THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Forestry

branchlines

Volume 31#2 Summer 2020

UBC Forestry on team that develops BIODEGRADABLE MEDICAL MASK Pg. 18

dean's message

This edition is remarkable in that we announce a number of high-profile awards, including forestry's top award, the Marcus Wallenberg Prize. This year, the prize was awarded to Nicholas Coops, Joseph Landsberg and Richard Waring, for their work on the 3-PG model (Physiological Principles Predicting Growth). The model is being widely used to predict forest growth and carbon storage. Amongst a number of other awards, we also recognize Richard Hamelin on his award of fellowship of the American Phytopathological Society and Sarah Gergel, who has been named the 2020 recipient of the Distinguished Landscape Practitioner Award by the North American Chapter of the International Association for Landscape Ecology.

This edition of Branchlines has been published under very unusual circumstances. It is the first time that we have had to go through the entire production process while working from home. It was produced during the first weeks of the COVID-19 pandemic, when faculty members, staff and students were all adjusting to the sudden change in their lives. It demonstrates well how committed everyone is to sharing their research and making it available to their colleagues and others within and outside of the faculty.

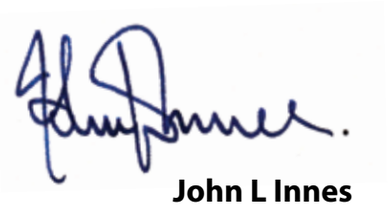
Early indications were that wildfires in 2020 might be severe. A drought on the southeast part of Vancouver Island and the Gulf Islands meant that fuel was unusually dry in the spring, and an April wildfire in Squamish resulted in loss of property, evacuations and a local state of emergency. Subsequently, there have been cool and wet conditions and June is expected to be 'normal'. As Lori Daniels explains, wildfire is an important issue related to COVID-19, as the smoke adversely affects many people and may interact with the virus to cause more severe symptoms.

Predicting the potential effects of wildfire is just one of many forms of forecasting done in the Faculty. Richard Hamelin describes some of the work that is being done in the area of biosurveillance. While the term 'Alien Forest Enemies' sounds like something out of science fiction, Richard and his team have shown that some invasive pathogens can hybridize with local species, increasing their ability to adapt to local environments and potentially increasing their virulence. This suggests that there may be rapid evolution amongst pathogens as they invade a new territory, making predictions of their impacts extremely difficult.

It is not just invasive pathogens that can change rapidly. Cora Skaien and Peter Arcese describe their work on sea blush, a coastal plant found in meadows on the Gulf Islands. These and many other flowers are suffering because of severe browsing by the large numbers of deer found on many islands. When deer are present, the plants are diminutive. Removal of the browsing pressure by the deer results in the plants growing to over a metre in height, as well as changes to the number and size of seeds produced.

On a different tack, the work done on the development of a biodegradable medical mask made from BC pulp by Orlando Rojas and colleagues in the Faculty of Applied Science, is a great example of the sort of lateral thinking that is going to be needed as we move towards a circular bioeconomy.

As this publication was being finalized, a great deal of thought was going into the issues of racism and discrimination. We take this very seriously, and are considering what we can and should do to make the world a better and more just place.



John L Innes
Professor and Dean

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THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Forestry

AWARDS AND RECOGNITION

DR NICHOLAS COOPS AWARDED MARCUS WALLENBERG PRIZE, FORESTRY'S HIGHEST HONOUR

An accomplished researcher and educator, Faculty of Forestry Professor **Dr Nicholas Coops** was one of three scientists awarded this year's Marcus Wallenberg Prize, the highest international accolade in forestry research. Often called the "Nobel Prize of Forestry", the award is given in recognition of groundbreaking research, scientific achievements, and innovative technologies that contribute to the advancement of forestry and the forest sector. With this distinction, the University of British Columbia ranks as the top institution in the world with the most faculty-affiliated researchers to receive the MWP during its 40-year history, and Canada is now tied with Sweden as the top two nations with the most prize winners.

Renowned for his expertise in remote sensing and its application in climate research, Dr Coops is recognized for his extensive work on large-scale satellite imagery; specifically its use in the 3-PG (Physiological Principles Predicting Growth) model conceived of, and created by, his co-winners, Dr Joseph Landsberg and Dr Richard Waring. The 3-PG model is used to predict forest growth and carbon storage. It is one of the world's most widely used models for assessing forest growth due to the fact it can make predictions on a global scale.

The prize will be awarded to Coops, Waring and Landsberg by King Carl Gustaf XVI of Sweden in a ceremony set for October of this year.

In addition to his position as professor, Dr Coops holds a Canada Research Chair in Remote Sensing (Tier 1). Among his many accomplishments is being published more than 460 times in joint authorship in scientific journals.

To learn more, visit https://forestry.ubc.ca/awards-honours/nicholas-coops-nobel-prize-of-forest-research-marcus-wallenberg-prize/.

DR RICHARD HAMELIN NAMED AMERICAN PHYTOPATHOLOGICAL SOCIETY FELLOW

Faculty of Forestry Professor **Dr Richard Hamelin** was granted fellowship by The American Phytopathological Society in recognition of his invaluable contributions to the field of forest pathology. Dr Hamelin is revered for his role in the establishment of the phytopathological molecular epidemiology field, along with the development of new methods and innovative tools used to detect, identify, and track tree pathogens. An esteemed educator, he is recognized not only for his groundbreaking research, but also for his role as professor, leading the way for plant pathologists of the future. Dr Hamelin is a Co-Project Leader for the CoAdapTree Project, conducting genomics-based research on pathogenicity zones.

To learn more, visit https://forestry.ubc.ca/awards-honours/richard-hamelin-american-phytopathological-society-fellow/.

DR SARAH GERGEL AWARDED THE 2020 DISTINGUISHED LANDSCAPE PRACTITIONER AWARD

Dr Sarah Gergel, Professor of Landscape Ecology and Conservation, was named as recipient of the 2020 Distinguished Landscape Practitioner Award, an honour bestowed by the North American Chapter of the International Association for Landscape Ecology. The award is granted to individuals whose research, expertise, and scientific contributions have helped shape our understanding of landscape ecology. An acclaimed professor, Associate Dean of Diversity and Inclusion in the Faculty of Forestry, and Fellow of the American Association for the Advancement of Science, Dr Gergel is respected as both a scientist and an educator. She leads UBC's Landscape Ecology Lab and her cutting-edge research on vulnerable ecosystems and river floodplains has led to many advancements, while her textbook *Learning Landscape Ecology* is recognized as fundamental in landscape ecology education.

To learn more, visit https://forestry.ubc.ca/awards-honours/sarah-gergel-landscape-ecology-award/.

DR SUZIE LAVALLEE APPOINTED AS ACADEMIC DIRECTOR OF UBC'S VANTAGE COLLEGE

Dr Suzie Lavallee, Professor of Teaching in the Department of Forestry and Conservation Sciences, has been appointed as academic director of UBC's Vantage College. A contemporary learning hub, Vantage College provides first-year programs to international students to support their transition to English language courses. Dr Lavallee is recognized for her many contributions to program and curriculum development and holds an adjunct professorship at Fujian Agricultural and Forestry University. A past Killam Teaching Prize winner, her passion for teaching and expertise in experiential learning have set her apart in the fields of forestry and education alike. Dr Lavallee is a project lead with UBC's Teaching and Learning Enhancement Fund (TLEF), recently receiving an award to create visual imagery teaching resources for vertebrate identification. This multifaceted project was designed to be a university-wide hub for 3D and immersion learning at UBC.

To learn more, visit https://vantage-college.ubc.ca.

AWARDS GRANTED TO OUTSTANDING STUDENTS IN THE FACULTY OF FORESTRY

UBC's Best in Program Forestry Student Awards are granted to outstanding undergraduate and master's students in the Faculty of Forestry. Recipients are recognized for their academic excellence and aptitude in their given program. **Noa Mayer**, Bachelor of Science in Natural Resources Conservation – Science and Management, was awarded the CIF Gold Medal. **Jenna Kuzinar**, Master of Sustainable Forest Management, was awarded the Association of BC Forest Professionals Sustainable Forest Management Prize. **Georgina Magnus**, Bachelor of Science in Natural Resources Conservation – Science and Management, was awarded the Clark S. Binkley Award. **Valentina Coy**, Bachelor of Science in Natural Resources Conservation – Global Perspectives, was awarded the Clark S. Binkley Award. **Hunter Rigatti**, Bachelor of Science in Forest Resources Management, was awarded the Gordon Baskerville Award. **Kathryn Chan**, Bachelor of Science in Wood Products Processing, was awarded the Larre Medal. **Priya Puri**, Bachelor of Science in Forest Sciences, was awarded the Outstanding Forest Sciences Student Award. **Shenae Borschneck**, Bachelor of Science in Urban Forestry, was awarded the Outstanding Urban Forestry Student Award. **Fred Zhu**, Bachelor of Science in Forest Operations, was awarded the Gerry Burch Award.

