RUNNING NHRI LIKE A BUSINESS
Building a model for efficiency in applied research…

The work environment at the NHRI is fast paced, focused and result driven. Over the years we've implemented a Lean/Six-Sigma type management system where key processes are standardized in order to improve efficiency. This approach to our work has allowed us to continuously improve, but more importantly, it has pushed us towards a tighter alignment with our clients, and by the same token, enabled our team to better meet the needs of industry.

We are all humans and we all tend to leave loose ends, push back deadlines, be a little sloppy when collecting data, leave a few stones unturned, etc. That's why we break down all our projects into deliverables and make someone accountable for each. If we do skip a beat, we can be reminded at the next weekly staff meeting simply by reviewing the deliverables list and project Gant charts. It also goes both ways. It can sometimes be very clear that someone on the team does not have the required time to take on a new task unless priorities are reassessed. In a nutshell, having an efficient project management system in place forces our team, and all the individuals on it, to keep it real.

Without falling into the details and protocols of how we manage deliverables we would like to give you a glimpse of how we operate our applied research facility by presenting our five most important operating principles.

#1 – Transparency and honesty are key.

Whether it be while discussing a reimbursement claim with a funding agency, presenting results to a client, or around our board room table during a staff meeting; we strive to be as transparent as possible which makes being dishonest almost impossible. No matter the setting, no matter how bad the failure, how hard the pill is to swallow… transparency and honesty are the marching orders! We promote a transparent work environment where individuals are accountable and responsible for their own contributions.

#2 – No research for the sake of research.

This operating principle means that any and all research that is conducted within our walls must be useful and have a well-defined end user. The first thing we need before starting a project is a real-life forestry problem. We work with various stakeholders to identify the real issues happening in the forest and turn them into applied research projects. We take questions from the field and bring them into our board room and labs. In a nutshell the NHRI was created to bring immediate, applicable and field-tested solutions for foresters, contractors, woodlot owners and forest workers with boots on the ground and eyes on the canopy. For our team this means that any and all research and field work must be focused exclusively on that end.

#3 – Run the Institute like a business.

We aim to run the Institute like a business in the sense that we are competitive and continuously working to improve our performance. We conduct all activities at NHRI to the highest standards. Furthermore, our team always puts the client first by actively involving them and keeping them continuously informed about their ongoing projects. Finally, whether we are working with a client, a research partner or a financial partner we strive to respect deadlines.

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RUNNING NHRI LIKE A BUSINESS
Building a model for efficiency in applied research
(Continued...)

#4 – The Institute is to be a model of efficiency

We want to make NHRI a benchmark in terms of efficiently delivering applied research and knowledge mobilization solutions for the forestry sector. We aim to accomplish this by putting in place a Lean/Six-Sigma type management system where key processes are standardized in order to improve efficiency and by making our people accountable and responsible for their work, clients, deadlines, etc. We also strive to become a model for efficiency in the eyes of our clients by bringing to their attention, and field testing, the best industry practices and technologies. Finally, we can become more efficient and impactful be developing and maintaining world class partnerships and be providing manpower and field resources to attract outside projects.

#5 – Mobilize and transfer knowledge effectively

Knowledge transfer and practical on the field training is an important component of our work at NHRI. We always communicate results rapidly and emphasize knowledge transfer within the forestry community. We also aim to use the highest standards and best management practices when setting up experiments and research plots, collecting and maintaining data and establishing and maintaining demonstration sites. Our efforts are aligned with our desire to encourage data sharing now and in the future. Knowledge mobilization is at the forefront of our mandate and it revolves around four key approaches.

IMPROVING our partners' forest management capacity through consultancy and the development and implementation of management and decision support systems.

ENABLING better management and decision making by developing best management practices, models, tools, APPs and analysis capacity.

TRAINING staff and professionals through workshops, videos and courses.

INFORMING the scientific/professional community and the public at large by publishing papers, reports, conferences, social media, newsletters and presentations.

