

Applications of UAVs in the Forestry Industry



INTERPINE

Bringing innovation to the forest industry



Eye in the Sky



Equipment Inspections





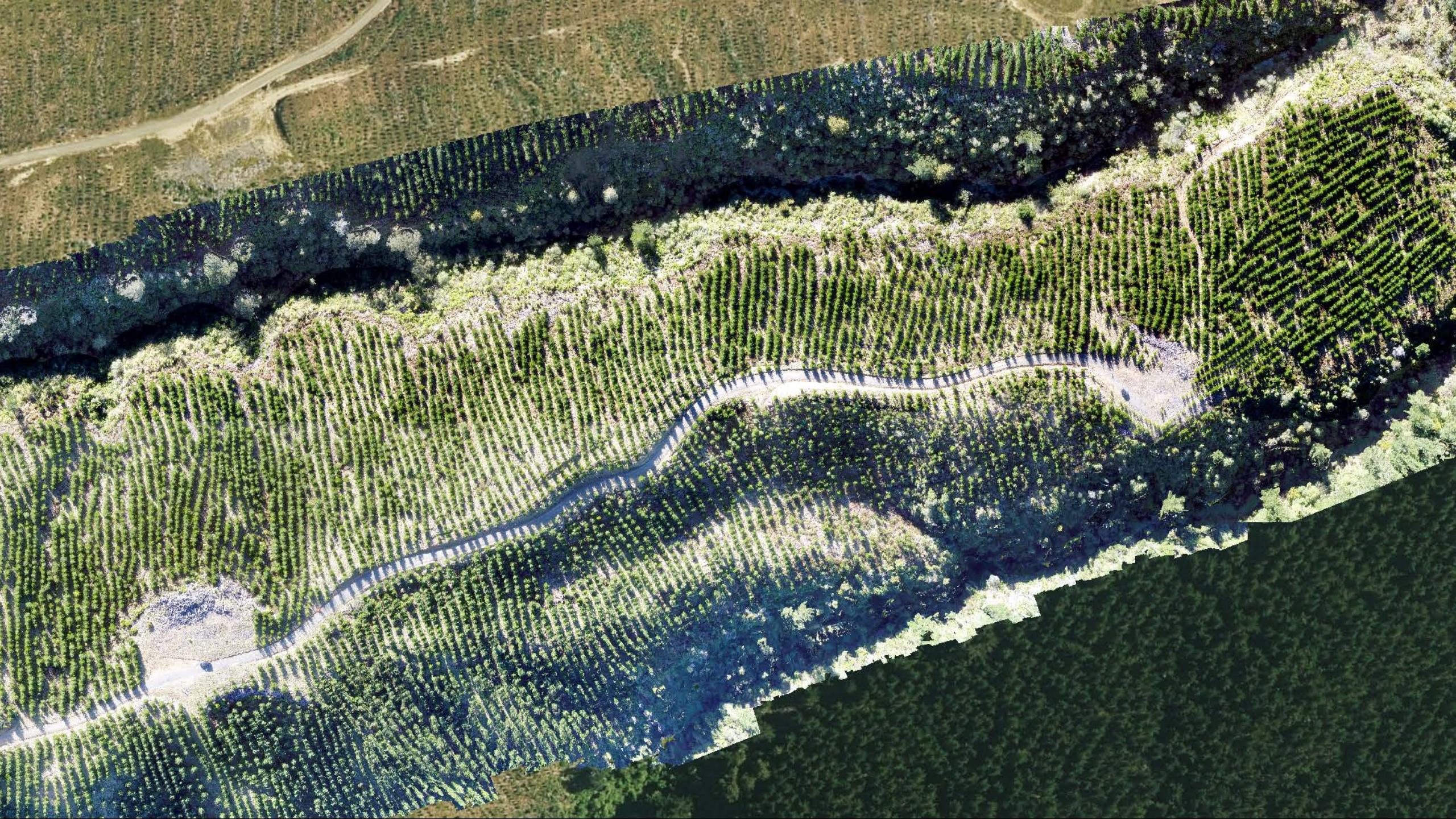
Waimana Forest - Port Blakely - Apr 27 2017 - North End

