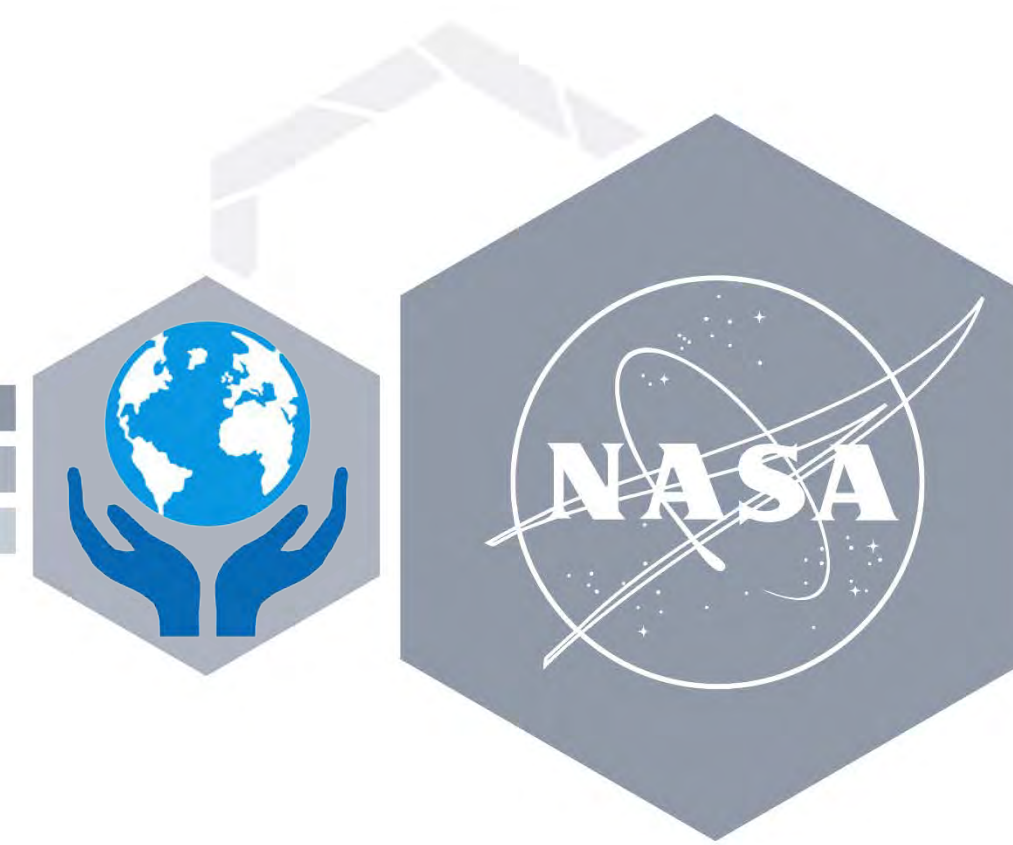


# Building Capacity To Use Earth Observations Through NASA's Capacity Building Program



## About NASA's Capacity Building Program

The Earth Science Division's Applied Sciences Program (ASP) promotes efforts to discover and demonstrate innovative and practical applications of Earth observations. ASP activities partner with organizations from the public and private sectors to apply scientific findings and satellite data in their decision-making activities. The Program has three primary lines of business: Applications, Capacity Building, and Mission Planning. All Program activities support goals to deliver near-term uses of Earth observations, build capabilities to apply Earth science data, and contribute to satellite mission planning.

The Applied Sciences' Capacity Building Program (CBP) builds capacity within the United States and the developing world to expand the Earth observations user base, and increase the awareness within non-traditional audiences of NASA Earth observations data and products. CBP engages across the ASP Application Areas portfolios of Water Resources, Disasters, Ecological Forecasting, and Health & Air Quality, as well as other application areas including Agriculture & Food Security, Energy, Urban Development, and Transportation & Infrastructure.

The Capacity Building Program works through both program and element activities. Program activities include participating in both domestic and international capacity building groups, such as the Group on Earth Observations (GEO) and the Committee on Earth Observation Satellites (CEOS), as well as identifying partnership opportunities to reach new end-users like the Indigenous Peoples Initiative and the creation of an interactive mapper. The program supports three Elements, including Applied Remote Sensing Training (ARSET), DEVELOP, and SERVIR, along with initiatives focused on building capacity to use Earth observations of indigenous peoples in North America and the creation of an interactive mapper for tracking and outreach activities.

## CBP Elements



**ARSET:** Empowers the global community through online and in-person remote sensing training to increase the use of Earth Science in decision making.



**DEVELOP:** Conducts 10-week feasibility studies that build capacity in individuals and institutions to use NASA Earth observations to enhance decision making.



**SERVIR:** Works in partnership with USAID and leading regional organizations globally to assist developing countries use Earth observation information.