For more information on the 2020 UBC Forestry Best in Program winners: https://forestry.ubc.ca/awards-honours/student-awards-silver-ring/.

KATHLEEN COUPLAND GRANTED THE KILLAM GRADUATE TEACHING ASSISTANT AWARD

In recognition of outstanding contributions as an educator, **Kathleen Coupland** was awarded one of the 2020 Killam Graduate Teaching Assistant Awards. Kathleen is admired by staff and students for the incomparable support she provides the Faculty of Forestry, along with her notable dedication to advancing higher education. Having obtained her PhD with FRESH, UBC's Forest Resource and Environmental Service Hub, Kathleen has demonstrated her passion for both teaching and forestry through her invaluable research on unique approaches and innovative teaching methods in higher education. In her position as Program Coordinator, Professional Masters Programs, Kathleen has taught courses in both Undergraduate and master's programs in sustainable forest management.

To learn more, visit https://academic.ubc.ca/awards-funding/award-winners/killam-teaching-service-winners.

STUDENTS GRANTED MASTER OF GEOMATICS FOR ENVIRONMENTAL MANAGEMENT BEST IN CLASS AND GRADUATE TEACHING AWARDS

Irene Carrasco, Master of Geomatics for Environmental Management (MGEM), was granted the first-place MGEM Best in Class Graduation Award in honour of her position as top student in the program. She is recognized for her exceptional work ethic, academic excellence, and drive to reach the top of her class.

Liam Irwin, Master of Geomatics for Environmental Management, was granted the second-place MGEM Best in Class Graduation Award. Mr. Irwin received the honour in recognition of his hard work and academic excellence in the program.

Paul Hacker, a PhD candidate with UBC's Integrated Remote Sensing Studio, was awarded the Master of Geomatics for Environmental Management Best Teaching Assistant Award. As a teaching assistant, Mr Hacker is respected by students and supervisors alike, known for his dedication to teaching and the invaluable support he provides MGEM students. A graduate of the MGEM program himself, he is recognized for his insight, experience, and working knowledge of the field.

To learn more, visit https://forestry.ubc.ca/students/graduate/programs/master-of-geomatics-for-environmental-management/.

BIENNIAL AOS AWARD RECOGNIZES FACULTY OF FORESTRY ORNITHOLOGY RESEARCH

In recognition of their recent research, Faculty of Forestry Professor and Forest Renewal BC Chair Dr Peter Arcese; Dr Ryan Germain; and Dr Corey Tarwater are the recipients of the American Ornithological Society's (AOS) 2020 Brina C. Kessel Award. Every two years, the AOS bestows the award for a paper published in the preceding two-year period that has made an exceptional contribution to ornithology. The Kessel Award for 2020 was presented to the faculty team for their paper "Examination of context-dependent effects of natal traits on lifetime reproductive success using a long-term study of a temperate songbird", published in 2018. Their work was recognized as "the finest long-term study of birds in North America."

DR GUILLAUME PETERSON ST-LAURENT AWARDED THE 2019 KILLAM POSTDOC FELLOW RESEARCH PRIZE

Dr Guillaume Peterson St-Laurent, a postdoctoral fellow in the Faculty of Forestry's Department of Forest Resources Management is one of two winners of the 2019 Killam Postdoctoral Fellow Research Prize. The prize is awarded annually by UBC's Faculty of Graduate and Postdoctoral Studies to fulltime postdoctoral fellows in recognition of outstanding research and scholarly contributions while at UBC. Dr Peterson St-Laurent's multidisciplinary research focuses on sustainability, climate change, and conservation at the intersections between social and natural sciences. He uses an innovative combination of mixed methods, drawing from quantitative, qualitative, and community engagement approaches to develop effective climate adaptation and mitigation responses for resource management where values are contested and livelihoods are potentially impacted. Established in 2011, the Killam PDF Prize is in memory of Izaak Walton Killam and his wife, Dorothy Johnston Killam, who together created the Killam trusts. Two prizes in the amount of $5,000 each are awarded to fulltime postdoctoral fellows at UBC each year.

NEW APPOINTMENT

Jorma Neuvonen was recently appointed as the Faculty of Forestry's assistant dean, professional education and international collaboration. In 2003, he joined the University of British Columbia as a director of operations for the marine conservation group Project Seahorse before joining our Faculty in 2007 as director of special projects. He has been involved with many of the Faculty's strategic initiatives and has assisted in the development of our professional masters, Bachelor of Urban Forestry and TRANSFOR-M dual master programs. In his new role, Jorma will be responsible for the administrative and financial oversight of our existing and future professional masters programs, and management and development of professional certificate and non-credit customized training programs for government, industry, and professional associations. He will also continue to coordinate and develop our international collaboration with partner universities and organizations. Jorma holds an MSc in forestry from the University of Helsinki and an MBA from UBC.

RESEARCH IN THE MEDIA

Here are a few excerpts taken straight from some of the stories coming out of the Faculty of Forestry. Visit the *Faculty in the News* section of our website to read more.

Wildlife cameras in closed BC parks capture animals roaming freely

May 8, 2020, published on *GlobalNews.ca*, Dr Cole Burton

A project started last year to capture wildlife in some of BC's parks has taken an exciting turn with the closure of those parks to humans during the novel COVID-19 pandemic.

In one case, researchers spotted a very rare skunk species not often seen around Vancouver.

"The spotted skunk is restricted to sort of this area in southwestern BC" Cole Burton, assistant professor and Canada Research Chair in Terrestrial Mammal Conservation at the University of British Columbia and the Faculty of Forestry told Global News.

To read the full article and Dr Cole Burton's comments, visit globalnews.ca/news/6922882/wildlife-cameras-bc-parks-project/.

What urban forests can teach us about good soil for our gardens

May 3, 2020, published on *CBC.ca*, Dr Susan Day

If you're lucky enough to have a patch of dirt near your home you may be spending more time in it through the COVID-19 pandemic. Gardening gets us outside and gives us purpose. You'll want to pay attention to your soil first, says urban forestry professor Susan Day.

Forest soils often contain plenty of organic matter which makes them healthy. Backyard gardeners can help improve their soil by adding compost and growing plants to enrich it.

Day tells Gloria Macarenko of *Our Vancouver*, "Soil is like the foundation of your house. You want to build a strong foundation so your walls stay up otherwise you're constantly just fixing cracks in the plaster."

To view the video and hear Dr Susan Day's comments, visit cbc.ca/news/canada/british-columbia/what-urban-forests-can-teach-us-about-good-soil-for-our-gardens-1.5549185.

UBC forestry professor receives prize

May 3, 2020, published in the *Vancouver Sun*, Dr Nicholas Coops

A University of BC forestry professor has received a prestigious prize for his work predicting forest growth using satellite imagery.

Dr Nicholas Coops will share the Marcus Wallenberg Prize, sometimes called the Nobel Prize of the forest sector, with two researchers from the United States and Australia who developed the 3-PG model to predict tree growth and a forest's ability to store carbon. Coops' work on satellite imagery enables the model to make predictions on a larger scale.

To read the full article and Dr Nicholas Coops' comments, visit https://vancouversun.com/news/local-news/ubc-forestry-professor-receives-prize/wcm/469fec81-883f-43ca-b7e8-f66d593feeef/.

