fall2014

Renew

in this issue:

UNIVERSITY OF ALBERTA
DEPARTMENT OF
RENEWABLE RESOURCES

100 years and thriving

A message from the Chair

This fall the Faculty of Agricultural, Life & Environmental Sciences reaches an important milestone – its 100th year anniversary.

While the Department of Renewable Resources has been a key part of this Faculty since 1994, our roots in forestry extend back to 1971, and our roots in soils and agronomy extend back to the Faculty's origins in 1914.

In addition to these long standing programs, we introduced our environmental conservation sciences program – with majors in conservation biology and land reclamation – 20 years ago. The program was the first of its kind in Canada. This blend of history and evolution reflects the ability of our Department to adapt over time.

As we look back on the last 100 years, we remain as strong as we have ever been, with a total of 30 faculty, 164 graduate students and 450 undergraduate students. We look forward to continuing to deliver high quality research and student training over the next century.

Vic Lieffers, Chair
Vic.Lieffers@ualberta.ca

Prioritizing seismic line restoration leads to major **cost savings**

Companies interested in restoring seismic lines just gained a major boost from a new tool that helps prioritize restoration efforts – potentially saving millions of dollars.

The tool, developed by graduate student Cassidy Van Rensen, looks at seismic lines to predict which are likely to regenerate on their own, and which might require a little bit of help. It then overlays key variables, such as woodland caribou habitat and the likelihood of future development, to determine where restoration could provide the greatest conservation benefit.

"This project is making restoration cost-effective by helping prioritize those lines that are unlikely to recover on their own," said Jeremy Reid, an industry lead on the project.

Van Rensen worked with Dr. Scott Nielsen and Dr. Vic Lieffers to develop the tool.

Project funders included: Alberta Innovates Energy and Environment Solutions (AI-EES); the Canadian Oil Sands Innovation Alliance (COSIA) – Nexen, Shell, Suncor, Statoil, ConocoPhillips; and NSERC.

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Researcher nets **prestigious grant**

Dr. Sylvie Quideau was recently awarded the prestigious Discovery Accelerator grant from the Natural Sciences and Engineering Research Council (NSERC) of Canada for her work on soil carbon.

The grant is awarded to a select few researchers in Canada with the goal of maximizing the impact of superior research programs. In Quideau's case, she aims to better understand how forest soils function as long-term carbon sinks and how these sinks might be impacted by climate change.

The work is critical, as current climate change scenarios project major shifts in vegetation communities in Canada's boreal forest. Thus, understanding how these shifts could impact the ability of forest soils to store carbon is urgently needed.

Macdonald recipient of **national scientific** achievement **award**

Dr. Ellen Macdonald, a professor in Forest Ecology and Plant Biodiversity, was recently awarded the Canadian Institute of Forestry's (CIF) Scientific Achievement Award at a ceremony in Salt Lake City, Utah.

John Pineau, Chief Executive Officer for the CIF, stated that "Ellen is a strong team player and this is evident through the number of co-authors she has worked with and through her involvement in a number of influential research projects – she is very deserving of this award."

Macdonald was "truly humbled" by the award which recognized her contributions to sustainable forest management in Canada. More specifically, the award highlighted Macdonald's contributions to understanding the role of understory plants on forest health and her work on natural regeneration following wildfire and forest harvesting.

The CIF Scientific Achievement Award recognizes unique and outstanding achievement in forest research.

New **CAIP** Chair **brings** passion **for wetlands, carbon, to** Alberta

Understanding the carbon balance of wetlands and communicating why it matters is the focus of the new Campus Alberta Innovation Program (CAIP) Chair in Watershed Management and Wetland Restoration, Dr. David Olefeldt.

Olefeldt says his work is all about "studying cumulative disturbances on wetlands – human disturbance, melting permafrost, wildfire – and how they influence both the exchange of greenhouse gases with the atmosphere and the release of dissolved carbon to downstream ecosystems".

The work is important because even though boreal wetlands are widely recognized for their ability to store carbon in the form of peat, a changing climate and an increase in human disturbance have the potential to influence the delicate balance of carbon uptake and release from wetlands.

A particularly unique aspect of Olefeldt's research is the fact that he works at multiple scales. He combines lab work and field work with remote sensing to better understand how site specific changes in wetlands may have effects at larger scales, ranging from watershed to global scales.

Wetland restoration is also a topic of interest for Olefeldt. "I'm interested in understanding how wetland ecosystem services, including carbon storage and influence on downstream water quality, can be maximized through management choices".

Olefeldt has already completed work in Sweden, northern Alberta and the Northwest Territories and is excited about the research and partnership opportunities at the University of Alberta.

The CAIP chair program was developed in 2011 by the Alberta Government to recruit new research leaders to Alberta.

