SERVIR:
Connecting Space to Village

Daniel Irwin, NASA

Peter Epanchin, USAID

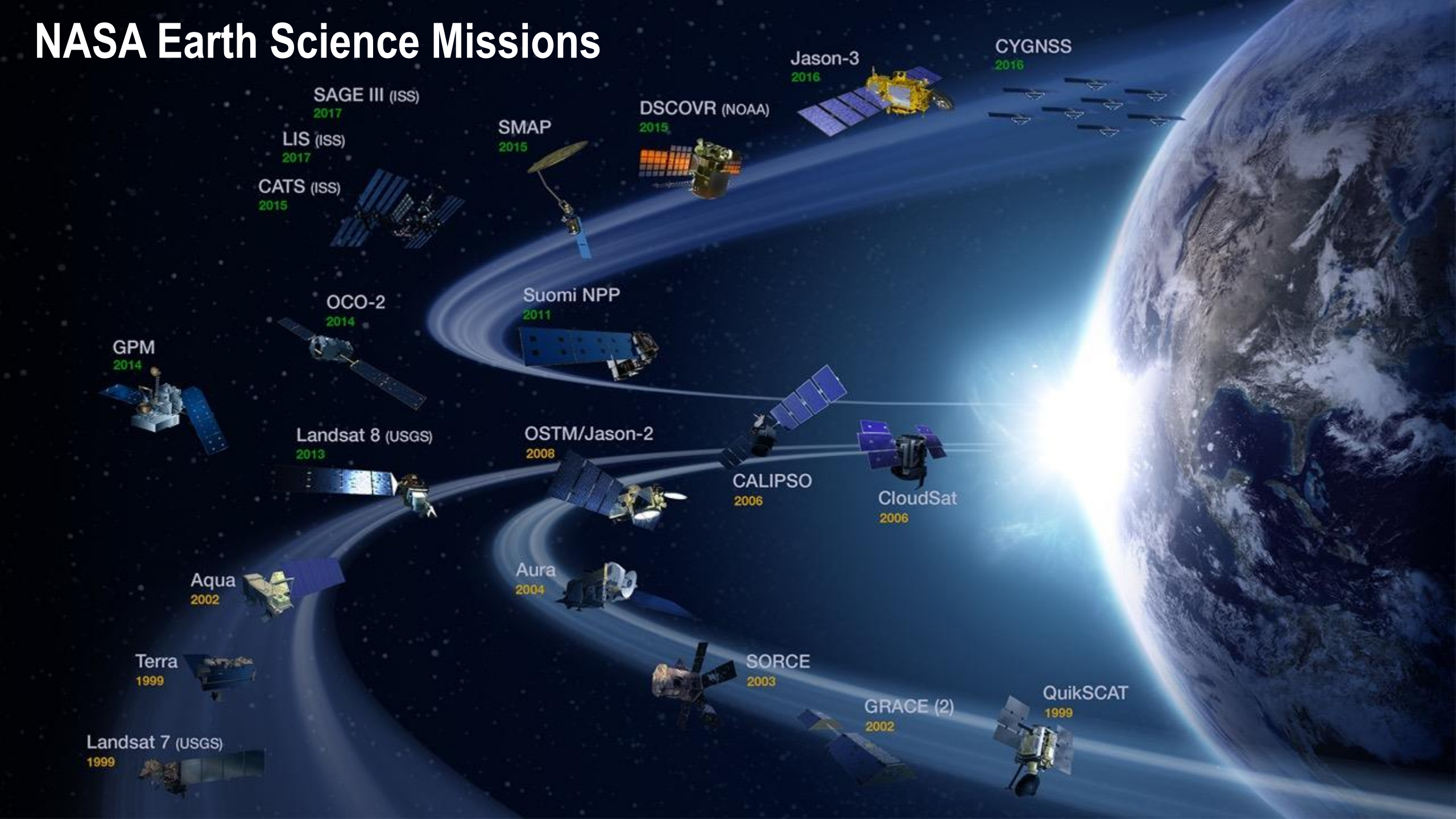
SERVIR

adpc

ICIMOD

USAID
FROM THE AMERICAN PEOPLE

NASA Earth Science Missions



NASA's Applied Sciences Program

Discovering and demonstrating innovative and practical uses of Earth observations in organizations' policy, business, and management decisions.

Applications

Prove-out, develop, and transition applications ideas for sustained uses of Earth obs. in decision making.

Capacity Building

Build skills and capabilities in US and developing countries to access Earth observations to benefit society.

Mission Planning

Identify applications early in mission lifecycle and integrate end-user needs in mission design and development.

Countries Around the World Need Satellite Data

Problem:

- Many of the most complex challenges linked to national security and prosperity occur in data-scarce environments
- Most countries lack the capacity to use satellite data and geospatial technologies to manage risks and safeguard economic growth

SERVIR connects space to village by helping developing countries use satellite data to address critical challenges in food security, water resources, weather and climate, land use, and natural disasters. A partnership of NASA, USAID, and leading technical organizations, SERVIR develops innovative solutions to improve livelihoods and foster self-reliance in Asia, Africa, and the Americas.

