

EDA PWEAA Clallam Forest Products Innovation Program

Investing in Forestry Skills

A Technology-Focused Workforce Training Program

Oregon State University | Peninsula College

University of Washington Olympic Natural Resources Center



FORTUNE

SUCCESS · CAREERS

Microsoft researchers have revealed the 40 jobs most exposed to AI—and even teachers make the list

By **Preston Fore**

April 28, 2026, 6:38 AM ET



Sorry, Gen Z: AI is expected to soon reshape dozens of popular professions—and possibly make some tasks obsolete

The top 10 least affected occupations by generative AI:

1. Dredge Operators
2. Bridge and Lock Tenders
3. Water Treatment Plant and System Operators
4. Foundry Mold and Coremakers
5. Rail-Track Laying and Maintenance Equipment Operators
6. Pile Driver Operators
7. Floor Sanders and Finishers
8. Orderlies
9. Motorboat Operators
10. Logging Equipment Operators

The top 40 most affected occupations by generative AI:

1. Interpreters and Translators
2. Historians
3. Passenger Attendants
4. Sales Representatives of Services
5. Writers and Authors
6. Customer Service Representatives
7. CNC Tool Programmers
8. Telephone Operators
9.  Travel Agents and Travel Clerks

EDA PWEAA Clallam Forest Products Innovation Program

Investing in Forestry Skills



Closing Skill Gap



Objectives

- Build new workforce pipelines
- Cultivate a future-ready workforce
- Provide diverse pathways



Future-Ready



Approaches

- Outreach networks and strategic partners
- Curricula Development
- Highschool CTE & PC Certificate Programs
- Advanced Career Development



Diverse Paths



Peninsula
College



Oregon State
University



UW Olympic Natural
Resources Center



Project Timeline

Outcomes

First step

2025

Foundation & Infrastructure

- Outreach
- Lab. Establishment

- ✓ Stakeholder involvement in training program and delivery
- ✓ Increased awareness of training opportunities

Second step

2026

Program Design

- Training courses and materials

- ✓ Mechanized Timber Harvesting Course and Certificate Program at PC
- ✓ Advanced training courses at ONRC

Third step

2027

Implementation

- Curriculum delivery
- Program evaluation

- ✓ Increased number of skilled forestry technicians and machine operators in the region
- ✓ Professional development opportunities
- ✓ Demonstrated program effectiveness



Current Progress



Stakeholder Engagement

- Peninsula College and OSU jointly developed a survey to understand the skills and competencies that employers are looking for.
- ORNC conducted a GIS/remote sensing curriculum survey



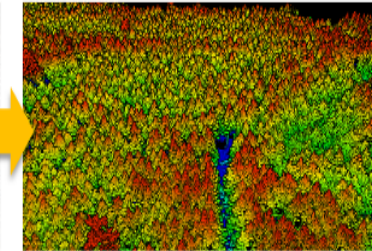
Simulator Lab Establishment

- Infrastructure underway at PC with purchase of simulators. Lab will be completed in Fall 2026.
- Mechanized timber harvesting course development is underway with course approval and delivery in Winter 2027.

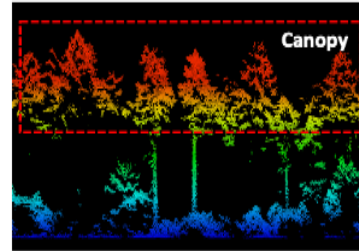
Airborne LiDAR



Drone Mounted LiDAR System



Airborne LiDAR Point Cloud (Starker forest, OR)

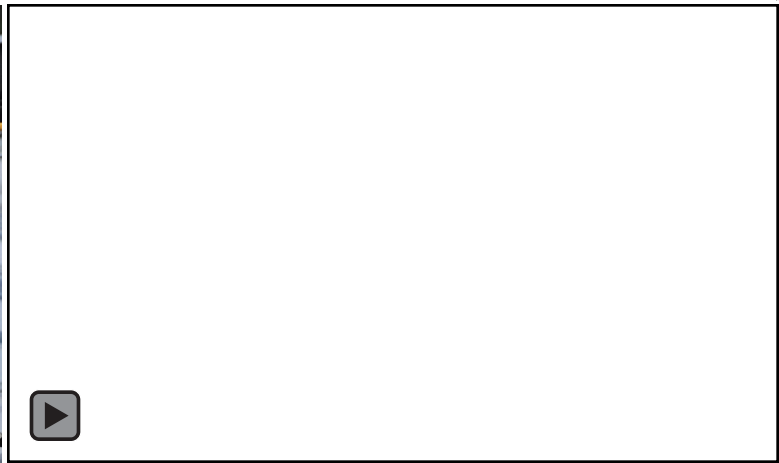


Canopy



Advanced Career Training

- OSU and UW ONRC have begun developing advanced career courses focused on drone operation and LiDAR remote sensing.



