

Monitoring forest health with UAS



University of Vermont Spatial Analysis Lab

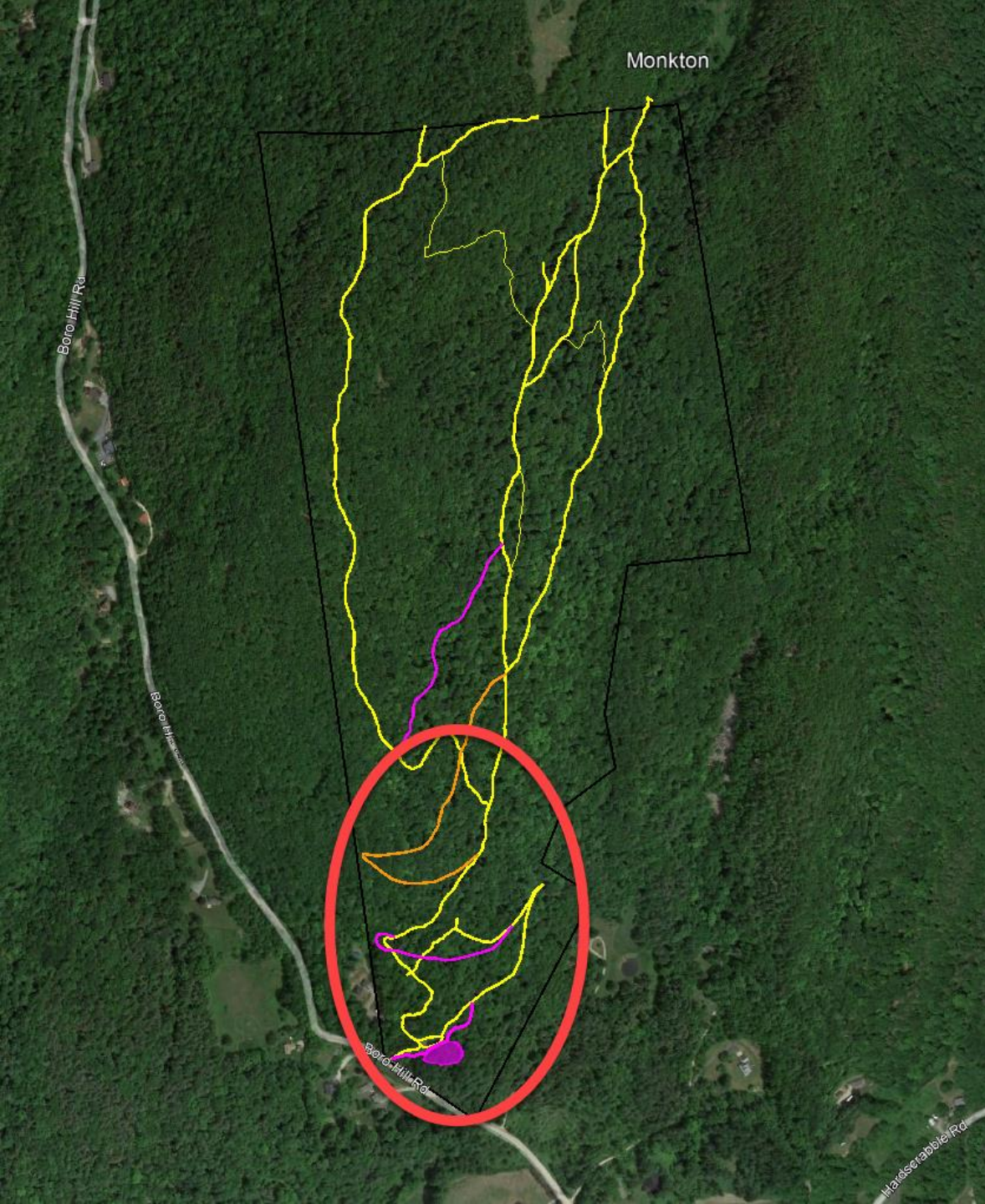
Adam Zylka

Maddy Zimmerman

Lauren Cresanti

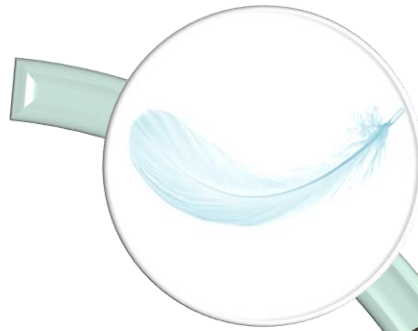
Kelly Schulze





Little Hogback Community Forest in June 2021

Criteria



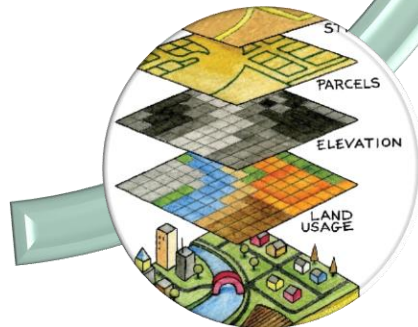
Lightweight &
Deployable



Safe



Rapid
Processing



GIS Ready
Products



UAS

- DJI M300 RTK
- DJI Mavic 2 Pro



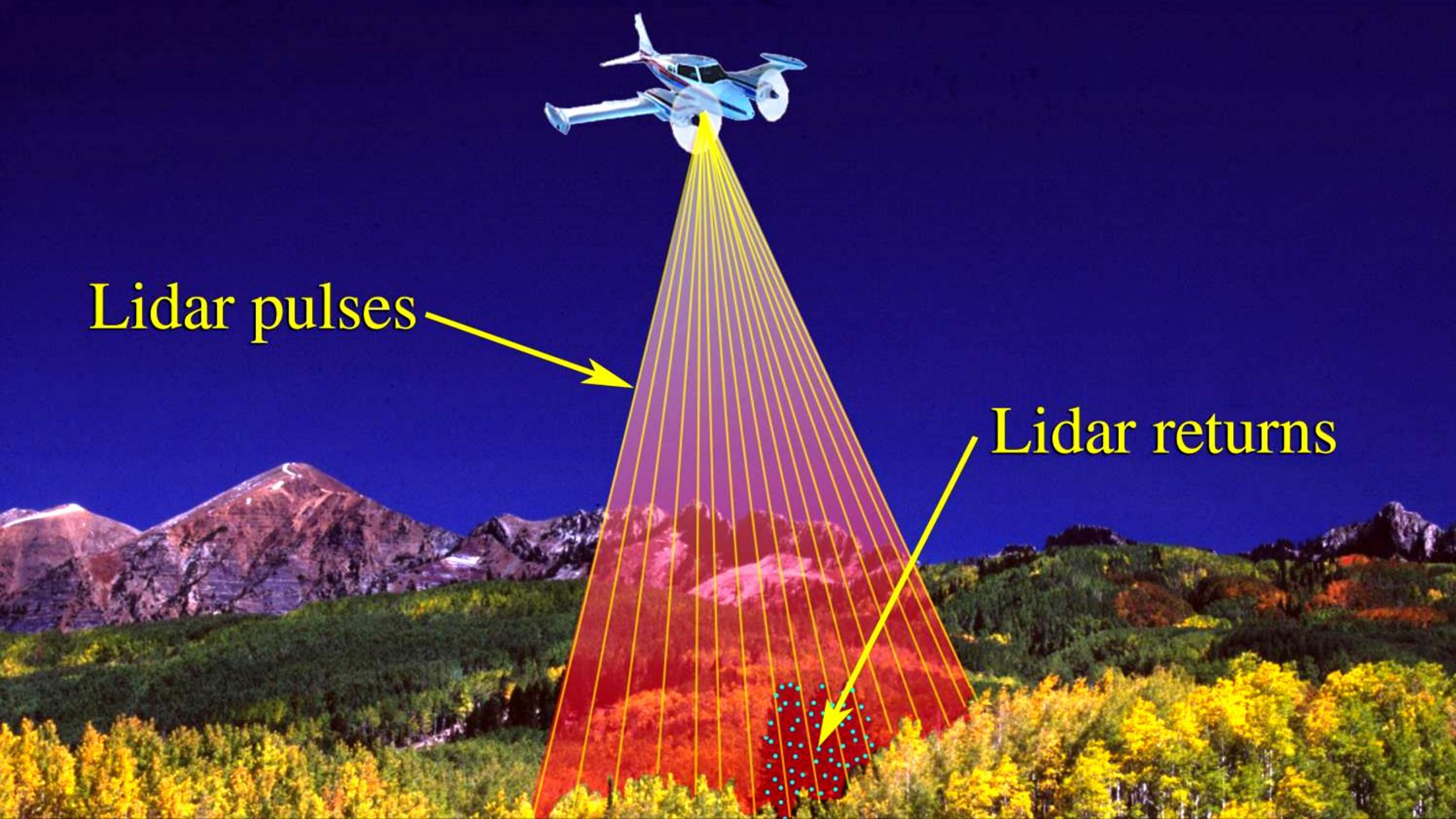
Sensors

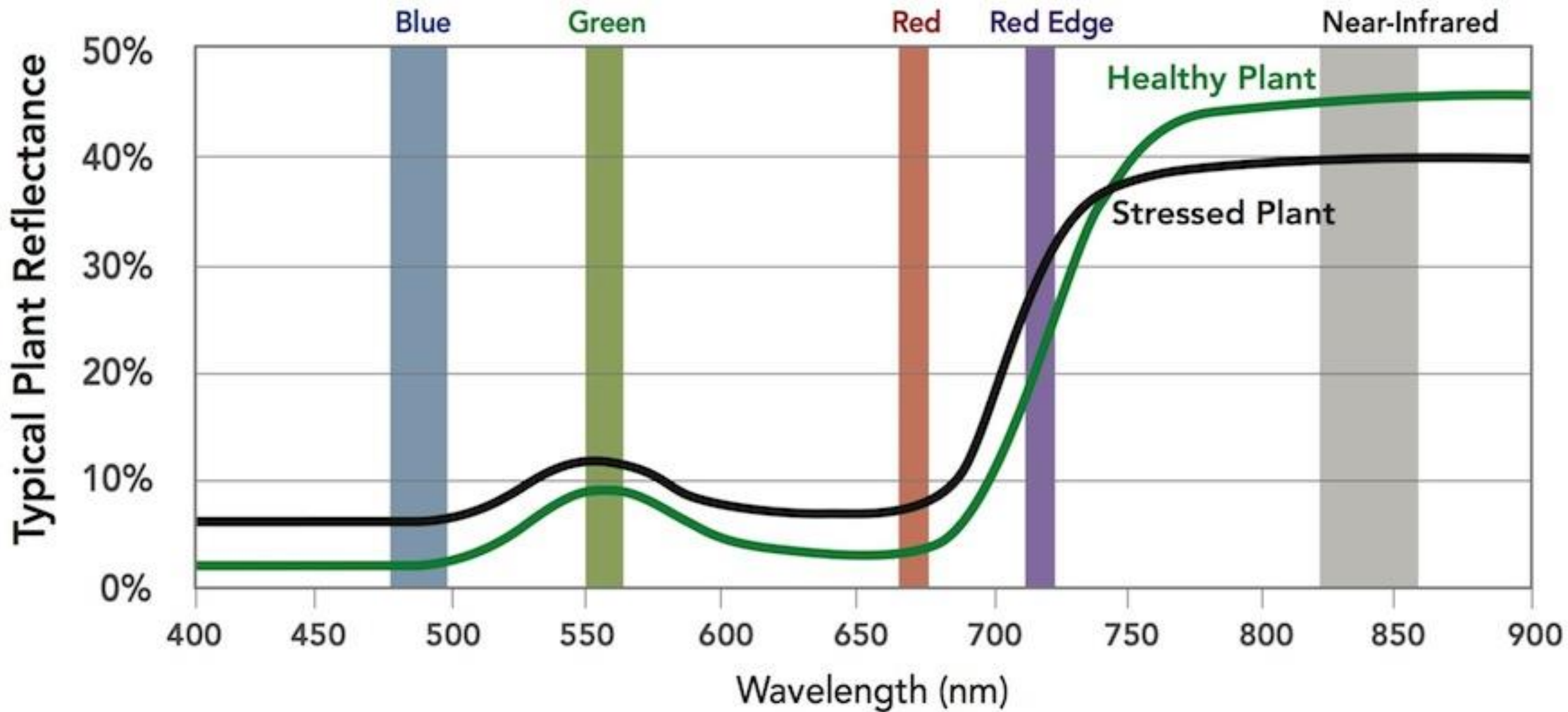
- Yellowscan Mapper LiDAR
- MicaSense RedEdge-MX Dual Camera