> *" We want to make NHRI a benchmark in terms of efficiently delivering applied research and knowledge mobilization solutions for the forestry sector. "*

Figure 1. Pictures taken during a few of our workshops. We deliver several workshops and trainings every year on different themes and to different segments of the forestry industry. Our workshops are always well attended and the results keep improving at every event.

PEOPLE IN THE SPOTLIGHT
Monique Girouard...
Keeping everyone aligned and on target!

Monique Girouard, Project Coordinator at NHRI

Monique Girouard has been part of our team at NHRI since 2013. Since then, she has occupied various roles and managed several key projects for our partners and clients. Her official title is Project Coordinator, but contrary to most who have a similar title she is responsible for coordinating much more than a single project. Even to the untrained eye it becomes obvious very quickly that most things that go on at the Institute end up on Monique's desk at one point or another. If fact, on top of managing her own projects, she is the one responsible for keeping everyone aligned and on track with project deliverables.

Monique is the gate keeper for our team. She is the one responsible for updating our deliverables lists, and more importantly, she is the one that raises the red flag when project deliverables are falling behind or late. In a nutshell she helps us keep it real! Monique makes sure we consider the effect of taking on new tasks can have on our workplan and client deliverables. Not always an easy task when working with people who seem to believe that days have 30 hours and weeks have 8 days.

Before joining the NHRI team, Monique worked for 5 years in process improvement for JD Irving at the Grande Rivière sawmill in Saint-Léonard NB. It is there that Monique developed her expertise in continuous improvement and became a Lean Six Sigma Black Belt. She also brings solid experience in different forestry fields such as GIS, growth and yield modeling and different in-analyses and models developed by NHRI and conducted under research contracts.

Monique holds a Bachelor of Science (biochemistry) from l'Université de Moncton as well as a Bachelor and a Master's in Forest Science from the UMCE forestry faculty. Her wealth of training and experience give her the required abilities to implement the project management program we have in place to ensure that all research projects are carried on time while meeting the requirement and objectives of clients. Needless to say, Monique is a very important ingredient in the NHRI's quest to deliver effective and efficient applied research solutions to the forestry sector!

"Monique is the gate keeper for our team. She is the one responsible for updating our deliverables lists, and more importantly, she is the one that raises the red flag when project deliverables are falling behind or late. "

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Canopy Cover Estimation from Landsat Images:
**Understory Impact on Top-of-canopy Reflectance in a Northern Hardwood Forest**

Authors: Stéphanie Landry, Martin-Hugues St-Laurent, Peter R. Nelson, Gaetan Pelletier & Marc-André Villard

Abstract:

