Task Group 17
Satellite Observations

Chair (for now): Emma Woolliams

Terms of reference – Part 1

To provide a consistent and coordinated response from the NMI radiometry community to the needs of the satellite-observation communities, particularly those related to climate change, this task group has the following objectives:

- Review the relevant documented requirements from the community relating to satellite observations, including:
  - The BIPM-WMO Metrology for Climate Action (2022) report (aka “Report”), recommendations 1A.1, 1B.2, 1B.8 – 1B.11, 1C.1 – 1C.7, 1D.1, 1D.4, 1D.6, 1D.9, 1E.1, 2D.1
  - The CEOS-GSICS SI-Traceable Space-Based Climate Observation System (2019) report (doi: 10.47120/npl.9319)
  - The 2005 report “Satellite instrument calibration for measuring global climate change: Report of a workshop”, published in BAMS. (doi: 10.1175/BAMS-86-9-1303)

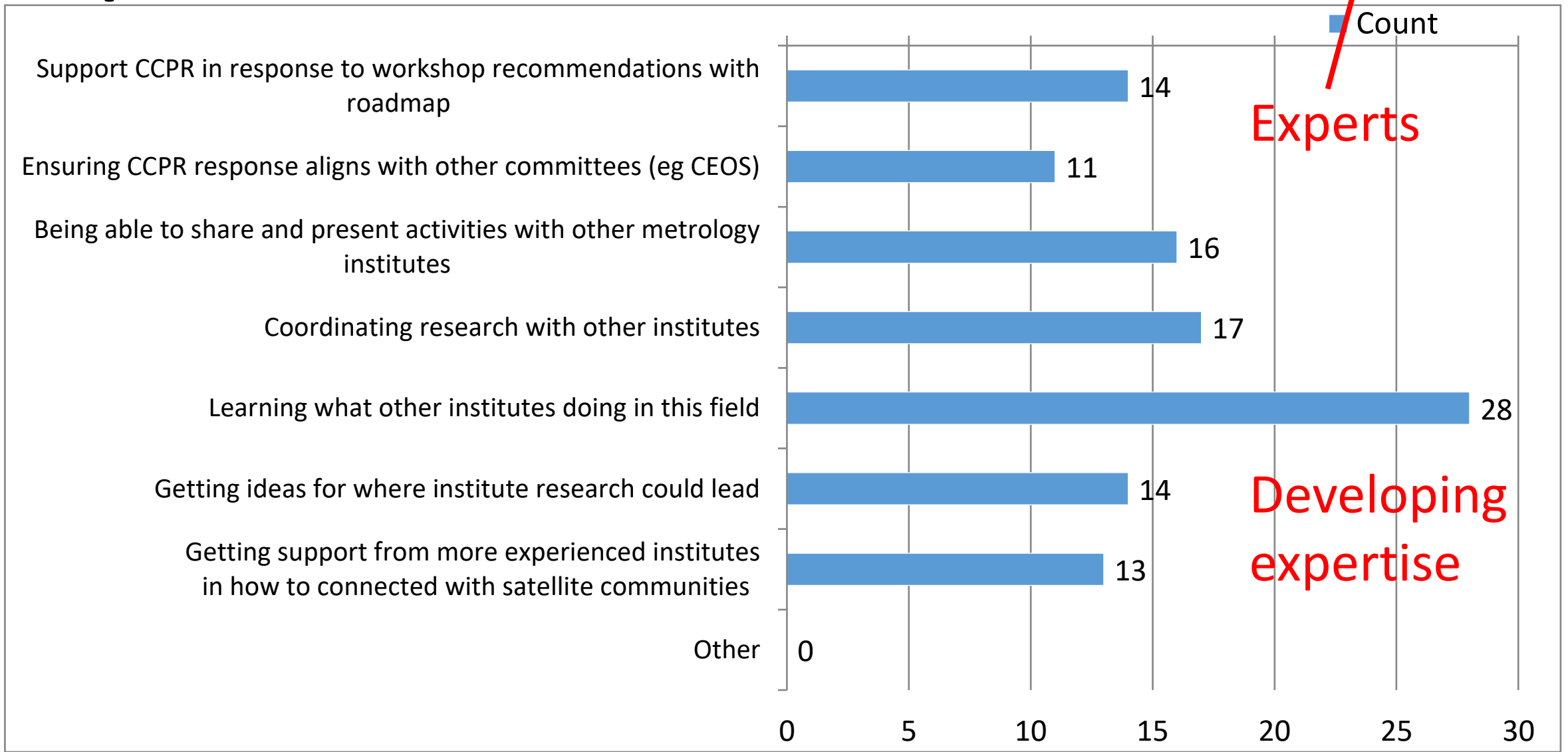
Terms of reference – Part 2

- Document the current capabilities of NMIs and research institutes and their potential for near-term observation improvement capabilities
- Produce a roadmap for the development/implementation of radiometric capability to provide calibration services for optical (UV, visible, SWIR, thermal IR) satellite sensors (pre- and post- launch)
  - Establish whether more specific reference standards and/or comparisons are needed to support the confidence in delivered SI-traceability to satellite sensor calibrations,
  - Define and structure research projects to develop such references / comparisons (satellite-relevant CMC claims, e.g., for radiance/radiance responsivity).