Unnamed Road, Waimana 3191, New Zealand



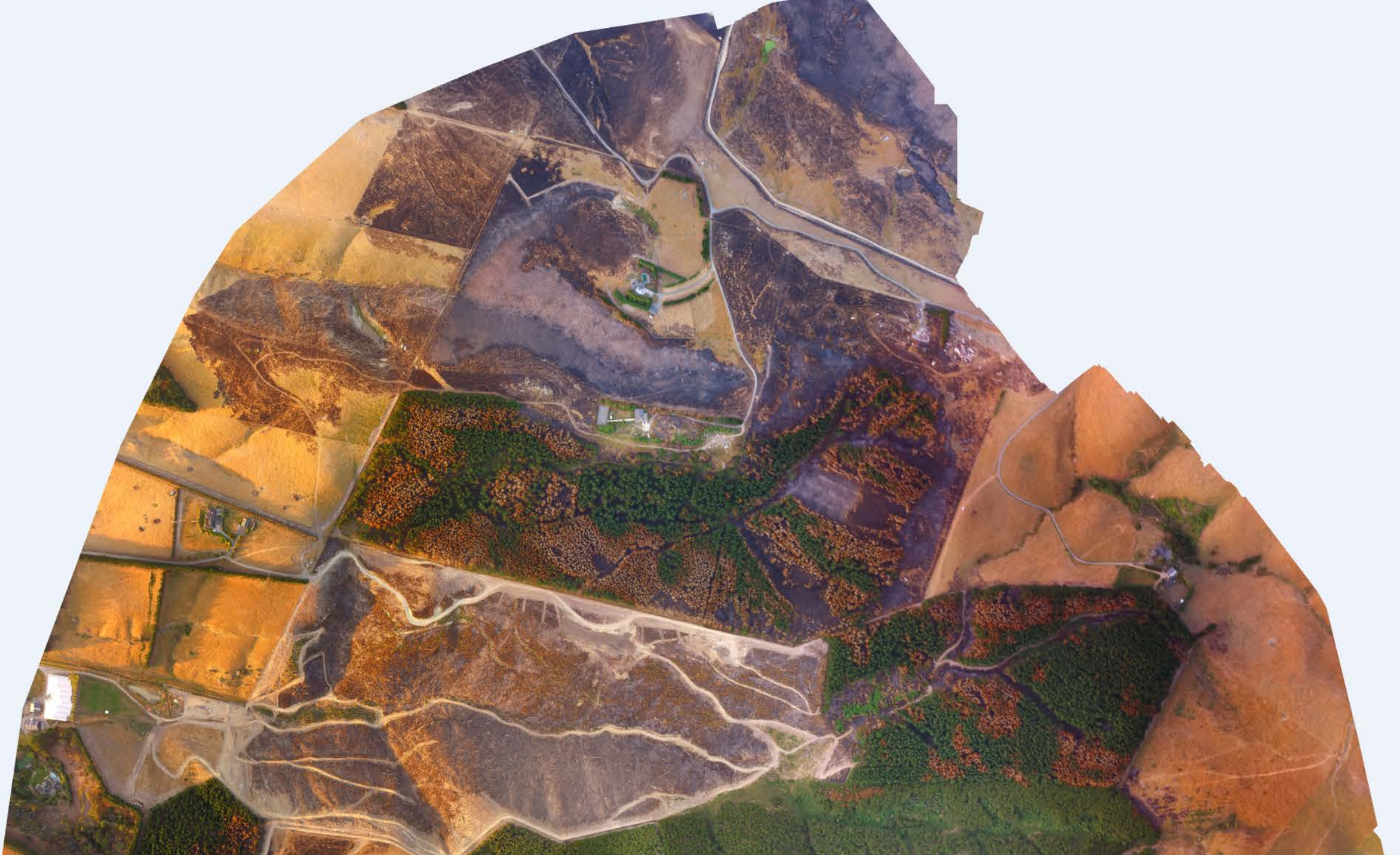
Regular Monitoring

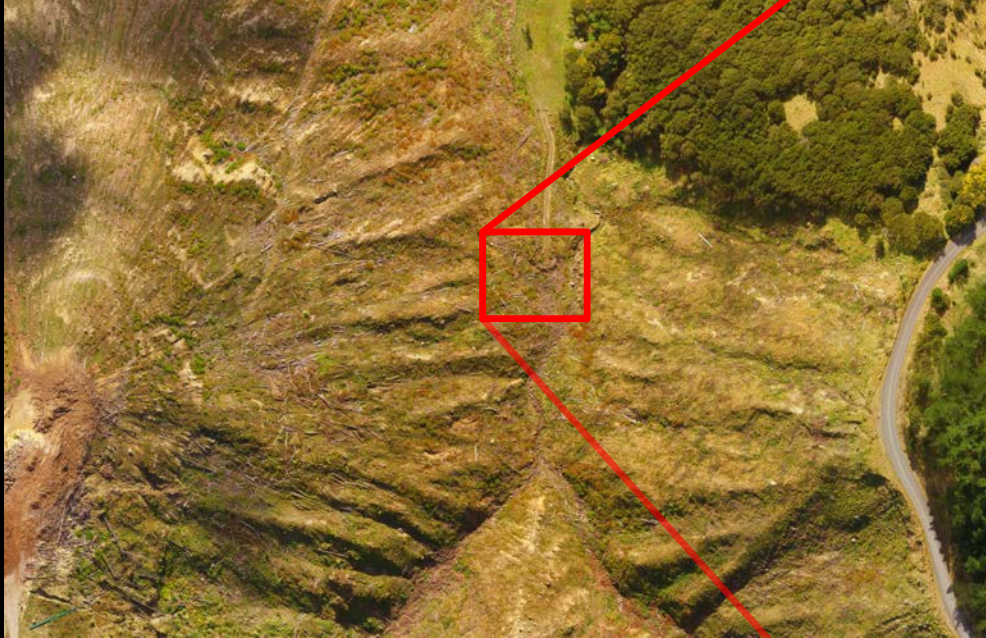




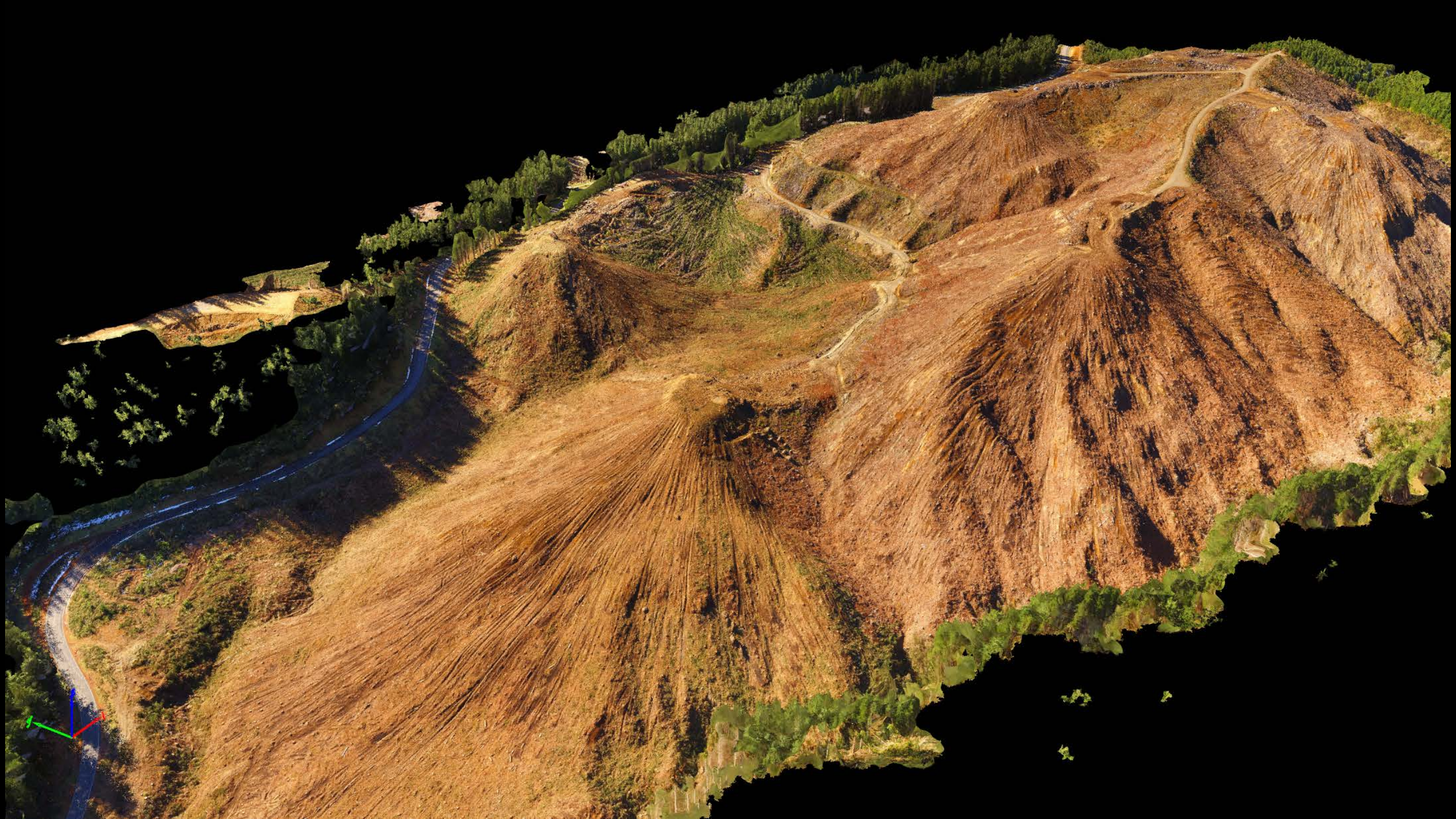


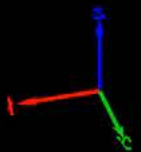
20m

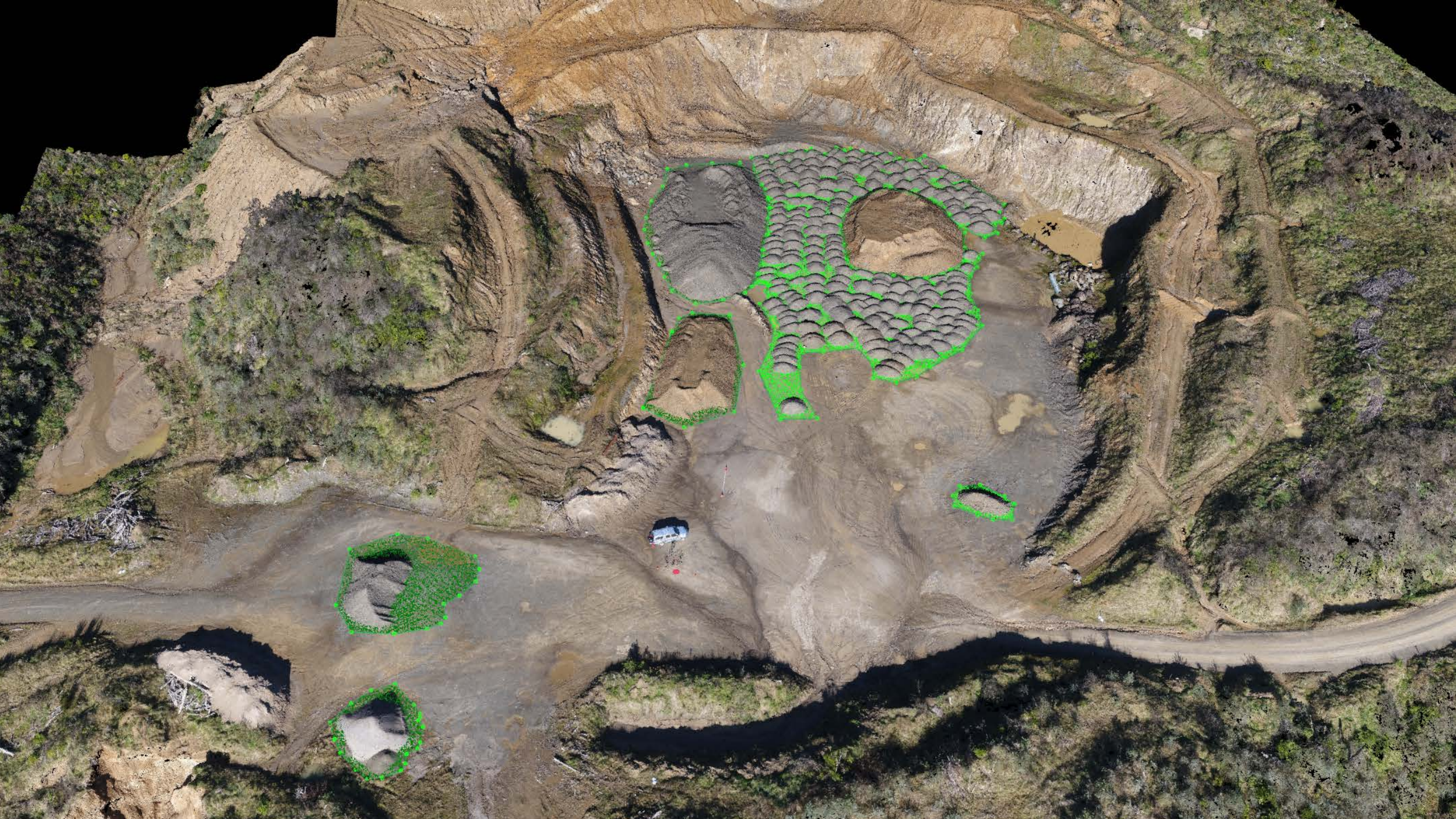






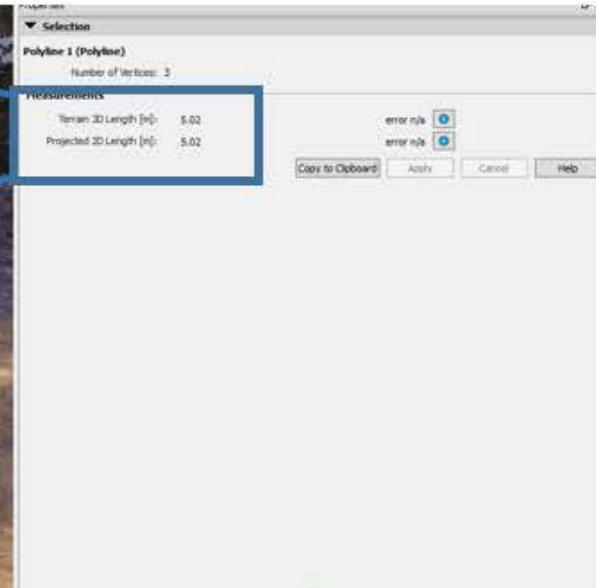


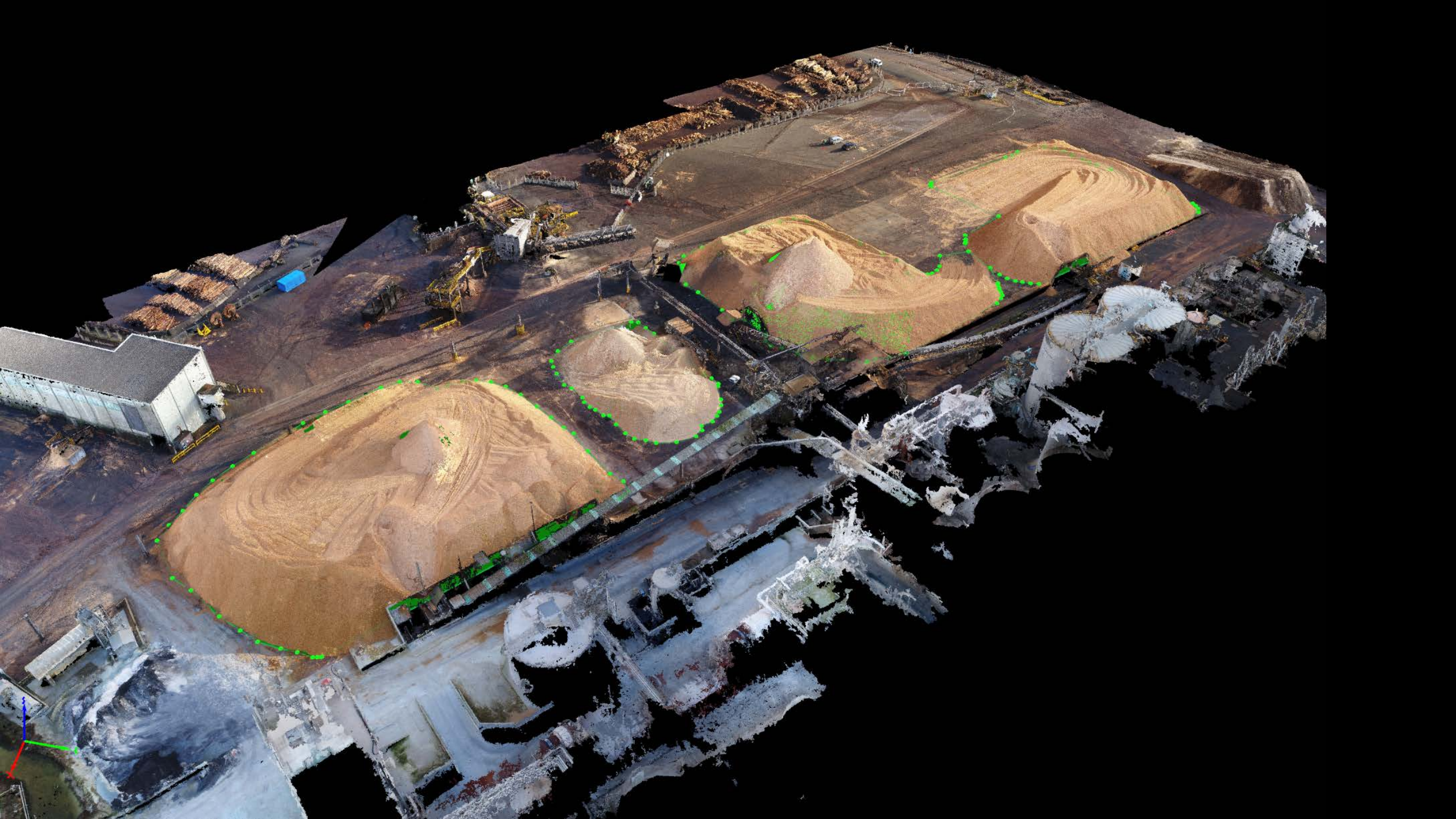




Measurements

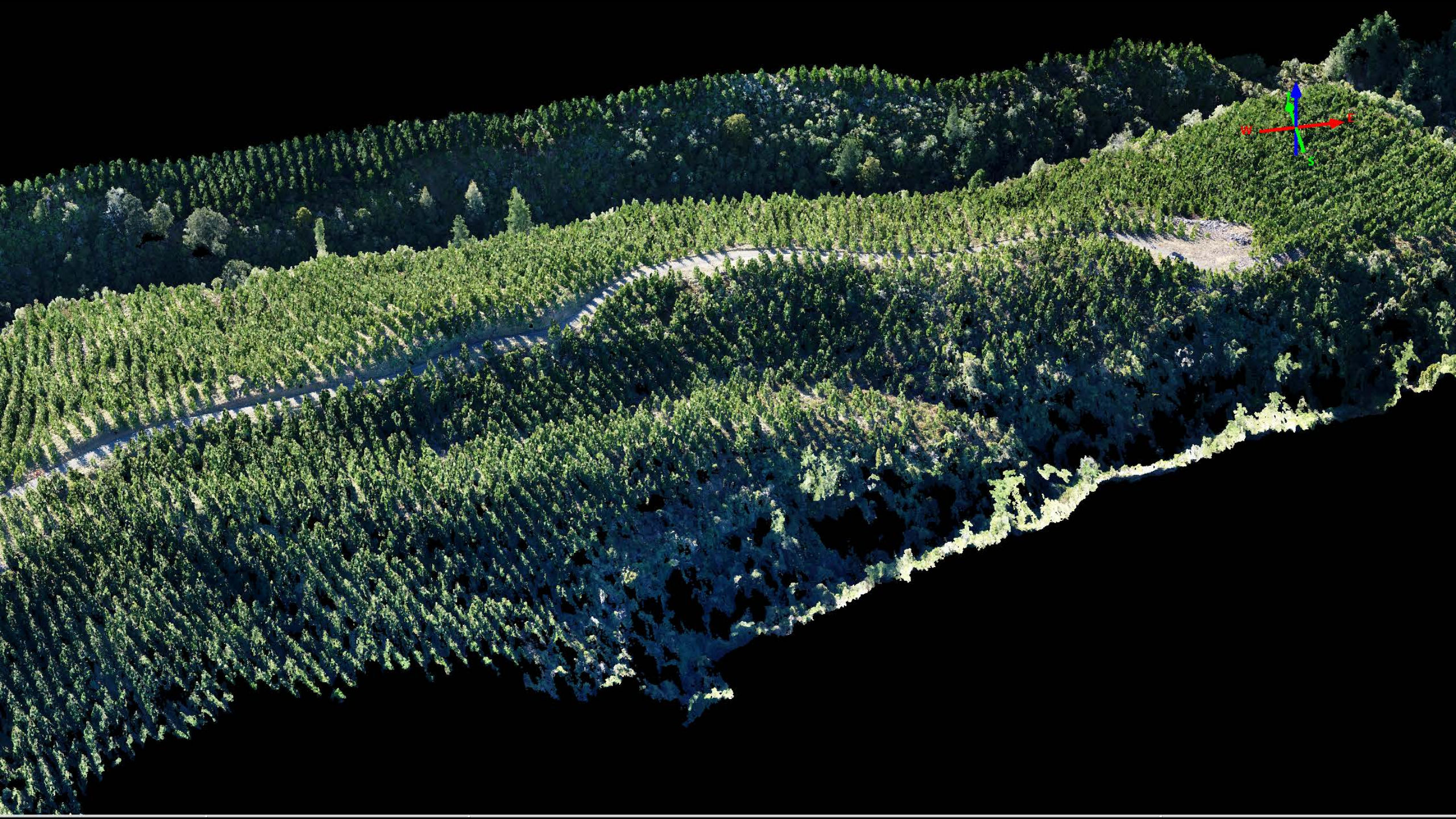
Terrain 3D Length [m]: 5.02
Projected 2D Length [m]: 5.02



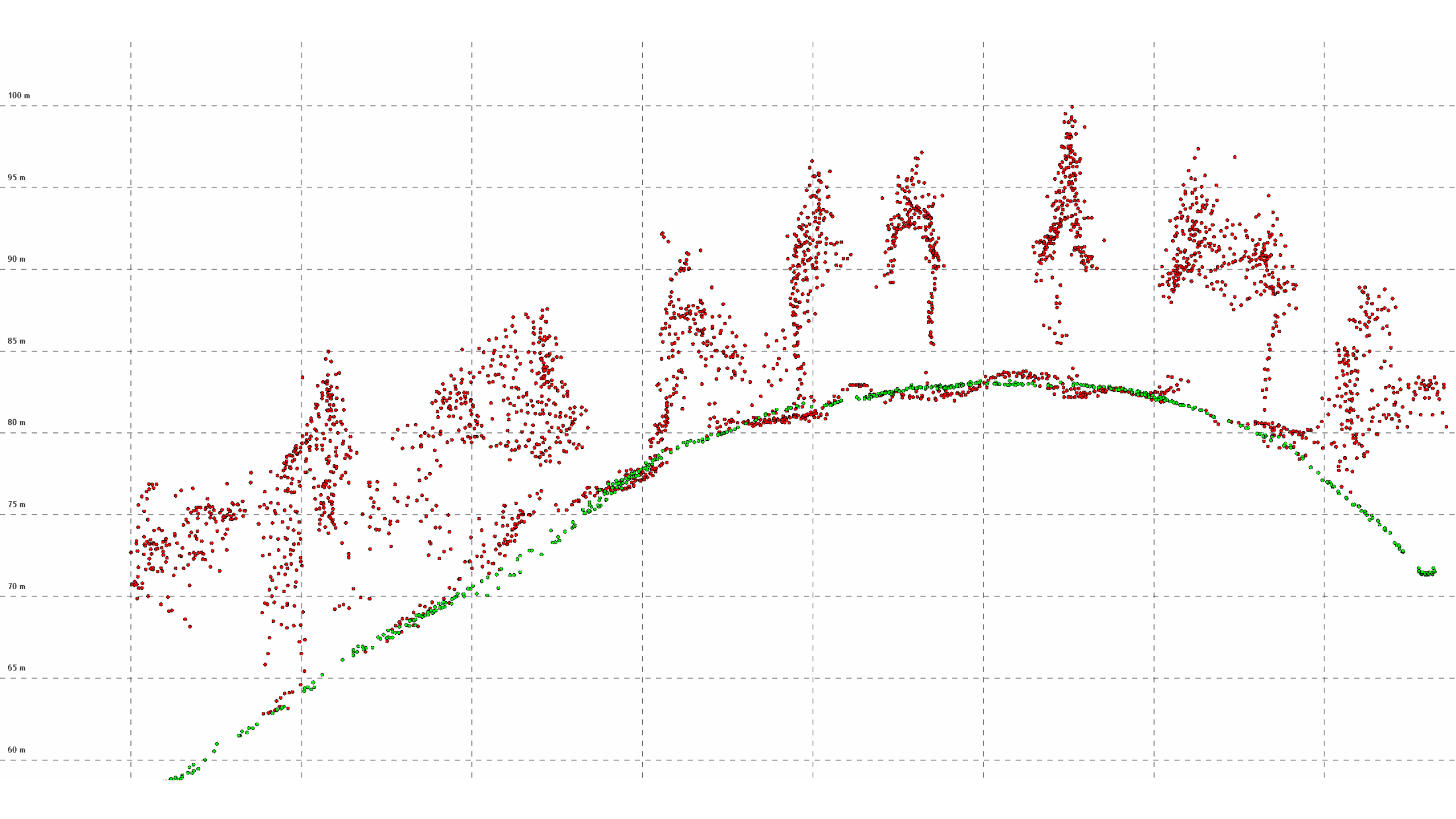


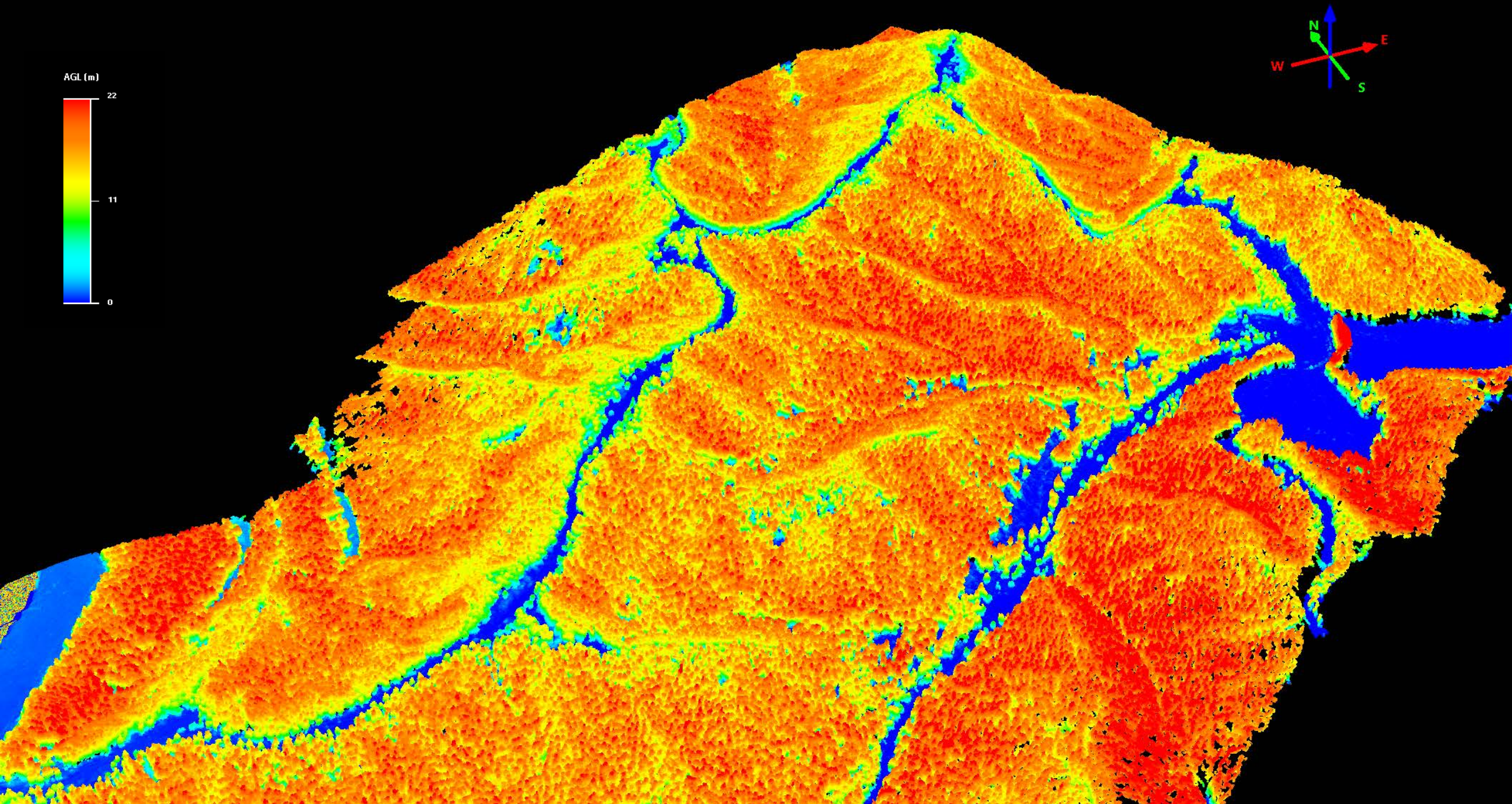


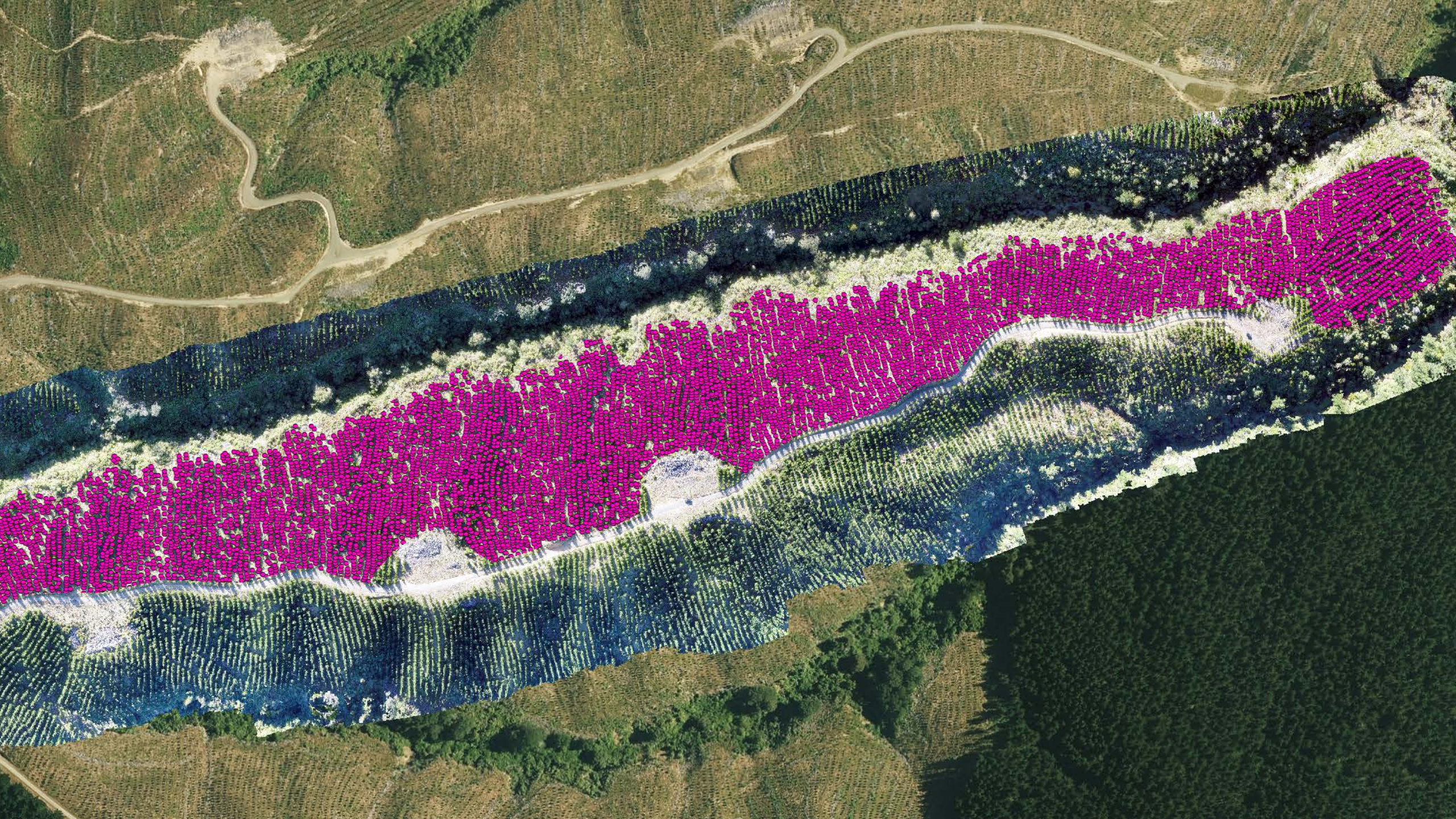
Slash Pile Volume 868m³

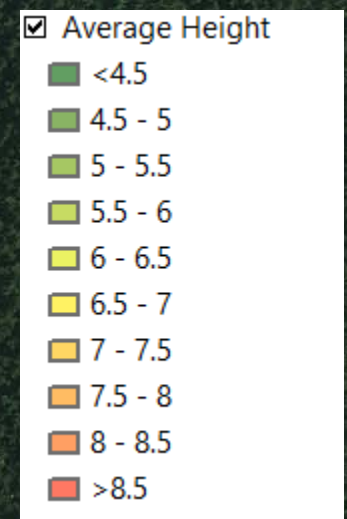
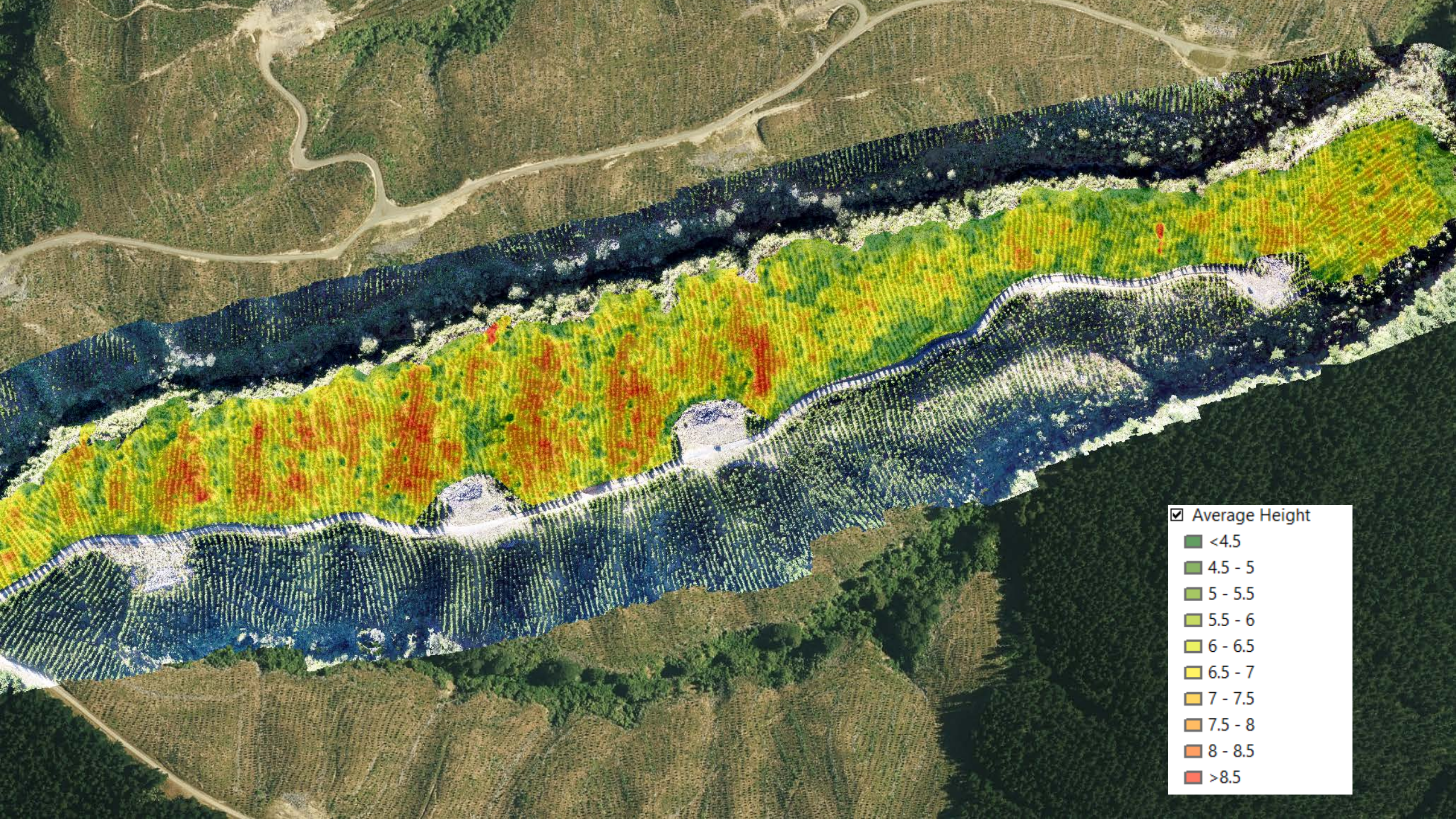


