Minutes

WGCV-52 Day #4

Thursday, 8 June 2023

Participants (** Virtual Participants)*

ASI	Antonio Montuori*
AIRCAS	Lingling Ma, Ning Wang
BIRA-IASB	Jean-Christopher Lambert
CAST	He Hongyan, Wenwen Qi
CEO	Marie-Claire Greening*
CONAE	Angel Matias Palomeque*
CSIRO	Cindy Ong, Matt Garthwaite
ESA	Philippe Goryl, Paolo Castracane, Fabrizio Niro, Marc Bouvet, Steffen Dransfeld, Sabrina Pinori (Serco for ESA), Clement Albinet, Rosalia Fonseca*, Rosario Ionnone*, Stefano Casadio*, Marin Tudoroiu, Esad Micijevic, Lidia Saavedra De Miguel*
EC-JRC	Peter Strobl
GISTDA	Prayot Puangjaktha, Passapak Sarathin
GA	Medhavy Thankappan
JAXA	Kazuhisa Tanada
KARI	Kyoung-Wook Jin
MYSA	Wayne Ng Su Wai*
NASA	Xiaoxiong (Jack) Xiong, Eric Vermote, Jaime Nickeson*
NOAA	Taeyoung Jason Choi, Manik Bali*, Lawrence Flynn*
NPL/UKSA	Nigel Fox
NRSCC	Xiaolong Dong
NSMC-CMA	Ling Sun
USDA	Michael Cosh*
USGS	Cody Anderson
WGCV Sec	Matt Steventon, Riza Singh

Welcome and Review of Day 3 Actions

Presenter: Philippe Goryl (WGCV Chair, ESA)

Main points:

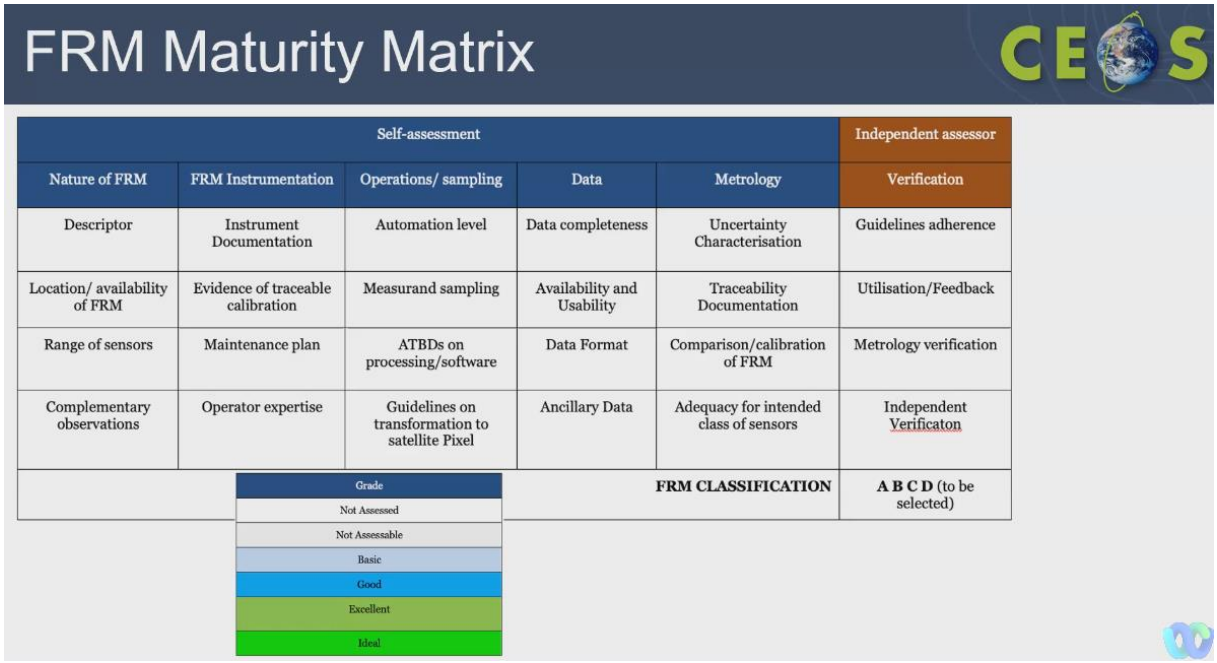
- Philippe Goryl (WGCV Chair, ESA) welcomed everyone to Day 4 of the WGCV-52 meeting.
- Matt reviewed the action and decision items from Day 3.

