

Predicting crop yields and fertilizer needs in Belgium?

Tracking marine heat waves in the North Sea?

Monitoring the health of urban trees?

Predicting city growth in Wallonia?

Forecasting river flooding?

Want to cast your eye further?

What about monitoring the melt of Antarctica's ice sheet, geological hazards in Central Africa or the biomass of the Congo Basin Forest?



The Belgian remote sensing community gathers in Brussels to commemorate and celebrate 40 years of Belgium Earth observation research programmes. © BELSPO

All of this – and more – is possible with satellite imagery. And the expertise to use it has been developed in Belgian research laboratories active in **Earth observation (EO)**: the science of gathering information about our planet through remote sensing technologies. For a small country, Belgium has an impressive presence in this field, with **over sixty research labs** actively contributing.

Our national earth observation research programmes have played a major role in this success story – for forty years.

It all began in **1985**. As a founding member of the **European Space Agency (ESA)** in 1975 and a partner in France's SPOT satellite programme since 1977, Belgium helped lay the groundwork for Europe's space capability. But satellites alone weren't enough – Belgium saw the need to build national expertise in using the data. This led to **TELSAT**, a pioneering programme focused on using optical data for agriculture, cartography, forestry, marine science, and development aid. Five research organisations were involved in the first phase of the programme.

Run by what is now the **Belgian Science Policy Office (BELSPO)**, TELSAT grew in scope and impact through four phases. It introduced radar data, expanded institutional involvement and applications, and time and again proved the value of satellite imagery across disciplines.



A drone monitoring growth of fruit in orchard - © BELSPO

At the dawn of the 21st century, TELSAT evolved into a new programme: **STEREO**. Launched in 2001, **STEREO I** marked a leap forward both in scope and ambition. In addition to satellite data, the programme incorporated **airborne and drone-based imagery**, while the arrival of Hyperspectral and LIDAR sensors opened new frontiers in remote sensing. Networks of scientists gained importance, and the Earth observation community in Belgium grew significantly. The programme also welcomed **international partners**.

Another major milestone followed with the establishment of **TERRASCOPE** (www.terrascope.be), a state-of-the-art data processing and distribution platform.

Outreach and education became a priority. A dedicated website (<https://eo.belspo.be>) was launched, and national and international workshops and conferences were organized to share knowledge and build a community.

Now, in **2025**, **STEREO IV** also focuses on **AI, deep learning, and big data** to study the impact of climate change, hazards, environmental health, biodiversity and green cities. The programme reflects both technological progress and a shift in mindset. Earth observation is no longer just about collecting data – it's about making sense of a rapidly changing world and acting on that knowledge.

STEREO's success stems from its flexible funding schemes, strong ties to researchers, a commitment to community building and support for new talent. By raising the visibility of Belgian research on the international stage, it has helped Belgian researchers to secure international funding and form international collaborations.



Very high resolution satellite image of slums in Ouagadougou (Burkina Faso) - © BELSPO

Today, Belgium's EO **research landscape** is robust, interdisciplinary, and globally connected. It features a large and dynamic research community working across a wide range of domains. Belgian researchers consistently publish in **top-tier journals** and contribute significantly to **major datasets and data processing tools used globally**. Despite its size, Belgium **punches above its weight** internationally, with major contributions in fields such as **coastal and marine research, geological hazard monitoring in Africa, ecosystem studies, land cover analysis, and agriculture**. Reflecting its scientific strength, **two Belgian scientists currently serve on ESA's Advisory Committee for Earth Observation (ACEO)**.

Belgium can be proud of 40 years of remote sensing programmes – a story of **innovation, talent, resilience, and purpose**. And as the next generation takes the lead, this legacy will continue to inspire.