

53rd CEOS Working Group on Calibration & Validation Plenary Meeting (WGCV-53)

Objectives & Agenda

March 5-8, 2024

Córdoba, Argentina

Hosted by the Comisión Nacional de Actividades Espaciales (CONAE)

Meeting Objectives

1. Welcome nominations and presentations from candidates for the position of the next WGCV Vice Chair for 2025-2026 and the subsequent Chair role for 2026-2027.
2. Review and discuss the latest updates from the WGCV subgroups, with a particular focus on their headline deliverables from the CEOS Work Plan.
 - a. Land Product Validation (LPV)
 - i. Discuss and address any challenges or discrepancies in the current LPV activities on the production of harmonised biomass products from CEOS Agency missions (CARB-22-01) and Cal/Val and the production of biomass products from CEOS Agency missions (CARB-17-05)
 - b. Infrared Visible Optical Sensors (IVOS)
 - i. Discuss the extension of L1 top-of-atmosphere interoperability (CV-17-01) and the development of a radiometry match-up database for collating and comparing radiometry over CEOS sites to define a reference. Address the challenges involved in receiving active contributions from the New Space Community.
 - ii. Discuss the progress made on the solar irradiance spectrum to make it transparent and visible on the cal/val portal.
 - c. Microwave Sensors Subgroup (MSSG)
 - i. Discuss progress, development issues and next steps for retrieval and validation of high winds with combined active-passive microwave measurements (CV-23-05) and retrieval and validation of sea surface atmospheric pressure with microwave remote sensing (CV-23-06)
 - d. Atmospheric Composition Subgroup (ACSG)
 - i. Validation protocols for atmospheric aerosol and cloud profiles (CV-22-01) - Progress update on the formulation of best practices document and status of open-source simulator tool for sub-orbital to orbital signal conversion.
 - ii. Ongoing AC-VC and ACSG coordination update on the following deliverables:
 - Tropospheric ozone datasets validation and harmonisation (VC-20-01) - Progress with AC-VC/ACSG contribution to TOAR-II activity.
 - Air quality constellation validation coordination (VC-20-02)
 - Air quality constellation validation coordination: validation plans (VC-20-03)
 - Air quality constellation validation coordination: announcements of opportunity (VC-20-04) - ESA/EUMETSAT Joint AO Call for the Validation of Sentinel-4 and Sentinel-5
 - iii. Initial CEOS-FRM maturity assessments for atmospheric Cal/Val data
 - iv. Proposal for a new CV-24-xx Deliverable: Third CINDI intercalibration field campaign (2024/Q2)
 - e. Synthetic Aperture Radar (SAR) Subgroup
 - i. SARCalNet: Establishment of initial SARCalnet processes and network initiation (CV-23-02). Present the SARCalNet documents for review and endorsement to be badged as a top-level WGCV activity as decided at WGCV-52.
 - f. Terrain Mapping Subgroup (TMSG)

