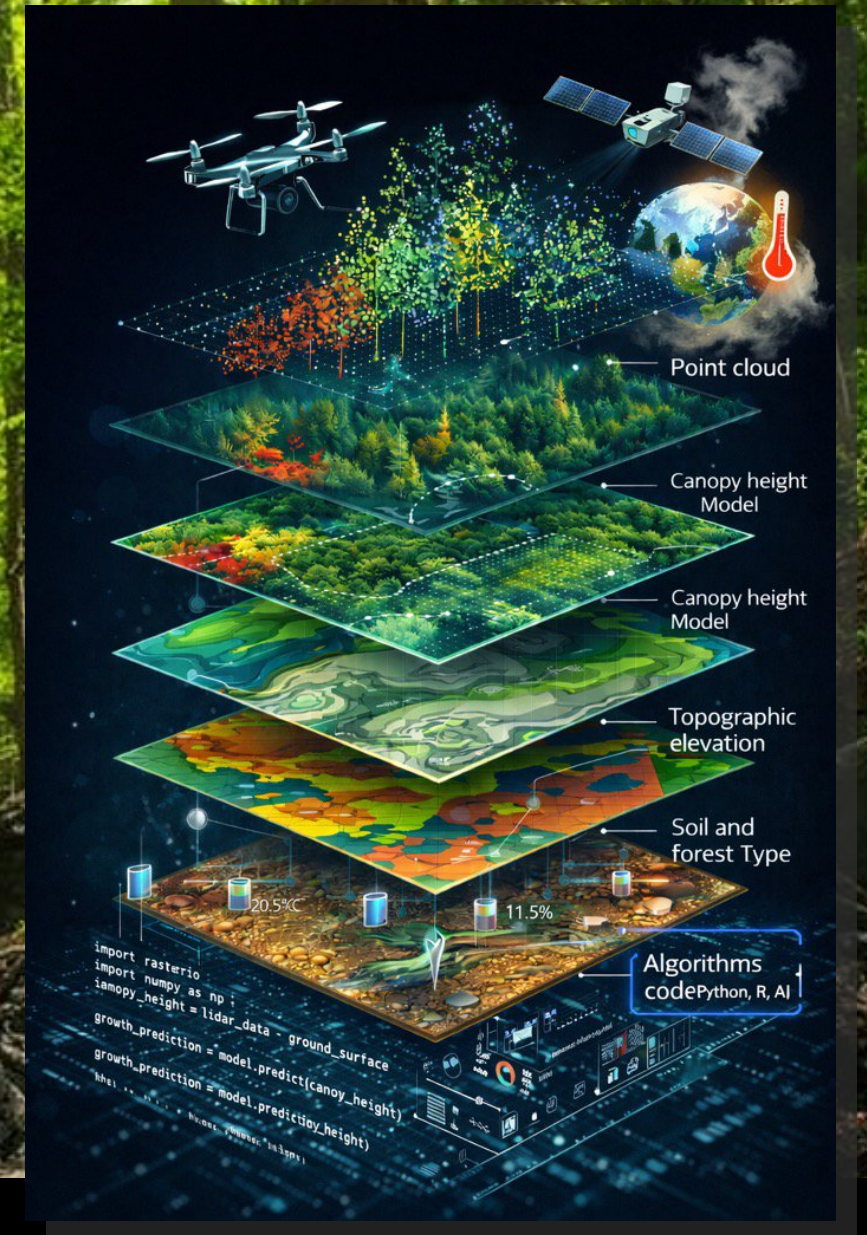


Digital Forestry @ UNB

Digital Forestry: Skills, Partnerships & a Future-Ready Forest Sector



FORESTRY & ENVIRONMENTAL MANAGEMENT

AUDIENCE CHECK-IN

Show of Hands!



1

Who graduated from UNB Forestry & Environmental Management (any degree)?

2

Who works directly with field data in their day-to-day job?

3

Who has hired a forestry or environmental management graduate in the last 5 years?

4

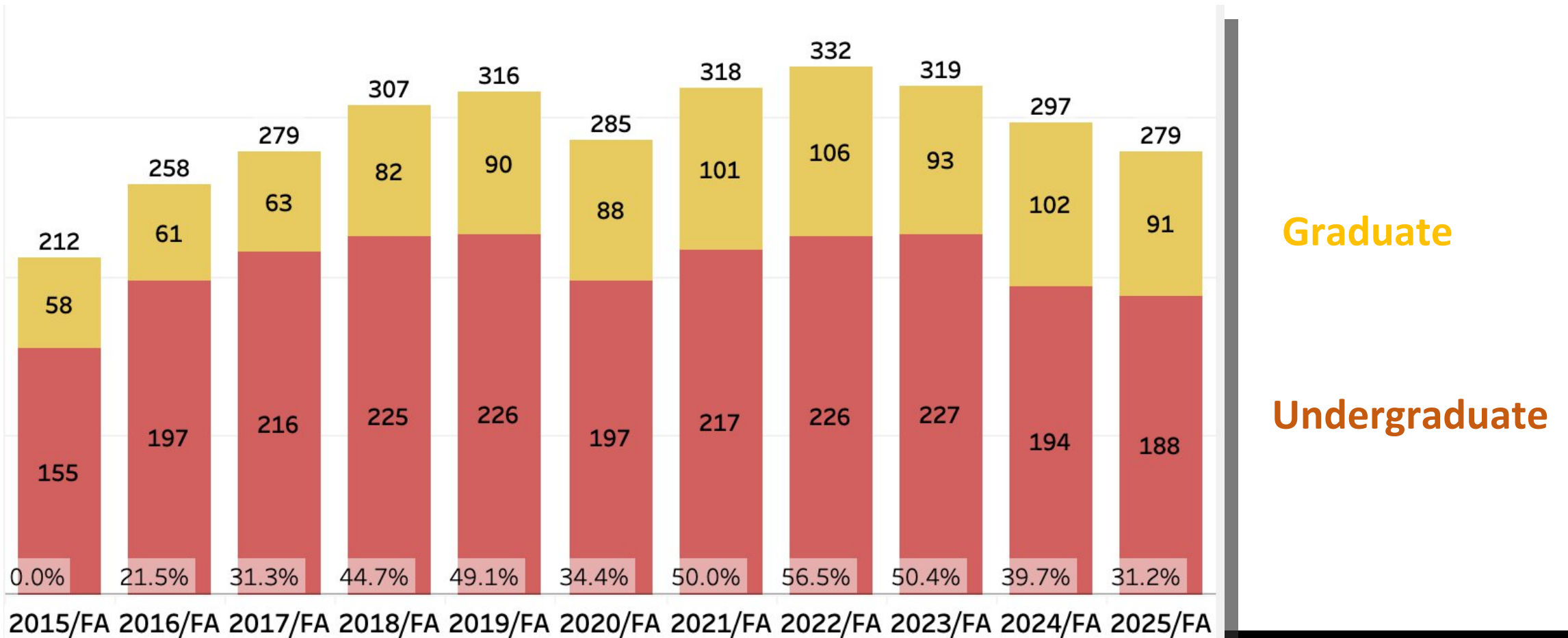
Who feels confident that your organization has the digital skills it needs to compete in the next decade?