In northern hardwood forests, light availability is considered to be the main factor limiting seedling and sapling growth. However, field measurement of this variable is time-consuming. To address this issue, we developed random forest regression models to estimate canopy cover from a Landsat 8 OLI image of a northern hardwood forest in northwestern New Brunswick, Canada. We then assessed the accuracy of model predictions with a canopy height model (CHM) derived from LiDAR data. We selected 2 threshold heights (1.3 and 5 m) to distinguish the understory from the overstory and to determine the impact of the understory on top-of-canopy reflectance. Our results show that the understory influenced top-of-canopy reflectance and that a 1.3 m height threshold provided the most accurate estimation of canopy cover. In contrast with studies conducted in softwood stands, we found no evidence that the shortwave infrared (SWIR1) band decreased the influence of the understory on top-of-canopy reflectance. In northern hardwood forests, the estimation of canopy characteristics, such as canopy cover and leaf area index, should be focused on the green band, as it was least influenced by understory vegetation.
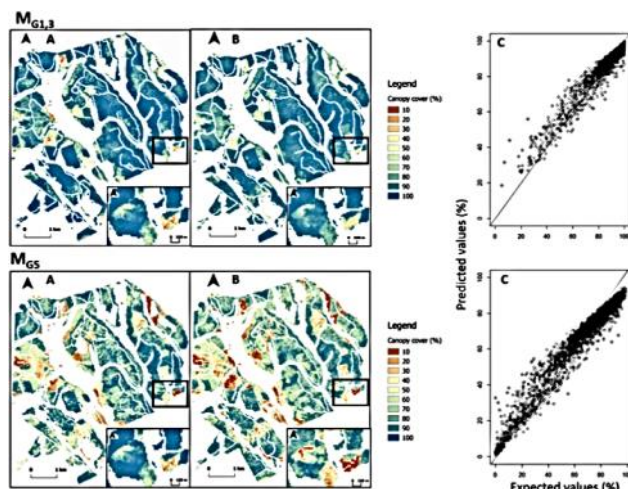
Figure 2. Predicted values of canopy cover estimated from general models and expected values estimated from a canopy height model derived from LiDAR data using a 1.3 m (MG1.3) and a 5 m (MG5) height thresholds to distinguish between under - and overstory in a northern hardwood forest. (A) Predicted values of canopy cover (%), (B) expected values of canopy cover (%), (C) predicted values vs. expected values of canopy cover (%).
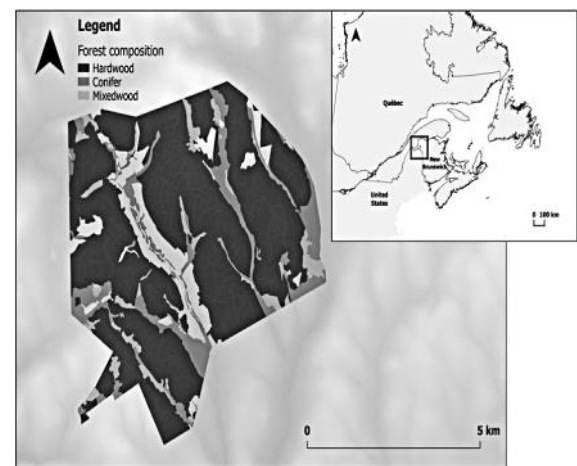
Figure 1. Location of study area in McCoy Brook area, northeast of Edmundston, New Brunswick, Canada

ONGOING PROJECT
Silviculture training is about to go mainstream!

eLearning Silviculture Training
Making the NHRI's Silviculture Prescription System Easily Accessible!

Over the years our team has become well honed when it comes to delivering training in the field. Whether it be offering workshops on the operationalization of the NHRI Silviculture Prescription System, field exercises to better identify form and risk issues at the tree level, or delivering a full day training on optimizing tree bucking, we have developed a solid capacity when it comes to creating knowledge and learning content, and delivering it. The question has now become, how do we take it to the next level?

We think the answer can be found in developing partnerships to offer silviculture training on open eLearning platforms such as UdeMy.com. Our goal is to make our NHRI Silviculture Prescription System accessible and easy to learn for any forestry worker, anywhere. So, a few months ago we started small and began working on turning one of our most successful workshops, Bucking for Value, into a video learning format that could be downloaded onto an open eLearning platform. The video training, which was prepared by Monique Girouard, has 11 video lectures divided into 6 modules and is entitled; Introduction to bucking hardwoods for value. This course is due to be released in both French and English by mid-September of 2019.

While we are excited about this new tool in our arsenal it is only a beginning and not an end. The initial video lecture series was meant as a trial run for a much larger project we are currently developing in collaboration with other academic and industry partners – details to come. The objective of this larger training initiative will be to develop and make accessible comprehensive training modules for the silviculture of northern hardwood and mixed wood. The primary purpose of the project is to produce a series of media products in support of the NHRI Silviculture Prescription System (SPS) to train foresters, technicians, students and woodlot owners. The training series will be divided into eight modules which will in turn be divided into video lectures. Examples of proposed courses for this project are:

MODULES FOR THE SILVICULTURE OF NORTHERN HARDWOODS

1. Introduction to silviculture systems (+/- 12 hours)
2. Introduction to stand dynamics (+/- 5 hours)
3. Introduction to the silviculture of northern hardwoods and mixedwoods stands (+/- 12 hours)
4. Adaptive silviculture to mitigate the negative effects of a changing climate (+/- 5 hours)
5. Silviculture options for problem stands (beech) (+/- 5 hours)
6. Intermediate silviculture treatments to improve growth, yields and tree quality (+/- 5 hours)
7. Evaluating trees for quality and vigour (+/- 2 hours)
8. Optimized tree bucking for increased value (+/- 1.5 hours)

This eLearning open access video training project is one of our most important knowledge mobilization projects for 2019-2020... we are very excited about developing the content and look forward to launching some of the key modules as early as spring 2020.
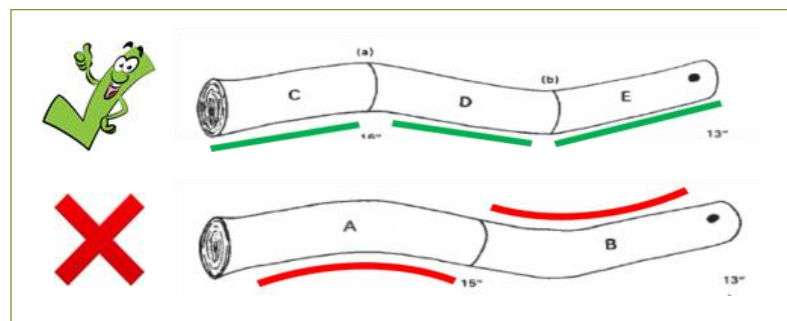
Figure 1. Simple exercise meant to train operators on how to make hardwood bucking decisions based on maximizing value. The video training series illustrates how to maximize the value of end products through optimized bucking techniques.

ONGOING PROJECT
Video documentary: Forests and climate adaptation

NHRI Produces a video documentary
"Our Forest at Risk: Un paysage en transition"

The NHRI is currently producing a video documentary entitled Our Forests at Risk: Un paysage en transition. The 25-minute documentary was produced by Gaetan Pelletier, Executive Director of NHRI, and directed by Mathieu Germain with the assistance of Tanguy Locqueneux. The video documentary delves into the subject of climate change, its potential effects on our forests and what can, and should, be done to adapt.

Climate change is expected to have significant impacts on drought and wind regimes in Atlantic Canada's forests, largely due to associated changes in temperature, precipitation, and significant weather events. If important species in the region decline in growth and/or disappear, there may be significant socio-economic costs in the forest sector (including industry, woodlot owners, and government) and forest-dependent/First Nations communities. Such costs may be associated with reduced timber supply, employment, traditional (aboriginal) wood products, recreation, aesthetics, and other such ecosystem services.

Adapting to these changes through assisted species migration, intermediate silviculture treatments such as pre-commercial thinning favoring temperate species, planting genetically enhanced seedlings, restoration silviculture, and others can help protect against losses and potentially generate benefits through new/enhanced wood products and services. Realization of these opportunities, however, requires the willingness of the forest sector and communities to integrate such adaptation into their planning.

The documentary is based on interviews with many well-respected researchers and professionals. Through their interviews an interesting storyline emerges. The story is based on finding solutions to climate change adaptation and highlights the importance of forest management in implementing those solutions. The main message of the documentary is that forest and forest management are undoubtedly crucial elements and potential solutions to mitigating the environmental and socio-economic effects of climate change.

This documentary is part of a much wider research and knowledge mobilization project entitled Costs and benefits of adapting to climate-induced changes in drought and wind regimes in New Brunswick's forests. The project is financed by Natural Resources Canada and lead by the Faculty of Forestry and Environmental Management at UNB with several of its professors participating as well as other collaborators like NHRI and private sector subject matter experts working on this project.

"Our Forest at Risk: Un paysage en transition" will have its first screening on October 2nd, 2019 during the Fall Meeting of the Canadian Woodlands Forum held at the Quality Hotel and Conference Center in Campbellton, New Brunswick from October 2nd and 3rd.

