

Nisar: Nasa-Isro mission to provide new insights into changing forests, wetlands

The mission will provide detailed insights into two key ecosystems - forests and wetlands - which play a crucial role in naturally regulating greenhouse gases in the atmosphere.

In Short

- The NISAR satellite is equipped with advanced radar systems
- The radar will penetrate forest canopies
- This information should inform the management of wetland ecosystems

In a bid to better understand the impact of climate change on Earth's ecosystems, NASA and the Indian Space Research Organisation (ISRO) are set to launch the NISAR radar satellite mission in early 2024.

The mission will provide detailed insights into two key ecosystems - forests and wetlands - which play a crucial role in naturally regulating greenhouse gases in the atmosphere.



Forests store carbon in their trees, while wetlands hold it in their organic soil layers. (Photo: Reuters)

[The NISAR satellite, equipped with advanced radar](#) systems, will scan nearly all of Earth's land and ice surfaces twice every 12 days. The data collected will help researchers understand the capture and release of carbon in these ecosystems.

Forests store carbon in their trees, while wetlands hold it in their organic soil layers. Any disruption to these systems can accelerate the release of carbon dioxide and methane into the atmosphere, contributing to global warming.

Paul Rosen, the NISAR project scientist at NASA's Jet Propulsion Laboratory, highlighted the importance of the mission, stating that the radar technology on NISAR will provide a sweeping perspective of the planet in space and time, offering a reliable view of how Earth's land and ice are changing.

Forestry and other land-use changes account for about 11% of net human-caused greenhouse gas emissions. [NISAR's data will improve](#) our understanding of how the loss of forests around the world influences the carbon cycle and contributes to global warming.



Nisar will monitor flooding in wetlands. (Photo: Nasa)

The radar will penetrate forest canopies, bouncing off tree trunks and the ground below, allowing researchers to estimate the density of forest cover and track changes over time.

Wetlands, despite constituting only 5 to 8% of the land surface, hold 20 to 30% of the carbon in Earth's soil. When wetlands flood, bacteria digest organic matter in the soil, making wetlands the planet's largest natural source of the potent greenhouse gas methane.

Conversely, when wetlands dry out, the stored carbon is exposed to oxygen, releasing carbon dioxide.

[NISAR will monitor flooding](#) in wetlands, tracking seasonal and annual variations as well as long-term trends.

Coupled with data on greenhouse gas release, this information should inform the management of wetland ecosystems. Bruce Chapman, a NISAR science team member and JPL wetlands researcher, emphasized the need to reduce our impact on wetland areas to prevent exacerbating climate change.

In addition to tracking ecosystem changes, NISAR will collect information on land motion, aiding researchers in understanding the dynamics of earthquakes, volcanic eruptions, landslides, and subsidence and uplift. It will also track the movements and melting of glaciers and sea ice.

Source: <https://www.indiatoday.in/science/story/isro-nasa-nisar-mission-forest-wetlands-changing-ecosystem-2455485-2023-10-30>