Land Products Validation and Evolution (LPVE) Workshop 2023

Registration Opens at 08:15, Bus from Frascati to ESRIN leaves at 08:00		
Day 1 (Magellan Room): Monday, 12 June 2023		
Opening Session Chairs: Philippe Goryl (ESA), Michael Cosh (USDA), Fabrizio Niro (Serco/ESA)		
09:00 – 09:20	Welcome and Meeting Objectives	ESA, CEOS-WGCV-LPV
Fiducial Reference Measurements (FRM)		
09:20 – 09:40	Fiducial Reference Measurements for Soil Moisture (FRM4SM): Where do we stand?	Alexander Gruber, TU Wien, Austria
09:40 – 10:00	Is the CEOS WGCV LPV two-stage validation approach suitable for conformity testing of coarse spatial resolution vegetation products? Outcomes of the FRM4Veg project	Fernando Camacho, EOLab, Spain
10:00 – 10:20	Surface Reflectance Intercomparison Exercise for Vegetation (SRIX4Veg) Overview and Initial Results	Niall Origo, NPL, UK
10:20 – 10:40	Uncertainty Quantification for Retrieving BRDFs from bottom-of-atmosphere radiometers for Fiducial Reference Measurements Generation	Sebastian Schunke, Rayference, Belgium
10:40 – 11:00	**COFFEE BREAK**	
Session 1: Cal/Val reference data: Supersites, Networks, and field campaigns Chairs: Valentina Boccia (ESA), Eric Vermote (NASA), Cody Anderson (USGS)		
11:00 – 11:20	Copernicus Ground-Based Observation for Validation (GBOV) service: status and perspectives for phase 2	Christophe Lerebourg, ACRI, France
11:20 – 11:40	USGS Field Validation Updates	Cody Anderson, USGS, USA
11:40 – 12:00	The Next Generation Hyperspectral Radiometric Validation Network for Land and Water Reflectance – the HYPERNETS Project	Kevin Ruddick, RBINS, Belgium
12:00 – 12:20	ENMAP data product validation: initial steps towards data homogenization and interoperability	Maximilian Brell, GFZ, Germany
12:20 – 12:40	Using European Research Infrastructures like ICOS and eLTER as robust and sustainable in-situ data providers for Cal/Val of Earth Observation products	Bert Gielen, University of Antwerp, Belgium
12:40 – 13:00	StrucNet: Supporting new spaceborne missions in the characterisation of vegetation vertical structure	Benjamin Brede, GFZ, Germany
13:00 – 14:00	**LUNCH**	

	Field Campaigns and Innovative Cal/Val solutions	
14:00 – 14:20	TRISHNA Cal/Val activities: preparatory studies	Mark Irvine, INRAE, France
14:20 – 14:40	New Instrumented Site for Future Thermal Infrared Missions Calibration and Validation	Arthur Dick, CNES, France
14:40 – 15:00	Towards FLEX validation strategy. An overview of ground activities within the ESA DEFLOX project.	Tommaso Julitta, JBHyperpsectral Devices, Germany
15:00 – 15:20	Multi-parameter field campaigns for satellite calibration and validation	Michael Cosh, USDA, USA
15:20 – 15:40	SI traceable validation of satellite products using an fAPAR network	Harry Morris, NPL, UK
15:40 – 16:00	**COFFEE BREAK**	
16:00 – 16:20	Ground based Validation over land of the passive optical remote sensing data	Eric Vermote, NASA, USA
16:20 – 16:40	Ground-based measurements for validation of L2A-products	Bringfried Pflug, DLR, Germany
16:40 – 17:00	The Canadian Airborne Biodiversity Observatory (CABO) – Standardized Cal/Val practices for biodiversity assessment at different spatial scales from hyperspectral remote sensing	Pablo Arroyo, NRC, Canada
17:00 – 17:20	Towards the validation of agricultural practices in order to support the transition towards a more sustainable agriculture	Sophie Bontemps, UCLouvain, Belgium
17:20 – 17:40	Near real-time validation of satellite-derived snow products using in-situ and webcam data	Cemal Melih, FMI, Finland
17:40 – 18:20	**Discussion 1: Cal/Val reference data (FRM, Networks and field campaigns): status, thematic/geographic data gaps and recommended evolutions**	**Discussion led by session chairs**
18:20 – 19:30	**Poster Session and Ice break**	

