EARTH SCIENCE
EARTH ACTION

Applied Remote Sensing Training (ARSET) Program

Online Resource Guide 2015-2025

Last updated March, 2026

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Self-Paced

ARSET offers asynchronous, self-paced training through our learning management system. Check back frequently as we build our catalog of flexible, interactive training courses that complement our live webinar offerings. Trainings features a mixture of lectures, demonstrations, and hands-on exercises. All online, self-paced trainings contain a final learning assessment that is available upon completion of all training modules. A certificate of completion is sent to participants who complete all modules and receive a passing score on the assessment.

Fundamentals of Remote Sensing

Participants 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.

Fundamentals

Bilingual (Spanish)

2025

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 their potential applications.

Fundamentals

2020

Developing Sustainable Earth Science Applications

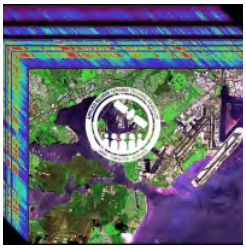
This training offers a flexible learning experience, allowing participants to choose to explore the Applications Pathway through any of the three storylines that are most relevant to them: the early career scientist, the partner new to remote sensing, and the experienced researcher.

Based on the NASA Earth Science Applications Guidebook, the training uses a narrative approach to introduce the Applications Pathway.

Introductory

2023

Hyperspectral Data for Land and Coastal Systems (Self-Paced)



The ability of hyperspectral data to characterize chemical, physiological, and morphological traits allows decision-makers to better understand critical components of ecosystem dynamics such as invasive species encroachment, forest decline and pest infestation, and ocean dynamics.

Introductory

2025

Agriculture

Satellite Remote Sensing for Agricultural Applications

This training addresses how to use remote sensing data for agriculture monitoring, specifically drought and crop monitoring. The training also provides end-users the ability to evaluate which regions of the world have agricultural productivity above or below long-term trends. This informs decisions pertaining to market stability and humanitarian relief.

Introductory

2020

Agricultural Crop Classification with SAR and Optical Remote Sensing

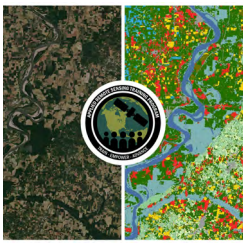
This five-part, intermediate training series focuses on the use of synthetic aperture radar (SAR) from Sentinel-1 and/or optical imagery from Sentinel-2 to map crop types and assess their biophysical characteristics. The training includes a SAR and optical refresher along with pre-processing and analysis of Sentinel-1 and Sentinel-2 data using the Sentinel Application Platform (SNAP) and Python code written in JupyterLab, a web-based, interactive development environment for scientific computing and machine learning.

Intermediate

Bilingual (Spansih)

2021

Large Scale Applications of Machine Learning using Remote Sensing for Building Agriculture Solutions



Participants become familiar with data format and quality considerations, tools, and techniques for processing remote sensing imagery on a large scale from publicly available satellite sources, using cloud tools such as AWS S3, Databricks, and Parquet. Additionally, participants learn how to analyze and train machine learning models for classification using this large source of data to solve environmental problems with a focus on agriculture. Participants gain a basic understanding of tools such as Pyspark and TensorFlow.

Advanced

2024

Crop Mapping using Synthetic Aperture Radar (SAR) and Optical Remote Sensing

This three-part, advanced training builds on previous ARSET agriculture trainings. We present more advanced radar remote sensing techniques using polarimetry and a canopy structure dynamic model to monitor crop growth. The training covers how to apply machine learning methods to classify crop type using a time series of Sentinel-1 & Sentinel-2 imagery. This series includes practical exercises using the Sentinel Application Platform (SNAP) and Python code written in Python Jupyter Notebooks.

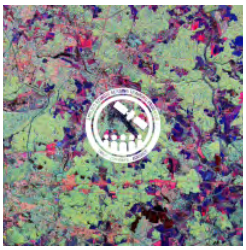
Advanced

Bilingual (Spanish)

2023

Agriculture

Mapping Crops and their Biophysical Characteristics with Polarimetric SAR and Optical Remote Sensing



This four-part, advanced training builds on the previous ARSET agricultural training. Here we present more advanced radar remote sensing techniques using polarimetry to extract crop structural information. We also present Sen4Stat – an open-source system demonstrating the potential of optical and SAR satellite Earth observations for monitoring and reporting of the SDG targets related to agriculture.

Advanced

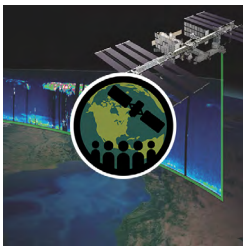
Bilingual (Spansih)

2022

Air Quality & Health

Air Quality

Lidar Profiling Satellite Observations for Air Quality Applications

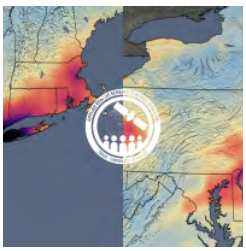


This training introduces data-users to the fundamentals of lidar remote sensing, highlighting strengths, limitations and differences when compared to passive remote sensors. Case studies are used to demonstrate how to interpret lidar imagery from a variety of past and current spaceborne lidars, including CALIOP, CATS, ICESat-2, and EarthCARE, and provides instruction on how to acquire lidar data for analysis by the user.

Introductory

2025

An Inside Look at How NASA Measures Air Pollution



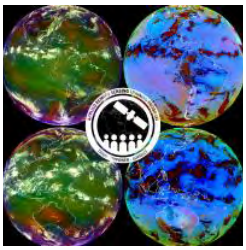
This training is tailored to those interested in learning how to access and visualize NASA satellite imagery. With the world's eyes and media coverage turned to recent global changes in air pollution, this two-part training series provides a primer for the novice and a good refresher course for all others. Participants learn which pollutants can be measured from space, how satellites make these measurements, the do's and don'ts of interpreting satellite data, and how to download and create your own visualizations.

Introductory

Bilingual (Spansih)

2020

High Temporal Resolution Air Quality Observations from Space



For certain applications, some satellites take too long to revisit the same spot. Some satellites are capable of continuous monitoring of the same area. This webinar series covers satellites with a high temporal resolution for air quality applications. Attendees learn about new and upcoming geostationary satellites, what data is available, and how to access them. The training covers satellites over the Americas, Asia, and Africa, and features speakers from NOAA, Yonsei University, and the Indian Institute of Remote Sensing.

Introductory

2018

Introduction to Satellite Remote Sensing for Air Quality Applications

This introductory training series provides a brief overview of some of the fundamentals essential to understanding the remote sensing process, data products, and their use in air quality applications. This training is specifically targeted at participants of the in-person workshops at the 17th IUAPPA World Clean Air Congress and the 9th CAA Better Air Quality Conference and the Atmospheric Optics: Aerosols, Visibility, and the Radiative Balance Conference.

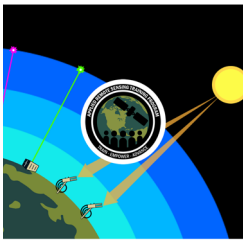
Introductory

2016

Air Quality & Health

Air Quality

NASA Atmospheric Composition Ground Networks Supporting Air Quality and Climate Applications



This online training provides a basic understanding of aerosol and trace gas measurements using both active and passive techniques for ground based remote sensing. It also teaches users how to select, access, and incorporate relevant data from these ground networks into their work. Finally, it demonstrates an application comparing ground-based and satellite remote sensing products.

