CEOS-LPV Quarterly Meeting Q1 2026: Intro and feedback from WGCV

Committee on Earth Observation Satellites

Fabrizio Niro

(Serco/ESA-ESRIN)

15th Jan 2026

Outline

- Upcoming CEOS-WGCV & LSI-VC Joint Meeting
- Update on Future CEOS-ARD
- Update on LPV supersites V2
- Protocol and FA lead status
- Communication and Events

WGCV-56 & LSI-VC-19 Joint Meeting

- The 56th meeting of the CEOS Working Group on Cal/Val (**WGCV**) and 19th meeting of the CEOS Land Surface Imaging Virtual Constellation (**LSI-VC**) will be held **jointly** from **20-24 April 2026**
- The meeting will be hosted by **USGS** at the Earth Resources Observation and Science (**EROS**) Center in Sioux Falls, South Dakota

WGCV-LSI Meeting objectives

- In addition to the individual WGCV and LSI meetings, a substantial portion of the week will be dedicated to **joint sessions**, to discuss around data quality and interoperability.
- The meeting will be a critical milestone to elaborate the **2026 CEOS-ARD Strategy document**, and we plan a dedicated CEOS-ARD Oversight Group session/day.

https://ceos.org/ard/

CEOS Analysis Ready Data (ARD)

- CEOS-ARD are **satellite data** that have been processed to a **minimum set of requirements** and organized into a form that allows **immediate analysis** with a **minimum** of additional user effort
- **Aims**

  Reduce barriers to the uptake of EO data

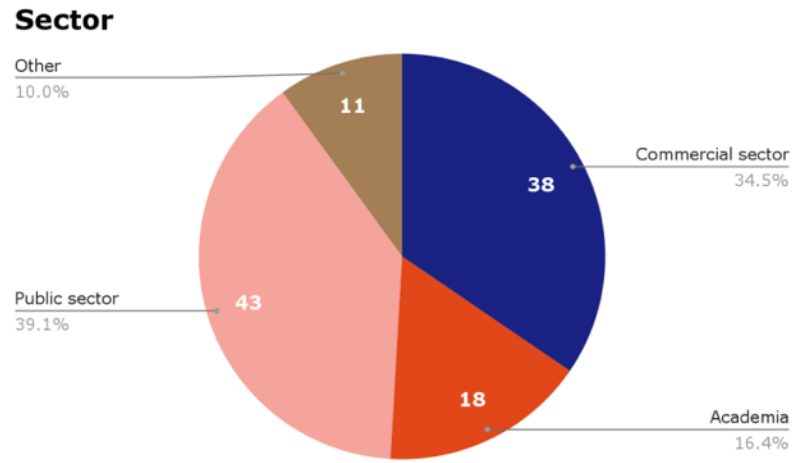
  Enable **new applications** and users

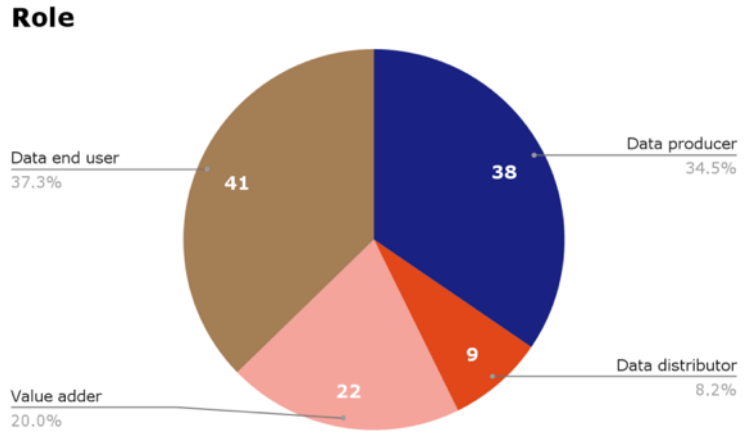
  Improve data **interoperability**
- Since 2016, nine CEOS-ARD Product Family Specifications (**PFS**) elaborated

https://ceos.org/ard/

Future CEOS-ARD

- EO sector has come a long way since CEOS-ARD was first elaborated in 2016:
  - Changing **technology**, including AI/ML
  - Evolving **user base** and **expectations**
  - Increasing demands for **interoperability**
- Need to keep moving forward.
  - Seeking **guidance** from the user community to help shaping the future of CEOS ARD!
  - **User survey** conducted (**110 responses**)
  - Strategy paper resulting from the survey

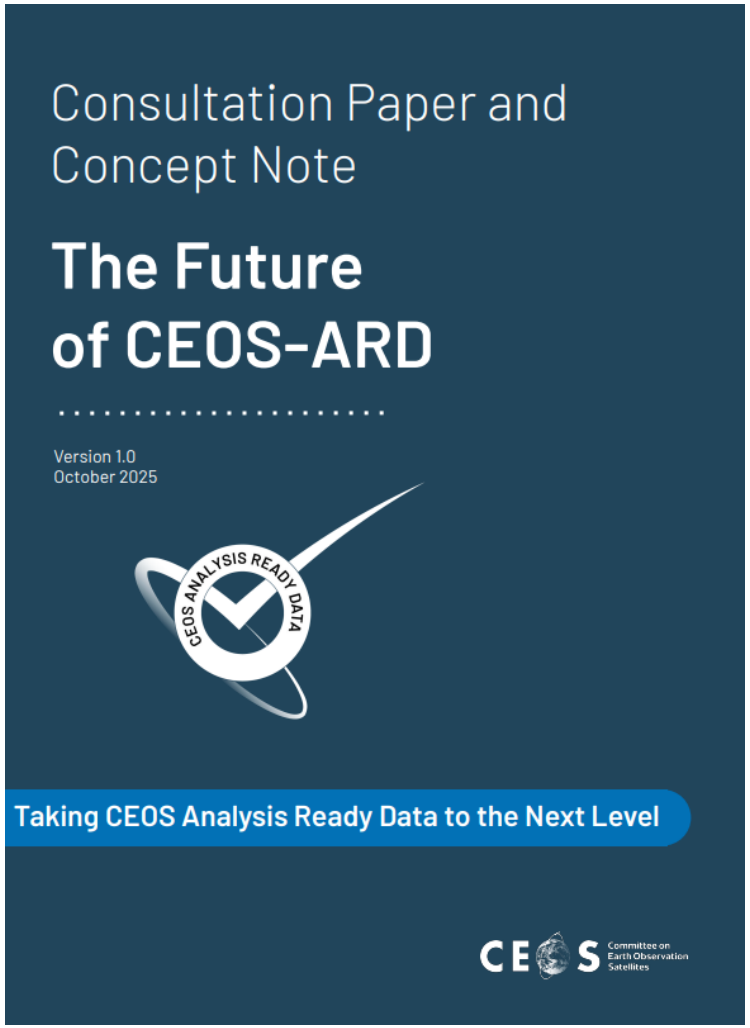




Future ARD concept paper

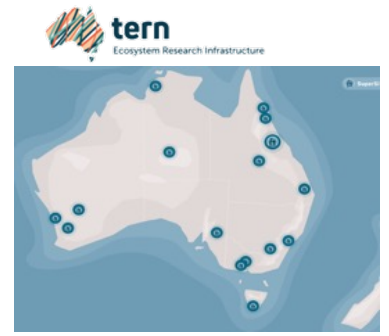
https://ceos.org/ard/

- Topics that future ARD should address with plan on how to tackle them:
  - **Enhanced Metadata** Specifications
  - Data and Metadata **Quality**
  - Ongoing **Quality Assurance** Monitoring
  - Fitness for Purpose
  - **Tools** to Aid Compliance Assessments
  - Measurand Consistency
  - Alignment with the Software Ecosystem
  - Thematic and **Higher-level ARD** Products
  - **Training** and **Outreach**



