Survey reveals expanding use of A-LiDAR and Enhanced Forest Inventory technologies

By Steve D’Eon, Canadian Wood Fibre Centre; Matt Meade, Canadian Institute of Forestry; Matt Kurowski, FPInnovations

Airborne-LiDAR (A-LiDAR) can provide forest managers with detailed information about their land. Combined with forest sample plots, an Enhanced Forest Inventory (EFI) can be generated to predict numerous forest attributes. Interest in the technology has been accelerating as the forest sector realizes the benefits the system provides.

To facilitate knowledge exchange about this technology, the Canadian Institute of Forestry (CIF), in collaboration with the Canadian Wood Fibre Centre (CWFC), held 14 workshops across Canada between November 2012 and March of 2014. Topics presented at the workshops ranged from A-LiDAR and EFI basics to detailed hands-on training using real data examples. Informal comments at the workshops indicated the forest sector was realizing the benefits in terms of improved forest management planning and operations as well as more reliable data that can be used to better inform business decisions. We decided to confirm client needs through a post-workshop survey.

In the spring of 2014, a survey was sent to over 1,000 workshop attendees with a response rate of around 13 per cent. The survey was split into two streams: one for those currently using A-LiDAR and one for those not currently using A-LiDAR. Respondents worked predominantly for provincial governments (43 per cent), forest industry (24 per cent), and consultants (11 per cent). There was a fairly even split between forest managers (28 per cent) and forest operations staff (21 per cent) as well as researchers (15 per cent) and those working in geomatics (13 per cent).

Those currently using A-LiDAR/EFI were overwhelmingly (97 per cent) satisfied with their investment in the technology. Indicative of a very high satisfaction rate, 62 per cent responded they would “absolutely” use the technology again. Their original use of the technology was prominently road planning (60 per cent) and common secondary uses were wet area mapping, cut-block location and layout, and identifying inoperable areas. On average, users reported using the technology in five different themes. As well, users envisioned five future uses for the technology with the most popular being identifying habitat for wildlife, conservation areas or other reserves, and log piece size such as diameter.

Those not currently using A-LiDAR/EFI mirrored the user group in terms of expected application of the technology. The most common expected uses were forest management planning, road planning, and cut block location and layout. Surprisingly, identifying understory trees and shrubs was the fourth most popular expected use amongst non-users.
The non-user group reported their main impediment to adopting the technology was cost. Issues such as internal skills and capacity were not seen as hurdles. In contrast, the non-user group admitted to inadequate knowledge about the cost of acquiring the data, with 73 per cent reporting their knowledge as out of date, just ball park figures, or self described as “poor”. A 2010 survey of non-users in B.C. showed a similar misconception about the cost of the technology paralleled by a self-admitted lack of knowledge around the costs (McMorland and Strimbu 2010).

This dichotomy—thinking the technology is expensive without knowing the cost—can be solved through better provision of information on costs, alternatives, and risks (51 per cent responded this information would be “most useful”) as well as cost-benefit analyses (46 per cent responded as “most useful”). Information on research projects in the works but not yet completed was reported as “least useful”.

FPInnovations is attempting to remedy the cost misconception by profiling the true costs of acquiring A-LiDAR and EFI, as well as expanding the number of case studies demonstrating costs-benefits. The CWFC, in collaboration with industry, academia, and the provinces, is expanding the problems the technology can be used to address providing users with even more applications. Users can look forward to more precise information upon which to base their decision to adopt the technology.

This is an exciting field for the Canadian forest sector and the CWFC, FPInnovations, and the CIF will continue to co-operatively deliver knowledge exchange products on the technology.

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References:

Applications open for equipment utilization under new Alberta Bio Future program

By Tony Kryzanowski

Alberta Innovates Bio Solutions (AI Bio) is now accepting funding applications for the ‘equipment utilization’ component of its new Alberta Bio Future (ABF) program. It will consider new requests on a continuing intake basis throughout the four years of the program.

Alberta Bio Future, launched in March 2015, is co-funded by AI Bio and the Ministry of Alberta Innovation and Advanced Education, with AI Bio leading and managing.

The ABF program is aimed at helping to accelerate growth in Alberta’s bioindustrial sector—from companies with great ideas requiring technical support and access to equipment, to companies on the cusp of commercializing a new bioproduct and needing that last “push” into the market.

Alberta anticipates great growth potential and business opportunity in the bioeconomy globally and wants local companies to actively participate in its development. The province believes greater support of the bioindustrial sector will also contribute to increased provincial diversification by adding value to the forest and agriculture sectors.

The goals of ABF are to make better commercial use of the province’s substantial forest, farm and municipal solid waste biomass resources in the development of new bioproducts such as bioplastics, biochemical, biocomposites and biofuels, and to develop new technology that can be used in the manufacture of these products.

