

MONITORING THE ATMOSPHERE, OCEAN AND CLIMATE FROM SPACE

TRANSFORMING OUR WORLD



MONITORING THE ATMOSPHERE, OCEAN AND CLIMATE FROM SPACE FOR TRANSFORMING OUR WORLD

EUMETSAT's crucial observations of weather, environment and climate, scientific and technical expertise and support to capacity-building help make the UN's Sustainable Development Goals a reality



In September 2015, the United Nations General Assembly adopted "Transforming our World – the 2030 Agenda for Sustainable Development". The agenda is a plan of action with 17 Sustainable Development Goals aimed at eradicating poverty as an indispensable requirement for sustainable development.

The ambitious goals contain 169 targets and will stimulate action over 15 years in areas of critical importance for humanity and the planet. They recognise the interconnectedness of striving for peace and prosperity with promoting the health and dignity of people, the sustainable use of our planet's resources and the need for urgent action on climate change, and the importance of forging effective partnerships to make this a reality.

Satellite agencies like EUMETSAT have a key role to play in the 2030 Agenda for Sustainable Development's aims. Systematic and global observations of the Earth from space are essential for decision making and policy formulation in all regions of the world.

EUMETSAT's primary objective as an intergovernmental organisation, as set out in its Convention, is to establish, maintain and exploit European systems of meteorological satellites, taking into account, as far as possible, the recommendations of the World Meteorological Organization (WMO). A further objective is to contribute to the operational monitoring of the climate and detection of global climatic changes.

EUMETSAT is proud to be contributing to the implementation of Agenda 2030 through provision of global, accurate, consistent and timely observations of the weather, environment and climate from space and its involvement in user training and capacity-building projects. The use of its data and products saves lives, prevents economic loss and supports sustainable development and innovation.

De facto, the fulfilment of EUMETSAT's objectives place the organisation in a unique position to contribute practically and tangibly to the achievement of many of the UN's Sustainable Development Goals.





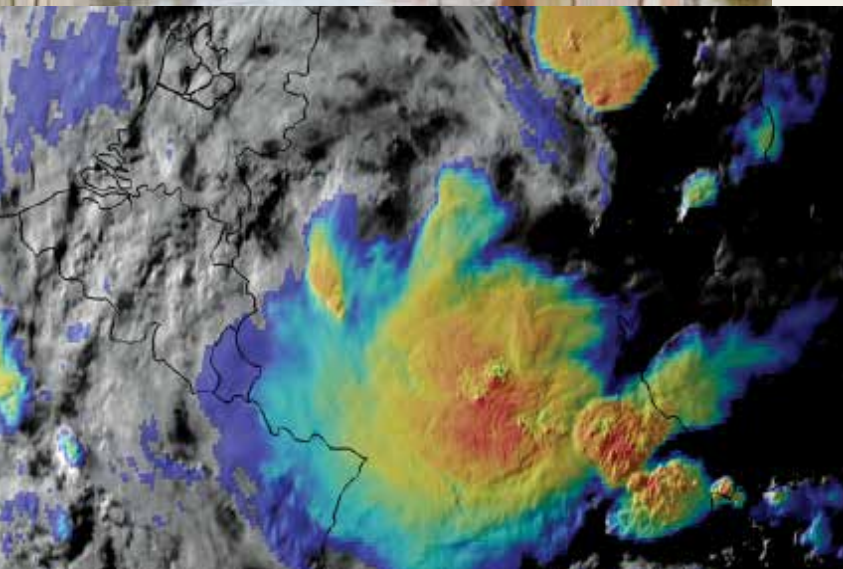
High impact weather

EUMETSAT observations are used by National Meteorological and Hydrological Services (NMHS) across the world in their endeavours to protect life and prevent economic loss from meteorological and hydrological hazards. Real-time satellite data are either used directly for nowcasting high impact weather or ingested in numerical prediction models supporting forecasts for ranges from days to seasons.

Building on these forecasts NMHS release early warnings that help reduce the number of people affected by disasters and related economic loss.