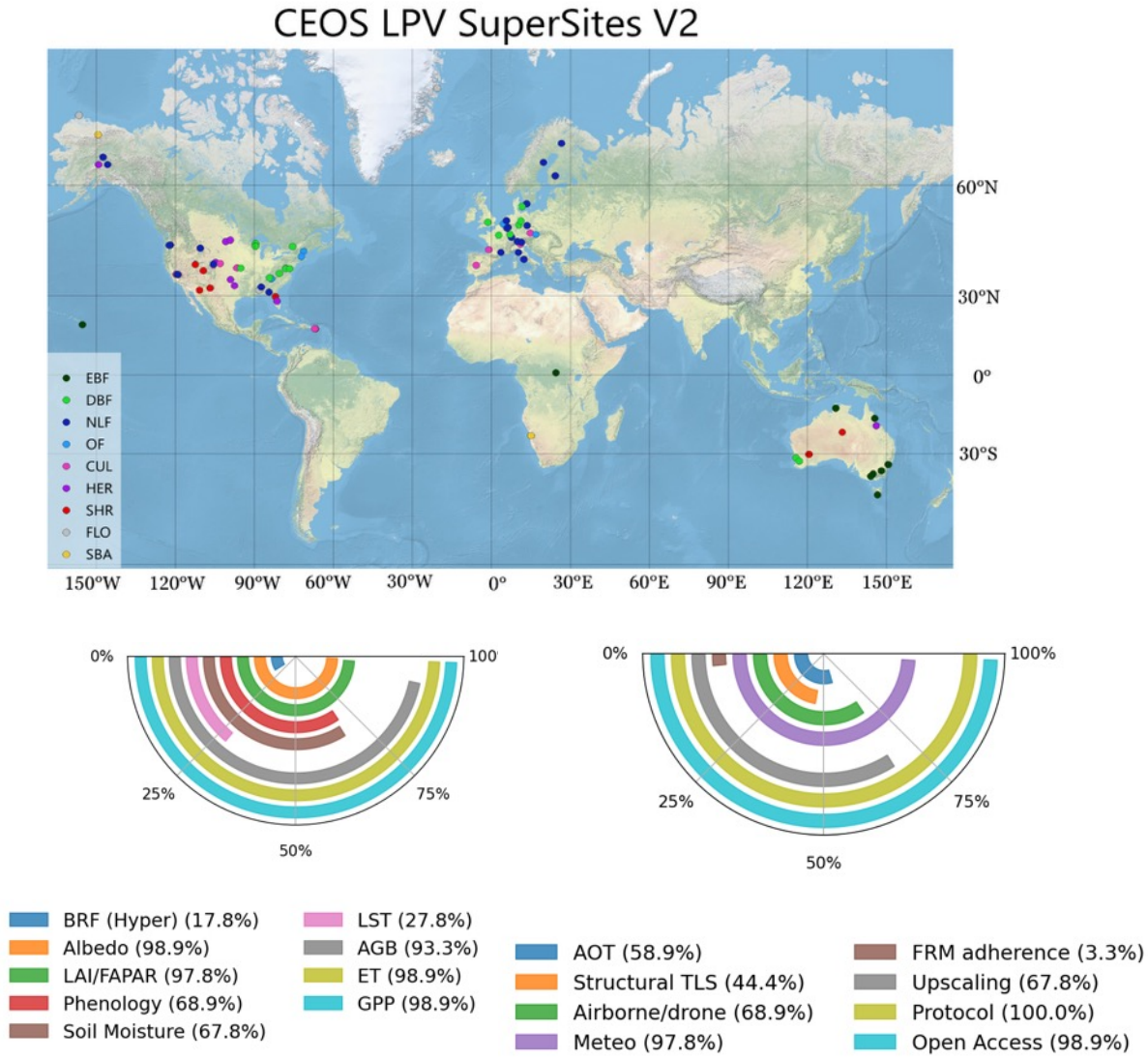
LPV Supersites review

- Review **definition**
  - Expand variables: **BRF**, **ET**, **GPP/NPP**, **SIF**
  - For validation of at least **3 family** of products
  - Adding **UAV-LiDAR** as ideal component
  - Assess spatial **representativeness**
  - Adherence (ideal) to **CEOS-FRM**
- Sites selection (220+ candidate)
  - Review main ecosystem **networks**
  - Include **recent** networks /sites
  - **Ranking:** ancillary data, spatial homogeneity, biomes/geographic relevance



LPV Supersites 2.0

- **92 sites** + 66 candidate
- Remaining **gaps**
  - Geographical gaps
  - LST, spectrally-resolved BRF
  - Limited adherence to FRM
- Status
  - **Spreadsheet** + **TN** circulated on 6th Nov 2025 for review by LPV
  - Few comments received
  - V2 will be now published on-line and communicated to WGCV

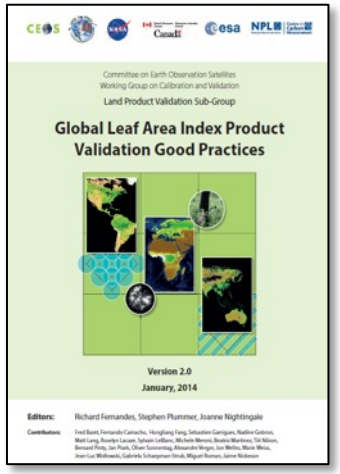


Collaborations and events

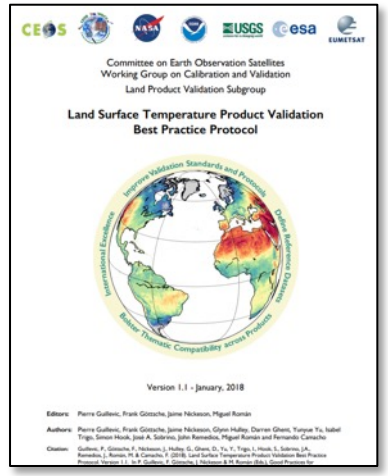
- Collaboration with **GEOGLAM**
  - CEOS-SIT action to work in collaboration with GEOGLAM to organise a **joint workshop on ET validation**
  - First meeting with GEOGLAM representatives held on 2nd Dec 2025, confirmed FAO interest in hosting the meeting on Q2 2026
  - Follow-up email thread including LSI and WGCV experts aimin ag having a side meeting during upcoming TSEB WS
- Upcoming events
  - EGU26, Vienna, Austria, May 3 – May 8
  - ForestSAT 2026, Gainesville, FL, May 4 - May 8
  - Two-source Energy Balance (TSEB) WS, Naples, Italy, 27-29 May