Intermediate

2024

Accessing and Analyzing Air Quality Data from Geostationary Satellites

This three-part training series a) provides an overview of geostationary capabilities for monitoring air quality around the world; b) introduces geostationary aerosol datasets from GOES-East, GOES-West, Himawari 8, and the Geostationary Environment Monitoring Spectrometer (GEMS); and 3) presents data access and python tools to read and analyze the datasets.

Intermediate

2022

Tools for Analyzing NASA Air Quality Model Output

This advanced training series shows how to apply Python codes and other online tools to read, map, and analyze datasets from NASA Goddard Earth Observing System (GEOS) air quality forecasts as well as products from the second Modern-Era Retrospective analysis for Research and Application (MERRA-2) reanalysis. The training includes three sessions, with each session being two hours long. The sessions include lectures and hands-on activities, including exercises, interacting with web-based and offline Python tools, and time to perform analyses.

Advanced

2022

Introduction and Access to Global Air Quality Forecasting Data and Tools

This first-of-its-kind ARSET training focuses on NASA and European Center for Medium-Range Weather Forecasts (ECMWF) global air quality (AQ) forecasting capabilities. Delivered in collaboration with the Copernicus Atmosphere Monitoring Service (CAMS), this training discusses the basics of AQ forecasting and teaches users how to access and interpret global air quality forecasts. Anyone who is interested in learning about AQ forecasting will benefit from this training.

Advanced

2021

Air Quality & Health

Air Quality

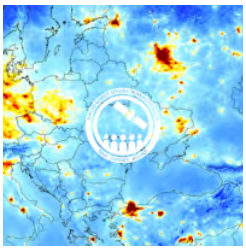
MODIS to VIIRS Transition for Air Quality Applications

This training teaches users how to access VIIRS data products, the differences involved in using VIIRS as opposed to MODIS, and how to apply VIIRS aerosol optical depth observations for air quality applications.

Advanced

2020

High Resolution NO2 Monitoring From Space with TROPOMI



The TROPOMI instrument onboard Sentinel-5P, launched in 2017, represents a significant improvement in spatial resolution over OMI. It is better-suited for many applications currently using OMI data, including monitoring air pollution. In this advanced training, attendees learn how to access and analyze TROPOMI data and learn about its applications.

Advanced

2019

Data Analysis Tools for High Resolution Air Quality Satellite Datasets

High resolution air quality data is helpful for monitoring urban air pollution. In this training, participants learn how to use Python scripts to map and analyze air quality data through hands-on exercises. The training covers MODIS aerosol optical depth data and OMI NO2 and SO2 data.

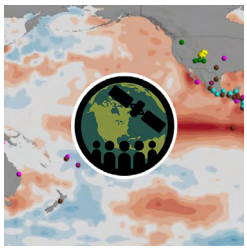
Advanced

2018

Air Quality & Health

Health

Remote Sensing for Climate-Sensitive Infectious Diseases

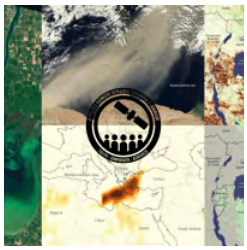


In this two-part training, participants learn the basic principles of how satellite remote sensing data can be applied to track climate-sensitive vector-borne disease outbreaks and provide early warnings for potential outbreaks.

Introductory

2025

Fundamentals of Satellite Remote Sensing for Health Monitoring



This introductory training provides an overview of environmental parameters available from NASA Earth Science that are useful for monitoring and predicting health for decision support. There are many different data sources from different satellite missions, sensors, and models, and sessions outline their features, strengths, and limitations. It also covers easily-accessible NASA data, web-based tools, analysis, visualization, and examples of data usage.

Introductory

2016

Methods in Using NASA Remote Sensing for Health Applications

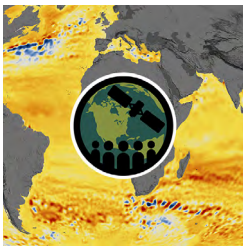
In this advanced training, participants learn how to access and apply NASA data relevant to public health. The training includes a presentation on tools available for evaluating the relationship between environmental conditions and health outcomes, followed by lectures on pollen dispersal and heat stress mitigation.

Advanced

2017

Climate

Sea Level Change Tools for Planning and Decision Support

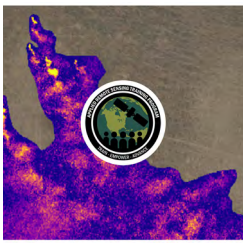


This training series focuses on NASA products and tools available to assess historical sea-level rise, access and understand projections of sea level, and investigate impacts. Participants are exposed to the causes behind regional and global sea-level changes and explore climate and analysis tools to access, visualize, and perform statistical analysis using NASA data.

Introductory

2025

Methane Observations for Large Emission Event Detection and Monitoring



This introductory two-part training begins with an introduction to the U.S. Greenhouse Gas Center and provides participants with an overview of how methane observations from the Earth surface Mineral dust Source Investigation (EMIT) mission can be used to identify and monitor areas of high methane enhancement. This course also demonstrates how to navigate the U.S. Greenhouse Gas center portal to access data products and highlights tools for visualizing methane observations.

Introductory

Bilingual (Spanish)

2024

Building Climate Risk Assessments from Local Vulnerability and Exposure

This training describes climate risk assessment approaches that originate with stakeholder expertise in the fundamental climate vulnerability and exposure of their system. The training provides an assessment and engagement framework and utilizes examples from the NASA Climate Adaptation Science Investigators (CASI) Program that is preparing NASA facilities for future climate resilience.

Introductory

2023

Selecting Climate Change Projection Sets for Mitigation, Adaptation, and Risk Management Applications

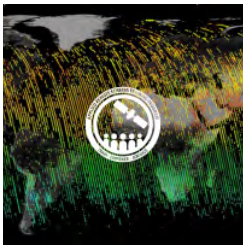
This two-part training provides an overview of resources for choosing climate projection sets for mitigation, adaptation, and risk management applications. The training gives an overview of application areas, defines a list of distinguishing characteristics of climate projection sets, and then highlights the main benefits and drawbacks of different types of projection sets.

Introductory

2022

Climate

Measuring Atmospheric Carbon Dioxide from Space in Support of Climate Related Studies



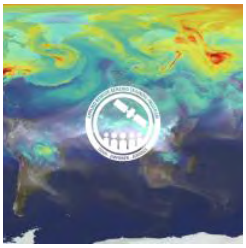
This introductory, four-part webinar series provides an overview of atmospheric carbon dioxide measurements from space with the OCO-2 and OCO-3 satellite missions. It includes a theoretical portion that describes the instrument, how the measurement is made, and the characteristics, limitations, and validation of the measurement.

Introductory

Bilingual (Spanish)

2022

Atmospheric CO2 and CH4 Budgets to Support the Global Stocktake



This three-part webinar series introduces bottom-up and top-down methods for tracking emissions and removals of carbon dioxide (CO2) and methane (CH4) from the atmosphere. This training explores how to combine this information to produce a more complete and transparent global stocktake, and supports efforts to reduce net emissions and mitigate their impact on the climate.

