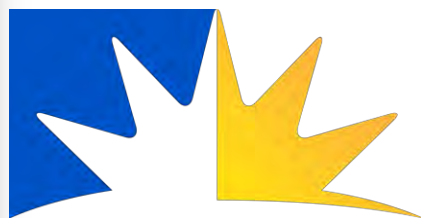




Using drone-based data to increase site selection efficiency and a supervised learning approach to landcover classification for Philippines community based reforestation

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Australia







-20.2

71.8

180

Altitude
1526 ft

150

S

210

8/8/23
8:44 AM



- Delineation required for carbon projection/monitoring, e.g.



Grassland



Shrubland



Open Forest

- Typically derived from existing landcover layers or simple satellite derived classification

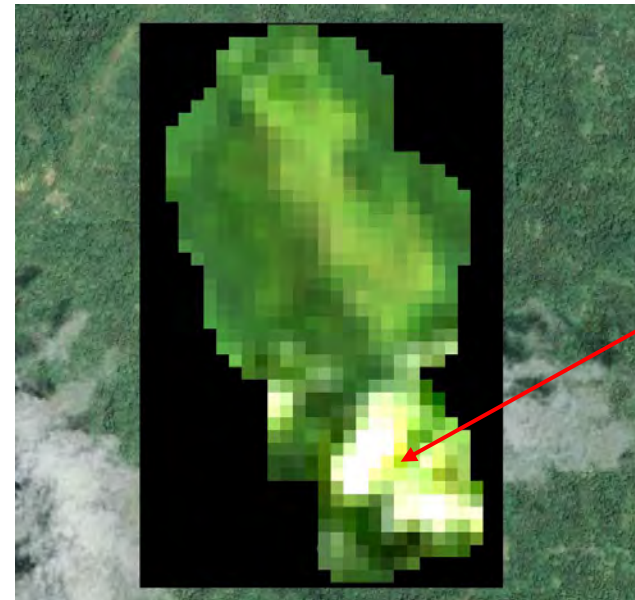


LandSat imagery

- Struggles to delineate fine scale landcover



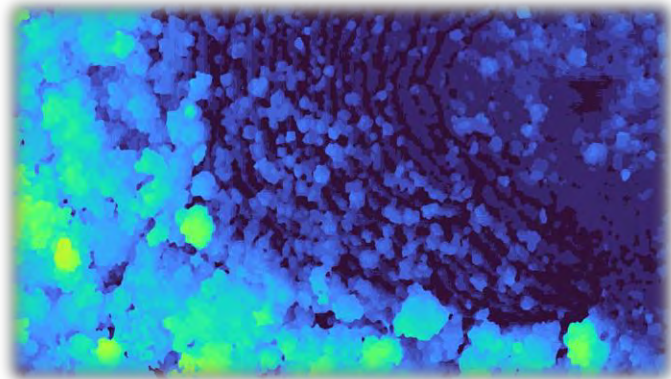
- Very few cloud free scenes



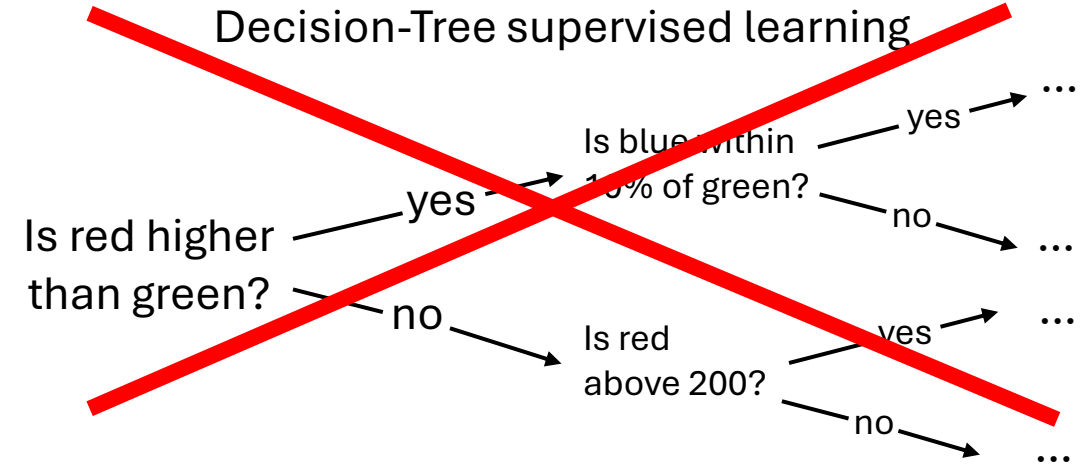
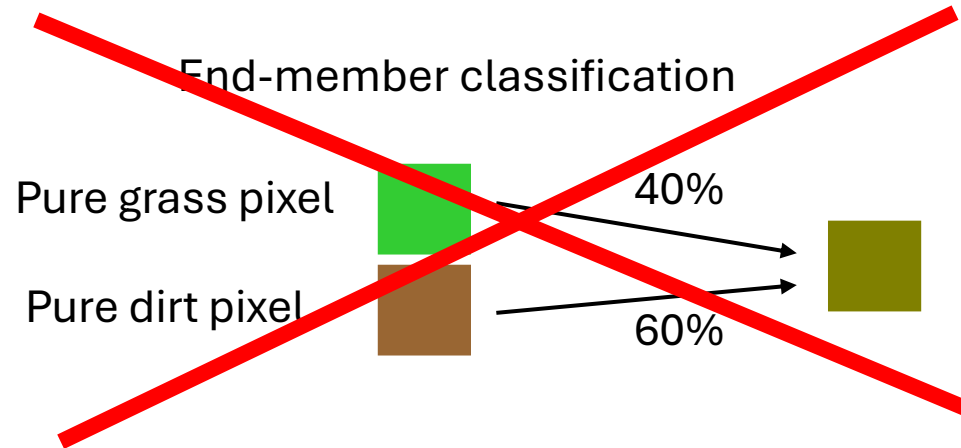
Cloud

