National Aeronautics and Space Administration

NASA earth

A Brief Update from the Capacity Building Program

Nancy D. Searby

Earth Science Division – Capacity Building Program Manager

NASA's Capacity Building Program

The Capacity Building Program provides individuals and institutions with workforce development, training activities, and collaborative projects to strengthen understanding of Earth observations and expand their use around the world.

ARSET

ARSET provides cost-free, often multilingual training on remote sensing topics. Through online trainings designed for all skill levels, the program teaches basic to advanced remote sensing skills to a worldwide audience using freely available resources.

DEVELOP

DEVELOP addresses environmental and policy issues through interdisciplinary feasibility projects that apply NASA data to community concerns. These projects provide experiential learning for both participants and partners to use geospatial data and to inform decisions.

SERVIR

SERVIR is a joint initiative of NASA, USAID, and leading geospatial organizations in Asia, Africa, and Latin America, that partners with organizations in these regions to address critical challenges like climate change, food and water security, land use, and air quality.

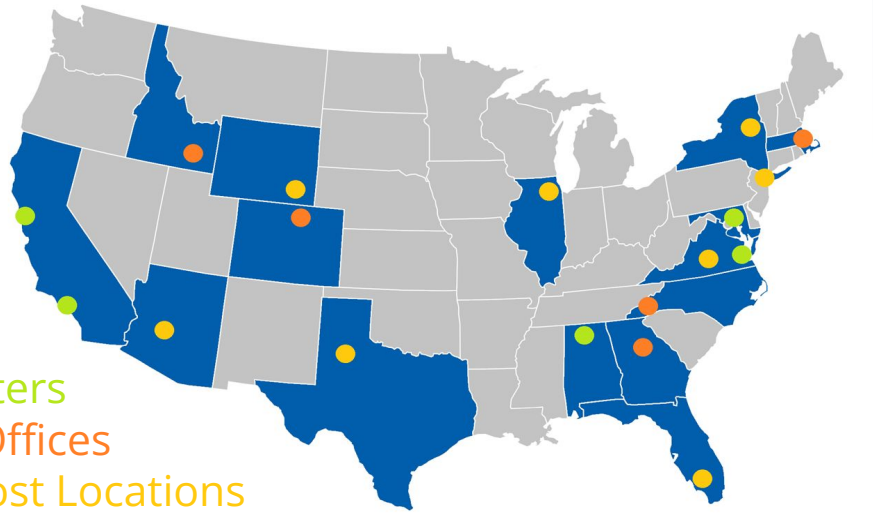
Indigenous Peoples Initiative

IPI co-develop place-based trainings and projects with Indigenous communities that use EO to inform decisions, centered around community engagement.

DEVELOP National Program

Dual capacity building experience

- 10-week paid opportunity
- Three terms each year – spring, summer, fall
- Learn to access and apply satellite data to real-world environmental issues
- Engage directly with decision-making organizations
- Networking opportunities
- Open to students and non-students, all majors and backgrounds, and international students studying in the U.S.



NASA Centers
Regional Offices
Pop-Up Host Locations

Anai, second from right, with her **FIRE Foundry** cohort—a group that assists individuals interested in fire-related careers in Marin County.