Protocol Status

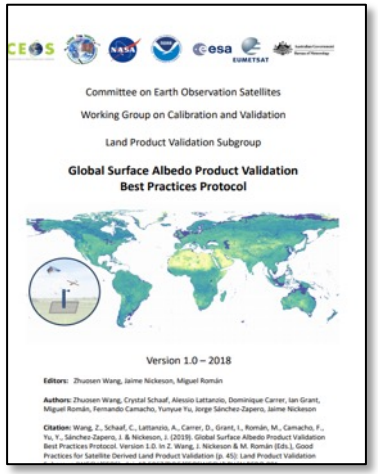
- **LC** protocol
  - **V1.1** (**Nov 2025**), implementing minor comments from WGCV
  - Already **~500 download** !!
  - Plan to present at **SIT Meeting** (April 14th - 16th, 2026, Irvine, California) for CEOS endorsement
- On-going efforts
  - Update of **fAPAR/LAI**, draft RSE paper in preparation
  - **VI** and **LSP**: consolidated draft ready to be finalised
  - **Fires**, **SM** update planned for 2026



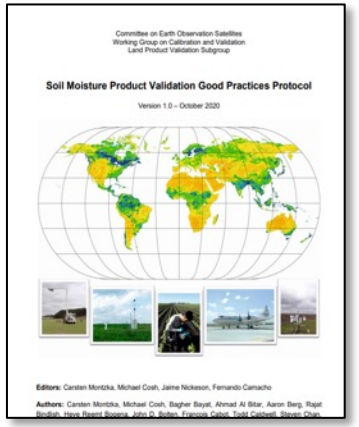
2014 - LAI



2018 - LST



2019 - Albedo



2020 - SM

2021 - AGB

2025 - LC

LPV communications / meetings

- 2025 Annual Newsletters: feedback from FA leads required !
- Quarterly telecons
- Yearly **tag up** meetings (ET, LSP, VI done)
- Up-to-date Web / list of products / key references
- Plenary LPV meeting (every 1 or 2 years): 2026 ?

https://lpvs.gsfc.nasa.gov/

FA leads status

	First Name	Last Name	Institution	Country	End of Term
Admin	Fabrizio	Niro	ESA	Italy	Apr 2028
	Vacant				
	Jaime	Nickeson	GSFC	USA	
Land Cover	Alexandra	Tyukavina	University of Maryland	USA	Mar 2027 (2nd term)
	Nandika	Tsendbazar	Wageningen University	Netherlands	April 2027 (1st term)
	Sophie	Bontemps	Université Catholique de Louvain	Belgium	**ex-officio**
Biophysical	Richard	Fernandes	Natural Resources Canada	Canada	Apr 2027 (one term)
	Hao	Teng	University of Maryland	USA	April 2027 (1st term)
	Luke	Brown	University of Salford	UK	Jan 2026 (1st term)
Fire/Burn Area	Louis	Giglio	University of Maryland	USA	Sep 2026 (2nd term)
	Bernardo	Mota	National Physical Lab	UK	Jan 2026 (1st term)
Surface Rad	Zhuosen	Wang	GSFC	USA	**ex-officio**
	Angela	Erb	Leidos	USA	Jan 2026 (1st term)
	Jorge	Sanchez-Zapero	EOLab	Spain	Jan 2026 (1st term)
Soil Moisture	John	Bolten	NASA GSFC	USA	Apr 2026 (2nd term)
	Alexander	Gruber	TU Wien	Austria	Oct 2026 (1st term)
LST	Thomas	Holmes	NASA/GSFC	USA	Dec 2028 (1st term)
	Lluis	Perez Planells	Karlsruhe Institute of Technology	Germany	Sept 2026 (1st term)
Phenology	Joshua	Gray	North Carolina State University	USA	Jan 2025 (2nd term)
	Victor	Rodríguez-Galiano	University of Seville	Spain	Aug 2025 (2nd term)
	Qiaoyun	Xie	The University Of Western Australia	Australia	Sep 2028 (1st term)
Snow Cover	Carrie	Vuyovich	NASA GSFC	USA	Jan 2026 (1st term)
	Juha	Lemmetyinen	Finnish Meteorologial Inst.	Finland	Sep 2026 (1st term)
Veg Index	Tomoaki	Miura	University of Hawai'i	USA	**ex-officio**
	Simon	Kraatz	USDA	USA	Apr 2027 (1st term)
	Sarah	Gebruers	VITO	Belgium	Sep 2028 (1st term)
Biomass	Laura	Duncanson	UMD/GSFC	USA	**ex-officio**
	Kim	Calders	Ghent University	Belgium	Feb 2026 (1st term)
	Mikhail	Urbazaev	GFZ	Germany	Dec 2028 (1st term)
	Vacant				
ET	Yun	Yang	Cornell University	USA	Jan 2027 (1st term)
	Carmelo	Cammalleri	Politecnico di Milano	Italy	Jan 2027 (1st term)
GPP/NPP	Arthur	Endsley	University of Montana	USA	Sept 2027 (1st term)
	Álvaro	Moreno	University of Valencia	Spain	Nov 2027 (1st term)