### Thematic Application Areas



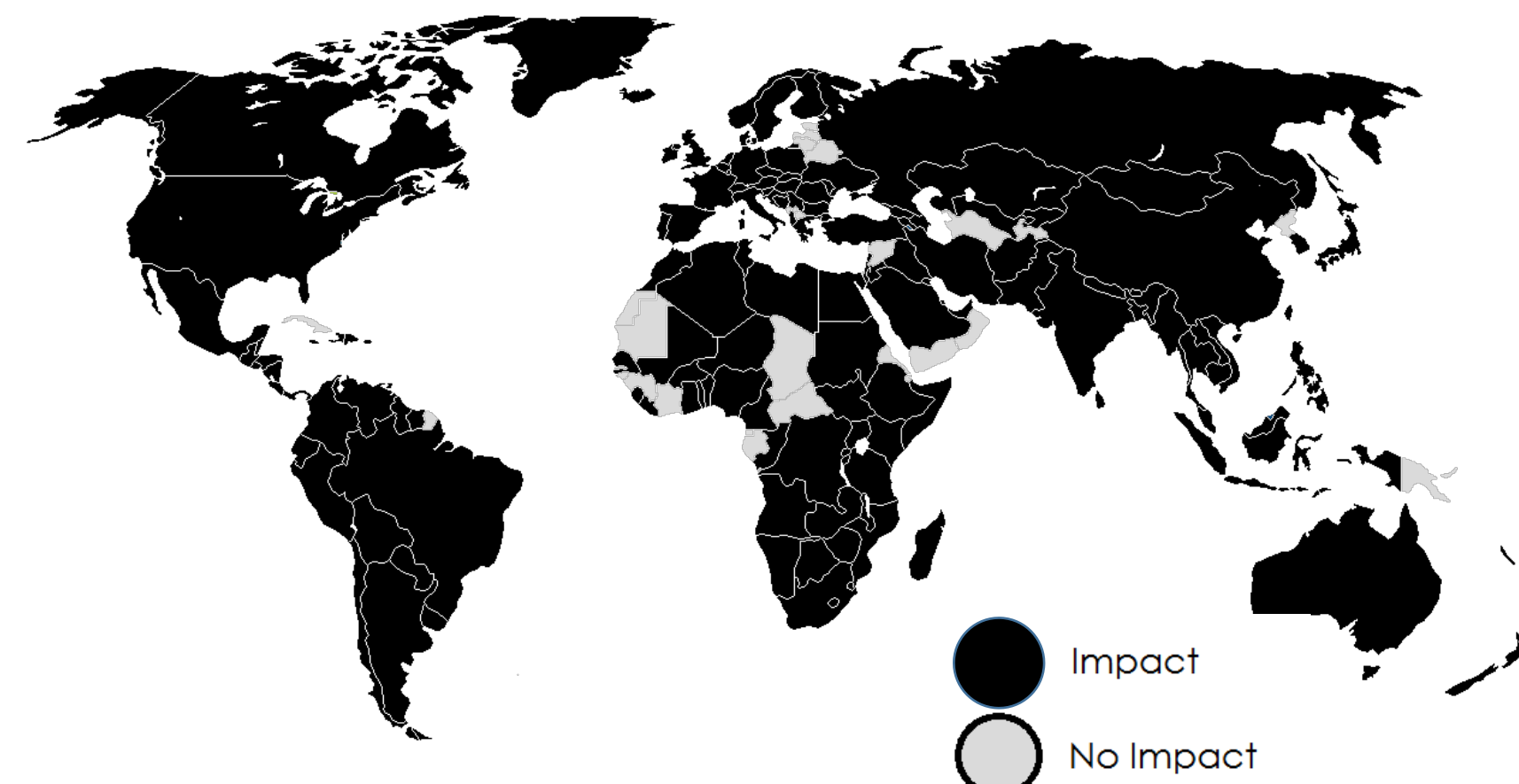
## 2017 Programmatic Achievements

6,622  
Individuals

2,369  
Institutions

104  
Trainings

142  
Countries



### ARSET

In 2017, ARSET conducted 18 trainings that engaged 4,864 individuals and 2,030 institutions in 132 countries. The program had 10,199 views of recorded online trainings. The most popular ARSET training in 2017 was *Introduction to Synthetic Aperture Radar*, which had ARSET's highest number of live instances of participation ever: 984. The training, given entirely in Spanish in one session and in English in another, has also done well with online views. Since the live training, the sessions have been viewed more than 3,800 times, with nearly 2,500 of them being viewings of the Spanish recordings.



### DEVELOP

DEVELOP had a dynamic year, engaging 342 individuals and 128 institutions through 70 feasibility projects. These projects, and the participants that conducted them, impacted 50 U.S. states and 23 countries. The program launched its interactive mapper on the DEVELOP website that allows viewers the opportunity to visualize and locate the program's extensive portfolio of feasibility studies from 2016 to the present. The program also had six peer-reviewed journal publications and continued its video series highlighting the use of Earth observations in decision making, with a record 34,286 YouTube views from more than 170 countries in 2017.