Introductory

2022

Earth Observations Toolkit for Sustainable Cities and Human Settlements

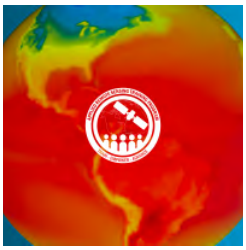
This three-part, introductory webinar series provides an overview of the Earth Observations Toolkit for Sustainable Cities and Human Settlements, an online knowledge resource that shares ready-to-use Earth observation data sets and tools. These resources can be applied in policy areas that are important to resilient and sustainable cities. Such areas include sustainable urban planning, adequate housing, access to public transport, and access to public spaces.

Introductory

Bilingual (Spanish)

2022

NASA Earth Observations for Energy Management



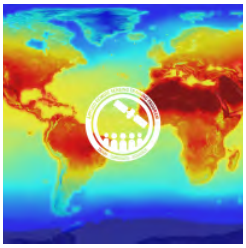
This training offers participants an introduction to how NASA EOs can contribute to a greater understanding of energy management applications. The course summarizes priorities and challenges for energy management and how various NASA EOs can support decision-making. Attendees will gain familiarity with a broad set of relevant NASA datasets, tools, platforms, and resources, as well as hear about case studies and real-world applications related to climate resilience, energy efficiency, and renewable energy.

Introductory

2021

Climate

Introduction to NASA Resources for Climate Change Applications



This two-part, introductory webinar series, co-produced by ARSET and the NASA Goddard Institute for Space Studies (GISS), provides an overview of NASA resources for monitoring climate change and its impacts. This training defines the terminology and the role of Earth observations in climate change assessment, and then provides an overview of NASA climate models suitable for emissions policy, impacts, risk, and resilience applications.

Introductory

2021

Earth Observations of Blue Carbon Ecosystems

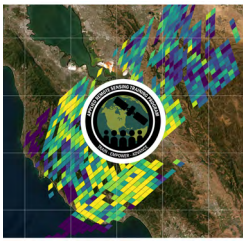
This training builds from a series of previous trainings on Remote Sensing of Coastal Ecosystems, Remote Sensing of Mangroves, Remote Sensing of Greenhouse Gases, and Remote Sensing of Carbon Monitoring for Terrestrial Ecosystems to provide a comprehensive overview of blue carbon ecosystem remote sensing. The training guides participants through mapping extent and quantifying the carbon stocks of blue carbon ecosystems using Earth observations to support assessment, monitoring, and restoration goals of these ecosystems.

Intermediate

Bilingual (French)

2024

Applications of Carbon Dioxide Measurements for Climate-Related Studies



This intermediate, three-part webinar series builds on the previous CO2 training from 2022, providing a more in-depth review of OCO-2 and OCO-3 measurements along with demonstrations of case-studies. The latter focuses on how to read, visualize, and interpret the data, how to account for quality flags in an analysis, how to use the data from the OCO missions to analyze impacts of an El Niño event on atmospheric CO2 and carbon sources and sinks, and how to examine spatial variations of CO2 over a metropolitan area.

Intermediate

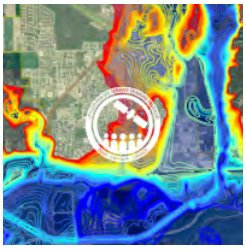
Bilingual (Spanish)

2024

Disasters

Floods

Monitoring Urban Floods using Remote Sensing



According to the UNDP, by 2050, two thirds of the world's population is likely to live in cities. Urban flooding is already a major risk for cities. Increasing impervious surface area, inadequate storm water drainage, and aging infrastructure all contribute. As a result, growing urban populations will face a greater risk of flooding from extreme weather events. This training series focuses on the components of urban flooding that satellite data can track extreme precipitation, flooding, and waterlogged and ponded surfaces.

Introductory

2018

Monitoring and Modeling Floods using Earth Observations

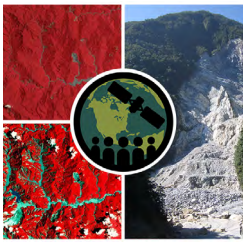
ARSET has offered several trainings on flood monitoring based on optical and SAR observations in the past. This two-part training focuses on recent developments and updates in flood monitoring tools and flood modeling techniques. Specifically, an overview of the Hydrological Modeling and Analysis Platform (HyMAP), a routing model used with NASA's Land Information System (LIS), and examples of flood modeling cases is presented in this training.

Intermediate

2022

Landslides

Landslide Monitoring and Risk Assessment Using NASA Earth System Data



This three-part training, in collaboration with the NASA Disasters Program, covers a number of topics relating to landslides, demonstrating a wide variety of NASA Earth science data uses to characterize landslides and their impacts. The training provides the scientific background of landslides to answer important questions such as: What is a landslide? Where do they occur? What causes them? And why?

Introductory

2025

Disasters

Populations

Humanitarian Applications using NASA Earth Observations

This four-part introductory training focuses on using NASA data products for monitoring human settlements and landscapes during armed conflict and forced displacement. This ARSET training is the first dedicated to humanitarian applications of NASA satellite imagery with topics including monitoring urban damage, mapping refugee settlement dynamics, and gauging climate hazards at refugee settlements.

Introductory

2022

Introduction to Population Grids and their Integration with Remote Sensing Data

This two-part training, developed and presented by members of the POPGRID Data Collaborative, focuses on the different global population grids and their application to a range of topics related to development planning and monitoring of the SDGs (e.g., environment, hazards, and access to resources). Attendees are exposed to the latest data and methods used to produce global grids, how the grids incorporate remote sensing inputs, and how population grids can be used in conjunction with other types of data.

Introductory

2021

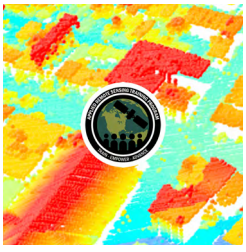
Earth Observations for Humanitarian Applications

The training focuses on flood risk assessments and specific challenges for assessing flood risk in refugee and IDP camps; gauging long-term heat stress in refugee camps and the challenges with decision making surrounding heat risk; and monitoring drought effects on agricultural landscapes in refugee settings using Earth observations (EO) to explore the correlations between anomalies in crop productivity and weather-based factors.

Intermediate

2024

Transforming Earth Observation (EO) Data into Building Infrastructure Data Sets for Disaster Risk Modeling



In this short course, we cover the basics of natural hazard risk modeling and exposure development with a focus on fusing data from multiple datasets expressly for the purposes of risk assessment. We also present examples of applying the techniques to applications related to flood risk assessment, climate adaptation, and earthquake modeling.

Intermediate

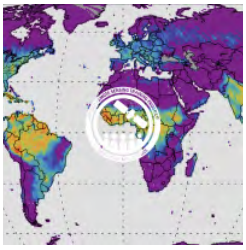
Bilingual (Spanish)

2023

Disasters

Solar Induced Fluorescence (SIF)

Use of Solar Induced Fluorescence and LiDAR to Assess Vegetation Change and Vulnerability



This introductory webinar series covers the fundamentals of Solar Induced Fluorescence (SIF) and LIDAR, their applications, and an overview of different satellite data sources that are openly available. In addition, it also includes a step-by-step guide on how to access, open, and interpret SIF and LIDAR data.

Introductory

Bilingual (Spanish)

2021

Solar Induced Fluorescence (SIF) Observations for Assessing Vegetation Changes Related to Floods, Drought, and Fire Impacts

This three-part, bilingual (English and Spanish) training demonstrates how SIF data can be used to study the impact of floods and droughts on agricultural systems and the impacts of fire on forested ecosystems. Participants gain hands-on experience analyzing SIF datasets from NASA missions including the Orbiting Carbon Observatory-2 (OCO-2) and Orbiting Carbon Observatory-3 (OCO-3), as well as using gap-filled data products derived using machine learning techniques.

