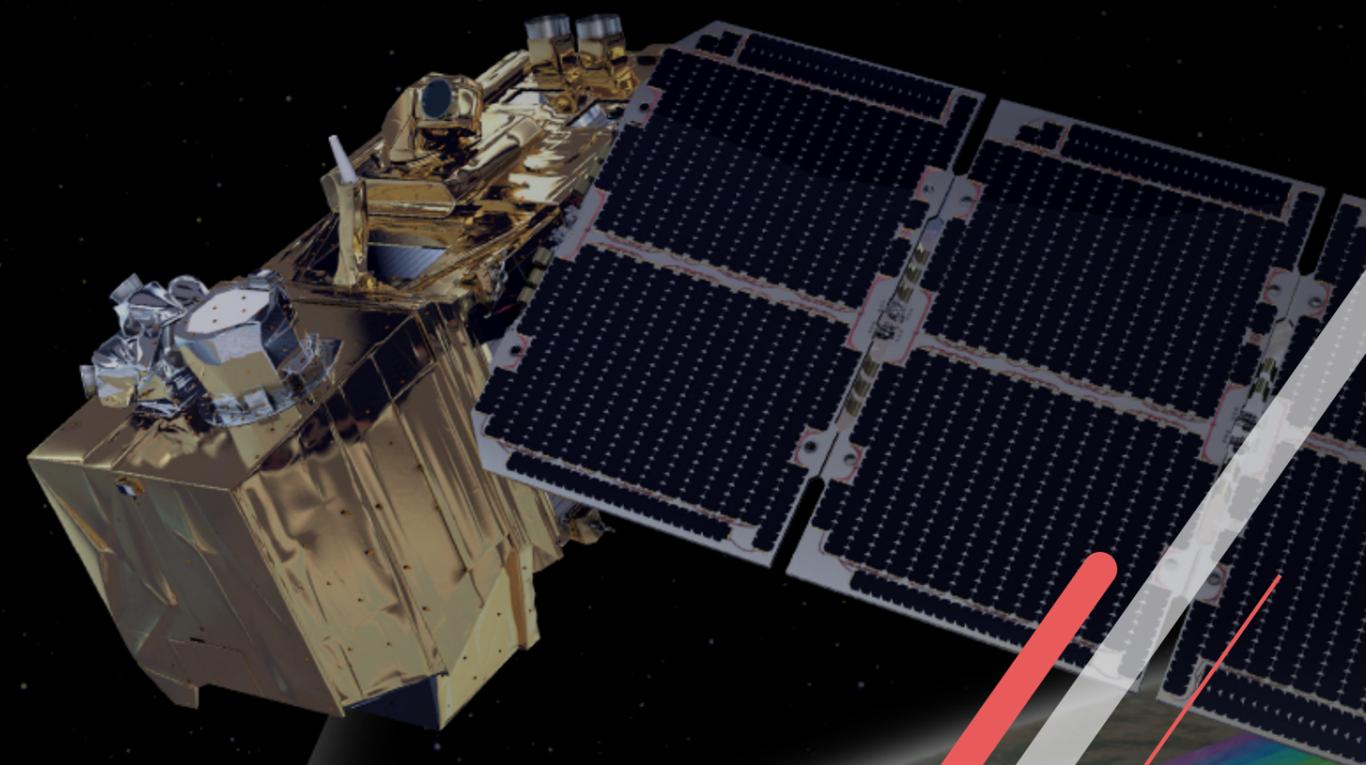




Horizon Europe,  
a programme of the  
European Union



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# **COPERNICUS: EARTH OBSERVATION SERVING SOCIETY**

**EXTENDED CAPABILITIES  
FOR THE BENEFIT OF  
EUROPE'S CITIZENS**



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# COPERNICUS: EARTH OBSERVATION SERVING SOCIETY

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## Copernicus' Earth observations for a healthy planet

The Earth's physical, chemical and biological systems and the human-made environment are constantly changing, instigated by both natural phenomena and the consequences of human activity. Through Earth Observation (EO) satellites, the status of and changes in these systems and environments can be monitored and assessed. Modelling, data assimilation and re-analysis provide seamless datasets on the different Earth subsystems about the past decades, the present and the future. These Earth observations and modelled data are invaluable in **understanding the planet's health and predicting future trends**. Furthermore, the gathered datasets, combined with research and development of targeted methods, provide us with unique means to mitigate climate change and moving to a fully sustainable future.

