COLLEGE OF FORESTRY

BIENNIAL REPORT

2021-2022

Weaving together knowledge for
greater sustainability in forestry

Oregon State University

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WELCOME

The College of Forestry is pursuing sustainability through collaboration that weaves together different ways of knowing to find solutions.

Our society and natural resource sector are facing many challenges created by climate change, population growth, increasing resource demands and issues of social justice and political and social polarization. Now, more than ever, our world requires natural resource solutions that support healthy ecosystems and forest landscapes, robust and resilient economies and thriving urban and rural communities.

As the nation's leading College of Forestry, we are advancing systems-based, integrative science that provides both a template, and a catalyst, for sustainable resource management and land stewardship. Our research and outreach focus on forest practices that aim to meet the fiber and wood needs of society, while protecting essential ecosystem services such as clean air and water, carbon storage and biodiversity, that are critical to sustaining life on earth.

Whether we are evaluating complex challenges like wildfire or innovating climate-friendly, carbon-neutral forest products, the College of Forestry pursues natural resource solutions and strategies that are grounded in science, economically robust and socially responsible.

As we do this work, interdisciplinary collaboration and inclusivity guide our approach. We are committed to identifying and removing barriers to provide equitable access to research, learning and engagement for the next generation of leaders in forestry and natural resources. We are also committed to partnering with Tribal Nations to weave together Western science and Traditional Ecological Knowledge to find solutions to some of humanity's most pressing conservation challenges.

Our goal is to have an impact that starts in our classrooms and research forests, expands to the Pacific Northwest and is adopted on a transformational and global scale to achieve a sustainable future for all.

We've made great progress in the last two years and we're proud to share some highlights and stories of impact in this report. Thank you for your support of our students, faculty and staff, and our vision to create a more sustainable world through teaching, research and outreach.

Tom DeLuca

Cheryl Ramberg-Ford and Allyn C. Ford Dean of the College of Forestry

EDUCATION

ADVANCING THE CIRCULAR ECONOMY

Nathan Vega

Scott Leavengood

Nathan Vega ('26), an undergraduate student double majoring in renewable materials and forestry, has always had an interest in the fields of renewable energy and forest-based bioenergy.

"I am especially interested in biochar for its potential to help with wildfire prevention, energy production and agricultural management," Vega says.

Biochar is a carbon-rich substance made by burning organic material, like agricultural or forestry residue, at low oxygen levels in a process called pyrolysis. Biochar can be used as a soil enhancer or as a way to sequester carbon. The energy or heat created during the conversion can also be captured and used as clean energy.

"Biochar is part of something called the circular economy," Vega says. "And the foundation of this economy is a transition to renewable energy and materials."

An alternative to the traditional linear economy, the circular economy is restorative or regenerative by design. It seeks to reduce waste and material use, recover resources at the end of a product's life, and channel them back into production, significantly reducing pressure on the environment.

Vega jumped at an opportunity to work within the circular economy, assisting Scott Leavengood, director of Oregon Wood Innovation Center, in testing Portland, Oregon, based Sankofa Lumber's new line of panel products known as "SecondStory."

SecondStory panels are unique in that they are composed of reclaimed structural building materials, including lumber, oriented strand board (OSB) and plywood. Sankofa refers to these panels as architectural surfaces and advises using them for purposes like flooring, casework and wall cladding. SecondStory panels are currently installed in the Oregon State women's gymnastics facility locker room.

Leavengood and Vega tested the panels to determine qualities like hardness, bond and bending strength and moisture performance. They measured the panels' performance based on comparable products like particleboard, medium-density fiberboard (MDF) and hardwood plywood. The Cascadia CleanTech Accelerator, powered by VertueLab and CleanTech Alliance, funded the testing.

"For entrepreneurs working with any kind of new material or new product, the first question they always get from potential customers is 'what's it like?' or in other words, how does the product compare to what's on the market now?" says Leavengood. "We were able to help Sankofa Lumber answer these questions since Nathan put the product through a workout."

> *"Biochar is part of something called the circular economy, and the foundation of this economy is a transition to renewable energy and materials."*

Bond strength is critical for composite products. Leavengood and Vega found the strength to be excellent even after products were exposed to high humidity and water submersion for several days.

Focusing on his classes and assisting Leavengood with his research projects provided Vega with support and something to focus on during the pandemic.

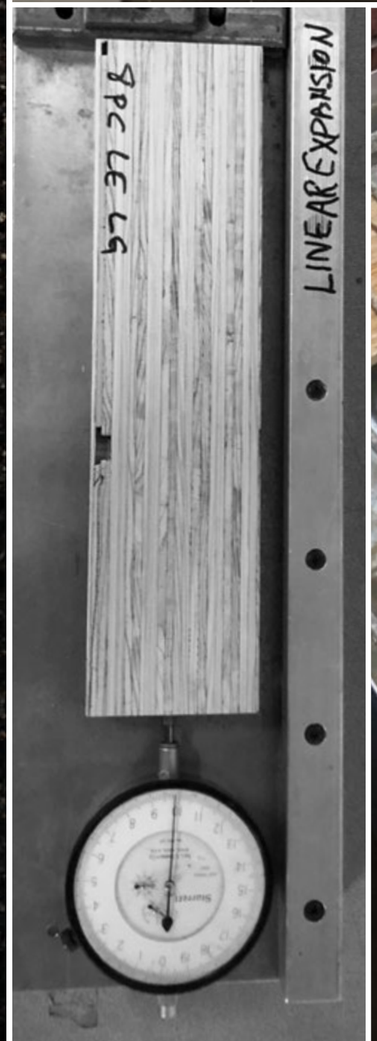
"Everyone at the College of Forestry was very welcoming and friendly," Vega says, "Plus, this job was a great part of the last year-and-a-half as it let me get out of the house and listen to music while I did the experiments."

Vega is a recipient of the Friends of Renewable Materials Seneca Scholarship, Powers Scholarship, and Presidential Scholarship from the College of Forestry. He said receiving the scholarships has been essential to ensuring his success at Oregon State.

"These scholarships have allowed me to pursue my education without distraction or worry," Vega says. "It's been such a relief to find that I am so supported."

When Vega is not studying, he likes to spend his free time reading, gardening, cooking, listening to music, hiking and playing the drums. He also likes to spend his time with his friends and family and he recently joined the college's logging sports team.

After graduation, Vega wants to work in bioenergy, specifically biochar production from forest biomass as a carbon-negative energy source.



EXAMINING RECREATIONAL IMPACTS

Lara Jacobs

Ashley D'Antonio

Lara Jacobs ('23) is bringing into focus the ecological and pathogenic impacts of outdoor recreation using a cultural impact lens.

Lara Jacobs is pursuing her Ph.D. in forest ecosystems and society, working collaboratively with a Tribe in Washington to examine how fecal matter from outdoor recreationists may create issues to the Tribe's food supply.

Jacobs says most people do not understand that when they deposit fecal matter in parks and protected areas, it may pose issues to watersheds, soils and animals, including humans.

"We've been taught for years just to dig a hole and bury fecal matter," says Jacobs. "However, this contrasts with the scientific literature that shows how bacteria survive in great abundance across seasons, and depth of burial doesn't seem to matter. The best practice isn't to bury your fecal matter unless you plan to put in a lot of work to completely compost it with soil. Outdoor recreationists should be packing out their fecal waste whenever possible."

This research is vital for multiple reasons, including the U.S. government Treaty obligations to manage the Tribe's non-reservation lands in a manner that maintains their natural resources, including subsistence foods.

"This research is also critical because the field of recreation ecology has yet to bring in a cultural impact lens," says Jacobs.

As a citizen of the Muscogee (Creek) Nation of Oklahoma who also has Choctaw heritage, Jacobs graduated magna cum laude from Oregon State University with a bachelor of science degree in women studies. The degree combined her interests in environmental issues with topics about systems of oppression and privilege. She also holds a master's degree in environmental studies from Prescott College, focusing on environmental education, conservation science and sustainability.

Her doctoral research centers on the spatial mapping of outdoor recreationists' behaviors and their associated environmental ecological and pathogenic impacts on Native lands managed by the National Park Service. Jacobs' main objective is to bring an inclusive lens to academia and help transform the academic landscape into a better and brighter place for everyone. While at OSU, she's worked to build bridges across the college to create spaces for Indigenous students to connect on various topics.

She co-founded the Traditional Ecological Knowledge club and is the current chair and graduate student representative. Jacobs reestablished an OSU chapter of the American Indian Science and Engineering Society and currently serves as president. She is secretary of the Indigenous Grad Student Alliance, and served as a member of the Indigenous Involvement Work Group for the George Wright Society. Jacobs is also a Ford Foundation Predoctoral Fellow, ARCS Scholar, Cobell Scholar, Native Nations Institute Awardee, Helen J. Harold Gilman Smith Scholar and Thurgood Marshall Scholar.

Jacobs says one of the best things about her graduate program has been working with her advisor, Associate Professor Ashley D'Antonio.

"Ashley D'Antonio's recreation ecology lab group is where the best GIS work is coming from in this field. She also provides an excellent example for how mentorship of graduate students can occur through positive and supportive interactions," says Jacobs. "I model my mentoring of students based on her actions."

After finishing her degree, Jacobs aspires to continue working in academia as a professor.

"My dream is to continue building knowledge about how outdoor recreation impacts Tribal Communities' marine systems," says Jacobs. "I plan to establish a lab group where I can dedicate space and time to mentoring Indigenous students and others from marginalized communities, including allies."

Indigenous women make up the smallest percentage of assistant, associate, and full professors nationwide — less than one-half of one percent. Jacobs hopes to use her position to show other Indigenous and marginalized people that they belong in the academy and help them realize their potential and achieve their dreams.

Trevor Denning

IMPROVING ACCESS

Trevor Denning is on a mission to make the outdoors more accessible for people with physical disabilities. And he's starting with Peavy Arboretum, in the Oregon State University College of Forestry Research Forests.

Denning, who graduated in 2022 from the College of Forestry with his bachelor's degree in tourism, recreation and adventure leadership, with a double minor in natural resources and leadership, has been in a wheelchair since 2011, after a spinal injury when he was 15. With the guidance of his major professor Ashley D'Antonio, he focused his final capstone project on ways to make Peavy Arboretum more accessible to those with physical disabilities. That project launched him into a short-term position with the research forests.

"I believe there needs to be more people who are disabled making decisions about accessibility because we are the ones with the real-world experience and know what needs to change," said Denning. "On many occasions, I have visited a local, state or national park that is deemed 'accessible,' when in fact, it is not."

Accessibility, according to Denning, is "not a one-shoe-fits-all type of problem to address."

"One of the greatest barriers or obstacles to accessibility is the lack of knowledge about the vast amounts of disabilities that exist," said Denning.

His work in the research forests will include providing trail information to people with disabilities so they can be empowered to make the best and most informed decision for themselves about whether they can navigate the trail. Information like trail length, width, travel surface, grade, elevation gain, location of the steepest pitch, as well as trail conditions, will be posted on the research forest website.

As the research forest team and volunteers perform trail maintenance and work on new trails, Denning will provide input and guidance and review processes like entrance and gate accessibility.

"Most people don't think of the research forest as a place for people with physical disabilities. But it needs to be," said Stephen Fitzgerald, director of the Oregon State University Research Forests. "Peavy Arboretum has shorter trails with less elevational pitch that have the potential to be modified easily. Trevor had a plan, ideas, expertise and the lived experience to help us begin to make these changes."

"Navigating a nondisabled world is tough," said Denning. "Restaurants, grocery stores, bookstores, classrooms and housing are some of the many things that need to be made more accessible. The first step is having people who are disabled in a position to make these changes. For the longest time, I have wanted to be one of those people."

And now he is.

After his work in the research forests, Denning hopes to work for a federal agency such as the Forest Service, Bureau of Land Management, National Park Service or the Army Corps of Engineers, helping give people with physical disabilities greater access to the outdoors.

Cat Carlisle

Klaus Puettmann

A LIVING LAB

Nearly a century of data provides knowledge for the future.

Since 1926, Oregon State University has conducted hundreds of studies across the College of Forestry's 15,000 acres of research forests. These studies have contributed impactful solutions to the everyday and real-world challenges of sustainably managing forests for many uses.