Figure 1. Picture of Mathieu Germain (forefront), the director of the video documentary, and Tanguy Locqueneux assistant to the director (backround). The documentary video is produced by the NHRI and is entitled: *"Our Forest at Risk: Un paysage en transition" and will have its first screening on October 2nd, 2019 during the Fall Meeting of the Canadian Woodlands Forum held at the Quality Hotel and Conference Center in Campbellton, New Brunswick from October 2nd and 3rd.*

OUR FORESTS AT RISK

UN PAYSAGE EN TRANSITION

A documentary by **Mathieu Germain**

with the assistance of *Tanguy Locqueneux*

Produced by Institut de recherche sur les feuillus nordiques Inc.
Northern Hardwoods Research Institute Inc.

PROMISSING PARTNERSHIPS
Validation of next-generation timber cruising application

" This project is another excellent example of how our team is constantly developing partnerships that gives us access to next-generation forest management technology in order to validate and field test them for our clients."

We are very pleased to announce that NHRI will be partnering with Lim Geomatics for the development of adaptive precision silviculture tools. In fact, the Northern Hardwoods Research Institute (NHRI) will be the first customer in the world for Lim Geomatics' new timber cruising product called PRISM. Timber cruising is not only the foundation of effective forest management but also necessary for research and development field work at the NHRI.

Built upon a modern ESRI framework, PRISM is comprised of a web and mobile app that work together to plan and perform successful cruises. The web app provides an intuitive interface for designing, assigning, and monitoring the progress of cruises. Prism is highly configurable to meet the needs of todays foresters as they can create a variety of cruises for diverse management goals and ecosystems. Prism can also be configured for unique silviculture practices, workflows, and company data structures. These latter capabilities, along with Lim Geomatics great track record and reputation are what made it attractive to the NHRI team.

Designed on the ArcGIS Online platform, Prism seamlessly integrates with a variety of existing data-collection applications and GIS tools. The application also streamlines data management with enterprise technology into the Cloud eliminating the need for complex file handling and transfers.

This product will become the official platform for geo-referenced data collection and will be thoroughly tested during the NHRI's very important 'Precision Block Planning Project' implemented with Groupe Savoie on NB Crown License #1 – managed by AV Group.

Upon successful implementation, Lim Geomatics will elaborate a workplan to investigate if the PRISM app could become the host platform for the NHRI's professional version of its tools such as the Silviculture Prescription System, the treatment cost calculator, the product prediction and tree classification tools, the harvesting cost functions and many other apps yet to be developed.

The Northern Hardwoods Research Institute is happy to embark on this venture with Lim Geomatics; an innovative company with a demonstrated track record and reputation. Founded in 2006, Lim Geomatics has built a trusted brand worldwide for developing and implementing innovative geospatial solutions and services.

This project is another excellent example of how our team is constantly developing partnerships that gives us access to next-generation forest management technology in order to validate and field test them for our clients.
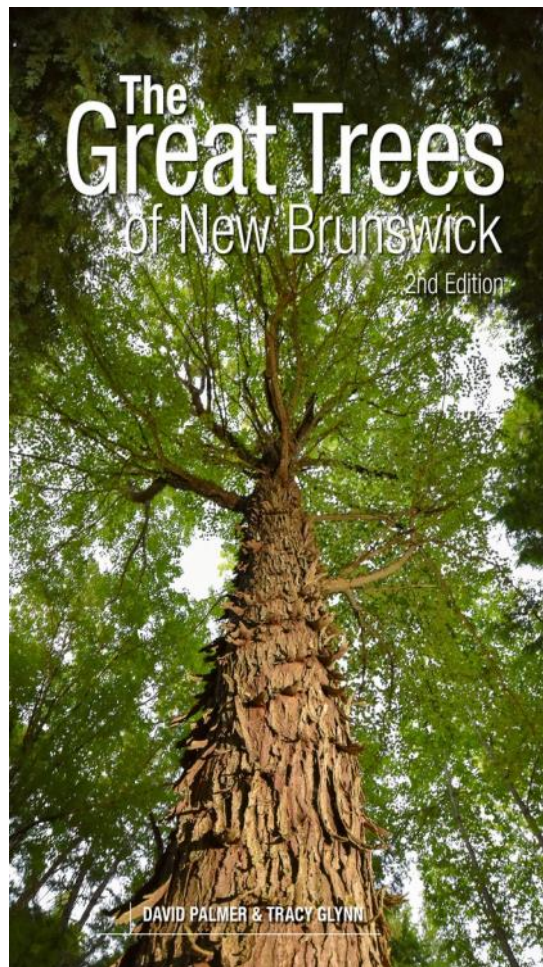
For more information on Prism click here.