Professor **Emeritus** appointed to Board of the **Agricultural Institute** of Canada

Professor Emeritus Dr. David Chanasyk isn't slowing down after his recent retirement. Chanasyk was recently appointed as the Vice-Chair for the Board of the Agricultural Institute of Canada. He was also recently appointed the Chair of the Education and Scholarship Committee for the Agricultural Institute of Canada Foundation.

Chanasyk spent his career investigating hydrology and applied soil physics in the context of both reclamation and agriculture.

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Students see **land reclamation** through a **German lens**

A group of students from the Land Reclamation International Graduate School (LRIGS) recently headed out to broaden their perspective on how to solve pressing land reclamation challenges.

The group toured through western Germany and saw an active lignite mine, examples of cultivation on former coal mines, and a site along the River Inde that was redirected to make way for an open cast mine. The group was also introduced to a suite of solutions to key reclamation challenges in rural and urban settings in Germany.

"Trips like this provide students with a real opportunity to see land reclamation in other parts of the world, and understand there are different ways of solving similar challenges," said Michal Guzowski, the LRIGS Coordinator.

A total of 16 students and one Post-Doctoral Fellow participated in the trip, along with two students and five researchers from Germany.

New NSERC Industrial Research Chair **in Tree Improvement** is all about **growing better** trees

Dr. Barb Thomas says there is a huge opportunity to help select and produce better trees by understanding their genetics. It's a topic she plans to address through her recent appointment as an NSERC Industrial Research Chair in Tree Improvement.

Through Thomas' program, she aims to understand what genetic traits help trees grow more quickly, produce higher quality wood and have a greater resistance to drought. She emphasizes that with climate change already affecting Alberta's forests, "we no longer have the luxury of focusing only on growth rates."

Diane Renaud with West Fraser suggests "we are at a critical time in Alberta where we need good science influencing future policy direction in forest genetics, and this Chair puts the U of A in a perfect position to contribute to this."

Thomas' research is diverse, and includes field trials to identify trees with 'optimal' genetic traits for adaptability, and modelling to assess the influence of increased growth rates on the overall productivity of the forest. She sees a real opportunity to tackle basic scientific questions critical to the field of tree improvement, while also addressing more applied, policy relevant questions through her work. "It's really up to the researcher and the student to be creative enough to tackle both the fundamental and the applied questions," said Thomas.

"This Chair position will help train undergraduate and graduate students and help to re-build capacity in forest genetics within the province," said Leonard Barnhardt, a Tree Improvement Specialist with the Alberta Government.

The collaborative approach Thomas brings to her research has earned the support of 10 forestry companies, and the provincial and federal governments. A full partner list can be viewed here: www.bit.ly/1u3qmkd.

New tool helps **managers plan** for **impacts** of **climate change on species**

Conservation planners and forest managers have a new tool that can help mitigate the impact of climate change on rare or endangered species, as well as forest productivity.

The tool brings a simple approach to an otherwise complex problem. It looks at the current climate in a location, and compares this to the projected future climate for a larger region. It then asks: where would I have to go to find a similar climate as is here today?

"We can determine which species will have to migrate the longest distances as a result of climate change, and prioritize conservation efforts" said study co-author Dr. David Roberts. The results can help in the design of new protected areas, and can be used to better understand which species might require assisted migration to ensure their survival.

The tools' utility isn't just limited to conservation planning though. It has the unique ability to also help forest managers optimize the location of seed sources for planting trees. In this case, the tool answers the question: if I want the forest I plant today to be resilient to future climate change, where should I go to find the right seed source?

The tool has generated significant interest from around the world. "People are really excited because we have taken this analysis to a very practical level" said Quinn Barber a graduate student and co-author on the project.

The research was led by Dr. Andreas Hamann and was primarily funded by the AdapTree Project: www.adaptree.sites.olt.ubc.ca/sponsors. Datasets for vulnerability assessments are publicly available at *http://tinyurl.com/VelocityWNA*.

Preparing **students** to provide **solutions**

Student Profile:
Alia Snively – M.Sc.

For Alia Snively, choosing to do a degree in the Department of Renewable Resources was about helping recreate ecosystems the way they were prior to human disturbance. It was about being part of the solution.

Snively worked with Dr. Simon Landhäusser on the Genesee coal mine lease – west of Edmonton. She looked at the influence of soil salvage procedures – the way in which soil is stripped from sites prior to mining – on the performance of planted trees.

She found that the depth at which soils are salvaged and then placed on reclamation sites played a major role in tree seedling performance. The deeper salvage and placement depths – in this case a depth of 40cm – resulted in less competition from weeds. The main driver of this was the fact that the deeper salvage depths resulted in a more diluted seed bank – allowing other more desirable forest species to establish. The results have direct implications for both field operations and future government policy.