Cat Carlisle who is pursuing a graduate degree in the Forest Engineering and Resource Management department, is adding her own study to the mix, examining the potential for Oregon's forests to contribute to carbon storage and sequestration. Carlisle is analyzing the inventory of carbon stock in the McDonald and Dunn Forests — and projecting how different forest management strategies might shift carbon levels in the forests over the next 150 years.

"The hope is to find ways to use forest management to take carbon dioxide out of the atmosphere and sequester it in biomass, to contribute to climate change mitigation. I hope this project sheds light on how to manage a sustainable working forest in a way that considers ecological factors like carbon stock, especially as the climate changes," Carlisle explained.

Because Carlisle is conducting this work in the research forests, she was able to immediately jump in and access a wealth of existing data.

Edmund Hayes Professor in Silviculture Alternatives, Klaus Puettmann, manages a long-term research study in the McDonald-Dunn and facilitates opportunities for students to learn in the forests. His study investigates alternatives to clearcutting and examines whether features of mature and old-growth Douglas-fir forests could be retained through a variety of types of timber harvests. He is a staunch advocate for the research forests and their value as a long-term resource.

"The research forests offer examples of a wide range of forest conditions and hold great value for researchers and teachers who want to consider a multitude of forestry approaches," Puettmann says, "We don't have many examples of different silviculture treatments that are this close to campus and accessible to students."

Puettman says one of the greatest benefits of performing his research project on the McDonald and Dunn research forests is the wealth of long-term data available. "Researchers and educators investigating various studies can potentially launch their project with the help of decades of data," he said.

Learn more about past and present research in Oregon State University Reseach and Demonstration Forests at *cfprojects.forestry.oregonstate.edu*.

GOING BEYOND THE LAND ACKNOWLEDGMENT

Cristina Eisenberg, the Maybelle Clark Macdonald director of Tribal initiatives in natural resources and associate dean of inclusive excellence at the College of Forestry, is committed to creating a safe space for learning where everyone thrives.

"Inclusive excellence means regardless of barriers like socioeconomic status, gender identity or if you are a first-generation student or a person of color, you will thrive because we are actively working to dismantle and remove barriers to success," said Eisenberg. "This work is a process and involves the whole community, working together, with cultural humility."

> *"The College of Forestry is filled with changemakers, embodying inclusive excellence and allyship."*

In her role as director of Tribal initiatives, she leads the newly formed Indigenous Natural Resource Office and within it, the Traditional Ecological Knowledge (TEK) Lab.

"Tribal initiatives have everything to do with inclusive excellence," said Eisenberg. "My job was created to take the College of Forestry beyond the land acknowledgment, which is not just about Indigenous peoples — it's about everybody."

The Indigenous Natural Resource Office guides people and the institutions with whom they work to find ways to support and empower Indigenous peoples and their communities while advancing social justice. Their work braids together TEK and Western science and research to find solutions to humanity's most pressing natural resource conservation problems.

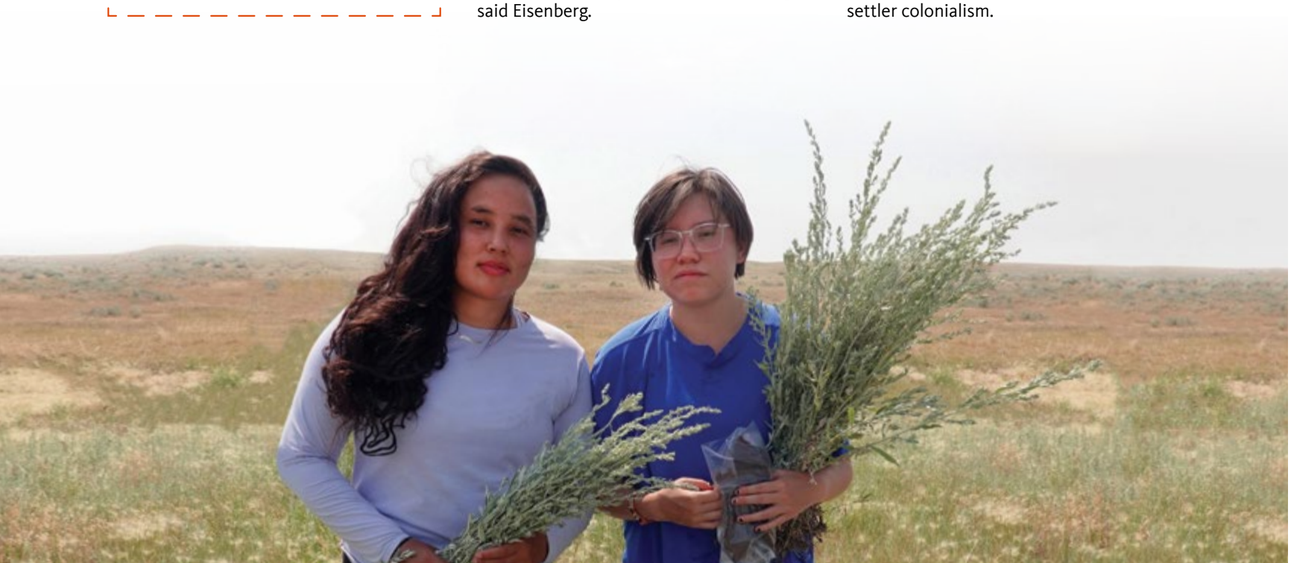
"Indigenous peoples have stewarded natural resources for millennia through their knowledge and traditional practices, and we want to decolonize and re-Indigenize the practice of science and advance holistic, systems-based thinking," said Eisenberg.

A priority for Eisenberg is to create, facilitate and support intercultural collaborative partnerships between Indigenous peoples, OSU, Federal agencies and conservation non-profits that identify mutual research interests, determine the tools needed and then co-create solutions that honor Tribal sovereignty.

Gail Woodside, Tribal liaison for the Indigenous Natural Resource Office and TEK Lab, says it's important that work with sovereign Tribal Nations be centered around not only decolonizing and partnering, but also following best practices and protocols.

"One way to do this, is to create a Memorandum of Understanding to lead and inform action," said Woodside. "As binding, enforceable contracts, these MOU's assist in protecting local knowledge, Elder interaction, and research processes in ceded lands, territories and fisheries in usual and accustomed locations."

Honoring Tribal sovereignty also means confronting the reality of what it means to be a land grant institution within an academic system founded on principles of settler colonialism.



"It means going beyond acknowledging to accepting responsibility for what was done to Indigenous communities — like forcible removal, displacement and trauma — and finding a solution," said Eisenberg.

Eisenberg believes education can be a powerful way to heal the damage. She is working to create opportunities and pathways for Tribal youth in higher education, using her lived experience as inspiration.

"I was a first-generation college student and am Latinx and Native American, of mixed Raramuri and Western Apache heritage," said Eisenberg. "I experienced homelessness, the farthest my parents made it was middle school, but I had a network of mentors that encouraged me to keep going. Everything I do is about paying that back."

While the TEK Lab's work takes place in the Western U.S., with a focus on the Pacific Northwest, the lab aspires to build allyships across cultures worldwide. Co-Principal Investigators like Tom DeLuca, dean of the College of Forestry, Tom Kaye of the Institute of Applied Ecology, and Luhui Whitebear of the Kaku-Ixt Mana Ina-Haws, embody this type of allyship.

"There is a hunger for Tribal inclusion, Tribal sovereignty, and honoring and respecting TEK," said Eisenberg. "And the College of Forestry is filled with changemakers, embodying inclusive excellence and allyship. From those who work within the Indigenous Natural Resource Office and participate in the College's Diversity, Equity and Inclusion workgroup, to those who work across the University, I have so much hope and feel so supported."

Opposite: Haile Chase-The Boy and Monroe Fox harvesting sage, Fort Belknap Indian Reservation; Photo by Cristina Eisenberg. Top: End of field season closing ceremony, Fort Belknap Indian Reservation; Photo by Erin LaMer. Center left: Dean Tom DeLuca collecting data with Savannah Spottedbird; Center right: Indigenous field technicians Monroe Fox and Tyrus Brockie braiding sweetgrass; Photos by Cristina Eisenberg. Bottom: TEK lab student, Brooklyn Richards, positions a marker; Photo by Karl Maasdam.

MORE TO MUSHOOMS THAN MEETS THE EYE

Certain species of ectomycorrhizal fungi are known to tolerate high metal environments, and initial work has shown that they may reduce metal toxicity.

Ray Van Court

Gerald Presley

No one loves mushrooms as much as Ray Van Court loves mushrooms.Their favorite food? Matsutake mushrooms. Their favorite hobby? Mushroom hunting. Their favorite time of the year? Mushroom season.

In fact, Van Court loves mushrooms so much they quit their corporate job to pursue ways to make the world a better place through fungi. As a Ph.D. candidate in wood science and graduate research assistant, Van Court is working on a project with assistant professor of forest-based bio-products Gerald Presley. Together, they use ectomycorrhizal fungi to bioremediate heavy metal-treated wood waste.

"Preservatives are critical to retaining the structural integrity of wood, but disposal of treated wood is problematic," Van Court says. "Wood treated with metals including arsenic and copper is disposed of in landfills, often unlined, where these toxic metals can move into the environment. Preventing the migration of these metals, and potentially recovering them, could reduce the ecological impact of these contaminants."

Certain species of ectomycorrhizal fungi are known to tolerate high metal environments, and initial work has shown that they may reduce metal toxicity. These mechanisms include binding them, transporting them, and producing compounds that stabilize the metals. Introducing fungi particularly adept at immobilizing metals in contaminated sites could reduce the environmental impact of toxic metal migration. The resulting retention of bound metals may also allow for reclamation.

This, says Van Court, represents a long-term solution to the problem of treated wood waste with little required inputs — all ectomycorrhizal fungi need are trees to associate with.

To test this idea, Van Court and Presley are performing a multi-stage lab experiment, screening 20 different species of ectomycorrhizal fungi in plate cultures against three toxic metals.

"This screening will identify which species best tolerate and uptake metals used in wood preservatives and is an enormous increase in species and metals compared to previous research," says Van Court.

In the second stage of the research, trees will be inoculated with the best performing fungi and planted in heavy metal-treated mesocosms, controlled containers that replicate natural environments. Trees and fungi will grow together in the metal contaminated system for a few months, after which their effect on metal will be measured. This initial work will test the effectiveness of the fungal system and pave the way for future field research.

While doing the research, Van Court was surprised by the scarcity of technologies related to ectomycorrhizal fungi and the limited knowledge on fungi growth. The fungi are usually in symbiosis with trees and for many species very little is known regarding how to replicate what the tree or other organisms in the ecosystem typically provide to the fungus.

"Admittedly, they are much harder to grow and maintain than decay fungi, but they represent a lot of untapped potential," Van Court says. "As all kinds of products — from medicines to packaging material — have come from decay fungi, what new sustainable products might come from ectomycorrhizal ones? With new analytical and genetic tools, I think we are poised to learn much more about these fungi, and I am excited to see where this research and other projects can go."

Marty Marrs

MAKING AN IMPACT

"Dream job" empowers Oregon State University Natural Resources graduate.

When Marty Marrs started thinking about changing careers, she knew one thing: This time, she wanted to do something that mattered to her.

Marrs graduated from Oregon State in 2022 after earning a B.S. in Natural Resources online through OSU Ecampus. Prior to that, she spent 18 years raising a family, which she loved, and also working in administrative jobs, which she wasn't as passionate about. "I just knew I had so much more to offer, and so much more to give," she said.

That's where Oregon State came in. A web search led Marrs, who was living in Georgia, to OSU Ecampus, where programs offered by the College of Forestry caught her eye. But she wasn't sure how to turn an interest in the natural world into an actual career.

"I was not your typical student," Marrs said. "I was making a complete career change, and I was also coming off of 18 years of staying at home with my kids. There is a lot of value and wisdom that comes with that, but I didn't know how to show that value."

An appointment with Britt Hoskins, the career advisor for students in the College of Forestry, helped change that.

"Britt took the time to talk to me, to find out where I did have experience, and helped me incorporate my OSU classes and the projects I did into my résumé," said Marrs.

Meanwhile, Marrs continued to take a full load of classes online through OSU Ecampus and moved cross-country from Georgia to Oregon, to be closer to her daughter and closer to more companies in the environmental consulting field.