Terms of reference – Part 3

- Recommend specific areas where funding could enable meeting the Report and roadmap objectives. Consider what is best done collaboratively, independently or by a single NMI, and review options for funding in national and international programmes.
- Provide a formal two-way liaison with the relevant satellite-observation international committees, e.g., CEOS WGCV, GSICS
- Provide formal recommendations for NMI management and funding agencies.
- Coordinate with relevant CCs (e.g., CCEM, CCT, CCQM, CCTF) on non-radiometric satellite sensor requirements.

Results of a survey sent out to those interested: What are you hoping to get from this task group?



Task Group or Discussion Forum?

Task Group

- Specific focus: Here developing a roadmap
- Limited duration
- Usually CCPR members only
- **Here the core group**

Discussion Forum

- Broader focus
- Long term
- Encouraged participation of other communities
- **Here the full group + others?**

Preference to start as a Task Group – may expand later

- Discussion forum perhaps better within stakeholder groups (i.e. inside CEOS rather than CCPR)
- We want to deliver a roadmap
- But naming is less critical for now

List of institutions who asked to join

NMIA	**Australia**	Errol Atkinson	Erik Thorvaldson	Mark Ballico	Alireza Mowla	Nishita Chowdhury
INMETRO	**Brazil**	Willian A T De Sousa		Iakyra Couceiro		
NRC	**Canada**	Liviu Ivanescu	Andrew Todd	Li-Lin Tay		
University Victoria	**Canada**	Justin Albert				
CMI	Czechia	Geiland Porrovecchio				
NIM	**China**	Nan Xu	Caihong Dai	Zhifeng Wu	Xinmeng Liu	Haiyong Gan
MIKES / Aalto	**Finland**	Erkki Ikonen				
PTB	**Germany**	Christian Monte	Tatjana Quast	Saulius Nevas	Daniela Narezo	
WMO	**Global**	Heikki Pohjola				
CSIR-NPL	**India**	Sumit Kumar Mishra				
Bureau of Standards	**Kenya**	Samuel Mutuku Musyoki				
VNIIOFI	**Russia**	Valeriy Gavrilov				
NMISA	**South Africa**	Rheinhardt Sieberhagen				
CMS/ITRI	**Taiwan**	Wen-Chun Liu	Yi-Chen Chuang			
NPL	**United Kingdom**	Nigel Fox	Emma Woolliams			
NIST	**United States of America**	John Lehman	Stephen Maxwell		Michelle Stephens	

Those in yellow identified as a core group (members of CCPR, existing experience, requested to be part of developing roadmap)
Boundary not limited – others can be added!

METROLOGY FOR CLIMATE ACTION

Bureau International des Poids et Mesures

WORLD METEOROLOGICAL ORGANIZATION

26–30 SEPTEMBER 2022

1000 Registered participants

200 Pre-recorded presentations producing over

100 Recommendations

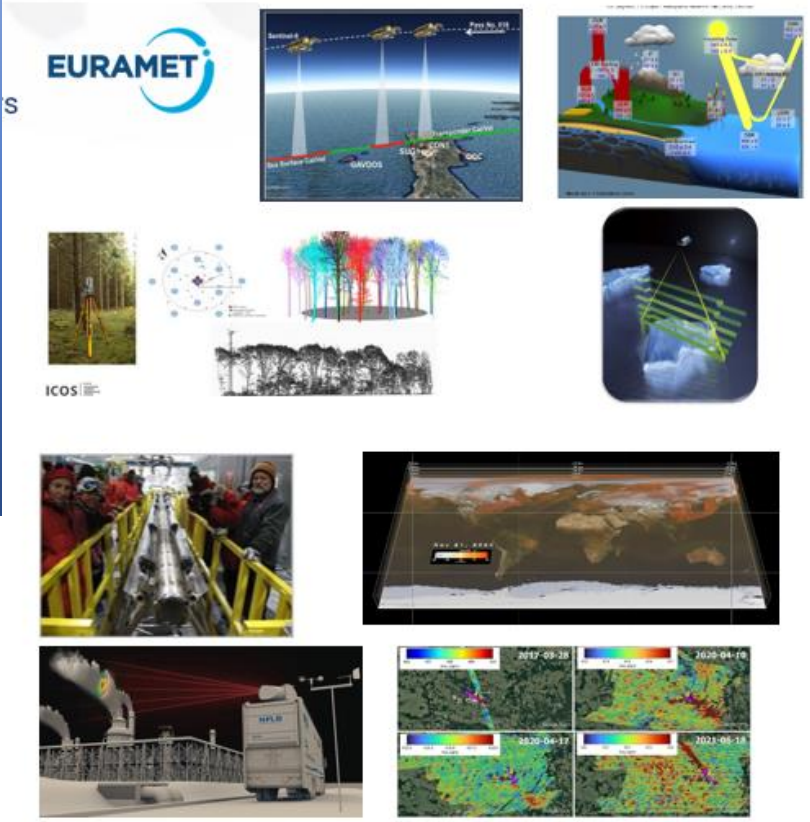
Theme 1: Metrology in support of the physical science bas observations

