



Atmospheric
Observation
Panel for
Climate

GCOS aerosol requirements/ statement of guidance

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**World
Meteorological
Organization**

Weather • Climate • Water

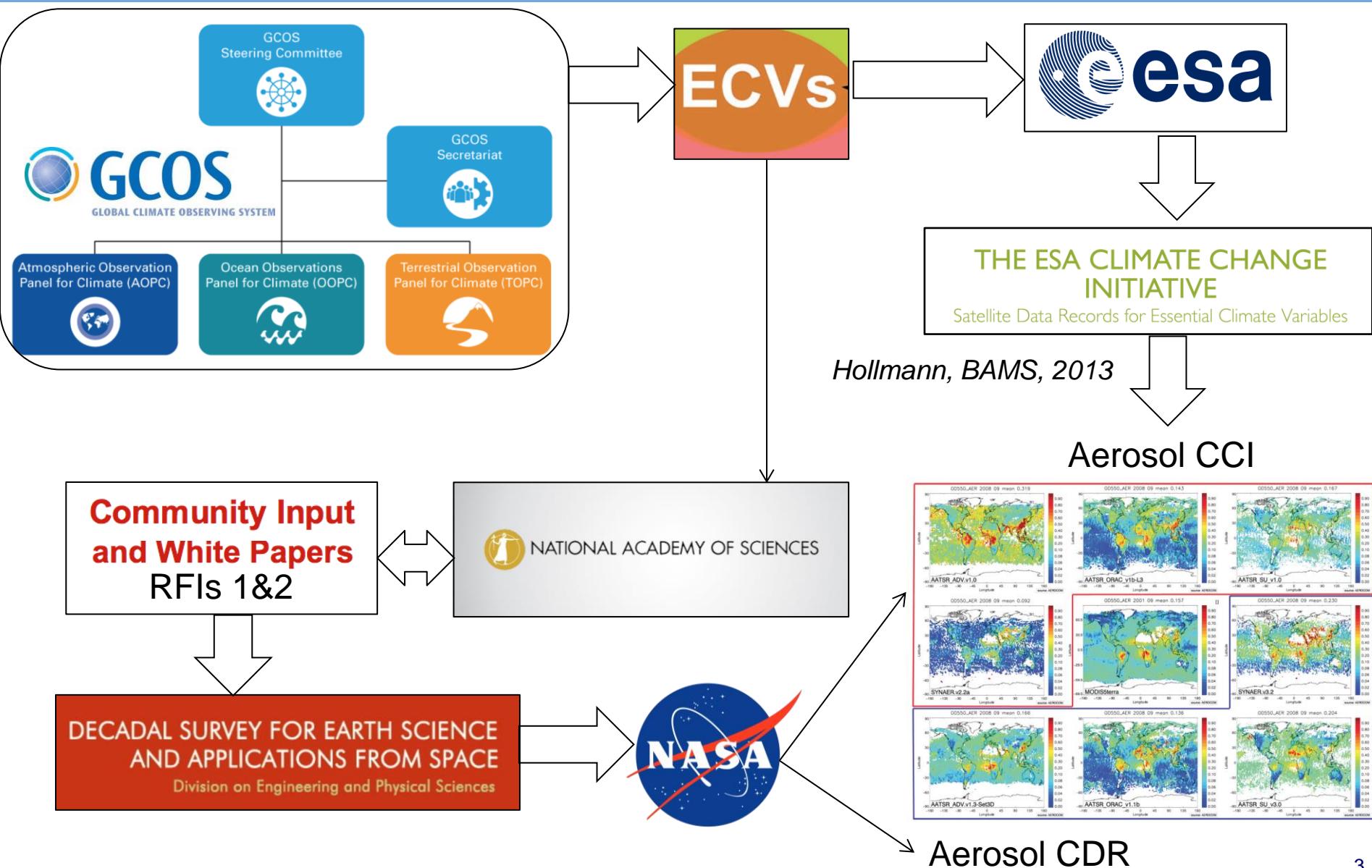


UNEP

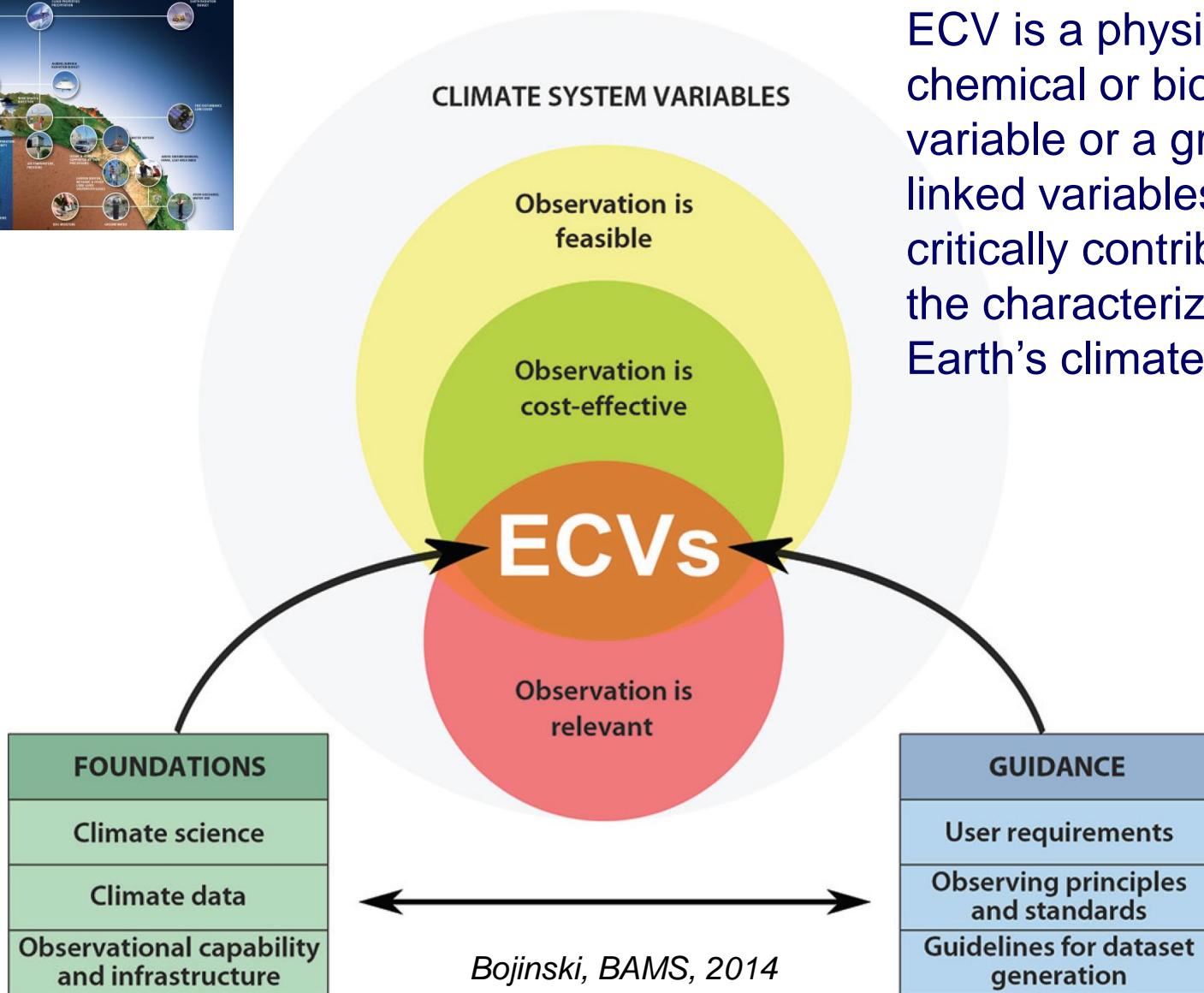


Ensure that the observations needed to address climate-related issues are obtained and made available to all potential users

Structure



Essential Climate Variables



Atmospheric Composition ECVs

Aerosols properties: aerosol optical depth; single-scattering albedo; layer height; extinction profiles for the troposphere and the lower to middle stratosphere (GCOS IP Annex A);

