

TECHNOLOGIES THAT ARE MAKING US MORE EFFICIENT

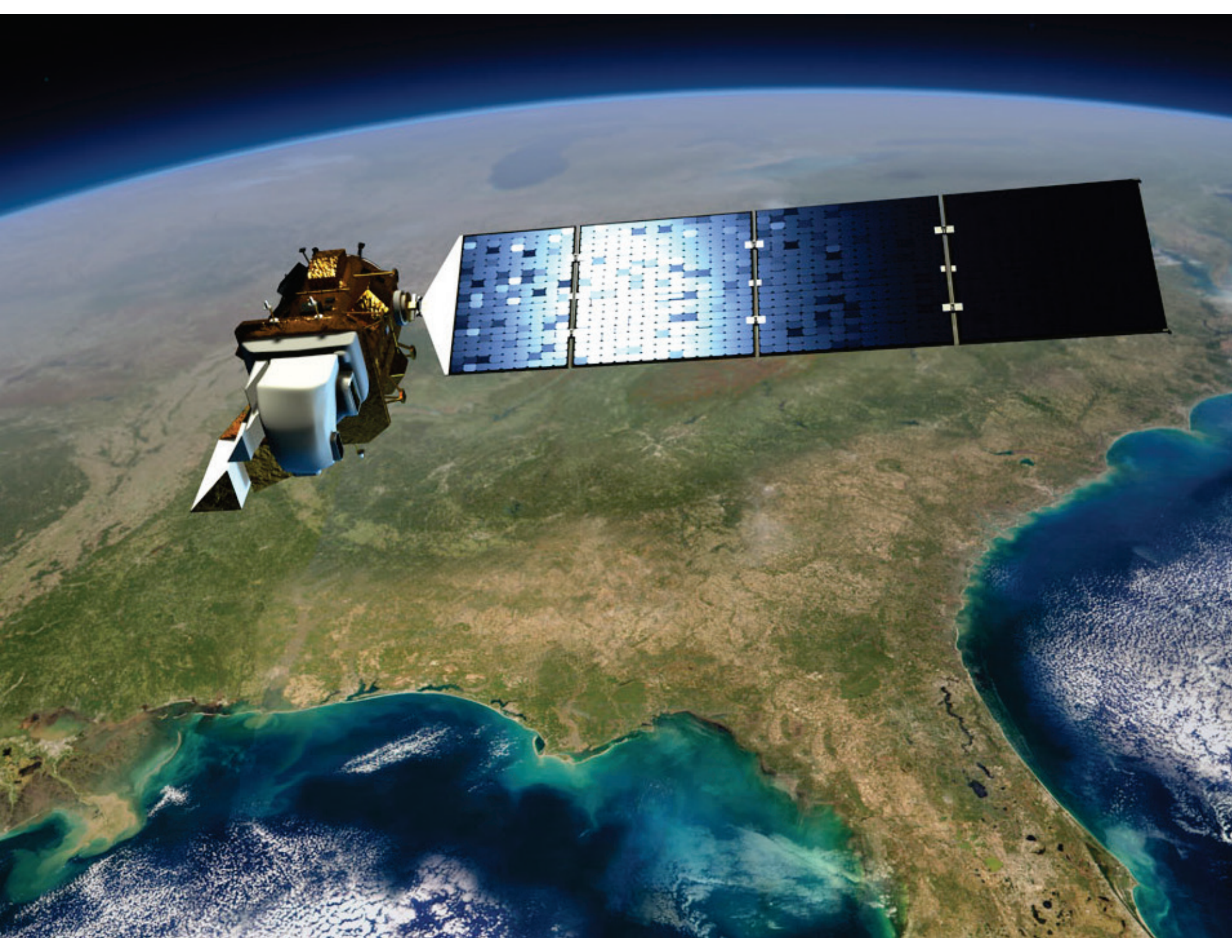
Randolph H. Wynne
Virginia Tech

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WWW.ANDERTOONS.COM

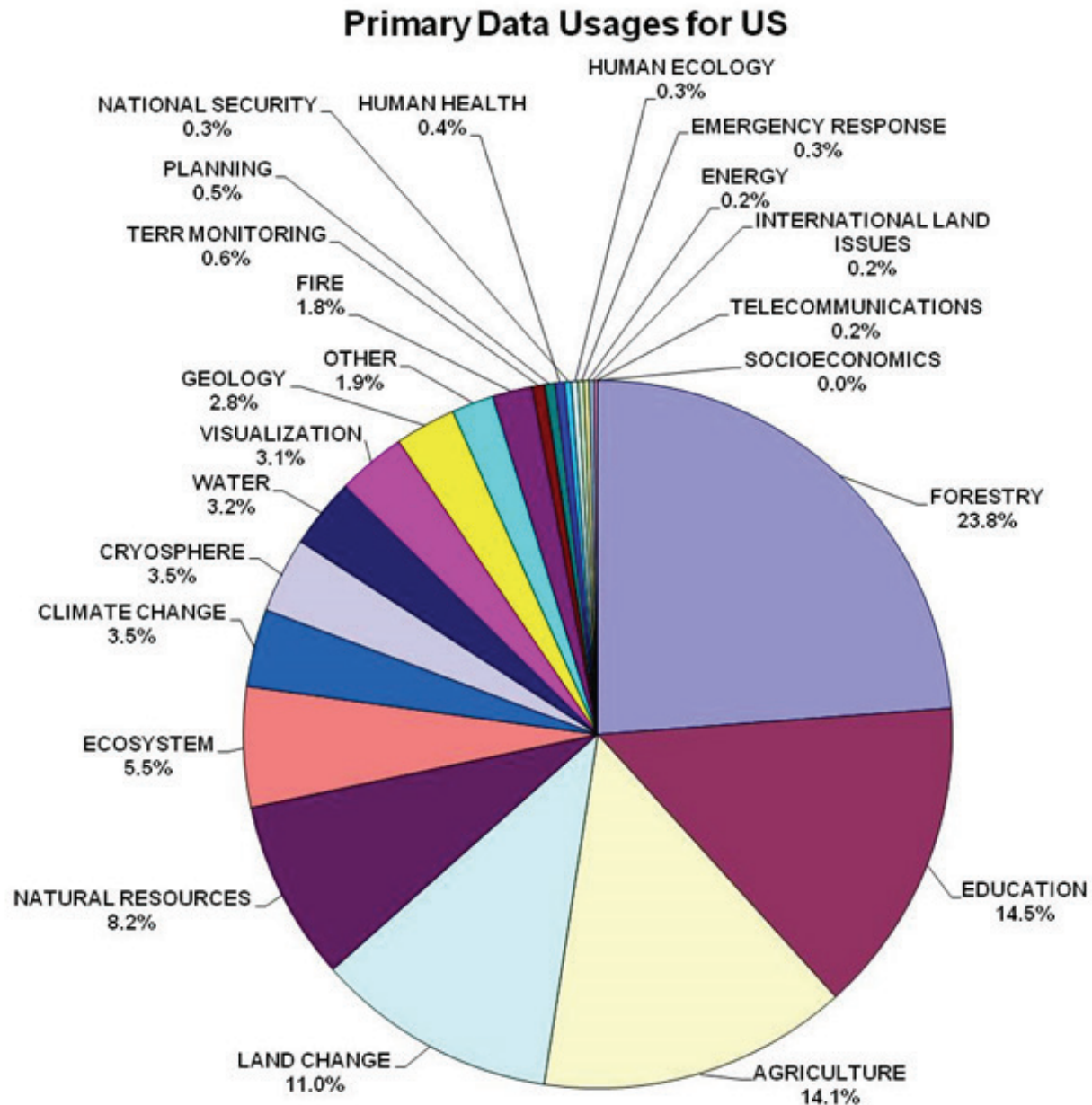


"I liked it better before big data and metadata when we just had good old regular data."





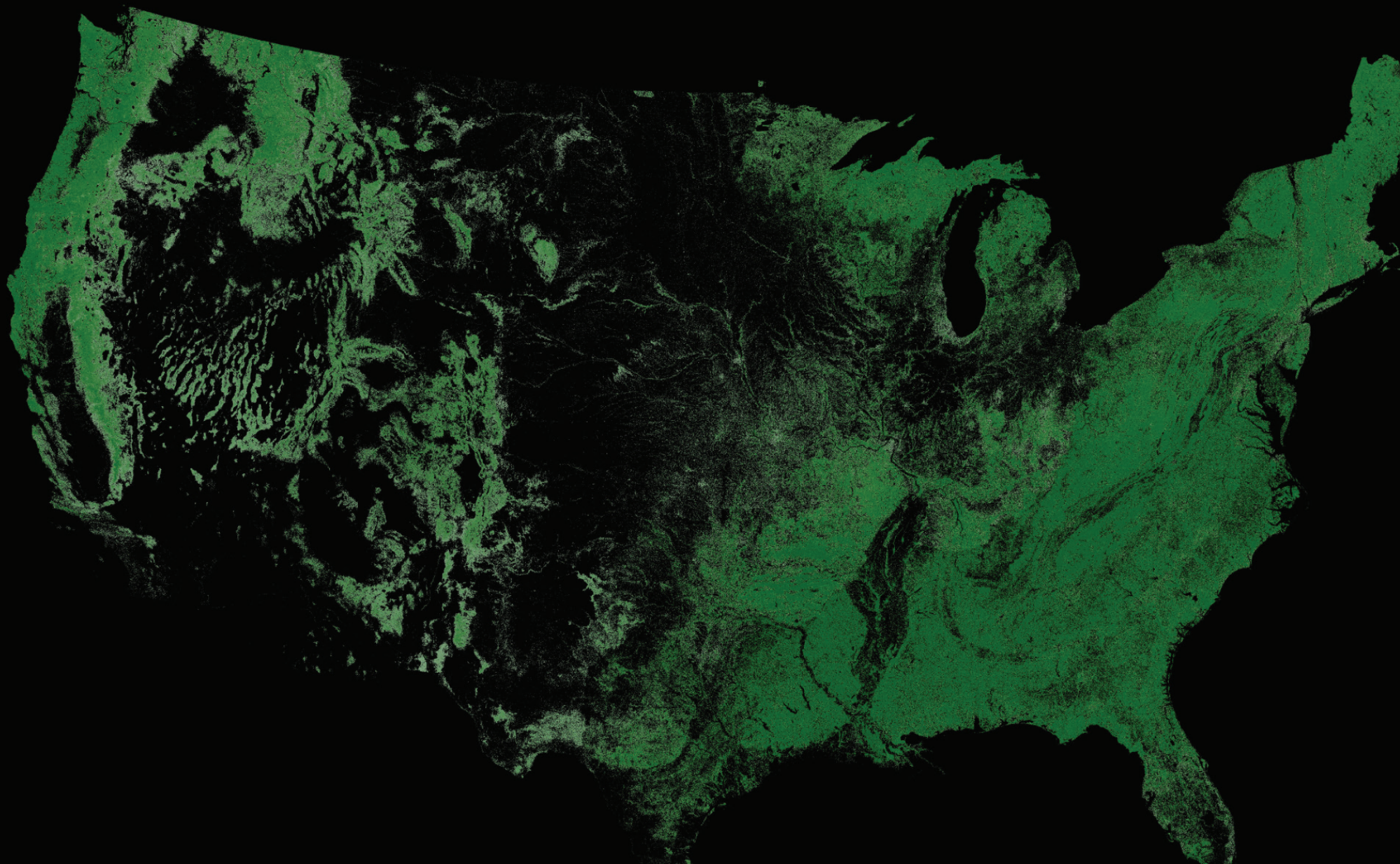
Forestry is the largest self-reported use of Landsat data in the United States