Lidar pulses



Lidar returns











June 14th, 2021



June 23rd, 2021



July 7th, 2021



August 25th, 2021



October 13th, 2021

NAIP Imagery

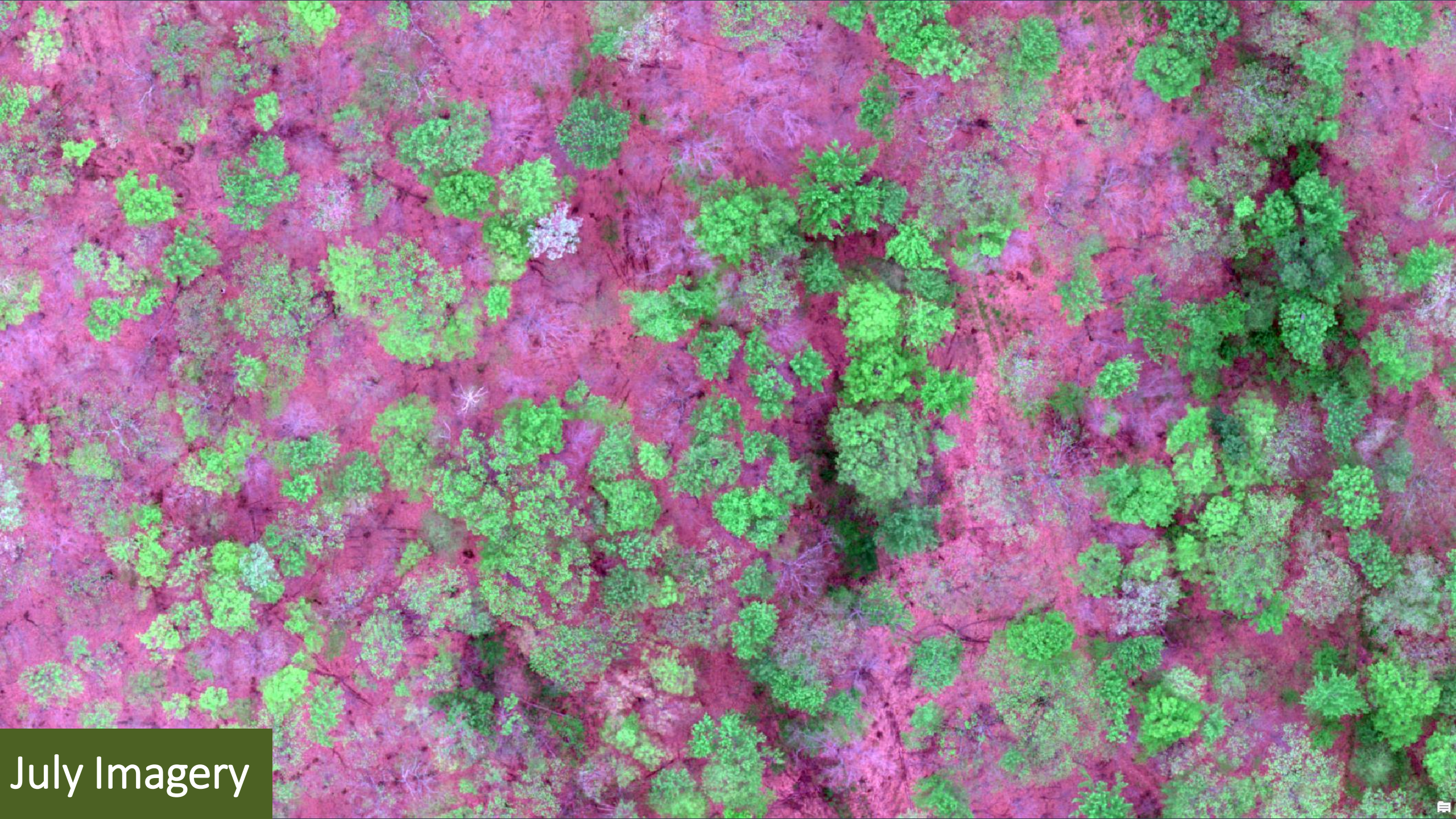


July Imagery



August Imagery



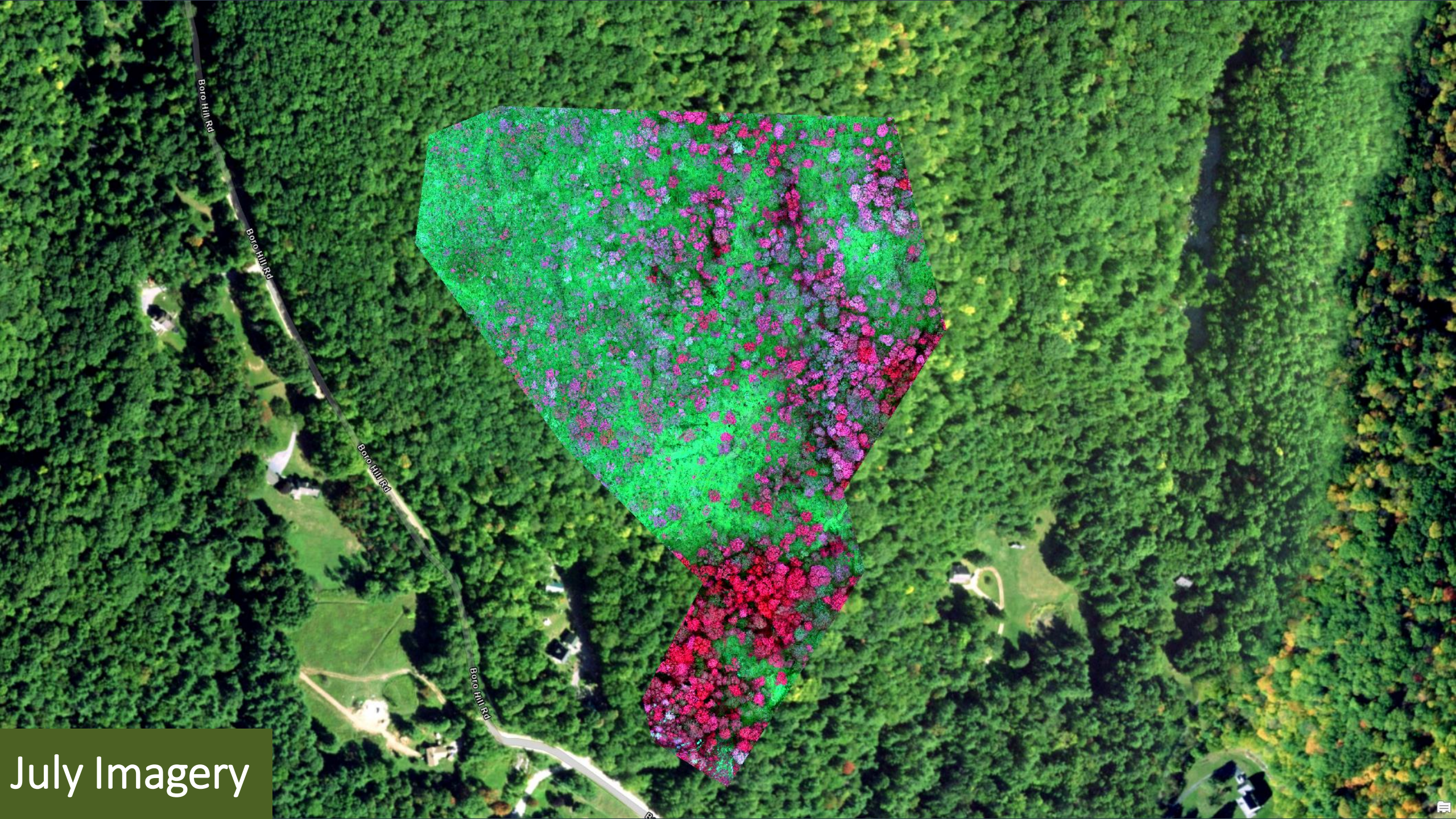


July Imagery



August Imagery

July Imagery



August Imagery





July Imagery



August Imagery

PROJECT

Name: YS-20210707-154952-LHCF
PP solution: ...-LHCF_SBET.txt
