Aerosol, Clouds and Trace Gases Research Infrastructure (ACTRIS):

delivering harmonised, high-quality atmospheric data and services

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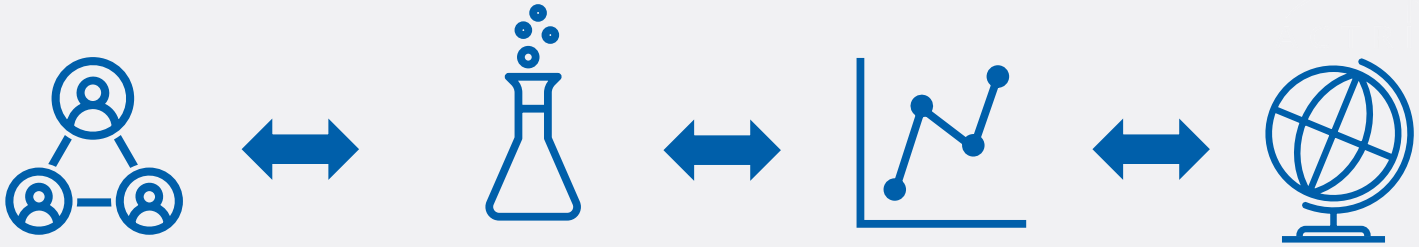
ACTRIS

Research Infrastructure

Research Infrastructure is facilities that provide resources and services for the research communities to conduct research and foster innovation in their fields.

- Bring together state-of-the-art facilities, data, and expertise
- Ensure long-term availability and quality of observations
