National Aeronautics and
Space Administration

APPLIED REMOTE SENSING TRAINING (ARSET) PROGRAM

Online Resource Guide

The Applied Remote Sensing Training (ARSET) program empowers the global community through remote sensing training. Participants learn how to use NASA Earth data and models for environmental management and decision support through online and in person training. Trainings are intended primarily for policymakers, NGOs, and other applied science professionals seeking to incorporate NASA remote sensing into their daily activities. ARSET hosts both introductory and advanced webinars each delivered in a series consisting of multiple parts. Check the individual webinar page for its level and more information. Most webinars have materials available in English and Spanish.

Introductory Webinars: Trainings are appropriate for applied professionals with no remote sensing experience.

Advanced Webinars: Trainings are appropriate for professionals with experience in remote sensing or NASA data and resources. Advanced topics will detail specific data or applications by region or discipline. These advanced trainings have case studies and hands-on exercises for participants on data access and processing.

Materials associated with any of the ARSET In-Person trainings can be considered Advanced in scope and content.

ARSET empowers the global community through remote sensing training.

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Suggested Sequence of Online Resources

Fundamentals of Remote Sensing: These sessions provide a basic overview of remote sensing, common applications, data portals and data formats. Some ARSET courses use them as prerequisites.

Learning Objectives: Participants will become familiar with satellite orbits, types, resolutions, sensors and processing levels. In addition to a conceptual understanding of remote sensing, attendees will also be able to articulate its advantages and disadvantages. Participants will also have a basic understanding of NASA satellites, sensors, data, tools, portals and applications to environmental monitoring and management.

Audience: These trainings are appropriate for professionals with no previous experience in remote sensing.

Registration Information: These webinar sessions are open and after registering you will be taken to the training content.

[Start with the following two courses.]

Fundamentals Session 1 is a general overview of the Basics of Remote Sensing, applicable for all thematic areas.

Fundamentals NASA's Earth Observing Fleet: Get familiar with Earth observing satellites in NASA's fleet, sensors that collect data you can use in ARSET trainings, and potential applications.

[Then take the path depending on the thematic area of interest.]

- Land Applications
- Water Resource Management
- Disaster Management
- Health & Air Quality

Each Training webpage will contain all materials associated with the series (e.g. presentations, exercises, assignments, data, and a link to View the Recordings »

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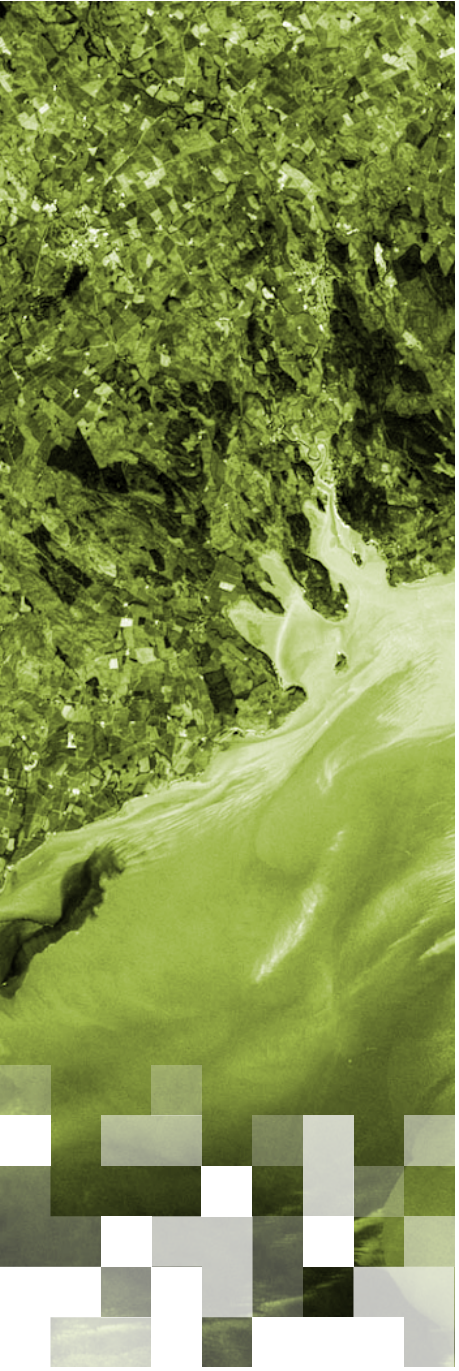


Remote Sensing Training for Land Applications

Trainings focus on accessing, interpreting, and processing NASA Earth Observation data for a variety of terrestrial applications and natural resources management. Topics include land cover mapping, conducting change detection, processing vegetation indices, degradation, deforestation, desertification, fire monitoring, and fire management. Trainings aid participants in the areas of conservation, animal movement, phenology, carbon monitoring, wildfire monitoring, and near-shore land and ocean processes.