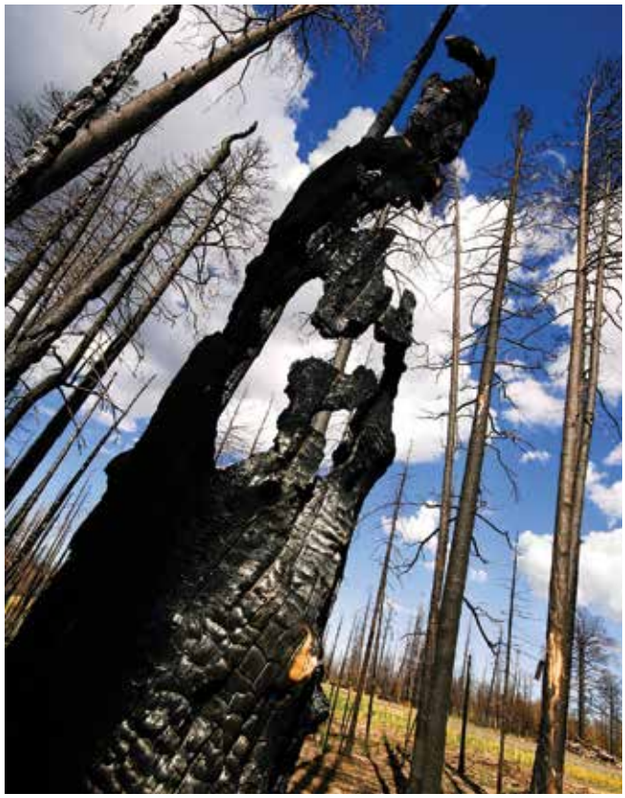
COVID-19: BC homeowners advised to prepare for wildfires

April 19, 2020, published on *MSN.com*, Dr Lori Daniels

With BC's wildfire season fast approaching and an out-of-control blaze already burning near Squamish, experts are urging the public to take steps now to protect their homes from fire.

"There will be fires this summer," said Dr Lori Daniels, a forest ecology professor in the University of BC's Faculty of Forestry. "Even a year like last year, when we had fewer fires, we still saw interface fires in the Okanagan. Homeowners need to be prepared."

To read the full article and Dr Lori Daniels' comments, visit msn.com/en-ca/news/canada/covid-19-bc-homeowners-advised-to-prepare-for-wildfires/ar-BB12QFlz.



How the mass planting of trees could transform our cities and tackle air pollution

April 17, 2020, published on *CNBC.com*, Dr Cecil Konijnendijk

Hubs of culture, politics and finance, the cities many of us call home can, at times, be hard to live in.

The challenges of an urban environment often include overcrowding, a high cost of living and air pollution. The latter is a serious issue that can affect us all: according to the World Health Organization, it's estimated that air pollution kills 7 million people each year, with 9 out of 10 people breathing air which contains "high levels of pollutants."

To read the full article and Dr Cecil Konijnendijk's comments, visit cnbc.com/2020/04/17/how-the-mass-planting-of-trees-could-transform-our-cities.html.

Science of spring: Why trees are the last plants to green up

April 3, 2020, published in *Ottawa Citizen*, Dr Sally Aitken

With people stuck at home and worried about their future, there is no better time to remind ourselves of the wonders of spring. The change of season is all around us with many facets of backyard biology, perhaps even things your kids might want to learn. In today's Science of Spring, Tom Spears looks at nature's timetable for greening up. Trees often look as though early spring is passing them by as they stand, grey and leafless, while lawns turn green and early flowers bloom. In fact, the tree is busy during this season, especially the deciduous trees that dropped their leaves in the fall. But all their work in April is under cover.

Like a car that spent all winter in a snowbank, the tree has a big job coming back to life. Sally Aitken, a researcher and associate dean of forestry at UBC, leads us through it.

To read the full article and Dr Sally Aitken's comments, visit https://ottawacitizen.com/news/local-news/science-of-spring-why-trees-are-the-last-plants-to-green-up/.

Giant 'Murder Hornets' Will Stay In BC For Now Because Canada Is Way Too Cold

May 8, 2020, published on *Narcity.com*, Dr Allan Carroll

As if things can't get any worse, one province is now dealing with huge murder hornets that look like they're straight out of a bad sci-fi movie. As the nation watches on in terror, one question stands out: will murder hornets in BC spread? You can breathe a sigh of relief because one expert says we're safe, for now.

To read the full article and Dr Allan Carroll's comments, visit narcity.com/news/ca/bc/murder-hornets-in-bc-arent-likely-to-spread-in-canada-because-its-too-cold.

Why 'mother trees' are crucial in fighting climate change

May 20, 2020, published on *CBC Canada*, Dr Suzanne Simard

CBC featured UBC forestry professor Suzanne Simard's research on mother trees, which are the oldest trees in forests that nurture, communicate and protect younger seedlings.

To watch the video, visit www.cbc.ca/player/play/1737690179731.

Firefighters facing additional challenges from COVID-19

April 15, 2020, published on *CFAX 1070*, Dean John Innes

While most of the world is focused on the ongoing situation with COVID-19, there are teams busy preparing for the upcoming forest fire season. What extra challenges will be presented this year? John Innes, dean, Faculty of Forestry, UBC, spoke with Adam about some of the additional challenges this forest fire season will present.

To listen to the full interview with Dean John Innes, visit iheartradio.ca/cfax-1070/audio/firefighters-facing-additional-challenges-from-covid-19-1.11968844?mode=Article.

WILDFIRE IN THE ERA OF COVID-19

Lori Daniels

The term "new normal" is taking on yet another new meaning for us in British Columbia. Wildfires defined 2017 and 2018, when intense, fast-moving and uncontrollable fires burned a record-breaking 2.5 million hectares of grasslands and forests. Those fires emitted two and three times the normal annual carbon dioxide emissions for our entire province and generated smoke that made air quality in western Canada the most hazardous in the world for many days. With the 2020 wildfire season upon us, the long-range forecast for this summer indicates well above average potential for fire in BC.

This year, COVID-19, which primarily infects the respiratory tract, has redefined our daily lives. Experts at UBC's School of Public Health and BC (BCCDC) Centre for Disease Control tell us COVID-19 infections are exacerbated by wildfire smoke, which weakens our natural defenses. People at high risk of the effects of COVID-19 overlap with those who are most vulnerable to the impacts of wildfire smoke, the elderly and people with chronic heart or lung disease, asthma, or diabetes. Deterioration in air quality may lead to more numerous or severe COVID-19 infections, while improvements to air quality may provide protection from the potentially severe effects of the virus.

Now, it is more important than ever to take proactive measures to reduce smoke and wildfire impacts. Several actions are already underway. Starting mid-April, the BC Ministry of Environment and Climate Change Strategy, BC Wildfire Service, Metro Vancouver, and provincial public health authorities worked together to implement burning restrictions to reduce exposure to harmful smoke including the temporary suspension of prescribed burns.

Minimizing accidental wildfire ignitions is critical. So far, there have been 139 fires in BC, 83% of which were caused by people. On average, 40% of wildfires in BC are human-caused and preventable. This year, extra care is needed. Outdoor enthusiasts need to ensure campfires are extinguished properly and be vigilant when using all-terrain vehicles in the back country. We can anticipate precautionary fire bans and restrictions during hot, dry weather.

Health experts from the BC Centre for Disease Control recommend we prepare for wildfire smoke in advance. Reducing exposure means limiting smoke particles in your home. Closing doors and windows is a good first step, but can contribute to heat stress if you do not have air conditioning. Portable air purifiers very effectively remove small particles from indoor air, as do filters and special settings on forced air units.

Becoming FireSmart is another way we can prepare for the fire season – especially since many of us live in fire-prone communities. Both FireSmart BC and FireSmart Canada provide excellent resources and suggestions for proactive ways to prepare you home and property. FireSmart Canada recommends reviewing safety gear and tips before your start. The following actions are among my favourites:

- Use the FireSmart Begins at Home App to assess your home.
- Clear leaves, pine needles, and combustible debris from your roof, gutters, porch, and deck. Dispose of debris.
- Rake and remove pine needles, dry leaves, and combustible debris within 1.5 metres of your home. Expand up to 10 metres if you can. Dispose of debris.
- If your woodpile is closer than 10 metres, relocated it away from your home.
- On mature trees, prune branches within two metres from the ground. Dispose of debris.
- Ensure all screened vents have mesh that is a maximum of 3mm to resist an ember storm.
- Develop a wildfire evacuation plan for your home and family.
- Help an elderly neighbour do FireSmart work to their home

Dr Lori Daniels is a professor in the Department of Forest and Conservation Sciences. She can be reached at Lori.Daniels@ubc.ca.