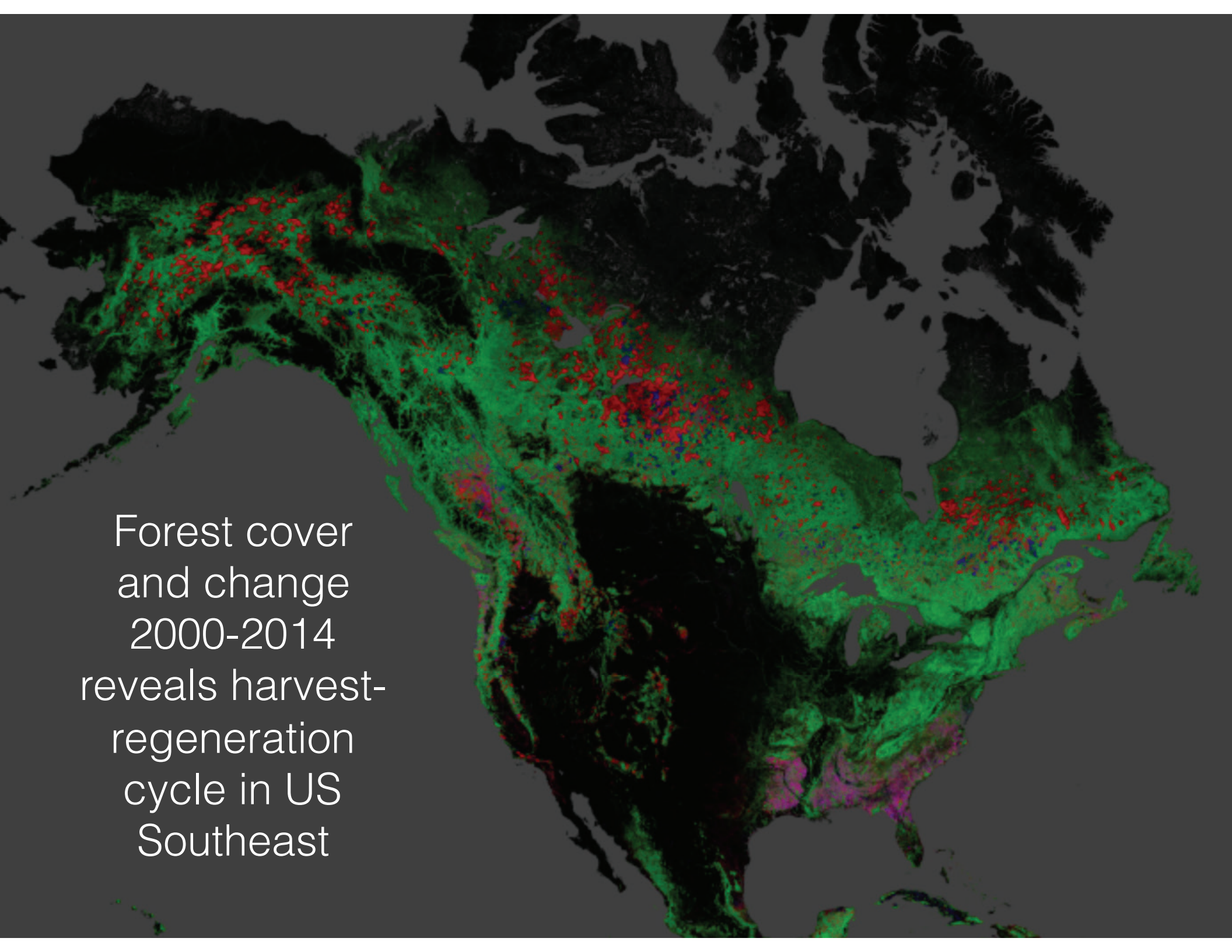
Forest cover by taxonomic group every five years

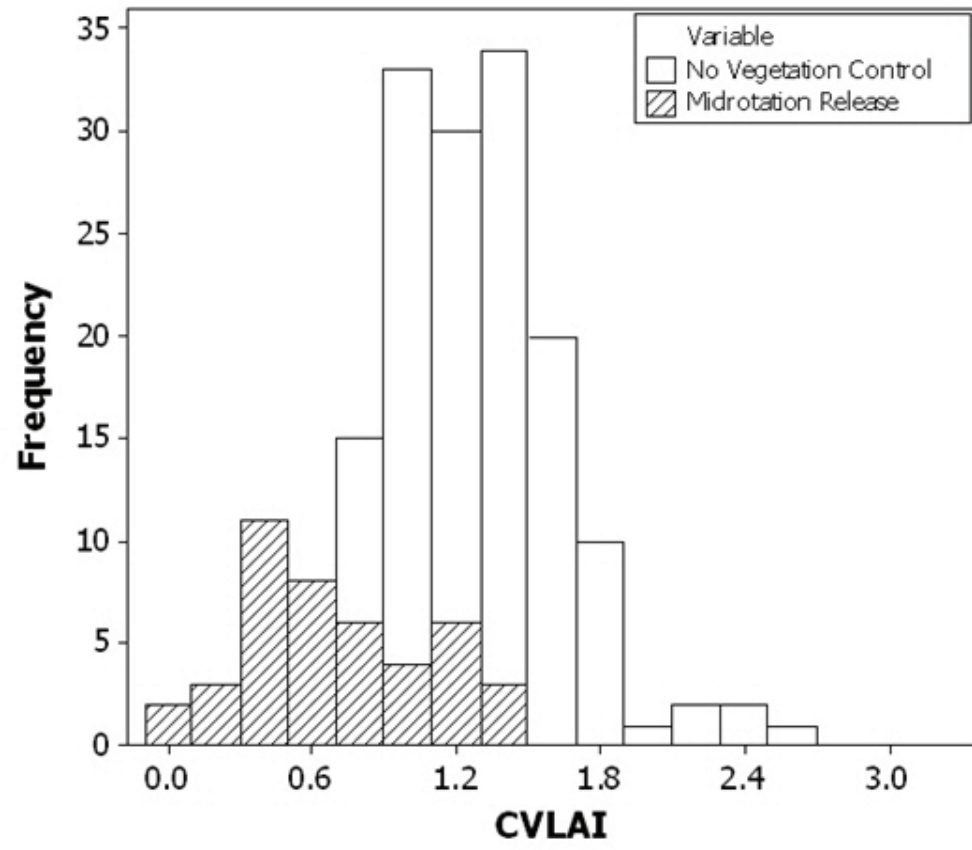
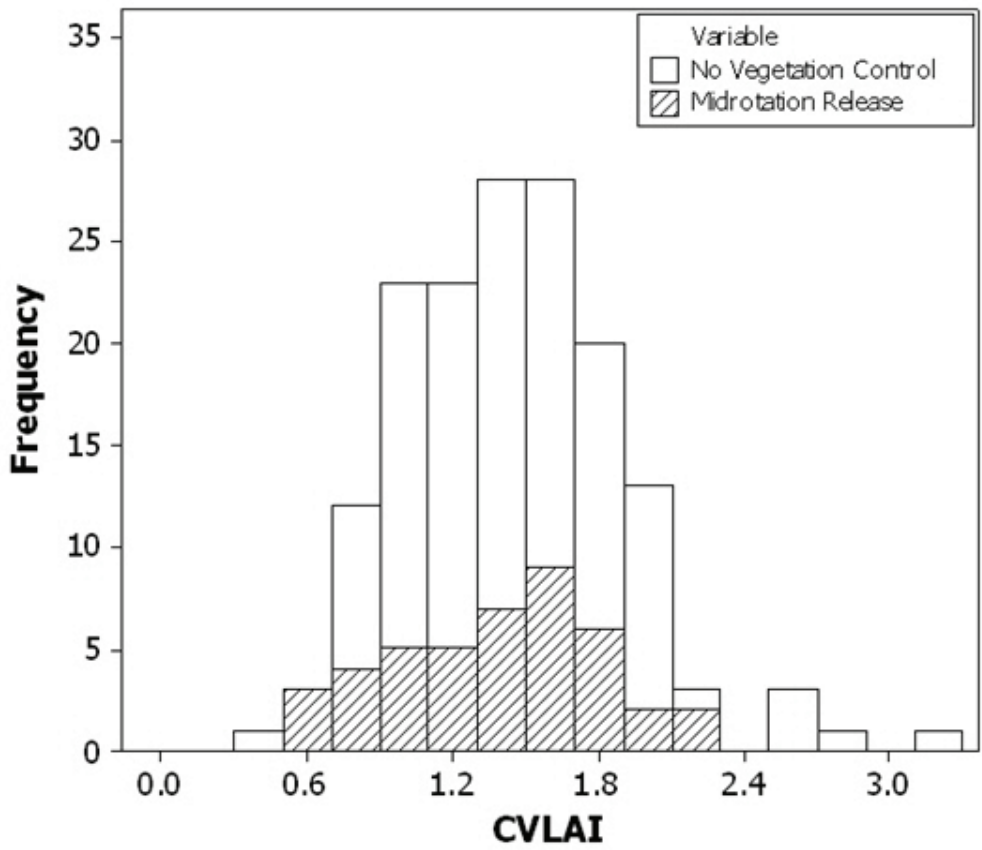


Percent tree canopy cover every 30 x 30 m



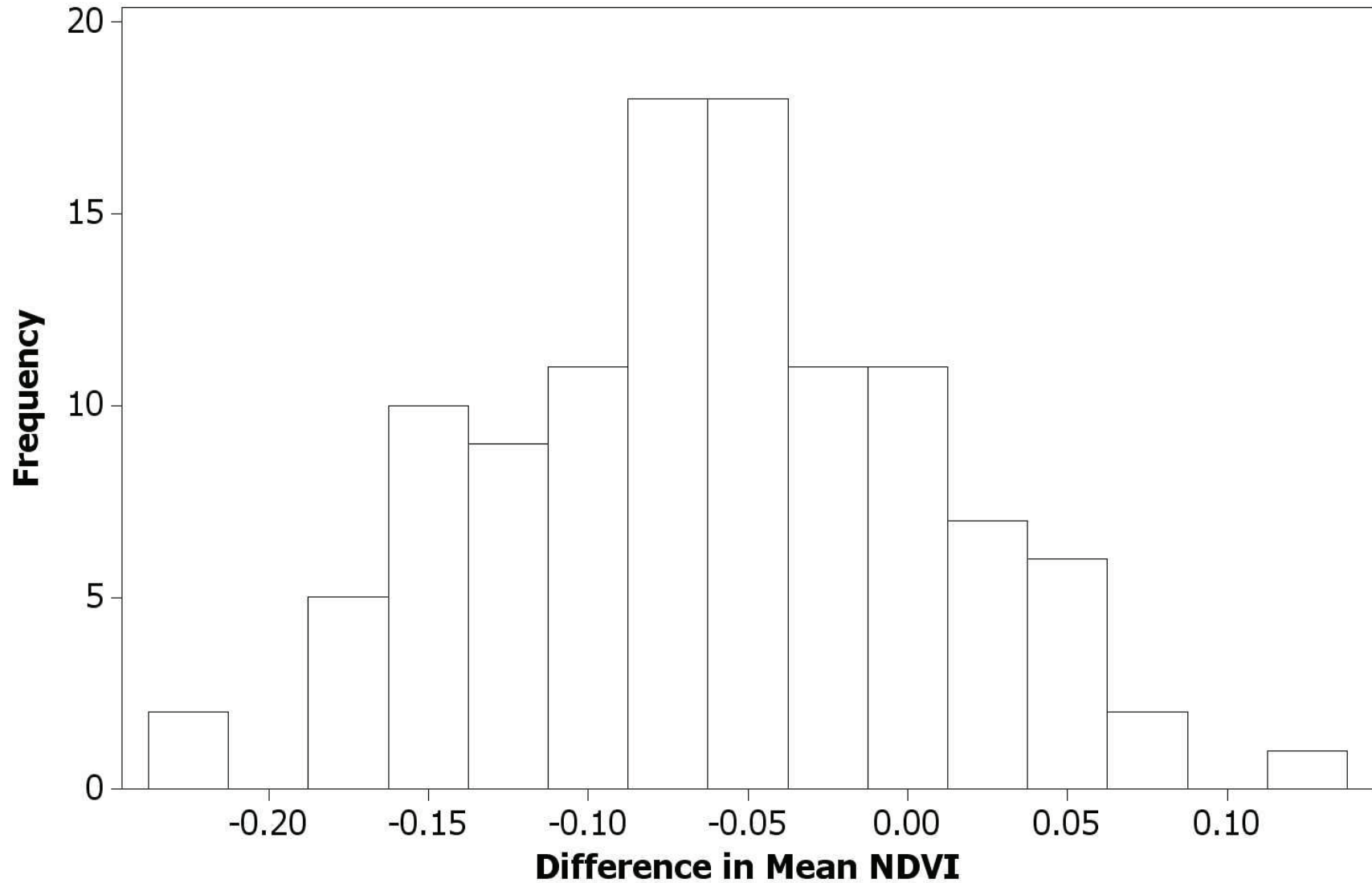
Forest cover
and change
2000-2014
reveals harvest-
regeneration
cycle in US
Southeast





