Earth Science from Space

KNMI plays an important role in developing earth observation satellites and in processing and interpreting their data. Forecasts for weather and climate, air pollution and solar radiation are largely made with data from these satellites.

Geostationary satellites, such as MSG, orbit so as to maintain a fixed point above the Earth

36.000 km

Polar satellites orbit at about 800 km from pole to pole, while the earth turns underneath

THE ATMOSPHERE

Northern lights

Thermosphere

85 km

Meteorites

Mesosphere

50 km

Weather balloon

Ozone layer, protects against UV radiation

Stratosphere

12 km

Troposphere

In this layer of the atmosphere our weather takes place

Important satellites with which KNMI works:

OMI
2004
NASA/KNMI
Measures ozone and air pollution

Metop series
2006
ESA/EUMETSAT
Ozone, wind and air pollution

MSG series
2002
ESA/EUMETSAT
Cloudiness, air pollution, sun and precipitation

TROPOMI
2017
ESA/KNMI
Air pollution, ozone and climate change

Aeolus
2018
ESA/KNMI
Wind profiles

EarthCARE
2024
ESA/JAXA/KNMI
Clouds, aerosols and climate change

What do our satellites measure?

Ozone layer
Ozone is monitored using UV light

Clouds
Cameras take pictures of the earth

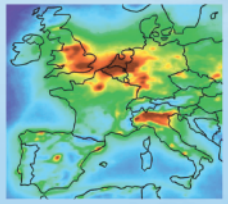
Wind
is calculated from radar reflections of sea waves

Climate change
Greenhouse gases such as methane are measured using infrared light

Air pollution
Small particles and gases, such as nitrogen dioxide, particulate matter and volcanic ash, are measured using UV light

Measuring air pollution is increasingly important. NO_2 measurements show that the air in Europe is not clean:

low *high*



The biggest air pollutants are

- Nitrogen dioxide (NO_2)
- Particulate matter (PM)
- Ozone (O_3)

KNMI is involved in the entire process from inception to use of satellite data

Formulating requirements

Planning

Design

Calibration

Launch

Data processing

Data interpretation

To customers
Government
Universities
Aviation
Meteorologists
Citizens