- i. Present the draft roadmap and seek agencies support for the launch of a Ground Control Points (GCP) Intercomparison Exercise (CV-23-04)
 - ii. Call for nominations for TMSG Co-chair
3. Discuss ongoing actions and next steps for the upcoming Workshop on state of the art for pre-flight calibration techniques (CV-14-03).
 4. In response to the CNES 2022 CEOS Chair's recognition of the need to maximise the benefit of the numerous upcoming CEOS Agency thermal infrared missions, WGCV is contributing to the definition of a common network of in situ calibration sites to harmonise calibration methods for thermal infrared instruments (TIRCALNET, co-led by IVOS), and development of protocols for the associated ground-based measurements (led by LPV). WGCV-53 will provide an opportunity for a report from the leads of these activities and a discussion of the necessary next steps, actions that can be taken at WGCV level in support, and identification of any synergies and other supporting activities across WGCV.
 5. Review the initial pilot assessments and other feedback on the Fiducial Reference Measurement (FRM) Assessment Framework. Discuss key findings and areas for improvement. Identify and outline next steps, proposing recommendations for refinement of the assessment framework and the online assessment portal (ESA Product Maturity Assessment Tool).
 6. Reflect on the initial progress of the SITSat Task Team and discuss suggested next steps.
 7. Present updates and discuss the various intercomparison exercises (ACIX-II, CMIX-II, DEMIX, [SRIX4Veg](#) workshop and SRIX4Veg II plans).
 8. Discuss the collaboration between GSICS and CEOS WGCV, with a focus on enhancing the quality of data used in climate analysis. Hold a discussion with GSICS representatives about the radiative transfer model and intercomparisons.
 9. Review and discuss the progress made on the [GHG Roadmap Annex C](#) WGCV actions. Also review the specific action [Inv-9](#) related to the sustainment of GHG Networks such as [NDACC](#), [TCCON](#), COCCON, and Pandora Global Network (PGN).
 10. Discuss the suggestion to develop a guidance document on Cal/Val resources for Greenhouse Gases (GHG) similar to the [hyperspectral guidance document](#) and agree a preliminary list of necessary topics and assignments for each.
 11. Discuss how WGCV can support the 2024 CEOS Chair priority on Biodiversity. Gather WGCV responses to the recommendations from the [Ecosystem Extent Task Team White paper](#).
 12. Reflect upon the CEOS endorsed New Space Task Team White Paper and discuss the subsequent actions that WGCV should take in response. Identify the specific interests of WGCV members in contributing to this follow up.
 13. Discuss the required resources and next steps for the establishment of the Radiometry match-up database, Ground Control Points (GCP) match-up , and GHG match-up database.
 14. Discuss the potential for increased coordination between WGCV and Bureau of Weights and Measures - World Meteorological Organization (BIPM-WMO). The BIPM-WMO cooperate to raise awareness within WMO of the issues of metrological traceability and measurement uncertainty, ensure appropriate use of SI units within the WMO measurement networks and demonstrate degrees of equivalence between measurement standards maintained in the WMO networks and National Metrology Institutes (NMIs).
 15. Gather additional WGCV feedback on the [BIPM-WMO Metrology for Climate Action workshop report](#) recommendations, focusing on Theme 1 (covering atmosphere, ocean, energy balance, biosphere, and cryosphere) and Theme 2 (specifically 2A and 2D, addressing atmospheric composition measurements and linking remote sensing GHG concentrations to emission fluxes).
 16. Confirm the plan and objectives for the WGCV-54 meeting, currently planned as a joint meeting with WGISS in Sioux Falls, SD, USA.

WGCV-53 Week at a Glance

The meeting will be held over 3.5 days, from March 5-8, 2024. The meeting time will be 09:00-17:00 for Day 1, 2, and 3. The meeting will be held in CONAE Auditorium

| | Day 1 5 March | Day 2 6 March | Day 3 7 March |
|----|--|---|---|
| am | Welcome Chairs' Report Tour de Table Agenda Review CONAE's Presentation CEOS CEO Report Action Review WGCV Vice Chair Nomination Presentations SITSat Task Team Report | Review of Actions MSSG Subgroup Report LPV Subgroup Report TIRCalNet | Review of Actions SRX4Veg-I, SRX4Veg-II CEOS-ARD Update Preflight Calibration Workshop Update CAL CEOS-GSICS Collaborations |
| pm | Group Photo ACSG Subgroup Report TMSG Subgroup Report Intercomparison Exercise: DEMIX, ACIX-III, CMIX-II, Cloud Camera Network New Space Topics Match-Up Database | IVOS Report Fiducial Reference Measurement (FRM) Assessment Framework SAR Subgroup Report SARCalNet WGCV response to cal/val related GCOS IP 2022 actions Agency Reports | Tour to CONAE Space Centre Greenhouse Gas Cal/Val and Network Updates WGCV and BIPM-WMO Coordination Biodiversity Topics Agency Reports WGCV Cal/Val Portal Upcoming Meetings Action and Decisions Review AOB & Close |
| | CONAE-hosted Icebreaker (at CONAE) | | CONAE-hosted Dinner |

Agenda

Day 1 (Auditorium Room)