Z Ref: POSPac elevation
LiDAR: MAP0038_calibration
Angle range:



STRIPS

- 01
- 02
- 03
- 04
- 05
- 06
- 07
- 08
- 09



Show Trajectory



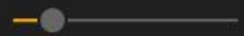
Show Cloud



EDL



Strength



Point Size



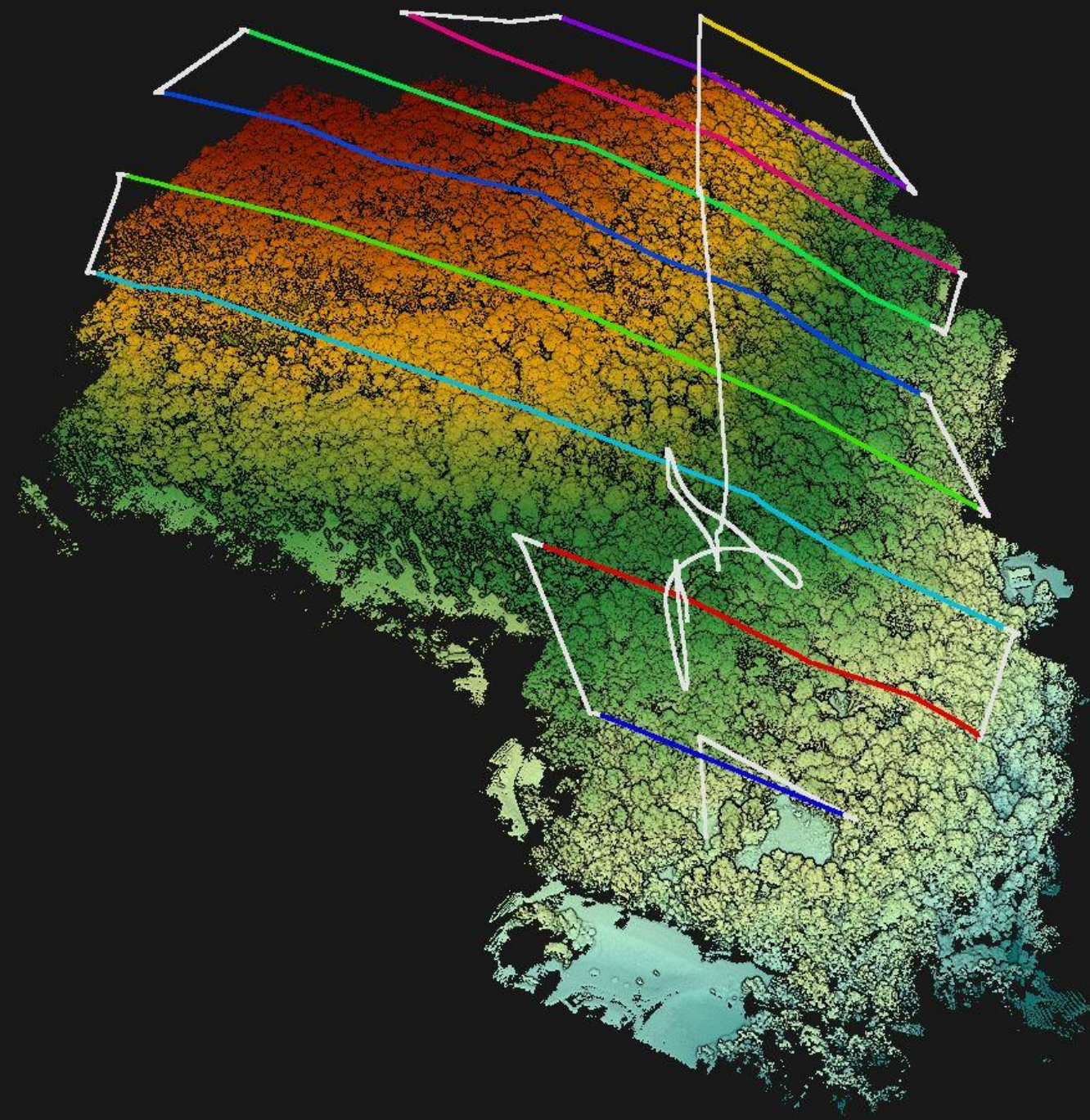
Cloud Color

Elevation

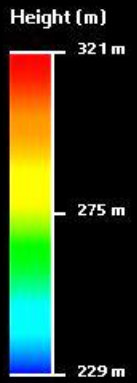
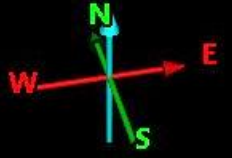
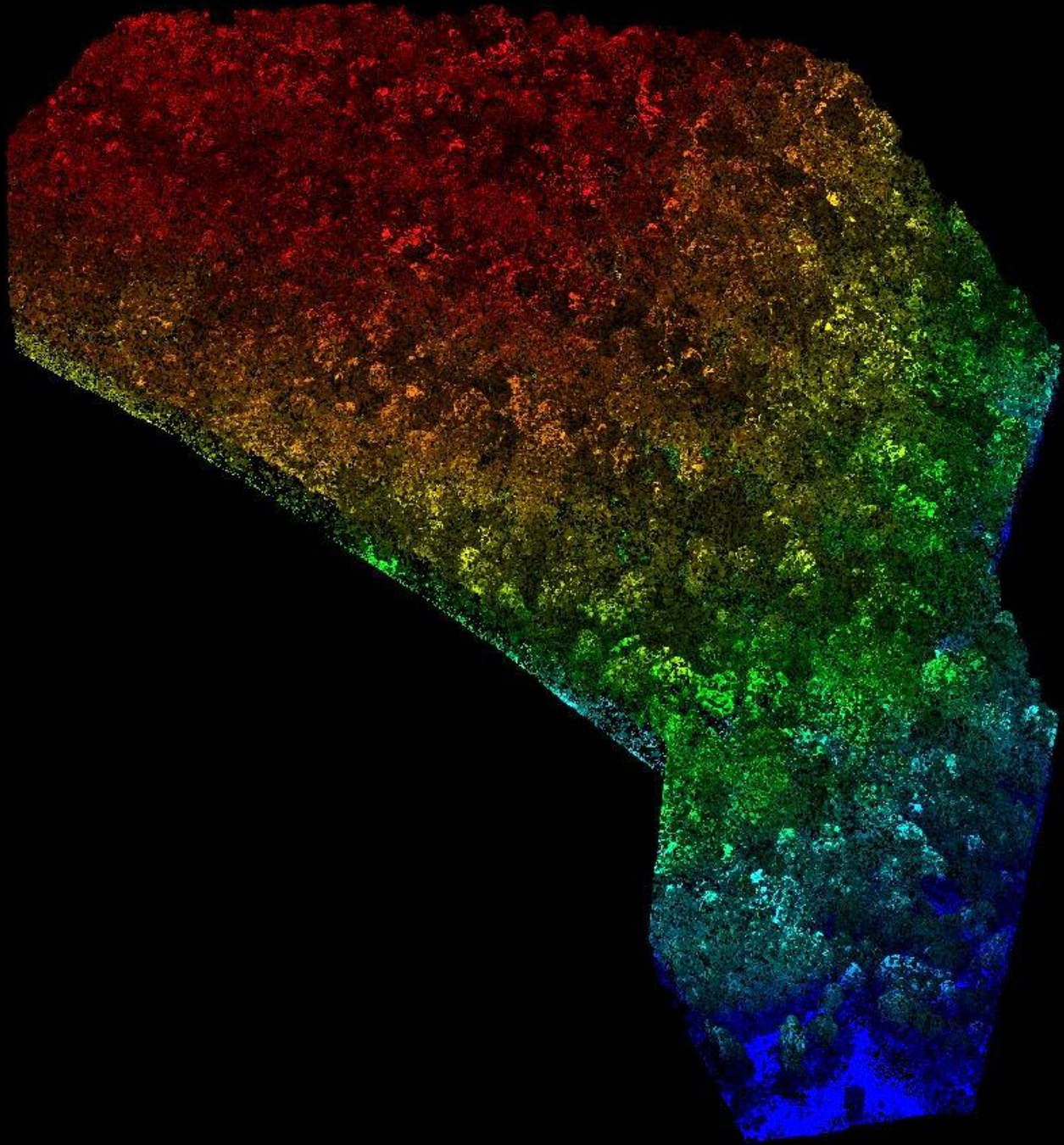