Snively is an excellent example of how our graduate research programs are training the next generation of resource managers and researchers. In this way, we are *preparing students to provide solutions.*

Her project was sponsored by Capital Power as part of Dr. Landhauser's NSERC Industrial Research Chair.

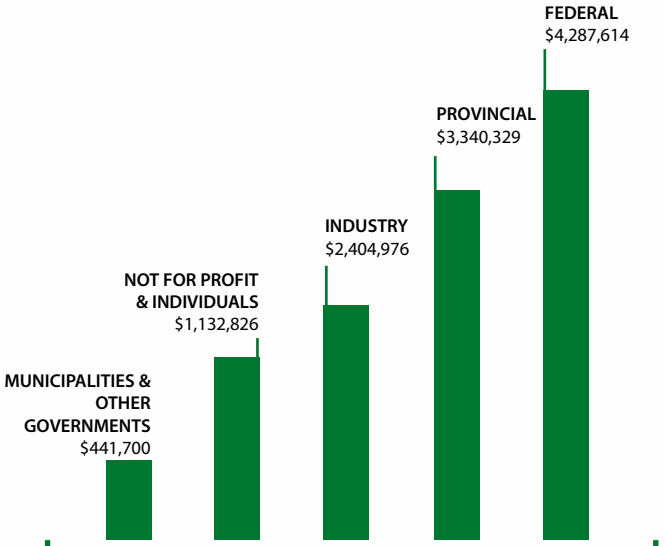
ECOSYS climate **model** sees **application** in **prestigious Arctic** research **program**

Dr. Robert Grant has made it his life's work to "build a more robust, carefully tested model to inform the climate change dialogue." It turns out, his commitment is paying off in spades.

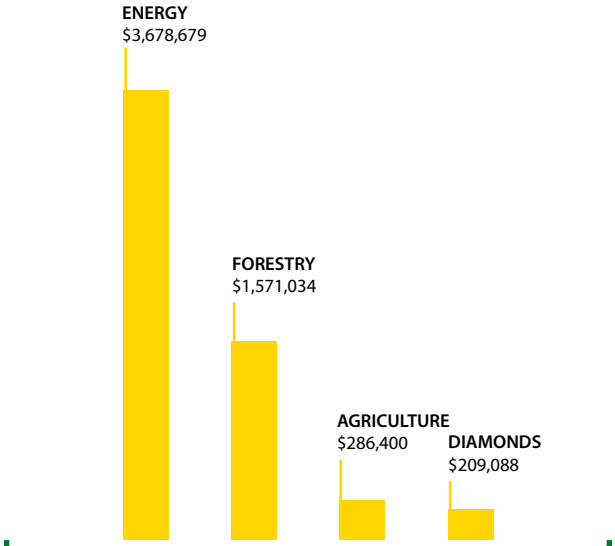
Grant's model is called ECOSYS, and he is currently applying the model as part of a prestigious arctic research project – ADAPT. The project aims to develop a clear understanding of, among other things, how climate change is affecting the arctic, how quickly changes are occurring, and what it means in terms of changes to productivity and carbon cycling.

Through the use of ECOSYS, Grant has shown that warmer temperatures and melting permafrost mean that more productive plants will be able to grow on arctic sites – and the increased carbon uptake from these plants will offset the increased carbon emissions from melting permafrost. However, this will also lead to a sharp increase in the release of methane – a major contributor to climate change. This information is critical for informing both scientific and policy discussions about the impacts of climate change in the arctic.

The ADAPT (Arctic Development and Adaptation to Permafrost in Transition) program was funded by an NSERC Discovery Frontiers Grant – a prestigious program that funds only the most cutting edge research in Canada.



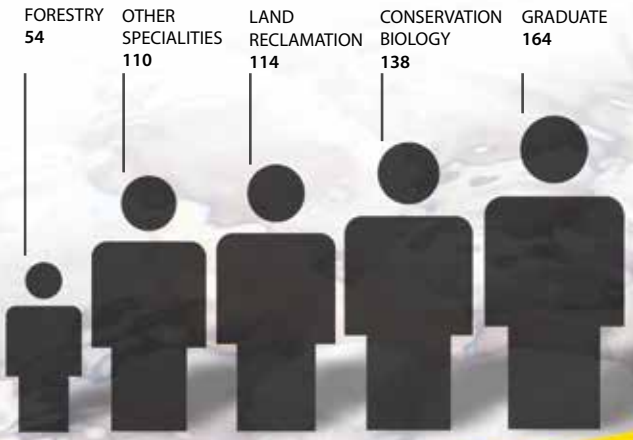
FUNDING BY **CONTRIBUTOR**



PROVINCIAL AND INDUSTRY FUNDING BY **SECTOR**

Our **Department** by the **Numbers**

TOTAL **ENROLLMENT**



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