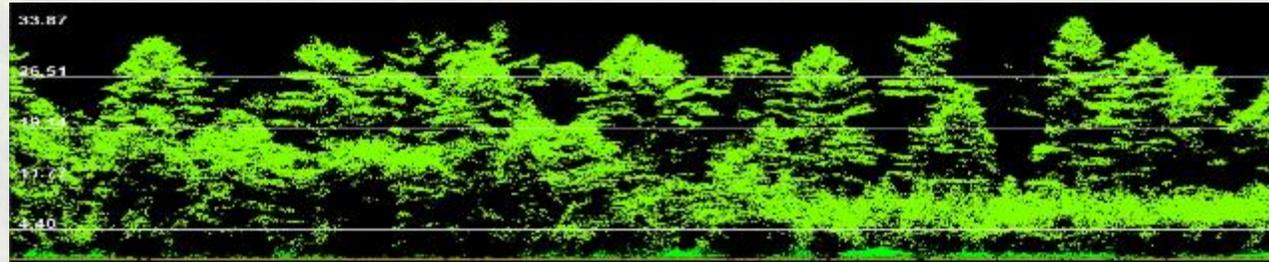


**Forestry Futures Trust Committee
Forest Resources Inventory
Knowledge Transfer and Tool Development (KTTD)**



Ontario's Living Forest Inventory



**Ian Sinclair
Forest Resources Inventory Unit
Ontario Ministry of Natural Resources and Forestry**

Tuesday, July 25, 2023

FFT Committee: Ray Riley (Chair), Bill Baker, Mike Barker, George Grete, James Harrison, Sandy Smith

FFT Staff: Anastasia Frisby, Peter Street, Shelley Vescio

www.forestryfutures.ca

KTTD Round 4

Application Process A

- Small-Scale Projects
- ≤\$35,000 (+HST) & 12-month period

Application Process B

- Large-Scale Projects
- >\$35,000 (+HST) & 24-months period

Open-Source and Proprietary Projects

Application Deadlines

All large-scale and proprietary small-scale projects – two stage process

- Letters of Intent due September 15; notification October 13
- Full applications due November 17; notification December 15

Small-scale open-source applications – single stage process

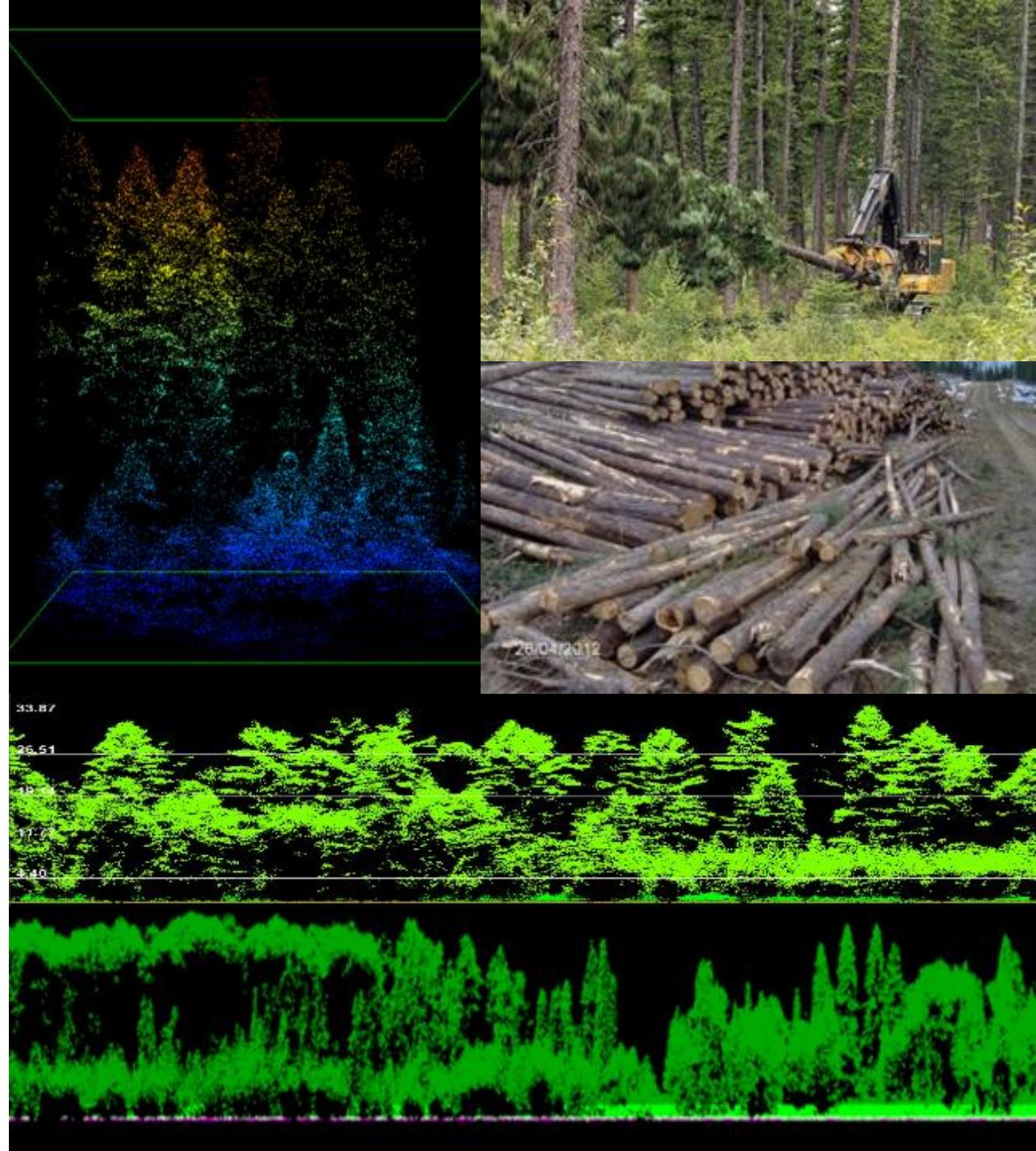
- Applications due November 17; notification December 15

