Monitoring Global Terrestrial Surface Water Height using Remote Sensing

May 13 & 16, 2025

11:00-12:30 (English) or 15:00-16:30 (Spanish) EDT (UTC-4)

Oceans, lakes, and rivers are major components of Earth's surface water. Freshwater lakes and rivers are primary sources of water supply for drinking, agriculture, energy, and transportation, and support aquatic ecosystems and wildlife. A series of NASA satellites (e.g., TOPEX-Poseidon, Jason 1, 2, 3, & 6) with altimeter observations have been used to estimate ocean surface and inland lake surface heights (> 50 km2) since 1992. The latest NASA mission, Surface Water and Ocean Topography (SWOT), which was launched on December 16, 2022, allows the first ever mapping of global surface freshwater components, including rivers, lakes, and wetlands, with high-resolution measurements (~200 m). Environmental changes, land use, and other water supply and demand changes affect these freshwater sources. Particularly, rivers spanning multiple countries or states within countries pose challenges in estimating water availability and usage. The SWOT data provides unique capability of monitoring changes in freshwater, including river and lake level elevations, river width, slope, and discharge. This training will focus on introducing SWOT freshwater data products and their applications for water resources and disaster management.

Part 1: Overview of Remote Sensing Observations for Monitoring Global Terrestrial Surface Water in Large Rivers and Lakes

ARSET Trainers: Amita Mehta, Sean McCartney, Erika Podest

Guest Instructors: Matthew Bonnema (JPL)

- Background
- Introduction to the SWOT Mission and Terrestrial Water Data Products

Part 2: SWOT Mission Applications and Access for Retrieving, Visualizing, and Manipulating Data

ARSET Trainers: Amita Mehta, Sean McCartney, Erika Podest

Guest Instructors: Matthew Bonnema (JPL), Michael Durand (Ohio State University), Merritt Harlan (USGS)

- Overview of SWOT Data Applications
- Overview and Demonstration of SWOTViz
- Overview and demonstration of WISP

ARSET empowers the global community through remote sensing training.