National Aeronautics and
Space Administration

Airborne Data Applications for Invasive Species Mapping

September 30, 2025

11:00-13:00 or 15:00-17:00 EDT (UTC-4)

Invasive species can cause catastrophic impacts on ecosystem health and function. Under a changing climate, urban expansion, and extreme weather events, the occurrence and impacts of invasive species is expected to increase. Remote sensing has been used as a tool to monitor the current extent and predict future spread of invasive species in aquatic and terrestrial environments.

This Applied Remote Sensing Training Program (ARSET) training highlights the different types of remote sensing data and products that can be used for terrestrial invasive species mapping and monitoring. Participants will be introduced to airborne and in situ field data applications for invasive species mapping utilizing datasets acquired during the Biodiversity Survey of the Cape (BioSCape) campaign in South Africa.

A demonstration of invasive species mapping using a managed Jupyterhub Python environment will provide the opportunity to apply a cloud based workflow to train airborne data from the Airborne Visible InfraRed Imaging Spectrometer - Next Generation (AVIRIS-NG) and utilize in situ field data. Participants will develop a site specific scene demonstrative of using in situ field data and imaging spectroscopy to map and visualize data, providing insights into the analysis of estimating invasive species using supervised image classification.

Upon the training's conclusion, participants will leave with a better understanding of the applications and limitations of imaging spectroscopy and airborne data products. Participants will also develop skills to apply their knowledge of the data to areas of interest to inform land management and planning decisions.

ARSET Trainers: Sativa Cruz, Justin Fain, and Juan Torres-Pérez

Guest Instructors: Michele Thornton and Rupesh Shrestha

- About ARSET
- Training Overview
- Impacts of Invasives
- Introduction to BIOSCAPE
- Introduction to AVIRIS Data
- Machine Learning Overview
- Jupyter Hub Spin Up Directions
- Notebook Demonstration
- Learn how to authenticate and work within NASA Earthdata Cloud
- Understand how to inspect and prepare data for machine learning models
- Train and interpret a machine learning model
- Apply a trained model to AVIRIS imagery to create invasive species maps
- Summary
- Q&A Session

ARSET empowers the global community through remote sensing training.

earthdata.nasa.gov