Through their use in weather forecasts, EUMETSAT's observations also contribute to transport safety and capacity, sustainable development and agriculture, water and land resource management and protection of public health, e.g. in case of heat waves amplified by heat islands in megacities.

Additionally, the data collection systems of EUMETSAT's Meteosat satellites collect and relay, in real-time, *in situ* observations from automated platforms deployed over the European and African continents and also over the Indian Ocean, as part of the global Tsunami early warning system.



On 29 May 2016, Meteosat imagery depicts a fast-developing, circular-shaped thunderstorm with very cold cloud tops (in red). Catastrophic floods washed away trees and cars and caused severe damage in Braunsbach and Simbach am Inn (top, source: Reuters).



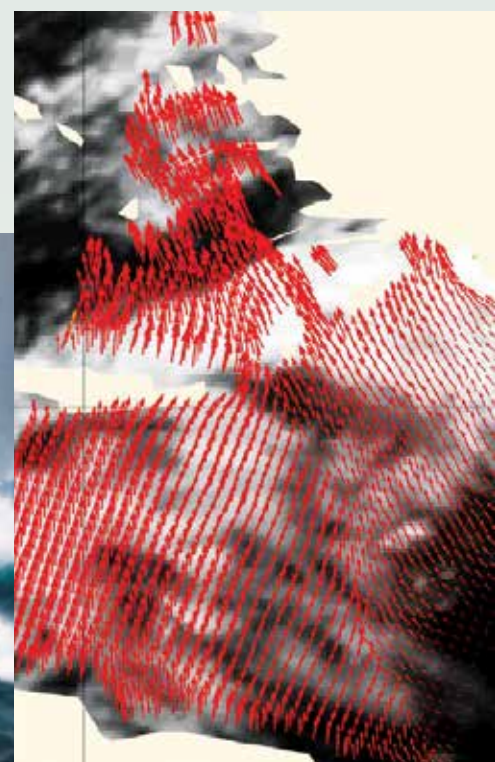
Our oceans

EUMETSAT monitors the oceans using its own satellites, Copernicus missions it operates on behalf of the EU, and the Jason missions shared with CNES, NASA and NOAA.

The resulting integrated marine data stream provides information about ocean currents, ocean surface winds, sea state, sea ice, sea surface temperature and ocean colour. These data are used directly and ingested in weather and ocean prediction models to provide crucial information for safety at sea, operations of marine infrastructure, fisheries, sustainable use of marine resources and protection of vital marine and coastal ecosystems.

In Europe, the Copernicus Marine Environment Monitoring Service (CMEMS) is the main provider of such analyses and forecasts for the global ocean and regional basins.

ASCAT ocean surface wind fields observed by the ASCAT scatterometer of EUMETSAT's Metop satellite (right), are crucial for safety at sea





Atmospheric composition

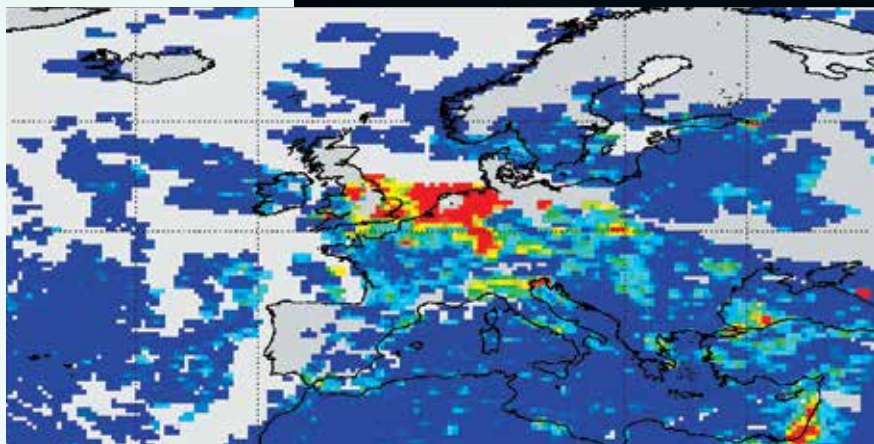
EUMETSAT monitors atmospheric composition from space using its geostationary and polar orbiting satellites which will, in the future, carry additional, dedicated Sentinel instruments provided by the EU Copernicus programme.