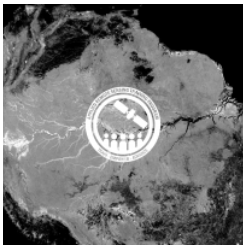
Intermediate

Bilingual (Spanish)

2025

Synthetic Aperture Radar (SAR)

An Introduction to Synthetic Aperture Radar (SAR) and Its Applications



This online webinar provides an introduction to SAR, including interferometric SAR (InSAR), as well as a review of the characteristics of historical, current, and upcoming openly-available SAR satellite data. It also explores the type of applications that each sensor can best address. Additionally, this webinar discusses online sources of openly available SAR data, along with tools, software, and other resources to understand, explore, and facilitate the analysis of SAR data.

Introductory

Bilingual (Spanish)

2024

Disaster Assessment using Synthetic Aperture Radar

This training includes theoretical portions for each disaster as related to the SAR signal interaction with surface conditions and demonstrations using Google Earth Engine, Jupyter Notebooks, and the SNAP Toolbox, all freely and openly available tools.

Intermediate

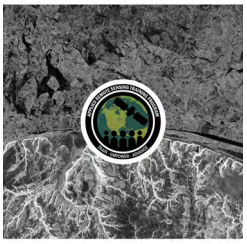
Bilingual (Spanish)

2022

Disasters

Synthetic Aperture Radar (SAR)

SAR for Detecting and Monitoring Floods, Sea Ice, and Subsidence from Groundwater Extraction



This training is a follow-on to the SAR training held in October 2022, which covered detection and monitoring of oil spills, landslides, and floods. This training addresses these applications through the use of open-source tools and SAR data to inform on disaster awareness and response and how to best allocate resources to mitigate their impacts.

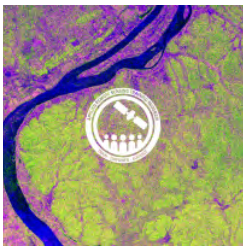
Advanced
Bilingual (Spanish)
2023

SAR for Landcover Applications

This webinar series builds on the knowledge and skills previously developed in ARSET SAR trainings. Presentations and demonstrations focus on agriculture and flood applications. Participants learn to characterize floods with Google Earth Engine and learn to analyze synthetic aperture radar (SAR) for agricultural applications, including retrieving soil moisture and identifying crop types.

Advanced
Bilingual (Spanish)
2019

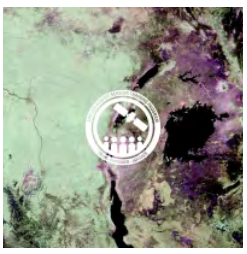
SAR for Disasters and Hydrological Applications



This training builds on the skills taught in previous ARSET SAR trainings in terms of the use of Google Earth Engine for flood mapping with radar data. This training presents two new topics; the use of InSAR for characterizing landslides and the generation of a digital elevation model (DEM).

Advanced
Bilingual (Spanish)
2019

Radar Remote Sensing for Land, Water, and Disaster Applications



This webinar series builds on ARSET's previous webinar, Introduction to Synthetic Aperture Radar. The training focuses on different techniques such as time-series', polarimetry, and interferometry for mapping and monitoring disasters, water, and land cover applications such as deforestation, crops, flooding, and earthquakes.

Advanced
Bilingual (Spanish)
2018

Disasters

Urban Heat Islands (UHI)

Satellite Remote Sensing for Urban Heat Islands

This training addresses the use of remote sensing in determining where "hot spots" of land surface temperature are located in urban areas, why these areas are experiencing increased temperature, which populations are most vulnerable, and ways to mitigate the effects through adaptive land use planning.

Introductory

2020

Satellite Remote Sensing for Measuring Urban Heat Islands and Constructing Heat Vulnerability Indices

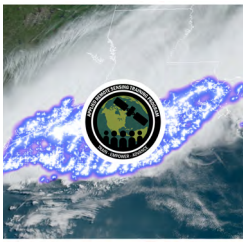
Once urban heat islands (UHIs) have been mapped, incorporating socioeconomic data pertaining to population, demographics, and health information into heat vulnerability indices (HVIs) can help guide interventions to manage heat related risks to public health. This four-part, advanced webinar builds on ARSET's urban heat island training held in November 2020 with hands-on exercises for participants to measure UHIs and construct HVIs for their areas of interest.

Advanced

2022

Other

Introduction to Lightning Observations and Applications



As the intensity and frequency of extreme weather events are likely to increase due to climate change impacts, lightning activity will likely increase as well, causing more power outages, increased risks of wildfire ignition, and increased numbers of injuries and fatalities. Therefore, information about lightning activity is critical for better preparedness against these disasters. This three-part, introductory training focuses on global and regional lightning data products that can be applied to disaster risk preparedness.

Introductory

2024

Disasters

Other

Introduction to NASA's "Black Marble" Night Lights Data

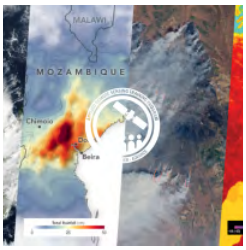
This webinar focuses on building the skills needed to choose the appropriate night lights product, acquire and understand Black Marble data, and how to use the data in analyses for tracking urbanization, electrification, and disaster monitoring.

Introductory

Bilingual (Spanish)

2020

Earth Observations for Disaster Risk Assessment and Resilience

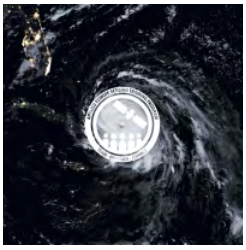


This webinar series focuses on Earth observation (EO) data useful for disaster risk assessment. The series covers disasters including tropical cyclones, flooding, wildfires, and heat stress. The training also covers access of socioeconomic and disaster damage data. Sessions 3 and 4 cover case studies and operational applications of EO for disaster risk assessment.

Introductory

2019

Monitoring Tropical Storms for Emergency Preparedness



Tropical storms have major impacts, including loss of life and destruction of property. In 2017 alone, the United States experienced three tropical storms with more than $1 billion in losses. Open source satellite data can be used before, during, and after a storm for monitoring and response. A storm's intensity, path, wind, precipitation, storm surge, and flooding can be derived from historical and near real-time satellite observations. In this introductory training, participants learn about the NASA data and tools they can use to monitor tropical storms.

Introductory

2018

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

The Global Disaster Alert and Coordination System (GDACS) provides near real-time data, alerts, and impact assessments that can be accessed online. In this two-hour webinar, participants learn how to use GDACS to monitor real-time disasters, assess the impacts of an event, and develop response strategies for both national and international events.

Introductory

2017

Disasters

Other

Satellite Observations for Analyzing Natural Hazards on Small Island Nations

This three-part training series focuses on small island nations while introducing the data, methods, and tools useful for monitoring natural hazards. Case studies are used to demonstrate methodologies applying satellite and model data and open access tools to analyze storm impacts, sea level rise, and landslides on small island nations.

Intermediate

Bilingual (Spanish)

2021

Remote Sensing for Disasters Scenarios

According to the WHO, every year disasters "kill around 90,000 people and affect close to 160 million people worldwide." This training shows participants how NASA remote sensing data can be used to characterize and monitor disaster-related events and support relief efforts. Each session covers a different disaster and its supporting data. Disaster scenarios include tropical storms, flooding, earthquakes, and landslides.

