FORSITE

Forestry & LiDAR: Enhancing Natural Resource Management and Operational Efficiency with a Digital Inventory®

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Forsitegeo.com

The Challenge of Managing Forested Landscapes

- Ever-changing ecosystem conditions
- Diversity of conditions and stakeholders
- Need to balance environmental, social, and economic goals
- Without facts we only have conjecture and assumption
  - Must have accurate knowledge for project-based solutions
- Limited/Costly Resources – Time, Labor, Transportation, etc…

DIGITAL INVENTORY®

A near-census, individual-tree LiDAR-based forest inventory covering every visible tree down to 6 feet in height across the entire ownership — delivered as a multi-layer GIS product. It's a Digital Copy of the Landscape.

- **Tree-level census:** not a sample or extrapolation
- **Wall-to-wall:** every stand characterized on its own merits
- **Multi-layer GIS:** DEM, CHM, health, slopes, fire risk, hydrology & more

Beyond Timber: Natural Resource Applications

Fire Risk & Tree Mortality

Predict mortality for trees across at 77% accuracy — enables proactive thinning & fuels treatment.

Carbon & Biomass

Wall-to-wall individual-tree data supports carbon accounting and economic reporting across ownership.

Riparian & Stream Analysis

High-res LiDAR hydrology enhances public datasets and provides added detail to help inform stream slope, shade & buffer delineation.

Growth & Yield Monitoring

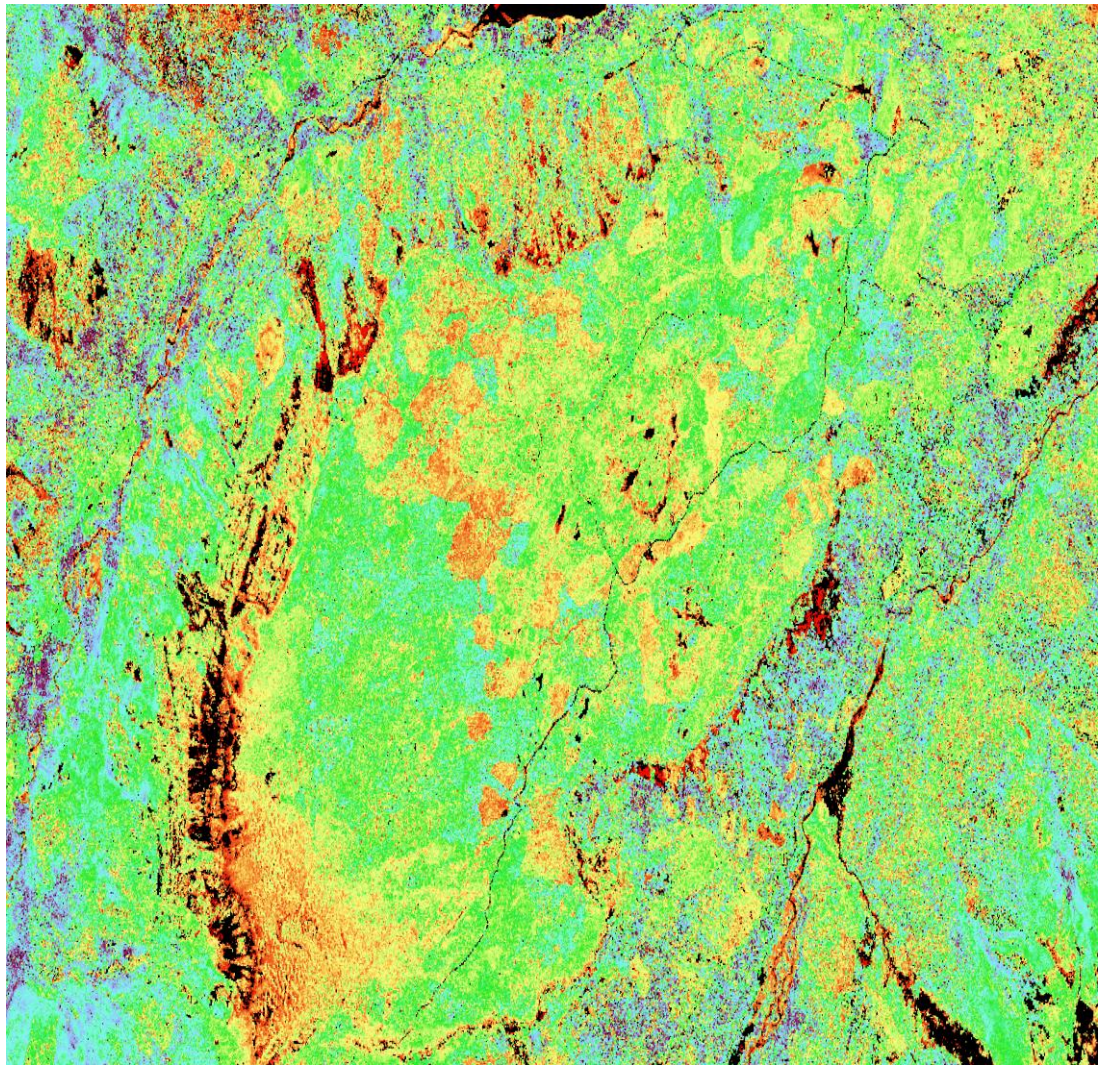
Multi-vintage inventories detect individual-tree height change between flights or when compared to historic planting records.

Habitat & Forest Structure

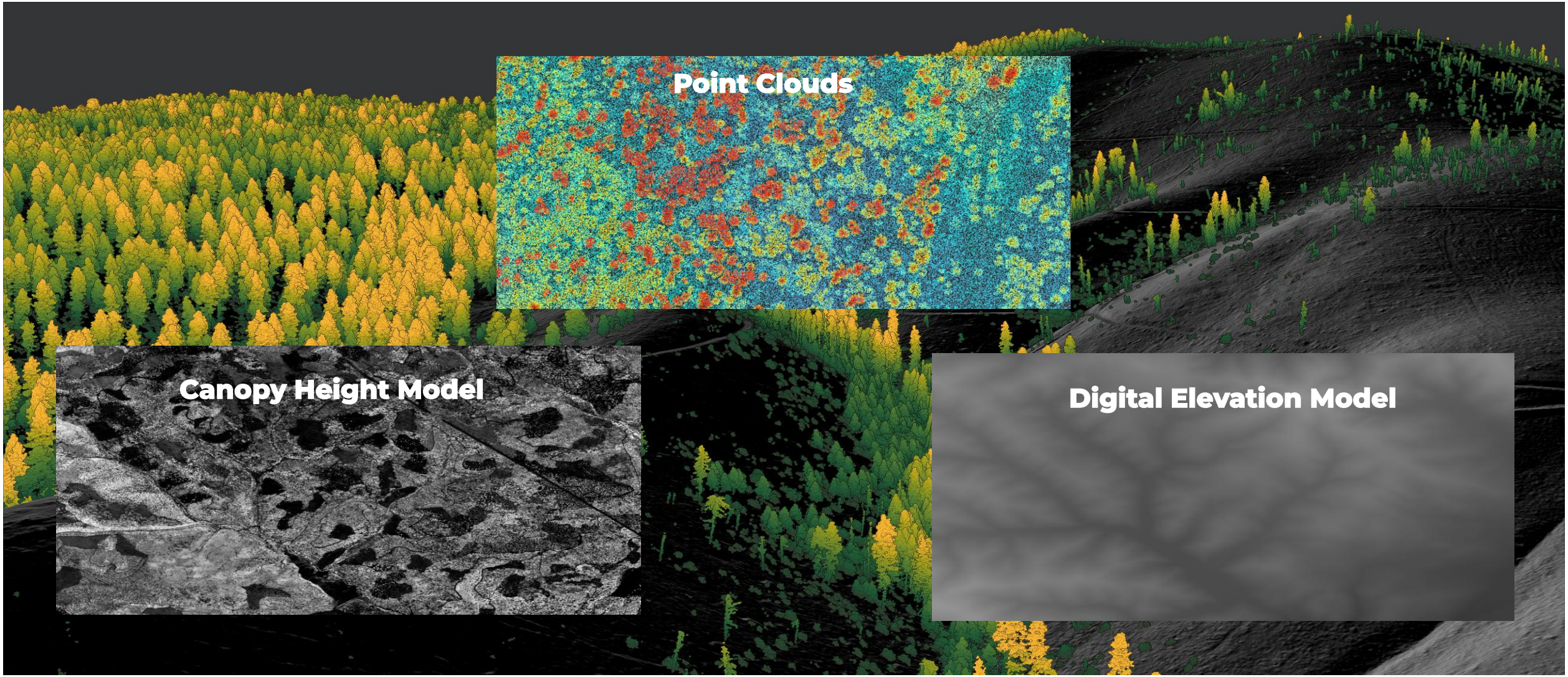
Class structural classification from bare ground to old-growth multi-strata for wildlife planning.

Post-Fire Salvage Planning

Spatially explicit mortality predictions drive stand-by-stand salvage prioritization within days of fire.



We Have LiDAR Data... Now What?