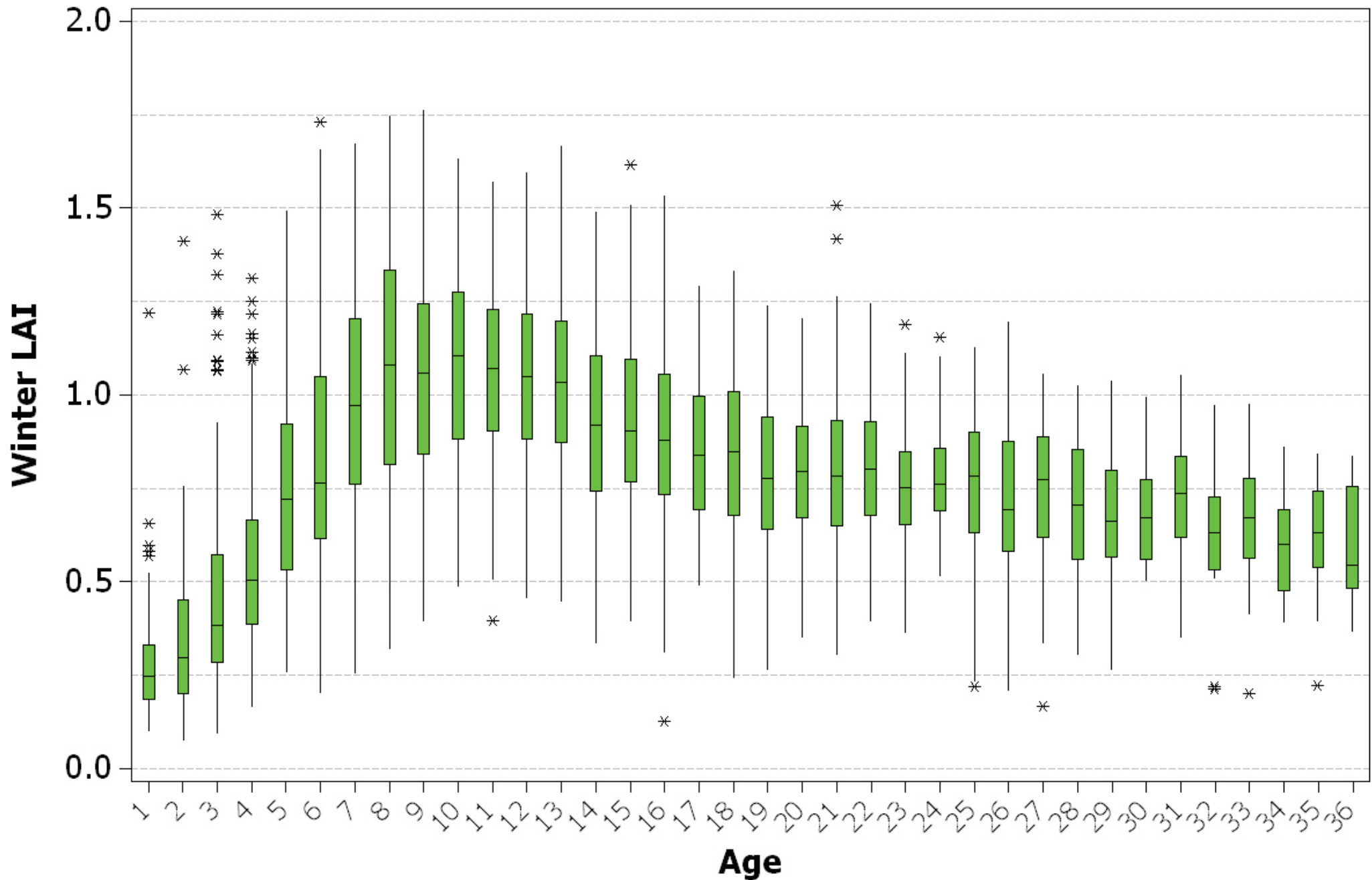
Competing Vegetation LAI Reduced After Release

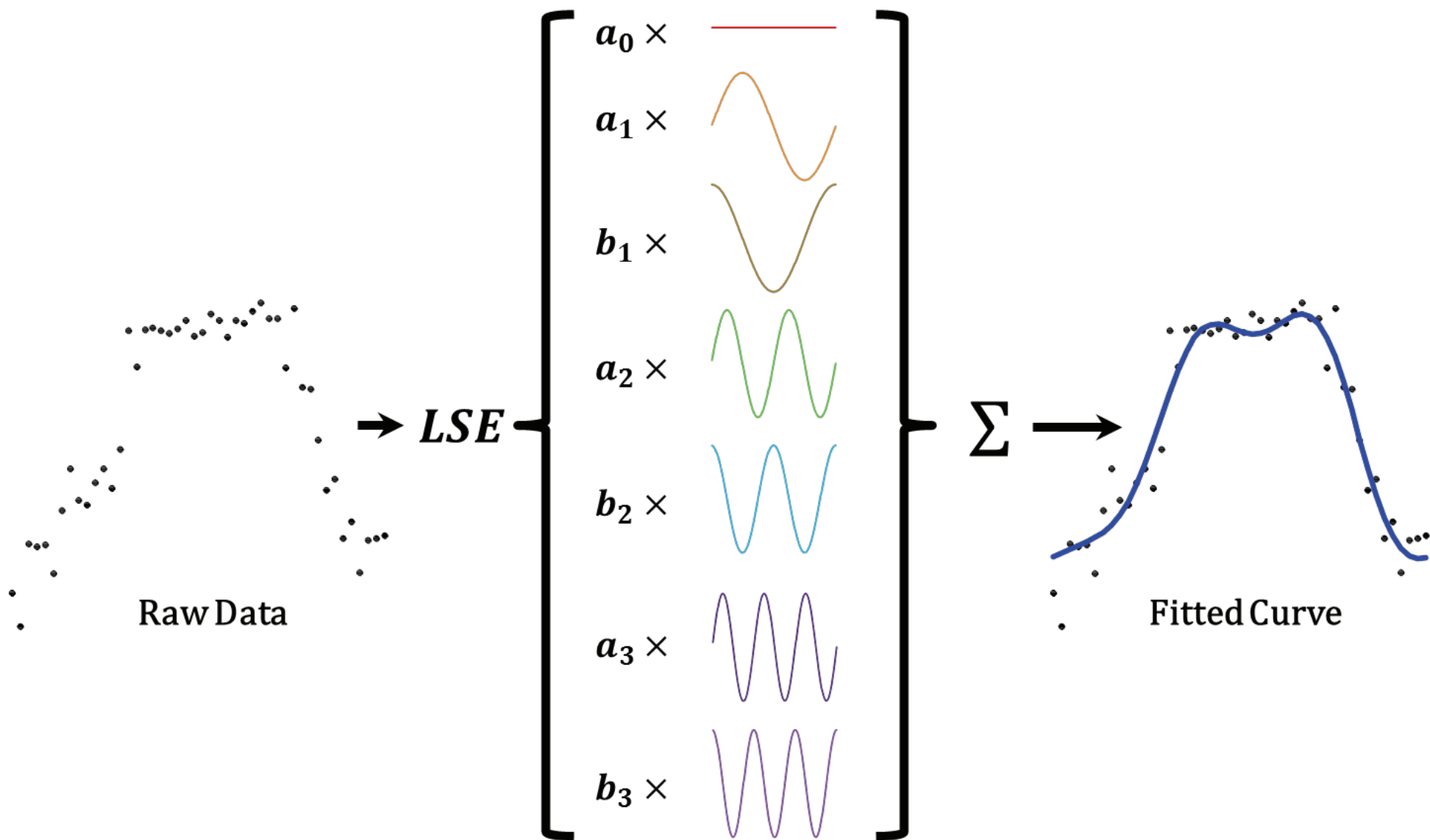
NDVI Difference One Year After Thinning



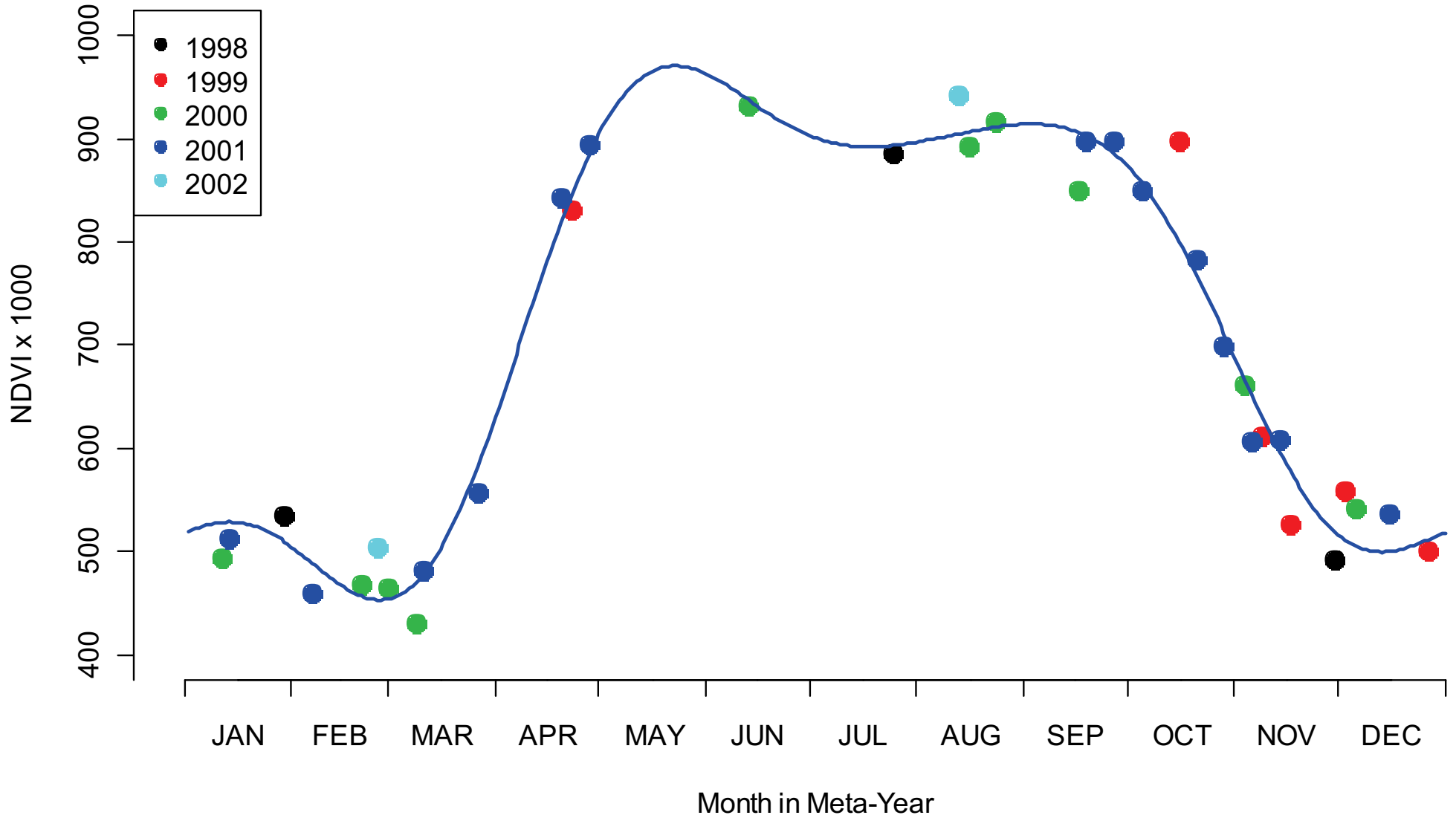
Thinning reduces leaf area, and therefore NDVI

