sentinel-5 precursor

→ DATA ACCESS AND PRODUCTS

ESA's Sentinel-5 Precursor represents the first atmospheric composition mission in the frame of the European Earth Observation programme Copernicus. It will provide routine observations of atmospheric trace gases and aerosols products serving air quality, climate and stratospheric ozone applications.

The satellite's single payload instrument, the Tropospheric Monitoring Instrument (TROPOMI), is a push broom imaging spectrometer with a wide field-of-view allowing global daily coverage. It provides continuous high resolution spectral measurements in ultraviolet (UV), visible (VIS), near infrared (NIR) and shortwave-infrared (SWIR) bands.

The TROPOMI sensor is jointly developed by the Netherlands Space Office (NSO), for the main part covering the UV/VIS/NIR channels, and ESA, providing the SWIR channel module and all remaining elements of TROPOMI.

Coverage

The instrument swath width is approximately 2600 km on the ground ensuring a global daily coverage. Given the high spatial resolution of typically 7x7 km^2 TROPOMI will enable sampling of small-scale variabilities specifically in the lower troposphere.

Observation Scenario

Sentinel-5 Precursor will be operated according to a pre-defined, fully repetitive observation scenario, maximising the measurement time on the day-side of the orbit at a Mean Local Solar Time of 13:30.

Sentinel-5 Precursor will fly in loose formation with the NOAA Suomi-NPP mission to benefit from the high-resolution cloud information provided by the VIIRS instrument.

Data Access

Sentinel-5 Precursor data products are made available systematically and continuously over the full operational lifetime (7 years expected). All data will be free of charge to the end users including the general public, scientific and commercial entities.

The Sentinel-5 Precursor Level-2 products are available either in:
· NRT (Near Real Time), provided to the user within three hours after sensing (one day for total tropospheric ozone).

· Offline, provided to the user within two weeks after sensing.
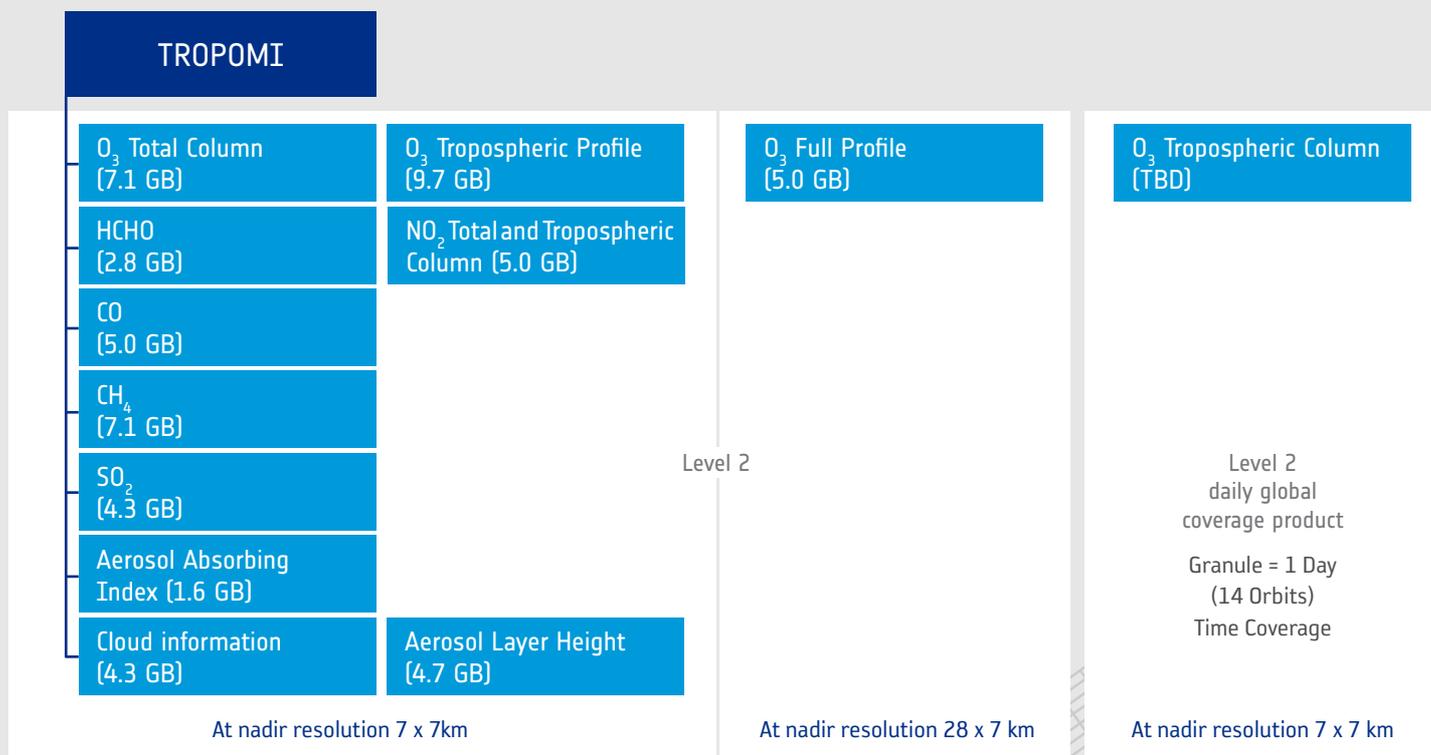
For more information visit:
https://sentinel.esa.int/web/sentinel/sentinel-data-access

