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## **Unveiling the Secrets of Deforestation**

Deforestation monitoring is crucial for understanding its impact on the environment, climate change, and policymaking. To achieve this, researchers have been using satellite remote sensing images, such as optical and *synthetic aperture radar (SAR)*, along with time series analysis. However, there is limited research comparing the performance of optical and SAR imagery for this purpose. In this study, Landsat and Sentinel-1 satellite data from 2016 to 2021 were utilized to detect forest cover loss in the northern Colombian Amazon, which has experienced significant deforestation since the Colombian peace agreement was signed in 2016.

The study employed the *Continuous Change Detection and Classification (CCDC)* algorithm to detect forest loss. Analysis of Landsat and Sentinel-1 images revealed a gradual increase in deforestation from 2016 to 2018, followed by a fluctuating trend. The peak deforestation years were observed in 2018 and 2020. A statistical test showed that the difference in detected forest loss area between Landsat and Sentinel-1 data was statistically significant in one study region but not in another.

Spatial distribution analysis indicated that the detected forest loss from 2016 to 2021 roughly followed the boundaries of the protected area. The accuracy assessment showed Landsat performed better.

**Keywords:** Physical Geography and Ecosystem analysis, CCDC, Forest loss, Landsat, Sentinel-1, Change detection, NNP, FARC

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