



International Maple Syrup Institute

ERC- Lidar Pilot Project

October 6th 2026, 10am

Report on Paul Renaud's Presentation

Prepared by Kaylie Stuckey for the IMSI Environmental Resilience Committee

The October 6 presentation covered progress on the Lanark pilot project and forest structure information obtained through LiDAR analysis. Participating sugarbushes showed greater similarity than expected. Carbon removal calculations were being completed, and the emissions analysis was just beginning.

Project objectives

The project aims to estimate the net carbon footprint of participating maple operations, assess how representative participants are of other Lanark producers, and identify opportunities to reduce emissions or improve sequestration. Findings will be shared with the Lanark District Maple Syrup Producers Association (LDMSPA), the Ontario Maple Syrup Producers Association (OMSPA) and IMSI. The pilot supports the first stage of the IMSI and OMSPA climate strategy: understanding the industry's current position.

Why Lanark was selected

Lanark was selected for its ecological setting and producer demographics. The presentation identifies the same eco-region as the Eastern Townships and a similar latitude to the lower Eastern Townships, northern Vermont and south-central Maine. The district had approximately 228,000 taps and more than 86 producers in 2021. Its producer demographics were described as comparable with Nicolet-Yamaska in Quebec, although Lanark covers a larger geographic area.

The Lanigan Group had previously studied five Lanark producers, ranging from 250 to 7,000 taps. Those earlier studies were reported to have found the operations climate friendly. All five producers are also participating in the current pilot.

Participation and boundaries

Eleven producers joined at the start, with one added in August. Current participants represent 75,700 taps, ranging from 250 to 40,000 taps. Excluding the largest and smallest operations, the average is approximately 3,200 taps. Two additional producers were expected in the fall, potentially bringing the total to approximately 100,000 taps.

Participants are spread across the district and include both single stand sugarbushes and operations collecting sap from several separate stands. The sample was described as broadly representative of Lanark producers by operation size.

Producers mapped the boundaries of their active sugarbushes, with assistance available through a mapping workshop. Some also used Google Earth. The study excludes other parts of their properties and areas planned for future expansion, so that forest information corresponds to the current maple operation.

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LiDAR analysis and forest measurements

LiDAR uses aerial scanning to gather detailed information about the forest. The Ontario Woodlot Association (OWA) processes this information within the mapped sugarbush boundaries. Outputs include forest area, basal area by diameter class, average tree height, stems per hectare and mean quadratic diameter. Basal area is the combined cross-sectional area of tree trunks per hectare, used to describe stand structure and estimate biomass. Mean quadratic diameter is an average diameter calculated so that it corresponds to basal area.

The LiDAR approach had previously been compared with ground-based forest measurements across Ontario. In response to David Folino's question, Paul clarified that this validation preceded the pilot and was not conducted specifically on the participating stands.

The processing uses 20 m by 20 m cells at approximately 2 m resolution and identifies dominant forest types within cells. It does not distinguish all species in a mixed cell. Edge cells and cells with large open spaces are excluded, which can underestimate biomass. The current processing also has limitations in extracting height and stem information by diameter class; more detailed processing would require additional funding.

Similarity across participating sugarbushes

The analysis showed less variation across participants than expected, despite differences in operation size and location. Medians and averages were closely aligned for basal area within diameter classes, average maple height and mean quadratic diameter. Paul viewed these patterns as encouraging for modelling and for drawing conclusions about other producers.

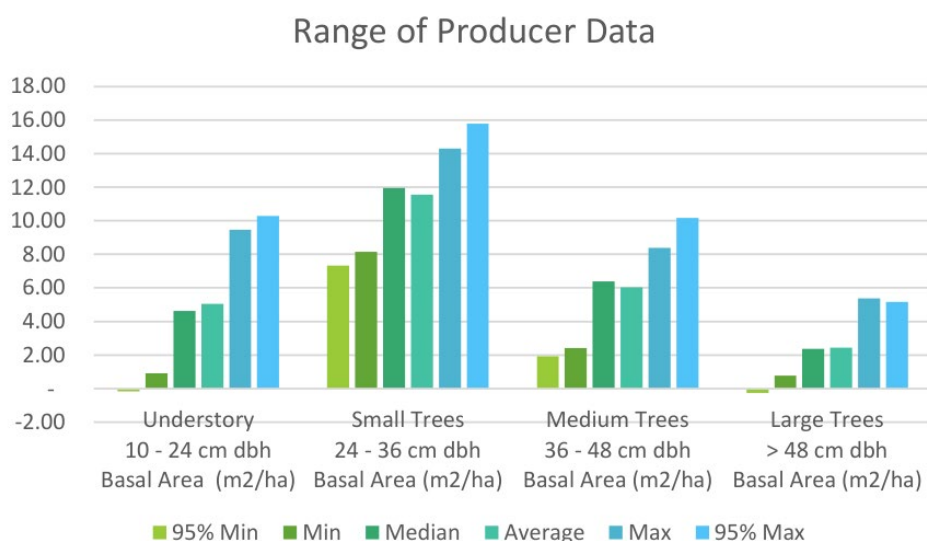


Figure 1. Basal area by diameter class across participating producers. Excerpt from slide 9 of Paul Renaud's presentation. The original chart labels and legend are retained.



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Paul also interpreted the low kurtosis values as suggesting relatively even-aged stands. This interpretation was related to the history of logging and settlement in Lanark and similar historical influences in other maple-producing areas.