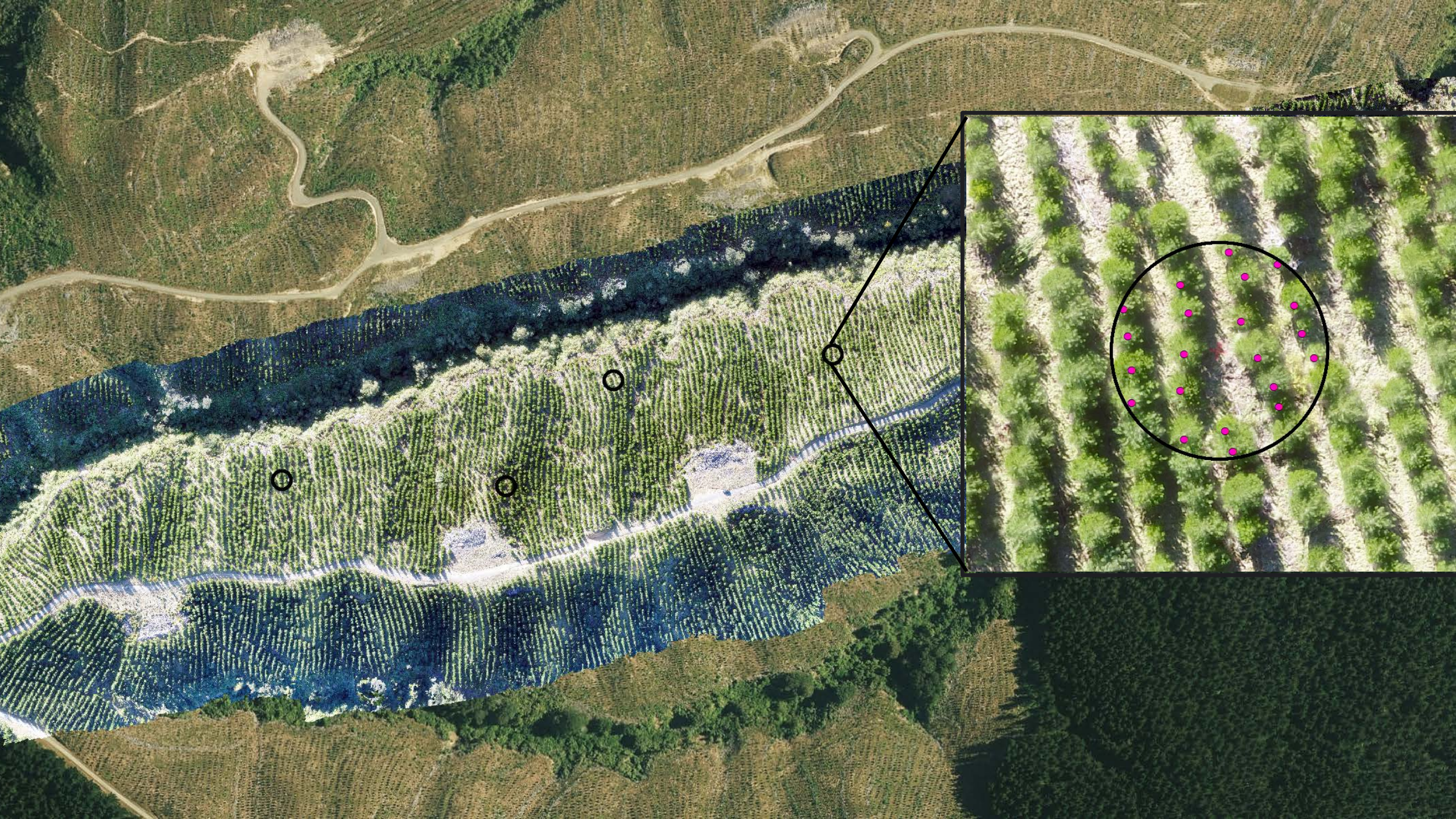
















Land Preparation QC

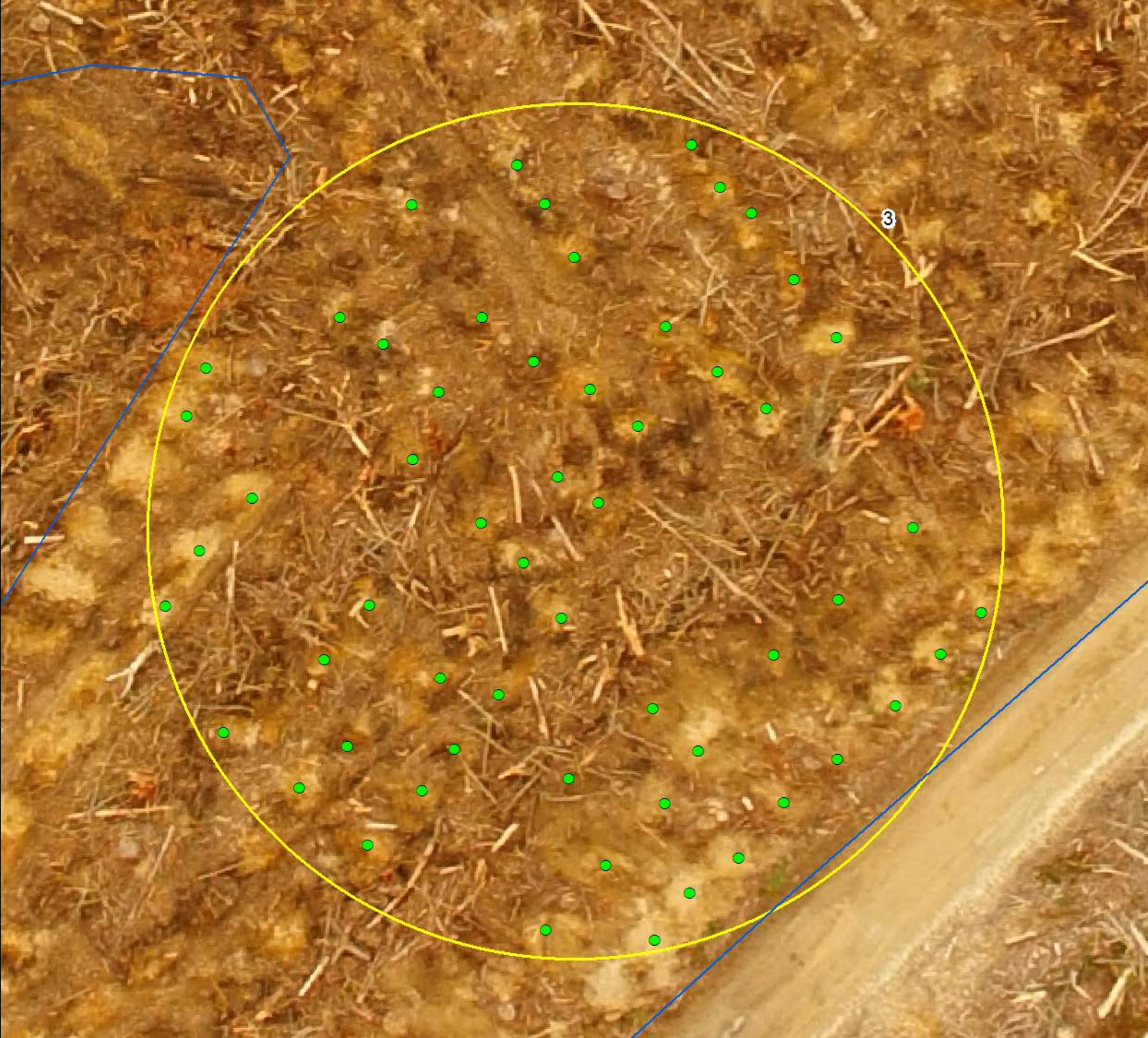




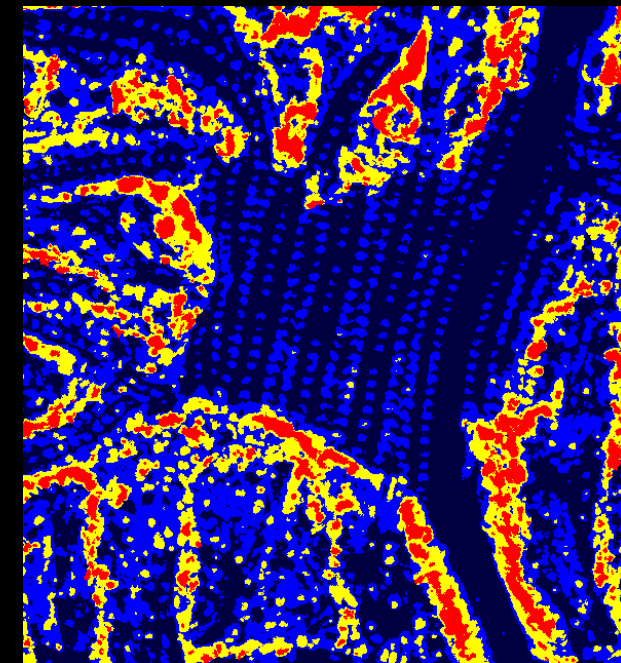
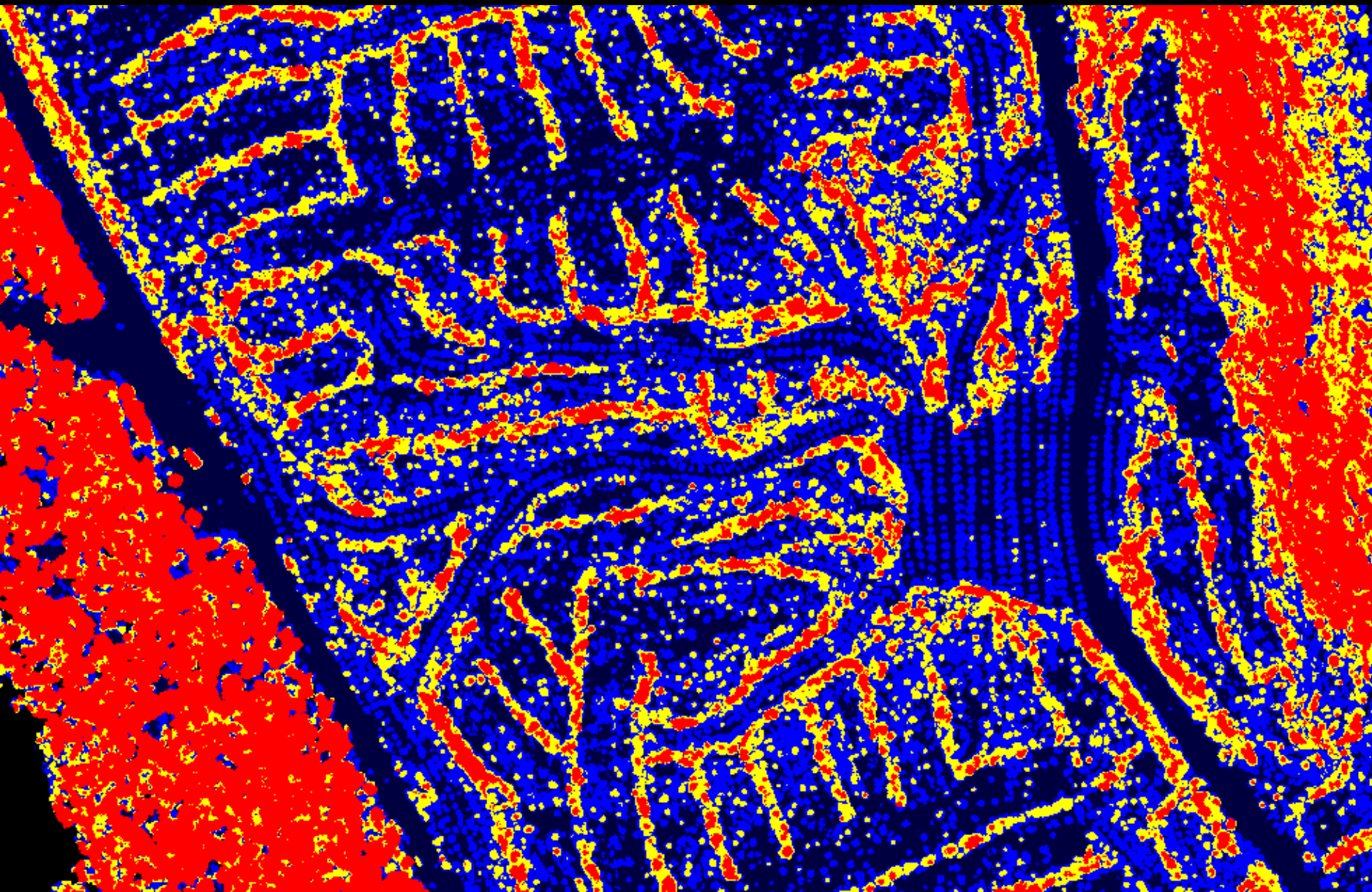




57 Spot Mounds



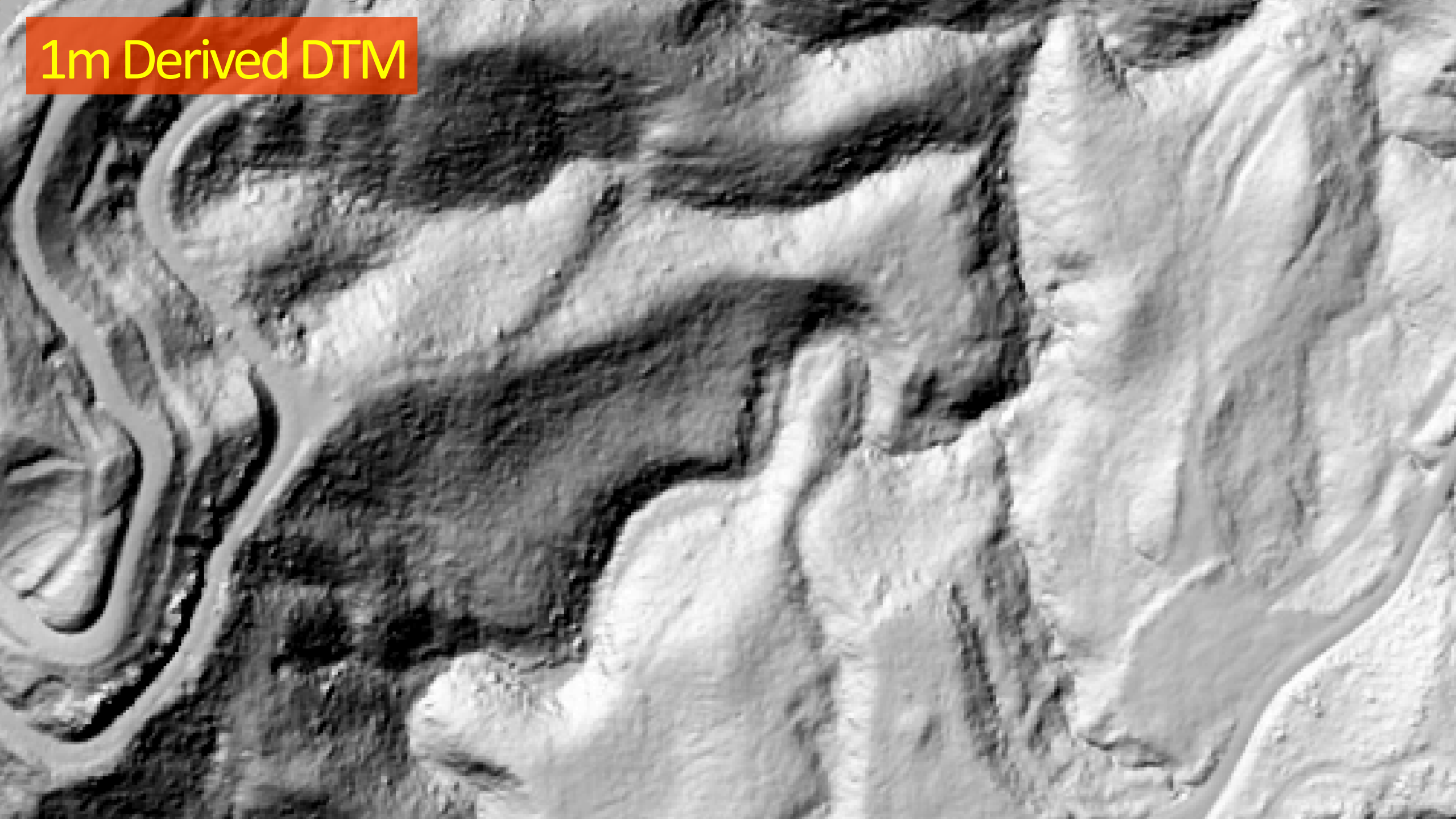
Point Cloud AGL Analysis

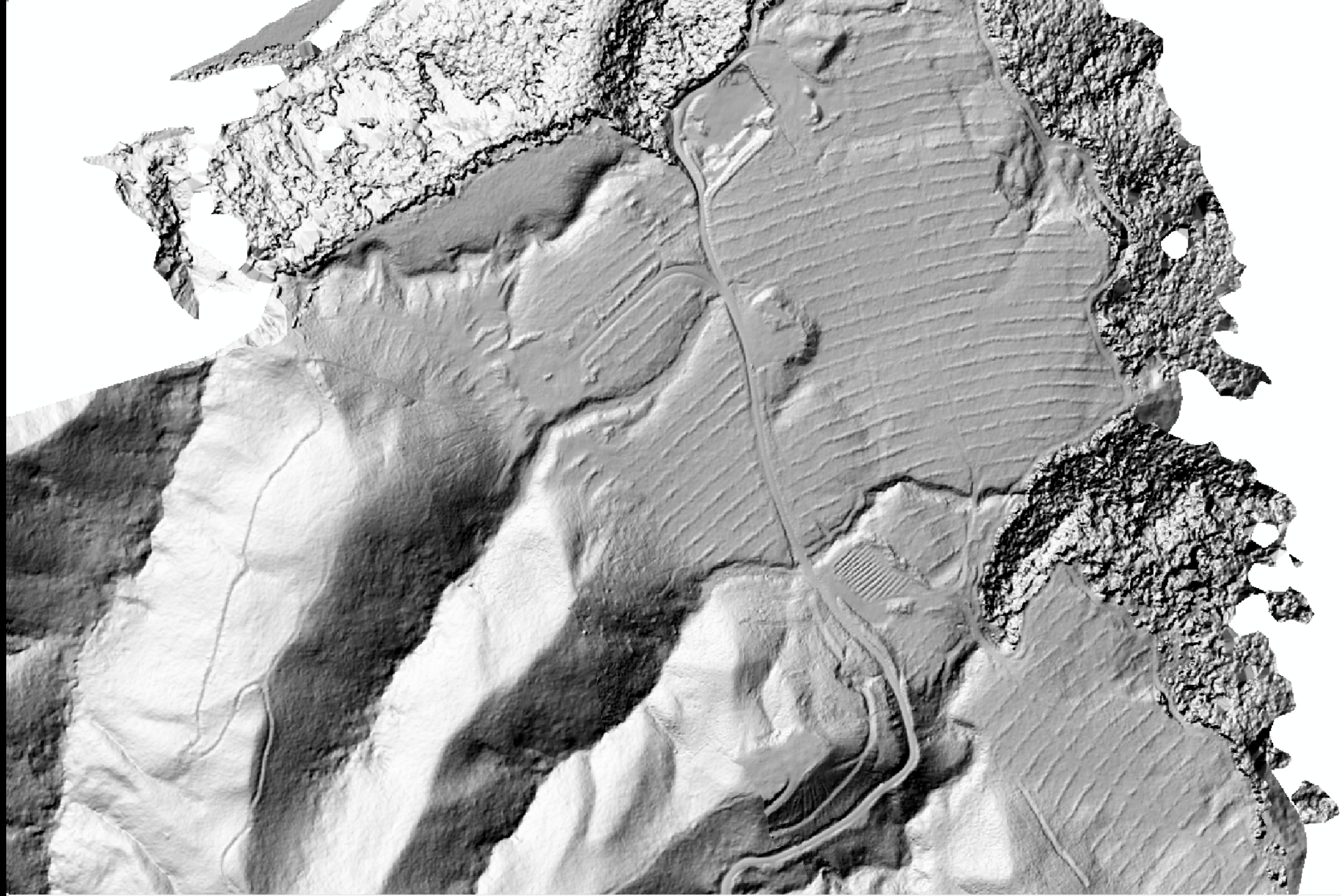


AGL Height (m)