- Support evidence-based decisions for society and the environment
- Enable collaboration across disciplines and borders



Experts & Users — Facilities & Instruments — Data & Digital Services — Knowledge & Impact

What is ACTRIS?

- Aerosol, Clouds and Trace Gases Research Infrastructure
- Short-lived atmospheric constituents and the processes leading to the variability of these constituents in natural and controlled atmospheres
- High-quality data & services

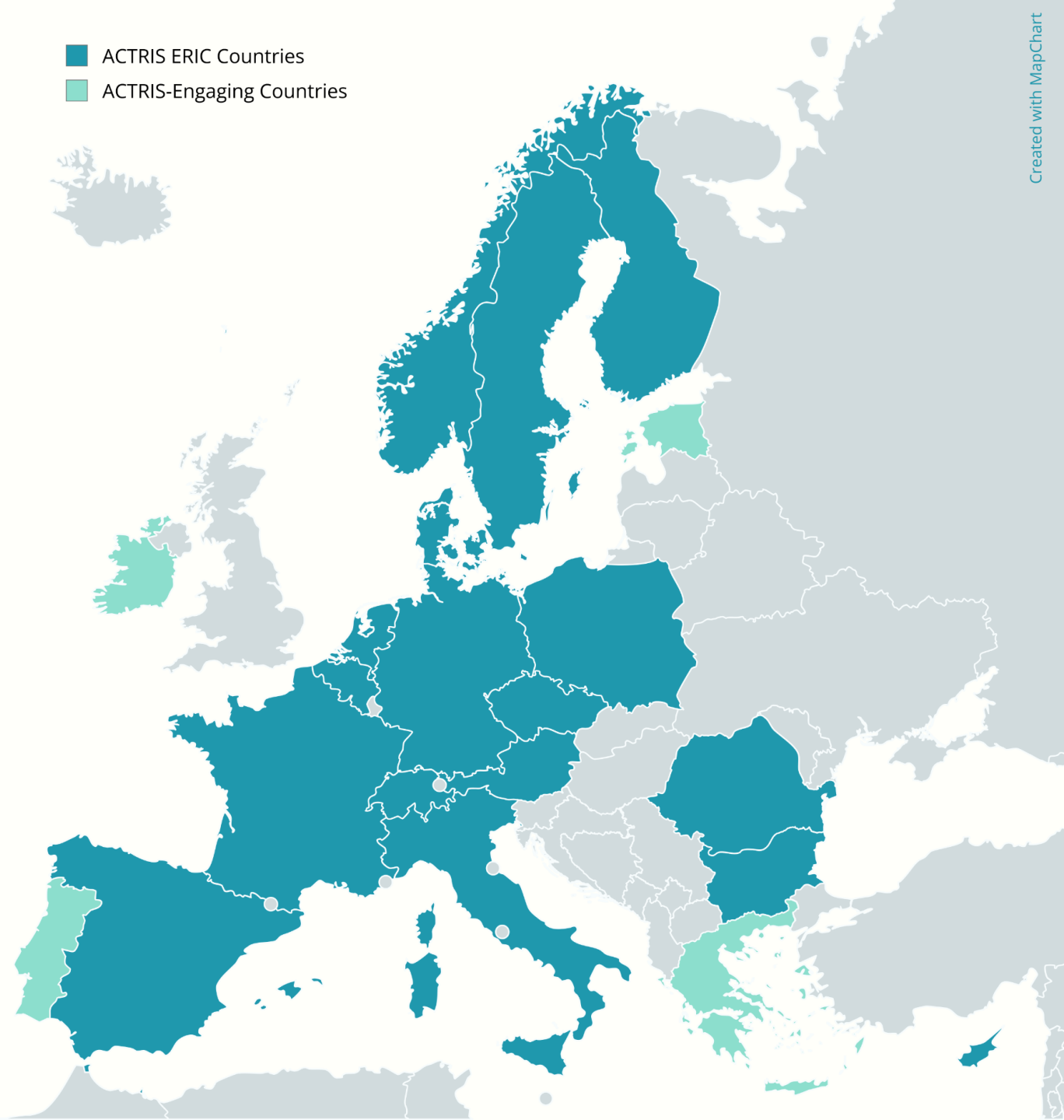
	In Situ	Remote Sensing
Aerosol		
Clouds		
Trace Gases		