THE GREAT TREES OF NEW BRUNSWICK
A must read for tree enthusiasts!

If you like trees, you live in New Brunswick and are looking for a great book to read for the end of summer then look no further than Great Trees of New Brunswick, 2nd Edition. Written by David Palmer and Tracy Glynn and published by Goose Lane Editions, the book is divided into three sections (hardwoods, softwoods and exotics) and features 41 chapters; one for each species presented. The authors have put together a book that doubles as an informative guide to the province's native and introduced species and a compendium of "champion" trees.

Each chapter presents the tree's defining features, habitat, uses and offers a description of the champion tree itself. On top of being very informative and easy to read the book also features amazing eye-catching photographs of each tree; making this book a prime candidate as a great coffee table book once you're done reading it – friends, family, neighbors and visitors from near and fare will surely love flipping through the pages of this wonderfully descriptive and visually stunning book.

"At NHRI we are particularly fond of the Saint-Leonard Silver Maple pictured on page 106 (...) since it was nominated by Pamela Hurley Poitras, our Silviculture Specialist!"

The book is also particularly interesting since the champion trees selected were draw from nominations from all corners of the province. At NHRI we are particularly fond of the Saint-Leonard Silver Maple pictured on page 106 and described on page 110 since it was nominated by Pamela Hurley Poitras, our Silviculture Specialist! Gaetan Pelletier, Executive Director of NHRI, also nominated a white ash tree that got an honorable mention as part of the list of Great Tree Nominations found in Appendix 1 of the book. The majestic white ash was discovered while the NHRI team was organizing a silviculture workshop with AV Group near Skiff Lake.

Great Trees of New Brunswick is fun book to read and own, so if you haven't got a copy yet follow the link below and make sure to purchase one now before they are sold out!

**Great Trees of NB
Click here!**

UPCOMING EVENTS

Canadian Institute of Forestry
Institut forestier du Canada

111TH CIF-IFC ANNUAL GENERAL MEETING & CONFERENCE

Hosted by the CIF-IFC Algonquin Section, the 2019 National Conference & AGM will take place from October 6th-9th in Pembroke, Ontario at the Best Western Pembroke Inn & Conference Centre.

iufro2019
Curitiba · Brazil
29 SEPT - 5 OCT

In 2019, for the first time Latin America will host a World Congress of the IUFRO (International Union of Forest Research Organizations). This event will take place in Curitiba, Paraná, Brazil (at Expo Unimed), from September 29 to October 5, and will be organized and coordinated by the Brazilian Forest Service (SFB) and EMBRAPA. Approximately three thousand participants are expected at the event, which will discuss various aspects related to forest research.

Canadian Woodlands Forum
FORUM
Forum canadien des opérations forestières
100 YEARS 1919-2019

Fall 2019 MEETING
Save the date!

October 2-3, 2019 - Campbellton, NB
Quality Hotel & Conference Centre

Proudly Hosted by AV Group NB Inc, in collaboration with the Northern Hardwoods Research Institute and Groupe Savoie Inc.

ADITYA BIRLA
AV GROUP
New Brunswick Inc.

Institut de recherche sur les feuillus nordiques
Northern Hardwoods Research Institute

GROUPE SAVOIE

Watch for program and registration details later this summer!