Have a project idea?
Submit a project request form here

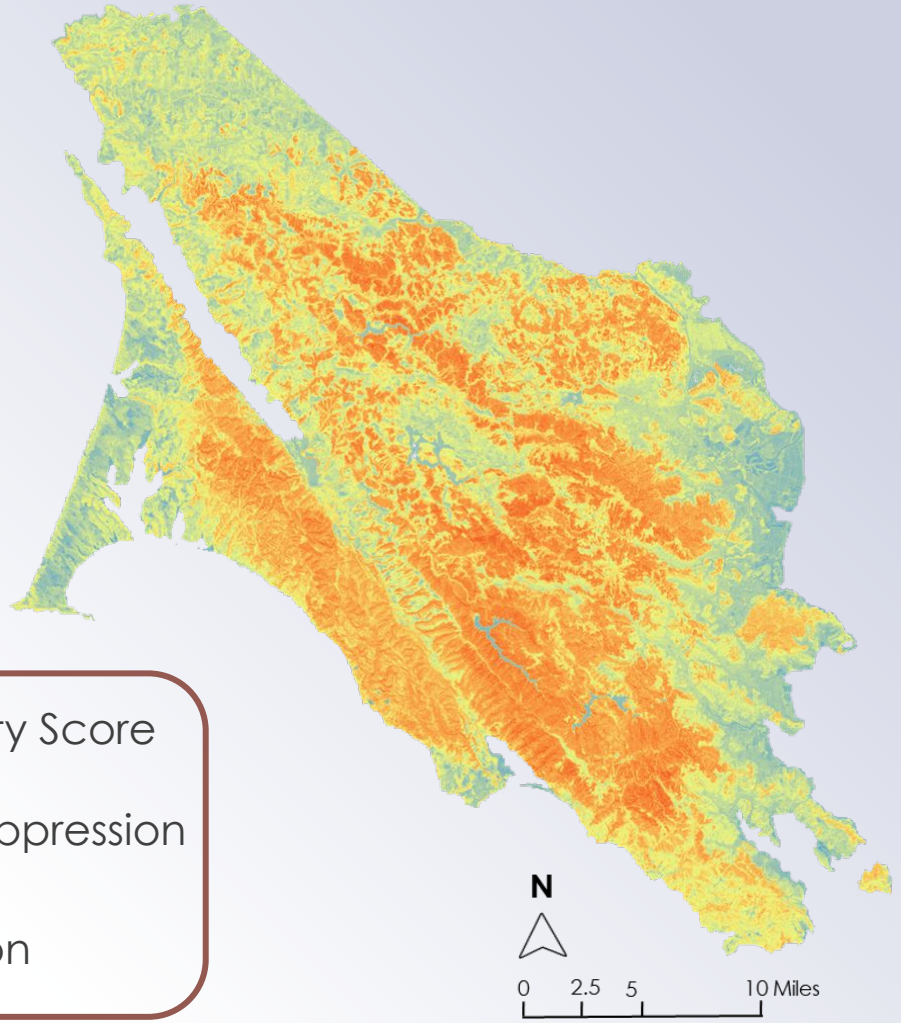
DEVELOP National Program

Dual capacity building experience

Have a project idea? Submit a project request form here

Anai's team used Landsat 7 & 8, Sentinel-2, ECOSTRESS, and LiDAR data to assess Marin County, CA's fire suppression index and develop environmental justice indicators to inform evacuation efforts of at-risk communities. The figure on the right shows fire suppression difficulty, which will inform firefighters' response to wildland fire county-wide.

The team held a remote sensing workshop for the Marin County Fire Department to enable them to recreate and update the Fire Suppression scores for the entire county.



Indigenous Peoples Initiative (IPI)

Collaborative Trainings

Karuk Department of Natural Resources remote sensing data and tools training for a variety of natural resource management applications including wildfires, climate, vegetation health, drought, and more.

Nihimá Nahasdzáán: The Art of Mother Earth was a Navajo Nation community Earth Observation event and included a dialogue & needs assessment session.

Virtual training: **NASA and Indigenous Communities: Fostering Earth Action**, hosted by the Native American Fish and Wildlife Society (NAFWS).

Fire and Climate Change: Adaptation Planning for Tribes
This workshop was hosted by the Institute for Tribal Environmental Professionals (ITEP) Tribes & Climate Change Program (TCCP), Stewardship Pathways Program, and Climate Science Alliance. the University of California Cooperative Extension, the Amah Mutsun Relearning Program, and the University of California Santa Cruz Conservation Science and Solutions Lab.

NASA Applied Remote Sensing Training (ARSET)

https://appliedsciences.nasa.gov/arset

Empowering the global community through remote sensing training.