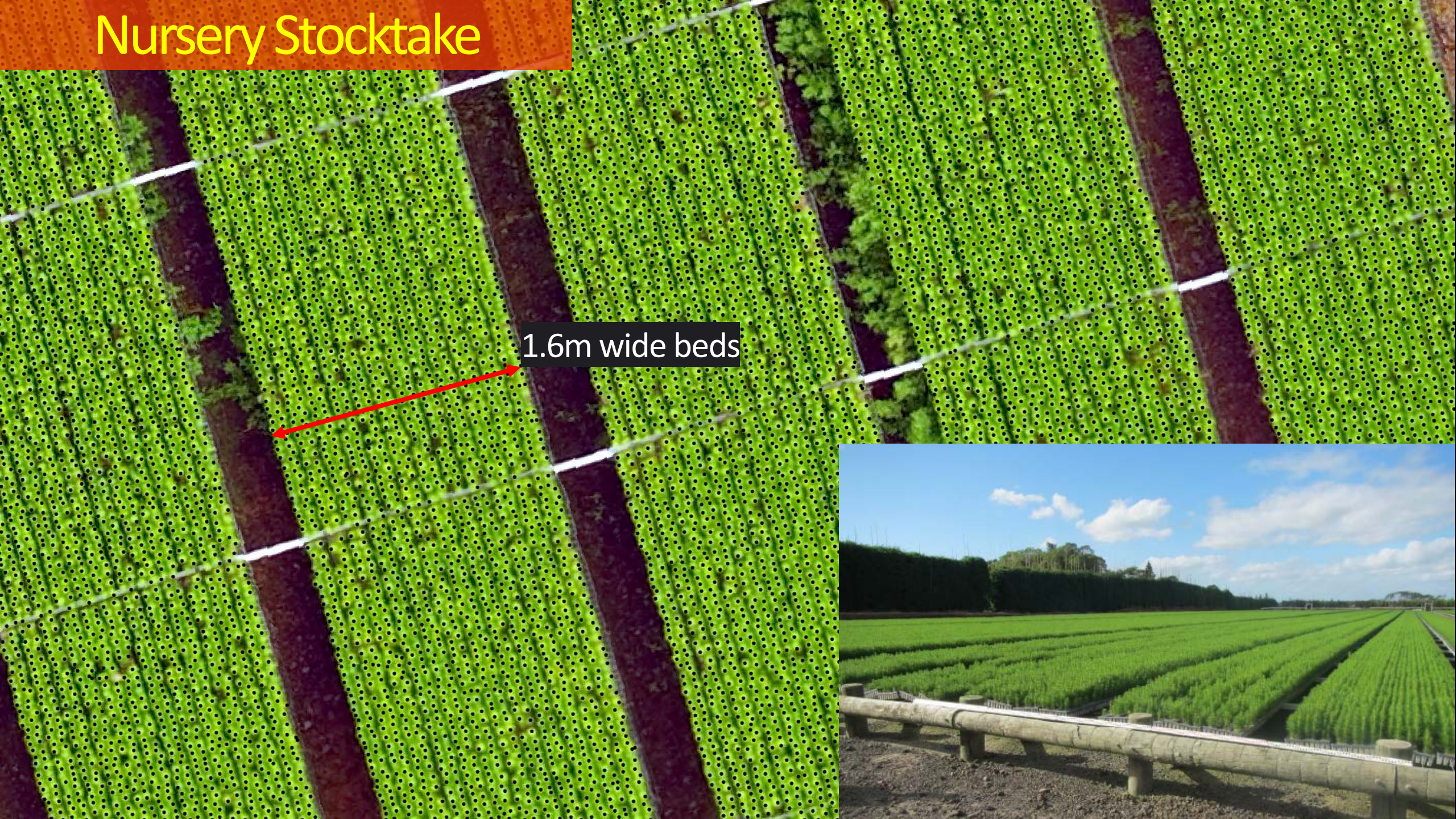


1m Derived DTM



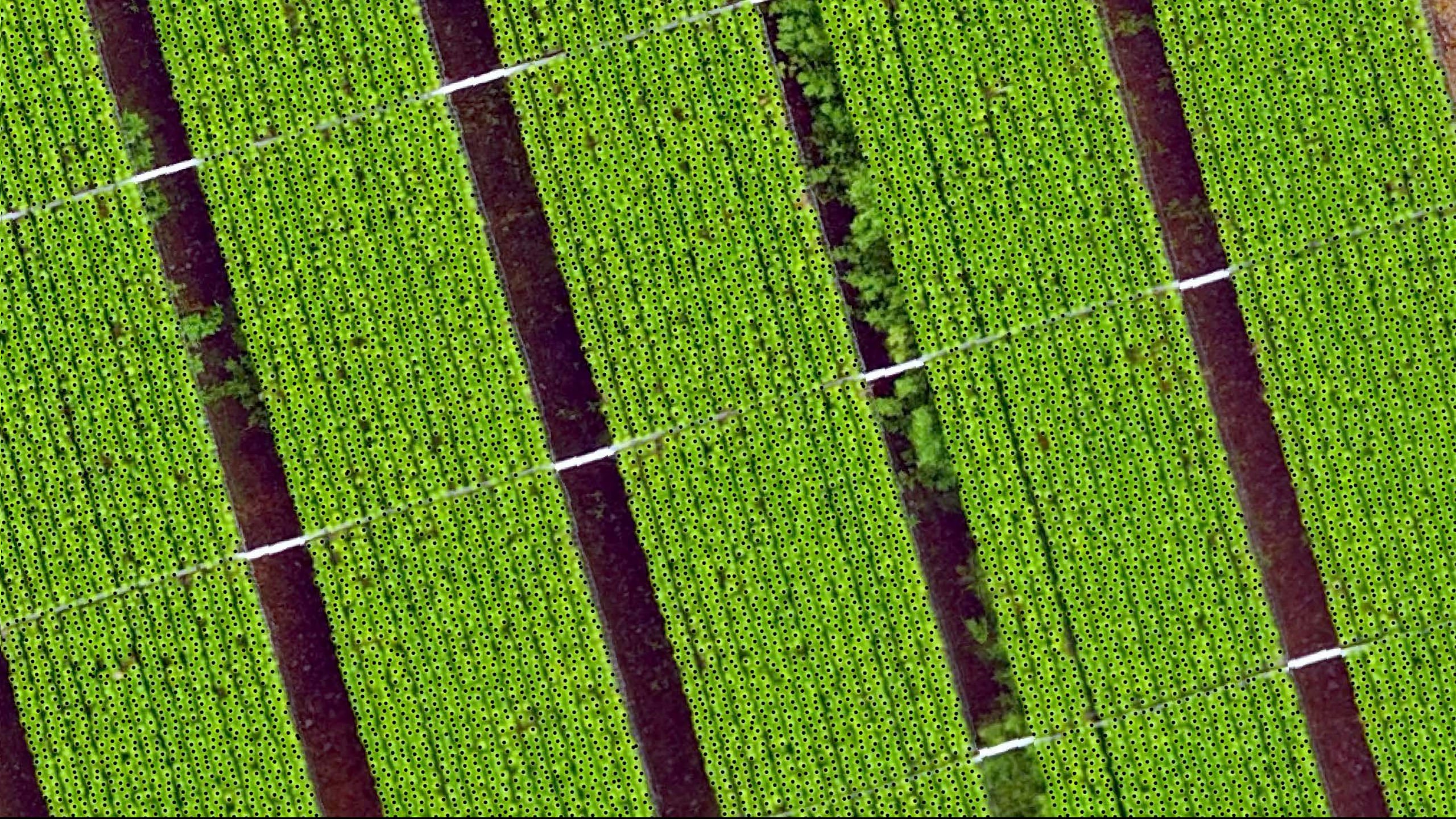


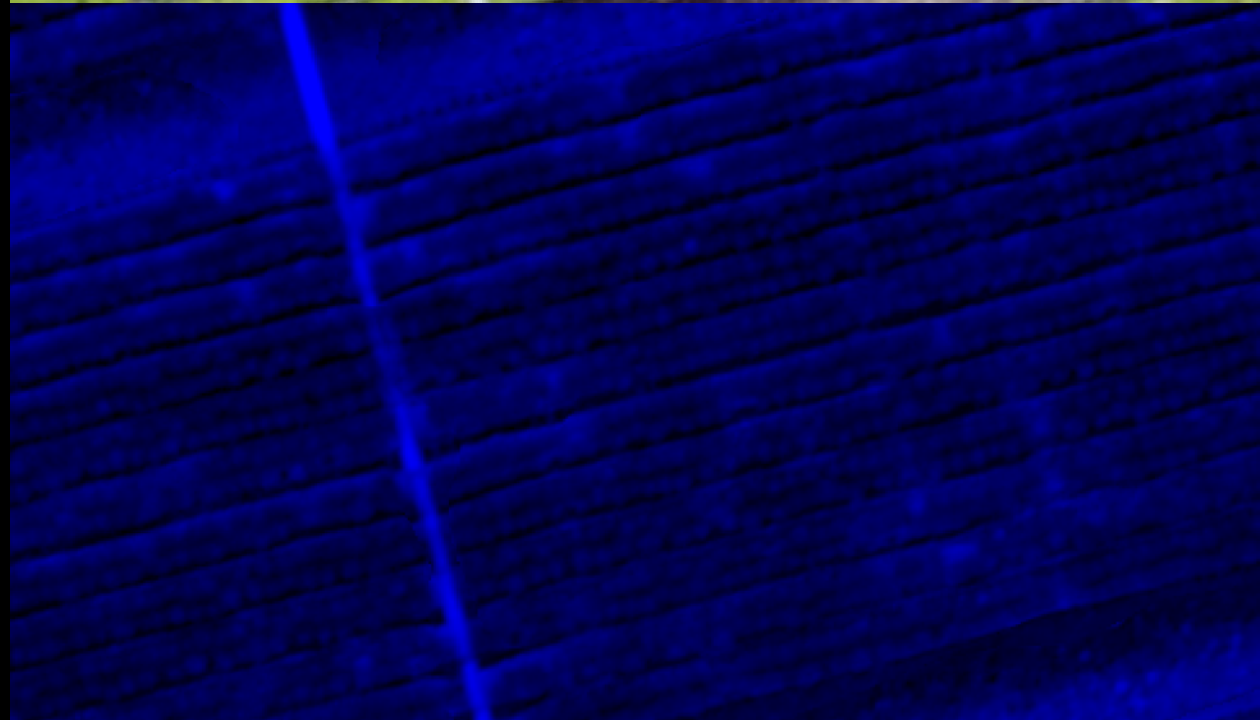
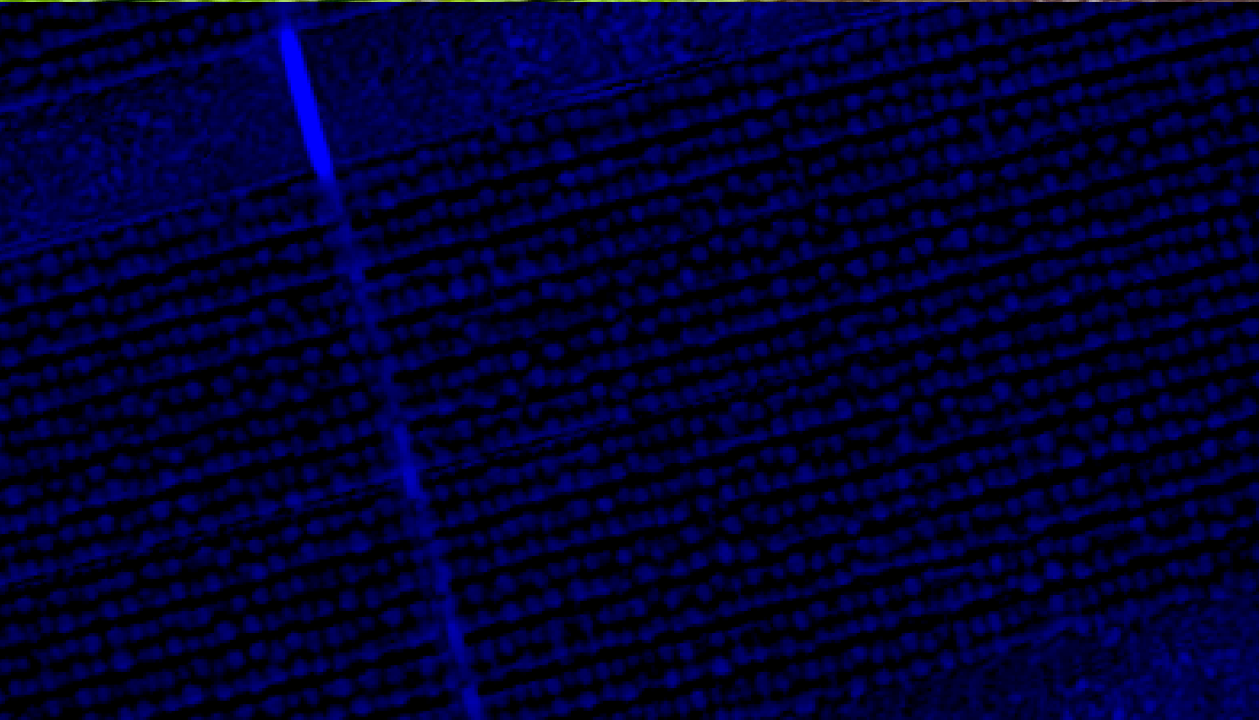
Nursery Stocktake



