



DIVERSE



FALL NEWSLETTER 2024

WE ARE JUST GETTING STARTED



ADAPTING FORESTS TO GLOBAL CHANGE



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A Message from our Principal Investigator, Dr. Christian Messier

Dear collaborators, students and partners of the DIVERSE project,

It has already been over a year since our project was approved for funding from NSERC. Although it might not yet be obvious to all, particularly the partners, the project has advanced significantly and we are now ready to get started on groundbreaking research, visit our various partners and sites, produce timely and useful reports and materials for our partners about our findings, and organize our first steering committee meetings (we just had our science committee meeting in December 2024). We are also in preparation for our first annual general DIVERSE meeting, and you should hear from us about it soon.



Photo: Dr. Christian Messier

Being one of the largest research projects in forestry has resulted in agreement complexities. This fall has been particularly busy setting up the money transfer agreements with all the universities involved, recruiting new graduate students, post-docs and research associates and initiating some very exciting projects. We have now quite an amazing team of 8 MSc students, 7 PhD students, and 5 post-doctoral fellows. A special welcome to our new eastern coordinator, Madeleine Gauthier, who started with DIVERSE in November 2024. A special section of this newsletter will formally introduce her to you. As planned, Themes 1 and 2 have been forging ahead first. In Theme 1, the FunTree project, aimed at measuring in the field the intraspecific variability of key functional traits for (continued on next page)





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many tree species found across Canada completed its very successful summer campaign with thousands of wood cores and hundreds of root samples to help us better characterize key functional traits for our Canadian tree species. This campaign is led by Drs Aubin and Dendoncker. In Theme 2, an analysis of the climatic risks under various climatic scenarios of all tree species found in the various regions of Canada, led by Drs. Dendoncker and Villemaire-Côté, has been completed and a peer-reviewed article should be submitted by the spring 2025. Theme 6 has had a busy fall under the leadership of Dr. Pinno with many meetings to get the scope and design of the silvicultural trial in place with feedback from partners. All theme leaders (Drs. Aubin, Nelson, Fortin, Pinno and Villemaire-Côté) have also been busy holding meetings to get the work within and among themes organized.

We have also confirmed the hiring of Dr. Matthew Garcia from the University of Minnesota to help us with the analyses and programming of the LANDIS model (theme 4) to make it better able to simulate the functional complex network approach that we will be testing. Various meetings are being held to start organizing the work.

Finally, I have initiated a collaborative writing of a perspective paper to be submitted to a high-impact journal that describes the unique and novel features of the DIVERSE project for the world to know.

I would like to think that we now have most of the pieces of this complex project in place and are ready to co-create together a new more resilient forest and socially acceptable forestry in Canada and the world!

Sincerely,



Christian Messier





Student Spotlight: Kyle Dues



Photo: Kyle Dues

Kyle Dues is a PhD student with DIVERSE, working under the supervision of Dr. Brad Pinno, who is a co-lead of DIVERSE and our Theme 6 Lead.

Where are you from?

I am from Kettering, Ohio, the home of the Wright brothers (pioneers in early aviation)

What is one fun fact about you, or a hobby you like?

I recently discovered a passion for endurance sports, completing my first triathlon and ultra-marathon this past summer.

When did you start on the DIVERSE project?
August 2023

What is your educational background before this, and what led you to forestry?

Before starting my PhD at the University of Alberta, I earned a Master's in Forest Resources from Mississippi State University. My research there focused on the effects of silvicultural prescriptions on drought tolerance in longleaf pine. Prior to that, I obtained a Bachelor of Science in Forest Ecosystem Science and Management from The Ohio State University, where I developed a foundational passion for forest ecology and management.

What about the DIVERSE project intrigues you or gets you excited?

What excites me most about the DIVERSE project is its potential for wide-reaching practical impacts. By exploring tree diversity and its effects on forest resilience, this research can directly inform sustainable management strategies across North America.



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What is your favourite tree species?

Tulip poplar (*Liriodendron tulipifera*)

Tell us about your research - what is your project about, what led you to be interested in this topic, and why is it important to you?