- Echo
- Max Echo
- Laser Number
- Strip
- Intensity
- Scan Angle
- Time

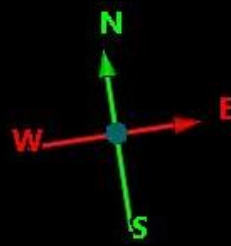
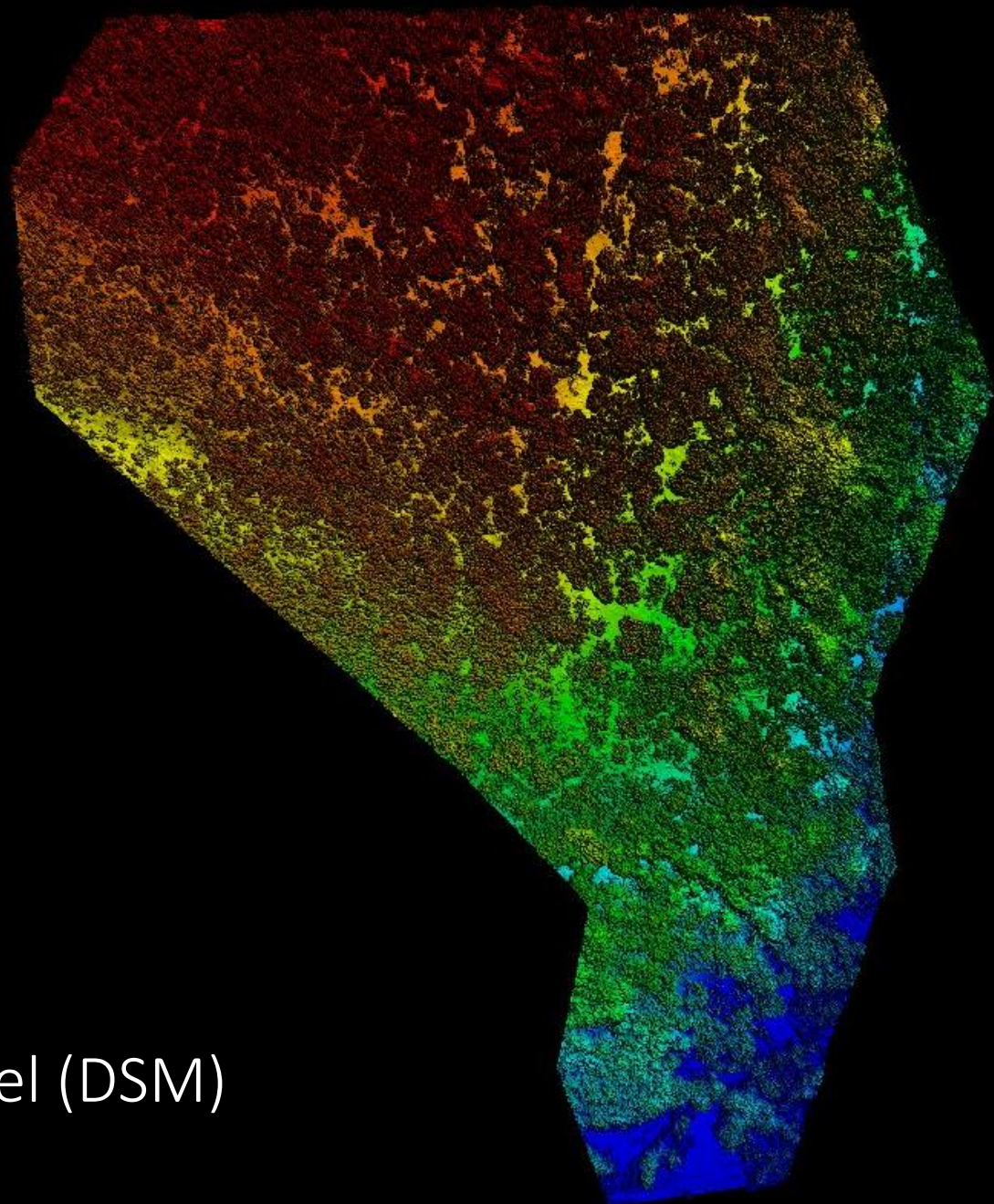
Picking Mode



