

Executive Summary

Landsat 8 imagery and a LIDAR derived vegetation height raster were used to examine a forested area in Northwestern Sonoma County. The Landsat bands 2, 3, 4, 5 and 6 were combined in various band combinations of two to four bands to produce seven different combinations. A classification scheme of Grass, Recent (recently disturbed), Small Tree, Medium Tree, Big Tree, Water, Ocean, and No Vegetation was used. Training areas were selected for each class. A supervised classification on each band combination was conducted using the maximum likelihood classification method. The band compositions were then composited with a LIDAR derived vegetation height raster and the maximum likelihood classification was repeated. A maximum likelihood classification was also conducted on the vegetation height raster. Acreages for the classification categories in each combination were computed.

No ground truth study was conducted, and no other data was available for comparison, so no formal accuracy assessment was conducted. Strong conclusions were difficult to reach. No formal statistical analysis was conducted. Comparisons based on the resultant images and summary tables show the following:

With the exception of NDVI, the addition of the vegetation height data reduced the amount of area classified as Grass.

The addition of vegetation height data increased the amount of area classified as Recent (recently logged or disturbed).

With the exception of NDVI and Natural Color, the addition of vegetation height data decreased the amount of area classified as Small Trees.

Aggregating the vegetation height raster to 30 meters to match Landsat resolution probably obscured cover types that only occurred in small or narrow areas. In this case the non-forest classifications.

The classification of water was consistent with classification based only on spectral data, the addition of the vegetation height raster resulted in higher acreage classified as water.

All band combinations probably under classified the amount of area in big trees.

Although I have no ground truth data, after conducting this project I have concluded that the addition of height data to Landsat data can benefit the classification of land cover.