I am deeply passionate about our current tree diversity study, installed last summer in Peace River, Alberta. This project explores below-ground root colonization and competition dynamics among key boreal species, focusing on the effects of species mixtures and spacings. What sets this study apart is our use of minirhizotron tubes, which allow us to monitor root growth patterns in detail. This research holds significant potential for advancing our understanding of boreal forest dynamics and improving forest management practices.

What issues in forestry "keep you up at night" (i.e. what topics or issues are of particular interest to you?)

While there is no specific issue I lose sleep over, I often find myself captivated by the complexity and resilience of natural systems. The intricate interplay of ecological processes continually fascinates me, fueling my curiosity and drive to study forestry.



Photo: Drone image at the NEBIE Plot Network, where Kyle spent three weeks of his summer in 2023 assisting in field work.





Picture a Scientist Documentary Viewing: A Chance to Reflect

Written by Kathryn Knodel, Western Coordinator

On November 28th, 2024, lab members of DIVERSE researchers at the University of Alberta were invited to watch the documentary “Picture a Scientist”. This documentary showcases women in STEM, as they talk about building a better future for women scientists. The primary cast includes MIT Professor of Biology Dr. Nancy Hopkins, who shared about her experience with discrimination as a female postgraduate student in the 60s and 70s, as well as her experiences working as a faculty member at MIT afterwards. The stories of chemist Dr. Raychelle Burks added another layer to the story through sharing her experiences as a black woman and chemistry professor. Geoscientist Dr. Jane Willenbring shared about her experiences with blatant sexual harassment by her supervisor while she was doing fieldwork for her MSc in Antarctica. It wasn’t until she had received tenure 16 years later that she was able to file a complaint against her supervisor, David Marchant, for fear of jeopardizing her career. Though the documentary primarily follows Hopkins, Burks, and Willenbring, it still showcases the experiences and stories of several other women.

This documentary viewing was a part of DIVERSE commitment to Equity, Diversity, and Inclusion (EDI), and was organized by Kathryn Knodel, our Western Project Coordinator with DIVERSE. The best way for us to grow and improve in terms of EDI, is through engaging with content like “Picture a Scientist”. This was a great opportunity for students and researchers to reflect on their own experiences after hearing the perspectives of several women in STEM. In total, about 15 students and faculty, including DIVERSE co-leads Dr. Brad Pinno and Dr. Charles Nock, met together to watch the documentary. Afterwards, the attendees broke out into smaller groups to reflect on a set of discussion questions and share how the documentary impacted them or made them think differently from before viewing. (continued on next page)





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One of the prompts of the documentary discussion questions was to think about how one pictures a scientist. Commonly what comes to mind for many, is a white-haired caucasian male in a white lab coat. “Picture a Scientist” challenged this notion, pointing out that there is not just one way to be a scientist. Dr. Hopkins made a very powerful statement, in saying that, when we don’t employ or recruit women scientists, we are effectively missing out on 50% of the best scientists. Representation is not merely something to be concerned with because of EDI requirements - when we don’t have adequate representation, we lose valuable perspectives, experiences, and knowledge. To have the highest quality of science and research, equal representation of men and women is essential.

If you’re interested in watching “Picture a Scientist” yourself, more information about the documentary is available on the website <https://www.pictureascientist.com/>.