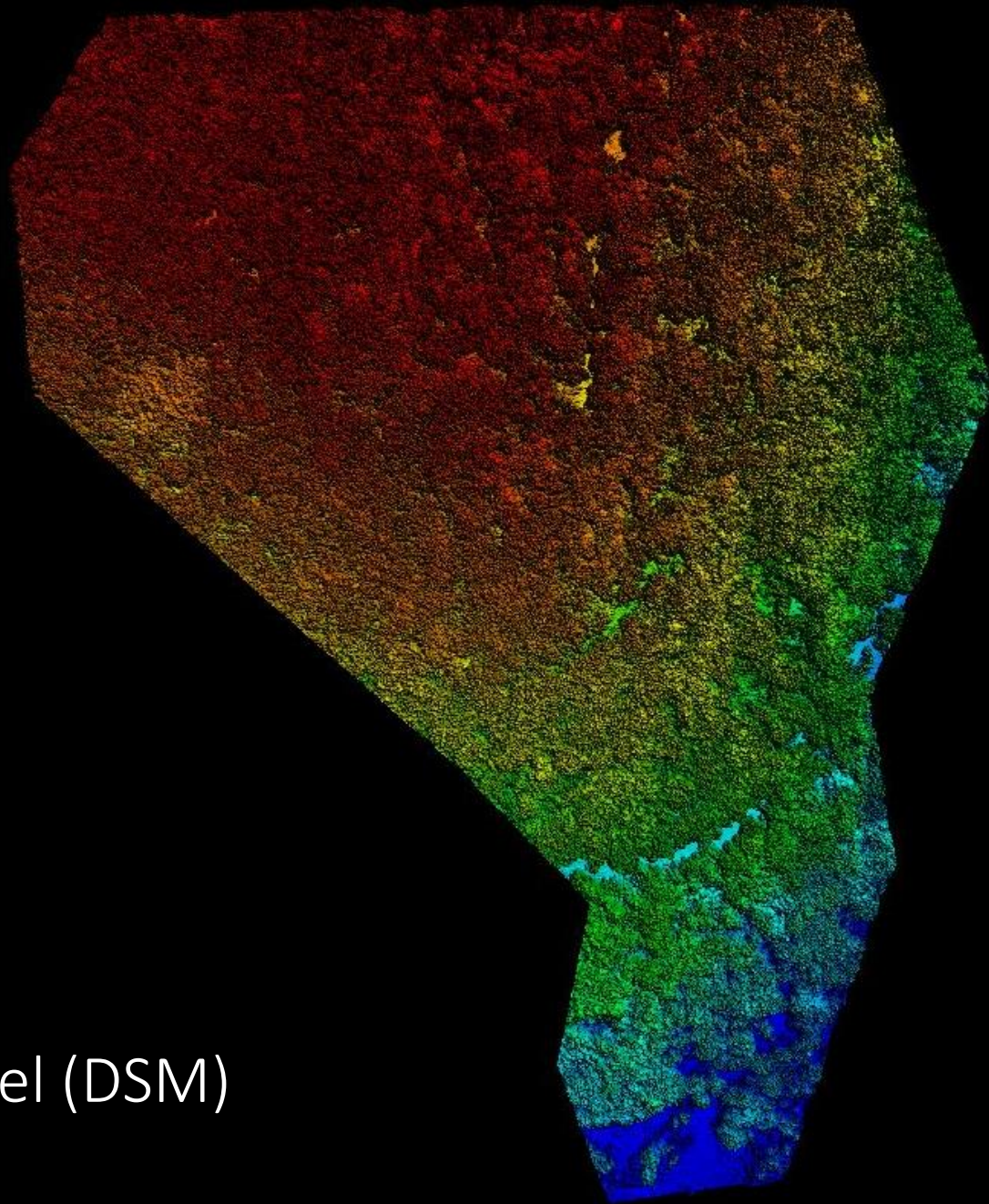
Modify project parameters



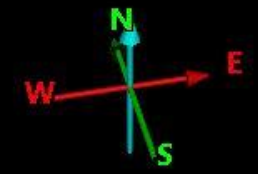
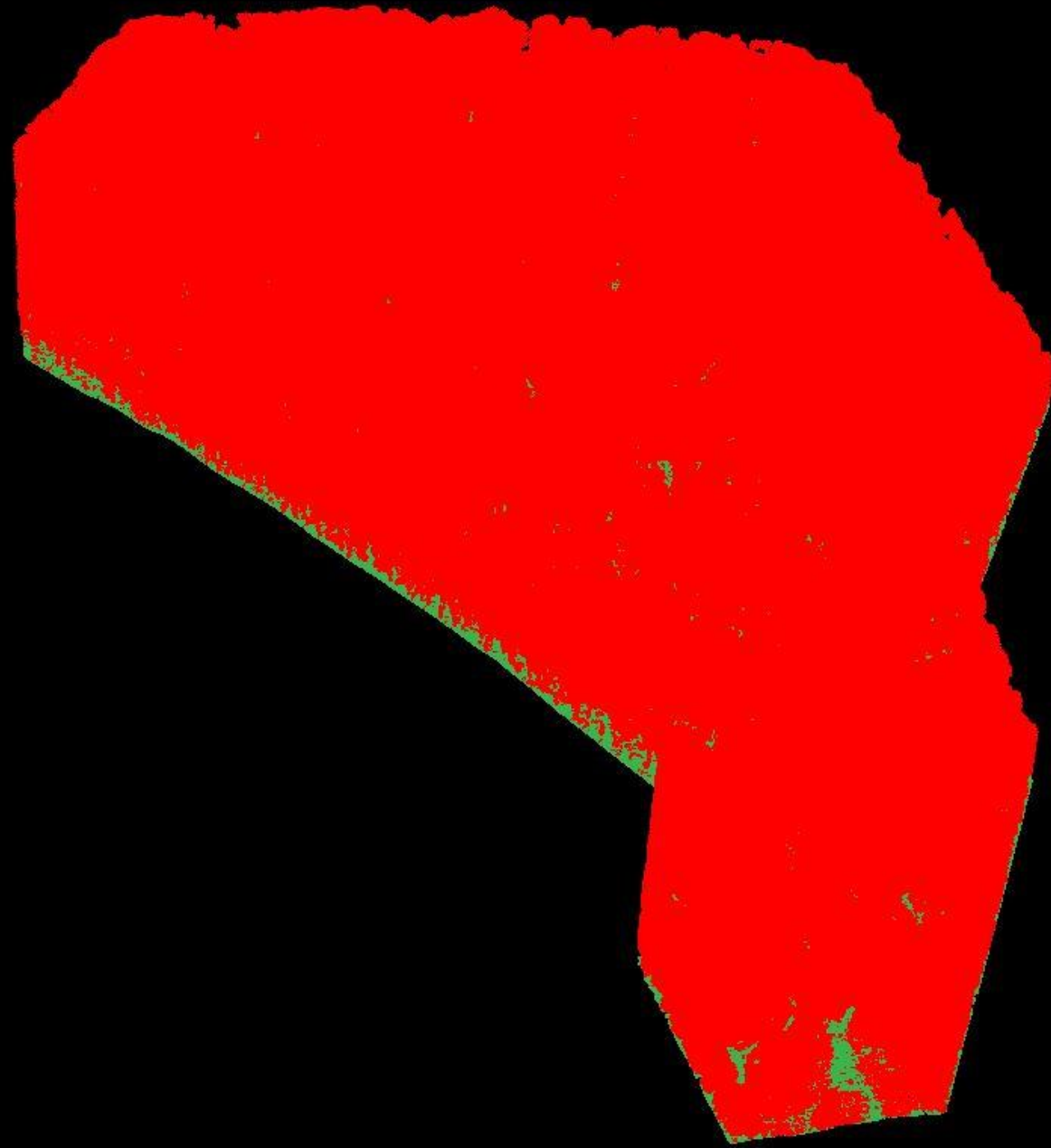
Point cloud
July



Digital Surface Model (DSM)
July

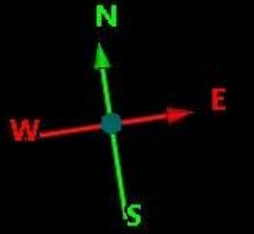
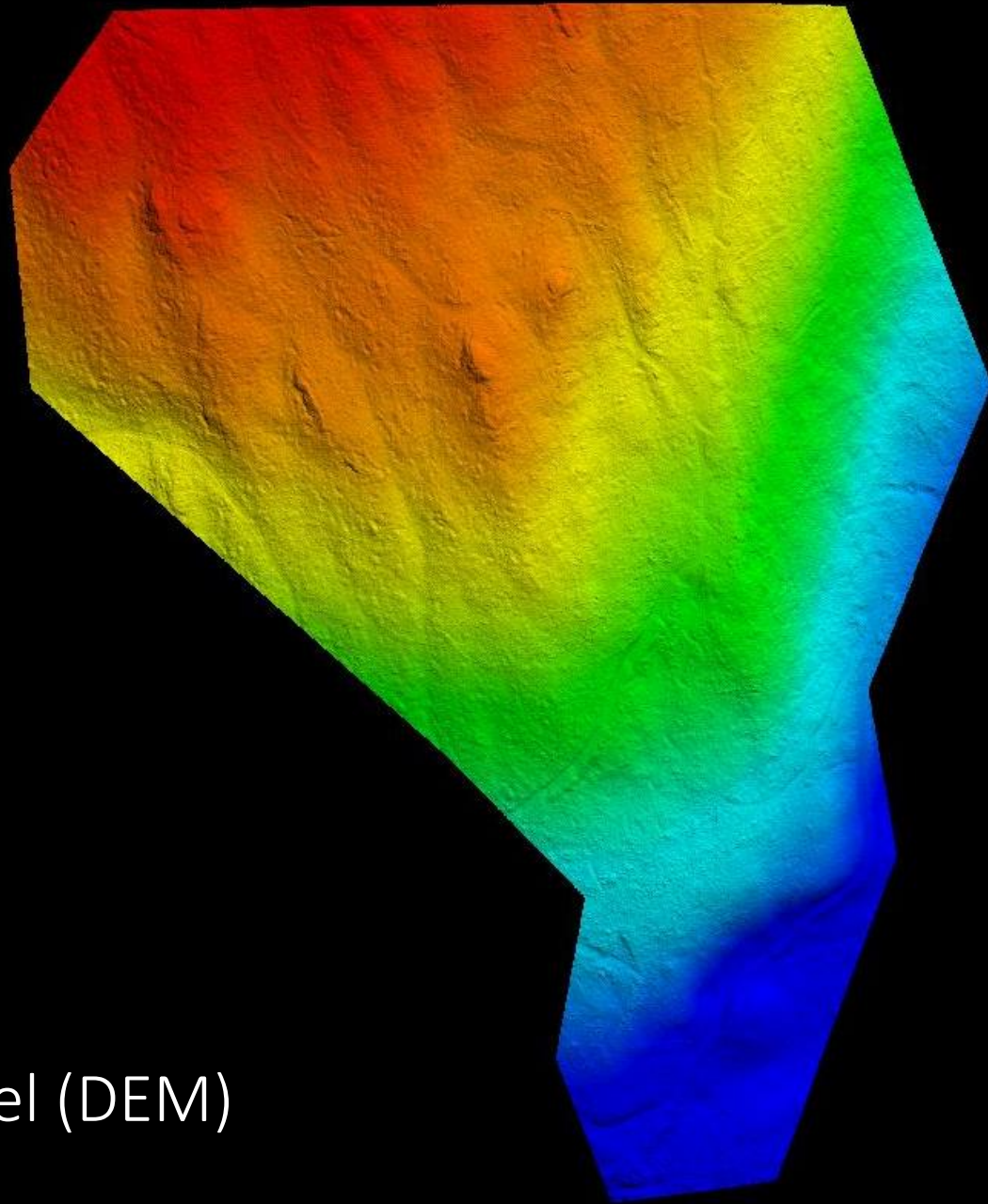