17 ACTRIS member countries:

Austria
Belgium
Bulgaria
Czechia
Cyprus
Denmark
Finland
France
Germany
Italy
Netherlands
Norway
Poland
Romania
Spain
Sweden
Switzerland

ACTRIS-Engaging countries:

Estonia
Greece
Ireland
Portugal



ACTRIS National Facilities

- Observational stations (e.g. Jungfraujoch in Switzerland)
- Exploratory platforms:
  - atmospheric simulation chambers (e.g. Euphore @ CEAM, Spain)
  - mobile platforms (e.g. Unmanned Systems Research Laboratory @ CYI, Cyprus)
  - laboratory platform (Aerosol, cluster and trace gas laboratory @ UHEL, Finland)

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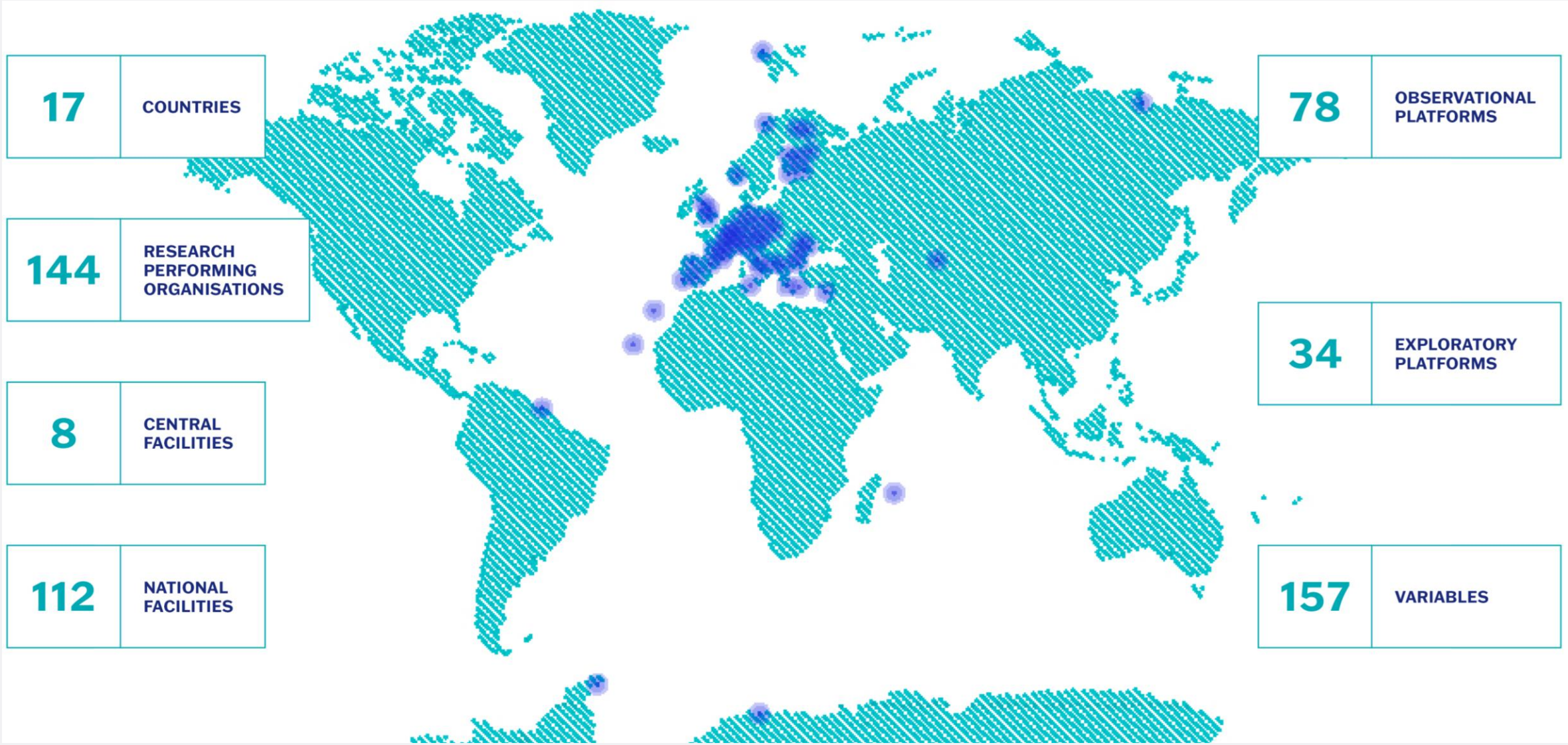
ACTRIS –distributed research infrastructure



