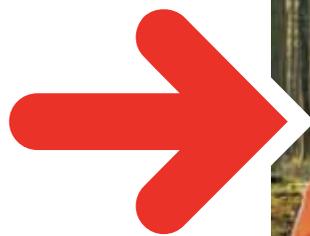# Next Generation Forestry with AFRIDS™ and Op Tracker™

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Lim Geomatics Inc.'s latest innovation for AFRIDS, the Cost Planning Module, could save Millar Western Forest Products Ltd. (MWFP) big money. "We're talking millions of dollars," says Chad St.Amand, a GIS analyst with the Alberta-based company, which harvests 2.5 million cubic metres of timber every year. "It was quite an eye-opener for me," he says. "I can see why the directors and higher-up managers have been asking for this tool for quite some time."

This new AFRIDS module allows forest managers to upload information from any number of harvest blocks and quickly calculate the most profitable way to get different types of wood out of the forest, directed to the right mill and out to the consumer. "We can send timber from harvest blocks to the Fox Creek mill and it's going to cost X amount of dollars, or we can send the same timber to the Whitecourt mill and it's going to cost Y amount," says St.Amand. "That quick cost comparison and understanding that cause and effect is a huge value that Millar Western, and others, are going to see."

St.Amand explains that AFRIDS can also help address the complex issue of balancing harvest operations with protected caribou habitat in northwestern Alberta. Accurately calculating the cost value of setting aside certain areas of forest could help conservationists and foresters work together to find the optimal balance between habitat protection and a robust forest industry.

MWFP has been using AFRIDS actively for a year. If you take a tour around the woodlands office, says St.Amand, you'll see how almost every desk has the web application up and running on a second monitor. "It just sits there because you can go and look at something really quick," he says.

Lim Geomatics helped St.Amand do the necessary modelling and analysis for 2.5 million hectares of land in northwestern Alberta to create an advanced forest inventory from LiDAR data. Digital imagery and forest inventory metrics—all those critical statistics and information that tell a detailed story about a harvest block—are accessible in AFRIDS and at the fingertips of the whole team.

Kevin Lim earned his PhD from Queen's University by pioneering the research on how airborne LiDAR data could be applied to create advanced forest inventories. He founded Lim Geomatics in 2006 with the mission to find ways for forestry companies to apply this new science to make better decisions in the field. "It's about giving people the tools they need to do their job," says Lim, summing up the rationale for creating AFRIDS. "It's about creating something that people can understand and use."

AFRIDS unlocks the power of LiDAR data and imagery with an easy-to-use interface that's accessible anywhere with an internet connection. "For a planner it's huge. For operations staff it's huge. For our contractors it's going to be huge as the application is rolled out for their use," says St.Amand, who has also spent most of his 20-year career figuring out how LiDAR data can improve efficiency for forestry operations.

St.Amand was based in Ontario before coming to Alberta in the spring of 2015. He gives the example of an Ontario sawmill that was forced to shut down in the early 2000s. It was a difficult time for the industry as a whole, but a miscalculation based on traditional approaches to estimating average stem diameter dealt the fatal blow. "The mill was designed to handle large diameter wood but was delivered a lot of small wood, so it ran inefficiently and ended up closing," says St.Amand.

The company that ran the mill had LiDAR data for the harvest blocks, but no one had known how to put it to use. St.Amand was curious if LiDAR could have saved the day so he crunched the numbers years later. He discovered that the data would have given the mill managers a much more accurate stem diameter from the get go and could have saved the mill. Today, the site has been remediated and no trace of the bustling wood-production facility remains.

MWFP is also working with Lim Geomatics' Op Tracker software, which brings the power of LiDAR data and advanced forest inventories into the cabs of harvesting equipment. The company has about 20 devices spread out across various field operations. "We've been asking for this for years." That's the first reaction St.Amand gets from machine operators when he installs the tablets that run Op Tracker into the cabs of feller bunchers.

Machine operators can only see about 50 feet around them when they're in the thick of an Alberta forest. Everything else disappears into the foliage. You can't tell if there's a creek ahead, a steep slope, a swamp or hectares of harvestable wood. Op Tracker provides a bird's eye view of the area using digital imagery, LiDAR data and the forest inventory metrics built into AFRIDS. The software also tracks and timestamps the machine's position.

The light bulb has gone off on Op Tracker for some of MWFP's harvest contractors. The software uploads information when connected to the internet. Operators and managers can see exactly what's been harvested as soon as its uploaded to the web application. "Instead of having an operator estimate that they're 50 per cent done or 20 per cent done, you can see what's going on in the block as it's being cut," says St.Amand.

As this new stream of data is collected from MWFP's Op Tracker devices, St.Amand is designing a new value product to showcase block by block, operator by operator, where a harvest block ranks in terms of cost and productivity. How efficiently an area gets harvested is tied to such factors as topography, size of the wood and block layout.

Intensive planning is an integral aspect of successful forestry operations. Companies have to meet their commitments to mills on the one hand and act as responsible stewards of a natural resource on the other. AFRIDS and Op Tracker are user-friendly tools that harness the potential of LiDAR point clouds and geospatial information at every stage of the planning and decision-making process.

AFRIDS has been embraced by several other industry players, such as American Forest Management and Rayonier Advanced Materials, but no two versions of the web application are alike. Each company worked alongside the Lim Geomatics development team to create a customized set of extensions designed for specific challenges. "Most of our tools are client-centric," says Lim. "When they log in, each company sees a different set of buttons that are unique to them."

The Cost Planning Module is one of the most sophisticated extensions for AFRIDS to date and the idea originally came from St.Amand. "It was really driven by Millar Western, for Millar Western," says Lim. This kind of long-term, collaborative relationship is the modus operandi for Lim Geomatics. "The key to success is having someone at the table that can describe what they need and then the Lim Geomatics innovation engine will figure out how we're actually going to meet those requirements and deliver the solution," says Lim.

So much of the forestry business, from strategic planning to harvesting to environmental stewardship, is tied to geography. Geospatial technologies—GIS, remote sensing, LiDAR, artificial intelligence, autonomous vehicles, virtual reality and augmented reality—have the potential to dramatically improve safety, transparency and productivity across the industry. "If companies are frustrated with their existing technology stack, they should call Lim Geomatics and discover the many other alternatives out there," says Lim.