University of Idaho
College of Natural Resources

CARNEGIE R1 CLASSIFIED UNIVERSITY

INTRODUCING

THE UNIVERSITY OF IDAHO

FOREST INNOVATIONS INSTITUTE

MARK KIMSEY

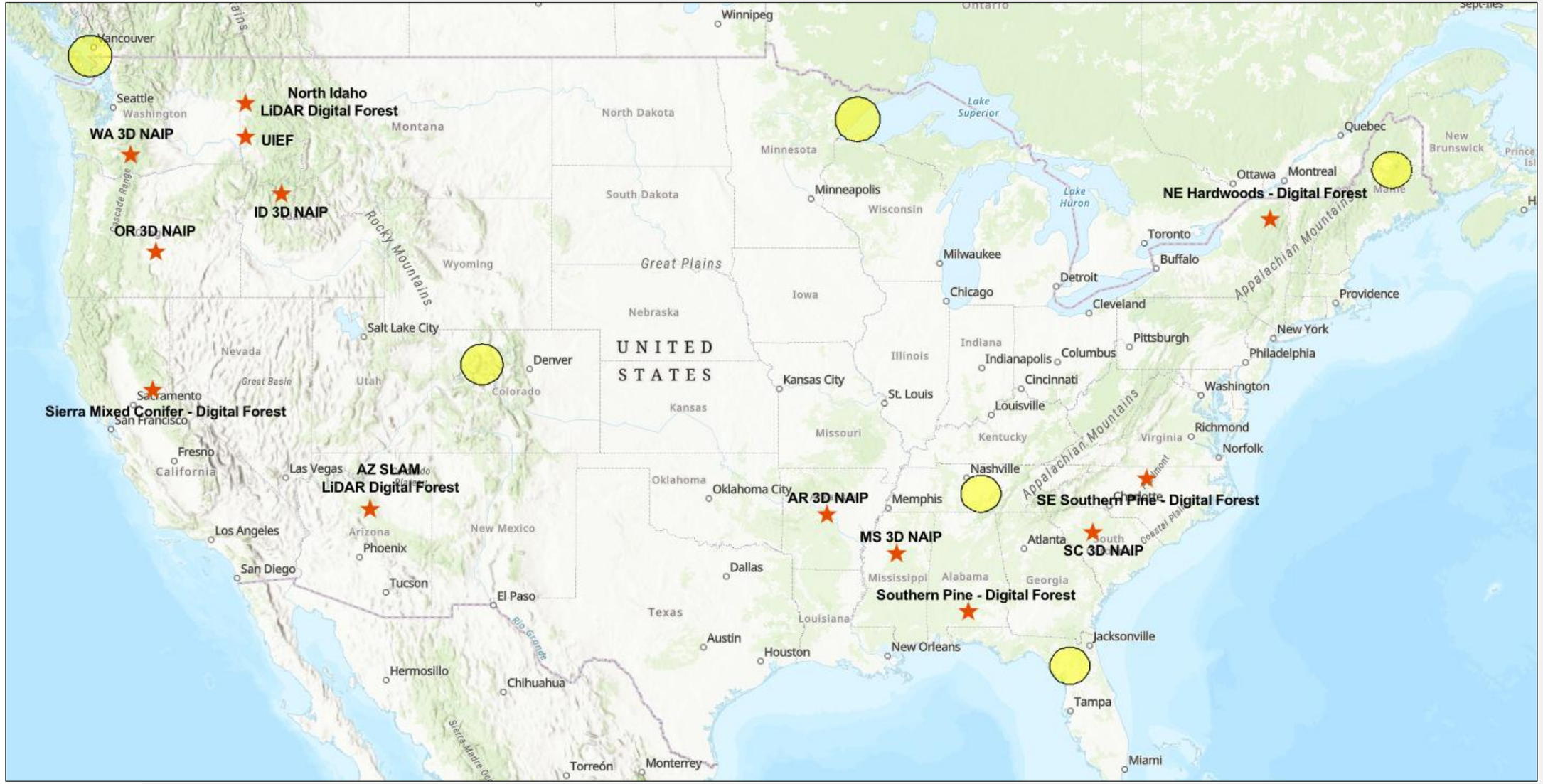
OLI WORKSHOP

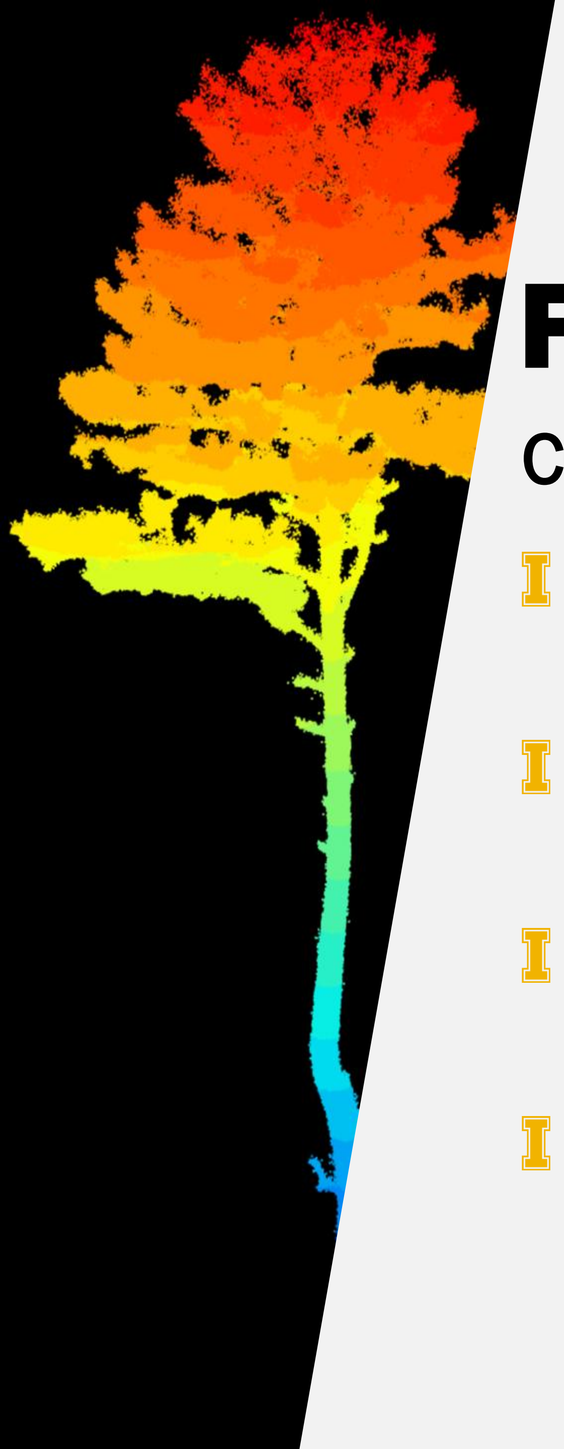
VANCOUVER, WA

APRIL 15, 2025

FOREST INNOVATIONS INSTITUTE

REGIONAL & NATIONAL IN SCOPE





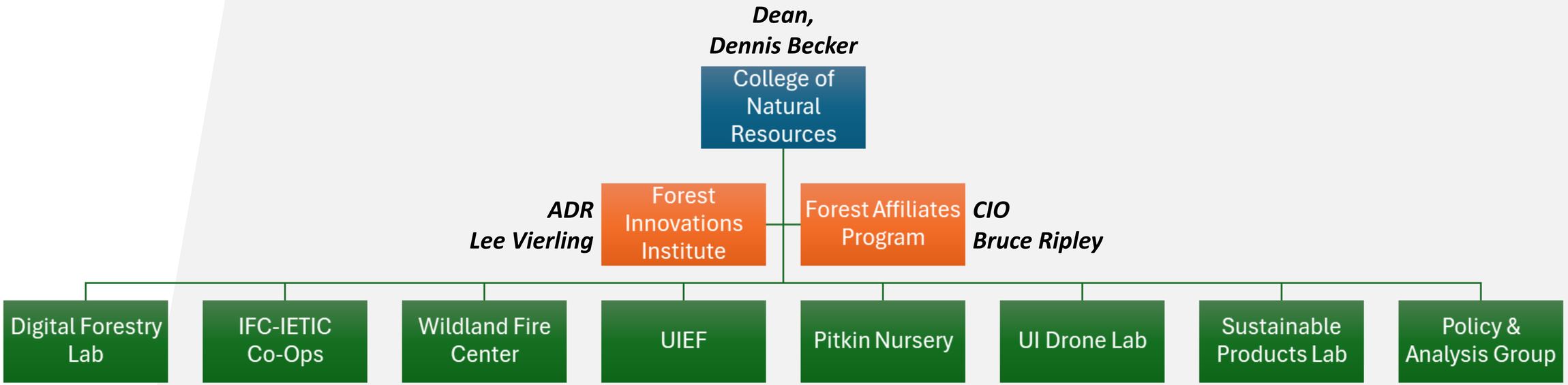
FOREST INNOVATIONS INSTITUTE

CORE MISSION

- Advance contemporary and emerging technologies and information systems
- Crosscutting research: digital transformation, networking, robotics, automation, remote sensing, AI
- Partner with University faculty and students for interdisciplinary training and research – workforce development
- Engage industry specialists, businesses, Native American Tribes, nonprofits, universities, and public land management agencies