A quick pulse check before we dive in!

Where are we at?

FORESTRY & ENVIRONMENTAL MANAGEMENT

Past 10 years: Enrolment



Growth in forestry and environmental management.

FORESTRY & ENVIRONMENTAL MANAGEMENT

Undergraduate

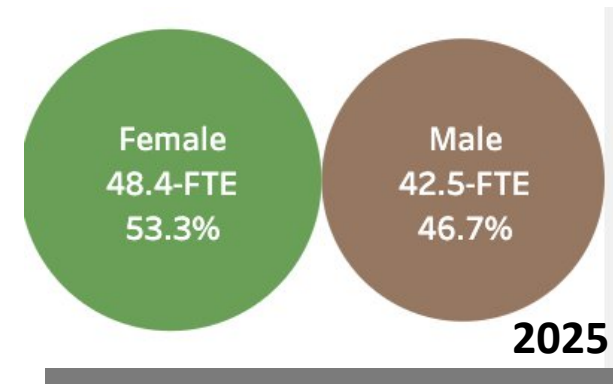
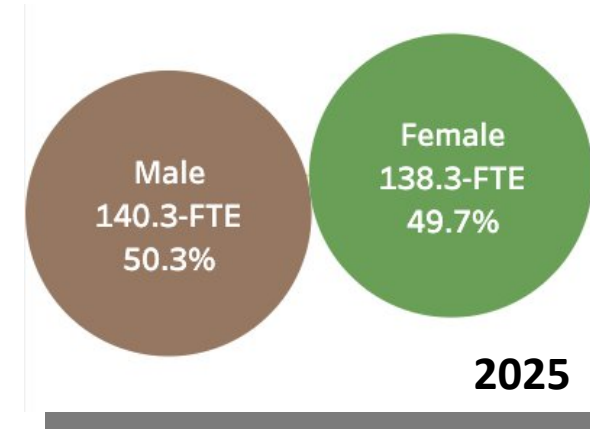
BSc Forestry (BScF)
BSc Environmental Management (BScEM)

Graduate

Master of Forestry (MF)
Master of Forestry Eng (MFE)
Master of Environmental Management (MEM)

Master of Science in Forestry (MScF)
Master of Science in Forestry Engineering (MScFE)
Master of Science in Environmental Management (MScEM)
PhD

Past 10 years: Enrolment



A diverse & balanced student community across programs.

FORESTRY & ENVIRONMENTAL MANAGEMENT

Undergraduate

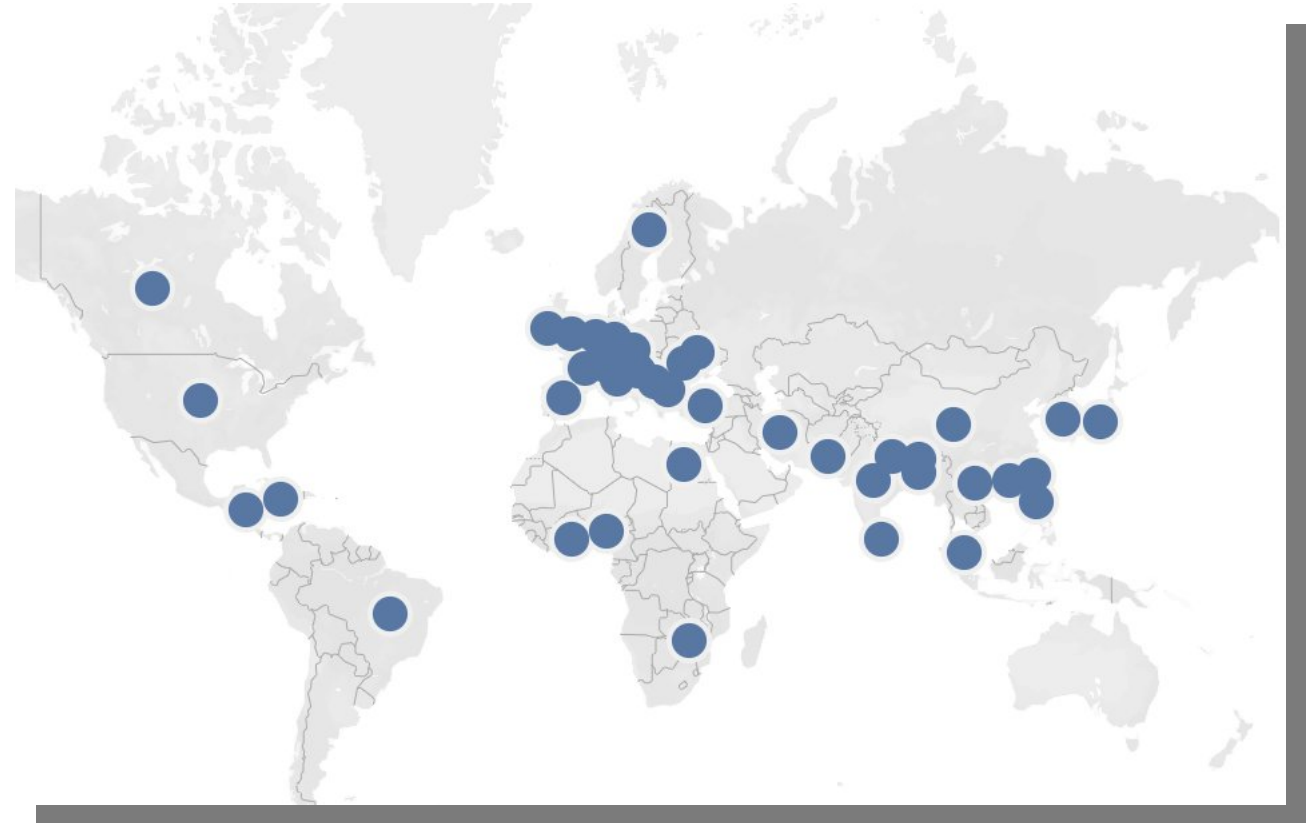
BSc Forestry (BScF)
BSc Environmental
Management (BScEM)