Self-thinning reductions in LAI with age across Alabama

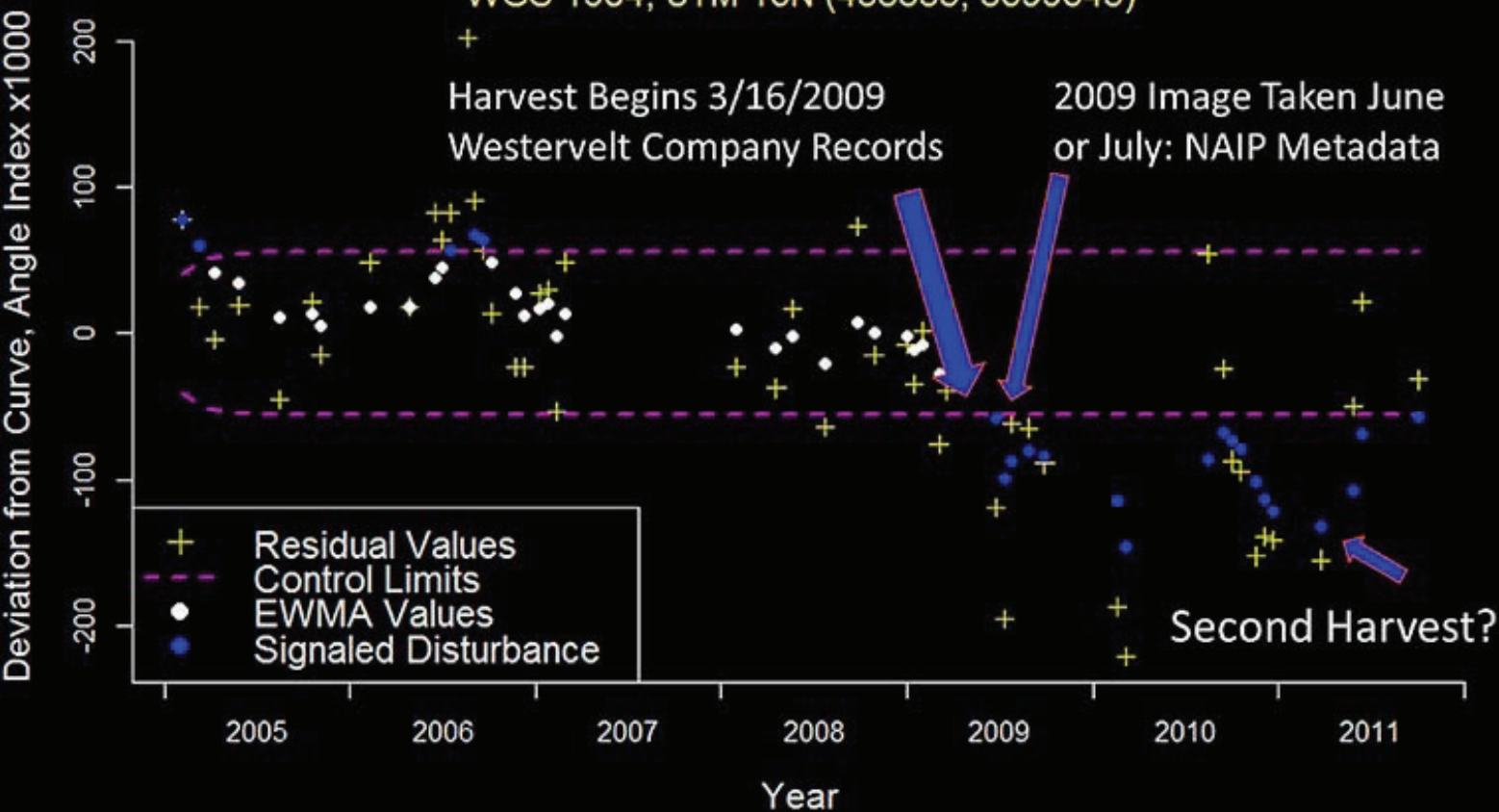




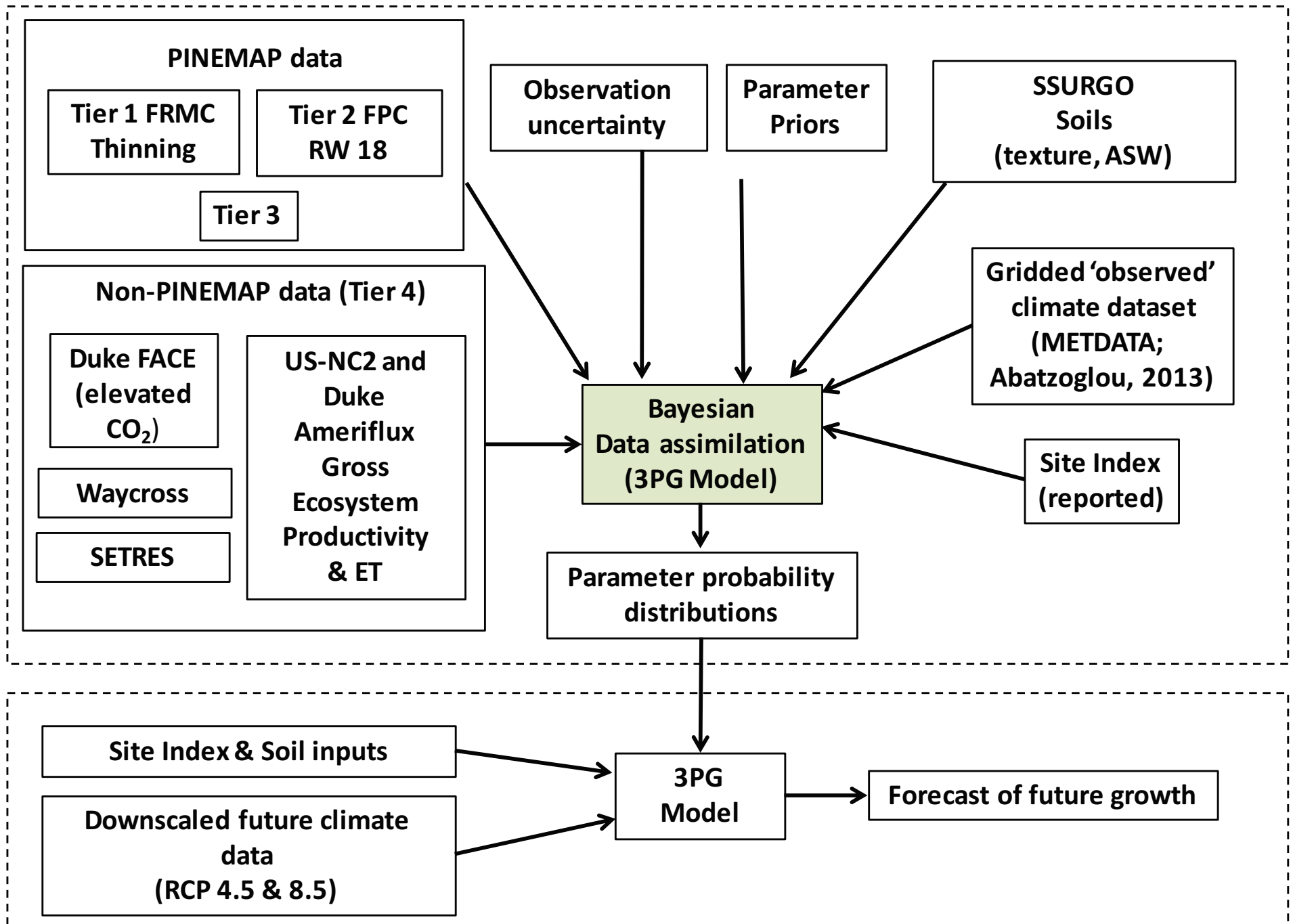
**NDVI Time Series for 30m pixel
at UTM17N 668850, 3958620
NLCD 2006 Classification:Deciduous Forest**

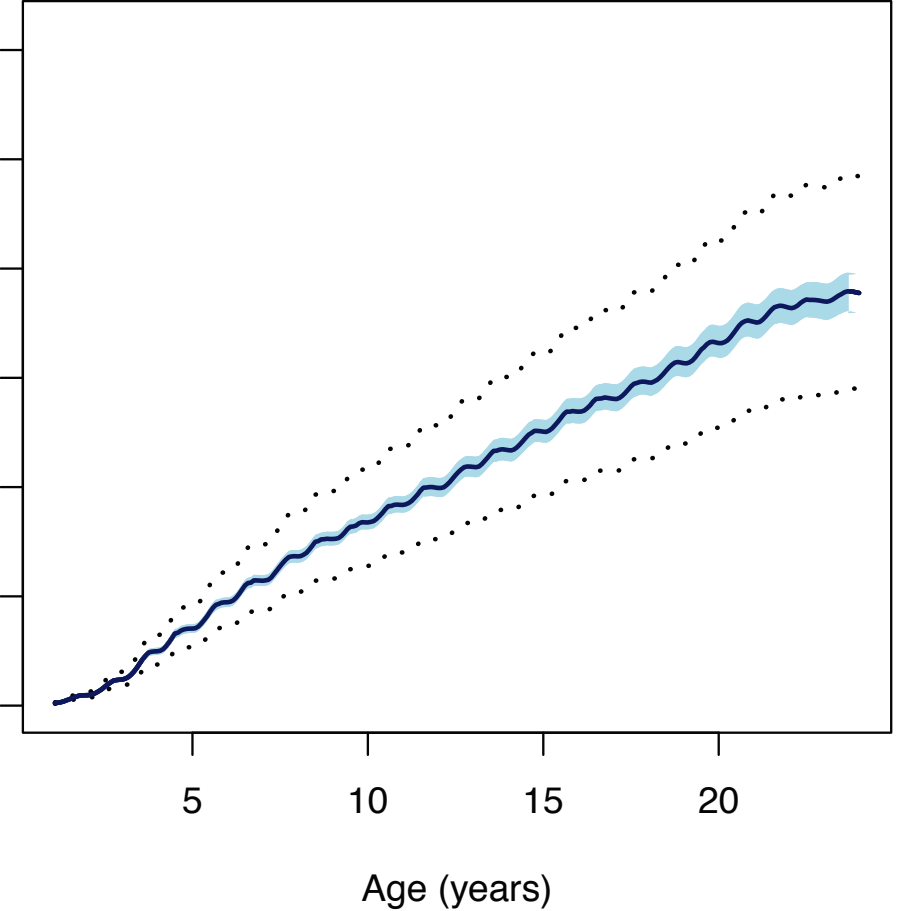
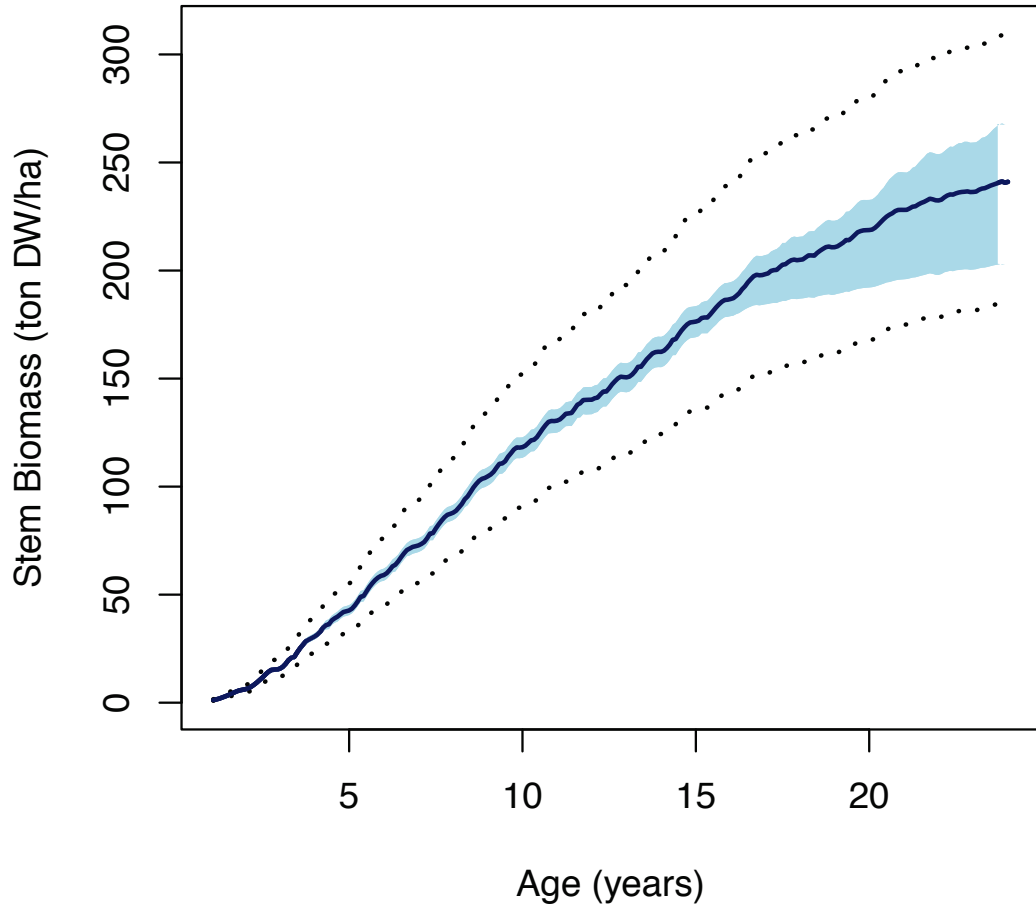


EWMA Chart for Commission Error Pixel, $\lambda = 0.3$, 3σ Control Limits WGS 1984, UTM 16N (433335, 3699645)



Data Assimilation of Pine Plantation Ecosystem Research (DAPPER) System









& Land

Drones



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Drone status

Taking photo #35

Autonomy

Battery voltage	84% (11.4 V)	Time in flight	04:20
Home distance	767 ft (00:21)	Estimated wind	
Link quality	99 %		1.9 kts

Flight data

Ground speed:	27.6 kts
Altitude:	1407.9 ft/AMSL 1300.8 ft/WGS84
Ground sensor height:	397.0 ft
Position:	N 36.6936039° W 80.0221277°

Instruments

AIRSPD kts	24 269 30	ALTITUDE ft/ATO	440
	30 20 20 30		430
	26.2		423.6
	24		410
	20.6		400
			423