FORESTINNOVATIONS INSTITUTE

LEVERAGING RESOURCES, INNOVATING WITH YOU



Remove research silos, engage, integrate, transform for 21st Century needs

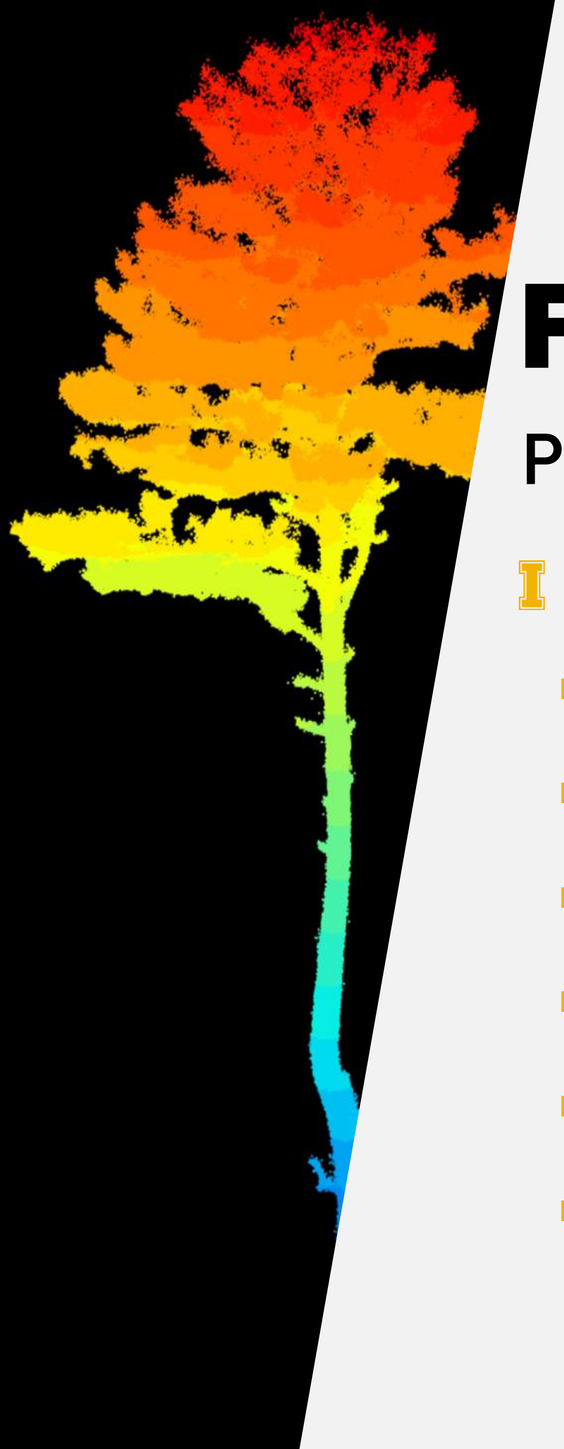
FOREST INNOVATIONS INSTITUTE

SINGLE ORGANIZATION – MULTIPLE RESEARCH UNITS

Key Advantages

- Coordinated Research
- No Geographical Limits
- Standardized Contracts and Project Rates
- Discounted Rates for Existing UI Group Members
- Nimble and Responsive to Single Service Project Needs
- Affiliates Program for Shared Research & Demonstration Projects

Not intended to provide commercial services

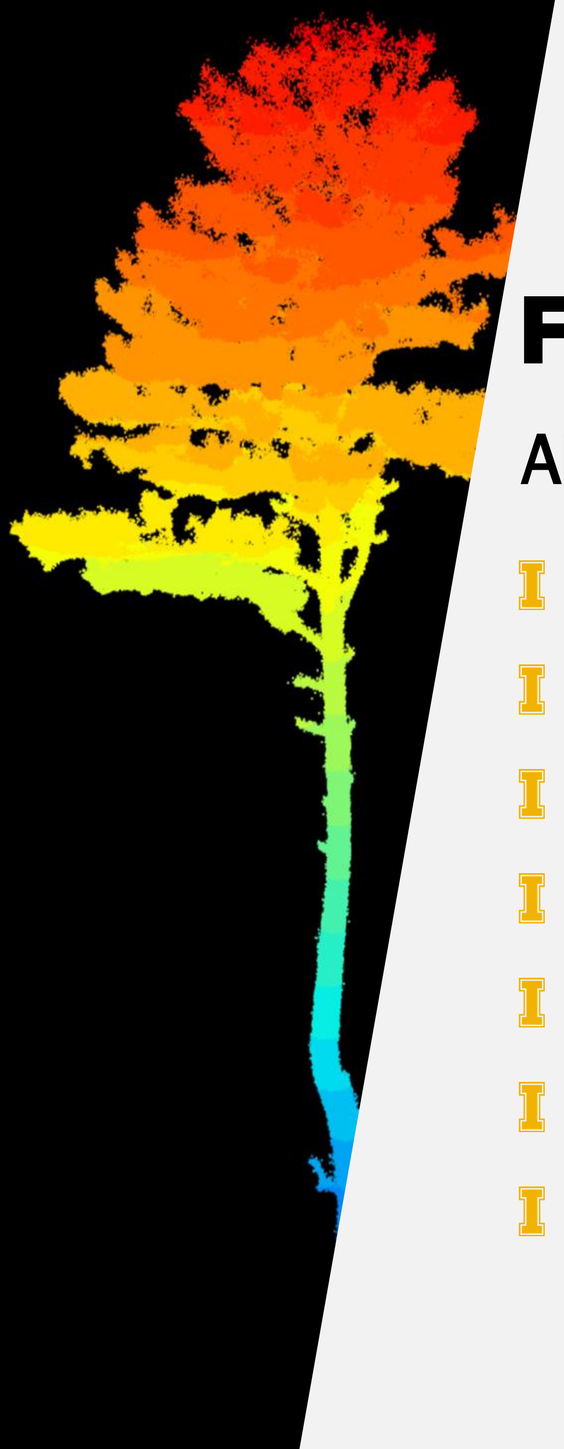


FOREST INNOVATIONS INSTITUTE

PROJECT RATE SHEET (*DRAFT*)