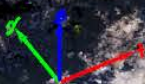
1.6m wide beds



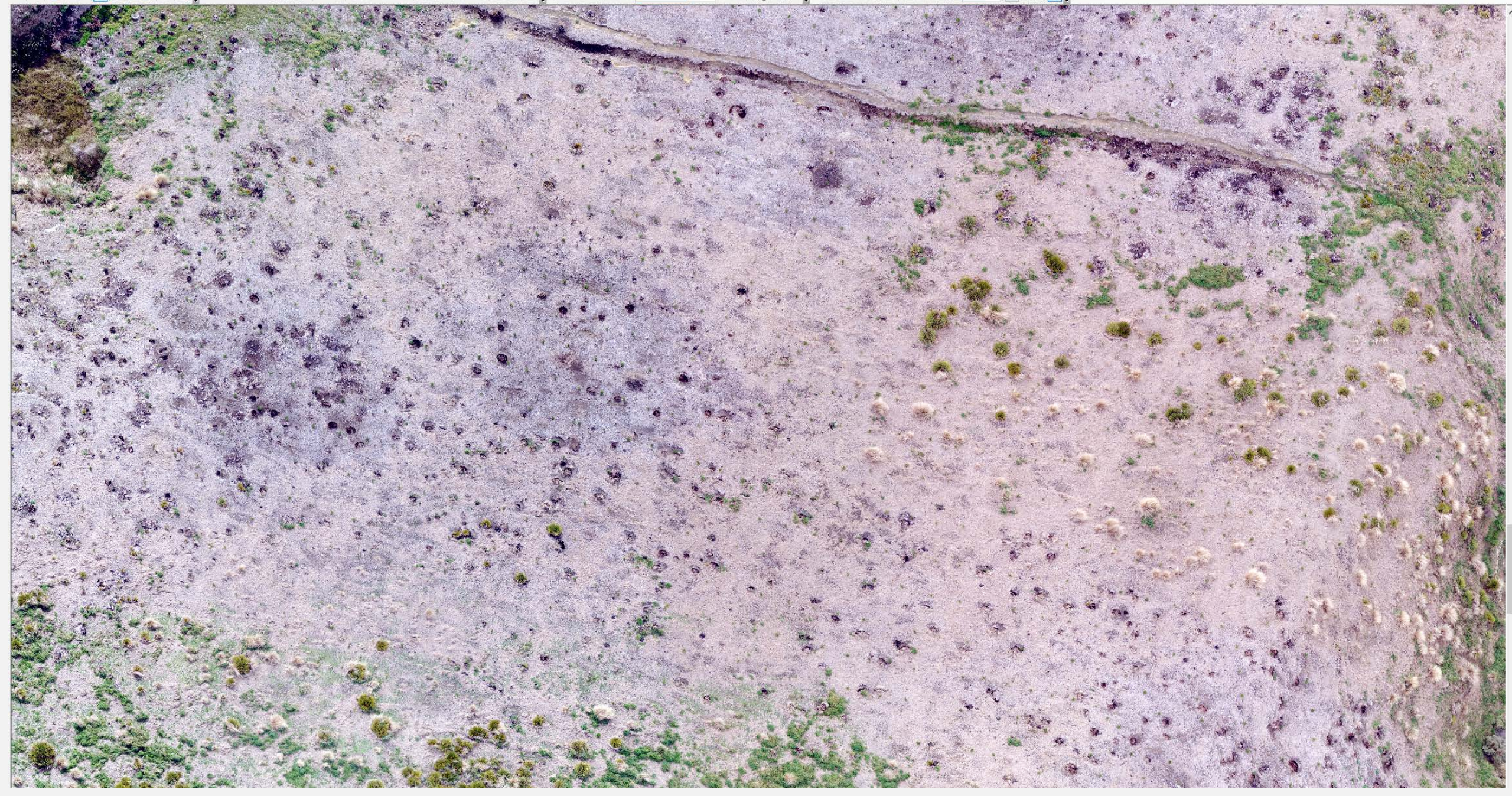


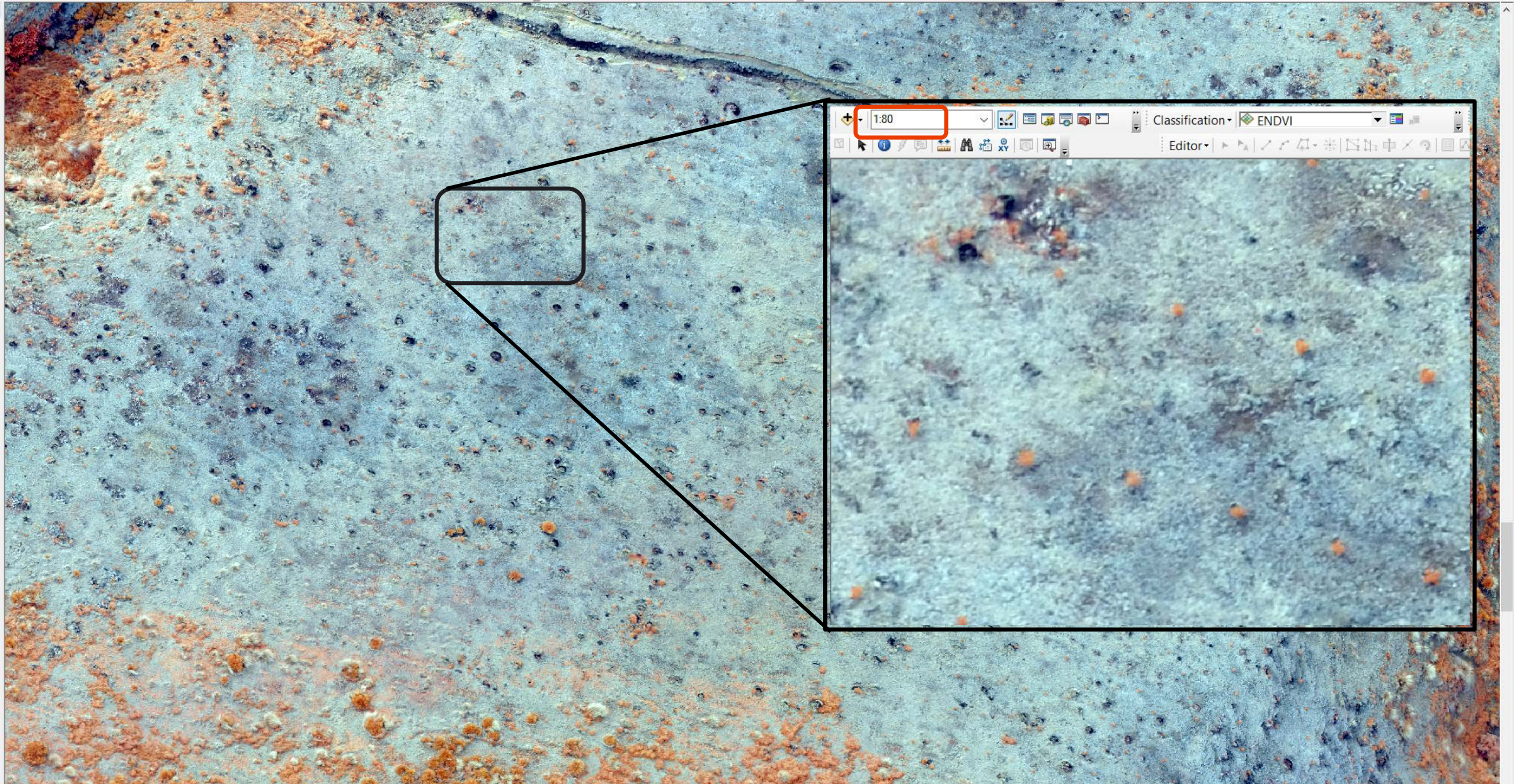


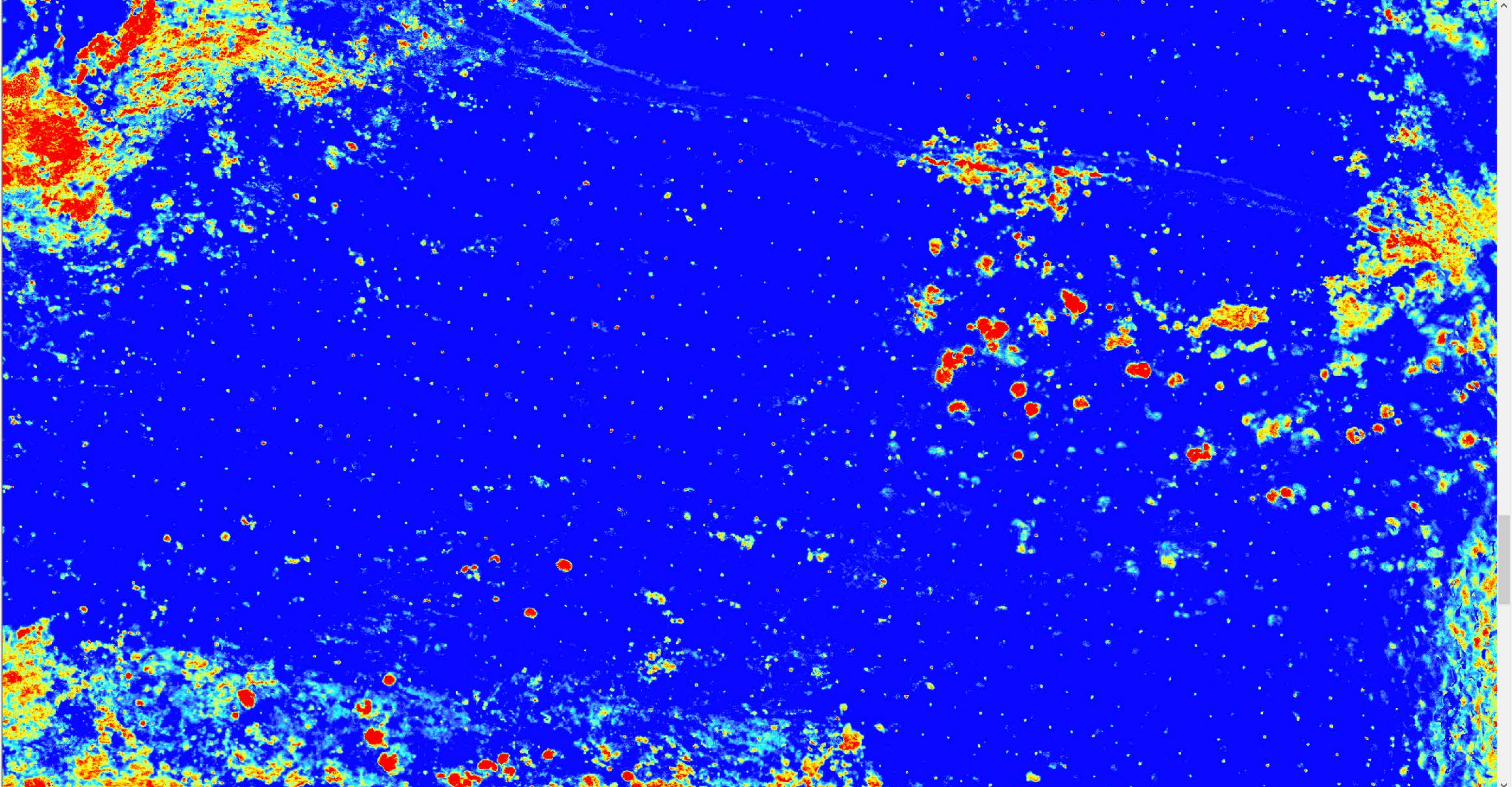
Planting QC

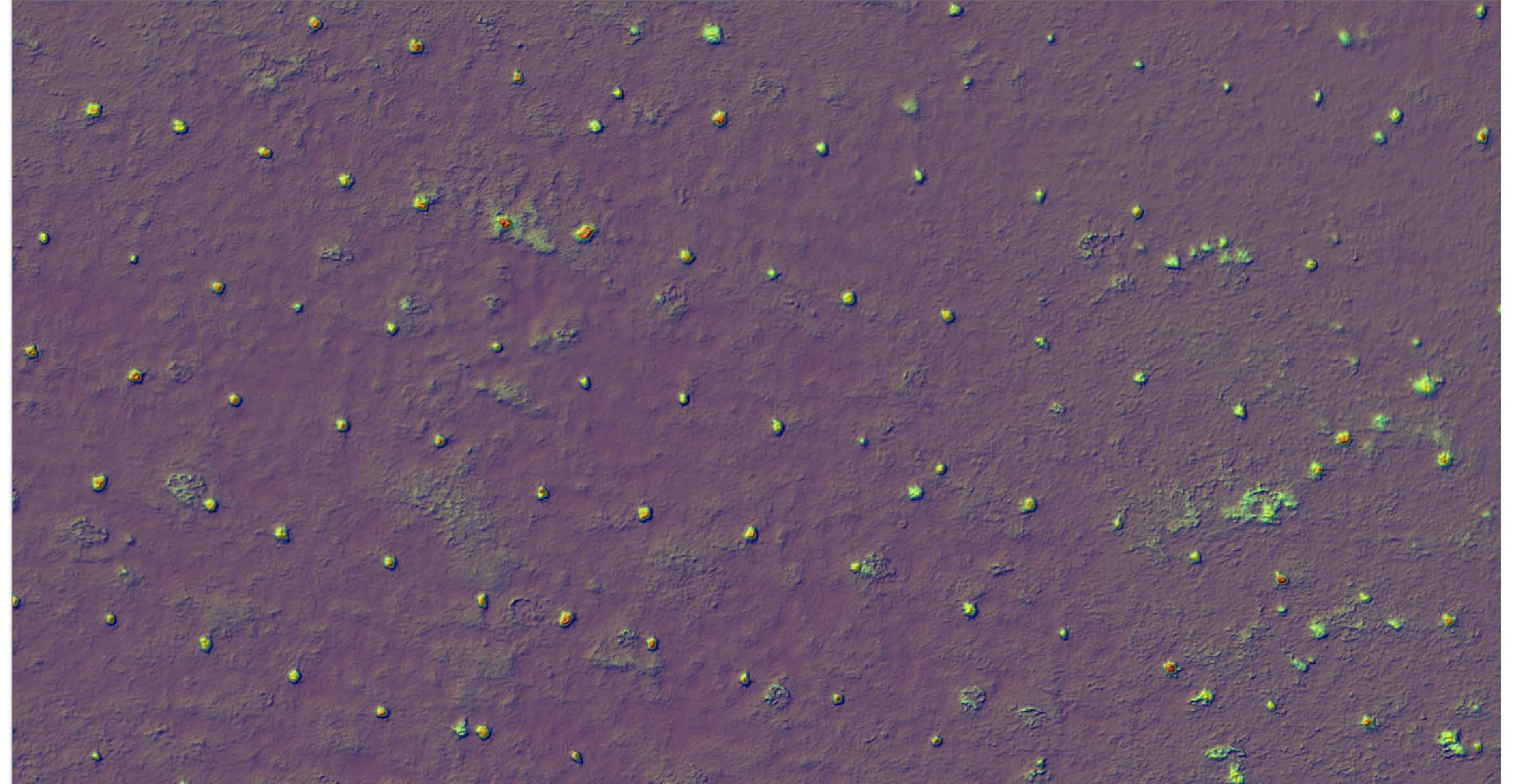


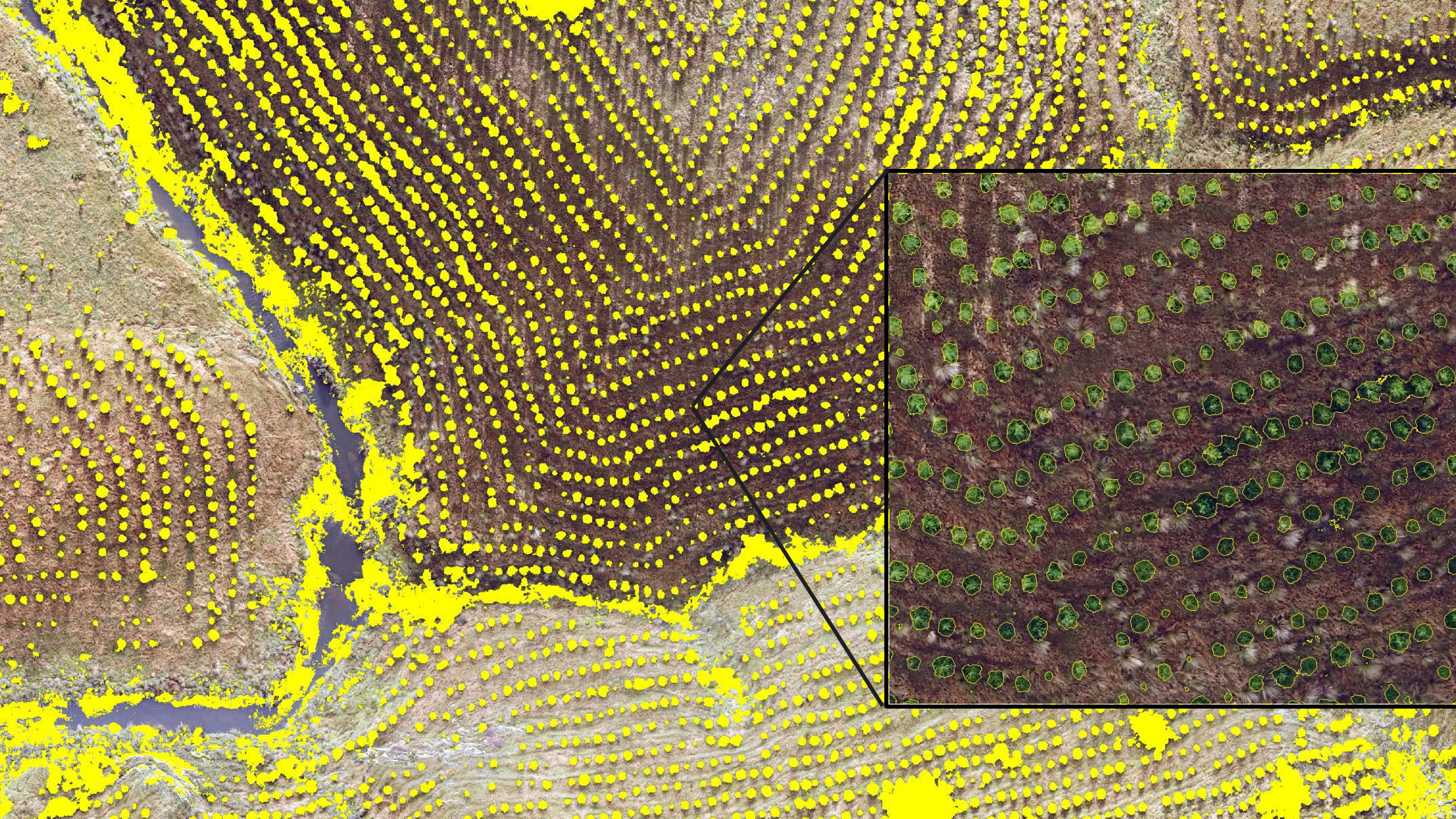












Plot	Slope	Radius	Tree Count	SPH	Comments
1	17	8.16	15	750	Small amount of grass
2	17	8.16	12	600	Gently slope small amount of grass
3	19	8.21	13	650	Medium weeds and grass
4	17	8.16	17	850	Just of skid track lots of slash but pretty clean a couple of browsed trees in plot
5	18	8.18	16	800	Good looking plot small amount of weeds
6	12	8.07	16	800	Very clean bit of grass
7	21	8.26	17	850	Clean plot
8	13	8.08	12	600	just of skid track thick grass
9	22	8.29	8	400	Thick grass very low stocked
10	26	8.42	8	400	Very low stocking
11	14	8.1	10	500	Trees 10 very low stocked are
12	23	8.32	17	850	Good looking plot small amount of weeds
13	17	8.16	15	750	Grassy area
14	17	8.16	15	750	Bit of slash and grass in plot trees look healthy
15	18	8.18	16	800	Bit of slash from pile above plot but healthy trees
16	15	8.12	14	700	Just below hauler skid clan just a small amount of weeds trees look healthy
17	26	8.42	10	500	Heavy grass just below skid very low stocking Trees 10
18	26	8.42	10	500	Very steep medium weeds low stocking
19	25	8.38	10	500	Steep overgrown slash pile
20	25	8.35	15	750	Lots of grass and slash
21	25	8.38	14	700	Very weedy lots of slash 1 dead one
22	10	8.04	13	650	Slash and very weedy
23	12	8.07	12	600	Very wet ground lots of grass
24	17	8.16	16	800	Very healthy
25	15	8.12	16	800	Lots of grass and slash
			337	674	



