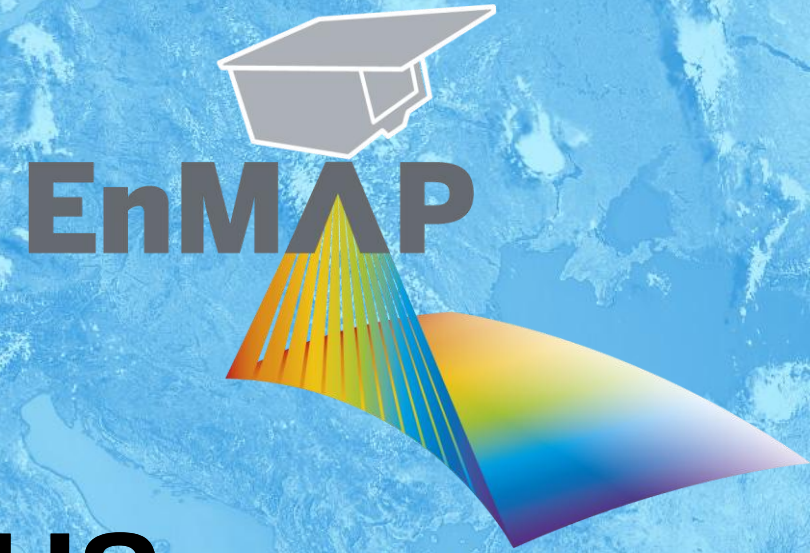


Supported by:



Federal Ministry
for Economic Affairs
and Climate Action

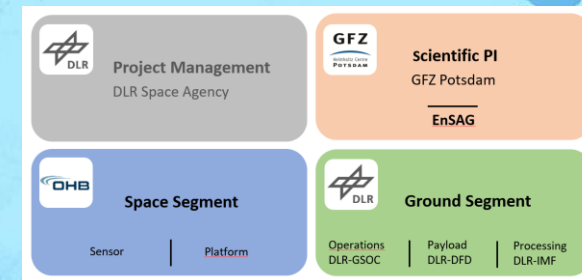
on the basis of a decision
by the German Bundestag



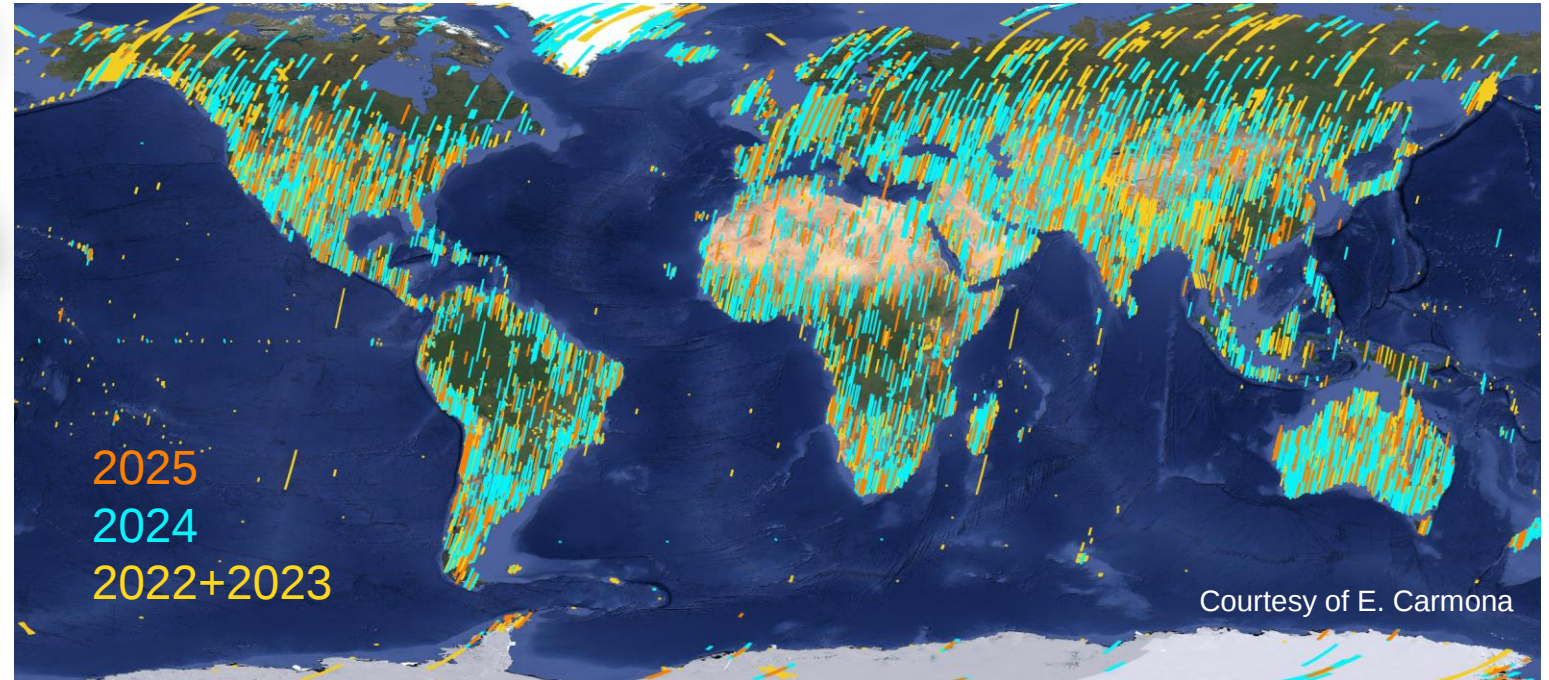
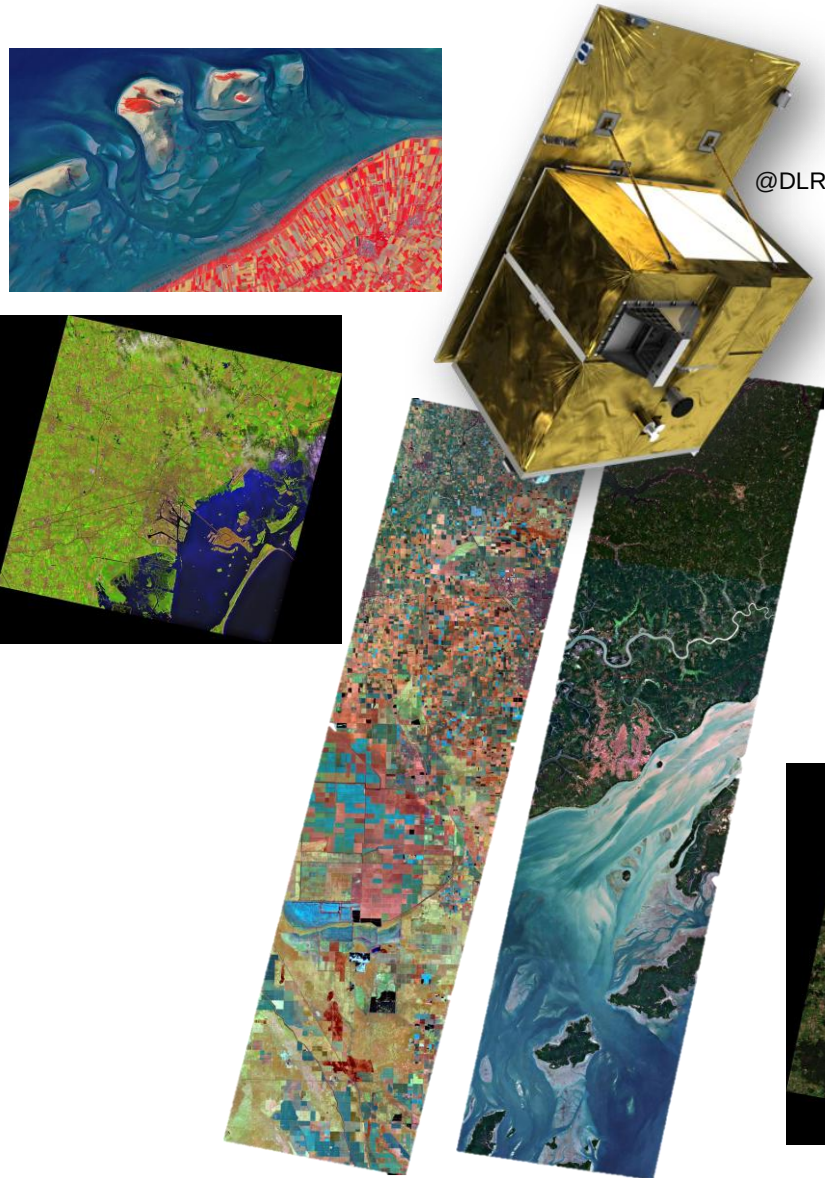
ENMAP MISSION STATUS

Dr. Laura La Porta, Mission Manager, & Vera Krieger, Mission Science Coordinator
on behalf of the EnMAP Consortium

D. Reintsema, R. Wernitz, K. Bagschik, M. Bock, S. Fischer
E. Carmona, D. Schulze, N. Pinnel, S. Baumann, M. Pato, S. Hartung,
M. Habermeyer, S. Engelbrecht, K. Wirth, ...
S. Chabrillat, K. Segl, A. Okujeni, ...
R. Feckl, M. Betz, S. Baur, ...