What and Who is SERVIR?

"Connecting space to village"

A joint initiative of USAID and NASA that partners with regional technical institutions around the world to get Earth observation information into the hands of decision-makers to improve development outcomes.

- Societal benefit from space
- 20+ satellites, data free and open
- Major research portfolio
- Limited internationally

- Poverty reduction and resilience
- Working on data-dependent issues in data-scarce places
- International field presence

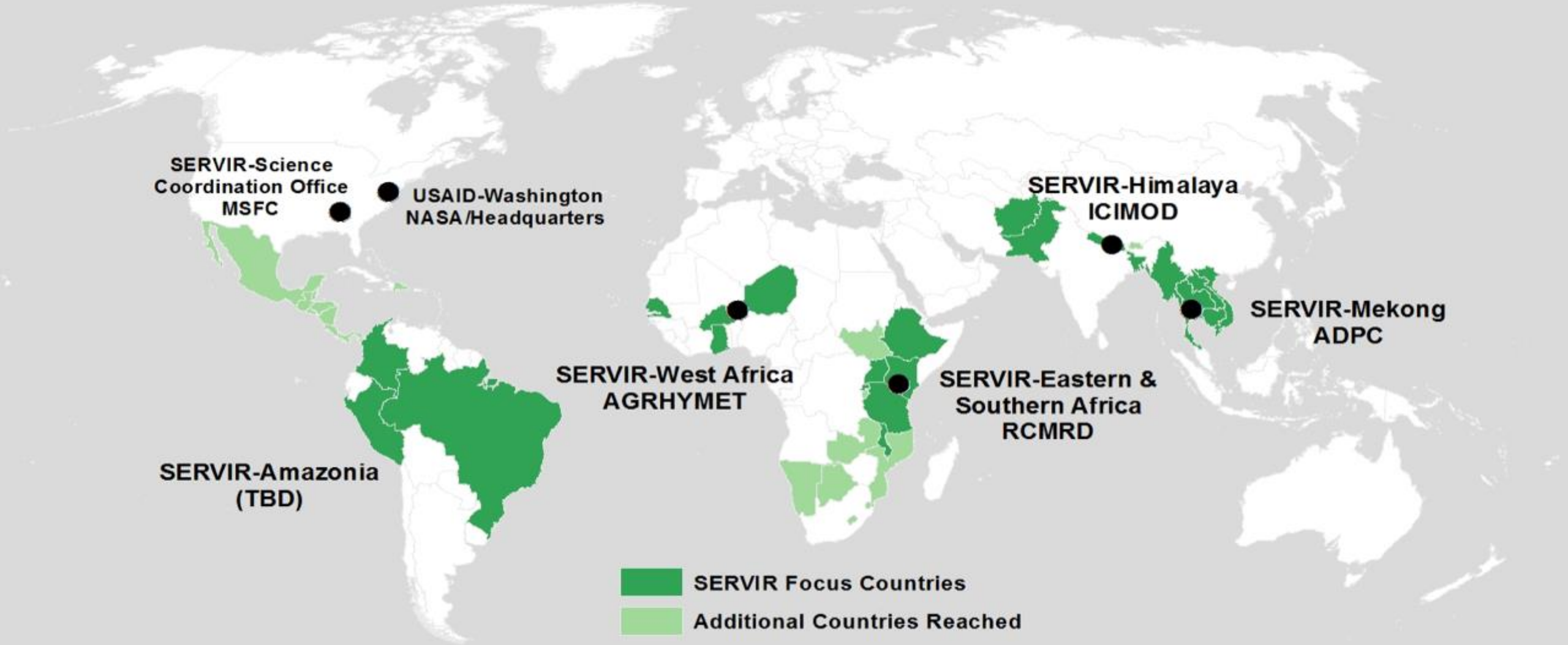
Regional hubs

Hub partners

Private sector partners:

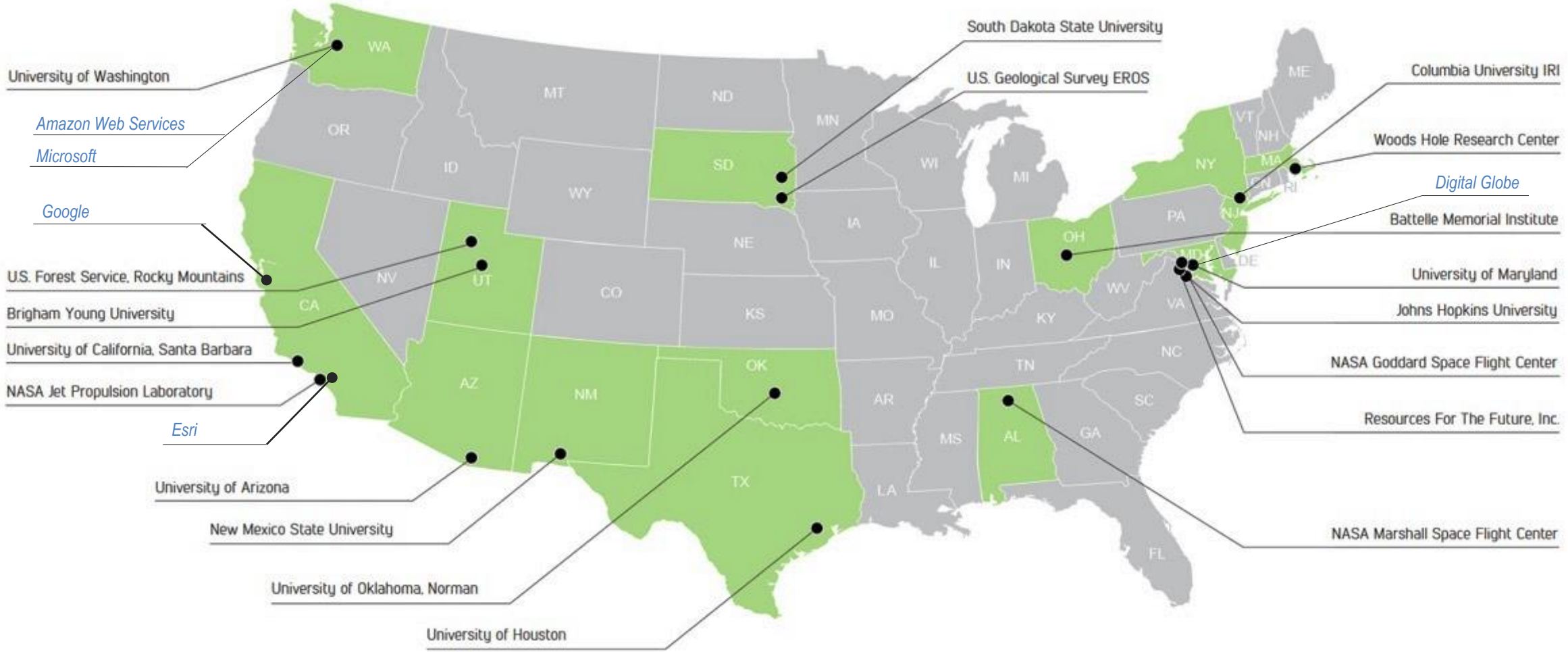
Research collaborators:
19 universities and research centers located in 14 states (in the U.S.)

Working in Over 40 Countries



Reaching Across the U.S.

