

# SERVICES CATALOGUE

Large Research Infrastructure

## Catalogue of services and options for scientists, schools, universities, technology companies and the public

Dear users,

here you will find information needed for your future stay and research activities within ACTRIS CZ. Accommodation and services provided by research infrastructure are free of charge as part of OPEN ACCES.



### **What is ACTRIS-CZ?**

ACTRIS-CZ is a large research infrastructure that focuses on the issue of regional air pollution levels in the Czech Republic and in a wider perspective also central Europe. It is composed of the National Atmospheric Observatory Košetice (NAOK), Observatory Milešovka and the Suchdol and Lom stations.



## Equipment

Equipment that can be provided for scientific purposes includes for example:

NAOK - mast	Measurement type	Available for users	Upon request
Sunset model 4 G (0 m)	Organic and elemental carbon	ANO	
Sunset model 4 G (230 m)	Organic and elemental carbon	ANO	
TSI CPC 3772	Aerosol particle number concentration	ANO	
TOF_ACSM	Atmospheric aerosols chemical composition	ANO	
Xact	Elemental composition of aerosol particles	ANO	
TSI CPC 3775	Aerosol particle number concentration	ANO	
TSI CPC 3750	Aerosol particle number concentration		ANO
SMPS TROPOS	Size distribution of aerosol particles		ANO
TSI APS 3321	Size distribution of aerosol particles		ANO
PSM	Size distribution of aerosol particles (> 1 nm)		ANO
CCNC	Aerosol particles hygroscopicity	ANO	
Aethalometer Magee Scientific AE33	Atmospheric aerosols light absorption		ANO
Low-volume sequential sampler LVS16	Sampling for subsequent chemical analysis	ANO	
Low-volume sequential sampler SEQ47/50	Sampling for subsequent chemical analysis	ANO	
Wind Observer 65 2D	Wind speed and direction	ANO	
Gill Wind Observer 3D	Wind speed and direction		ANO
Vaisala hmp 155	Air temperature and humidity	ANO	
R.M. Young 61302 L	Air pressure	ANO	
Skye SKU 420 a 430	AVA and AVB radiation	ANO	
Ceilometr Vaisala	Boundary layer height	ANO	

### Equipment table:

[https://actris.cz/web/wp-content/uploads/2023/04/Tabulka-pristroju\\_UCHP.pdf](https://actris.cz/web/wp-content/uploads/2023/04/Tabulka-pristroju_UCHP.pdf)

### List of measurements:

[https://actris.cz/web/wp-content/uploads/2023/04/Merici\\_program\\_A-CZ\\_2023.pdf](https://actris.cz/web/wp-content/uploads/2023/04/Merici_program_A-CZ_2023.pdf)

## Overview of measurements

What data and measurements are available?

### Meteorological measurements

- **Synoptic measurements:** air temperature, air pressure, vapor pressure, air humidity, dew point temperature, wind speed and direction, precipitation amount and type, sunshine duration, visibility, course of weather, cloud cover – type, degree of cloud cover, soil temperature (depths of 5, 10, 20, 50, 100 cm), soil moisture (depths of 7, 25 a 75 cm), evaporation, new snow height; maximum, minimum and surface temperature. These values are sent to the Central Forecast Office in Prague in an hourly interval and are used for weather forecasting.
- **Climatological measurements:** air temperature, air pressure, air humidity, wind speed and direction, precipitation amount, sunshine duration, visibility, cloud cover – type, degree of cloud cover, soil temperature (depths of 5, 10, 20, 50 a 100 cm), new snow height, evaporation. Values are measured at climatological times of observation (7 AM, 2 PM, 9 PM).

### Air quality and precipitation measurements

- **Real-time:** NO-NO<sub>x</sub>-NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, CO, physical and chemical properties of aerosol particles.
- **Offline:** PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1</sub>, chemical composition – cations (PM<sub>2.5</sub>), anions (TSP), EC/OC (PM<sub>2.5</sub>), PAHs, heavy metals (PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1</sub>).

## Users

Users are represented by various groups of people including scientists, high school and university students, tech companies, but also general public.

Users can use the equipment and infrastructure facilities free of charge. Also data from the LRI ACTRIS-CZ, including the data from the NAOK, Milešovka and Suchdol and Lom stations are available.

The Open Access offer also includes (in justified cases) an offer of accommodation directly at the NAOK in rooms with private bathroom facilities (max capacity of 24) with the possibility of rural non-vegetarian food and use of well-equipped conference room and a kitchen.



## Scientific workers

LRI ACTRIS-CZ provides the possibility of “Open access”. “Open access” serves infrastructure users who can use physical or virtual access by submitting an Application.

The entire process from submitting an application to realizing Open Access can take just four weeks.

Physical access is a type of access where the user directly visits the infrastructure and realizes their project approved by the ACTRIS-CZ expert council. The project may be in the form of training by an expert group or performing own measurements. This type of access applies exclusively to the location of the National Atmospheric Observatory Košetice.

Virtual access is a type of access where one can request data created by VVI ACTRIS-CZ. These data refer exclusively to the measurement sites associated with VVI ACTRIS-CZ.