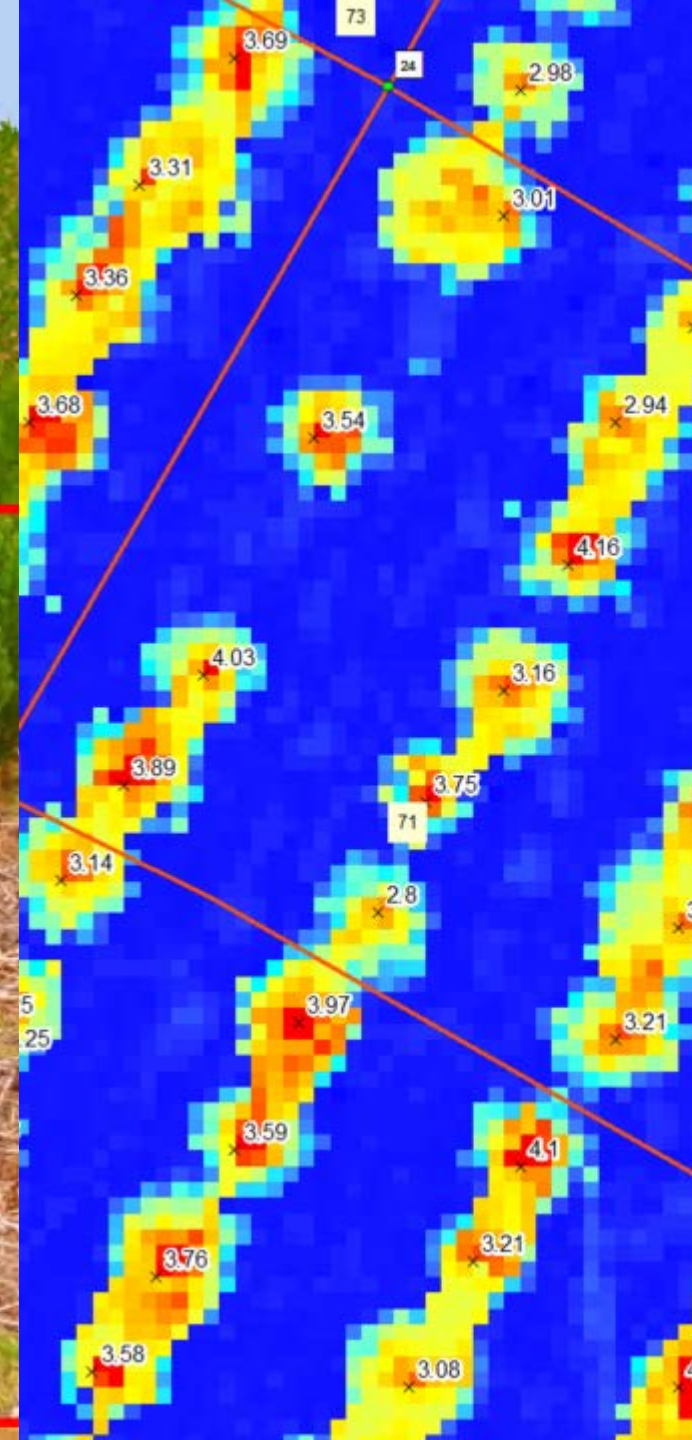


Panos

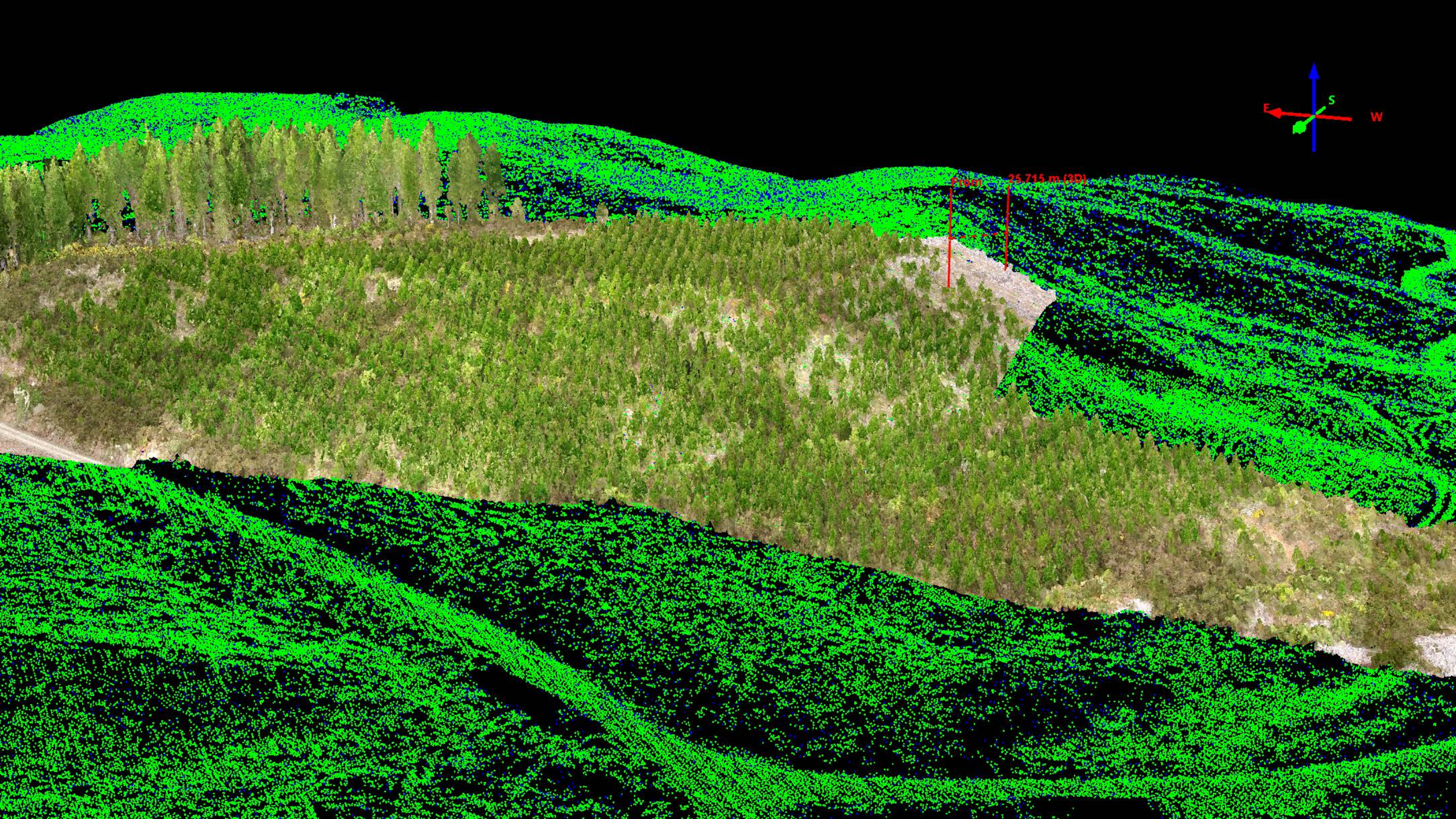


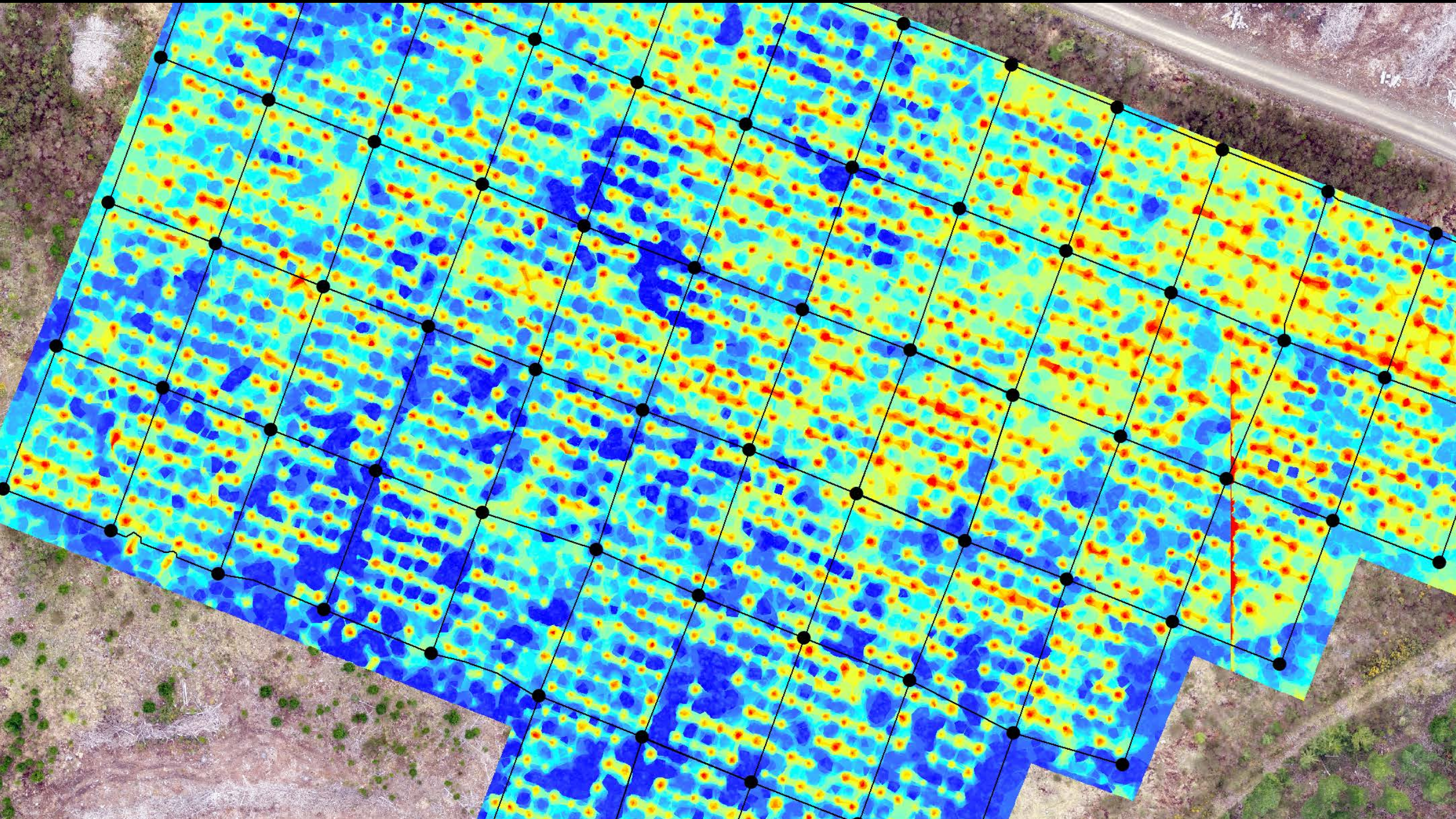
Monitoring Trials

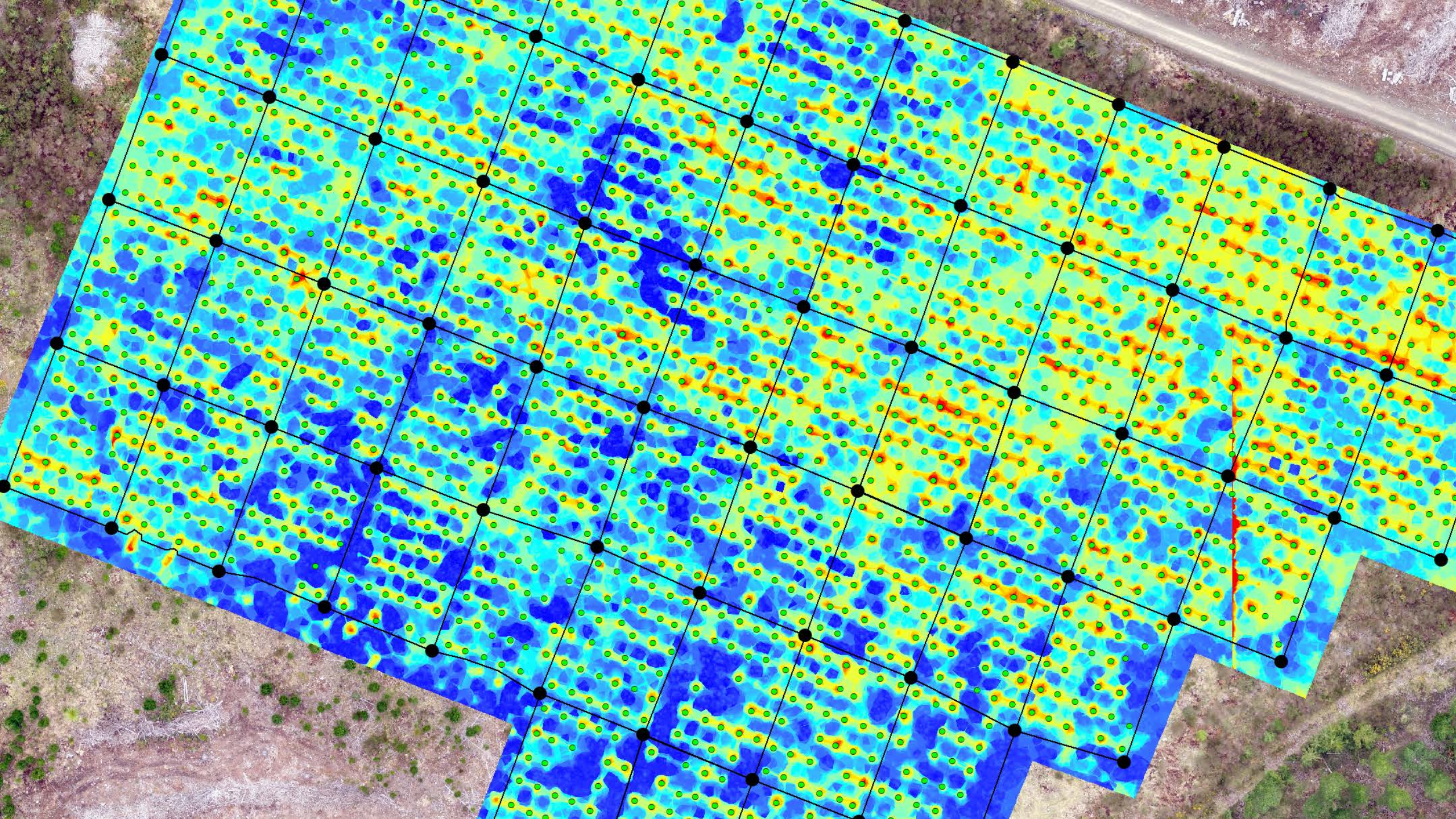
Monitoring Trials



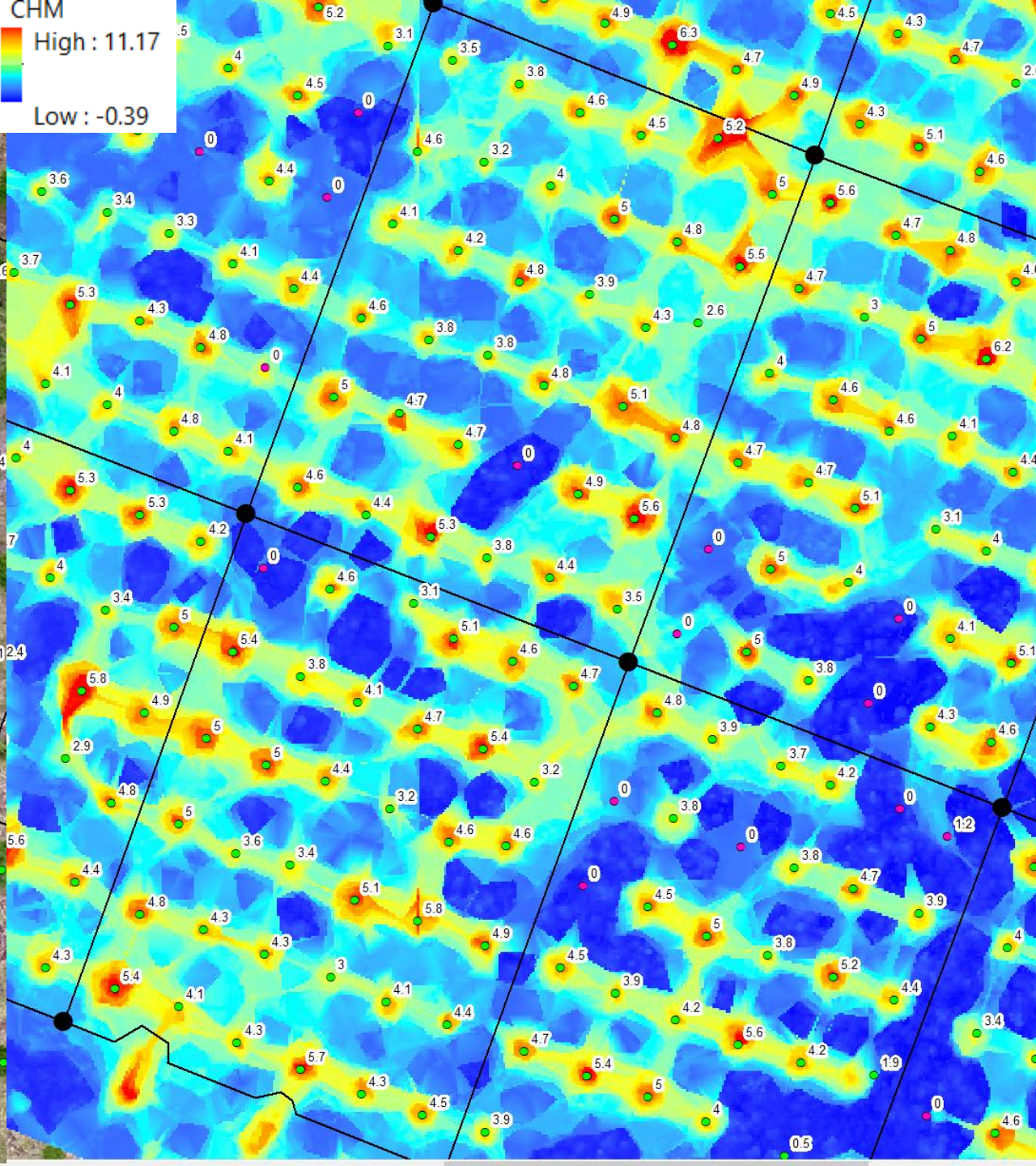






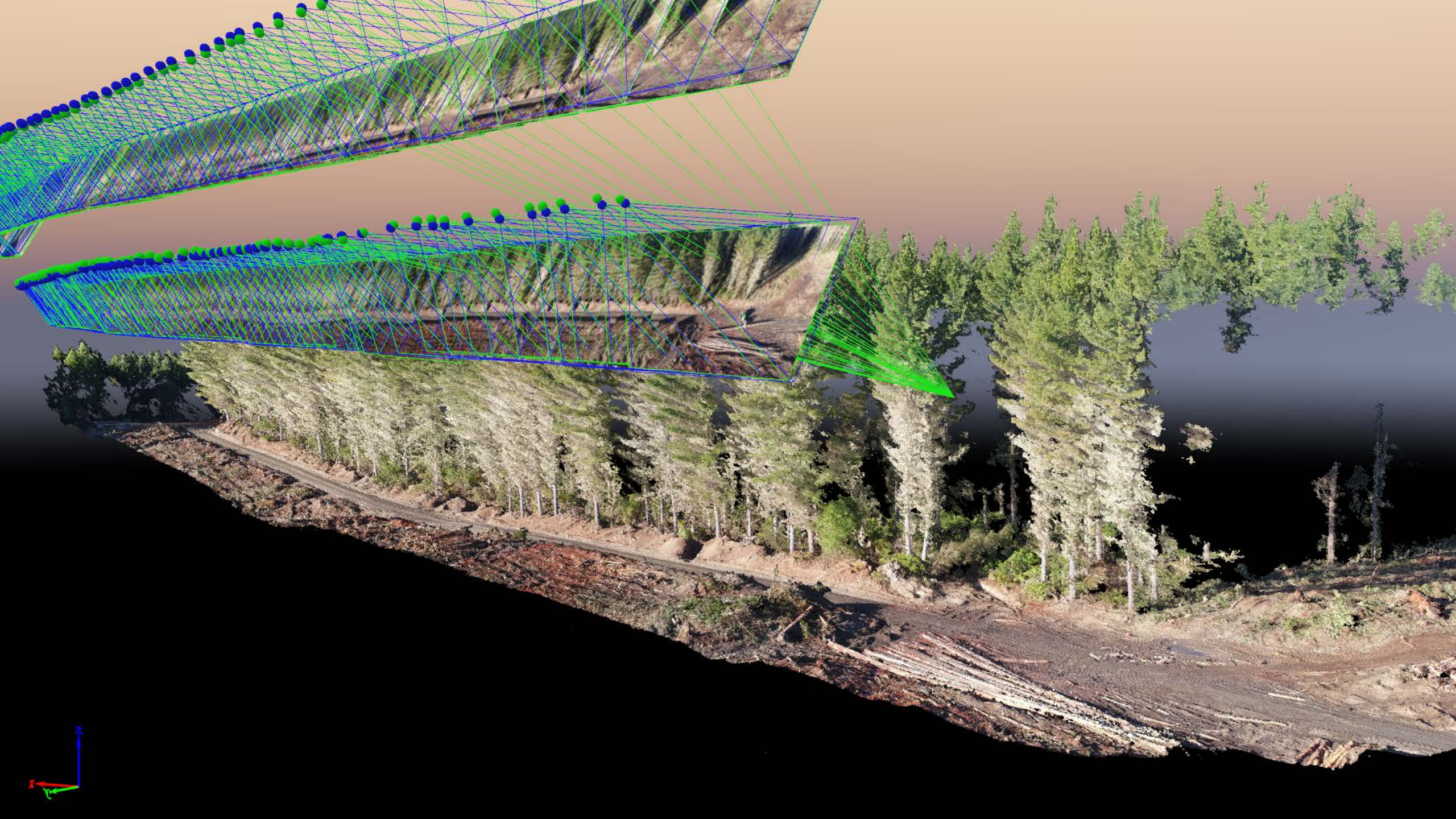


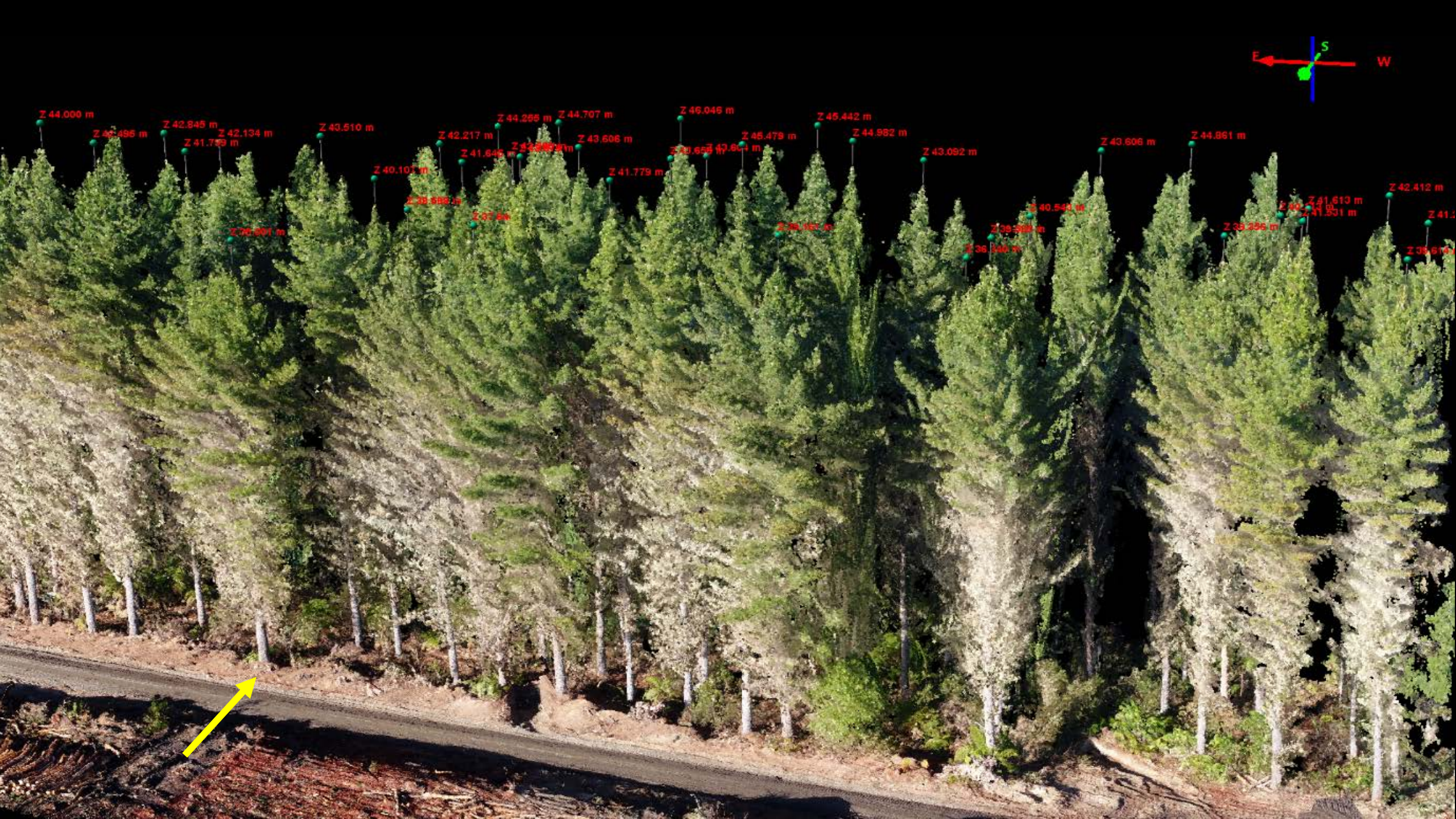




Breakage Studies







Z 44.000 m Z 46.486 m Z 42.845 m Z 42.134 m Z 43.510 m Z 44.256 m Z 44.707 m Z 46.046 m Z 45.442 m Z 44.982 m Z 43.606 m Z 44.861 m

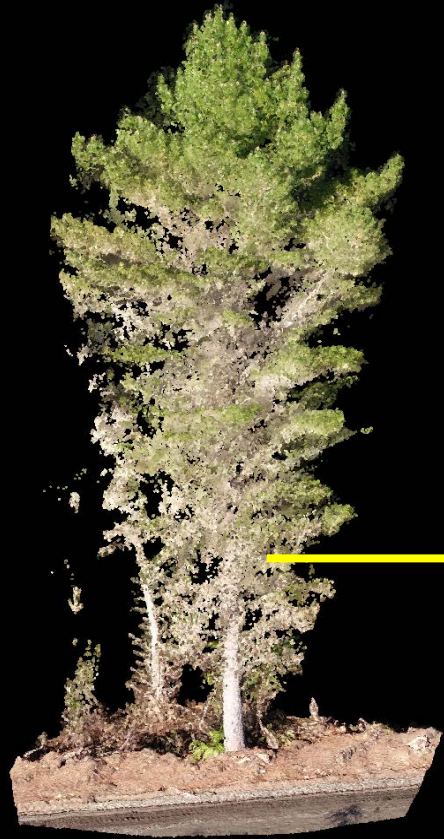
Z 40.101 m Z 41.845 m Z 42.217 m Z 43.606 m Z 45.479 m Z 43.092 m Z 43.606 m Z 44.861 m

Z 36.901 m Z 39.888 m Z 41.779 m Z 41.779 m Z 40.544 m Z 40.544 m Z 41.613 m Z 42.412 m

Z 36.840 m Z 36.840 m Z 36.840 m Z 36.840 m Z 36.840 m Z 36.840 m Z 36.840 m Z 36.840 m

Z 41.513 m Z 41.513 m Z 41.513 m Z 41.513 m Z 41.513 m Z 41.513 m Z 41.513 m Z 41.513 m

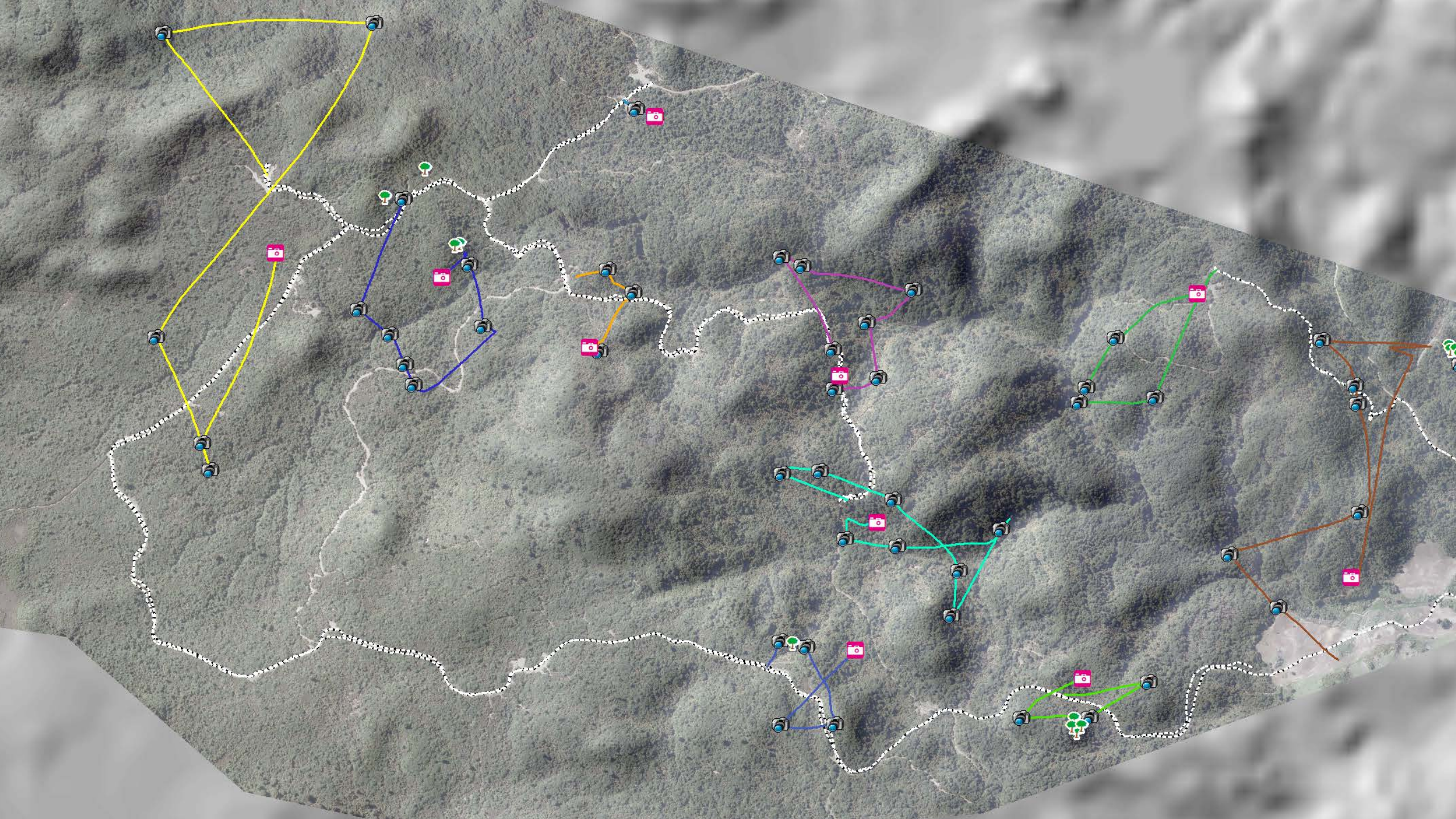
Z 42.412 m Z 42.412 m Z 42.412 m Z 42.412 m Z 42.412 m Z 42.412 m Z 42.412 m Z 42.412 m