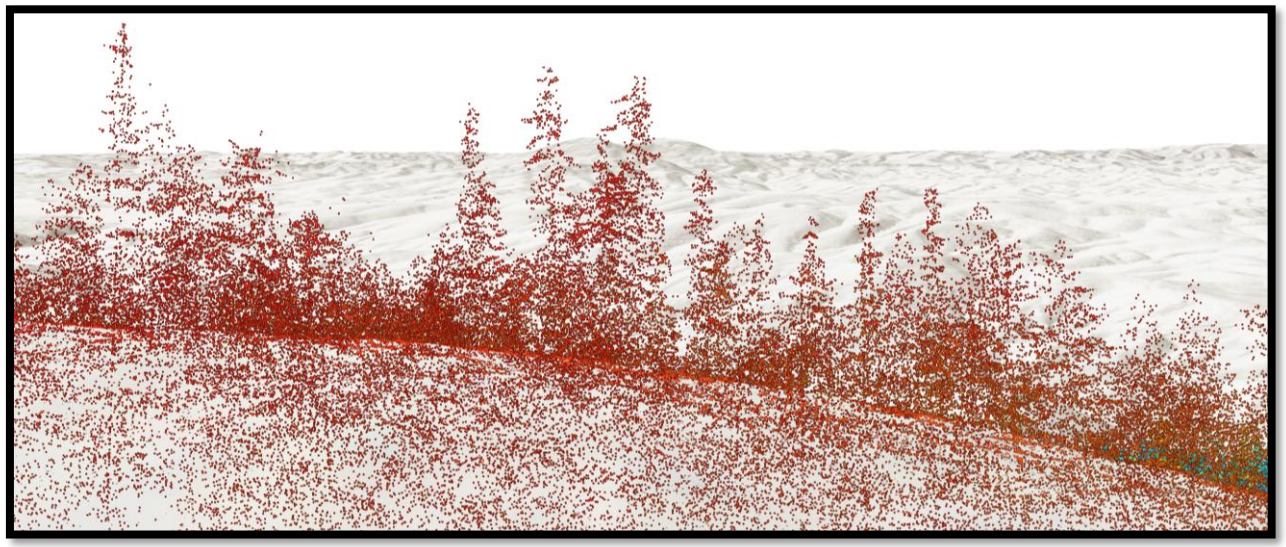


LiDAR Quality: USGS QL2 vs ForestView®

USGS LiDAR QL2

+2 PPM

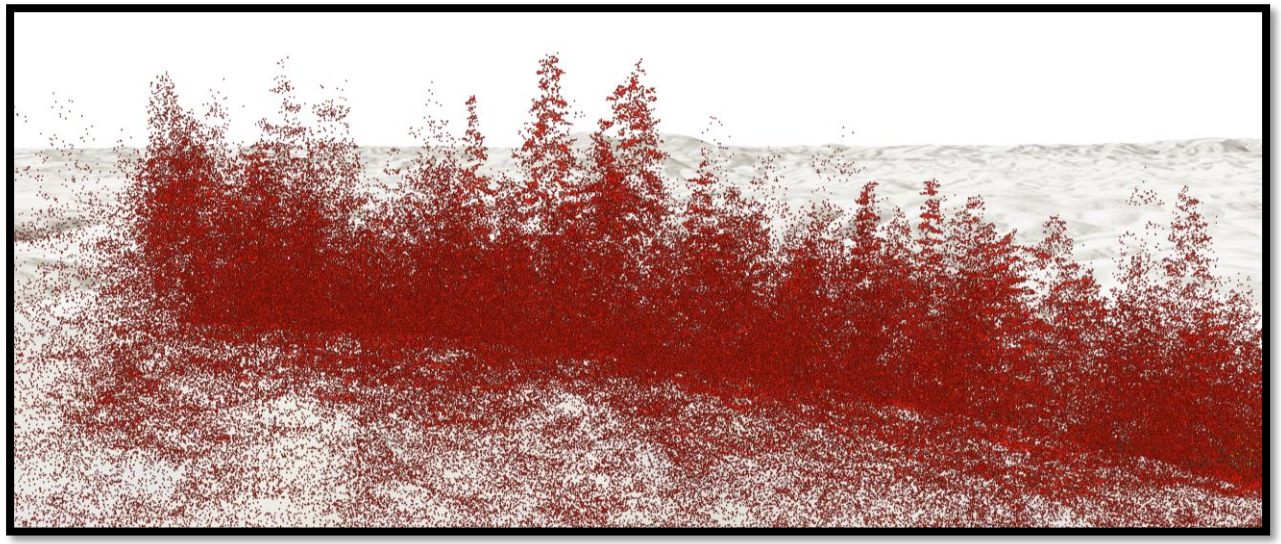
1 Meter Resolution
Derived Rasters



ForestView® LiDAR Spec

+16 PPM

0.3 Meter Resolution
Derived Rasters

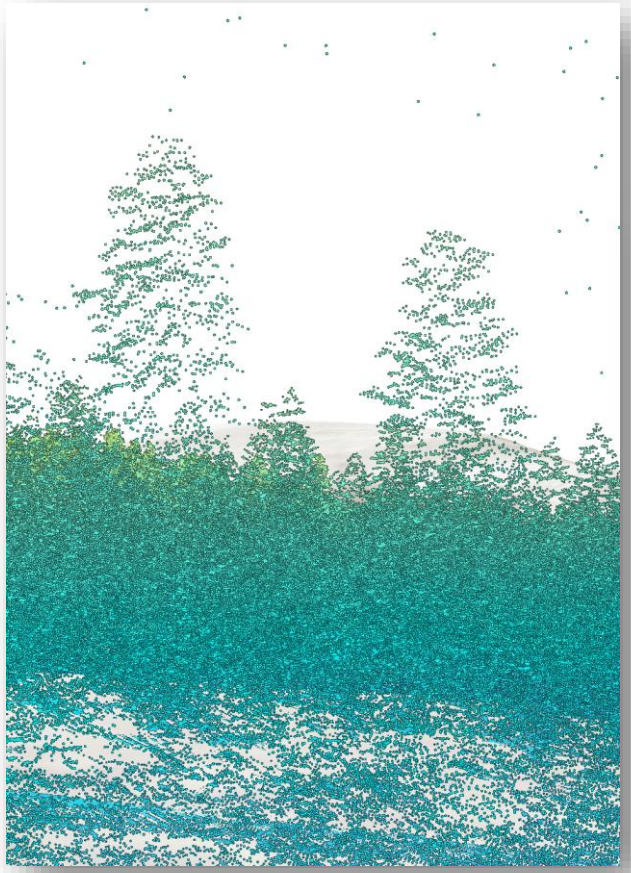


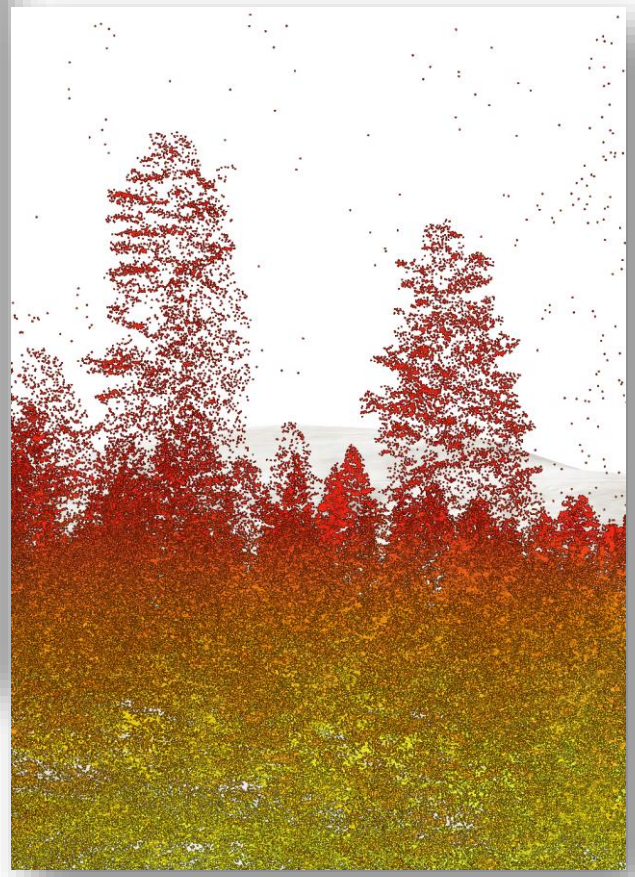
LiDAR Quality: USGS QL1 vs ForestView®

USGS LiDAR QL1

~8 PPM

0.5 Meter Resolution
Derived Rasters



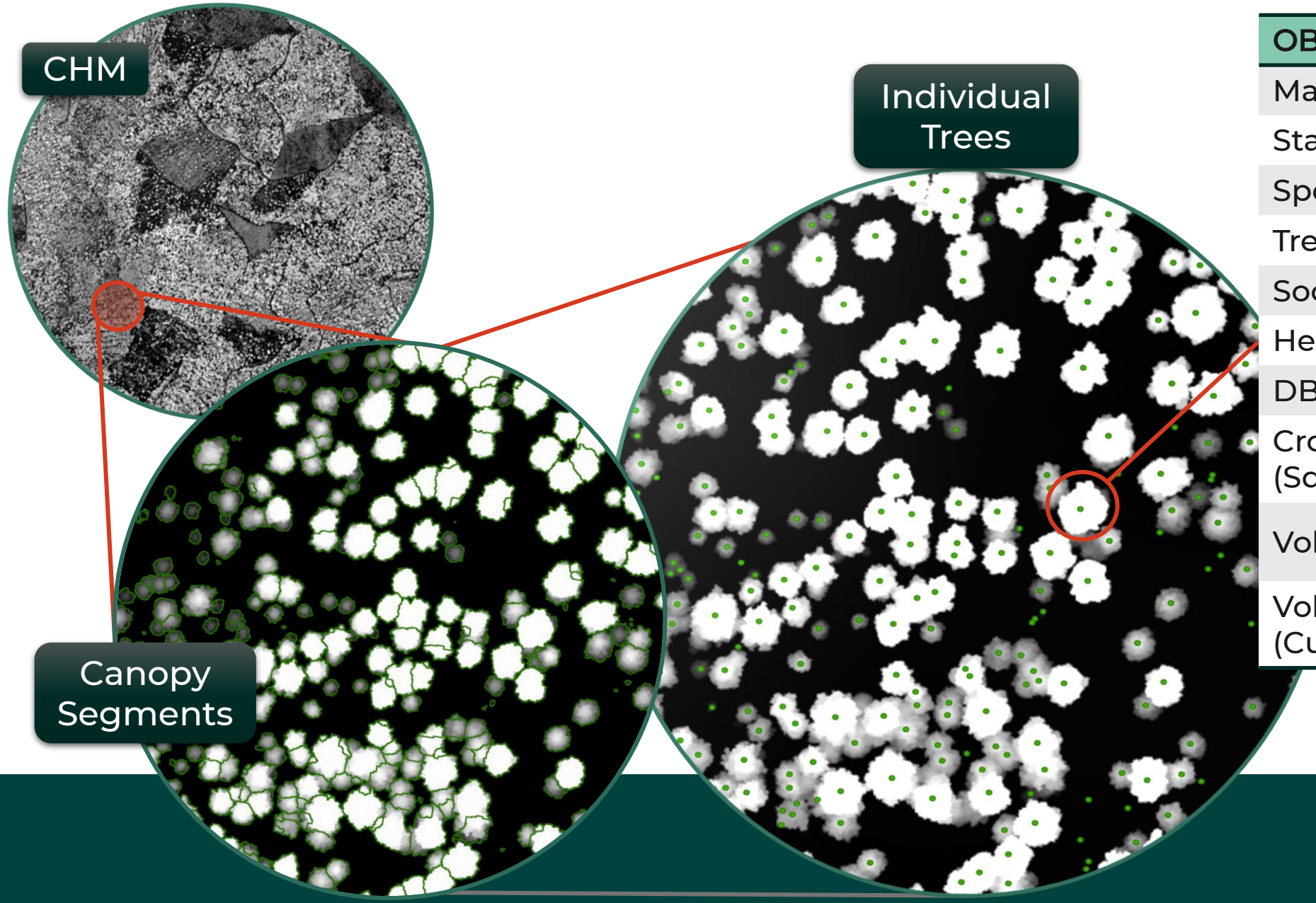


ForestView® LiDAR Spec

16+ PPM

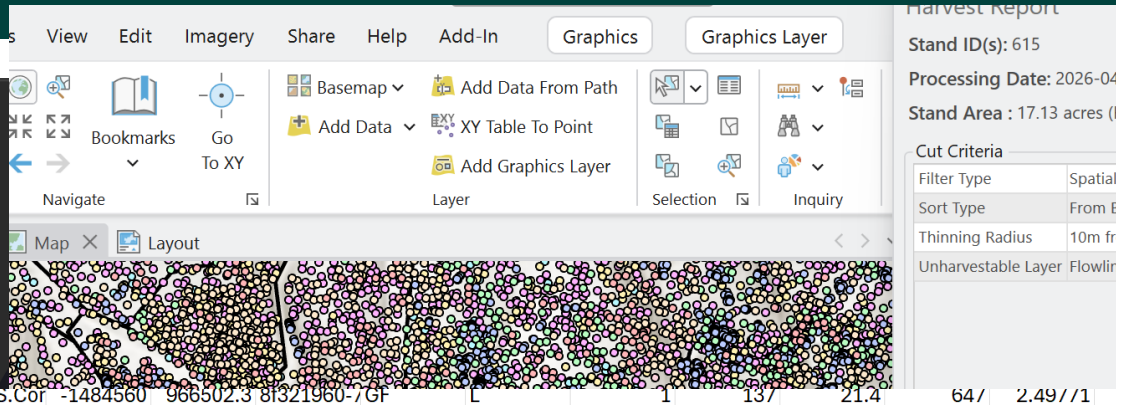
0.3 Meter Resolution
Derived Rasters

Individual Tree Inventory



OBJECTID	1
Management ID	Big Creek
Stand ID	26092406
Species	Hemlock
Tree Status	Live
Social Position	Dominant
Height (Feet)	119
DBH (Inches)	20.5
Crown Area (Square Feet)	758
Volume (Board Feet)	546
Volume (Cubic Meters)	3.1061

Stand Level Inventory Metrics



Harvest Report

Stand ID(s): 615

Processing Date: 2026-04

Stand Area : 17.13 acres (

Cut Criteria

Filter Type	Spatial
Sort Type	From E
Thinning Radius	10m fr
Unharvestable Layer	Flowlir

