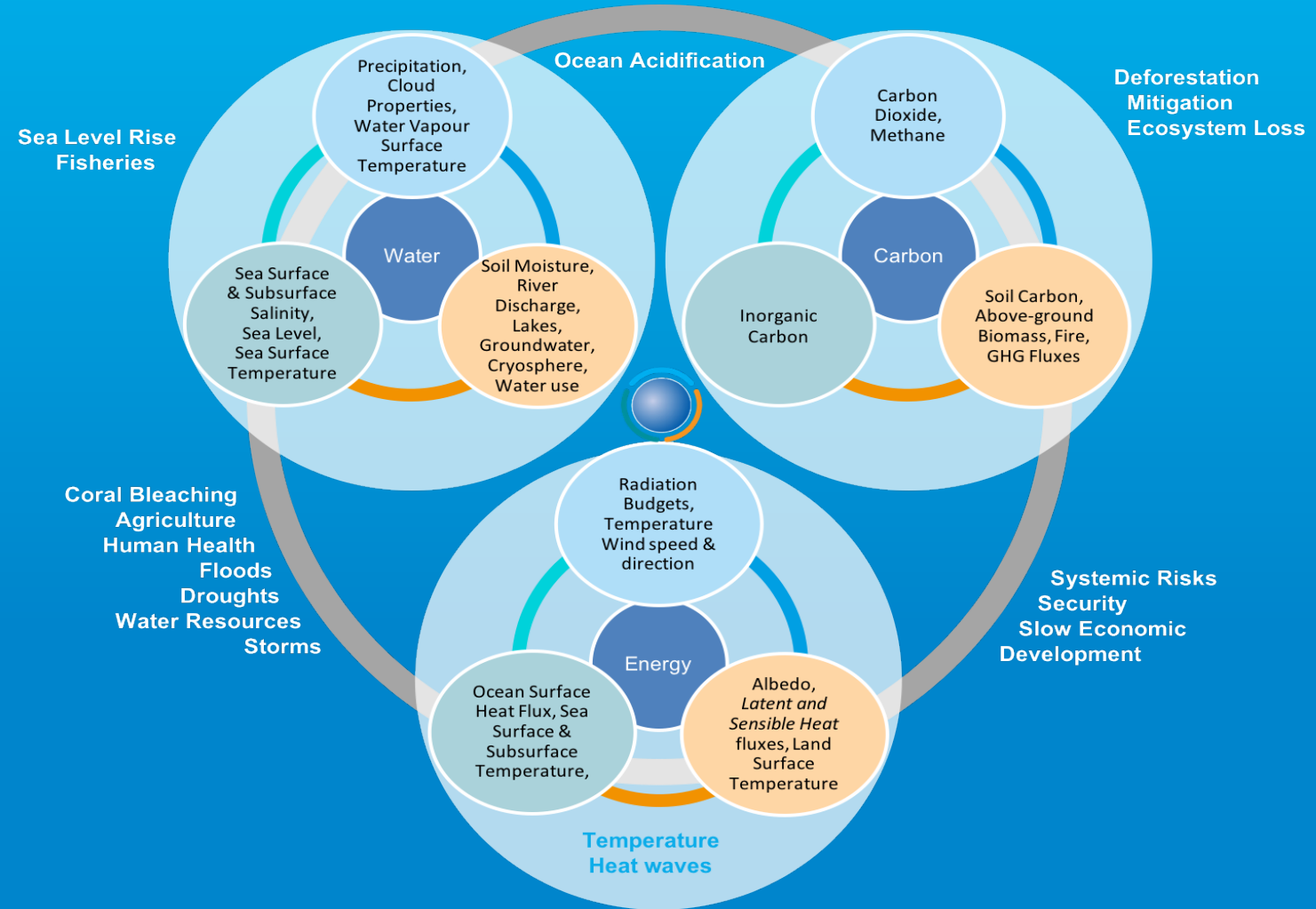
For carbon the target is to quantify

- fluxes of Carbon related gases to $\pm 10\%$
- Changes in stocks of carbon to $\pm 10\%$ on decadal scales on land and in the oceans
- Changes in atmospheric annually carbon stocks to $\pm 2.5\%$

• GCOS has many ECV related to the carbon cycle, the main ones are:

- Ocean Inorganic Carbon
- Atmospheric composition of CO_2 and CH_4
- Greenhouse Gas Fluxes
- Soil Carbon, Aboveground biomass, Permafrost

Joint Panels Meeting,
18-22 March 2019,
Marrakech



Joint GCOS Panels meeting 18-22 March 2019

- Held jointly with WCRP/WDAC and CEOS/CGMS WGClimate
- Joint meeting, three phases:
 - among all
 - among 3 GCOS Panels
 - each panel meeting individually
- Adaptation
- Cycles – carbon, energy, water
- + 3x Topics:
 - Extreme events,
 - air-sea/land fluxes,
 - coastal land-sea exchanges

Part 1 - Information on gaps and needs:

→ GCOS community discussion on Observation and science priorities to inform GCOS and WCRP

Main overarching conclusions:

- need for commitment to long-term, sustained climate observation systems
- need for open access to climate observations, irrespective of source
- need to have traceable observations for accurate long-term monitoring
- Conference on Observations for Climate (Partnership GCOS + GOOS / Copernicus / WGClimate/WDAC)
 - Report in next GCOS Status Report, and include actions in revised Implementation Plan

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Part 2 - Studying:

Ensure that climate observations are enhanced and continued into the future, in order to fully monitor the Earth's water and carbon cycles, energy balance and biosphere:

Break-out groups

- (1) Carbon
- (2) Water
- (3) Energy
- (4) Biodiversity / Life

Cross-Panel discussions:

- (a) Air/sea energy fluxes
- (b) Coastal-Land-Ocean-Water Fluxes
- (c) Extremes

- Scoping papers to be further developed, Published? IPCC AR6 cut-off date 31 Dec 2019.
- Discussion need to be continued (workshops, task teams...)
- Big ticket questions to the EO community will be formulated

Outcome of Marrakesh meeting relevant to WCRP: Recommendation 1

- Consider the regional and temporal resolutions needed to improve the understanding of the carbon cycle.
- How information about carbon isotopes can be used and what is needed to improve monitoring of the carbon cycle?

Outcome of Marrakesh meeting relevant to WCRP: Recommendation 2

- Work with modelling and observational communities to establish a scientific basis for improving observations, i.e. how to capture the Earth's energy balance observationally and what is the needed accuracy of these observations to close the Energy balance sufficiently to resolve the radiative forcing.

Recommendation 2 (continued with details)

- Provide contribution of **surface flux** work as done under OceanObs / GCOS.
- Recommend and support that the community should submit a 'proposition of continuation' of CONCEPT-HEAT (Consistency between planetary **heat** balance and ocean heat storage).
- Encourage and support contributions to other scientific papers, for example on the EEI inventory (e.g. **added expertise from observations** on atmospheric, land and cryosphere storage)
- Building on a previous workshop, improve **links** between model and observational communities.
- Recommend and support the continuation of Ocean Reanalysis Intercomparison Project. Support related **reanalysis inter-comparison** projects.
- Determine the time-scales needed to understand the **global energy balance**.
- Identify the **regional scale** that needs to be considered (e.g. including heat re-distribution: transport in the atmosphere and ocean, and regional budgets)
- Continue to increase scientific understanding, knowledge and tools through the physical budget constraint approach, and address implications of changes in the **energy budget**

Timeline