SERVIR's U.S. Research Collaborators and Technology Partnerships

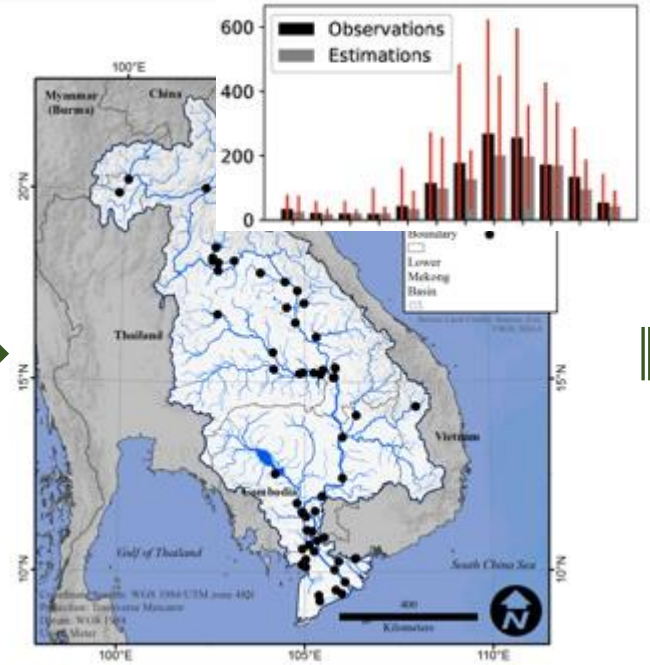


SERVIR Approach

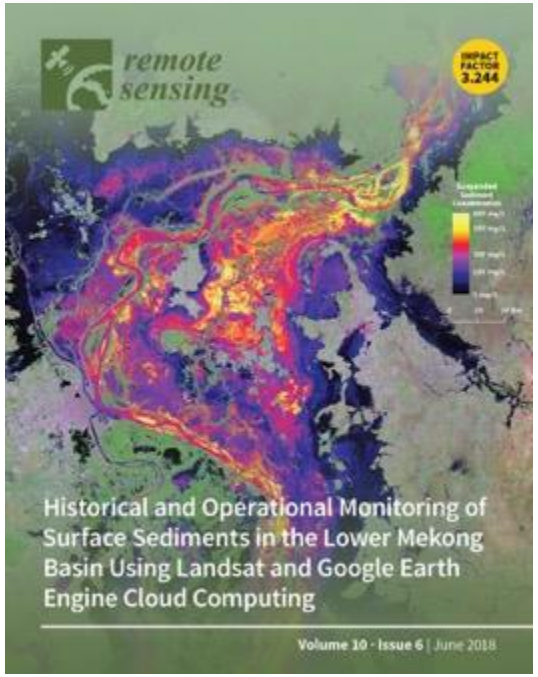
- Leverage American leadership and comparative advantage of NASA, USAID, U.S. companies, and U.S. universities and science agencies
- Build lasting institutional capacity to address priority resilience issues related to security and prosperity – food, water, disasters, land
- Tap into the most innovative and appropriate applications of science and technology to develop replicable, adaptable solutions

Monitoring Sedimentation In the Mekong River

Dam on Nam Theun river in Laos



Limited *in situ* sediment measurements sites used to compute model accuracy



SERVIR's work was featured on the front page of the June issue of Remote Sensing

New dam construction and changes in land cover and land use is having a significant impact on sediment loads and water quality throughout the Lower Mekong basin.

(Courtesy of USAID)

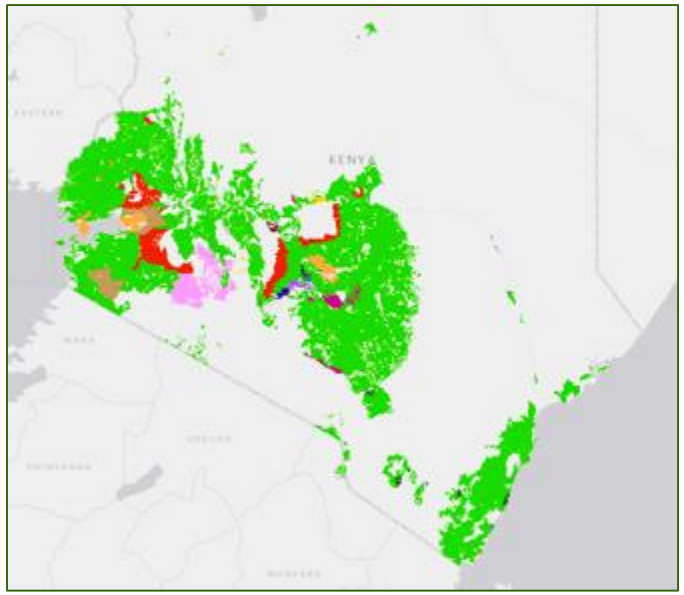
Previously, to assess sediment concentration, decision makers had to rely on their sparse network of *in situ* water quality stations in the Mekong River Basin.

SERVIR and the Mekong River Commission implemented a model leveraging the entire Landsat archive, allowing users to supplement limited station data with satellite products. The model output enables dam managers to reduce the impact of sedimentation on fisheries downstream.

SERVIR Crop Masks Leads to Kenya Agricultural Insurance System

Kenya's State Department of Agriculture (SDA) used SERVIR Eastern and Southern Africa's high-resolution, country-wide agricultural crop mask map to design their pilot Agricultural Insurance System to provide payouts to farmers during incidences of crop failure.

- Previous attempts to develop such a system was prohibitively expensive and time consuming.
- SERVIR-E&SA is strengthening the capacity of SDA to use the latest multi-satellite data and integration techniques to update the crop masks on an annual basis to ensure the sustainability of the insurance system.