Atmospheric observations for societal needs

Climate change

Emissions in industrial hotspots

Atmospheric hazards

Air quality in urban areas

Validation of Earth observations from space

Evaluation of models and data assimilation

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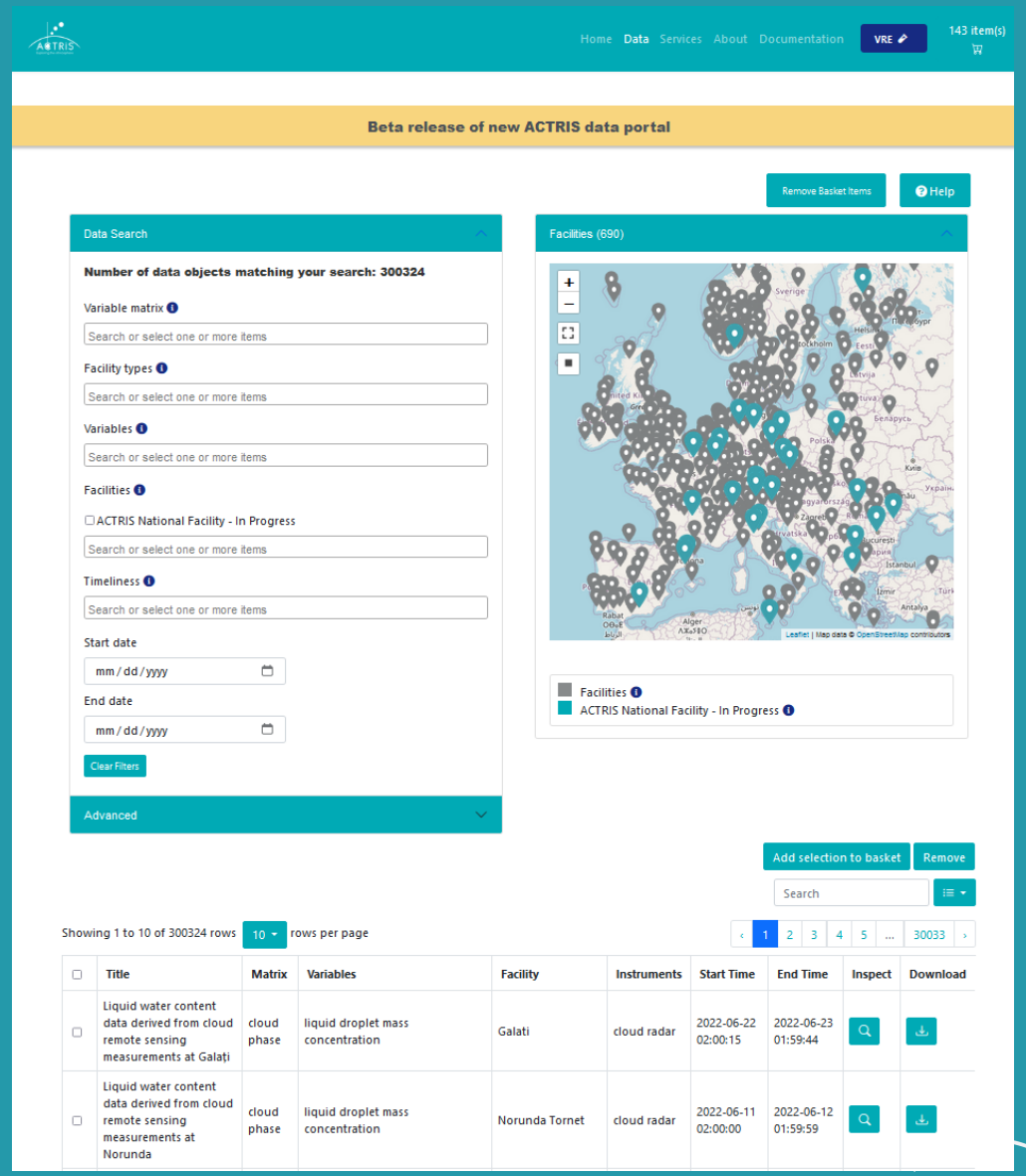
ACTRIS Core Services: data provision

- All data available for free via the ACTRIS Data Centre
- Over 100 variables
- Common measurement and data processing protocols + QA/QC
- Virtual tools for processing data online
- Joint effort from different parts of ACTRIS
  - Harmonization of the measurements
  - Development QA/QC processes
  - Software development
  - Shared vocabulary



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ACTRIS core services: access to the facilities

- ACTRIS provides physical, remote and hybrid access to the facilities to various user groups
- Access can be e.g. for:
  - Instrument testing in different environments and weather conditions (usage)
  - Field / experimental campaigns
  - Deployment side-by-side with regular ACTRIS instruments
- Access to ACTRIS facilities is provided mainly free of charge thanks to the Trans-National Access (TNA) programmes
- Selection process for the projects

Cyprus USRL, CARO, Munchen, Izana

Open calls for access to the facilities

- Open call offered via IRISCC project
- IRISCC – Integrated Research Infrastructure Services for Climate Change Risks
- Climate change-driven risks projects
- Second call just closed on 28 November 2025, but the third call will be announced soon
- Fast-Track is open throughout the project until 2028 for immediate access in response to climate emergencies.
- More info at iriscc.eu

Check ACTRIS opportunity page for upcoming calls:
https://actris.eu/opportunities/open-calls