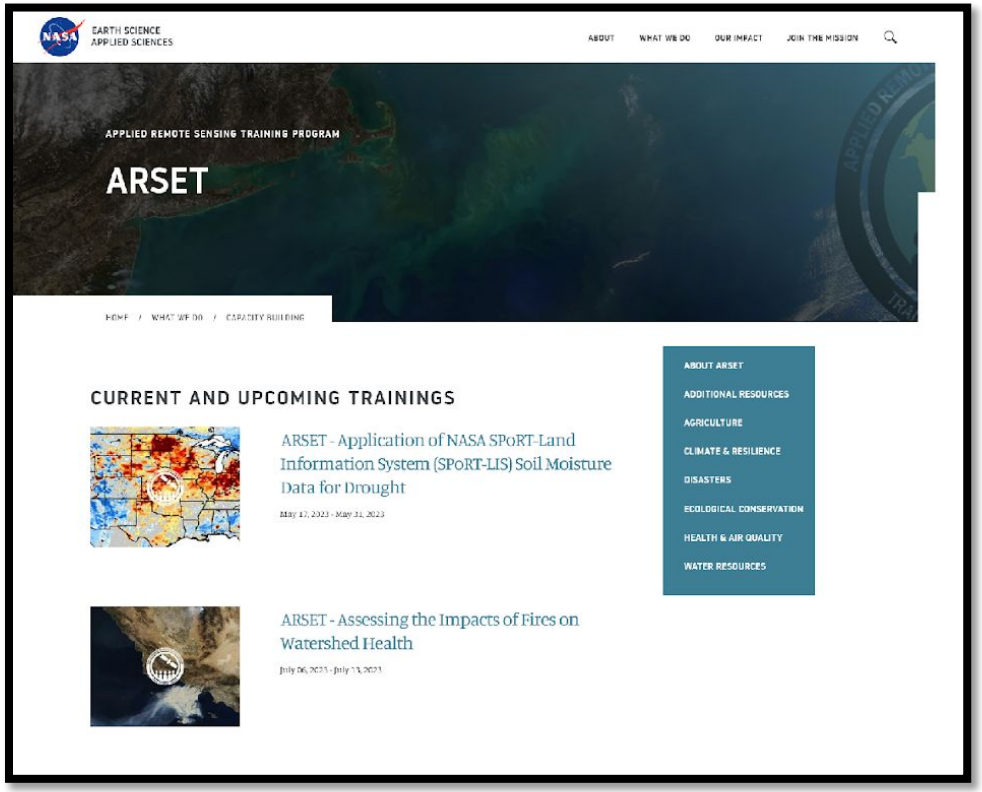
ARSET delivers cost-free training on the use of Earth Observations for decision making.

ARSET Training Themes

- AGRICULTURE
- CLIMATE & RESILIENCE
- DISASTERS
- ECOLOGICAL CONSERVATION
- HEALTH & AIR QUALITY
- WATER RESOURCES

ARSET Trainings

- Our trainings are:
  - Online and in-person
  - Live and instructor-led, or self-guided
  - Online: Typically, 3 – 4 sessions, 1-1.5 h each
  - Provided at no cost, with materials and recordings available from our website
  - Often multi-lingual
  - Range in level from **introductory** to **advanced**



