A decorative graphic on the left side of the slide consisting of two overlapping parallelograms. The front one is blue and the back one is a light green. They are positioned diagonally, with the blue one partially covering the green one.

Saving the Rainforest from Space

Using Satellite Imagery to Identify Leading Indicators of Deforestation
By: Drew Hibbard

Project Goal/Impact

Deforestation is a threat to humanity

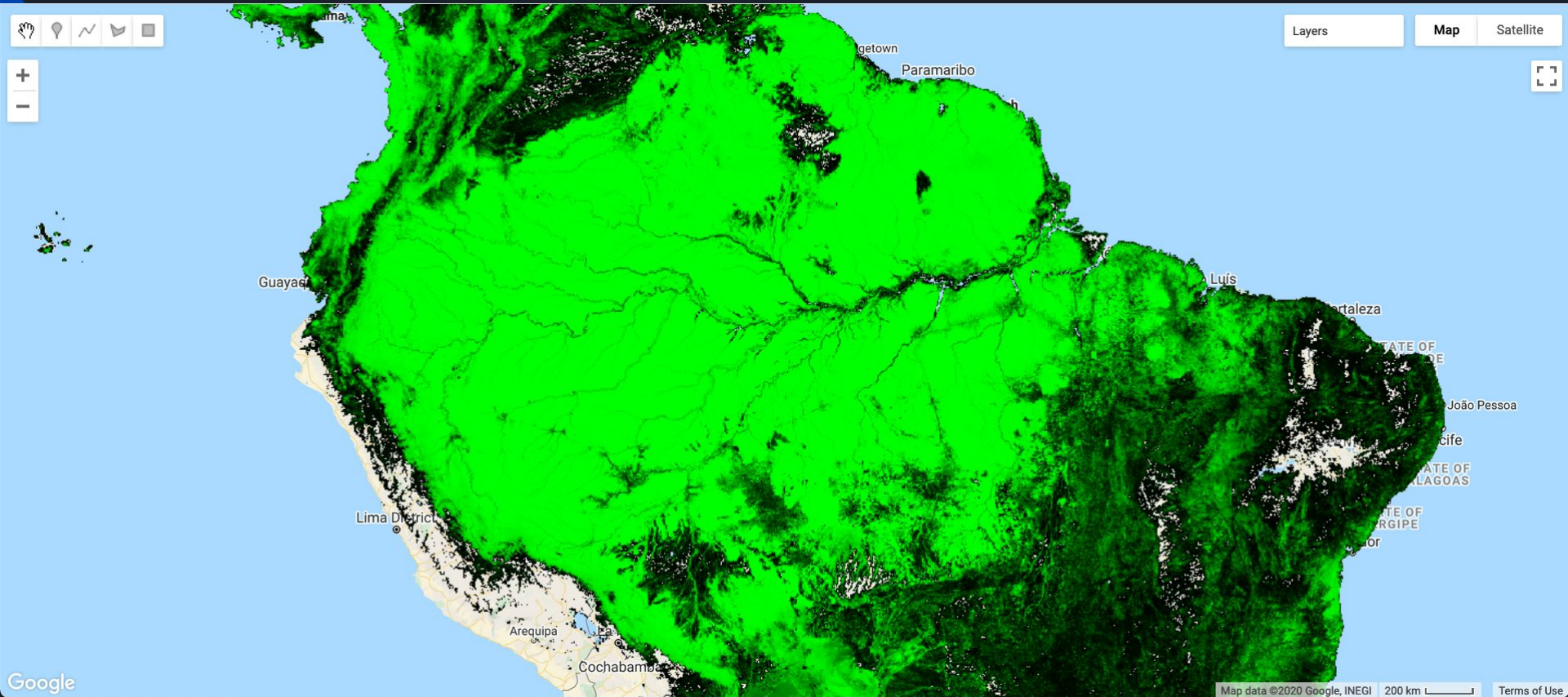
Track changes over time with satellite imagery