EnMAP – 3rd yr in-orbit, 2nd yr routine operations



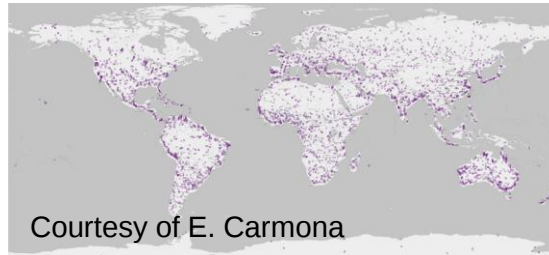
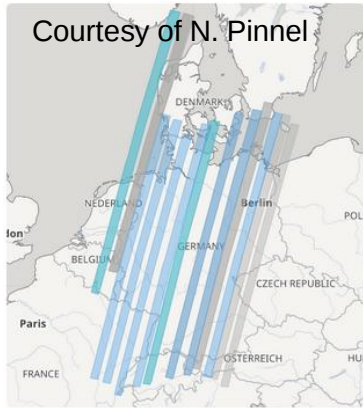
Operations ran almost uninterrupted!
> 50% of collected data acquired in 2024

A very good year for EnMAP!

See talks by
Emiliano Carmona *Three years of EnMAP Ground Segment Operations*
Ruper Feckl *Overview and Status of the Spacecraft from the Perspective of the Manufacturer*

Highlights

- **Extensive Foreground & Background Mission**

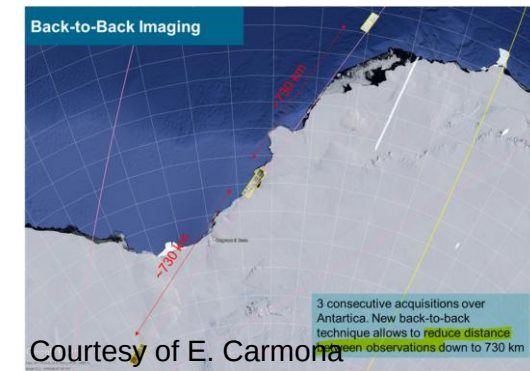


- Inuvik (X-band D/L)

Improved exploitation of EnMAP S/C capabilities

- < Data-Take / day > ~226 in Q4-2024
- In total **> 14.500** Earth Data-Take
- **> 122.500** 1-tile-L0 products

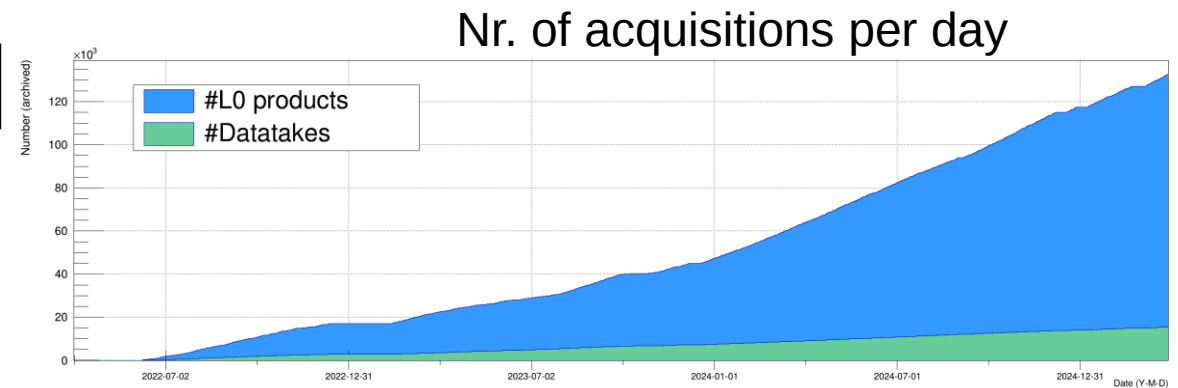
- New feature
Average Nr. DT/day
Increased by ~20%



- Changes in IPS and proposal/quota handling

NEW

A single-tile observation is now automatically extended to 3 tiles (1 tile equals 30km)
15 tiles added to the quota/contingent for all existing active proposals to take this extension into account.



Courtesy of E. Carmona

Foreground Mission

Goals 2024

- optimizing acquisition rate
- generating time series covering EU, in particular Germany

https://www.enmap.org/data_tools/foreground_mission/



ID	Date [M/D/Y], Time [UTC]	Center [Lat°, Lon°]	Duration [sec]	Off-Nadir Angle [°]	Pathdirection	Status	Data
02.2	3/11/2025, 10:59:16 AM	50.508, 10.690	146.92	6.515	descending	acquired	GeoJSON
17.3	3/14/2025					acquired	GeoJSON
27.4	3/15/2025					acquired	GeoJSON
31.2	3/16/2025					acquired	GeoJSON
25.2	3/18/2025					planned	GeoJSON
05.3	3/19/2025, 11:06:27 AM	50.698, 8.677	146.922	4.805	descending	planned	GeoJSON

- Ran since 2022 parallel to campaigns
- Started as program in 03/2024
- Stripes ~1000 km long
- Defined with users (workshops, **survey**)
- Updated to take seasons into account
- Assigned **max. priority**
- Flexible (**campaigns**, weather)
- Collected > 450 stripes since 2022
- Acquired > 130 stripes since 03/2024
- **50%** stripes has cloud coverage < **20%**

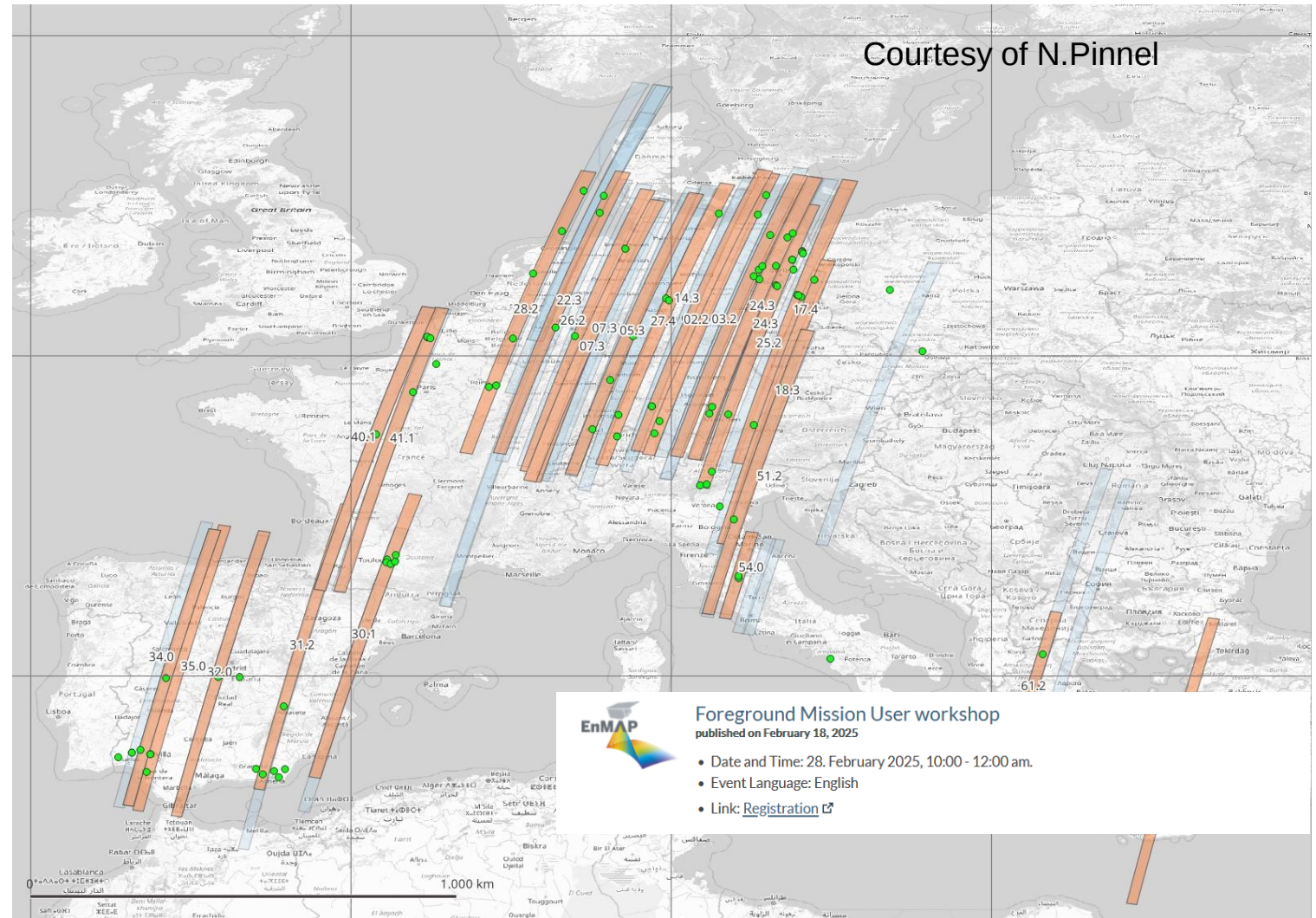
See Talk by Nicole Pinnel „Lesson learnt from FM2024“

Foreground Mission

- FM ran in parallel to several **on-ground campaigns**:

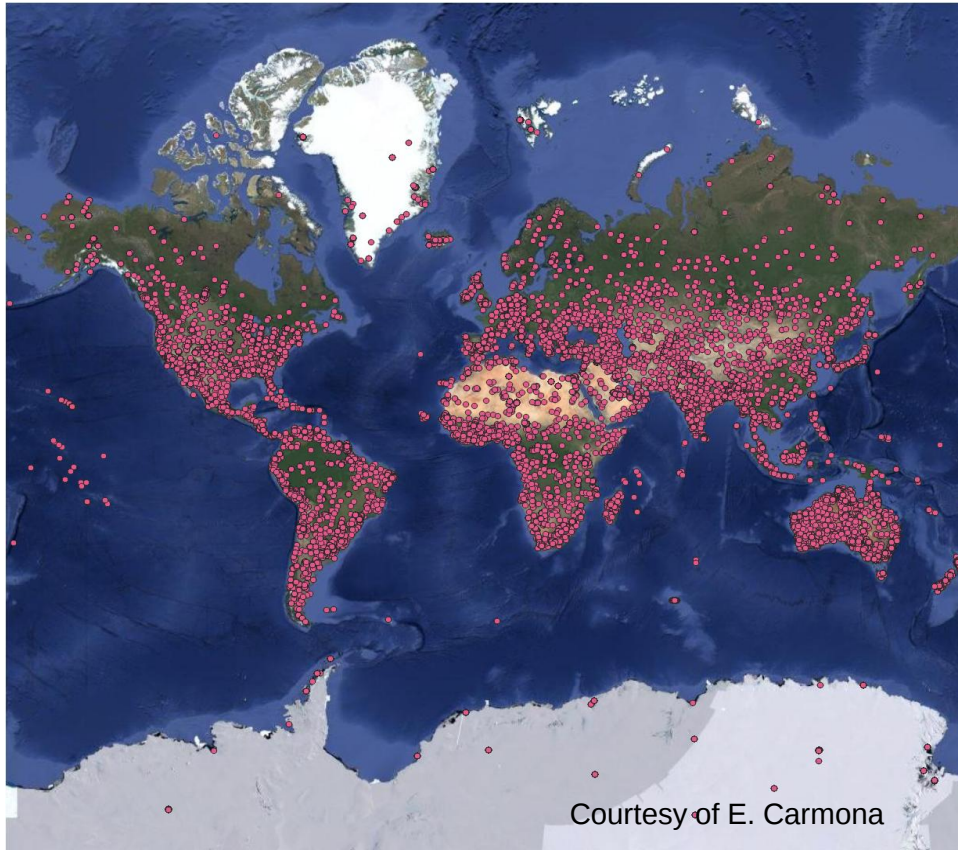
- Methane Experiment (USGS)
- Greenland (GFZ)
- Artic (AWI)
- Soil Sites/Demmin (GFZ)
- Oil detection (Mexico) (NASA)
- Aquatic/Agriculture (Uni Valencia)
- Sardegna, Largo di Garda (CNR)
- Jolanda di Savoia (ITC, CNR)
- Namibia (HU Berlin, GFZ)
- Deception Island, Antarctica (GFZ)
- ...

- Coordination by GFZ supported by the Ground Segment Application Support
- User input is very welcome!



See Talk by Nicole Pinnel „Lesson learnt from FM2024“

Background Mission



Targets

- network sites (+ US-LTER, Fluxnet, Geotrees – tropical areas)
- specific targets linked to thematic applications (snow, soil, geology, volcanoes, coral reef, methane leaks)

Goals

- focus on time-series, but areal coverage in progress

Global Targets List (> 600 sites)

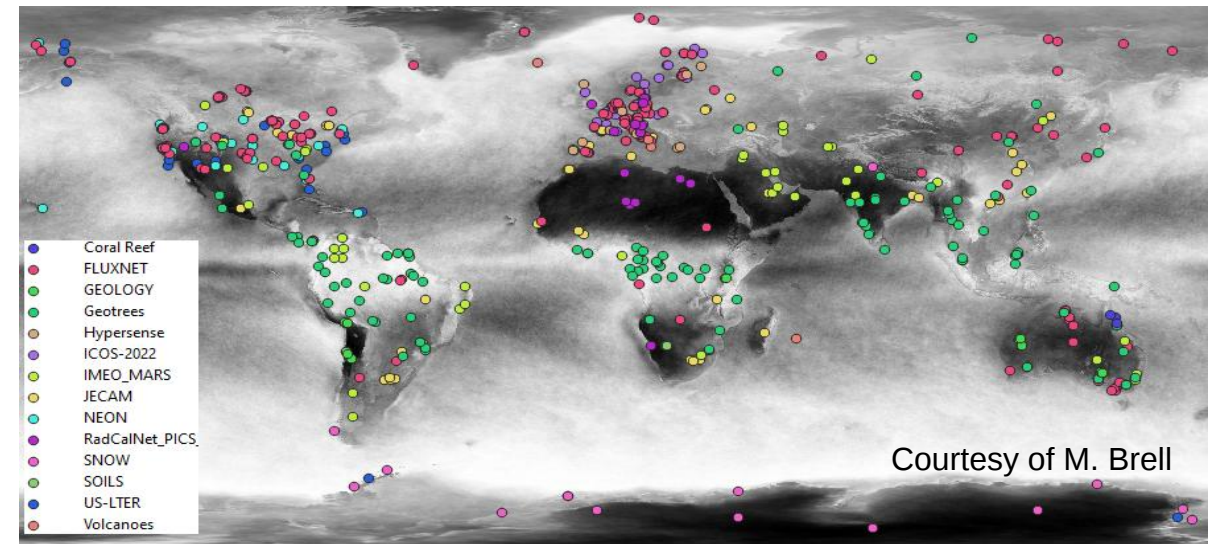
Priority **low**

Schedule

- updated quarterly

New planning feature

- tests ongoing



See talks by **Emiliano Carmona** *Three years of EnMAP Ground Segment Operations*

Moon calibrations

- Moon observations for calibration & cal/val studies
- Along-track scanning strategy
- 7 Moon acquisitions since launch
- More frequent acquisitions in future, close in time to Sun calibrations
- Data not publicly available
- Started collaborations with external partners for Moon data exploitation

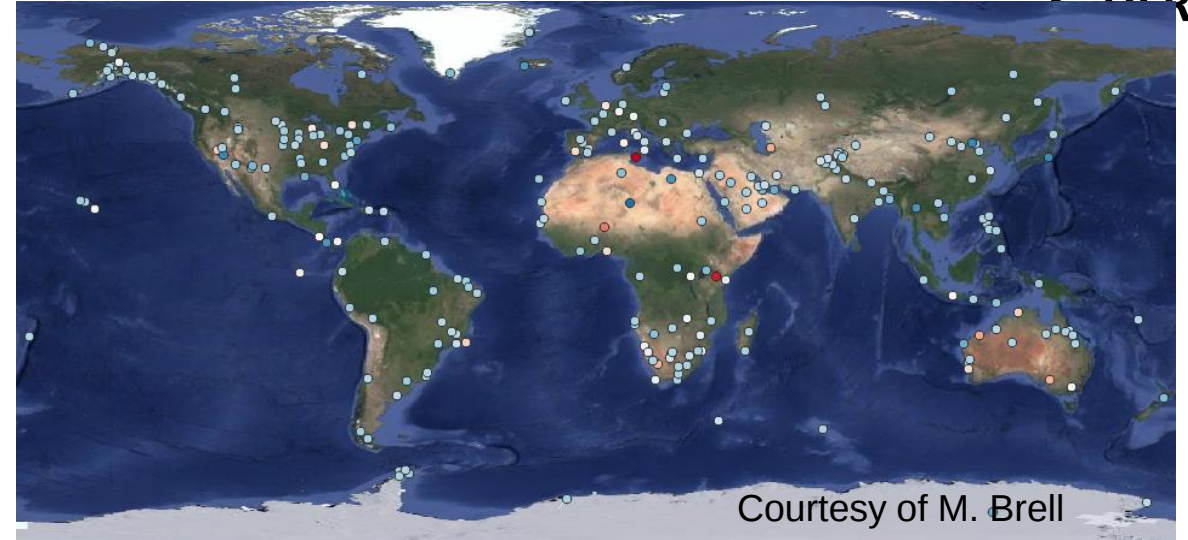


See Talk by **Miguel Pato** *Overview of EnMAP processor and calibration activities*

EnMAP & PRISMA match-ups



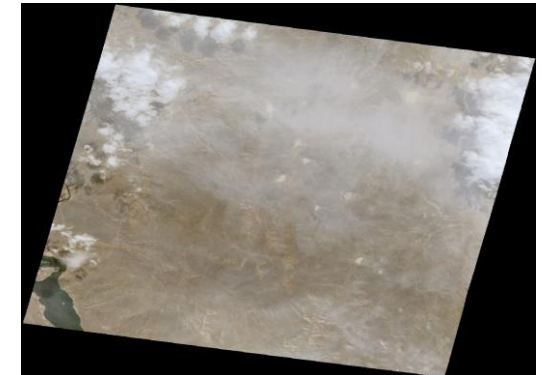
- ~ 70 common acquisitions globally distributed (including science or network sites in the frame of cal/val or thematic campaigns)
- Goals: development of L1/L2 transfer functions (for multi-sensor time-series analyses), and/or cross-calibrations
- Regular meeting to identify/select match-ups
- Schedule prepared 1x month



Courtesy of E. Carmona

- 69 attempts 06/2024-02/2025
- 48 successful
- ~24 with cloud-coverage < 20%

Workflow well established
→ ongoing work!



Courtesy of E. Carmona

Contact us if you are interested in collaborating!

