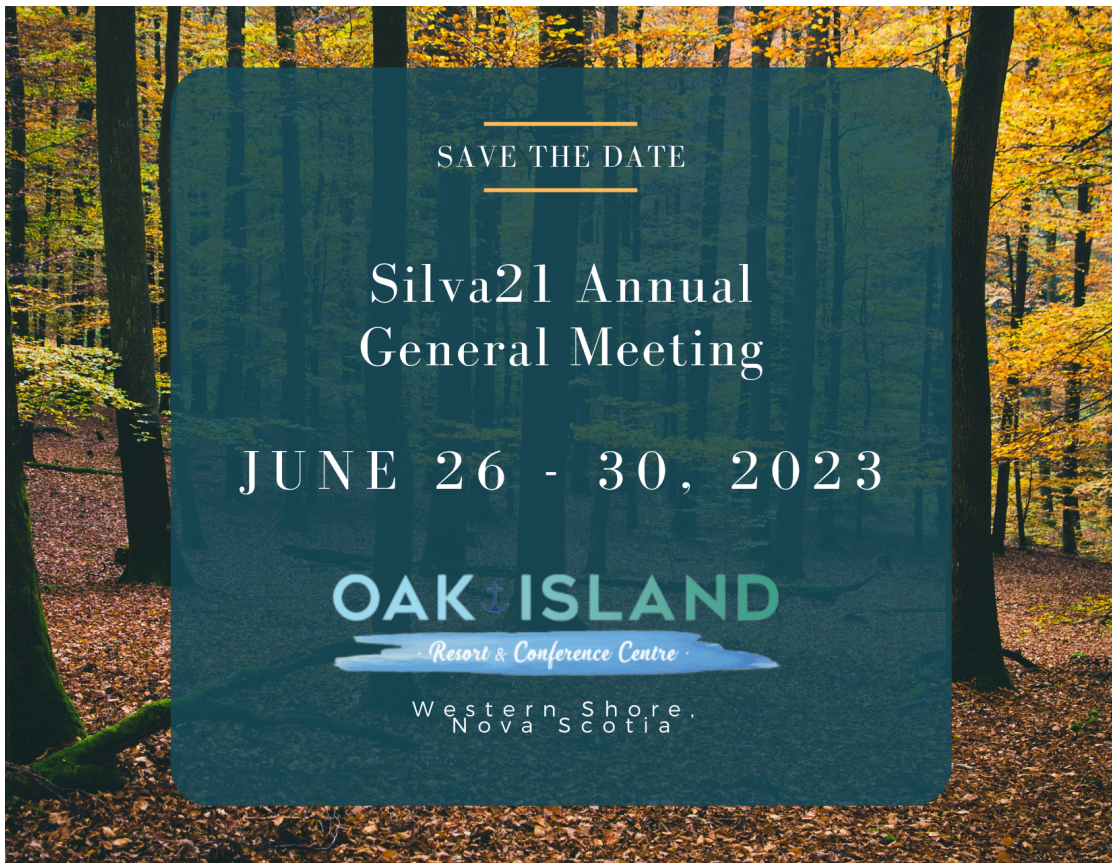


**Silva21's 2nd Annual General Assembly
SUMMARY REPORT**



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Welcome!

Silva21's second Annual General Assembly (AGM) took place from June 27th to 29th at [Oak Island Resort & Conference Centre](#) on the Western Shore of Nova Scotia on the ancestral and unceded territory of the Mi'kmaq people. The AGM brought together a diverse group of over 50 participants from across Canada including graduate students, postdoctoral fellows, research associates, university professors, provincial and federal government researchers, and forest industry partners.

The event aimed to foster knowledge exchange, collaborative discussions, and exploration of parts of the Acadian Forest within Silva21's own [Nova Scotian hub research site](#). The goals of this years' AGM were to:

- Provide an opportunity for researchers, HQP and partners to meet, network and socialize
- Provide of an overview of the projects, results and ongoing programs of work at each research theme and hub
- Allow partners to provide feedback about how projects may help adapt silviculture to changing realities

At the first AGM last year in Quesnel, BC, the three days of presentations were organized by research hub (Quesnel, Malcolm Knapp, Romeo Malette, Lac St-Jean, Montmorency, Newfoundland, Petawawa, Estrie, Haliburton, Black Brook, Acadia and Nova Scotia). This year, the three days of events were organized by Silva21's research themes: Observe, Anticipate and Adapt.



Pre-AGM Event: An EDI Panel

Silva21 always aims to highlight the importance of EDI in all aspects of research, but particularly in important large group settings such as the AGM. For that reason we began the week with a discussion panel discussing equity, diversity and inclusion in the field of forestry. The goal of the panel event was to:

- Provide a platform for experts from diverse backgrounds to share their experiences and insights on EDI-related topics in the forestry industry
- Increase awareness and understanding of EDI-related challenges and opportunities in the forestry industry
- Promote an open and constructive dialogue on EDI-related issues
- Encourage attendees to reflect on their own EDI-related practices and commitments, and identify opportunities for improvement
- Foster a more inclusive and equitable forestry industry through collaboration and knowledge sharing

This event was hosted by [Dr Etienne Bélanger](#) from Forest Products Association of Canada (FPAC). Dr Bélanger is co-chair of Silva21's [Advisory Committee](#) and lead of Indigenous relations and forestry at FPAC. Panelists included:

- [Jillian Weldon-Genge](#), regional forester at Nova Scotia's Department of Resources and Renewables,
- [João Paulo Czarnecki de Liz](#), PhD candidate at Université Laval, and
- [Dr Anne Bernard](#), postdoctoral fellow and newly appointed professor at the University of Laval.

