

GLOBAL WATERS

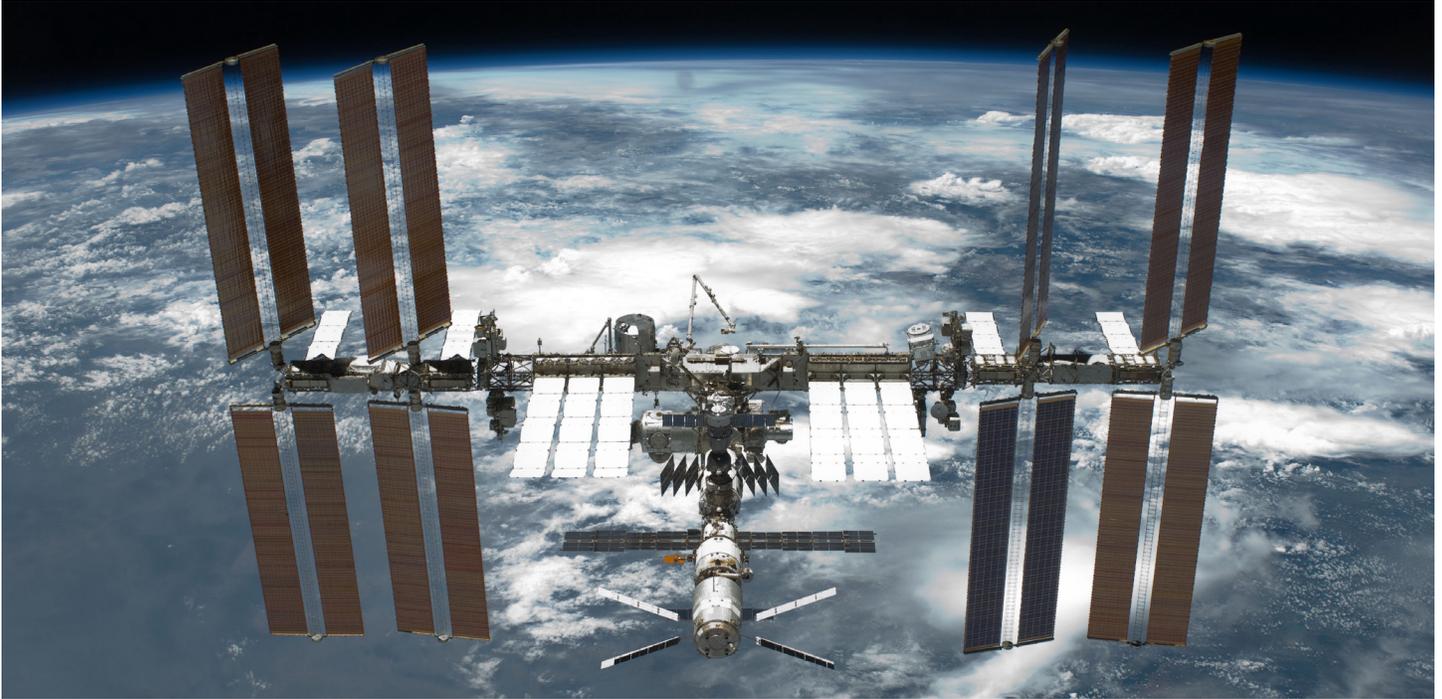


Photo credit: SERVIR Global

From Satellite to Village, Turning Data into Action

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Since 2005, an ambitious collaboration between NASA and USAID has been quietly but steadily building the capacity of scientific organizations, government officials, emergency responders, and communities across the developing world to better handle environmental challenges and more effectively pursue resilient development. Known as SERVIR — which means “to serve” in several languages — it seeks to deliver near-real-time environmental data from Earth-orbiting satellites to data-scarce communities and scientists, and translate that data into tools, products, and services that can inform local decision-making on everything from land use and food production to water management and disaster risk reduction.

SERVIR’s overarching goal of transferring knowledge from U.S. scientists and development experts to their counterparts abroad equips partners with the skills and information needed to handle environmental challenges as they arise, while empowering local scientists and policymakers — and the communities they serve — to become more self-reliant.

For more information, please visit Globalwaters.org.

Now entering its 13th year, SERVIR showcases the productive potential of interagency collaboration within the U.S. Government. “The success of SERVIR is a result of bringing together perhaps two of the most different agencies in the federal government — NASA and USAID,” says SERVIR Co-founder Dan Irwin. “NASA works in space and uses the unique vantage point of space to monitor our planet, and USAID works on the ground in over 100 countries around the world. By sharing our complementary expertise — and partnering with leading technical organizations — we’re connecting space to village, creating demand-driven, actionable services using satellite data to help countries address critical issues such as floods and droughts.”

Democratizing Access to Scientific Data Fuels Greater Self-Reliance

SERVIR works hand-in-hand with institutional partners via four regional hubs: [SERVIR-West Africa](#), [SERVIR-Eastern and Southern Africa](#), [SERVIR-Hindu Kush Himalaya](#), and [SERVIR-Mekong](#). With that geographic reach, SERVIR has helped streamline access to scientific data in 45 countries since the program’s launch. The number of beneficiary countries is poised to grow in the coming years as demand surges for satellite-based Earth observation data that can inform decision-making, and the new SERVIR Amazonia hub arrives in South America in 2019.

Through each regional hub, SERVIR engages a primary institutional partner that helps connect NASA and USAID officials with their local counterparts. These institutional partners, such as the Asian Disaster Preparedness Center in the Mekong basin, not only offer connections to national governments and development agencies, but also facilitate knowledge transfer and accelerate capacity building by helping connect local scientists, development officials, policymakers, and emergency response officials. “If we want lasting influence, we have to connect effectively to local institutions,” says Kevin Coffey with USAID’s Global Climate Change Office. “We do think really hard about sustainability.”

