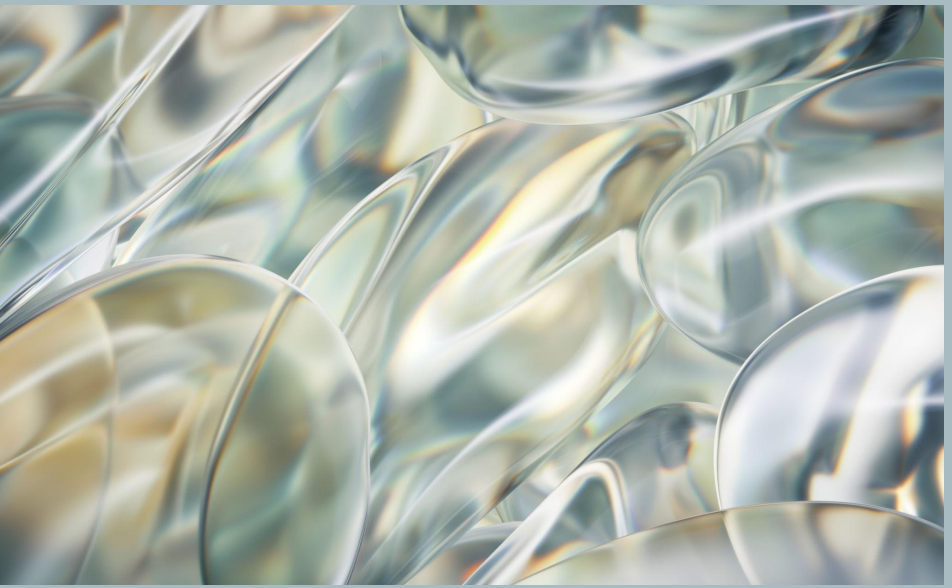
EAS 516

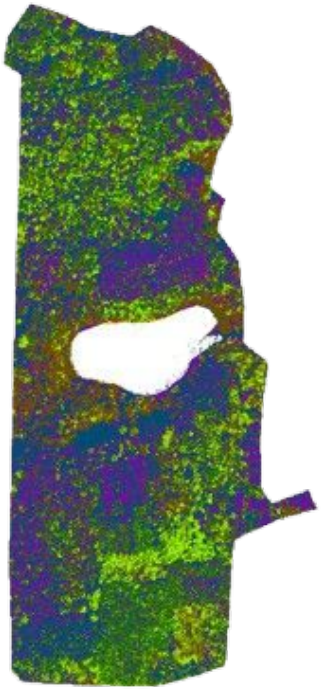


Saginaw Forest: Canopy Cover Estimate, Classification, and Biomass Analysis

Shaman Garcia

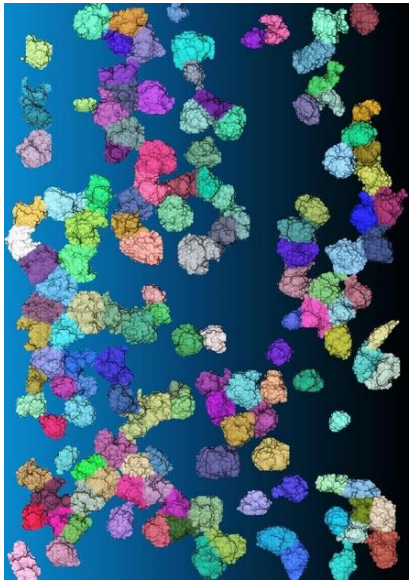