SUCCESSFUL PILOT PAVES THE WAY FOR FUTURE CLIMATE ACTION TRAINING IN VANCOUVER NEIGHBOURHOODS

Cheryl Ng

Through an interactive outdoor tour, participants learn to identify climate change causes, impacts, mitigation, and adaptation in the neighbourhood

Climate action can be fun, neighbourly, and local. This is the message that UBC's Collaborative for Advanced Landscape Planning (CALP) aimed to foster through its recent Cool 'Hood Champs program. Using the popular Citizen's Coolkit throughout a series of interactive workshops, the CALP team trained local residents in Vancouver to become climate champions in their neighbourhoods. Key highlights included: outdoor activities to learn about climate change and urban forestry, hands-on mapping exercises to identify vulnerabilities and envision an ideal climate-friendly neighbourhood, and crafting of personal climate action plans. Participants were even able to meet and be inspired by existing champions like Jim Boothroyd and Andrea Sara from Green Bloc.

The first cohort successfully finished their program at Killarney Community Centre in March 2020, while the second cohort was treated to a highly-interactive online version amidst COVID-19. In total, 90% of participants felt they learnt about fun ways to engage their friends, family, and neighbours in climate action, while 80% felt more motivated and confident to take climate action. All in all, the program trained over 30 champions, with many going on to plant shade trees in their yards and implement their own action plans. At least six other organizations, including the Kitsilano and Trout Lake Community Associations and the City of Victoria, have requested for us to conduct similar programs for them. The overwhelmingly positive response to Cool 'Hood Champs has been extremely encouraging, and certainly paves the way for more capacity-building at the neighbourhood scale.

Cheryl Ng is the engagement coordinator for the Faculty's Collaborative for Advanced Landscape Planning (CALP). She can be reached at cheryl.ng@ubc.ca.

ALEX FRASER RESEARCH FOREST HAS A NEW HOME

Kylie Green

The new home of the Alex Fraser Research Forest (AFRF) is a 55-acre property located on the Fox Mountain plateau just 5.5km from the city limits of Williams Lake. This new property will serve as our main office and will offer accommodation.

The property is half forested and half grazing land, with a five-bedroom house, insulated and heated shop, uninsulated pole barn, and open-air barn. The property also boasts access to its own pond/skating rink, and the surrounding area of Fox Mountain is famous for world class mountain biking, hiking, and all sorts or outdoor recreational activities.

Researchers will be able to collaborate easily while living and working from one location, having improved access to the greater Cariboo region. We will facilitate ongoing research and education in the region on forest resilience, fire recovery, First Nations' forest management, and forest governance.

Students will have an opportunity to engage in hands-on forest stand management activities on a property not subject to Provincial forest management legislation. The agriculture opportunities on the property open new potential for research on agroforestry and improved range management practices.

While COVID-19 has delayed our move and our Grand Opening, we remain optimistic that this property will soon be a hub of activity in the Cariboo-Chilcotin.

Kylie Green is the administration manager at AFRF. She can be reached at kylie.green@ubc.ca.

PROTECTING CANADIAN FORESTS THROUGH APPLIED BIOSURVEILLANCE RESEARCH

Richard Hamelin

Invasive alien forest species represent a significant threat to Canada's forests. One consequence of the expansion of global trade and transportation networks is a sharp increase in the number of foreign invasive insects and pathogens that are intercepted or introduced to our shores. Once they arrive, these invasive species are hard to eliminate or contain, and may lead to severe infestations which destroy large forested areas. This negatively impacts biodiversity, recreation opportunities, and commercial values.

As a forest pathologist, I believe proactive biosurveillance is crucial in preventing future invasions. But, there are some serious challenges to preventing potential introductions. It is difficult to know where potential invaders come from, and their origin – this information would be needed in order to block these pathways at the source. It is also difficult to predict what alien species will become invasive and threaten our forests; after all, only a fraction of the alien species become invasive.

Some of the solutions to these challenges can be found in the extraordinary toolbox of genomics. My work focusses specifically on using genetic and genomic approaches to better understand forest disease epidemics and in the development of diagnostic and monitoring tools. Currently, I lead a large multidisciplinary project on the BioSurveillance of Alien Forest Enemies (BioSAFE), which brings together a team of over 85 experts working on the development of genomic tools that will improve our ability to detect invaders and prevent their spread.

One very successful invader we are studying is the fungal pathogen that causes Dutch elm disease (*Ophiostoma novo-ulmi*), one of the deadliest tree diseases in the world. Our team decoded the genomes of nearly 100 samples of this pathogen from a global collection from Asia, Europe, and North America to better understand how it became such a virulent tree killer.

One surprising result of our study, published recently in *Nature Ecology and Evolution*, is that we found considerably more diversity than initially expected. Alien invaders typically go through a "genetic bottleneck" after their introduction because only a few, with a limited gene pool, become established. This usually limits the adaptive potential of those invaders. But we found that hybridization with different species or taxa drove this increase in diversity in the Dutch elm disease pathogen and that the hybridization was widespread as more than one third of the pathogen population possessed some signature of hybridization.

We believe the genes acquired from other fungi likely helped the pathogen evolve to become more efficient in its attack. One of those genes triggered the capacity for sexual recombination in the pathogen, while other genes improved its ability to grow. Altogether, the traits acquired by this pathogen lead to increased diversity and adaptive potential, making it a more effective invader. One intriguing possibility is that the pathogen mated with closely related species and then, via selection, used a mix-and-match approach to combine the best elements that improved its reproduction, survival, and virulence. This could have resulted in a better ability to kill elm trees. For example, we discovered that one of the fastest evolving genes in the pathogen directs the detoxification of a tree's defence compound.

With this new knowledge in hand, I hope we will be able to better understand and predict what makes an invasive pathogen successful and how to better contain or eliminate it. We are now moving forward to apply this research in the field through a new tool my team is designing. It will economically develop accurate genomic profiles to identify pathogen sources and risk level. This tool, in the hands of end-users, will move the biosurveillance of forest enemies into the next generation and help prevent future invaders from coming in.

Dr Richard Hamelin is a professor at the Department of Forest and Conservation Sciences. He can be reached at richard.hamelin@ubc.ca.

UBC RESEARCH PROVIDES INSIGHTS INTO GRIZZLY BEAR HABITAT SELECTION

Cameron McClelland

In Alberta, grizzly bears are classified as a threatened species. While it is accepted that the leading cause of grizzly bear mortality is human impact, there is still much uncertainty regarding grizzly bear populations and anthropogenic landscape change. A key research focus is on food availability, particularly what temporal changes occur in food availability throughout the year, as well as annually, under climate change. While much is known about where important vegetative bear foods occur on the landscape and what foods are important to grizzly bears during different parts of the year, little is known about the influence of annual and inter-annual availability on grizzly bear habitat selection.

Phenology is the study of recurring biological cycles and can be used as a metric to determine when in a season, or year, a vegetative food source becomes available to wildlife for consumption as well as to compare and quantify annual change. In our study, we used satellite data to, first, create a fine spatial scale remote sensing product capable of monitoring daily regional phenology in the Yellowhead Bear Management Area, and second, to use this information to infer availability of important vegetative food species and determine how it relates to grizzly bear habitat selection.

First, we used Dynamic Time Warping (DTW) as a data fusion technique to combine landsat satellite data and Moderate Resolution Image Spectroradiometer (MODIS) imagery, to quantify daily changes in vegetation between 2000-2018, using the Enhanced Vegetation Index (EVI) at a 30 m resolution. This approach, entitled DRIVE (Daily Remote Inference of Vegetation), was validated using imagery acquired from a network of ground cameras. DRIVE output was compared to the start and end of season dates (SOS and EOS, respectively). It was determined that DRIVE increased both the spatial and temporal resolution of existing remote sensing data sources and was capable of determining SOS within an average of seven days and EOS within an average of 10 days from ground cameras. In further analyzing the DRIVE product, it was also determined that between 2000-2018, SOS advanced at a maximum rate of 0.78 days per year in the study area.

Once fine scale phenology layers were available, a set of new methods were developed to create daily vegetative food species availability layers from 2000-2017. First annual species distribution models (SDMs) were created using a modeling technique that combines food presence data and machine learning techniques. SDMs were combined with DRIVE outputs to create daily vegetative food availability layers for eight food species. These were combined with environmental variables and grizzly bear GPS collar data to model daily and seasonal food species selection by grizzly bears over three years of dry, average and wet mean annual precipitation. Results highlighted the annual variability of food selection and the need for a product to determine how food availability varies annually. Specifically, it was determined that in the dry spring, selection for root species was stronger and occurred earlier than in the average/wet years, and in the dry fall, the period of selection for berries was longer than in the wet year. My research, demonstrated the utility of DRIVE in determining long-term phenology trends and how habitat selection of grizzly bears varies in accordance to food availability. This success can be attributed to advances in remote sensing data and the ability to create high-spatial and temporal resolution products. DRIVE tools may enable access by forest managers to previously unavailable data, which will help improve the understanding of the complex environment in which grizzly bears reside and aid in maintaining their populations as well as other wildlife for generations to come.

