Monitoring air quality from space

Air pollution is a major environmental challenge, affecting millions worldwide. Poor air quality harms health, damages crops, threatens ecosystems and can disrupt energy supplies and transport infrastructure. Some pollutants are also greenhouse gases, which trap heat and drive climate change. Of chief concern among these are carbon dioxide and methane, with rising concentrations – largely due to human activity – that continue to set new records.

Observations from EUMETSAT's satellites are key to creating a complete picture of the chemical composition of the atmosphere. Satellites provide better spatial coverage than ground-based instruments, giving an up-to-date, reliable global view. This helps scientists reveal trends and track how pollutants move through the atmosphere.

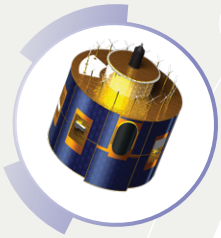
The Paris Agreement, an international treaty adopted in 2015 to limit global warming, sets the framework for Europe's efforts to hold emitters accountable and guide climate action. EUMETSAT's data support this by monitoring greenhouse gases from both natural and human sources, giving policymakers the evidence needed to act.

As well as operating satellites, EUMETSAT processes the data to make them available in a timely manner to its Member States and other users.

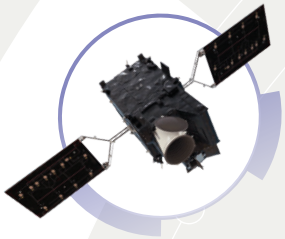
Through the Atmospheric Composition Monitoring Satellite Application Facility (AC SAF), led by the Finnish Meteorological Institute, Ilmatieteen Laitos, EUMETSAT produces, validates, delivers and archives data and products that support air quality forecasting and research.

EUMETSAT also delivers air quality data to the Copernicus Atmosphere Monitoring Service, implemented by the European Centre for Medium-Range Weather Forecasts on behalf of the European Commission (EC). The service uses the information to provide consistent and quality-controlled reporting for Europe and the rest of the world.

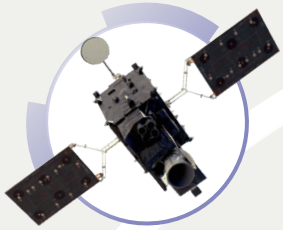
The satellites and the air quality data they provide:



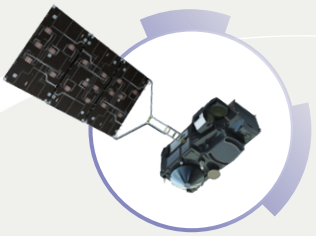
Meteosat Second Generation



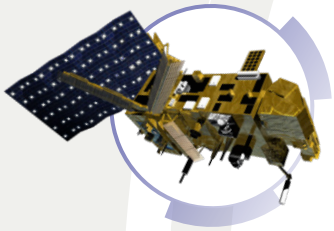
Meteosat Third Generation Sounder



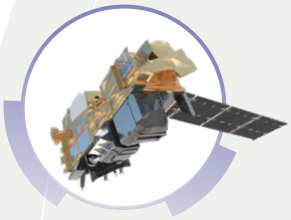
Meteosat Third Generation Imager



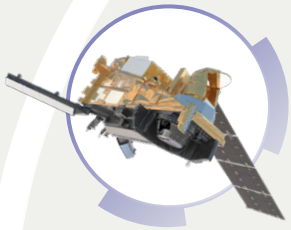
Copernicus Sentinel-3



Metop



Metop Second Generation A



Metop Second Generation B

CO2M

Current satellite fleet

Meteosat Second Generation

Aerosol characteristics in the atmosphere, including volcanic ash and dust.
Partners: EUMETSAT, ESA.

Meteosat Third Generation

Higher-resolution data on air mass characteristics, including water vapour.

Aerosols, including volcanic ash and dust.

Trace gases such as ozone, sulphur dioxide and carbon monoxide.

Copernicus Sentinel-4, carried on MTG-S1: ozone, sulphur dioxide, nitrogen dioxide, formaldehyde, glyoxal and aerosols.

Partners: EUMETSAT, ESA, the EC.

Copernicus Sentinel-3

Aerosol Optical Depth.
Partners: EUMETSAT, ESA, the EC.

Metop

Trace gases, including ozone, nitrogen dioxide, carbon monoxide, methane and water vapour, together with aerosols.
Partners: EUMETSAT, ESA.

Metop Second Generation

Higher-resolution and more detailed characterisation of trace gases and aerosols.

Copernicus Sentinel-5, carried on Metop-SGA: ozone, sulphur dioxide, nitrogen dioxide, water vapour, methane, carbon monoxide, bromine oxide, formaldehyde and glyoxal.

Aerosols including volcanic ash and dust.

Partners: EUMETSAT, ESA, the EC, CNES, DLR.

Future additions to the satellite fleet

CO2M constellation

Carbon dioxide, methane and nitrogen dioxide concentrations in the atmosphere. The monitoring of aerosol optical depth supports the accuracy of carbon dioxide and methane measurements.
Partners: EUMETSAT, ESA, the EC.

EUMETSAT

Eumetsat Allee 1
64295 Darmstadt
Germany

Tel: +49 6151 807 3660/3770
Email: press@eumetsat.int

For more information, visit the EUMETSAT website
www.eumetsat.int