Tuesday, March 5, 2024

CONAE Auditorium opens at 8:30 a.m. Day 1 meeting starts at 9:00. Arrival by 8:45 a.m. The bus departs at 07:50 a.m. from Patio Olmos, Av. Vélez Sarsfield 361, Córdoba. Coffee breaks will be at the entrance of the auditorium.

| Time (ART) | Item | Presenter(s) |
|---------------|---|-----------------------------------|
| 09:00 – 09:25 | 1.1: Welcome and Chair's Report <ul style="list-style-type: none">• Welcome and review of agenda• Tour de table | Philippe Goryl |
| 09:25 – 09:40 | 1.2: CONAE's Welcome Presentation [PPT] <ul style="list-style-type: none">• Overview of CONAE activities• SAOCOM Programme updates | Laura Frulla |
| 09:40 – 10:15 | 1.3: Action Review [PPT] <ul style="list-style-type: none">• WGCV-52 | Matt Steventon |
| 10:15 – 10:30 | 1.4: CEOS Executive Officer's Report [PPT] | Steven Ramage |
| 10:30 – 11:00 | 1.5: WGCV Vice-chair Nomination Presentation <ul style="list-style-type: none">• Medhavy Thankappan (Geoscience Australia) (15 min) | Medhavy Thankappan |
| 11:00 – 11:15 | Coffee Break (15 min) | |
| 11:15 – 12:00 | 1.6: SI-Traceable Satellite (SITSat) Task Team Report [PPT] <ul style="list-style-type: none">• Discussion: Inputs for the dedicated SITSat Task Team page in the Cal/Val Portal | Nigel Fox, Yolanda Shea (Virtual) |
| 12:00 – 12:45 | Lunch Break (45 min) | |
| 12:45 – 13:00 | Group Photo (15 min) | |
| 13:00 – 14:00 | 1.7: Atmospheric Composition Subgroup (ACSG) Report [PPT] [Presentation: 30 min, Discussion: 30 min] <ul style="list-style-type: none">• Validation protocols for atmospheric aerosol and cloud profiles (CV-22-01)• Ongoing AC-VC and ACSG coordination update• Initial CEOS-FRM maturity assessments for atmospheric Cal/Val data• Proposal for a new CV-24-xx Deliverable: Third CINDI inter-calibration field campaign (2024/Q2) | Jean-Christopher Lambert |
| 14:00 – 14:30 | 1.8: ACIX-III, CMIX-II and Cloud Camera Network [PPT] | Eric Vermote |

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| | [Presentation: 15 min, Discussion: 15 min] | |
| 14:30 – 15:30 | <p>1.9: Terrain Mapping Subgroup (TMSG) Report [PPT]</p> <p>[Presentation: 30 min, Discussion: 30 min]</p> <ul style="list-style-type: none"> • DEMIX update • GCP Match-up database • CV-22-02 update: Summary of activity and peer-reviewed paper of CEOS Terms and Definitions Wiki | Peter Strobl (Virtual) |
| 15:30 – 15:45 | Coffee Break (15 min) | |
| 15:45 – 16:45 | <p>1.10: WGCV Contributions to the CEOS New Space Task Team [PPT1][PPT2] [PPT3]</p> <p>NSTT White Paper</p> <ul style="list-style-type: none"> • Review of inputs to date • New Space Radiometry Match-up database • Discussion | Philippe Goryl, Cody Anderson |
| 16:45 – 16:55 | Buffer time | |
| 16:55 – 17:00 | Day 1 Close | |
| 17:00 | CONAE-hosted Ice breaker (at CONAE) | |

Day 2 (Auditorium Room)

Wednesday, March 6, 2024

Bus departs at 07:50 a.m. from Patio Olmos, Av. Vélez Sarsfield 361, Córdoba. Coffee breaks will be at the entrance of the auditorium.