After Land Fundamentals, any Introductory and Advanced series can be taken dependent upon topic and interest.

1. **Fundamentals Session 2A: Satellites, Sensors, Data and Tools for Land Management and Wildfire Applications**

2. **Fundamentals Session 2C: Fundamentals of Aquatic Remote Sensing**

3. **Introductory**

Remote Sensing of Forest Cover and Change Assessment for Carbon Monitoring

Remote Sensing for Conservation & Biodiversity

Introduction to Remote Sensing for Scenario-Based Ecoforecasting

Introduction to Remote Sensing for Coastal and Ocean Applications

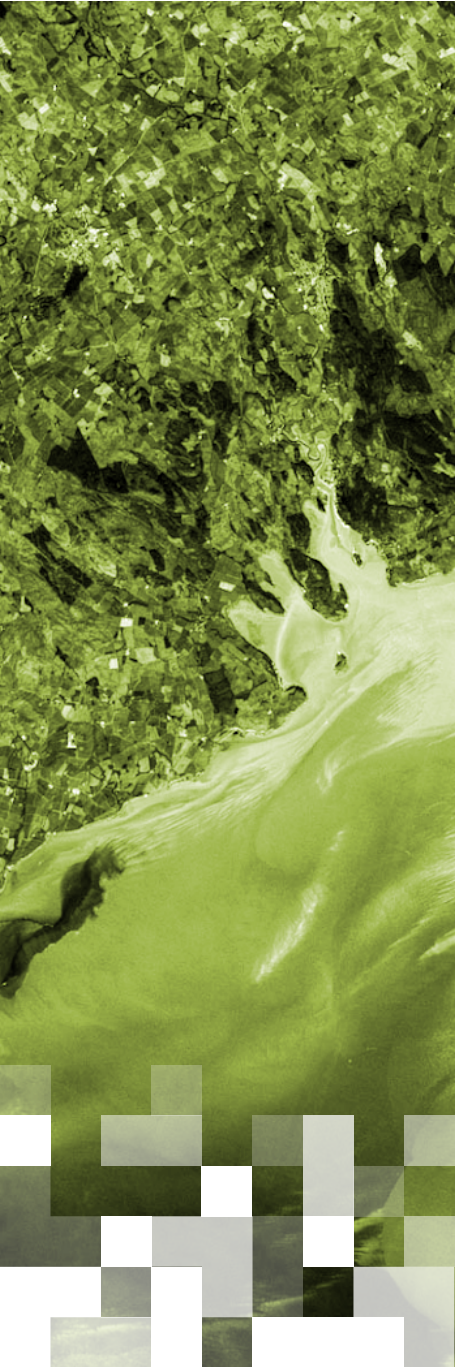
Earth Observations for Indigenous-Led Land Management

Remote Sensing for Freshwater Habitats

Introduction to Synthetic Aperture Radar

Using the UN Biodiversity Lab to Support National Conservation and Sustainable Development Goals

New Sensor Highlight: ECOSTRESS



Remote Sensing Training for Land Applications

Satellite Remote Sensing for Agricultural Applications

Understanding Phenology with Remote Sensing

Remote Sensing of Coastal Ecosystems

4. Advanced

Advanced Webinar: Land Cover Classification with Satellite Imagery

Advanced Webinar: Accuracy Assessment of a Land Cover Classification

Advanced Webinar: Change Detection for Land Cover Mapping

Advanced Webinar: Investigating Time Series of Satellite Imagery

Advanced Webinar: Remote Sensing for Monitoring Land Degradation and Sustainable Cities SDGs