Identify the leading indicators and prevent

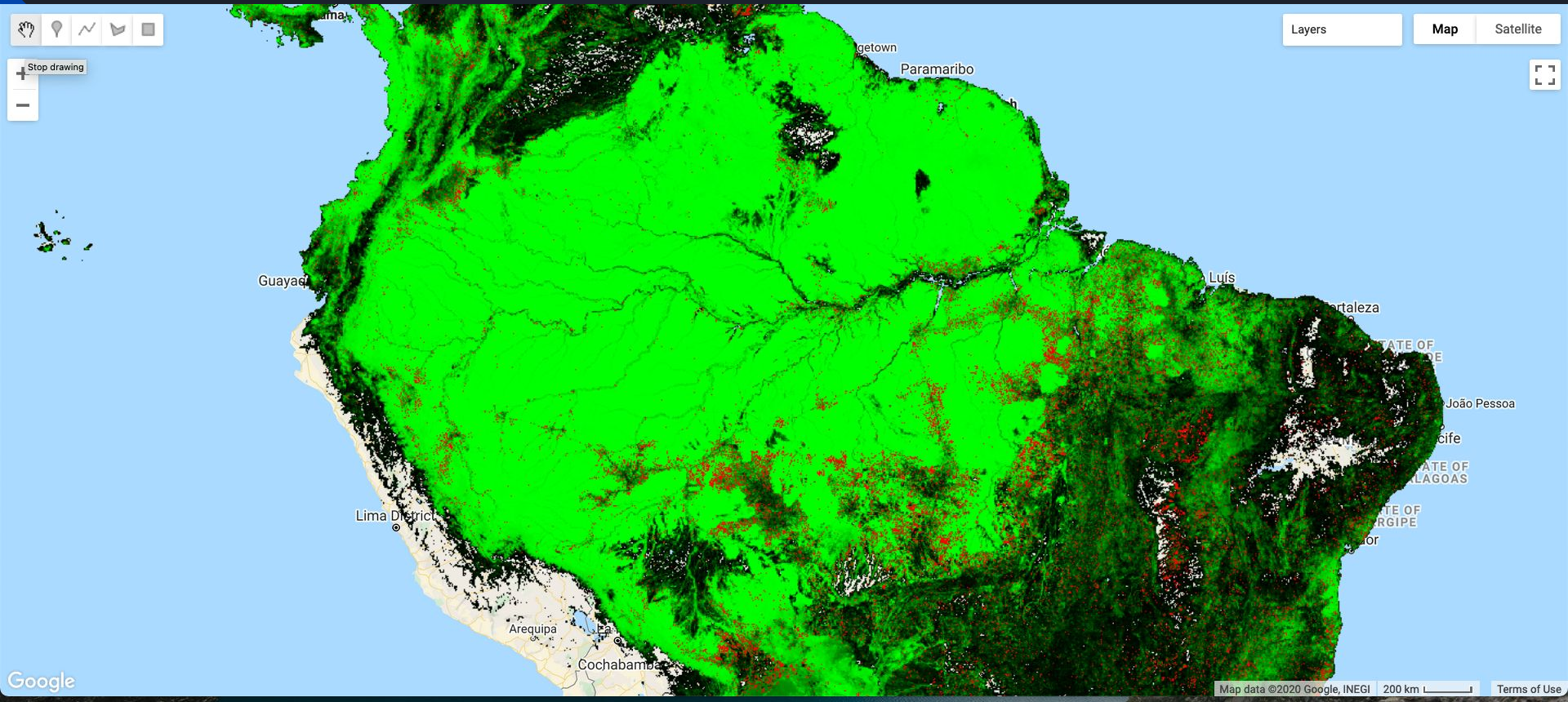


Mapping High-Level Forest Change

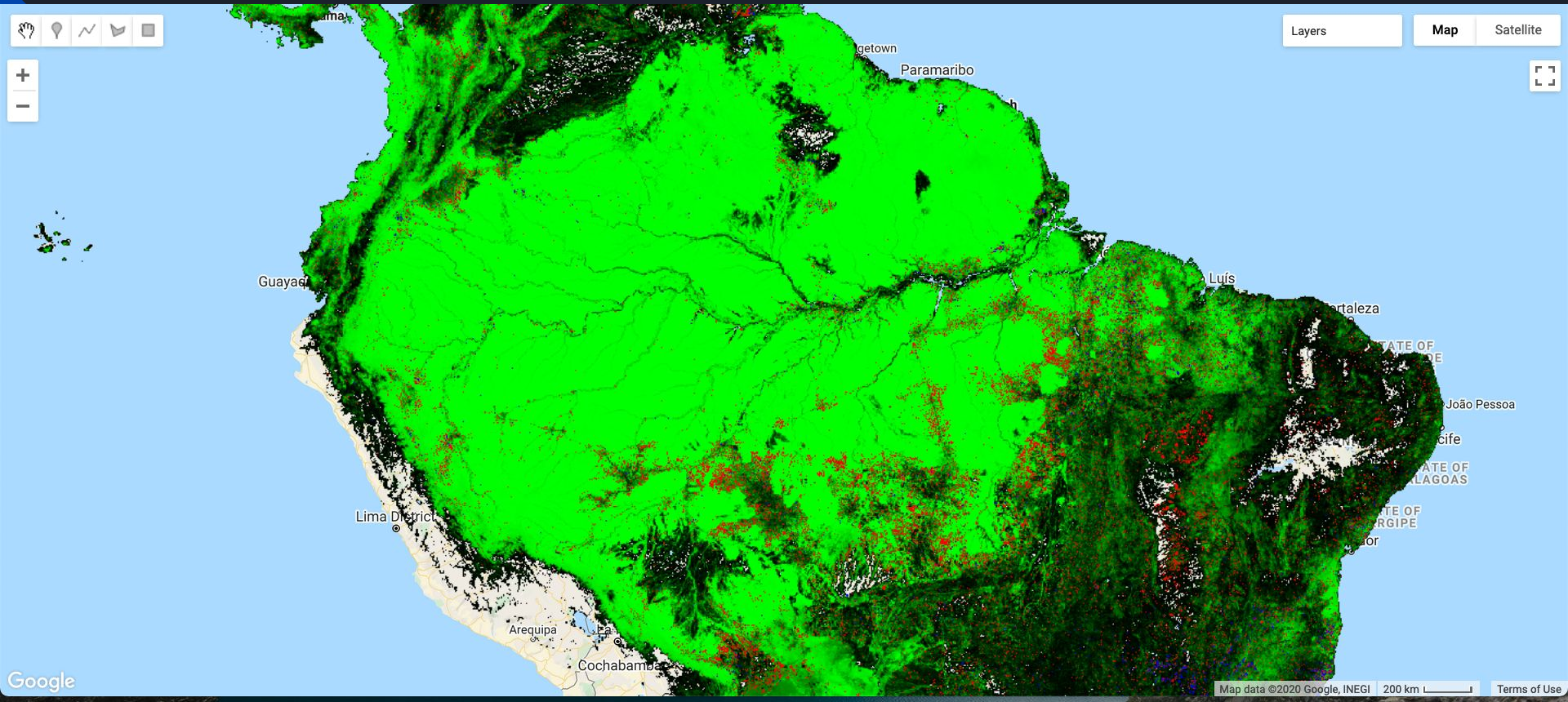




Base Layer: forest cover in green (2000)



New layer: forest loss as red dots (2015)



New layer: forest gain in blue dots (2015)

