

Remote Sensing in Hydrology

Remote sensing is the science of gathering information about the Earth's water and land from a distance, typically using satellites or aircraft. It is a crucial tool in modern hydrology for several reasons:

Why Remote Sensing is Crucial

Large Coverage: It can monitor vast river basins and remote areas where humans cannot easily access or install ground-based sensors.

Monitoring Changes: It tracks variations in water levels, snow cover, and soil moisture over time, providing a historical and current perspective.

Disaster Management: It is used to predict and map natural disasters such as floods and droughts, helping in early warning and relief efforts.

Important Applications

1. Evapotranspiration (ET) Estimation

Remote sensing measures how much water is returning to the atmosphere from plants and soil. This is vital for water management and understanding the water cycle of a specific region.

2. Precipitation Mapping

Using satellite data (such as TRMM - Tropical Rainfall Measuring Mission and GPM - Global Precipitation Measurement) allows hydrologists to measure rainfall patterns on a global scale, even over oceans.

3. Land Use Change

It involves tracking how forests are being converted into farms or cities. These changes significantly affect how water flows across the landscape and how much of it infiltrates into the ground.

4. Water Quality

Remote sensing can detect pollutants or algae blooms in lakes and reservoirs from space by analyzing the spectral signatures of the water surface.

Summary

By providing a bird's-eye view of the Earth's surface, remote sensing allows for more accurate modeling of hydrological processes and better management of water resources globally.