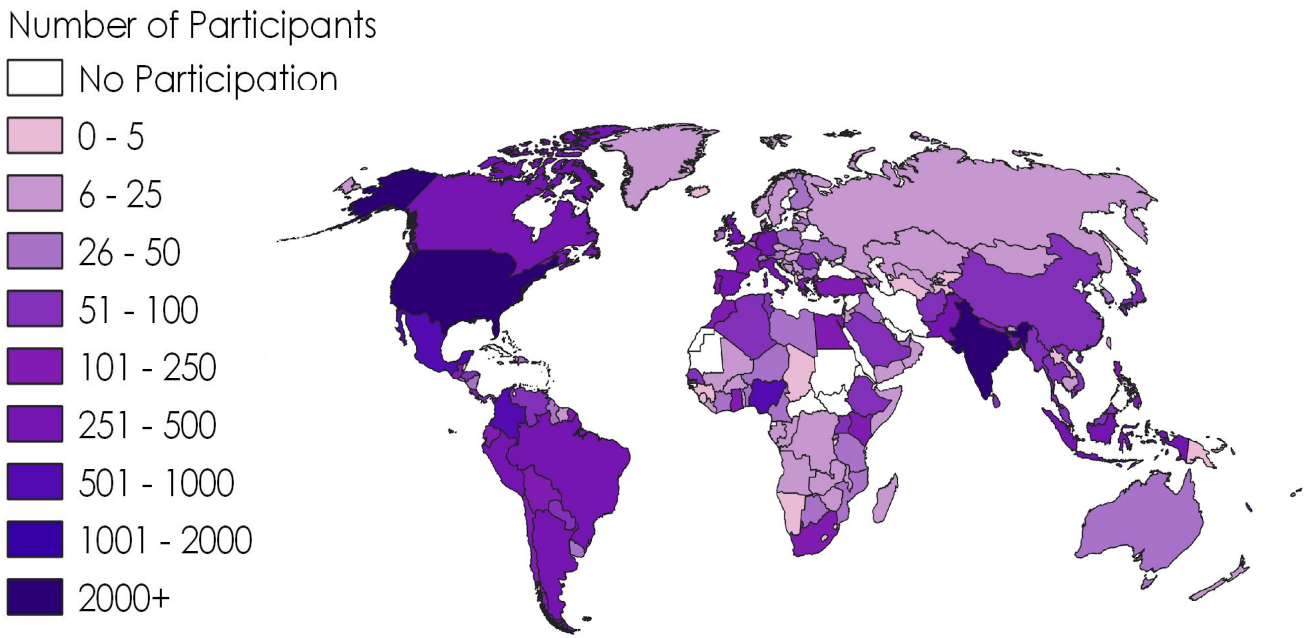
EARTH SCIENCE
APPLIED SCIENCES

CAPACITY
BUILDING

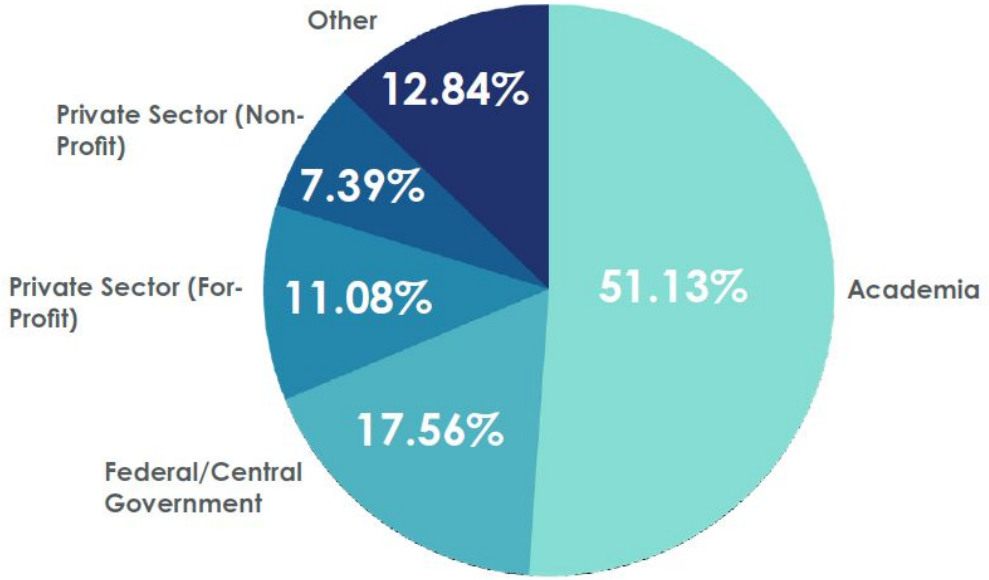
ARSET Trains an International Audience

2009 – 2023

190+ trainings | 100,000+ participants | 182 countries | 17,000+ organizations



Participation by sector



Training highlight – Satellite Observations and Tools for Fire Risk, Detection, and Analysis