Identification

Name:	Simulator (EB-01-008)
Drone Flight Log:	1

Camera information

Camera type:	DKUS/ELPH RGB
Camera state:	On
Number of photos:	34

Advanced instruments

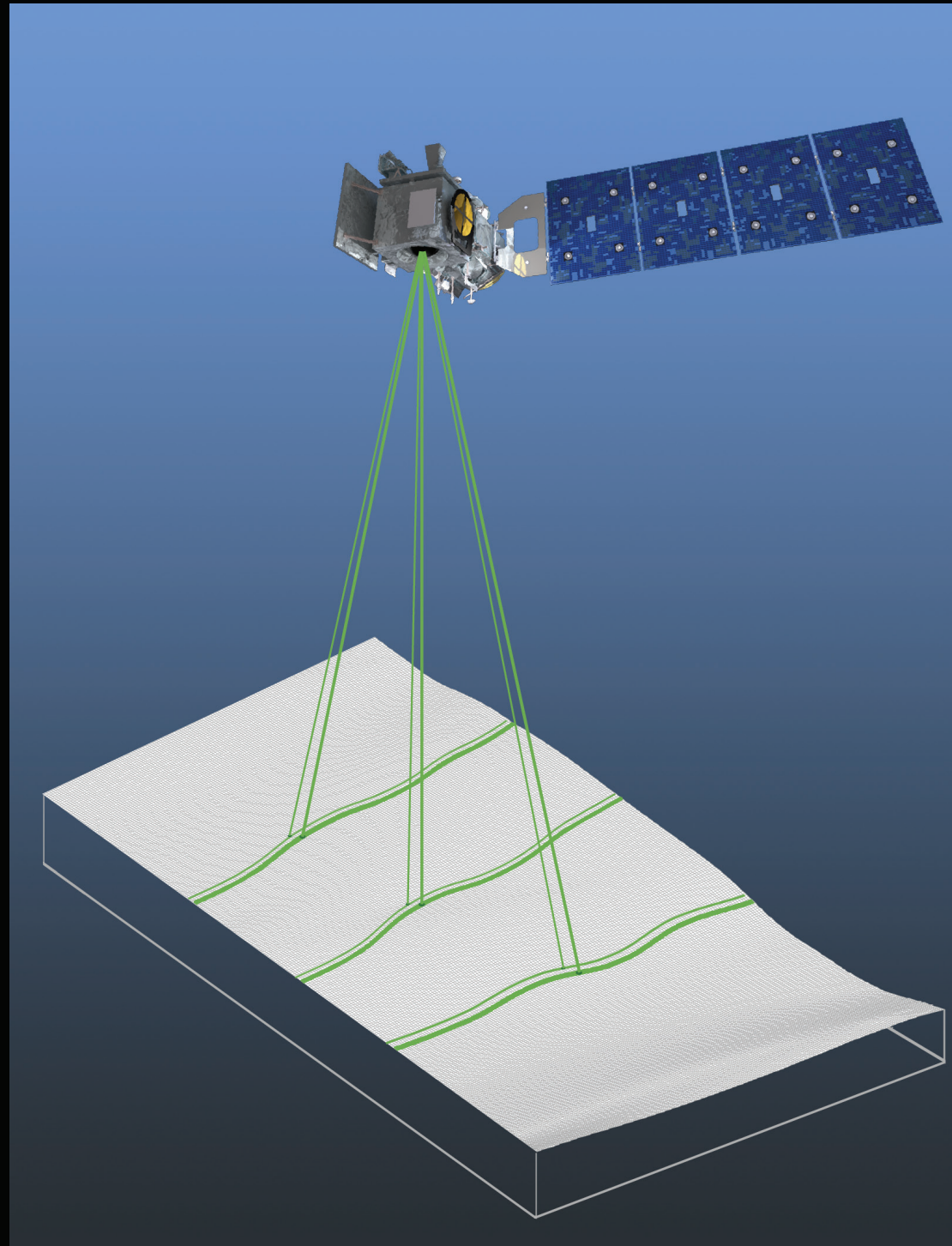
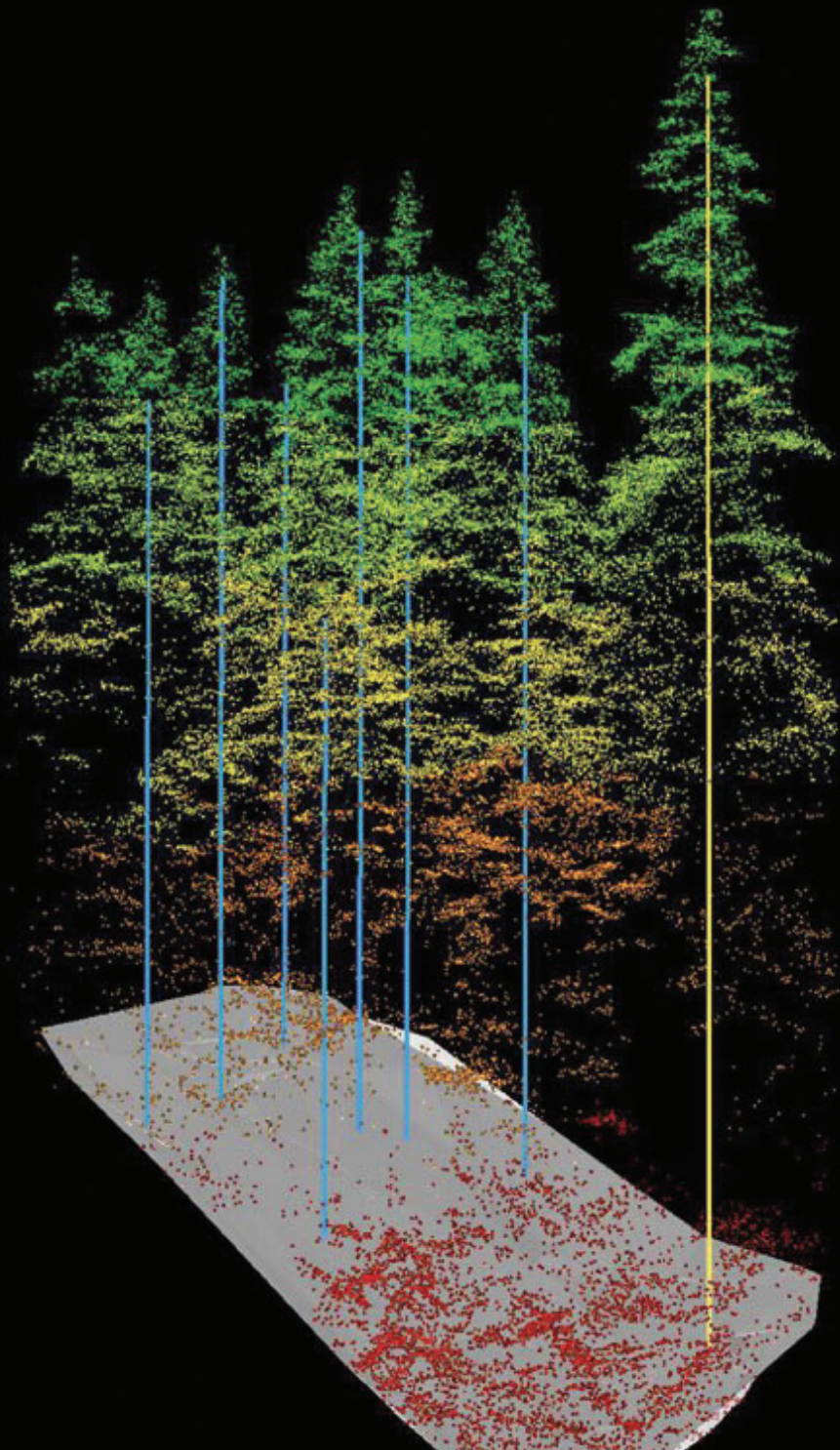
Autopilot temperature	GNSS
104.0 °F	Satellites: 8
	Accuracy: 12.687 ft
	Status: Standalone 3D

Simulator

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Wind: 2.1 kts 132 °





Prediction of Canopy Heights over a Large Region Using Heterogeneous Lidar Datasets: Efficacy and Challenges

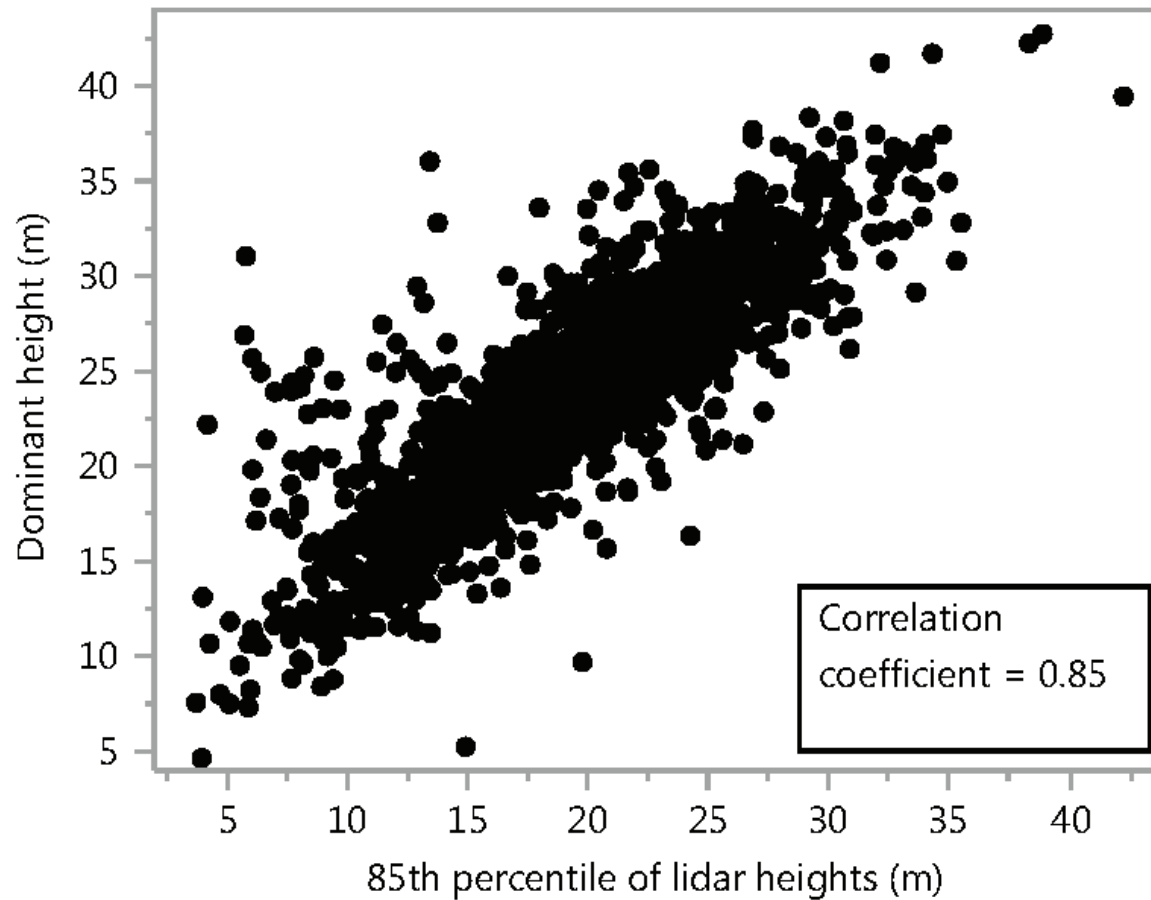
Ranjith Gopalakrishnan ^{1,*} ✉, Valerie A. Thomas ¹ ✉, John W. Coulston ² ✉ and Randolph H. Wynne ¹ ✉

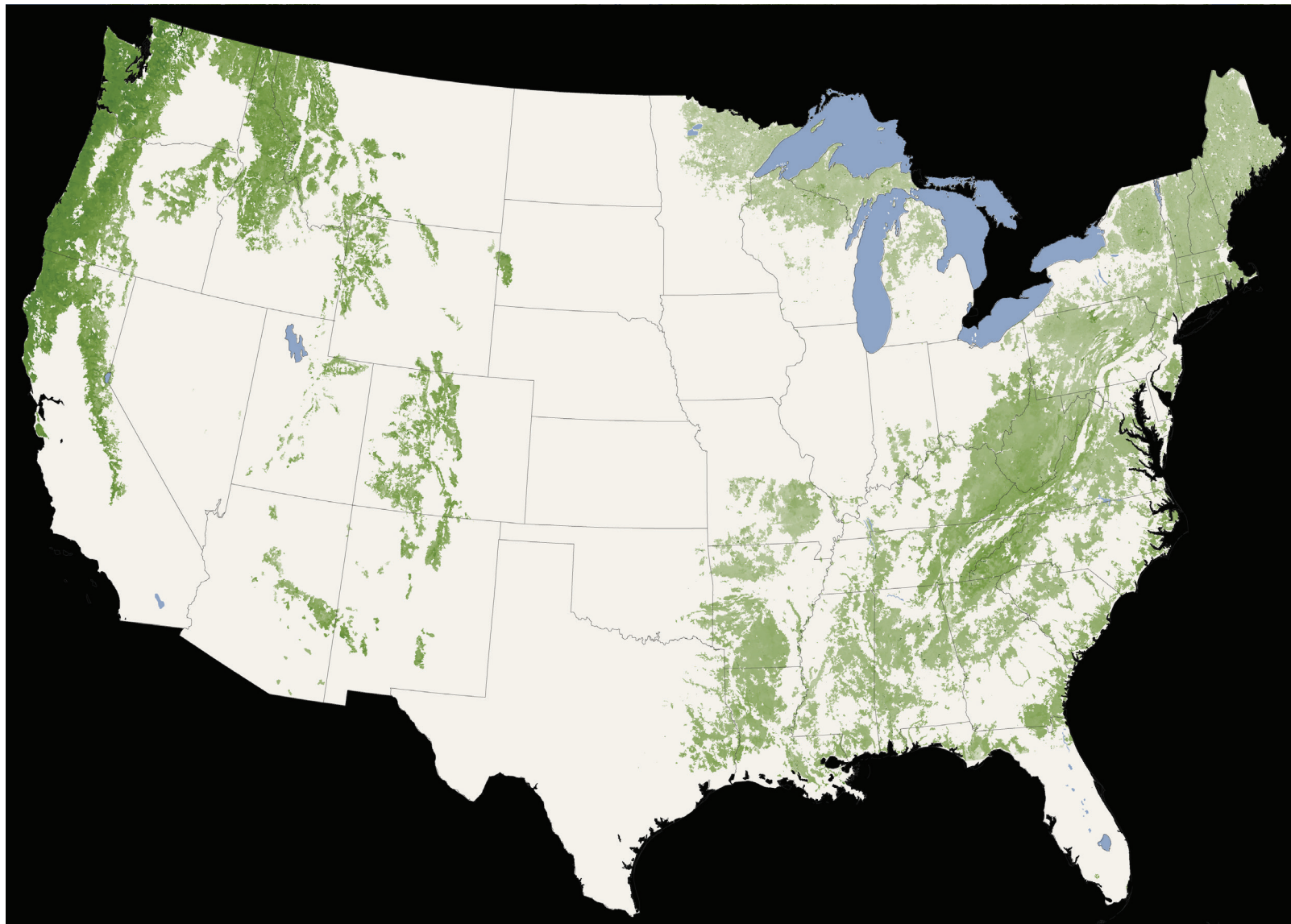
¹ Dept. of Forest Resources and Environment Conservation, Virginia Tech, Blacksburg, VA 24061, USA

