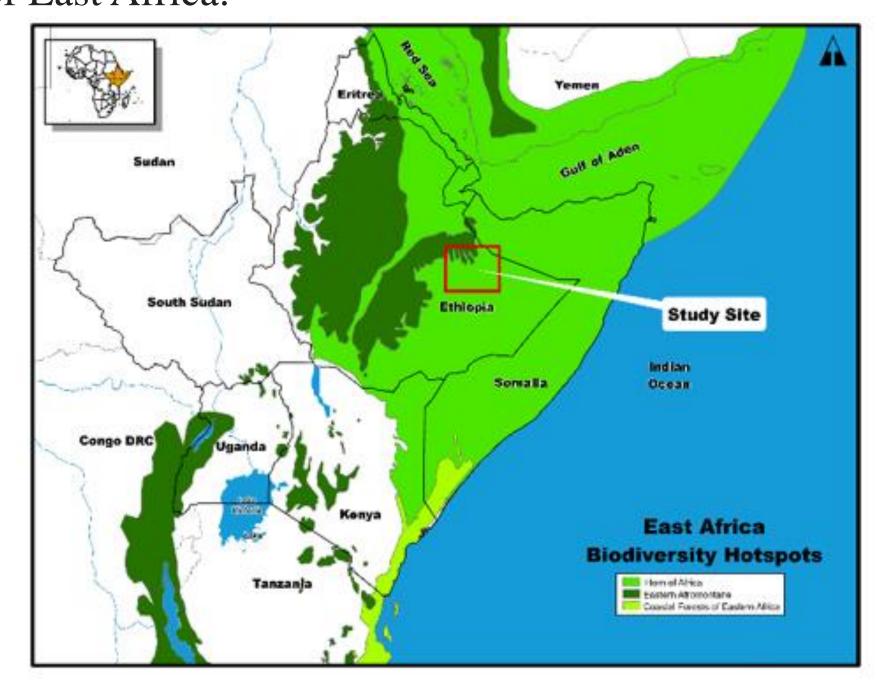
# Image Classification in Google Earth Engine (GEE) for Biodiversity Hotspot Mapping

#### Motivation

Many of the world's remaining biodiversity hotspots coincide with areas of rapid population growth and agricultural expansion. Understanding the geographic distribution of various land cover types within these hotspots is limited by a lack of current, detailed maps and the rapid land use changes underway in these areas. This is particularly true in the project study site of East Africa.



## Google Earth Engine (GEE)

The cloud computing infrastructure of the Google Earth Engine (GEE) platform can facilitate the processing of big geo datasets over large areas and observe the environment for extensive periods of time.

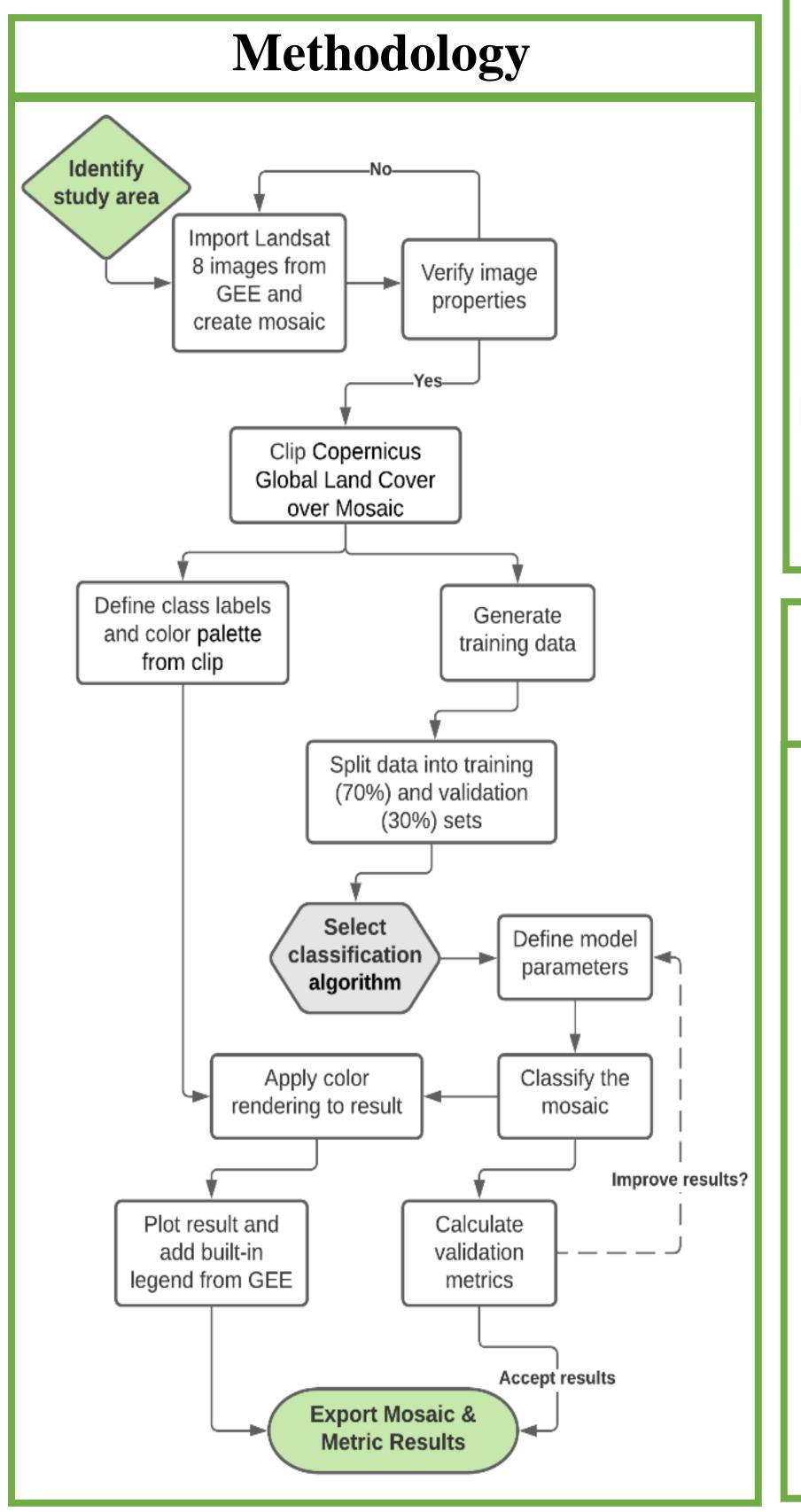
### **Future Work**

There may be an opportunity to create a new classification approach that combines the strengths of Google Earth Engine with the high predictive performance of other open-source space platforms such as H2O Automated Machine Learning (AutoML).



#### **Datasets**

USGS Landsat 8 Surface Reflectance Tier 1 Copernicus Global Land Cover Layers: CGLS-LC100 collection 3



## **Land Cover** Classes

Shrubs

Herbaceous Vegetation

Cultivated & Managed Vegetation

Urban Areas

Bare / Sparsely Vegetated

Herbaceous Wetland

Closed Forest, Evergreen Broad Leaf

Closed Forest, Deciduous Broad Leaf

Closed Forest, Unclassed

Open Forest, Deciduous Broad Leaf

Open Forest, Unclassed

## Remaining Challenges

GEE has computational constraints that limit model optimization.

None of the models were very successful at classifying open and closed forest habitat types.

Moderate level of commison and ommison errors in agricultrual areas coould lead to over or under estimatton levels of the encroachment in other habitat types.

#### Results Model Kappa Accuracy 0.75 0.40 Random Forest 0.39 Gradient Boosted Trees 0.74 0.70 0.31

