

# Cabauw Experimental Site for Atmospheric Research

The **Cabauw** Experimental Site for Atmospheric Research Observatory (CESAR) is located in the central flat and rural region of the Netherlands approximately 17 km southwest of the city of Utrecht. It is managed by the Royal Netherlands Meteorological Institute (KNMI, de Bilt).



Cabauw is unique because of its vicinity to industrial areas on the one hand and sections of open ocean water on the other hand, so that it is often exposed to very clean or very polluted air. Therefore, at Cabauw it is possible to study a very wide range of air masses in a relatively short time providing the research community with a large spectrum of weather situations and air mass histories to link aerosol, clouds, chemistry and radiation. Because of the flat terrain of the Netherlands the influence of orography on the measurements can be neglected.

A suite of operational and research instruments is located on a 200 m high tower and at the surface. Both on the tower and at the surface there is ample opportunity for scientists to locate and run their own instruments. A small workshop and facilities to house and operate computers are located at the base of the tower. A high-speed Internet link connects the site to the outside world and provides means for remote control and (real-time) data transfer.

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## 1. RESEARCH INTEREST AND PARTICULAR COMPETENCES

In May 2002 seven national institutes in the Netherlands signed a memorandum of understanding of using the Cabauw site for land-atmosphere, and atmospheric research. All participating institutes have instruments operating at the Cabauw site, and together they participate in national and international research programs. The participating institutes are

- Royal Netherlands Meteorological Institute, KNMI
- Delft University of Technology, DUT
- National Institute for Public Health and the Environment, RIVM
- Wageningen University and Research Centre, WURC
- Netherlands Energy Research Centre, ECN
- European Space Agency, ESA-ESTEC
- Netherlands Organization for Applied Scientific Research, TNO

Activities at Cabauw comprise:

- Monitoring of long term tendencies in atmospheric parameters
- Studies of atmospheric and land surface processes for climate modeling
- Validation of satellite measurements (OMI, MSG, GOME, SCHIAMACHY)
- The development and implementation of new measurement techniques
- Training of young scientists at post-doc, PhD and master level.

## 2. GEOGRAPHICAL INFORMATION

Geographical coordinates: 51.971° N,  
4.927° E  
Altitude above sea level: - 0,7 m  
In operation since: 1972

## 3. METEOROLOGICAL INFORMATION

Main wind direction:  
Air pressure:  
Air temperature:

## 4. INSTRUMENTATION / MONITORING ACTIVITIES

Remote sensing	In situ (tower)	In situ (ground)
wind profiler	SJAC	rain gauges
ceilometer	LAS-X	disdrometer
IR-radiometer	FSSP-95	TDR

3 GHz radar	nephelometer	radiosondes*
35 GHz radar	sonic anemometer	ozone*
backscatter lidar	gas analyzer	optical particle counter
GPS-receiver	aethalometer	sun photometer
microwave radiometer	CO2	BSRN
UV radiometer	humidograph	total sky imager
scintillometer	wind sensors	
pyranometer	temperature sensors	
pyrgeometer		

\*) radiosondes are launched twice daily and Brewer ozone measurements are performed at De Bilt (25 km NE of the site). Ozone soundings are performed there twice a week.

Most instruments are operated continuously at the site. A Raman lidar system is currently under construction and will be operated at the site in the near future.

## 5. SPECIFIC INFORMATION

### a) URL of field site:

Cabauw site: <http://www.knmi.nl/onderzk/atmoond/cabauw/cabauw.html>

CESAR: <http://www.cesar-observatory.nl>

### b) Policy in relation to data availability and data access:

Data is supplied through a database managed by and at KNMI. Restricted data can be made accessible through a password-protected site. Public data is accessed directly through the KNMI web site and is free of charge. Data users are committed to acknowledge the use of Cabauw facilities and data in their publications. For data of a more experimental nature users are requested to contact the person responsible for the instruments and data and offer him/her co-authorship on any publication to protect the intellectual investment in the data.

### c) Access to the facility:

Access to facilities is free of charge. However, KNMI will impose handling charges and material charges in case large modifications and structures are necessary to put instruments in place on the tower or on the terrain or in case significant extra manpower is needed to run equipment. The Cabauw site is located near the village of Lopik (1.5 km distance) from which there is bus transport. Lodging is available in the surrounding towns (2-4 km distances) or the more distant cities (5-10km distance). There is no lodging capacity at the site itself.

### d) Fee for using the facility:

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### e) Scheduled scientific activities at the site:

KNMI and Cabauw has been host to several international field experiments in the last three years, such as the [Baltex Bridge Cloud campaigns](#). It participated and participates in a number of FP5 programs such as [CLOUDNET](#) and [CLIWANET](#).

**f) Association to national, European and/or international networks:**

Cabauw is linked internationally through the CEOP-network (GEWEX), the Advanced Profiling Network Stations (GEWEX) and Global Atmospheric Boundary Layers Experiment (GABL, GEWEX).

**g) Indication on specific issues for which collaboration is sought:**

The principal areas for collaboration are in the field of:

- Clouds Precipitation Aerosol Radiation Interaction. Measurements of clouds / precipitation / aerosol / radiation and studies of the radiative links between the parameters.
- Land Atmosphere Interactions. The energy transfer between the surface and the atmosphere.
- Validation of satellite observations of atmospheric composition, aerosols and clouds.

## 6. INSTITUTION IN CHARGE

[KNMI](#), the Royal Netherlands Meteorological Institute, is the national centre of knowledge and application in the field of weather prediction and climate research in the Netherlands. KNMI has a long and distinguished record of research and accomplishments in the area of remote sensing of the environment. KNMI is member of the Centre of Climate Research (CKO), an associate member of the Buys Ballotschool and is leading or participating in several (inter)national programs of remote sensing of the atmosphere, oceans, and land surface. KNMI is partner in the ACCENT network.

Head of the Atmospheric  
Research Department:

[Reinout Boers](#)

Climate and Seismology

Sector

KNMI

PO Box 201

3730AE De Bilt

Netherlands

Phone: +

Fax: +

Data Base Management:

[Henk Klein Baltink](#)

Climate and Seismology

Sector

KNMI

PO Box 201

3730AE De Bilt

Netherlands

Phone: +

Fax: +

Technical Support and  
Coordination:

[Wim Hovius](#)

Climate and Seismology

Sector

KNMI

PO Box 201

3730AE De Bilt

Netherlands

Phone: +

Fax: +

## 7. CONTACT PERSON

## 8. IMAGES



Cabauw 213 m high meteo mast



Cabauw remote sensing site



View to the North from



Cabauw tower



9.4 m booms at 20 m in  
directions