Intermediate training, six sessions

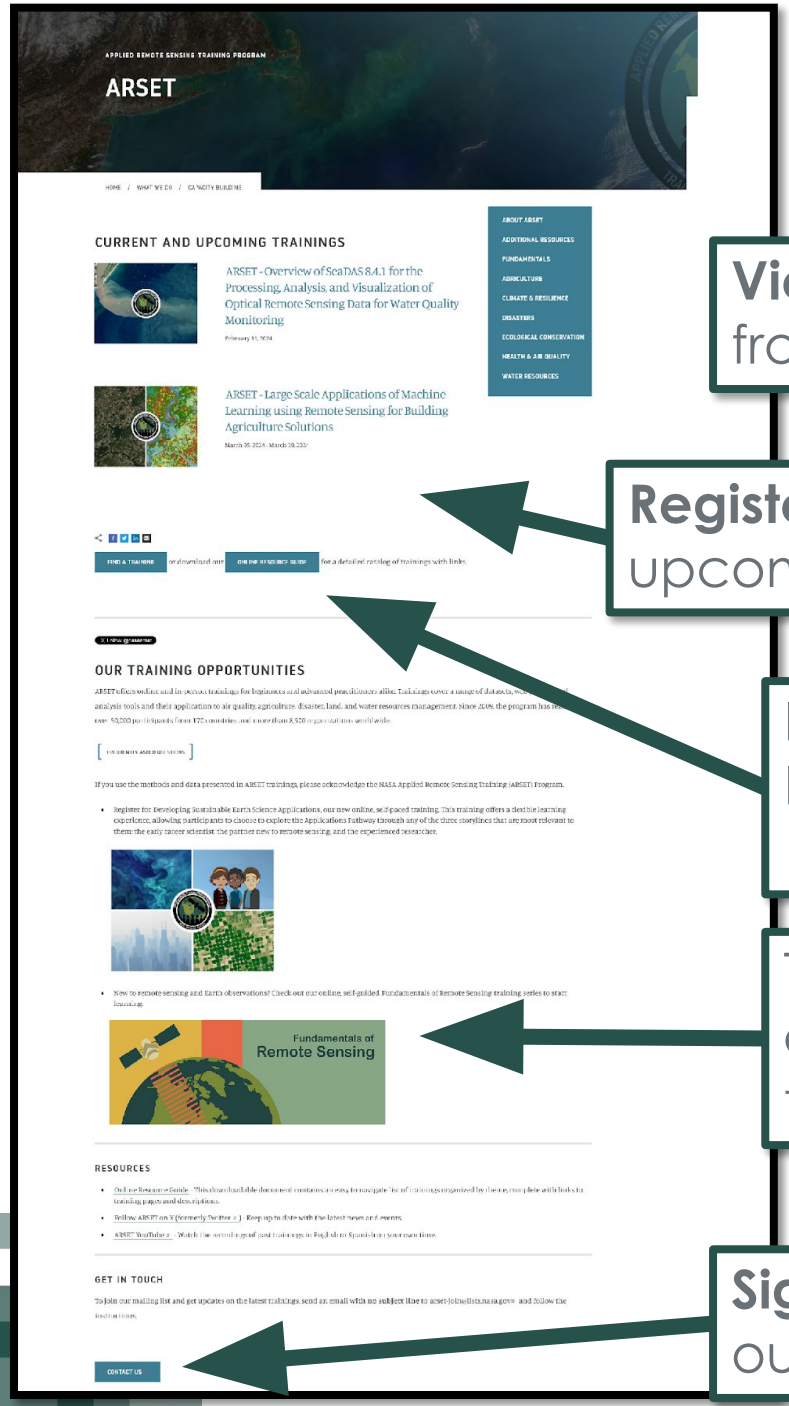
- Satellites and sensors used in conducting fire science
- Fire risk and fuels mapping
- Active fire and smoke detection, and fire emissions
- Post-fire impacts and burn severity mapping
- Tools for active fires, emissions, and burned areas
- Exercises using FIRMS, Giovanni, Climate Earth Engine
- Case study examples: Western US, Sub-Saharan Africa, Southern Mexico

Other training topics of interest

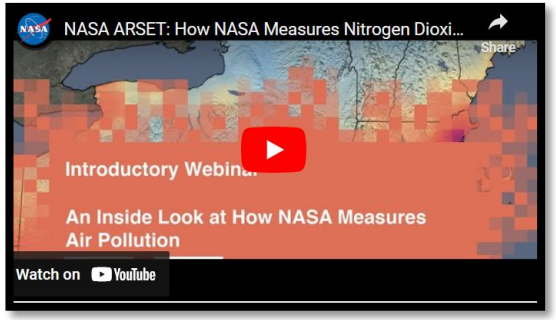
- Land cover mapping, change detections, and vegetation indices
- SAR for flood detection, crop classification, and disaster assessment
- Water quality, evapotranspiration, drought
- Air quality monitoring, reanalysis, and forecasting
- Machine learning