Biomass Estimate From Remote Sensing

- Canopy Estimate
- Forest Classification
- Allometric Equations



Forest Classification

ArcGISPro



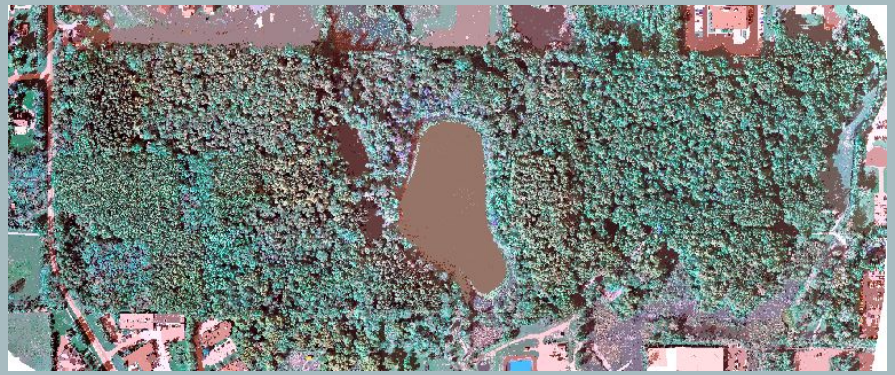
Canopy Analysis

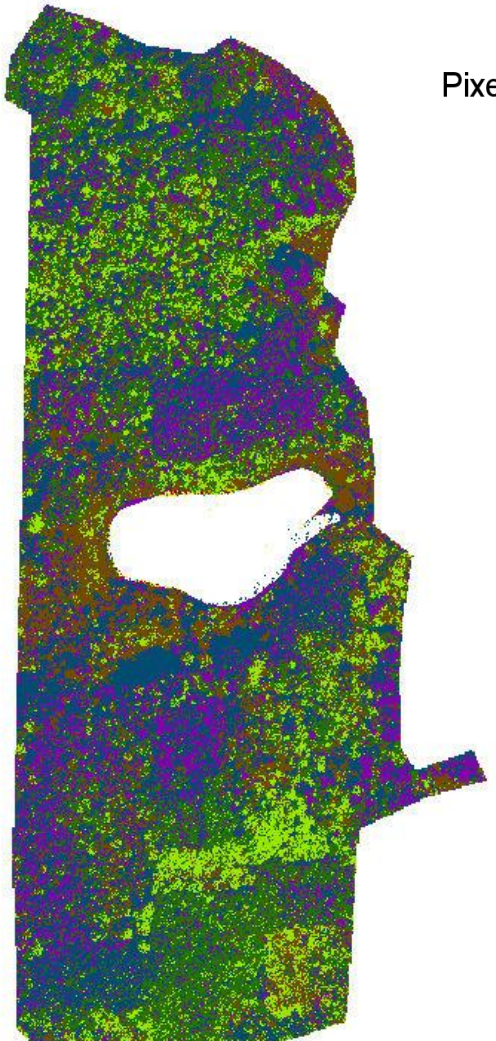
Pycrown