NEW co-lead in **Phenology**
Dr. Qiaoyun Xie
The University Of Western Australia

NEW co-lead in **VI**
Dr. Sarah Gebruers
VITO
Belgium

NEW co-lead in **Biomass**
Dr. Mikhail Urbazaev
GFZ
Germany

Still vacant:
- Vice-chair
- Non-EU Biomass lead

Reports from FA leads

CEOS
Committee on
Earth Observation Satellites

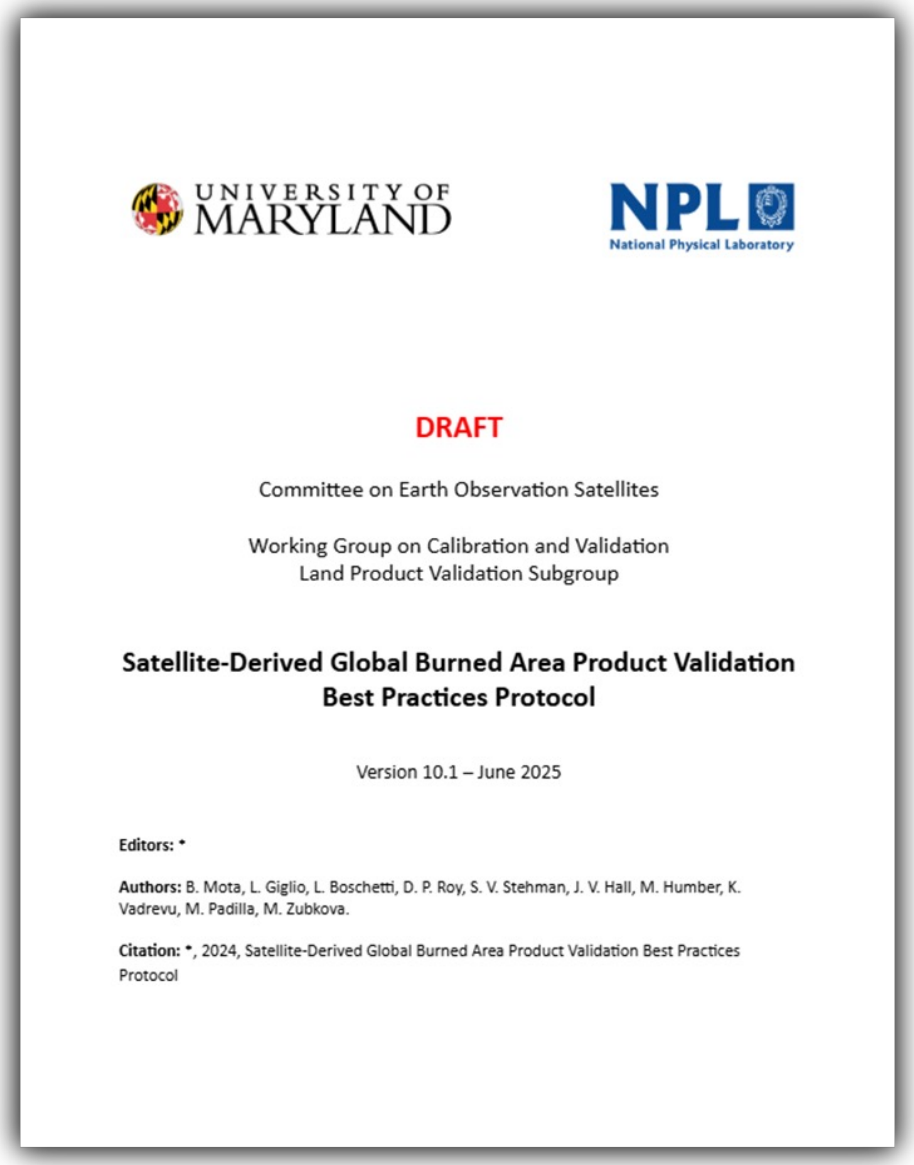
Fire Disturbance (1/5)

Continuing to update the current draft, that was based on the 2010 burned area validation note

Still some disagreement within the community regarding the required sample sizes, metrics and use of ‘long units’

Needs updating on coarse resolution validation and on the use and role of “future space”

Promote workshop discussion at the next GOFC Fire IT meeting (join meeting at Earsel Forest Fires conference in June)



UNIVERSITY OF MARYLAND

NPL National Physical Laboratory

DRAFT

Committee on Earth Observation Satellites

Working Group on Calibration and Validation
Land Product Validation Subgroup

Satellite-Derived Global Burned Area Product Validation Best Practices Protocol

Version 10.1 – June 2025

Editors: *

Authors: B. Mota, L. Giglio, L. Boschetti, D. P. Roy, S. V. Stehman, J. V. Hall, M. Humber, K. Vadrevu, M. Padilla, M. Zubkova.

Citation: *, 2024, Satellite-Derived Global Burned Area Product Validation Best Practices Protocol

Fire Disturbance (2/5)

Contents lists available at ScienceDirect

Remote Sensing of Environment

journal homepage: www.elsevier.com/locate/rse

Comprehensive global fire radiative power evaluation by minimizing detection bias with intercomparison and extended triple collocation analysis

Yoojin Kang [a], Jaese Lee [b], Jungho Im [c,d,e,*]

[a] Department of Forestry, Environment, and Systems, Kookmin University, Seoul, Republic of Korea
[b] Department of Environment and Energy Engineering, Gwangju Institute of Science and Technology (GIST), Gwangju, Republic of Korea
[c] Department of Civil, Urban, Earth, and Environmental Engineering, Ulsan National Institute of Science & Technology (UNIST), Ulsan, Republic of Korea
[d] Graduate School of Carbon Neutrality, Ulsan National Institute of Science & Technology (UNIST), Ulsan, Republic of Korea
[e] Graduate School of Artificial Intelligence, Ulsan National Institute of Science & Technology (UNIST), Ulsan, Republic of Korea

- Attenpt to use ETC to assess diffrences between NRT FRP products
- Example on how MODIS is used to link between SLSTR and VIIRS – providing multi-sensor evaluation
- Implementation of strict match-up process
- Difficult to separate the AF detection from FRP measured uncertainties - importance of tailoring confidence levels

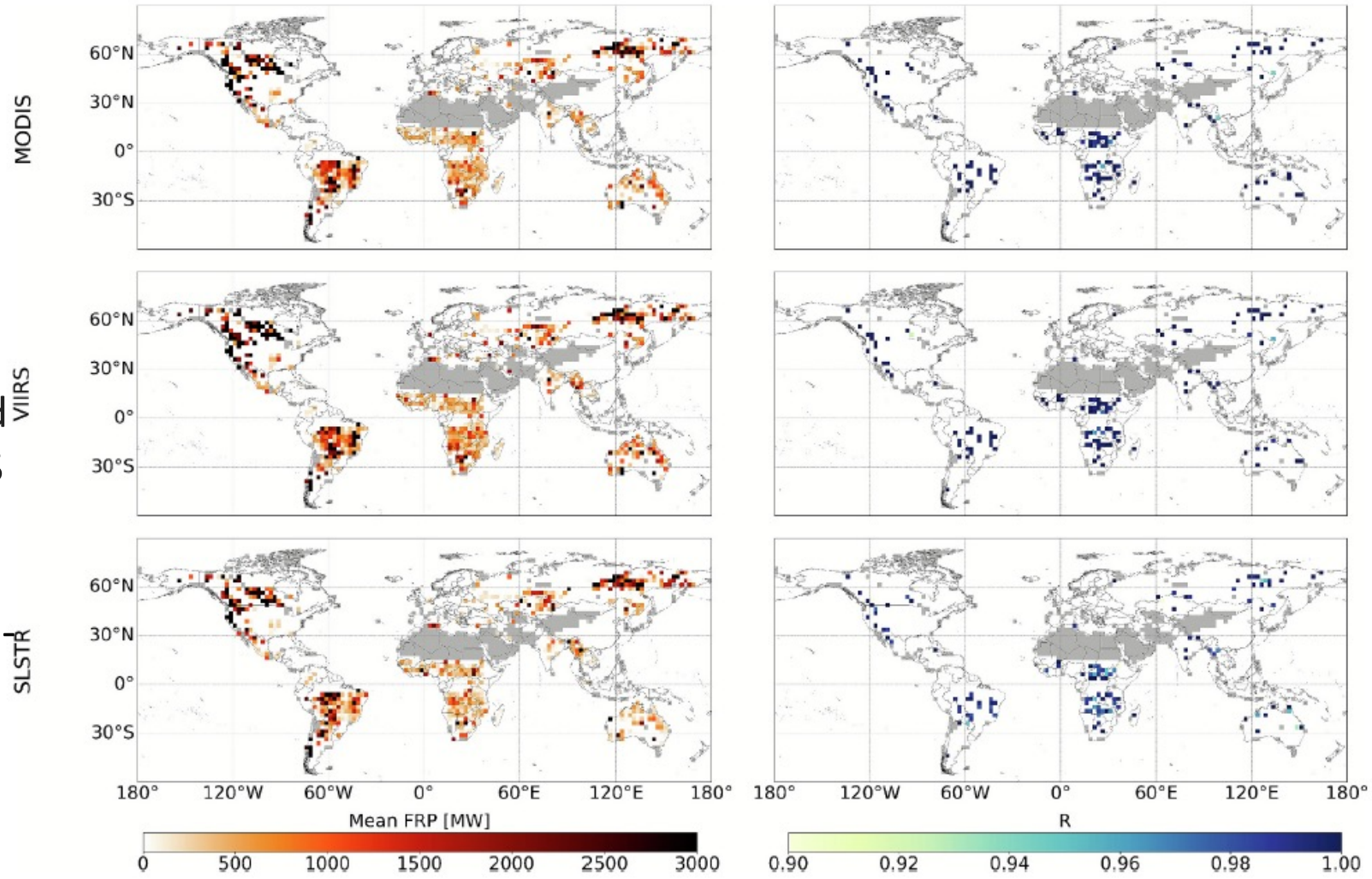


Fig. 7. Global ETC result for FRP. (Left) Annual mean FRP and (right) correlation coefficient at 13:30 local time for MODIS, VIIRS, and SLSTR_adjusted. Grey areas indicate non-vegetated regions, which were excluded from this analysis. ETC results are shown only for grids with at least 30 valid data points.