Online Resource Guide

Visit our website: https://appliedsciences.nasa.gov/arset

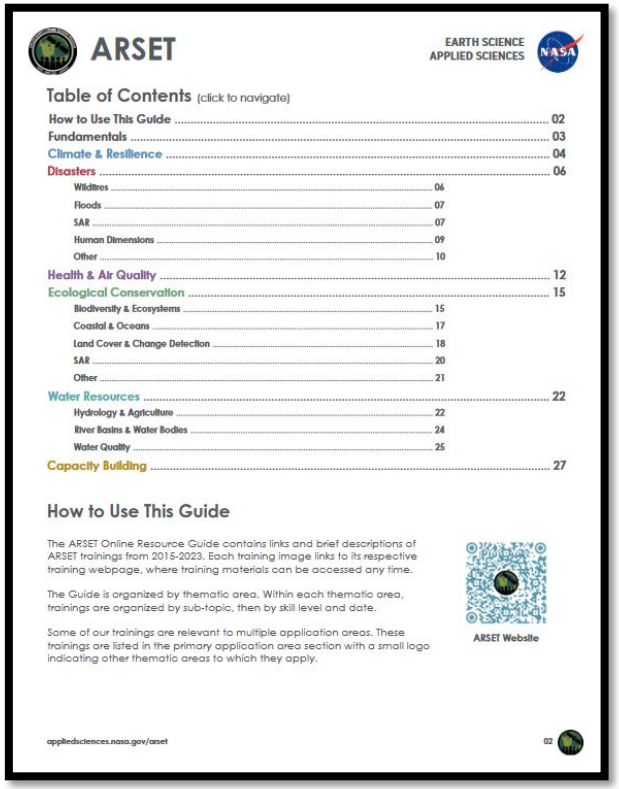


View recordings and materials from previous trainings



Register for an upcoming training

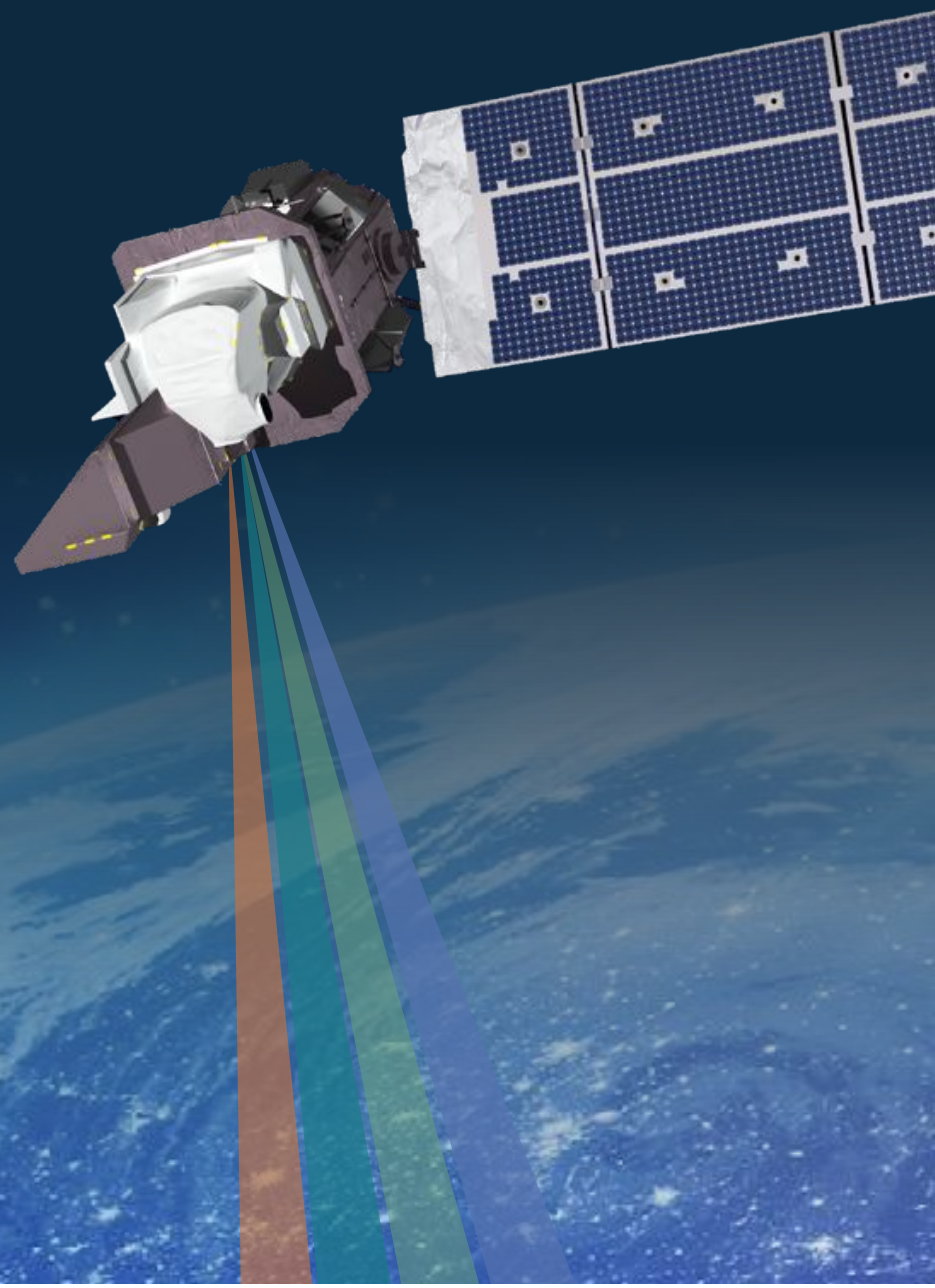
Browse our **Online Resource Guide**



Take our **Fundamentals of Remote Sensing** training

Sign up for our listserv to find out about our newest trainings

CONNECTING **SPACE** TO **VILLAGE**



Founded in 2005, SERVIR is a NASA & USAID partnership with leading geospatial organizations in Asia, Africa, and Latin America.