DJI Matrice 350

- Mounted with Zenmuse L1
- Can capture LiDAR and RGB imagery
- Can create paired Canopy Height Model and RGB layers



Classification Technique

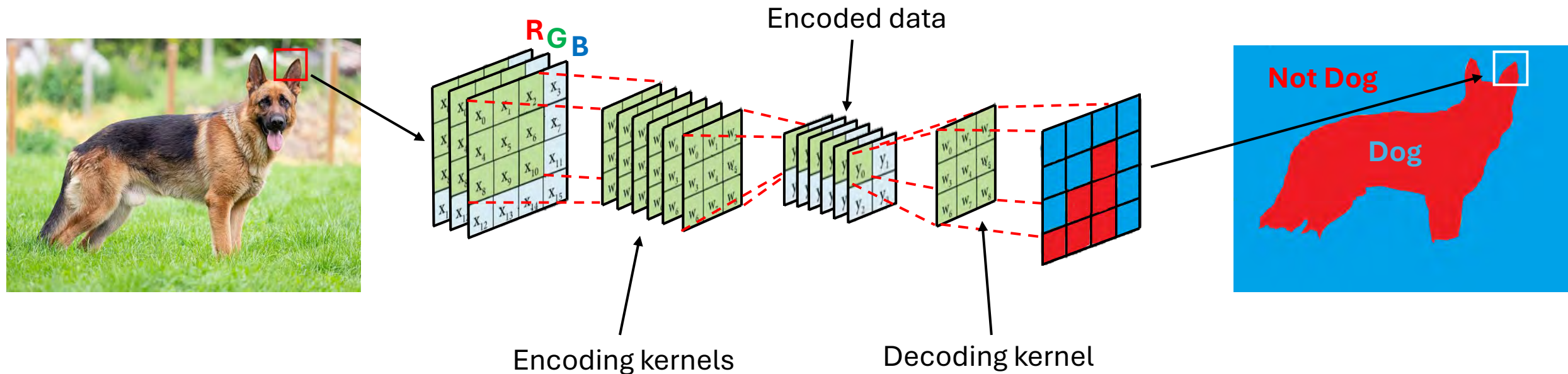


- Super-pixel groupings underwhelming



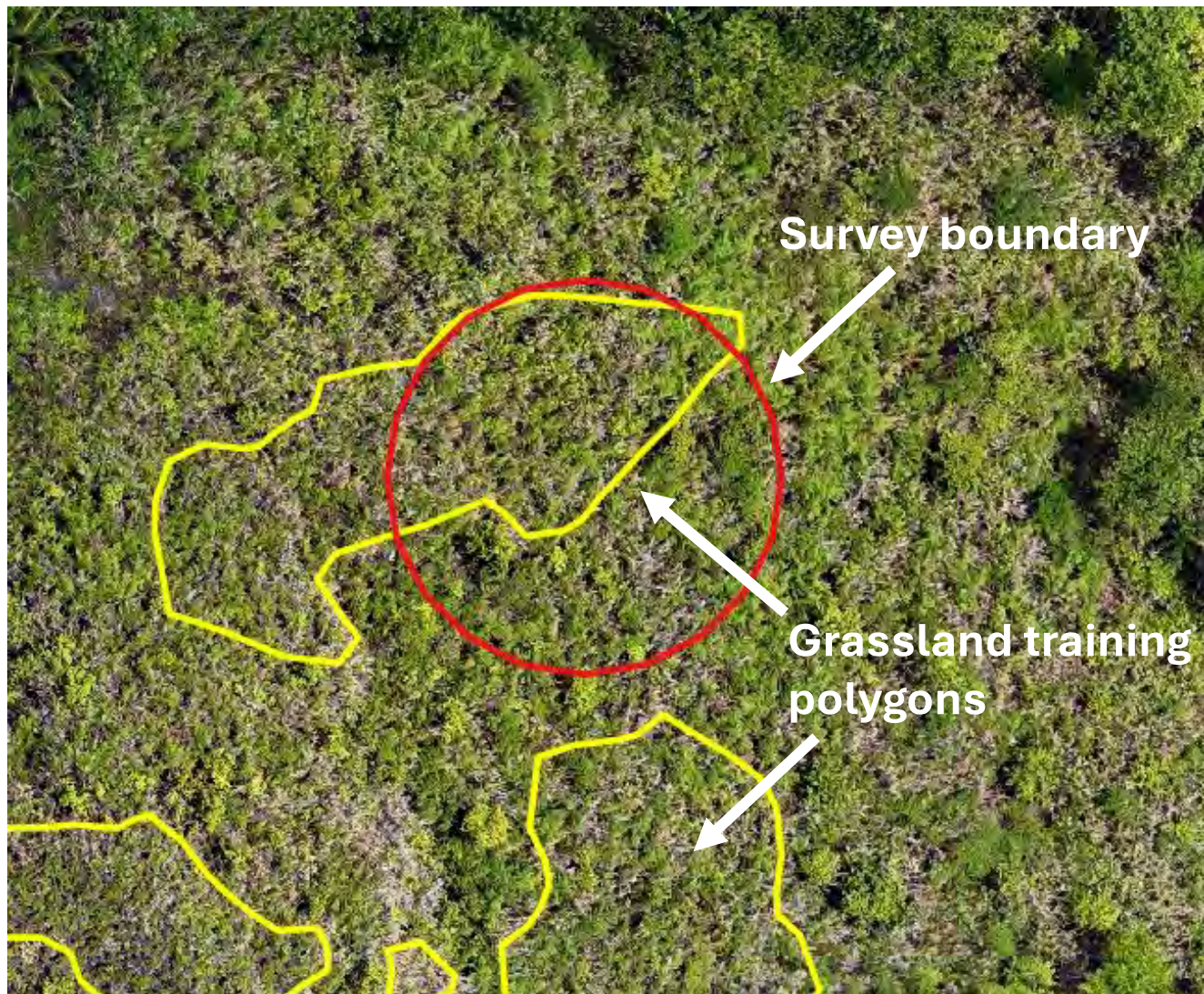
Convolved Neural Networks

- Neural network assign random weighted nodes between input and output (prediction)
- Iteratively correct the weights until output closely match desired output (training)
- Convolved neural networks use moving kernels to 'collapse' input segments into spatially reduced, but higher dimensional layers

