Figure 1:- Jyrinvaara within the region of Pohjois-Karjala.

Photo 1:- Table showing comparison of theoretical and empirical elevation corrections for the point cloud.

Measurement	Value
DTM elevation	208.216
Point cloud elevation	238.07
Empirical correction	29.854
Theoretical correction (raster)	16.36

Emprical correction = Point cloud elevation - DTM elevation.

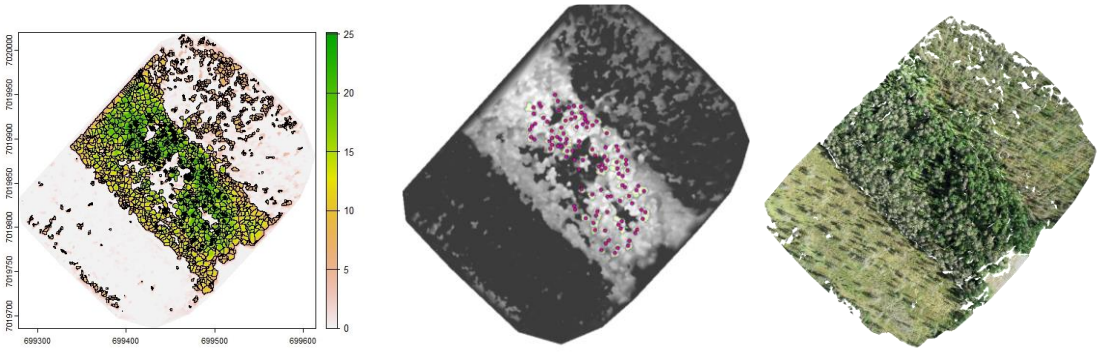

Figure 2:- Figure showing CHM segmentation (left), CHM (middle), and Orthomosaic (right).

Here it can be seen that the CHM segmentation is as accurate as the height of CHM. Similarly, CHM is as accurately rasterized as the orthomosaic features and CHM segmentation matches well with the features of orthomosaic features. Additionally, CHM segmentation showed detected crown and canopy that are fairly matchable to orthomosaic. Vegetation details are rather visible in orthomosaic than other two.

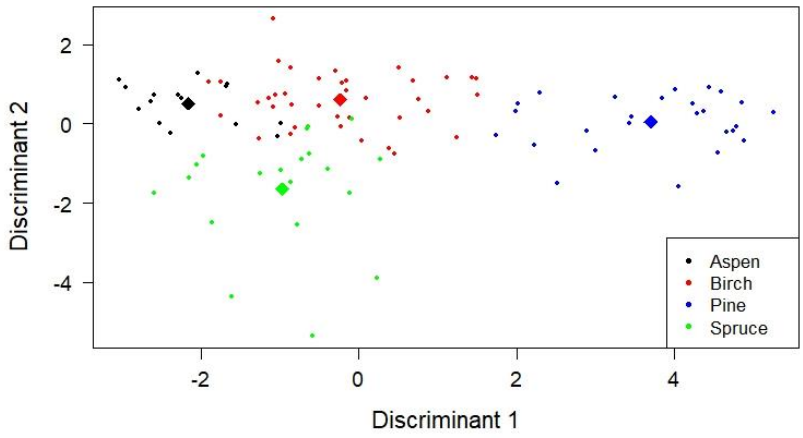

Figure 3:- Linear Discriminant Plot. The model used 3 discriminants and 4 variables for classification.

Error matrix:

	Aspen	Birch	Pine	Spruce
Aspen	11	0	0	0
Birch	3	33	0	1
Pine	0	1	27	0
Spruce	0	4	0	21

Model accuracy = 0.8811881

Here's the model written based on the coefficients:

LD1=2.3369533×Red60−2.0182013×Red40−1.7144235×Green70+0.2392859× Blue10

LD2=1.096403×Red60+1.501532×Red40+3.490123×Green70+2.165133× Blue10

LD3=−2.929197×Red60+2.345676×Red40−2.227198×Green70−1.827588×Blue10

Interpretation:

```
Call:
lda(form, data = d, prior = pri)

Prior probabilities of groups:
 Aspen  Birch   Pine Spruce
  0.25   0.25   0.25   0.25

Group means:
            Red60       Red40    Green70     Blue10
Aspen  -0.3125682 -0.07512608  0.9889792 -1.1586031
Birch  -0.2477453 -0.23325348  0.4329680 -0.1544340
Pine    1.1323846  1.02955145 -1.3956017  1.0182079
Spruce -0.7640777 -0.77482700  0.4871305 -0.4020453

Coefficients of linear discriminants:
              LD1      LD2       LD3
Red60    2.3369533 1.096403 -2.929197
Red40   -2.0182013 1.501532  2.345676
Green70 -1.7144235 3.490123 -2.227198
Blue10   0.2392859 2.165133 -1.827588

Proportion of trace:
   LD1    LD2    LD3
0.8739 0.0917 0.0344
```

Figure 4:- LDA model summary

Here LDA output explains that the training data corresponds to each 25% of Aspen, Birch, Pine, and Spruce species. This figure also explains the group means; these are averages of predictors in each species that are used by the LDA to predict the model coefficients. Much of our model is explained by LD1 with 87.39%, and the remaining other percentages by LD2 and LD3.

Specifically under LD1, Red60 and Blue10 have positive coefficients then Pine moves (positive) farther toward the positive discriminant than other species but other species move toward the negative discriminant. On the other hand, Red40 have negative coefficients then pine moves towards the negative and others move closer to pines. Similarly, under LD2, overall coefficients are positive then pine moves towards positive determinant, but other species move towards negative determinants, showing a tendency for Red60, Red40, and Blue10 to deviate species farther. However, the classification of species is largely explained by a combination of LD1 predictors. In conclusion, classification could be explained with an 88.12 % accuracy.