16591	ArcGIS.Cor	-1484560	966502.3	8f321960-7	GF	L	1	137	21.4	647	2.49771
16592	ArcGIS.Cor	-1484575	966536.3	7d2305c8-	DEAD	D	1	129	24.9	540	3.38153
16593	ArcGIS.Cor	-1484571	966525.2	d195ebba-	DF	L	1	124	25.3	965	3.49105
16594	ArcGIS.Cor	-1484575	966559.3	c9425561-1	RC	L	1	131	22.8	307	2.83521
16595	ArcGIS.Cor	-1484575	966548.3	22153d8e-	RC	L	1	121	24.3	479	3.22053
16596	ArcGIS.Cor	-1484567	966570.4	8111ff06-3	RC	L	1	135	26.1	488	3.71532
16597	ArcGIS.Cor	-1484575	966564.2	ad3e92ea-	DF	L	1	149	26.5	1136	3.83007
16598	ArcGIS.Cor	-1484578	966595.9	4cd4aa08-	WL	L	1	137	17.7	431	1.70868
16599	ArcGIS.Cor	-1484567	966587.8	601aaba9-	DF	L	1	131	21.6	527	2.54462
16600	ArcGIS.Cor	-1484563	966580.7	d29375dc-	DF	L	1	132	25.6	1098	3.57433
16601	ArcGIS.Cor	-1484578	966618.2	c73aa6bc-	DF	L	1	129	20.2	479	2.22545
16602	ArcGIS.Cor	-1484571	966617.3	3a5350e8-	DF	L	1	122	22.5	653	2.76109
16603	ArcGIS.Cor	-1484573	966602.6	c3df6d15-6	DF	L	1	135	25.9	1187	3.6586
16604	ArcGIS.Cor	-1484576	966622.9	3af9dd74-1	DF	L	1	124	22.9	657	2.86013
16605	ArcGIS.Cor	-1484579	966633.4	8533b11b-	DF	L	1	120	25.4	1123	3.5187
16606	ArcGIS.Cor	-1484569	966637.9	108129cb-	DF	L	1	105	20.8	711	2.35962
16643	ArcGIS.Cor	-1484591	966509.6	84360da3-	RC	L	1	107	20.7	343	2.33698
16644	ArcGIS.Cor	-1484596	966510.8	c3a26e5a-	DF	L	1	125	24.8	913	3.35443
16645	ArcGIS.Cor	-1484587	966533.8	a039a7cf-c	RC	L	1	118	24.4	533	3.24709
16646	ArcGIS.Cor	-1484583	966536.8	8183326d-	RC	L	1	121	27.9	868	4.24545
16647	ArcGIS.Cor	-1484599	966562.3	2986e263-	WL	L	1	121	15.3	141	1.27673
16648	ArcGIS.Cor	-1484586	966586.3	a8378749-	DEAD	D	1	145	28.1	639	4.30653
16649	ArcGIS.Cor	-1484593	966580.9	8ff95dfc-f3	DF	L	1	138	25.7	1191	3.60231
16650	ArcGIS.Cor	-1484584	966596.3	afd8b150-7	DF	L	1	145	24.3	702	3.22053
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16654	ArcGIS.Cor	-1484592	966659.3	0632cce2-(	DF	L	1	114	20.4	518	2.26974
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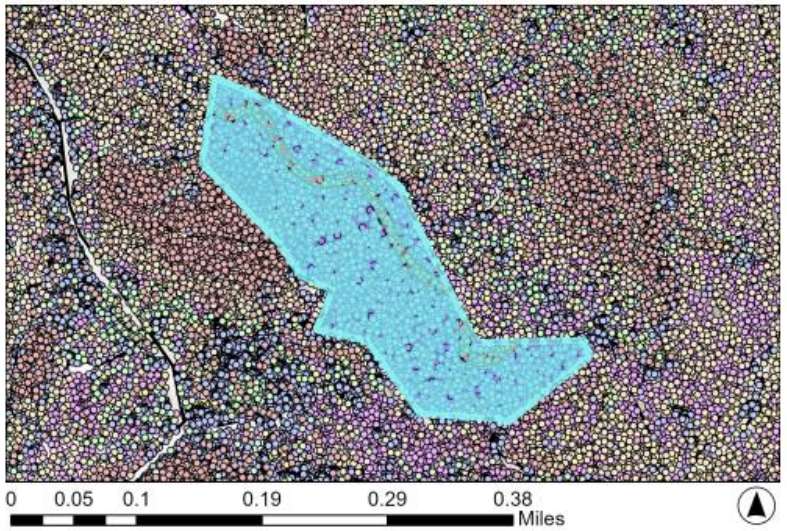
16690	ArcGIS.Cor	-1484619	966519.8	bbb265e4-1	RC	L	1	99	18.4	257	1.84651
16691	ArcGIS.Cor	-1484601	966518.6	d7755bc2-	GF	L	1	97	16.7	597	1.52107

HARVEST REPORT

NORTHWEST MANAGEMENT, INC.

Stand(s): 615
Total Area: 17.13 acres

Cut Criteria
Filter Type: Spatial Thin
Sort Type: From Below (DBH)
Thinning Radius: 10m from Dripline
Unharvestable Layer: Flowlines__Buffer

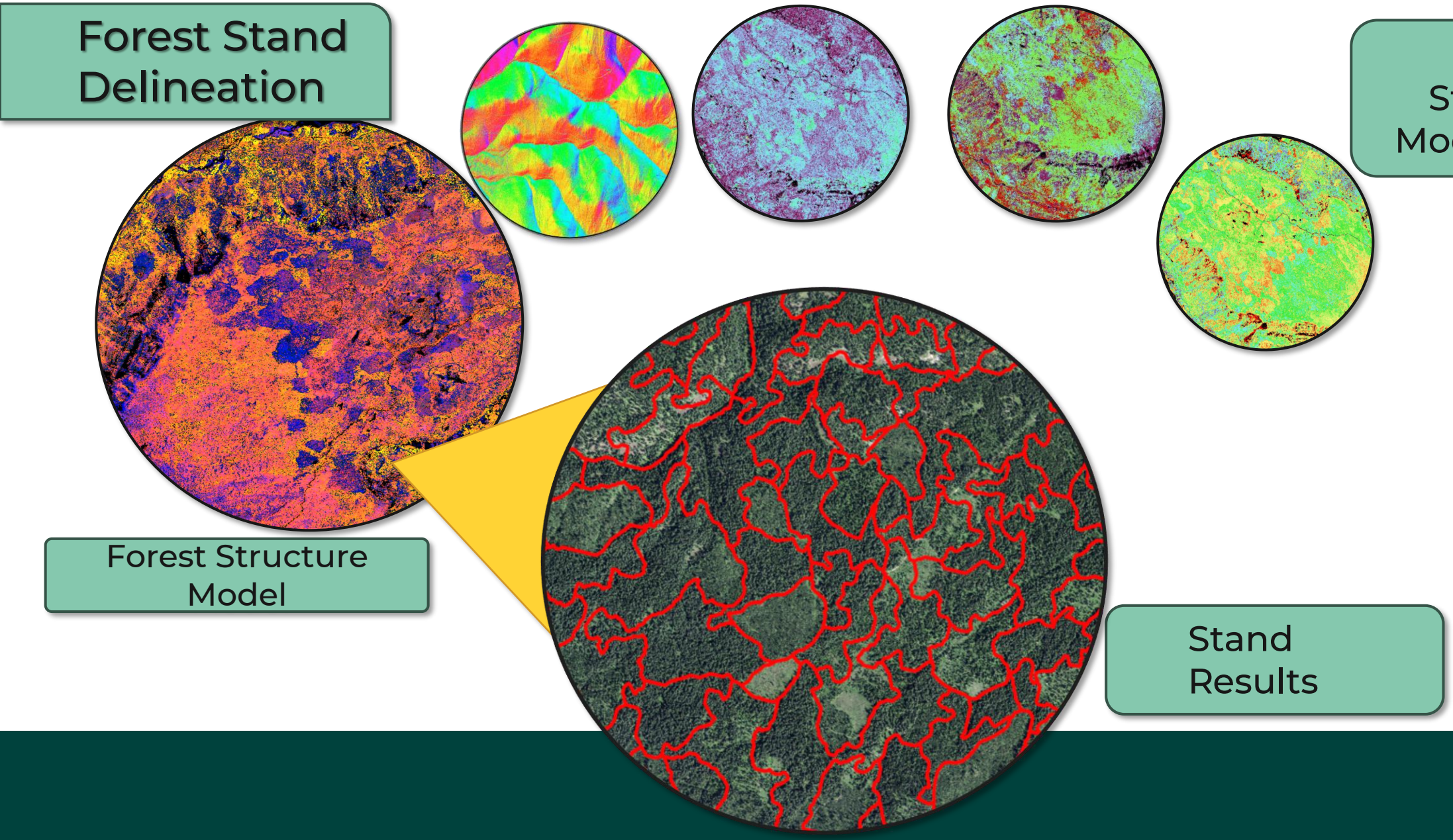


Harvestable Area:
Stand 615 - 15.32 ac.

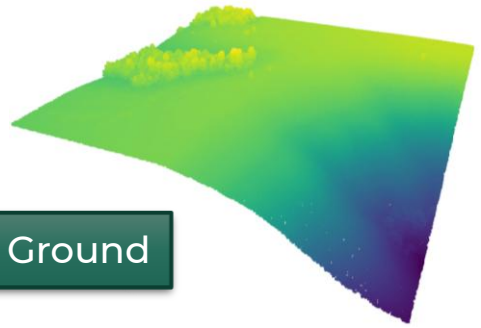
	Trees (n)	TPA (n/ac)	BA (ft²/ac)	Board Feet (mbf)	Avg Height (ft)	Avg DBH (in)
Total	2149	125.48	170.97	N/A	71.95	12.66
Cut	2006	117.13	149.53	N/A	70.27	12.23
Leave	143	8.35	21.44	N/A	95.46	18.73

Species		Total	Cut	Leave
DF	Count	532	476	56
	BF	0.00	0.00	0.00
RC	Count	689	638	51
	BF	0.00	0.00	0.00
GF	Count	328	319	9
	BF	0.00	0.00	0.00
PP	Count	18	14	4
	BF	0.00	0.00	0.00
WL	Count	164	152	12
	BF	0.00	0.00	0.00
OT	Count	375	365	10
	BF	0.00	0.00	0.00
DEAD	Count	43	42	1
	BF	0.00	0.00	0.00

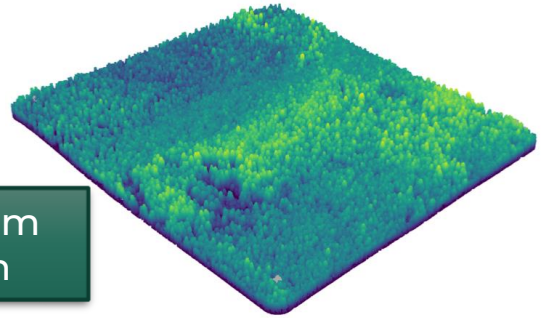
Forest Stand Delineation



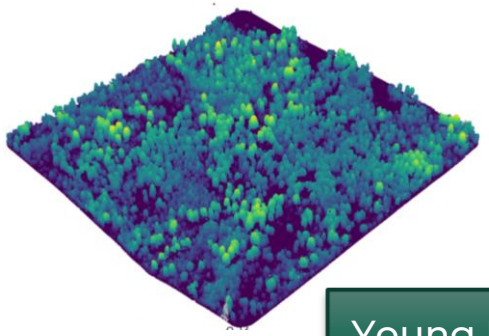
Forest Structural Classification



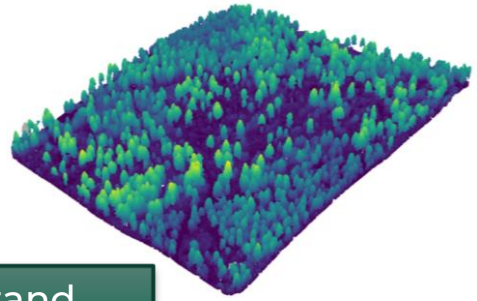
Bare Ground



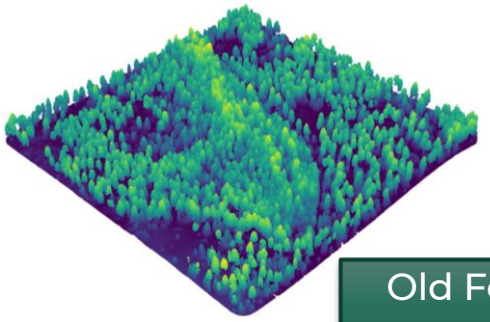
Closed Stem Exclusion



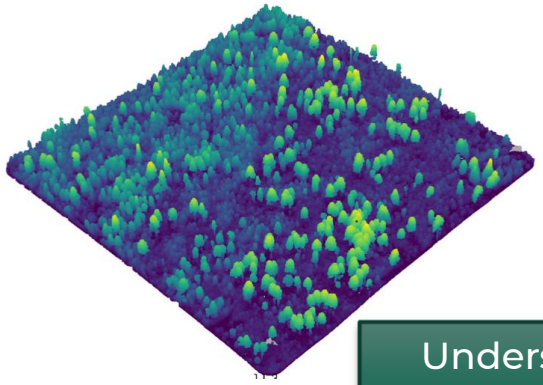
Young Multi-Strata



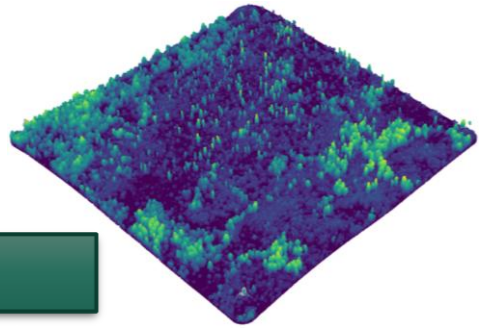
Stand Initiation



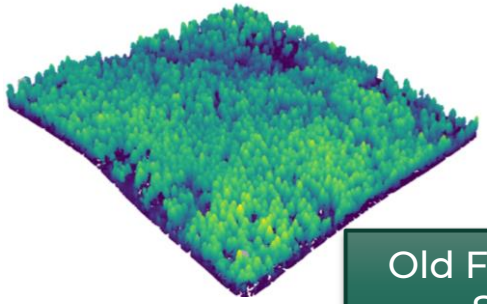
Old Forest Multi-Strata



Understory Reinitiation



Open Stem Exclusion

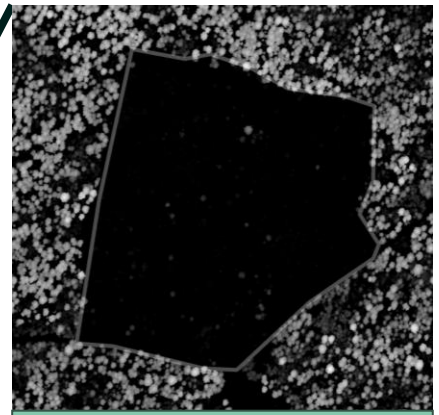


Old Forest Single Stratum

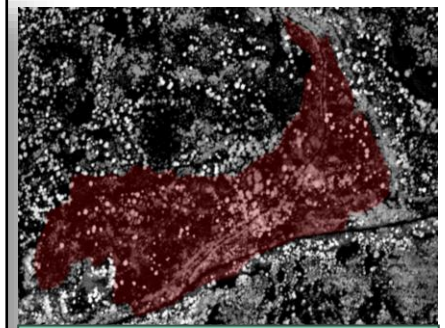
Forest Structural Classification: Stand Examples

