GCF Task Force Policy Brief

Beyond Free Data - Realizing Institutional Remote Sensing Capacities

By Marius von Essen, Postdoctoral Scholar, Institute of the Environment and Sustainability, University of California Los Angeles (UCLA)

November 2026

TABLE OF CONTENTS

Key Messages **2**

Everyday obstacles have institutional root causes **3**

Case Study: the NICFI Satellite Data Program **5**

Why these findings matter **6**

Finding: Actors on the periphery experience the most obstacles **7**

Recommendations reported by practitioners **7**

Looking ahead **9**

Key Messages

- Satellite data and monitoring tools are now widely available, often for free, Yet subnational governments and other frontline institutions still experience challenges in effectively integrating them into their operations.
- A recent UCLA study finds that remote sensing capacity rests on four institutional determinants: dependable data access, technical expertise, organizational support and equitable partnerships
- Unless these institutional conditions are addressed, the obstacles will continue to emerge. Building lasting capacity must therefore consider the institutional conditions of the organizations where remote sensing is used.
- This brief offers practical recommendations for governments, agencies, funders, and data providers for strengthening remote sensing capabilities in the long-term

Monitoring changes in tree cover, deforestation rates, degradation, biodiversity, and other land use changes has become faster, more precise, and more feasible as satellite data and monitoring tools become increasingly available - often for free. With extensive datasets like Landsat and Copernicus, the bottleneck to accessing remote sensing is no longer in orbit. Yet subnational governments and other frontline institutions still experience challenges in effectively integrating remote sensing data and tools into their day-to-day operations. In 2023, the Governors' Climate and Forests Task Force (GCF Task Force) - the world's largest subnational network dedicated to protecting forests, reducing emissions, and enhancing livelihoods across the tropics - convened government technicians, technology providers such as CTrees, Planet Labs, and SERVIR Global, and academics at the Emmett Institute for Climate Change and the Environment at UCLA School of Law for a Remote Sensing Technical Workshop to better understand the practical challenges of using remote sensing and improve the way in which these tools can be used by governments to support critical forest governance efforts.

From this workshop, UCLA developed a study that found that remote sensing capacity rests on four elements: dependable data access, technical expertise, organizational support, and equitable partnerships. When these elements are not in place or are not sufficiently implemented, obstacles to building remote sensing capacity within institutions can arise. These obstacles do not exist in isolation but are rooted in deeper institutional conditions and unless these are addressed, the obstacles will continue to emerge. Building lasting capacity must therefore consider not only the tools and technology itself, but the institutional conditions of the organizations where remote sensing is used. For subnational governments, this shift requires a clear articulation to decision makers regarding the urgency and necessity of these tools, especially for land use change monitoring, biodiversity conservation, mapping of Indigenous territories, carbon accounting, supply chain monitoring, integrated fire management, and law

enforcement. In fact, some financing and international regulatory regimes (e.g., banks, European Union Regulation on Deforestation-free Products (EUDR), and carbon accounting) enforce penalties for not improving monitoring and verification. Based on the results of this recent study, this brief offers practical recommendations for governments, agencies, funders, and data providers for strengthening remote sensing capabilities in the long-term.

Everyday obstacles have institutional root causes

The study draws on 38 semi-structured interviews with practitioners and decision-makers along the entire remote sensing value chain in Latin America, Africa and Southeast Asia. Interviewees included civil servants in subnational and national agencies, Indigenous organizations, civil society, development agencies and banks, space agency programs, and satellite and technology companies. They were asked how they currently use remote sensing and which data sources they rely on, what obstacles they face, how these obstacles affect their work, and what could be done to address them.

From these conversations, the researchers identified a clear pattern. An organization's capacity to use remote sensing rests on four elements: **dependable access to data, technical expertise, organizational support and clear mandates, and fair, lasting partnerships** with the people who provide data and build tools. When one or more of these elements is missing, capacity becomes much harder to build and maintain. Interviewees described the practical, day-to-day obstacles they face, which the study calls "operational frictions." These obstacles do not appear from nowhere. They are produced by deeper "institutional conditions" within the organizations themselves: their rules, budgets, mandates and work cultures, and the individuals in leadership roles who decide how much support remote sensing receives. A committed director can champion remote sensing, secure funding and protect technical staff. A leader who is unfamiliar with what the technology can do, or who sees it as a low priority, can leave it without a budget, a mandate or a future. The examples below show how specific frictions trace back to these underlying conditions.