Intermediate

Bilingual (Spanish)

2019

Ecological Conservation

Biodiversity and Ecosystems

Introduction to the Integration of Animal Tracking and Remote Sensing

Animals are sentinels of environmental change, and animal telemetry is a commonly used tool to quantify habitat use and help understand environmental changes. NASA data can be used to characterize the environmental parameters that infer the habitats that animals use. This training provides participants with an overview of animal tracking sensors, NASA's history of animal tracking, NASA's Internet of Animals project, and the types of remote sensing data that can be paired with animal telemetry.

Introductory

2025

Invasive Species Monitoring with Remote Sensing

This training highlights project-based applications of remote sensing for plant species of interest, especially those affecting grasslands, aquatic inland lakes, and waterbodies, and more, with a lens towards innovative uses of hyperspectral data for additional invasive species detection.

Introductory

2024

Evaluating Ecosystem Services with Remote Sensing

This training outlines the basics of ecosystem services and natural capital accounting. It also provides an overview of how Earth Observations (EO) can be used to support global frameworks and initiatives such as standards set by the United Nation's System of Environmental Economic Accounting (UN-SEEA). Case-study examples are provided to highlight locally specific efforts such as valuation of native pollinators, urban ecosystem accounts, valuation of coastal resilience and coral reef habitats, and forest conservation and carbon sequestration.

Introductory

2022

Using the UN Biodiversity Lab to Support National Conservation and SDGs

There is a global demand for more NASA ARSET trainings focused on biodiversity, conservation, the UN Sustainable Development Goals (SDGs), and how to link NASA satellite data to ecological and human-influenced systems. This training aims to fill that gap by extending the influence of this NASA-supported tool and increasing its dissemination, use, and overall success. UN Biodiversity Lab makes global datasets on biodiversity and sustainable development easily accessible, supporting our broad audience.

Introductory

Multilingual (Sp., Fr.)

2020

Ecological Conservation

Biodiversity and Ecosystems

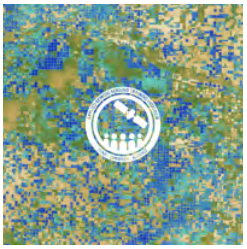
Understanding Phenology with Remote Sensing

This training focuses on the use of remote sensing to understand phenology: the study of life-cycle events. Phenological patterns and processes can vary greatly across a range of spatial and temporal scales, and can provide insights about ecological processes like invasive species encroachment, drought, wildlife habitat, and wildfire potential.

Introductory

2020

New Sensor Highlight: ECOSTRESS



This webinar focuses on a NASA instrument that was launched and installed on the International Space Station in Summer 2018. Designed to study terrestrial ecosystems and plant water stress from the ISS, ECOSTRESS can also be used to better understand crop health, volcanoes, urban heat, wildland fires, coastal systems, and much more.

Introductory

2019

Earth Observations for Indigenous-Led Land Management

This introductory training shares lectures, case studies, and demonstrations with representatives of indigenous peoples' organizations and focuses on how Earth observations (EO) data and tools can provide spatial information for forest monitoring, mapping, and responding to ecosystem threats. This series helps attendees strengthen their technical capacities to use EO data and tools to enhance their sustainable land management practices.

Introductory

Bilingual (Spanish)

2019

Remote Sensing for Conservation and Biodiversity

Conservation and biodiversity management play important roles in maintaining healthy ecosystems. Earth observations can help with these efforts. This online training introduces participants to the use of satellite data for conservation and biodiversity applications. The training will highlight specific projects that have successfully used satellite data.

Introductory

2019

Ecological Conservation

Biodiversity and Ecosystems

Introduction to Remote Sensing for Scenario-Based Ecoforecasting

Assessing the ecological impacts of a changing climate is crucial for natural resource management decision-making. NASA Earth observations can be used to help make these decisions. This four-part training series, in collaboration with the USGS North Central Climate Center, includes an overview of the satellites, sensors, and tools relevant to ecological forecasting; available climate products and data for ecological modeling; scenario planning; and the application of modeling for species distribution and state-and-transition simulations.

Introductory

2017

Introduction to Remote Sensing for Conservation Management

This training series focuses on regional and global observation resources for conservation management. It provides a basic overview of remote sensing, tools for accessing and visualizing relevant NASA Earth science data, and case study applications for utilizing these tools for conservation management. The target audience for this series are NGOs (national and international) focused on conservation and biodiversity issues.

Introductory

2015

Spaceborne Lidar for Monitoring Vegetation Structure and Biomass using GEDI

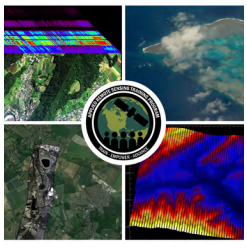
This two-part, bilingual (English and Spanish) training builds on a fundamental understanding of light detection and ranging (lidar), including its strengths, limitations, and distinguishing characteristics compared to other active and passive remote sensing observations. A central focus of the training is NASA's Global Ecosystem Dynamics Investigation (GEDI) mission, a novel spaceborne lidar sensor that began collecting data in April 2019.

Intermediate

Bilingual (Spanish)

2025

Biodiversity Applications for Airborne Imaging Systems



This training series highlights the use of hyperspectral Visible to Shortwave Infrared (VSWIR) imaging spectroscopy data for measuring and monitoring terrestrial and aquatic biodiversity and focuses on using thermal and LiDAR data for characterizing the structure and function of ecosystems using airborne campaigns. This training prepares participants to use data from upcoming NASA satellite missions and airborne campaigns.

Intermediate

2023

Ecological Conservation

Biodiversity and Ecosystems

Using the UN Biodiversity Lab to Monitor the Pulse of the Planet

This training focuses on using remote sensing and geospatial data within the NASA-supported UN Biodiversity Lab (UNBL) to take action on national conservation and sustainable development priorities. With over 400 of the world's best global data layers on biodiversity, ecosystem services, and sustainable development, UNBL enables decision-makers and policymakers to access essential global data, upload national datasets, and calculate dynamic indicators for any area of interest, all without any background in remote sensing and GIS.

Intermediate

Multilingual (Sp., Fr.)

2022

Species Distribution Modeling with Remote Sensing

SDMs contextualize future scenarios based on known or projected ecological parameters and are the cornerstone for adaptive management planning around short- and long-term changes to complex landscapes. This training provides an overview of SDMs, shows how to use remote sensing data for landscape characterization, and highlights multiple Applied Sciences projects that have developed tools for conducting SDM for a variety of ecosystems.

Intermediate

2021

Remote Sensing for Freshwater Habitats

This webinar series guides participants through using NASA Earth observations for habitat monitoring, specifically for freshwater fish and other species. This training also provides a conceptual overview, as well as the tools and techniques for applying landscape environmental variables to genetic and habitat diversity in species.

Intermediate

2019

Airborne Data Applications for Invasive Species Mapping

This one-part training introduces airborne and in situ field data applications for invasive species mapping utilizing datasets acquired during the BioSCAPE campaign in South Africa. This training is a collaboration between ARSET and the Oak Ridge National Laboratory (ORNL) DAAC.

Advanced

2025

Ecological Conservation

Coastal and Oceans

Monitoring Aquatic Vegetation with Remote Sensing

This training combines basic information on the remote sensing of AVs, spectrometry of aquatic/coastal vegetation, and a demonstration of the NASA-funded Floating Forests citizen science tool.