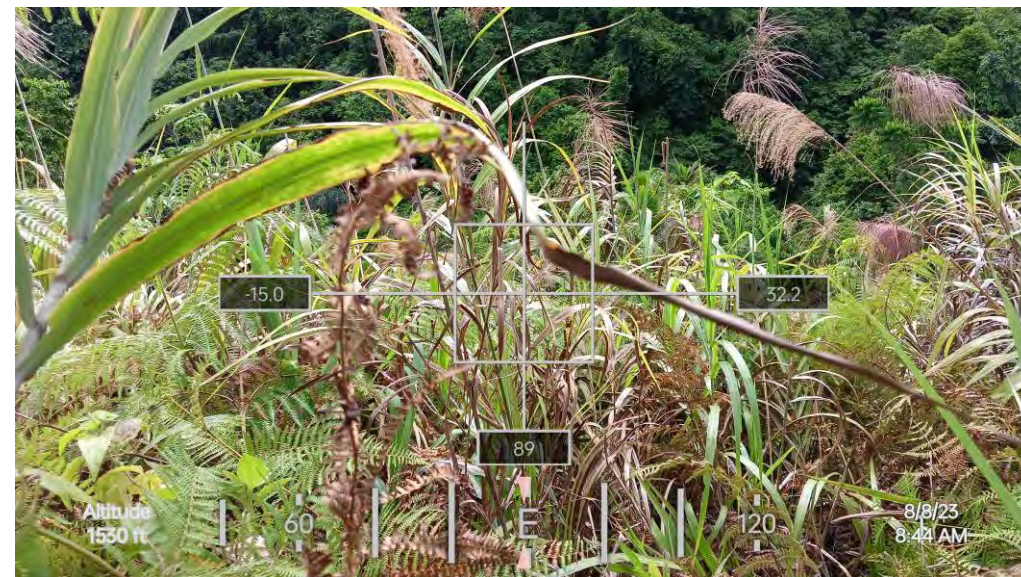


Training

Polygons as training inputs