When expertise leaves the organization
Remote sensing knowledge often rests with a small number of people in an organization. When they leave, the organization's ability to run its monitoring systems can leave with them.

- *Friction:* Remote sensing expertise sits with only a few people within the organization and does not remain in the organization when these individuals leave
    - *Root*: Short-term contracts, political cycles that reassign staff, higher private-sector salaries, no documentation or onboarding

Short-term training
Organizations invest in training, but the skills fade or move elsewhere before they become part of embedded institutional routines or cultures.

- *Friction:* Remote sensing training efforts do not stick
    - *Root*: One-off workshops instead of continuous learning; trained staff leave for better-paid jobs

Remote sensing as an afterthought
Without dedicated budget lines, permanent positions or a clear mandate, remote sensing remains a side activity that depends on project funds and a few committed individuals.

- *Friction*: No dedicated budget, permanent staff positions or clear responsibility for remote sensing
    - *Root*: Senior decision-makers unfamiliar with what remote sensing can do; competing political priorities

Using external consultants without long-term integration of their contributions.
Consultants build monitoring systems, but when they leave, agencies often cannot run, update or reproduce the work themselves.

- *Friction:* Agencies depend on consultants to build capacities and fail to reproduce the work after the consultants leave
    - *Root*: Project-based funding with narrow deliverables; knowledge transfer is not required

Reliance on third-party data
Agencies hesitate to build routine processes around the best available sources if there is uncertainty around the long-term costs and availability of those data.

- *Friction:* Uncertainty whether free data will be available in the future leads to forgoing of the best data and tools and may stall development of capacities
    - *Root*: Data owned and governed by outside providers; budgets cannot absorb even modest recurring costs

Tools built without sufficient user input
Products designed without sufficient end-user input and testing often miss what local teams actually need to see and decide.

- *Friction:* Tools and maps do not fit local needs
    - *Root*: End users rarely involved in design; priorities set upstream by funders, providers, and national ministries