Kaggle Challenge -
*Planet: Understanding
the Amazon from Space*



Kaggle Challenge Data

40,000 Images

256x256 pixels,
3m/pixel

17 non-exclusive tags

Cloudy

Partly cloudy
+ primary

Haze +
primary

Primary

Agriculture
+ roads +
habitation

Primary +
selective
logging

Agriculture/
pasture +
primary +
partly cloudy

Habitation +
partly cloudy

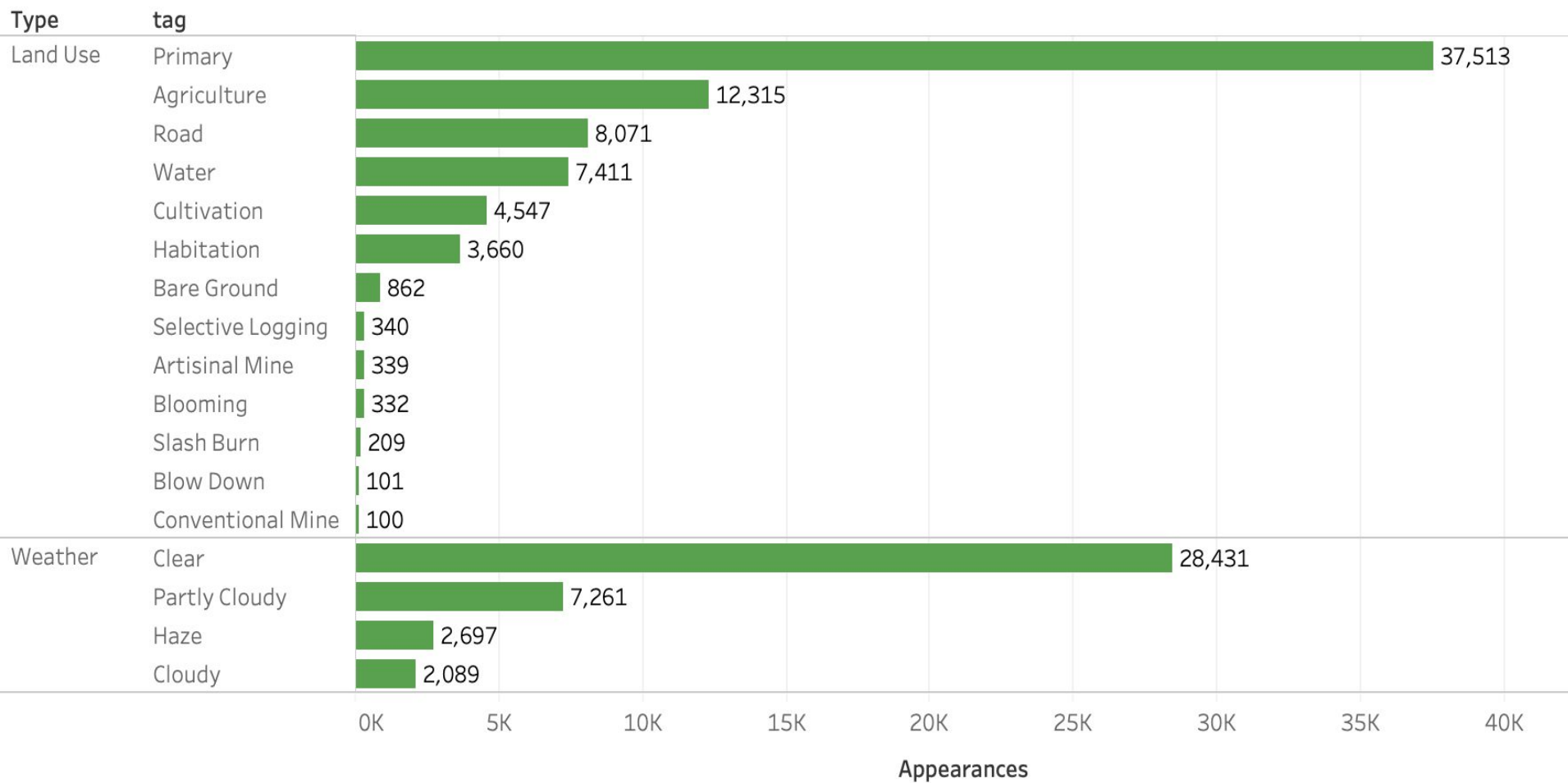
Agriculture +
roads +
primary

Water +
primary

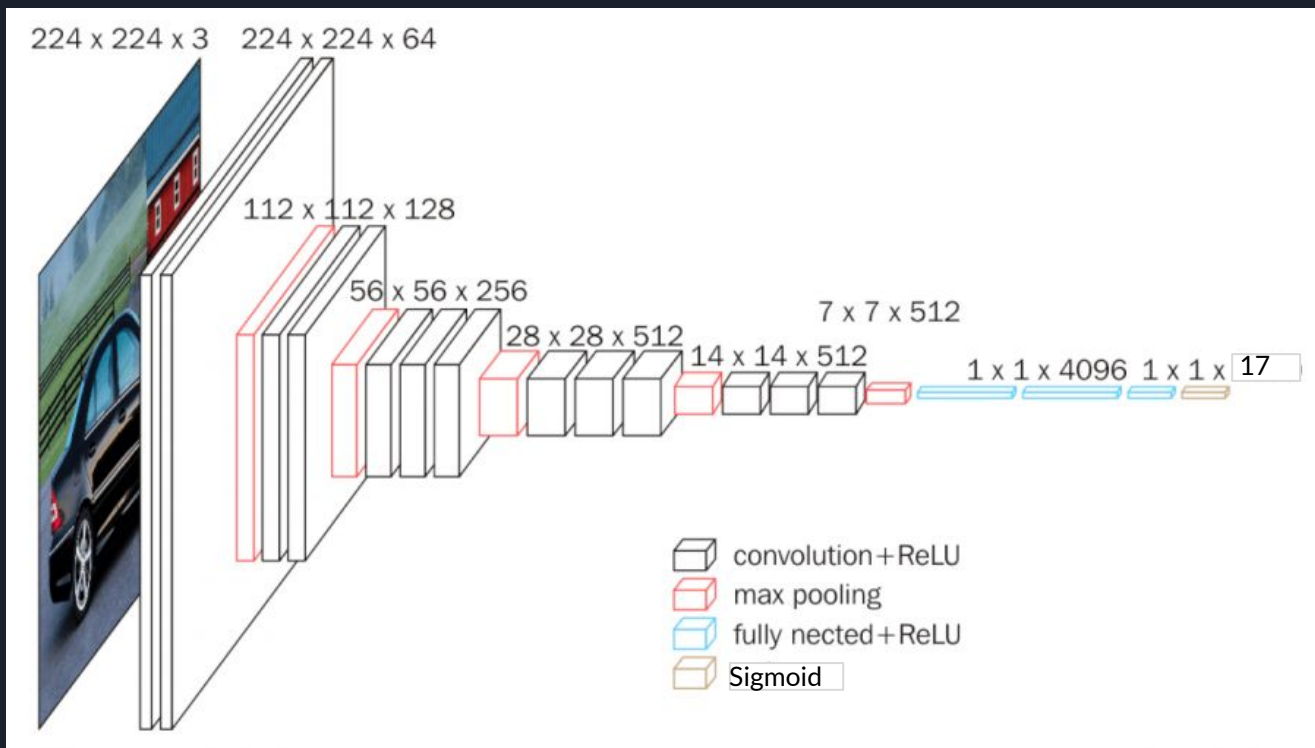
Shifting
cultivation
+ primary


Roads +
primary