These satellite observations provide key inputs to forecasts of air quality over large urban areas as well as sand and dust storms, in particular in Africa. Public health benefits from the use of this information for regulating traffic or other economic activities and for warning of potential respiratory problems.

In Europe, EUMETSAT data is used by the Copernicus Atmosphere Monitoring Service (CAMS), which provides information on air quality, the ozone layer and harmful ultraviolet radiation to users worldwide.

EUMETSAT data and imagery are also used for forecasting the dispersion and transport of accidental pollutions and to monitor wildfires and the plumes of aerosols and the gases they generate.

EUMETSAT observations of volcanic ash and SO₂ plumes are also crucial for ensuring safety of aviation and optimisation of air traffic management capacity in case of eruption.



On 1 April 2014, the GOME-2 instruments onboard Metop-A and -B observed elevated levels of NO₂ total column concentration over parts of Germany, Belgium, the Netherlands and the UK



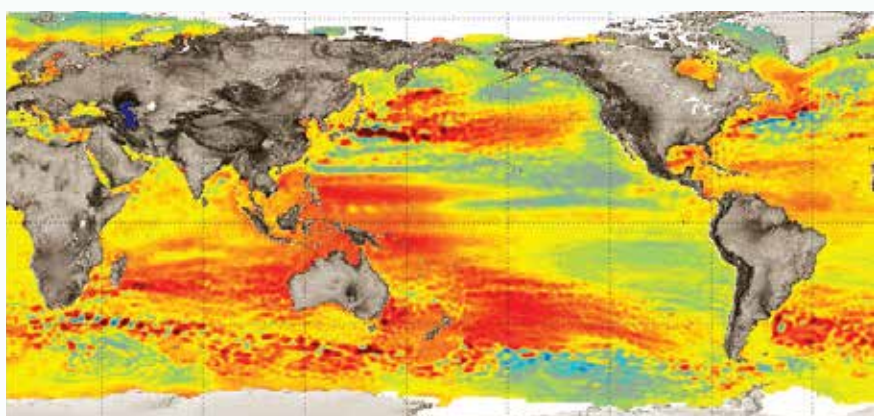
The changing climate

Satellites have the unique potential for observing systematically and globally 31 of the 50 Essential Climate Variables (ECV) identified by the Global Climate Observing System (GCOS).

With almost 40 years of Meteosat data available from its archives, and commitments for collecting another 30 years of observations from its current and next generation satellites, EUMETSAT is one key contributor to the Architecture for Climate Monitoring from Space, jointly coordinated by the Coordination Group for Meteorological Satellites (CGMS) and the Committee on Earth Observation Satellites (CEOS).

A recent inventory of existing and planned climate records of ECVs observable from space has revealed that 26 percent of the records originate from EUMETSAT and its Satellite Applications Facilities (SAFs).

Through data rescue, systematic recalibration of historical data and reprocessing of long series of data using the latest algorithms, EUMETSAT and its SAFs have already delivered



Map of regional trends (1993 - 2016) of mean sea level extracted from Topex/Poseidon and Jason altimetry data (source: CNES/LEGOS/CLS)

many climate records addressing 15 ECVs and plan to deliver improved and more data records also addressing additional ECVs from the atmosphere, ocean and terrestrial domains.

In addition, EUMETSAT supports the production of climate information as part of the Copernicus Climate Change Service and cooperative projects involving research partners and other satellite operators.

