SPRING 2020

FOCUS

THE MAGAZINE OF THE OSU COLLEGE OF FORESTRY

OUR PEOPLE, OUR PLACES

Work at College of Forestry labs and facilities informs decisions and prepares future leaders.

Oregon State University

At the College of Forestry, we conduct research, outreach, and education programs that deliver healthier forests, resilient ecosystems, and innovative products for the benefits of people and communities. This work plays a significant role in Oregon State University's recognition as an international leader in forestry research and education as we deliver programs and conduct research throughout Oregon and around the globe.

It wouldn't be possible, however, if it weren't for the outstanding work conducted at the OSU Corvallis campus and within the local community. This issue focuses on our world-class researchers and students and the individual labs and forests where they work every day.

We're especially passionate about our College Research Forests. Our ten tracts of land span 15,000 acres throughout Oregon. These forests are the perfect place for us to deliver teaching, research, demonstration, and outreach programs. They provide an outdoor classroom for our students and serve as living laboratories for our researchers to study everything from aquatic ecology to silvicultural methods to human behavior.

We're proud to share several of our forests with the community, for recreation and demonstration. The Corvallis community uses the McDonald and Dunn Forests for activities including hiking, dog walking, trail running, hunting and mountain biking. We trust our skilled staff of experts to manage all of these activities while protecting cultural resources, alongside the typical activities of a working forest, which provide a suite of environmental, economic and social benefits.

The McDonald and Dunn Forests are also home to several interesting research studies, including those conducted at "The Pole Farm." There, our Utility Pole Research Cooperative does work that improves the lifetime performance of utility poles, a critical wood product that is used by society every day.

For Josh Fix, a forest engineering student, the Research Forests play a pivotal role in his education and personal life. As a student employee of the Research Forests, he's had the opportunity to learn about all facets of multiple-value management and appreciate the beauty and benefits forests provide.

Back on campus, the refurbishment of the Oak Creek Greenhouse has made a considerable contribution to the capacity of our researchers and students who grow seedlings there. The once-abandoned space is now state-of-the-art and allows us to evaluate how seedlings perform in a variety of conditions.

As a friend of the college, I hope you'll visit us in Corvallis soon. The grand opening of the George W. Peavy Forest Science Center is at 3:00 p.m. on May 12, and it would be great to see you there. This is a perfect opportunity to reconnect and learn more about our work, people, and spaces, and our efforts to improve the entirety of the working forest landscape.

ANTHONY S. DAVIS
Interim Dean

PLEASE JOIN US FOR A DAY OF CELEBRATION

05.12

GEORGE W. PEAVY FOREST SCIENCE CENTER

Grand Opening

WHEN: 3:00 PM – 5:00 PM

WHERE: 3100 SW JEFFERSON WAY

The OSU Foundation and the College of Forestry invite you to attend the grand opening of our new mass timber showcase building.

Dean's Dinner

WHEN: 5:30PM

WHERE: CH2M HILL ALUMNI CENTER

Join the College of Forestry as we celebrate our outstanding alumni honorees, scholarship recipients and our college community.

FORESTRY.OREGONSTATE.EDU/DEANS-DINNER

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Focus is published by the OSU College of Forestry. Our goal is to keep our alumni, friends, faculty, staff and students informed about the College of Forestry and its many activities and programs.

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OAK CREEK

A LEGEND IN THE WORLD OF GEOMORPHOLOGY

As hikers trek through Oak Creek, they might notice its beautiful, crystal clear water, or Douglas-firs that line the banks. But when Assistant Professor **Catalina Segura** looks at Oak Creek, she sees something iconic – something famous in her world of stream geomorphology.

"I knew about Oak Creek before I knew about Oregon State University or Corvallis," she says. "It's famous because of the work done there. A very impressive data set was collected there in the late 60s and early 70s. There's not much else like it in the world."

Segura now feels privileged to conduct her own research, related to primary production in streams, at this site.

Segura says primary production provides the fundamental source of energy for life on earth, and therefore understanding what controls primary production is key to understanding ecosystems. Most of the primary production in streams like Oak Creek come from algae that lives on rocks. That's why it's crucial to understand how the movement of rocks in the stream bottom interacts with algae locally and throughout the stream's reach.

Segura works with Associate Professor **Dana Warren** on a project funded by the National Science Foundation. Two sites are being compared: Oak Creek and Mill Creek, a tributary of the Siletz River in the Coastal Range.

Segura says the rocks in each of these streams are very different. The rocks in Oak Creek are basalt and coarser, while the rocks in Mill Creek are sandstone and finer.