Graduate

Master of Forestry (MF)
Master of Forestry Eng (MFE)
Master of Environmental Management (MEM)

Master of Science in Forestry (MScF)
Master of Science in Forestry Engineering (MScFE)
Master of Science in Environmental Management (MScEM)
PhD

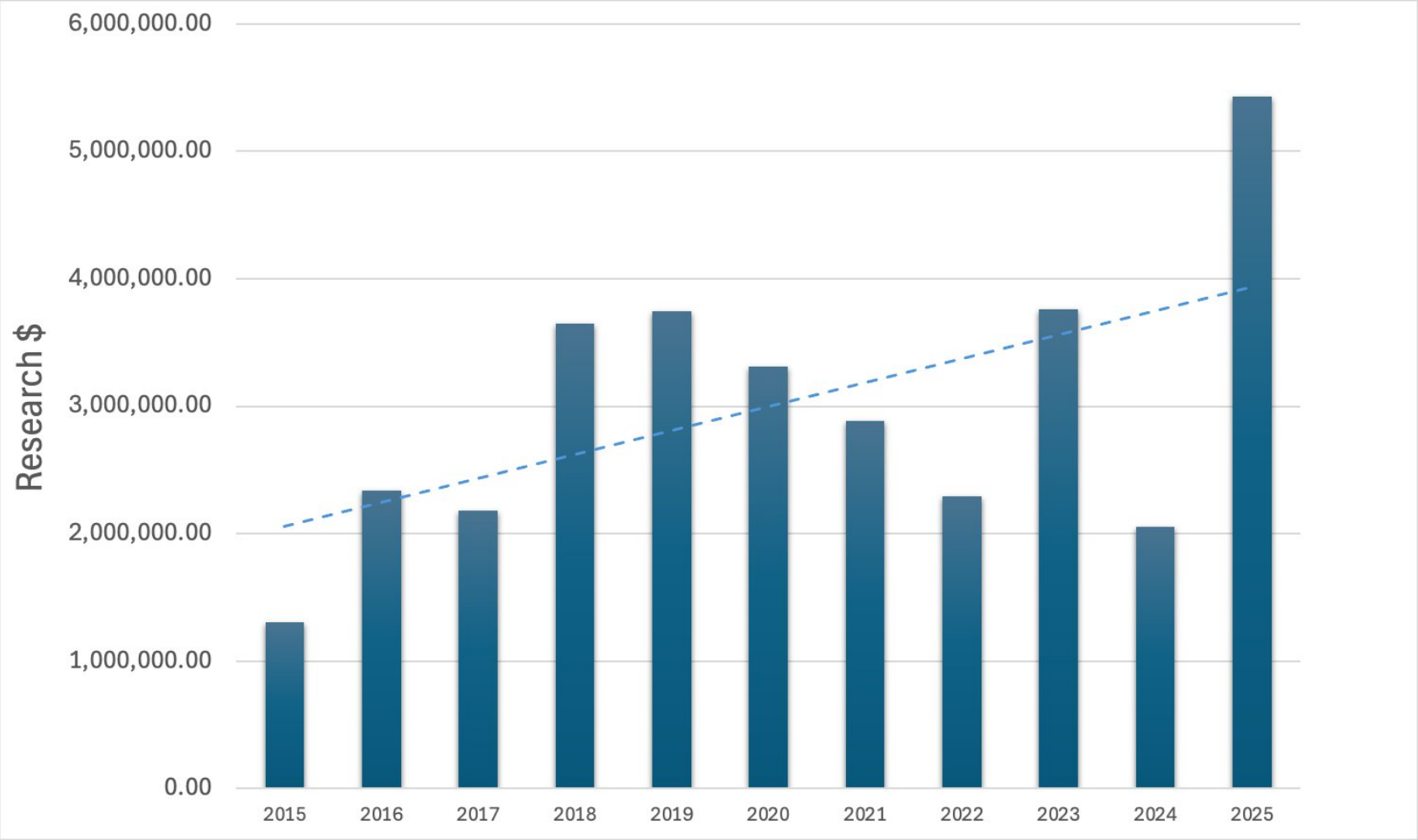
Past 10 years: Enrolment



Global reach with local impact.