New crop mask developed to support food security in Kenya

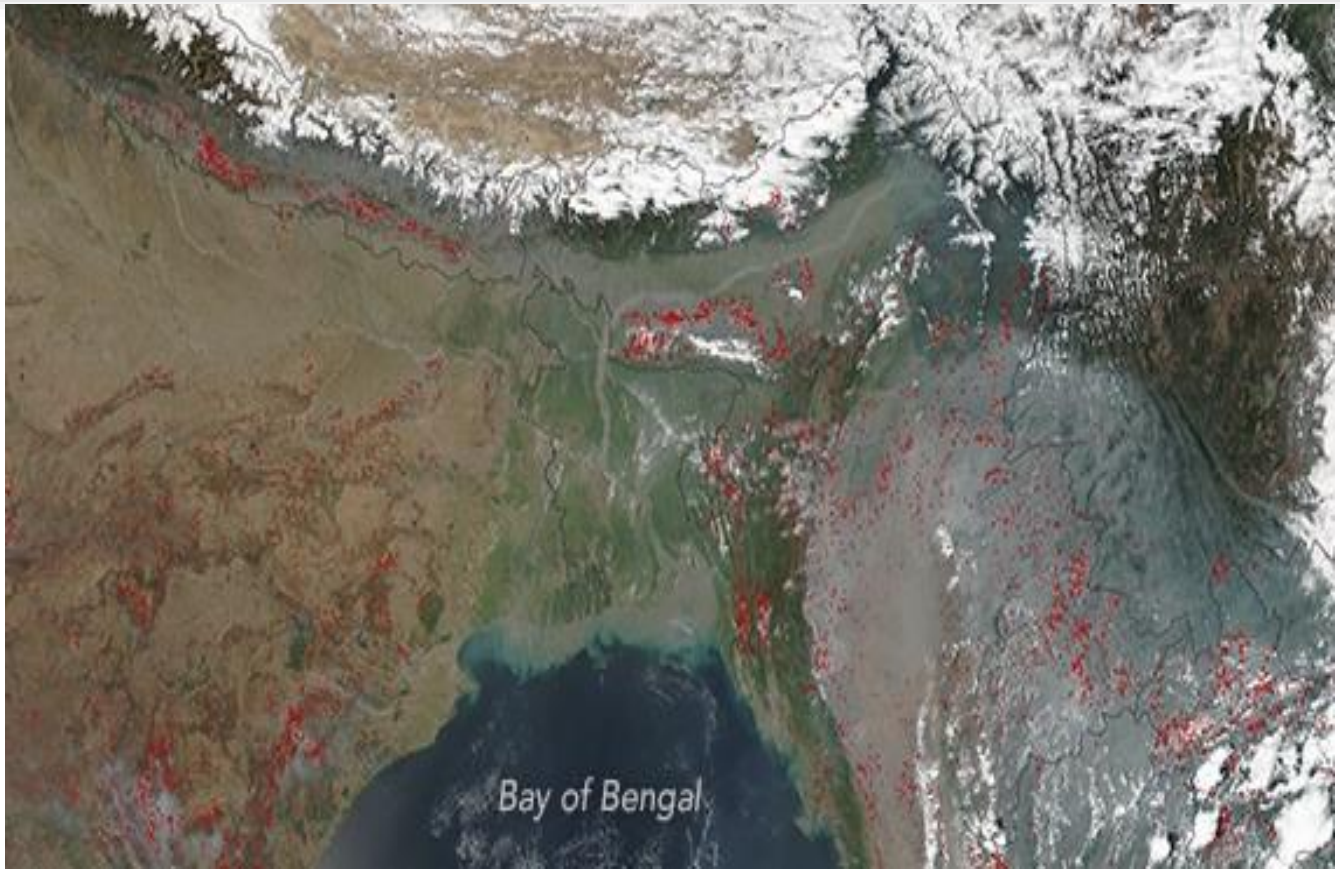

BUSINESS DAILY

Planning, growth made easier with digital maps

Crop map value discussed in Africa Business Daily. (Courtesy of USAID)

Detecting and Responding to Forest Fires in Nepal

SERVIR's Forest Fire Monitoring System displayed in Nepal government lobbies (Courtesy of USAID)



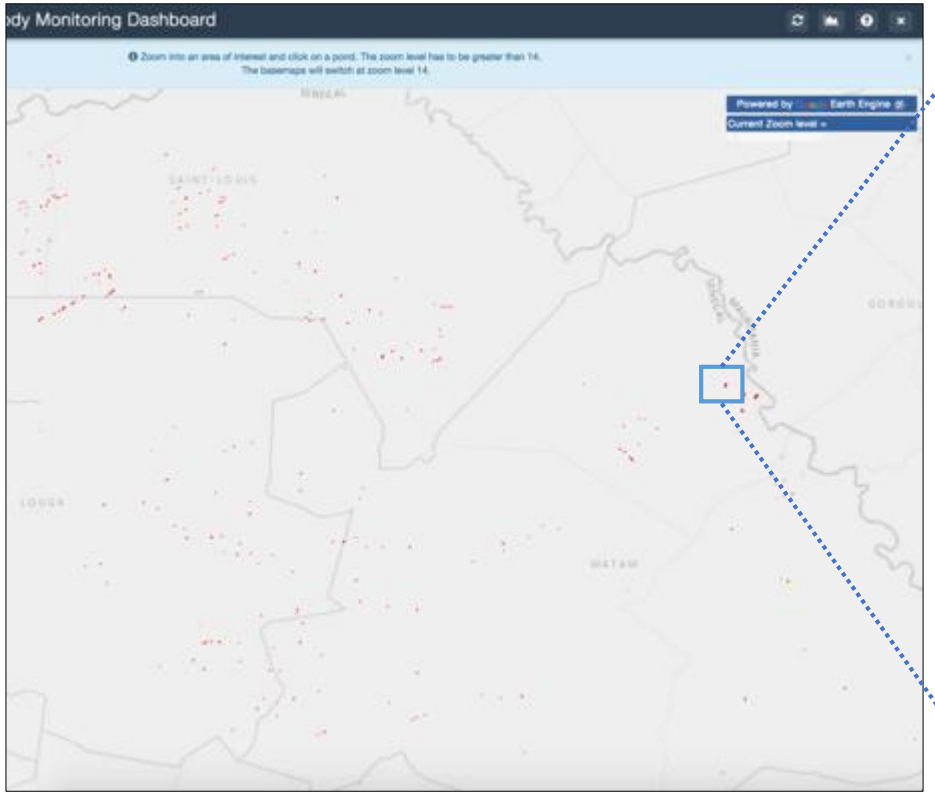
Red dots indicate forest fire hot spots, as detected by the satellite thermal sensors

Through SERVIR's fire monitoring system, use of satellite data is firmly embedded in Nepal's government Forest Department. This system triggers action and response on the ground, especially in remote areas of the country.