### Examples of measurements accessible to scientific workers

- Possibility of sampling (aerosol particles, gaseous fraction) using the Sven Leckel or Digital high-volume or low-volume samplers.
- Data from real-time measurements – NO-NO<sub>x</sub>-NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, CO, physical and chemical properties of aerosol particles.
- Data from offline measurements – PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1</sub>, chemical composition – cations (PM<sub>2.5</sub>), anions (TSP), EC/OC (PM<sub>2.5</sub>), PAHs, heavy metals (PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1</sub>).
- Meteorological data – air temperature, air pressure, precipitation amount, sun shine duration, global radiation intensity, wind speed and direction, soil moisture, soil temperature, visibility, meteorological phenomena.
- Possibility of selected analyses of environmental and biological samples in the RECETOX accredited laboratories: Trace analysis laboratories (a special request via direct Open Access required)<sup>1</sup>.



## University and high school students

### Lectures for high school students directly at your school or NAOK

Provide your class with a lecture about air quality, measurement options, their application and current trends in atmospheric sciences.

---

<sup>1</sup> Environmental and biological sample analyses in accredited laboratories of RECETOX are a paid service

During the lecture, our researchers will introduce the students to how and why the different measurements are taken within the ACTRIS-CZ and provide answers to the questions: what will the data be used for? What will be the practical applications of the knowledge gained from them? What does the existence of ACTRIS-CZ mean for the Czech Republic?

### Professional thematic seminars for university students

We offer universities the organization of expert seminars on topics related to air quality and their applications. The seminars are led by experienced ACTRIS-CZ infrastructure researchers.

### Theses supervision and mentoring

Within the VRI, there is a list of final theses topics for which it is possible to apply.

These theses are announced under the guidance of expert supervisors from Masaryk University - RECETOX, CzechGlobe and ICP.

### Excursion to the meteorological station Košetice

In case of interest, an introductory lecture on ACTRIS-CZ, its technologies, equipment, research focus can be part of the excursion for secondary schools and universities. Below is an accompanying schedule depending on educational institution type.



#### Excursion

Specification	Duration	Organizer
Meteorological garden	1 h	Czech Hydrometeorological Institute
Air quality	1 h	Czech Hydrometeorological Institute
Greenhouse gases	1 h	CzechGlobe
Persistent organic pollutants	1 h	Masaryk University – RECETOX
Aerosols	1 h	ICP



## Presentations

Presentations are offered at the NAOK or at the applicant's own premises (e.g. at the school).

Specification	Duration	Organizer
Pollutants with ambient air quality limit values	45 min	Czech Hydrometeorological Institute
Results of measurements in Košetice	45 min	Czech Hydrometeorological Institute
Focus of CHMI	15 min	Czech Hydrometeorological Institute
Greenhouse gases	45 min	CzechGlobe
Role of aerosols in the atmosphere	45 min	ICP
Physical and chemical properties of aerosols	45 min	ICP
Persistent organic compounds	45 min	Masaryk University – RECETOX
Size matters ... small particles in the atmosphere	60 min	CzechGlobe
Height matters. Why do we monitor air quality at the extreme 250m high mast in Vysočina?	60 min	CzechGlobe
Different approaches to explore the impact of COVID-19 lockdowns on carbonaceous aerosols at a European rural background site.	60 min	CzechGlobe
How air quality is monitored and how does Czechia compare to other countries in terms of air quality?	60 min	CzechGlobe
Persistent organic compounds, how their pollution levels changed over the last 30 years – history of integrated monitoring at the background station in Košetice	60 min	CzechGlobe
Global change and measurements of greenhouse gas concentrations with the ICOS infrastructure.	60 min	CzechGlobe



## General public

- Open house
- Education for the public – public lectures.
- Virtual tours



## Technological companies

Offer for tech companies includes testing of specialized instrumentation, calibration, measuring rooms for instrumentation. Services for tech companies can be subject to a fee.

### Instrumentation testing

- Parallel measurements in real atmospheric conditions
- Testing measuring devices in extreme conditions (vibrations, shocks)
- Testing measuring systems and technologies in demanding conditions of high masts.
- Testing using drones<sup>2</sup>

### Calibrations

- Calibrations within the Prague Aerosol Calibration Center (PACC)

### Measurement spaces for campaigns

- Concrete platforms with electricity available
- Platforms at different heights on a 250m high mast
- Container

### Detailed offer of testing and parallel measurements

- Possibility to test specialized measuring equipment in demanding conditions (shocks, vibrations, various height gradients) on a 250m high mast. Instrumentation can be placed on the individual measuring platforms (50m, 125m, 240m), size of the device is limited by the size and load capacity of the elevator.
- Possibility of parallel measurements using specialized measuring devices for determination of hygroscopic properties of aerosol particles: HTDMA, CCNC.
- Presentation and training in the process of operation, maintenance and calibration of selected measuring devices.

---

<sup>2</sup> paid service





## Contact

If you are interested in some form of cooperation, organizing an event or should you have any questions, feel free to contact us at [info@actris.cz](mailto:info@actris.cz).



## ACTRIS CZ PROJECT

[www.actris.cz](http://www.actris.cz)