FORESTRY & ENVIRONMENTAL MANAGEMENT

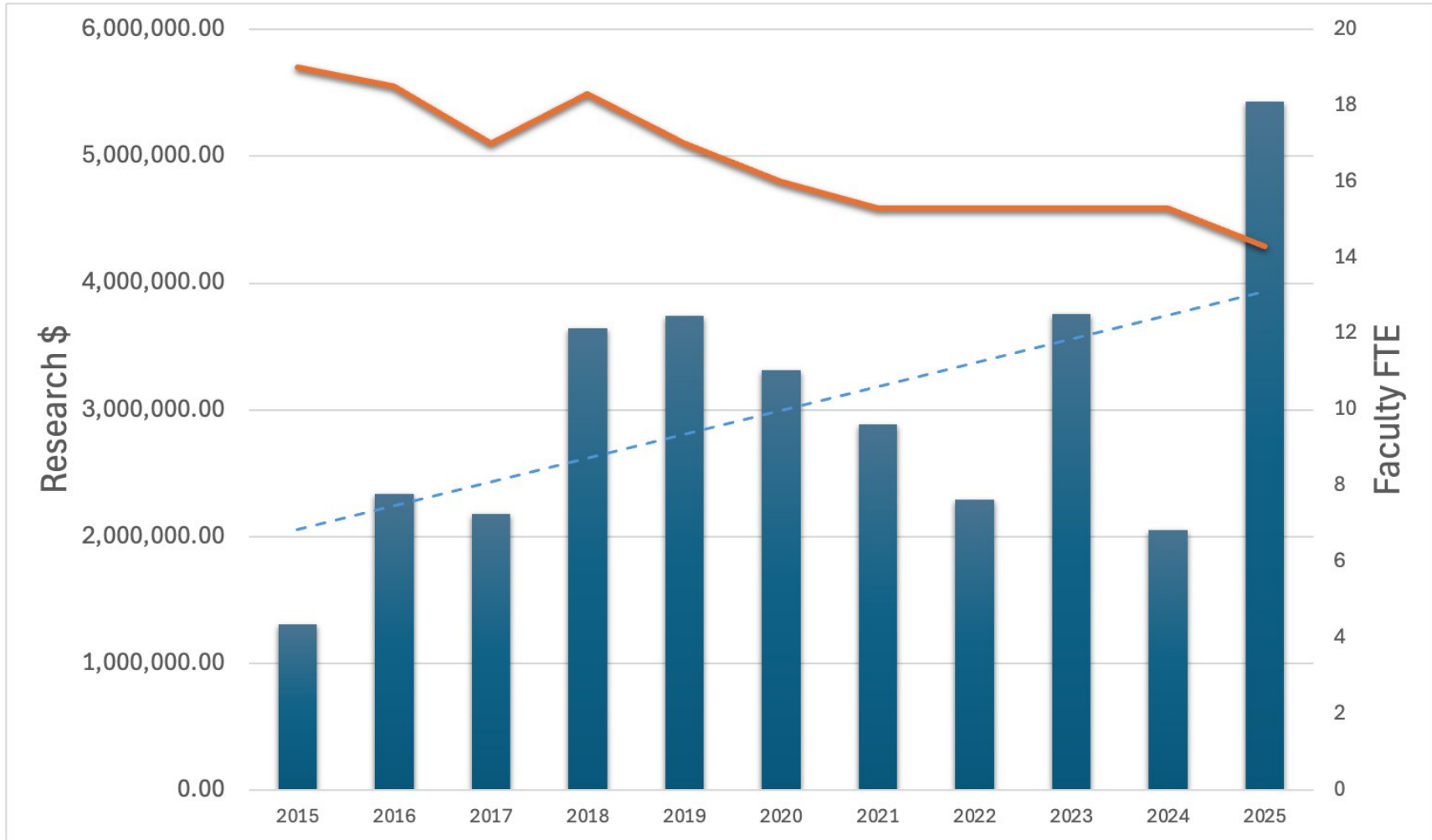
Past 10 years: Research \$



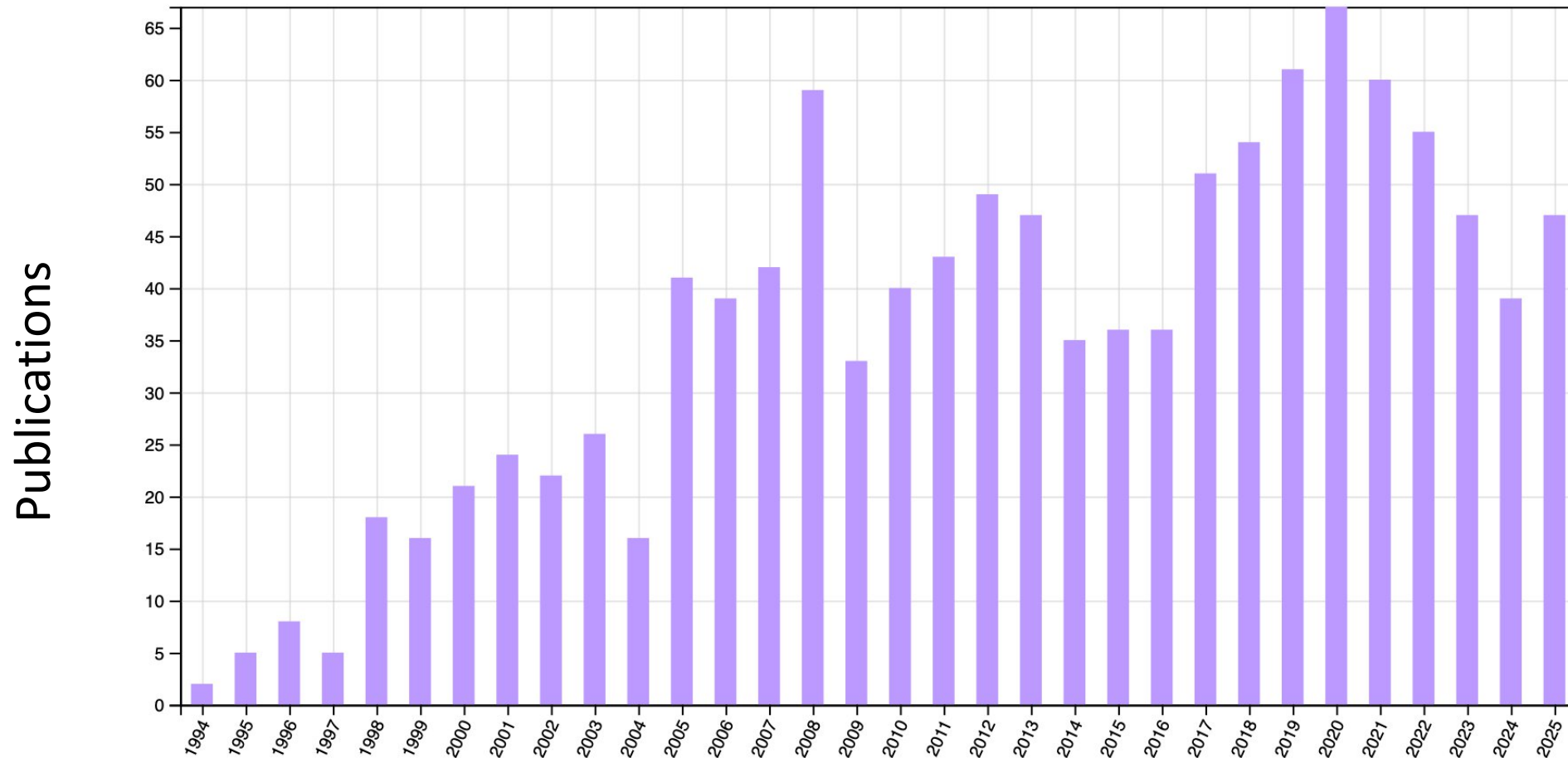
Research funding growing with impact.