| Time (ART) | Item | Presenter(s) |
|---------------|---|--------------------------------|
| 09:00 – 09:20 | 2.1: Welcome <ul style="list-style-type: none">Review of day 1 actions | Philippe Goryl, Matt Steventon |
| 09:20 – 10:20 | 2.2: Microwave Sensors Subgroup (MSSG) Report [PPT] [Presentation: 30 min, Discussion: 30 min] <ul style="list-style-type: none">UpdatesDiscussion | Xiaolong Dong (Virtual) |
| 10:20 – 11:20 | 2.3: Land Product Validation (LPV) Subgroup Report [PPT] [Presentation: 30 min, Discussion: 30 min] <ul style="list-style-type: none">Consideration of the potential for GPP/NPP land product Focus Area within LPVConsideration of the potential for Evapotranspiration land product Focus Area within LPVRe-evaluating Validation Stages for Several products (some may have already been moved in the last year)<ul style="list-style-type: none">Elevating Soil Moisture to Stage 4 with the release of FRM4SMElevating Albedo to Stage 4Elevating Burned Area to Stage 3Review Supersites for LPV considering new focus areas and updated needs | Michael Cosh (Virtual) |
| 11:20 – 11:35 | Coffee Break (15 min) | |
| 11:35 – 12:00 | 2.4: TIRCalNet [PPT] | Philippe Goryl, Nigel Fox |
| 12:00 – 12:45 | Lunch Break (45 mins) | |
| 12:45 – 13:45 | 2.5: Infrared and Visible Optical Sensors (IVOS) Subgroup Report [PPT] [Presentation: 30 min, Discussion: 30 min] | Nigel Fox |
| 13:45 – 14:45 | 2.6: Fiducial Reference Measurement (FRM) Assessment Framework Pilots Review [PPT] <ul style="list-style-type: none">FRM Pilots<ul style="list-style-type: none">FRM4DOASRadCalNetICOSPGN | Nigel Fox, Paolo Castracane |

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| | <ul style="list-style-type: none"> ○ Brewer ○ BAQUNIN ○ Hypernets ○ DION <ul style="list-style-type: none"> ● ESA Product Maturity Assessment Tool | |
| 14:45 – 15:45 | <p>2.7: Synthetic Aperture Radar (SAR) Subgroup Report [PPT1][PPT2]</p> <p>[Presentation: 30 min, Discussion: 30 min]</p> <ul style="list-style-type: none"> ● New challenges for SAR Cal/Val (addressing Cal/Val of geophysical parameters derived from SAR measurements, Mission Cross-Calibration, and Cal/Val of New Space SAR missions) (Dirk Geudtner) ● Update on SARCalNet initiative (Bruce Chapman) | Dirk Geudtner, Bruce Chapman (Virtual) |
| 15:45 – 16:00 | Coffee Break (15 min) | |
| 16:00 – 16:30 | <p>2.8: WGCV response to cal/val related GCOS IP 2022 actions [PPT]</p> <ul style="list-style-type: none"> ● Review the Implementation Plan and identify relevant WGCV actions and potential gap ● B1.3 Better align the satellite FRM program to the reference tier of tiered networks and enhance/expand FRM to fill gaps in satellite cal/val ● B5.1 Increase the number of in situ river level observations that are exchanged internationally and can be used to calibrate satellite observations of water levels | Philippe Goryl |
| 16:30 – 17:00 | <p>2.9: Space agency reports (as requested) on new Cal/Val activities, etc. [10 mins for each report]</p> <ol style="list-style-type: none"> i. CONAE (Marc Thibeault) [PPT][16:30-16:40] ii. JAXA (Akihiko Kuze) [PPT][16:40-16:50] iii. CSIRO (Matt Garthwaite) [PPT][16:50-17:00] | |
| 17:00 | Day 2 Close | |

Day 3 (Auditorium Room)

Thursday, March 7, 2024

Bus departs at 07:50 a.m. from Patio Olmos, Av. Vélez Sarsfield 361, Córdoba. Coffee breaks will be at the entrance of the auditorium.

| Time (ART) | Item | Presenter(s) |
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| 09:00 – 09:15 | <p>3.1: Welcome</p> <ul style="list-style-type: none"> ● Review of day 2 actions | Philippe Goryl, Matt Steventon |