Fiducial Reference Measurement (FRM) Assessment Framework [Slides]

Presenter: Nigel Fox, Philippe Goryl, Paolo Castracane

Main points:

- Nigel reviewed the draft document V0.1 for Roadmap towards an assessment Framework for Fiducial Reference Measurements (FRMs). The FRM maturity matrix follows the familiar model of the cal/val matrix and includes sections on: Nature of FRM; FRM Instrumentation; Operations/Sampling; Data; Metrology.
- The proposed framework takes a pragmatic approach relying on self-assessment and transparency/accessibility of evidence against a set of criteria which are subject to peer review through a board of experts led by CEOS WGCV.
- In order to be flexible, maximise inclusivity and encourage the development and evolution of FRM from new or existing teams compliance with criteria will be based on a gradation scaling rather than a simple pass or fail.
- The degree of compliance and associated gradation can then be presented in a Maturity Matrix model - EDAP like to allow intended users of the FRM to assess suitability for their application and indeed funders to decide on where and what aspects to focus any investment. The matrix model provides a visual 'simple' assessment of the state of any FRM for all given criteria making visible where it is mature and where evolution and effort needs to be expended.
- In addition to this broad-based summary an overall classification of the degree of compliance will be provided based on meeting specific gradations for particular criteria. More details can be viewed from the linked slides.
- An on-line catalogue will be provided by CEOS to host the listing of endorsed FRM measurements.



- At the end of the process, FRMs are provided with an overall classification.

- An overview of the document can be viewed from the linked slides.

Discussion

- The goal is to create a catalog of FRMs approved by CEOS, but endorsement is not mandatory. However, to claim something as an FRM, individuals or organisations must go through the assessment process outlined in the framework.

- It was suggested labelling the framework as "CEOS-FRM" to establish a distinction and aspirational value. The aim is for people to aspire to achieve the CEOS FRM status. CEOS has a reasonable justification for endorsing and providing a process for FRM.

- Peter Strobl (EC-JRC) asked what the framework should label as FRM: a process, facility, entity, results, or data. The discussion revolved around the distinction between the FRM facility or instrument and the resulting data.

- Philippe noted that at the facility level, such as MOBY, it would be considered an FRM, rather than individual measurements from a specific time period.

- The discussion touched upon the ability of FRMs to provide cal/val characteristics and assess the performance of satellite sensors. It was highlighted that FRMs should provide information that allows for the assessment of a satellite sensor's performance, and this information could be in the form of transformed data that matches the sensor's characteristics.

- The question was raised about whether the facility or the resulting data should be labelled as FRM. It was suggested that even if the facility producing the data were turned off, the package of information that remains usable by the sensor could still be called an FRM. The ongoing nature of the facility was mentioned as a factor to consider.

- Kyoung-Wook Jin (KARI) was uncertain about the CEOS endorsement of FRMs and whether an ideal measurement that lacks CEOS endorsement can still be considered an FRM.

- The response clarified that while anyone can use a measurement and call it an FRM, following the assessment process and obtaining CEOS recognition provides independent review and assessment. If someone wants to use the measurement from anything they choose to do and they have gone through a process themselves to call it FRM and use it for satellite they can do that but if they want that to be officially recognised so that people know there has been some independent review and assessment done then they should follow this assessment process. CEOS is recognised as an international body of space agencies that has the authority to provide some recognition for the process.

- The discussion touched upon the gradations in the FRM framework, particularly the distinction between "excellent" and "ideal" grades. Nigel noted that the labels have been borrowed from existing EDAP. The aim was to provide encouragement and aspiration, acknowledging that achieving the ideal grade might be challenging. The gradations are intended to reflect progression rather than a simple yes or no assessment.

- Jack Xiong (NASA) noted that although the aim is to have an ideal measurement process, it can be harder to achieve, but it is still considered a required process. Even if a measurement falls into the "excellent" grade, it can still be classified as an FRM.

- Peter suggested a multilevel approach, distinguishing between the process and the product or result. He referred to the experience with the Analysis Ready Data (ARD) process, where higher classes of threshold often result in people meeting the minimum standard to be recognised as an FRM, rather than reaching the end goal. He supported the CEOS-ARD model of Threshold and Goal.

- Nigel expressed his reservations, emphasising the objective of establishing a scale that fosters ambition rather than solely conforming to minimum standards.

- Philippe recalled the WGCV-51 meeting, where they aimed to avoid a binary yes or no approach and exclude everyone. The assessment framework was intended for the New Space and Mission Manager (MM) used by NASA and ESA. It serves as a tool to communicate and interact with data providers and also to motivate them. The goal was inclusiveness and increasing engagement.

- Jean-Christopher Lambert (BIRA-IASB) noted missing elements in the information content of FRM documents for the atmospheric domain. He suggested adding a field for representativeness and incorporating concepts on measurement and uncertainty. Jean shared examples where certain parameters or criteria were not applicable to the atmospheric domain.

- Nigel noted the possibility of incorporating Jean-Christopher's suggestions by making some changes in the labels to better accommodate other domains. The goal is to ensure the criteria are relevant across multiple domains and sufficiently generic.

- CEOS-FRM provides a means for assessing and evidencing claims that a measurement is FRM. As an independent body, it would provide credibility and a third party check.

- Michael Cosh USDA via chat about the motivation for collecting data to the standard of FRM.

- It was noted that the motivation is to get the best quality measurement possible. The FRM concept was developed specifically for satellite calibration and validation, distinguishing it from in situ

measurements. It is also a means for individuals or organisations to demonstrate their competency and applicability for use in satellite programs.