The researchers, together with graduate student **Samantha Cargill**, collected data on oxygen and used that to model the amount of primary production by algae on rocks.

"Now that we understand what happens during storm events in the winter when the water runs quickly and the rocks in the bottom move frequently, we can think about seasonal variability. We have a new post-doctoral fellow,

Sandra Villamizar, who will take the project in this new direction." In the meantime, several sensors for this project remain in Oak Creek. They are monitored intermittently. Segura also takes her classes to Oak Creek so undergraduate and graduate students can observe the research happening there.

"I tell my students about how we collect data and take them to those locations. We look at flow measurements and do a few different labs in the forest," she says. "Logistically, I appreciate how convenient it is. You can visit Oak Creek as frequently as you want, and it makes it easy to integrate teaching and research."

Segura says there are also benefits to Oak Creek being inside a managed forest, managed by the College of Forestry.

"The forest director, Professor **Stephen Fitzgerald**, has helped facilitate our research by doing things like restricting access to the stream at sensitive times," she says. The other study area near the Siletz was also convenient. It is located partially on tribal land, and partially on Weyerhaeuser property.

"Last year we were able to host high school students and teachers through the SMILE: Science Math Investigative Learning Experience program," Segura says. "We trained the teachers in different modules to take back to their classes, and that was very gratifying. It's amazing that so many people can benefit from the interesting work we're doing thanks to our location."

Assistant Professor, Catalina Segura

Segura and Warren collect data in the field.

Post-doctoral fellow, Sandra Villamizar

THE ECOLOGY OF SURPRISE

Michael Paul Nelson, Ruth H. Spaniol Chair of Renewable Resources in the College of Forestry, says many may not realize how much research is conducted on the H.J. Andrews Experimental Forest.

Researchers throughout Oregon State University, across the state, and around the world conduct research at the forest. Long-Term Ecological Research Program Coordinator **Lina DiGregorio** explains the research conducted on the Andrews Forest is broad.

"We aren't a specific lab that studies a single area of the forest," she says. "Our program involves faculty from across the college, the university, the Forest Service and all over the country and world."

First established in 1948 as a U.S. Forest Service Experimental Forest, the Andrews Forest is an approximately 16,000-acre ecological research site in Oregon's western Cascades Mountains. Supported by Oregon State University and the U.S. Forest Service, the research program is part of the Long-Term Ecological Research network, funded by the National Science Foundation.

Professor Emeritus, Mark Harmon

Ruth H. Spaniol Chair of Renewable Resources, Michael Paul Nelson

Nelson says the work is important and, at times, surprising.

He nicknamed the interesting research done at the Andrews Forest, 'the ecology of surprise.'

"There are surprises about how complex our system is, but also how theory or observations elsewhere suggest one thing, and over time, we find quite another."

For example, Professor Emeritus **Mark Harmon** initiated a study at the forest related to log decomposition of large trees. The long-term study started about 35 years ago and found that some trees could take around 200, and even up to 800 years, to fully decompose.

"That's surprising because fewer than two percent of all ecological studies last even five years," Nelson says. "The idea of a group of scientists conducting a study for 200 years is audacious."

Nelson says it's similarly surprising that the number of living cells and types of living organisms is greater on dead trees than on living trees.

Another study that led to surprising results was one led by Assistant Professor **Catalina Segura** and Associate Professor **Dana Warren**. The two researchers work in different departments within the College of Forestry, and Warren is duel-appointed to the Department of Fisheries and Wildlife in the College of Agricultural Sciences. Working at the Andrews Forest brought them together.

The pair discovered that a small creek known as Cold Creek produces over 15 times the amount of water equivalent to its topographic drainage area. It appears that this water is received at high elevation and "funneled" through porous lava flows.

"Before this study, we knew the water was cold, but we didn't know why," Nelson says. "The isotopic signature is unique from the other creeks and streams as well, and its flow is steady, even throughout the summer in dry conditions."

Nelson's hope is the research that surprises and delights scientists continues, and that the public understands what an important resource the Andrews Forest is to forests and communities.

"I want people to have a 'wow response,' when they think about the forest and our research," Nelson says. "I want them to recognize how special and unique it is. I want people to know about and be proud of the work that's happening in this place. The science that happens in the Andrews Forest will inform decisions for land managers world-wide."

Photography by Lina DiGregorio.

Five acres of Peavy Arboretum are filled with utility poles. But why?

"It's our pole farm," answers Senior Faculty Research Assistant **Jed Cappellazzi.** "We are growing them!"

He's only joking, of course. Cappellazzi and fellow Senior Faculty Research Assistant **Matthew Konkler** co-facilitate the College of Forestry's Utility Pole Research Cooperative, and the five acres of poles at Peavy Arboretum only make up a small piece of the cooperative's unique, world-class research.