Cam McClelland is a former master's student with the IRSS lab (Dr. Nicholas Coops), and currently works for the Grizzly Bear Program at fRI Research in Hinton, Alberta. He can be reached at cammcclell@gmail.com. More information on the research work can be found at http://paw.forestry.ubc.ca/

UBC Forestry would like to acknowledge FRI Research, NSERC and a number of forestry and oil and gas companies for supporting this research.

FUSING SATELLITE IMAGES TO DETECT FIRE PATTERNS

Nicholas Leach

The 2017 fire season burned massive swaths of forest across British Columbia and the rest of the Pacific Northwest. It was a historic fire year, with more forest burned than any other year on record. But, that record only lasted a single year: in 2018, an even greater area of BC's forest burned. In order to understand the true environmental effects of these increasingly severe wildfires, new tools are needed to rapidly detect and map the areas that they burn.

Solving this challenge formed the basis of my research with the Faculty of Forestry's Dr Nicholas Coops as we uniquely combined satellite data sets to study forest fire burn patterns. As fires spread, they leave distinct patterns on the landscape. The severity, shape, size, and timing of these patterns are important indicators, each holding pieces of information about how the ecosystem has been affected and how it may respond. In forest ecosystems where fires are the dominant disturbance, these pattern indicators also serve as a template for forest management practices which aim to emulate natural forest cycles.

In the days, weeks, and months after a fire, weather and vegetation regrowth begin to obscure these spatial patterns. Rather than attempting to survey the burned areas in person, satellite imagery can be used to efficiently capture the fire patterns at scales ranging from small individual burns to nationwide maps. However, in practice, finding the right images acquired at the right time can prove challenging. Imagery that is too coarse misses the small but critical details, like unburned patches dispersed within the burned perimeters. Imagery too fine in scale often lacks the revisit rate to capture the fires multiple times before their patterns begin to fade. To further complicate the issue, smoke and clouds can result in gaps in usable imagery for weeks or months.

Swarms of miniature satellites, called CubeSats, help resolve this issue in a unique way. Dozens of these miniature satellites orbit the earth like a string of pearls, snapping images one after another. Taken together, they capture the entire surface of the earth nearly every day with high resolution cameras. Rather than being forced to choose between imagery that is detailed but infrequent and imagery that is frequent but has limited resolution, CubeSats offer the best of both scenarios, frequently delivering detailed imagery.

However, the sole use of CubeSats imagery presents certain drawbacks. When it comes to quality, miniature satellites can't compete with their heavyweight cousins. Subtle but important properties, like the consistency between subsequent images, suffer in CubeSat imagery. In order to conduct a deep analysis of burned areas, ideally imagery from both CubeSats and conventional satellites would be combined.

My recent research focused on fusing these datasets in order to study forest fire burn patterns with an unprecedented combination of resolution, timeliness, and sensor performance. Together with Tanka, a Vancouver-based start-up, I developed software which automatically takes CubeSat images and, using imagery from the Sentinel-2 and Landsat satellites, ensures that each one is precisely calibrated to each CubeSat image. This makes it possible to examine how each pixel behaves through time, detecting both sudden and gradual changes in the condition of the vegetation. Simultaneously, I estimated spatial pattern indicators, including the complexity of the burn's perimeter and the number of unburned patches within the greater burn area.

Thanks to the support from Tanka, Nikola Obrknezev, and the Natural Sciences and Engineering Research Council (NSERC), through my research I found that some key indicators of fire patterns are sensitive to the properties of the satellite imagery used to measure them. Considering that these indicators help predict ecosystem behavior after fires and influence forest management and harvesting practices, it is critical to ensure that our understanding of them is as accurate as possible. By fusing together the best available satellite images into a powerful new and unique dataset, we can make significant steps forward in improving our understanding of the behavior and importance of wildfire on BC's landscape.

Nicholas Leach is a data scientist at Tanka Building Products. He can be reached at nicholas.leach@alumni.ubc.ca.

ISLAND WILDFLOWER RAPIDLY ADAPTS TO DEER PRESENCE

Cora Skaien and Peter Arcese

Cora Skaien conducting surveys of seablush inside one of the exclosures on Sidney Island

Can plants outrun environmental change? The answer is both yes and no. Perhaps the Red Queen's advice to Alice in Lewis Caroll's *Through the Looking Glass* describes it best: "… you see, it takes all the running you can do, to keep in the same place."

This advice is fitting when looking at the thousands of species facing environmental change – they must either run as fast as they can to adapt to those changes without seeming to actually make progress; go elsewhere; or become extinct. For biologists, it means that they must race to estimate the capacity for rapid adaptation in a species of interest and then build those findings into conservation plans.

The overpopulation of deer on the Gulf and San Juan Islands of British Columbia and Washington State has been a concern studied by biologists over many decades. The removal of native predators, such as cougars, bears, and wolves, and more recent restrictions on human hunting, including bans on many large islands, have both contributed to the population growth of deer on large islands. As a result, browsing pressure – feeding by herbivores such as deer on leaves, shoots, and plants such as shrubs – has become unsustainable for many species throughout most of the region, despite first being reported as an issue by Ian McTaggert-Cowan in the 1950s, and more intensively documented over the last two decades by researchers from the University of British Columbia, including our team's recent work.

Many ecosystems now at risk of being lost in our region were once maintained by Indigenous Peoples who practiced sustainable harvesting of plant and animal species and, as a consequence, contributed positively to the persistence of our coastal Douglas-fir, Garry oak, and Maritime meadow ecosystems which are now under threat.

Despite the recent extinction of dozens of culturally and biologically significant plant species from many Gulf and San Juan Islands, and the dramatic simplification of bird and pollinator communities, there are also glimmers of hope. The findings of our recent study of seablush (*Plectritis congesta*) – a wildflower of endangered Garry oak ecosystems – from 12 island populations, offer one such glimmer. Our findings indicate that seablush appears to demonstrate a particularly remarkable ability to evolve rapidly in response to browsing by deer. This led us to ask: are this species' defenses enough to enable it to survive the presence of overabundant deer, or would those defenses be overwhelmed causing it to become extinct? A focus on seablush allows us to also consider parallel questions facing hundreds of specialist plants endemic to the federal Species at Risk Act (SARA) – listed "Garry Oak and Maritime Meadow ecosystems" in Canada.

We have observed that seablush is a species that appears to be locally adapted to deer presence, by virtue of its stature, growth form, flower size, and seed type. Our findings were demonstrated by maintaining large exclosures on Sidney Island with over 3,000 plants from 12 populations that either coexisted with deer or existed without them. The seablush were planted in and outside of exclosures, either exposing them to or protecting them from the deer.

Our results indicated seablush populations varied in size depending on whether or not they had been historically exposed to deer. Seablush presents as a diminutive plant just centimeters tall from areas where deer are common. While on islands without deer for 30 or more years or without exposure from the pollen of plants on islands with deer, seablush presents as a showy plant sometimes reaching over a metre in height. By constructing "common gardens" of many populations grown together at UBC's Totem field, we demonstrated how seablush

Seablush often dominates Garry oak and Maritime meadows when deer are absent, such as seen here on a Southern Gulf Island

populations have likely co-evolved with deer in ways that allow it to survive and reproduce at high rates by remaining small early in the season and producing more but smaller seeds. By comparison, "naïve" plants from islands with no history of deer being present, bolt earlier, grow taller, and produce dramatically showier flowers with larger but fewer seeds.

By pairing these experiments with the results of others which imposed artificial selection on plant height to simulate browsing with scissors, we know that seablush populations can double in size, or become half as tall, within just five generations. While that clearly qualifies as rapid adaptation, we also show that browsing by deer drove all populations extinct within three years in the absence of protection on Sidney Island.

This leads us to conclude that while seablush is clearly capable of rapid adaption in response to environmental change, it remains vulnerable to extinction where deer populations have become hyper-abundant – an outcome that would likely never have happened historically due to mortality from large predators and Indigenous hunters who maintained these diverse ecosystems via their land stewardship activities. We suggest that learning how to reinstate Indigenous practices and traditional knowledge in southwestern BC will be critical to stopping biodiversity declines in Garry oak and Maritime meadow ecosystems and in restoring extirpated species where possible.