- Simplified Rates For Project Invoicing

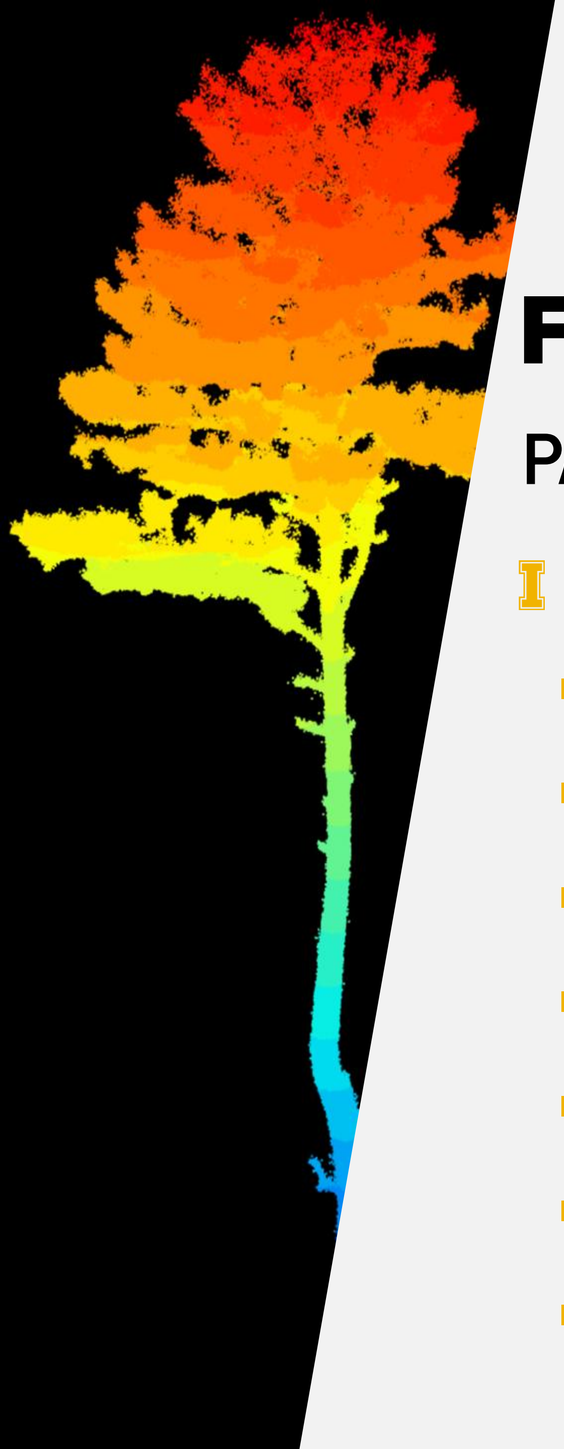
Senior Staff	$150 / hr
Project Scientist	$80 / hr
Graduate Student	$40 / hr
Undergraduate	$30 / hr
Direct Expenses	Itemized by project
Indirect Expenses	Project dependent



FOREST INNOVATIONS INSTITUTE AFFILIATES

AFFILIATES PROGRAM – OPEN TO ANYONE

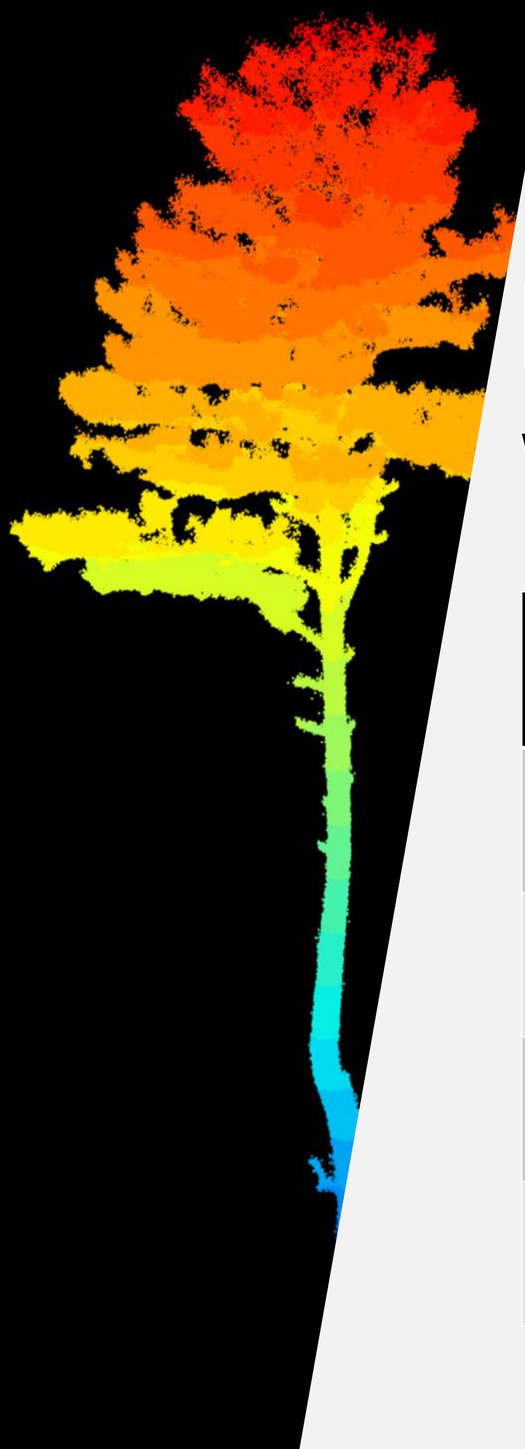
- **Applied Research**: Share practical, applied research & education
- **Membership**: No membership requirements (Agency, Industry, Consultant)
- **Cost**: Low cost of membership, from single users to large agencies
- **Education**: Equal access to training modules & workshops
- **Design**: Equal access to data design, best practices, and applied analytics
- **Demonstration**: Access to applied demonstrations
- **Content Experts**: One day of staff time per year for memberships $3,000/yr +



FOREST INNOVATIONS INSTITUTE AFFILIATES

PARTICIPATION ASSESSMENTS *(DRAFT)*

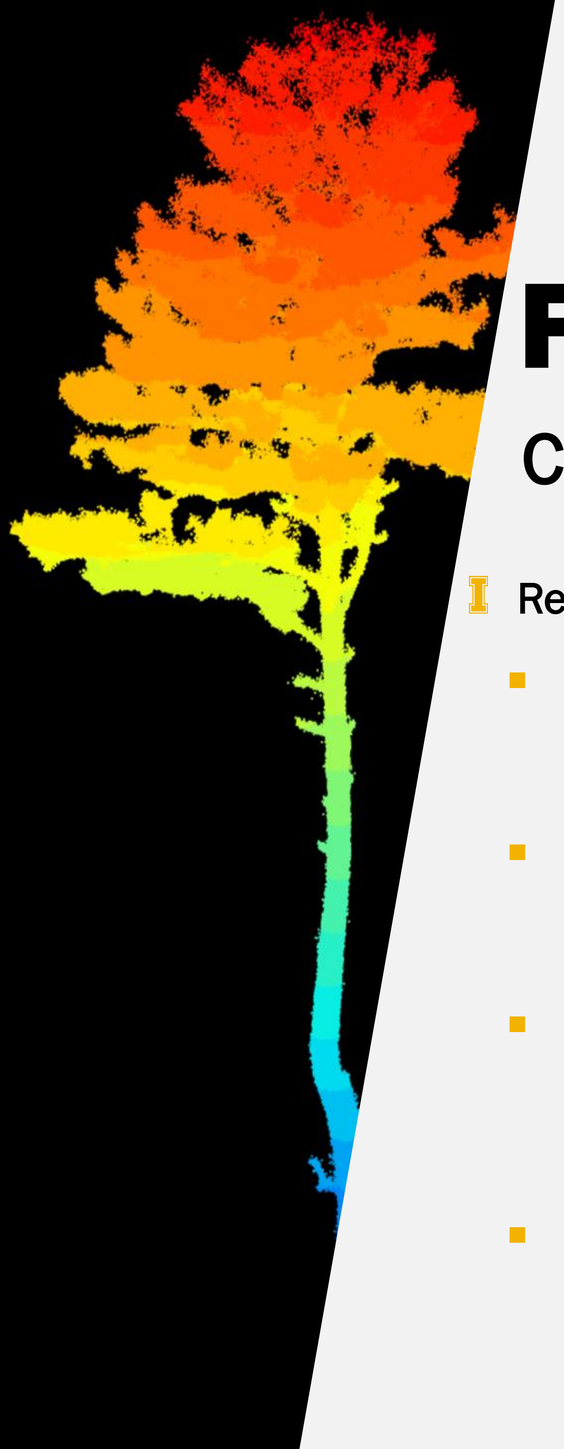
- Simple Assessment Structure Based on Business Segment Size
  - 1 $1,000 / 2 Yrs
  - 2 – 4 $1,000 / Yr
  - 5 – 10 $3,000 / Yr
  - 11 – 20 $5,000 / Yr
  - 21 – 50 $7,000 / Yr
  - 50 + $9,000 / Yr
  - * Large Agency > 1,000 TBD



INSTITUTE VS AFFILIATE PROJECT

WHAT SEPARATES PROJECTS

Institute Project	Affiliates Project
Project control by funder	Project control by Affiliates director
Contract deliverables	No deliverables
Negotiable IP rights	No IP rights
Additional overhead	Very low overhead



FOREST INNOVATIONS INSTITUTE

CURRENT STAFFING & WORKFORCE DEVELOPMENT

Research Scientists

- Dr. Edward Flathers
  - Remote sensing, data org, process automation
- Dr. Heather Greaves
  - Remote sensing, veg and surface mapping
- Dr. Jaslam Poolakkal
  - Advanced statistics modeling, scalable and interactive applications
- Dr. Aaron Sparks
  - Remote sensing, inventory & disturbance characterization

Graduate Students

- Noel Daugherty (MS)
  - Remote sensing & biometrics
- Steevensen Alcius (Fulbright PhD)
  - Remote sensing & biometrics
- Haley Anderson (PhD)
  - Forest health modeling

Undergraduate Students

- Christian Marzan (BS Forestry)
- James Shook (BS Forestry)
- Spencer Lake (BS Forestry)
- Miah Dannahower (BS Forestry)
- Riley Robenstein (BS Wildlife)
- Mia Wanstrom (BS Wildlife)
- Bidhi Paudel (BS Comp. Sci.)
- Robbie Reinhardt (BS Comp. Sci.)