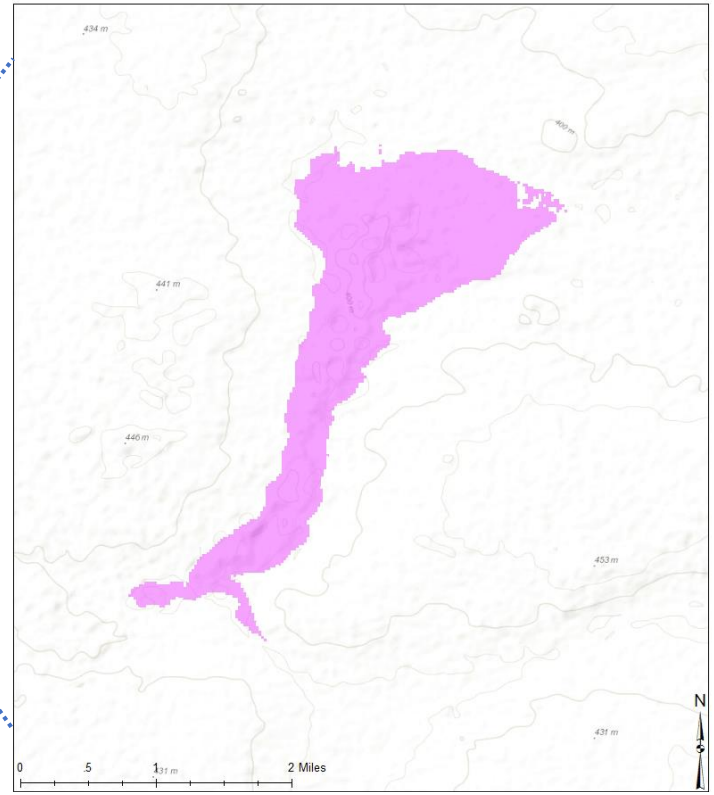
Monitoring Small Water Bodies in West Africa for Pastoralists

Pastoralists in parched West African rangelands are always in search of ponds with water for their livestock. SERVIR has developed a tool that scans the latest satellite data and updates a map of available water in those ponds. This information is relayed to the pastoralists by radio and cellphones.

Pastoralists in West Africa searching for water and forage. (Courtesy of USAID)



Using latest satellite observations, SERVIR monitors thousands of small ephemeral ponds across the Senegal to determine the availability of water

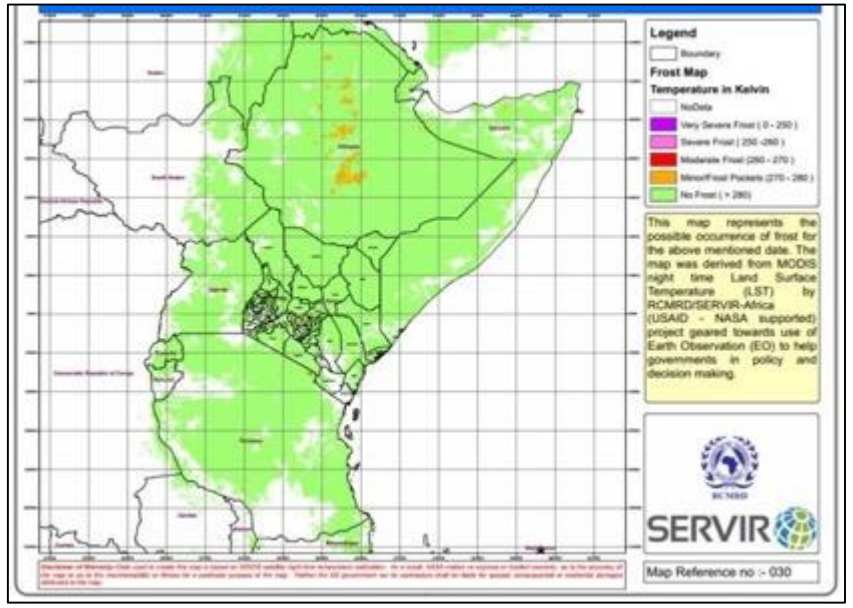


Monitoring changes in pond water over time

Forecasting and Mapping Frost for Kenyan Tea Farms

SERVIR's satellite-based monitoring and forecasting of frost conditions in the Kenyan tea growing regions has spurred insurance companies to offer new, frost insurance riders to farmers. The satellite data has been used to adjudicate insurance claims and provides great opportunities for taking preventive actions, such as harvesting the tea leaves before a frost. This information is relayed to the farmers at local collection points.