Image Classification

Class Orthomosaic

- Segmented using 15,15 spatial and spectral detail





Pixel Composition

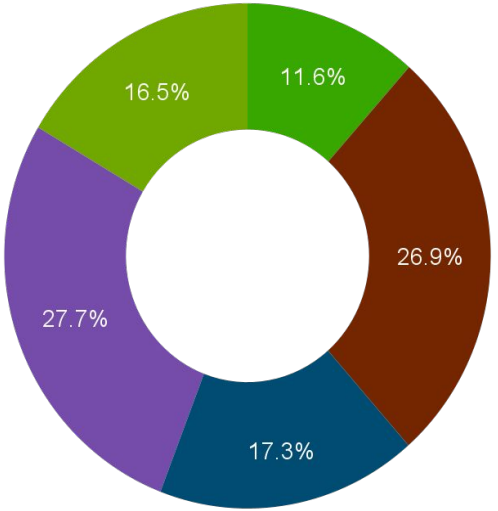
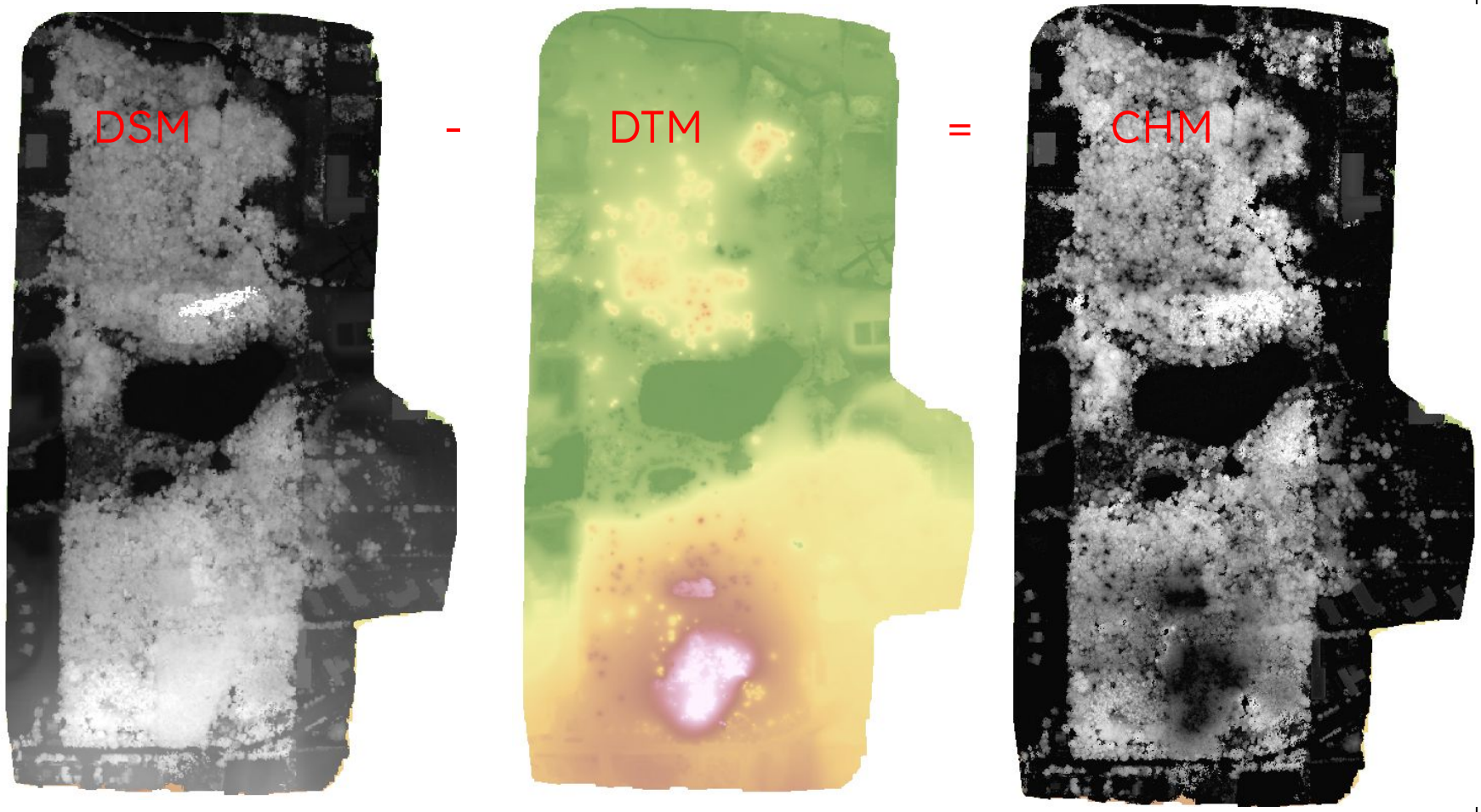
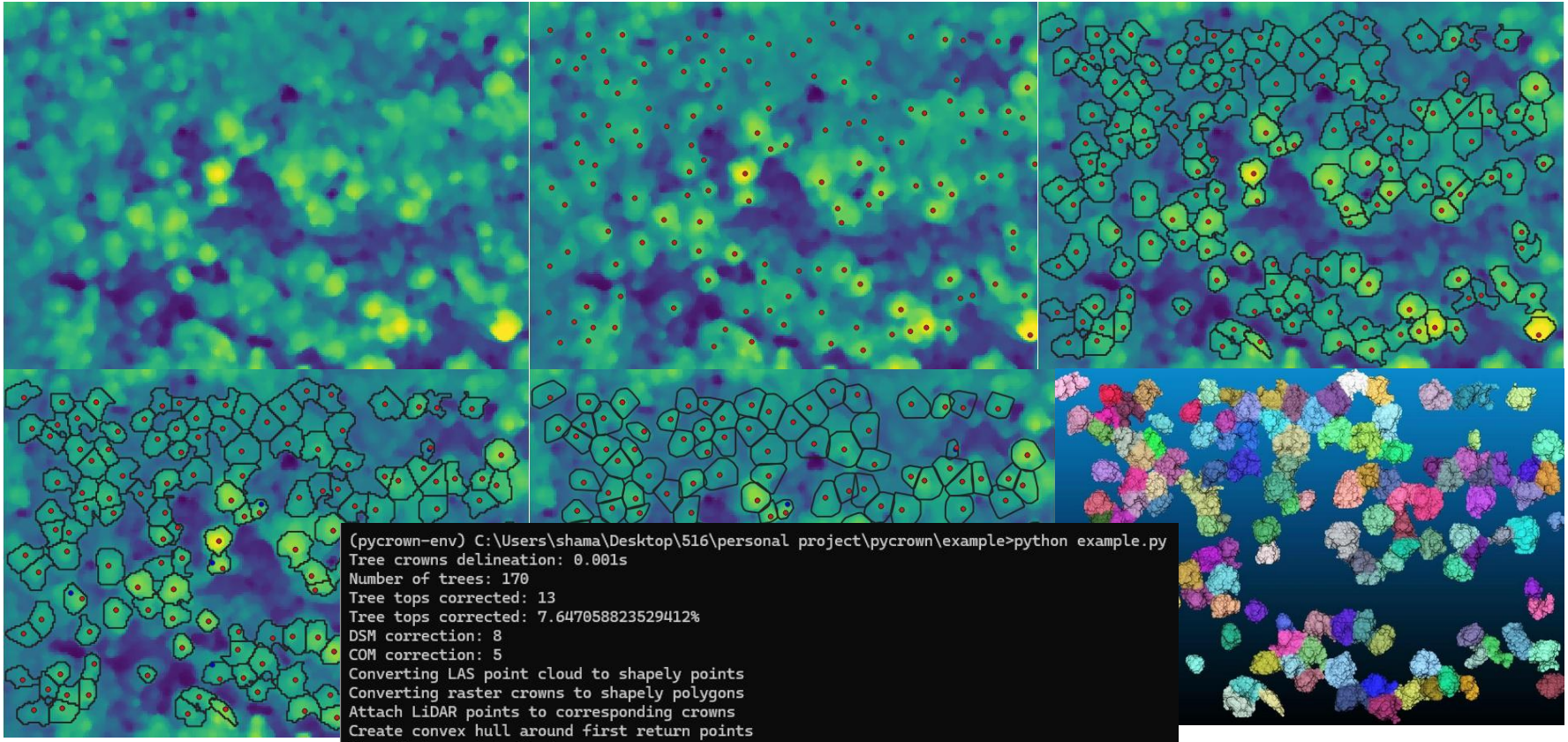


