GCOS Report to WGClimate-3

Jean-Louis Fellous

GCOS "Space Rapporteur"

GCOS Staff 2013

- Retirement of Richard Thigpen (USA) (November 2012)
- Retirement of William Westermeyer (USA) (December 2012)
- Supporting the GCOS Expert Panels:
  - Programme Officer (AOPC, TOPC): Anna Mikalsen (Germany)
  - Programme Officer (OOPC): Katherine Hill (UK/Australia)
  - Junior Professional Officer : Jessica Holterhof (Germany)
- Space Rapporteur: Jean-Louis Fellous (France)
- Supporting the Observation & Adaptation Workshop:
  - Germany Secondment: Stefan Rösner (1 Oct 2012 – 31 March 2013)
  - US Secondment: Daniel Muller (11 Feb – 5 April 2013)
- Implementation Manager: Tim Oakley (UK)
- Director: Carolin Richter
- Admin. Assistant: Imelda DeChavez

Panel and SC Meetings 2013

- **Atmosphere** (**AOPC**) and **Land** (**TOPC**) Observing Panels will meet this year at WMO, Geneva
  - TOPC-15 (6-7 March 2013) includes WCRP representation
    - Handover TOPC chair from Han Dolman (NL) to Koni Steffen (CH)
    - TOPC-14 was attended by Joanne Nightingale, chair of WGCV/LPV
    - WGCV/LPV now formally invited as *ex-officio* member of TOPC
  - AOPC-18 (2-5 April 2013) includes WCRP and CCI representation
- Change in GOOS governance delayed **Ocean** (**OOPC**) Panel meeting
  - GOOS will meet 25-27 March 2013, Qingdao, China (lead: Eric Lindstrom, USA, former OOPC Chair)
  - OOPC co-chairs designated: Marc Bourassa, USA, Toshio Suga, Japan

Panel and SC Meetings 2013 (cont'd)

- **Data and Products**
  - WCRP Data Advisory Council, 2nd meeting, 4-5 March 2013 (EUMETSAT)
- **CBS Lead Centres for GCOS**
  - Meeting in Chile, 8-10 October 2013
- **21st GCOS Steering Committee**
  - 14-18/21-25 October 2013, Offenbach, Germany
  - 2014 in China

Programme Activities 2013

- **ESA Climate Change Initiative**
  - Second Phase – decision on second set of GCOS ECVs
    - 29 ECVs can be observed by satellites;
    - 1st phase of CCI: 13 ECVs (Clouds, GHGs, Ozone, Aerosols, SST, SSL, Sea Ice, Ocean Colour, Glaciers and Ice Caps, Ice Sheets, Land Cover, Fire, Soil Moisture)
  - ESA Living Planet Symposium 9-13 September 2013, Edinburgh
  - 14 Sep ESA CCI, D/GCOS or SC Chair invited
- **CEOS** – Plenary 5-6 November 2013, Montreal
  - Working Group on Climate 20-21 February 2013
    - ECV Inventory – "where can you get the data ?"
- **CGMS** – Plenary 11-2 July 2013, Tokyo
  - Ensure liaison with CEOS
  - EUMETSAT Conference 15-20 September 2013

Programme Activities (cont'd)

- **GEOSS and its SBA Climate**
  - Next Plenary and Ministerial Summit 13-17 January 2014, Geneva
  - GCOS to be considered as SBA Climate
- **UNFCCC - SBSTA**
  - GCOS to report on Assessment of Adequacy
  - Next SBSTAs in 3-14 June 2013 (research dialogue: ecosystems) and in November 2013 (observations: side events?)
  - Next COP-19 in Poland, Warsaw, 11-22 November 2013
- **WCRP - JSC**
  - 27-31 May 2013, Brasilia, Brazil

Programme Activities (cont'd)

- **IPCC WG I Plenary for AR5**
  - Important input for GCOS assessment and new implementation plan
  - 23-26 September 2013, Stockholm
  - GCOS-SC Chair participated in the review process, as individual expert
- **Future Earth** – ICSU driven process
  - Observations need to be strengthened
  - Several working group meetings in 2013

GCOS Continuous Improvement and Assessment Cycle

Assessment on Progress & Adequacy 2015

Where are we now?