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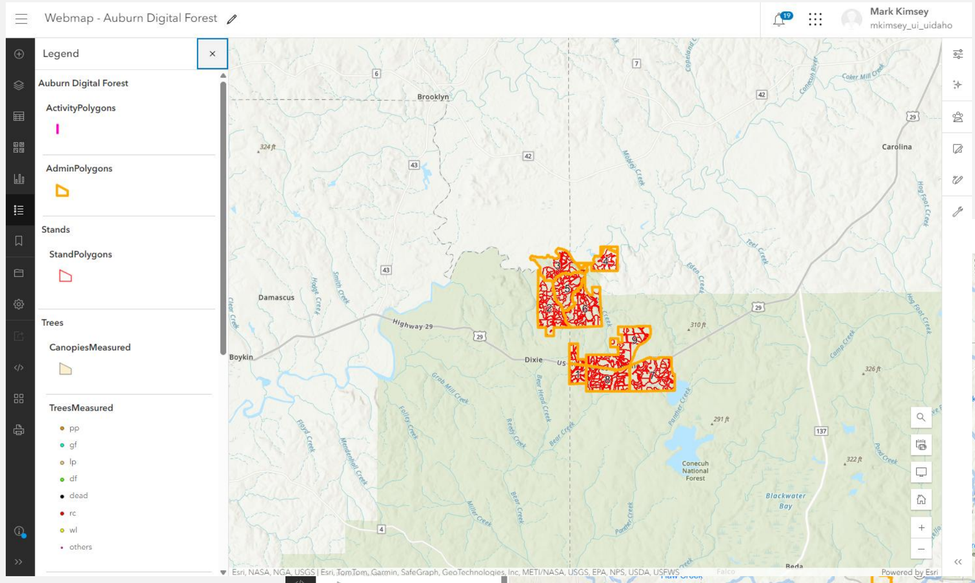
CURRENT PROJECTS

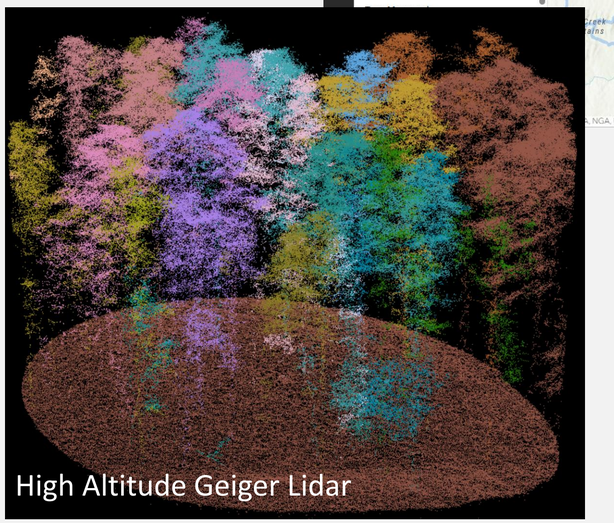
NATIONAL INITIATIVE

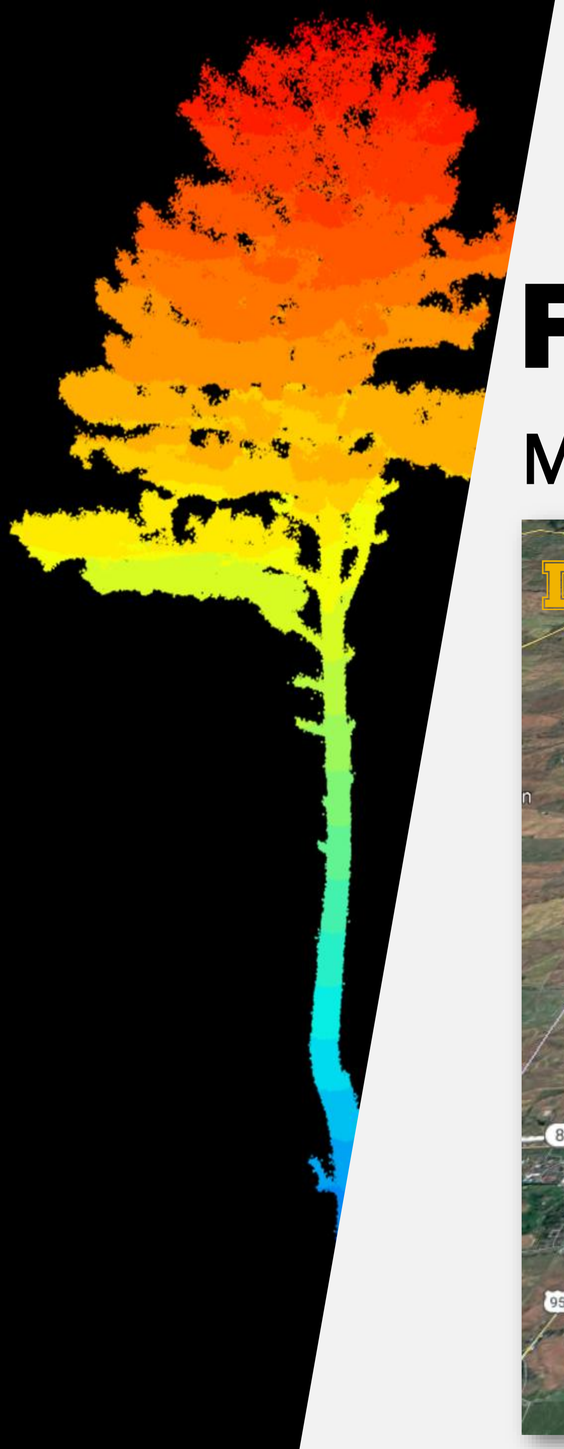
DEVELOP A COORDINATED INNOVATION NETWORK TO LINK RESEARCH FORESTS NATIONWIDE

PAUL SMITHS COLLEGE, AUBURN, DUKE, UC BERKELEY, OREGON STATE
…MANY OTHERS PENDING

- Drive digital forest innovation
- Broad geographic networking
- Diverse forested communities for testing
- Deploy a common data model to all partners and develop common analytics
- Develop Next Generation Research and Management Personnel
- Leverage Research and Resources for Competitive Grant Funding
- Build International Relationships