Fire Disturbance (3/5)

Recent Publications – FRP intercomparison

- Guo, X., Liu, Y., Liu, P., Wang, H., & Wu, W. (2025). Monitoring active fires in Borneo from Sentinel-2 MSI images. GIScience & Remote Sensing, 62(1).
- Gao, X., Shi, W., Zhang, M. and Wang, L., 2025. DAFDM: A Discerning Deep Learning Model for Active Fire Detection Based on Landsat-8 Imagery. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing.
- da Costa, D.C., Batista, L.V., da Silva, R.M. and Santos, C.A.G., 2025. Real-Time Active Fire Detection in the Pantanal Biome, Brazil, Using Convolutional Neural Networks. Fire Technology, pp.1-22.
- Cassimon, A., Reiter, P., Mercelis, S. and Mets, K., 2025. Designing a classifier for active fire detection from multispectral satellite imagery using neural architecture search. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing.
- Kang, Y., Lee, J. and Im, J., 2026. Comprehensive global fire radiative power evaluation by minimizing detection bias with intercomparison and extended triple collocation analysis. Remote Sensing of Environment, 333, p.115136.

Fire Disturbance (4/5)

Recent Publications – Burned Area

- Zhang, Z., Qi, B., He, G., Wang, M., Huang, S., Long, T., Wang, G. and Xu, Z., 2025. High resolution global forest burned area changes monitoring using landsat 7/8 images. *Geo-spatial Information Science*, pp.1-14.
- Nolde, M., Rösch, M., Riedlinger, T. and Taubenböck, H., 2025. Multi-sensor near-realtime burnt area monitoring using a superpixel-based graph convolutional network approach. *GIScience & Remote Sensing*, *62*(1), p.2498188.
- Padilla, M., Ramo, R., Gomez-Dans, J.L., Sierra, S., Mota, B., Lacaze, R. and Tansey, K., 2025. Near-real time monitoring of burned area at global scale based on deep learning. *International Journal of Remote Sensing*, *46*(16), pp.5996-6038.
- Cambrin, D.R., Colomba, L. and Garza, P., 2025. Magnifier: A Multi-grained Neural Network-based Architecture for Burned Area Delineation. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing.
- Zhao, Y. and Ban, Y., 2025. Near real-time wildfire progression mapping with VIIRS time-series and autoregressive SwinUNETR. International Journal of Applied Earth Observation and Geoinformation, 136, p.104358.
- Guo, X., Liu, Y., Liu, P., Wang, H., & Wu, W. (2025). Monitoring active fires in Borneo from Sentinel-2 MSI images. GIScience & Remote Sensing, 62(1). https://doi.org/10.1080/15481603.2025.2539551

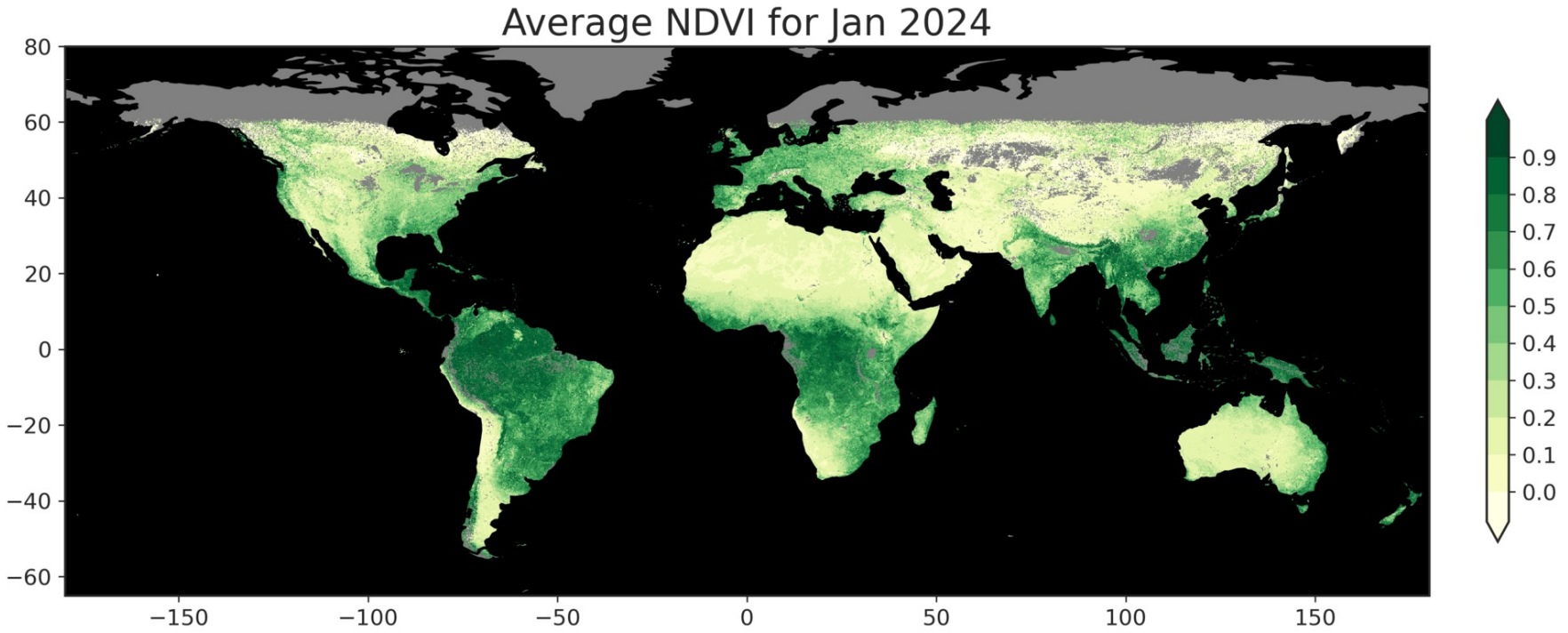
Fire Disturbance (5/5)

Upcoming conferences with sessions that include fire product QA (validation)

- 9th Sentinel-3 Validation Team (S3VT) Meeting 2026, 30 March - 01 April, ESRIN, Frascatti, Italy
- EGU 2026, 3–8 May Vienna, Austria - session BG1.1 – The Role of Fire in the Earth System: Interactions with Climate, Biosphere, and Human Systems
- 14th EARSeL Workshop on Forest Fires 2026, 25-26 June, Lisbon, Portugal
- GOFC-GOLD Fire IT/GWIS meeting 23-24 June, Lisbon, Portugal

Vegetation Indices (1/3)

!! NEW CLMS NDVI 300m V3 product released on 17 December 2025 !!