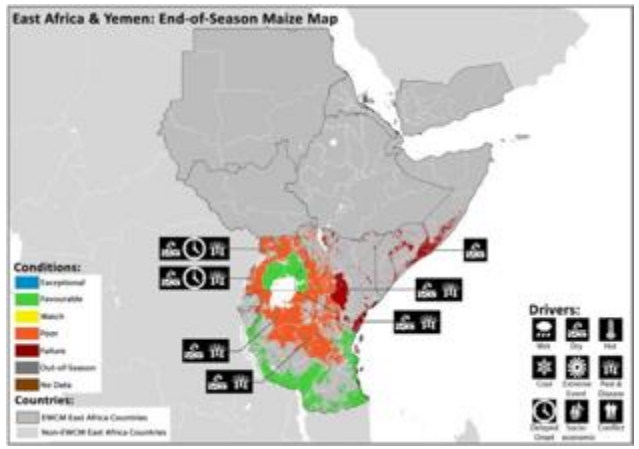
SERVIR team meeting with Kenyan tea farmers to understand possible mitigation options based on frost forecasting information. (Courtesy of USAID)



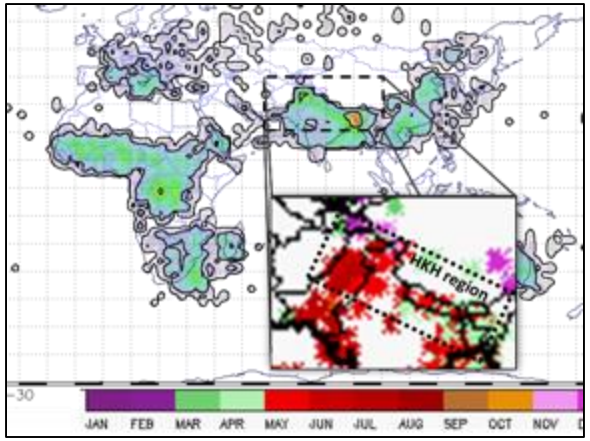
SERVIR frost occurrence map showing affected areas in Kenya (orange areas)

Tea leaves affected by frost

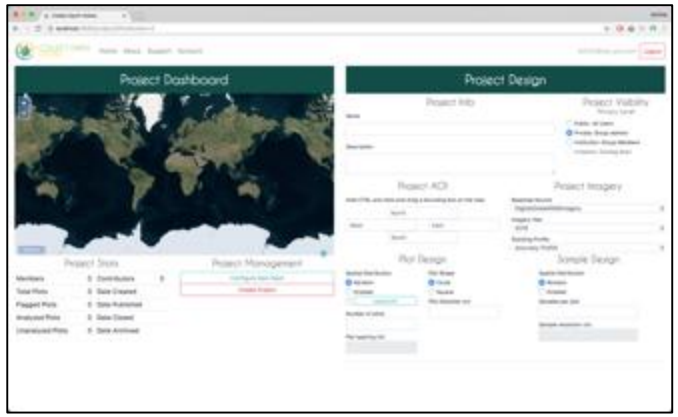
Replicable and Scalable Solutions



GeoGLAM Crop Monitor was created for individual countries and is being expanded to the Greater Horn of Africa through SERVIR



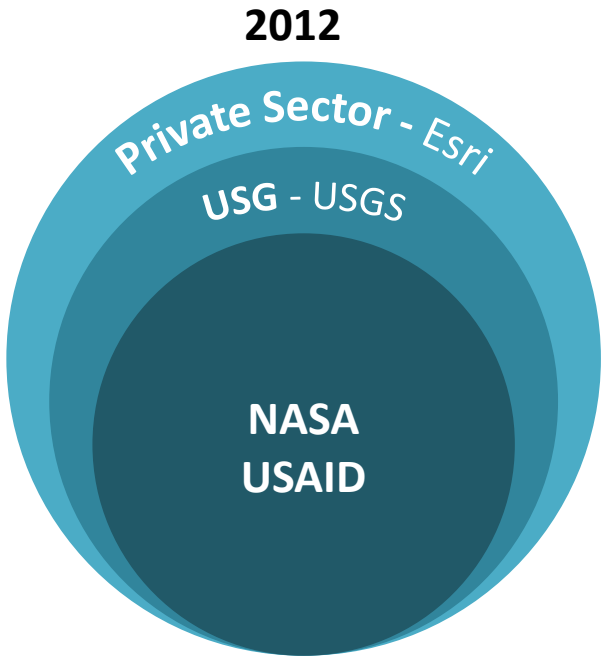
Thunderstorm monitoring and forecasting was created for SERVIR-HKH region and has been expanded to the Mekong region