- Antonio Montuori via chat asked to provide some clarification since the FRM is a new concept for him:
  - Is the FRM referred to measurements collected within in situ campaigns, models or ground/airborne/satellite sensors? or something complementary/different to these measurements?
    - It was confirmed that it is related to in situ campaign, model, ground and airborne measurements.
  - Is the FRM assessment related both to the sensor/instrument itself and to the measurement provided?
    - The response affirmed that the assessment encompasses both the sensor/instrument and a suite of measurements.
  - Is this assessment also related to the accuracy of geophysical parameters to be retrieved?
    - It was confirmed that the assessment does consider the accuracy of geophysical parameters, ensuring they are suitable for specific applications.
- It was suggested to give WGCV some time to review and provide comments on the FRM document.
- Fabrizio Niro (ESA) noted supersites are important in various domains.
- Nigel noted that it is possible to have at the labelling stage FRM supersite for X, Y, Z. Then apply the criteria for all relevant characteristics.
- Nigel added that for Class A, a significant fraction of criteria would need to be covered, emphasising the importance of communication from data providers. He also mentioned the availability of many examples that can be tested.
- Jean-Christopher suggested starting with an instrument of networks and then seeing where FRM projects add up to the state of the art, checking for redundancy in ACSG, Hyperspectral documents. Nigel noted that the Annex section is a starting point that needs to be reviewed and updated.
- It was suggested to consolidate the existing FRM document and come up with a concrete document showing the test cases at WGCV-53.

WGCV-52-ACT-29	Paolo Castracane and Nigel Fox to rename FRM Assessment Framework to "CEOS-FRM Assessment Framework" before distribution.	**COMPLETE**
WGCV-52-ACT-30	Paolo Castracane and Nigel Fox to distribute the CEOS-FRM Assessment Framework and any other supporting documents (e.g., slides) to the team for review and feedback. Key will be to assess cross-domain applicability of the framework, noting the issues raised about the atmospheric domain for example.	**COMPLETE**

	wgcv@lists.ceos.org wgcv-community@lists.ceos.org +CHIME group	
WGCV-52-ACT-31	Paolo Castracane and Nigel Fox to send a revised CEOS-FRM Assessment Framework following the review by the community.	**August**
WGCV-52-ACT-32	Following receipt of the revised CEOS-FRM Assessment Framework (ref: WGCV-52-ACT-31) – Team to undertake some example self-assessments to check the applicability and suitability of the FRM Assessment Framework. Collate feedback to refine the framework and share examples. *Possible examples: Marc Bouvet (RADCALNET), Fabrizio Niro (ICOS), Stefano Casadio (Baqunin), Jean-Christopher Lambert (FRM4DOAS), Nigel Fox (Hypernets, Gobabeb), etc.*	**Results to be presented at WGCV-53**

AusCalVal Update [Slides]

Presenter: Matt Garthwaite

Main points:

- Provided a brief update on the AusCalVal facility. One of the roadmaps released in 2021 was concerning EO from space. Recalled that the roadmap has 5 focus areas including Data quality and integrity monitoring.
- CSIRO started to implement AusCalVal as a National Facility in 2022 as part of the National Space Program for EO – Australian Space Agency's programmatic response to the roadmap. It is currently under consideration by the federal government.
- The facility will establish a network of sites across Australia for calibrating EO sensor data and validating derived products. It aims to provide free and open access to quality-assured and consistent data.
- The target customers include government, international partners, industry, and research organisations.
- An ATAG team has been formed to support the initiative.
- An update on the various existing Australian Capabilities programs and calibration and validation facilities sites across Australia were provided.
- AquaWatch Australia is a ground based observation system in Australia that collects integrated information from various aqua missions. It operates through a single platform, allowing for the consolidation and analysis of data from multiple sources.

- More details can be viewed from the linked slides.

Discussion

- Kyoung-Wook Jin (KARI) was impressed with Matt's presentation and asked about the future plans for satellite launches by Australia.

- Matt Garthwaite (CSIRO) noted that Australia is planning to launch Satellite Cross-Calibration Radiometer (SCR) satellite which is a series constellation in the hyperspectral domain and Medhavy Thankappan would cover this topic in more detail during the Geoscience Australia (GA) presentation.

- It was clarified that the word 'shop front' used in the initial AusCalVal activities presentation slide refers to an essentialised point or interface that offers free and open access data.

Land Product Validation (LPV) Subgroup Report [Slides]

Presenter: Michael Cosh (Virtual)

Main points:

- Highlighted a recent turnover in LPV memberships and efforts to identify and convince potential members to join the LPV group.

- Provided status updates on the ten LPV focus areas including Biophysical, Fire/Burn Area, Phenology, Vegetation Index, Land Cover Snow Cover, Surface Radiation, Soil Moisture, LST and Emissivity and Above Ground Biomass.

- A joint workshop between CEOS LPV and GEOGLAM is planned for September 2023 at National Agricultural Library in Beltsville, Maryland, USA.

- Past Actions update on Above Ground Biomass related activities:

- *CARB-19-04: Forest Biomass measurements for GFOI countries*
    - The action has been moved to LSI-VC Forest and Biomass Subgroup.