- Spatial resolution: 300m, global
- Temporal resolution: 10-daily composites, from 2014 – present:
  - 2014 – 2018 based on PROBA-V
  - 2019 – present based on Sentinel-3/OLCI
- NDVI based on BRDF corrected TOC data
- Includes NDVI uncertainties

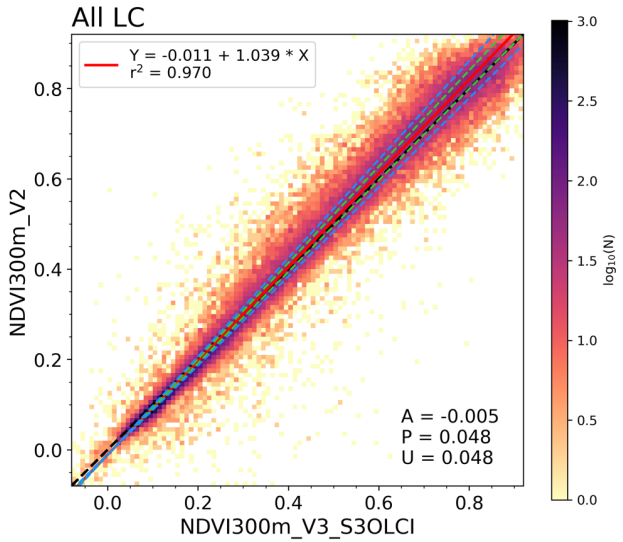
  → Consistent long timeseries

https://land.copernicus.eu/en/products/vegetation/normalised-difference-vegetation-index-v3-0-300m

Vegetation Indices (2/3)

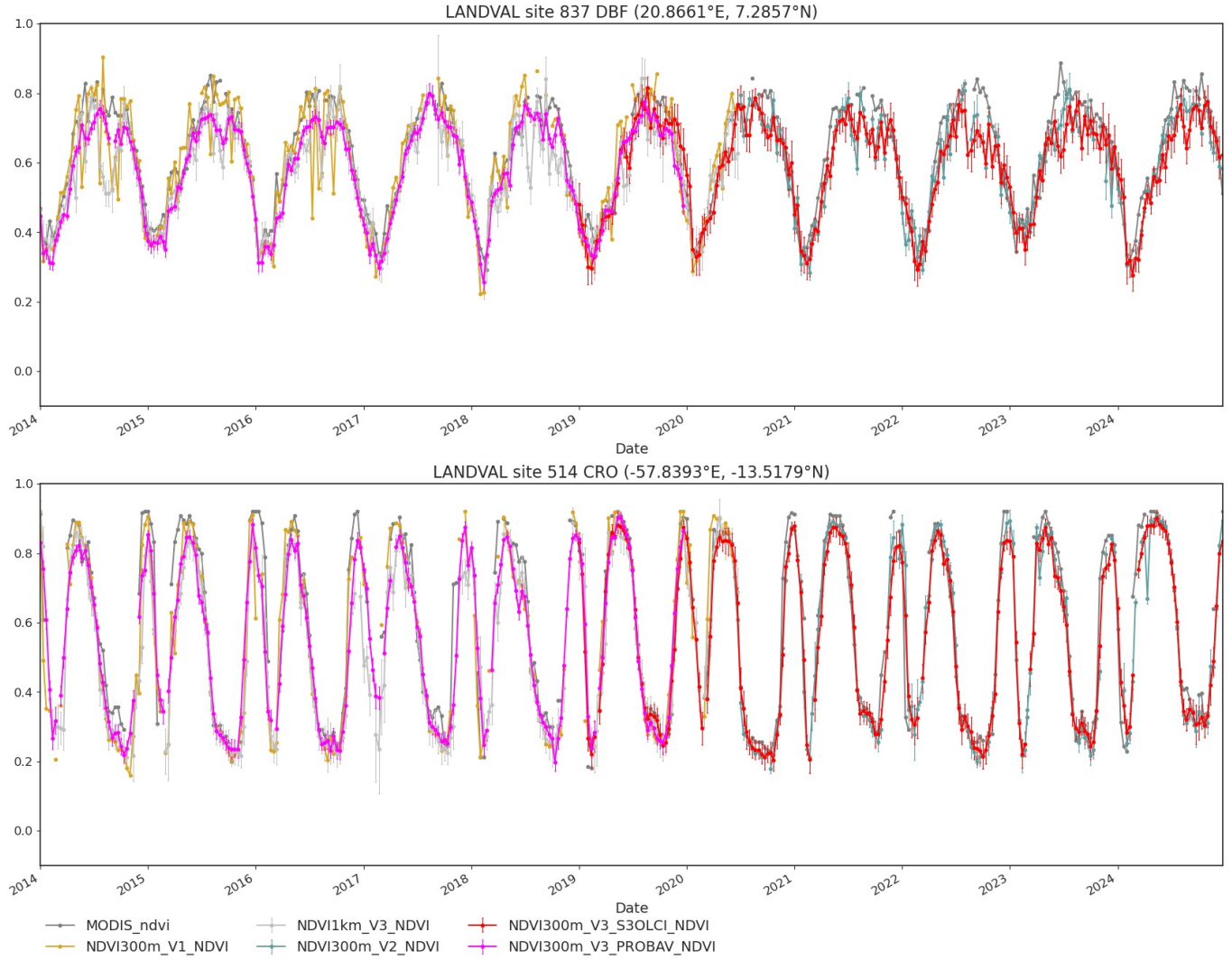
Validation of CLMS NDVI 300m V3 product

land.copernicus.eu/en/technical-library/validation-report-normalised-difference-vegetation-index-300m-version-3/@@download/file



Intercomparison with CLMS NDVI 300m V2 (previous version)

Temporal profiles over LANDVAL sites: Comparison with CLMS NDVI 300m V1 and V2, CLMS NDVI 1km, and with external data from MODIS



Vegetation Indices (3/3)

What's next

- Paper about new NDVI 300m V3 product in preparation
- Setting up continuation of LSA SAF ENDVI product with METimage
- Exploring PhenoCam in-situ data for NDVI validation

Snow (1/2)

Mission News

- CSA has released an RFP for conceptual design, development plans and cost estimates for a future implementation of the Canadian SWE mission concept, TSMM
- Hydroterra+ selected in ESA Earth Explorer for Phase A study would provide snow information over Europe, [ESA - ESA selects four new Earth Explorer mission ideas]
- EDGE is one of four NASA Earth System Explorer proposed missions that will be downselected to one selected mission in early-2026. They added a science component to evaluate seasonal snow measurements to the concept.