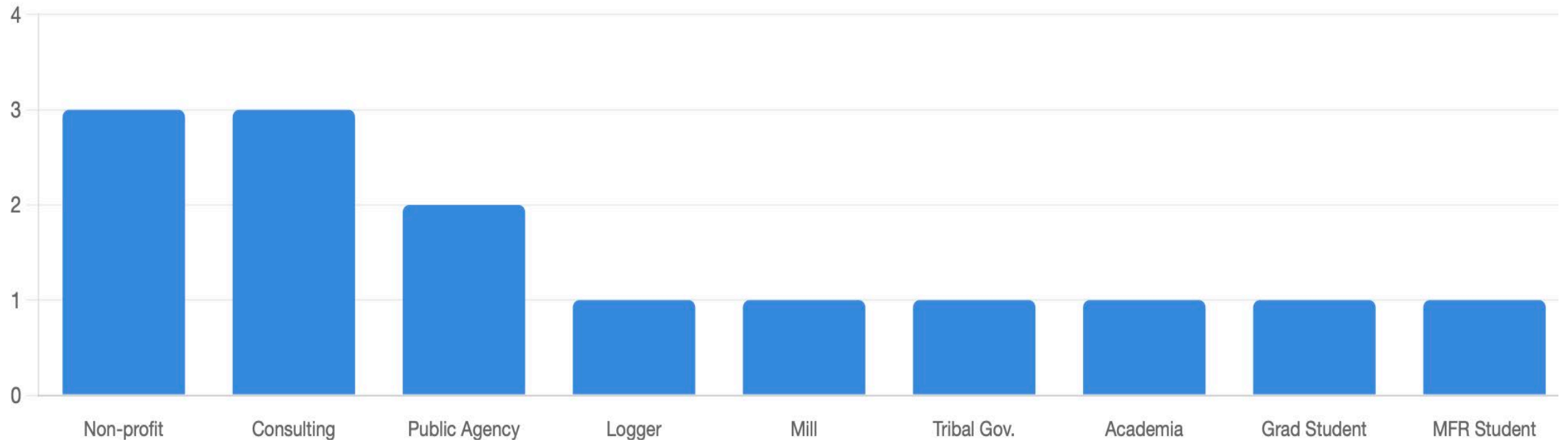
Who Responded?