As graduation approached, she saw a position posted with a sustainability consultancy in Portland, Oregon. She was interested but apprehensive because she did not meet every qualification. She applied anyway. After lots of preparation and two rounds of interviews, Marrs received the news she'd been dreaming of.

Marrs is now an impact assessment scientist with Environmental Resources Management, studying the ways that natural resources and human dimensions intersect in the environment.

"I love being able to play a role in keeping natural resources available and safe for everyone. That was my goal and drive for going back to school."

A version of this story was originally published in Horizons, blogs.oregonstate.edu/horizons

ENCOURAGING GLOBAL PERSPECTIVES

After a two-year COVID-19 hiatus, the College of Forestry was first out of the gate at Oregon State University to relaunch its international student programs.

Coordinating multiple international undergraduate and graduate student experiences, travel arrangements and academic details is no small feat. Adding a global pandemic to the mix? That adds a whole new level of stress and logistics.

But when the pandemic halted international travel, the International Programs team at the College of Forestry (Director Michele Justice, Manager Kerry Menn and Administrative Assistant Rona Bryan) rose to the challenge, shifting their focus to online engagement on a global scale. In 2021, the team hosted a virtual Future Forests workshop in partnership with the University of British Columbia and University of Helsinki, which drew over 500 viewers worldwide. Funded by the US Forest Service International Programs, the team also supported a cohort of 12 Peruvian students who completed the Master of Natural Resources program in an OSU-led project aimed at building capacity in the Peruvian forestry education sector.

In 2022, as travel restrictions lifted, the College of Forestry was first to relaunch their portfolio with five of the 11 programs offered university-wide originating from the college. Students embarked on exchange, study abroad and internship programs all over the world including Ireland, at Bangor University in Wales and at the University of Canterbury in New Zealand. The Dean's Tour resumed, and Dean DeLuca led a group to Finland and Sweden to learn about innovations in forestry and resource management.

Two new faculty-led programs also made their debut. The Salmon Coast: Forest + Resource Management for Sustainability in Canada launched on Vancouver Island, British Columbia. The program introduced students to the interaction between sustainable forest management and Indigenous Knowledge.

Also new was the Land of the Long White Cloud: Ecosystems of New Zealand program. The popular Mountains to the Sea: Ecosystems of Chile program, in its fifth year, was relocated to Patagonia and hosted by a new university partner, Universidad Aysén de Chile.

"I returned from Chile with direction and hope," said Maya Greydanus ('23), a Forestry undergraduate specializing in forest restoration and fire option. "My time abroad influenced me to be more thoughtful and selfless in my planning. I now know I want to work towards reducing global waste, live like a citizen of an international community and seek out the humility of being a guest in another culture."

2022 FACULTY-LED INTERNATIONAL PROGRAMS:

- Salmon Coast (Canada): Mindy Crandall
- Mountains to the Sea (Chile): Carlos Gonzalez, Claudio Guevara
- Italian Alps: Mariapaola Riggio, Eric Hansen
- Malaysian Borneo: Mark Needham, Matt Betts, Ian Munanura
- New Zealand: Dave Shaw, Chris Still, Adam Sibley

Opposite: University of Canterbury's Cass field station. Right, top to bottom 1: Stella Peters, a Kiix̱in tour guide leads Salmon Coast faculty-led program participants through the only known remaining traditional First Nations village on the west coast of southern British Columbia, which was inhabited by Huu-ay-aht ancestors for more than 5,000 years. 2: Mountains to the Sea: Ecosystems of Chile participants enjoy the view during a learning experience at Río Simpson. 3: Luis Prato, a visiting scholar from Chile sponsored by Associate Professor Seri Robinson, concludes his time at OSU with an exhibition of his woodturning and laboratory work. The College of Forestry International Programs welcomes interns and exchange students from around the world and in FY 21-22, the college hosted 25 international scholars. 4: Architect and industry leader in renewable material Jaakko Torvinen (right) presents his landmark work Pikku-Finlandia, which utilizes whole trees as load-bearing columns, to the Dean's Tour in Helsinki, Finland. Following the Tour, Jaakko came to the College of Forestry as a visiting scholar, supported by Thompson Timber.

A SUMMER JOB LIKE NO OTHER

Forest engineering student, Casey Warburton ('23) gained field research experience in Oregon and California.

Some college students take a break from academics or research in the summer, finding jobs that take their minds off school. Not Casey Warburton.

"I worked in many research forests all over Oregon and California including the H.J. Andrews Experimental Forest, Hinkle Creek and even down in the redwoods," Warburton said. "College of Forestry Professors Catalina Segura and Kevin Bladon gave me specific tasks to do, but I also had the opportunity to assist graduate students in their research."

Some of Warburton's most memorable field work included performing synoptic sampling of the H.J. Andrews watersheds. To do this work, he hiked up the two main streams collecting water samples, and hiked up almost every tributary that flowed into the two main streams.

He also enjoyed learning about how water flows through the soil after large storm events. To examine these processes, he dug three soil pits along a hillslope near streams in three different locations to install sensors that detect water in the soil.

"One of my favorite memories of this fieldwork was when my partner and I were taking samples out of one of the main creeks in the H.J. Andrews Forest and looking around at the water, the trees, all the rocks, downed logs, and thinking how lucky we were to see everything we were seeing around us," Warburton said. "It made me realize how so very few people have had the opportunity to experience that stream from that specific location."

Warburton said his summer fieldwork experience was eye-opening.

"Seeing all the different research and participating in so many different projects gave me a new understanding of all the different parts and pieces of a watershed and how they interact."

EDUCATION HIGHLIGHTS

The College of Forestry's Renewable Materials undergraduate degree is now called Wood Innovation for Sustainability, a title that better reflects the degree curriculum and the state-of-the-art advancements in wood technology. The college is also offering a new undergraduate minor, Wood Products Sales, which primarily targets sales-oriented College of Business students. As part of the recruiting strategy for the minor, the Wood Science and Engineering department (WSE) is engaging with industry partners who fund scholarships via our Wood Industry Sales Professionals program. A huge thanks to: Wildwood Trading Group, founding sponsor along with the Portland Wholesale Lumber Association, Bright Wood, Affiliated Resources, Timber Products, Plateau Forest Products and Patrick Lumber.

The Department of Forest Engineering Resources and Management passed both the Society of American Foresters (SAF) and Accreditation Board for Engineering and Technology (ABET) accreditation in 2021 and 2022. Accreditation is given to programs that meet the highest standards of academic programs.

Associate Professor **John Punches** received a $800,000 grant from the Bureau of Land Management to create a Professional Fire Management program at Oregon State University. He is working collaboratively across the college to implement and has created programming including prescribed burning practicums and guard school.

After a two year pause due to the COVID pandemic, Professor **Lech Muszynski** took a group of students, faculty and staff back on the road for the WSE "manufacturing experience" course. With help from **Scott Leavengood**, the Director of the Oregon Wood Innovation Center, and **Fred Kamke**, the JELD-WEN Professor of Wood-Based Composite Science, and two years of virtual delivery led by Education and Internship Coordinator **Michelle Maller**, connections with regional companies were renewed and updated and 13 manufacturing facilities were visited.

Professor **Laurie Schimleck** received the Society of Wood Science & Technology's (SWST) Distinguished Educator Award for 2022. The award was given at the SWST annual meeting in Kingscliff, Australia.

Arijit Sinha received a USDA grant for a project titled Training the Next Generation in Digital Manufacturing and Mass Timber Buildings 2.0. The grant provides funds for summer internship experiences for approximately 50 undergraduate researchers over five years, focused on research or Extension. These summer internships require active participation in research and/or Extension to build critical thinking and problem-solving abilities, preparing undergraduates to be workforce ready upon graduation. As sustainability concerns multiply, the use of mass timber in tall buildings is also increasing. These internship experiences focus on digital manufacturing and an increased understanding of wood technology and instill in students the unique knowledge and skills needed by this economically critical sector.

Professor **Jim Rivers** developed a new course called Terrestrial Vertebrate ID and Natural History that will be offered on-campus and e-campus.

Stewart Professor of Forest Operations **Woodam Chung** organized a conference that brought together the Council on Forest Engineering (COFE), the International Symposium on Forest Mechanization (FORMEC), and the International Union of Forest Research Organizations (IUFRO) Division 3 for three days in Corvallis, Oregon. This international meeting was the first time in 50 years that U.S. and European groups had met to discuss cutting-edge scientific research and innovative practices in forest operations and engineering.

Woodturning with Science I, led by Wood Science & Engineering faculty member **Seri Robinson** had the largest enrollment ever in Fall 2022. The first bowl assignment generated a large, diverse set of bowls from multiple species, including fir, maple, walnut, cherry burl, elm and hickory. None of the students had used a lathe before classes started.

Assistant Professor **Mindy Crandall** inspired and excited foresters about forest policy and the social aspects of forestry through her class FOR 460. Though the subject material is challenging, she is able to transform the ways future foresters view the complicated interplay between policy, society and the environment.

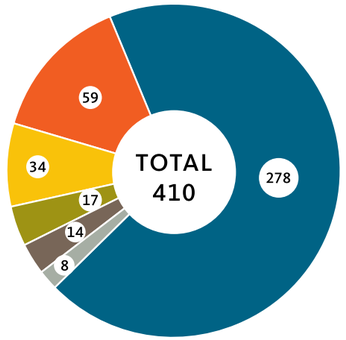
Associate Professor **Catalina Segura** was named a Fisher Family Faculty Fellow. This honor is given to those who display professional excellence. Segura also received a National Science Foundation Faculty Early Career Development (CAREER) award, one of the NSF's most prestigious honors. Her NSF CAREER grant includes outreach at the Oregon Museum of Science and Industry (OMSI) during the meet-a-scientist days in addition to creating curriculum for the museum. As a geomorphologist and hydrologist, Segura is interested in the movement of water and sediment in mountainous landscapes.

Professor **Temesgen Hailemariam** was appointed as the N.B. and Jacqueline Giustina Professor of Forest Management and the Director of the Center for Intensive Planted-forest Silviculture. Temesgen has been with the College of Forestry since 2003. Temesgen has had a prolific career in growth and yield modeling, silviculture, forest operations, carbon estimation, and climate change issues. His work has resulted in over 90 peer-reviewed publications and $4 million in funding. Importantly, he has trained 7 Ph.D. and 15 M.Sc. students that have gone on to distinguished careers in academia, agencies, consulting, and private industry. Over his career, Temesgen has been honored with several awards including the Dean's Award for Outstanding Achievement in the Mentorship of Graduate Students (2019), the Xi Sigma Pi Mentor Award (2008) and the Emerging Scholar Faculty Award of the OSU chapter of the Honor Society of Phi Kappa Phi (2007). The Giustina Professor of Forest Management endowment honors Nat, '41, and his wife Jacqueline Giustina. Their son, Larry Giustina, '71, and his wife Carolyn Keen Giustina, '71, generously supported this endowed professorship.

For two years in a row, attendance at the College of Forestry career fair has seen steady growth. This is a testament to the hard work of people like **Brooke Harrington** and **Britt Hoskins**, the Career Development Center and other partners to promote and run the event. In 2022, the career fair continued to gather momentum as evidenced by the record attendance of over 200 students. Compared to our total Corvallis-based undergraduate enrollment, this represents a 26% engagement rate at a non-required event. The percentage of female students attending increased by 11% from 33% in 2021 to 44% in 2022 and veteran students attending increased by 50% over 2021, from 8 to 12 students. 85% of the students attending were from the College of Forestry and we were able to engage an average of 34 industry partners each fair.