Forest Structural Classes

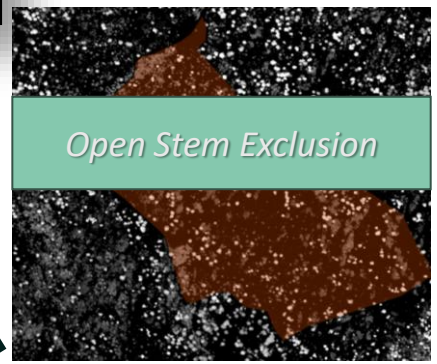
A	Stand Initiation
B	Open Stem Exclusion
C	Closed Stem Exclusion
D	Understory Reinitiation
E	Young Multi Strata
F	Old Forest Multi Strata
G	Old Forest Single Stratum
N	Bare Ground



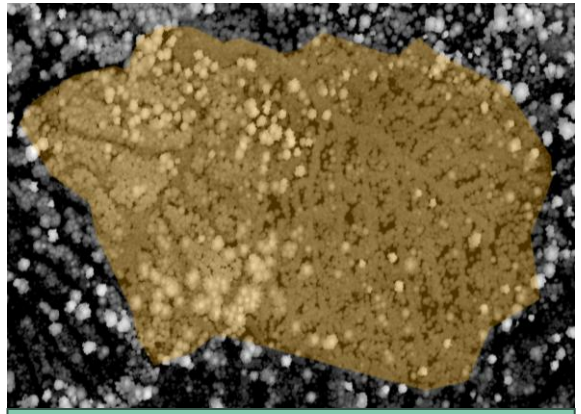
Bare Ground



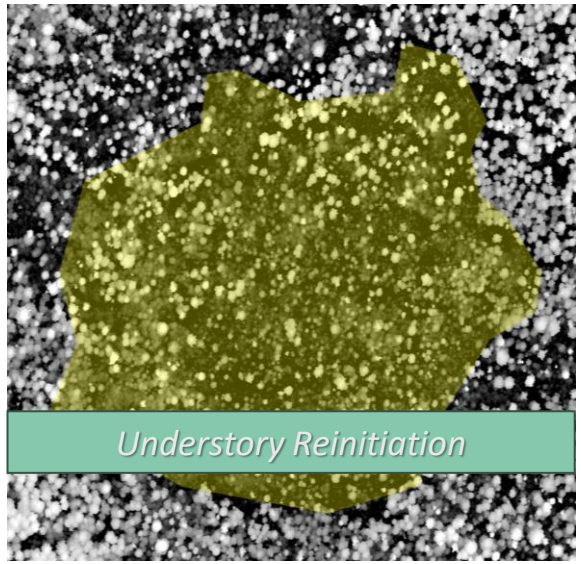
Stand Initiation



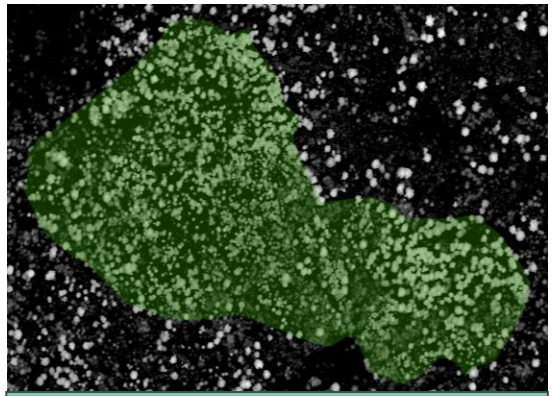
Open Stem Exclusion



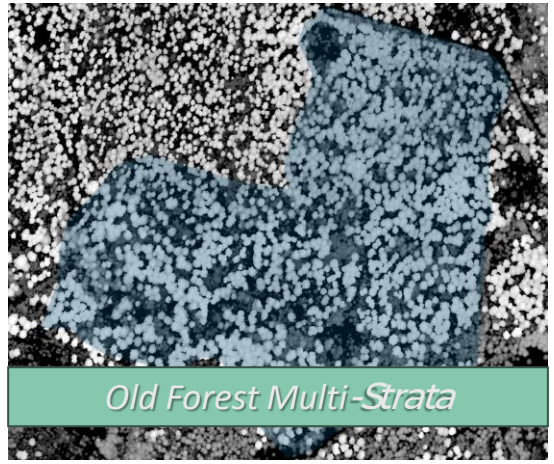
Closed Stem Exclusion



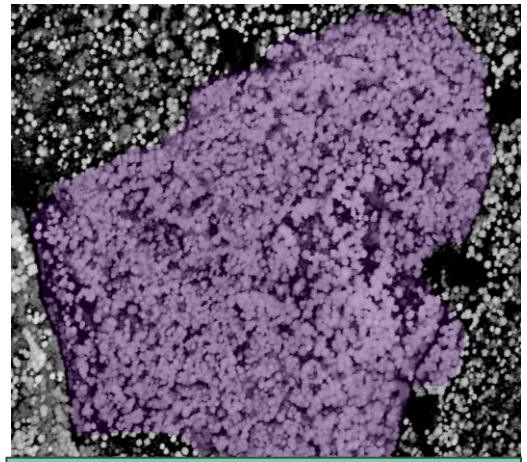
Understory Reinitiation



Young Multi-Strata

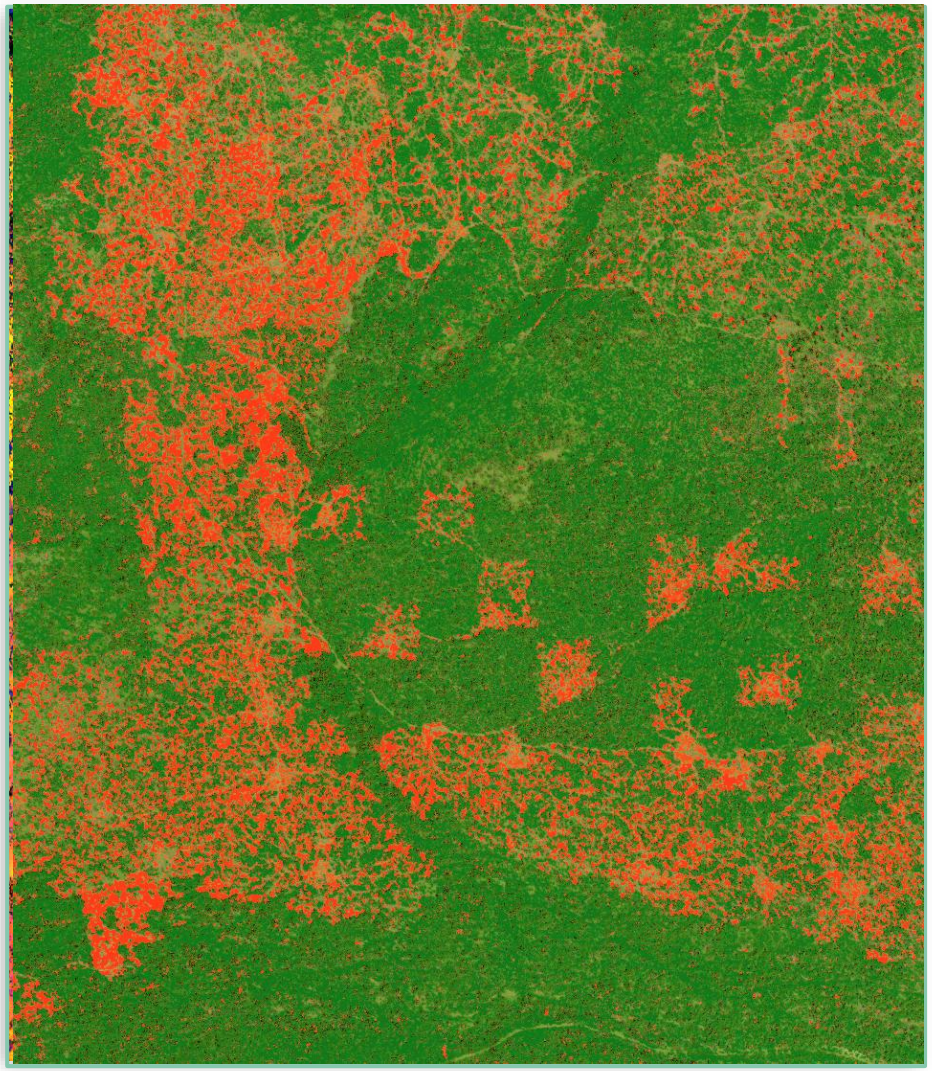


Old Forest Multi-Strata



Old Forest Single Stratum

A Living Inventory: Change Detection Over Time



2019

Baseline

- Individual-tree census established
- Stand delineation & structure mapped
- Volume & basal area by stand

2020

2nd Flight

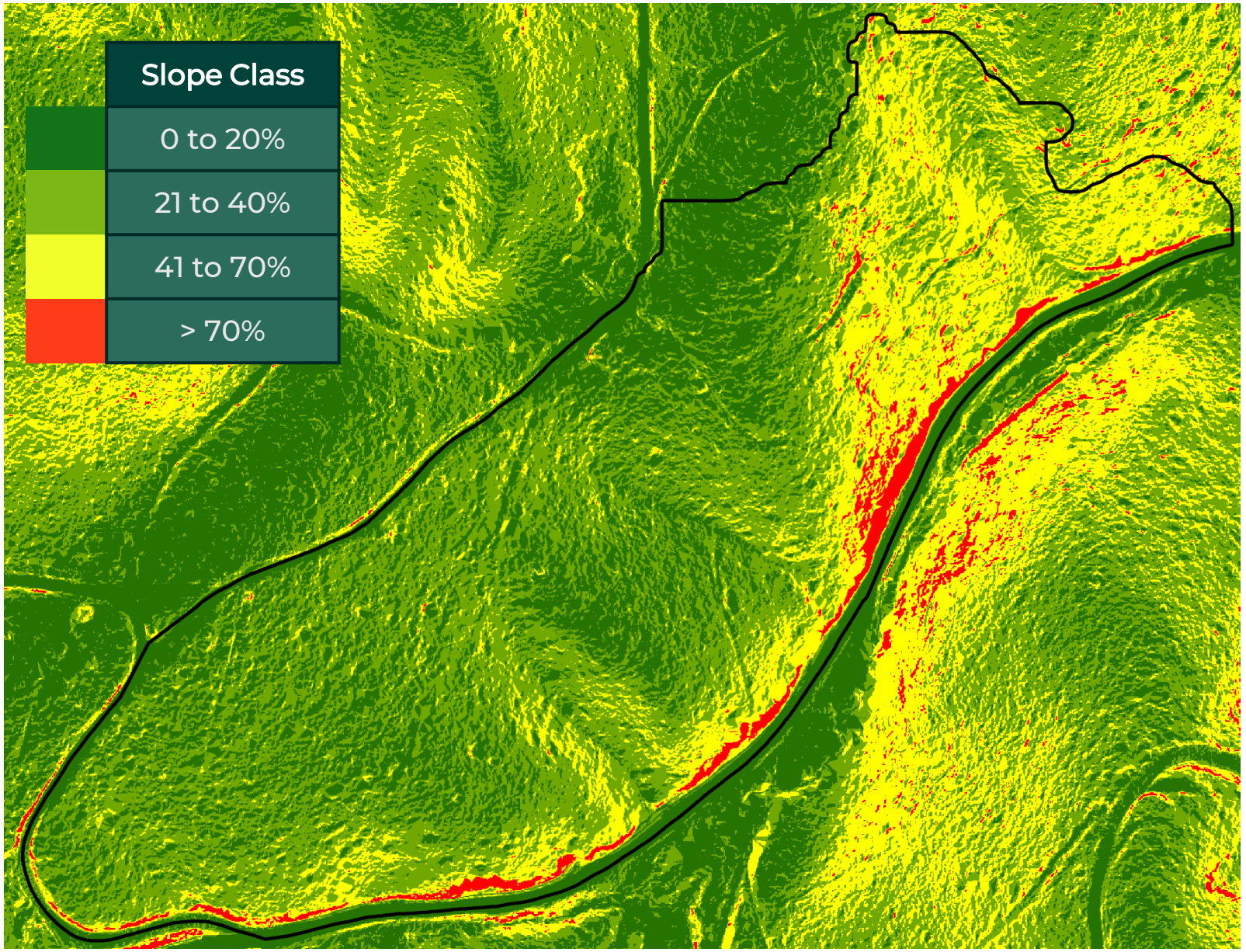
- Tree height and growth change detected per tree
- Harvest areas identified via CHM/DEM change