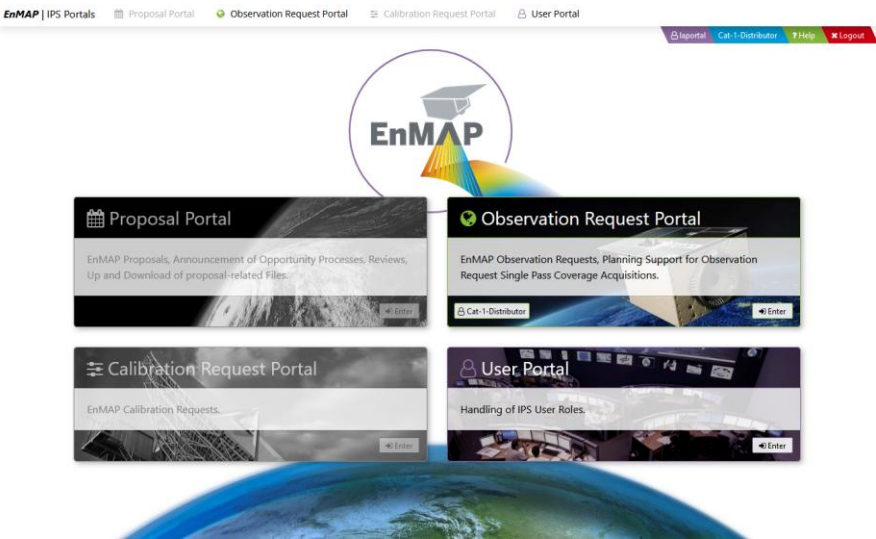
Ordering Observations and Accessing the Catalogue



Register@ <https://planning.enmap.org/>



Submit proposal



Browse archive

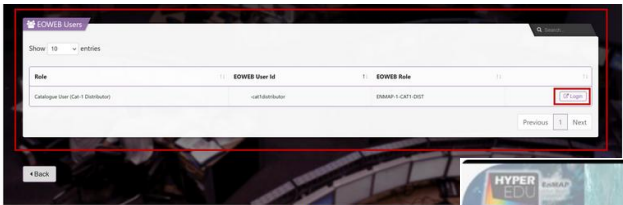
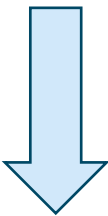
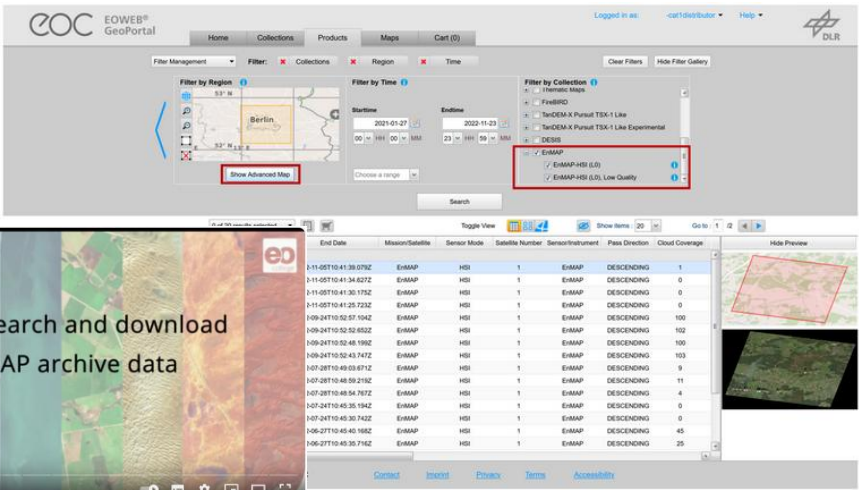
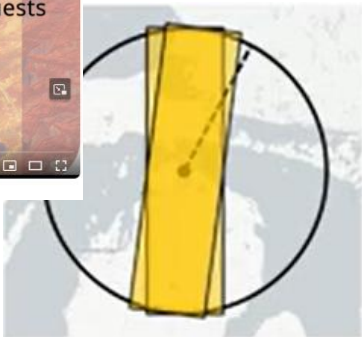


Fig. 28 Entry point to the EOWEB GeoPortal



Plan & Submit Obs. Request



Data access points



L0 Quicklooks

EOWEB ®

L1B

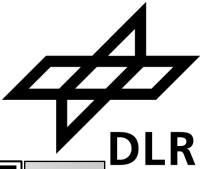
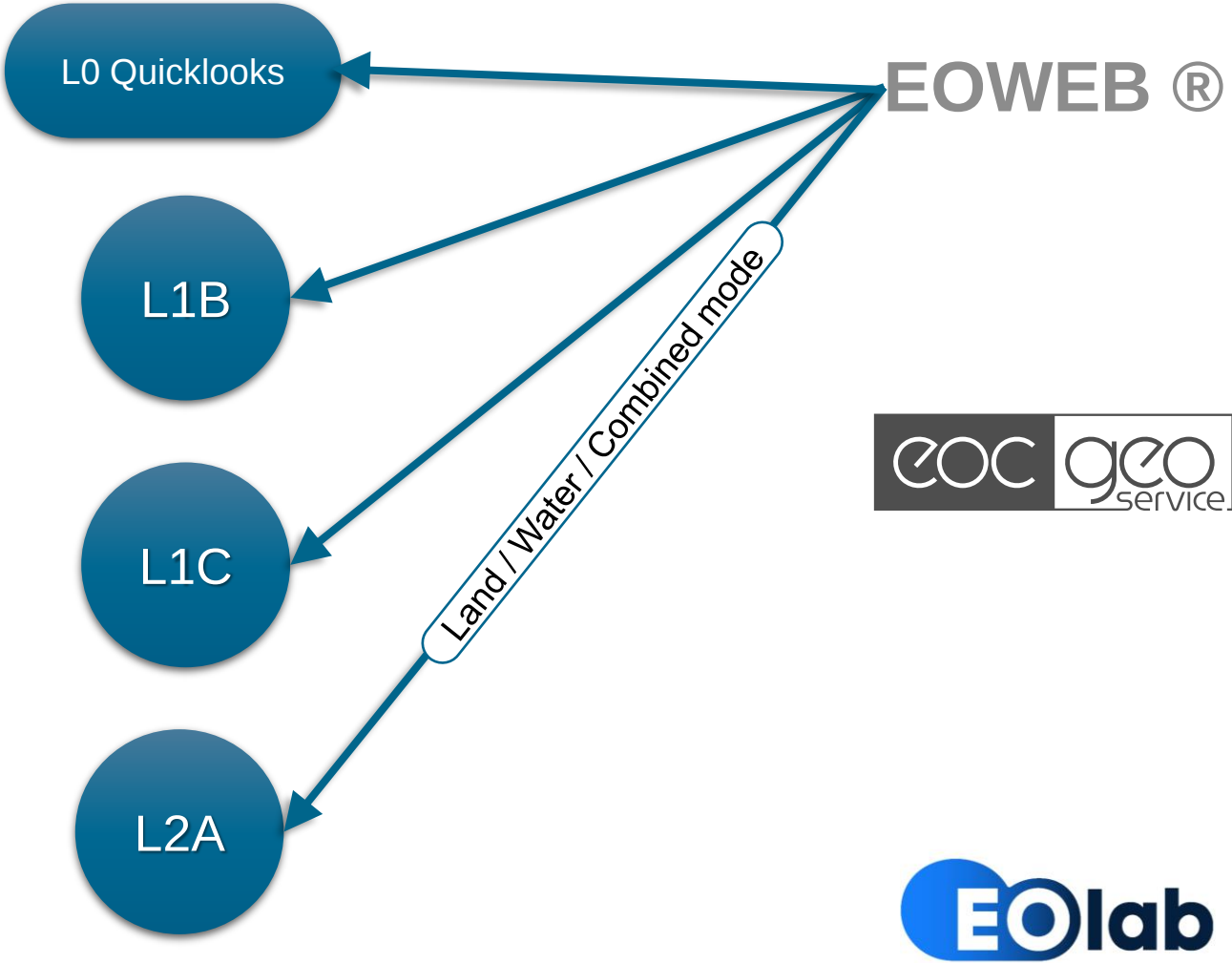


L1C

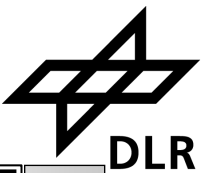
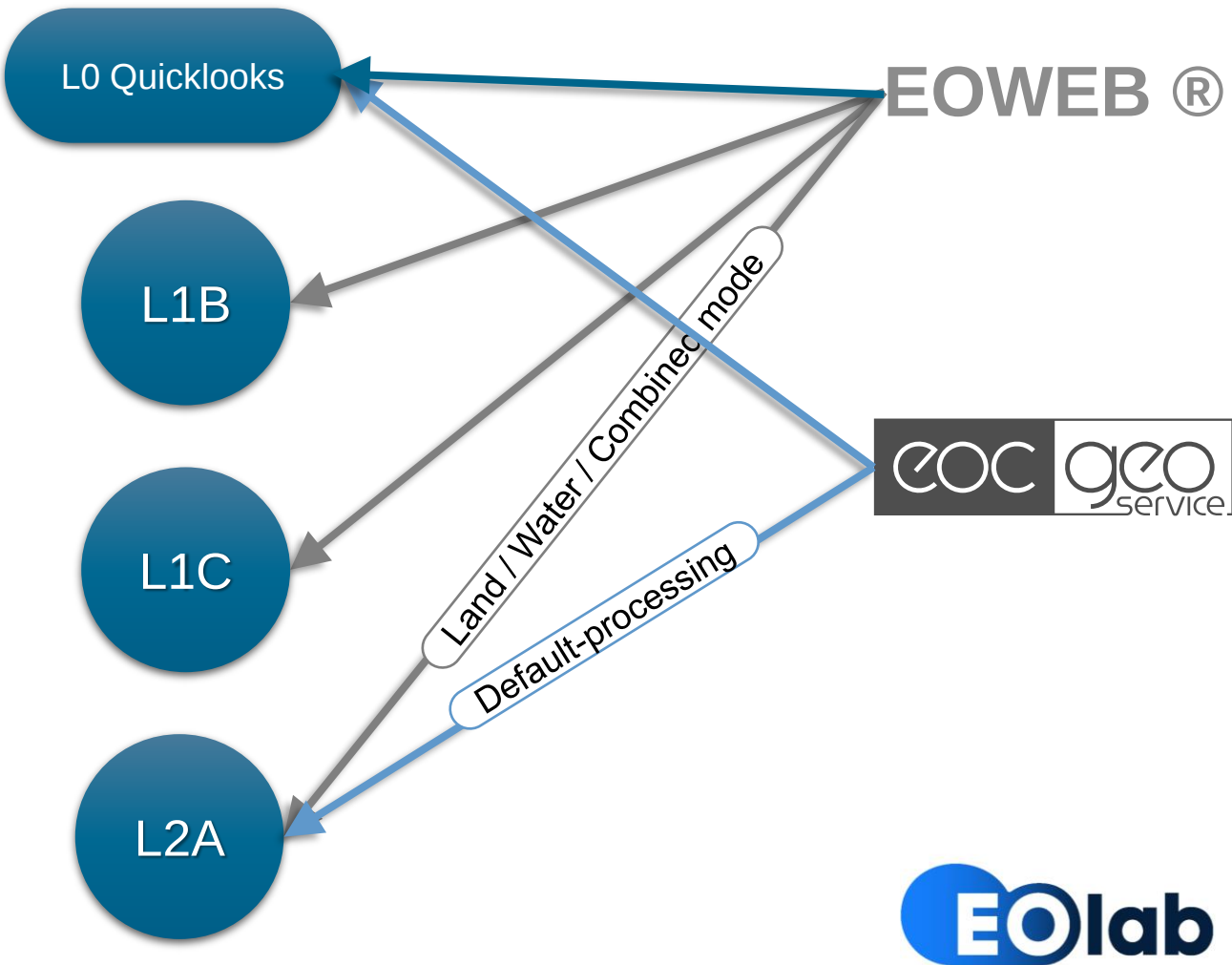
L2A