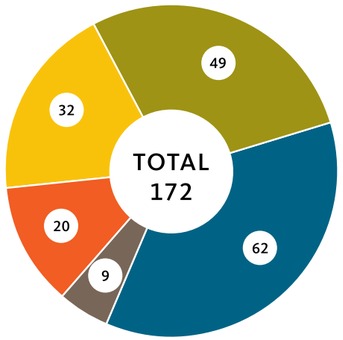
UNDERGRADUATE AND GRADUATE STUDENT ENROLLMENT STATISTICS

FY 2021 – FY 2022



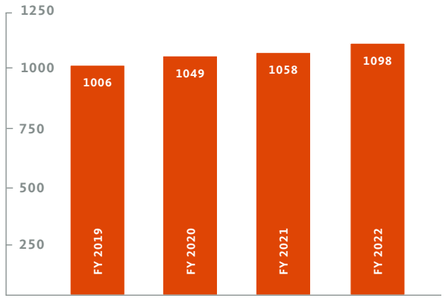
TOTAL UNDERGRADUATE DEGREES AWARDED BY MAJOR
FY 2021 – FY 2022

- NATURAL RESOURCES
- FORESTRY
- TOURISM, RECREATION AND ADVENTURE LEADERSHIP
- FOREST ENGINEERING
- WOOD INNOVATION FOR SUSTAINABILITY *(FORMERLY RENEWABLE MATERIALS)*
- FOREST ENGINEERING/ CIVIL ENGINEERING (DOUBLE)

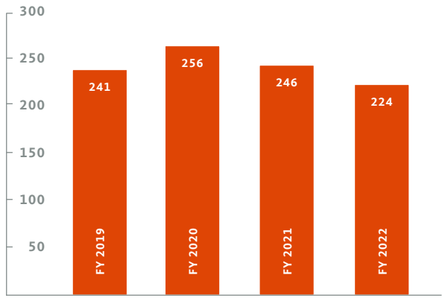


TOTAL GRADUATE DEGREES AWARDED BY TYPE
FY 2021 – FY 2022

- MASTER OF NATURAL RESOURCES
- GRADUATE CERTIFICATE
- MASTER OF SCIENCE
- DOCTOR OF PHILOSOPHY
- MASTER OF FORESTRY



UNDERGRADUATE ENROLLMENT



GRADUATE ENROLLMENT

RESEARCH

TESTING THE TRIAD

Balancing timber production to maximize biodiversity.

As the human population grows, the demand for resources is increasing. But at what cost to biodiversity? Just as the agricultural industry contends with how to sustainably feed eight billion humans, the challenge for forest managers is to find sustainable ways to meet human wood consumption needs, explains Matt Betts, Ruth H. Spaniol chair of renewable resources and professor in the department of Forest Ecosystems and Society.

"What we consume has a huge impact on our planet's biodiversity," said Betts. "But very few researchers have tested approaches to minimize tradeoffs between timber production and biodiversity conservation."

Betts explains that in agriculture, there are two main camps of thinking. The first, "land sparing," involves setting aside large portions of the landscape as unmanaged reserves, and growing crops intensively in others. The second, "land sharing," involves low-intensity "nature-friendly" agriculture. This results in lower yield, increased total area for food production and therefore few or no reserves.

In forestry, this "land sharing versus sparing" model has been expanded to a triad approach, where a given landscape may be divided into differing proportions of three distinct management groups — reserves, focused on biodiversity conservation; intensive management, focused on wood production; and ecological forestry, which is a mix of both.

To test this approach, he is collaborating with stakeholders inside and outside the College of Forestry to launch a 20-year study across 40 different sub-watersheds in the Elliott State Research Forest. The research is designed to test different proportions of all three management types across various forest landscapes (watersheds). By doing this, Betts and his team hope to learn how these management approaches affect biodiversity and wood production over time.

Before the project can begin, it must gain the approval of many stakeholder groups to be completed on the state-owned forest. In the meantime, Betts is working on a shorter-term version of this project funded by the National Institute for Food and Agriculture.

In collaboration with several college researchers, including Klaus Puettmann, Doug Mainwaring and John Sessions along with Taal Levi, a professor in the Department of Fisheries, Wildlife and Conservation Sciences, and doctoral student Maggie Hallerud, Betts' team is collecting data from forests that fall under the categories of reserve, intensive management and ecological forestry. They are performing preliminary modeling about how each approach affects biodiversity. Hallerud is leading the biodiversity data collection and analysis and Levi is leading the eDNA analysis in this work.

Before and after each experiment, the team counts various species, measures vegetation and incorporates cutting-edge research methods. Researchers are identifying recorded bird sounds through machine learning, tracking wildlife with game cameras powered by artificial intelligence and using DNA barcoding (eDNA) to monitor species diversity.

This study comes with limitations, however, and Betts thinks the most meaningful insights will come from a longer-term project with more controlled experiments at landscape scales.

"That's the real gold standard for science," he says. "What we find in short-term studies is often overturned by what we find in long-term studies. And with how long-lived trees are, there's certain information we could never get during a single career."

Betts believes a long-term research project in the Elliott State Research Forest could offer critical insights into how to conserve biodiversity and sequester carbon while sustainably keeping up with society's increasing demand for wood products.

"We don't have enough information about this mix of forestry practices in the Pacific Northwest," he said. "A long-term project like the one proposed for the Elliott would enable us to try to reduce the potential trade-offs between timber production and conservation — and identify an ideal mix of forestry management practices that enable production of wood while still maintaining biodiversity. If successful, this could be a fantastic example of approaches to balance human needs with biodiversity conservation, and how people can collaborate to move beyond historical conflicts about forest values."

MODULAR MASS TIMBER

Advancing mass timber to boost affordable housing and jobs.

What if we could accelerate the use of mass timber, restore forests, create jobs and address the housing crisis in Oregon?

The Oregon Mass Timber Coalition thinks it's possible. In September 2022, the OMTC was awarded over $41 million by the U.S. Economic Development Build Back Better Regional Challenge, to strengthen Oregon's national leadership in mass timber, adding new capacity to produce mass timber modular housing.

"The housing crisis in Oregon is severe, with our state ranking 49 out of 50 for housing supply relative to its population," says Iain Macdonald, director of the TallWood Design Institute at the College of Forestry. "A thriving mass timber industry could help provide affordable housing, while also decreasing the carbon footprint of built environments, improving the resilience of forests and creating living-wage jobs."

Oregon State University is a key leader in the OMTC, which includes Business Oregon, the Oregon Department of Forestry, and the University of Oregon. The two universities are spearheading the research for the coalition, including the development of two new facilities: the Oregon Acoustic Research Lab at the University of Oregon, and the Oregon Fire Testing Facility at OSU.

Stewart Professor of Forest Operations Woodam Chung is leading an important pillar of the project. He aims to leverage "smart technology" to modernize the field of forestry.

Chung explains that forestry in the region — and its workforce — has suffered from a lack of innovation, jeopardizing the sector's sustainability and global competitiveness.

Forestry is also one of the most dangerous job sectors in the country — and has a diminishing and aging workforce.

But, Chung says, "smart forestry" can help shift these trends by modernizing forest practices through innovative technologies that make forestry more efficient and safer — from harvest to mill.

> *"We're looking at all of these interconnected issues holistically and weaving together research projects that can enhance and expand the mass timber industry."*

One pilot project Chung will pursue through the grant is the use of smart cameras on harvesting machines. The cameras use data-driven algorithms to detect which trees to harvest in real-time, based on their species, size, straightness and knot sizes. This kind of technology will enable foresters to utilize small diameter trees for mass timber and maximize the value recovery of forest resources.

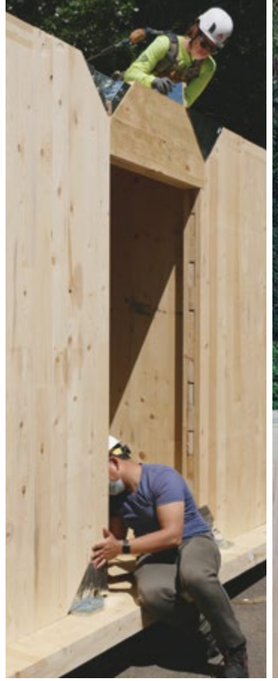
"We can apply this system to forest restoration practices, so we can efficiently separate trees that could be utilized for mass timber at harvest. This can improve the efficiency of wood handling and supply," he says.

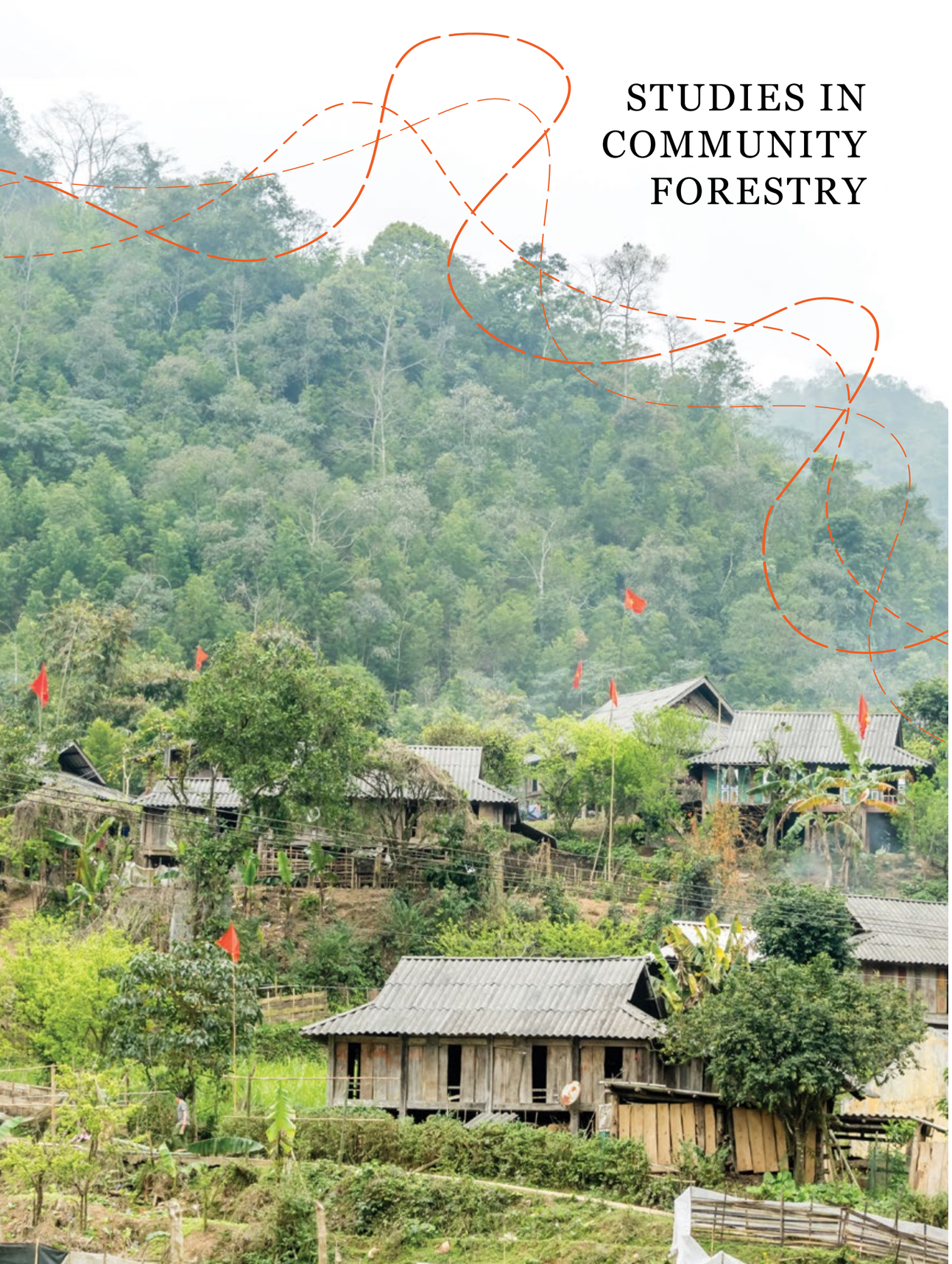
He explains that this will also increase fire resilience, as it will help thin dense forests so there is less wildfire fuel left behind. This is important economically, too. Forest restoration is costly, and if the removed fiber can be gainfully used in a commercial mass timber product, the U.S. Forest Service will be able to treat more acres each year.

Chung is also working on landscape mapping, wearable devices to improve health and safety for workers, and smart sensors.

"This kind of technology is a win for forest health, fire resilience, economic development and the environment," says Chung.

"We're looking at all of these interconnected issues holistically and weaving together research projects that can enhance and expand the mass timber industry," says Macdonald. "It's an incredible opportunity to drive real change that will result in meaningful improvements to livelihoods and our environment."