Advanced Webinar: Techniques for Wildfire Detection and Monitoring

Advanced Webinar: SAR for Landcover Applications

Advanced Webinar: Forest Mapping and Monitoring with SAR Data

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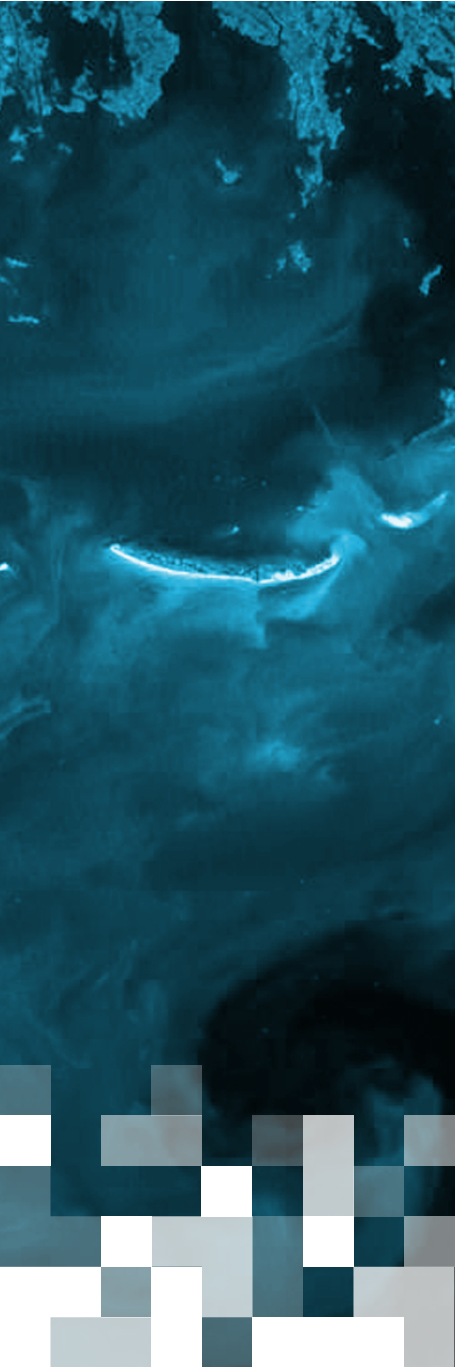


Remote Sensing Training for Water Resource Management

In person and online trainings focus on accessing, interpreting, and processing NASA Earth Observation data for a variety of water availability and quality parameters. Topics include rainfall, soil moisture, evapotranspiration, groundwater, harmful algal blooms, and water temperature.

After Water Resources Fundamentals, any Introductory and Advanced Series can be taken dependent upon topic and interest.

1. **Fundamentals Session 2B: Satellites, Sensors, and Earth Systems Models for Water Resources Management**

2. **Introductory**

Water Resource Management Using NASA Earth Science Data

Introduction to Global Precipitation Measurement (GPM) Data and Applications

Applications of Remote Sensing to Soil Moisture and Evapotranspiration

Introduction to Remote Sensing of Harmful Algal Blooms

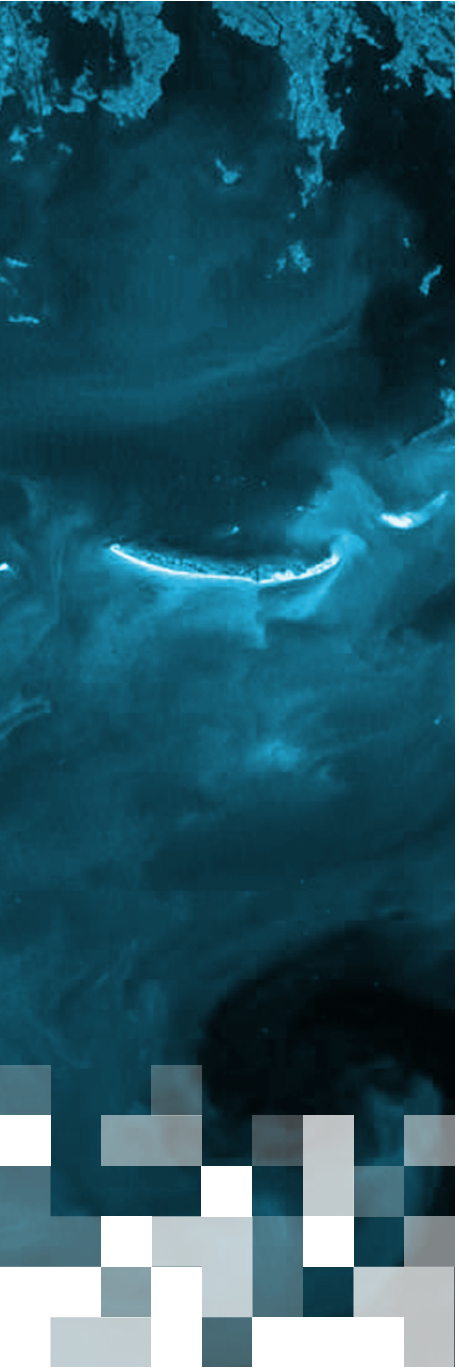
Introduction to Using the VIC Hydrologic Model with NASA Earth Observations