Data access points



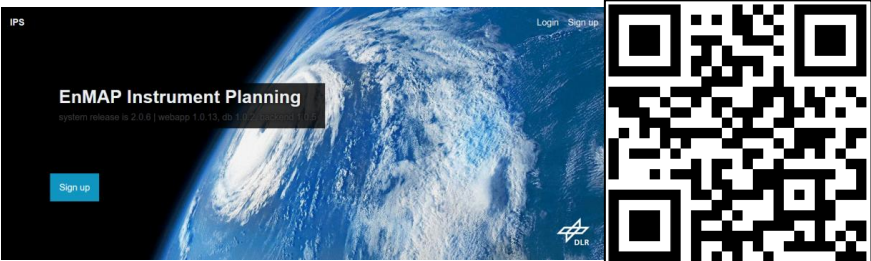
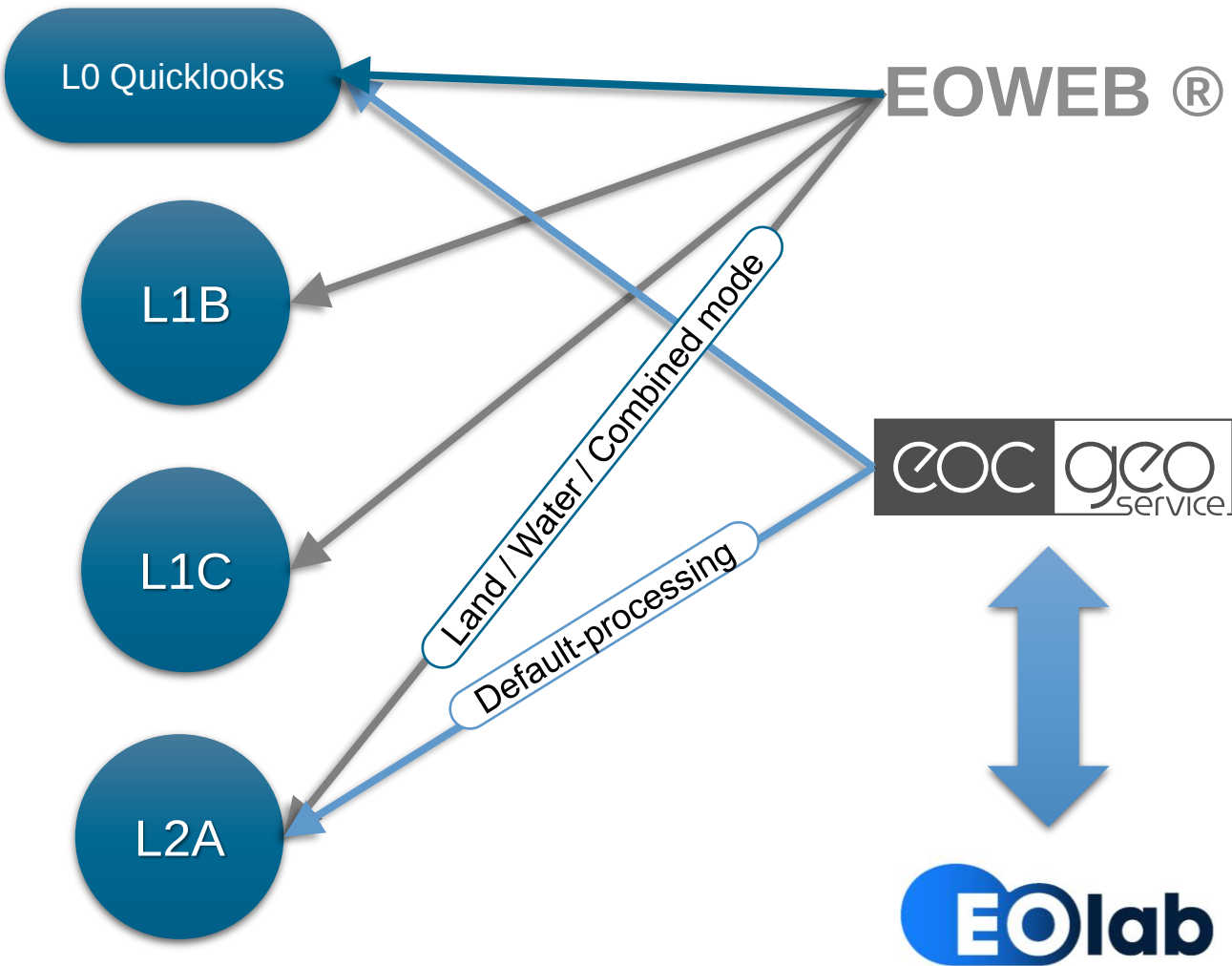
Data access points



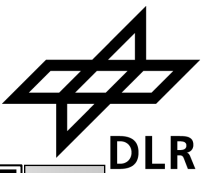
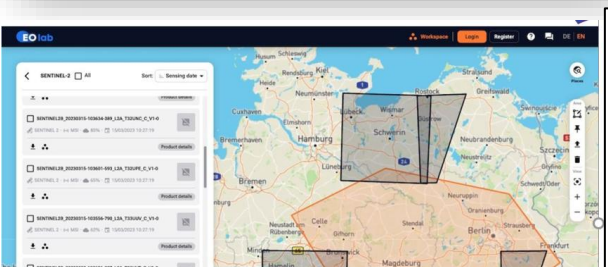
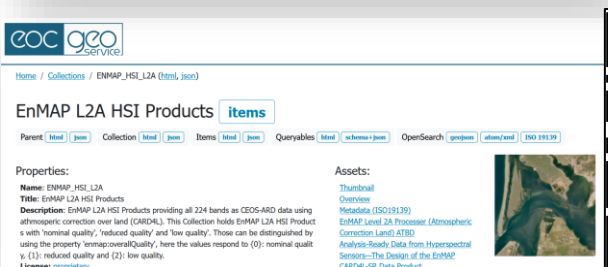
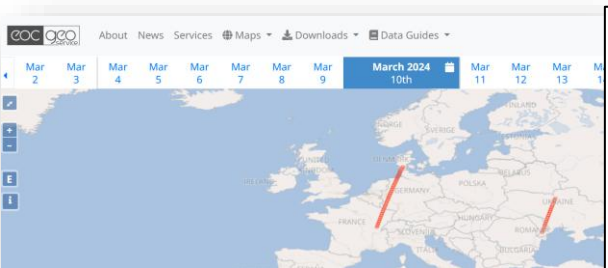
Tasking



Data access points



Tasking





SpatioTemporal Asset Catalog (STAC) Access



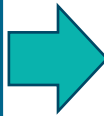
- STAC EnMAP data is hosted by the EOC Geoservice:
<https://geoservice.dlr.de/eoc/ogc/stac/v1>

EnMAP L0 HSI Quicklook Products [items](#)

- **L0 quicklooks** do not require registration

EnMAP L2A HSI Products [items](#)

- Access to EnMAP **L2A** Data **requires** an account linked to an **authorized institution**



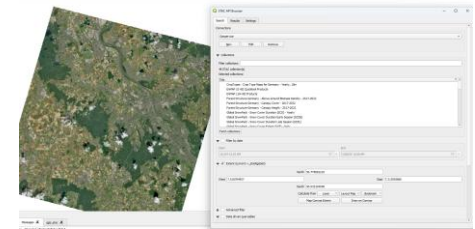
Programmatic Access via JupyterLab

- Python-based STAC access for **bulk** querying and downloading L0 quicklooks and L2A data.
- Data downloads currently require an **additional manual authorization workaround** via cookie authentication
- Tutorial & Templates available



