# ESA launches Biomass satellite to map global forest carbon in unprecedented detail



The European Space Agency (ESA) has successfully launched its groundbreaking Biomass satellite, marking a significant advancement in climate science and environmental monitoring. The launch occurred at approximately 11:15 CEST from Kourou, French Guiana, where the satellite was carried into orbit aboard the Vega-C rocket.

The Biomass mission aims to produce the most precise 3D maps of the world’s forests ever recorded from space, with an emphasis on measuring the global forest carbon stock. This data represents a crucial tool for understanding and monitoring the carbon content stored in forests, which plays a major role in the balance of greenhouse gases affecting the Earth's atmosphere.

Once deployed in orbit, the satellite will unfold a large, space umbrella-shaped radar antenna—a sophisticated design created by US defence contractor L3 Harris. The complete deployment of this antenna, which is made necessary by its size and complexity, is expected to take nine days to finalise.

At the heart of the mission is the P-band synthetic aperture radar, developed by Airbus and noted to be the first of its kind functioning in space. This radar operates with long wavelengths, enabling it to penetrate dense forest canopies and measure the woody biomass beneath the leaves—the primary reservoir of carbon within forests. The Next Web likens the satellite’s operation to an MRI for Earth’s forests, providing detailed internal imaging from space to reveal data hidden beneath thick foliage.

The Biomass satellite operates by capturing radar signals that reflect off the surface of the Earth. The umbrella antenna receives these signals and sends them back to the satellite's instruments, where they are processed into extremely detailed three-dimensional maps. These maps illustrate the structure of forests in terms of leaves, branches, and trunks, providing invaluable data for scientists.

Understanding the carbon stock within forests is essential because forests act as filters for greenhouse gases such as carbon dioxide. However, destruction or burning of forests releases these stored carbon quantities, exacerbating the problem of global warming—distinct from but related to climate change. Global warming refers specifically to the abnormal heating of the planet due to trapped greenhouse gases, while climate change involves broader shifts in weather patterns and temperature.

ESA’s Biomass mission is expected to revolutionise climate science by enabling scientists to monitor carbon storage and emissions with refined accuracy. This will support improved tracking of deforestation and forest regrowth, aid climate modelling, and inform policy-making related to emission targets, land use, and conservation efforts.

Beyond its primary focus on forests, the satellite’s advanced radar technology has versatile applications. It can map subsurface geology in desert regions, monitor the structural dynamics of ice sheets, and even reveal forest floor topography. This capability provides new insights into various Earth ecosystems, broadening the scope of environmental monitoring from space.

The data and insights produced by the Biomass mission stand to significantly enhance global understanding of natural carbon reservoirs, contributing to ongoing international efforts to address climate-related challenges. The Tech Times is reporting on the launch and its potential scientific and environmental impact.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.esa.int/Applications/Observing_the_Earth/FutureEO/Biomass> - This page provides detailed information about the Biomass mission, including its objectives, launch details, and the technology used, such as the P-band synthetic aperture radar and the 12-meter deployable antenna.
2. <https://www.esa.int/Applications/Observing_the_Earth/FutureEO/Biomass/The_satellite> - This article describes the satellite's design, highlighting the 12-meter deployable reflector supplied by L3 Harris Technologies and the P-band synthetic aperture radar developed by Airbus.
3. <https://www.esa.int/Applications/Observing_the_Earth/FutureEO/Biomass/ESA_s_pioneering_Biomass_satellite_arrives_at_launch_site> - This news release details the arrival of the Biomass satellite at Europe's Spaceport in French Guiana, confirming the launch site and the mission's objectives.
4. <https://www.airbus.com/en/newsroom/press-releases/2025-02-airbus-built-biomass-forest-measuring-satellite-shipped-to-kourou> - This press release from Airbus discusses the shipment of the Biomass satellite to Kourou, French Guiana, and provides insights into the satellite's design and mission goals.
5. <https://www.esa.int/Enabling_Support/Space_Transportation/Vega/Vega-C> - This page offers information about the Vega-C rocket, including its capabilities and role in launching missions like Biomass from Europe's Spaceport in French Guiana.
6. <https://www.arianespace.com/press-release/arianespace-and-esa-announce-the-earth-explorer-biomass-launch-contract/> - This press release from Arianespace and ESA announces the launch contract for the Biomass mission, detailing the launch vehicle and mission objectives.
7. <https://www.techtimes.com/articles/310184/20250430/esa-launches-space-umbrella-fight-climate-change-what-does-biomass-satellite-exactly-do.htm> - Please view link - unable to able to access data