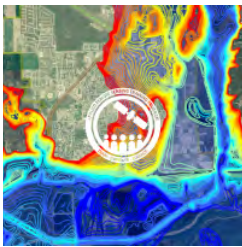


Disasters

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

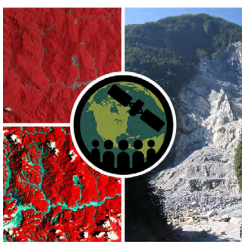


ARSET has offered several trainings on flood monitoring based on optical and SAR observations in the past. This two-part training focuses on recent developments and updates in flood monitoring tools and flood modeling techniques. Specifically, an overview of the Hydrological Modeling and Analysis Platform (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

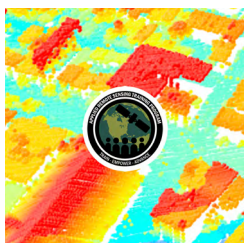
Earth Observations for Humanitarian Applications



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.

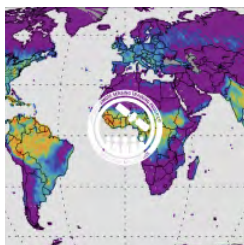
Intermediate
Bilingual (Spanish)
2023



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.

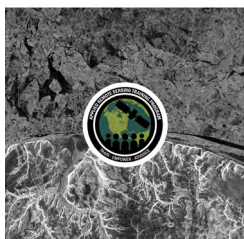
Intermediate
Bilingual (Spanish)
2022



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

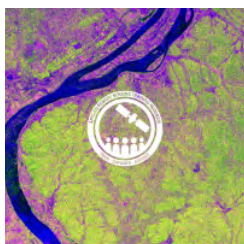
SAR for Landcover Applications



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

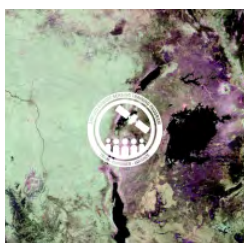
SAR for Disasters and Hydrological Applications



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.

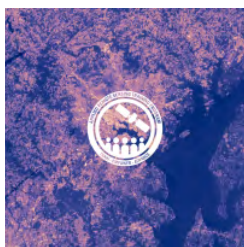
Advanced
Bilingual (Spanish)
2018



Disasters

Urban Heat Islands (UHI)

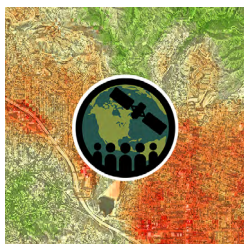
Satellite Remote Sensing for Urban Heat Islands



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

Introduction to Thermal Remote Sensing and Applications in Urban Heat Island Mapping



This training begins by establishing the physical principles of TIR, including emissivity and blackbody radiation. While these fundamentals are broadly applicable to numerous applications, this training specifically focuses on using data from NASA's Ecosystem Spaceborne Thermal Radiometer Experiment on Space Station (ECOSTRESS) to identify heat-vulnerable communities and quantify urban heat island (UHI) effects.

Intermediate
2026

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

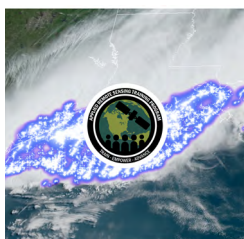


Once urban heat islands (UHIs) have been mapped, incorporating socioeconomic data pertaining to population, demographics, and health information into heat vulnerability indices (HVIs) can help guide interventions to manage heat related risks to public health. This four-part, advanced webinar builds on 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.

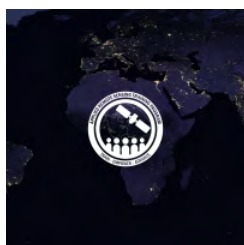
Introductory
2024



Disasters

Other

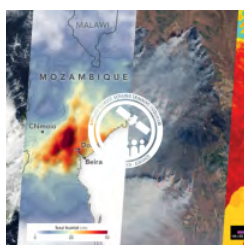
Introduction to NASA's "Black Marble" Night Lights Data



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

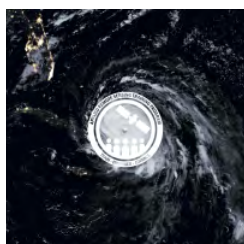
Earth Observations for Disaster Risk Assessment and Resilience



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)



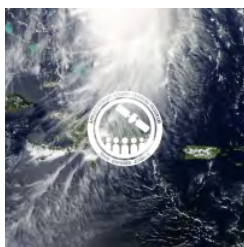
The Global Disaster Alert and Coordination System (GDACS) provides near real-time data, alerts, and impact assessments that can be accessed online. In this two-hour webinar, participants learn how to use GDACS to monitor real-time disasters, assess the impacts of an event, and develop response strategies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