The panel began by highlighting the importance of hearing from women in forestry since women make up only approximately 18% of the workforce - significantly lower than the national average across all workforces of 48%. Each panelist gave a brief introduction of themselves, their field of research and explained what EDI meant to them, why these concepts are important and how they're demonstrated in their workplace. Many concepts were discussed including the benefits of EDI, accessing training and employment opportunities, creating a welcoming and inclusive environment, leadership and representation, integrating EDI into practices and policies, promoting EDI in research and measuring progress and continuous improvement

To see the event description and the complete list of questions, [click here](#).

Day 1: OBSERVE - Innovative tools to assess growth and vigour of trees to allow flexible and forest adaptive management strategies in the face of climate change and disturbances

Honouring Indigenous lands and heritage

Following the theme of the previous evening, Silva21 wanted to keep EDI and reconciliation at the forefront of our event. For this reason we invited Melanie Robinson-Purdy from the [Acadian First Nation](#) to perform a traditional Indigenous [smudging ceremony](#). Melanie performed a smudge and prayer and told the story of how hunting with her dad in the woods was a great memory she had of her in the forest before he passed away. Silva21 thanked Mrs. Robinson-Purdy with a traditional gift of tobacco, purchased from the projects' First Nation's partner the W8bana'ki Nation in Quebec

Silva21 aims to go beyond simple acknowledgements, not only to build stronger trust and relationships with our First Nation partners and Indigenous communities but also because research is conducted on so many different territories across Canada. For this reason, Silva21 acknowledged the land and the Indigenous communities that have cultured them throughout history with the following reflection:

Silva21 acknowledges the ongoing research conducted on the traditional, ancestral, and unceded territories of Indigenous communities that has been their home for countless generations. We acknowledge the diverse Indigenous cultures, languages, and histories that have shaped and continue to enrich these lands. We pay respect to the Elders, both past and present, and extend our gratitude to the Indigenous communities who have stewarded the forests and lands upon which we live, work and play.

We acknowledge that the effects of colonization, past and ongoing, have had profound impacts on Indigenous peoples and their relationship with the land. We are committed to learning from - and working in partnership with - First Nations communities to promote the principles of reconciliation, respect, and collaboration in the field of forestry.

As we gather here today, we invite all participants to reflect on the vital role that Indigenous knowledge, perspectives, and voices play in shaping our understanding of the forest ecosystem and sustainable forest management. Join us in committing to ongoing efforts of building meaningful relationships with Indigenous communities, acknowledging their rights and sovereignty, and integrating Indigenous knowledge and perspectives into our research and practices in a future of reconciliation, equity, and sustainability.



Welcome address from Dr Achim & Dr Coops

Following the Indigenous ceremony and prayer, principal investigator [Alexis Achim](#) from the Université Laval and co-lead [Nicholas Coops](#) from University of British Columbia welcomed to the group by thanking our collaborators and partners, highlighting the number of ongoing projects and HQPs across the three research themes and the various forms of scientific output that has come from the project so far.

Guest Speaker: Florian Bergoin, Nazko First Nation

The Silva21 group met Florian Bergoin at last year's AGM event in [Quesnel](#), a Silva21 research hub and located on the unceded traditional territories of the Lhtako Dene Nation, Nazko First Nation, Lhoosk'uz Dené Nation, and ?Esdilagh First Nation (formerly Alexandria Band). Mr. Bergoin is a registered forest professional (RPF) and the natural resources manager of the [Nazko First Nation](#) in British Columbia and is now an important collaborator on multiple Silva21 projects. We asked Mr. Bergoin:

“From your perspective, what are the current strengths and weaknesses of adaptive forest management in British Columbia? Is Canada doing enough to engage and collaborate with Indigenous communities?”

Mr. Bergoin described the current landscape and management practices in BC, which is generally managed by emulating natural disturbances resulting in even-aged stands and large patch sizes. These forests are highly prone to wildfire and are sensitive to forest health issues, which has led to reductions in annual allowable cut (AAC) and availability and quality of non-timber products.

Mr Bergoin highlighted the many concerns raised by the community including major impacts on water and fish resources, on wildfire and access to plant resources. However recent changes have led to the DRIPA act, greater consultation with First Nation communities and changes in governance and Indigenous participation from the BC government.

This had led to multiple adaptive management tools including forest landscape plans and changes in land tenure. Ongoing challenges are still a result of small remote communities with limited access to communication technology and economic opportunities and many barriers to education, regulated professions and trustworthy relationships. Still, the Nazko First Nations is undertaking many new projects and collaborations including implementing wildfire prevention and community resiliency initiatives, land-use planning at the territory level, economic development and diversification strategies, community forest initiatives, ecosystem restoration projects and collaborations with academic institutions and other agencies.

For a copy of Mr Bergoin's presentation, [click here](#).

Introduction to Observe from the Scantiques Roadshow

To introduce our observed theme, we heard from [Chris Mulverhill](#), a postdoctoral fellow at the University from Columbia in the [Integrated Remote Sensing Studio](#) (IRSS). Dr Mulverhill is, an expert in remote sensing, so we asked him:

“What does Silva21’s Observe theme mean to you and what are the ongoing challenges you encounter in your research in remote sensing?”