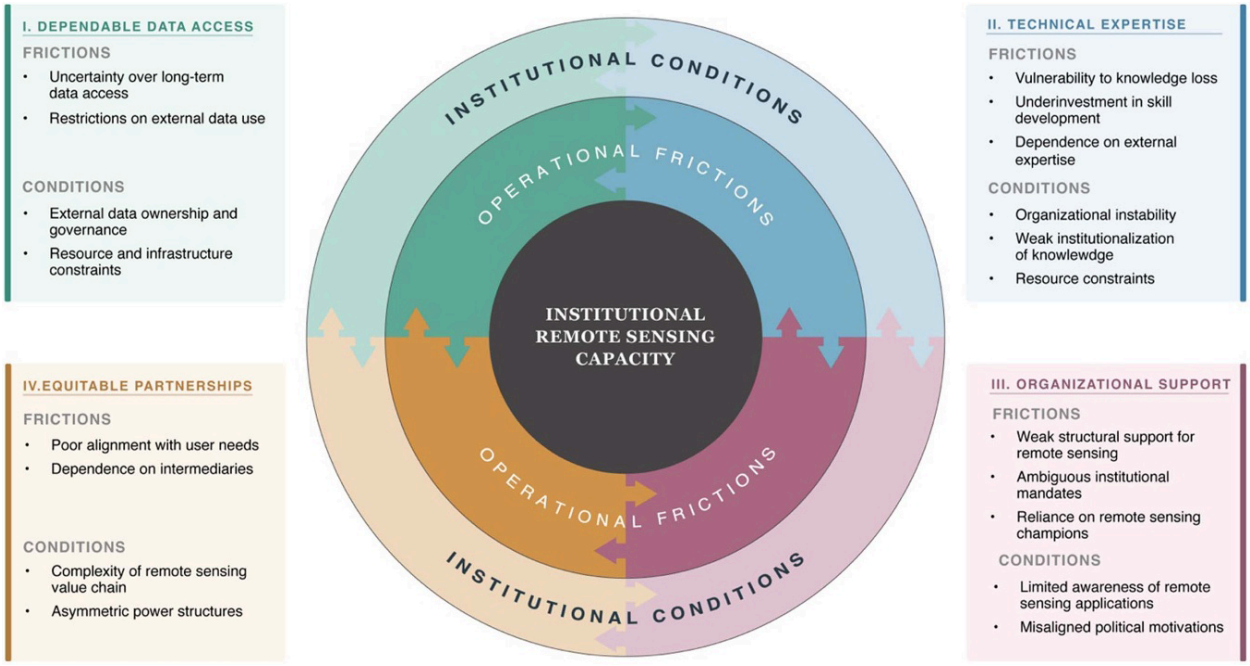


Figure 1. The four elements of remote sensing capacity. Everyday obstacles (inner ring) stem from deeper institutional conditions (outer ring), and both weaken an organization's ability to use remote sensing (center).

Case Study: the NICFI Satellite Data Program

For many years, high-resolution satellite imagery of the tropics was expensive and few organizations could afford it. In 2020, Norway's International Climate and Forest Initiative (NICFI) set out to change this through a four-year contract worth approximately US$43 million with Kongsberg Satellite Services (KSAT) and its partners Planet and Airbus. Launched in October 2020, the NICFI Satellite Data Program offered monthly high-resolution images (under 5 meters) of the entire tropical belt, free of charge for non-commercial use.

Uptake was rapid and within a year 70% of surveyed users called it their main source of imagery. By early 2025, more than 37,000 users from 158 countries had registered, including governments, researchers, Indigenous peoples, NGOs and the private sector. While some government agencies and programs integrated NICFI-Planet data into their forest monitoring and enforcement processes, others relied on alternative sources due to skepticism over the data's long-term availability.

In 2023, NICFI stated that it could not fund the program alone at the current cost. In 2025, Norway's Ministry of Climate and Environment cancelled its public search for a data

provider for the new phase of the data program after a legal challenge by a losing bidder. As of October 2026, no new phase has been announced. Planet now offers the imagery through its own program, which does not cover government use. As of May 2026, Global Nature Watch (formerly Global Forest Watch) offers limited Planet imagery through its Horizon program through May 2027.

Why these findings matter

Remote sensing capacity building is usually treated as a technical issue and as such is accompanied by calls for better data, higher resolution and more training. The study findings show that human and organizational factors are equally important. Barriers are institutional, regulatory and procedural, not only technical and in many instances the technology is already outpacing its users. Closing this gap between technical advancements and adoption on the ground calls for a shift from treating remote sensing primarily as a technology to treating it as an element of public service. This entails that administrations staff, fund, and mandate remote sensing like any other service they provide, rather than a series of one-off projects that depend on donor grants or a few dedicated individuals.

That shift requires that political leaders have a better understanding of the importance that remote sensing carries for addressing urgent environmental and social topics. Remote sensing underpins a wide range of public tasks, including monitoring land use change, conserving biodiversity, mapping Indigenous territories, designing policy, accounting for carbon, tracing supply chains and enforcing the law. Increasingly, it also determines access to finance and markets. For example, jurisdictional Reducing Emissions from Deforestation and Forest Degradation (REDD+) programs pay for verified emission reductions, development banks increasingly tie lending to environmental safeguards, and regulations such as the EUDR require proof that commodities are deforestation-free. Jurisdictions that can monitor and verify what happens on their land are better placed to benefit from these opportunities and to avoid their penalties. Strong monitoring capacity is therefore not a technical side project, but a direct investment in a subnational government's ability to attract finance, protect its exports, and govern its forests.

What this means in practice:

- Open data does not help users who have no clear mandate to use it, no software or hardware to process it, or no knowledge to adapt and apply it.
- Training staff who will leave in two years because of budget constraints does not create institutional capacity.
- Consultancy without knowledge transfer, and data provision without governance reform, each address a symptom while leaving the root cause intact.

The recommendations below, drawn from what practitioners themselves told us, set out how governments, agencies, funders and data providers can each help build capacity that lasts.