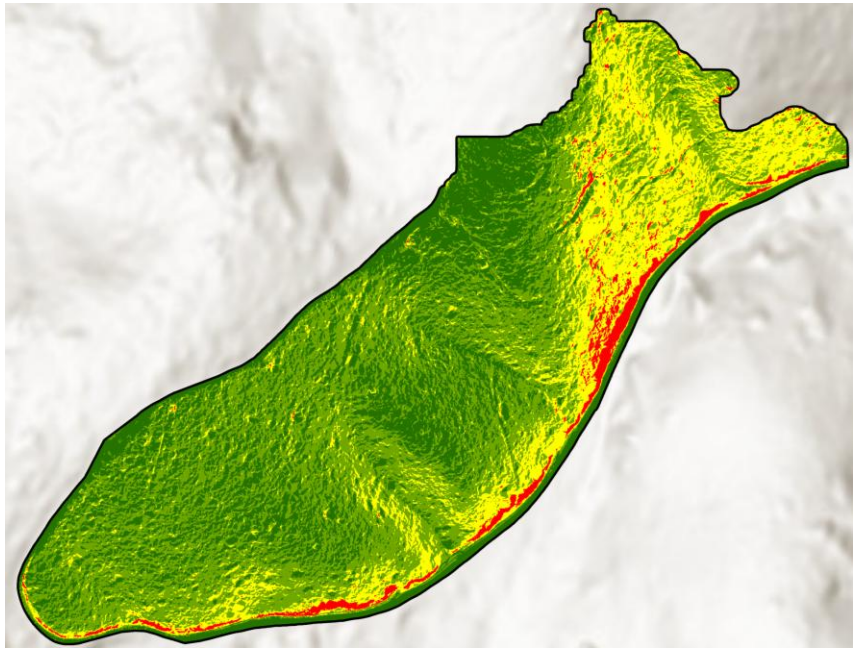
2021

3rd Flight

- 2-year growth rate confirmed
- Post-harvest residual trees assessed
- Site productivity index updated

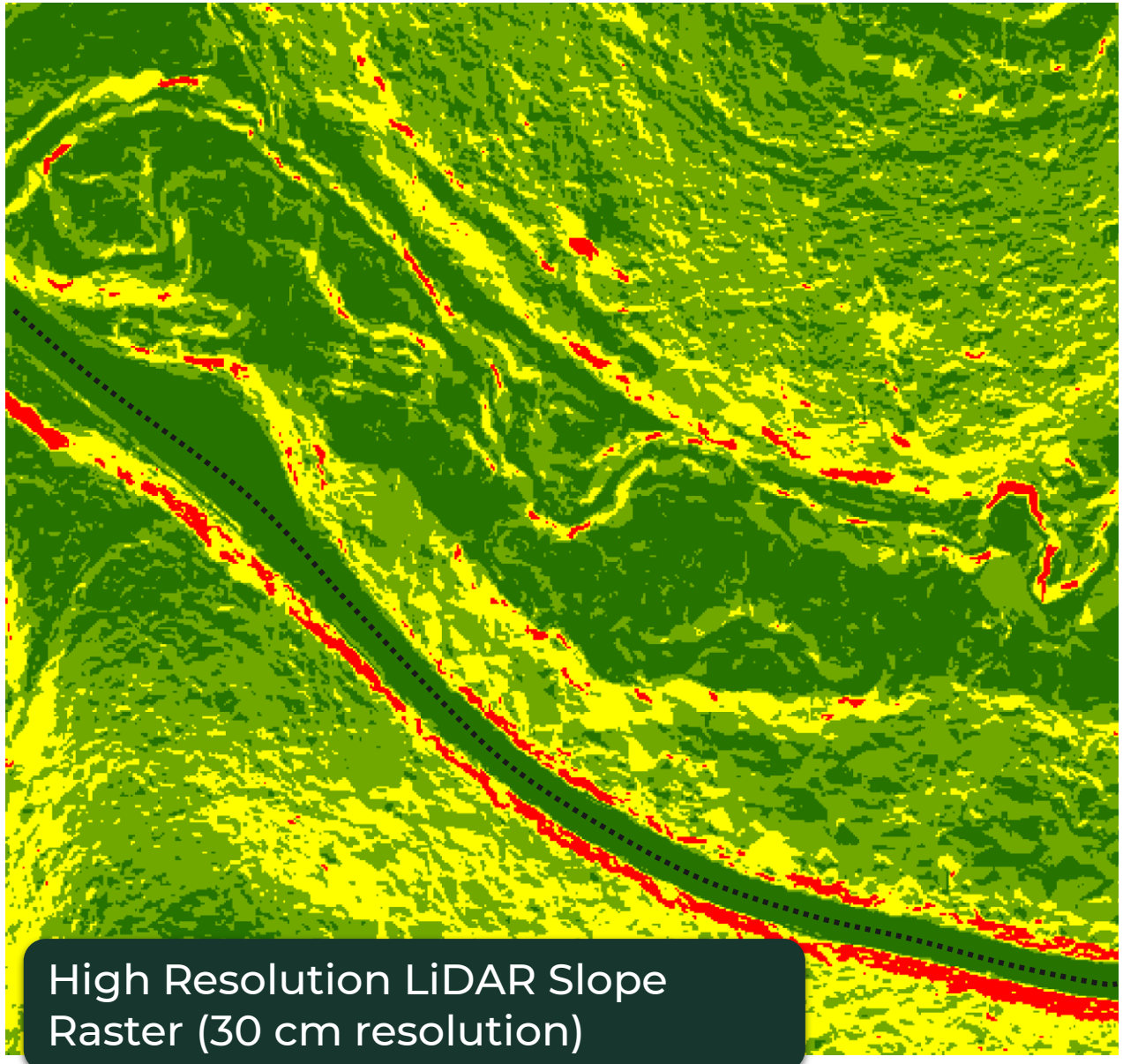
Operable Slopes Datasets

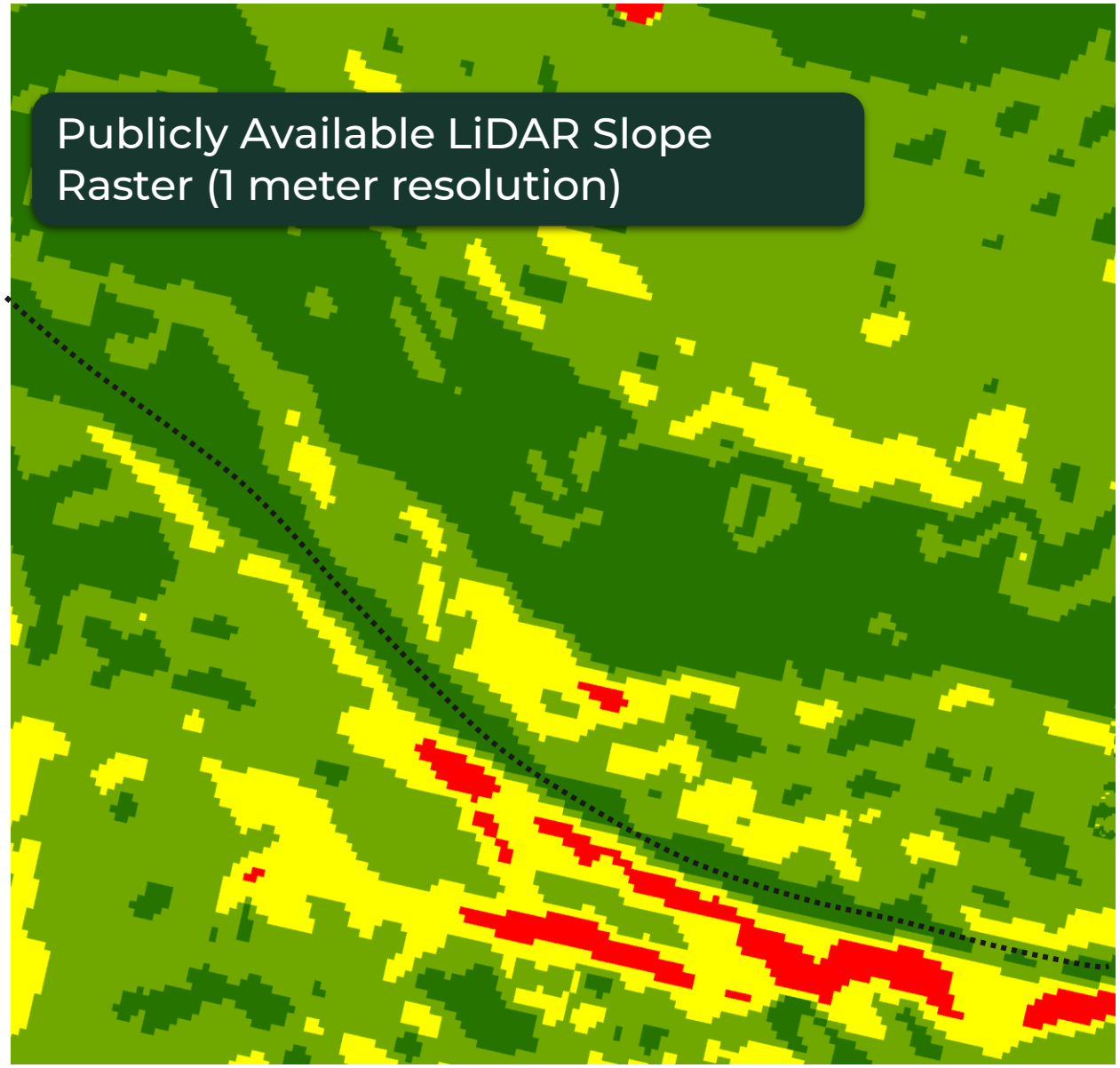




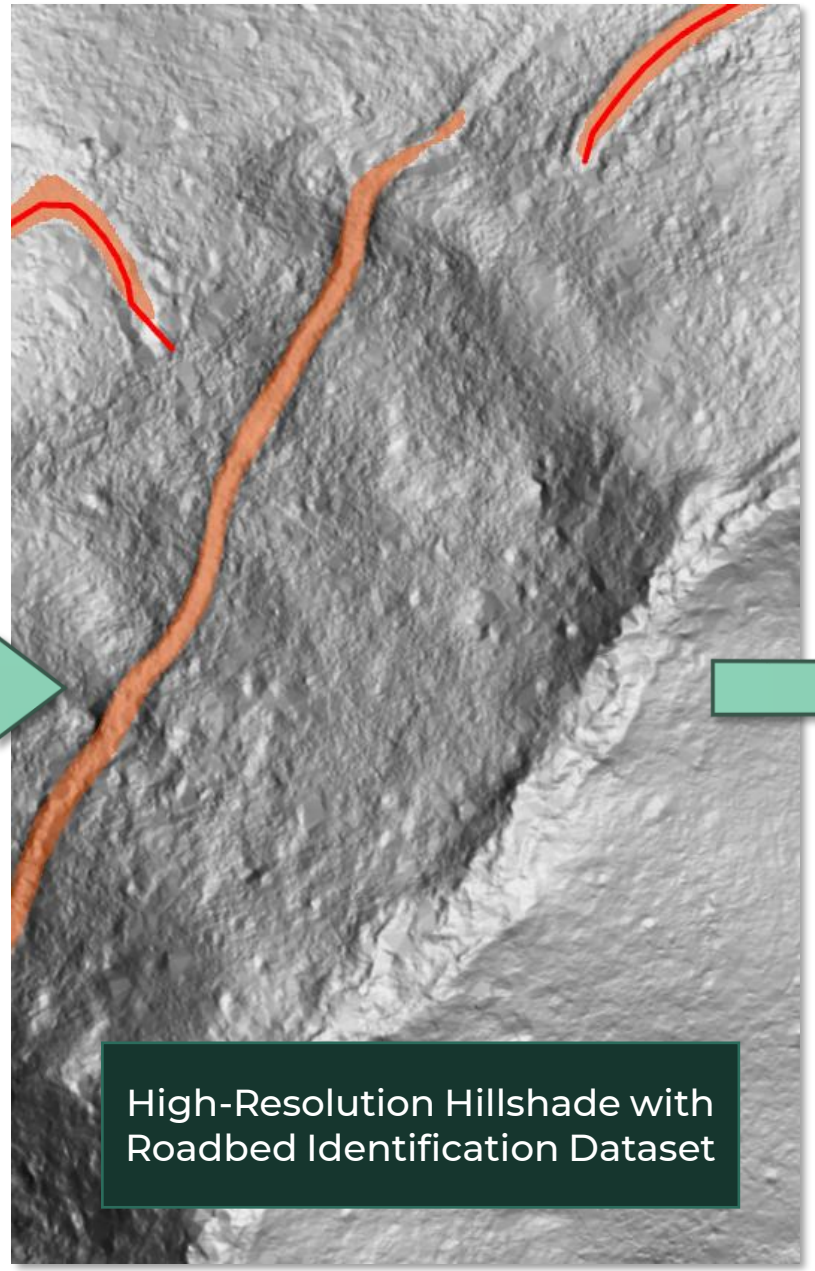
Slope Class	Acres	Class Uses
0 to 20%	3.84	Landings, Roads, Tractor Ground
21 to 40%	5.79	Tractor Ground
41 to 70%	2.61	Line or Tether Ground
> 70%	0.38	Line, Tether, Helicopter or Inaccessible