Digital Surface Model (DSM)
August

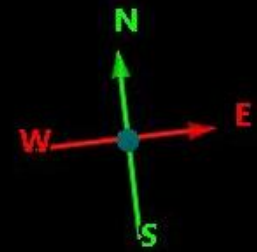
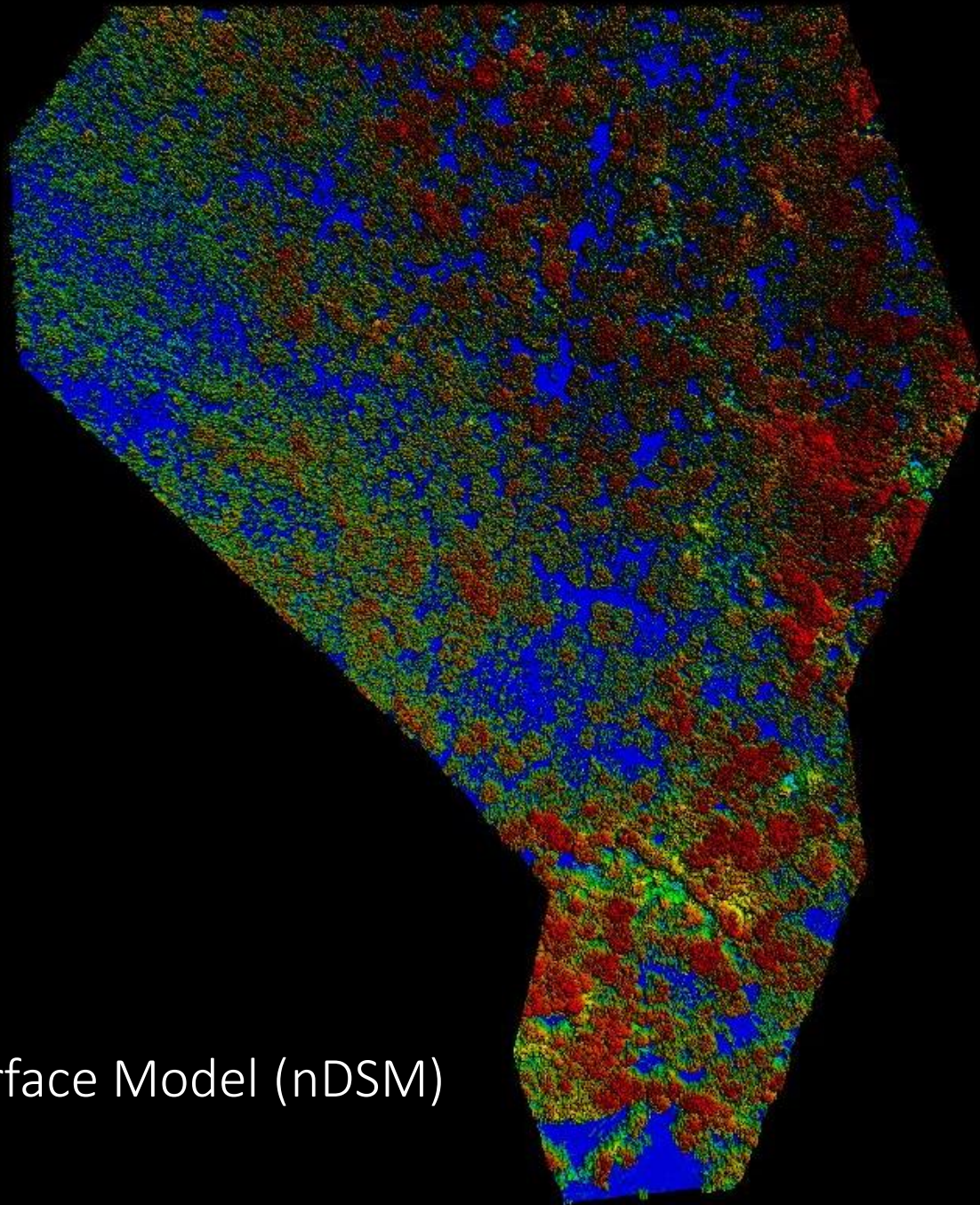


Classification
0
2

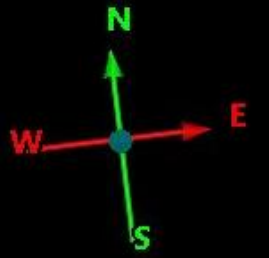
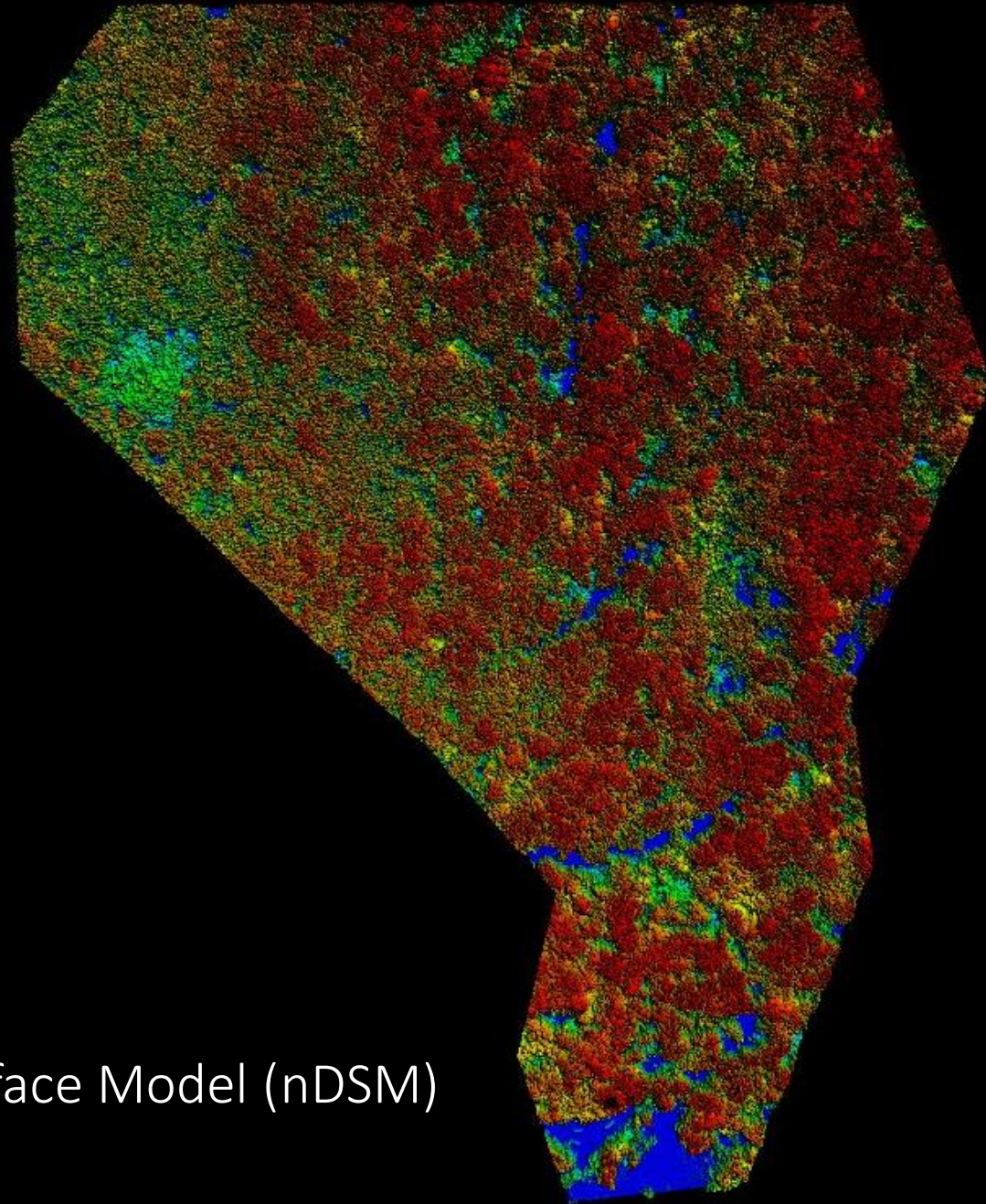
Classified Point Cloud
Red: Above ground
Green: Ground