Dr Mulverhill discussed the ongoing successes and challenges of using this data and tying it into tree response to climate change and the implications for adaptive silviculture.

For a copy of this presentation, click [here](#).

Dr Mulverhill was also one of three IRSS HQPs to travel to Nova Scotia for this year’s AGM from Vancouver via road trip in what we call [Scantiques Roadshow](#): Canada's First Coast to Coast (to coast) remote sensing tour!

The Scantiques Roadshow

To tell the group more about the adventures of the Scantiques Roadshow, two PhD students from the IRSS lab who were on this road trip, [Liam Irwin](#) and [Sarah Smith-Tripp](#) told us more about it.

You can read more about it on the [Silva21 blog](#), as well as Sarah’s [blog](#).

Presentations from Observe HQP

HPQs with research projects under the <i>Observe</i> research theme and links to their AGM presentations		
Liam Irwin, PhD student	OB1a : Advanced remote sensing: free-to-grow to thinning stage	View presentation here
Sarah Smith-Tripp, PhD student	OB2 : Regeneration after catastrophic disturbances	View presentation here
Chris Mulverhill, Postdoctoral Fellow	OB5a : Continuous forest inventory framework	View presentation here
Alexandre-Martin Bernard (completed PhD project)	OB3b : Early alert systems for forest management	View presentation here

José Riofrio, Postdoctoral Fellow	OB4a : Climate-sensitive mortality models in Ontario	View presentation here
Gabrielle Thibault (completed MSc project)	OB1b : Optimization of the characterization of burn patterns	View presentation here
The following are newly recruited HQPs (within the last 6 months) who gave a 3-minute introduction to their upcoming projects		
Lukas Olson, MSc student	OB6 : Metrics of silvicultural prescription: composition and structure	See slides here
Madison Brown, MSc student	OB5c : Metrics of silvicultural prescription: stand condition	
Spencer Shields, MSc student	OB5b : Metrics for silvicultural prescription	
Raphael Pouliot, RA	OB3c : From theory to action at the Montmorency Forest	

Maritime industry partners perspective: JD Irving

At this year’s AGM we aimed to have more discussion components with our government and Industry partners. For this reason we invited one speaker for each theme to give a 15 minute presentation followed by a 45 minute [World Café](#) style discussion.

For the *Observe* theme we heard from [Shane Furze](#), RPF and silviculturist at [JD Irving](#), a Silva21 industry partner. Shane has a long history with our group, as he was a HQP on Silva21’s predecessor research project, AWARE and was also present at last year’s AGM. This year, Dr Furze presented the achievements and challenges of JD Irving woodlands in the face of climate change.

Across more than 2.3 million ha of managed lands, JD Irving is invested in research and intensive silviculture management of their forests that are the basis of their vertically integrated supply chain. They agree that the uncertainty of climate change poses the greatest challenge to future management and wood volumes include site and species resilience, impacts on growth and yield forecasting, the increased frequency and severity of biotic and abiotic disturbances and continuous inventory updates.

For a copy of Shane’s presentation, [click here](#).



World Café

For our World Cafe style discussions, our invited speakers were asked to prepare one question for the group, the other two were prepared by the Silva21 [Scientific Integration Committee](#) and the last was determined by the audience on the spot.

Q1: As practitioners, how do we put this research into practice? How can we apply, and scale, the Silva21 research to meet operational needs?

- Industry participation is key and staying involved step-by-step including checkpoints to stay on track
- Output goals and expectations should be defined at the onset
- Ongoing collaboration with in person meetings (like this AGM!), seeing operations in practice
- Workshops with everyone involved (e.g. technical sessions) and two-way-teaching of how to integrate workflows
- Tangible results with common language and industry-friendly communication (e.g. [extension notes](#), maps, reports). Finding one metric that speaks to everyone (even for ecosystem services)
- Being open to new avenues for communication and making them available (e.g. apps)
- ↑ worth of human resources

Q2: What are the main barriers to operationalizing new technologies into existing workflows?

- Complexity of tools and the ability to utilize multiple tools
- Costs (to equipment and data, funding availability)
- Policy to allow and implement new technology
- Land tenure systems (volume-based that leave ↓ flexibility and discourage investment)
- Show real life impacts of tools and new successes visible (to be used as future examples)
- Communication: focus on a specific problem we are trying to solve and ensure we can communicate how our research overcomes these barriers
- Training (e.g. of drone pilots, expertise in GIS/code); allow HQPs to be training vectors for implementation

Q3: Where does the responsibility for training and education lie for the next generation of foresters around new technologies? Should they learn it at university, training courses or on-the-job training?

- Facilitate the jump for academia to industry; integrate industry internships, co-op programs, etc. (bottom up approach)
- Government should promote grants and incentives for these kinds of programs
- Work towards congruence among university programs, certifications, etc. and professional accreditations

Q4: How can we convert the impact of this science into a return on investment?