Introductory

Bilingual (Spanish)

2022

Remote Sensing for Mangroves in Support of the UN Sustainable Development Goals

This training focuses on mapping and monitoring mangroves and how it relates to UN sustainable development indicator 6.6.1: Change in the extent of water-related ecosystems over time. Indicator 6.6.1 is used in determining progress toward meeting Sustainable Development Goal 6, which is to "Ensure availability and sustainable management of water and sanitation for all."

Introductory

2020

Remote Sensing of Coastal Ecosystems

Coastal and marine ecosystems serve key roles for carbon storage, nutrients and materials cycling, and serve as reservoirs of biodiversity. They also provide ecosystems services such as sustenance for millions of people, coastal protection against wave action, and recreational activities. Users, particularly those with little remote sensing experience, stand to benefit from this training covering some of the difficulties associated with remote sensing of coastal ecosystems, particularly beaches and benthic communities such as coral reefs and seagrass.

Introductory

Bilingual (Spanish)

2020

Introduction to Remote Sensing for Coastal and Ocean Applications

In this intermediate training, participants are provided with an overview of remote sensing for coastal and ocean applications. This includes a background in aquatic remote sensing, data access and tools for processing and analyzing imagery, and examples and live demonstrations of tools that have been developed for NASA and partner organizations. This training covers data products from MODIS, VIIRS, HICO, and other sensors commonly used for ocean applications.

Intermediate

2016

Ecological Conservation

Land Cover and Change Detection

Using Google Earth Engine for Land Monitoring Applications

This training covers the GEE Code Editor, hands-on exercises on change detection, time series analysis, land cover classification, and accuracy assessment of optical imagery. These processes are an integral part of optical imagery analysis for many applications, including monitoring forest disturbance, wildfire mapping, identifying land cover degradation, mapping ecosystem connectivity, and identification of land surface changes due to urban growth.

Intermediate

2021

Remote Sensing of Land Indicators for Sustainable Development Goal 15

In this training, participants learn how to access and apply satellite data relevant to land indicators, such as estimating total forest area and forest change. The training includes an overview of the SDGs, as well as an introduction to image classification and change detection.

Intermediate

2017

Remote Sensing of Forest Cover and Change Assessment for Carbon Monitoring

In this training, participants are provided with an overview of carbon monitoring for terrestrial ecosystems. This includes background information about the Intergovernmental Panel on Climate Change (IPCC), Greenhouse Gas (GHG) inventories, the United Nations Framework Convention on Climate Change (UNFCCC), and development of the Reducing Emissions from Deforestation and Degradation (REDD+) program. This training covers products from Landsat, MODIS, Sentinel, and other sensors commonly used for land management applications.

Intermediate

2016

Remote Sensing for Monitoring Land Degradation and Sustainable Cities SDGs

In this training, attendees learn to use a freely-available QGIS plugin, Trends.Earth, created by Conservation International (CI). It includes special guest speakers from the United Nations Convention to Combat Desertification (UNCCD) and UN Habitat. Trends.Earth allows users to plot time series of key land change indicators. Attendees learn to produce maps and figures to support monitoring and reporting on land degradation, improvement, and urbanization for SDG indicators 15.3.1 and 11.3.1.

Advanced

Bilingual (Spanish)

2019

Ecological Conservation

Land Cover and Change Detection

Investigating Time Series' of Satellite Imagery

This training focuses on two tools, AppEEARS from the LPDAAC, and LandTrendr via Google Earth Engine (GEE). AppEEARS enables users to integrate point or polygon ground-based data with satellite imagery. The GEE implementation of LandTrendr enables users to analyze land cover dynamics, including short-term disturbances and long-term trends.

Advanced

2019

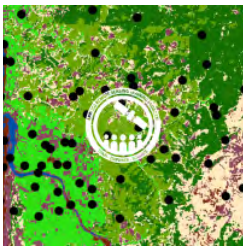
Change Detection for Land Cover Mapping

This advanced training focuses on using satellite imagery to map changes in land cover. Attendees learn change detection methods, including image subtraction and classification. They also conduct their own change detection analysis. This training uses QGIS, the R statistical program, and the Random Forest algorithm.

Advanced

2018

Accuracy Assessment of a Land Cover Classification



The next step to using land cover classifications is being able to evaluate the performance of a land cover map using accuracy assessments. This training equips attendees with the skills necessary to conduct an accuracy assessment on a land cover map and identify which classes might be misrepresented.

Advanced

2018

Land Cover Classification with Satellite Imagery

Land cover classification is an important first step to assessing land cover and land use. This advanced training provides lectures and hands-on activities focused on using satellite imagery for land cover classification. In two four-hour sessions, attendees learn how to acquire Landsat imagery, display it in an open-source Geographic Information System (GIS), analyze spectral signatures of land cover types, and conduct a supervised land cover classification.

Advanced

2017

Ecological Conservation

Spectral Indices

Calculating Spectral Indices for Land and Aquatic Applications using QGIS

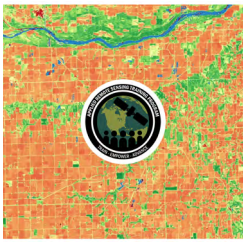
This one-part, bilingual training provides an overview of spectral indices for land and aquatic applications as they are calculated within QGIS. Specifically, this training begins with an introduction to the Normalized Difference Vegetation Index (NDVI), along with its calculation, uses, and applications in diverse thematic areas (agriculture, disasters, etc.). We also review many additional land- and aquatic-based indices.

Introductory

Bilingual (Spansih)

2025

Spectral Indices for Land and Aquatic Applications



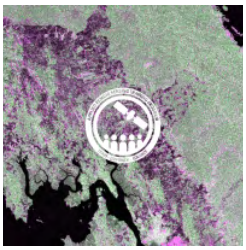
This training provides an overview of spectral indices for land and aquatic applications. Not only do these sessions discuss the correct circumstances under which to use these indices, but participants also take part in hands-on indices calculation over relevant study areas.

Introductory

2023

Synthetic Aperture Radar (SAR)

Forest Mapping and Monitoring with SAR Data



This advanced training series introduces participants to 1.) SAR time series analysis of forest change using Google Earth Engine (GEE), 2.) land cover classification with radar and optical data with GEE, 3.) mapping mangroves with SAR, and 4.) forest stand height estimation with SAR.

Advanced

Bilingual (Spanish)

2020

Ecological Conservation

Other

Connecting Citizen Science with Remote Sensing

This training provides attendees an overview of citizen science efforts that use Earth Observations, and shows how to engage with community members in a supportive and meaningful manner to achieve project goals. Attendees are also provided with case-study examples of successful citizen science projects, with some examples from NASA supported projects and activities.

Introductory

Bilingual (Spanish)

2023

Remote Sensing of Drought

Prolonged drought can result in economic, environmental, and health-related impacts. In this training, participants learn how to monitor drought conditions and assess impacts on the ecosystem using precipitation, soil moisture, and vegetation data. The training provides an overview of drought classification, as well as an introduction to web-based tools for drought monitoring and visualization.

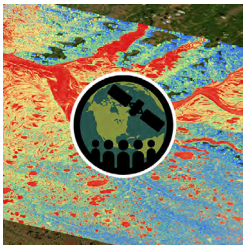
Advanced

2017

Water Resources

Hydrology

Monitoring Global Terrestrial Surface Water Height using Remote Sensing



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). This training focuses on introducing SWOT freshwater data products and their applications for water resources and disaster management.