STUDIES IN COMMUNITY FORESTRY

Reem Hajjar

Modeling interactions between community forest dynamics and local livelihoods amidst institutional changes.

The National Science Foundation awarded associate professor Reem Hajjar $1.6 million through the Dynamics of Integrated Socio-Environmental Systems (DISES) program to research community forestry in Southeast Asia.

Hajjar, with a team of researchers, will study the impacts that community forestry has had on preventing deforestation while enhancing local livelihoods dependent on those forests. Researchers include Ruth H. Spaniol chair of renewable resources and professor in the department of Forest Ecosystems and Society, Matt Betts, associate professors Robert Kennedy and Jamon Van Den Hoek from the College of Earth, Ocean, and Atmospheric Sciences assistant professor Samuel Bell from the College of Agricultural Sciences, as well as participating organizations, the Spatial Informatics Group and the Center for People and Forests (RECOFTC).

"Scholars and practitioners have long sought answers to the question: what institutional arrangements — such as particular policies, organizational structures, informal norms and rules — are best to balance the two, often competing, objectives of rural development and forest conservation?" Hajjar says.

Case studies show that community forest management, where some degree of forest rights and responsibilities is transferred to local communities, can be an effective form of decentralized forest governance, but long-term success and sustainability are variable.

"Our project will identify the conditions that lead to positive community forest management outcomes, like increased forest cover, biodiversity, or local incomes, and the contexts and arrangements that lead to substantial trade-offs across Vietnam, Thailand and Cambodia," Hajjar says.

In an unprecedented scale of analysis, this project is currently investigating the impacts of community forest management on forest conditions and livelihoods. Using spatial datasets, researchers are testing the hypotheses that community forest management is more likely to maintain and restore forest cover and biodiversity and enhance community livelihoods relative to forests that national governments manage.

The research team expects the magnitude of these impacts will be affected by the types of rights that communities can exercise over their forests and how secure those rights are. They also expect that impacts will be affected by baseline social conditions, like poverty levels and distance to markets, and baseline ecological conditions, like forest degradation and agricultural suitability. The researchers are also hoping to uncover the feedback mechanisms that drive this social-ecological system towards positive outcomes. In 2023, the team began field work in Cambodia, visiting a number of rural communities and their forests to better understand the mechanisms behind how these institutional changes are changing social-ecological interactions on the ground.

"With our research design, we can test to see if a positive feedback loop is driving social-ecological outcomes. Since communities now have some rights over those forests, we can see if communities are benefiting from more forest products and services associated with improving forest conditions," Hajjar says. "That, in turn, could incentivize them to continue to manage the forest sustainably and lead to better forest conditions."

The result will be generalizable models that recognize feedback between forest conditions and livelihoods under community forest management. The goal is to produce models capable of predicting landscape and livelihood changes at various spatial and temporal scales under changing institutional drivers and ecological conditions.

The project is also training Ph.D. students and postdoctoral fellows in data science, spatial analysis, biodiversity modeling and qualitative methods. Course materials will be developed to bring socio-environmental modeling exercises into the classroom at Oregon State and at a partner university in Cambodia. Open access, user-friendly datasets, maps and models will be available for scholars and practitioners working on environmental governance systems in the U.S. and beyond. Finally, policy briefs will be produced to inform ongoing debates about community forestry in southeast Asia.

"This work will be of interest to governments and organizations promoting local governance of natural resources, including in the U.S., where forests under community management are increasing in number, and in low- and middle-income countries where communities manage over 25% of forests," Hajjar says.

POST-FIRE: DEBRIS FLOWS

Predicting near real-time post-fire debris flows along ODOT corridors.

Landslides can have major environmental, societal and economic impacts — and they often occur in conjunction with extreme events, like heavy precipitation, wildfires and earthquakes.

In mountainous, forested terrain across the West, like in Oregon, shallow landslides are a persistent hazard that can impact aquatic ecosystems and the structure of a forest. But despite the prevalence of this hazard, much remains unknown about the interplay between a landslide, the forest structure, and events like heavy rainfall and wildfires.

Richardson Chair in Forest Engineering, Resources and Management, Ben Leshchinsky is leading a team to learn more about landslides in forested environments — which will help provide new insights into how the dynamics of a forest and its vegetation affect the size and rate of landslides. This group is developing models to predict the susceptibility of future slides in mountainous, forested regions and evaluate the importance of forest vegetation on landslide size and rate. These efforts will provide insights into how vegetation may influence shallow landslides, particularly following wildfire.

The team is using climate monitoring stations, remote sensing and field testing of burned and live roots across the Cascades to better understand how factors like slope vegetation influence the likelihood of landslides and debris flows, as well as the timing at which these hazards are critical. Understanding more about slope stability and susceptibility will also provide valuable insights into how extreme events like heavy rainfall might initiate slope failure — especially how forests and their associated root strength may control post-wildfire mass movements.

Oregon State University researchers are collaborating with many agencies on this project including the Oregon Department of Forestry, the United States Forest Service, the United States Geological Survey, Oregon Department of Geology and Mineral Industries, and Oregon Department of Transportation.

POST-FIRE: RECOVERY

Assessing post-fire land management practices to improve recovery of soil health, vegetation and ecosystem services.

With the dramatic increase in wildfire activity in the western United States, post-fire land management has also increased to recoup economic value from burned forests, improve forest safety and expedite recovery and restoration of soil health, vegetation and forest and aquatic ecosystem functions.

However, limited research on post-fire land management strategies — like emergency stabilization, salvage logging or herbicide application — has led to uncertainty about the effectiveness of available management practices, particularly in relation to soil and water.

Professor Kevin Bladon is leading research to quantify the effects of wildfire and post-fire land management practices on soil physical properties, biogeochemical processes and vegetation recovery. He and his team hope to facilitate improved policy and management decisions that will reduce soil erodibility, improve soil nutrient availability and encourage vegetation regeneration in areas impacted by wildfires.

"Our research is occurring on the west side of the Oregon Cascade Mountains in collaboration with a range of landowners who have each approached post-fire land management differently," Bladon said. "Our preliminary data has led to unexpected and conflicting results," he added, "which indicates the need for additional research to inform the development of better decision support tools for land managers."

NEW AND CONTINUING AWARDS BY SPONSOR
FY 2021 – FY 2022

SPONSORS	FY 2021	FY 2022	TOTAL
FEDERAL	**$7,593,102**	**$10,790,550**	**$18,383,652**
USDA United States Forest Service	$2,715,074	$3,351,158	$6,066,232
National Science Foundation	$1,400,342	$3,722,144	$5,122,486
USDA National Institute of Food & Agriculture	$1,656,132	$2,414,399	$4,070,531
USDA Agricultural Research Service	$840,096	$461,444	$1,301,540
US Department of Energy	$274,407	$452,410	$726,817
USDA Agricultural Marketing Service	$500,000	-	$500,000
USDI United States Geological Survey	$17,438	$268,995	$286,433
USDA Animal & Plant Health Inspection Service	$120,000	$120,000	$240,000
USDI National Park Service	$69,613	-	$69,613
STATE	**$845,913**	**$3,411,771**	**$4,257,684**
Oregon Department of State Lands	$559,200	$1,869,670	$2,428,870
California Department of Forestry & Fire Protection	$128,570	$448,510	$577,080
Oregon Department of Transportation	-	$417,000	$417,000
Washington Division of Natural Resources	$25,779	$288,400	$314,179
Oregon Department of Forestry	$32,334	$169,691	$202,025
Oregon Forest Resources Institute	$61,981	$116,359	$178,340
Oregon (various)	$38,049	$52,141	$90,190
Subawards	-	$50,000	$50,000
OTHER	**$1,140,338**	**$568,094**	**$1,708,431**
National Council for Air & Stream Improvement	$307,572	$180,000	$487,572
Non-profits (various)	$240,162	$185,170	$425,332
Industry	$374,116	$10,630	$384,746
Subawards	$138,968	$53,900	$192,868
Foundations	$10,000	$107,644	$117,644
Municipal	$69,520	$30,750	$100,270
TOTAL SPONSORED AWARDS	**$9,579,352**	**$14,770,415**	**$24,349,767**
SPECIAL PROGRAMS	**$3,448,194**	**$3,221,893**	**$6,670,087**
OSU Cooperatives — Industry, State, Federal	$1,980,052	$1,818,907	$3,798,959
McIntire Stennis — USDA Formula Funds	$1,187,114	$1,147,021	$2,334,135
Fish & Wildlife Habitat in Managed Forests (FRL)	$281,028	$255,965	$536,993
GRAND TOTAL	**$13,027,546**	**$17,992,308**	**$31,019,854**

RESEARCH HIGHLIGHTS

Since late 2018, Oregon State University, the Department of State Lands, the State Land Board, Tribal representatives, and a dedicated and diverse stakeholder advisory committee have worked tirelessly towards a vision to transform the Elliott State Forest into a world-class research forest. In April 2022, this vision became a reality with the passing of senate bill 1546-1, which will secure the Elliott as a publicly-owned living laboratory, protected for generations to come as a place for scientific inquiry, conservation, education, economic growth, cultural preservation, and recreation. As Oregon State University refines the Elliott State Research Forest management plan, the College of Forestry is just beginning to explore the profound research possibilities the forest opens up.

The H.J. Andrews Experimental Forest Long-Term Ecological Research (LTER) program is managed by Oregon State University in partnership with the U.S. Forest Service. First established in 1948 by the U.S. Forest Service, the Andrews, as it's affectionately known, was designated a Long-term Ecological Research site in 1980 and is one of 25 nationwide sites funded by the National Science Foundation. Many of the active research sites have been monitored for 50-60 years — an exceptionally rare occurrence as less than two percent of ecological studies last more than five years — and major research themes of the program include disturbance processes, landscape and water dynamics, carbon sequestration and fluxes, biological diversity, forest-stream interactions, soil and watershed processes, and the cultural dimensions of forests and watersheds. The history of the H.J. Andrews Forest Program, like that of any long-term ecological research program, has not only revealed environmental trends over time, but also revealed important knowledge for society, provoking questions about humankind's relationship to the world. In FY 2021, the H.J. Andrews Forest Program received renewed funding of over $1 million from the National Science Foundation for another six years.

Associate Professor **Emily Jane Davis** and Workforce Coordinator **Manuel Machado**, along with partners from the College of Forestry, the University of Oregon, Utah State University, and Lomakatsi Restoration Project, are leading a project funded by the US Department of Agriculture's Agriculture and Food Research Initiative to increase recognitional equity of the labor-intensive forest workforce and grow awareness of their crucial role in ecosystem restoration and wildfire risk reduction. In addition to building and sharing knowledge, including practical advice for private landowners about how to recognize and potentially avoid creating inequitable, unsafe working conditions when contracting service forestry activities, the project is also building partnerships with organizations like Rural Development Initiatives, Washington Department of Natural Resources, and Firelands, a rural worker solidarity organization. Davis and her collaborators are developing educational materials and training for workers and businesses and launching a website as a one-stop source of information for the project.

Following the severe 2020 Archie Creek wildfire in western Oregon, Professor **Kevin Bladon** and Associate Professor **Dana Warren** explored the effects of stream temperature on native salmonid fish populations in the Hinkle Creek watershed, a tributary to the Umpqua River, that was almost entirely burned. Their research, published in the Ecosphere journal, showed that loss of riparian forests from wildfire led to increased stream temperatures in summer, yet salmonid fish persisted.

Assistant Professor **Mindy Crandall** is leading a research project that aims to better understand the dynamic relationships that exist between forests and communities in the West — and uncover more information about active forest management. Generating more knowledge about these connections will help support decisions related to how we might best manage forests to provide ecosystem services, like carbon sequestration, and economic value to rural communities while dealing with wildfire risks.

Oregon Wood Innovation Center continues to support advances in wood technology and ensure products meet performance standards related to fire resistance, weathering, moisture and durability. OWIC's relationships with individual companies, fostered by Professor and Director **Scott Leavengood**, continue to help meet the OWIC goal of "connecting people, ideas, and resources." Several projects related to new product development are either planned or continuing — including developing composite panels from horticultural residues, evaluating new fire-retardant coatings for plywood and particleboard; testing wood wool cement boards (in collaboration with Wood Science and Engineering Professor **Arijit Sinha**) and leading a U.S. Forest Service-sponsored project to densify common decking materials and assess fire performance of mock decks.

