



AI for Earth Grantee Profile

National Geographic Labs

Conservation Intelligence Initiative

Moving conservation platforms to the cloud

Summary

National Geographic Labs recognized that the conservation model practiced for the last several decades is failing and began exploring new ways to advance their efforts. In the conservation sector, the same model has been followed without incorporating learnings from mistakes, and there will unfortunately always be more poachers than rangers to detect them. National Geographic Labs asked itself how other industries have benefited from technology and why it's been failing in the conservation sector, recognizing that there was a disconnect between folks in the bush and the people with technology know-how. In order to more efficiently use technology to advance conservation, the two groups needed to understand how to collaborate and communicate with each other. Using AI, technology can help conservation workers recognize events that normally require hands-on continuous observation to identify. Technology acts as a force multiplier to help the people on the ground be more efficient at their jobs and to better protect the animals and places that they're tasked with protecting. While technology is not a silver bullet, it's a critical component in making conservation successful moving forward.

Using AI for image and acoustic processing

Protecting wildlife from poaching and other threats is a key focus for conservation groups globally, as these threats have increased in recent years. For example, according to the [World Wildlife Fund](#), between 2007 and 2013, rhino poaching in South Africa increased 7,700 percent, and in 2011, authorities seized more than 23 metric tons of illegally acquired ivory taken from 2,500 elephants. The extinction of endangered species will lead to a loss of biodiversity and harm to natural ecosystems, and the threat of poachers is particularly high due to coronavirus shutdowns.

Because tourism in many countries is at a standstill due to the pandemic, funding for rangers and other reserve staff has been cut significantly, and many staff are being laid off. Northern Rangelands Trust, a group of 42 conservancies in Africa, has had to reduce staff salaries by 50 to 80 percent. The resulting problem is twofold. It means fewer boots on the ground to monitor for poachers. It also means that citizens may resort to extreme measures, poaching for meat in order to feed their families and selling illegal goods to keep their families

afloat. [According to John Scanlon](#), special envoy for African Parks, increased poaching due to coronavirus is “a matter of great concern.”

Advancing conservation with modern tools

The recent shift in dynamic creates an opportunity for technology to be implemented in more creative ways to stem poaching and maintain conservation. As internet connectivity expands to more remote areas, a cloud-based solution allows for easily maintained solutions requiring just a basic internet connection. Through its [Conservation Intelligence Initiative](#), National Geographic Labs, in partnership with [Vulcan’s EarthRanger](#) and [Esri](#), is able to capture real-time data and identify longer-term trends. Conservation Intelligence develops technology-based tools that empower conservation partners to monitor biodiversity, habitat health, and human-wildlife interactions. Using Microsoft Azure cloud compute capabilities, still images, video feeds, and acoustic recordings can be run through a dynamic AI model to detect, in real time, wildlife on the ground. Azure will enable the Initiative to store, train, and test models without requiring significant hardware investments. The Azure platform is ideal for its usability and scalability, with a flexible building block approach. This comprehensive model’s impact is twofold: animal and habitat health can be observed and tracked, and

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threats to endangered species can be detected in real time. Says Corey Jaskolski, a National Geographic Fellow, “Technology can be our eyes and ears, and using AI, technology can help us recognize events that we normally need people in the loop 24/7 in order to understand.” Using the trained AI-model, the resulting solution can augment the captured imagery and then differentiate between a trespasser carrying an assault rifle and a trespasser carrying a backpack. The acoustic detector can recognize and identify both animal vocalizations and gunshots, allowing wildlife to be monitored for wellbeing, but also identifying threats in near-real time. This approach was tested and proven out in Kenya’s Northern Rangeland Trust (NRT), where technology is being pioneered to monitor rhino health in conjunction with community conservation efforts. Where some solutions are developed by universities or nonprofits without boots on the ground, the NRT partnership allowed National Geographic Labs to understand the realities of solution deployment and maintenance.

“As soon as an animal is detected, that gets pushed to EarthRanger immediately and then on the cloud-based system, the image goes to the cloud and gets processed. In sub-one minute, we have an event happening and then getting that pushed back to the EarthRanger system where people can see it,” explains Jaskolski. According to Fabien Laurier, the vice president of National Geographic Labs, “Both our hardware that we have been developing with the support of Microsoft, as well as the cloud platform, which will provide cloud-based AI

capabilities, are all going to be integrated with EarthRanger directly.” EarthRanger’s software then provides wildlife managers and ecologists with real-time and historical remote sensing data, giving them the unified view needed to monitor and protect wildlife, land, and other assets.

Incorporating technology into conservation efforts during unprecedented times

As conservation strategy evolves, the cloud is being increasingly used as a resource to scale operations on the edge. Says Jaskolski, “One of the things that conservation efforts struggle with is when you're building hardware and you've got to maintain and support every little computer and every little box, you have a pretty big scaling problem for a small group like Nat Geo Labs. So we're moving a lot of our work to the cloud and

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we're building a big Azure cloud infrastructure to roll out what we started together at Labs into other protected areas around the world.” Digitizing traditional conservation methods means quantitative metrics can be produced and progress can be more easily measured. Using technology allows conservation to continue, despite current limitations in human and financial resources. Keith Roberts, Conservation International’s Executive Director of Wildlife Trafficking, says, “I really see tech as playing an instrumental role in the conservation sectors, it’s also going to save lives. A lot of the time it’s not just saving wildlife. There’s a very strong human element to conservation. I personally have lost a number of friends that have been shot and killed in action. I've seen it firsthand with some of the platforms that we use, where managers can deploy assets [on the cloud], keeping the rangers, the men and women on the ground, safer, to ensure that their lives are safe and they can get home at the end of the day.”

Despite recent challenges within conservation, many are optimistic for what the future holds. “The conservation sector is probably facing its largest catastrophe globally in the history of conservation. I think it can be doom and gloom, as some people are looking at it. I'm seeing this as an incredible opportunity to springboard tech into the conservation sector and really be innovative in how we move things forward,” says Roberts. “In fact, without tech, conservation is going to be in a very sorry place moving forward.”

About National Geographic Labs

National Geographic Labs harness technology and innovation, driving new ways of exploring and understanding the world, redefining our relationship to the planet and to each other, and inspiring actions to secure a planet in balance. The Conservation Intelligence Initiative develops advanced technologies that empower protected area partners by enabling data-driven conservation. The Initiative is developing tools to capture biodiversity, habitat health, and human-wildlife interaction data, as well as to provide, in partnership with Vulcan EarthRanger and Esri ArcGIS, timely information to protected area staff. Together, these tools enable rapid and effective response to illegal activities and threats.

Resources

Websites

[National Geographic Labs Conservation Technology](#)

Documentation

Threats: Illegal Wildlife Trade. World Wildlife Fund. Accessed September 19, 2020.

<https://www.worldwildlife.org/threats/illegal-wildlife-trade#overview>

Dina Fine Maron. "Poaching threats loom as wildlife safaris put on hold due to COVID-19." National Geographic. April 10, 2020. <https://www.nationalgeographic.com/animals/2020/04/wildlife-safaris-halted-for-covid-boost-poaching-threat>