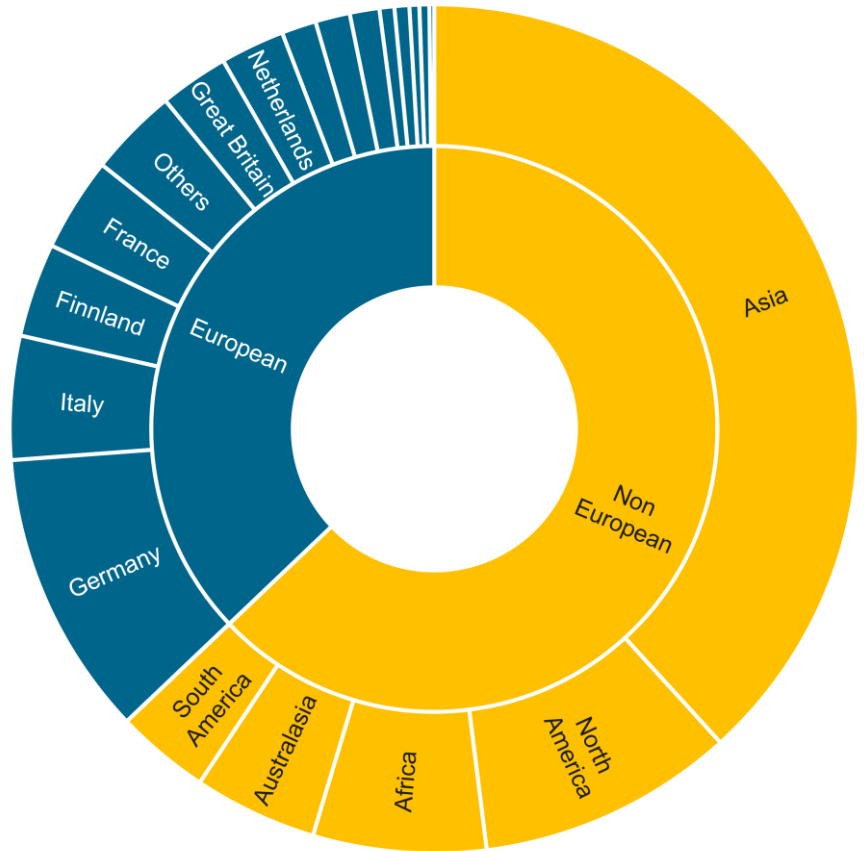
Access via QGIS

- Access via URL:
<https://geoservice.dlr.de/eoc/ogc/stac/v1>
- Via QGIS STAC API Browser Plugin
- EnMAP L2A data **currently not accessible** due to missing authentication method
- QGIS 3.42.0 'Münster' was released on 2025-02-21 which now features **native STAC support**, however with limited functionality

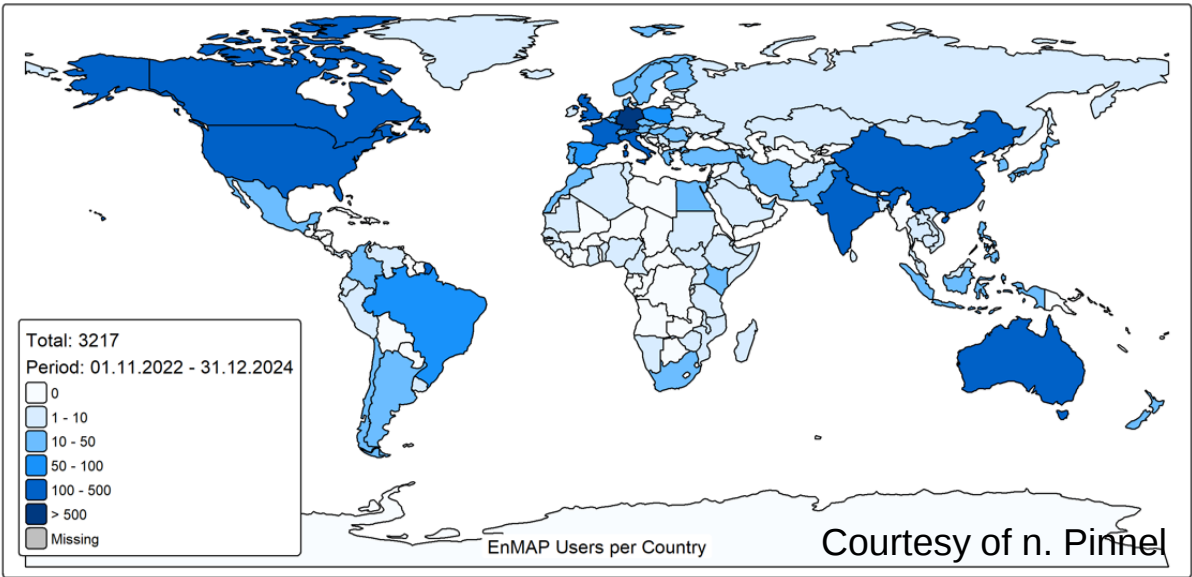


Users

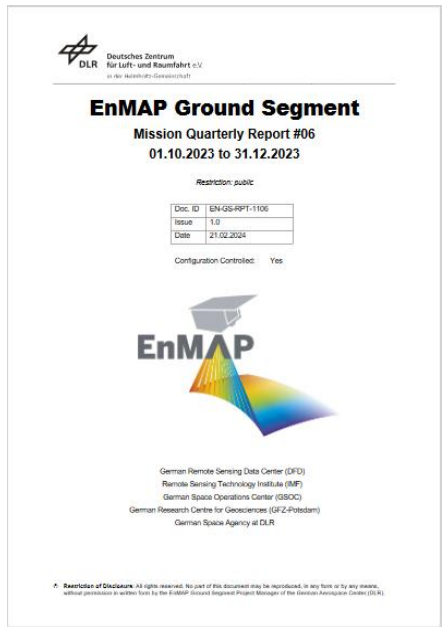
01.10.2024 to 31.12.2024



More and more international users

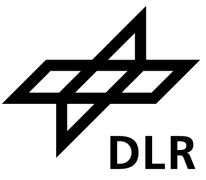


Courtesy of n. Pinnel



MQR available @ enmap.org

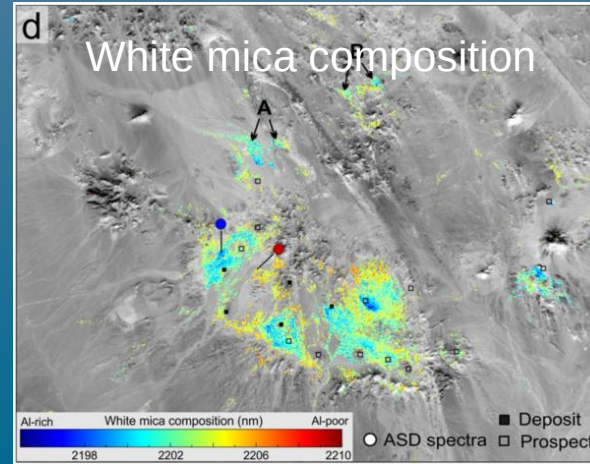
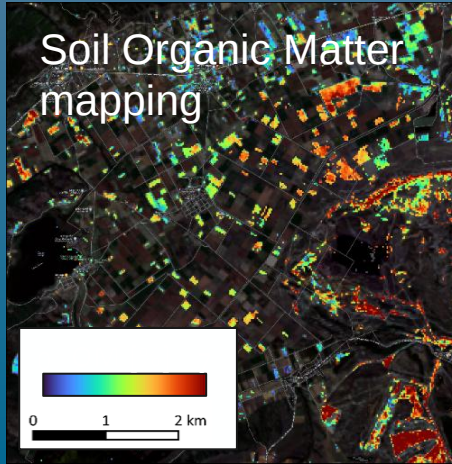
Icon	Topic	New within reporting period 01.07.2024 to 30.09.2024		
		Proposal	Total tiles requested	Total tiles granted
	VEGETATION	25	5294	1195
	GEO/SOIL	26	2693	285
	WATER	10	3410	180
	SNOW/ICE	0	0	0
	URBAN	0	0	0
	ATMOSPHERE	5	127	59
	HAZARD/RISK	1	12	12
	METHODS	0	0	0
	CAL/VAL	1	999	999
	Total	68	12535	2730



Extensive science program

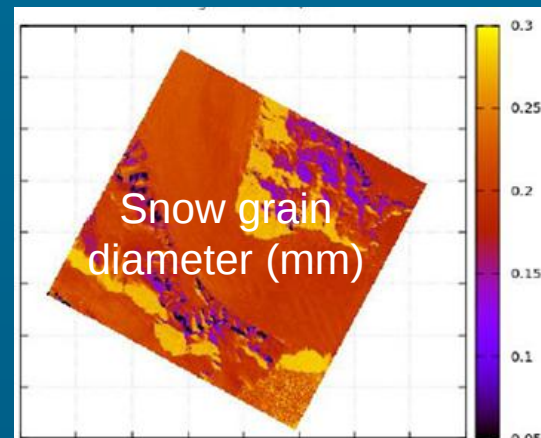
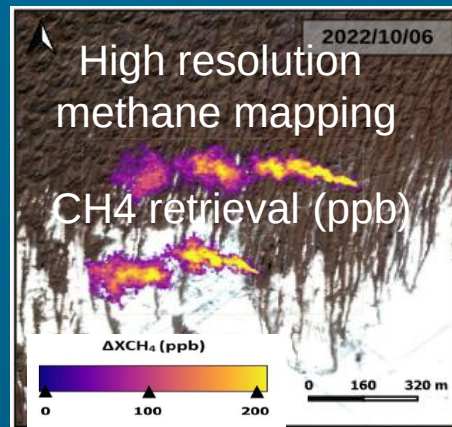


Agricultural test site,
northern Greece
Chabrillat et al., 2024



Rekodiq porphyry
Cu–Au deposit,
Pakistan
Asadzadeh et al., 2024

Turkmenistan oil & gas
field
Roger et al., 2023



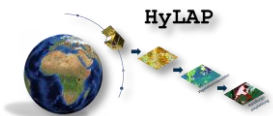
Aviator glacier,
Antarctica
*Kokhanovsky et al.,
2024*

EnMAP-Box

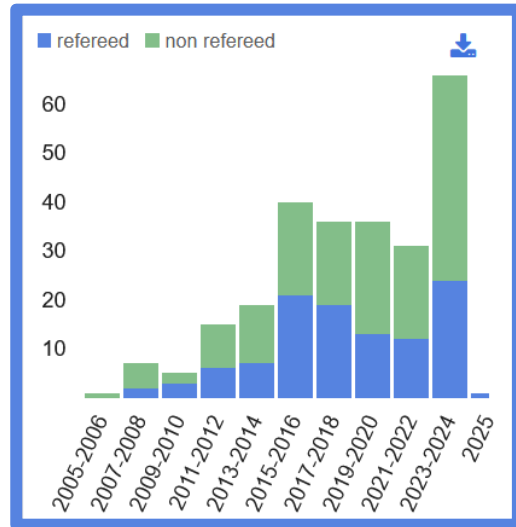
**HYPER
EDU**

See Talk by **Sabine Chabrillat** *EnMAP imaging spectroscopy mission Science exploitation program: Science results 3 years after launch*