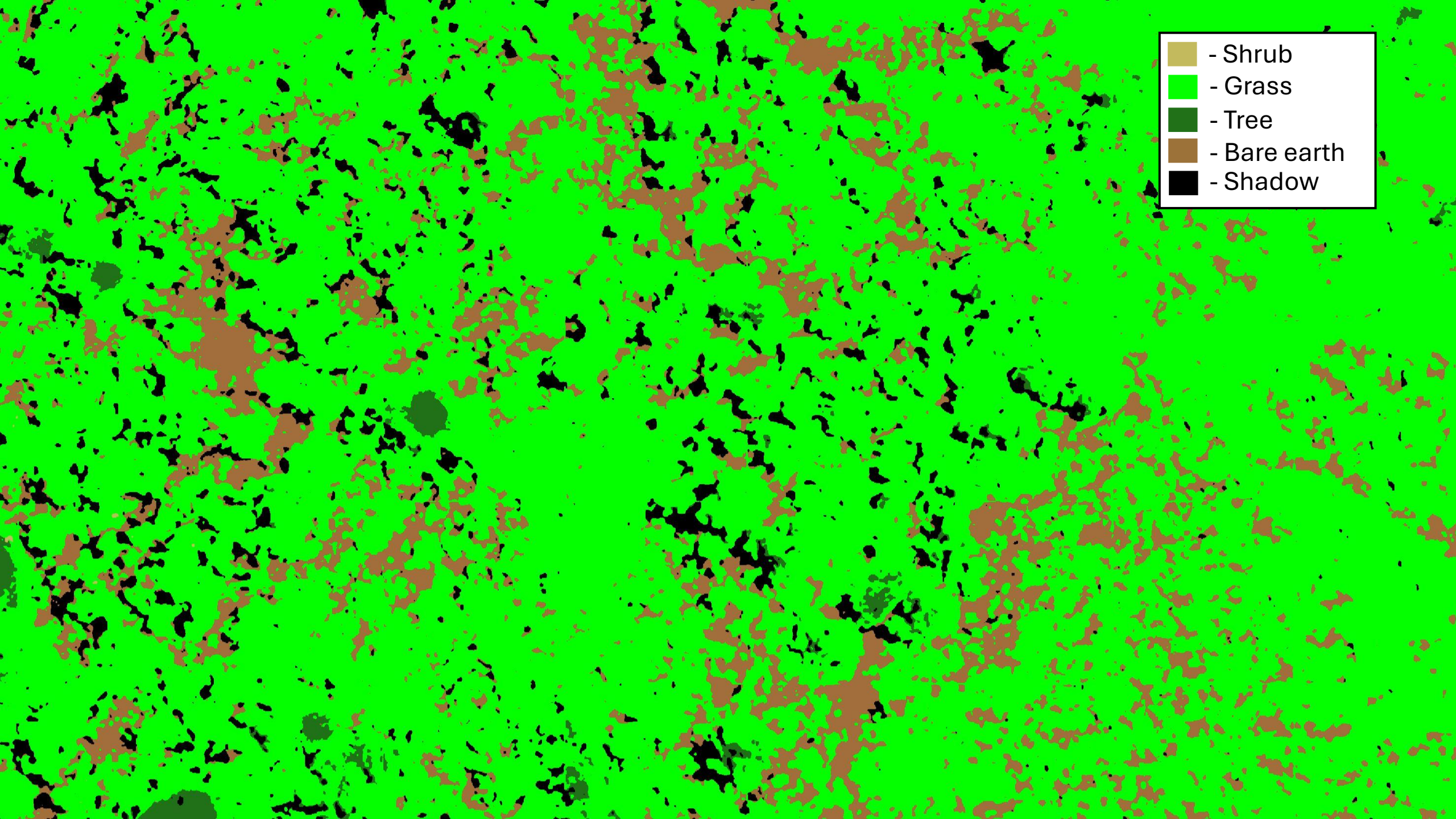


Photographs at time of survey