- Linking scientific contributions with ROI (balancing industry models with academics)
- Quantifying different variables of forestry; e.g. the damage of fires/pests, ecosystem

- services, etc.
- Making ROI transparent to the scientific community so we can quantify it with our data
 - Incentives required from government officials.
 - Is this the job of academics? As foresters, where does our mandate stop?
 - Difficult to quantify when these are not often linked. There is rarely incentive from industry to open source work by scientists.
 - Maybe the missing link is between science and forestry operations and then forestry operations and ROI

Day one recap

After the World Café discussions, we concluded day one asking participants to complete a [short survey](#) to reflect on the day and answer the following questions:

- What stood out to you as the most exciting research, news and/or project highlights?
- Could you identify any shortcomings of any projects or any remaining research gaps up until this point that need to be filled?
- How do we fill these gaps and/or increase our efforts?

Day one recap from the audience regarding project highlights, potential shortcomings and ways the Silva21 project and ways to increase efforts to fill these potential gaps.		
Highlights	Shortcomes	How to increase efforts
-The Scantiques Roadshow -Real time EFI updates -Fire burn characterization	-How do we implement new results into operations and industry? -How do we make scientific results better understood for a more general audience?	-Collaboration between academia, industry and other groups -Promote tools using plain language



Day 2: ANTICIPATE - improving growth models and prediction methods to account to a new climate reality that includes multiple risks of disturbance

Introduction to Anticipate

The Silva21 kicked off Day 2 with an introduction to *Anticipate* by our Fearless Leader (and principle investigator), Dr [Alexis Achim](#). We asked Dr Achim:

“What does Silva21’s Anticipate theme mean to you and what are the ongoing challenges you encounter in your research including growth models, prediction methods and risk of disturbance?”

Dr Achim began this introduction by reminding the group of the shared sense of urgency surrounding pressures and stresses on Canadian forests. In Canada there is a shared sense of difficulty in predicting forest losses due to climate change, fiber supply access, security and competitiveness, as well as social licenses and public engagement. So while we are already seeing a changing culture of silviculture (Achim et al., 2022), the real issue may not be only in convincing stakeholders to adapt to the new realities of changing climate but also to maintain the world’s faith in silviculture. Dr Achim stressed that for this reason, Silva21 must rise to the challenge with a coordinated and coherent science-based response.

To demonstrate how Silva21 is already working towards this goal, Dr. Achim highlighted many of the different projects under the *Anticipate* theme including research on climate projections, climatic drivers of growth and mortality, indicators of tree vigour, silviculture tools such as thinning and salvage harvesting to mitigate risk and losses, respectively, as well as management-scaled solutions. Within all of these research projects, Dr Achim reminded the audience of the ongoing challenges ahead and the main questions that would be addressed by HQPs in the upcoming presentations, including:

1. How best to make projections in time when climate drivers include extreme events?
2. How will future climate affect return intervals for various disturbances?
3. How can silviculture mitigate the risk of damage?
4. How can management lead to resistant and resistant landscapes?

For a copy of Dr Achim’s presentation, [click here](#).

Presentations from *Anticipate* HQP

HPQs with research projects under the <i>Anticipate</i> research theme and links to their AGM presentations		
Catherine Chagnon, RA	AN1a : Climatic drivers of tree growth	View presentation here
Guillaume Moreau, PDF	AN4 : Stem vigour and growth of tolerant hardwoods	View presentation here
Amy Wotherspoon, PDF	AN1b : Future climate envelopes	View presentation here
Christina Howard, PhD candidate	AN3a : Integration of climate drivers into growth modeling (Quebec focus)	View presentation here
Jamie Ring, MSc student	AN3b : Integration of climate drivers into growth modeling (maritime focus)	View presentation here
Florence Leduc, MSc student	AN1c : Impact of climate change on growth of commercial forest species in Nova Scotia	View presentation here
Sergio Alonso Sanches, MSc student	AN6a : Thinning as a tool to increase resistance to stressors	View presentation here
Joao Paulo Czarnecki de Liz, PhD student	AN5 : Targeted assisted migration	View presentation here
Catherine Beaulieu (completed MSc project)	AN9 : Flexibility in forest management to preserve caribou habitat	Watch video presentation and slides on Newfoundland fieldwork
Marilou Yargeau (completed MSc project)	AN7 : Tree-level response to thinning	View presentation here
The following are newly recruited HQPs (within the last 6 months) who gave a 3-minute introduction to their upcoming projects		
Philippe Riel, PhD student	AN1d : Wood properties as proxies for past climate conditions	View their presentations here
Sébastien Dumont, PhD student	AN1e : Effect of extreme climatic events on boreal and temperate tree growth	
Emmanuelle Baby-Bouchard, RA	AN2 : Boreal forest growth dynamics in the face of climate change	

Kirk Johnson, PhD student	AN8b : Viability of climate-informed, landscape-level strategies (west focus)	
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Perspectives from the Department of Natural Resources and Renewables: Dr James Steenberg

Having the AGM in Nova Scotia meant it was important to hear from the local provincial government. For that we invited [James Steenberg](#), senior research and planning forester in the forestry division from the Department of Natural Resources and Renewables. We asked Dr Steenberg:

“Thinking about the Anticipate theme within Silva21, what are some of the successes and ongoing challenges of adaptive silviculture in the face of climate change in Nova Scotia and what/how is the provincial government currently prioritizing?”

Dr Steenberg discussed Nova Scotia's perspective on climate change and silviculture highlighting the province's current practices to focus on emulating natural disturbances in forestry, creation and restoration of multi-aged, multi-species forests with a focus on restoring late successional species and enhancing ecosystem resilience to climate change. Nova Scotia's triad approach was also presented as a form of ongoing planning for the implementation of three separate areas of management; high production (timber-focused), an ecological matrix (a mix of conservation values and timber production) and conservation (areas for strictly conservation).