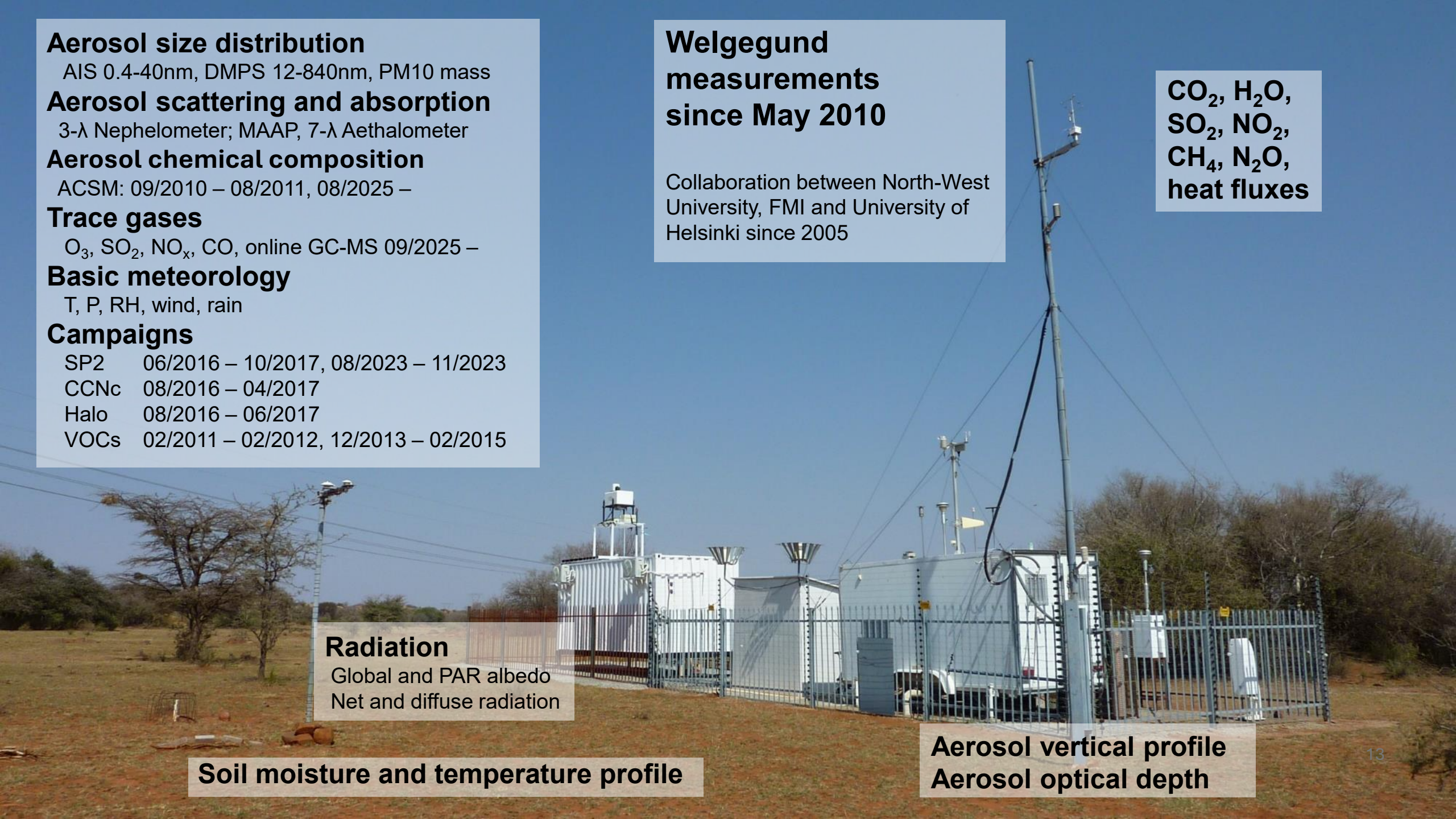
ACTRIS Services: Training & expertise

- essential to ensure knowledge transfer and best practice
- attract users from outside immediate ACTRIS network
- over 35 training courses and workshops in 2020-2024, both in-person and virtual
- over 1500 attendees, mostly engineers, technicians, PhD students and young scientists
- Upcoming: Aerosol in situ school 2026 (Czech Republic, 14-20 March 2026)
- see Events at the ACTRIS website https://www.actris.eu/news-events/events

Cloud remote sensing training school , 2025

ACTRIS Services: Technical & Innovation support

- Standard operation procedures developed for all ACTRIS techniques and variables
- Harmonised retrieval methods for geophysical products
- Centralaised instrument calibration services for the NFs
- Uptake of ACTRIS technical procedures in international networks, e.g. CARGO-ACT project
- Identifying new technologies and services
- Fostering collaboration & offering opportunities through the access program
- Co-creation between private sector and ACTRIS