Introductory

Bilingual (Spansih)

2025

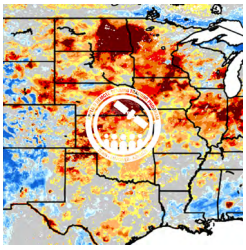
Introduction to Snow and Ice Data Products and Applications for Water Resources Management

Approximately 75% of the Earth's total freshwater is stored in glaciers, ice sheets, and permafrost (USGS). In many regions, snowmelt also serves as a major source of freshwater. NASA Earth system models can diagnose snowfall during winter and estimate snow water equivalent—a key parameter for assessing freshwater resources. This training introduces NASA's snow and ice data products and snow water equivalence data to participants, with a particular focus on snow data application to monitoring and forecasting snow-fed river flow and water availability.

Introductory

2025

Application of NASA SPoRT-Land Information System (SPoRT-LIS) Soil Moisture Data for Drought

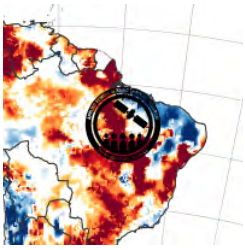


Conducted by experts in LIS and operational drought monitoring, this training enables users to interpret SPoRT-LIS soil moisture percentile products for drought applications. Examples from operational applications as well as practice exercises (for using LIS data for drought monitoring) are included in this training.

Introductory

2023

Groundwater Monitoring using Observations from NASA'S GRACE Missions



GRACE observations have been used for detecting groundwater depletion and for drought and flood predictions. This lightning-style training is designed to answer the demand and interest from the applications community in technologies that can be used to support water resources management. The training provides an overview of the GRACE missions, groundwater data availability, and their applications in the monitoring and management of water resources.

Introductory

Bilingual (Spansih)

2020

Water Resources

Hydrology

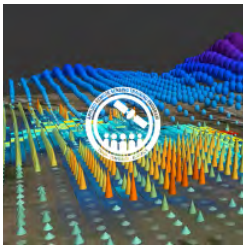
Using Earth Observations to Monitor Water Budgets for River Basin Management

Rivers are a major source of freshwater. They support aquatic and terrestrial ecosystems, provide transportation, and generate hydropower. Managing river basin watersheds is critical for developing policies for sustainable water allocation and development. Over the course of four sessions, this introductory training series addresses the use of satellite data and Earth system modeling data sources to estimate surface water budgets.

Introductory

2019

Introduction to Using the VIC Hydrologic Model with NASA Earth Observations



The Variable Infiltration Capacity (VIC) Model uses inputs to better understand hydrological processes in near real-time. Many of the inputs are available from NASA remote sensing and Earth system models, allowing the model to provide soil moisture, evapotranspiration, and runoff as outputs. Together with precipitation data, these outputs provide quantitative assessment of a regional water budget. This introductory training includes an overview of the model, sources of satellite-derived input data, and implementation of the model.

Introductory

2018

Water Resource Management using NASA Earth Science Data

This five week training covers precipitation (rainfall and snow fraction), soil moisture, evapotranspiratoin, runoff and streamflow, groundwater, and lake level heights. Attendees are introduced to a number of NASA data products.

Introductory

2015

Applications of Remote Sensing-Based Evapotranspiration Data Products

This three-part training series focuses on introducing newly available ET products derived from remote sensing observations. It specifically covers a web portal called OpenET (https://openetdata.org/), which includes ET products estimated by using six models as well as Landsat satellite observations. These ET products cover the Western United States. In addition, information about global ET products derived from ECOsystem Spaceborne Thermal Radiometer Experiment on the Space Station (ECOSTRESS) is also given.

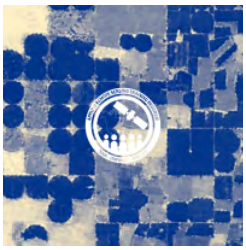
Intermediate

2022

Water Resources

Hydrology

Applications of Remote Sensing to Soil Moisture and Evapotranspiration

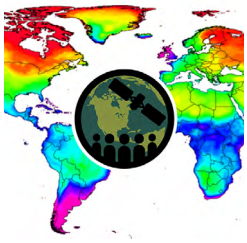


This training series is intended to help attendees learn about NASA soil moisture and evapotranspiration products and learn how to access and apply them for water resource management. Throughout the five sessions, participants learn how to monitor and manage water resources with techniques learned during the training.

Intermediate

2016

Assessing Extreme Weather Statistics using NASA Earth eXchange Global Daily Downscaled Projections (NEX-GDDP-CMIP6)

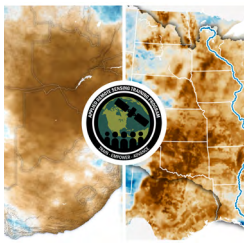


NASA Earth eXchange Global Daily Downscaled Projections (NEX-GDDP-CMIP6) provide global, high resolution, bias-corrected projections of daily minimum and maximum temperatures, precipitation, humidity, windspeed, and surface radiation from the Coupled Model Intercomparison Project Phase 6 (CMIP6) GCMs at 0.25x0.25-degree resolution. This training focuses on evaluating projected statistics of extreme heat and cold wave events, and extreme precipitation excess and deficit events, from NEX-GDDP-CMIP6 at the regional scale.

Advanced

2025

Drought Monitoring, Prediction, and Projection using NASA Earth System Data



This four-part, advanced training builds upon previous ARSET trainings and provides hands-on data analysis exercises for monitoring different types of drought (meteorological, hydrological, and agricultural). Moreover, the training includes drought prediction analysis on sub-seasonal to seasonal (S2S) time scales and climate change projection analysis of drought conditions.

Advanced

2024

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

Past ARSET trainings on water resources and flood management covered TMPA and IMERG data and their applications in detail. This advanced training focuses on analysis and interpretation of the new long-term IMERG data, focused on extreme wet and dry period monitoring and management. The training includes lectures and hands-on exercises demonstrating how to derive regional precipitation statistics.

Advanced

2020

Water Resources

Hydrology

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

Past ARSET trainings on monitoring water budgets for river basins focused on data sources relevant for river basin monitoring and management, and provided case studies for estimating the water budget of a watershed using remote sensing products. This advanced training includes lectures and hands-on exercises for participants to estimate water budgets for a given river basin.

Advanced

2020

Hydrography

Mapping and Monitoring Lakes and Reservoirs with Satellite Observations

This training focuses on introducing remote sensing observations for monitoring the water level of lakes; a critical surface water component affecting the residential, economical, and recreational sectors in the area. Recent observations of lake bathymetry based on remote sensing observations are also presented.

Introductory

2021

River Basin Delineation Based On NASA Digital Elevation Data

This lightning-style training focuses on describing NASA digital elevation data and its applications in deriving river basin information by using Hydrological data and maps based on SHuttle Elevation Derivatives at multiple Scales (HydroSHEDS) database. Exercises are provided for river basin delineation using HydroSHEDS.

Introductory

2019

Water Resources

Hydrography

NASA Satellite Laser Altimetry for Coastal and Near-Shore Bathymetry

The Advanced Topographic Laser Altimeter System (ATLAS) instrument's green wavelength, photon-counting lidar signal can reach depths of up to 40 meters in regions with adequate water clarity to provide shallow, near-shore bathymetric data for a range of applications. The ATL24 product provides near global along-track coastal and nearshore satellite-derived bathymetry. This training improves users' knowledge of ICESat-2, the ATL24 product, and how to access, plot, and analyze ICESat-2 bathymetry data.