² USDA Forest Service (Southern Research Station), Knoxville, TN 37919, USA

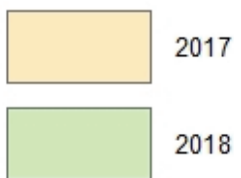
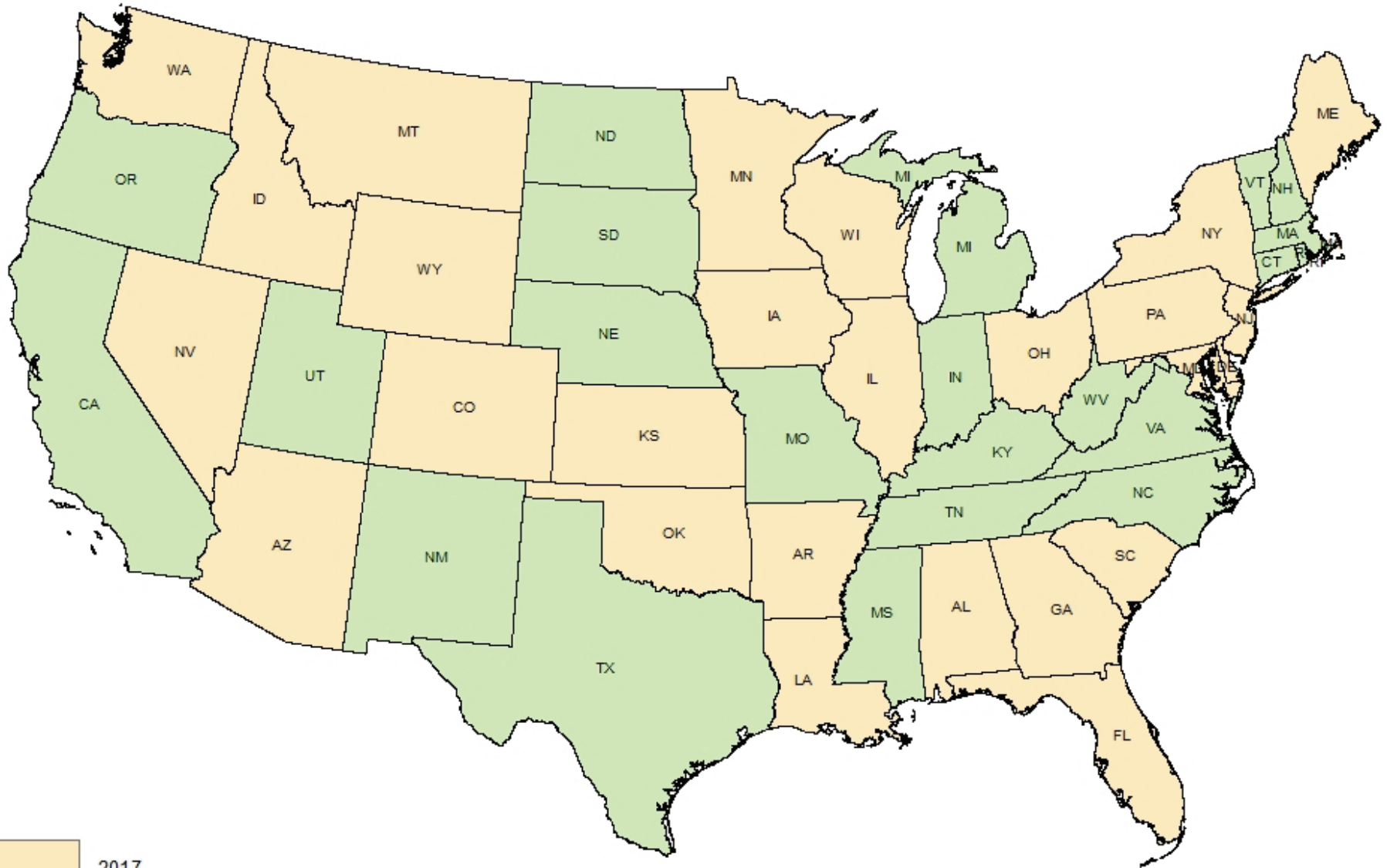
* Author to whom correspondence should be addressed.

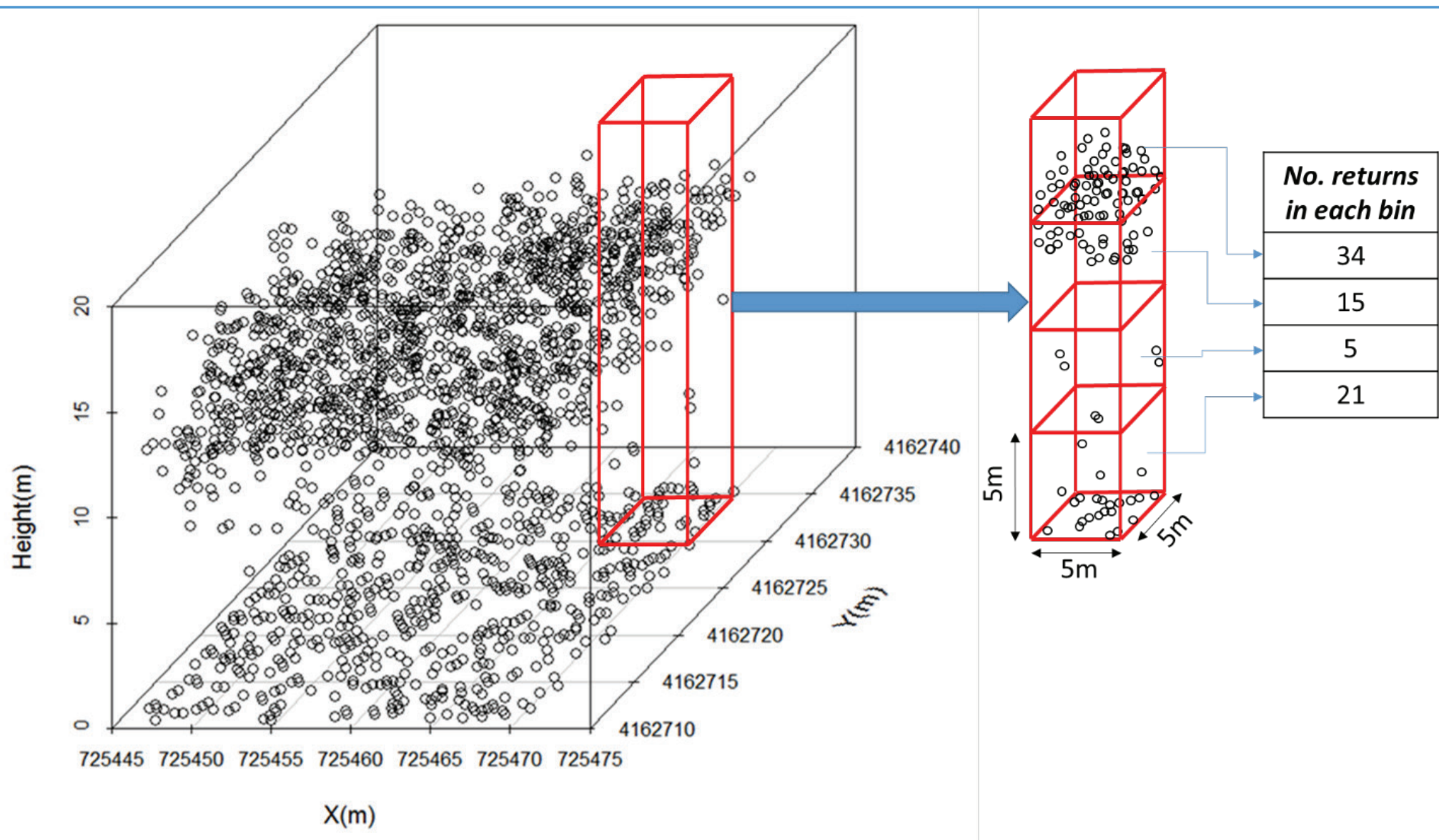
Received: 20 March 2015 / Revised: 10 August 2015 / Accepted: 12 August 2015 / Published: 27 August 2015