Download forms from forestryfutures.ca select *Forms and Reports*

Presentation outline

Ontario's Living Forest Inventory

- Background
- Concept
- Future adaptation model
- KTTD R4 research themes



Background: Why a living forest inventory?

Commitment to continuous (CFI) or living (LFI) forest inventory dates to the 2005 eFRI policy statement of inventory evolving from static to more frequent updates

Forest inventory update (as defined by Gillis and Leckie 1996):

1. Changes that can be observed or mapped in a spatially explicit way, such as harvest or fire
2. Changes that need to be sampled or modelled, such as regeneration or growth

Intended goals

- Create a foundational inventory data set to support strategic and operational level planning.
- Generate updated measurements models that support apples to apples time over time assessment/comparisons.
- Long term monitoring to assess live tree stock, survivor growth, ingrowth, net growth (rate), natural mortality harvest removals, and net change (rate).
- Outcomes that improve ability to measure, estimate, and model future forest conditions and allow for the capture of forest dynamics, wood supply monitoring, and improved certainty for broad scale reporting.

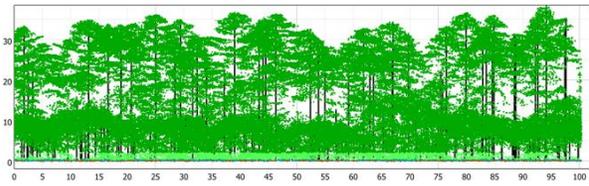
Concept: Living forest inventory: General framework

Proposed assumptions

Forest description: Create a foundational data set of forest descriptions that support forest management planning, resource planning, broad scale monitoring and reporting by:

1. Base level attributes (establish baseline inventory with T2)
2. Determine and report change to base level attributes
 1. Updates to base level attributes (harvest, forest health, silviculture via annual reporting, spatial analysis)
 2. Modelling (growth, plot monitoring networks, etc)
3. Base data integration (roads, ownership, water)
4. Information management (build on existing architecture and infrastructure)

Future adaptation model: Adaptive processes via continual improvements



Lidar

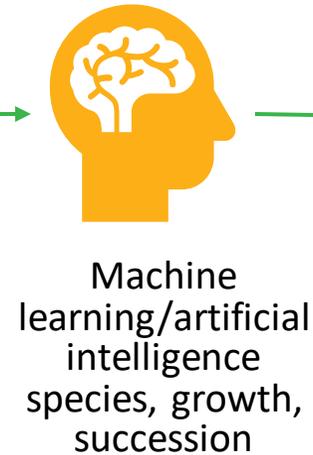
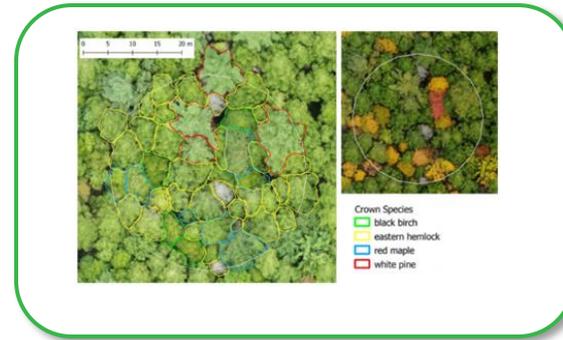


Field plot networks

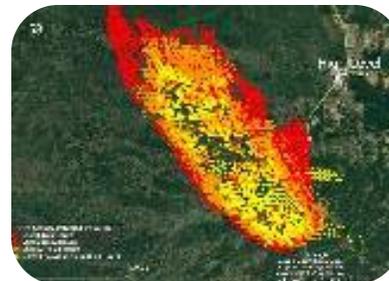


Satellite data
(Leaf on/off)

Crown identification, size, age, overstory forest unit, diversity, etc.