Progress Report

How to improve the system?

New Networks

Research

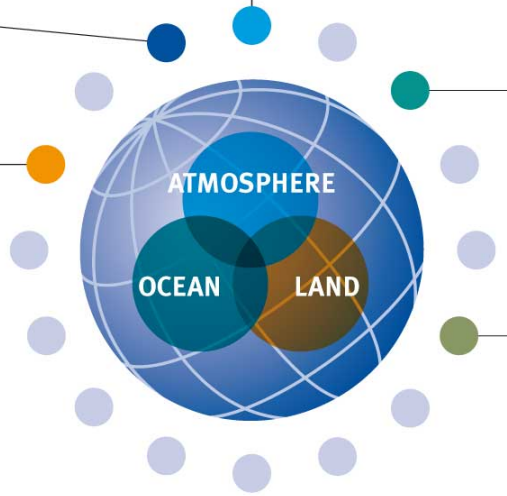
WCRP, IGBP

National Coordination

GCOS Cooperation Mechanism

Contributing Systems

Global Terrestrial Observing System,
Global Ocean Observing System,
WMO Integrated Global Observing System,
and others



New Implementation Plan 2016

What needs to be measured?

Essential Climate Monitoring Variables (ECVs)

Implementation Plan

How to do it?

Climate Monitoring Principles

Guidelines for Datasets and Products

Regional Action Plans

By whom/by which means?

Space Agencies

Network Owners

Meteorological Service, Hydrological Service,
Research Organizations, and other institutions

Data and Analysis Centres

Next Steps

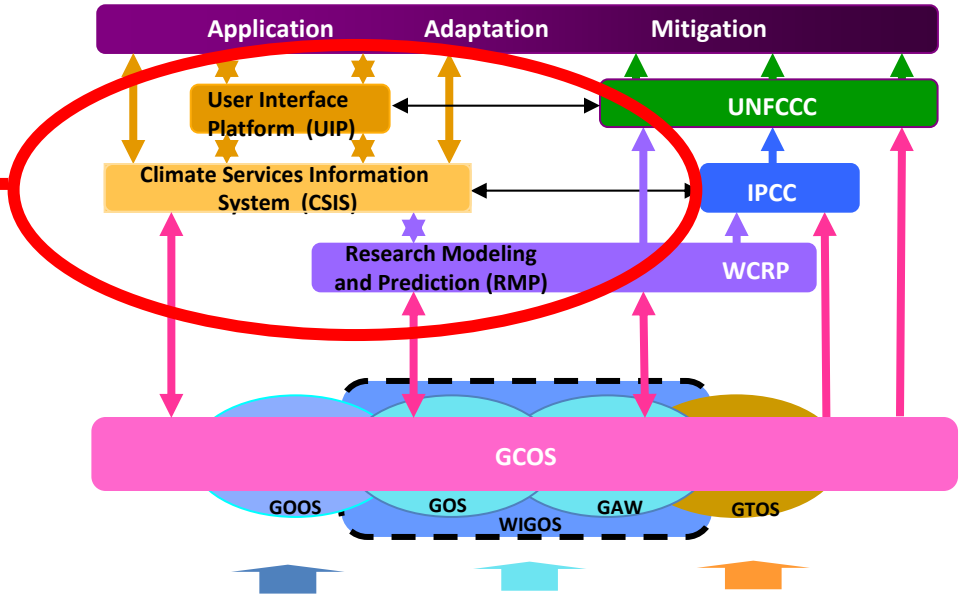
- **Next steps in assessment cycle**
  - reviewing data needs for adaptation and service provision (2013), linking with GFCS, UNEP and other initiatives
  - assessing general progress and adequacy (2013-2015), taking account of uncertainties identified by the IPCC Fifth Assessment process
  - formulating new Implementation Plan (2015-2016)
- **GFCS contribution**
  - GCOS / IOC / UNEP workshop on Observations and Adaptation
  - 26-28 February 2013, Offenbach, Germany
- **Future activities will be subject to the outcome of a Sponsors' review of the programme to be held over coming 12 months**
  - Chairman: Wolfgang Kusch

GCOS supports the "Global Framework for Climate Services"