“Our primary purpose in the ABF program is to add value to Alberta’s biomass, and to encourage companies and researchers to view it as a resource that can be used in a variety of ways,” says Christine Murray, AI Bio Lead Director responsible for ABF program implementation. “We value the strong partnerships between R & D organizations and companies in Alberta to move these projects forward.”

With a total of $20 million in funding until 2019, Alberta Bio Future is a follow-up to other initiatives offered through the Alberta government over the past decade. It is targeted to areas that have shown growth potential. The program also responds to feedback from industry, where it identified a need to fill technological or marketing gaps to take a product or technology to the next level.

The ABF program consists of three priority areas: Equipment Utilization; Product and Technology Commercialization; and Research and Innovation.

AI Bio is accepting applications under the Equipment Utilization program area now. It will begin accepting applications for funding under the other two areas later this year.

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“For projects funded under the Product and Technology Commercialization program area, we will be looking at companies that have done a lot of advanced work on a product and are engaged in the last steps to bring it to market,” says Murray. “It is building on our experience with our (former) Advanced Materials and Chemicals program.”

The Research and Innovation program area will provide funding support to Alberta researchers, their partners, and Alberta companies focused on new ideas to use sustainably produced biomass for the development of new industrial bioproducts.

All three program areas have a strong partnership component to them. For example, Equipment Utilization opens the door to partnerships between companies and academic, research or government institutions in Alberta, to help companies achieve scale-up or pilot development of their bioindustrial products or technologies. There is a great deal of fibre processing equipment and expertise available on a fee-for-service basis, at Alberta Innovates Technology Futures (AITF) or public educational institutions in various parts of the province.

“This (Equipment Utilization) program will pay for development work that is moving forward,” says Murray. “It is not an R & D program. It’s for companies that have maybe already done some lab bench work, and they are now ready to move it to a larger scale.”

The total request for financial support under this program area cannot exceed $100,000. It does not support the purchase of equipment, and applicants must contribute at least 50 per cent of a first project’s cost, with a minimum of half of that contribution being in cash. Once approved for funding, projects must be completed within 12 months.

For more information about AI Bio’s new Alberta Bio Future (ABF) program, visit http://bio.albertainnovates.ca/funding/abf/ or call (780) 427-1956.


Advancing woody biomass inventory precision for forest residues in Canada

By Tony Kryzanowski

The Biomass Inventory Mapping and Analysis Tool (BIMAT) is an online tool that allows users to estimate available forestry and agriculture biomass sources in Canada. It is currently undergoing a significant upgrade.
BIMAT was developed several years ago by the Canadian Forest Service (CFS) and Agriculture and Agri-Food Canada, through the Program of Energy, Research and Development (PERD), administered by Natural Resources Canada, to identify and evaluate sustainable sources of biomass on a national scale. It is currently undergoing a significant upgrade that will update supporting databases and models, increase its precision and allow for updates to be performed more frequently.

On the forestry side, databases and models have been updated. Using an inventory of mills annually consuming greater than 100,000 cubic metres, analysts estimate that the gross amount of sustainable mill and roadside harvest residues is nearly 51 million oven dried tonnes (ODT) based on data collected from 2013-14, representing just over one billion gigajoules of energy. At $4 per gigajoule, that represents a value exceeding $4 billion.

“We are updating and revising our modeling strategies and frameworks to increase the precision of our forest residue estimates across Canada,” says Brent Joss, Fibre Bio-Geomatics Analyst with the Canadian Wood Fibre Centre (CWFC). “We’ve tapped into multiple resources to update and improve the precision of our estimates, and we are taking steps to ensure updates can be performed efficiently going forward.”

The incorporation of new data into the models is allowing for greater precision to be achieved.

“Many mills now provide information related to their feedstock requirements, such as the species they consume. This allows us to achieve another level of detail when calculating residues,” says Joss. For example, by knowing what species a mill is consuming, a more accurate estimate of oven dried tonnes can be calculated.

In addition to calculating more precise feedstock and harvest volume estimates, the updated residue models can also fractionate mill biomass into its various residual elements, such as peeler cores, chips, sawdust and bark. This information can then be combined with species-specific wood fibre attributes such as wood and bark density, moisture content, shrinkage, and calorific values, to assess secondary product options at various points along the supply chain.

“We intend to explore more than just the bioenergy options,” explained Joss. “We have incorporated spatially-explicit wood fibre attribute information that allows us to assess the economics of different product options for wood residues across Canada.”

Eventually, the updated databases and models will be incorporated into BIMAT. When complete, BIMAT will also be able to estimate potential available biomass volume from urban wood residues as well as juvenile, non-merchantable stands. Designers hope to have the tool completely updated within two years.

To access the BIMAT tool, visit www.agr.gc.ca/atlas/bimat.