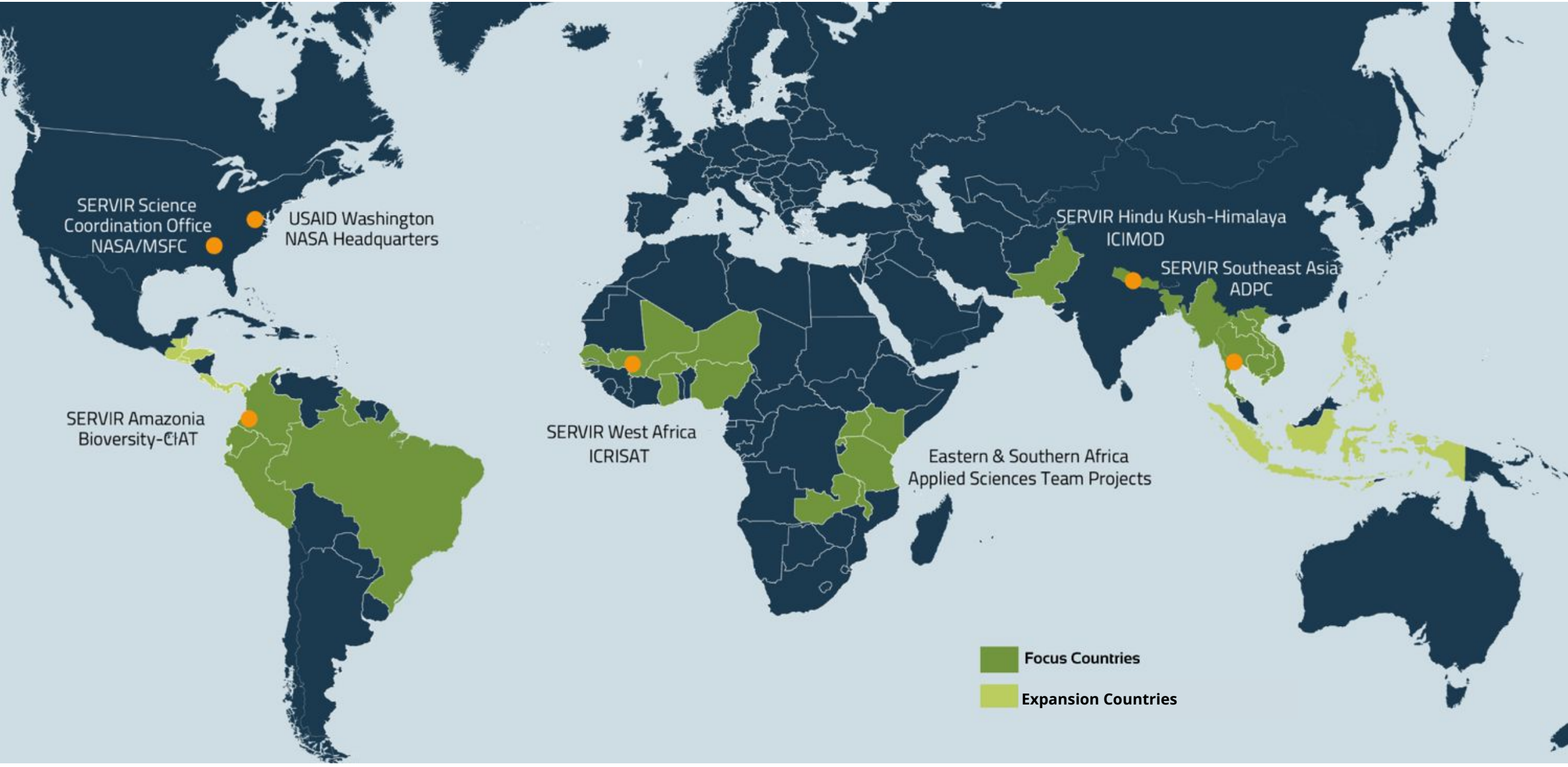
SERVIR works with country partners to

1. Strengthen climate adaptation through improved food security, water resource management & hydroclimatic disaster risk reduction, and air quality monitoring; and