Energy

Food

Water



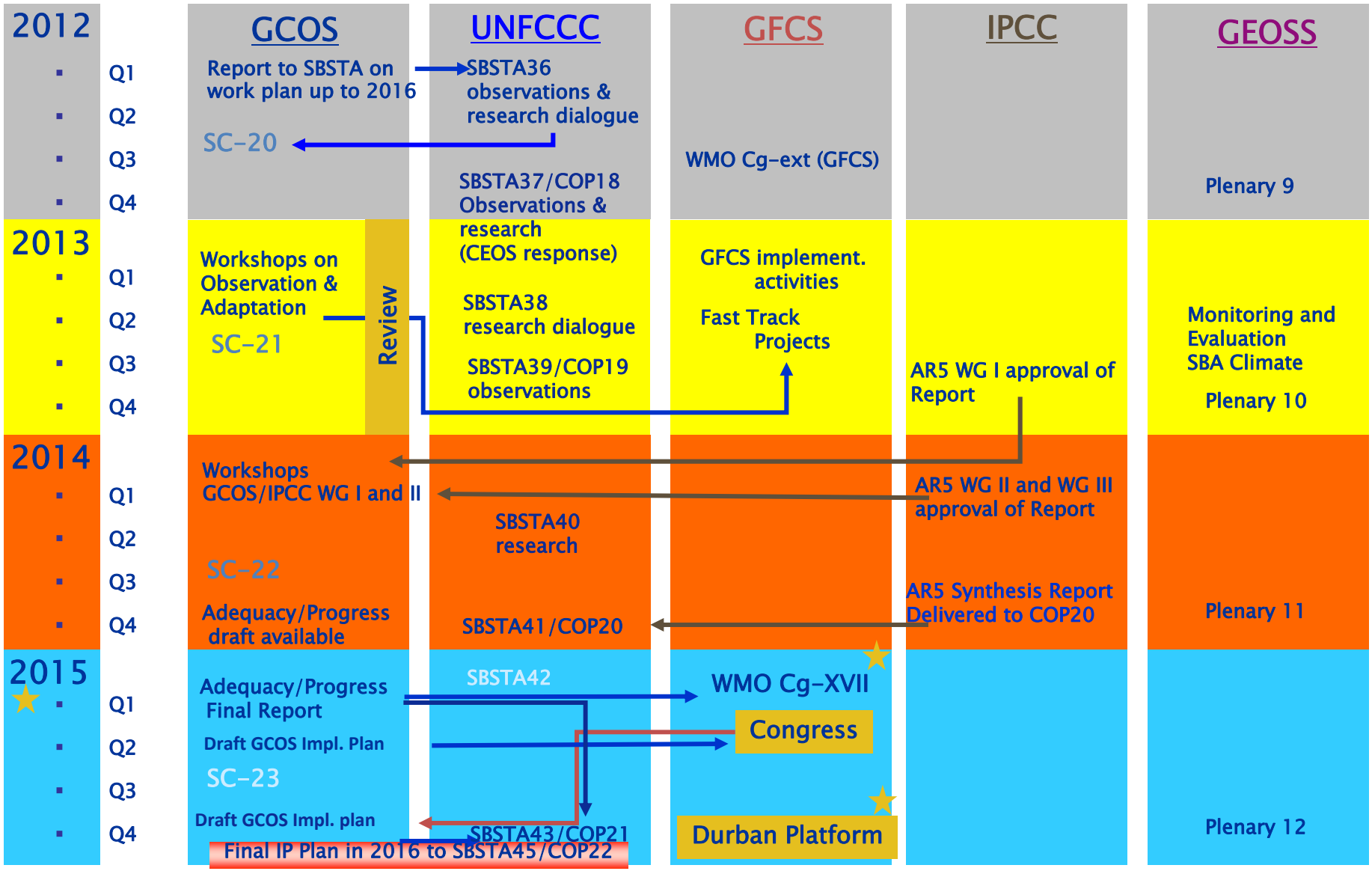
ESSENTIAL CLIMATE VARIABLES

OCEANIC	ATMOSPHERIC	TERRESTRIAL
Surface (10)	**Composition (3)**	**Biological/Ecological (6)**
Sea-surface temperature	Carbon dioxide	Land cover
Sea-surface salinity	Methane and other long-lived greenhouse gases	FAPAR
Sea level	Ozone and Aerosol supported by their precursors	Leaf area index
Sea state		Above ground biomass
Sea ice	**Upper-air (5)**	Soil carbon
Surface current	Temperature	Fire disturbance
Ocean colour	Wind speed and direction	**Hydrological (5)**
Carbon dioxide partial pressure	Water vapour	River discharge
Ocean acidity	Cloud properties	Water use
Phytoplankton	Earth radiation budget (including solar irradiance)	Ground water
Sub-surface (8)	**Surface (6)**	Lakes
Temperature	Air temperature	Soil moisture