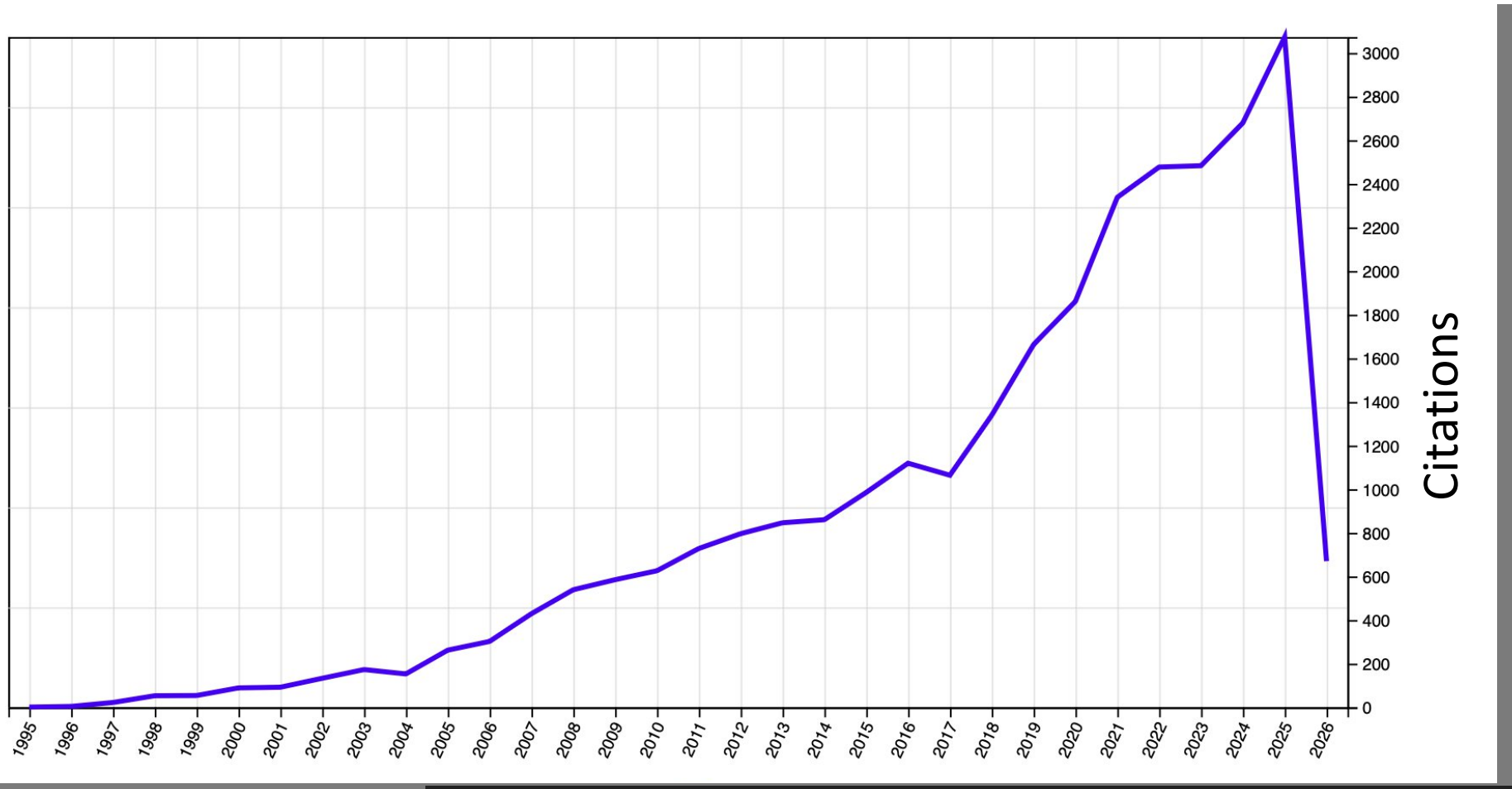
FORESTRY & ENVIRONMENTAL MANAGEMENT

Past 10 years: Research \$ + Faculty FTE



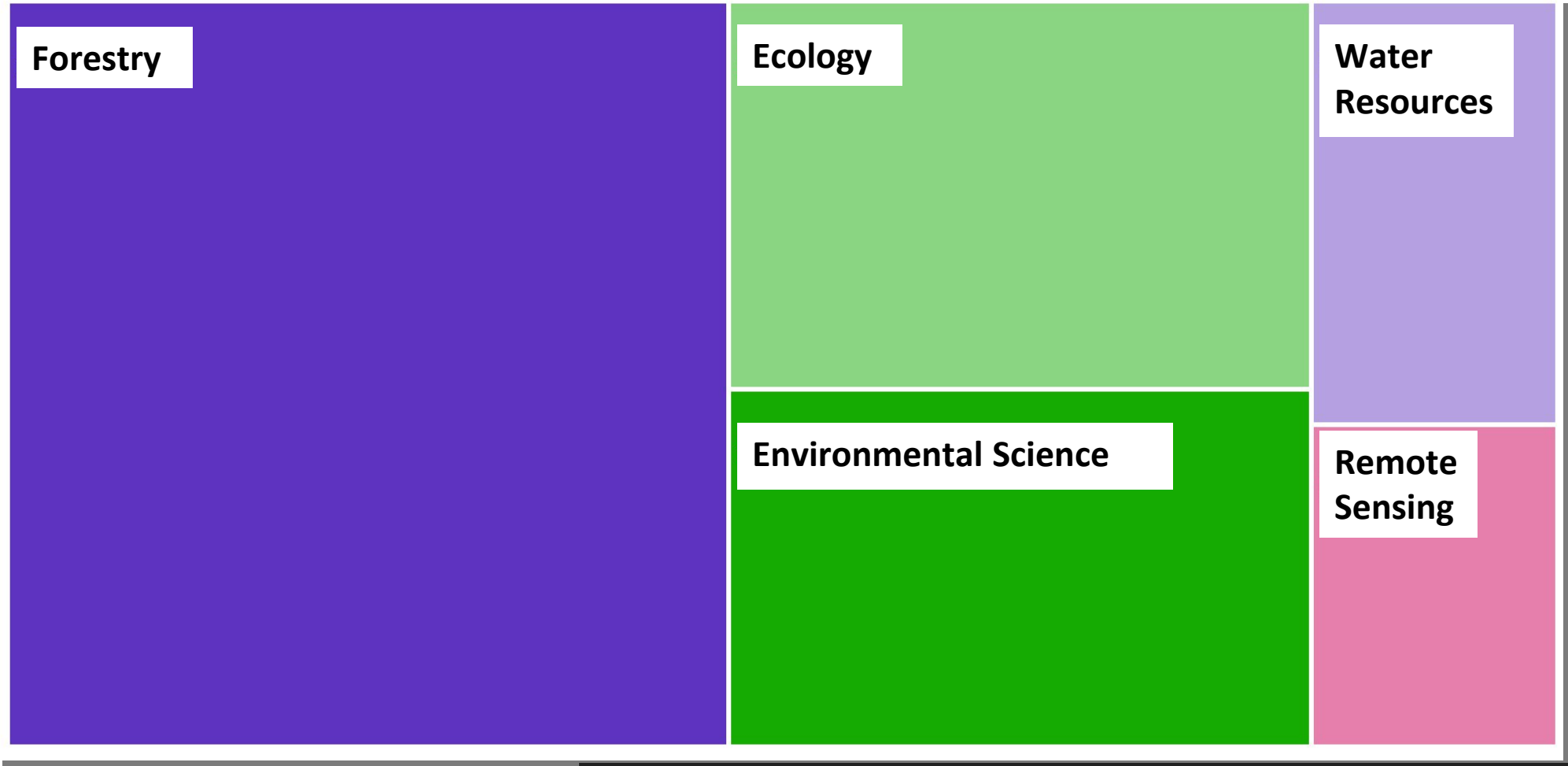
Research impact growing even as faculty numbers decline.





