

Vegetation Fraction Estimation With Machine Learning

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Objectives

- Test ML models to compare effectiveness for fCover estimation
- Understand importance of features and their relation to fCover
- Use the best method to generate seasonal predictions

Methodology

- Combined reflectance and land class data from Google Earth Engine with ground measurements of fCover
- Filtered to select high quality data for model training
- Tuned models through strategies such as hyperparameter optimization, cross-validation, and weighted sampling

Results

- Best results from random forest regression model
- Cubist model performs most similarly, followed by neural network
- SVM model tends to deviate most

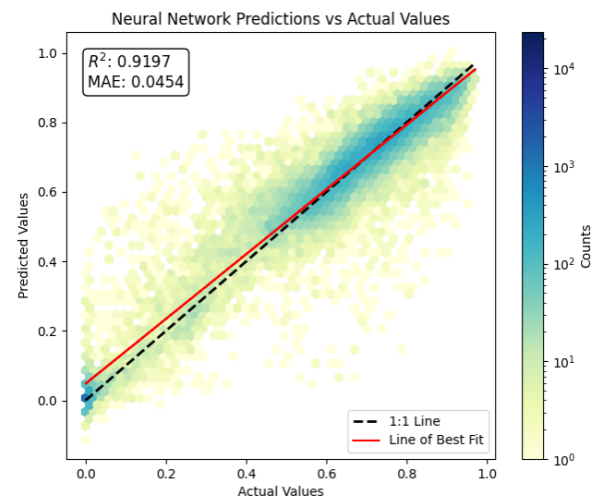
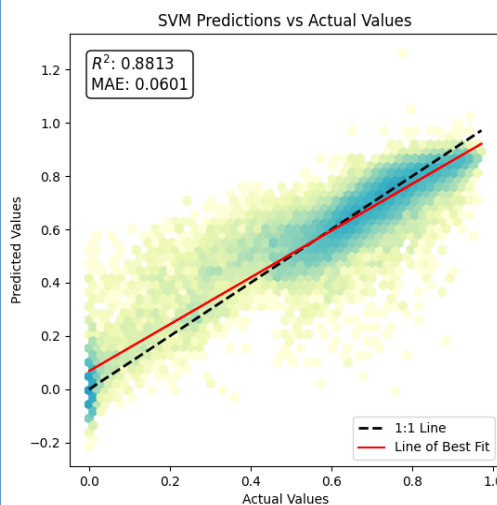
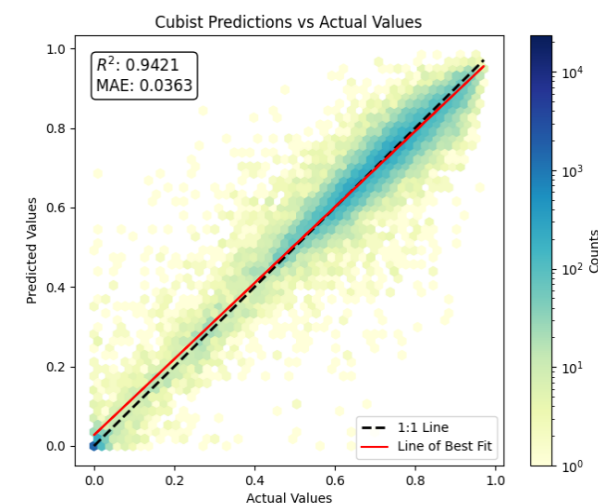
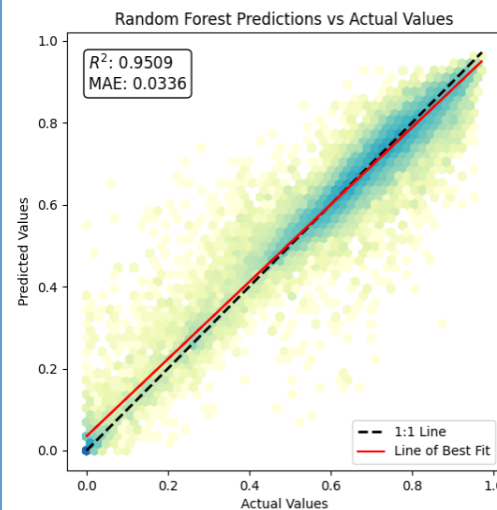
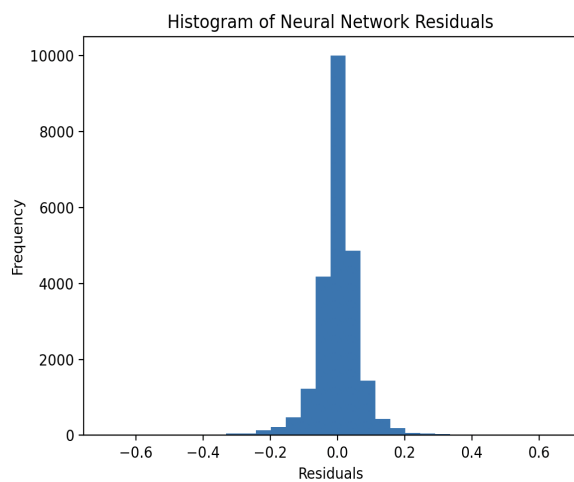
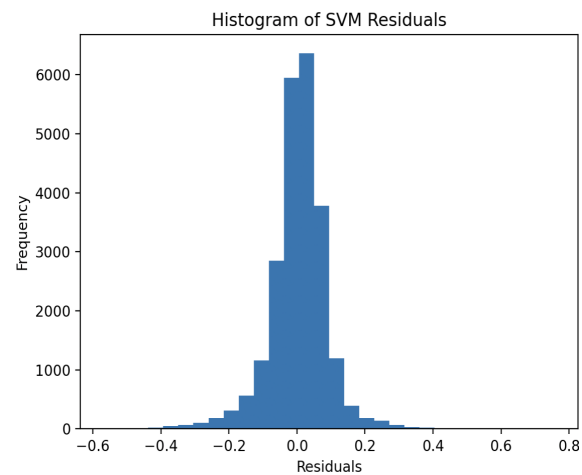
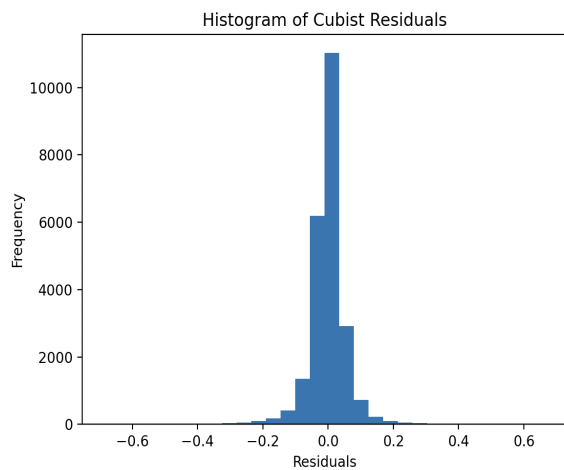
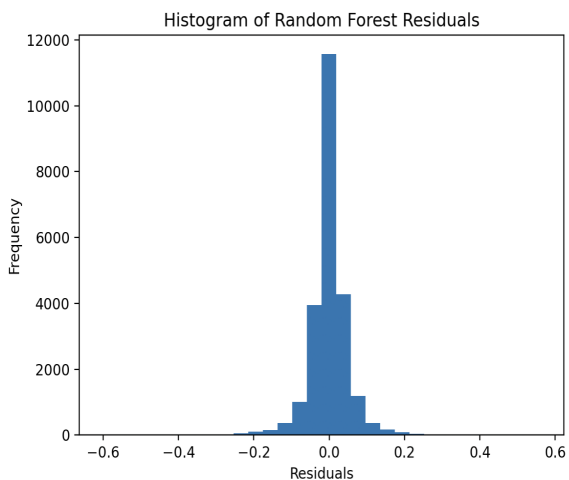
Data Types in Final Model by Importance

Feature	Gini Importance
I1 (red light)	0.4344
I2 (near-infrared light)	0.2150
Land class	0.1257
Solar azimuth	0.0608
I3 (shortwave infrared light)	0.0527
Solar zenith	0.0426
Sensor azimuth	0.0392
Sensor Zenith	0.0286

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