Distribution of Image Tags



Fully Re-Training the VGG16 Convolutional Neural Network



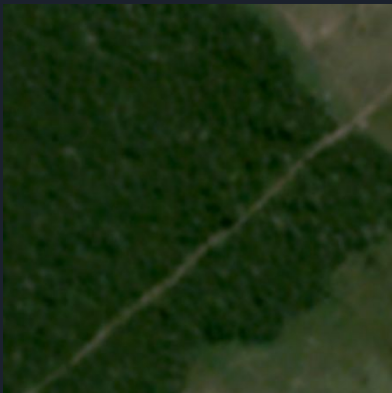


Model Results: 92% Mean F-Beta Score

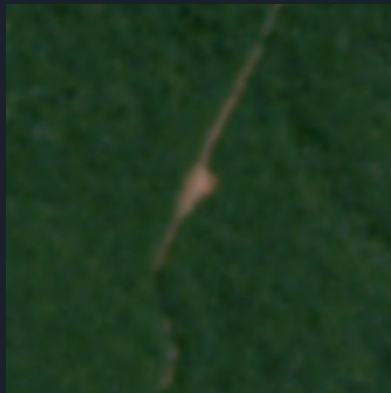
	Positive Class Recall	Positive Class Precision
Agriculture	88.1%	69.7%
Road	82.6%	69.6%
Habitation	68.0%	63.1%
Cultivation	58.0%	41.4%

Testing on New Imagery

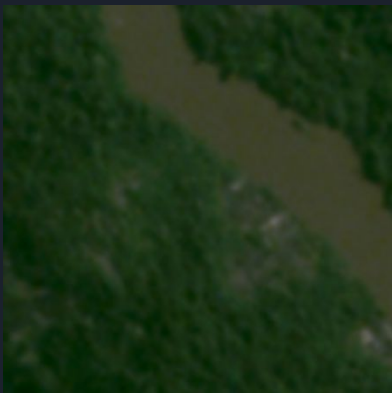




Forest
Road



Forest
Road



Forest
Water



Agriculture
Road



Questions?



Appendix



Confusion Matrices