The development of mass timber products has allowed engineers to build taller and stronger timber structures to replace steel and concrete structures in multi-family residential and commercial buildings. Veneer based products such as Mass Ply Panels (MPP) are the next generation mass timber panel products that will drive innovation towards low seismic damage and less time to functional recovery of a building. A full-scale three story building made entirely of veneer-based composites with Oregon grown fiber was designed, constructed and tested at the College of Forestry's new A.A. "Red" Emmerson Advanced Wood Products Laboratory. Two phases of testing to validate low damage resilient design have been conducted while the third and final phase is planned for June 2023. Successful demonstration of this low damage performance-based design will lead to increased use of mass timber in building applications and increased confidence in the material.

The College of Forestry is leading a three-year, $4 million-dollar project, with the U.S. Forest Service, Washington State University, Montana State University, and multiple other partners from academia, government, Tribes and community organizations, to develop critical knowledge and increased capacity to inform policy and management decisions for resilient forested watersheds and downstream communities to ensure the protection and distribution of safe drinking water. The funding for this work was part of the 2022 U.S. federal budget and was put forward by U.S. Senator Jeff Merkley as a priority issue.

Associate Professor **Dana Warren** is leading a collaborative, interdisciplinary National Science Foundation-funded project to integrate art history with historical ecology. The project uses 19th-century landscape art to explore pre-industrial forests in the northeastern U.S., creating a path forward for future work that uses art in scientific research. Collaborators include other faculty at Oregon State University, including Professor and Extension Forest Health Specialist **Dave Shaw**, as well as researchers from the University of Vermont, the U.S. Forest Service (Durham, NH office), and the Smithsonian American Art Museum.

Associate Professor **Mariapaola Riggio** is investigating the impact of environmental and design factors on the performance of advanced wood products in mass timber buildings. As part of her research, Riggio transformed the College of Forestry's Peavy Forest Science Center (PFSC) into a living laboratory to examine the long-term performance of mass timber buildings. She installed structural health monitoring systems around the PFSC to track different factors, like moisture levels that could lead to rot or decay.

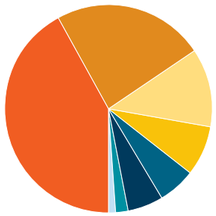
Associate Professor **Bogdan Strimbu** is leading a research project that aims to improve remote sensing forest inventory data collection by developing an operational system to integrate the data, or point clouds, and provide a more complete inventory of forests. The goal is to develop two software programs, one that will fuse point clouds from above and below the canopy — and another, which will compile a comprehensive forest inventory from point clouds. Providing a nearly complete picture of the forest ecosystem will help researchers and forest managers better understand the effects of climate change, including threats to trees like fires, insects, diseases and competition, the state of wildlife habitat and the status of carbon storage.

Associate Professor **Catalina Segura** is leading a project to build knowledge about the vital process of water movement in forested watersheds by researching how storm events affect water and sediment transport through them. This research will help inform management policies, practices and regulations and provide valuable data and tools to better understand and predict the impacts of disturbances to forested watersheds.

RESEARCH EXPENDITURES BY SOURCE
FY 2021 – FY 2022

SOURCES	FY 2021	FY 2022
Grants and Contracts	$10,061,696	$10,530,888
Forest Research Lab Appropriation	$5,580,825	$5,968,988
Forest Research Lab Harvest Tax	$2,895,523	$3,005,296
Research Cooperatives	$1,980,052	$1,818,907
Endowments and Gifts	$1,244,457	$1,615,836
McIntire-Stennis Federal Appropriation	$1,186,331	$1,498,507
Indirect Cost Recovery	$427,848	$467,117
Other (Sales and Service)	$216,662	$339,264
TOTAL	**$23,593,393**	**$25,244,802**

RESEARCH EXPENDITURES BY SOURCE
FY 2021 – FY 2022 PERCENTAGES



- **42.2%** Grants and Contracts
- **23.6%** Forest Research Lab Appropriation
- **12.1%** Forest Research Lab Harvest Tax
- **7.8%** Research Cooperatives
- **5.9%** Endowments and Gifts
- **5.5%** McIntire-Stennis Federal Appropriation
- **1.8%** Indirect Cost Recovery
- **1.1%** Other (Sales and Service)

OUTREACH

PRESCRIBED BURN EDUCATION

Prescribed fire training and education transforms rural residents' relationship to fire and builds a foundation for effective landscape restoration.

For many Oregonians, fire means smoke, summer anxiety and blackened landscapes. With the increasing number and intensity or wildfires, the need to do something is urgent.

More than 1 million acres of land — many of them forest and wildlands — burned during the highly destructive wildfires of 2020. Clearing brush is essential to mitigating wildfire in Oregon, and one way to do this is through controlled burning — purposeful lighting of fire under ideal weather conditions, with safeguards in place. But controlled burning can be difficult for private landowners to implement.

The Oregon State University Extension Service, in partnership with the Rogue Valley Prescribed Burn Association, a cooperative composed of landowners and fire professionals, is doing work in the Rogue Valley to change perspectives and offer help through education and outreach.

To help normalize controlled burns, Chris Adlam, OSU Extension wildland fire specialist, is delivering hands-on learning opportunities, including live-fire trainings, workshops and conferences to help participants envision a better future dealing with fire.

This outreach has helped establish a new model for prescribed burning on private lands and has led to broader stakeholder involvement. With OSU Extension's help, membership in the Rogue Valley Prescribed Burn Association has grown to include landowners, forest workers and wildland firefighters, including several federally qualified burn bosses, and attracted interest from collaboratives and community groups across the region.

North of the Rogue Valley, the day was gray and the skies threatened to open, but nothing could dampen the enthusiasm of the 20 trainees from the Natural Resources Conservation Service, who gathered in the Oregon State University Dunn Forest for lessons in prescribed fire.

The class — taught by OSU Forestry and Natural Resources Extension faculty — was a three-day learning experience for employees of NRCS, which consults with private landowners about land-use restoration solutions. In order to recommend prescribed fire, NRCS staff need to be certified.

Tom Snyder works in the Eugene NRCS field office and concentrates on oak woodland and savannah, a fire-adapted landscape that's been shaped for thousands of years through intentional burning by the Indigenous peoples now known as the Confederated Tribes of Grand Ronde and Confederated Tribes of Siletz Indians. Cultural burning supports wildlife habitat and plays an important part in the traditions, culture and Sovereignty of Tribes.

"We've been doing restoration without fire, which is the tool that created this landscape," Snyder said. "We'll be able to use fire in the future as part of our restoration methodology within the Willamette Valley."

In most cases, according to Stephen Fitzgerald, Extension silviculture specialist and director of the OSU College of Forestry Research Forests, landowners use heavy machinery, mowing, spraying and grazing to thin out overgrown land. Grazing is better than mowing because there's no thatch buildup that remains as fuel for wildfires. But nothing beats fire.

"Fire recycles nutrients and causes a flush of growth. Then those plants support insects, which are important pollinators, and other wildlife," he said.

EXTENSION BY THE NUMBERS

5,381 educational presentations

1,140 consultations with Extension agents

7 extension agents carry out statewide fire program

PREPARING FOR INVADERS

OSU Extension quickly mobilizes to respond to emerald ash borer discovery.

In late June 2022, the dreaded emerald ash borer, which has decimated hundreds of millions of ash trees east of the Rocky Mountains, was discovered in Oregon. Oregon State University Extension Service, working with Oregon Department of Agriculture, Oregon Department of Forestry and other partners, responded immediately.

After ODA confirmed and announced the identification of the invasive insect in Forest Grove in Washington County, OSU Extension stepped in to curate and disseminate essential information about the devastating pest and assist with initial monitoring efforts to determine how far and fast the insect is spreading in Oregon.

"For emerald ash borer, and other known and emerging issues, OSU Extension has become a valued and trusted partner because of our ability to quickly bring relevant expertise to the table and effectively share research-backed information through our statewide network," said Alex Gorman, OSU Extension forester. "With this foundation and our established connections with agency partners, we were poised not only to contribute to the immediate response, but also to longer-term actions."

Gorman had only recently started in his new position serving Washington, Columbia and Yamhill counties. His first reaction, he said, was a sense of dread followed by sadness. Gorman knew what to expect from his exposure to EAB while a graduate student at the University of Minnesota.

Guided by Oregon's existing emerald ash borer readiness and response plan, he knew how to quickly contribute that expertise. OSU Extension's role is to conduct and share results of relevant research, which includes coordinating Oregon Forest Pest Detector training programs and providing information through its established channels and programs, including Master Gardeners, Master Woodland Managers, Master Naturalists and other volunteer networks.

The same day the detection was announced, OSU Extension activated an interdisciplinary team that includes faculty and staff with expertise in forestry, pest management, invasive species, horticulture and communications. The OSU team quickly organized essential information on their online EAB resources webpage and shared it through social media, announcements on county webpages and newsletters. The page includes information on how to identify ash trees, how to identify the insect and recognize look-alikes, how to monitor for EAB and report sightings and recommendations for tree protection.

An existing publication, *Oregon Forest Pest Detector Pest Watch — Emerald Ash Borer*, was rapidly updated online and a pocket guide was reprinted. Copies immediately went to ODF and all OSU Extension offices around the state for distribution. The guide includes insect identification, host plants, signs and symptoms and what to do if you suspect an insect you've seen is EAB.

"We have infrastructure, expertise and capacity to disseminate information in a way that makes sense and is helpful and productive and informative," said Chris Hedstrom, communications and outreach coordinator for the Oregon IPM Center in OSU's College of Agricultural Sciences. "Extension does a great job moving quickly. We have the ability to publish quickly and to house all the information in one place."

OSU Extension's EAB resource page includes several publications, articles, a video and a podcast episode. Extension foresters have distributed information through educational workshops, webinars, community events and social media posts through OSU Extension's Master Gardener program. Access these resources at *extension.oregonstate.edu/collection/emerald-ash-borer-resources.*

Podcast brings science-based information to woodland owners and managers.

When woodland owners encounter problems beyond their expertise, they often approach Oregon State University Forestry and Natural Resources Extension Service experts for help, either through email or phone or through professional Extension events like field days, workshops, seminars and short courses.

Those approaches can be limiting, though. Direct contact involves travel time for all involved and conflicting schedules and obligations mean some people can't attend events.

In response, Lauren Grand, OSU Extension forester in Lane County, and her Extension colleagues created a podcast. Instead of having to be present at a certain time and place to reach a limited audience, Extension professionals present their educational content to an unlimited audience 24 hours a day, seven days a week, providing more people access to the information they want and need.

Twice a month, the "In the Woods" podcast shares stories and interviews with forest scientists, land managers and members of the public, communicating science-based and forest-related research. The podcast helps strengthen the forestry community, reaching both traditional and new audiences. While the traditional Oregon woodland owner is often older, listeners to "In the Woods" trend younger with 39% of listeners ages 28-34 and 26% ages 23-27. Reaching more young, urban, non-forest owners and natural resource professionals is in line with Extension's mission of being accessible to all.

The podcast was one of the top 20% of podcasts shared globally on Spotify and the three highest-rated podcasts discussing water, soil and forest fungi. Half of listeners have, or plan to, adopt tips and skills they learned about in the episodes they've listened to. 75% of listeners report the podcast has improved their understanding of how research informs natural resource management.

TREE SCHOOL

Online training tools help woodland owners during COVID-19.

More than 79,000 family forest owners in Oregon manage 3.6 million acres of private forestland, providing substantial economic, social and ecological value. Surveys show that landowner goals are diverse, as are the challenges they face in their forest stewardship.

The annual Oregon State University Extension Service Tree School is an important opportunity for landowners to gain knowledge and skills or find assistance. But COVID-19 forced cancellation of all three in-person Tree Schools in 2020.

After cancellation in 2020, the Tree School events were provided online in a series of 35 webinars hosted by OSU Extension in Clackamas County, in collaboration with the Oregon Forest Resources Institute and the Oregon Partnership for Forestry Education. The classes provided comprehensive coverage of major subjects to support successful forestland stewardship to meet diverse landowner objectives. Topics were developed based on needs assessment surveys, focus groups and conversations and included reforestation, thinning, forest health, wildfire, safety, business and taxes, succession planning and forest products.