FORESTRY & ENVIRONMENTAL MANAGEMENT

Past 30 years: Research areas



Where are we going?

FORESTRY & ENVIRONMENTAL MANAGEMENT

Threats



Wildfire



Pests



Drought



Fragmented data

Opportunities



AI



Digital twins



Sovereign data



Indigenous leadership



Forestry is facing increasingly complex changes.

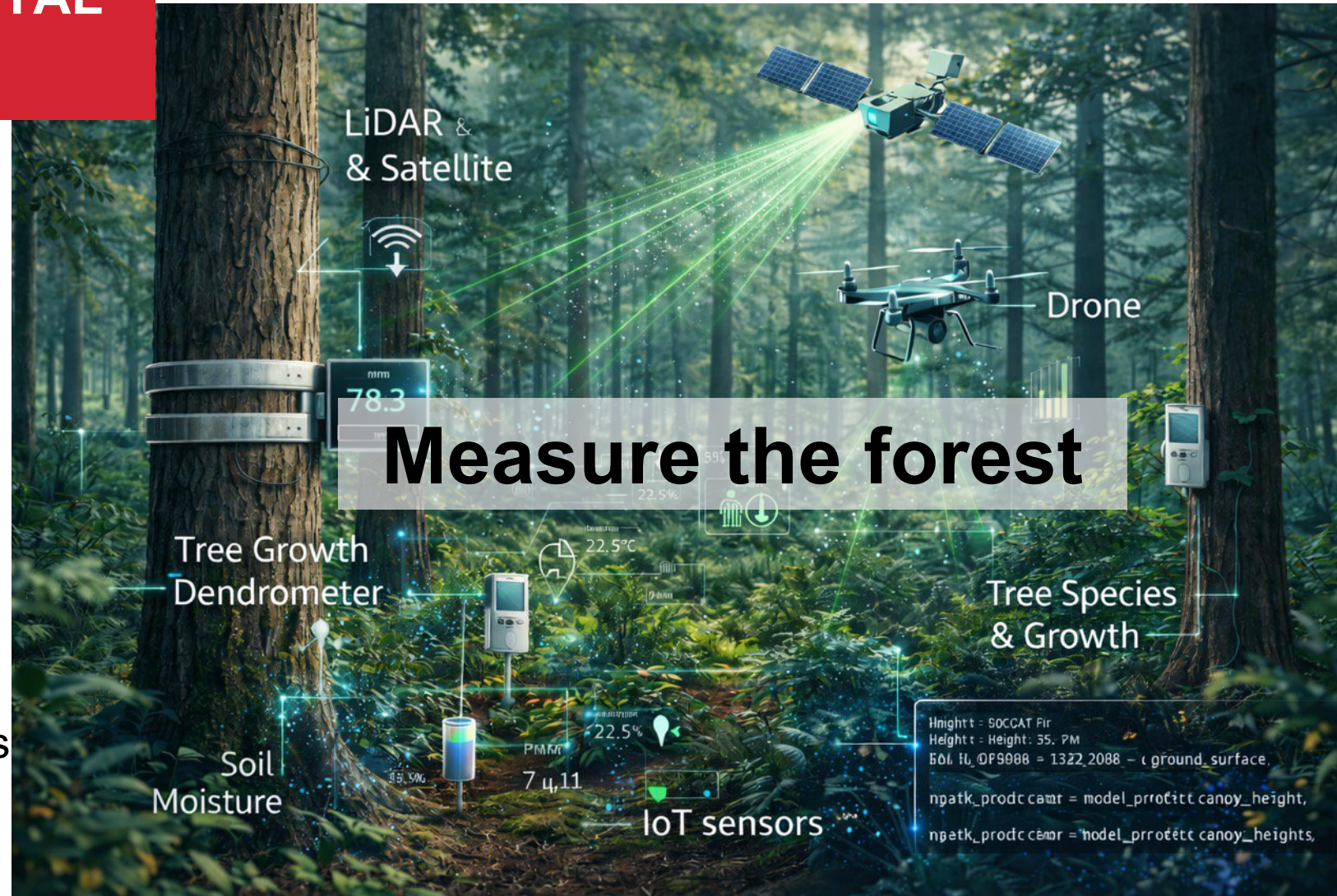
FORESTRY & ENVIRONMENTAL MANAGEMENT

What is Digital Forestry?

...integration of digital technologies into forest management

Data Acquisition & Monitoring

- remote sensing (LiDAR, satellites)
- drones
- IoT sensors: real-time, high-resolution data on forest conditions
 - soil moisture, air quality, and tree species/tree growth, etc



Digital tools are transforming how forests are measured, monitored, and managed.

FORESTRY & ENVIRONMENTAL MANAGEMENT

What is Digital Forestry?

...integration of digital technologies into forest management

Modeling and simulation

- create 3D "digital twins" of forest areas for virtual inventory
- growth simulation
- before-and-after analysis of disturbances
 - fire, wind, insects, temperature, etc



Simulation models allow us to explore forest futures before decisions are made on the ground.

FORESTRY & ENVIRONMENTAL MANAGEMENT

What is Digital Forestry?

...integration of digital technologies into forest management

Management and Optimization

- utilize AI to manage and model big data
- optimize timber harvesting/ operations (under future scenarios)
- enhance decision-making for operations and conservation



Advanced analytics turn complex forest data into smarter management decisions.

FORESTRY & ENVIRONMENTAL MANAGEMENT

What is Digital Forestry?