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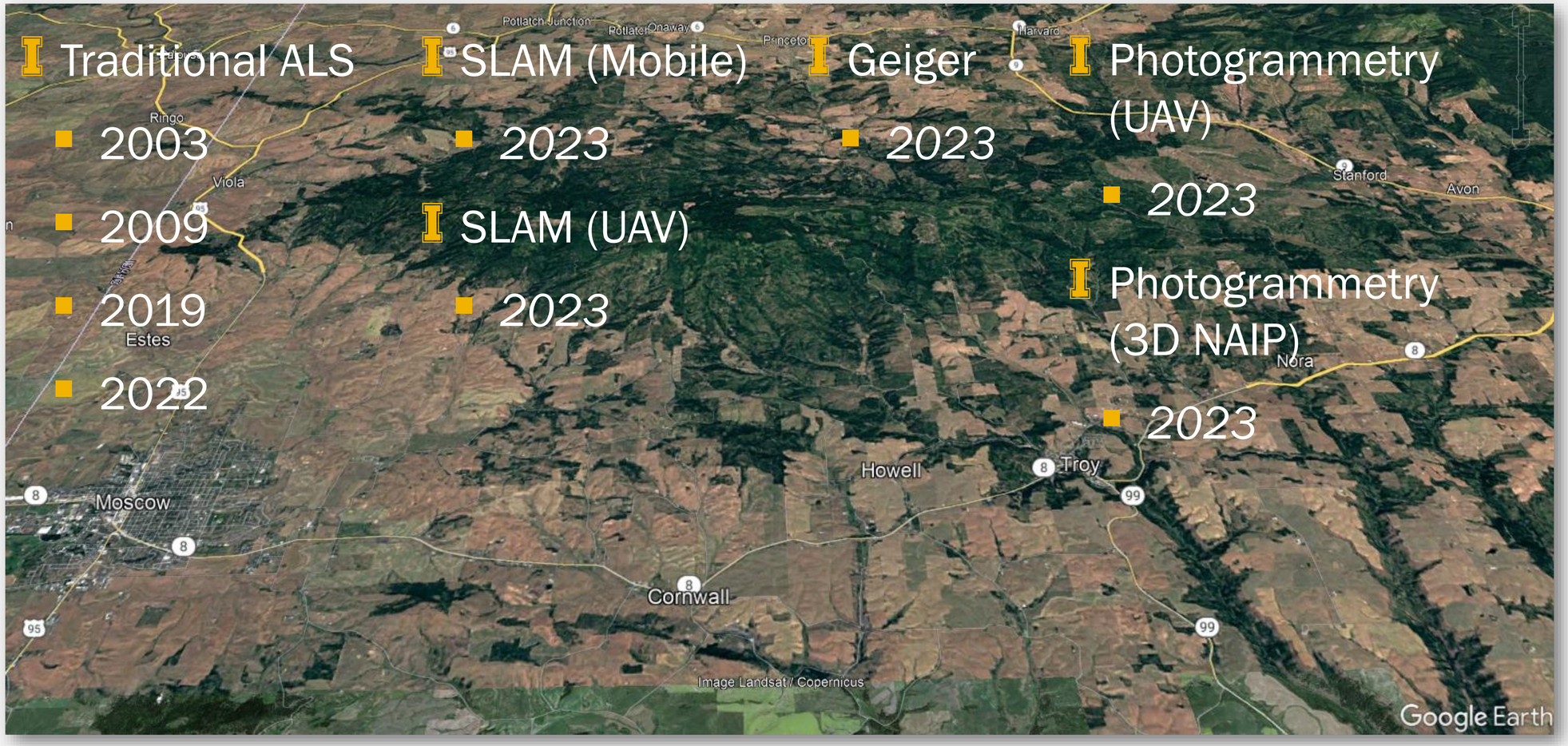
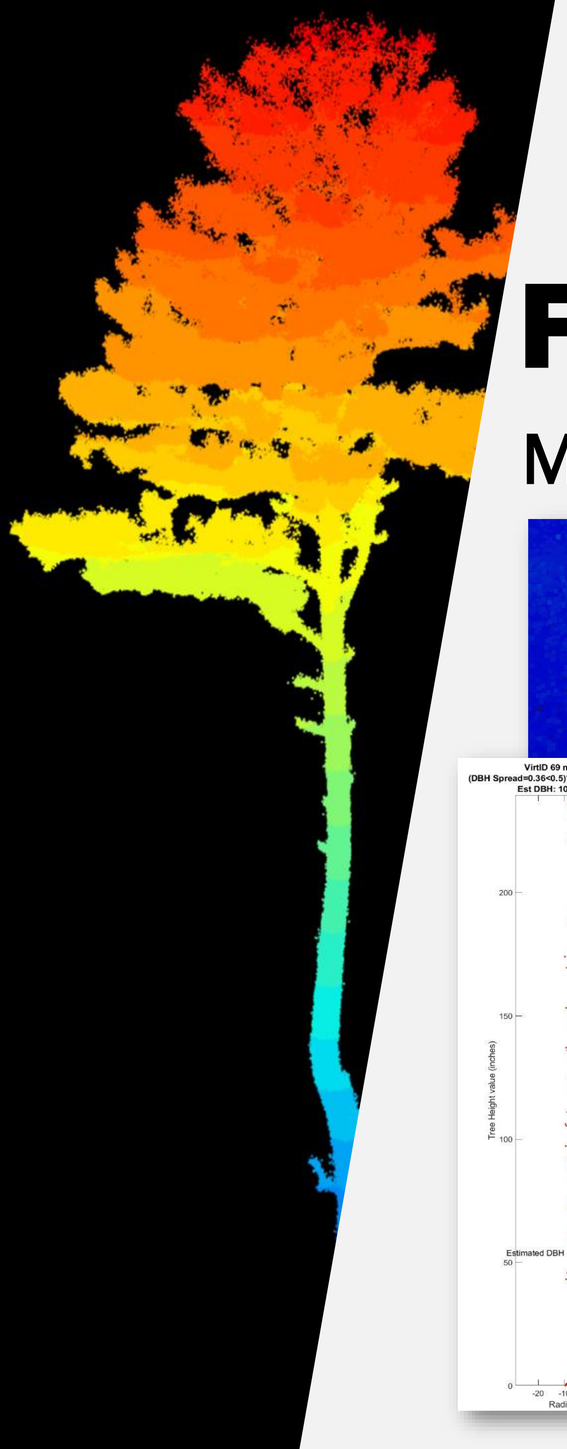
MOSCOW MOUNTAIN DIGITAL FORESTRY LABORATORY