The 2020 Tree School Online webinars drew more than double the number of people than in-person events in 2019. Participation included 3,046 people on live webinars, 5,796 views of recorded webinars on YouTube and 4,019 views on Facebook. Though people missed in-person networking, the online format allowed many more participants compared to typical sessions that are limited by classroom size and geography. In post-program surveys with 1,420 responding, 98% said the classes were very useful or useful, and 97% of participants indicated they would use the information they learned.

Tree School Online continued in 2021, drawing about 4,000 attendees to live webinars. The recorded webinars were watched a combined nearly 17,000 times on YouTube and 4,000 times on Facebook. The online format has allowed many more people to join sessions compared to in-person sessions limited by classroom size and availability to join. The large number of views of the recorded sessions shows that this option greatly expanded the availability of Tree School classes compared to the in-person events.

Other major collaborators include Forests Forever Inc., the Oregon Department of Forestry, the Oregon Small Woodlands Association, Ecotrust, Soil and Water Conservation Districts, Clackamas Community College, Clackamas County, and many other organizations, businesses and volunteers. A total of 69 instructors and hosts developed and delivered the webinars in 2021.

Story source: Glen Ahrens

COMMUNITY

LIDAR-ASSISTED AESTHETIC FORESTRY

Innovative techniques ensure harvests that prioritize forest health and aesthetics.

In the College of Forestry's McDonald-Dunn forests, every activity is a carefully orchestrated act, designed to balance multiple values — from ensuring forest health and providing opportunities for education and research, to maintaining ecological biodiversity and minimizing impacts on recreational access. But equally important, and often unnoticed, is the effort that goes into maintaining the aesthetics of the forests.

"One reason our neighbors live near the forest and in the Corvallis Vineyard Mountain neighborhood is that it is beautiful up here," said Stephen Fitzgerald, director of the Oregon State University Research Forests. "We want to maintain the surrounding aesthetics as much as possible, especially when the harvests are near viewsheds or highly used recreation trails."

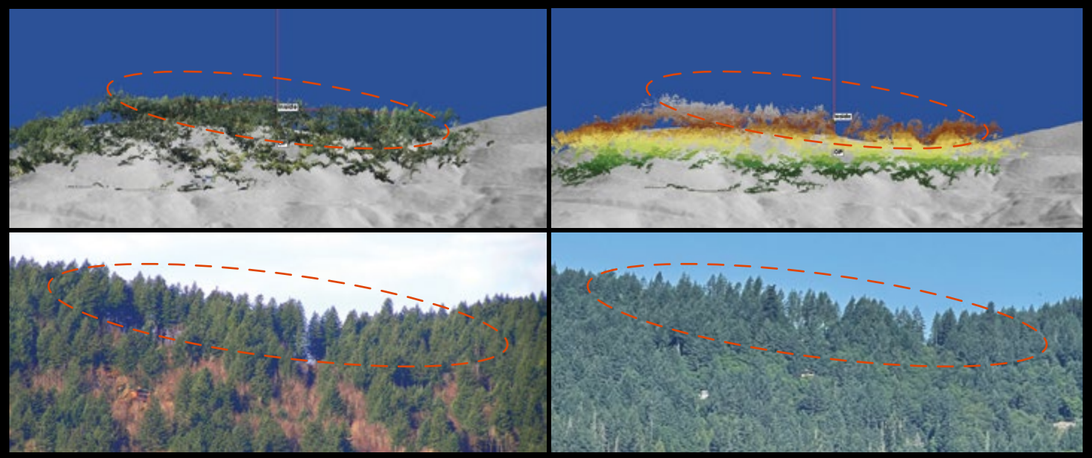
For the Davie Crocket II harvest — the moniker given to the recent harvest on Vineyard Mountain by the students involved in the operation — research forest staff, including Fitzgerald, Forest Manager Brent Klumph, Associate Professor of Forest Engineering Bogdan Strimbu, graduate student Bryan Begay, and forestry student workers, designed a three-phase planning technique to account for potential viewshed impacts.

Using cutting-edge technology, including GPS and LiDAR to help them "see the future," and ensure the view of the harvest wouldn't significantly impact the community or recreational forest users, the crew first used GPS to pinpoint tree location, then LiDAR (Light Detection and Ranging), a remote sensing method that uses light in the form of a pulsed laser, to reconstruct a digital version of the forest. The final phase of harvest planning involved walking the forest floor.

Being able to view what the harvest might look like before it was harvested from different vantage points allowed the research forest staff to add or subtract trees within the harvest area. For example, Fitzgerald explained, the proposed harvest area was also evident from Highway 99 near Lewisburg. To ensure the harvest didn't stand out from that perspective, Highway 99 was included as a vantage point in the modeling.

The final step of walking the forest floor with boots on the ground and eyes on the trees allowed Fitzgerald and his team to view the tree spatial arrangement, including canopy density, and make any final adjustments.

As a result of this project, the logging contractor, Drew Marshall, received the 2021 Certificate of Merit through the Oregon Department of Forestry (ODF) for his excellent work and eye for detail. The award recognizes forest operators that "go the extra mile" to protect Oregon's natural resources while working in the forest.



Top: a vehicle-mounted LiDAR system in use on a forest road. Center, left to right: LiDAR image of the harvest areas before cut and after cut. Bottom, left to right: Before and after images of harvest from Highway 99 at Lewisburg up to Vineyard Mountain near Corvallis.

TAPPING INTO OREGON'S MAPLE TREES

The sugar maple has a reputation as a powerhouse for maple syrup production — but it's not the only maple game around. An interdisciplinary team of researchers led by the College of Forestry is at the forefront of a movement to tap into Oregon's bigleaf maple. The goal? Put the Pacific Northwest on the maple syrup map.

"This is a great economic opportunity for Oregonians to build an industry centered around the bigleaf maple, particularly in western Oregon, where the tree is especially abundant," says Eric Jones, the principal investigator for the project and assistant professor of practice at the College of Forestry.

So why hasn't a bigleaf maple tapping industry taken off before in the Pacific Northwest? Economics. The bigleaf maple, acer macophyllum, has less sugar in its sap — usually about one-third to one-half — than the sugar maple. So instead of needing around 40 gallons of sap to make a gallon of syrup, as is the case with sugar maple, it takes 80-90 gallons of bigleaf maple sap. But technology advancements like food-grade vacuum tubing that extract higher volumes of sap from trees and commercial reverse osmosis machines which remove 75% of water from the sap, have resulted in a cost-effective way to turn less sugary sap into syrup.

> *"We're trying to help landowners find the easiest and most economic and ecologically prudent path to get into 'sugaring.'"*

"This technology is a gamechanger for the bigleaf maple," says Jones.

To help establish a sustainable bigleaf maple industry in Oregon, Jones assembled a diverse research team including scholars and students from anthropology, food science, extension, geography, environmental arts and humanities, economics, ethnobiology and engineering. The U.S. Department of Agriculture awarded the team $1 million in funding through a pair of multi-year awards to promote the emerging industry, provide training and educate landowners interested in developing commercial enterprises.

"I think there's a romance and infectious nature to tapping bigleaf maples and we're trying to help landowners find the easiest and most economic and ecologically prudent path to get into 'sugaring,' as they refer to it in the maple industry," says Jones.

Besides producing maple syrup with a complex flavor profile, the bigleaf maple is the source of other products like nutritional maple water, edible flowers, honey, lumber, figured wood and firewood.

The research team is working to mitigate the risks involved with managing and sugaring bigleaf maples, including incorporating food safety standards into commercial production and investigating how wildlife, diseases and different climatic conditions affect bigleaf maple stands.

With climate change ushering in greater uncertainty about the future of Pacific Northwest forests, the team is interested in how the trees will fare under changing conditions. While hotter, drier weather in some areas will negatively impact bigleaf maple populations, the trees may prove resilient in certain microclimates. Jones is currently an advisor on a pilot project in Washington, where the group is planting thousands of bigleaf maple trees on old dairy land as part of a carbon offset program.

"The bigleaf maple is a tenacious tree, as any forester will attest to, and perhaps it has a role in helping mitigate climate change," says Jones.

Jones hopes that a growing maple industry will invite people to develop a deeper appreciation for the land and find new ways to engage with each other and with Oregon's biodiverse and ecologically complex environment.

"Our team of researchers is working hard to make the emerging bigleaf maple industry an inclusive and equitable economic opportunity," Jones says. "We hope to ignite a bigleaf maple culture in the Pacific Northwest like the sugar maple culture in the Northeast."

A RECREATION HUB ROOTED IN COMMUNITY

A training ground for championship youth cycling team

To the more than six dozen youths who comprise the Corvallis Composite Mountain Bike Team, the McDonald and Dunn research forests aren't just a convenience, but rather a lynchpin to the team's existence and excellence.

"The research forest is a fantastic resource," said the team's director, Matt MacClary. "We also practice on Starker forest land and have a great relationship with them, but the research forest is totally critical to what we do."

Seventy-five riders from Corvallis-area middle schools and high schools participate on the five-year-old team under the guidance of 39 coaches. The team is growing "as fast as we can train coaches," said MacClary, noting membership numbers are governed, for safety reasons, by coach-to-rider ratios set by the National Interscholastic Cycling Association.

The Corvallis team is a founding member of the Oregon Interscholastic Cycling League, a collection of 19 teams that compete in a series of four or five racing events each summer and fall.

"We'll meet at a trailhead, get in some stretching and education and then get out on the trails," MacClary said. "The kids learn about trail stewardship, sharing the trail, how to dismount and listen to instructions from horseback riders. And we make sure kids get the chance to work on building and maintaining trails."

"We're always moving around so kids get to see different parts of the forest," he added.

"Having the good riding opportunities available has shown up with good results. Corvallis won the state championship this year and last year as far as the overall team result."

Giving back through volunteering

Opportunities for the public to enjoy the McDonald and Dunn research forests continue to be enhanced by volunteers of all ages who are always eager to welcome new members to their ranks.

Ken Imamura, a retired Hewlett-Packard process engineer, is one of College of Forestry's "core volunteers," a group which volunteers on a weekly basis and is collectively responsible for most of the trail work on the research forests.

"I retired in October 2008 and started volunteering in the forest in November," said the 76-year-old Imamura, who lives near Peavy Arboretum. "The work is meaningful — users of the forest really appreciate what we do. I see people I know from work or from town, and two-thirds of the people who pass us and know we're volunteers thank us for what we contribute. That means more to me than any wage."

Fifty years Imamura's junior is volunteer Andrew Miller, a Corvallis High School graduate with a nearly lifelong relationship with the research forests.

"I first started going to the forest close to 20 years ago; I'm 26 now," he said. "I've had a connection with McDonald forest most of my life — it means a lot to me for sure."

Miller, a mountain biker, trail runner and running coach, was inspired to forest volunteerism by the local trail running community.

"Everybody in the community was so good to me, and I wanted to be a part of that," he said. "I feel like it's the right thing to do. Others have done it before me, which is why Mac forest is so cool, and now it's my time to get out there and give back and hopefully get others involved."

Whether it's blowing leaves off trails, cleaning out ditches or pulling down overhanging limbs, the work of volunteers like Miller and Imamura involves "whatever needs to be done to make it safer for users of the forest," Imamura said.

Miller stresses that volunteer opportunities are open to anyone who completes the college's application process.

"You don't have to be in the know, it's not a select group of people," he said. "Everybody wants to see more people getting out and giving back to the community."

A forest for all ages

Among the recreationists who regularly enjoy McDonald and Dunn research forests are members of a nationwide, grassroots organization of women dedicated to the preservation of America's wild places.

"We lead hikes here every month, sometimes more. We're grateful to have the forest accessible," said Peg Herring of the Willamette Valley Broadband, a local chapter of the national Great Old Broads for Wilderness. "We appreciate that the College of Forestry offers the research forest as a place for community members to hike and recreate and find solitude in the natural world. And we appreciate that the stewardship plans for the forest are being shared with those who use and love the forest. We are keen to protect its ecological values, which are irreplaceable."

Headquartered in Durango, Colorado, Great Old Broads for Wilderness was founded in 1989 by "older women who love wilderness," according to its website, for the purpose of bringing "knowledge, leadership and humor to the wilderness preservation movement."