Intermediate

2025

Water Quality

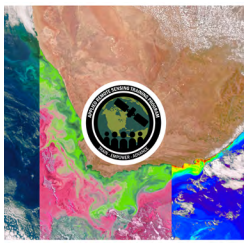
The Application of Earth Observations for Assessing Waterborne Disease Risk

This two-part training focuses on describing and accessing remote sensing observations useful as water quality indicators of waterborne diseases. It also presents case studies where remote sensing data are used to assess the likelihood of cholera outbreaks.

Introductory

2025

Introduction to Plankton, Aerosol, Cloud, Ocean Ecosystem (PACE) Hyperspectral Observations for Water Quality Monitoring



This three-part, introductory training provides an overview of past and current hyperspectral sensors. Specifically, the training provides information on NASA's PACE mission, its sensors and data products, webtools for accessing data, and software for processing hyperspectral data and water quality parameters derived from PACE/OCI. The training also highlights some advantages and limitations of PACE data. This is the first ARSET training focusing on the use of hyperspectral data for water quality applications.

Introductory

Bilingual (Spanish)

2024

Water Resources

Water Quality

Introduction to Remote Sensing of Harmful Algal Blooms

Harmful algal blooms (HABs) can have a negative impact on the ecosystem and human health. Satellite remote sensing is able to collect data frequently and over a large area to identify impaired water quality from HABs. This data can help decision-makers decide where to take water samples, determine what toxins are in the water, decide whether they need to change or move drinking water intakes, and decide whether a fishery needs to be closed.

Introductory

2017

Monitoring Coastal and Estuarine Water Quality: Transitioning from MODIS to VIIRS

This intermediate training provides an overview of recent satellites and sensors used for extending the MODIS long-term water quality time series, specifically focusing on VIIRS image processing using the NASA Ocean Color software, SeaDAS. This training points out similarities and differences between MODIS and VIIRS and demonstrate water quality monitoring procedures using these sensors in selected coastal and estuarine regions.

Intermediate

Bilingual (Spansh)

2021

Overview of SeaDAS 8.4.1 for the Processing, Analysis, and Visualization of Optical Remote Sensing Data for Water Quality Monitoring

This two-hour training provides an overview and demonstration of the latest version of SeaDAS 8.4.1, which is useful for remote sensing of water quality monitoring. This training also serves as a prerequisite for future ARSET training on remote sensing of water quality.

Advanced

2024

Monitoring Water Quality of Inland Lakes using Remote Sensing

This advanced-level training focuses on using remote sensing observations from Landsat 8 and 9, Sentinel-2, and Sentinel-3 for assessing water quality parameters, including chlorophyll-a concentration, turbidity, and Total Suspended Solids (TSS) in inland lakes.

Advanced

2023

Water Resources

Water Quality

Monitoring Coastal and Estuarine Water Quality using Remote Sensing and In Situ Data

This two-part, advanced training series is a follow-on to the training on coastal and estuarine water quality held in September 2021. It is a hands-on training with demos provided by instructors, followed by an hour of lab time for participants to use Level-1 MODIS and VIIRS data provided by the Ocean Biology DAAC (OB.DAAC) and SeaDAS and OCSSW software for deriving water quality parameters.

Advanced

2021

Integrating Remote Sensing into a Water Quality Monitoring Program

This training series helps attendees perform advanced image processing of satellite data and learn about using satellites to track indicators of harmful algal blooms. This includes monitoring water temperature and chlorophyll-a concentrations. Attendees can also use this information for reporting around UN SDG 6.

Advanced

2019

Processing Satellite Imagery for Monitoring Water Quality

This training series helps attendees perform advanced image processing of satellite data and learn about using satellites to track indicators of harmful algal blooms. This includes monitoring water temperature and chlorophyll-a concentrations. Attendees can also use this information for reporting around UN SDG 6.

Advanced

Bilingual (Spanish)

2018

Wildland Fire

Introduction to NASA Earth Observations and Tools for Wildfire Monitoring and Management

FIRMS is a web-based application with a dynamic mapping interface to visualize current and historical satellite imagery, active fire detections/ hot spots and related science data products to identify the location, extent, and intensity of wildland fire activity and its effects. This three-part training familiarizes participants with the various modules available in FIRMS, explores the range of data and information available as well as the characteristics of satellite-based active fire detection, and provides hands-on experience that can be applied in GIS applications.

Introductory

2025

Advanced NASA Earth Observations and Tools for Active Fire, Smoke, and Post-Fire Monitoring

Monitoring post-fire impacts to vegetation is essential for evaluating burn severity, which informs post-fire debris flow risk; understanding patterns in ecosystem recovery; and identifying areas that require restoration intervention. Multiple sources of satellite imagery and derived data products relevant to smoke, post-fire conditions, and STA identification are available within NASA's Fire Information for Resource Management System (FIRMS). This training introduces participants to several capabilities within FIRMS not covered in the previous training.

Intermediate

2025

Satellite Observations and Tools for Fire Risk, Detection, and Analysis

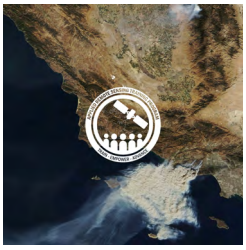
Remote sensing can be used to monitor pre-, during-, and post-fire conditions; including weather and climate conditions, fuel characterization, fire risk, smoke detection, monitoring, and forecasting, fire behavior, and the post-fire landscape. This 6-part, intermediate training provides lectures and case studies focused on the use of Earth observations for operational fire monitoring: pre-, during-, and post-event.

Intermediate

Bilingual (Spanish)

2021

Assessing the Impacts of Fires on Watershed Health



This advanced-level training focuses on using remote sensing observations for monitoring post-fire impacts on watershed health, building off the ARSET training offered in 2021: Satellite Observations and Tools for Fire Risk, Detection, and Analysis. Specifically, this training highlights uses of NASA Earth observations (EO) for pre-fire land cover mapping, watershed delineation and stream mapping, post-fire burn severity mapping, and pre- and post-fire riverine and freshwater water quality.

Advanced

2023

Wildland Fire

Using Earth Observations for Pre- and Post-Fire Monitoring

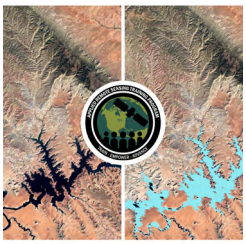
During the first session, this training reviews pre-fire risk assessment by investigating land surface variables (e.g., vegetation type and height, fuel regimes, fuel moisture, and topography) and climate variables (e.g., temperature and precipitation). In the second session, this training teaches you to conduct post-fire mapping of burned area and burn severity using vegetation indices such as the Normalized Burn Ratio (NBR).

Advanced

2022

Skill-Building

Fundamentals of Machine Learning for Earth Science



This training provides attendees an overview of machine learning in regards to Earth Science, and how to apply these algorithms and techniques to remote sensing data in a meaningful way. Attendees will also be provided with end-to-end case study examples for generating a simple random forest model for land cover classification from optical remote sensing.

Introductory

Bilingual (Spanish)

2023

Remote Sensing Training: Methods & Best Practices

This three-part training series shares the training best practices used by NASA's Applied Remote Sensing Training Program (ARSET). The skills taught in this training enable participants to develop their own online or face-to-face remote sensing trainings for their organization or community of practice.

Intermediate

2016