...integration of digital technologies into forest management

Sustainability & Planning:

- enables stakeholders and rightsholders to simulate financial and environmental scenarios
- long-term forest management and sustainable practices

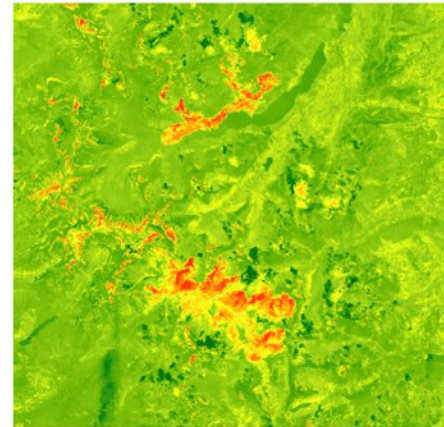


Plan sustainably

Scenario modelling supports sustainable forest management across generations.

FOR3303: Remote Sensing in Forestry & Environmental Management

- Change detection
 - Burn perimeter and severity
- Image classification
 - Land type
- Deep learning
 - Object identification
- Accuracy assessment



Forest burn areas represented as red



Classification

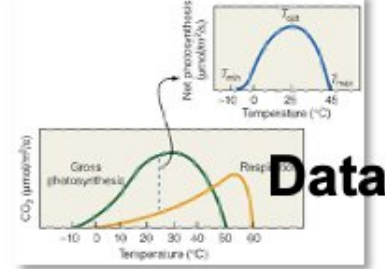
Classname	
	Grass
	blue roof
	brown roof
	concrete
	dark soil
	red roof
	soil
	trees
	white roof

Dr. Chris Wong,
Assistant Professor of
Remote Sensing

FOR 3006: Forest Management Foundations



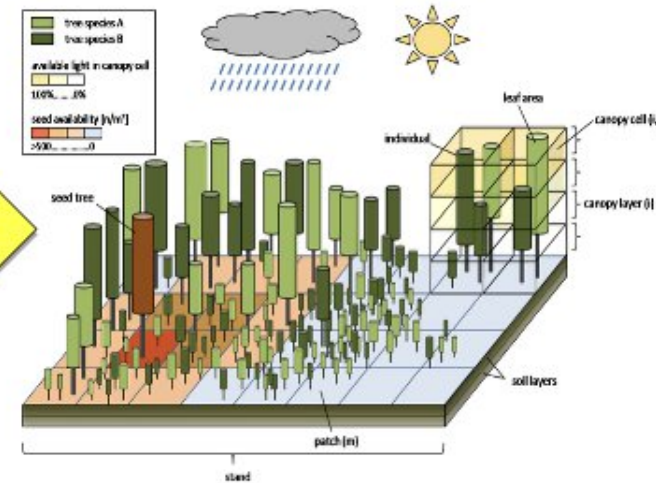
Real Forest Ecosystem



Data

```
! Write plot id, number, size, and simulation time to screen
!-----
! (echo) END
! WRITE(*,*)
! WRITE(*,*) Starting simulation...
! WRITE(*,*) 100 plots, 100000, 10000, 1000
! DO IF
! DO FORALL(PS, 'Plot ID: ', ID, /50, 'Plot size (m²): ', PS, /50,
! 'Number of plot realizations: ', 10, /50,
! 'Simulation time (years): ', 10)
! Start (year)
!-----
! DO yr = 1, 1000
! Write progress to screen
! IFMODULO(yr, 10) THEN
! WRITE(*,*) yr
! DO FORALL(PS, 'Year: ', yr)
! DO IF
! CALL climate(yr)
! CALL tree_mortality(yr)
! CALL tree_growth(yr)
! CALL tree_regeneration(yr)
! CALL light_availability(yr)
! CALL soil_fertility(yr)
! CALL stand_object(yr)
! END IF
! END DO
! Close all open units
!-----
CALL close_units()
```