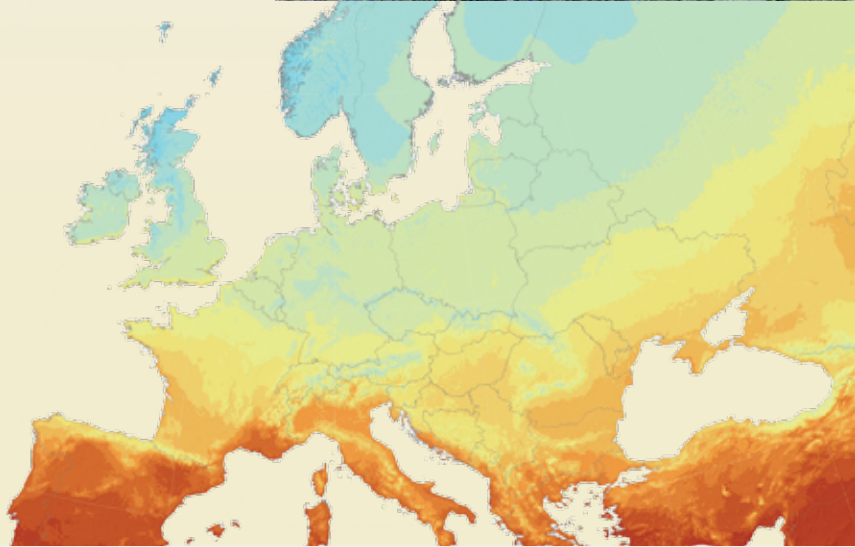
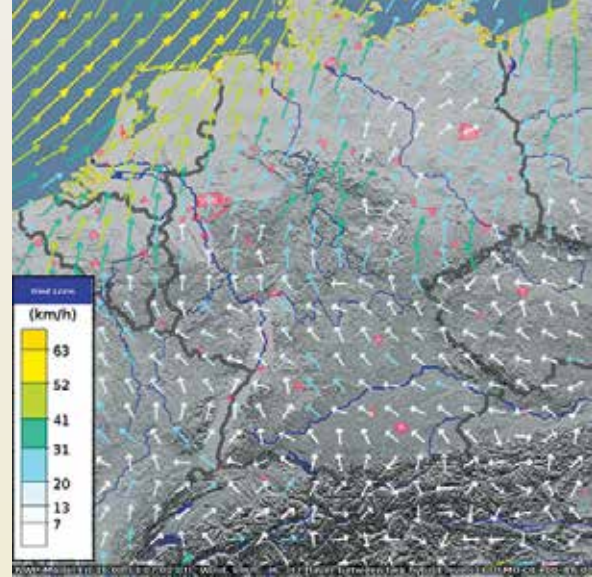


Energy

The dependencies between energy, weather and climate are increasing. As the demand for energy remains temperature-dependent, weather now determines the supply of the renewable part of the energy mix. Therefore, weather forecasts influence day-to-day decisions on energy production, while climate data are essential inputs for well-informed decisions on strategic investments in the energy sector, in particular on preferred energy sources and production capacity.

Observations from EUMETSAT satellites have a twofold contribution as they increase the performances of weather forecasts and are used to produce climate records of solar radiation parameters that can aid decision-making in relation to solar energy installations.

Forecast of surface wind field (top right) used to guide operations of wind turbines and predict their energy input to power grids (source: DWD), and a map of photovoltaic solar electricity potential (right) based on Meteosat solar irradiance climatology (source: JRC with inputs from CM SAF)



Training and capacity building

EUMETSAT supports training and capacity-building initiatives in Africa, Eastern Europe and Central Asia.

One example is EUMETSAT's uninterrupted support to a series of highly successful EU-funded capacity building projects (PUMA, AMESD, MESA, GMES&Africa). These projects involve the African Union Commission and regional economic communities in the development of weather, environment and climate information services, and an increasingly broad range of applications that are central to sustainable development.