- *CARB-21-03: Forest Biomass Reference Networks (GEO-TREES).*
    - There has been nothing concrete as yet in terms of actual funding for data collection, but likely in the near future.

- *CARB-22-01: Production of harmonized biomass products from CEOS Agency missions.*
    - For 2023 this activity will focus on intercomparison and validation of global biomass products from CEOS Agency missions.

- *CARB-17-05:* Cal/Val and production of biomass products from CEOS Agency missions.
    - Plot scale data is being coordinated through GEO-Trees. More data needs to be collected.

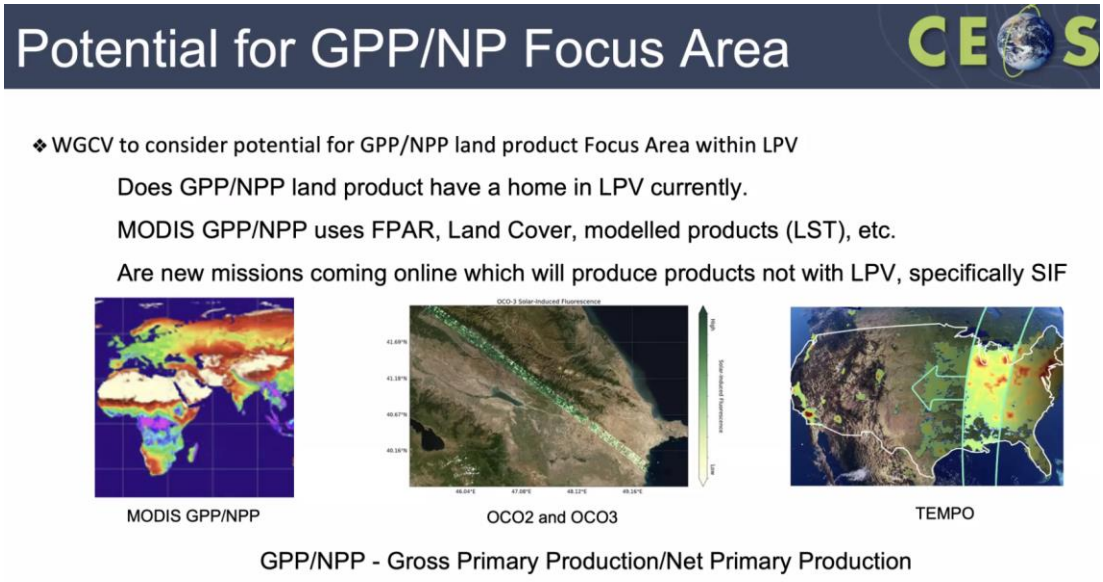
- LPV has been interacting with IVOS on Supersites. There is a diversity of sites with landscapes of interest. There is a need for ongoing dialogue with IVOS on Top of Atmosphere (TOA) calibration in relation to LST.

- Discussions have also taken place regarding commercial satellite products, involving companies such as Planet, MAXAR, and SPIRE. The increasing availability of data from these commercial providers has been noted. However, caution has been emphasised regarding the potential impact on public perceptions, highlighting the importance of careful interpretation and communication of these data.

- GEE is providing a platform for people to interact with Landsat products.

- Questions for WGCV discussion:
  - WGCV to consider potential for GPP/NPP land product Focus Area within LPV
  - WGCV to consider potential for Evapotranspiration land product Focus Area within LPV
  - Elevating Soil Moisture to Stage 4 with the release of FRM4SM

- More details can be viewed from the linked slides.



Discussion

- Philippe Goryl (WGCV Chair, ESA) thanked Michael for his contributions to the New Space document.

- LPV is currently using the GEE platform, Philippe recalled that Dave presented on the EAIL platform. It would be good to understand how we can further exploit EAIL and see if it can be used as a common platform for the benefit of the group.

- Cindy Ong (CSIRO) asked about the absence of Australian participation in the LPV Subgroup work on fire/burn areas, considering the country's fire programs.

- It was noted that the focus/burn area is still under development. Michael will reach out to the STAC group and extend contact with the Australian team to explore collaboration opportunities in this area.

- Michael Cosh (UDSA) noted that the questions shared in the slides for discussion do not require any action yet but it needs to be discussed: during the meeting.

- Nigel Fox (UKSA) commented that the decision on taking on the initiatives and structuring within the LPV subgroup rested with the subgroup itself.

- Philippe agreed, expressing the importance of GPP/NPP and suggesting that LPV should decide whether to incorporate it.

- Other discussions revolved around topics falling under the LPV subgroup, such as the potential for Evapotranspiration land product Focus Areas. The elevation of Soil Moisture to Stage 4 with the release of FRM4SM was also mentioned.

- The feasibility of FRM4Land cover as a categorical observation was discussed, with considerations for specific products and the need to define boundaries and categories. The importance of being specific about the area being discussed and the challenges involved in determining land cover and crop classification were also emphasised.