When it comes to Silva21's *Anticipate* theme, Nova Scotia is currently focusing on how to anticipate and adapt to natural disturbances using forest modeling on individual tree models for uneven-aged management, climate sensitive growth and yield models, and species range shifts.

To see Dr Steenberg's presentation, [click here](#).

Unfortunately due to time restraints we were not able to do a full World Café around this discussion topic, though we had planned on discussing the following three questions:

- 1.
2. *How can we mitigate trade-offs between short-term vulnerability and long-term resilience in silviculture? How can research and new modeling techniques be used in doing so?*
3. *Do you feel like governments are ready to accept "risks" and convey them to the public in their assessment of forest planning? Is acknowledging future variability and risk something governments are ready to do?*

4. *Provincial governments have traditionally relied on one or two models to support forest management planning. If more models were available, would you be ready to make predictions using ensembles of models rather than just using a single model (just like the IPCC does with climate projections)? Would the uncertainty associated with these predictions be considered as a valuable piece of information?*

The Wabanaki-Acadian Forest field tour

Having our AGM take place in Nova Scotia was a great opportunity to visit the local Acadian forests and landscape. A special thanks to [Jamie Ring](#) for organizing the field tour and showing us the variety of forest stands in Acadian forests. In Nova Scotia, 79% of forested land is privately owned, with only 38% being Crown Land, providing a provincial harvest of approximately 2.6 million m³ per year. The Wabanaki-Acadian forest that we visited is a temperate mix of long-lived shade-tolerant species and includes red spruce, eastern hemlock, sugar maple and American beech with yellow birch and white pine as secondary species. The most common disturbance type in these forests is windthrow (during hurricanes), though infrequent, and occurs about once every seven years. Other disturbances include fire and forest insects such as the spruce budworm and bark beetle. Gap disturbances promote the development of uneven-aged characteristics with complex horizontal and vertical stand disturbances. The three types of forest stands visited on the field tour are outlined below.

The three Acadian forest stands and their dominant tree species visited during the Acadian forest field tour.		
Acadian forest type	Dominant tree species	Description
Site 1: Natural red spruce forest Location: 44.718488, -64.267551	Red spruce, white pine, eastern hemlock, yellow birch	A benchmark forest type for ecological management. This site had some natural canopy gaps from senescence and advanced regeneration filling those gaps. By showing us a soil core you see how red spruce forests can be atop soils with a wide range of moisture levels, moderately fertile and mainly derived from glacial till.
Site 2: Red spruce shelterwood Treated in 2016 Location 44.637517, -64.299071	Red spruce, white pine stand with advanced regeneration (treated in 2016)	In the stand the shelterwood objectives were to produce light conditions suited for regeneration of long lived shade tolerance species. At the time of treatment 2/3 of the basal area was retained. After a cohort of regeneration is established the overstory can be removed to release the regeneration creating an even-aged stand. alternatively, another partial harvest could be



		<p>completed to release patches of regeneration while maintaining mature cover (known as irregular shelterwood).</p> <p>In stands like these, challenges include blowdown and stem breakage which is common in any partial harvest, but particularly in forests that experience frequent windstorms.</p>
<p>Site 3: Wind-damaged red spruce shelterwood,</p> <p>Treated in 2018; blown over during 2019 and 2022 windstorms</p> <p>Location: 44.688795, -64.292123</p>	<p>Red spruce, white pine stand</p>	<p>At this site, we saw first-hand how achieving shelterwood prescription objectives are at the mercy of the retained trees to provide shade conditions for regeneration.</p> <p>In the case of this stand, a large portion of trees were damaged by wind due to shallow, wet soils with significant stoniness.</p> <p>To mitigate these windthrow hazards, pre-treatments assessments classify exposure, soil type and growing stock classification. Hazard ratings are then rated to ID sites for commercial thinning or selection harvesting.</p> <p>Arranging retention in gaps, compared to uniformly treating the site results in a more windfirm residual stand.</p>

For more information on these stands and Acadian silvicultural treatments, including risks to windthrow, check out the [field tour brochure](#) made by Jamie Ring.



Day 3: ADAPT - testing innovative silviculture treatments and forest management strategies adapted to new socio-environmental reality to ensure sustainable fiber supply

Guest speaker: Verena Griess, Professor, ETH Zurich

To start the final day of the AGM we heard from our international guest, Dr. Verena Griess, a professor of forest resources management at ETH Zurich in Switzerland. Dr Griess was also a professor at the University of British Columbia when she was one of the original co-applicants of the Silva21 project. Unfortunately by the time Silva21 received their NSERC grant she had taken a new position in Switzerland. However, she remained involved in project collaborations, particularly those related to the viability of climate-informed, landscape level strategies (i.e. [AN8b](#)). We asked Dr Griess:

“From your perspective, what are the current strengths and weaknesses of adaptive forest management in Switzerland? How does Canada compare?”

Dr Griess, having studied and worked in forestry in both countries explained that the differences between Canada and Switzerland is not only the obvious difference in size and population density, but the way these factors contribute to its forest management. It was interesting to learn that the forested land in Switzerland is 71% publicly owned - the opposite of Nova Scotia like we learned yesterday during the field tour.

