GCOS

GLOBAL CLIMATE OBSERVING SYSTEM

GCOS Implementation Plan 2016

Observations for adaptation, mitigation and climate science

ICSU International Council for Science

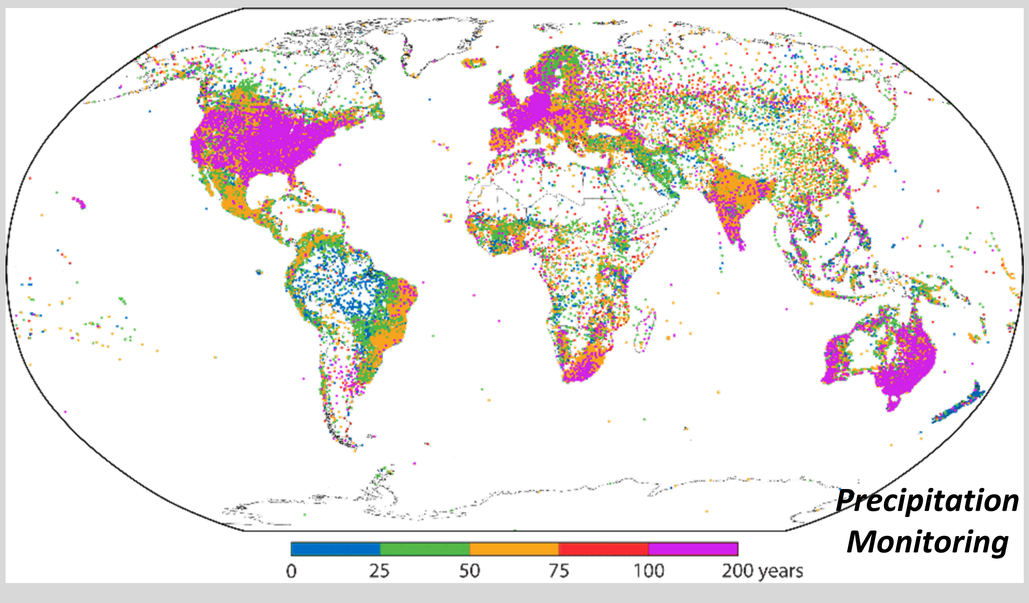
UNEP

New GCOS Implementation Plan

GCOS has been recognized by the UNFCCC since 1997 as the programme that leads the improvement of systematic observations to meet the needs of the convention (e.g. Decisions 8/CP.3, 14/CP.4, 9/CP.15). (See also unfccc.int/3581).

In response to a request from SBSTA 43 in 2015, GCOS has produced *The Global Observing System for Climate: Implementation Needs (GCOS-200)* and submitted it to the UNFCCCC at this session.

While the global observing system has been very successful there remain gaps as shown in the plot below of precipitation monitoring sites coloured by the length of their records. Supporting national efforts it improve these observations such as these is an important part of the plan.