12

Respondents

9

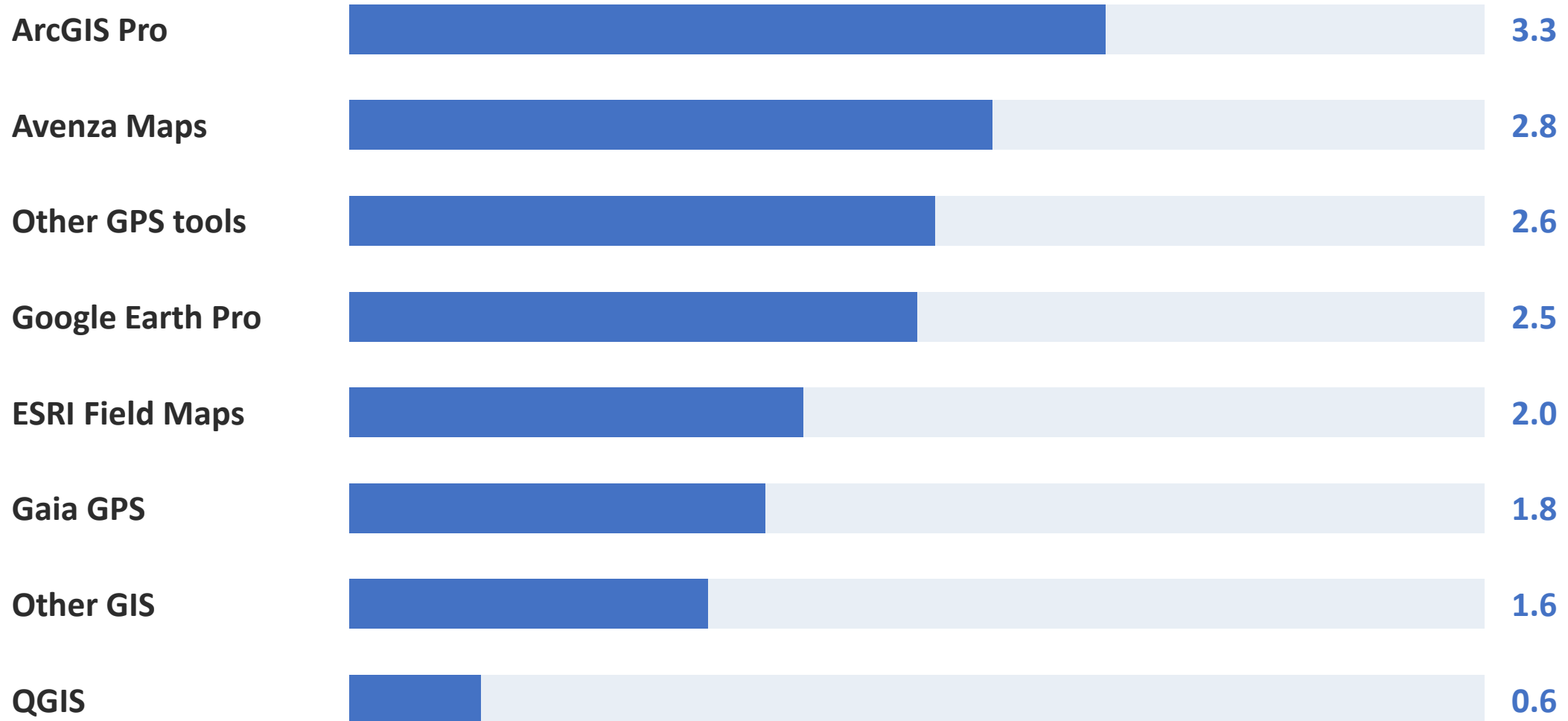
Employer Types



GIS & Mapping Tool Familiarity

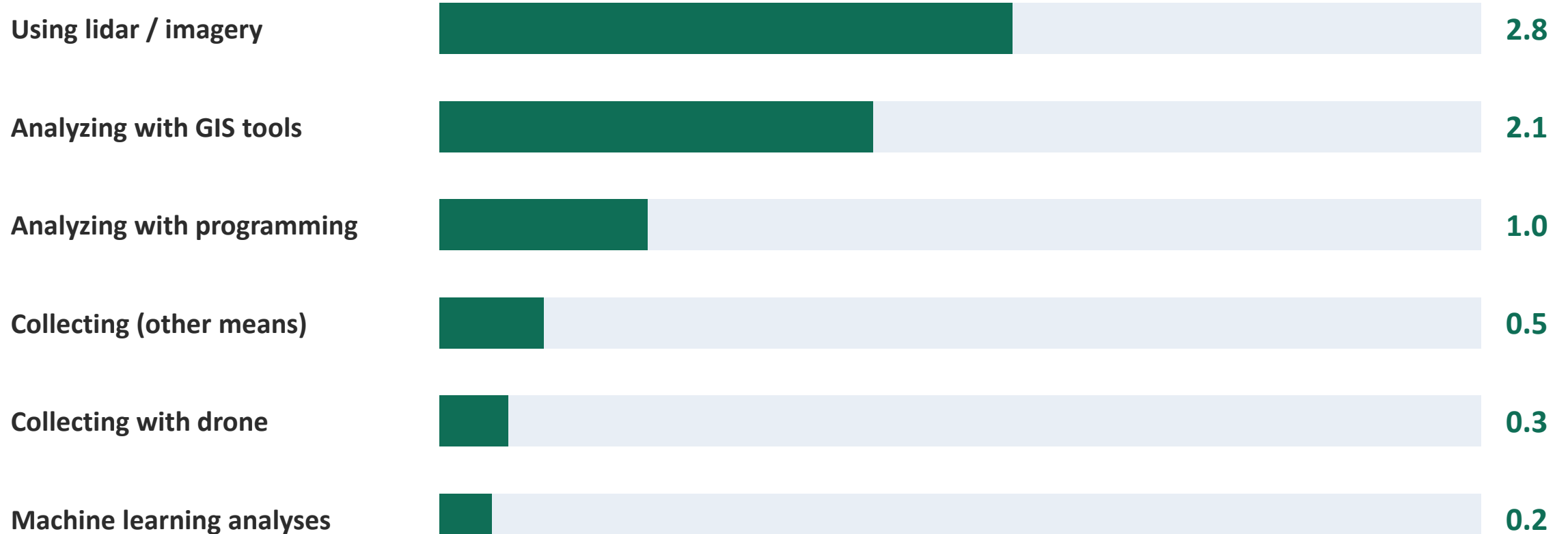
ArcGIS Pro is the most familiar tool — several near-expert users. QGIS is nearly unknown.