Day 2 (Magellan Room): Tuesday, 13 June 2023		
Session 2: Cal/Val Protocols and Uncertainty budget estimate Chairs: Marin Tudoroiu (ESA), Fernando Camacho (EOLab), Roberto Colombo (University Milano Bicocca)		
09:00 – 09:20	Surface reference database from the synergetic retrieval of AERONET and satellite measurements.	Pavlo (Pavel) Lytvynov, GRASP-SAS, France
09:20 – 09:40	Sentinel 2 uncertainty estimates and spectral correlation in land products	Javier Gorroño, IIAMA, Spain
09:40 – 10:00	Establishing an end-to-end uncertainty budget for the ECV Land Cover	Grit Kirches, Brockmann Consult, Germany
10:00 – 10:20	Approaches to global sampling for land cover map validation	Alexandra Tyukavina, University of Maryland, USA
10:20 – 10:40	Validation and Comparison of annual global land cover maps at 100m to 10m resolution	Nandika Tsendbazar, Wageningen, The Netherlands

10:40 – 11:00	**COFFEE BREAK**	
11:00 – 11:20	Quantifying the spatial-temporal mismatch between flux-tower ground measurements and satellite observation footprints: a prototype framework with Sentinel-2	Gregory Duveiller, MPI For Biogeochemistry, Germany
11:20 – 11:40	UAS Hyperspectral (UAS-HSI) data collection best practices and implementation of the spatial response resampling methodology for Cal/Val	Margaret Kalacska, McGill University, Canada
11:40 – 12:00	Fire Radiative Product (FRP) product validation using wildfire progression maps to identify opportunistic near-simultaneous detections.	Bernardo Mota, NPL, UK
12:00 – 12:20	Uncertainty budget analysis of the validation of soil moisture estimated by coarse resolution remote sensing: application to SMOS	François Gibon, Cesbio, France
12:20 – 12:40	Results of the Intercomparison and Validation of Northern Hemispheric Snow Extent Products 2015-2020 carried out within SnowPEx+	Thomas Nagler, ENVEO, Austria
12:40 – 13:00	**GROUP PICTURE**	
13:00 – 14:00	**LUNCH**	
	Radiative Transfer Models and Intercomparison exercises	
14:00 – 14:20	The Radiation Transfer Model Intercomparison: RAMI-V and RAMI4ATM results	Nadine Gobron, JRC, Italy
14:20 – 14:40	Overview and Status of ACIX-III Land Atmospheric Correction Inter-comparison eXercise	Kevin Alonso Gonzalez, Rhea for ESA, Italy
14:40 – 15:00	CMIX-II: Second edition of the Cloud Mask Inter-comparison eXercise	Jan Wevers, Brockmann Consult, Germany
15:00 – 15:20	Inter-comparison of PACO BOA surface reflectance between multi- and hyperspectral sensors: EnMAP overpasses with DESIS, Sentinel-2, Landsat and CalVal sites	Raquel De Los Reyes, DLR, Germany
15:20 – 16:00	**Discussion Session 2 – Cal/Val Protocols and Uncertainty budget estimate: status, remaining challenges, harmonization needs, recommended future research activities**	**Discussion led by session chairs**
16:00 – 16:20	**COFFEE BREAK**	
	Session 3: Retrieval and Validation of global satellite land products Chairs: Steffen Dransfeld (ESA), Jaime Nickeson (NASA), Jadu Dash (Soton University)	
16:20 – 16:40	Validation and evolution of the Sentinel-3 OLCI Terrestrial Chlorophyll Index (OTCI): current status and future applications	Jadu Dash, Soton University, UK
16:40 – 17:00	Sentinel-3 OLCI GIFAPAR validation using the Copernicus Ground-Based Observations for Validation (GBOV)	Ana Perez-Hoyos, Albavalor, Spain
17:00 – 17:20	Progress in innovative retrieval methods and Cal/Val approaches for multi-sensor derived fAPAR and LAI	Christiaan Van Der Tol, University of Twente, The Netherlands

17:20 – 17:40	GEOV2-AVHRR long-term time series of global LAI, FAPAR and FCover since 1981: principles and validation based on the comparison with ground measurements and with GEOV2-CGLS, GIMMS3g, GLASS and C3S products	Aleixandre Verger, CSIC, Spain
17:40 – 18:00	Cloud-free global maps of four essential vegetation variables retrieved with Gaussian Processes from S3-OLCI	Dávid Kovács, University of Valencia, Spain
18:00 – 19:30	**Poster Session and Ice Break**	