The co-op's membership includes energy, chemical and timber companies from every region of the United States and some parts of Canada. Co-op members are happy to host researchers to study utility poles in use across the country, but there are many external factors affecting poles already in use.

"We don't always know the history of these poles," Cappellazzi says. "And they're vulnerable to more external stimuli including things like car accidents. If something like that happened, we would lose all of our replication with the study we're running."

Konkler says that the five acres at Peavy Arboretum is different and well protected.

"That's where we're really free to experiment," he says.

"Our industry partners really appreciate the space because the weather at the Arboretum causes poles to deteriorate pretty quickly. So, even in the long-term studies we're running, we're able to get answers to their questions relatively quickly."

The Arboretum has about 30 active studies. Studies began at that site when the first post installed on January 7, 1928. Some of the older poles still stand, although they are not being studied.

The utility pole co-op was founded in the 1980s and charged with developing fumigants to help preserve utility poles. Since then, its focus has changed and it now addresses a variety of wood-

THE POLE FARM

related issues that improve the performance of wood, allowing poles to last longer and make utilities more competitive.

Assistant Professor **Gerald Presley** joined Oregon State in 2019 to oversee the co-op. He says its future is exciting.

"It's great to be in a position to do applied research with wood-based products," he says. "Wood utility poles are an essential part of our national infrastructure and have advantages over steel alternatives. Not least among these is that they are a renewable resource grown and manufactured right here in Oregon and throughout the Pacific Northwest."

Chemical leaching and fire mitigation are a few of the next big issues in the industry that the co-op plans to tackle in Peavy Arboretum and beyond.

"When it comes down to it, we're trying to protect the investment of wood poles," Konkler says. "We do our best to look comprehensively at the forest and wood products industry to understand everything that goes into creating, establishing and maintaining these poles."

A PLACE THAT GROWS

THE STORY OF OAK CREEK: FROM STORAGE FACILITY TO TOP-NOTCH GREENHOUSE

Visitors to the Oak Creek Greenhouse on Western Boulevard in Corvallis enjoy world-class technology and a variety of seedling studies – plants growing in just about every place one can look. But it wasn't always like that.

When Assistant Professor **Carlos Gonzalez-Benecke** arrived at Oregon State in 2015, he toured all of the facilities that were available to him for research projects. One was the Oak Creek Greenhouse, but unfortunately, at the time, it could only facilitate small seedling studies due to the large amounts of timber and nursery materials stored there.

"Once I became oriented with my work here, I made revitalizing the greenhouse a priority," he says.

Interim Dean **Anthony S. Davis** and a team of graduate students (**Carson Alberg**, **Matthew Davis**, **Kaitlin Gerber**, **Rebecca Sheridan** and **Christina St. John**) shared the vision for a functioning greenhouse that took advantage of all the space and potential the Oak Creek location offered. So, everyone worked together to quickly clean out the space.

Once the space was clear, Gonzalez-Benecke considered what greenhouse characteristics plants like Douglas-fir seedlings need to have to thrive while making the space as flexible as possible for a variety of uses.

Ph.D. student, Patricio Alzugaray

"Plants need resources to grow: water, nutrients and radiation," Gonzalez-Benecke says.

Nutrients are easily provided by fertilizers, but Gonzalez-Benecke gave more thought to water and radiation.

"We wanted to be able to manipulate those factors," he explains. "This is why we installed an extensive irrigation system, as well as fixing the roof that allows us to better adjust environmental conditions inside the greenhouse. We can provide more light or provide a total black out in certain sections of the greenhouse."

The heating system and fans also manipulate factors including temperature, relative humidity and air movement.

The greenhouse hosts several research projects for the College of Forestry and the College of Agricultural Sciences.

"For our purposes, the greenhouse is perfect," Gonzalez-Benecke says. "We are proud of it, and we are happy to be a resource for the college and the broader campus community. We invite visitors and members of the industry to come tour it."

One of Gonzalez-Benecke's Ph.D. students, **Patricio Alzugaray**, has a long-term study of Douglas fir seedlings at the greenhouse.

Seedlings can be produced in a wide array of containers, and Alzugaray is testing the benefits and disadvantages of using biodegradable, paper containers.

The first phase of the study involved growing the seedlings inside the greenhouse and taking root morphology and physiology measurements.

In October 2019, Alzugaray outplanted the seedlings on five sites across the region. He will continue to monitor their growth and performance.