WGCV-52-ACT-33	LPV Chair to connect the fire/burn area team with Cindy Ong so that additional connections can be made to Australian work in this area.	**End July**

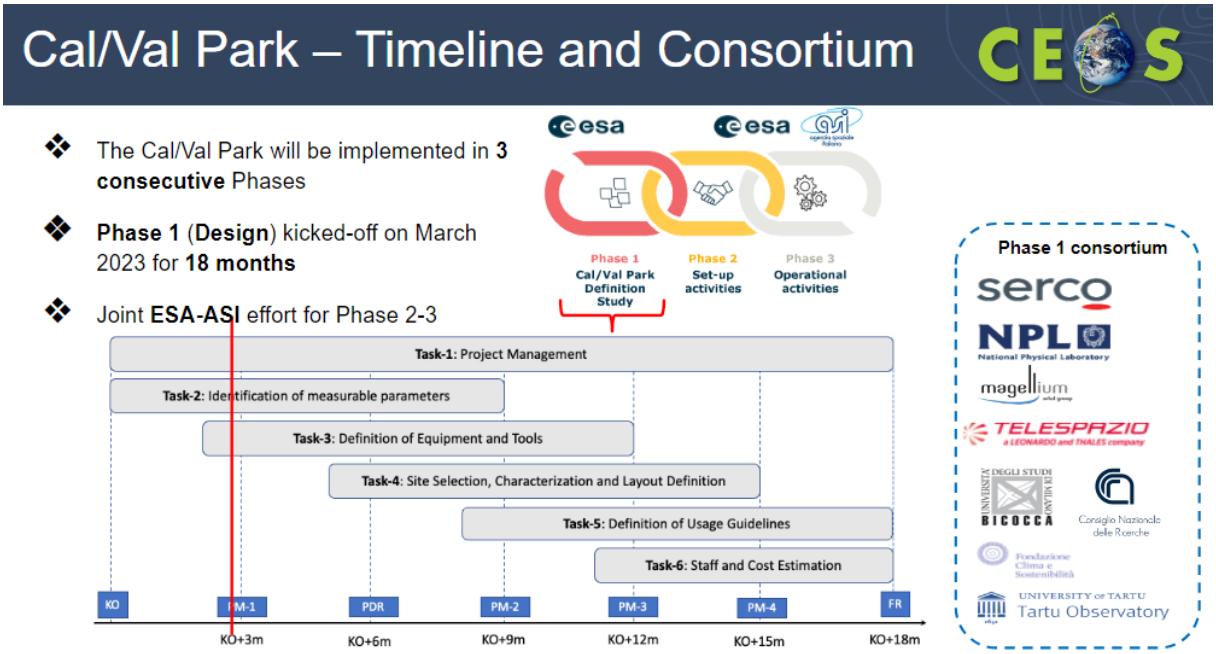
CalVal Park and BAQUNIN (Site for AC) [Slides]

Presenter: Fabrizio Niro, Stefano Casadio

Main points:

- The two supersites include CalVal Park for optical vicarious calibration and Boundary-layer Air Quality-analysis Using Network of Instruments Supersite for Atmospheric Research and Satellite Validation (BAQUNIN).

- Cal/Val park is a collaborative effort between ESA and ASI aimed at supporting Cal/Val needs for vicarious calibration of optical sensors in VNIR/SWIR range both multi and hyperspectral having GSD less than equal to 30 m and with a strong focus on HR/VHR sensors.



- The protocols will be made available and will facilitate cross-agency collaboration.

- More details can be viewed from the linked slides.

Discussion

- It was proposed that there should be reporting about the Cal/Val park within the group and circulation of a document for awareness. It can be seen more as a communication and feedback opportunity. It was noted that WGCV endorsement would only be needed if the Cal/Val Park initiative wanted to join initiatives like RadCalNet, etc. The importance of the Cal/Val Park working as part of a larger system was proposed, collaborating with initiatives such as AusCalVal and Baotou, and becoming a joint network.

- Nigel Fox (UKSA) was unsure about what distinguishes the Cal/Val Park from the discussion on FRM. He stated that if the Cal/Val Park enables FRM measurements of satellites, there would be no need for further distinction.

- It was noted that each measurement provided by the park would need to go through its own FRM process and for the MTP, there will be its own kind of MTF target portal for assessments.

- The long-term maintenance and perspective of the Cal/Val Park were discussed, with emphasis on the need to ensure sustainability. While the design already accounts for this, the exact costs and quantification of long-term sustainment, maintenance, and other expenses still need to be determined.