Salinity	Wind speed and direction	**Cryospheric (4)**
Current	Water vapour	Snow cover
Nutrients	Pressure	Glaciers and ice caps
Carbon dioxide partial pressure	Precipitation	Ice sheets
Ocean acidity	Surface radiation budget	Permafrost
Oxygen		**Other (1)**
Tracers		Albedo

GCOS comprises the climate relevant components of existing observing systems

GCOS ensures the sustained provision of reliable physical, chemical and biological observations and data records, across all domains, including hydrological and carbon cycles and the cryosphere

Time table for delivering the adequacy/progress report and new IP



Thank you
for your attention!

Back up slides

Key Performance Indicator

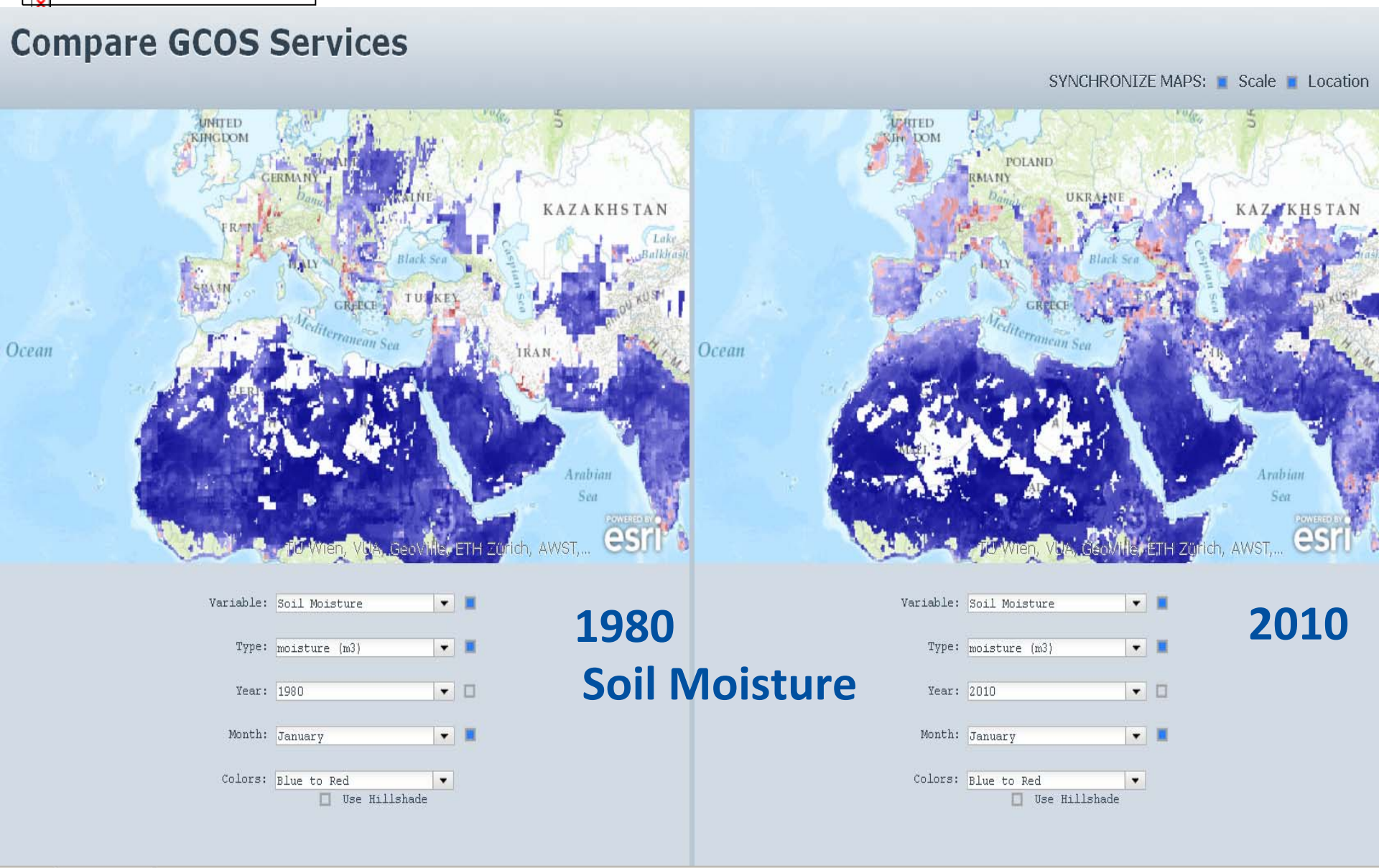
4.3.1. Progress in implementing the Global Climate Observing System – unit [%]

