AOPC – IP Actions- List of Rapporteurs

Green: start 2023
Yellow: start 2024 or later
Orange: more than in two years (no IP rapporteurs assigned for now)
Grey: satellite – WGClimate

IP Action	Activity	Responsibility	IP rapporteur	Comments
A1: Ensure necessary levels of long-term funding support for in situ networks, from observations to data delivery	1. Undertake an assessment of current levels of funding support for global in situ networks delivering relevant in situ ECV data, including cal/val measurements, and identify those in situ networks with immediate or short-term problems around adequacy and sustainability of funding	GCOS Sec supported by the ECV stewards	GCOS Sec with ECV stewards	Activity will be started and led by the GCOS Sec. ECV steward will support if requested. **Table A1.1**
	2. Identify entities that can provide support for the networks identified as at risk in Activity 1.		ECV Stewards	
	3. Advocate with funding agencies to support identified networks.		ECV Stewards	
A2: Address gaps in satellite observations likely to occur in the near future	4. Limb-sounding missions capable of measuring several ECV species in the Upper Troposphere/Lower Stratosphere (UTLS) and stratosphere.	Space Agencies	Gary and Stephan	
	6. Wind lidar	Space Agencies	Stephan and Rainer	
A3: Prepare follow-on plans for critical satellite missions	Develop follow-on plans to ensure medium and long-term continuity of the following satellite observations: 1.Earth Radiation Budget (ERB) measurements. 2. Cloud profiling. 3. Cloud lidar. 4. Global Precipitation Measurement (GPM) consisting of a dual-frequency precipitation radar and passive microwave	Space Agencies	Maria and Rainer	

	measurements to provide sufficient temporal and spatial sampling of rain areas.			
B1: Reference networks	1. Continue development of GRUAN	WG-GRUAN and DWD	WG-GRUAN Peter	Monitoring.
	2. Implement the GSRN	GSRN TT and CMA	GCOS Sec Maria, Carmen, Peter	Ongoing. 2 members of AOPC part of TT
	3. Better align the satellite FRM program to the reference tier of tiered networks and enhance / expand FRM to fill gaps in satellite cal/val	Space Agencies WMO	Peter, Christine	
	4. Develop further the concept of a reference network tier across all earth observation domains	WMO	Christine	
	5. Establish a long-term space-based reference calibration system to enhance the quality and traceability of earth observations	Space Agencies	Stephan	
B2: GBON	1.Implementation of initial GBON and the associated SOFF mechanism to fill long-standing gaps to globally monitor climate over land and oceans.	WMO	Tim, Peter Blair, Christine, Bernard	Monitoring
	2. Consideration of alignment of GSN and GUAN with GBON	WMO	Tim	
B3: New Earth observing satellite missions	1. Improve diurnal sampling of observations and coverage of GHGs, precursor aerosols	Space agencies	Rainer	
	2. Explore new ways to improve estimates of Earth's Energy Imbalance (EEI) with novel remote sensing techniques	Space agencies	Maria	
	4. Explore and demonstrate the feasibility of satellite missions based on new satellite technologies for climate monitoring.	Space agencies	Stephan	
B4: Expand surface and in situ monitoring of trace gas	1. Expand surface-based and in situ observations of a range of atmospheric and oceanic composition ECVs, including GHGs, ozone, aerosol, clouds and water vapour, and other gaseous precursors, in the atmosphere.	NMHS, Research org	Paolo, Gary	

composition and aerosol properties	2. Promote cooperation of the existing networks for establishing new composition observing capabilities in areas where they are lacking over land (in large areas of Africa, South America, Southeast Asia), over oceans, and over ice-covered regions.	NMHS, Research organizations	Paolo, Gary	
B9: latent and sensible heat fluxes and wind stress	1.Improve and extend in situ measurements needed to estimate surface fluxes, with the objectives of improving accuracy and better defining the uncertainties of those measurements and calculated fluxes.	NMHS, GOOS	Liz, Carmen	CPG at JPM23
	2. Extend sites with co-located measurements of direct turbulent and radiative fluxes and variables required to estimate turbulent surface fluxes targeted at improving parameterizations of air-sea exchange and air-land exchange.		Liz, Carmen, Matilde	CPG at JPM23
	4.Develop new approaches and improved methods to better exploit relevant ECV measurements to estimate ocean surface heat, moisture and momentum flux	Satellite Agencies	Stephan, Maria	
B10: Identify gaps in the climate observing system to monitor the global energy, water and carbon cycles	All activities	GCOS Secr	Maria, Rainer, Gary	workshop June 2023. CPG at JPM23
C1: Develop monitoring standards, guidance and best practices for each ECV	1. Review existing monitoring standards, guidance and best practices for each ECV, ensuring these reflect current state-of-the-art. Maintain a repository of this guidance for ECVs	Action started by GCOS Sec	Imke, Blair, Chiara	Activity will be started and led by the GCOS Sec. ECV steward will support if requested. **Table C1.1**
	2. Ensure the development of monitoring standards, guidance and best practices, including intercomparison procedures, for those ECVs where such guidance does not exist.		Imke, Blair, Chiara	