Carbon Dioxide, Methane and other Greenhouse gases: Tropospheric CO₂ column; Tropospheric CO₂; Tropospheric CH₄ column; Tropospheric CH₄; Stratospheric CH₄

Ozone: Total column ozone; troposphere Ozone; Ozone profile in upper and lower stratosphere; Ozone profile in upper strato-and mesosphere

Precursors (supporting the Aerosol and Ozone ECVs): NO₂ tropospheric column; SO₂, HCHO tropospheric columns; CO tropospheric column; CO tropospheric profile

Aerosols properties	Aerosol optical depth	4hr	5-10km/NA/	Max(0.03;10%);	0.02/decade
	Single-scattering albedo	4hr	5-10km/NA/	0.03;	0.01
	Aerosol-layer height	4hr	5-10km/NA/	1km;	0.5km
	Aerosol-extinction coeff. profile	weekly	200-500 km/ 1km(near tropopause), 2km(mid stratosphere)/	10%,	20%

Considered updates in ECVs

ECV product as in GCOS IP Annex A	revised ECV product	OSCAR Variables	Comments from AOPC
Aerosol optical depth	Aerosol optical depth	Aerosol Optical Depth	Recommendation to change definition in OSCAR
Aerosol single-scattering albedo	Aerosol single-scattering albedo	(no corresponding variable in OSCAR)	New product. Add to OSCAR
Aerosol layer height	Aerosol layer height	(no corresponding variable in OSCAR)	New product. Add to OSCAR
Aerosol Extinction coefficient profile	Aerosol Extinction	Aerosol Extinction Coefficient	Change name to Aerosol Extinction, Recommendation to change definition in OSCAR
	Aerosol size distribution	(no corresponding variable in OSCAR)	New product. Add to OSCAR
	Aerosol Composition	(no corresponding variable in OSCAR)	New product. Add to OSCAR
	Aerosol Refractive index	(no corresponding variable in OSCAR)	New product. Add to OSCAR

Essential Climate Variable (ECV) Climate Data Record (CDR) inventory

- An Essential Climate Variable is a geophysical variable that is associated with climate variation and change.
- GCOS has defined a set of ECVs for three domains: atmospheric, terrestrial, and oceanic.
- The joint COES/CGMS Working Group on Climate was tasked to provide a structured, comprehensive and accessible view of the CDRs that are currently available and planned to become available from existing and committed satellite missions of CEOS and CGMS agencies.
- The current inventory has 900+ CDRs, and 44 aerosol related CDRs.
- The inventory is available at:
<http://climatemonitoring.info/ecvinventory/>, and will be open for new inputs in November 2018, please consider to contribute.
- For questions related to the inventory please contact:
ecv_inventory@eumetsat.int
- For questions related to NASA CDR contributions to this inventory please contact: Wenying.Su-1@nasa.gov

A Snapshot of the inventory

Existing data records Planned data records

Existing data records

Show 10 entries Search: aerosol

RecordID	Details	tempCov	Domain	ECVName	ECVProduct	PhysQuantity	ResponsibleOrg	Status
10170		>>	Atmosphere	Aerosol Properties	Aerosol-extinction Coefficient Profile	Aerosol-extinction Coefficient Profile	NASA Langley Research Center SAGE II Team	Existing
10183		>>	Atmosphere	Aerosol Properties	Aerosol Optical Depth	Aerosol Optical Depth	NASA	Existing
10187		>>	Atmosphere	Aerosol Properties	Aerosol Optical Depth	Aerosol Optical Depth	NASA	Existing

Deep Blue from Christina Hsu/Andrew Sayer

CCI from Thomas Popp

Existing data records Planned data records Details (existing)

Detailed information for existing data record

Refresh

Record Information	Stewardship	Generation Process	Record Characteristics	Documentation	Accessibility
Applications					
Responder name	Christina Hsu				
Responder E-mail	Christina.Hsu@nasa.gov				
Co-editor E-mail (optional)	andrew.sayer@nasa.gov				
Observer E-mail (optional)					
Data record identifier	10.5067/MEASURES/SWDB/DATA302				
Data record					

