

IIT-I develops app to monitor water quality in wetlands

TIMES NEWS NETWORK

Indore: Researchers at IIT-Indore have developed a digital application that monitors water quality in wetlands using satellite imagery and cloud computing to detect issues like pollution and algae growth.

The tool was created by professor Manish Kumar Goyal and research scholar Vijay Jain from the department of civil engineering. It uses satellite data to track water quality parameters and identify problems such as excess nutrients and turbidity, an official release said.

India has 15.98 million hectare of wetlands, covering nearly 5% of its geographical area. The country is a signatory to the Ramsar Convention since 1982 and has 93 Ramsar-designated wetlands spread over 1.36

ADVANTAGES OF THE TOOL

> Real-time updates: Detects pollution, algae growth, or water quality issues faster than manual testing

> Cost-effective: Uses free satellite data and open-source platforms, reducing the need for expensive equipment

> User-friendly: Designed so that even local communities, NGOs, and non-specialists can use it

SCALABLE:
CAN BE APPLIED
ACROSS ALL
OF INDIA'S
WETLANDS

> Early warning system: Can help predict and prevent serious problems like algal blooms, invasive species spread, or pollution events



million hectare. While wetlands cover about 9% of earth's surface, they contribute more than 23% of global ecosystem services. These ecosystems face pressure from urbanization, pollution, climate change, and invasive species.

Traditional wetland monitoring has been dependent on manual water sampling and laboratory testing, processes that take time and can delay corrective action. The new application uses freely available Sentinel-2 satellite data with 10-met-

re spatial resolution and five-day temporal resolution. It calculates four indices: NDCI for chlorophyll content, NDTI for turbidity levels, NDWI for freshwater availability, and NDMI for moisture in aquatic vegetation.

The tool offers real-time updates, uses free satellite data and open-source platforms, and is designed for use by local communities, NGOs, and non-specialists. It can be applied across India's wetlands and may help detect problems like algal blooms or pollution events.

IIT-I director professor Suhas Joshi said, "This innovation reflects IIT Indore's commitment to developing technology for societal and environmental impact. By combining science, technology, and sustainability, this tool empowers authorities and communities to

protect our vital wetland ecosystems."

Professor Goyal said "Our tool provides real-time data that can be used as an early warning system for emerging threats. It enables quicker action, ensuring that wetlands can be protected and preserved for future generations."

He added, "Our near real-time water quality monitoring application empowers wetland managers and stakeholders with timely, satellite-based insights to detect pollution, eutrophication, and turbidity, enabling rapid intervention and informed decision-making to protect India's Ramsar Wetlands."

The researchers plan to add more water quality parameters and enable instant alerts on pollution events. The application is free for all users.