Boundary-layer Air Quality-analysis Using Network of INstruments (BAQUNIN) [Slides]

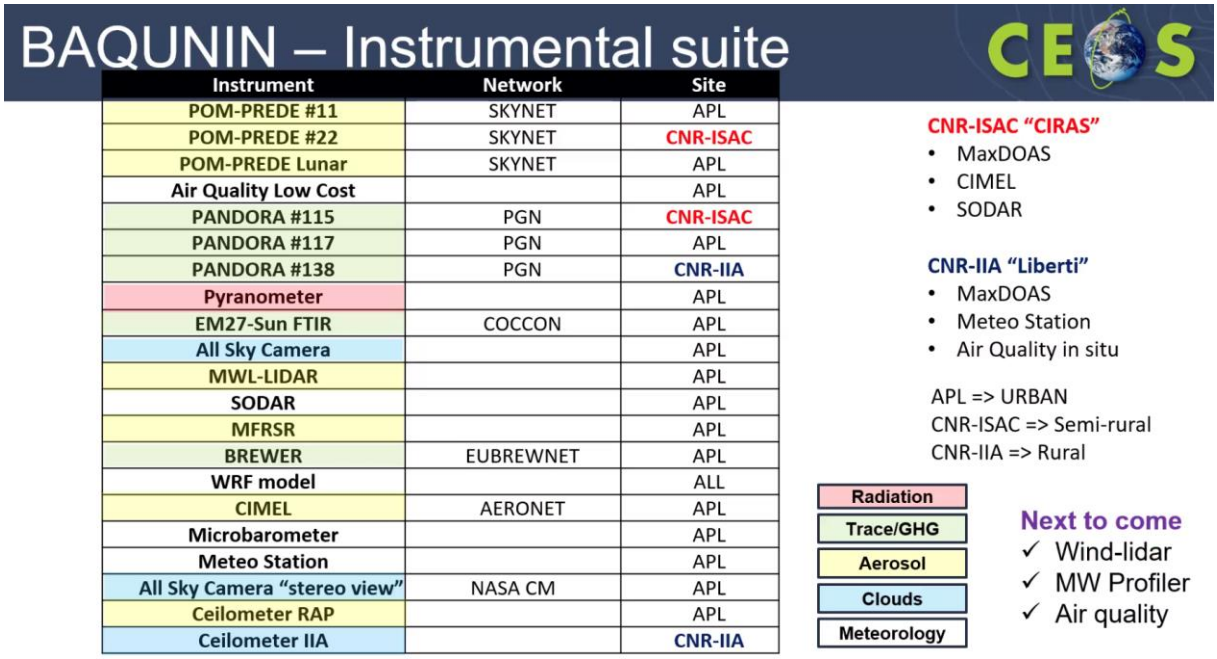
Presenter: Stefano Casadio (ESA/Serco)

Main points:

- Provided background on BAQUNIN and noted that the aim is to sustain the maintenance and operation of ground based remote sensing and in situ instruments for Satellite Cal/Val and Atmospheric Monitoring/Research purposes, operating in the Rome area.

- The site activities include acquiring, homogenising and distributing high quality data; performing inter-calibration and validation campaigns; attracting and engaging space, research and health agencies; stimulating research in urban atmospheric boundary layer physics and chemistry by facilitating inter-connections between national and international research institutes.

- There is a vast instrumental suite:



Instrument	Network	Site
POM-PREDE #11	SKYNET	APL
POM-PREDE #22	SKYNET	CNR-ISAC
POM-PREDE Lunar	SKYNET	APL
Air Quality Low Cost		APL
PANDORA #115	PGN	CNR-ISAC
PANDORA #117	PGN	APL
PANDORA #138	PGN	CNR-IIA
Pyranometer		APL
EM27-Sun FTIR	COCCON	APL
All Sky Camera		APL
MWL-LIDAR		APL
SODAR		APL
MFRSR		APL
BREWER	EUBREWNET	APL
WRF model		ALL
CIMEL	AERONET	APL
Microbarometer		APL
Meteo Station		APL
All Sky Camera "stereo view"	NASA CM	APL
Ceilometer RAP		APL
Ceilometer IIA		CNR-IIA

- BAQUNIN collaborates with many ESA projects like AERONET, SKYNET, EUBREWNET, EVDC, PGN. All the instruments produce data in a native format and BANQUNIN harmonises the data coming from all the instruments. All the information can be found at https://www.baqunin.eu/

Discussion

- It was noted that sensors from the pigeons are recovered as they always follow the same route back home.

TIRCalNet [Slides]

Presenter: Steffen Dransfeld

Main points:

- Initiated last year in response to CNES CEOS Chair priority. Led by Patrice Henry of CNES. with the need of having something similar to the RadCalNet domain.

- Several TIR missions are operational such as ECOSTRESS, ASTER, LANDSAT-8&9, MODIS, VIIRS, SLSTR, SEVIRI, etc. TIR future missions with higher resolution include TRISHNA, LSTM, and SBG. There are also various commercial missions coming down the pipeline.

- There are demanding LST accuracy requirements better than 0.1 K for climate studies. It is important to perform vicarious calibration for the validation of on-board calibration systems (black bodies) or direct calibration and L2 products (temperature & emissivity) validation need.

- The objectives are:
    - To collect surface temperature and emissivity, and atmospheric data necessary for the simulation of observations by TIR optical sensors and thus verify their radiometric calibration;
    - To increase the number of matchups between in-situ measurements and space sensor observations and reduce the overall uncertainties, and reduce the efforts of individual agencies;
    - To ensure traceability of the space sensor radiometry to the "Système International" (SI);
    - To support the establishment of the Global Earth Observation System of Systems by providing measurements to verify the radiometric consistency between EO space sensors;
    - To build on success and experience return from RadCalNet network dedicated to VNIR-SWIR optical sensors cal/val;

- Higher resolutions create new issues for current TIR cal/val sites.