**Copernicus** serves as an independent and powerful European EO solution aimed at developing European information services to benefit all European citizens. It provides global data with its own fleet of Earth observation satellites (**Sentinels**) and offers geographic information services for environmental monitoring and civil security. These services are tailored to the needs of European users and primarily cover the areas of environment, climate protection, sustainable development, humanitarian aid and security-related issues.

## Copernicus evolves together with the Earth Observation market

Earth Observation is the second largest commercial market for the EU space industry. Market demand is expected to grow quickly in the next ten years. This is the case for **advanced, very high-resolution satellite imagery** and **affordable, high-resolution, high-revisit products** (typically smaller satellites in constellations). Horizon Europe supports efforts needed to mature application-oriented EO technologies to underpin competitiveness and contribute to the integration of space into society and the economy. The focus of EU-funded activities in EO technologies is on the timeliness and reactivity of observations, their resolution and swath (the area imaged by the sensor on the surface), the performance of sensors, onboard data handling capabilities and underlying technologies, among others.



### Boosting innovative R&I

€50.7 million of H2020 funds contributed to EO technology research between 2014-2020



### Europe's eyes on Earth

Monitoring our planet and its environment for the ultimate benefit of European citizens



### Supporting EU objectives

Enabling climate change decision making and supporting EU policy and Green Deal objectives

## Focused R&I supports the technological development of Copernicus and the related services

Looking to the future, **six Sentinel Expansion missions** are being studied, with the support of Horizon Europe, to address EU policy needs and evolving Copernicus user needs and to expand the current capabilities of the Copernicus space component:

**Copernicus Hyperspectral Imaging Mission for the Environment:** A unique visible-to-shortwave infrared spectrometer to support sustainable agriculture, biodiversity management, and soil property characterisation.

**Copernicus Imaging Microwave Radiometer:** A wide-swath conically-scanning multi-frequency microwave radiometer to observe sea-surface temperature, sea-ice concentration and sea-surface salinity.

**Copernicus Anthropogenic Carbon Dioxide Monitoring:** A near-infrared and shortwave-infrared spectrometer to measure atmospheric carbon dioxide produced by human activity.

**Copernicus Polar Ice and Snow Topography Altimeter:** A dual-frequency radar altimeter and microwave radiometer to measure and monitor the sea-ice thickness and overlying snow depth.

**Copernicus Land Surface Temperature Monitoring:** A high spatial-temporal resolution thermal infrared sensor to provide observations of land-surface temperature.

**Copernicus L-band Synthetic Aperture Radar:** A L-band SAR providing additional information, such as on vegetation, dry snow or ice, that cannot be gathered by the Copernicus Sentinel-1 C-band radar mission.

Dedicated research projects are also foreseen to evolve and expand the capacity of the Copernicus services.

## Introducing current space R&I projects Examples of Horizon 2020 projects

**Project HI-SIDE** (High-Speed Integrated Satellite Data Systems) aims to develop and demonstrate satellite data-chain technologies to advance onboard data handling and support high-speed data transfer for future applications.

**Project LEMON** (Lidar Emitter and Multispecies greenhouse gases Observation instrument) aims to develop a Lidar emitter for space applications to monitor greenhouse gases and water vapour.

**Project REDDCopernicus** assessed a future Copernicus Earth Observation service component to support sustainable forest monitoring.

## Be part of the EU-funded space R&I

Horizon Europe is the EU's key funding programme for research and innovation, with a budget of around €95 billion over 2021-2027, of which close to €1.6 billion is dedicated to space research. The space R&I is managed by the **Health and Digital Executive Agency (HaDEA)**, the **EU Agency for the Space Programme (EUSPA)**, the **European Space Agency (ESA)** and the **European Commission** itself. Most calls are also published on the **EC Funding and Tenders participant portal**.