Introductory Webinar: Using Earth Observations to Monitor Water Budgets for River Basin Management

Introductory Webinar: River Basin Delineation Based on NASA Digital Elevation Data

Introductory Webinar: Satellite Remote Sensing for Agricultural Applications

Groundwater Monitoring using Observations from NASA's Gravity Recovery and Climate Experiment (GRACE) Missions



Remote Sensing Training for Water Resource Management

3. Advanced

Advanced Webinar: Remote Sensing of Drought

Advanced Webinar: Processing Satellite Imagery for Monitoring Water Quality

Advanced Webinar: Integrating Remote Sensing into a Water Quality Monitoring Program

Advanced Webinar: Applications of GPM IMERG Reanalysis for Assessing Extreme Dry and Wet Periods

Advanced Webinar: Using Earth Observations to Monitor Water Budgets for River Basin Management II

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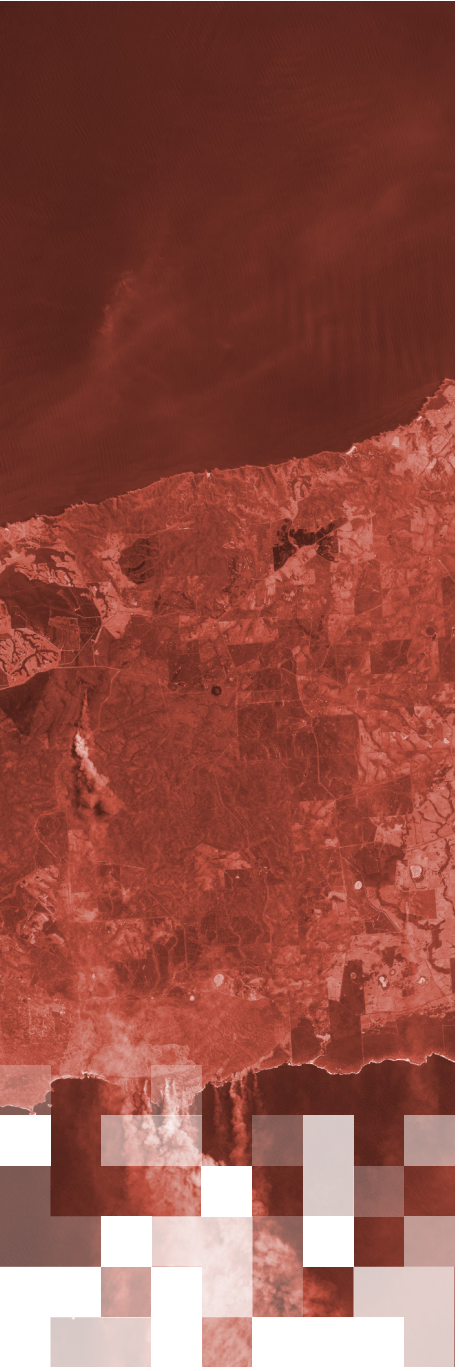


Remote Sensing Training for Disaster Management

In person and online trainings focus on accessing, interpreting, and processing NASA Earth Observation data for disaster management. The trainings are aimed at facilitating disaster monitoring, preparedness, and relief activities by using remote sensing observations. Topics include extreme rainfall, drought, floods, landslides, hurricanes, storm surge, earthquakes, and oil slicks.

Any Introductory and Advanced Series can be taken dependent upon topic and interest.