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| 09:15 – 09:45 | 3.2: SRIX4Veg [PPT] [Presentation: 15 min, Discussion: 15 min] <ul style="list-style-type: none"> ● SRIX4Veg-I (Valentina Boccia) [PPT] <ul style="list-style-type: none"> ○ Achievements and Final Workshop ○ Ongoing activity for drafting the Protocols and Procedures for SR validation using UAVs ● SRIX4Veg-II (Cindy Ong) [PPT] <ul style="list-style-type: none"> ○ Summary of Related Preliminary Workshop ○ Overview of what to expect for actual inter-comparison exercise mid-March, and way forward | Cindy Ong (Virtual), Valentina Boccia (Virtual) |
| 09:45 – 10:00 | 3.3: CEOS-ARD [PPT] <ul style="list-style-type: none"> ● CEOS-ARD Oversight Group and ARD product assessments update ● OGC ARD SWG progress | Medhavy Thankappan |
| 10:00 – 10:15 | 3.3a: Surface Reflectance Quality, Equivalency and Consistency | Medhavy Thankappan |
| 10:15 – 10:45 | 3.4: CEOS Analytics Lab (CAL) [PPT] | Dave Borges |
| 10:45 – 11:15 | 3.5: Pre-flight Calibration Workshop Update [PPT] | Nigel Fox, Xiaoxiong (Jack) Xiong (Virtual), Philippe Goryl |
| 11:15 – 11:30 | Coffee Break (15 min) | |
| 11:30 – 12:00 | 3.6: GSICS Collaboration Update [PPT] <ul style="list-style-type: none"> ● Radiative Transfer Model and Intercomparisons | Philippe Goryl, Paolo Castracane, Manik Bali (Virtual) |
| 12:00 – 12:45 | Lunch Break (45 min) | |
| 12:45 – 13:45 | Visit to CONAE Space Centre (2 groups in parallel) | |
| | Buffer time (15 minutes) | |
| 14:00 – 14:45 | 3.7: Greenhouse Gas Cal/Val and Network Updates <ul style="list-style-type: none"> ● Joint Cal/Val Campaign meeting for OCO-TROPOMI-TEMPO-GOSAT ● GHG match-up database - GOSAT-AIRM, GOSAT-IASI Match ups [PPT] ● GHG Cal/Val Networks Sustainment ● Collaboration with the IMEO Cal/Val Working Group [PPT] ● Develop a guidance document on Cal/Val resources for | Akihiko Kuze, Jean-Christopher Lambert, John R. Worden (Virtual) |

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| | <p>Greenhouse Gases (GHG) similar to the hyperspectral guidance document</p> <ul style="list-style-type: none"> • Update on GHG Roadmap Annex C (John R. Worden, Virtual) [PPT] • Discussion | |
| 14:45 – 15:15 | <p>3.8: WGCV Collaboration with BIPM-WMO [PPT]</p> <ul style="list-style-type: none"> • Feedback on the BIPM-WMO Metrology for Climate Action Workshop Report • Discuss how WGCV can contribute to the workshop's recommendations | Philippe Goryl, Emma Woolliams (Virtual) |
| 15:15 – 15:30 | Coffee Break (15 min) | |
| 15:30 – 16:30 | <p>3.9: WGCV support to 2024 CEOS Chair priority on Biodiversity</p> <ul style="list-style-type: none"> • Biodiversity intro and potential biodiversity focus areas for CEOS (Gary Geller) [PPT] (10 mins) • Essential Biodiversity Variables (EBVs) [PPT] (Marc Paganini) (10 mins) • Introduction to SAR Challenge around the circumpolar forest (Lucie Viciano & Yves Crevier) [PPT] • WGCV responses to the recommendations from the Ecosystem Extent Task Team White paper (10 mins) <ul style="list-style-type: none"> ○ Areas for collaboration with the EETT ○ Intercomparison exercise • General discussion and wrap up (10 mins): <ul style="list-style-type: none"> ○ Are the products your community develops aligned with global frameworks? With the Essential Biodiversity Variables and/or Global Biodiversity Framework Indicators? | Philippe Goryl (ESA), Lucie Viciano and Yves Crevier (CSA), Gary Geller (NASA), Marc Paganini (ESA) |
| 16:30 – 17:20 | <p>3.10: Space Agency Reports (as requested) on New Cal/Val Activities, etc. [10 mins for each report]</p> <ol style="list-style-type: none"> I. Chilean national satellite program and cal/val activities (Carolina Barrientos) [PPT] [16:30-16:40] II. GA (Medhavy Thankappan) [PPT] [16:40-16:50] III. USGS (Cody Anderson) [PPT] [16:50-17:00] IV. ISRO (Santhisree) [PPT] [17:00-17:10] V. BELSPO (Jean-Christopher Lambert) [PPT] [17:10-17:20] | |
| 17:20 – 18:00 | 3.11: CEOS WGCV CalVal Portal Updates [PPT] | Paolo Castracane |
| 18:00 – 18:15 | <p>3.12: Plans for WGCV-54 Meeting [PPT]</p> <ul style="list-style-type: none"> • Plans for the joint meeting with WGISS | Philippe Goryl, Cody Anderson |
| 18:15 – 18:20 | 3.13: Plans for the next WGCV telecon | Philippe Goryl |
| 18:20 – 18:40 | 3.14: Day 3 Decisions and Actions review | Matt Steventon |