"It is invigorating to see the quality of research coming out of the Oak Creek Greenhouse, especially considering Oregon State's historic strength in advancing forest regeneration," Davis says. "Access to world-class facilities like this help our students and our faculty make discoveries that will sustain healthy forest landscapes in Oregon and beyond."

THE VALUE OF RECREATION

"RECREATION IS AT THE NEXUS

When the State of Oregon needed to increase revenue for outdoor recreation facilities and maintenance, they turned to Oregon State University for answers to their questions, and for scientific data to help inform their decisions.

A study completed by **Randy Rosenberger**, professor and College of Forestry Associate Dean for Student Success, connected outdoor activities on trails to health savings by utilizing and recalibrating a tool called the Outdoor Recreation Health Impacts Estimator. The tool was originally developed to focus on transportation decisions (walking, cycling or utilizing public transportation as opposed to driving) to estimate changes in life expectancy and quality of life.

The tool converts positive health effects into monetary unit, and even includes the cost of treating certain diseases as well as the loss of productivity illnesses cause.

The study became part of the 2019-2023 Statewide Comprehensive Outdoor Recreation Plan (SCORP).

"In my research, I quantify things that aren't normally quantified," Rosenberger says. "Things like recreation aren't traded in markets with prices. They don't have voices. This study gives them a voice, and I think through it, people are starting to realize that recreation is at the nexus of everything. It's not just something we like to do if we have the time. It's creating healthier communities and saving those same communities money on health services."

Rosenberger replicated the study for the McDonald and Dunn Forests, two of the College Research Forests. The college owns more than 15,000 acres of working forests around the state that are utilized for research, outreach and education with some open to the public for recreation. He found that recreation on the Research Forests saved $754,395 in cost of illness savings in 2017 alone. This data can now be used by private and public agencies for planning, budgeting, assessment and grant applications.

View the full SCORP online:
oregon.gov/oprd/PRP/Documents/SCORP-2018-Health-Benefits-Estimates.pdf

OF EVERYTHING." RANDY ROSENBERGER

DID YOU KNOW?

The U.S. Department of Health and Human Services recommends adults get at least **150 minutes** per week of moderate-intensity or **75 minutes** per week of vigorous-intensity aerobic physical activity.

60 percent of adults in Oregon meet this recommendation. **63 percent** of adults in Benton County meet this.

BY THE NUMBERS

In 2017, the McDonald-Dunn College Research Forests saw 17,271 individual recreation visitors who accounted for more than **155,000 total visits**.

McDONALD-DUNN RECREATION ACTIVITY:

51.5% WALKING/HIKING

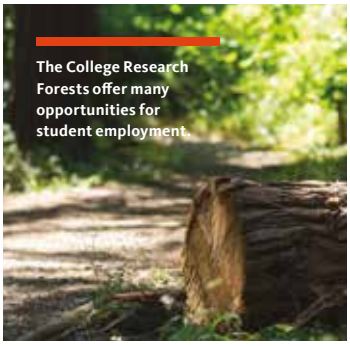
19% DOG WALKING

16% RUNNING/ JOGGING

12% MOUNTAIN BIKING

1.5% HORSEBACK RIDING/MISC.

Recreation visits to the McDonald and Dunn Forests resulted in **$754,395** in cost of illness savings, or health benefits, associated with eight chronic illnesses; and accounted for 14 percent of the total health benefits estimated for all of Benton County ($5.4 million).



The College Research Forests offer many opportunities for student employment.

JOSH FIX

STUDENT PROFILE | **MAJOR: FOREST ENGINEERING | YR: JUNIOR**

Josh Fix says he's never seen a photo that accurately portrays just how green the forests in Oregon are.

"They're almost glowing," he says. "I love the simplicity of the forest; how quiet and different everything is. They provide a breath of fresh air and create wonder in me."

Fix, who grew up in Minnesota, first fell in love with the forests of Oregon as a child during a visit to the state.

He initially declared a major in civil engineering at Oregon State before realizing he wanted to work outside.

"I found forest engineering and it was the perfect major for me," he says. "It allows me to solve the same kind of problems and use applied science, but I get to do it outside where I see a bigger impact because of everything outdoor spaces provide."

When he's not studying, Fix works with the College Research Forests as a recreation field assistant. He found the position through the college's job shadow program. He shadowed **Ryan Brown**, former Research Forests recreation and engagement program manager, and learned about the open position. Fix, who loves recreation as well as engineering, thought the job sounded like a perfect fit.

"I do trail maintenance, manage invasive species and repair interpretive materials at our trailheads," Fix says. "There is something different every day."

Matt McPharlin, recreation field coordinator and volunteer coordinator, is Fix's supervisor, but Fix says he's more than that.