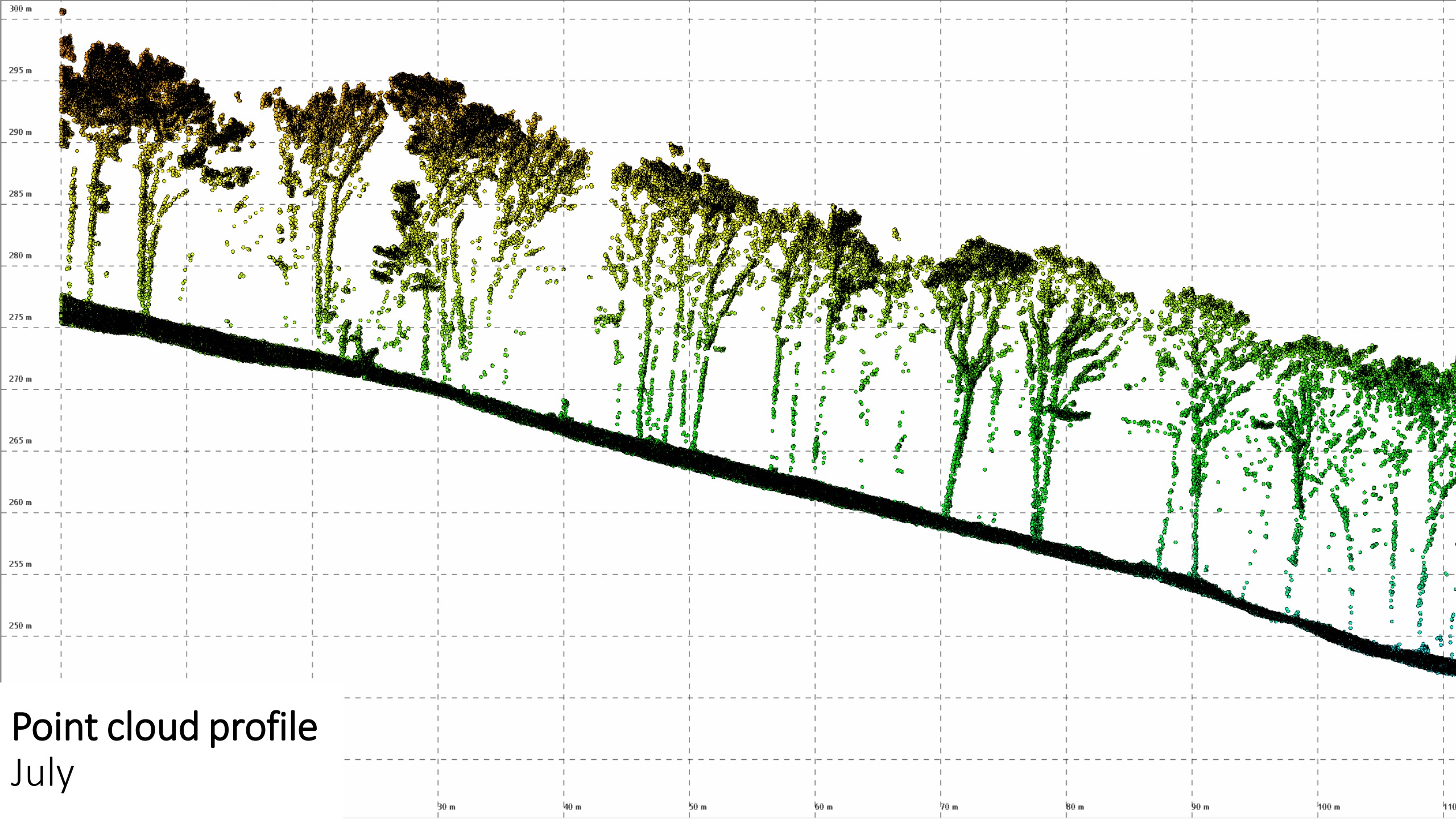
Digital Elevation Model (DEM)
July



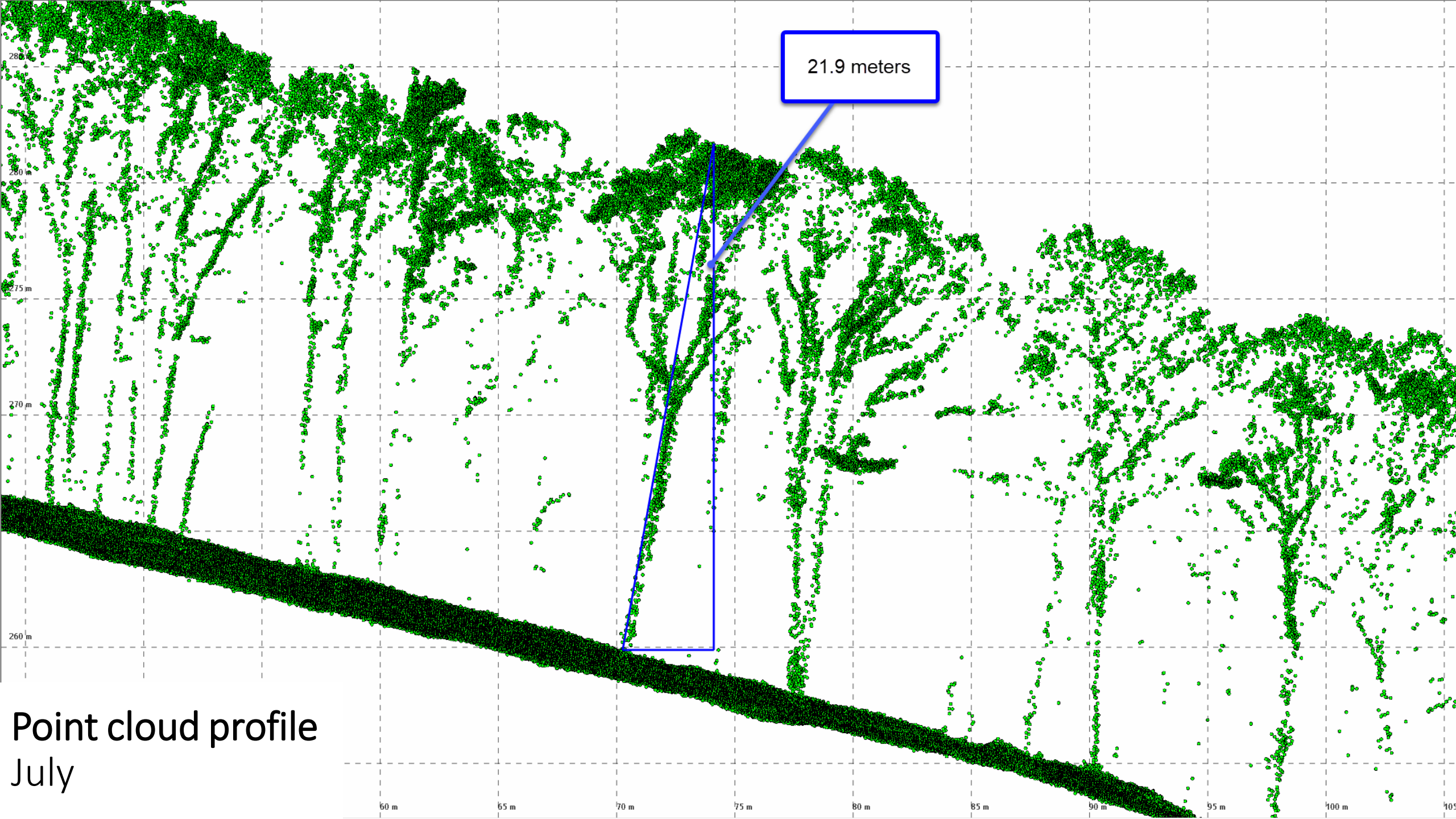
Normalized Digital Surface Model (nDSM)
July