- GCOS Implementation Plan recommends 143 tasks classified along the domains (A – O – T and cross-cutting)
  - action, responsible entities, time frame are clearly defined
  - performance indicators are given
  - annual costs implications are estimated

Programme Activities (cont'd)

- **Mapping and Visualisation of ECVs and networks contributing to GCOS**
  - ESRI - Geographic Information System (GIS) software and geo-database management applications
  - Anna Mikalsen (GCOS) / Nils Hettich (SPACE) visited the ESRI Labs last autumn 2012
    - Further evolving the beta version
    - Investigating the purchase of licenses and support.

Report on progress made in observations



Overview of atmospheric products

ECV	Global Products	FCDR required
Wind Speed and Direction	Surface wind retrievals	MW, radar
Precipitation	Estimates (liquid & solid)	MW, GEO VIS/NIR/IR
Upper-air Temperature	Temperature retrievals	MW, IR, Radio-occultation
Upper-air Winds	Upper-air wind retrievals	VIS/IR, Doppler Lidar
Water Vapor (Trop., strat.)	Total column, profiles	MW, UV, VIS, IR, limb
Cloud Properties	Amount, top P & T, etc.	VIS/IR, IR/MW, lidar
Earth Radiation Budget	TOA/Surf. ERB, irradiance	BB radiance, solar irrad.
CO_2, CH_4 and other GHGs	GHG retrievals (regional)	NIR/IR
Ozone	Total column, profiles	UV/VIS/IR/MW, nadir/limb
Aerosol Properties	Optical depth, albedo, etc.	UV/VIS/NIR/SWIR/TIR, limb sounding, lidar profiling
Precursors of O_3 & Aerosols	Retrievals of precursors, e.g. NO_2, SO_2, HCHO & CO	

Overview of oceanic products

ECV	Global Products	FCDR required
Sea-surface Temperature	Integrated SST analyses based on satellite and *in situ* data records	IR, MW
Sea-surface Salinity	Datasets for research on sea-surface salinity	MW
Sea Level	Sea level global mean and regional variability	Altimetry
Sea State	Wave height, other measures of sea	Altimetry
Sea Ice	Sea-ice concentration, extent, edge, supported by thickness & drift	MW, VIS, radar, lidar, SAR altimetry
Ocean color	Ocean radiometry, Chl-a	Multispectral VIS imagery

Overview of terrestrial products

ECV	Global Products	FCDR required
Lakes	Lake levels, areas	VIS/NIR, radar
Snow Cover	Snow areal extent, SWE	VIS/NIR/IR, passive MW
Glaciers and Ice Caps	2D vector outlines, DEM	VIS/NIR/IR, InSAR, stereo
Ice Sheets	Elevation changes	Altimetry, SAR, gravity
Albedo	BRDF	Multispectral radiances
Land Cover	Moderate/High res. maps	VIS/NIR, radar
FAPAR	Maps	VIS/NIR
LAI	Maps	VIS/NIR
Biomass (Forest)	Regional, above ground	Radar, lidar
Fire Disturbance	Maps, burnt areas/active	VIS/NIR/SWIR/IR
Soil Moisture	Maps	Active & passive MW
(*Land surface Temperature*)	*Temperature records*	*IR from GEO, MW from LEO*