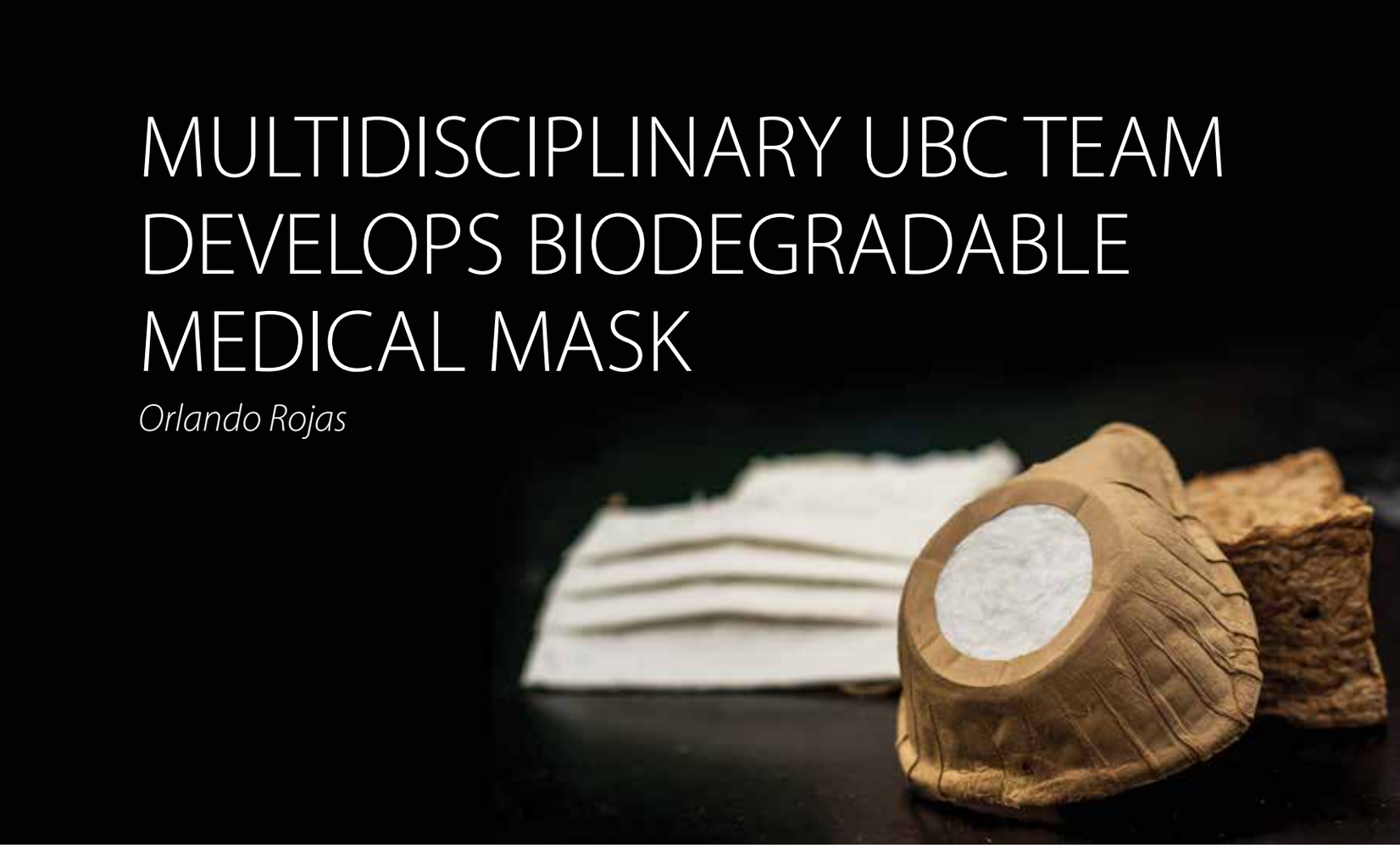
Dr Cora Skaien is a recent PhdD graduate and can be reached at cora.skaien@ubc.ca.

Dr Peter Arcese is a professor at the Department of Forest and Conservation Sciences and is the UBC Faculty of Forestry's Forest Renewal Chair in Conservation Biology. He can be reached at peter.arcese@ubc.ca.

Deer are often overabundant in the Southern Gulf Islands of BC, due to removal of predators. Plants in this region must either evolve to tolerate deer browsing, or go extinct

MULTIDISCIPLINARY UBC TEAM DEVELOPS BIODEGRADABLE MEDICAL MASK

Orlando Rojas



When arriving at the University of British Columbia in January, as the scientific director of the Bioproducts Institute, I never imagined that only a few months later, we would be in the midst of a global pandemic, and that by May, I would be co-leading a team responsible for developing what is believed to be the world's very first fully biodegradable medical mask prototype.

Since the initial stages of the pandemic, disposable mask litter is apparent all around us. Masks and gloves are polluting the sidewalks and could eventually enter our rivers and oceans. To meet the growing demand of healthcare professionals, a solution was needed urgently – ideally one that was cost-effective, using local sourcing and biodegradable materials, helping mitigate the masks' environmental impact.

Solving these types of challenges very much fits the vision of the Bioproducts Institute, which brings together inter- and multi-disciplinary teams of researchers comprised of scientists and engineers to unlock the full potential of materials, chemicals, and energy produced in nature, including creating high-performance materials from renewable resources.

Together, Johan Foster – chemical and biological engineering associate professor and NSERC Canfor Industrial Research Chair in Advanced Bioproducts – and I began pulling together a UBC team from the institute and beyond. Our outreach received overwhelming support, spontaneously generating the assistance of researchers in forestry; chemical and biological engineering; mechanical engineering, chemistry; and medicine. We assembled in-house expertise in the areas of complex fluid, fibre processing, surface chemistry, nanotechnology, and additive manufacturing.

The success of developing the "Canadian-Mask" or "Can-Mask" in a matter of weeks was only possible due to the years of research and expertise from the Bioproducts Institute, and the Pulp and Paper Centre, as well as our recent work with Aalto University and the Finnish Research Center (VTT). These organizations are leaders in techniques such as 3D forming of paper by applying heat and pressure, and foam forming – which is used to create light-weight porous materials. My previous experience with nonwovens at North Carolina State University's Nonwovens Institute, was also instrumental since we worked on several projects related to the adoption of bio-based materials in advanced textiles.

While a mask for air filtration appears to be a simple task, multiple functions of the frame and filtration media require the use of advanced technologies. A unique aspect of the project was the involvement of undergraduate students in the initial design process. Within a week, we received 12 submissions reflecting various proposals for different aspects of the design ranging from how to make the straps to how to make the mask take the shape of one's face. These contributions helped inform the broader design considerations.

Our Can-Mask prototype is comprised of two key components: the passive and the active. What is innovative about our design is combining all of these ideas and making a system

> Since the initial stages of the pandemic, disposable mask litter is apparent all around us. Masks and gloves are polluting the sidewalks and could eventually enter our rivers and oceans."

that is the first of its kind.

The passive component is the non-permeable mask frame which is designed to provide protection while also holding the filter in place. It must conform to the human face and must be flexible enough to adapt to a range of people. Other considerations include how it feels on the skin; how it fits; and of course, how it looks. It is made entirely from BC wood fibres from sources such as pine, spruce, cedar, and other softwoods.

Our prototype for the mask frame can be produced by two methods using cellulose fibres – thermoforming and wet-laying. The wet-laying process is similar to papermaking – using a screen in the shape you want to make, you lay the wet fibres on the screen and as they dry, they take the pre-designed form. For this, we have used different designs produced by 3D printing. Paper is very adaptable, enabling us to add wet strength and anti-microbial agents, as well as a moisture barriers to help with the mask's performance.

For the active component, the preferred option uses a biomass-based filter specially designed by our team. By using the foam-forming process, a competitive level of filtration performance is developed by suspending the fibres into unique, porous structures, creating a low-density material. It is essential to create a permeable network of fibres that lets air in but filters out 95% of very small (0.3% micron) particles. Other performance criteria our team has addressed include protein resistance for medical use, water and oil resistance, and fire retardancy.