1. Atmospheric chemistry and physics
2. Oceans and hydrology
3. Earth Energy Balance
4. Biosphere monitoring
5. Cryosphere Monitoring

Theme 2: Metrology as an integral component of operati gas emissions based on accurate measurements and ana

1. Accuracy requirements for atmospheric composition measurements across economic sectors, and temporal and spatial scales
2. State of play in integrated approaches for advanced GHG emission estimates and the way forward to operational services
3. Novel GHG concentration and flux methods and sensors
4. Strengthening the linkage of remote sensing GHG concentration measurements to emission fluxes

Follow up workshop 16-18 September 2024 https://bipm-cenv2024.org/



CEOS/GSCIS workshop:

https://atpi.eventsair.com/pre-flight-calibration-workshop/

Pre-flight Calibration and Characterisation of Optical Satellite Instruments for EO

19–22 November 2024 | ESA–ESTEC | Noordwijk, The Netherlands

Home Programme Abstract Submission Schedule Registration Venue Committees Contact

"Workshop on Pre-flight Calibration and Characterisation of Optical Satellite Instruments for Earth Observation"
19 - 22 November 2024 at ESTEC, Noordwijk, The Netherlands

Organised by the Committee on Earth Observation Satellites (CEOS) Working Group on Calibration and Validation (WGCV) and the Coordination Group for Meteorological Satellites (CGMS) Global Space-based Inter-Calibration System (GSICS)

ABSTRACT SUBMISSION NOW OPEN

Deadline: extended to 31 May 2024

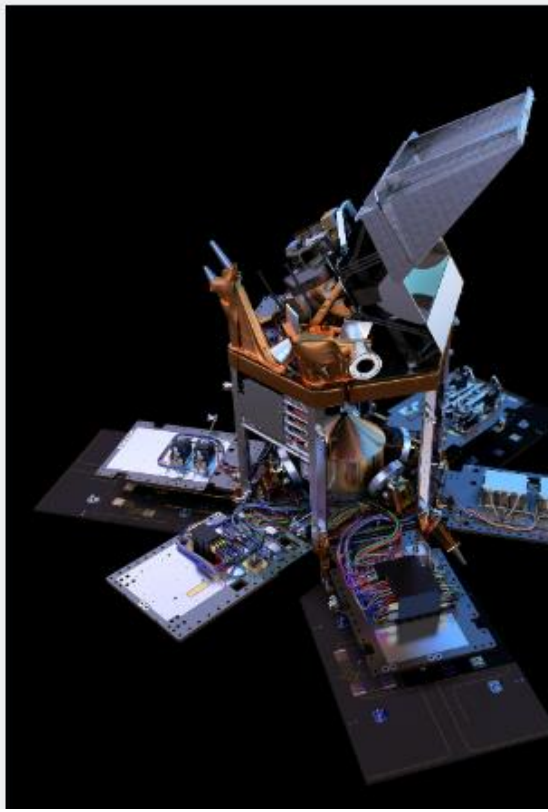
WORKSHOP REGISTRATION NOW OPEN

The workshop seeks to bring together, experts from industrial and academic developers of instruments, those specifying, designing and performing calibration and characterisation as well as scientists, engineers, New Space actors, agencies and funding organisations interested in: what is and/or might be possible for a next generation instrument or future application. The workshop will be organised to encourage discussion and debate on what is 'fit for purpose' for particular types of application.

Topics

UV-SWIR and TIR

- Future Calibration / Characterisation Requirements
- Principles of Calibration / Characterisation / Traceability / Uncertainty and its Documentation / Reporting
- Spectral Response Function / Bandwidth / Wavelength / Smile (Discrete bands & Spectrometers)
- Stray Light (Out-of-Field, Out-of-Band), Point Spread Function, Ghosts, Scattered
- Radiometric Gain / Non-Linearity / Polarisation Sensitivity



Steps so far

- Established a core and extended group interested in the work
- Produced a document to discuss the recommendations and gather ideas about what needs to be in the roadmap
- Produced abstract for the follow up event – to submit this week!
- Started organising core group discussions in July and August to be ready for the follow up event.