- Challenges include spatial representativeness of the in situ reference measurements for higher resolutions, directional effects, lack of emissivity measurements, data access, data harmonisation, do not provide TOA radiances, data quality assurance (error budget traceable to SI), In situ instruments calibration quality and traceability, needs for the development of denser ground-based reference Network.

- The site at La Crau identified by CNES will be suitable for TRISNA, LSTM and SBG missions. The study has identified most of the uncertainty sources are from the atmosphere, emissivity and temperature.

- First test runs show that the main impact on TOA Brightness Temperature is the uncertainty on the ground emissivity. Uncertainties on the atmospheric profiles are an issue but of lesser impact.

- Further characterisation of the La Crau site is planned, around things like variations in emissivity, directional effects, environmental effects, etc.

- Next steps towards other sites require transfer of CNES La Crau uncertainty budget template, performing simulations, development site measurement and forward propagation protocol, analyse site characteristics, develop roadmap to equip and operate sites, and further discussion with partner agencies on how to collaborate and set up networks (funding for instrumentation, site operation, analysis, etc.).

- More details can be viewed from the linked slides.

Discussion

- Nigel Fox (UKSA) congratulated the TIRCalNet team and expressed surprise at the low uncertainty achieved at La Crau compared to existing land surface temperature (LST) activities.

- Kyoung-Wook Jin (KARI) asked about the analysis being based on nighttime data only, and Steffen Dransfeld (ESA) mentioned that he believes it includes both day and night data assimilation.

- Eric Vermote (NASA) asked whether the real goal of TIRCalNet is the calibration and validation of Surface Temperature or Top of the Atmosphere (TOA) Brightness Temperature.

- Steffen noted for the calibration and validation of Surface Temperature there are a lot of existing networks in place that perform the validation very well. TIRCalNet performs the vicarious calibration for the thermal sensor at TOA.

- It was noted that on board sensors calibration accuracy is higher than ground based validation. TIRCalNet serves different purposes: validating and calibrating sensors without onboard devices and validating sensors with onboard calibration devices like LSTM. It is useful for validating at the TOA level, similar to VIIRS or MERIS. Eric described it as insurance and an independent check when calibration is specified with a black body and measurement accuracy of 0.1 Kelvin. Steffen agreed and suggested that initially, there might be more focus on validation than calibration.

- The diffuser as for the visible instrument is much less accurate than the black body as a calibration device on board so there may be less need for thermal but it is an independent check on the radiometry and maybe initially there will be more validation than calibration.

- Surface Temperature is useful for all sensors and TOA validation will be very useful for the New Space sensors that don't have the black body on board.

- It was noted that there is upward and downward thermal irradiance being measured to help calculate TOA irradiance

RadCalNet [Slides]

Presenter: Marc Bouvet

Main points:

- RadCalNet is a common platform for collecting, processing and analysing radiometric data. The end product is surface reflectance and atmospheric data.

- Currently, there are five sites from where data is collected. Users can download the atmospheric and surface reflectance data from the RadCalNet portal.

- There are Skyview cameras installed at various sites to collect the data.

- There is a forum within the portal that enables two way communication with the users.

- There are more than 5000 days worth of data available in the past 10 years.

- Versioning of the data is facing some complexities.

- Two full reprocessing have taken place since opening in 2018 - in 2020 and 2022. A partial reprocessing is planned for 2023 which is expected to be released in June-August timeframe.

- Full archive of the data was reprocessed in 2020 and 2022.