Though Switzerland is a net timber importing country, federal laws govern forestry practices and are formulated with a bottom up-approach, led by the Swiss citizens themselves. These laws enforce the national overarching goals to maintain forest area and its spatial distribution and natural ecosystem but still ensure it can provide various functions sustainably and support and maintain the forest industry.

Currently, Switzerland is focusing on forest growth modeling and improvements on the probability of adverse effects that are likely to occur as a result of climate change. This is a high national priority given the extremely high altitudes of Swiss mountains that are the most vulnerable to climate change effects whose severity is correlated to upwards shifts in altitude. An interesting component was the concept of [Dragon-Kings, Black Swans and the Prediction of Crises](#), concepts to correspond to meaningful outliers, which are found to coexist with power laws in the distribution of event sizes under a broad range of conditions in a large variety of systems.

For a copy of Dr Griess' presentation, [click here](#).

Introduction to *Observe* by Dr Loïc D’Orangeville

After hearing from Dr Griess, [Dr Loïc D’Orangeville](#) from the University of New Brunswick gave us an introduction to Silva21’s *Adapt* theme. We asked Dr D’Orangeville, a co-applicant of the project:

“What does Silva21’s Adapt theme mean to you and what are the ongoing challenges you encounter in your research of large-scale, transborder experiments?”

He explained adapting forest management to climate change meant optimizing stand and landscape characteristics through silviculture to minimize risks. This includes data collection from existing trials, linking stand attributes with resilience, implementing climate-adapted forestry practices and establishing legacy trials.

These large-scale legacy trials include two of Canada's largest field trials; ThiRST and [TransX](#). ThiRST (Thinning to Reduce Stress in Trees) explores how precommercial thinning can make white spruce plantations less vulnerable to drought and is tightly linked to Silva21 partners JD Irving. TransX is a transborder experimental tree plantation across eastern Canada and the United States with three main objectives: 1) assess the warming tolerance of broadleaf and coniferous species and populations to inform adaptive silviculture strategies, 2) assess the capacity of southern populations to adapt to the current conditions in eastern Canada and inform assisted migration and changes in seed transfer zones, and 3) quantify genetic control of growth and survival across temperate range for well-known improved progenies.

For a copy of Dr D’Orangeville’s presentation, [click here](#).

Presentations from *Adapt* HQP

HPQs with research projects under the <i>Adapt</i> research theme and links to their AGM presentations		
Tommaso Trotto, PhD candidate	AD2 : Learning from the past: key stand attributes linked with resilience	View presentation here
Rover Liu, MSc student	AD3a : Silvicultural scenarios to promote resilient stand structures	View presentation here
Ethan Ramsfield, PhD student	AD1 : Revisiting existing trials	View presentation here
The following are newly recruited HQPs (within the last 6 months) who gave a 3-minute introduction to their upcoming projects		

Jacob Ravn, PhD student	AD9b : Assisted migration trials: early response	View their presentations here
Mario Stolz, MSc student	AD3b : Silvicultural scenarios to promote resilient stand structures	
Chloe Larstone-Hunt, MSc	AD3c : Rainfall exclusion experiment: the effect of thinning	

Embracing Interdisciplinary Approaches: Integrating Social Science in Forestry

The AGM presentations then took an important shift in perspective to hear from Silva21 collaborators and social scientists [Dr Shannon Hagerman](#) and [Profe Maude Flamand-Hubert](#). Dr Hagerman and Profe Flamand-Hubert invited the audience to shift their perspective away from data collection and scientific methodology to a more open perspective where forestry is not just about the trees and forests but also their perceived value by different communities and how this value shapes individual core values and drives personal decision making.

Presentations from *Adapt* HQP (social science)

Laurence Boudreault, PhD student	AD6 : Culturally important species	View presentation here
Anne Bernard (completed PDF project)	AD8a : Silvicultural practices at the page of global changes: a public policy challenge	View presentation here
Sandrine Paquin (completed MSc project)	AD5b : Climate change and adaptive silviculture: playing to collaborate with a serious game	View presentation here
Dane Pedersen, PhD student	AD5a : Deliberative-analytic framework to engage public and stakeholders	View presentation here

Visualization techniques for social commentary

After lunch, these presentations were followed by the discussion of a potential future project of Silva21: *Visualization techniques for social commentary* (Project [AD7](#)). [Sabrina St-Onge](#), a close collaborator and MSc student in Dominik Roeser's lab, provided us with an [overview](#) of exploring 3D visualization options for forest landscapes.



This project is important so we can see how visualization of forests helps communities understand complex data, visualize the impacts of management, motivate action, become educated and overcome uncertainty.

Dr Coops led the discussion and asked the audience to think about what our goal was visualization truly is. For this reason, in planning this project in the upcoming months we would like to ask you:

- *Should this project allow for Discussions in linked projects of adaptive management? Or is it better focused for visualization of key Silva21 outcomes?*
- *Should this project be data driven? Or should the visualization be creative and artistic?*
- *Will it be led by a contract position from someone such as a communicator? Or will it focus on public engagement and communication media?*

If you have feedback to these questions or ideas for this project feel free to reach out to Nicholas, Alexis, or Amy.