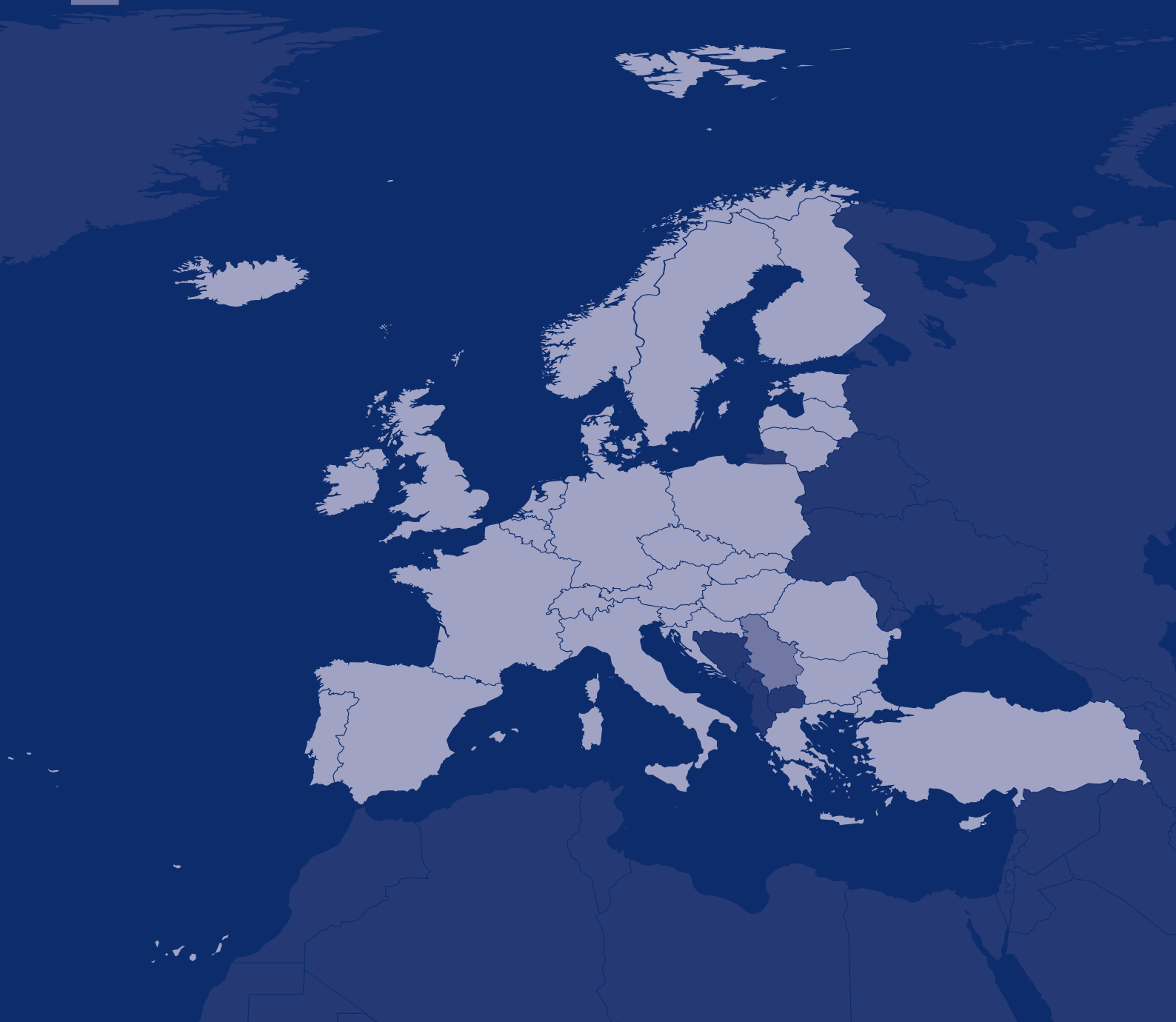
Via its EUMETCast-Africa data broadcast system, EUMETSAT provides access to data from satellites and weather and ocean forecast information from a variety of sources to more than 550 reception stations installed across the African continent.

EUMETSAT's record of effective partnership building, multilateral and bilateral cooperation makes it a trusted partner in capacity-building projects facilitating the use of Earth observation data and the building of sustainable communities, industries and environments.



The 12th EUMETSAT User Forum in Africa in Kigali, Rwanda, involves more than 160 participants from 51 African countries in a workshop atmosphere

- MEMBER STATES
- COOPERATING STATES



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MEMBER STATES



COOPERATING STATES



EUMETSAT also has established cooperation agreements with organisations involved in meteorological satellite activities, including the National Meteorological Services of Canada, China, India, Japan, Russia, South Korea and USA