

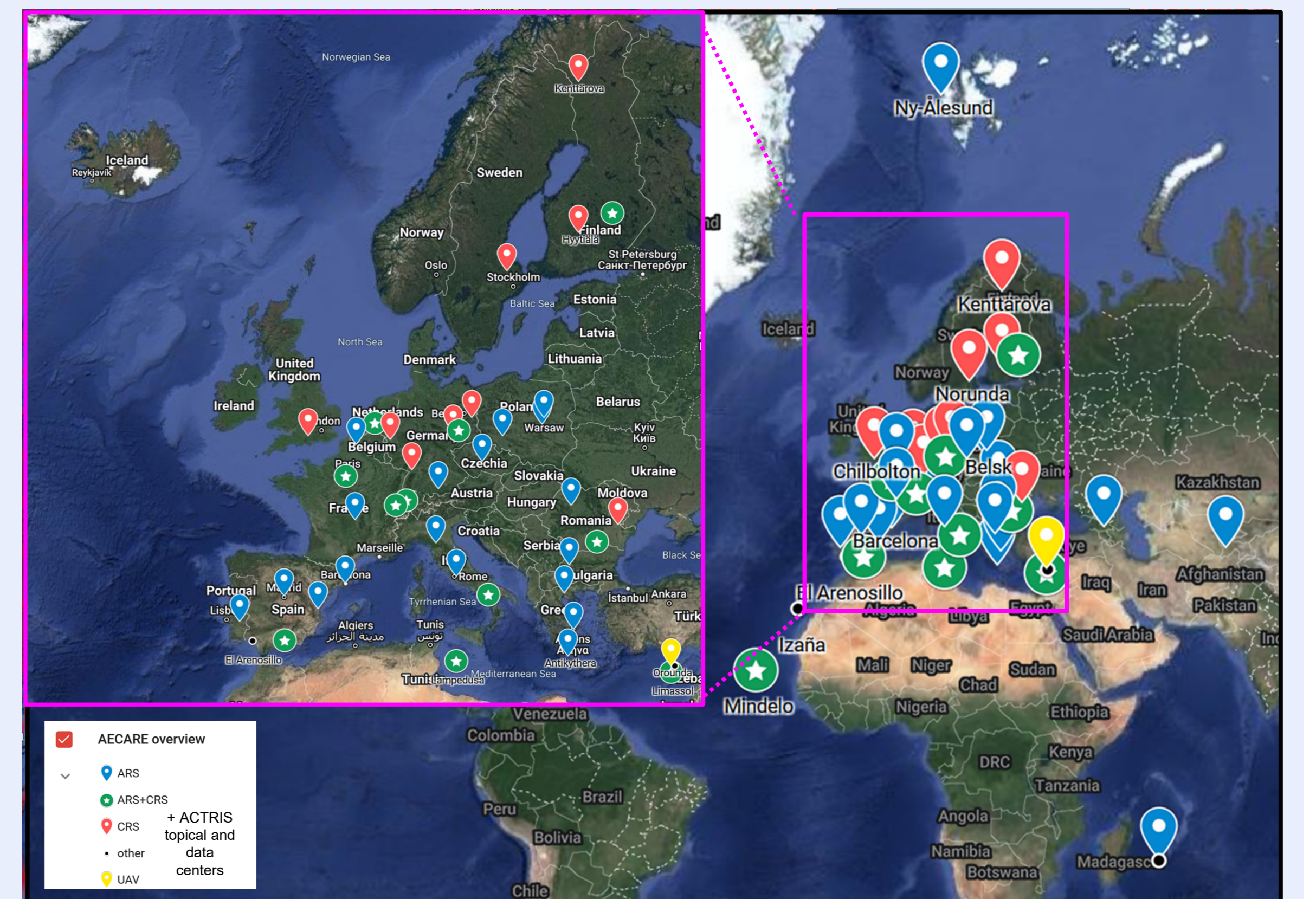
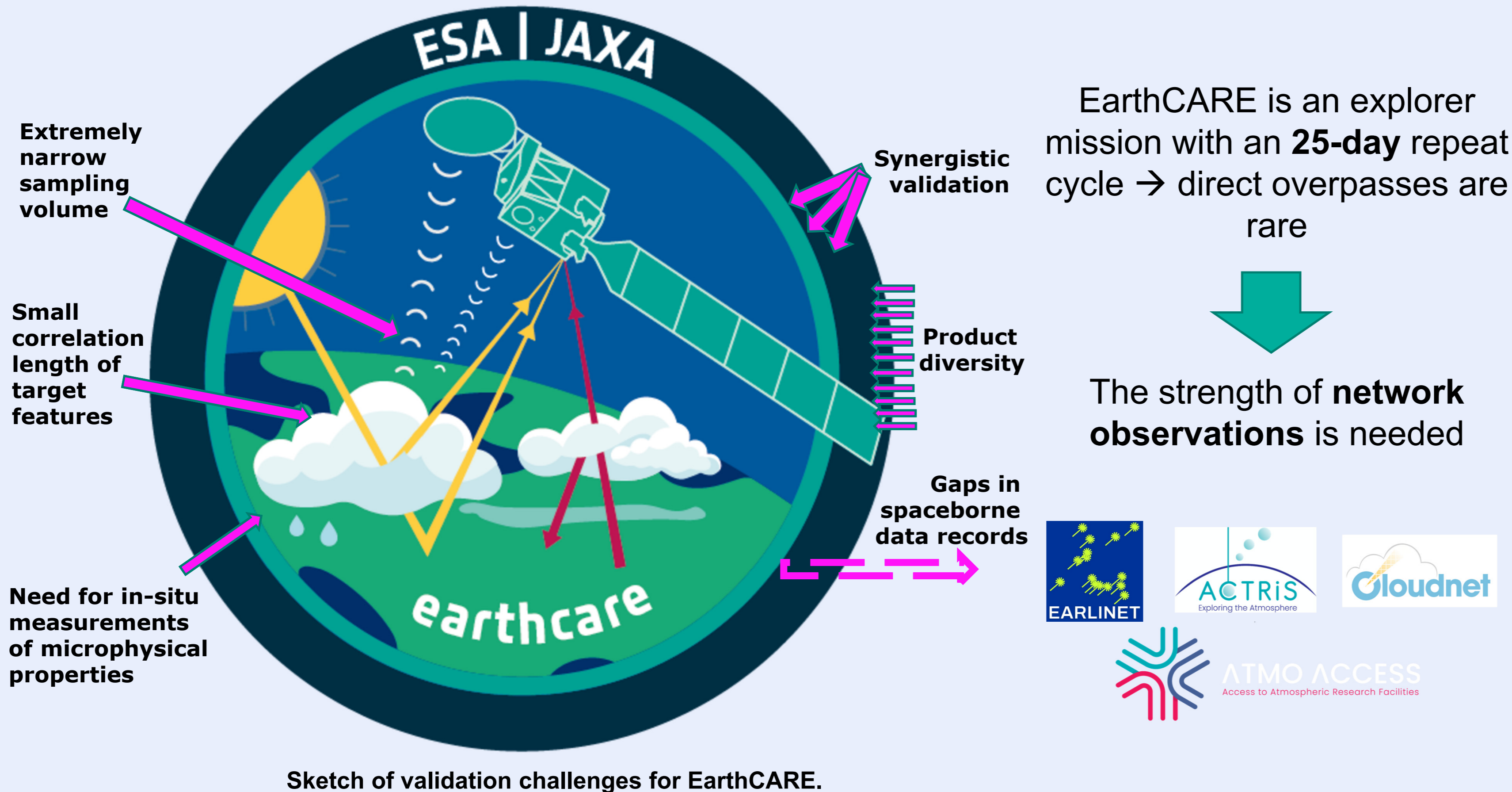
An overview of the European activities for the EarthCARE validation in the framework of ACTRIS/ATMO-ACCESS (EVID05)