Operable Slopes: Resolution Comparison

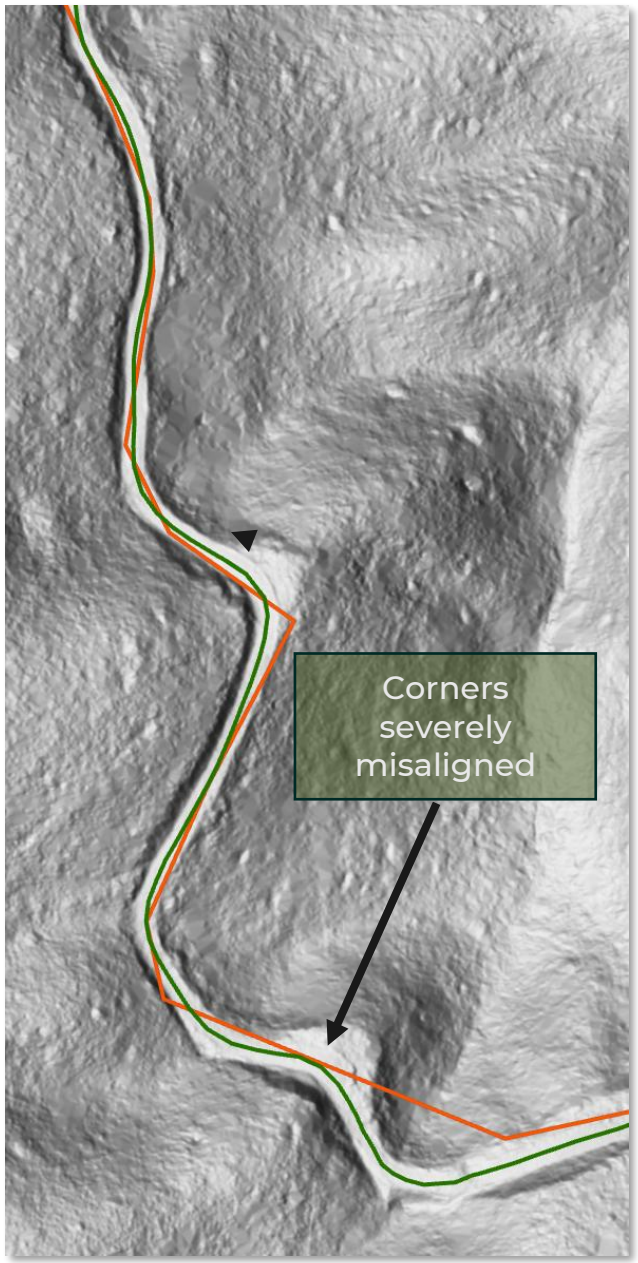


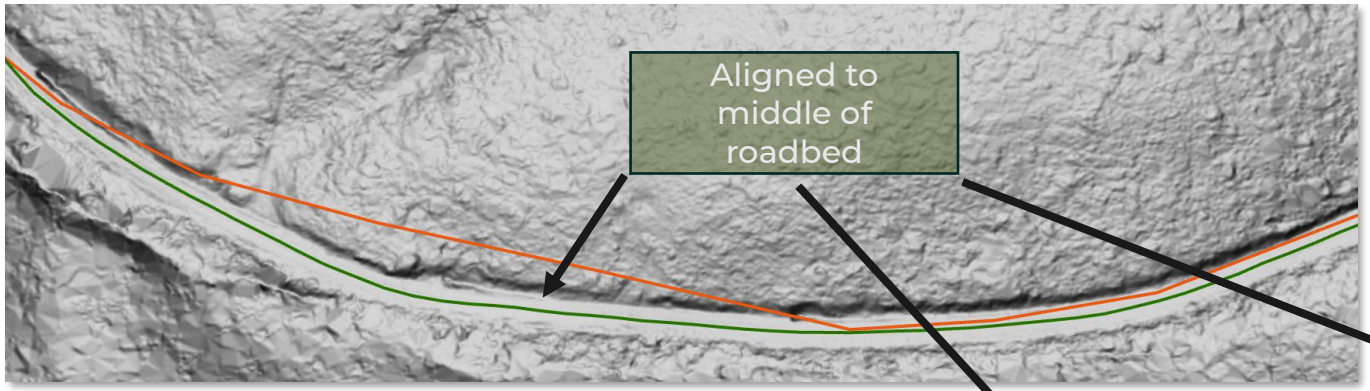


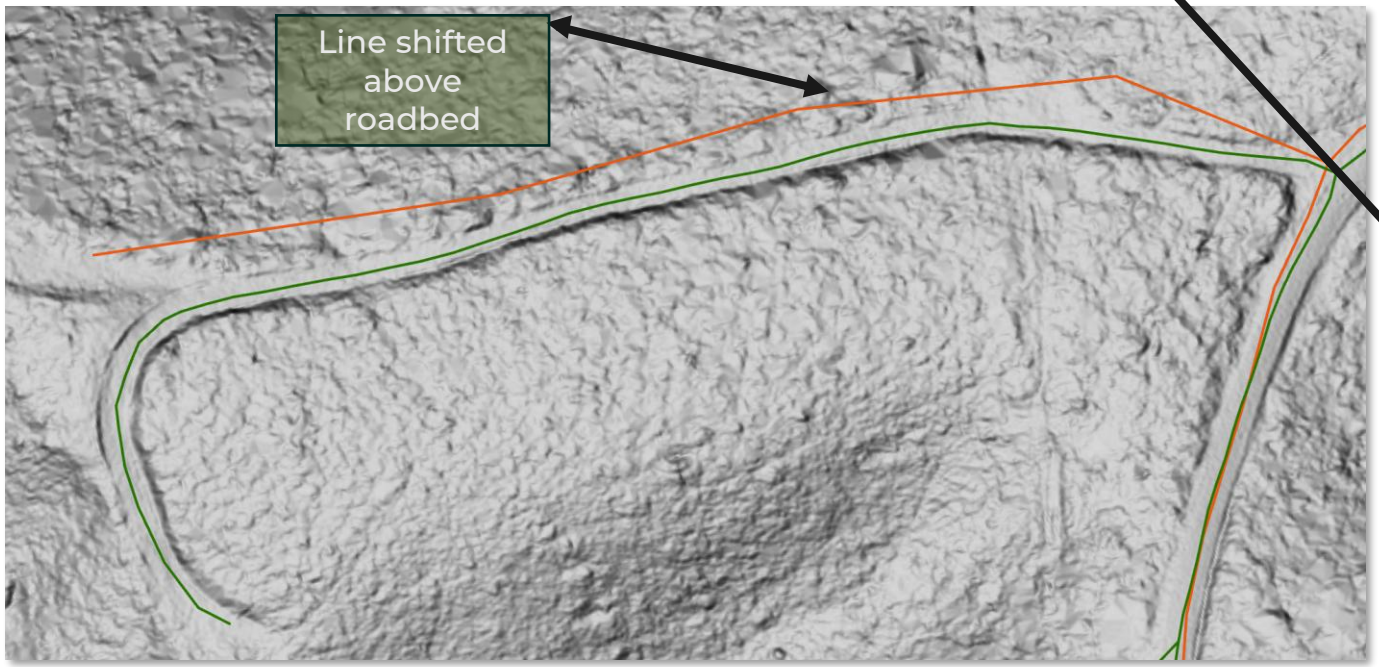
Roadbed Extraction with High-Resolution LiDAR