Perspectives from Ontario Industry: Chris McDonell, GreenFirst Forest Products

It was great to hear from our Ontario partners at [GreenFirst Forest Products](#) for the first time at one of our large events since starting the project. We had the honour of having [Chris McDonnell](#), Chief Forester for Ontario and the President of the Ontario Professional Foresters Association, speak to the forestry profile in northeastern Ontario. We asked Mr McDonnell:

“Thinking about the Adapt theme within Silva21, what are some of the successes and ongoing challenges of adaptive silviculture in the face of climate change in Ontario and what is GreenFirst currently prioritizing?”

In this area (where the [Romeo Malette](#) forest hub can be found!) forestry is governed by area-based and sustainable forest license land tenures and GreenFirst Forest Products supplies 2.5 million m³ of wood to the surrounding area. When we asked Chris to talk about what adaptive forest management means to him given his field of expertise and experience with GreenFirst, he explained some of the successes and challenges.

For GreenFirst, successes include sustained commitment and results for conifer renewal, collaborative management with indigenous communities and good environmental group and stakeholder engagements. On the other hand, GreenFirst is facing the same challenges to adaptive silviculture as the rest of us; disturbances such as the spruce budworm, forest tent caterpillar, and unusual fire weather patterns. Of course, a turbulent market and rising fuel costs, as well as limited implication of mixed-wood forest management and intensive treatments, don't help companies like GreenFirst.



To address these challenges, GreenFirst utilizes predictive ecosite mapping at a finer scale to support practitioners, supports herbicide alternative programs, and prioritizes drone and lidar technology for greater operations and inventory and working to improve seedling quality through seed zone movement.

World Café

Q1: In considering adaptive silviculture in a changing climate, is there a scale where should efforts be prioritized or are all equally important? What are the top 2-3 considerations for adaptation at seedling , stand and landscape scales?

- Scale may be dependent on risk and management goals
- Seedling level: prioritizing new species, site, timing
- Stand level: plantation timing, diversification, microclimate
- Changing scale may be dependent on the complexity of the landscape
- Landscape level: diversification of stand types, ages, plantations, etc.
- There is also likely to be a connection between scales.
 - Ex: Diversity of conifers may mean ↑ yield; but then may be more prone to fire? Then ↓ yield at landscape scale
- Also depends on policy (federal vs provincial)
- What about temporal scale?

Q2: The European Union has adopted a new deforestation-free regulation. That regulation aims to guarantee that the products, including wood products, EU citizens consume do not contribute to deforestation or forest degradation worldwide. But the EU has adopted a definition of forest degradation that may have implications for silviculture and Canada:

"forest degradation' meaning the structural changes to forest cover, taking the form of the conversion of naturally regenerating forests and primary forests into plantation forests and other wooded land and the conversion of primary forests into planted forests".

The EU's definition of 'planted forest' means "forest predominantly composed of trees established through planting and/or deliberate seeding provided that the planted or seeded trees are expected to constitute more than fifty percent of the growing stock at maturity".

How to reconcile such a policy in the context of sustainable forest management and Canada's obligations to regenerate forests post-harvest (not to mention commitments to tree planting initiatives)?

- What to do in jack pine/lodgepole pine?
- In Canada, could we afford to *not* plant after harvest even where silvicultural relevant
- In Brazil, they have zoned plantations vs planted areas. Would EU regulation accept that?
- Could this be used as a catalyst for the implementation of the triad model
- Define the 50%... If at the regional level then the change may not be so significant
- Is there control in private forests?
- Define the period of reference
- *Potential for a concept paper?*

Q3: How does assisted range expansion and long-distance migration align with the existing



certification processes in Canada considering obstacles posed by the planting of exotic species?

- The certification process is influenced by the interest group. It does not apply to genotypes and seed transfer guidelines can be rigid and often based on untested assumptions and historical precedent. However, legislative change is difficult and a very slow process
- Still, translocating species is not new but we will likely need demonstrations and data to show the decision makers for public lands and policy and regulation will have to be adapted.
- Dependent on public versus private land; Difficult on private land; they can be planted but there are probably rules as well. Might need to be more restrictive to reduce risk.
- Could be allowed in very specific conditions; no large-scale conversion and would have to be tested with limited scale and re-evaluation
- Could work with different scales of migrations; ie in municipalities. The 1st rule of FSC: apply local laws.
- What about exotic versus invasive species? What's an exotic species after all? Maybe more related to the ecosystem. Will need to understand more about this concept.
- Also province-dependent; in ON it would not be possible due to policy restrictions. In BC there are strict rules about moving provenance (south-north + elevation) and is restricted to historically native species.
- Boundaries might also be a problematic concept.
- Growth and yield models are not adapted to those species

Q4: How can the Silva21 projects fit in the Sustainable Transitions Framework? (concept proposed by Anne Bernard during her presentation; review her presentation [here](#))