Finding: Actors on the periphery experience the most obstacles

The operational frictions identified in the study are not evenly distributed. They are most pronounced at the edges of the remote sensing value chain, among subnational governments, Indigenous organizations and local civil society groups. Interviewees in poorer countries and regions also reported more basic problems: unstable internet, a lack of hardware and software, and few job candidates with foundational skills. Part of the reason is that engagement by data providers and funders often stops at the national level. Training and tools reach local users only if someone passes them down, and feedback from local users rarely travels back up. The more remote a user, the smaller the chances for access and exchange. Yet these are often the actors on the frontlines of efforts to stop deforestation, and the ones who most need reliable monitoring capacity.

Recommendations reported by practitioners

For incoming governors and their teams

- **Keep the people.** Protect remote sensing and Geographic Information System (GIS) posts from political turnover and turn key roles into permanent positions. State officials in the Brazilian Amazon named staff continuity through changes of government, among both technicians and decision-makers, as their main challenge.
- **Write the process into rules.** Adopt a regional ordinance, directive or manual that defines how monitoring is done, so new staff do not start from zero and the work does not depend on the personal priorities of whoever takes office. Even simple documentation of processes can substantially improve training for incoming staff.
- **Give a mandate, backing, and a budget line.** Assign clear responsibility for systems and data, and signal from the top that technical staff have support. Guyana built strong monitoring by retaining good people in an institution with a clear mandate. Budget for equipment and internet, not just training: staff who are trained but lack the tools afterwards cannot keep their skills.
- **Use peer networks.** Brazilian and Peruvian state officials credited GCF Task Force technical exchanges with solutions they adopted; without such channels, states tend to hire consultants instead.

For agency heads and technical teams

- **Make systems that outlast individuals.** Document where data is stored, how analyses are run, and who does what, so the system does not depend on any single civil servant. Even a simple readme file helps.
- **Train several people, and train them to train others.** One regional program schedules the next training right away, with the previous participants as the trainers.
- **Anchor capacity in local universities.** They outlast project and political cycles and already do much of the spatial analysis governments need.
- **Show leaders what the data delivers.** Communicate results and statistics so remote sensing is seen as core, not optional.

For funders, development agencies and intermediaries

- **Co-develop, then hand over.** Start with a needs assessment, build the tool with its future owner, and plan the handover from day one. One regional program has supported its partners for eight years across two phases.
- **Fund the unglamorous parts.** Cloud storage, data repositories, hardware and internet - not only training and sleek tools
- **Train the people who stay.** Training often goes to staff on a promotion track at capital level; district-level staff, one interviewee specifically recommended to focus on embedding people who are more likely to stay with their communities, such as women and Indigenous and local people
- **Secure data access after the program ends.** Program data often becomes unreachable once funding stops because nobody planned for it.

For data providers, tool developers and researchers

- **Share data and methods, not just conclusions.** Users need the underlying data and procedures to apply research results.
- **Commit to usability, not delivery.** Treat data agreements as partnerships that include making data usable, not just delivering it to specification.
- **Be transparent about continuity.** Warn users early about data changes, keep backup sources, publish methods and code.
- **For Indigenous and local communities:** Deliver actionable alerts in their language, follow free, prior and informed consent, and show concrete benefits. Be mindful of data sovereignty and governance - many past projects took data and left nothing behind.

Looking ahead

Implementing these recommendations does not require new technology or infrastructure. Instead, they require treating remote sensing as part of how institutions work and in line with other services. As such, remote sensing should be staffed, funded, mandated and built in partnership with the people who use it. With new administrations taking office across GCF Task Force member states and provinces, now is the moment to protect the capacity that already exists and expand on it by implementing the above recommendations where appropriate, applicable, and feasible.

Learn more

- **Full study:** von Essen, M., Ordway, E.M., Carlson, K.M., Sonwa, D.J. and Boyd, W. (2026). Institutional dimensions of remote sensing capacity for tropical forest monitoring. *Environmental Research Letters* 21: 124019. Open access: **https://doi.org/10.1088/1748-9326/ae7b5e**
- **Blog post:** "The Bottleneck in Forest Monitoring Isn't in Orbit," *Legal Planet*: **https://legal-planet.org/2026/09/15/the-bottleneck-in-forest-monitoring-isnt-in-orbit/**
- **Contact:** secretariat@gcftaskforce.org