1. Introductory

Overview of the Global Disaster Alert and Coordination System (GDACS)

Introduction to Global Precipitation Measurement (GPM) Data and Applications

Introduction to Remote Sensing for Wildfire Applications

Using NASA Remote Sensing for Disaster Management

NASA Remote Sensing Observations for Flood Management

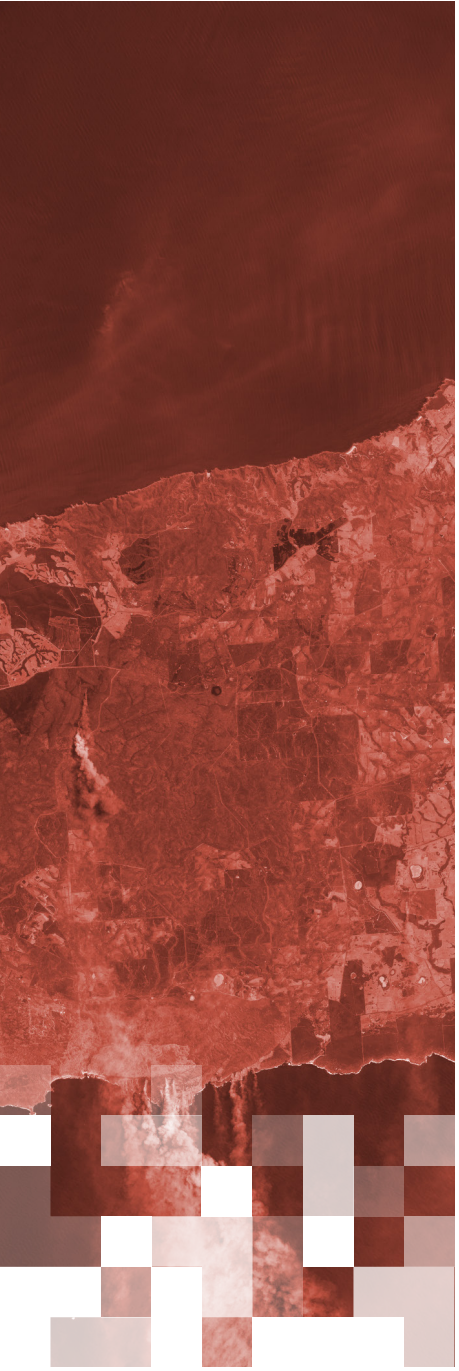
Introduction to Synthetic Aperture Radar

Monitoring Tropical Storms for Emergency Preparedness

Monitoring Urban Floods Using Remote Sensing

Earth Observations for Disaster Risk Assessment & Resilience

Remote Sensing for Disasters Scenarios



Remote Sensing Training for Disaster Management

2. Advanced

Advanced Webinar: Using NASA Remote Sensing for Flood Monitoring and Management

Advanced Webinar: Remote Sensing of Drought

Advanced Webinar: Radar Remote Sensing for Land, Water, & Disaster Applications

Advanced Webinar: SAR for Landcover Applications

Advanced Webinar: SAR for Disasters and Hydrological Applications

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Remote Sensing Training for Health & Air Quality

In-person and online trainings focus on assessing, interpreting, and processing NASA Earth observation data for a variety of health and air quality applications. Topics include observations of aerosols and trace gases; data access and applications; smoke and dust detection and monitoring; satellite-based surface particulate matter data sets; long range transport of atmospheric aerosols and trace gases; surface and satellite data inter-comparisons; comparisons between regional and global air quality models and satellite data; and long term air quality trends.

Any Introductory and Advanced Series can be taken dependent upon topic and interest.

1. Introductory

Fundamentals of Satellite Remote Sensing for Health Monitoring

Introduction to Satellite Remote Sensing for Air Quality Applications

Satellite Derived Annual PM2.5 Datasets in Support of United Nations Sustainable Development Goals

High Temporal Resolution Air Quality Observations from Space

An Inside Look at how NASA Measures Air Pollution

2. Advanced

Advanced Webinar: Satellite Remote Sensing of Particulate Matter Air Quality

Advanced Webinar: Methods in Using NASA Remote Sensing for Health Applications

Advanced Webinar: Data Analysis Tools for High Resolution Air Quality Satellite Datasets

Advanced Webinar: High Resolution NO2 Monitoring from Space with TROPOMI

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