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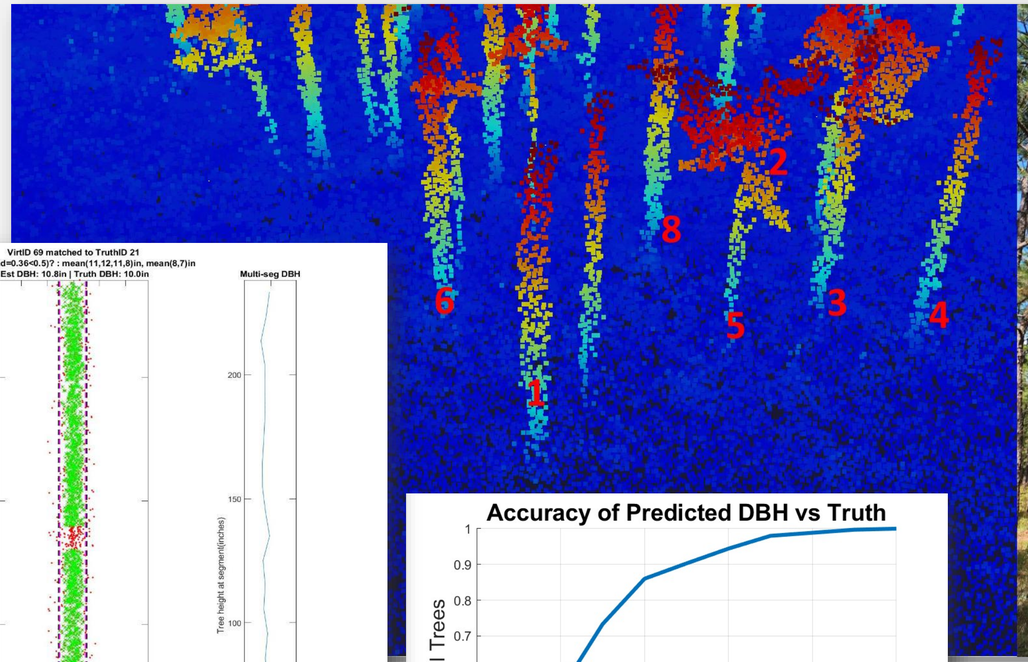
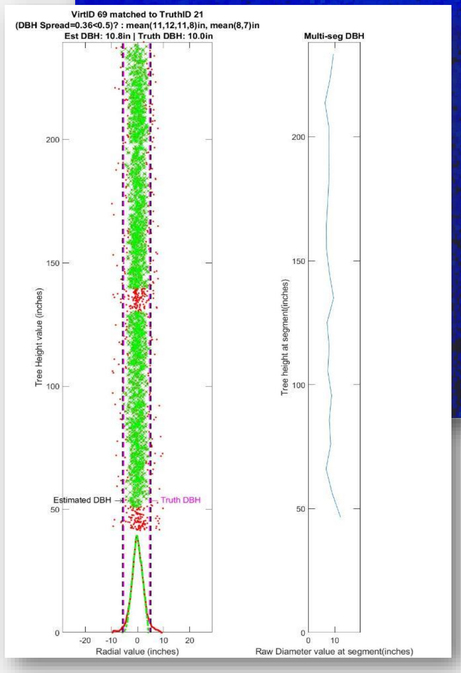
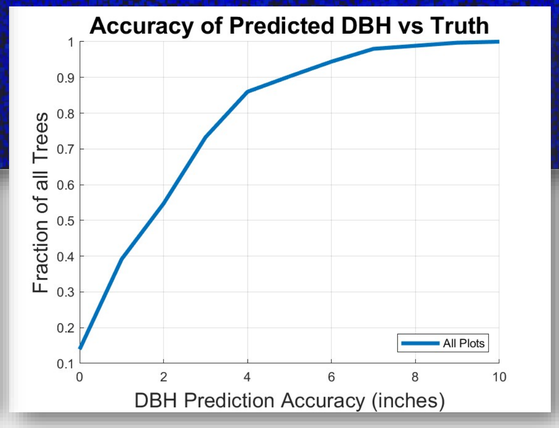
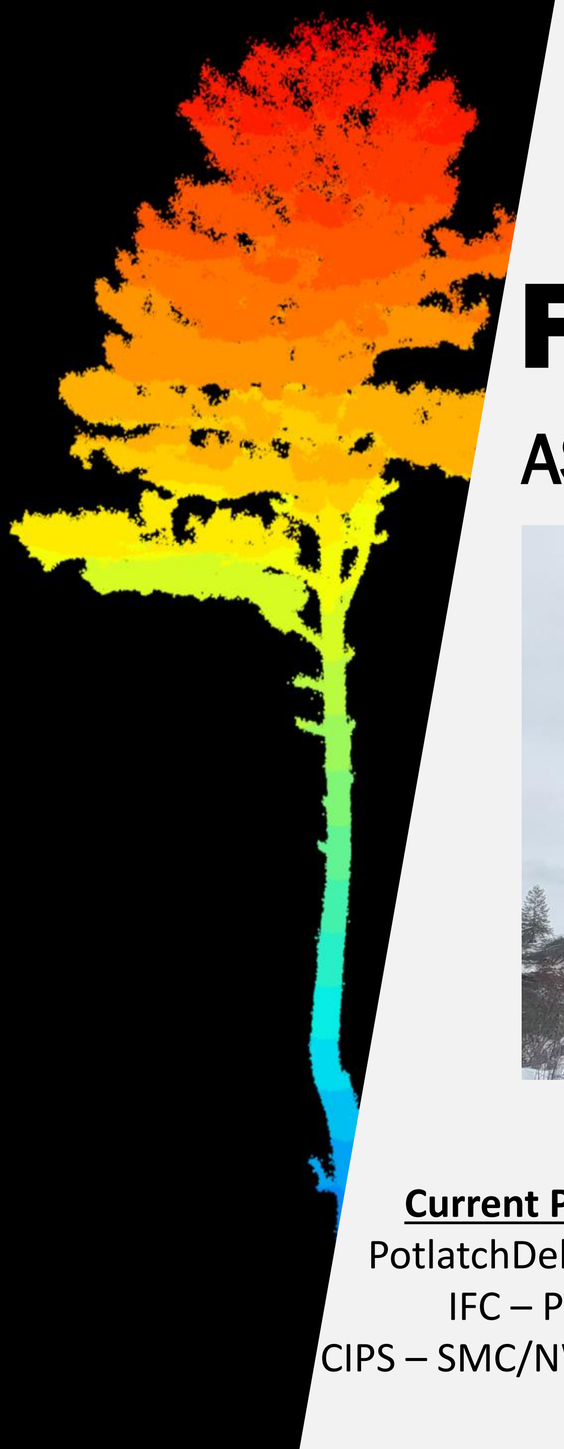
MEASURING STEM DIAMETER W/GEIGER LIDAR - MS









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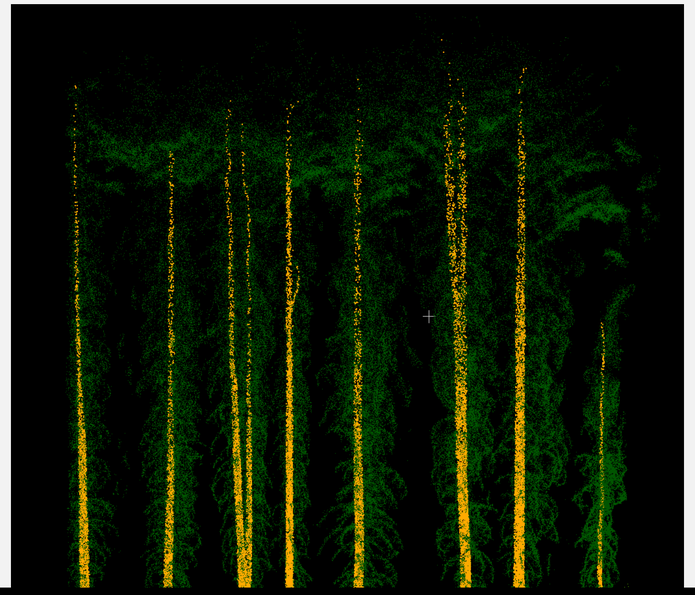
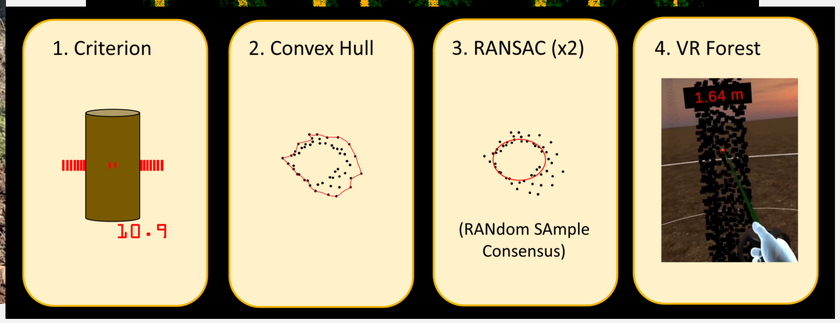
ASSESSING SILVICULTURE EFFECTS ON TAPER W/SLAM