- Challenge Silva21 innovative tools in a forest paradigm; how to put these tools together? How do they fit together in a changing climate? projects within the observed theme would be applied and very different manners
- Are industry and governments using these tools? How do we advocate for people to use the tools we are developing in our projects? Can we be explaining the tools more? And to whom?
- Need to work on communication effort; Need to change perspectives at many different levels. It's challenging for researchers to explain concretely what we are doing. We need to frame in a context of what is possible or unlikely. Everything should be done to inform the public.
- Need to find a common point amongst different stakeholders for different challenges. How do we communicate this to different stakeholders?
- What you implement in change (transformation) with forest is about the 7th generation to come; We are missing the next generation's input.
- Silver 21's final outcome goal for every project is at a pretty large scale; how can we spark the HQP evolution to putting these into action?
- We are struggling at researchers to find a common definition and what it means to become an advocate including to be advocates for people to use our own tools
- Engaging with your stakeholders is key. Individually, do we need to do better to communicate? We should all be able to do it but the peer-reviewed journal process is limiting - we need to find other ways to communicate/advocate/extrapolate our projects and have a bigger picture beyond journals to connect to smaller groups. We should have

journalists at the AGM

- Have to work towards bringing down our barriers: human beings are uncomfortable with change. So how do we show them that change is in a better direction is a good thing. Should this be a pillar of Silva21? To inform policy, industry, etc.
- Community forests are a great example of great communication; having a conversation *outside* of our discipline, doing it in a way we can solicit feedback, having a piece of something bigger, focusing around community and can include a reconciliation piece.
- Can this be done using a full life cycle carbon analysis to present a carbon budget
- Otherwise how do we influence politicians since they have more influence than the community?

Day three recap

Day three recap from the audience regarding project highlights, potential shortcomings and ways the Silva21 project and increased efforts to fill the gaps.		
Highlights	Shortcomes	How to increase efforts
<ul style="list-style-type: none"> ● Assisted migration ● Social science projects ● Immediate application of tree vigour assessment 	<ul style="list-style-type: none"> ● Links with putting work into application and practice in industry and communities ● Missing links to adapting silviculture prescriptions ● Would be nice to have more collaborations with research forests and/or First Nations 	<ul style="list-style-type: none"> ● A comprehensive review on research gaps and industry needs ● More information sharing with local interest groups, stakeholders and Indigenous communities ● Potentially new MSc and PhD projects ● Stronger links between individual researchers and practitioners ● Organizing visits and meetings with specific interest people with specific problems ● Training to Silva21 members for integration and understanding social and cultural aspects into research and application

Silva21 committee meetings & HQP workshops

The AGM is not only a time to present updates and advances on future works but also for annual in-person meetings of Silva21's [committees](#) - the Advisory Committee (AC) and the Science Integration Committee (SIC). This year, both committees met together to review the highlights and potential shortcomings of the various research projects and their evolution in the previous few years. Members took notes throughout the week and then presented ideas during the meeting. The goal of the SIC was to prompt discussion for ideas that will become the basis for future research papers (part of [project AD8b](#)), while the AC aimed to identify overarching themes that may be addressed by administrative tasks such as developing new projects and acquiring more funding if necessary.

While the AC and SIC were meeting, HQPs were busy with annual meetings of their own. The [EDI committee](#) met to review the results of the Year 3 EDI survey as well as to discuss the upcoming annual action plan for Silva21. The remaining HQP attended a workshop on scientific communication to highlight the importance of the multitude of different forms scientific outputs now sought after including blog posts, extension notes, extended abstracts, conference presentations, etc. Their goal was to start writing extended abstracts of their AGM presentations that could be shared with the general public on the Silva21's website.

To view the outline of the HQP workshop, [click here](#).

Closing remarks

After three full days of sessions (and non-stop rain), Silva21's second Annual General Assembly proved to be an exceptional event that brought together foresters, academics, industry partners and collaborators that make up this exciting cross-Canada research project. Many attendees commented on the excitement of hearing updates of projects that had been presented last year. It was a great opportunity to see the tools that were being produced in a variety of different fields including remote sensing, dendrochronology and social science.

The exploration of the Acadian Forest, combined with the exchange of knowledge and ideas, fostered a sense of collective commitment to the importance of adaptive forest management practices in the face of climate change. Taking place only a few weeks after wild forest fires in Nova Scotia, the event served as a powerful reminder of the unprecedented challenges our forests are facing, but also all the innovative research that is ongoing to ensure adaptive and sustainable silviculture.

Lastly, we had the opportunity to celebrate the first of the departed from the Silva21 group. Special recognition to the following HQPs for the successful completion of their projects:



- [Catherine Beaulieu](#) has completed her masters project at the Université Laval under the supervision of Alexis Achim and in collaboration with Kruger Inc.
- [Anne Bernard](#) completed her 2-year postdoctoral fellowship under the supervision of Alexis Achim and Maude Flamand-Hubert and has accepted a faculty position at Université Laval. She is also pregnant with her first child! Congratulations!
- [Michael Burnett](#) completed his research associate position under the supervision of Nicholas Coops and is now working at a GIS company in Vancouver, BC.
- [Guillaume Moreau](#) has completed his postdoctoral fellowship under the supervision of John Caspersen and Alexis Achim and has accepted a faculty position at the Université Laval.
- [Alexandre Morin-Bernard](#) is working to complete his PhD project under the supervision of Alexis Achim and Nicholas Coops before starting his new faculty position at the Université Laval.
- [Sandrine Paquin](#) has completed her masters project at the Université Laval under the supervision of Maude Flamand-Hubert.
- [Gabrielle Thibeault](#) has completed her masters project at the Université Laval under the supervision of Alexis Achim and after in collaboration with the MFFP.

(To see all of the successfully published research by all our HQPs, be sure to check out the [publications section](#) of the Silva21 website.)

As we bid adieu to this year's assembly, we eagerly anticipate the ripple effects that these passionate exchanges and collaborations will have on the broader Silva21 community, across different collaborators, hubs, labs and HQPs.