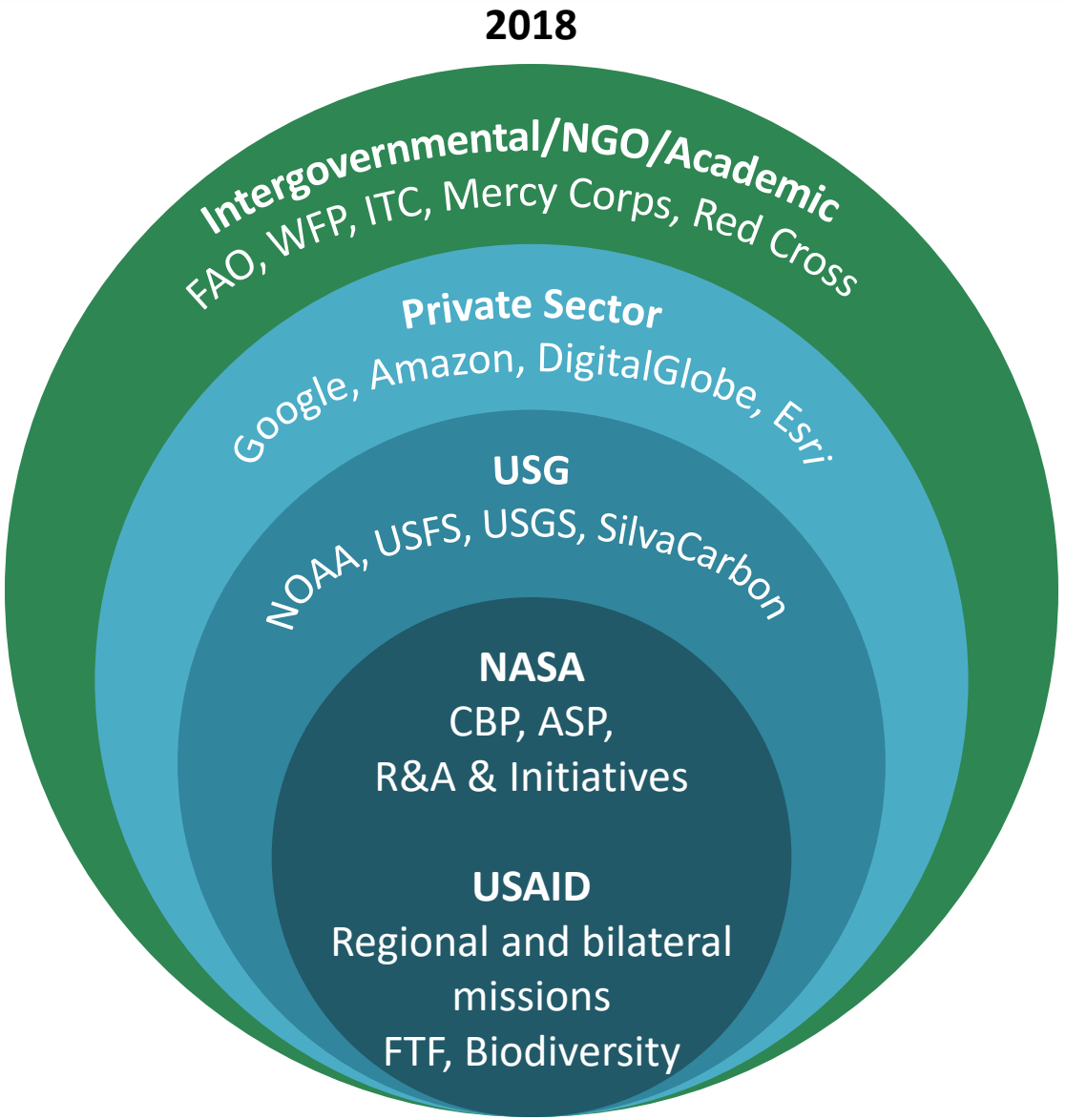


Collect Earth was created by FAO, Mapcha was created by SERVIR-Mekong. Joining efforts, Collect Earth Online is being expanded as a global service.

SERVIR-West Africa's small water body mapping service for pastoralists is being expanded in East Africa

Partnerships and Collaborations





SERVIR is a U.S. "Asset" to Position Strategically

SERVIR generates many forms of value

Advances security, prosperity, and resilience

- Stronger **science and technology capacity to solve food, water, disaster, and land challenges**
- **Better data for the U.S. and our partners in critical regions** through extensive research collaborations

Furthers American values and policy goals

- Incentivizing **data sharing and collaboration across borders** in critical areas
- **Science diplomacy** engages future scientists, women, and youth with the U.S.

Reduces reliance on U.S. assistance and building countries' self-reliance

- **Strengthening institutions** to use science and technology for development over the long term
- **Improving efficiency and accountability** of our partners, helping them make better use of scarce resources

Fosters U.S. leadership in science and technology for society

- **Leading U.S. tech companies** extend their reach in emerging markets, benefitting more people
- At the cutting edge of **Earth observation for development** through a unique collaboration model

(Courtesy of USAID)