Since its inception, Great Old Broads has spread throughout the United States in the form of Broadbands, member-run local or regional chapters that support the group's mission of education, advocacy, outreach and collaborative stewardship. Willamette Valley is one of four Broadbands in Oregon.

Among Great Old Broads is a strong representation of retired professionals, academics and scientists, said Herring, herself an OSU professor emerita of science communication. The Willamette Valley Broadband was established about 15 years ago by another OSU professor emerita, Carol Savonen, and now there are more than 300 people on its newsletter mailing list.

"It gives us opportunities to organize for the purpose of educating ourselves about forest issues and research, and it offers a beautiful place to recreate together," Herring said. "The accessibility of McDonald and Dunn forests is a real gift to the community. Our desire is to see the forest sustained not just as a timber plantation but as a demonstration of research and ecological management as part of its mission of education.

"The Willamette Valley Broadband is focused on the legacy that's left to future generations, and we'd like that to be an intact forest where students can learn and visitors can experience how forest ecosystems function," she added. "We want to do all we can to ensure the forest is managed with that in mind."

FEEDING OUR COMMUNITY

Rootstock, the new College of Forestry food pantry, works to provide a variety of resources and educational experiences for faculty, staff and students to ensure that more people in our community have the food and resources they need.

According to recent research conducted by Mark Edwards, professor of sociology and director of Oregon State University Policy Analysis Laboratory at the School of Public Policy, 24% of Oregon State students on the Corvallis campus are estimated to be food insecure. Though there is not specific food insecurity data related to College of Forestry students, 34% of College of Forestry students have high financial need compared to 28% of OSU's population. College of Forestry students also have the fourth highest financial need of OSU Colleges. To address food insecurity issues and help meet immediate student needs, Rootstock, a food pantry for undergraduate and graduate students of the College of Forestry, opened in January 2022. Located on the first floor of the Peavy Forest Science Center, Rootstock is a community space providing food and resources to those in need.

Since opening, it has served over 200 students. When students visit Rootstock, they walk away with food for meals, snacks, condiments, spices, milk, meat as well as menstrual/hygiene products and cleaning supplies. Information is also available about programs available to them through the OSU Basic Needs Center including SNAP benefits and textbook loaning programs. In addition, Rootstock works with faculty and staff to reduce catering waste after events by emailing and tweeting when leftover food is available from events and meetings.

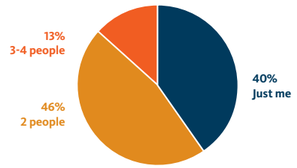
A student survey was conducted and showed that students do not have enough information about additional services on campus or about the Supplemental Nutrition Assistance Program (SNAP). The committee remedied this with signs in the pantry and the community nook space with information about eligibility and how to find additional resources.

For more information, including ways to contribute, please visit *forestry.oregonstate.edu/rootstock*.

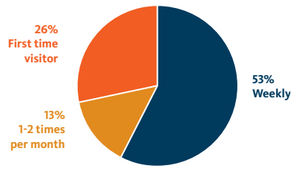
ROOTSTOCK SURVEY 2021-2022

ROOTSTOCK
food • resources • community

How many people are in your household?



How often do you visit the pantry?



Do you or other household members worry about the ability to purchase healthy food because of income limitations?

FOOD DRIVE 2021-2022

College of Forestry 2021 and 2022 food drives raised nearly $40,000.

The 2021 College of Forestry food drive raised over $19,000, the equivalent of over 57,999 meals, despite being run virtually. With a revamped online bake sale sign-up and new events like a pet photo contest and virtual 5K Fun Run called Race to the Top Banana, College of Forestry staff, faculty and students were able to participate from the comfort and safety of their home offices. In 2022, through direct donations and events like book sales, the virtual 5K, bake sales and the fan-favorite pet photo contest, the College of Forestry raised nearly $18,500, the equivalent of 55,422 meals.

COMMUNITY HIGHLIGHTS

The Forest Discovery Trail program, developed to honor Dr. William Ferrell, the first forest ecologist hired by the College of Forestry, is a 1.2-mile-long discovery trail in the McDonald-Dunn Research Forest's Peavy Arboretum. Designed for Pre-K – 12th grade learners, the program is available for anyone who wants to learn more about forests. Students of all ages can walk the trail and discover on their own or using a Forest Explorer Journal, learn about the history of the Kalapuya people and early explorers and settlers. They can also practice plant identification and explore topics about forest ecology and hydrology, soil science, forest wildlife and carbon storage.

This program was developed in partnership with the Oregon State University College of Forestry, the OSU Research Forests and the family and friends of Dr. William Ferrell, and aligns with Oregon core science curriculum standards.

The OSU College of Forestry is developing a new management plan for the McDonald and Dunn Research Forests, which is anticipated to be ready for implementation in 2024. This new plan will determine how the forests provide opportunities for teaching, research and outreach efforts of the College of Forestry. The new research forest plan will reflect the college's diverse values, and will position the McDonald-Dunn Research Forest to be a model example of multiple value forest management. Management decisions and activities on the McDonald-Dunn Research Forest will be driven by College of Forestry research agendas, education and demonstration opportunities, and considerations of an inclusive balance of forest uses and values.

The process of developing the new management plan has involved opportunities for public input, and two committees, an external Stakeholder Advisory Committee and internal Faculty Planning Committee, working in tandem from spring 2022 through fall 2023.

The 2022 Starker Lecture Series focused on women who act as agents of change in forestry, the forest products sector and their communities. It was the most well-attended Starker Lecture series in the last 12 years. Over 1,500 people attended online and in-person and over 2,300 people have viewed the recorded lectures to-date.

For nearly a decade, the College of Forestry, the Oregon State University Research Forests and Oregon State University Extension Service have partnered with Community Health Centers of Linn and Benton County to host the national "Get Outdoors Day" program at Peavy Arboretum. This program creates inclusive opportunities that encourage healthy and active outdoor fun for families and children — particularly on public lands and natural areas.

In the past, the bilingual (Spanish and English) event targeting Title 1 schools provided free transportation and busing to the McDonald-Dunn Research Forests. The event organizers also coordinated with dozens of local agencies and organizations to provide opportunities to learn about natural resources, forestry, cultural history and healthy lifestyles.

In 2021, due to the ongoing COVID-19 pandemic, event organizers pivoted to an online format, also providing a free bilingual Get Outdoors Day magazine as an additional option to address constraints around computer and internet access and feelings of screen fatigue. Throughout the virtual adaptation process, the planning team repeatedly asked themselves: Will this be equitable? Would this approach exclude anyone? In 2022, event organizers continued to explore questions around accessibility, taking Get Outdoors Day to communities, and hosting pop-up events in local Corvallis and Albany parks.

The Peavy Forest Science Center isn't just a living laboratory gathering data from two hundred sensors to contribute to mass timber performance research. It's also a showcase for public art, courtesy of Oregon's "Percent for Art" legislation. Dedicated to providing Oregonians with high-quality, accessible art in public places, the Percent for Art legislation sets aside no less than one percent of funds for the acquisition of public-facing artwork in all state building construction projects. The following artists were selected by the Peavy % for Art Committee. Special thanks to committee members Seri Robinson, Mariapaola Riggio, Anthony Davis, Adrienne Wonhof, Thomas and Nicole Maness, Gail Woodside, Libby Ramirez, Bill Coslow and Kate Ali.

1 **Title:** Listening to the Forest

Artist: Leah Wilson

Media: Acrylic and bio-based resin on birch plywood

Location: Spans the second- and third-floor south stairway

2 **Title:** The Perseverance of Decay

Artist: Robert M. Horner

Media: Wood and rock

Location: Near the south end of the arboretum

3, 4 **Title:** Things Remembered in the Flood

Artists: Wakanim Artist Collaborative – Earl Davis, Shoalwater Bay Indian Tribe; Tony "Naschio" Johnson, Chinook Indian Nation; Travis Stewart, Confederated Tribes of Grande Ronde; Shirod Younker, Coquille Indian Tribe

Media: Alder, red cedar, port orford cedar, big leaf maple, myrtlewood, walnut, ponderosa pine, redwood, douglas-fir, birch plywood, aluminum, steel, and concrete

Location: Wood figures on the second and third floors with metal pieces placed throughout the arboretum

FACULTY + STAFF

Senior Leadership Team


DELUCA

Thomas H. DeLuca
Cheryl Ramberg-Ford and Allyn C. Ford Dean of the Oregon State University College of Forestry, Professor
Forest soils, fire ecology, restoration, natural resource sustainability
BS: University of Wisconsin-Madison, 1984
MS: Montana State University, 1987
PhD: Iowa State University, 1993


KAVANAGH

Katy Kavanagh
Associate Dean of Research, Professor
Forest ecosystem science and management
BS: SUNY College of Environmental Science & Forestry, 1977
MS: SUNY College of Environmental Science & Forestry, 1987
PhD: Oregon State University, 1993


LEE

Kevin Lee
Director of Marketing and Communications
BA: Portland State University, 2009


OBER

Holly Ober
Associate Dean for Science Outreach and Program Leader for Forestry & Natural Resources Extension
Forest ecology, wildlife ecology
BS: Duke University, 1994
MS: University of Arizona, 2000
PhD: Oregon State University, 2007


EISENBERG

Cristina Eisenberg
Associate Dean for Inclusive Excellence, Maybelle Clark Macdonald Director of Tribal Initiatives in Natural Resources
Traditional Ecological Knowledge, ethnobotany, restoration ecology and ecocultural restoration
MA: Prescott College, 2006
PhD: Oregon State University, 2012


RILEY

Amy Riley
Director of Student Success
Psychology, education, adult higher educaton
BA: University of Washington, 2001
MS: University of Wisconsin, 2016


HANSEN

Eric Hansen
Department Head (WSE), Professor
Organizational innovation, environmental marketing, corporate responsibility, forest products marketing
BS: University of Idaho, 1990
PhD: Virginia Tech University, 1994


BLADON

Kevin Bladon
Department Head (FES), Associate Professor
Watershed hydrology and management, disturbance effects of water quantity and quality, aquatic ecology, hillslope runoff and biogeochemical processes, microclimate change and tree-water relationships
BS: University of Alberta, 2002
PhD: University of Alberta, 2006


HATTEN

Jeff Hatten
Department Head (FERM), Associate Professor
Forest soils and nutrition
BS: Western Washington University, 1999
PhD: University of Washington, 2007


WONHOF

Adrienne Wonhof
Director of Administration and Operations
BS: Southern Oregon University, 1999
BS: University of Oregon, 2001

Endowed Faculty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Forest wildlife landscape ecology
BA: Queen's University, 1992
BS: University of New Brunswick, 1999
MS: University of Waterloo, 1995
PhD: University of New Brunswick, 2005


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Integrated social and ecological systems, social science, policy, natural resources
BS: McGill University, 2000
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RIPPLE

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Wildlife habitat analysis, landscape ecology
BS: South Dakota State University, 1974
MS: University of Idaho, 1978
PhD: Oregon State University, 1984


CHUNG

Woodam Chung
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Improving forest operations and management systems to better address environmental, economic and social needs
BS: Seoul National University, 1993
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LESHCHINSKY

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Geotechnical engineering
BS: University of Delaware, 2007
MS: Columbia University, 2008
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Green building materials, sustainable built environment, product development for efficient use of renewable materials, life cycle analysis
BE: Delhi College of Engineering, 2003
MS: Oregon State University, 2007
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LYONS

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To learn more about endowing a position, contact **Zak Hansen** at OSU Foundation, **zak.hansen@osufoundation.org** or visit **www.osufoundation.org**.


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Surveying, photogrammetry, residual stand damage
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BUKOSKI

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International parks, nature-based tourism
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Structural mechanical connections, wood mechanical properties
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Wood liquid relations, wood drying and physical properties, VOC emissions
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Production economics, small timber harvesting systems
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Resource recreation and tourism
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Fire, regeneration
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MF: Duke University, 1968
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Physiological ecology
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PhD: University of California-Berkeley, 1963

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Life cycle assessment of wood products, sustainability of wood products, manufacture and use of wood composites
BS: SUNY College of Environmental Science & Forestry, 1964
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Woodland management, conservation and restoration, succession planning for forest landowners
BS: Oregon State University, 1984
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