Tropical Change Detection with SAR and UAVs in Mamoní Valley, Panama

Abigail Bohman and Ruijin Ma, Ph.D.
Geographic Information Science | University of Redlands

The Problem

Panama is the 40 kilometer wide isthmus that connects the major continents of North and South America. It also separates the Pacific and Atlantic Oceans.

The natural resource-rich environment and a growing demand for land has led to the deforestation of forests that reach taller than 11-story buildings to make room for grazing land and development. In Mamoní Valley, Panama, this deforestation is a known problem. However, tools are needed to quickly and easily determine where the problem is occurring.

Overcoming Clouds with SAR and Drones

Synthetic Aperture Radar (SAR) platforms emit waves that can penetrate through the ever-present tropical clouds and collect surface information from the backscatter and intensity of the return wave.

Using Multivariate Alteration Detection, which depends on Canonical Correlation, a change detection analysis was applied to two SAR images from two different dates. UAV (drone) imagery was used to calibrate and validate the result from SAR analysis.

Result

The result from the change analysis of SAR data showed patterns of land cover change.

Change was verified from UAV imagery from the same dates.