Projects and institutions – a selection



Publications



Source: NASA ADS



Remote Sensing of Environment

Volume 315, 15 December 2024, 114379



The EnMAP spaceborne imaging spectroscopy mission: Initial scientific results two years after launch

Sabine Chabrillat ^{a, b}, Saskia Foerster ^{a, y}, Karl Segl ^a, Alison Beamish ^a, Maximilian Brell ^a, Saeid Asadzadeh ^a, Robert Milewski ^a, Kathrin J. Ward ^a, Arlena Brosinsky ^a, Katrin Koch ^a, Daniel Scheffler ^a, Stephane Guillaso ^a, Alexander Kokhanovsky ^a, Sigrid Roessner ^a, Luis Guanter ^c, Hermann Kaufmann ^a, Nicole Pinnel ^d, Emiliano Carmona ^d, Tobias Storch ^d, Tobias Hank ^e, ...Sebastian Fischer ^w

Comparison of ASI-PRISMA Data, DLR-EnMAP Data, and Field Spectrometer Measurements on "Sale 'e Porcus", a Salty Pond (Sardinia, Italy)

by Massimo Musacchio ^{1,*}, Malvina Silvestri ¹, Vito Romaniello ¹, Marco Casu ^{2,3}, Maria Fabrizia Buongiorno ¹ and Maria Teresa Melis ²

¹ Istituto Nazionale di Geofisica e Vulcanologia, Osservatorio Nazionale Terremoti, Via di Vigna Murata 605, 00143 Roma, Italy
² Department of Chemical and Geological Sciences, Cittadella Universitaria (Blocco A)-S.S. 554 Bivio per Sestu, 09042 Monserrato, CA, Italy
³ Department of Earth Sciences (DES), La Sapienza Università di Roma—Piazzale Aldo Moro 5, 00185 Rome, Italy
 * Author to whom correspondence should be addressed.

Remote Sens. 2024, 16(6), 1092; <https://doi.org/10.3390/rs16061092>

LETTER • OPEN ACCESS

High-resolution observations of NO₂ and CO₂ emission plumes from EnMAP satellite measurements

Christian Borger*, Steffen Beirle, André Butz, Leonie Olivia Scheidweiler and Thomas Wagner*

Published 25 March 2025 • © 2025 The Author(s). Published by IOP Publishing Ltd

Environmental Research Letters, Volume 20, Number 4

Citation Christian Borger et al 2025 Environ. Res. Lett. 20 044034

DOI 10.1088/1748-9326/adc0b1

Research Article Vol. 32, No. 16/29 Jul 2024 / Optics Express 28215

Optics EXPRESS

Full mission evaluation of EnMAP water leaving reflectance products using three atmospheric correction processors

MARIANA A. SOPPA,¹ MAXIMILIAN BRELL,² SABINE CHABRILLAT,^{2,3} LEONARDO M. A. ALVARADO,^{1,4} PETER GEGE,⁵ STEFAN PLATTNER,⁵ IAN SOMLAI-SCHWEIGER,⁵ THOMAS SCHROEDER,⁶ FRANÇOIS STEINMETZ,⁷ DANIEL SCHEFFLER,² VITTORIO E. BRANDO,⁸ MARIANO BRESCIANI,⁹ CLAUDIA GIARDINO,⁹ SIMONE COLELLA,⁸ DIETER VANSTEENWEGEN,¹⁰ MAXIMILIAN LANGHEINRICH,¹¹ EMILIANO CARMONA,¹¹ MARTIN BACHMANN,¹¹ MIGUEL PATO,¹¹ SEBASTIAN FISCHER,¹² AND ASTRID BRACHER^{1,13,*}

Gaussian Process Regression Hybrid Models for the Top-of-Atmosphere Retrieval of Vegetation Traits Applied to PRISMA and EnMAP Imagery

by Ana B. Pascual-Ventoe ^{1,*}, Jose L. Garcia ¹, Katja Berger ^{1,2}, José Estévez ¹, Jorge Vicent ^{1,3}, Adrián Pérez-Suay ¹, Shari Van Wittenberghe ¹ and Jochem Verrelst ¹

¹ Image Processing Laboratory (IPL), Parc Científic, Universitat de València, 46100 Paterna, Spain
² Helmholtz Center Potsdam, GFZ German Research Center for Geosciences, 14473 Potsdam, Germany
³ Magellium, 31520 Toulouse, France
 * Author to whom correspondence should be addressed.

Remote Sens. 2024, 16(7), 1211; <https://doi.org/10.3390/rs16071211>



Detecting methane emissions from palm oil mills with airborne and spaceborne imaging spectrometers

Adriana Valverde^{1,*}, Javier Roger¹, Javier Gorroño¹, Itziar Irakulis-Loitxate^{1,2} and Luis Guanter^{1,3}

Asadzadeh, S., Koellner, N., Chabrillat, S. (2024), Detecting rare earth elements using EnMAP hyperspectral satellite data: a case study from Mountain Pass, California. Scientific Reports, 14, 20766. doi: 10.1038/s41598-024-71395-2

Evaluation of EnMAP imagery for predictive modelling of soil salinity in highly saline soils

@EGU24-17168

Francisco M. Canero¹, Diego Lopez-Nieta¹ and Victor Rodriguez-Galiano University of Seville, Department of Physical Geography, Seville, Spain (fcanero@us.es)

Identification of a Potential Rare Earth Element Deposit at Ivanpah Dry Lake, California Through the Bastnäsite Indices

by Otto C. A. Gadea¹ and Shuhab D. Khan^{1,*}

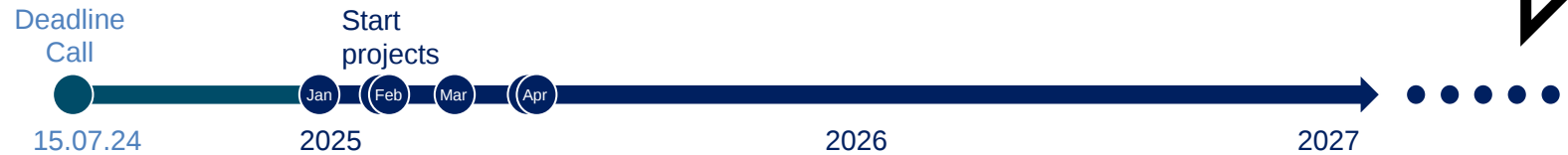
Department of Earth and Atmospheric Sciences, University of Houston, Houston, TX 77204, USA
 * Author to whom correspondence should be addressed.

Remote Sens. 2024, 16(23), 4540; <https://doi.org/10.3390/rs16234540>

Hajaj, S., Harti, A.E., Pour, A.B. et al. Recurrent-spectral convolutional neural networks (RecSpecCNN) architecture for hyperspectral lithological classification optimization. Earth Sci Inform 18, 125 (2025). <https://doi.org/10.1007/s12145-024-01534-w>

& more to come...

Commercial users



- Agency call for ideas to German companies → 5 funded projects
- New role for commercial user (Cat-2) opened in 02/2025
- Currently only German companies can task EnMAP
- German companies with science projects funded by EU-institutional organisations → Cat-1 (higher prio)
- ESA members state companies have access to the catalogue, other requests considered on a case-by-case basis

NEW

EnMAP Webinar on the application and commercialisation potential

published on February 18, 2025



- Date and Time: 29. and 31. January 2025, 10:00 - 12:00 am.
- Event Language: English
- Link: [Agenda](#)

On 29th and 30th January 2025 two EnMAP Webinars took place online in order to inform the general user community about the mission characteristics and acquisition status, examples of scientific exploitation, online education material developments (HyperEDU), current EnMAP funded projects (29.01.2025), and

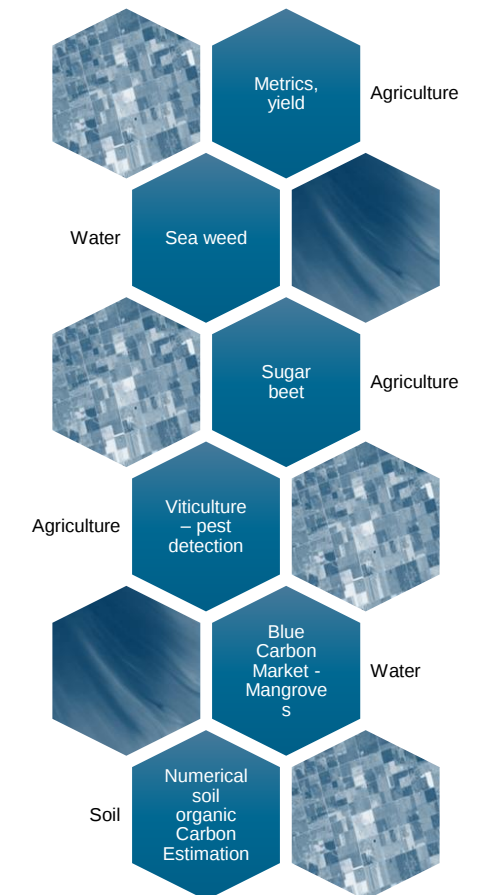
EnMAP Workshop Commercial Tasking

published on February 18, 2025



- Date and Time: 12. March 2025 9:30 - 11:30 am.
- Event Language: German
- Link: [Registration](#)

In this workshop, we will demonstrate how commercial EnMAP users can access EnMAP data and provide a step-by-step guide to planning EnMAP acquisitions (Cat-2 access). Tasking for EnMAP data will also be unlocked for German companies and their partners starting on March 12, 2025.



