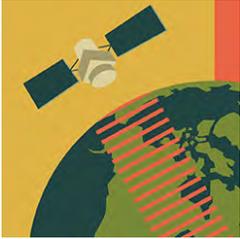




REMOTE SENSING BASICS

FUNDAMENTALS OF REMOTE SENSING



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.

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.

DISASTERS - WILDFIRES

INTRODUCTION TO REMOTE SENSING FOR WILDFIRE APPLICATIONS



This webinar series provides a basic overview of remote sensing tools for accessing and visualizing NASA Earth science data relevant to wildfires and case study applications for utilizing tools for pre- and post-burn wildfire conditions.

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 will provide lectures and case studies focused on the use of Earth observations for operational fire monitoring: pre-, during-, and post-event.



DISASTERS - WILDFIRES

TECHNIQUES FOR WILDFIRE DETECTION AND MONITORING



With more frequent and severe droughts, certain areas are experiencing longer fire seasons. Wildfire detection, monitoring, and mitigation is increasingly important in these regions. Satellite remote sensing data is useful for identifying active fires, evaluating burned areas, and assessing fire emissions. This advanced training will highlight tools useful for local fire managers. Presentations and exercises will introduce participants to tools to identify active fires, visualize fire emissions, and calculate burn severity.

USING EARTH OBSERVATIONS FOR PRE- AND POST-FIRE MONITORING



During the first session, this training will review 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 will teach you to conduct post-fire mapping of burned area and burn severity using vegetation indices such as the Normalized Burn Ratio (NBR).

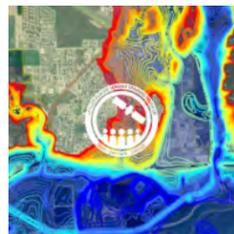
DISASTERS - FLOODS

NASA REMOTE SENSING OBSERVATIONS FOR FLOOD MANAGEMENT



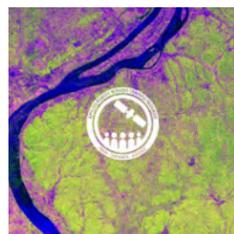
This training introduces remote sensing resources available for monitoring extreme precipitation and flooding, as well as flood mapping tools for flood management and planning.

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 webinar series will focus on the components of urban flooding that satellite data can track extreme precipitation, flooding, and waterlogged and ponded surfaces.

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).

DISASTERS - FLOODS

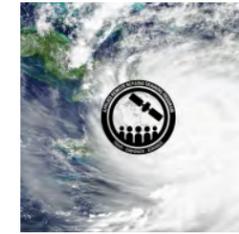
USING NASA REMOTE SENSING FOR FLOOD MONITORING AND MANAGEMENT



This webinar provides demonstrations and hands-on experience in using NASA remote sensing observations and flood mapping tools useful for flood management. Participants learn to access rainfall, stream-flow, and surface inundation extent data for regional flood cases. In addition, participants learn to access digital elevation and terrain data, as well as socioeconomic data, to facilitate flood risk assessment and post-flood relief planning using a GIS framework.

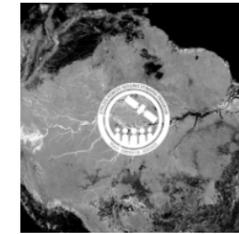
DISASTERS - OTHER

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.

INTRODUCTION TO SYNTHETIC APERTURE RADAR



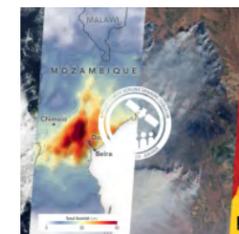
SAR can observe the Earth's surface day and night, through most weather conditions, and the signal can penetrate the vegetation canopy. There are a number of existing SAR datasets from current and past airborne and satellite missions, as well as exciting upcoming missions. This online webinar will focus on building the skills needed to acquire and understand SAR data, including polarimetric and interferometric SAR (PolSAR and InSAR), as well as potential applications.

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 webinar, participants will learn about the NASA data and tools they can use to monitor tropical storms.

EARTH OBSERVATIONS FOR DISASTER RISK ASSESSMENT AND RESILIENCE

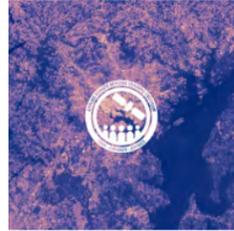


This webinar series will focus on Earth observation (EO) data useful for disaster risk assessment. The series will cover disasters including tropical cyclones, flooding, wildfires, and heat stress. The training will also cover access of socioeconomic and disaster damage data. Sessions 3 & 4 will cover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



DISASTERS - OTHER

SATELLITE REMOTE SENSING FOR URBAN HEAT ISLANDS



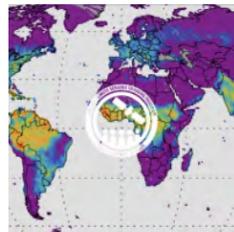
This training will address the use of remote sensing in determining where “hot spots” of land surface temperature are located in urban areas, why these areas are experiencing increased temperature, which populations are most vulnerable, and ways to mitigate the effects through adaptive land use planning.

INTRODUCTION TO NASA’S “BLACK MARBLE” NIGHT LIGHTS DATA



This webinar will focus 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.

USE OF SOLAR INDUCED FLUORESCENCE AND LIDAR TO ASSESS VEGETATION CHANGE AND VULNERABILITY



This introductory webinar series will cover 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 will also include a step-by-step guide on how to access, open, and interpret SIF and LIDAR data.

INTRODUCTION TO POPULATION GRIDS AND THEIR INTEGRATION WITH REMOTE SENSING DATA



This 2-part training, developed and presented by members of the POP-GRID Data Collaborative, will focus 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 will be 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.

HUMANITARIAN APPLICATIONS USING NASA EARTH OBSERVATIONS



This four-part introductory training will focus 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.



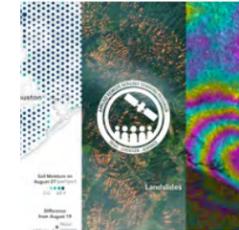
DISASTERS - OTHER

USING NASA REMOTE SENSING FOR DISASTER MANAGEMENT



NASA remote sensing and modeling resources are useful for managing a variety of disasters - including earthquakes, tsunamis, volcanoes, floods, landslides, wildfires, and oil spills - particularly in regions with very little in situ data. This intermediate course will provide an overview of NASA remote sensing data and applications for disaster management.

REMOTE SENSING FOR DISASTERS SCENARIOS



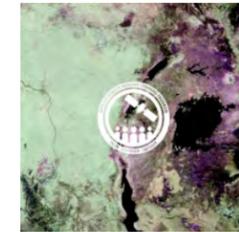
According to the WHO, every year disasters “kill around 90,000 people and affect close to 160 million people worldwide.” This training will show participants how NASA remote sensing data can be used to characterize and monitor disaster-related events and support relief efforts. Each session will cover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

SATELLITE OBSERVATIONS FOR ANALYZING NATURAL HAZARDS ON SMALL ISLAND NATIONS



This three-part training series will focus on small island nations while introducing the data, methods, and tools useful for monitoring natural hazards. Case studies will be 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.

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 will focus 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.

SAR FOR LANDCOVER APPLICATIONS



This webinar series will build on the knowledge and skills previously developed in ARSET SAR trainings. Presentations and demonstrations will focus on agriculture and flood applications. Participants will 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.