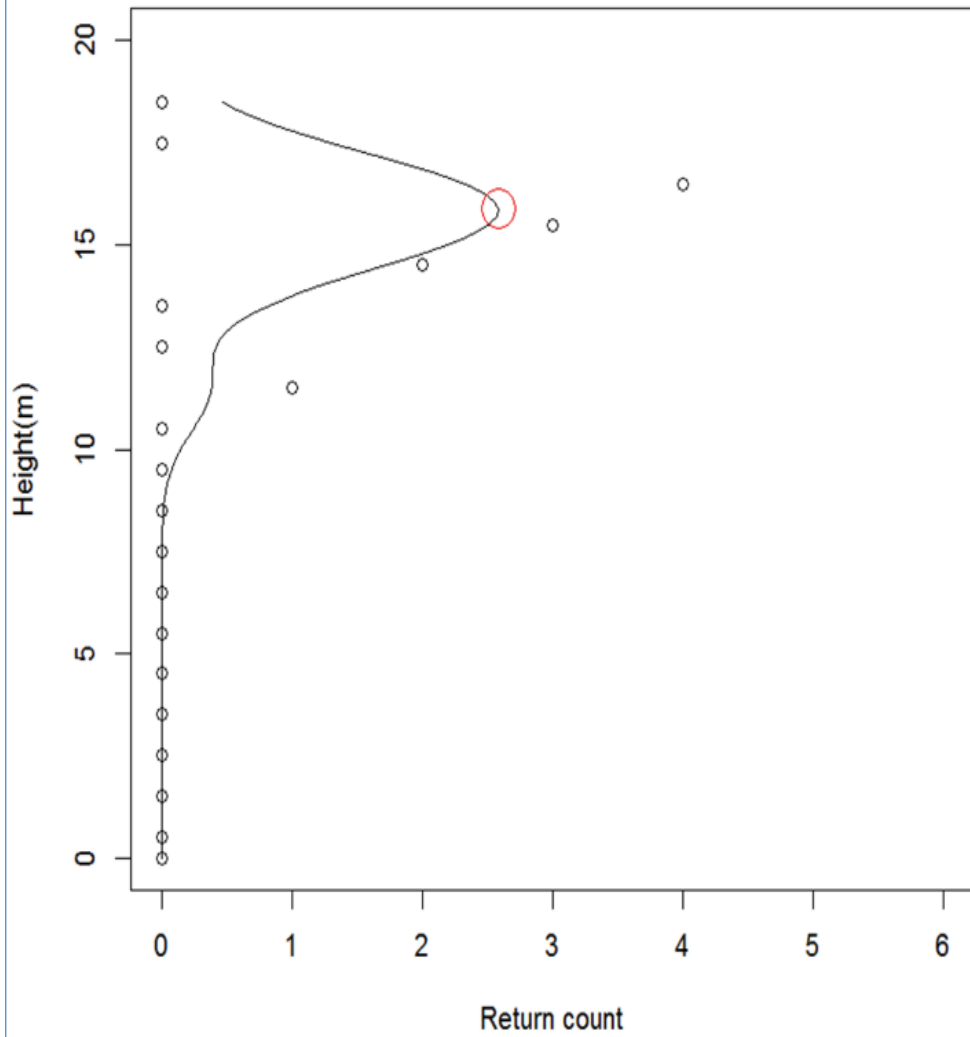


DRAFT 2017 - 2018 NAIP SCHEDULE

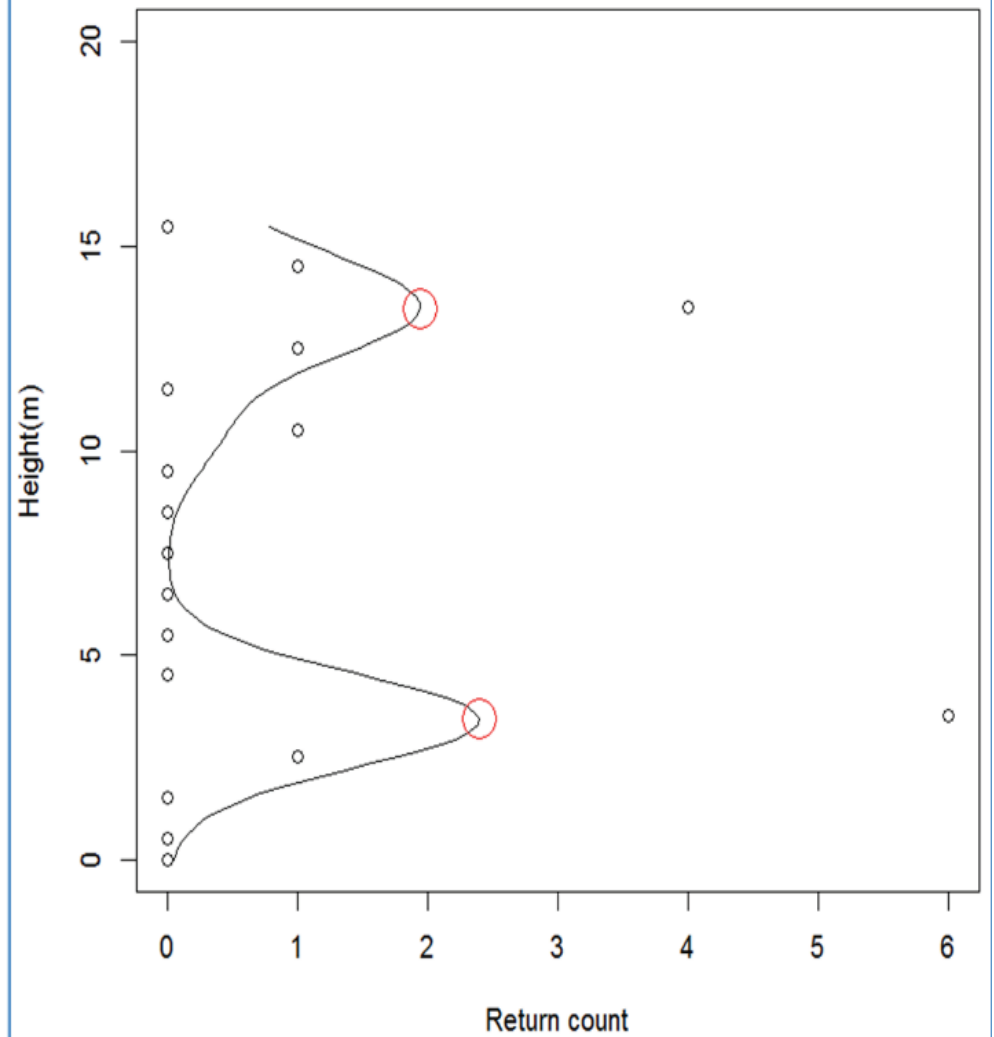




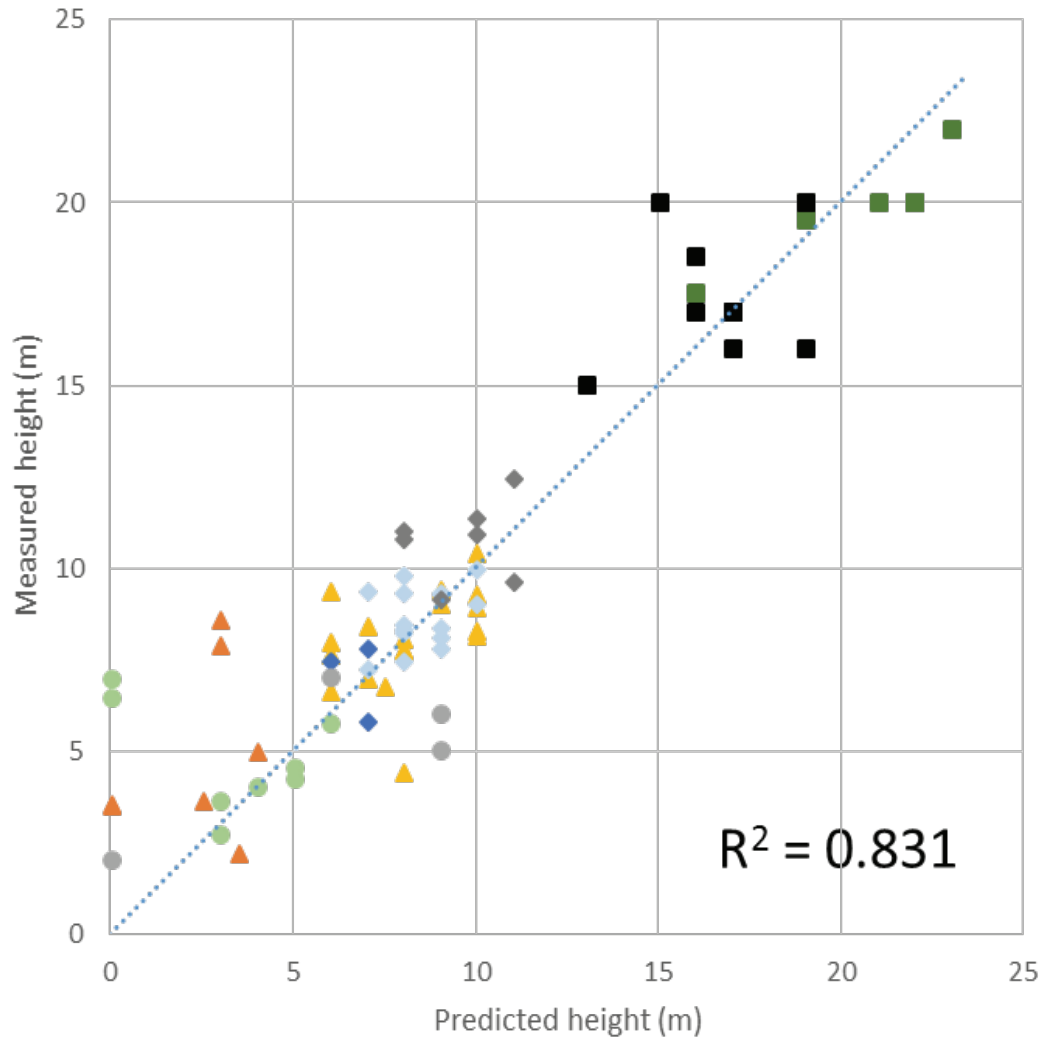
Voxel column at: 725464; 4162721

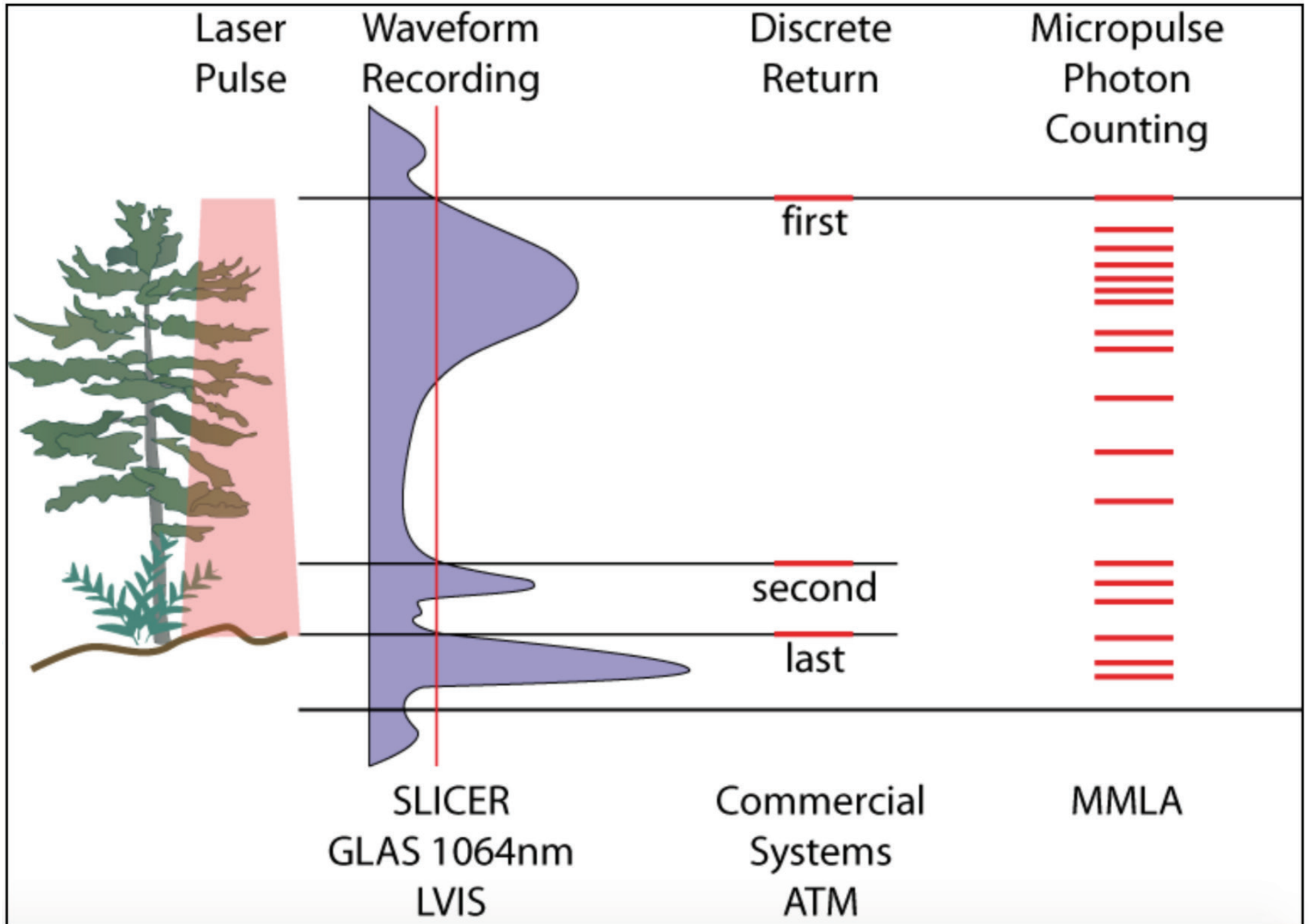


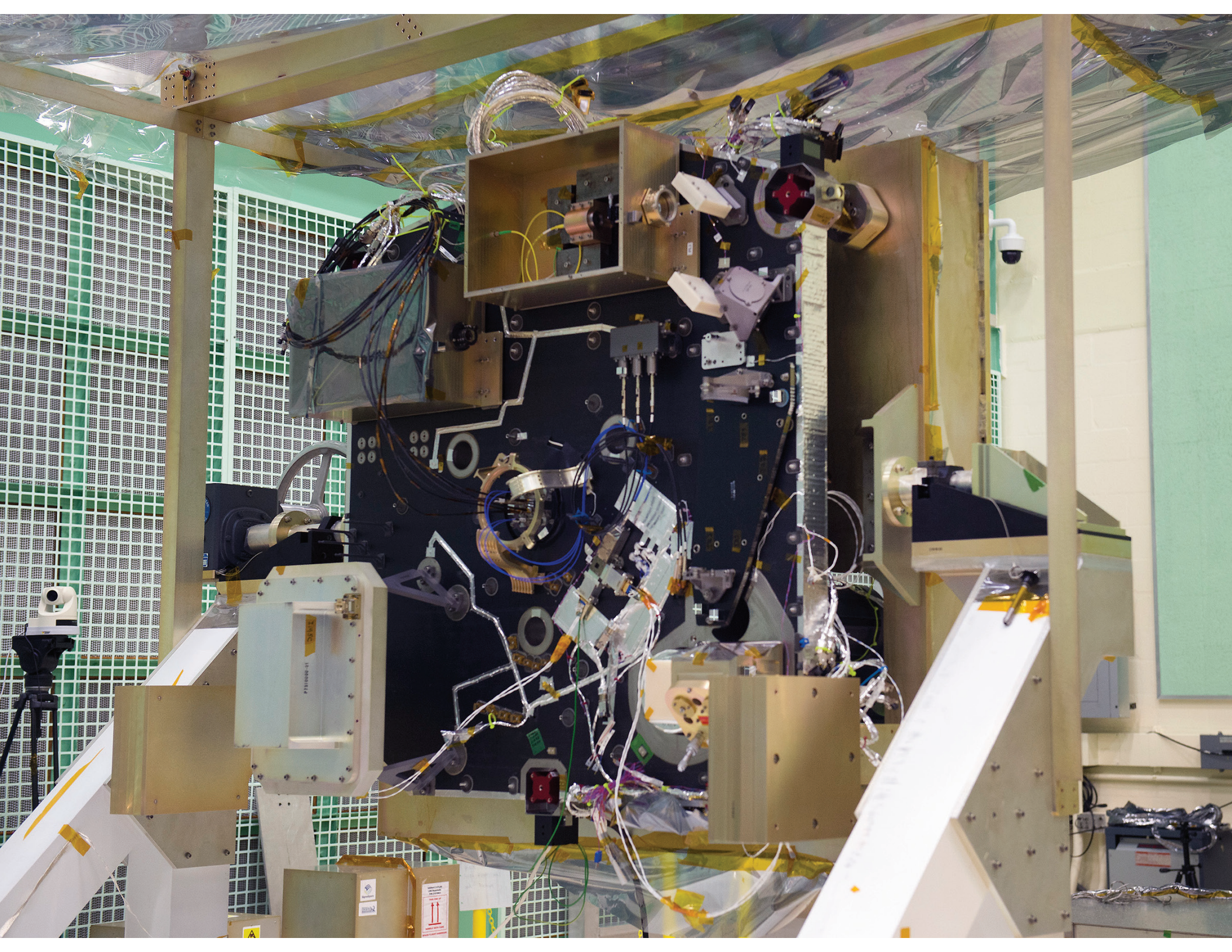
Voxel column at: 725252; 4162609



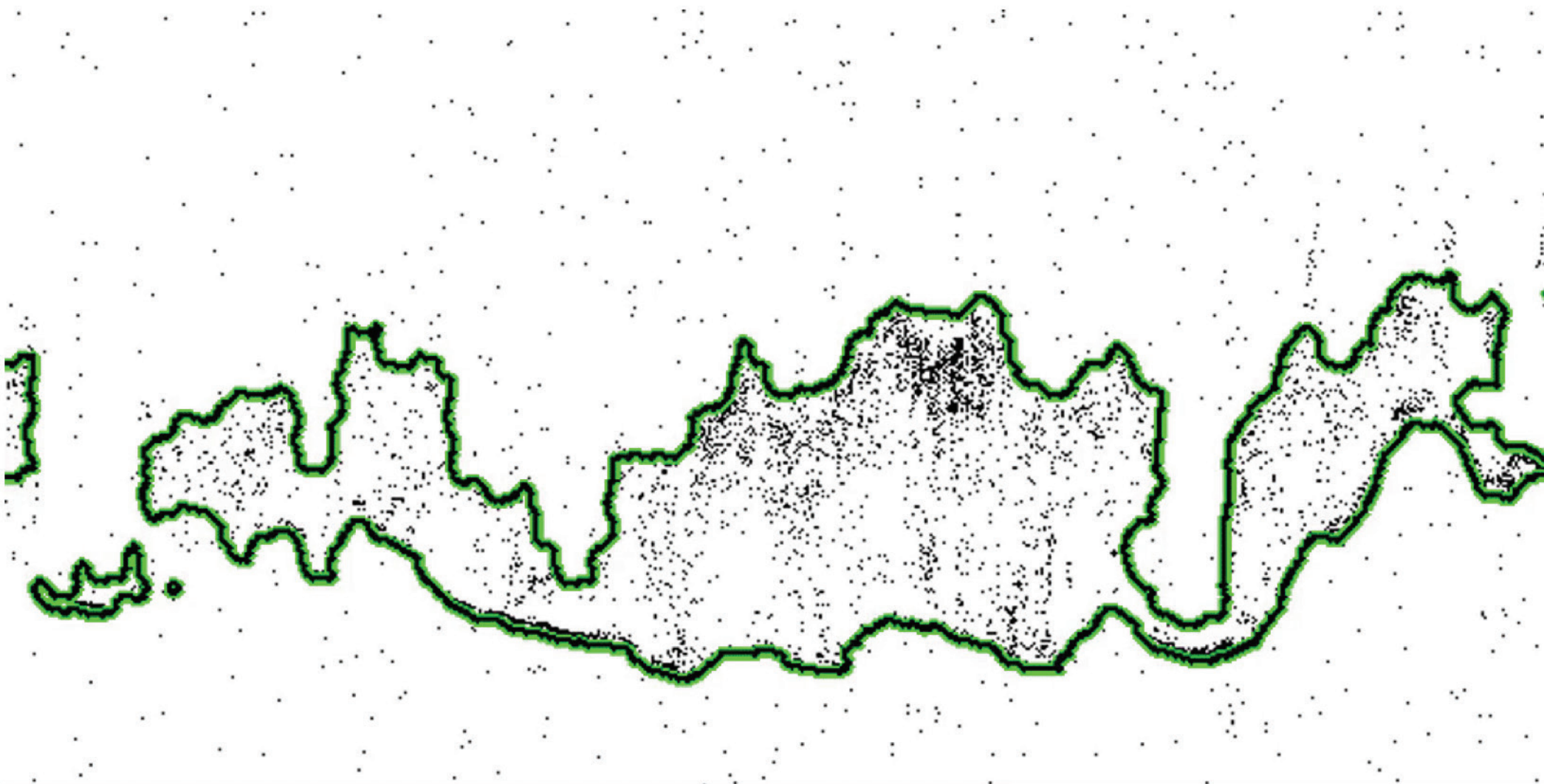
Height to the living canopy







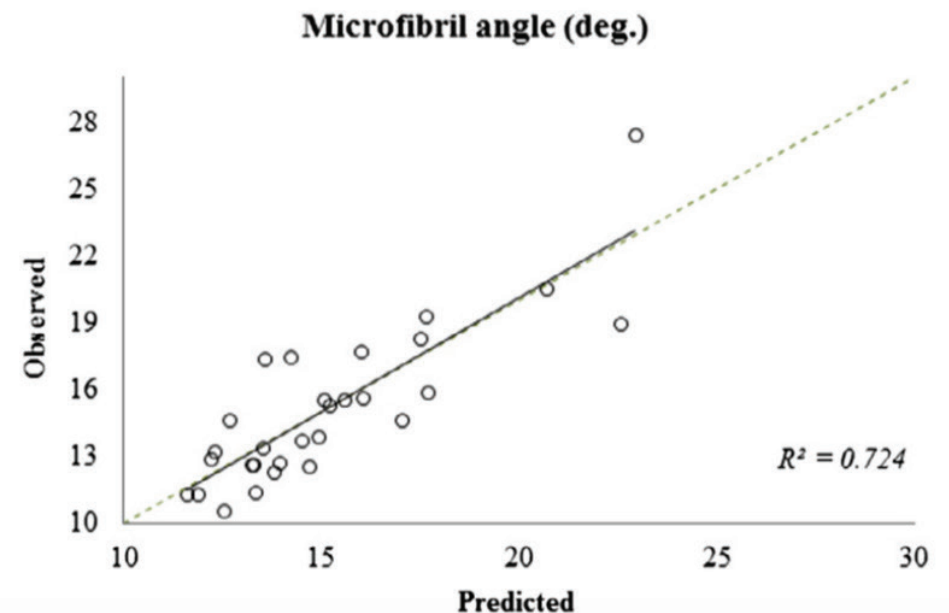
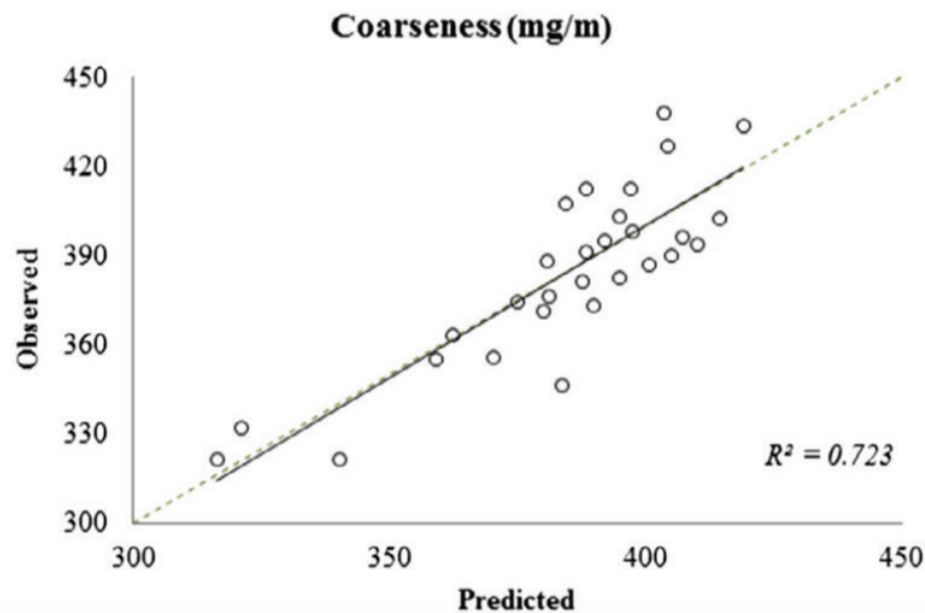
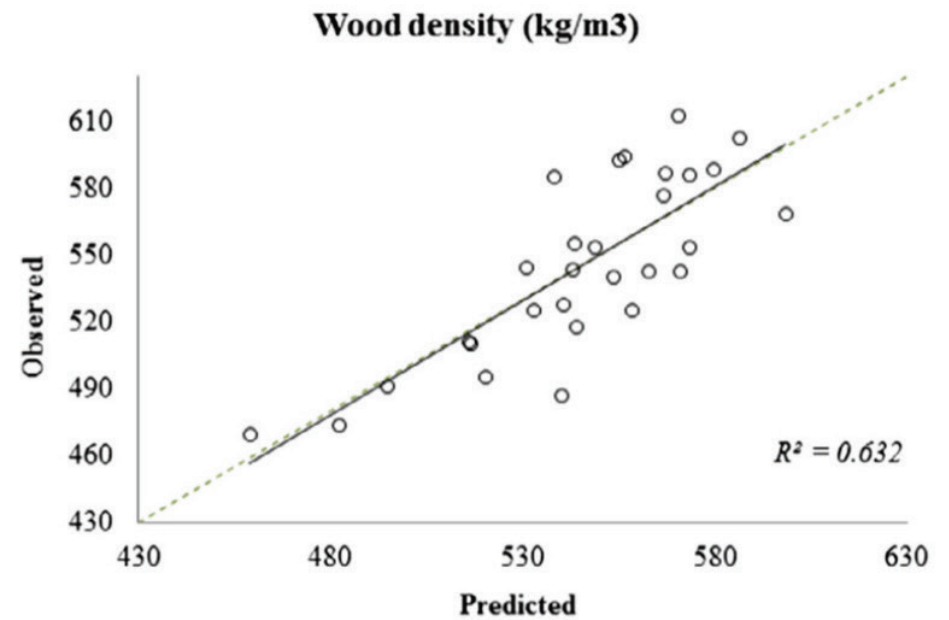