Day 3 (Big Hall): Wednesday, 14 June 2023		
Session 3: Retrieval and Validation of global satellite land products (_continued_**)** Chairs: Steffen Dransfeld (ESA), Jaime Nickeson (NASA), Jadu Dash (Soton University)		
09:00 – 09:20	The future of Copernicus DEM & WorldDEM: statistical analysis of the WorldDEM Neo	Ernest Fahrland, Airbus, UK
09:20 – 09:40	Validation of moderate and higher resolution satellite albedo products	Angela Erb, University of Massachusetts Boston, USA
09:40 – 10:00	On the suitability of SAIL-based algorithms for vegetation biophysical variable retrieval from decametric multispectral and hyperspectral missions	Luke Brown, University Of Salford, UK
10:00 – 10:20	Spatiotemporal Upscaling of In-situ Land Surface Temperature Data to Validate Copernicus Global Land Service datasets	Jasdeep Anand, University of Leicester, UK
10:20 – 10:40	Global Application and Evaluation of DisALEXI Evapotranspiration model on the OpenET Google Earth Engine Platform	Yun Yang, Mississippi State University, USA
10:40 – 11:00	**COFFEE BREAK**	
11:00 – 11:20	OSMOSE: 20-year of passive microwave and optical indices for the biomass	Arnaud Mialon, Cesbio, France
11:20 – 11:40	Evaluating the synergistic use of Sentinel mission data to derive terrestrial vegetation gross primary productivity (GPP): The SEN4GPP Project	Elise Belakebi-Joly, Noveltis, France
11:40 – 12:00	Development and validation of global productivity models using Earth Observations: the ECOPROPHET and TerrA-p projects	Manuela Balzarolo, University of Antwerp, Belgium
12:00 – 12:20	Validation of Copernicus pan-European high resolution vegetation phenology and productivity (HR-VPP) products based on Sentinel-2 observations	Enrique Martínez-Sánchez, EOLab, Spain
12:20 – 13:00	**Discussion Session 3 – Advanced Retrieval methods and Validation of global satellite products: status, limitations, and recommendations for future land products**	**Discussion led by session chairs**
13:00 – 14:20	**LUNCH**	

	Summary and Wrap-up session
	Chairs: Michael Cosh (USDA), Fabrizio Niro (Serco/ESA)

14:20 – 15:20	**Highlights from the session and Recommendations from the discussion:**	Rapporteurs
	• Session 1 – Cal/Val reference data: Supersites, Networks and field campaigns	
	• Session 2 – Cal/Val Protocols and Uncertainty budget estimate	
	• Session 3 – Retrieval and Validation of global satellite land products	
15:20 – 16:00	**Wrap up Discussion**	**ESA, CEOS-WGCV-LPV**
16:00	**End of the Workshop**	

Demo Program

Time: during poster session (**18:00 – 19:30**)
Duration: 45 min
Location: Annex Room

12 June
- W. Preimesberger (TUW) – "The Quality Assurance for Soil Moisture (QA4SM) service for Cal/Val standardization and operability"
- J.P. Arroyo Mora (NRC) and M. Kalacska (McGill University) – "Standalone flight planning application for push-broom hyperspectral imagers and Spatial Coverage Map and Resampling Error Assessment"

13 June
- S. Schunke (Rayference) – "Eradiate: an open-source 3D radiative transfer model for Earth observation applications"

	Poster Programme	
1.	Utilizing the Largest Hyperspectral Surface Reflectance Data Set and Some Adjustment Techniques to Account for Spectral Response Differences Among Optical Sensors	Martin Claverie, UCL Geomatics, Belgium
2.	Harmonization and comparison of atmospheric radiative transfer models with the ALG toolbox	Jorge Vincent, Magellium, France
3.	Semi-empirical modelling and deep learning for burned area near-real time monitoring in the framework of the Copernicus Global Land Service	Marc Padilla, Complutig, UK
4.	An improved hyperspectral surface reflectance datasets and aerosol model over four selected PICS	Yves Govaerts, Rayference, Belgium