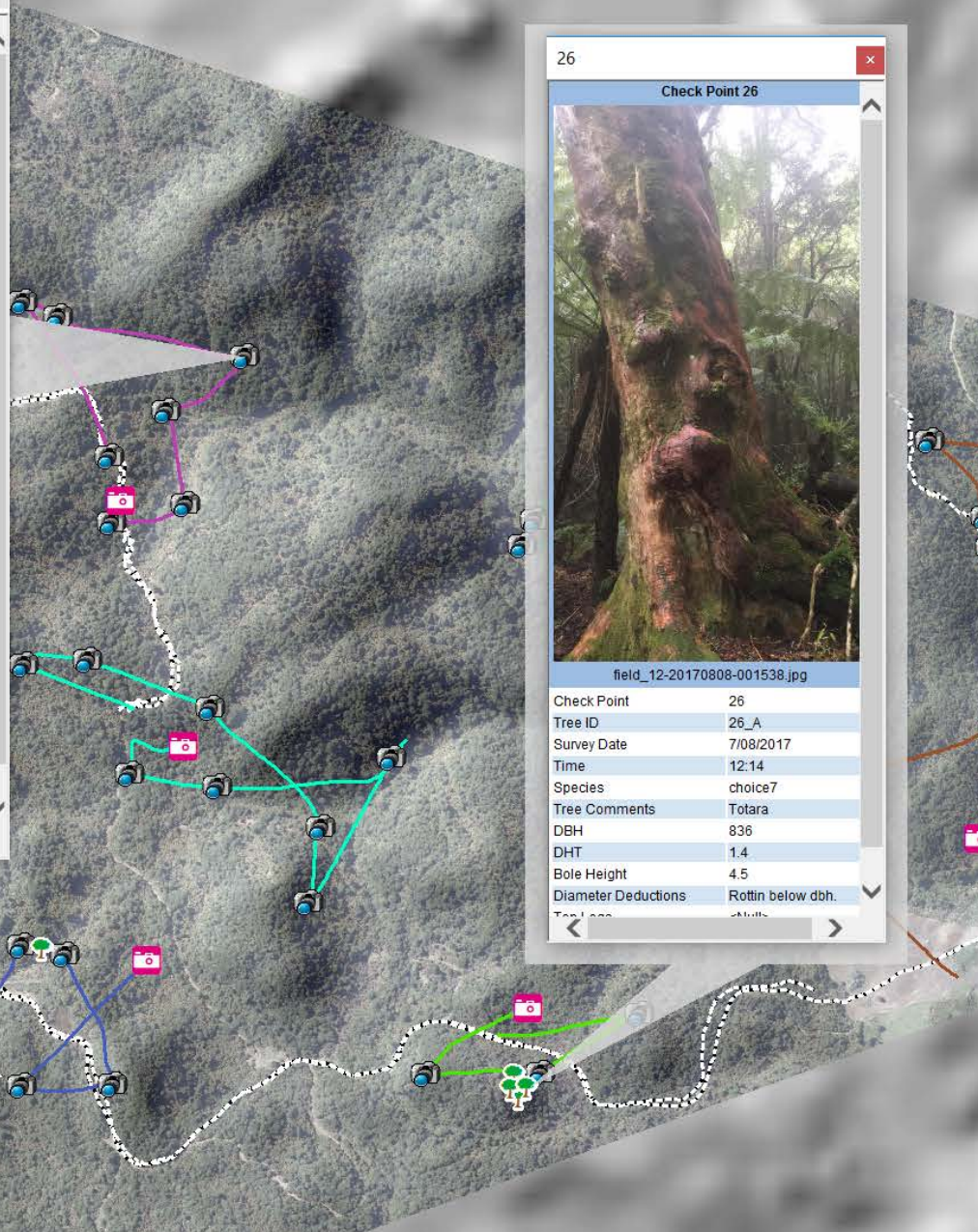




Tree 5
19.7m

Tree 5
31.6m





26

Check Point 26

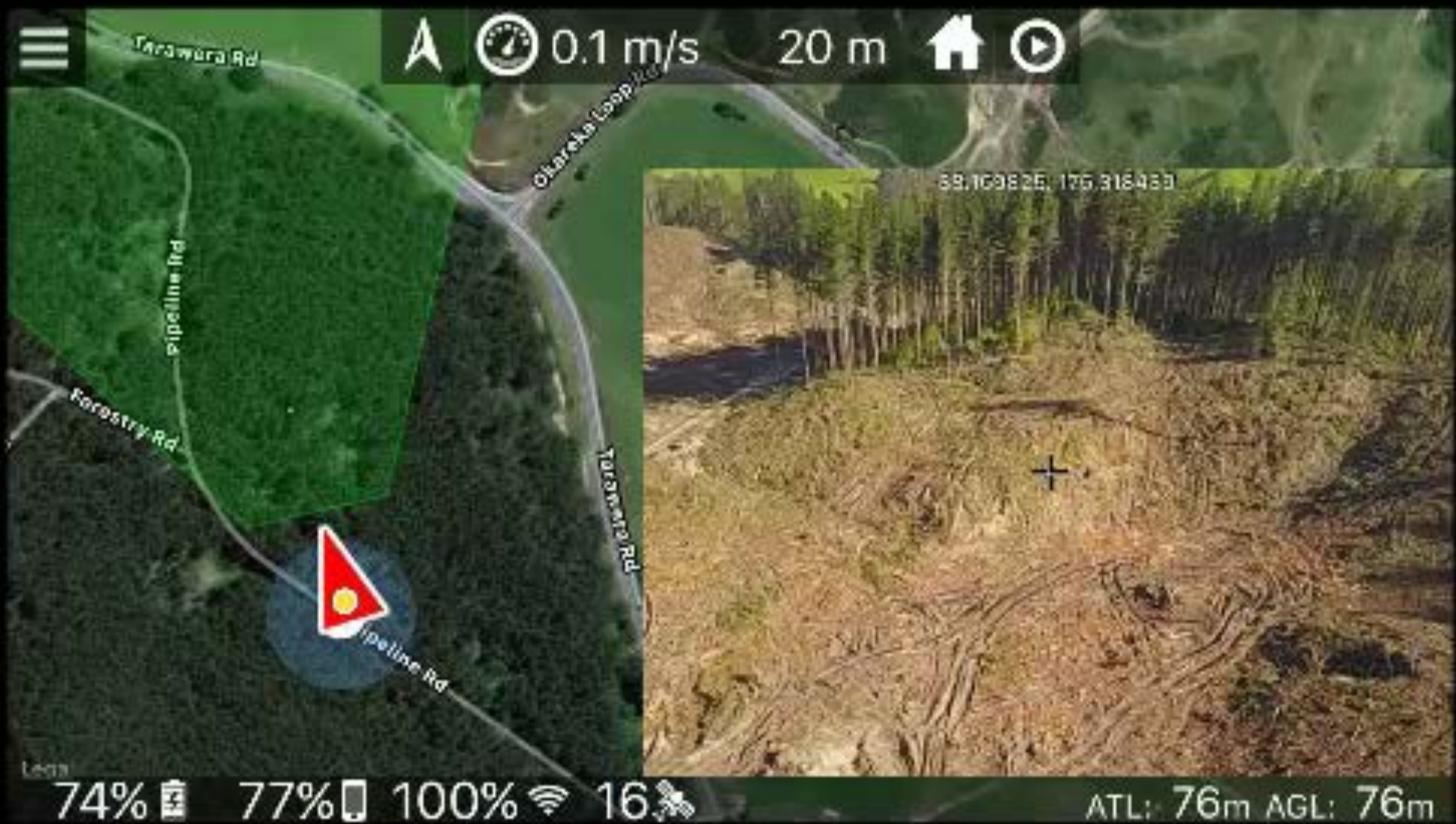
field_12-20170808-001538.jpg

Check Point	26
Tree ID	26_A
Survey Date	7/08/2017
Time	12:14
Species	choice7
Tree Comments	Totara
DBH	836
DHT	1.4
Bole Height	4.5
Diameter Deductions	Rottin below dbh.

Hyperlinks

<https://roundme.com/tour/185083/view/479856/> (UAV Panos)
 UAVVideoSections\Section6.MP4 (Check Point UAV Video Tracklogs)

Jump...
Close



Tarawera Rd



0.1 m/s

20 m



Okareka Loop Rd

Pipeline Rd

Forestry Rd

Tarawera Rd

Pipeline Rd

58.169825, 175.318453

Legs

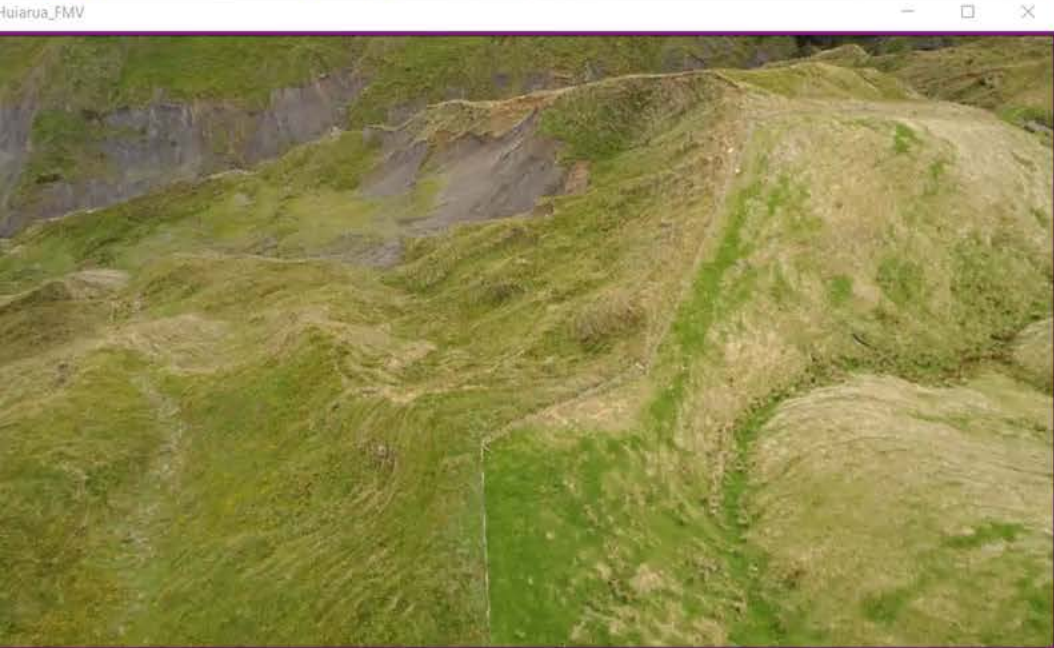
74%

77%

100%

16

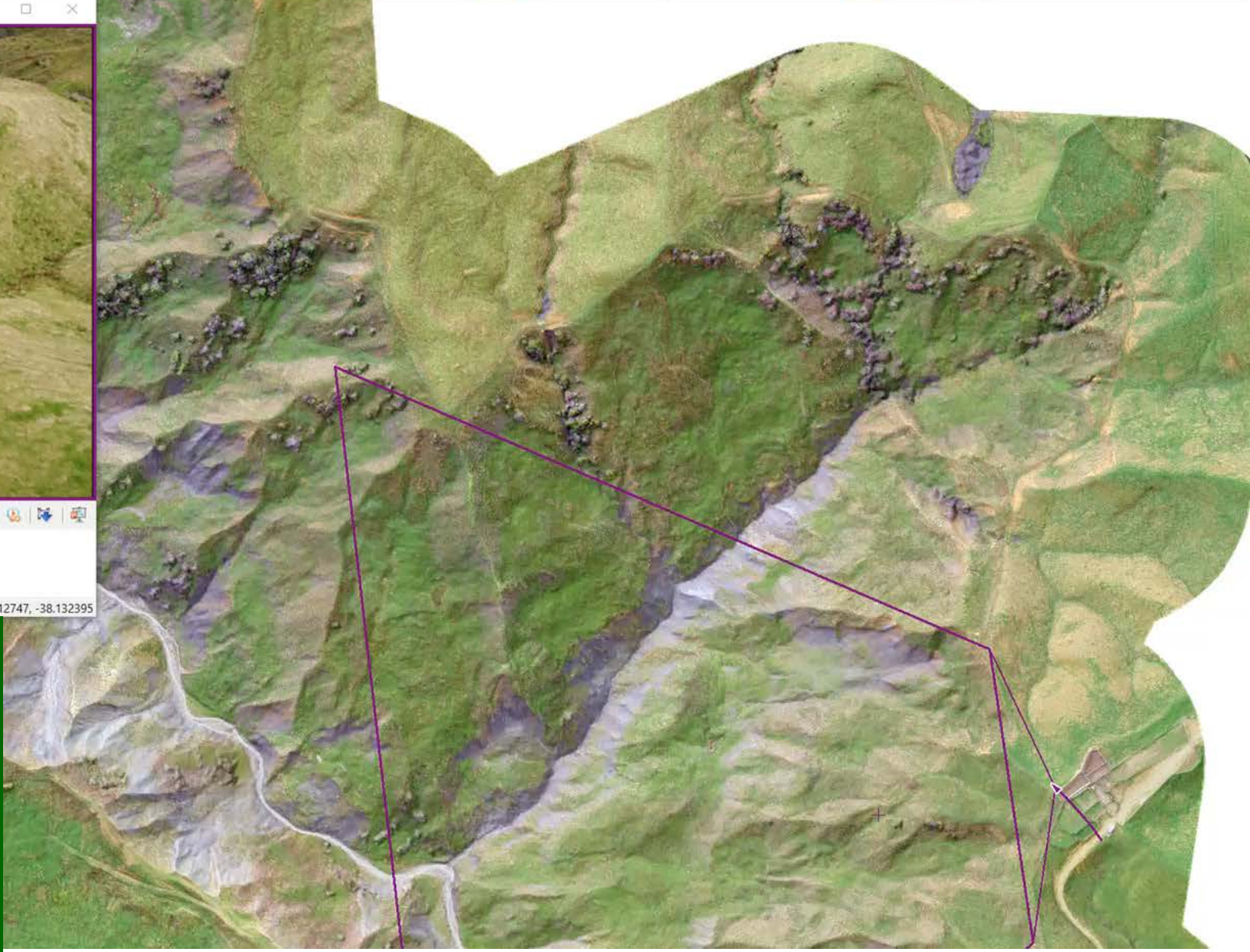
ATL: 76m AGL: 76m



00:00:01:34 / 00:00:05:27 Playback Rate: 1x Recording Status:

17, 2017, 12:05:23 178.012747, -38.132395



This block contains the playback controls for the video. It includes a progress bar, a play/pause button, and a recording status indicator. The playback rate is set to 1x. The coordinates 178.012747, -38.132395 are displayed at the bottom right of the control panel.



Full Motion Video

Updated Fire Maps Onsite



-  Fire-Ohaaki_0118_0700-hotspot_Min100C
-  Fire_Ohaaki_Jan2017_MappedArea_13012017

Lake Rotoaira Invasive Weed Mapping 2017

Genesis Intake Weed Mapping 2017



Interpine was engaged by Genesis Energy, to map the area of surface weed (Lagarosiphon and Hornwort) beds or floating rafts on Lake Rotoaira.

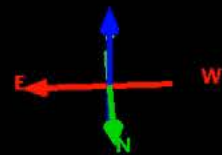
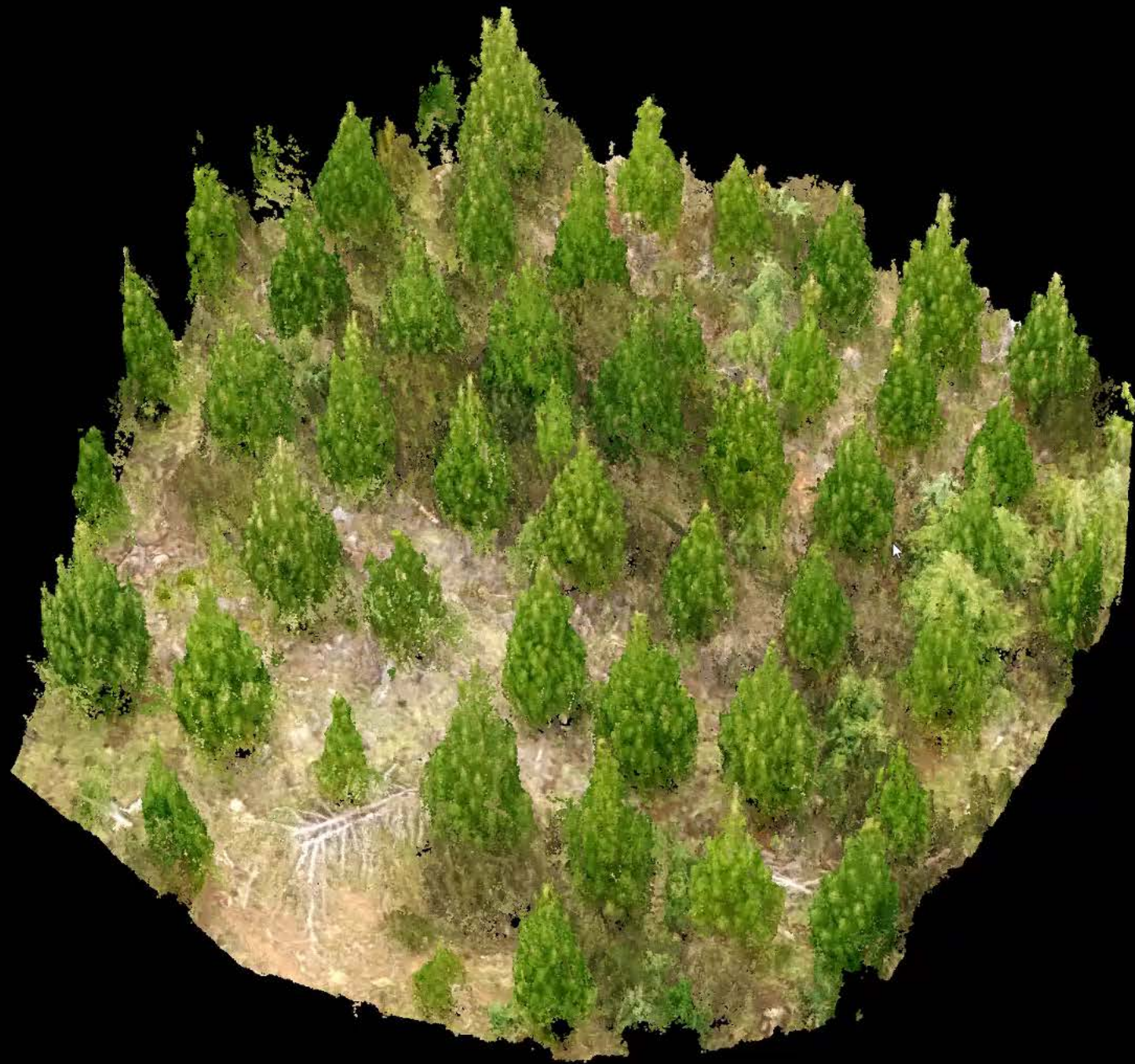
The focus of the work was in an area on the north shore between Wairehu canal and the lake hydropower inlet.

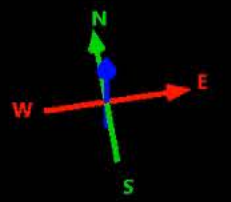
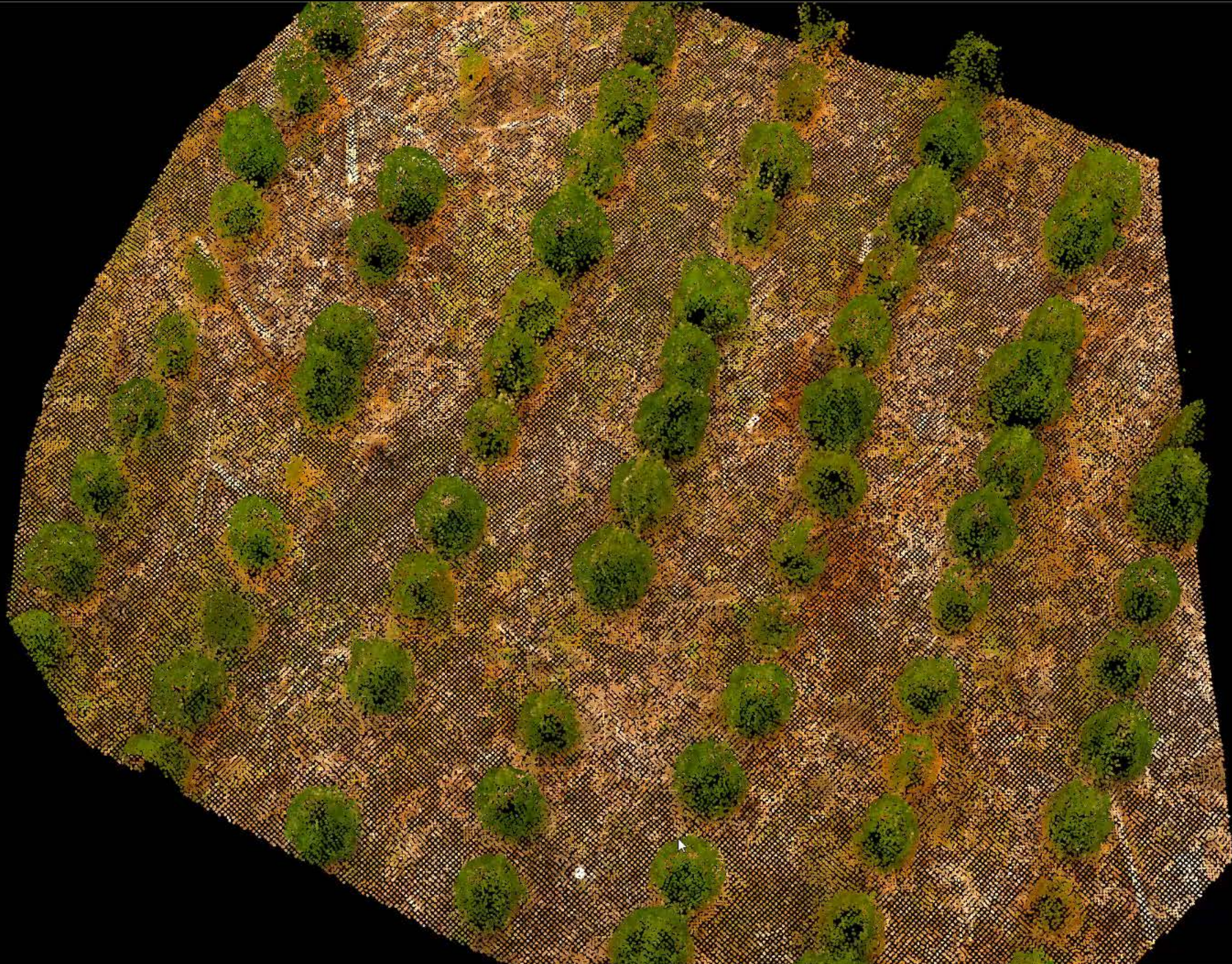
Following initial mapping, GPS locations of the lake weed were provided for the mechanised weed harvesting in order to target the weed beds.

Following harvest the area was re-flown to assess the extent and accuracy of the harvest operation.

Both mapping flights were undertaken using multirotor UAV using a NIR camera with a polarised lens.