How does the program know what type of data is most needed at the local level, and how to effectively translate that data into actionable information? SERVIR’s institutional partners conduct needs assessments in consultation with local stakeholders that identify information gaps. In turn, SERVIR is able to more effectively gather and distribute the data in highest demand, and help integrate this information into technical tools and services that assist communities in making better-informed choices about land use and economic development.

“While dealing with the different stakeholders, it is important to understand their needs and capabilities,” says Faith Mitheu, water and disasters thematic lead for SERVIR Eastern and Southern Africa. “This way, it will be easy to bridge the gap between science and policy by developing sound products that can be easily used for decision-making.”

When applied correctly, Earth observation data can strengthen national and international systems by enhancing the monitoring, forecasting, and overall awareness of hazards and impacts. It further creates greater self-reliance in countries where SERVIR is active, enabling disaster managers to prepare for and respond to natural

disasters, building resilience in the face of the next extended drought, and mitigating against the worst impacts of future floods.

Empowering local scientists to serve as translators of scientific data gleaned from NASA satellites is of critical importance to SERVIR's overall mission. "Making satellite data freely available is a start," says Eric Anderson, NASA/SERVIR Associate Chief Scientist and disaster theme lead, "but we need people who can make free data useful and relevant to unique decision-makers' most pressing needs."

For that reason, "the most important and exciting aspect of SERVIR is working with local partners to co-develop cutting-edge, satellite-based services," Irwin adds. "In fact, part of our design is that SERVIR hubs and their end users will fully operate and manage the services when they are completed. Moreover, we're seeing hubs across the network sharing their expertise with other hubs, so SERVIR is a great example of both south-south and north-south exchange."

Getting Ahead of the Next Drought or Flood

Improving disaster preparedness and increasing the speed and efficiency of emergency response are critical aspects of SERVIR's mission. This is particularly true with water-related disasters, which can expose communities to catastrophic flooding, infrastructure damage, prolonged drought, and crop failure, as well as other economic and health impacts. Through its regional hubs, SERVIR funnels satellite-based Earth observation data concerning land use and flood hazard zones to local officials to bolster communities' disaster preparedness and response in the wake of such disasters.

How does it work in practice?

One night in late July, a rupture of the Xe Namnoy Xe Pian Dam in Laos sent more than 130 billion gallons of water cascading into downstream communities located along the Xe Pian and Xe Khong rivers in Laos' Attapeu province, displacing thousands. The SERVIR-Mekong team responded immediately, teaming up with NASA's Disasters Program, the Japan Aerospace Exploration Agency, and the European Space Agency to obtain satellite imagery that penetrated the thick cloud cover above the flood-stricken region and provided emergency response teams on the ground with near-real-time information about the movement of floodwaters in the days following the dam break. These efforts not only contributed to a more effective flood response from local authorities, but also helped gauge the socio-economic impacts of the flood, as SERVIR-Mekong's institutional partners combined satellite data with infrastructure maps, land-use maps, and topographic information to measure the depth of floodwaters in particular areas and fine-tune estimates for flood-related economic damages.

Such holistic efforts are "truly novel," says John Bolten, SERVIR Applied Sciences Team member and Associate Program Manager of water resources for the NASA Applied Sciences Program, who helped lead this past summer's flood-mapping efforts in the Mekong region.

As the SERVIR-Mekong team and its local partners further refine flood hazard mapping tools, they are examining the potential for such tools to assist with emergency

response in communities along flood-prone waterways in other regions where SERVIR is active. By combining satellite imagery with socio-economic and land-use data, SERVIR empowers local officials and communities to stay one step ahead of the next flood or drought to reduce injury and loss of life, mitigate infrastructure damage, and minimize the short-term and long-term impact of water-related emergencies. As water scarcity intensifies in many areas of the world and traditional precipitation patterns grow more erratic, SERVIR's ability to enhance flood and drought monitoring is an area rich with potential. After all, says Bolten, "You can't manage what you can't monitor."

A Global Footprint

With local partners increasingly taking the lead in turning Earth observation data into actionable tools and services and working to integrate scientific data into the policymaking process within their respective countries, the future is looking bright. In addition to improving knowledge transfer and continuing its capacity building work, SERVIR's U.S.-based staff are continuing to lower existing barriers to access Earth observation data — a critical component to sustaining the positive impact of SERVIR for years to come. "It's a very exciting endeavor for us, to continue promoting our free access to data," says Bolten. To that end, SERVIR is now looking into how cloud-based information storage services can be used to more seamlessly connect data-gathering satellites with data-scarce communities on the ground.

To inform its future growth, SERVIR has engaged in rigorous evaluation of its programming in recent years. The product of this self-reflection, [SERVIR's Service Planning Toolkit](#), released in September 2017, encompasses lessons learned and best practices, and represents "the way we think is the right way to do things," says USAID's Coffey. "It was collectively done by USAID and NASA, and both sides are quite proud of it."

Already, the toolkit is being put into action as SERVIR plans the launch of its newest hub — [in South America's Amazon basin](#) — and continues to grow its global footprint.

By Russell Sticklor



Additional Resources:

- [SERVIR on USAID.gov](#)
- [SERVIR Global](#)
- [SERVIR Service Planning Toolkit](#)
- [SERVIR Global: A Retrospective Report: 2014–2018](#)
- [USAID Office of Global Climate Change](#)
- [NASA](#)

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