Figure 13 Observation scenarios target coverage areas (from Concept B)

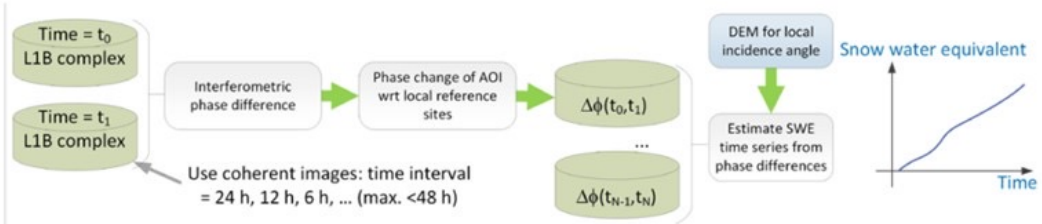


Figure 37 Overview of the algorithm to estimate accumulation of snow water equivalent.

Figures: Earth Explorer 10 candidate mission Hydroterra – Report for Assessment

Snow (2/2)

Upcoming Meetings & Snow Schools

Joint Eastern and Western Snow Conference
Denver, Colorado, USA, on **12-15 May, 2026**
"Presentations on all physical and social aspects of snow and ice research are welcome, including, but not limited to, in situ and remote measurement of snow and ice covers, snow ecology, new advances in snow observation technology, and social interactions with snow."

CUAHSI SNOW MEASUREMENT FIELD SCHOOL 2026
Granby, Colorado, USA, on **5-9 January, 2026**
This course provides fundamental training to students in making and analyzing snow measurements including depth, density, water equivalence, grain size and shape, stratigraphy, temperature, and hardness. Students completing this course will be able to perform high-quality fieldwork and design studies making snowpack measurements.

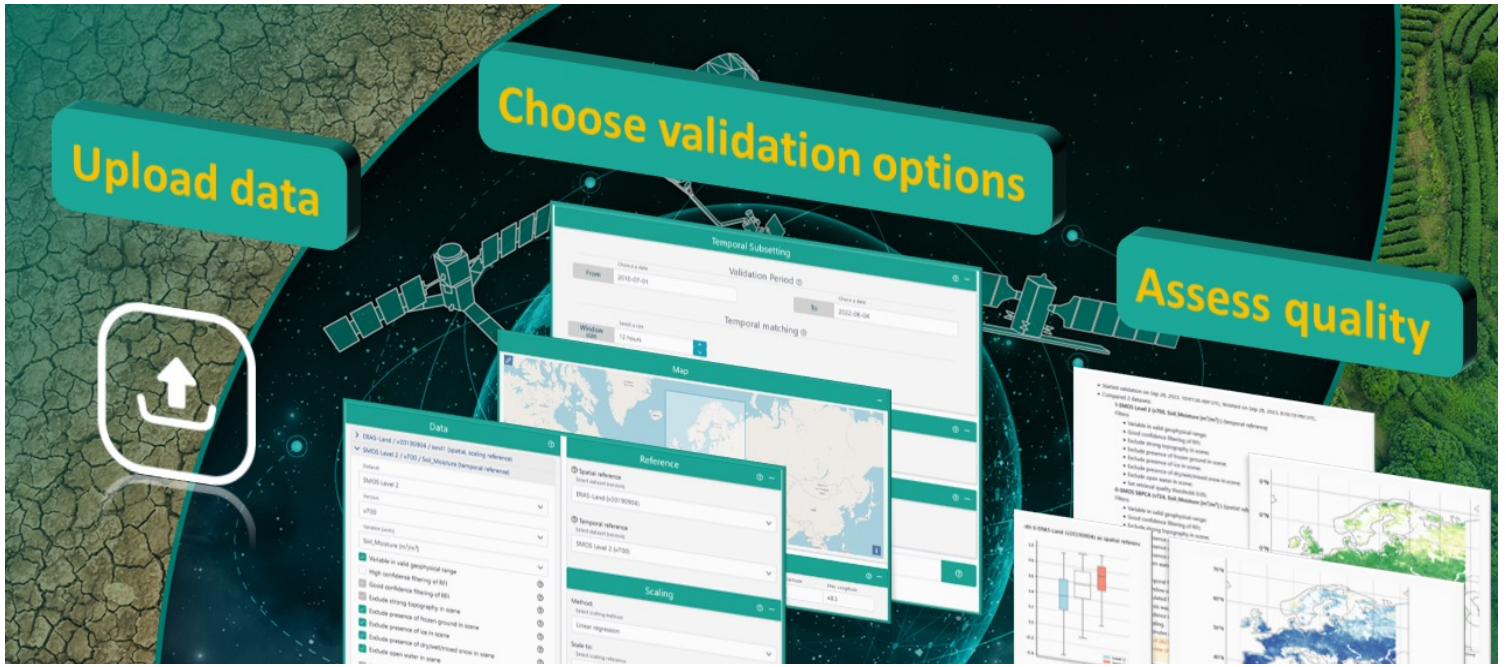
11th EARSeL Workshop on Land Ice and Snow 2026
Helsinki, Finland, on **9-11 February, 2026**

EGU SNOW SCIENCE WINTER SCHOOL 2026
Davos, Switzerland, on **22-28 February, 2026**
Training in modern techniques for snow characterization, supporting research in fields such as polar studies, hydrology, climate science, remote sensing, and avalanche dynamics. The training combines classroom-based theoretical lessons with field practice in small groups

Quality Assurance for Soil Moisture

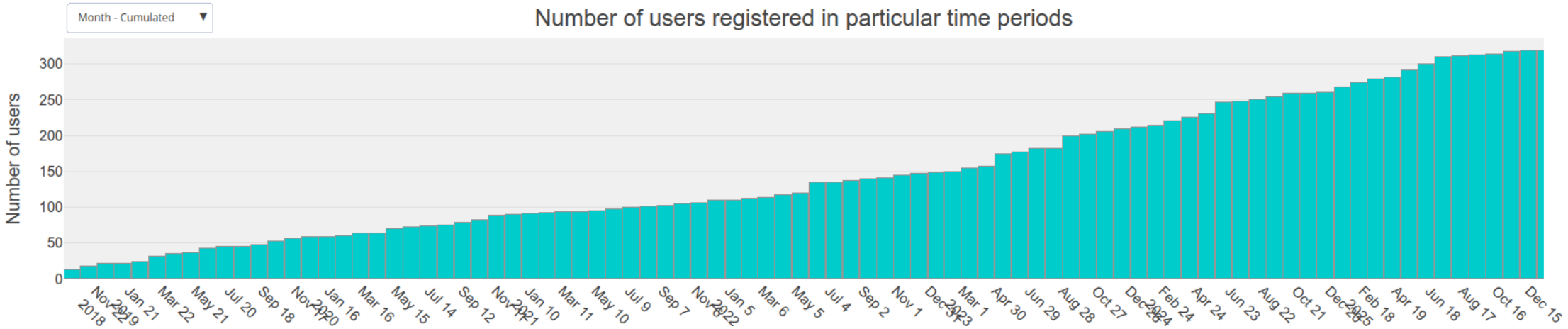
- QA4SM Version 4 release Planned March 2026
  - Enabled NRT data streams and automated creation of validation reports
  - Public API for greater flexibility
  - Interactive data viewer for the exploration of validation results
  - New features to validate high-resolution products (focus on spatial metrics)