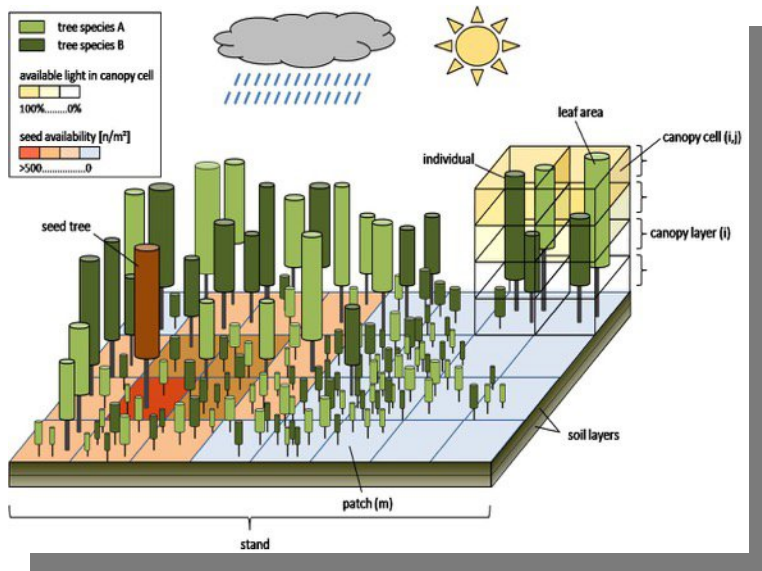
Computer Code



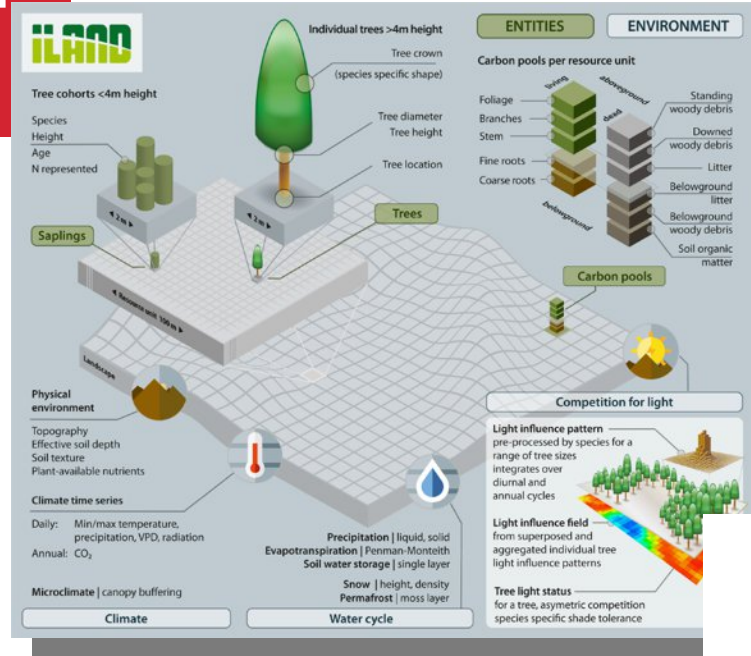
Virtual Forest Ecosystem

FORESTRY & ENVIRONMENTAL MANAGEMENT

FOR 4096: Advanced Topics in Forest Management

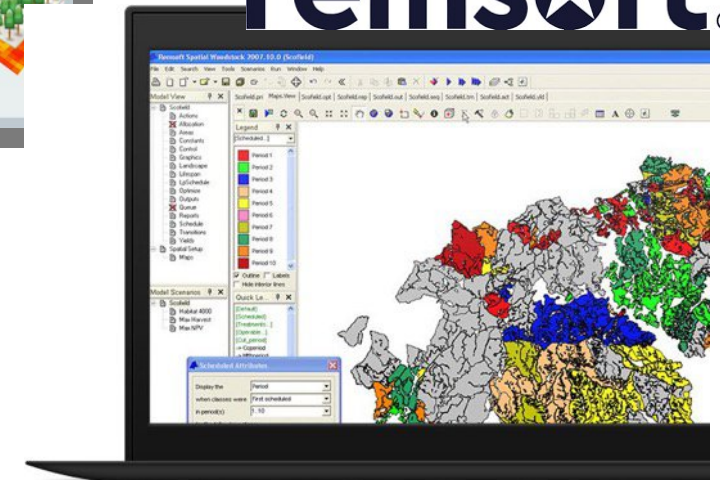


An advanced forest stand simulation model capable of predicting the effects of silviculture and climate change.



Tools for Assessing and Managing Forests & Community Trees

Dr. Anthony Taylor,
Associate Professor of
Forest Management



Modeling forests today to understand the landscapes of tomorrow.



FORESTRY & ENVIRONMENTAL MANAGEMENT

\$2.5M donation from Acadian Timber/Macer Holdings

- launch a professional **Master of Forestry – Digital Forestry** program (soft launch Fall '26)
- in collaboration with the Faculties of Computer Science and Engineering (Geodesy & Geomatics)
- leveraging data governance and networks via the **McKenna Institute** and **DataNB**



New Brunswick already leads in digital forestry —
the MF-Digital Forestry program connects the ecosystem.

FORESTRY & ENVIRONMENTAL MANAGEMENT

Master of Forestry – Digital Forestry

- Forest Science
- Forest Management
- Data Science, AI
- Tools/gadgets/sensors
- Final Capstone - bring the disciplines, skills, and knowledge together and **apply** it to real-world

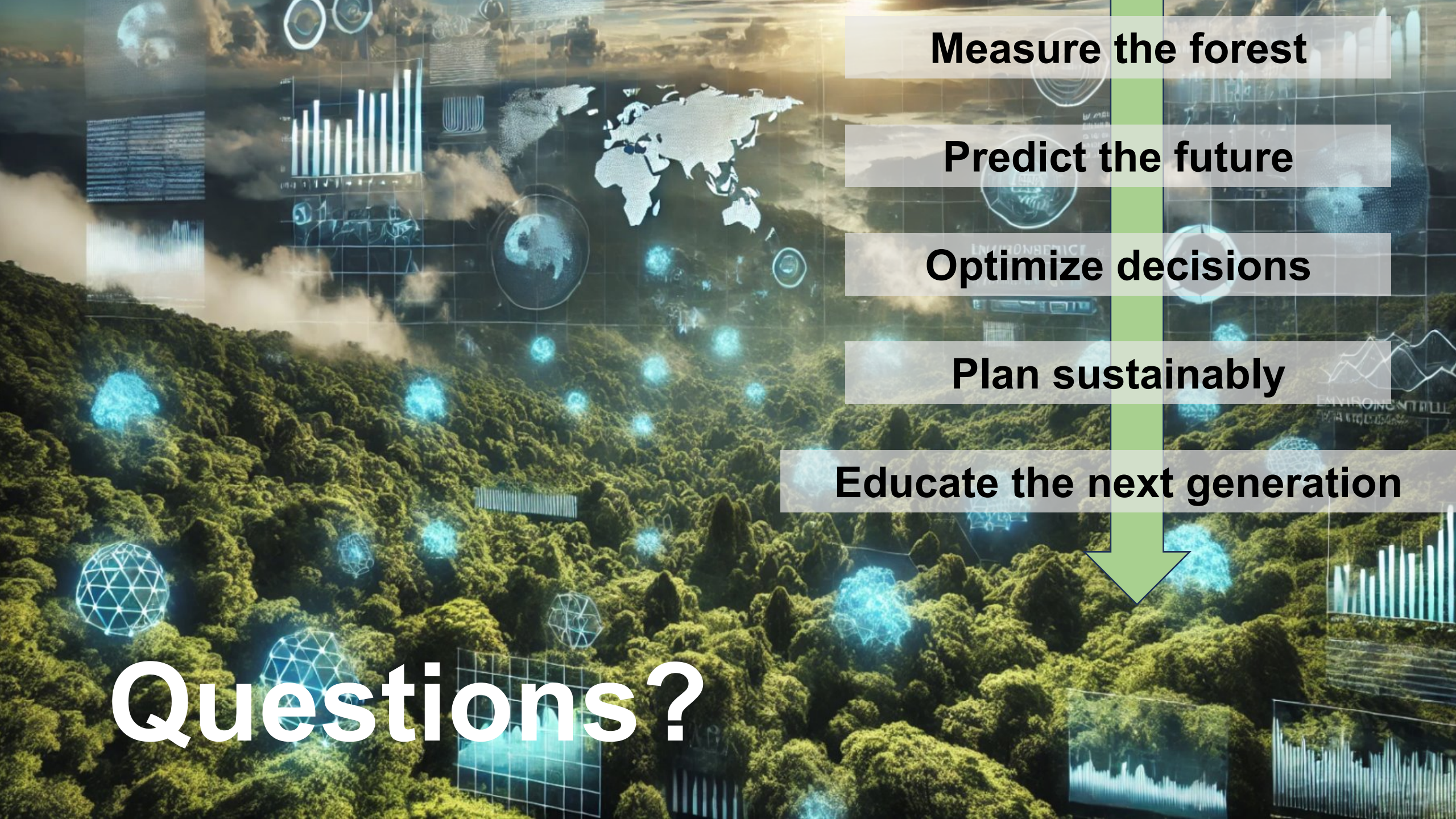


From skills to solutions: applying digital forestry in the real world.

FORESTRY & ENVIRONMENTAL MANAGEMENT



New Brunswick is ready to be the model for the rest of Canada.



Measure the forest

Predict the future

Optimize decisions

Plan sustainably

Educate the next generation

Questions?