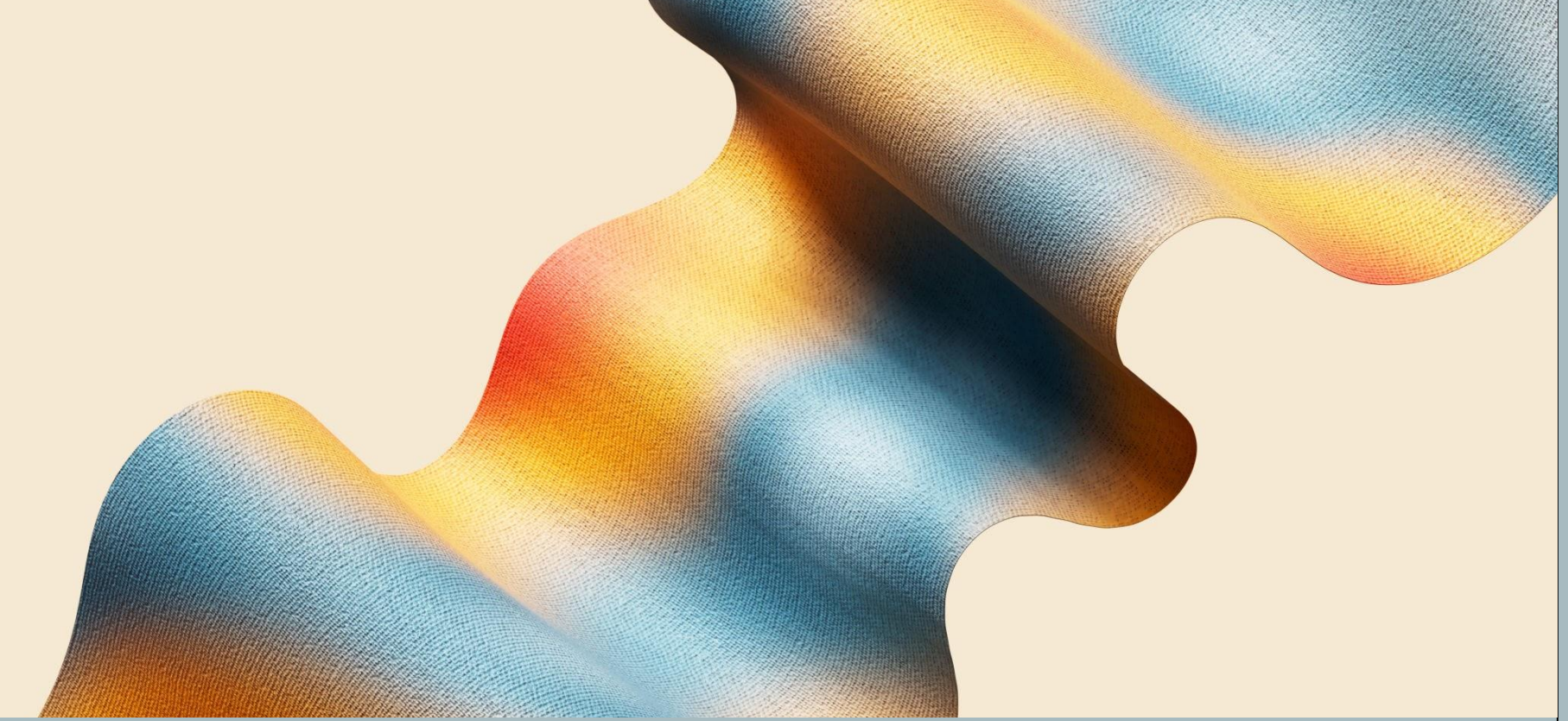
Image Classification


DSM
-
DTM
=
CHM



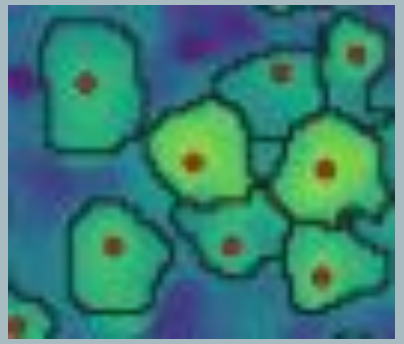
```
(pycrown-env) C:\Users\shama\Desktop\516\personal project\pycrown\example>python example.py
Tree crowns delineation: 0.001s
Number of trees: 170
Tree tops corrected: 13
Tree tops corrected: 7.647058823529412%
DSM correction: 8
COM correction: 5
Converting LAS point cloud to shapely points
Converting raster crowns to shapely polygons
Attach LiDAR points to corresponding crowns
Create convex hull around first return points
Classifying point cloud
Number of trees detected: 149
Processing time: 0:00:20.123166 [HH:MM:SS]
```

#

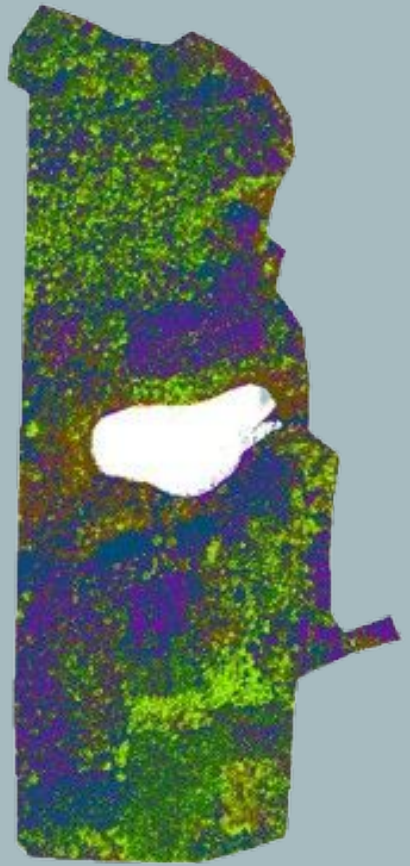


Putting it all together

Tree centers and height



Forest composition ratios



allometric equations(averaged)

Species	Jenkins	Ter-Mikaelian & Korzukhin
Acer platanoides	$M = 0.02 \cdot D^{2.43}$	$M = 0.04 \cdot D^{2.5}$
Picea abies	$M = 0.05 \cdot D^{2.28}$	$M = 0.07 \cdot D^{2.3}$
Pinus strobus	$M = 0.03 \cdot D^{2.37}$	Not provided
Quercus rubra	$M = 0.04 \cdot D^{2.36}$	$M = 0.06 \cdot D^{2.41}$

Biomass Estimate

dbh	height	species	Jenkins	Ter-Mikaelian & Korzukhin	Average
4.5	7.77	Acer.platanoides	0.7732793347	1.718269478	1.245774406
38.5	23.85	Quercus.rubra	205.9778248	310.2113744	258.0945996
35	35.7	Picea.abies	165.7467973	249.1463574	207.4465774
61	34.25	Pinus.strobus	510.9200708		510.9200708

ADJUST THE DATA USING TRUTHED MEASUREMENTS

SUM ALL YOUR TREES TO GET THE BIOMASS FOR THE AREA OF INTEREST!

What I would do differently?