Clear-sky OMI tropospheric NO_2 columns averaged over 60 month (2005-2009).
Image credits: Geert Vinken (TU/e) and Folkert Boersma (KNMI)
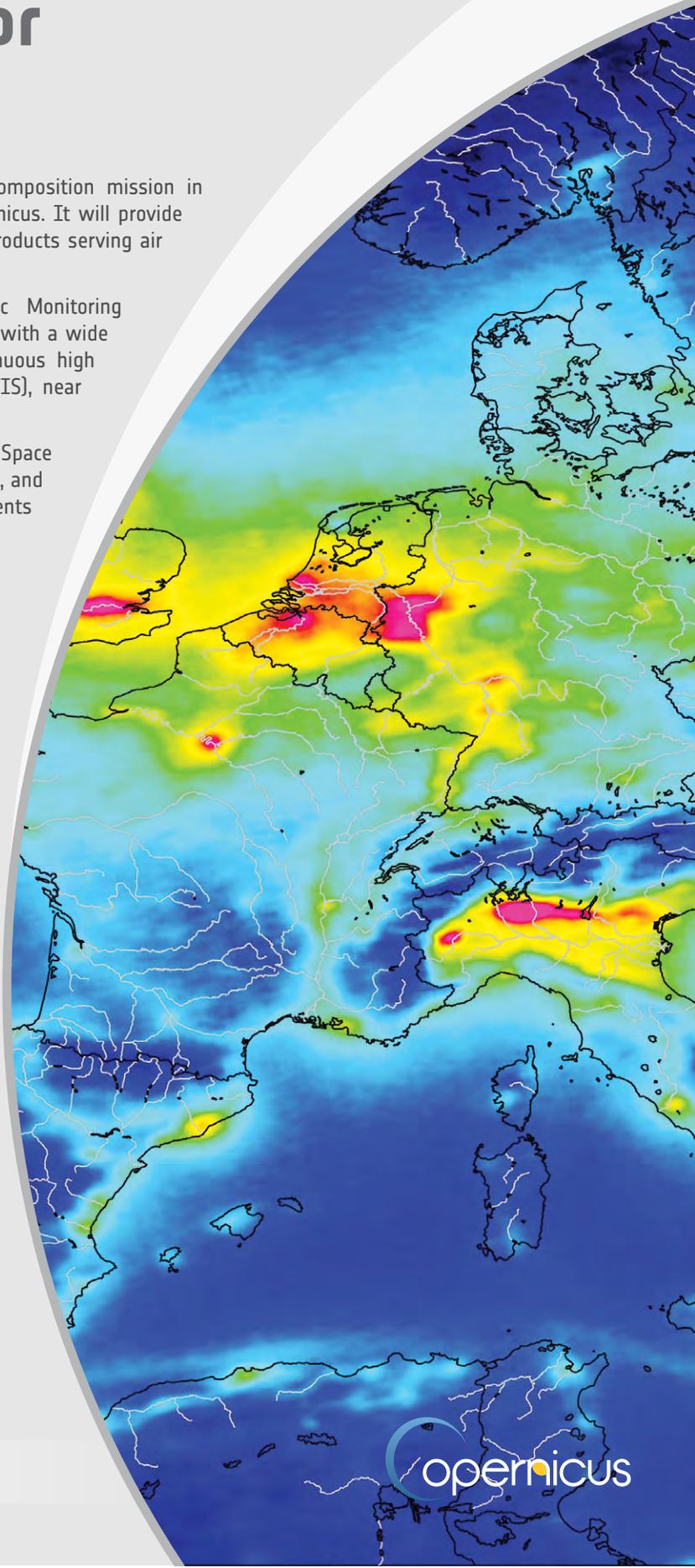
User Products

The Level-2 products are derived from the measurements in the eight TROPOMI bands covering the UV and visible from 270 to 500 nm, the NIR from 675 to 775 nm and the SWIR band, from 2305 to 2385 nm. The following products will be provided to the users (data volume per day):

TROPOMI			
O_3 Total Column (7.1 GB)	O_3 Tropospheric Profile (9.7 GB)	O_3 Full Profile (5.0 GB)	O_3 Tropospheric Column (TBD)
HCHO (2.8 GB)	NO_2 Total and Tropospheric Column (5.0 GB)		
CO (5.0 GB)			
CH_4 (7.1 GB)			Level 2 daily global coverage product
SO_2 (4.3 GB)		Level 2	Granule = 1 Day (14 Orbits) Time Coverage
Aerosol Absorbing Index (1.6 GB)			
Cloud information (4.3 GB)	Aerosol Layer Height (4.7 GB)		
At nadir resolution 7 x 7km		At nadir resolution 28 x 7 km	At nadir resolution 7 x 7 km

Each data product will comprise one logical file (directory) containing two physical files: one header file in .xml format and one datablock file in netCDF-4 format, providing the main product data and metadata. The metadata will follow the Climate and Forecasting (CF) convention.

Tools

The Sentinel-atmospheric Toolbox (BEAT) will be made available to end users to support extraction, visualisation and analysis of products.

More information can be found at:
https://sentinel.esa.int/web/sentinel/toolboxes/sentinel-atmospheric

The Sentinel Online Handbook

The **Sentinel-5 Precursor Mission guide** is an overview of the mission, its objectives, the satellite, its payload, the ground segment, generated data products and related news.
https://sentinel.esa.int/web/sentinel/missions/sentinel-5p

The **Sentinel-5 Precursor User Guide** provides a high-level description of the instruments, coverage and acquisition, and available product levels.
https://sentinel.esa.int/web/sentinel/user-guides/sentinel-5p-tropomi

The **Sentinel-5 Precursor Technical Guide** provides a point of engagement for ESA and technical users who have previous experience of similar Earth observation missions, and possess in-depth understanding of data manipulation and management.
https://sentinel.esa.int/web/sentinel/sentinel-5p-tropomi-wiki

Further Information
For Copernicus User support, please contact **EOSupport@Copernicus.esa.int**