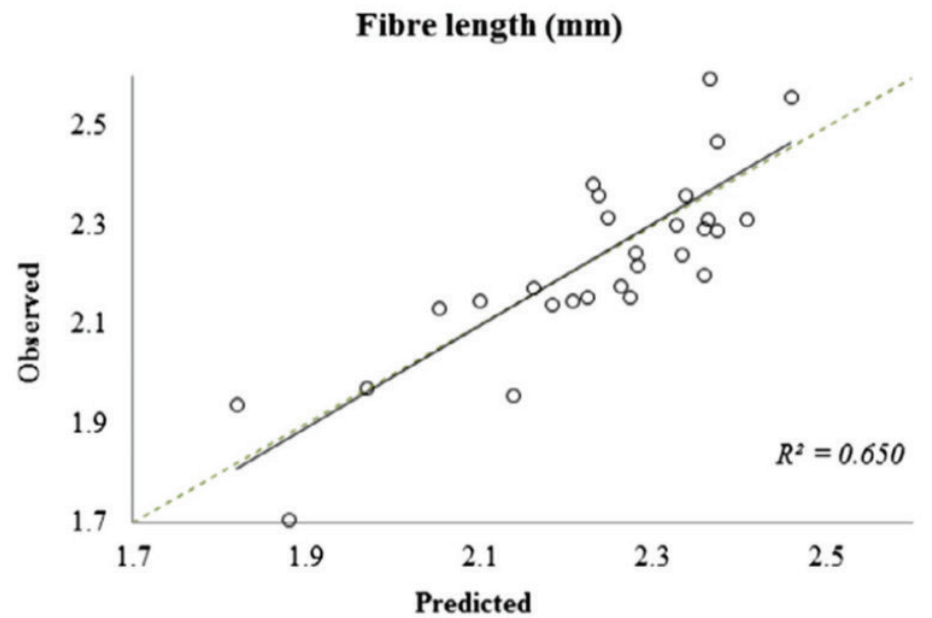
Contour detection (top of canopy and ground) with noisy photon-counting lidar datasets



Terrestrial lidar data to estimate wood properties

D. Blanchette et al. / Forest Ecology and Management 347 (2015) 116–129

(a) Black spruce (bS) sites



IT'S NOT BORING
UP HERE - YOU GET TO
LOOK THROUGH EVERYONE'S
DATA!



Conclusions

- New developments in imaging technologies are changing the way we do business on the supply side (mensuration, silviculture) as well as (potentially) on the product side