Outlook

- EnMAP for Charter
 - Feasibility study concluded; next step: regular operations

User Support and Data dissemination

- EnMAP users survey (feedback)
- EOLAB/CODE platform
- More conferences and workshops!
 - LPS2025 EnMAP sessions, EnMAP for public authorities workshop in 2026

See **Saskia Förster et al**– *Preparing and engaging national stakeholders for hyperspectral data utilization across research, public authorities and commercial applications*

Synergies & Cooperation with other hyperspectral sensors:

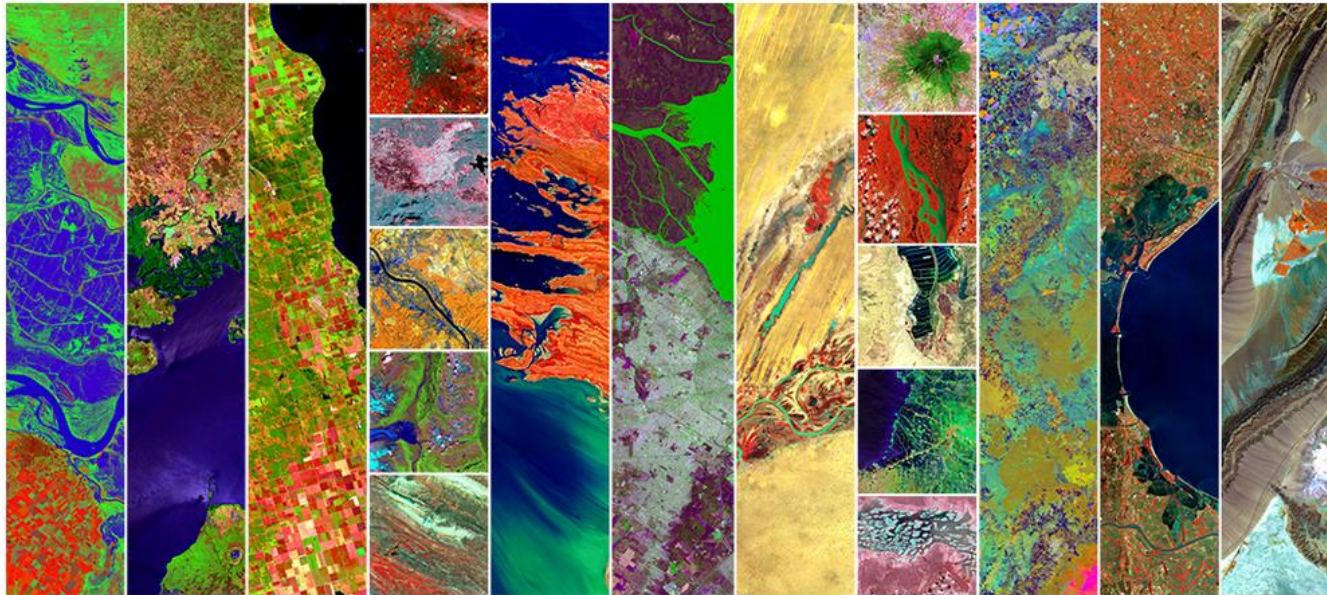
- Acquisition and analysis of parallel PRISMA/EnMAP acquisitions
- Further attendance of dedicated conferences: sensors cross-calibrations
- Cooperation with EMIT, DESIS, PACE ... CHIME/SBG core sites
- EnMAP // ESA Rose-L campaign (EnMAP LMU & GFZ teams -- > field measurements)

Mission extension preparation!



Conclusion

All you need is on the EnMAP official website!



Images: EnMAP data ©DLR [2023/2024]

EnMAP

Home Data & Access Mission Science & Applications Tools Events & Education

Welcome to EnMAP

The German Spaceborne Imaging Spectrometer Mission

The Environmental Mapping and Analysis Program (EnMAP) is a German hyperspectral satellite mission that monitors and characterizes Earth's environment on a global scale. EnMAP measures geochemical, biochemical and biophysical variables providing information on the status and evolution of terrestrial and aquatic ecosystems. More information about the main objectives and the status can be found on the [mission page](#).

The planned schedule of upcoming priority acquisitions is available in the [Foreground Mission](#).

News

HYPERedu releases German version of MOOC 'Introduction to Hyperspectral Remote Sensing'
published on March 28, 2025

[HYPERedu](#) now presents 'Beyond the Visible - Einführung in die Hyperspektrale Fernerkundung', the German version of the popular MOOC 'Introduction to Hyperspectral Remote Sensing'. More information about the course as well as the registration link can be found at [EQ College](#) ☞.

EnMAP Image Featured in Helmholtz Imaging Film!
published on March 11, 2025

An EnMAP image from the deserts of Iran, previously submitted to the Helmholtz Image Competition, has been selected for inclusion in the Helmholtz Imaging film. Chosen from submissions between 2021 and 2024, the EnMAP image of Siah-Kuh is one of 17 featured in the film. This strikingly colorful image, captured by EnMAP's highly sensitive sensors, reveals an extraordinary geologic formation shaped by volcanic and sedimentary processes. Beyond its scientific value, this region holds historical significance as a former royal hunting ground and a resting place for caravans. Today, it is a protected national park (Siah-Kuh), where nature and history converge.

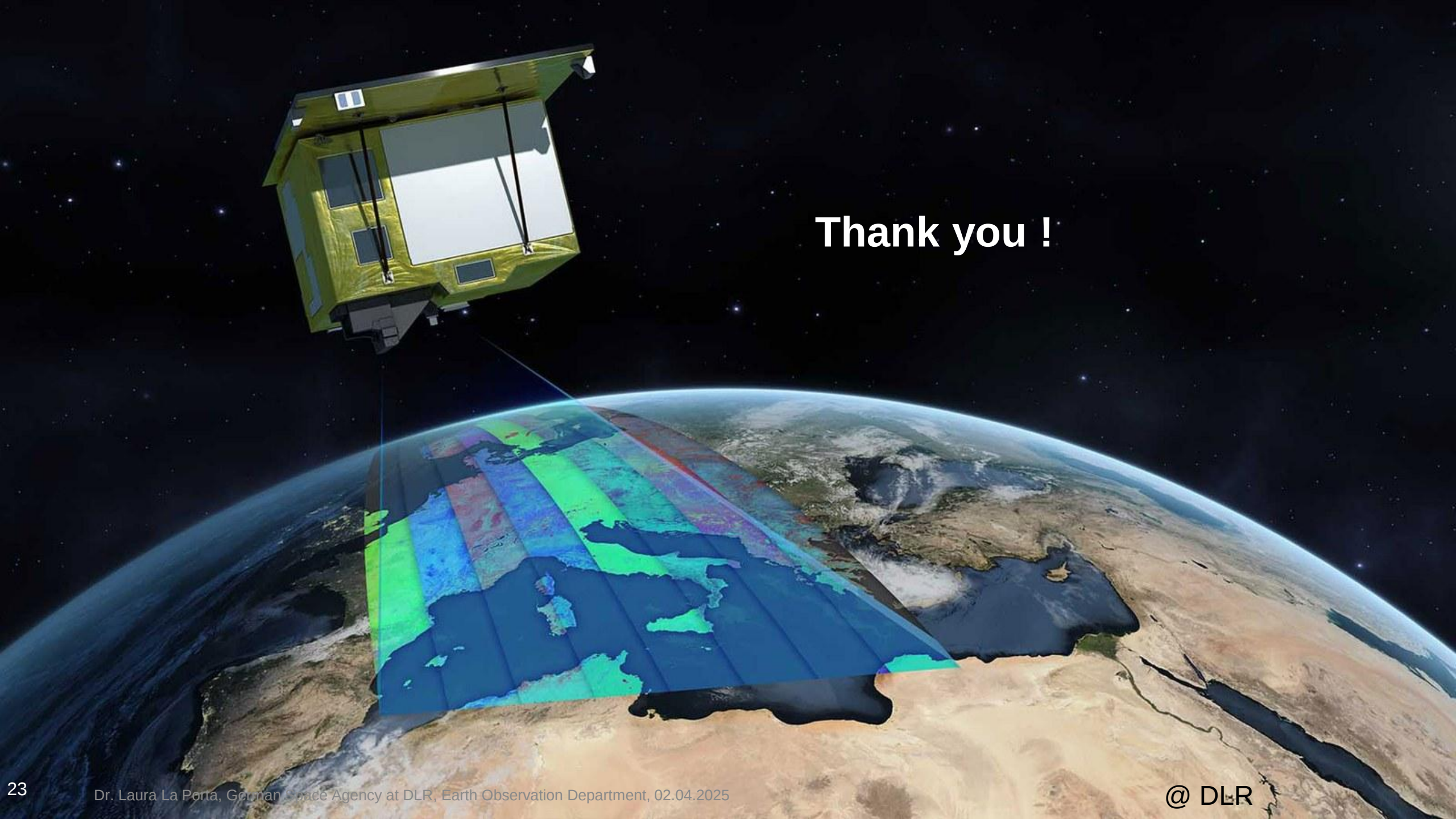
EnMAP back to nominal operations on 06.03.2025
published on March 07, 2025

The EnMAP mission successfully resumed nominal operations on Thursday, March 6 (latest regular acquisitions on February 20). The EnMAP instrument is once again acquiring data, and user requests are being incorporated into the mission planning as usual.

EnMAP Workshop Commercial Tasking
published on February 18, 2025

- Date and Time: 12. March 2025 9:30 - 11:30 am.
- Event Language: German
- Link: [Registration](#) ☞



A satellite with a gold-colored body and a large white rectangular panel is shown in orbit above Earth. A blue sensor beam originates from the satellite and projects onto the Earth's surface, illuminating a coastal area with a colorful, multi-colored overlay representing data. The Earth's surface shows land, water, and clouds. The background is the blackness of space with some stars.

Thank you !