Existing data records Planned data records Details (existing)

Detailed information for existing data record

Refresh

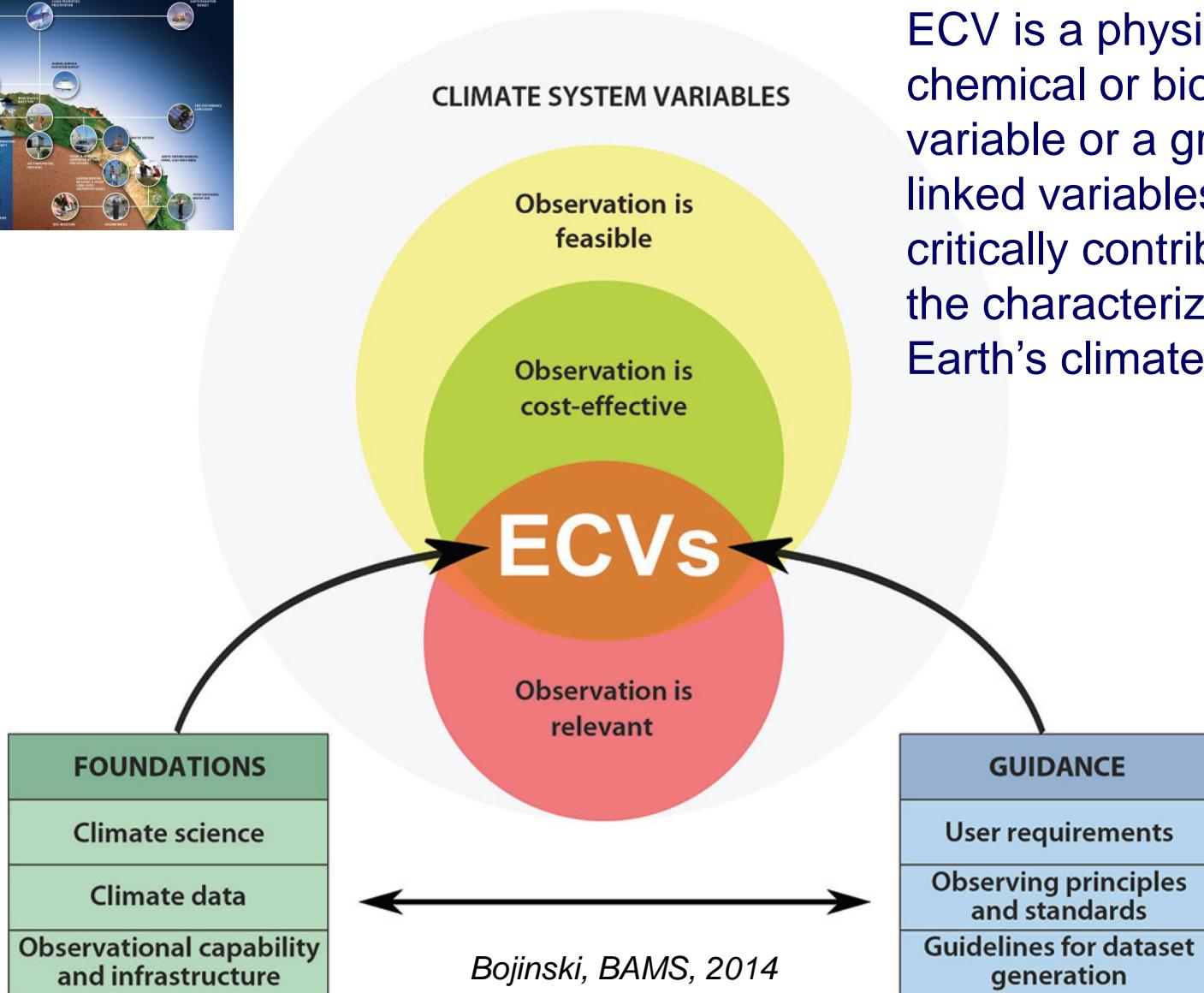
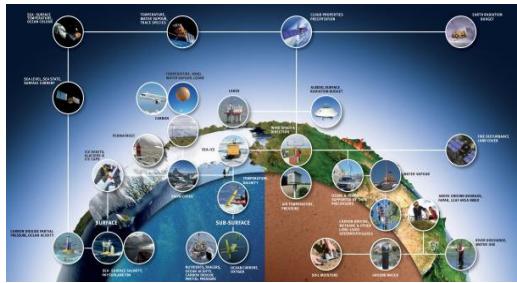
Record Information	Stewardship	Generation Process	Record Characteristics	Documentation	Accessibility
Applications					
Responder name	Thomas Popp				
Responder E-mail	thomas.popp@dlr.de				
Co-editor E-mail (optional)					
Observer E-mail (optional)					
Data record identifier	ESACCI-L2P_AEROSOL-AER_PRODUCTS-(A)ATSR(2)_ADV_v2.30_plume. Generated 30/04/2016				
Data record					