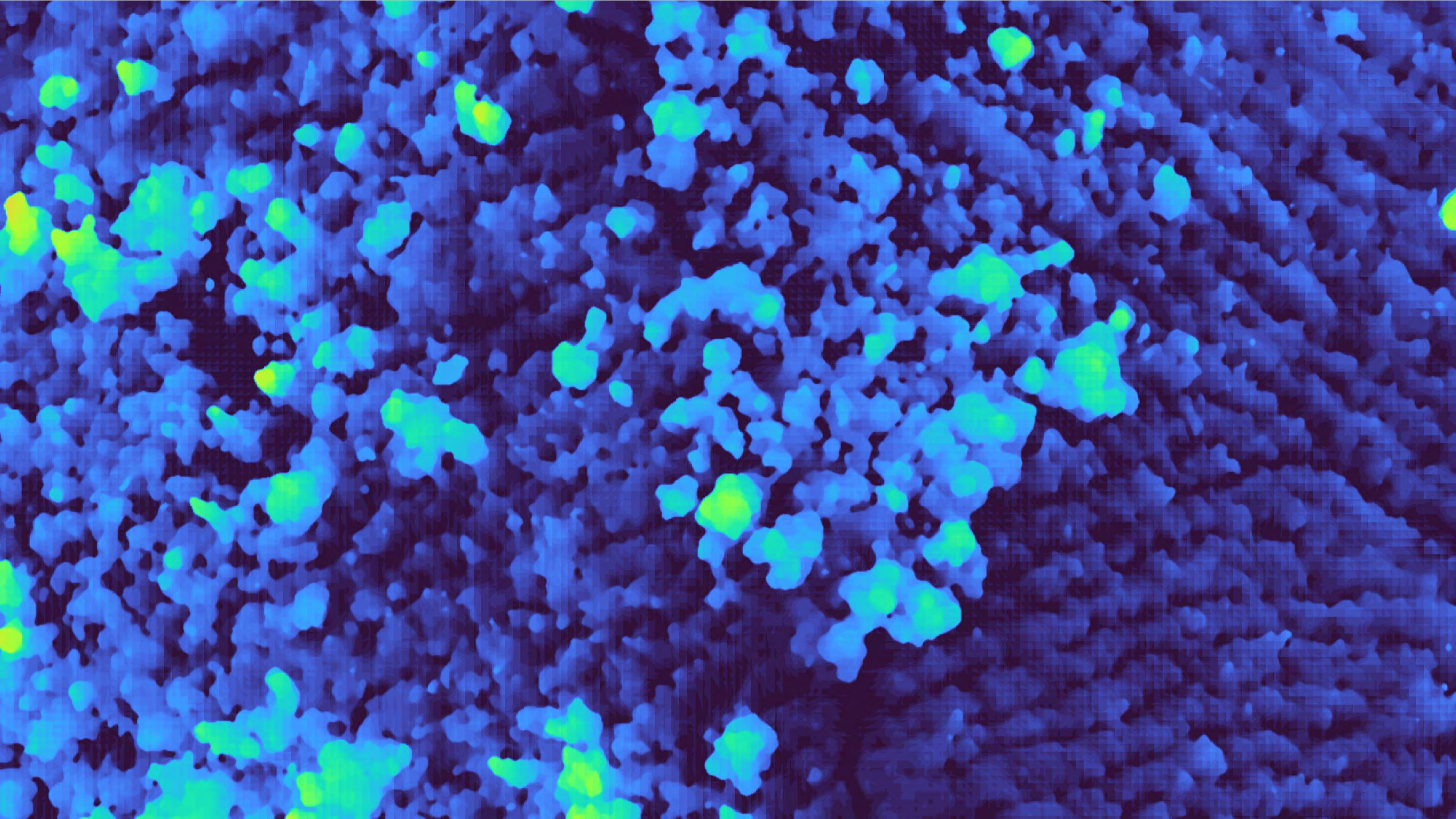


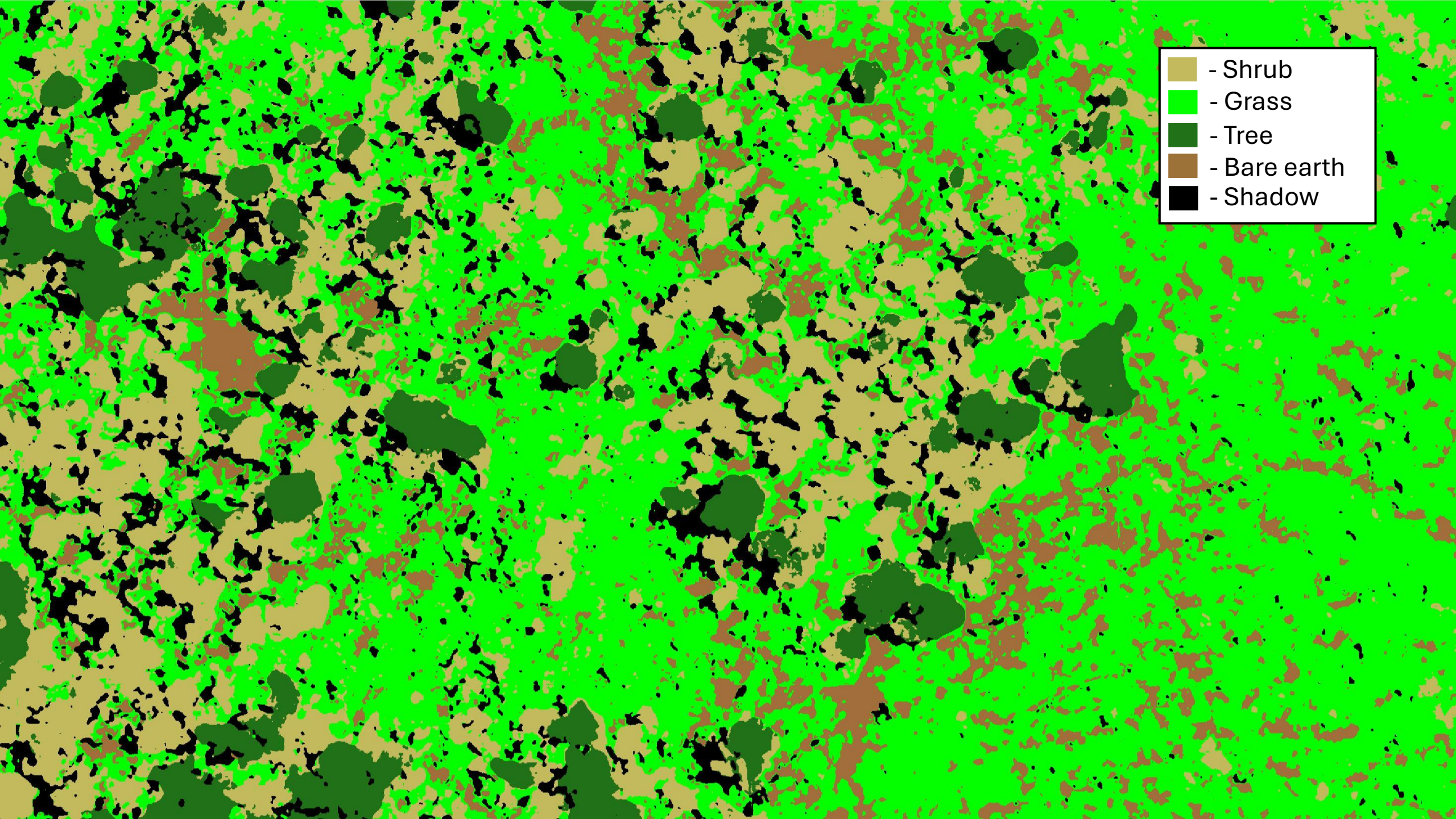
Results!