2. Mitigate climate change through improved land use and forest management

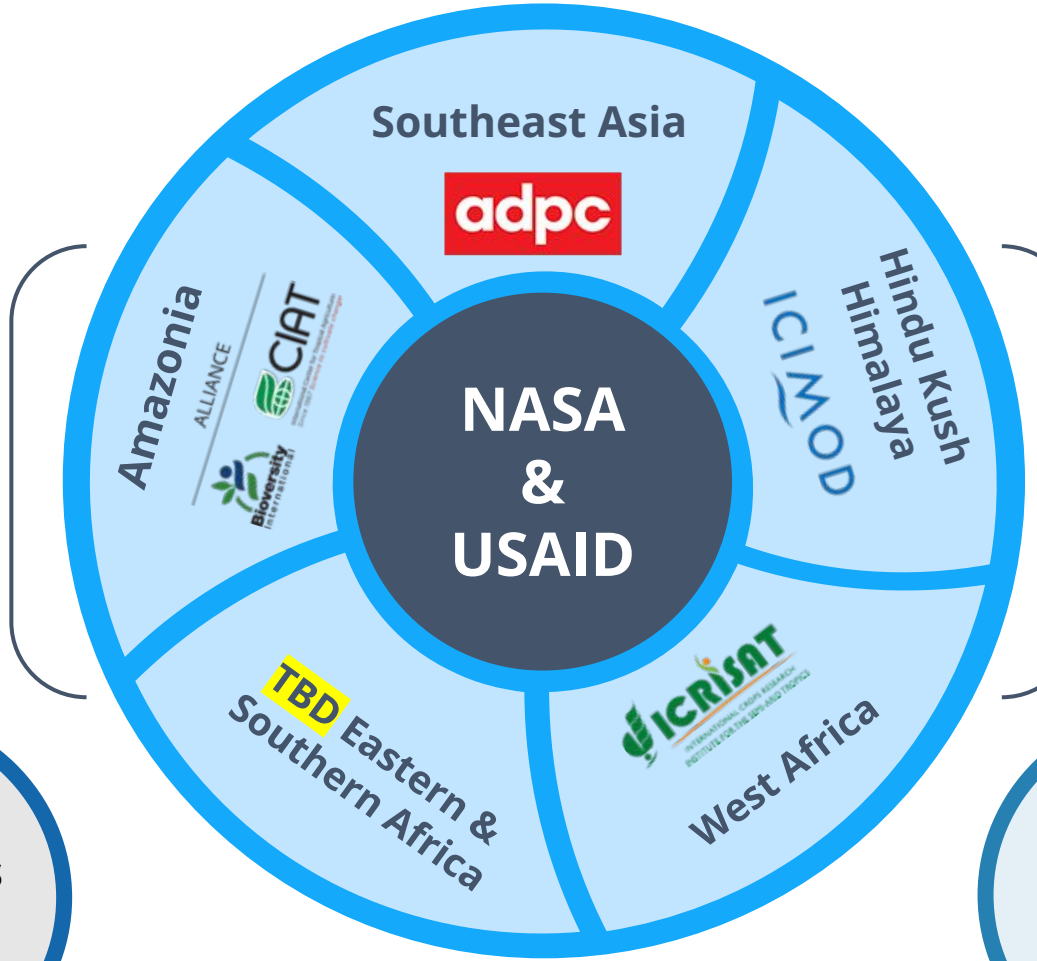
USAID FROM THE AMERICAN PEOPLE | NASA | SERVIR | ICRISAT | RCMRD | ICIMOD | adpc | ALLIANCE Bioversity International | CIAT


Agriculture & Food Security
Water Security
Ecosystem & Carbon Management
Weather & Climate Resilience
Air Quality & Health


SERVIR Science
Coordination Office
NASA/MSFC
USAID Washington
NASA Headquarters
SERVIR Amazonia
Bioversity-CIAT
SERVIR West Africa
ICRISAT
Eastern & Southern Africa
Applied Sciences Team Projects
SERVIR Hindu Kush-Himalaya
ICIMOD
SERVIR Southeast Asia
ADPC
Focus Countries
Expansion Countries

Collaborators

- Private Sector
- U.S. Government Agencies
- International Organizations
- U.S. Universities & Research Centers



End Users & Beneficiaries

- Governments
- Private Sector
- NGOs
- Communities Households Individuals

SERVIR Service Planning Toolkit

- Consultation & Needs Assessment
- Stakeholder Mapping
- Service Design
- Monitoring, Evaluation & Learning

Locally-Led Development

Open-Source Science

- SERVIR embraces open science, with a strong GitHub presence and focus on sharing data with users
- The SERVIR Applied Sciences Team ROSES21 solicitation lays out a roadmap to accomplish open & accessible science
- SERVIR continually explores new avenues of sharing data, methodologies, & results:
  - *Earth Information System*
  - *Earth Data Collaborative*
  - *Earth on AWS*
  - *Google Earth Engine*