Thank you!

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Essential Climate Variables



ECV is a physical, chemical or biological variable or a group of linked variables that critically contributes to the characterization of Earth's climate.

AOPC members (2018)

- Dr Kenneth Holmlund, AOPC Chairman, Head Remote Sensing and Products Division, EUMETSAT, Germany
- Prof. Philip Jones, AOPC Deputy Chair, University of East Anglia, UK
- Dr Dale Hurst, CIRES at NOAA, US
- Dr Elizabeth KENT, National Oceanography Centre, UK
- Dr. Imke Durre, NOAA's NCEI
- Dr. Olga Kalashnikova, JPL, US
- Dr. Peng Zhang, Deputy Director-General, National Satellite Meteorological Center, China
- Prof. Peter Thorne, Co-Chair GRUAN, National University of Ireland, Ireland
- Dr Rainer Hollmann, Deutscher Wetterdienst Satellite Application Facility on Climate Monitoring, Germany
- Dr. Shinya Kobayashi, Climate Prediction Division, Japan
- Dr Zhanqing LI, University of Maryland, US

AOPC actions:

- **Monitoring of aerosol properties (A39)** e.g Provide more accurate measurement-based estimates of global and regional direct aerosol radiative forcing (DARF) at TOA and its uncertainties through accurate monitoring of the 3D distribution of aerosols and aerosol properties.
- **Fundamental Climate Data Records and Climate Data Records for greenhouse gases and aerosols ECVs** e.g. (A32) Extend and refine the satellite data records (FCDRs and CDRs) for GHG and aerosol ECVs
- **Validation of satellite remote sensing, e.g. (A31)** Engage existing networks of ground-based, remote sensing to ensure adequate, sustained delivery of data from ground-based instruments for validating satellite remote-sensing of the atmosphere.

OSCAR (Observing Systems Capability Analysis and Review Tool)

- OSCAR is a resource developed by WMO in support of Earth Observation applications, studies and global coordination.
- OSCAR contains quantitative user-defined requirements for observation of physical variables in application areas of WMO (i.e. related to weather, water and climate).
- OSCAR provides detailed information on all earth observation satellites and instruments, and expert analyses of space-based capabilities.



AOPC overview

- Was established by the GCOS Steering Committee in 1995 in recognition of the need for specific scientific and technical input
- Supported, amongst others, by the **WMO Integrated Global Observing System (WIGOS)**
- Plans, monitors and promotes the atmospheric component of GCOS:
 - to maintain and review the list of GCOS **Atmospheric Essential Climate Variables (ECV)**;
 - to liaise with relevant stakeholder bodies in order to determine and maintain the requirements for atmospheric datasets
 - to advocate for the establishment, re-establishment and maintenance of integrated systems to provide long-term, high-quality, consistent data
 - to propose and promote the establishment of new systems, or enhancements to current systems and practices, to address deficiencies;
 - to review the current state and identify gaps and inadequacies of the atmospheric component of the global observing system;
 - to promote the rehabilitation of relevant historical data sets;