	3. Review and revise the climate monitoring guidance in the WIGOS manual to bring it in line with the updated guidance developed in this Action.			
	4. Review the GCOS climate monitoring principles.		Imke, Blair, Chiara	Topic at JPM23
C2: General improvements to satellite data processing methods	All activities	Space Agency	Rainer, Stephan	
C3: General Improvements to in situ Data Products for all ECVs	All activities	Research organizations	Blair, Bernard	
C4: New and improved reanalysis products	All activities	Reanalysis Centers	AOPC reanalysis Expert, Chiara	
C5: ECV-specific satellite data processing method improvements	4. Reprocess the LEO NASA 25+ year Lightning Imaging Sensor (LIS) data set from the Optical Transient Detector (OTD, 1995-2000), LIS on the Tropical Rainfall Measuring Mission (TRMM-LIS, 1997-2015) and International Space Station (ISS-LIS, 2017-Present).	Space agencies	TT-LOCA chair	
	5. Reprocess the GEO Geostationary Lightning Mapper (GLM) on GOES-16/17/18 (2017 Present).	Space agencies	TT-LOCA chair	
D1: Define governance and requirements for Global Climate Data Centres	All activities		Imke, Chiara, Liz	CPG at JPM23
D2: Ensure Global Climate Data Centres exist for all in situ observations of ECVs	1. Identify ECVs for which adequate global centres do not exist or are insufficiently supported and facilitate and support the creation or improvement of global data centres for these ECVs	GCOS Sec supported by the ECV stewards	GCOS Sec with ECV stewards	Activity will be started and led by the GCOS Sec. ECV steward will support if requested. **Table D2.1**
	2. Promote regional data centres, their interoperability, where possible, synchronisation of their data holdings, and	GCOS Sec	ECV stewards	Ongoing

	the provision of data in their archives to global data centres.			
D3: Improving discovery and access to data and metadata in Global Climate Data Centres		Global Data Centers	TBD 2025	
D4: Create a facility to access co-located in situ cal/val observations and satellite data for quality assurance of satellite products	1. Improve access to co-located satellite and reference quality in situ observations, as well as tools for evaluation purposes. This facility will use data from reference networks and FRM programs for a broad range of ECVs for calibration/validation of satellite programs.	Space Agencies	Carmen, Peter, Stephan	
D5: Undertake additional in situ data rescue activities	All activities	Existing data rescue organization, C3S	Peter, Chiara	Monitoring
F1: Responding to user needs for higher resolution, near real time data	1. Identify the higher resolution observations of ECVs to support the Climatic Impact-Drivers (CIDs) identified in the IPCC AR6 and develop plans to address the priority needs. (see IPCC WGI AR6 Figure SPM.9).	GCOS Sec	Matilde, Carmen	CPG at JPM23
	3. Increase temporal resolution of surface air temperature, soil moisture and precipitation to capture both climate and human-induced changes and extremes.	NMHS	Christine, Bernard, Chiara	
	4. Include daily averages with the monthly CLIMAT reports for land surface stations (GSN/RBON).	WMO	Blair, Peter, Tim	
F2: Improved ECV satellite observations in polar regions	2. Greenhouse gases at high latitudes with a focus on the permafrost regions in wintertime. 5. Atmospheric ECVs at the very highest latitudes.	Space agencies	Gary, Maria	
F4: Improve climate monitoring in urban areas	1. Audit existing GCOS ECVs to identify those that are urban-relevant and produce updated requirements where needed.	1. GCOS Sec (2024) 2. 2025 3. 2025		Will need decision from SC on how to proceed. Maybe a TT but in 2024

	2. Identify new urban-relevant products and define their requirements. 3. Develop plans to address the urban monitoring requirements identified in Activities 1 and 2.			
F5: Develop an Integrated Operational Global GHG Monitoring System	1. Design and start to implement a comprehensive global set of surface-based observations of CO2, CH4 and N2O concentrations routinely exchanged in nearreal time suitable for monitoring GHG fluxes.		Paolo/Gary	Timeline depending on request from WMO. Monitoring actions – WMO GHGW
	2. Design a constellation of operational satellites to provide near-real time global coverage of CO2 and CH4 column observations (and profiles to the extent possible).	Space agencies	Gary	
	3. Identify a set of global modelling centres that could assimilate surface and satellite-based observations to generate flux estimates.			Monitoring actions – see above