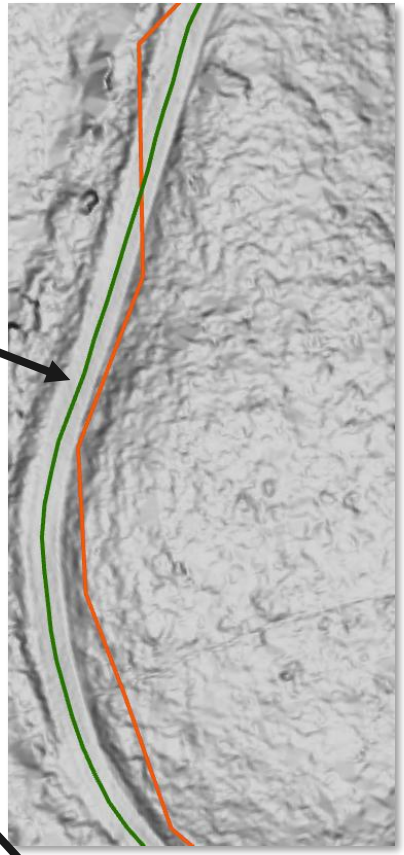


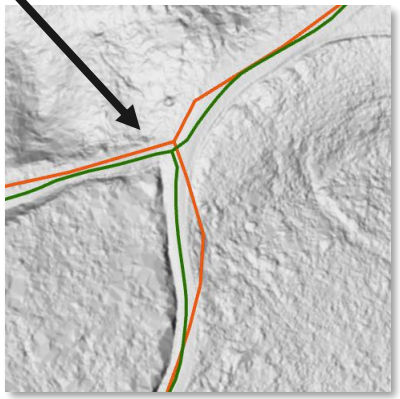
Roads Alignment Comparison



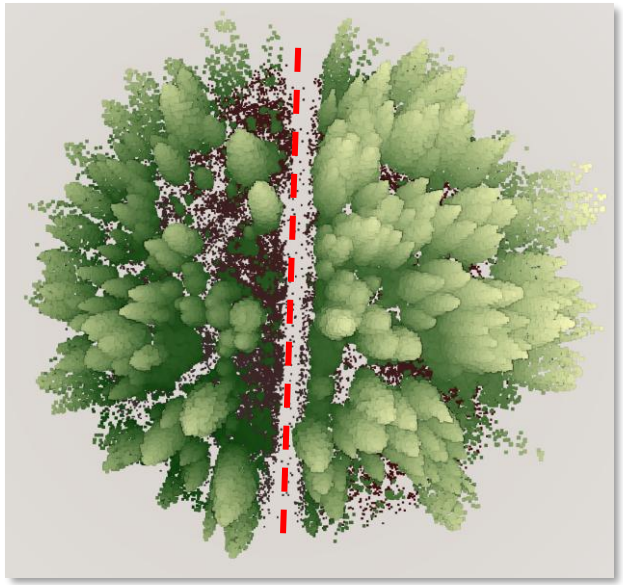


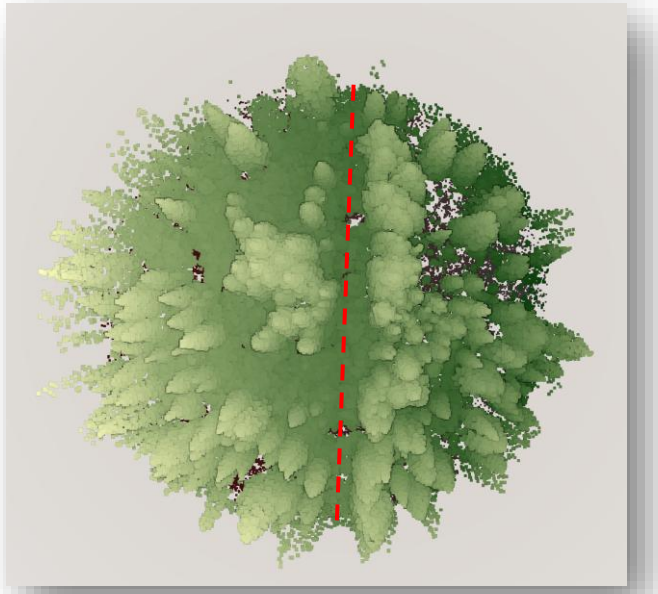


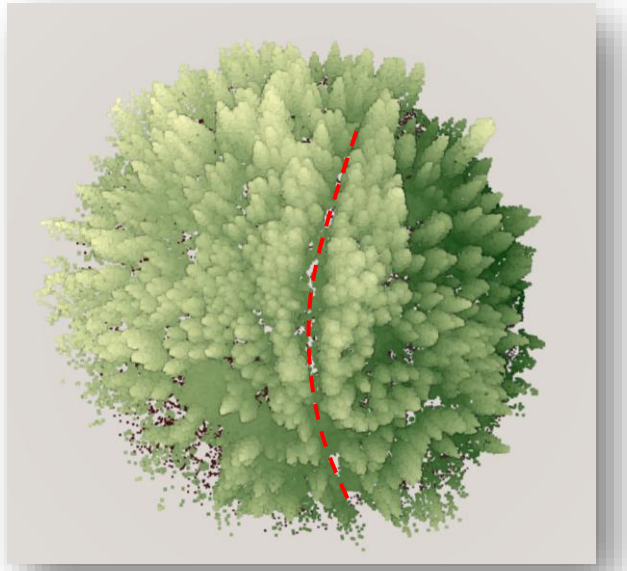


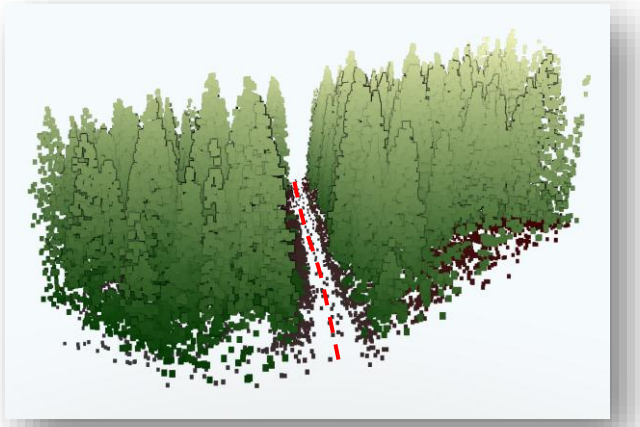


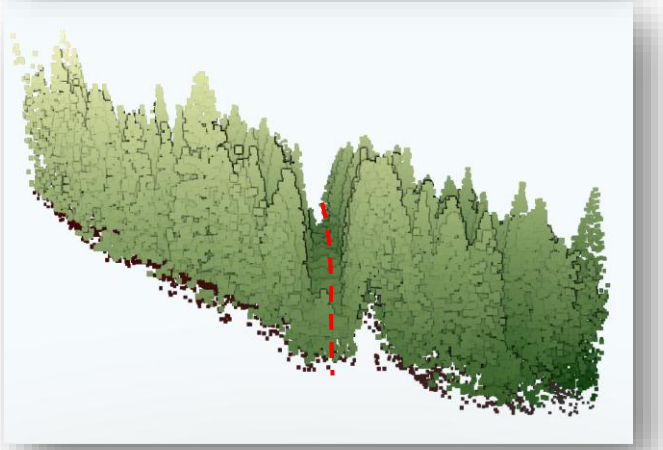
Evaluating Vegetation Density

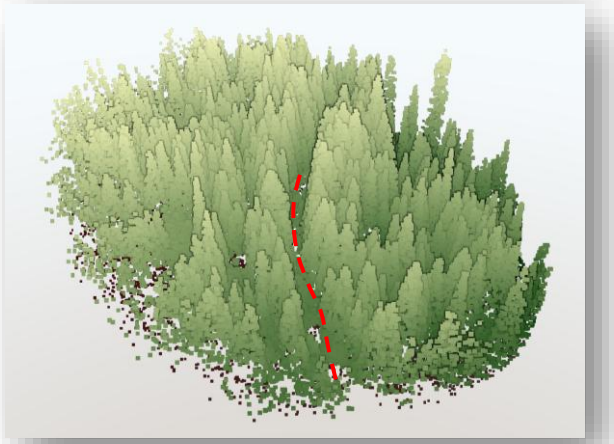




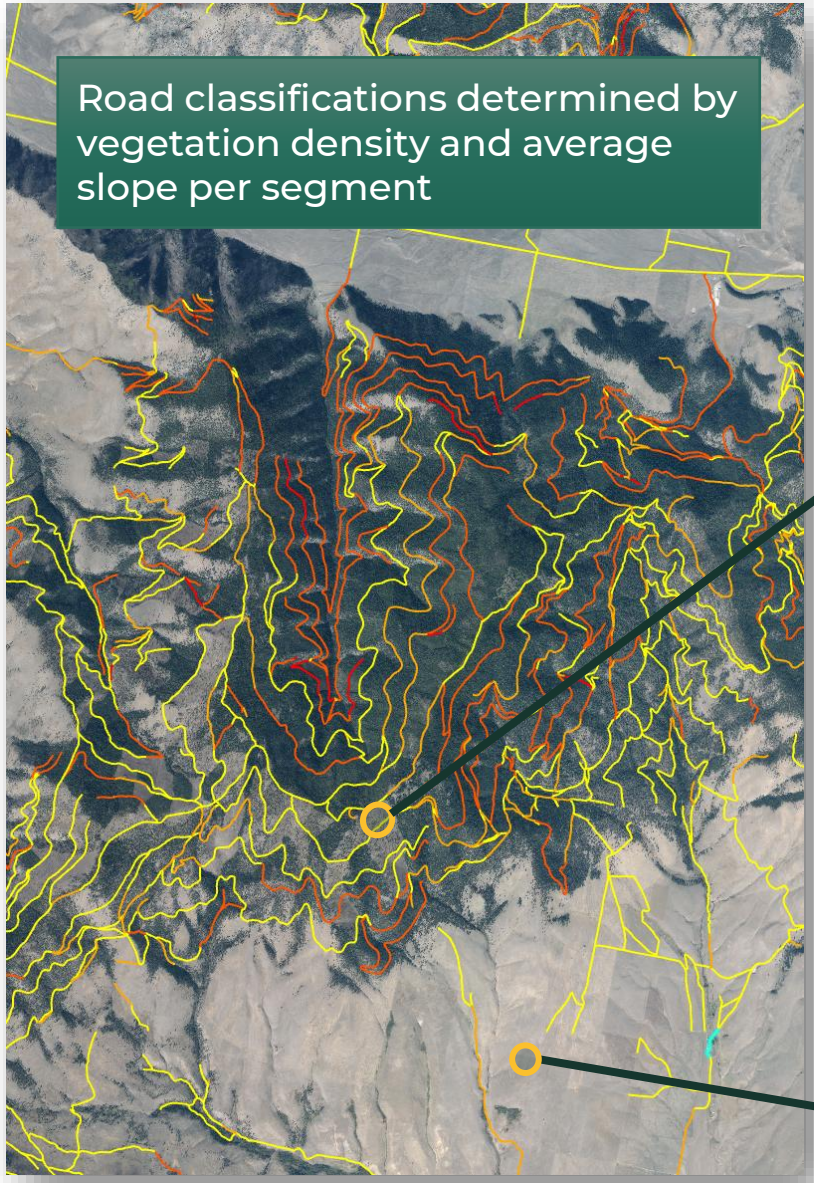


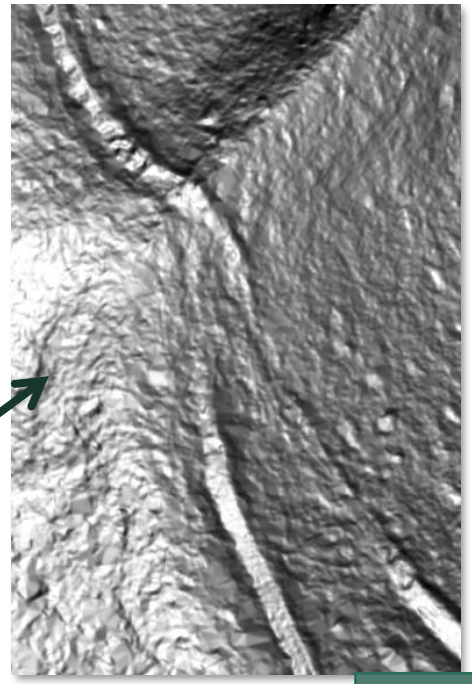


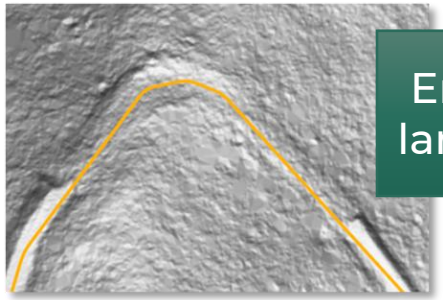




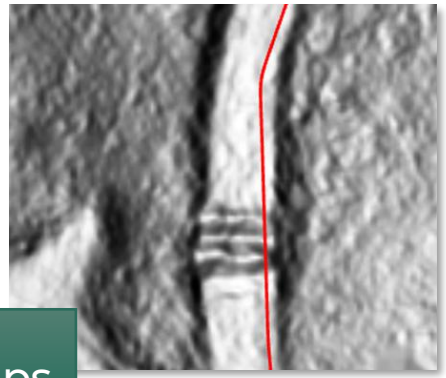
Road Classification & Identifying Obstacles