Aerosol size distribution
AIS 0.4-40nm, DMPS 12-840nm, PM10 mass

Aerosol scattering and absorption
3-λ Nephelometer; MAAP, 7-λ Aethalometer

Aerosol chemical composition
ACSM: 09/2010 – 08/2011, 08/2025 –

Trace gases
O_3, SO_2, NO_x, CO, online GC-MS 09/2025 –

Basic meteorology
T, P, RH, wind, rain

Campaigns

SP2	06/2016 – 10/2017, 08/2023 – 11/2023
CCNc	08/2016 – 04/2017
Halo	08/2016 – 06/2017
VOCs	02/2011 – 02/2012, 12/2013 – 02/2015

Welgegund measurements since May 2010

Collaboration between North-West University, FMI and University of Helsinki since 2005

CO_2, H_2O, SO_2, NO_2, CH_4, N_2O, heat fluxes

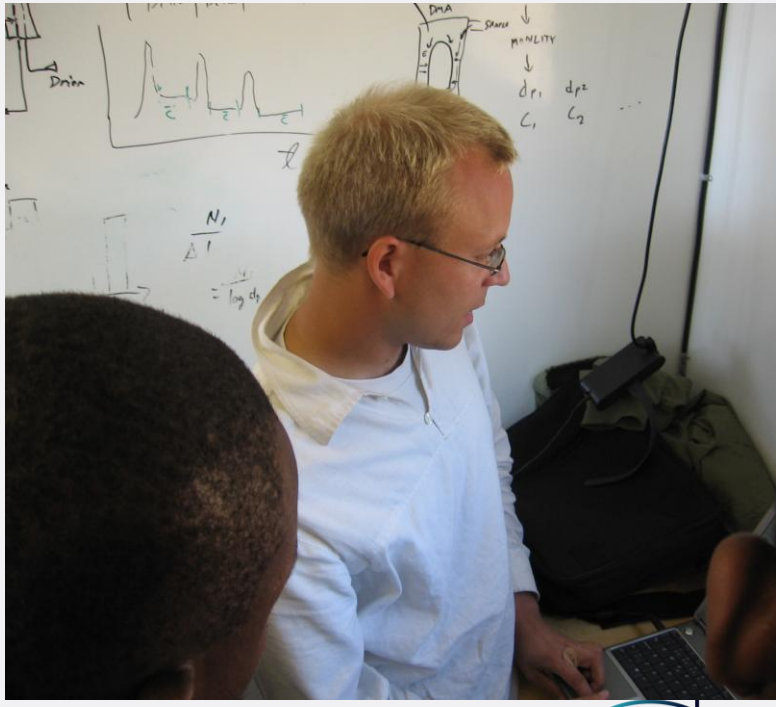
Radiation
Global and PAR albedo
Net and diffuse radiation

Soil moisture and temperature profile

Aerosol vertical profile
Aerosol optical depth

Establishing Welgegund site: lessons learned

1) Location, electricity, safety, access, regulation, data connection
2) Training, calibration, spare parts, data backup
3) Air conditioning, quality of electricity, good grounding



Main message:

1) **Commitment to comprehensive and continuous environmental observations**

2) **Continuous method development (instrumentation, models)**

3) **Active and open collaboration across various boundaries**

4) **Willingness to tackle and solve grand challenges together**

Welgegund
17.11. 2025

Upcoming event:
ACTRIS Science Conference 2026

ACTRIS Science Conference
20-23 April 2026 Oslo, Norway

Dates: 20-23 April 2026

Place: Oslo, Norway

Abstract submission deadline: 05.12.2025

Conference themes: 5

More information: actris.eu/ASC2026

- Long-term trends and variability of the atmospheric composition
- Atmospheric processes in the natural or controlled atmospheres
- Air quality and health
- Innovative technologies and methodologies for atmospheric probing
- Extreme events and emerging scientific topics in atmospheric sciences

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Thank you!
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