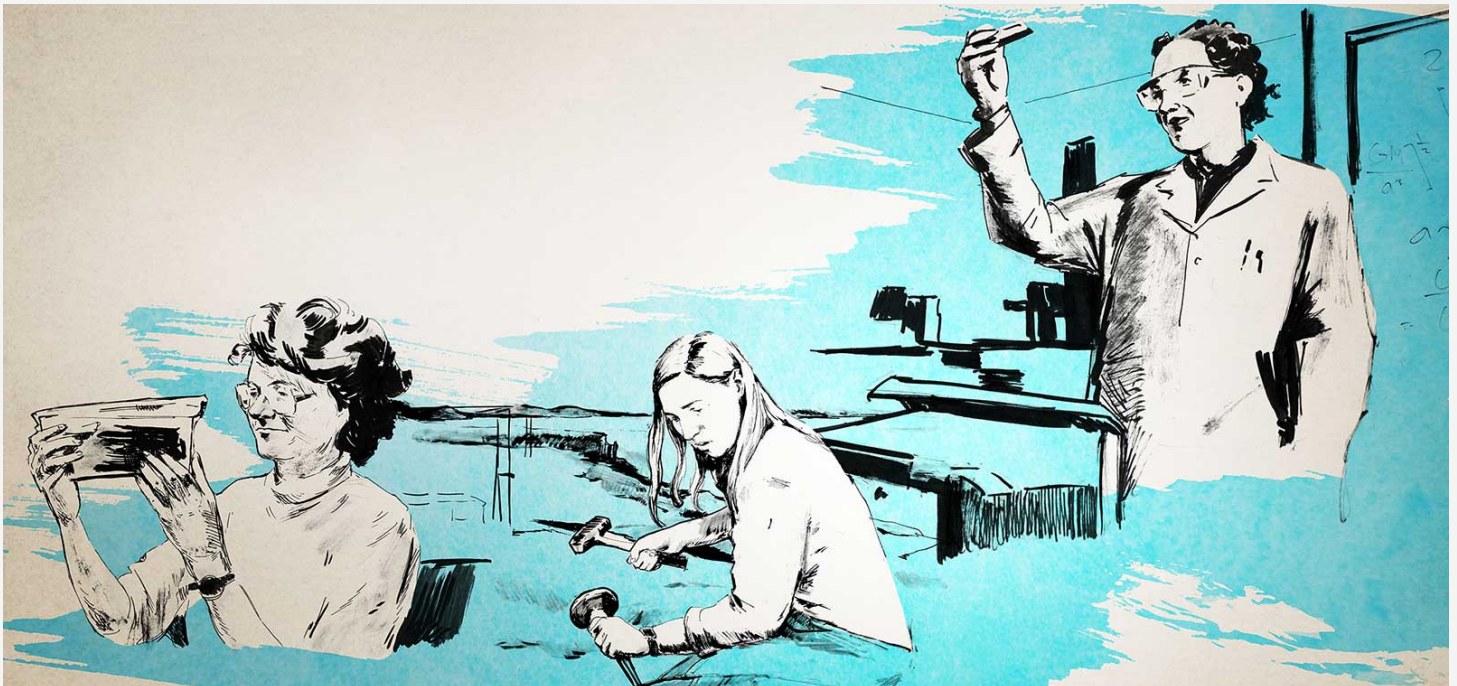


Image: Art depicting Dr. Nancy Hopkins (left), Dr. Jane Willenbring (middle), and Dr. Raychelle Burkes (right), the main cast of the Picture a Scientist documentary, in action in their respective disciplines. [pictureascientist.com](https://www.pictureascientist.com/)





Welcoming Our New Eastern Coordinator to the DIVERSE Team

The DIVERSE project is thrilled to welcome Madeleine Gauthier as our new Eastern Coordinator. Madeleine brings her expertise in advancing our efforts to strengthen the resilience of Canadian forests in the face of global changes.

Driven by a passion for climate change and social justice, Madeleine believes science not only reveals our shared vulnerabilities in a changing world but also empowers us to make informed decisions that drive meaningful change. In her research, Madeleine has been interested in developing tools to help institutions address climate change, exploring participatory research methodologies, and using science as a playground to envision alternatives to the current extractive and colonial economic systems.



Photo: Madeleine Gauthier

Madeleine holds a bachelors in biology with a Minor in Anthropology from McGill University. She earned her masters in biology at McGill in 2021, contributing to a multidisciplinary research team. Following her graduate studies, she worked with Professor Catherine Potvin as a research assistant and coordinator on several initiatives, including the PIVOT project, the Onigam participatory research, and the Bacuru Droa old growth observatory – project.