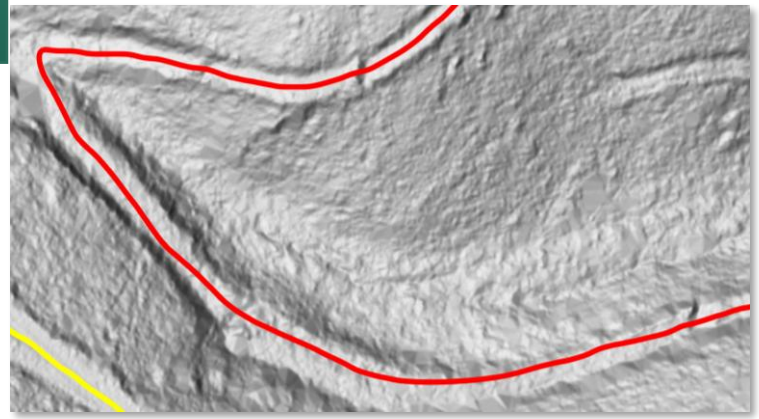




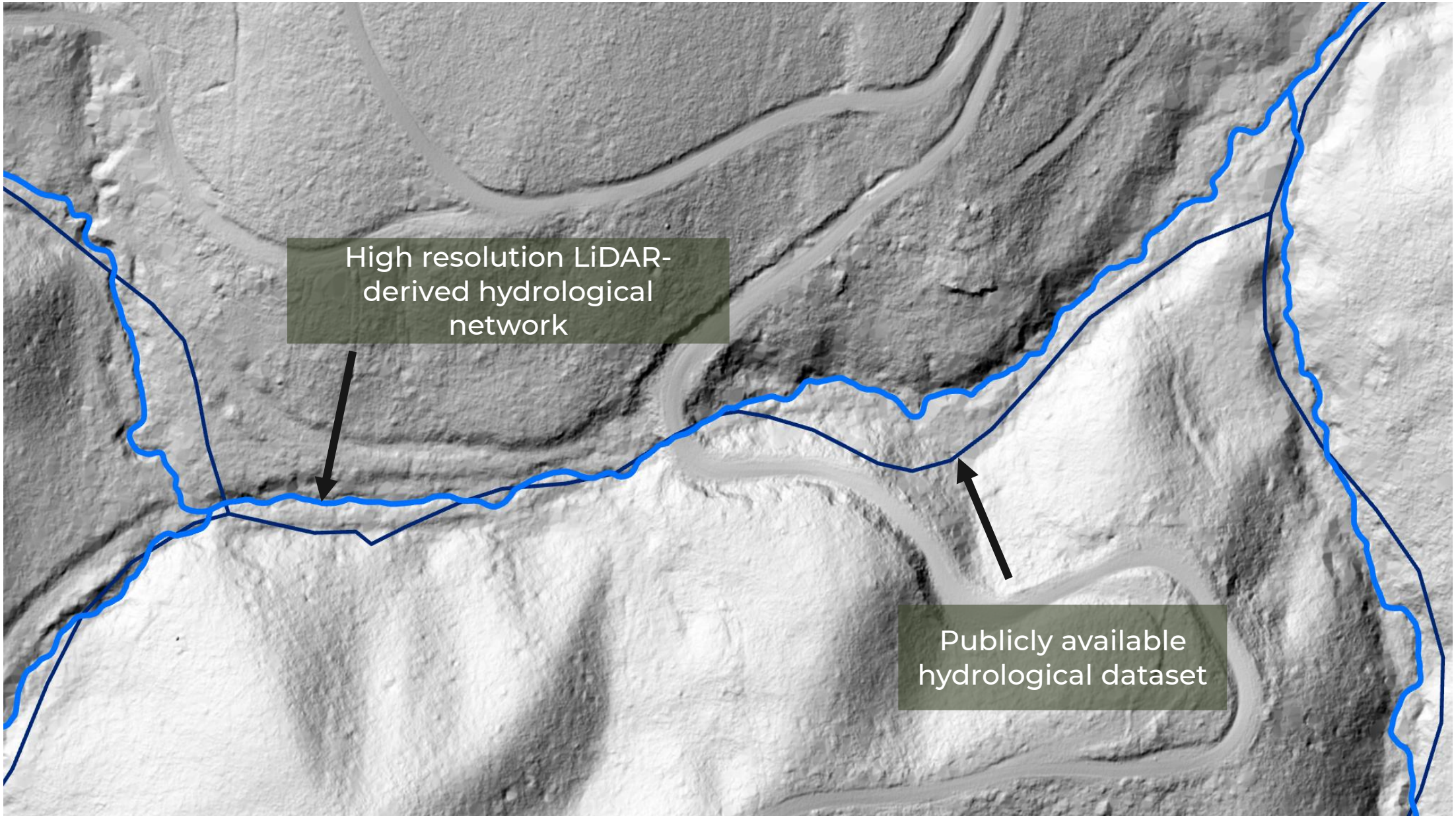
Erosion & land slides



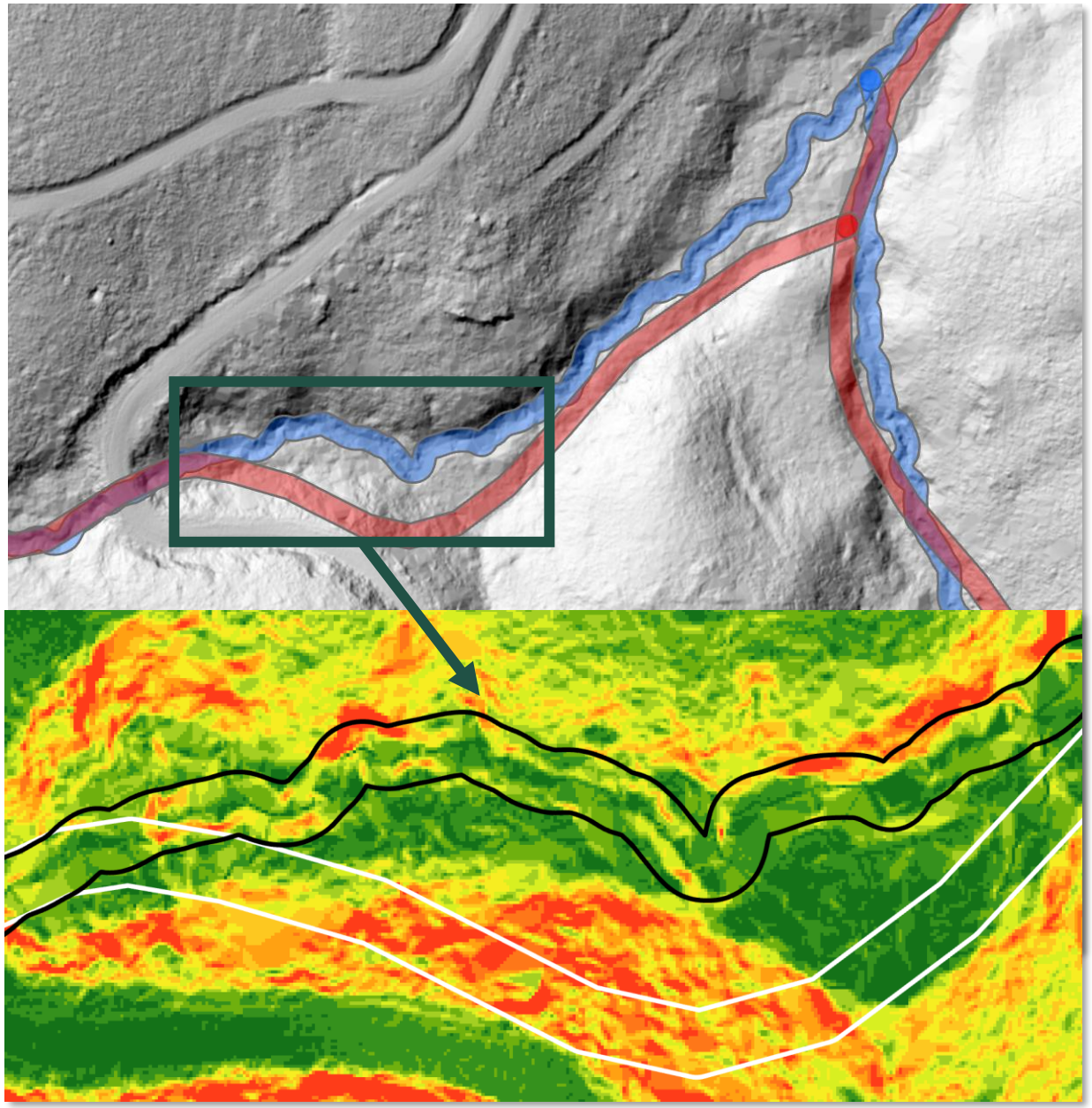
Tank traps & berms

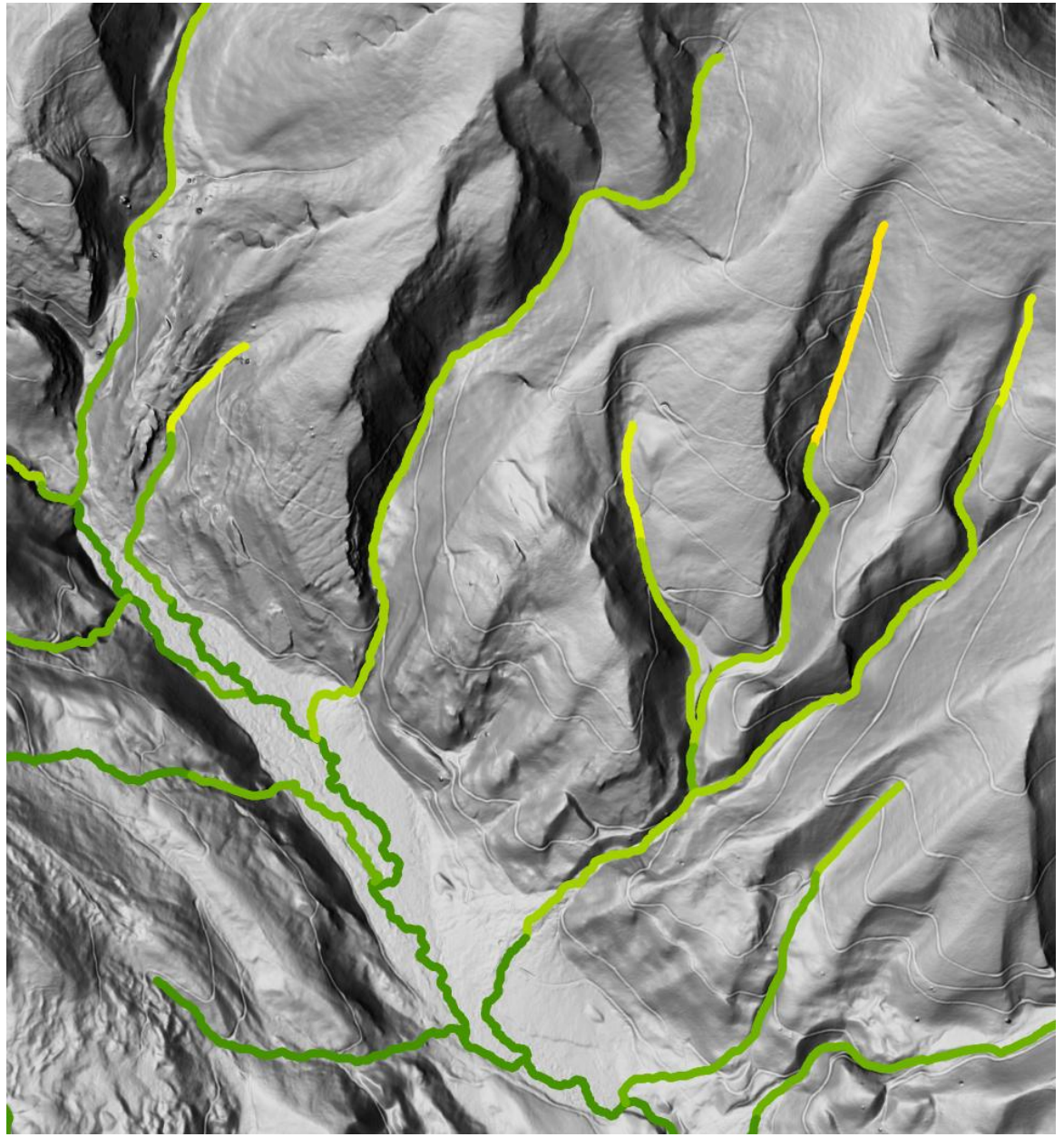


Hydrological Network Alignment Comparison

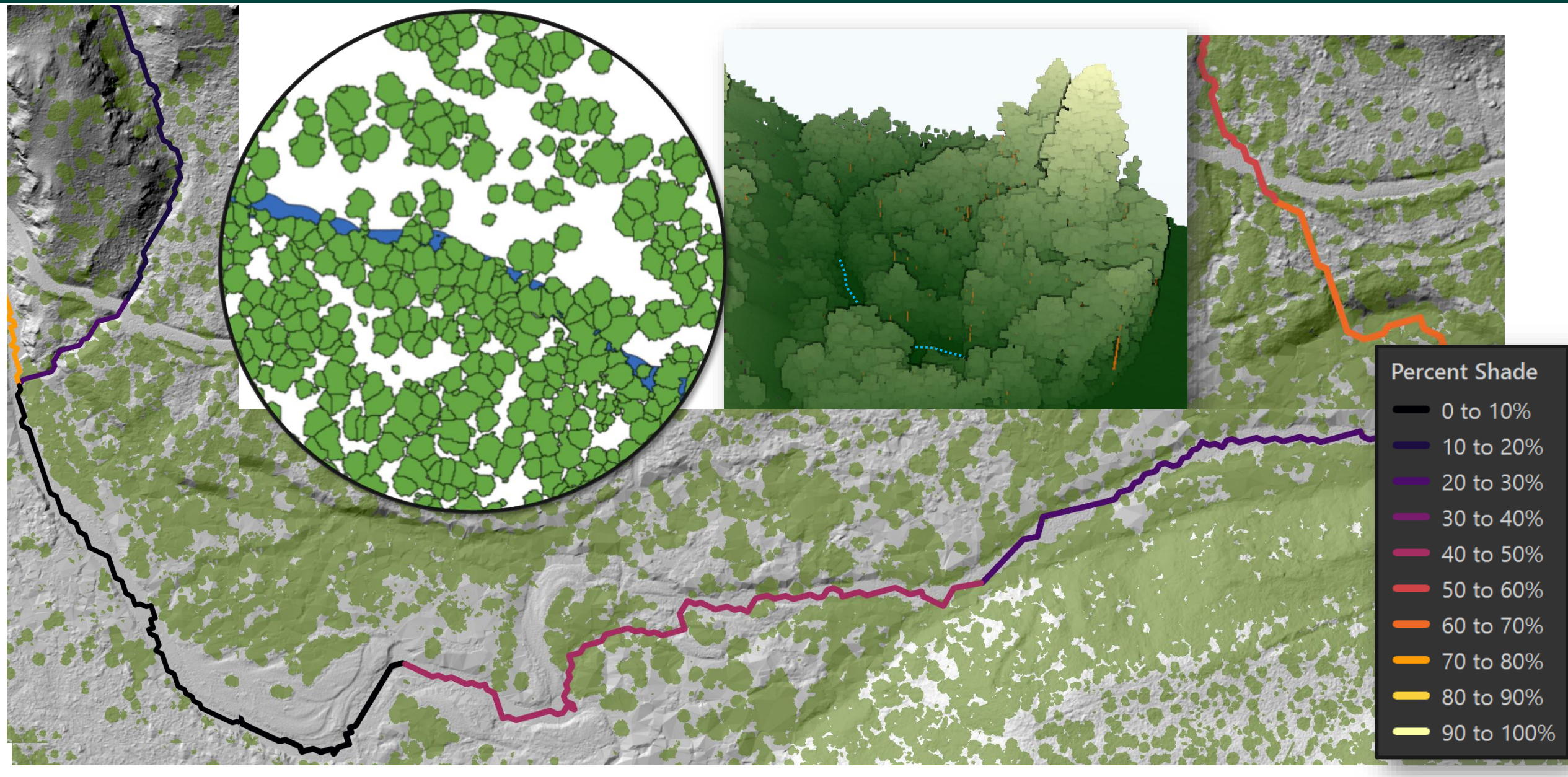


Stream Slope Analysis





Stream Shade Analysis



Acknowledgements

Forsite sincerely appreciate and thank the Tribes, Industry Partners and the University of Idaho Experimental Forest, who have allowed us to share some of the results of their respective LiDAR Inventory Projects. In respect of these clients and their natural resources information; no specific management units or geographic locations are identified.


The Possibilities Are Endless...?
Questions? Let's chat!