Tree size distribution

The highest basal area was in the smallest tappable diameter class, 24–36 cm. Low understory basal area was described as expected because of the smaller trees' contribution to biomass and sugarbush management. Paul suggested that the declining pattern across the larger diameter classes reflected thinning over time to maintain an open canopy.

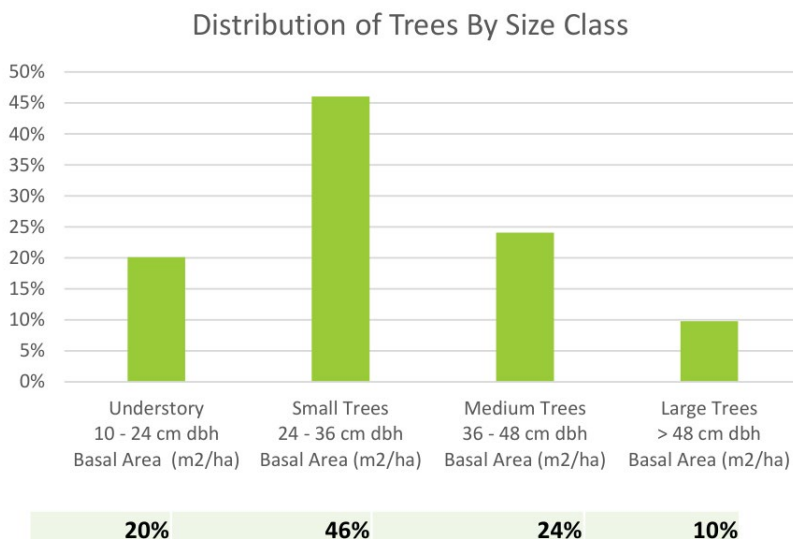


Figure 2. Distribution by size class presented by Paul Renaud. Excerpt from slide 10. The original chart title, category labels and percentages are retained.

Discussion of tree age

Paul interpreted the size pattern as indicating younger sugarbushes than expected and discussed estimates of approximately 80–90 years. The estimates were derived from mean quadratic diameter and average growth rates associated with Proctor research. The project did not have funding to collect tree cores from every participating sugarbush.

Mark Isselhardt asked how diameter was being connected to age and noted that trees could be small because they had been suppressed. Tim Rademacher also questioned the age-estimation approach, emphasizing variability in growth rates and maple's ability to survive in the understory. Mark noted that age and suppression history could matter when considering management responses. Paul acknowledged the resource limitations and said that the assumptions would be part of a subsequent discussion. Later, Tim noted that historical changes and the relatively young nature of forests across much of the maple region were already documented, while recognizing local exceptions.



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Biodiversity observations

Biodiversity appeared low in the analysis, which groups hardwoods together and cannot distinguish oak from maple within a stand. Excluding edge cells also removes some conifers. Conversations with producers suggested greater species diversity than the study could measure. Understory management was raised as an area where researchers could help examine opportunities to support biodiversity.

Producer uses and forest stewardship

Comparing a sugarbush's basal area and diameter distribution with regional averages could help identify management questions. Digital sugarbush maps provide a reusable tool and could support comparisons over time.

The next phase includes collecting information about tree removal where producers use wood for fuel. The discussion addressed how wood removal affects carbon storage and forest ecology. Retaining more deadwood was raised as a possible management consideration for wildlife and the forest floor.

Mark Isselhardt expressed interest in measuring production per area or tappable basal area to support comparisons with other forest and agricultural products. He also discussed how diameter distributions could inform management. Paul also discussed the potential policy value of area-based measures when considering maple production and forestry on Crown land.

Ray Bonenberg emphasized forest stewardship and the role of maple production in providing employment and economic benefits. He stressed that the message was about establishing maple's place in the landscape rather than opposing the forestry industry. Les raised forest preservation as an important issue in the Midwest, where trees are being lost.

Project status and remaining work

The project was approximately two months behind schedule. Collecting producer information took time, and the OWA's limited staff and resources meant that analysis had to fit around other projects. Completion was still anticipated by the end of 2026.

Carbon removal calculations were being completed and the emissions analysis was starting. The project focuses on direct and energy-related emissions (Scopes 1 and 2); Scope 3 is excluded. Carbon removal calculations use Canadian Forest Service methodology for managed lands, described in the presentation as the Tier 3 modelling approach used by Canada for IPCC reporting.

Subsequent phases include combining removal and emissions results into net carbon footprints. Results will then be brought back to participating producers so they can see how their sugarbush compares with the group average and discuss practices that could improve their carbon footprint and climate resilience. The final phases include documenting and presenting the results.

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Possible expansion and communications

David Folino expressed interest in documenting the protocols so the approach could be used elsewhere. He also noted regional differences in historical land use and the value of broadening the dataset. Adam Wild said the value of a New York application would depend on the outcomes sought and the final pilot findings.

Large Vermont producers were suggested as a possible extension. David anticipated interest from cooperators, and Tim reported statewide LiDAR coverage in Vermont. Other possibilities discussed included Ohio, New Brunswick and further work in Ontario, with interest already expressed by OMSPA's Eastern District.

Ray asked members to consider how final results could be communicated to different audiences, including producers, consumers and government. He also raised whether another pilot would be needed or whether existing information could be used, and said he wanted to wait for the final findings before making assumptions.

Sources: Paul Renaud's October 6, 2026 presentation slides and the transcript of the IMSI Environmental Resilience Committee meeting. Figures are excerpts from the supplied slides.