Current Projects

PotlatchDeltic - MOE

IFC – PPDM

CIPS – SMC/NWTIC/VMRC

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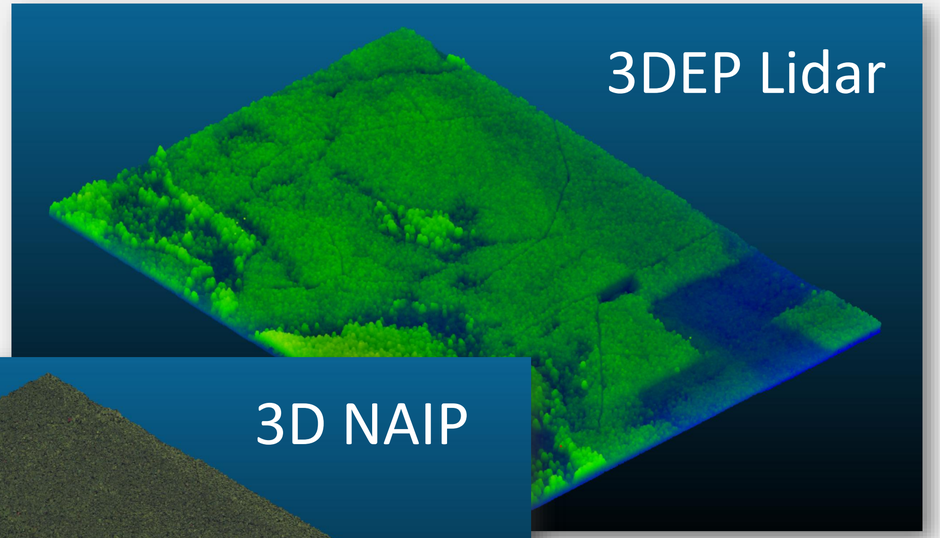
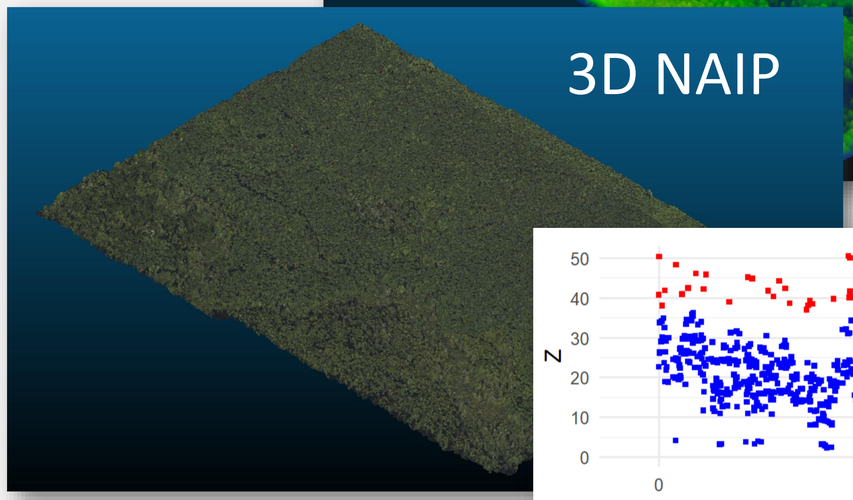
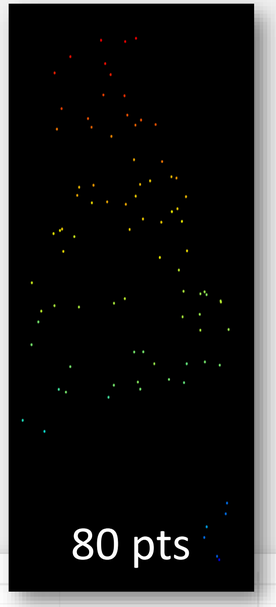
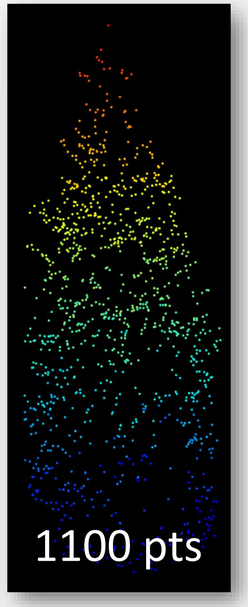
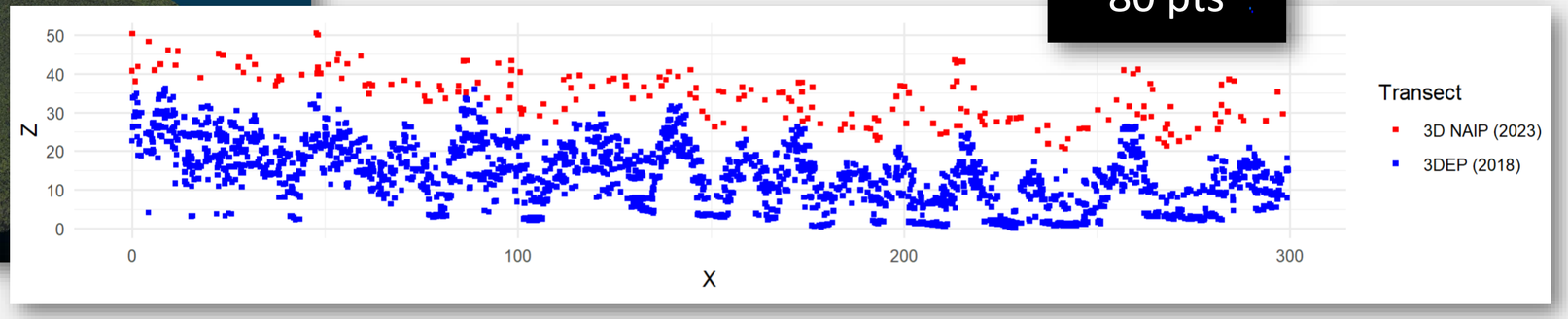
MAPPING SITE PRODUCTIVITY W/3D NAIP + 3DEP LIDAR