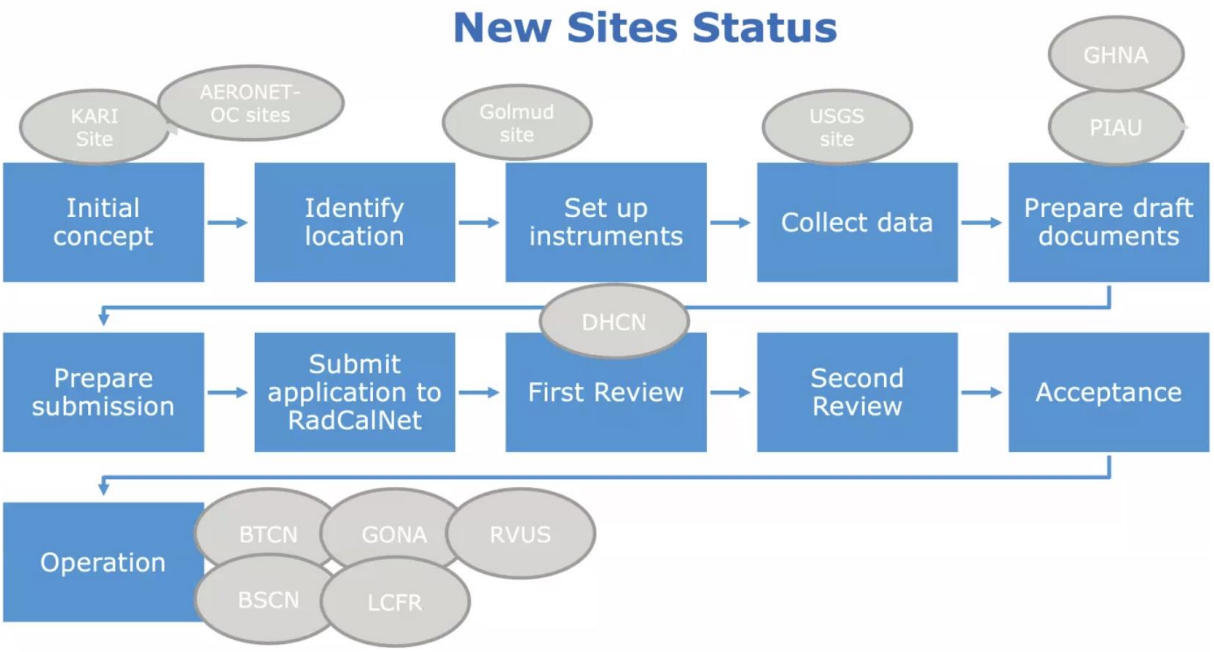
- Issues in 2023 with volume of data due to poor weather conditions, issues with data processing at two sites, and minor data quality issues for one site.

- Several data processing and calibration issues were identified and there were some interruptions. However, the data are now reprocessed and will be made available in 2023.

- BRDF is not accounted for, which causes issues for off-nadir observations, but averaging across all sites shows good results within accepted bounds.

- 800 users have registered to access the portal and around 20 new people are joining every month.

- Reviewed status of new sites that are working through the process to join the RadCalNet network:



- Ongoing study to look at the components that make up the uncertainty when comparing a satellite TOA and RadCalNet TOA – further understanding which uncertainties come from where.

- More details can be viewed from the linked slides.

Discussion

- Matt Garthwaite (CSIRO) asked about any plans for user workshops and workshops specifically for site operators.

- Marc Bouvet (ESA ESTEC) noted they will plan to organise a user workshop soon which will likely be conducted online. He also mentioned that anyone is welcome to join the IVOS RadCalNet Working Group for a better forum to discuss the workshop for site operators.

- Fabrizio Niro (ESA) shared that a lot of positive feedback has been received and that the dark sites have been mentioned as a priority.

- Regarding future sites, there are no specific requirements for site location except for the guidelines published to advise on the best location for sites. There are no restrictions on the type of instrumentation used, as long as the guidelines and requirements outlined in the document are met.

- When asked about multi-directional information, it was clarified that it is not currently built into the network. However, individual sites have the flexibility to offer it as a value added service for commercial users or other purposes. The discussion also touched on the distinction between free and paid service levels.

Space Agency Reports

GA [Slides]

Presenter: Medhavy Thankappan

Main points:

- Medhavy reviewed the Satellite Cross calibration Radiometer (SCR) mission, which is planned to be a hyperspectral mission focused on the transfer of radiometric calibration between reference (e.g., Landsat, Sentinel) and client systems.

- Reviewed the specifications of the satellite and the operations concept. Showed intersections with Landsat, which will be a key reference. Orbits have been carefully selected to maximise intersection opportunities.

- The SCR mission was announced in 2022, and its planning and development continue with partners, including the lead partner ASA. While the budget announcement in May 2023 indicated changes to refocus ASA's efforts, no specific changes were mentioned for the SCR mission or the National Space Program for Earth Observation (NSP-EO). GA is closely working with ASA to clarify priorities for SCR, including the development of a calibration and validation plan.

- Queensland corner reflector array of 40 sites is maintained by GA and was supported by AusCalVal in 2023. These corner reflectors are used by ESA for the Sentinel-1 mission.

- GA previously hosted two Pandoras on behalf of ESA at Canberra and Alice Springs. Moving forward, only one instrument will be hosted at Alice Springs and the second instrument relocation is under consideration. Alice Springs instrument is awaiting shipment back from Europe after re-calibration. GA welcomes input on additional Pandora sites and potential exploration of such sites can be done through AusCalVal.

- More details can be viewed from the linked slides.

Discussion

- It was noted that the launch date of the SCR satellite is likely to be delayed due to the change in the Australian Government.

- Taeyoung Jason Choi (NOAA) asked a specification question regarding the orbit selection specification of seven days.

- Medhavy Thankappan (GA) noted that the calibration reference needs to be transferred to a client within the seven days timeframe and should be within 0.2% accuracy.

CEOS Working Group on Climate (WGClimate) Report

Presenter: Jeff Privette (Virtual)

- Jeff Privette was not online to present the WGClimate report. Presentation slides will be shared once received.

WGCV-52-ACT-34	Group to review WGClimate slides and provide any feedback/questions.	**July**

Day 4 Close

Philippe Goryl (WGCV Chair, ESA) thanked everyone for joining and closed Day 4 of the WGCV-52 meeting.