https://qa4sm.eu/

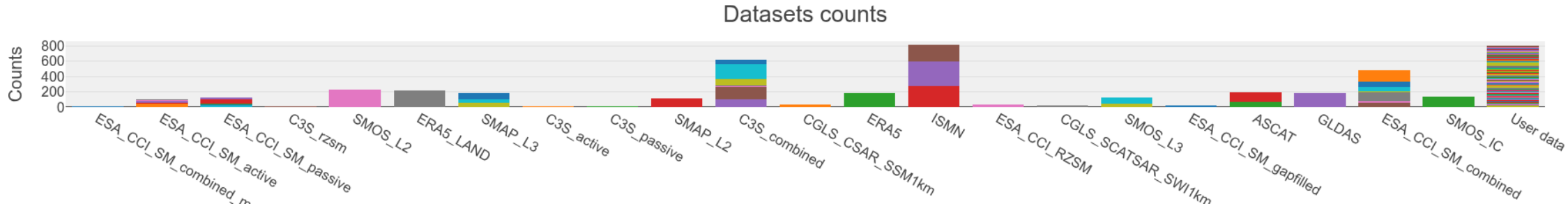


Quality Assurance for Soil Moisture

- 319 Users from 40+ countries



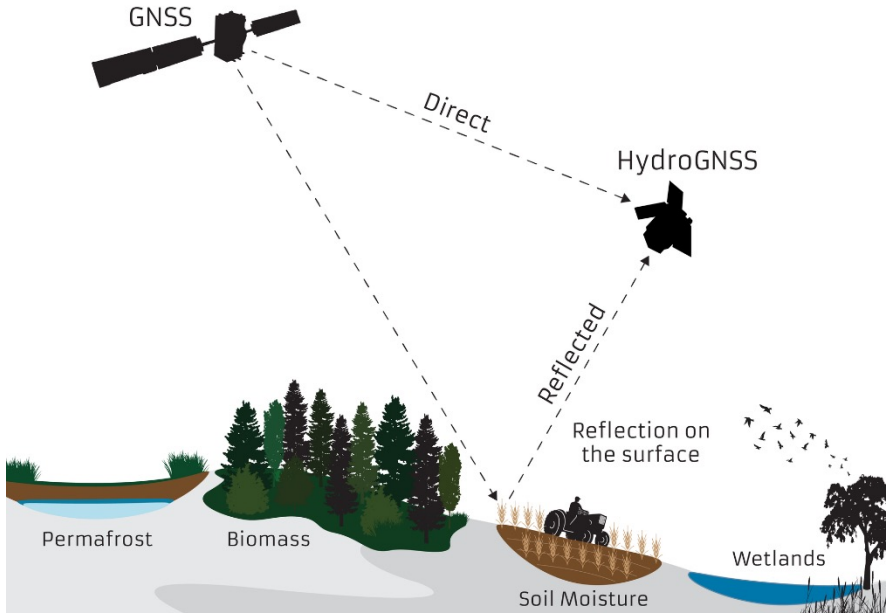
- Wide usage across data sets



New missions

HydroGNSS

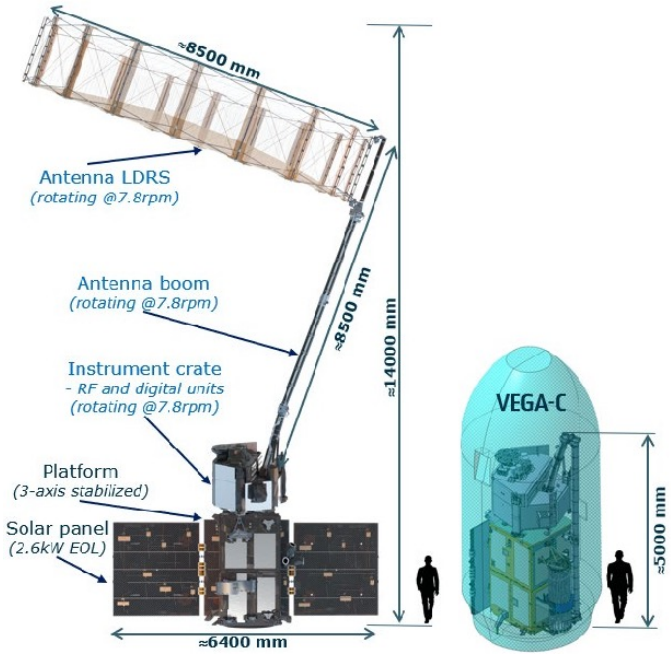
- ESA Scout framework / FutureEO programme
- Two-satellite constellation
- GNSS reflectometry (L-band) to measure climate variables related to the water cycle
- Provide continuity for SMOS, complement Biomass mission
- Soil moisture at 25 km, 1 day repeat cycle
- **Successfully launched on 28 November 2025**
- **QA4SM implements new features for HydroGNSS validation**



New missions

CIMR

- Copernicus Imaging Microwave Radiometer
- Two-satellite mission (Planned 2029/2035)
- Multi-frequency instrument (1.5, 6.9, 10.65, 18.7, 36.5 GHz)
- Spatial resolution: 5 – 15 km; potentially sub-daily sampling
- Focus on Arctic / sea and ice;
- Soil moisture as secondary product
- Planned SM + L-VOD @ 9 and 36 km (SMAP-like)
- **Validation of both SM and VOD will be done using QA4SM**



Conferences and workshops

- EGU 2026:
  - Remote Sensing of Soil Moisture: 29 Abstracts
  - Advancing the monitoring, maintenance and utilization of in situ soil moisture: 12 Abstracts

- 8th Satellite Soil Moisture Validation and Application Workshop
  - Discussions ongoing about the next date/venue (probably fall 2026 / spring 2027)

Evapotranspiration(1/3)

Workshops:

- Two Source Thermal Remote Sensing for the Management of Agricultural Systems (TSEB Workshop), Naples, Italy, May 27–29, 2026
  - https://www.tsebworkshop2026.org/
- Joint meeting between LPV-ET and GEOGLAM team is planned to be held during the TSEB workshop.

Collaborations:

- Emails between LPV-ET and GEOGLAM team for collaboration. GEOGLAM recently initilized the effort about EVA (essential agriculture variables), including ET as one of the EVA parameters.
  - https://agvariables.org/

Evapotranspiration(2/3)

Missions:

- There were conversations between TRISHNA and OpenET team. OpenET team has provided ground observed ET dataset to TRISHNA for validation/evaluation.
- TRISHNA, a new satellite mission observing thermal data is planned to launch in 2026, will provide more thermal observations for ET modeling.
  - https://cnes.fr/en/projects/trishna
- The commercial sector, Hydrosat, has launched two satellites, while 16 satellites in total is planned. Observation data is available to be requested.
- Sentinel ET product (Sen-ET) from ESA using Sentinel-2 and Sentinel-3 is under development.
- The new Landsat Science Team was announced in December 2025 and includes good representation from the ET community.
  - https://www.usgs.gov/landsat-missions/news/new-landsat-science-team-

Evapotranspiration(3/3)

Protocol:

- An extensive draft of the protocol is ready.
- Six ET experts to help with writing different sections. These experts are from U.S., Europe, Brazil and Australia.
- Targeting a version to share with a larger ET community before the Summer of 2026 .