Based at Université du Québec en Outaouais, Madeleine will coordinate the research themes and support the Leadership team. Her collaborative approach and dedication to fostering dialogue between stakeholders make her a valuable addition to the team.





A First Annual Meeting in the West

On December 18th, 2024, DIVERSE held its first Annual Meeting in Edmonton, with industry and governmental partners, DIVERSE students, researchers from the University of Alberta as well as the Project Leadership Team. At this meeting we heard from a couple of our grad students based at the University of Alberta about their research progress and discussed the challenges and potential solutions of seed selection, site selection, and other variables when thinking about implementing the Theme 6 silvicultural trials.

Thank you to everybody who made it through the snowstorm to attend our meeting!



Photo: Attendees of the Dec. 18th, 2024 Western DIVERSE meeting. From left to right: Kevin Solarik, Christian Messier, Madeleine Gauthier, Charles Nock, Doug Turner, John Stadt, Andreas Hamann, Nick Boyce, Scott Formaniuk, Caroline Whitehouse, Andy Shandro, Robert Froese, and Brad Pinno.





Theme 1 Update: News from the FunTree Campaign

As you might have seen in the summer newsletter, students and researchers from more than 30 institutions have come together during the FunTree Field Campaign to collect tree data across Canada and some regions of the US. The FunTree initiative is a collaborative field campaign led by Theme 1 lead Isabelle Aubin (NRCan-CFS) and the Post Doctoral Fellow Morgane Dendoncker (Université du Québec en Outaouais) that aims to collect data to refine our knowledge of tree vulnerability to climate change. Several of our tree species in Canada have a wide subcontinental distribution spanning large environmental gradients leading to large variation in their traits. These variations are important to consider in the assessment of Canadian forest vulnerability to climate change, but also to understand tree capacity to adapt to climate change. However, it is rarely considered due to lack of data, especially for non-commercial tree species.

2024 Field numbers:

- More than 40 collaborators from 30 institutions;
- 200 sites across Canada and North-East USA;
- More than 1000 wood cores collected on 18 tree species;
- 340 seedlings belonging to 7 temperate species collected with their whole root system.

With these collected data, FunTree focuses on filling knowledge gaps on two key aspects of Canadian forest vulnerability:

- Tree species sensitivity to drought
- Regeneration failure
- Specifically, the collected data will be used to:
 - Develop needed knowledge on tree sensitivity to drought by evaluating intra-specific variability of key traits across a precipitation and temperature gradient.
 - Gather a high-quality dataset on Canadian tree species; to be integrated to DIVERSE vegetation dynamics models and forest vulnerability assessments.
 - Input collected data into the TOPIC and TRY databases to foster and support future research projects.



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Key collaborators: Audrey Maheu (UQO), Julie Messier (UWaterloo), Morgane Urli (UQAM), Anne Ola (INRS), Olivier Villemaire-Côté (ULaval), Christian Messier (UQO, UQAM), Nelson Thiffault (NRCan-CFS), Alison Munson (ULaval)



Image: photo collage of the FunTree campaign's field crew, submitted by Theme 1 lead Dr. Isabelle Aubin.





Relevant Articles and Papers

- X. Ding, P.B. Reich, M. Hisano, H.Y.H. Chen, **Long-term stability of productivity increases with tree diversity in Canadian forests**, Proc. Natl. Acad. Sci. U.S.A. 121 (49) e2405108121, <https://doi.org/10.1073/pnas.2405108121> (2024).
- **Adapting to the future: Silviculture strategies** - article by Nelson Thiffault, with T. Jones, M. Hoepting, and J. Fera: <https://www.woodbusiness.ca/adapting-to-the-future-silviculture-strategies/>
- **DIVERSE Webinar Series Recordings**: check out our YouTube channel, where all past DIVERSE webinars will be shared: <https://www.youtube.com/@DIVERSEResearch>
- Felton, A., Seidl, R., Lindenmayer, D.B. et al. **The choice of path to resilience is crucial to the future of production forests**. Nat Ecol Evol 8, 1561–1563 (2024). <https://doi.org/10.1038/s41559-024-02473-x>

