
Global Earth Observations for Leveraging the Essential Climate Variables

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Berlin, ISRSE36, 12 May 2015, Plenary 2



How have the Essential Climate Variables (ECVs) been used and leveraged in the following selected areas?:

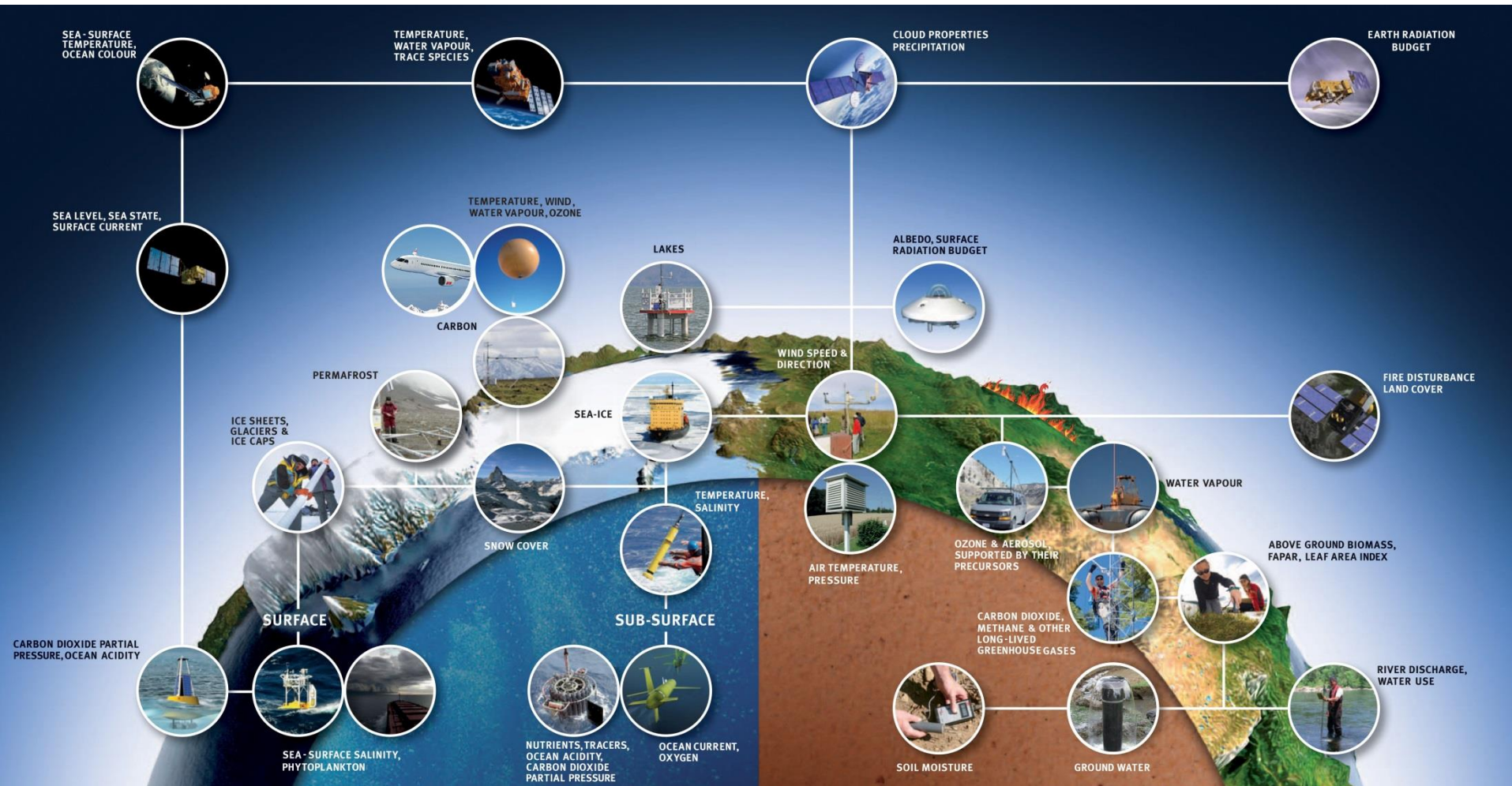
IPCC and its assessment process

Earth Life Cycles: Water and Carbon

Agencies and Programmes



Concept: Global Observations for Climate & ECVs



The GCOS includes surface-based, air-borne, and space-based components and constitutes, in aggregate, the climate observing component of the Global Earth Observation System of Systems (GEOSS).

Scope of GCOS as a System (of Systems)

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



OCEANIC

Surface (10)

- Sea-surface temperature
- Sea-surface salinity
- Sea level
- Sea state
- Sea ice
- Surface current
- Ocean colour
- Carbon dioxide partial pressure
- Ocean acidity
- Phytoplankton

Sub-surface (8)

- Temperature
- Salinity
- Current
- Nutrients
- Carbon dioxide partial pressure
- Ocean acidity
- Oxygen
- Tracers

ATMOSPHERIC

Surface (6)

- Air temperature
- Wind speed and direction
- Water Vapour
- Pressure
- Precipitation
- Surface radiation budget

Upper-air (5)

- Temperature
- Wind speed and direction
- Water Vapour
- Cloud properties
- Earth radiation budget (incl. solar irradiance)

Composition (5)

- Carbon dioxide
- Methane
- Other long-lived greenhouse gases
- Ozone, supported by its precursors
- Aerosol, supported by its precursors

TERRESTRIAL

Biological/Ecological/Other (7)

- Land Cover
- FAPAR
- Leaf area index
- Above ground biomass
- Soil carbon
- Fire disturbance
- Albedo

Hydrological (5)

- River discharge
- Water use
- Ground water
- Lakes
- Soil moisture

Cryospheric (4)

- Snow cover
- Glaciers and ice caps
- Ice sheets
- Permafrost

The GCOS Essential Climate Variables (ECVs) are required to support the work of WMO, IOC of UNESCO, UNEP, ICSU, and also in particular UNFCCC and the IPCC.

All ECVs are technically and economically feasible for systematic observation. It is these variables for which international exchange is required for both current and historical observations.

ATMC-2
Thursday, 14 May 2015
14 00 hrs

Global Climate Observations
Roadmap to the Future

GCOS Conference
2 – 4 March 2016
Amsterdam, NL

GLOBAL CLIMATE OBSERVATIONS



THE ROAD TO THE FUTURE 2-4 March, 2016
Amsterdam