0 = no experience, ; 1 = minimum; 2= some; 3 = moderate; 4 = advanced; 5 = expert



Remote Sensing Tool Familiarity

0 = no experience, ; 1 = minimum; 2= some; 3 = moderate; 4 = advanced; 5 = expert



The entire group is effectively a beginner in remote sensing — a strong case for starting from the fundamentals.

Course Preferences

Delivery format

Virtual + In-Person

Equal demand — 6 of 12 selected each

Preferred timing

Work hours (6) · Evenings (5)

Weekends least preferred (2); daytime / weeknight scheduling recommended

In-person location

Port Angeles, WA

Top choice by wide margin — 7 of 12; Forks and No Preference tied at 2

Course structure

Building-up series

Preferred 6 vs 4 for standalone; both formats should be offered

Strong readiness: 8 of 12 companies approved work-hour participation; 11 of 12 expressed interest in the 2026 pilot.

OSU Mechanized Harvesting Laboratory: Workforce Development

Dr. C. Kevin Lyons
Wes Lematta Professor of Forest Engineering
Director Mechanized Harvesting Laboratory
Oregon State University
kevin.lyons@oregonstate.edu

Alexander Tkachuk
Research Assistant
Mechanized Harvesting Laboratory
Oregon State University
alexander.tkachuk@oregonstate.edu

Overarching *EXPERIENTIAL LEARNING* principle

The MHL believes that:

- Participants create their own knowledge by working to solve problems.
- Promoting creativity increases the knowledge gained.



Attributes of an experiential learning activity

For an experiential learning activity to be effective it must:

1. Be skill appropriate.
2. Fit the available resources.
3. Have clear objectives.
4. Promote creativity (complex rules stifle creativity)
5. Emphasize the coaching topic.



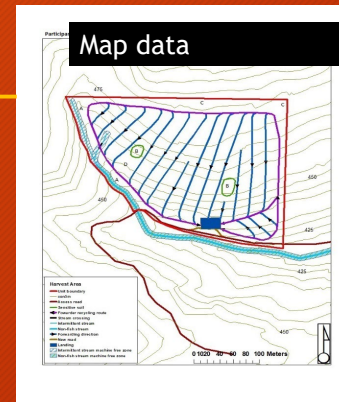
MHL levels of workforce training

Engagement



Photo by Hamilton 2023

Education



Training



Components of the John Deere forest harvesting simulator system

The JD simulator system consists of four software packages

1. Machine and terrain simulation
2. John Deere TimberSkills
3. Terrain Editor
4. TimberMatic Maps

Machine training example: TimberSkills

The image shows a screenshot of the 'Forestry Machine Simulator 4.3.10 - The work order' application. The main window displays a 3D simulation of a harvester in a forest. A 'Pause Break' button is visible in the top right of the simulation area. A 'Simulator' score report is overlaid on the right side, and a detailed criterion table is shown in the bottom left.

Simulator Score Report: 1270E_H414
 Time: 4/20/2026 5:08 PM
 Training file: The work order

CRITERION	VALUE	TARGET	SCORE
Average simultaneous boom movements	2	2	0.83
Boom tip distance (m)	99.79	120.01	1
Boom control (0...1)	0.61	0.7	0
Stem count	10	10	1
Mean stack quality	0.85	0.85	0.54
Cabin damage	0	0	1
Machine damage	0	0	2
Boom to trees	0	0	1
Boom other damage	0	0	1
Saw damage	0	0	1
Damaged trees	1	0	3
Stumps over 20 cm	1	0	2
Stumps over 30 cm	0	0	1
TOTAL			3.37

Criterion Table:

CRITERION	VALUE	TARGET	SCORE
Average simultaneous boom movements	2	2	0.83
Boom tip distance (m)	99.79	120.01	1
Boom control (0...1)	0.61	0.7	0
Stem count	10	10	1
Mean stack quality	0.85	0.85	0.54
Cabin damage	0	0	1
Machine damage	0	0	2
Boom to trees	0	0	1
Boom other damage	0	0	1
Saw damage	0	0	1
Damaged trees	1	0	3
Stumps over 20 cm	1	0	2
Stumps over 30 cm	0	0	1
TOTAL			3.37

Tree Information:
 S3 birch
 A pulp 300 cm
 Length 300 cm Diameter 97 mm

Worker safety example

ABC Analysis

A

List existing antecedents that could trigger unsafe behavior

- Availability
- Rushing
- Anticipate mild consequences
- Peer pressure

B

State the unsafe behavior in observable terms

- Not wearing hearing protection when running a chainsaw.