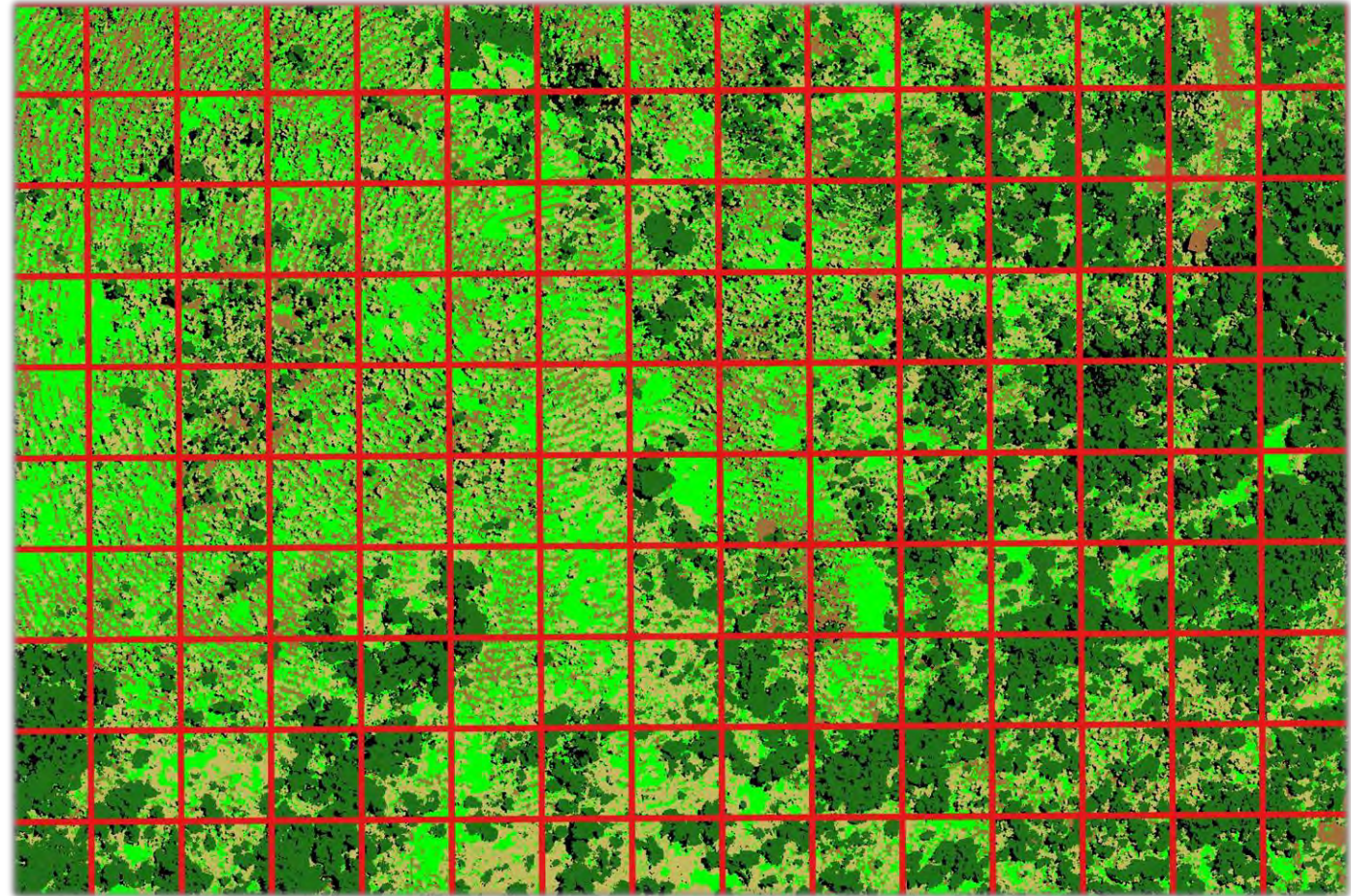




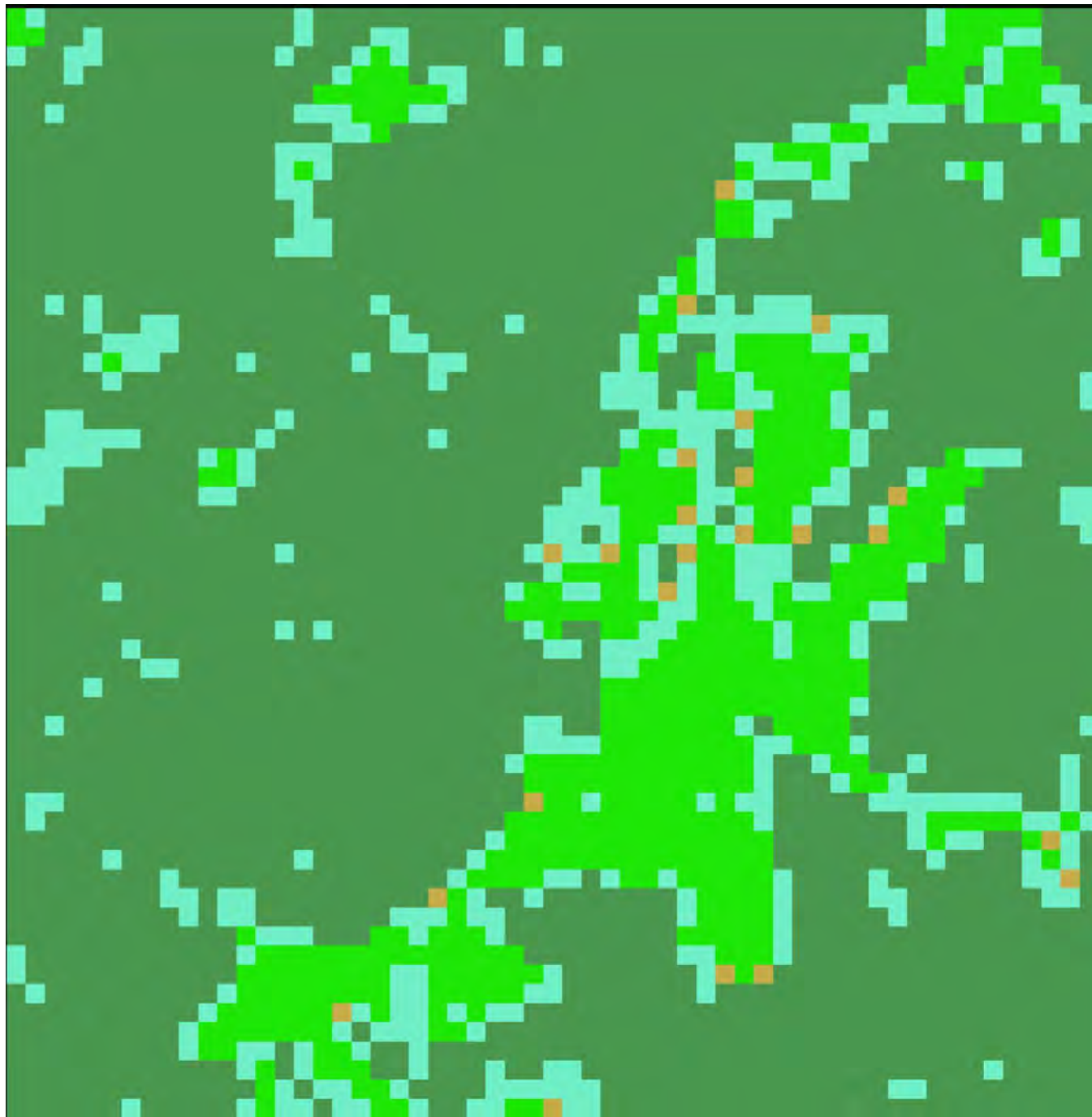


Can this be used to scout for new eligible area?

- Classify harmonised LandSat footprint cells
- Philippines definitions
 - Closed Forest: >40% trees
 - Open Forest: <40%, >10% trees
 - Shrubland: >40% Shrubland
 - Grasslands: Grasses present, above criteria not met