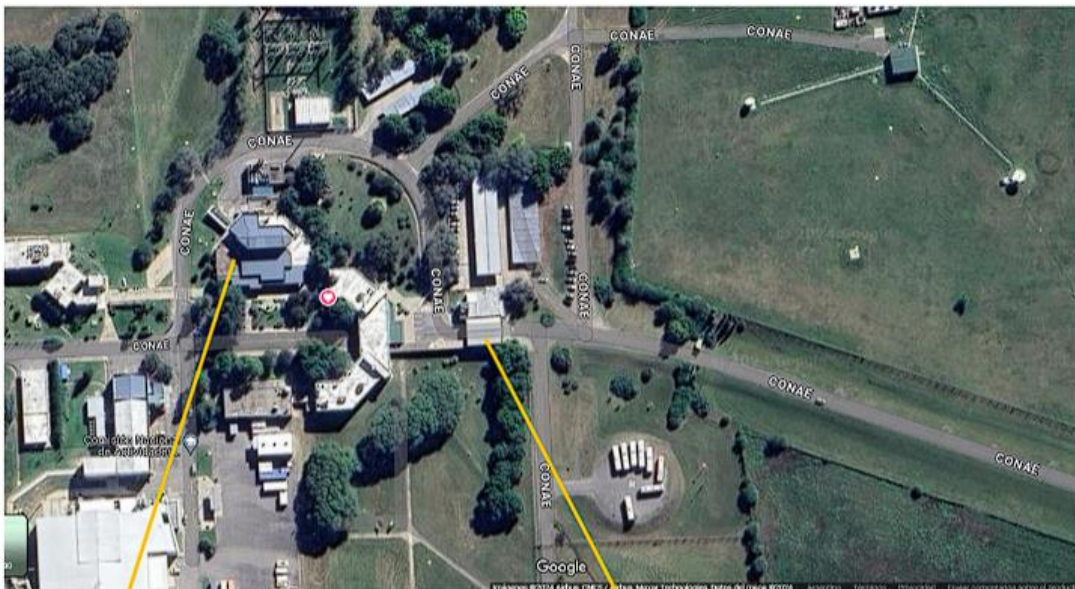
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|---------------|------------------------------|
| 18:40 – 19:00 | 3.15: AOB |
| 19:00 | Day 3 Close |
| 19:00 | CONAE-hosted dinner at CONAE |

Day 4 (Auditorium Room)

Friday, March 8, 2024

Note: The agenda items scheduled for Day 4 have been rescheduled to Day 3. There will be no meeting held on Day 4.

CONAE OVERVIEW



Auditorium

Entrance