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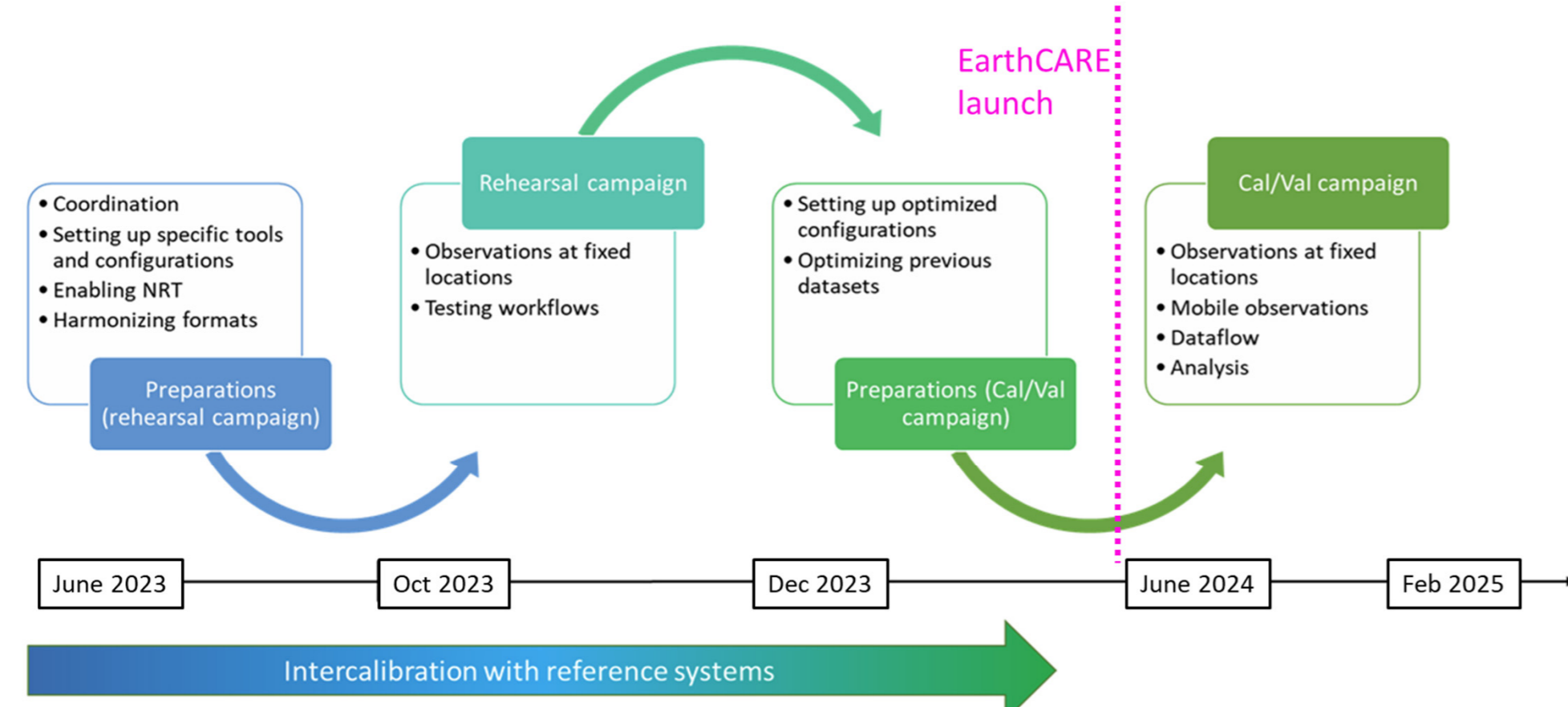
Motivation: EarthCARE and its validation challenges