"Matt has been a great mentor to me," Fix says. "He encourages me to think outside the box and get the most out of this work."

Fix says his favorite part of working in the College Research Forests is interacting with people recreating in the forests.

"I like to stop and say 'hi,'" he says. "I meet interesting people from the community, many of whom have lived in Corvallis for years and have been using the forests longer than I've been alive. I like being able to talk to people and share stories."

Fix says one of his most impactful experiences on the job was interacting with a group of blind and visually impaired hikers.

"It made me realize how special the College Research Forests are," he says. "They are able to enjoy the forest in a completely different way than I do. It made me think about how to make the forest more accessible for differently abled individuals."

When he's not working, Fix utilizes the forests as a student during labs, but enjoys the forest most when he's able to enjoy it in his free time.

"When I'm in the forest, I don't feel the pressure of school," he says. "I can take a deep breath and dream about my goals to manage and care for a working forest like this one day."

To learn about the College Research Forests and their initiatives, visit:

cf.forestry.oregonstate.edu

JOSHUA STUMP

STUDENT PROFILE **MAJOR: RENEWABLE MATERIALS | YR: SENIOR**

Faculty-led programs through the College of Forestry provide life-changing experiences.

Renewable Materials senior **Joshua Stump** is hungry for international experience.

He landed at Oregon State after earning a Jazz Piano Performance degree from Arizona State University and spending five years in the United States Navy.

"Music was my passion growing up, but my first experience in college was a hard lesson for me about what happens when you don't take education seriously," Stump says. "With mounting student debt hanging over my head, I joined the Navy to jump start my life financially."

After five years, he was ready to move on to the next stage and decided to follow an interest of his since childhood: sustainability and the environment.

"I've always had enormous respect for nature and other forms of life," says Stump, "My dad took me to Mount Rainier National Park as a child, and that made a huge impression on me."

After researching degrees at Oregon State, Stump chose the renewable materials program, which he knew would lead him toward a career promoting the use of natural solutions for products we use every day, including sustainable building practices.

Stump completed an internship with Boise Cascade during summer 2018. He's also an apprentice piano restorer.

During his Navy service, Stump traveled to Australia and several Asian countries. He has not visited Europe yet, even though he is extremely interested in the area.

"I have always been very interested in German culture," Stump says. "I have family heritage there, and I have always been fascinated with their work ethic and interest in art and music. I think Germany would be an amazing place to live."

He is planning to participate in the short-term, faculty-led Alpine Europe program. The program, offered through the college's Office of International Programs, takes students to the European Alps and provides a holistic view of the sustainable wood products industry. He is also interested in completing an internship focused on piano restoration in Austria

"I am hoping to combine my interests," Stump says. "Playing piano has been what has defined me since childhood, and I would love to focus on alternatives for soundboards in pianos. They are made exclusively with Sitka spruce. With Sitka forests disappearing due to climate change, I want to help find alternatives for soundboards."

Stump says he would love to live in Europe someday.

"My dream is to build a completely self-sustaining home," Stump says. "I would spend my time repairing and tuning pianos and use my free time to engaging in environmental activism."

College News and Notes

THREE OUTSTANDING ALUMNI TO BE HONORED AT DEAN'S DINNER

The College of Forestry is pleased to honor three Oregon State alumni at the annual Dean's Dinner on May 12, 2020. **Dr. Stephen DiFazio**, '95, MS in ecology and '02, Ph.D. in forest genetics; **Nadine Orozco**, '12, MS in wood science and engineering; and **Peter Wakeland**, '95, BS in forest management, will be honored for outstanding contributions to their fields.

THOMAS H. DeLUCA TO JOIN COLLEGE AS DEAN IN JULY

Oregon State has selected **Thomas H. DeLuca**, a higher education leader with deep experience in both natural resource and environmental issues, as the next Cheryl Ramberg-Ford and Allyn C. Ford Dean of the College of Forestry. He will join the college in July 2020.

DeLuca is a forest soil scientist whose long research career includes more than a decade in Sweden and the United Kingdom. He comes to Oregon State from the University of Montana, where he is the dean of the W.A. Franke College of Forestry & Conservation.

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@COFOREGONSTATE

IN MEMORIAM

The College of Forestry mourns the loss of these alumni and colleagues. We wish peace and comfort to their family and friends.

Wayne Giesy
Hull-Oakes Lumber
March 14, 1920 – July 28, 2019

James "Jim" Denison
Class of 1950
1927 – November 9, 2019

Dr. John F. Bell
Class of 1949 and
Professor, CoF
January 7, 1924 – November 16, 2019

Dr. Amy Grotta
Extension Agent and
Assistant Professor, CoF
December 24, 2019