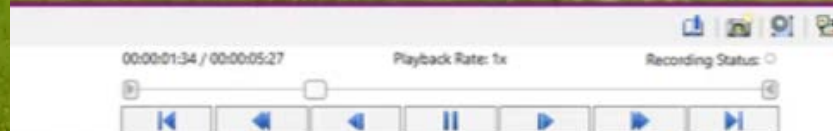
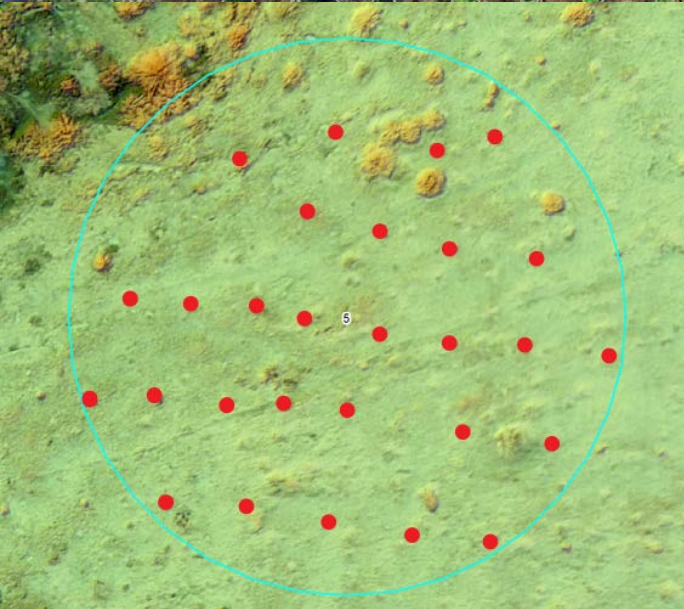
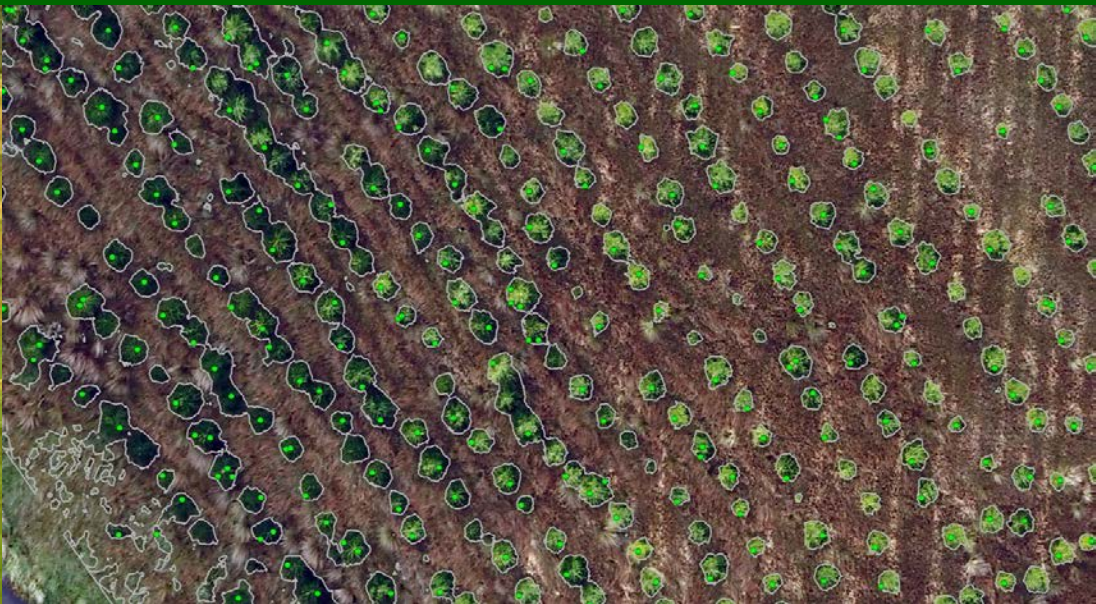




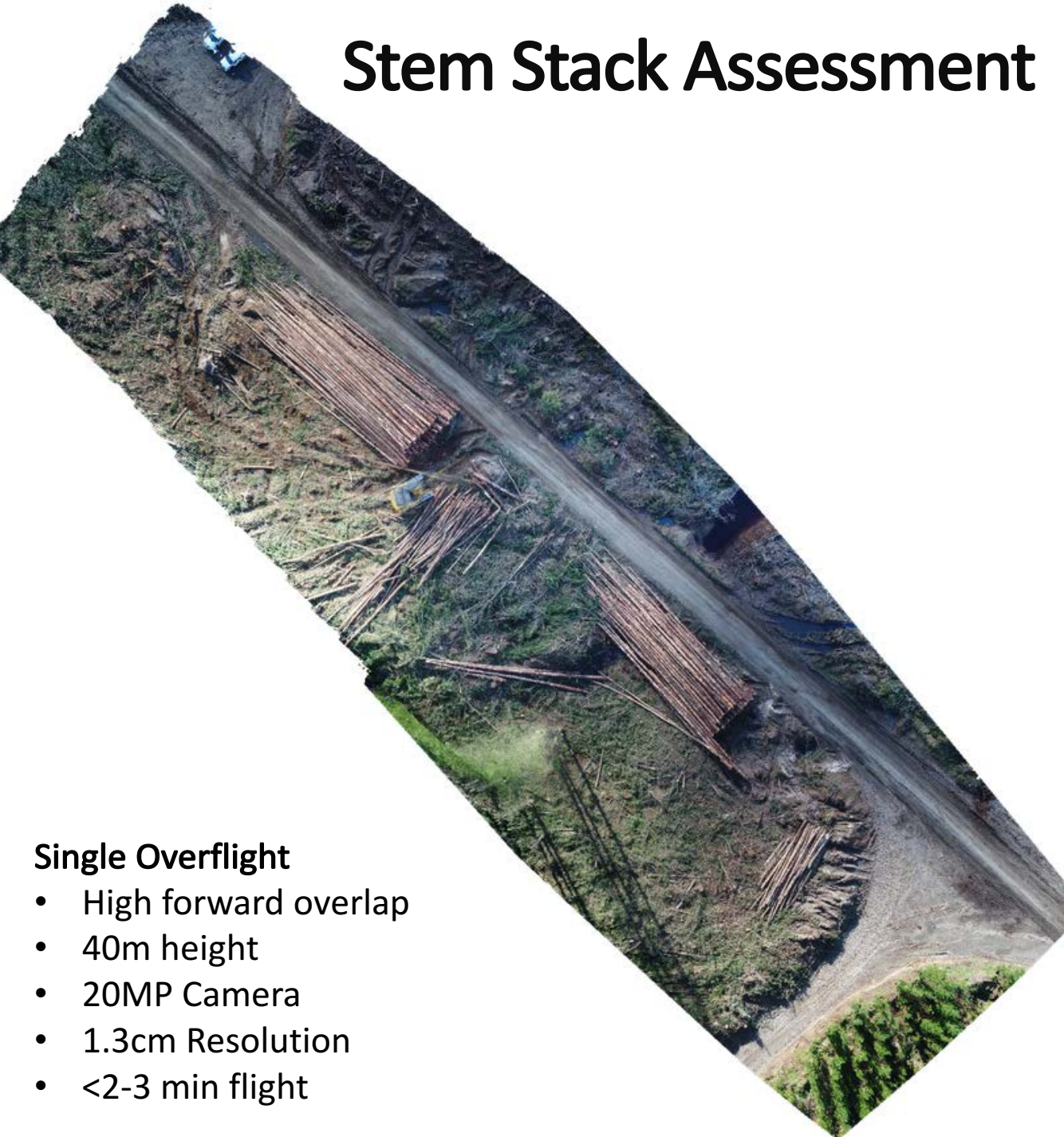




Develop New Measurement & Monitoring Systems

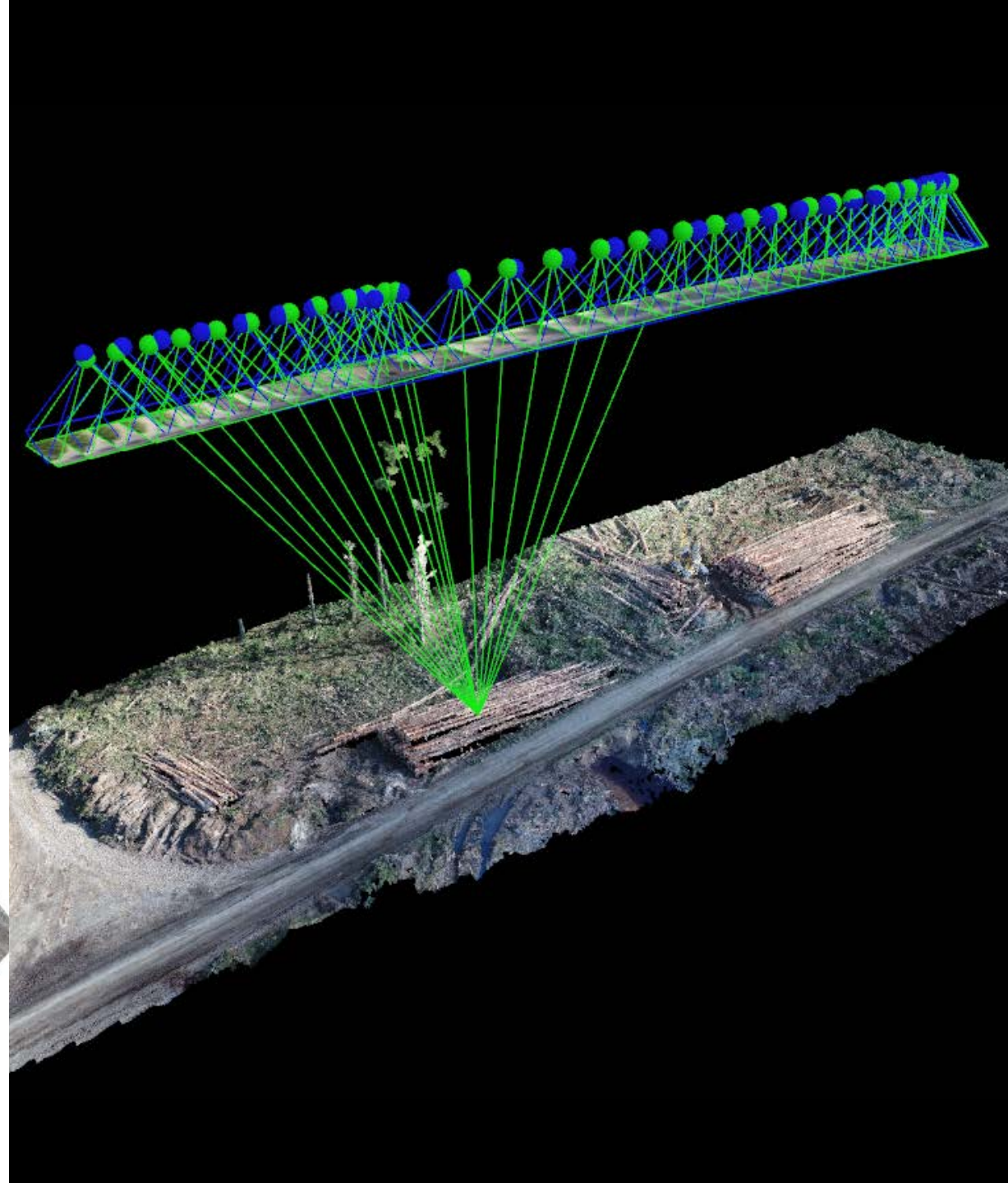


Stem Stack Assessment



Single Overflight

- High forward overlap
- 40m height
- 20MP Camera
- 1.3cm Resolution
- <2-3 min flight



Measure Stem Stacks



38m



Measure Delimbed Stems



120m AGL
20MP Camera
3cm resolution

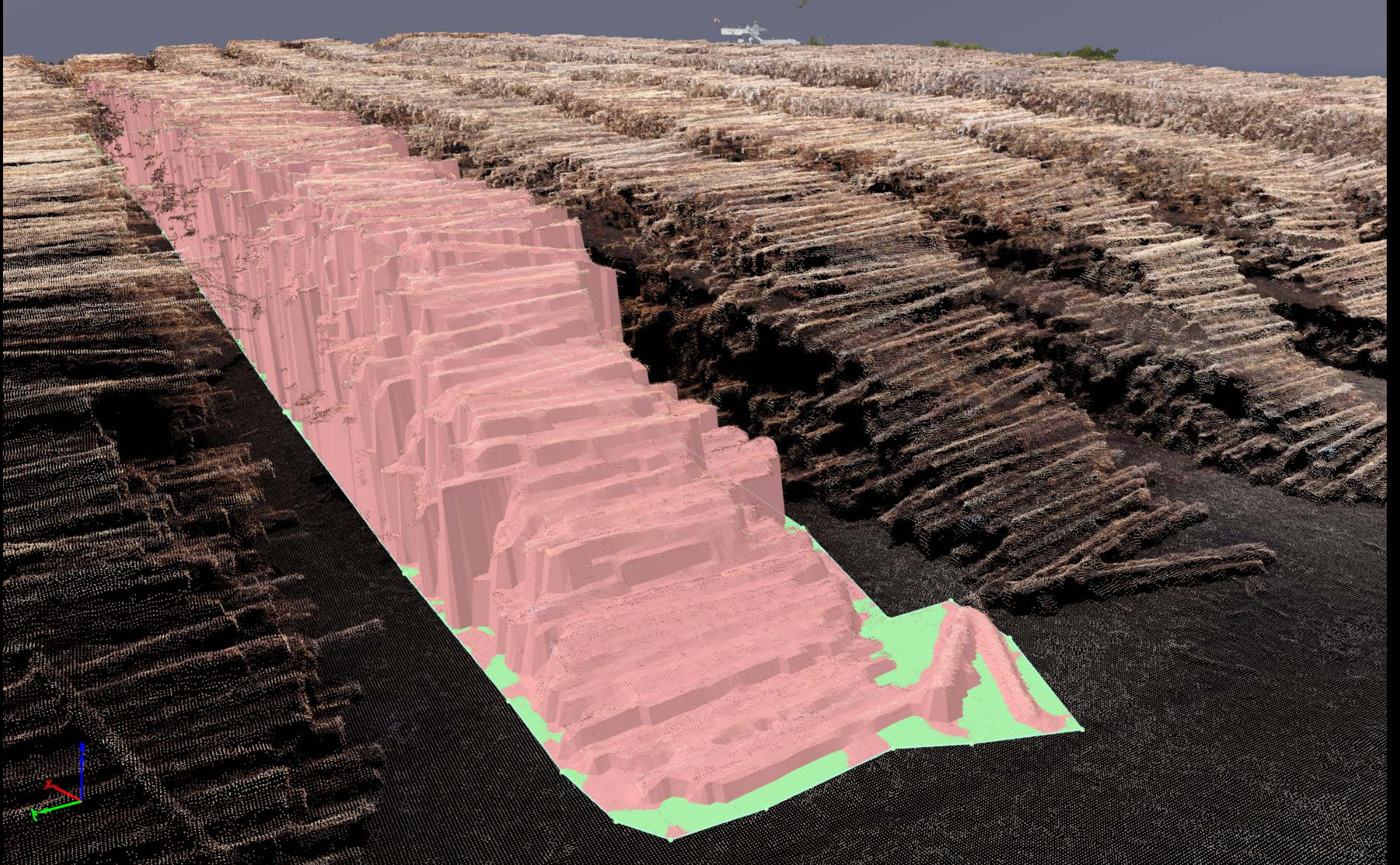
27.3m

Measure Delimbed Stems



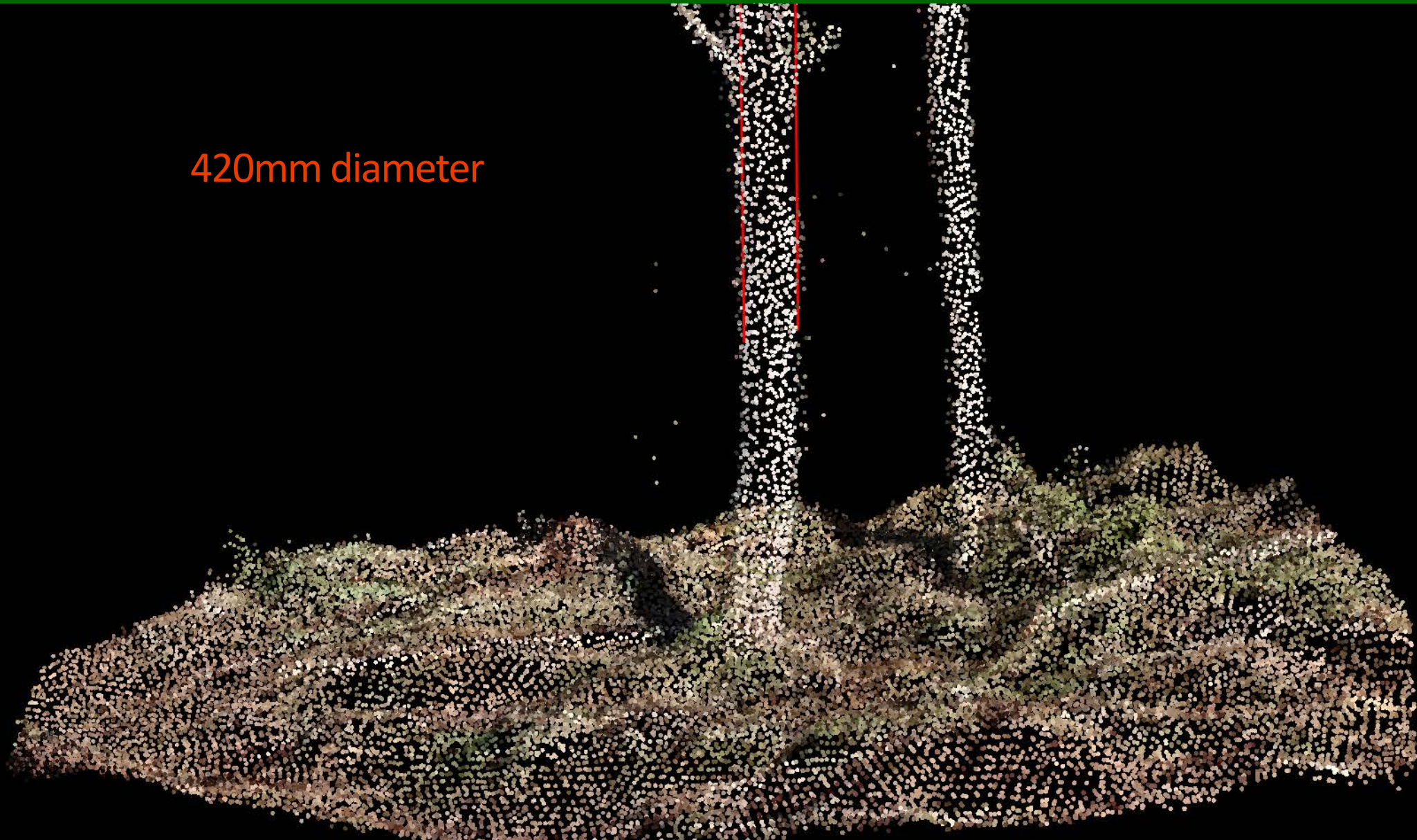
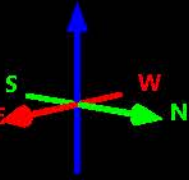
120m AGL
20MP Camera
3cm resolution





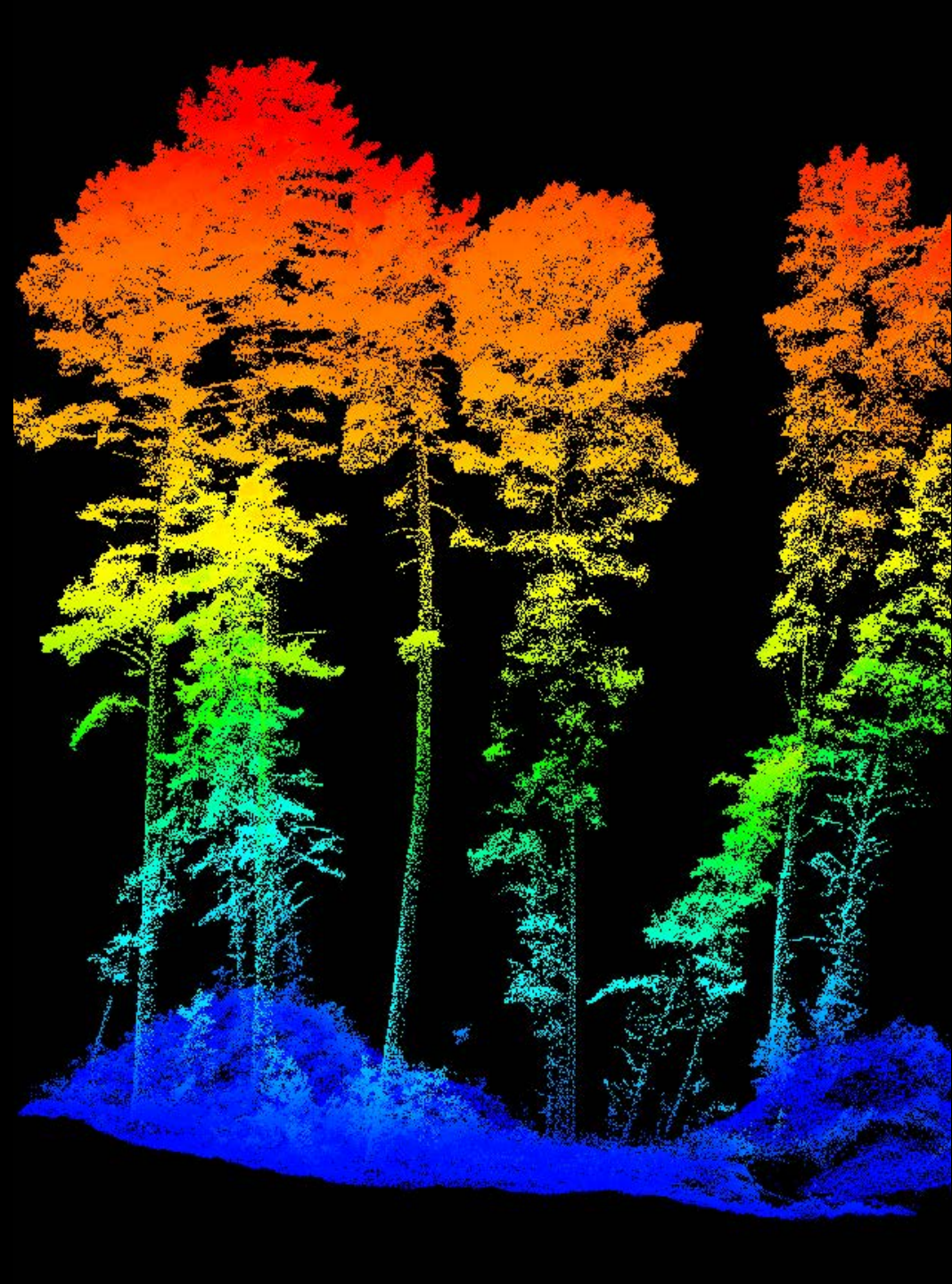
Point Cloud - Measure Standing Trees?

420mm diameter



Measure Standing Trees?







Shared Geographic Understanding

Opening Access and Engaging Everyone



INTERPINE

Bringing innovation to the forest industry

Application of UAVs in the Forestry Industry



Sarah Pitcher-Campbell



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