Currently, we are evaluating the prototypes that we have. At this point, we know it works as a filter and is breathable. The question is: does it fulfill the high standard of an N95 mask? To make it truly superior in performance, it needs to electrically trap any charged particles in the air, including the virus. In-house visualization techniques, including tomography tests are currently underway. Following our testing to ensure the masks meet health industry specifications, we will consider certification.

In reflection, I am extremely grateful for the tremendous support and the many long hours the UBC community – students, faculty, and staff – invested to develop the CanMask prototype. A project of this magnitude and impact is accelerated with a multidisciplinary approach. We are also grateful that UBC granted special lab access so we could continue this work while observing all health and safety protocols.

Never in our lives have we faced a crisis with such profound health, social, economic, and environmental impacts. If COVID-19 has taught us anything, it is how important it is to have a robust supply of protective equipment like N95 respirators and medical masks. It is very exciting that the CanMask provides an example of the opportunities for materials to be locally-sourced, while being biodegradable; it also demonstrates the potential for our forest resources and forest products industries to fulfill the material needs of the future.

Dr Orlando Rojas is the Canada Excellence Research Chair in Forest Bioproducts and the scientific director of the Bioproducts Institute at UBC. He is a wood science professor with the Faculty of Forestry. He is also a professor with the UBC departments of chemical and biological engineering. He can be reached at orlando.rojas@ubc.ca.

Johan Foster (left) and Orlando Rojas (right)

MATT WEALICK RECEIVES UBC ALUMNI BUILDER AWARD

Each year, *alumni UBC* recognizes outstanding alumni across all faculties who have enriched the lives of others and significantly contributed to the University of British Columbia. In 2019, the Faculty of Forestry nominated **Matt Wealick, BSF 2001, RPF**, for the Alumni Builder Award in recognition of his strong engagement and support of the Faculty and contributions to First Nations forestry issues.

Matt has maintained a strong and deep connection to the Faculty since graduation, most recently as co-chair of the First Nations Council of Advisors. He also serves as a Board Member and Chair of the Aboriginal Affairs Committee for the Truck Loggers Association.

As a Sto:lo person and a member of the Tzeachten First Nation of the Chillwack Valley, Matt's career has increasingly focused on First Nations forestry over the years. "When I started at UBC I came from an industry background as an everyday forester, with no idea what First Nations forestry was about," he says. "There were only 10 or 12 aboriginal students in the faculty at that time. Now it's quite a bit different of course."

After graduating from UBC Matt went on to receive a Master of Science in Environment and Management from Royal Roads University and received his RPF designation. He built his career gradually, first as a planning and operations forester, then as an engineering supervisor and then as an operations manager.

After returning to Chilliwack in 2005, Matt was appointed manager of the Ts'elxwéyeqw Forestry Limited Partnership, giving him the opportunity to build a forest company from the ground up. Not only did Matt manage every conventional aspect of the business, he worked in areas that are specific to First Nations forestry, like rights and title, traditional and cultural use, and capacity building.

When the Ts'elxwéyeqw Tribe reorganized its corporate structure to create a management company, Matt became the Chief Operating Officer, overseeing six businesses and managing five forest licenses.

In 2013, Matt received an Aboriginal Business Award for the Joint Venture Business of the Year, for his work at Ts'elxwéyeqw Tribal Management.

In 2017, Matt established his own consulting company called Spa:th Strategies. His business focuses on providing unique solutions to the challenges of managing First Nations forest tenures.

"I'm using everything I have learned up until now to help First Nations successfully incorporate their cultural values into their management plans," he says. "For example, if you take a sanctuary area in a forest, the objective is peace and tranquility. So how do we manage the cut allowance to ensure that we meet the objectives for wildlife preservation, fisheries management, and aboriginal spiritual values? This can be done in a way that's congruent with provincial government plans."

Matt also gives his time as a volunteer to First Nations communities, serving on two Tzeachten committees and the Operating Board for the Heiltsuk Nation.

Matt's message to current and future UBC Forestry students is clear: "This is a prime time for First Nations students to be involved in forestry, especially with the education you get from UBC. The industry is crying out for people who have an aboriginal background and know what their community's needs are; they are valuable to industry and government," he says. "There's lots of work in the forest industry and natural resource management, so stick with it and push through. It will benefit us all in the end."

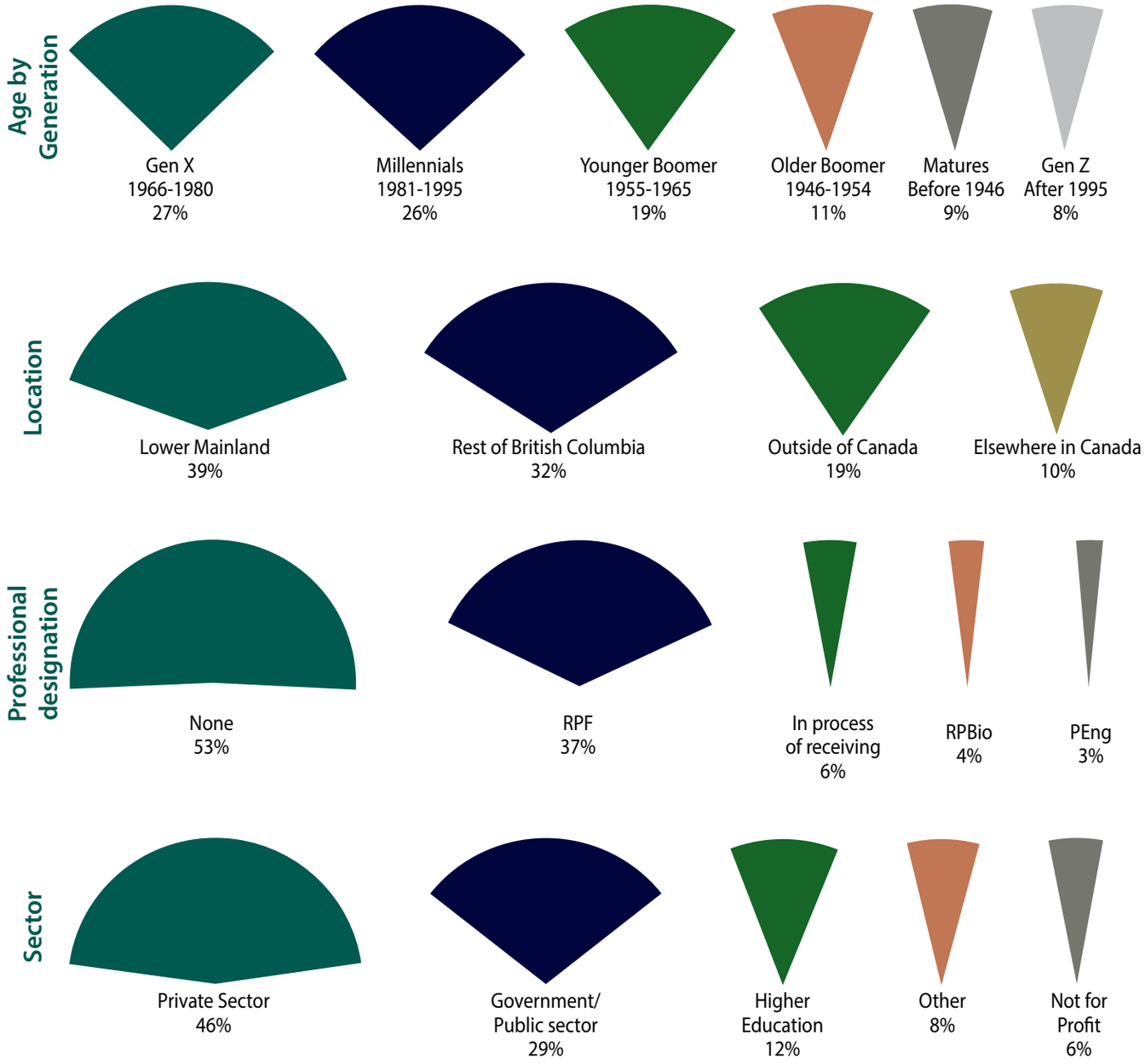
The Faculty of Forestry congratulates Matt Wealick on receiving the Alumni Builder Award. If you have a great story about a Forestry alumnus or alumna, please let us know. Contact Michelle Lindsay at michelle.lindsay@ubc.ca or phone 604.827.0297.

ALUMNI SURVEY HIGHLIGHTS

As part of our expanded efforts to build stronger ties with our alumni, the Faculty conducted a survey this past fall to better understand the relationship our alumni have with the Faculty and gain their feedback.