Map of participating stations colour-coded according to their measurement capabilities.

Project: The ATMO-ACCESS pilot activity for EarthCARE Cal/Val support

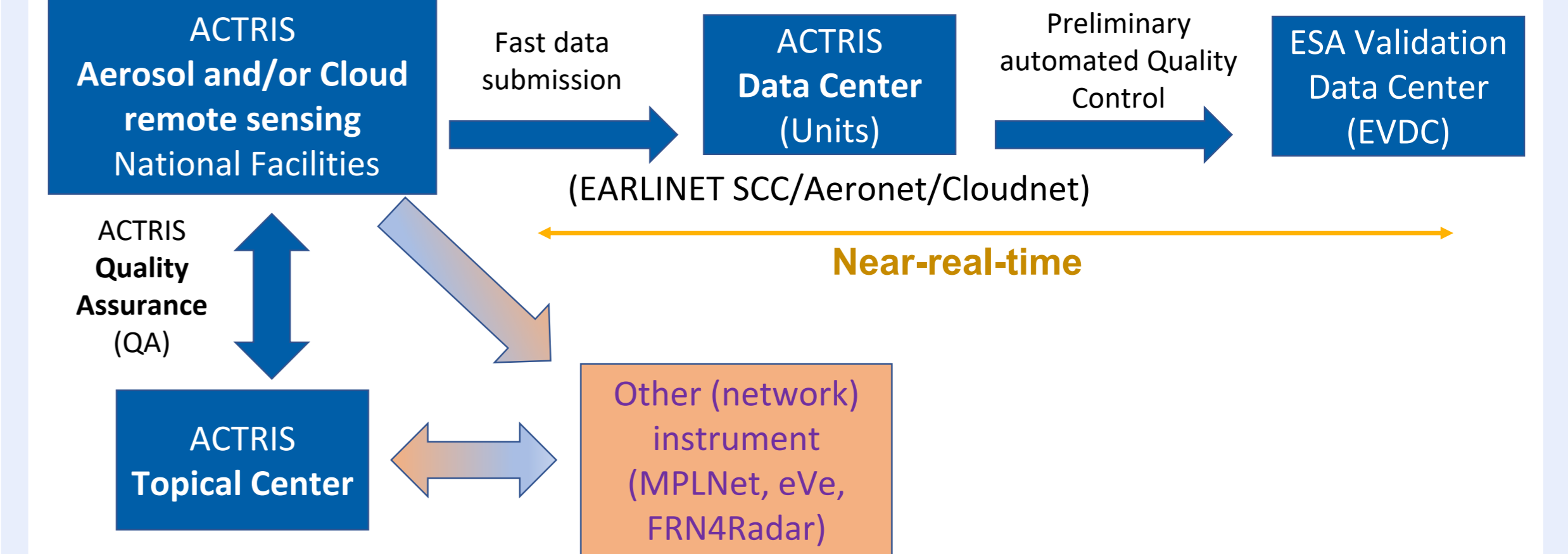
The project in a nutshell



Framework:

ATMO-ACCESS project: Sustainable Access to Atmospheric Research Facilities
 ↓
 A pilot project to experiment better access to research infrastructures for international stakeholders, like ESA

Main goal: Fast access to high quality data for EarthCARE Cal/Val



Instrumentation

ARS = Aerosol remote sensing

	Minimum requirements	Optimum set up
Capabilities	Backscatter + Raman extinction + depolarization at 355 nm or 532 nm	3+2+2: Backscatter + Raman extinction + depolarization at 355 and 532 nm plus backscatter at 1064 nm
Height resolution (raw)	≤ 15 m	≤ 3.75 m
Time resolution (raw)	≤ 60 s	≤ 10 s
Full overlap	≤ 300 m	≤ 200 m
Maximum altitude	≥ 15000 m	> 15000 m

CRS = Cloud remote sensing

Criteria	Minimum requirements	Optimum set up
Minimum sensitivity	~40 dBZ at 1 km in the absence of attenuation.	~50 dBZ at 1 km in the absence of attenuation.
Temporal resolution	30 seconds and 60 m resolution in the vertical	1 second and 10 m resolution (or better) in the vertical
Velocity resolution	10 cm s ⁻¹ or better	5 cm s ⁻¹ or better
Doppler spectrum	No	Yes
Polarisation diversity	No	Yes (LDR preferred but SLDR also suitable)
Type of instruments that fulfill the Minimum requirement or the optimum setup	35 or 95 GHz cloud radar in vertical pointing mode	Polarisation and Doppler spectrum capabilities. Elevation scanning capabilities with angular resolution better than 2°

Instrumentation of the remote sensing facilities of ACTRIS/ATMO-ACCESS.

Validation results

See presentations:

- Nathan Feuillard: *Reflectivity Validation of EarthCARE CPR reflectivity using ACTRIS ground-based Cloud Radar Network*
- Lukas Pfitzenmaier: *Doppler velocity validation of EarthCARE cloud profiling radar using ACTRIS ground-based cloud radar network (EVID05)*
- Ewan O'Connor: *Operational implementation of the sub-orbital to orbital tool together with Doppler velocity unfolding across the ACTRIS cloud radar network for EarthCARE validation (EVID05)*
- Christina-Anna Papanikolaou: *First Insights into ATLID Level 2A Data: Comparisons with ACTRIS/EARLINET observations as part of EVID05*
- Franco Marengo: *Validation of EarthCARE Aerosol Products Using Ground-Based Lidar and UAV Observations in Cyprus and Greece*

See posters:

- Kalliopi Artemis Voudouri: *Evaluation of the EarthCARE aerosol classification scheme using ACTRIS/EARLINET automated aerosol typing methods*
- Christina-Anna Papanikolaou: *Validation of ATLID Level 2A Products Using Potenza Ground-Based Measurements (EVID05)*

And many others using ACTRIS, ATMO-ACCESS, EARLINET and Cloudnet Data

Glossary/Acknowledgements

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Glossary
 ACTRIS = The Aerosol, Clouds and Trace Gases Research Infrastructure
 ARS=ACTRIS aerosol remote sensing
 ATMO-ACCESS = Sustainable Access to Atmospheric Research Facilities
 CRS=ACTRIS cloud remote sensing
 EARLINET = European Research Lidar Network
 EVDC = ESA Validation Data Center
 UAV= in-situ flights

CEOS Best practice document

See presentation:
 • Eleni Marinou: *Best Practice Protocol for the Validation of Aerosol, Cloud, and Precipitation Profiles (ACPPV)*
 And soon to be published

Best practices for the Validation of Aerosol, Cloud, and Precipitation Profiles (ACPPV)

- Chapter 1: Introduction..... 2
- Chapter 2: Validation needs for space profilers..... 19
- Chapter 3: Survey of validation measurements..... 100
- Chapter 4: Correlative metadata and data format..... 159
- Chapter 5: Guidance for the validation of lidar and aerosol products..... 181
- Chapter 6: Guidance for the validation of radar, cloud and precipitation products..... 217
- Chapter 7: Statistical validation..... 241
- Chapter 8: Near-real time validation through data assimilation..... 264
- Chapter 9: Gaps and Challenges..... 288