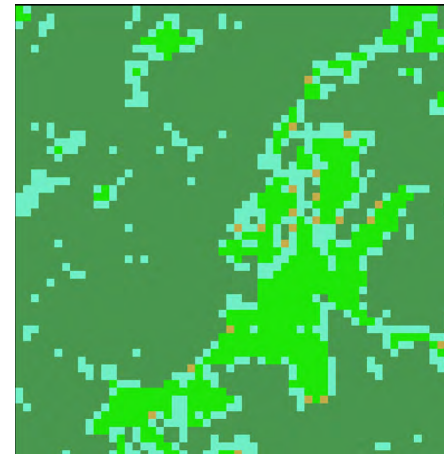
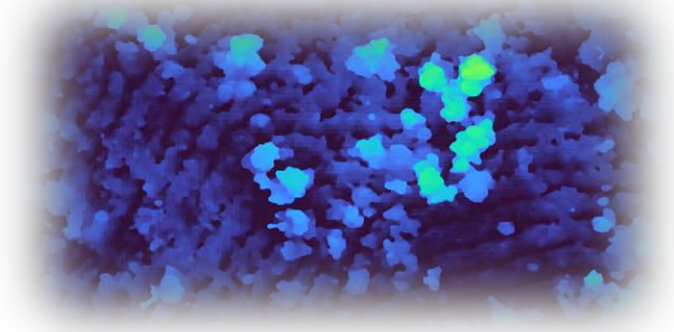
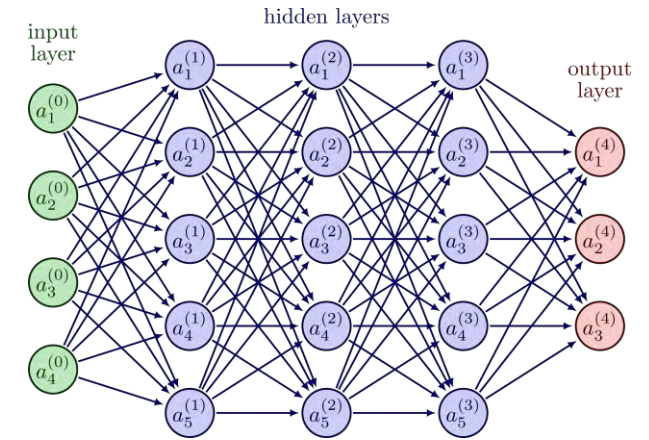






Conclusions

- Convolutional Neural networks promising for whole scene Classification
- Inclusion of CHM band greatly improves results
- Classifications can be scaled up



Thank You!