### SERVIR

In 2017, SERVIR was active in more than 45 countries, conducting 61 projects and 59 trainings. The program developed, provided oversight for, enhanced, or launched 26 applications and tools, including geoportals to improve data availability and sharing, online agricultural atlases to support food security, and vulnerability assessment tools to inform disaster-related decisions. These products and tools operate based on data from 27 different satellite instruments. A total of 1,202 individuals were trained in the use of SERVIR tools, technologies, data, and methodologies, with a total of 241 institutions engaged.



## Approaches to Capacity Building

- ▶ **Trainings:** CBP provides capacity building through in-person, webinar, and on-demand virtual module trainings.
  - ARSET works directly with agencies and policy makers to develop in-person and online trainings that teach end-users how to access, visualize, and apply NASA Earth Science Data in their professional area. Modules and webinar recordings are publicly available in English and Spanish on the program website.
  - SERVIR, through its international hubs, offers trainings to decision makers in developing countries to support environmental management.
- ▶ **Short-term Feasibility Projects:** CBP provides capacity building through feasibility projects that take place in rapid 10-week long terms through the DEVELOP Program. These projects serve as a dual capacity building venue with project participants gaining hands-on experience in the use of Earth observations and partner organizations gaining results and methods from these projects.
- ▶ **Longer-term Multi-year Projects:** CBP provides capacity building through in-depth international projects conducted by SERVIR and co-developed by developing countries. These projects provide products and tools to enhance decision making in the developing world.
- ▶ **Engagement w/Other Space Agencies:**
  - Work with other space agencies to offer trainings through CEOS WGCapD
  - Coordinate capacity building efforts with GEO CBC WG

## Future Plans

- ▶ Engage with interagency and international consortiums, boundary organizations, and the broader NASA Earth Sciences community to further increase the number of individuals and institutions benefiting from NASA's investment in Earth science.
- ▶ Support the collection and communication of best practices to learn and improve capacity building approaches.
- ▶ To improve feedback of lessons learned through capacity building to the broader Earth science community, CBP continues to grow a community of practice of Earth observation use capacity building practitioners through science conferences like the American Geophysical Union fall meeting, through relationships with other program managers in Applied Sciences and in Research and Analysis, through participation in data active archive center (DAAC) User Working Groups and Science Team meetings, and through broader engagement with the community.
- ▶ ARSET is implementing its asynchronous learning platform, allowing attendees to take self-guided trainings; introducing new disasters management-related topics; offering change detection trainings with applications for disasters and ecosystems; and, dedicating a training to geostationary satellite data.
- ▶ DEVELOP is recognizing its 20th anniversary throughout 2018, has expanded its network through the establishment of a new node in Boston, Massachusetts in January of 2018, and is continuing to increase its projects' use of socioeconomic data.
- ▶ SERVIR is increasing capacity of its hubs to maximize use of high-performance computing for service development and delivery, continuing to increase hub and science coordination office (SCO) capacity to process and use SAR imagery and LIDAR, and selecting the newest SERVIR hub, SERVIR-Amazonia.

## Opportunities to Collaborate & Engage

### CBP is interested in:

- ▶ Improving coordination of activities so that resources can be leveraged and efforts amplified
- ▶ Aligning training types and geographic areas
- ▶ Aligning activities within specific thematic areas through projects
- ▶ Defining collaboration opportunities with VLAB and NASA CBP programs (ARSET, DEVELOP, and SERVIR) as well as WGCapD and GEO to utilize Earth observations to monitor coastal health, marine and ocean resources, water availability, and drought to enhance environmental decision making, and to share and build capacity building best practices

### Engage with CBP:

- ▶ Take an ARSET training: visit <https://arset.gsfc.nasa.gov/> for more information about upcoming trainings list and access the archive of past trainings.
- ▶ Connect a decision making organization to DEVELOP to serve as a feasibility project end-user – project request form, found at <https://develop.larc.nasa.gov/projects.php>. Email to [NASA-DL-DEVELOP@mail.nasa.gov](mailto:NASA-DL-DEVELOP@mail.nasa.gov).
- ▶ Serve as a volunteer advisor for a DEVELOP feasibility project: email DEVELOP at [NASA-DL-DEVELOP@mail.nasa.gov](mailto:NASA-DL-DEVELOP@mail.nasa.gov) to learn about projects within your area of expertise.
- ▶ Visit the DEVELOP code repository at <https://github.com/NASA-DEVELOP> to access scripts and code that support the integration of Earth observations across a variety of applications.
- ▶ Engage with SERVIR hubs around the world to collaborate in trainings in a developing countries.
- ▶ Visit <http://catalogue.servirglobal.net/> for more information and access to SERVIR's Global Product Catalogue, a searchable collection of user-tailored products and tools using Earth Observations and NASA Products to inform resilient development.

### Engage with CEOS & GEO:

- ▶ **CEOS:** leverage the coordination efforts of CEOS and CGMS for CB
- ▶ **GEO:** join the GEO CBC WG (WMO and CEOS are already participating organizations)

## Challenges

- ▶ Discoverability of capacity building activities so that we are able to coordinate and leverage
- ▶ Defining and documenting user needs and then brokering those needs to match with available capacity building resources
- ▶ Putting the necessary measurements and programs in place to build sustained capacity and understand the impact