Disturbance data



Disturbance monitoring models



Reporting data

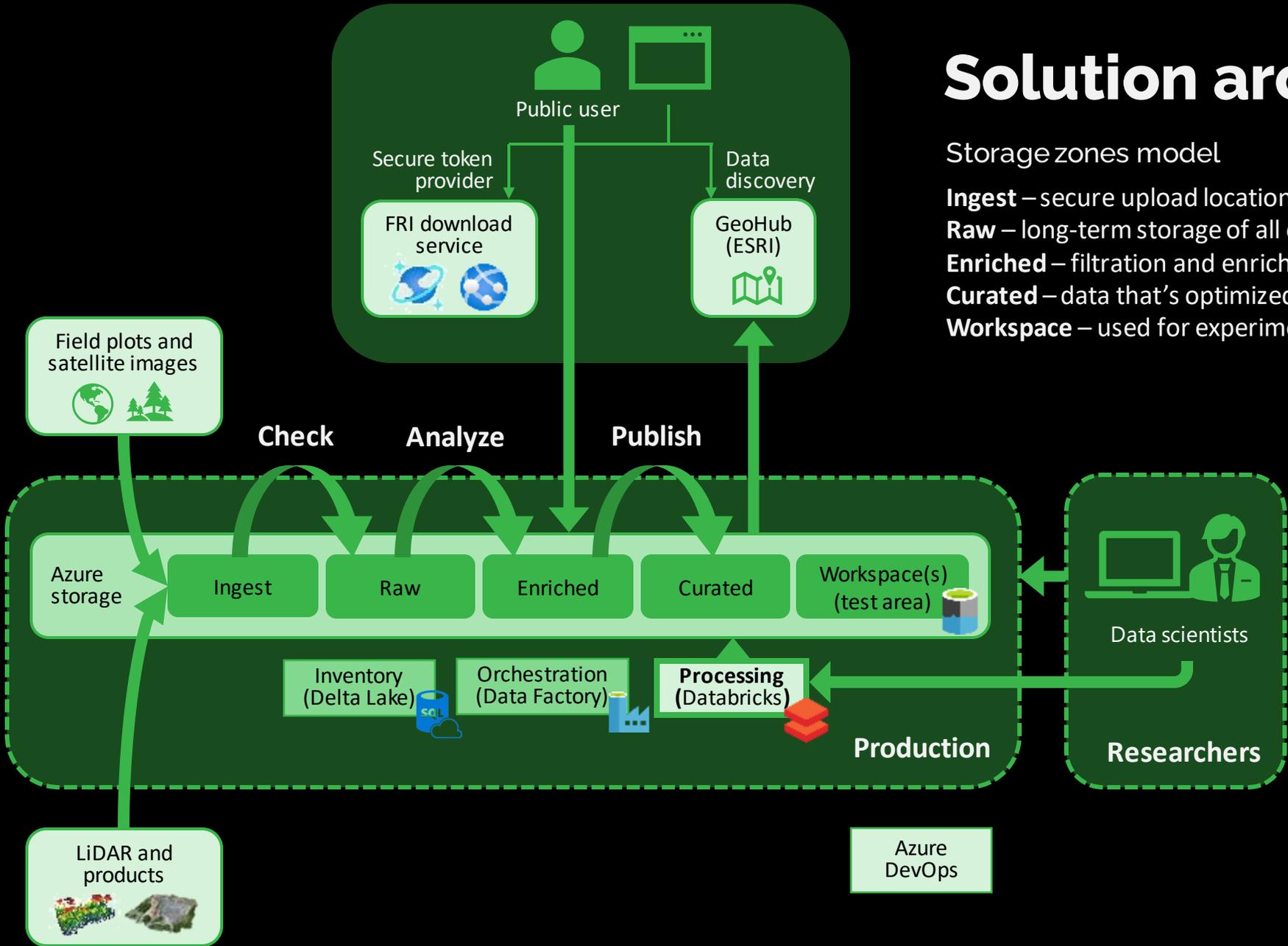
Living inventory update



Solution architecture

Storage zones model

- Ingest** – secure upload location for external parties
- Raw** – long-term storage of all original data files (immutable)
- Enriched** – filtration and enrichment of data through processing
- Curated** – data that's optimized for analytics rather than data processing
- Workspace** – used for experimentation and testing new data processing



KTTD 4 research themes

1. Tools and products to enhance living inventory production (plot sampling tools, data collection modernization)
2. Advanced remote sensing (monitoring, updating and reporting)
3. Tools and products to enhance field data sampling (sample design to support LFI, data collection designs, RPAS)
4. Tools and products for client and stakeholders (changing climate considerations, wood products, G&Y model updates, forest characterization, automation of annual reporting)
5. Lidar (single photon) (roads mapping, descriptive wood properties)
6. Advanced computing (machine learning, artificial intelligence: deep learning for species, biotic and abiotic disturbance)

Integrate updates to improve spatial and empirical understanding of stand growth and development patterns, allow for more rapid and effective response to disturbance events, promote appropriate and tailored silvicultural prescriptions, develop refined economic projections of timber- and non-timber values, improve understanding of socio-economic reliance on forest ecosystems and, ultimately, aid in formulating effective evidence-based forest policy (Coops et al. 2022)

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[Enhanced Forest Resource Inventory -
forestryfutures.ca](https://forestryfutures.ca)

Ontario 