Normalized Digital Surface Model (nDSM)
August

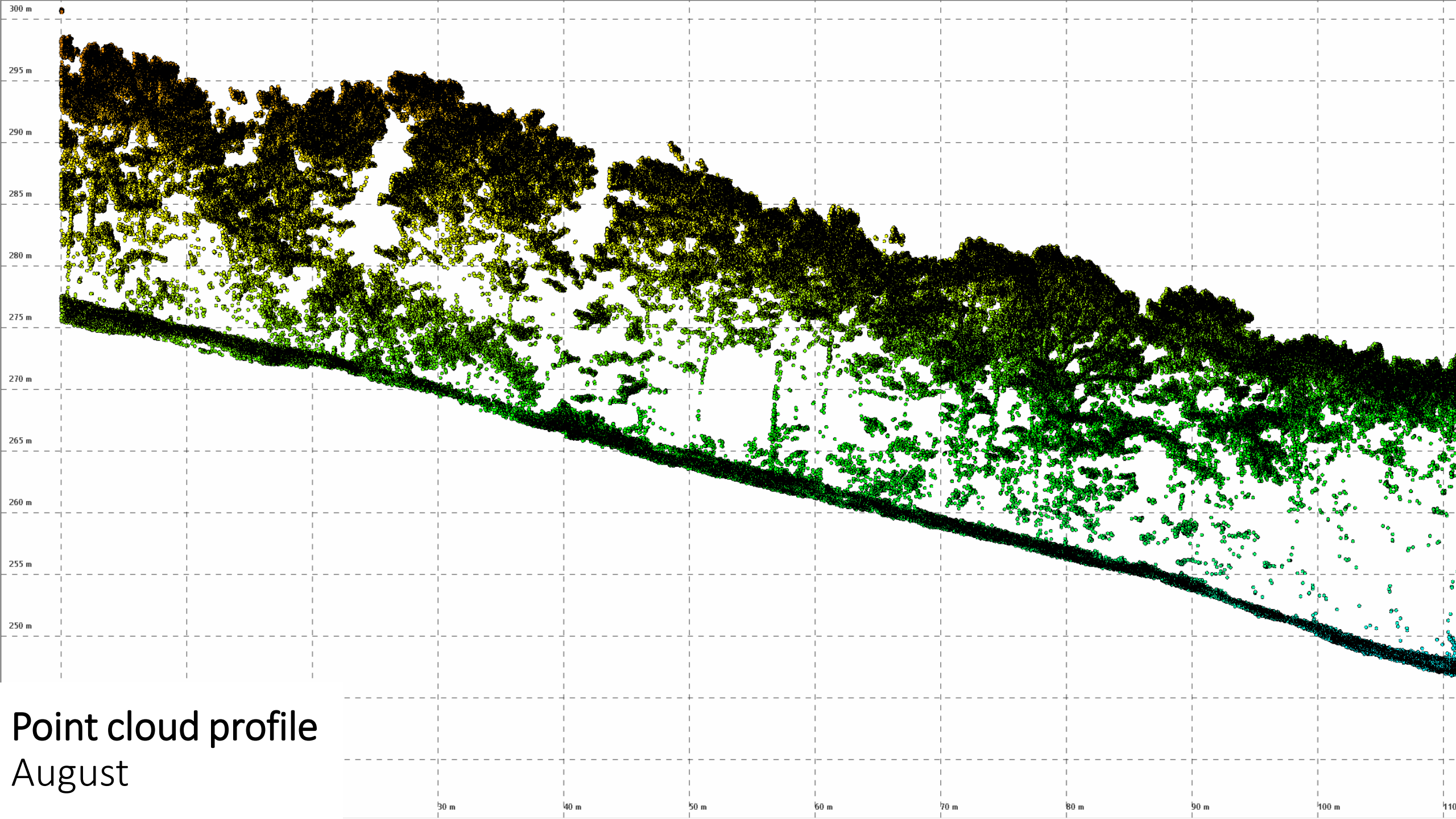


Point cloud profile
July

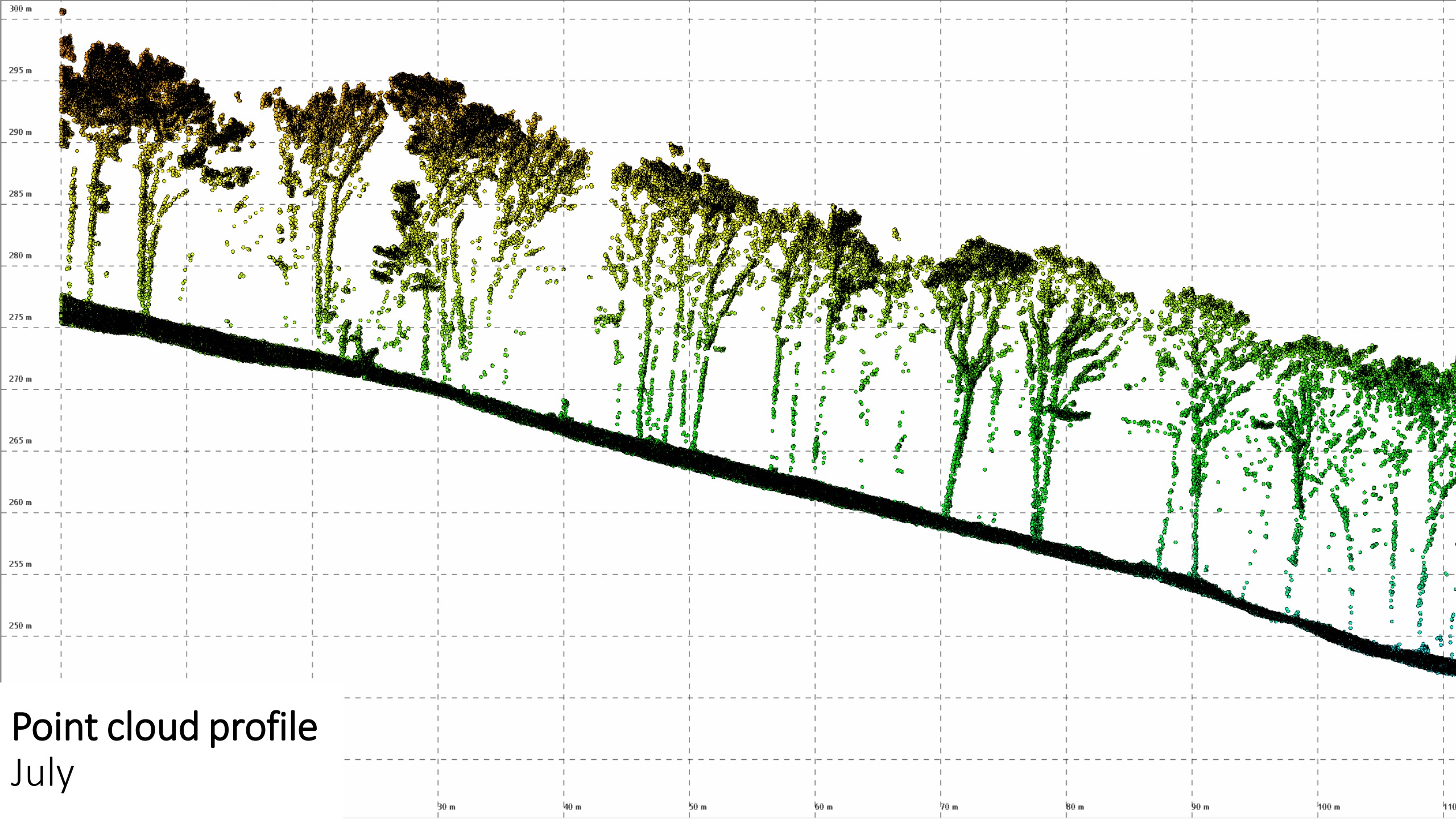


21.9 meters

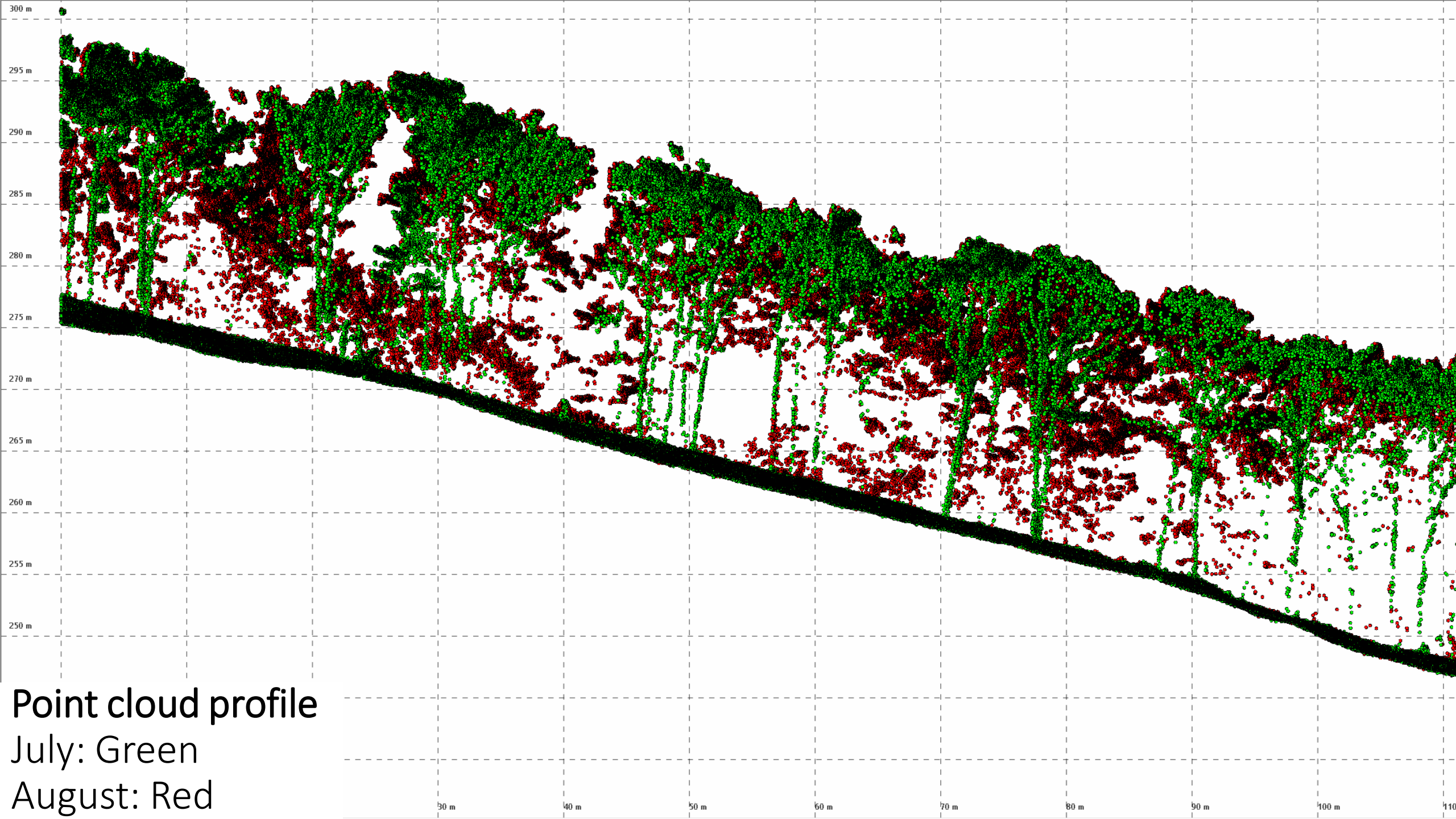
Point cloud profile
July



Point cloud profile
August



Point cloud profile
July



Web map

<https://go.uvm.edu/ouwl7>



Web scene (3D)

<https://go.uvm.edu/vyb3a>





Our special thanks to the shareholders of the Little Hogback Community Forest!

REFERENCES

Gladders, D. (n.d.). *Lymantria dispar egg mass*. University of New Hampshire. Retrieved December 9, 2021, from <https://extension.unh.edu/resource/gypsy-moth-fact-sheet>.

Liebhold, A. M., Halverson, J. A., & Elmes, G. A. (1992). Gypsy moth invasion in North America: A quantitative analysis. *Journal of Biogeography*, 19(5), 513-520. <https://login.ezproxy.uvm.edu/login?url=https://www.proquest.com/scholarly-journals/gypsy-moth-invasion-north-america-quantitative/docview/16417956/se-2?accountid=14679>

Rosovsky, J. (2021, June 7). *Gypsy Moths are Making a Comeback in Vermont. Why?*. Agency of Agriculture, Food and Markets. Retrieved December 1, 2021, from <https://agriculture.vermont.gov/agency-agriculture-food-markets-news/gypsy-moths-are-making-comeback-vermont-why>