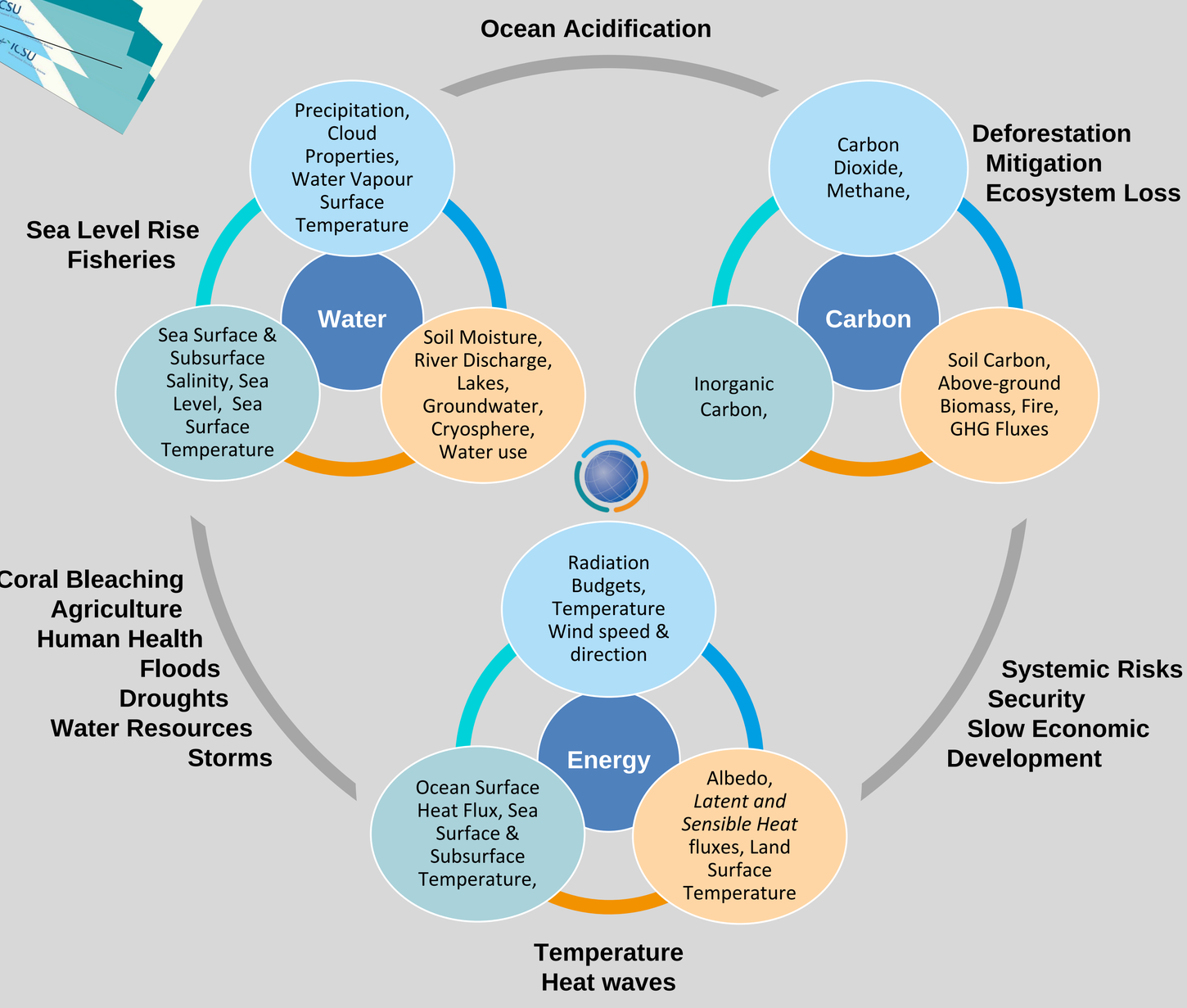


Precipitation Monitoring

Measuring the three climate cycles: Carbon, Water and Energy, Essential Climate Variables monitoring change will

- allow prediction of future climate, climate change and extremes
- enable planning and risk reduction
- improve climate science and understanding
- provide public information about the climate

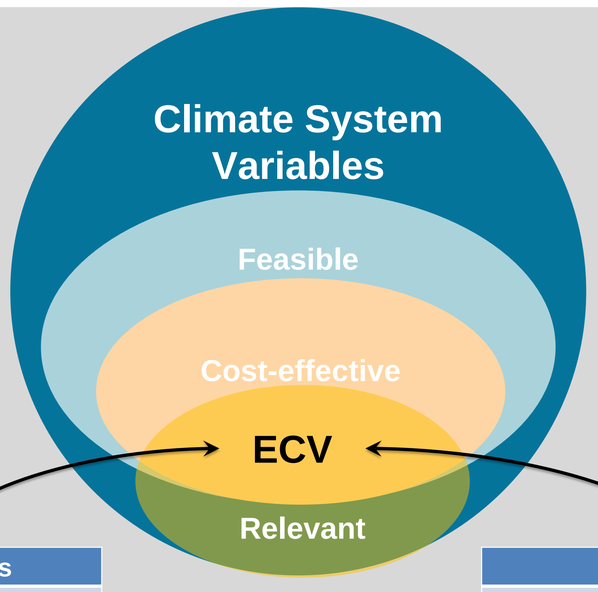
GCOS supports the development of a global climate observing system by supporting national and regional networks, and encouraging consistent, comparable climate-quality observations. Observation systems include national meteorological and hydrological agencies, regional ocean observing systems, academic programmes and citizen science.



ECVs in Each measurement domain are linked to the climate cycles and help address impacts of climate change and variability.

Measurement Domain	Essential Climate Variables in the 2016 Implementation Plan
Atmospheric	Surface: Air temperature, Wind speed and direction, Water vapour, Pressure, Precipitation, Surface radiation budget. Upper-air: Temperature, Wind speed and direction, Water vapour, Cloud properties, Earth radiation budget, Lightning. Composition: Carbon Dioxide (CO_2), Methane (CH_4), Other long-lived greenhouse gases (GHGs), Ozone, Aerosol, Precursors for aerosol and ozone.
Oceanic	Physics: Temperature: Sea surface and Subsurface, Salinity: Sea Surface and Subsurface, Currents, Surface Currents, Sea Level, Sea State, Sea Ice, Ocean Surface Stress , Ocean Surface heat Flux. Biogeochemistry: Inorganic Carbon, Oxygen, Nutrients, Transient Tracers, Nitrous Oxide (N_2O), Ocean Colour. Biology/ecosystems: Plankton, Marine habitat properties.
Terrestrial	Hydrology: River discharge, Groundwater, Lakes, Soil Moisture. Cryosphere: Snow, Glaciers, Ice sheets and Ice shelves, Permafrost. Biosphere: Albedo, Land cover, Fraction of absorbed photosynthetically active radiation, Leaf area index, Above-ground biomass, Soil carbon, Fire, Land Surface Temperature. Human use of natural resources: Water use, GHG fluxes.

Essential Climate Variables (ECV)



Only those parameters that are feasible, cost-effective and relevant to user needs can be ECVs. Following GCOS guidance ensures that observations are of sufficient quality for climate uses. GCOS aims to support and encourage the continued monitoring of all ECVs and to fill gaps in existing systems.

Foundations
Climate Science
Climate Data
Observational capability and infrastructure
Adaptation and mitigation needs
Climate Impacts

Guidance
ECV Product Requirements
Observing Principles and Standards
Data Access and Stewardship
Actions to maintain and improve observational systems
Review of Monitoring