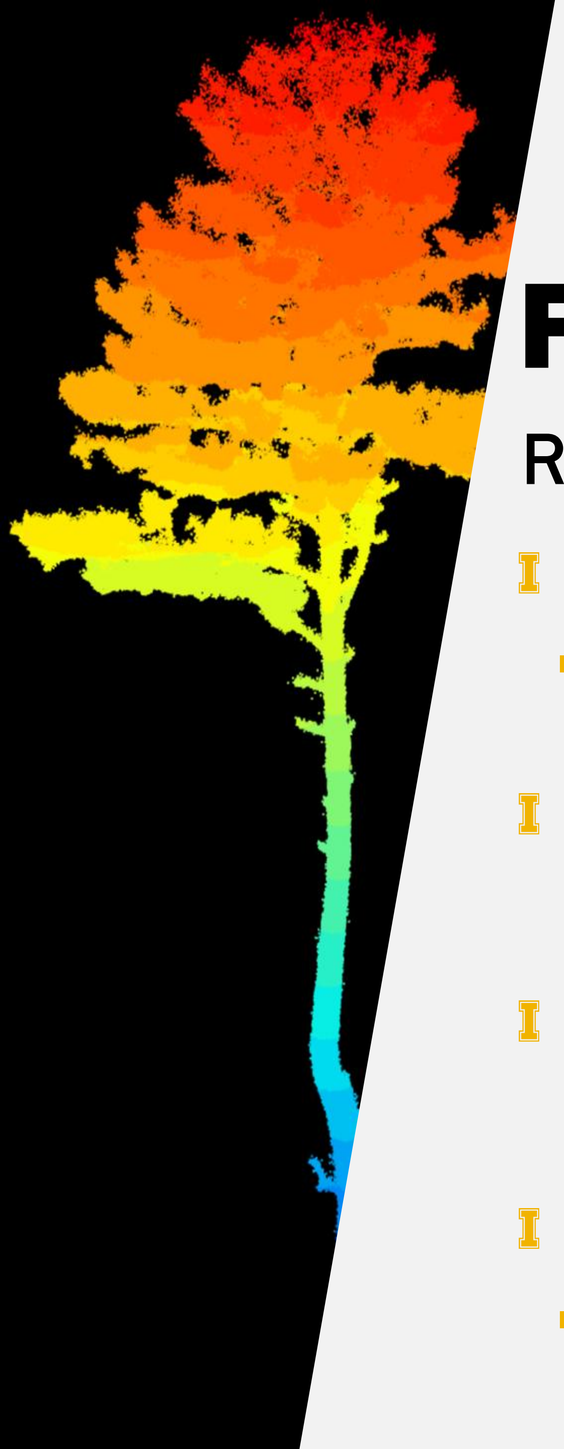






FBRI Forest Biometrics Research Institute

NRCS Natural Resources Conservation Service



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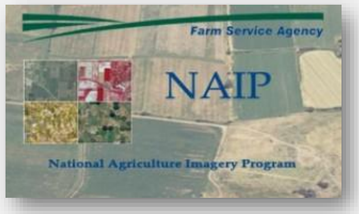
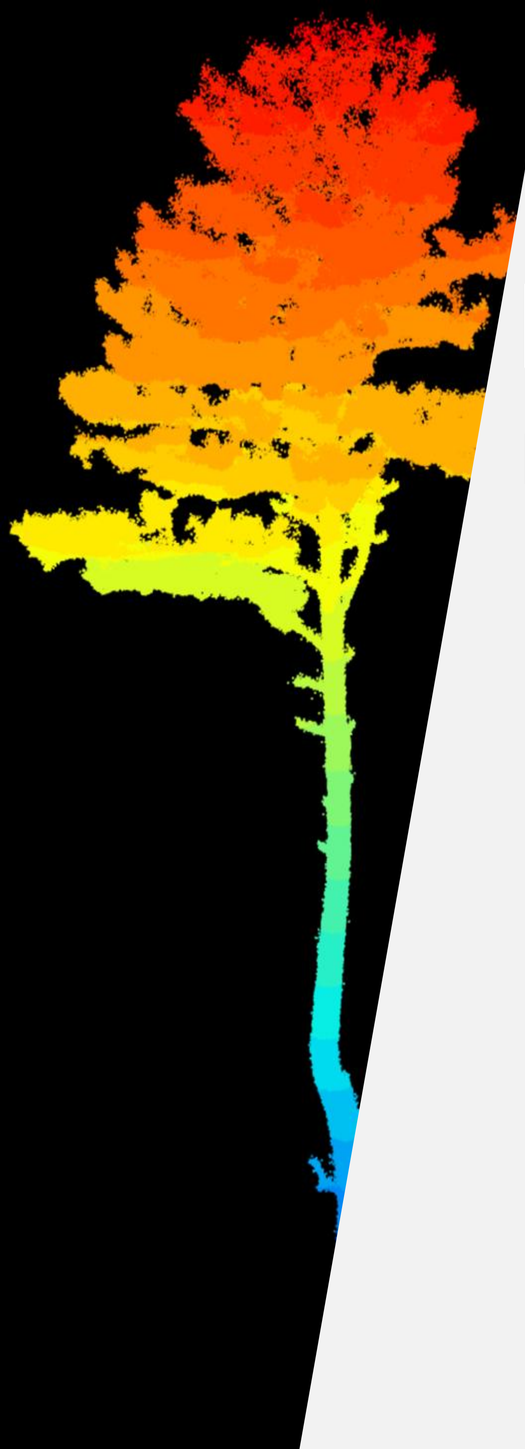
RS INFORMED - ML SMALL AREA ESTIMATION MODELS

- Traditional Linear-Model SAE techniques struggle with:
  - Statistical assumptions, non-normal data, outliers, and nonlinear relationships
- Project integrates robust estimation methods and machine learning algorithms into the SAE framework to ***estimate diameter distributions***, incorporating spectral (MODIS, NAIP) and DSM products (3D NAIP, 3DEP)
- Post-hoc analysis will quantify uncertainty, sensitivity, and reliability of RS informed estimates, prioritizing the explainability of machine learning-based SAE models vs. traditional SAE approaches
- Project sponsored by USFS-FIA, NCASI, PotlatchDeltic, Green Diamond
  - OR/WA/ID + AR/MS/SC

NASA MODIS
Moderate Resolution Imaging Spectroradiometer





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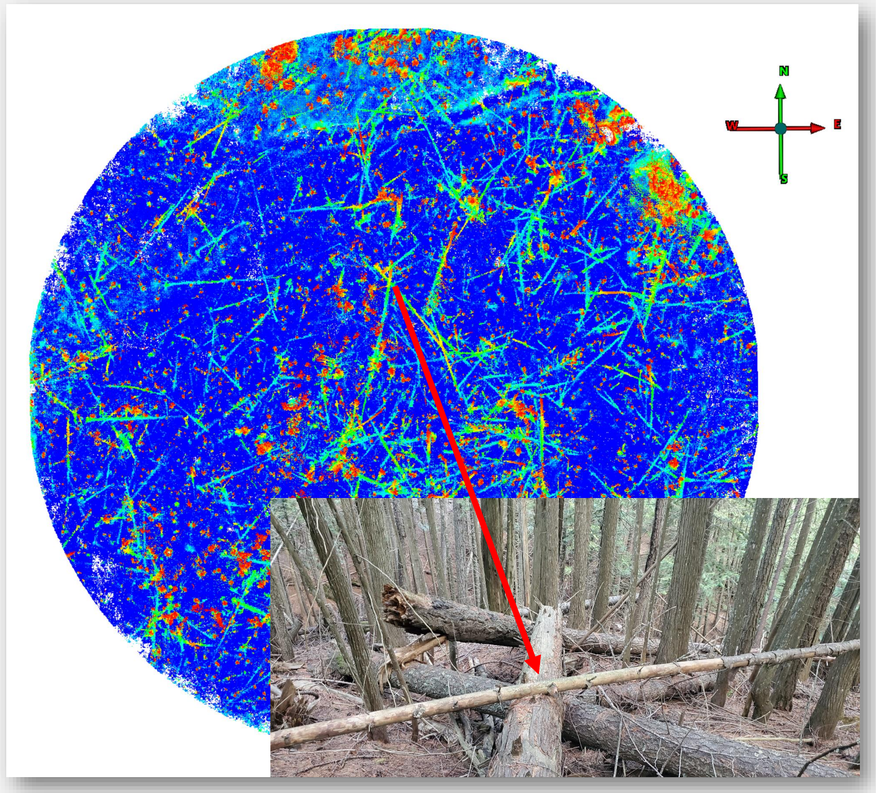
FUEL/BIOMASS MODELING W/GIEGER LIDAR - FUTURE

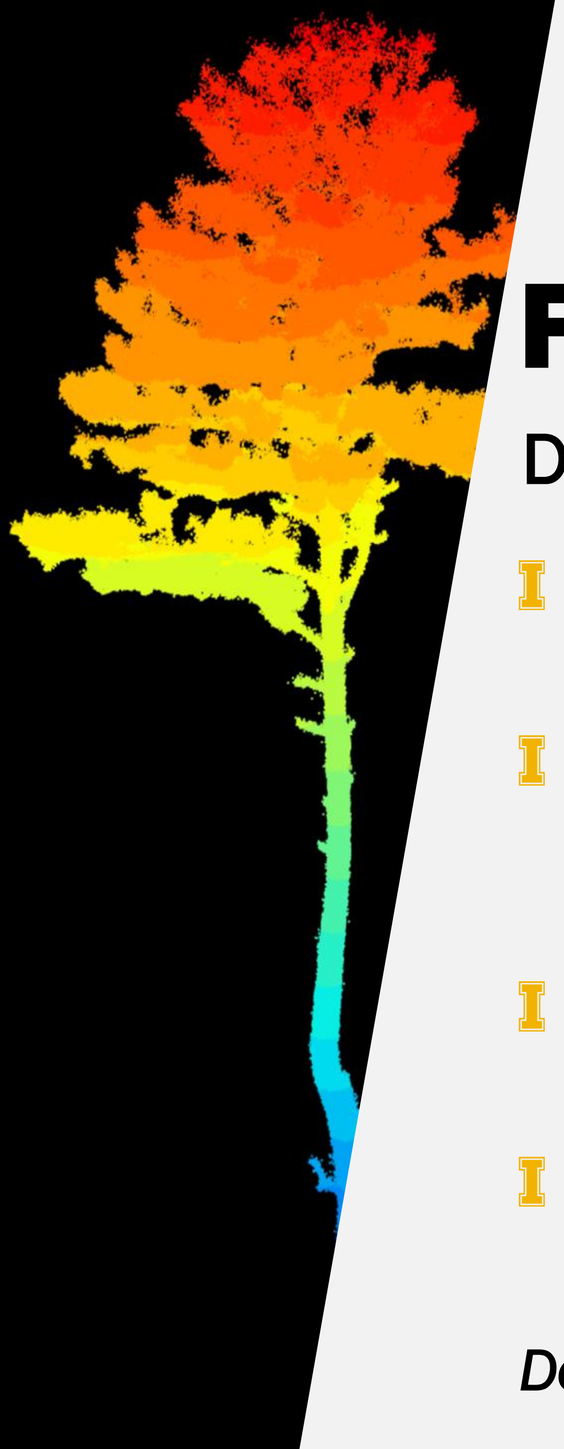


MIT LINCOLN LABORATORY

3D EO

FlamMap

Rocky Mountain Research Station



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DIGITAL FORESTRY – CURRENT FOCUS SUMMARY

- Building a library of LiDAR demonstration data to use for demonstrating differences in LiDAR data collection platform and point cloud density
- Review available segmentation routines and develop a matrix to align the best algorithms with the available platform/density combinations for delivering the best available individual tree inventories
- Publish prototype demonstration projects to allow hands on review of data, technology, and analytics
- Build plug-ins to use for batch processing data to speed implementation

Designed to bring immediate value for Affiliate members

BRUCE RIPLEY
Chief Innovation Officer

College of Natural Resources
Forestry, Rangeland and Fire Sciences
CNR 204B
bripley@uidaho.edu
503-522-7470 (Mobile)
875 Perimeter Dr MS1138 | Moscow ID 83844-1138

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