C

List consequences of unsafe behavior and value for S/L, C/U, +/-

Consequence	S/L	c/u	+/-
Saves time	S	C	+
Injury	L	U	-
Comfort	S	C	+
Reprimand	L	U	-
Peer approval	S	C	+



Action plan

Action	Who	Start	Completion
Purchase and store reusable corded earplugs in all pickup dry boxes			
During monthly safety inspections ensure hearing protection stored with all saws in pickup dry boxes.			
Write into job descriptions for all staff that it is mandatory to wear PPE when onsite.			
Initiate mandatory annual hearing testing for all staff and employees			
Review safe work practices and PPE for using chainsaws			

Questions?



Applied Technology Skills for Forestry Workforce

Francisca Marrs Belart
Associate Professor
Oregon State University
francisca.marrs@oregonstate.edu

Gayoung Won
Graduate Fellow
Oregon State University
gayoung.won@oregonstate.edu

Drone Operation

Objective

Operate drone (small unmanned aircraft systems, UAS) to access, observe, and collect data in the field

Why learn this?

- Access and observe areas that are difficult, unsafe, or impractical to reach on foot
- Reduce time and cost compared to traditional field methods
- Support multiple field tasks with one adaptable platform

How is it used?

- To collect aerial imagery and LiDAR data
- To monitor field conditions and inspect sites
- To support aerial spraying and treatment work
- To support wildland fire management and disaster response

Remote Sensing

Objective

Use aerial and satellite sensors to observe, measure, and analyze landscape conditions across large areas without direct ground access

Why learn this?

- Allows monitoring of large areas more efficiently than traditional ground-based methods
- Improves accuracy and consistency in mapping and landscape assessment
- Increasingly affordable and widely available through expanding imagery and geospatial tools

How is it used?

- For forest inventory and stand assessment
- For vegetation condition and landscape change monitoring
- For harvest and road planning
- For post-treatment evaluation and regeneration monitoring

GNSS (Global Navigation Satellite System)

Objective

Deploy practical low-cost GNSS for accurate positioning with reduced operational complexity compared to survey-grade systems

Why learn this?

- Enhance work safety by providing reliable positioning for forest workers
- Replace manual flagging for stream buffer zones and stand boundaries
- Cost-effective and reliable positioning solution for forestry operations

	Cost	Accuracy
Practical GNSS	~\$500	0.5-2 m
Survey-grade	~\$15,000	0.2-1 m

How is it used?

- For geofencing stream buffer, equipment limitation zones, and hazardous area
- Stand boundary delineation and mapping, real time alerts
- Harvesting equipment and forest worker tracking

Field Mapping Apps

Objective

Utilize mobile map-based tools used to view, collect, and organize field information in one place, often with offline access and location tracking

Why learn this?

- Field crews increasingly rely on mobile tools for daily operations
- Offline access supports more reliable work in remote areas
- Field information can be updated, shared, and integrated more efficiently across workflows

How is it used?

- For pre-trip planning and map review before field visit
- For real-time navigation and reference in low-connectivity environments
- For field data collection linked to maps, GIS layers, and reporting workflows

Drone Operation

1. Drone Fundamentals and Regulations

- What is a drone?
- Basic UAS systems and components
- Regulations and legal considerations

2. Hands-on Flight Training

- Basic flight control and operation
- Pre-flight checks and safety procedures
- Introductory field flight practice

3. Flight Planning and Mission Setup

- Mission planning fundamentals
- Site conditions and operational constraints
- Planning for safe and efficient field flights

4. Drone Use in Forest Environments

- Forestry applications of drones
- Operational challenges in forest terrain
- Canopy, visibility, and terrain considerations

Remote Sensing

1. Remote Sensing Fundamentals

- Principles of remote sensing
- Common sensor types and data sources
- Applications in forestry and natural resources

2. LiDAR as Remote Sensing

- LiDAR principles and data structure
- Strengths and limitations of LiDAR
- Forestry applications of LiDAR

3. Data Processing – CloudCompare

- Point cloud visualization
- Basic point cloud processing
- Measurement and feature extraction

4. Data Processing – ArcGIS Pro

- Raster and vector data integration
- Spatial analysis and map interpretation
- GIS workflows for forestry applications

Field Mapping Apps

1. Data sources

- Finding sources of data
- Understanding different data files and conversion

2. Avenza for Field Mapping

- Importing and organizing maps for field use
- Using layers, markers, and notes in the field
- Recording georeferenced observations during fieldwork

3. Google Earth for Planning and Visualization

- Reviewing terrain, access, and site conditions before fieldwork
- Using imagery for route planning and site familiarization
- Supporting pre-trip planning and field visualization