

## Ontario Centres of Excellence Inc.

### Expression of Interest Form – Centre for Earth and Environmental Technologies

Please complete and return by e-mail to: [Don.Lewis@oce-ontario.org](mailto:Don.Lewis@oce-ontario.org), or [Michael.Fagan@oce-ontario.org](mailto:Michael.Fagan@oce-ontario.org), or [Richard.Worsfold@oce-ontario.org](mailto:Richard.Worsfold@oce-ontario.org)

#### **Project Title: Multi-cohort Forest Classification Using LiDAR**

#### **Project Leader: Jay R. Malcolm**

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#### **Partner(s) / Problem Owner(s)**

Name of Organization: Tembec Industries Inc.  
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Name of Organization: Forestry Research Partnership  
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Name of Organization: Forestry Futures Trust, Enhanced Forest Productivity Science Program  
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**Problem/Issue Research will Address:** [In 3 or 4 sentences, what is the problem you intend to solve?] Multi-cohort Forest Management offers a strategy for balancing wood fibre production and wildlife habitat conservation by applying silvicultural techniques that emulate natural structural variability within boreal forest stands. Traditional forest resource inventory (FRI) appears to be unsuited to allowing reclassification of cohorts at a stand or landscape level. However, LIDAR is of special interest in multi-cohort forest classification because of its ability to accurately measure a wide variety of forest stand-level parameters. It also has been used to measure horizontal

variability in forest structure within stands. Because LIDAR can accurately measure tree height distributions, it also can estimate stem diameter distributions. This suggests that LIDAR could potentially be used in delineating cohort types. This research project will rigorously explore this possibility through the application of LiDAR technology in various boreal forest types and conditions, leading to software automation and subsequent incorporation into a large-scale forest inventory management system. This project strongly compliments the proposed 'Evaluation and Development of Standards for LiDAR Data Collection in Forestry' and 'Predictive Ecosite Classification Using LiDAR'.

**Target Technology/Solution:** [In 3 or 4 sentences, what technology or solution is expected]. In addition to a peer-reviewed and accepted approach to the classification of multi-cohort forest structure at a stand and landscape level using LiDAR, a modular software application that automates this classification will be developed, and made available as a component part of a full-scale and comprehensive forest inventory management system. This software module will assign multi-cohort classifications based on a combination of LiDAR and other related datasets (e.g., FRI) as a result of rigorously reviewed outputs of this project.

**Technology Receptor(s):** [What organization(s) will use/commercialize the technology?] Tembec Industries Inc. will use this multi-cohort classification approach and the associated software application. The Ontario Ministry of Natural Resources (MNR) will also use the project outputs/software in the production of enhanced forest resource inventory for the province, and in supporting the policy that leads to the eventual implementation and practice of multi-cohort forest management. Lim Geomatics Inc., a newly established Ontario business, will work closely with all partners in this project to develop and ultimately commercialize the software application component that will be modular/plug and play to the Forest Inventory Management System.

**Project Duration:** Months \_\_\_\_\_ or Year(s) 3

**Investment and Leverage (Year 1):** Differentiate between cash and in-kind support to the proposed project.

	All or Part of Year One		Year Two (if appl)		Year Three (if appl)	
	Cash	In-Kind	Cash	In-Kind	Cash	In-Kind
OCE (Requested):	\$20k		\$20k		\$20k	
Partner (1) Tembec		\$10k		\$10k		\$10k
Partner (2) FRP	\$20k	\$5k	\$20k	\$5k	\$5k	\$10k
Other(s) OMNR	\$5k	\$5k	\$10k	\$5k		\$5k
LAMF	\$15k	\$2k	\$10k	\$2k		\$2k
EFPS	\$112k		\$91k			
<b>Total</b>	<b>\$172k</b>	<b>\$22k</b>	<b>\$151k</b>	<b>\$22k</b>	<b>\$25k</b>	<b>\$27k</b>