5.	Earth Observation of ECVs tends to overestimate low and underestimate high values: blame statistics, not models	Hongxiao Jin, Lund University, Sweden
6.	Validation of Copernicus Global Land Service Sentinel-3 OLCI Leaf Area Index, Fraction of Absorbed PAR and Vegetation Cover products	Enrique Martinez-Sanchez, Eolab, Spain
7.	Validation of LSA-SAF EUMETSAT Polar System LAI, FAPAR and FVC global vegetation products derived from AVHRR sensor.	Enrique Martinez-Sanchez, Eolab, Spain
8.	Evaluation of Proba-V Collection 2 Products	Carolien Toté, VITO, Belgium
9.	PRISMA for land cover mapping: different approaches for the classification of the Earth's surface	Federico Carotenuto, CNR, Italy
10.	Data fusion of PRISMA hyperspectral imagery with Sentinel-2 multispectral imagery for spatial resolution improvement	Giandomenico De Luca, CNR, Italy
11.	SITES Spectral - Swedish Infrastructure for Ecosystem Science	José M. Beltrán Abaun, Lund University, Sweden
12.	Intercomparisons of sentinel 3 SYNERGY surface directional reflectance – Results and plans for the OPT-MPC routine service validation.	Naga Moparthy, ACRI-ST, France
13.	Validating long-term actual and reference SEVIRI-MSG ET estimates along five dimensions	Bagher Bayat, Forschungszentrum Jülich, Germany
14.	Multi-spectral UAV sensor limitations in mapping complex vegetation and satellite validation	Margaret Kalacska, McGill University, Canada
15.	Artillery crater mapping in VHR satellite imagery: methodology and validation aspects	Sergii Skakun, University of Maryland, USA
16.	The impact of mapping accuracy on crop area estimation: the case of winter wheat in Ukraine	Sergii Skakun, University of Maryland, USA
17.	Web-based tool for validation of Sentinel-2 and Sentinel-3 derived bio-geophysical products against ICOS terrestrial ecosystems measurements.	Noelle Cremer, Serco/ESA, Italy
18.	The Quality Assurance for Soil Moisture (QA4SM) service for Cal/Val standardization and operability	Pietro Stradiotti, TUW, Austria
19.	Surface ALbedo VALidation (SALVAL) Platform: Towards CEOS LPV Validation Stage 4	Jorge Sanchez-Zapero, EOLab, Spain
20.	Algorithm and preliminary validation of Sentinel-3 based surface albedo product for the continuity of Copernicus Climate Change Service	Jorge Sanchez-Zapero, EOLab, Spain
21.	Validating long, temporally dense time-series from a network of autonomous field-spectrometers around the globe using Sentinel-2.	Paul Naethe, JB Hyperspectral, Germany
22.	Ground Reference Observations Underlying Novel Decametric Vegetation Data Products from Earth Observation (GROUNDED EO): Project Overview and Status	Luke Brown, University of Salford, UK

23.	The Fire Radiative Power (FRP) Inter-comparison framework: an approach to identify differences for non- simultaneous detection products.	Bernardo Mota, NPL, UK
24.	CEOS WGCV LPV Vegetation Index Validation Protocol	Else Swinnen, VITO, Belgium
25.	Generating and validating an irrigation map in Spain using in-situ not collected specifically to be used with Earth Observation data	Sophie Bontemps, UCLouvain, Belgium
26.	Validation of the Copernicus Sentinel-2 Sen2cor Scene Classification Products	Avi Putri Pertiwi, DLR, Germany
27.	Copernicus Snow & Ice products from Sentinel-2 and Sentinel-1 over Europe	Florence Marti, Magellium, France
28.	Spatially explicit vegetation fractions to improve climate model simulation: A 29-year time series of annual Plant Functional Type (PFT) fraction maps through the fusion of the CCI MRLC 300 m land cover dataset and existing high-resolution data products	Céline Lamarche, UCLouvain, Beglium
29.	Time series performance of Copernicus Sentinel-2 operational L2A-Products of year 2022	Bringfried Pflug, DLR, Germany
30.	ENMAP background mission: support for the Hyperspectral monitoring of Cal/Val network sites for satellite radiance, reflectances and land product validation	Sabine Chabrillat, GFZ, Germany
31.	Overview of Copernicus Global Land LAI, FAPAR and FCover from SPOT/VEGETATION to Sentinel-3/OLCI	Aleixandre Verger, CSIC, Spain
32.	3D forest model validation of woodland from inter-comparison between simulated and real Terrestrial LiDAR	Chloe Randall, NPL, UK
33.	The CEOS Land Product Validation Subgroup	Jaime Nickeson, NASA, USA
34.	Characterization and correction of the spatiotemporal mismatch between satellite and in situ measurements with independent high-resolution measurements	Ruben Urraca, JRC, Italy
35.	Correcting plant area index for woody material using near-infrared digital hemispherical photography	Luke Brown, University of Salford, UK
36.	Land HYPERNET	Agnieszka Bialek, NPL, UK
37.	Earth Observation LAI and FAPAR products operational Cal/Val. A new integrated system for long-term deployment of Digital Hemispherical Pictures systems	Gael Polles, TimeLapse Go, UK
38.	Utilising the Land Hypernet sites for understanding the temporal dynamics of reflectance for vegetation	Harry Morris, NPL, UK
39.	Cloud-based calibration & validation API	Lauri Häme, Terramonitor, Finland
40.	The synergy of microwave coarse-scale measurements and optical/thermal observations in a random forest regression for estimating 1 km soil moisture using Google Earth Engine.	Farzane Mohseni, University of Bonn, Germany