We invited the 3,850 alumni that we have email addresses for to take part and we were overwhelmed by the response, with almost 1,600 alumni participating. The survey provided valuable information to help us develop our programs, inform prospective students about what their careers may look like, and better communicate with you, our alumni.

Here's a snapshot.



We received over 3,758 responses to our open ended questions that provided deeper insights and are exceedingly helpful at identifying trends and themes that will further improve our programs. Noted requests were:

- Create stronger connections to industry and professional associations
- Insure a clear pathway for students to achieve professional designations
- Provide students with additional business and project management skills
- Prioritize field work

Thank you to all those who took part.

FACULTY ESTABLISHES CHAIR IN CONSERVATION

Dr Tara Martin, Professor in conservation decision science in the Department of Forest and Conservation Sciences, is the inaugural holder of the **Liber Ero UBC Chair in Conservation**. This new Chair is established through generous support from **Val and Dick Bradshaw**, with matching funds from the University of British Columbia.

Tara Martin is a pioneer in the field of conservation decision science: combining predictive ecological models with decision science to inform what actions to take, where to take them, and when, in order to achieve conservation and natural resource management goals.

"My work is about the translation of data into ecological decisions," she says. "We study the impacts of various pressures on biodiversity, then translate the data into predictive models that can assess the effectiveness of different management interventions to recover endangered species and ecosystems, including actions to adapt to climate change."

"Right now there are over 700 species at risk in Canada, and current approaches to conservation are failing. Decision-makers are often investing in species with the lowest likelihood of recovery at the highest cost," she says. "If we are likely to lose a species no matter how much we spend, we need to know this so we can use our resources more effectively and invest in recovering species with a greater likelihood of success."

The new Chair in Conservation will allow Tara and her team to have consistent funding to support the work of translating data into actionable decisions. "Val and Dick Bradshaw's financial support helped establish my position," Tara says. "I'm very grateful to them and to UBC for allowing me to hold this Chair, which helps ensure consistent funding for our graduate students and the pioneering work we do."

Val and Dick Bradshaw are philanthropic leaders in conservation research. In addition to the Chair in Conservation at UBC, they have established a Chair in Conservation Biology at McGill University, a Chair in Fisheries Research at University of Victoria, and a Chair in Coastal Management at Simon Fraser University. They have also established the two-year Liber Ero Postdoctoral Fellowship program that supports four conservation biologists annually.

Tara Martin was born in Canada to a Canadian mother and an Australian father, and has moved seamlessly between the two countries. She completed her undergraduate and graduate degrees in Australia, and received a PhD in Ecology from the University of Queensland in 2004.

She then did two years of postdoctoral research in the UBC Faculty of Forestry, after which she established the Conservation Decision Lab at the Australian national science agency CSIRO. In 2013 Dr Martin returned to Canada, and took up her position at UBC in 2018.

In 2018 Dr Martin's research received national attention with a front-page feature article in The Globe and Mail. "That raised my profile immediately, and opened the doors to a number of important conversations about conservation in Canada at a national scale," she says.

Priority Threat Management (PTM) is a key tool developed by Dr Martin and her colleagues. This decision tool identifies the threat management strategies that will recover the most species for the least cost, drawing on empirical data and expert knowledge of biodiversity threats, as well as the costs; feasibility; and benefits of management to species recovery.

To date, PTM has been applied to three study areas in BC, as well as regions in southwestern Saskatchewan, New Brunswick, one third of the Australian continent including the state of New South Wales, Indonesia, and Antarctica.

Dr Martin leads a team of 12 graduate students and postdoctoral fellows. "The mentoring of the next generation of conservation leaders is a huge motivation for what I do," she says. "These brilliant minds will become leading conservation researchers and practitioners at universities, conservation NGO's, government agencies, and industry bodies."

The Faculty of Forestry is deeply grateful to the Bradshaws for their support of this important conservation research. For more information, or to explore your opportunities to support research in the Faculty, please contact Emma Tully, emma.tully@ubc.ca or phone 604.822.8716.

MEET THE DEVELOPMENT AND ALUMNI ENGAGEMENT TEAM

The five members of the Development and Alumni Engagement team in the Faculty of Forestry are a passionate and dedicated bunch. They work to ensure that the Faculty has the resources it needs to support priority projects in student learning, research, and engagement with alumni and the corporate community.

OK, but what do they really do? And what do they think about it? How did they end up in Forestry? Do they have any fun? We wondered; we asked; they answered.

Tell me about your job.

Emma Tully, assistant dean, development and alumni engagement: I am part of the Faculty's management team and I oversee the fundraising and alumni engagement programs. I am a link between the Faculty and the community – engaging with donors, alumni, organizations, associations, and industry to find meaningful ways to connect them with the Faculty.

Marie Labitté, development officer: I'm a front-line fundraiser. I seek financial support for the Faculty to offer excellence in teaching and research, strengthen our community engagement, and provide students with the best possible learning environment.

Sean McGuire, development officer: I have the same job as Marie. We also develop relationships with our alumni and connect them with opportunities for volunteering and raising financial support.

Debbie McPherson, development coordinator: I'm the back end support for the team. I manage administrative duties such as reporting, meeting preparation, financial processing, donor stewardship and recognition.

Michelle Lindsay, alumni engagement manager: I'm the first contact for our alumni and it is my responsibility to keep them engaged with the Faculty. I produce the alumni newsletter, run events, and answer alumni requests.

Where do you come from?

Marie: I come from a small farm in Normandy, France. My partner and I moved to Canada in 2012. After spending three years in Toronto, we moved to Vancouver. In 2015,

working in finance, I decided to use my skills for something I was truly passionate about: forest ecosystems.

Debbie: I am the fourth generation of my family to be born and raised in Victoria. I graduated from Camosun College in hospitality and worked for many years at the Empress Hotel and on cruise ships. Then I moved to Vancouver, and 12 years ago began working as a temp in the Dean's office. I joined the DAE team seven years ago.

Michelle: I completed a recreation diplomat at Langara College and graduated from Royal Roads University with a commerce degree. I started my not-for profit career working at the Rick Hansen Foundation for six years.

What do you most enjoy about your job?

Emma: The people: their stories tell us that our work really has an impact by supporting research and student learning experiences that might not otherwise be possible. Our job is to help connect donors with the great work taking place at UBC, and what could be better than that?

Michelle: The people! I love getting to know our alumni. Learning about their connection to the University, the skills that they gained, and the friendships that they formed is a joy.

Marie: Helping our supporters fulfill their own aspirations and achieve our shared vision for forests. Building and fostering a strong, inclusive community of supporters for our Faculty and our forests.

How much did you know about forestry before joining this team, and what have you learned?

Debbie: While I don't have formal forestry education, my family has a long history in the forest industry. My grandfather ran a logging machinery company in Victoria and his father was a logger and wood carver. Some of my great-grandfather's work is in the ceiling of the Q Bar in the Empress Hotel in Victoria.

Sean: I grew up in BC and spent much of my time in the forests and mountains so I feel very connected to this ecosystem. My wife is an ecologist (she received her PhD from UBC) whose research was focused on the west coast and it has been great to learn from her. Over the years, I continue to enjoy and learn about our forests and other natural resources.

Emma: I've learned a lot over the past nine years with the Faculty, thanks to being surrounded by some of the world's leading experts in the field. In our roles we need to translate complex research topics into language a broader audience can understand and get behind. My rule of thumb is: if I can understand it, then everyone else will too.

The Development and Alumni Engagement team is here for you! If you'd like to share a story, get some information, or become involved as a volunteer or donor, please contact us.

https://support.ubc.ca/category/projects-by-faculty/faculty-of-forestry/.

The field of forest operations in Canada is rapidly changing, the discipline has evolved significantly, and today's forest operations have become a bridge-builder between different disciplines to support sustainable forestry practices in Canada.

The first webinar of our Faculty of Forestry Series, hosted by Dr Sally Aitken, featuring Dr Dominik Roeser, Professor in the Department of Forest Resources Management can now be found online.

Dr Roeser's presentation provides a vision for forest operations of the future and features recent research highlights in forest operations at UBC. Highlights of the presentation include virtual reality in operational planning, fuel supply for small-scale combined heat and power installations, safety in steep slope harvesting, and a pathway to more commercial thinning operations in BC.

https://support.ubc.ca/?post_type=contacts&p=2480.

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Forest Sciences Centre
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Vancouver BC CANADA V6T 1Z4