

FOCUS

THE MAGAZINE OF THE OSU COLLEGE OF FORESTRY

ADAPT + THRIVE

The college is ready and poised
to shape the future of forestry.

FALL 2021



**Oregon State
University**





ADAPT + THRIVE • FALL 2021

Change is one of the few constants in life. A critical skill to thrive in a world of change is the ability to adapt.

Whether addressing pandemic-altered work and life, managing forests as complex systems, or changing our behavior after new discoveries, adaptation is key to flourishing and moving forward.

At Oregon State University and the College of Forestry, our students, faculty, staff, and alumni have proved they can adapt and thrive in a changing world.

In this issue of *Focus*, you will learn about **Skye Greenler**, a

fire ecologist and PhD candidate who is at the forefront of a more holistic perspective in scientific inquiry. Greenler is working to understand how systemic problems inhibit adaptation to our current fire challenge.

On another front, alumna **Balkis Bakar** is an OSU graduate who adapted wood-based composite manufacturing technology to create a new composite material made from grape cane fibers.

Adapting to the world can be a profoundly personal experience like it is for student **Trevor Denning**, who uses a wheelchair, loves the outdoors and is on a

mission to make outdoor areas more accessible to those with physical disabilities.

Newly hired assistant professor **Takuya Iwamura** wants to expand the reach of science and research to those not interested in the traditional scientific processes. His approach applies quantitative methods such as remote sensing, GIS, and computational modeling. A global citizen, Iwamura is adept at navigating human and social dimensions and viewing experiences and life through multiple lenses.

Finally, **Lara Jacobs**, a citizen of the Muscogee (Creek) Nation of

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Oklahoma who also has Choctaw heritage, focuses on the ecological and pathogenic impacts of outdoor recreation using a cultural impact lens. Jacobs works collaboratively with a Tribe in Washington to examine how fecal matter from outdoor recreationists may create issues for the Tribe's food supply. As a result, she wants to encourage a shift in recreationists' behavior.

The stories in this issue help illustrate how our ability to adapt and look at things in new ways increases our capacity to recover and flourish. In addition, our capabilities are influenced by the amount of support we have around us.

As a research, education and outreach leader, we have the opportunity to model what it looks like to support and sustain each other and adapt to an ever-changing world. Working together, we can address numerous challenges to support forests, ecosystems and communities to benefit people throughout Oregon and worldwide.

Sincerely,

Tom DeLuca

Cheryl Ramberg-Ford and Allyn C. Ford Dean
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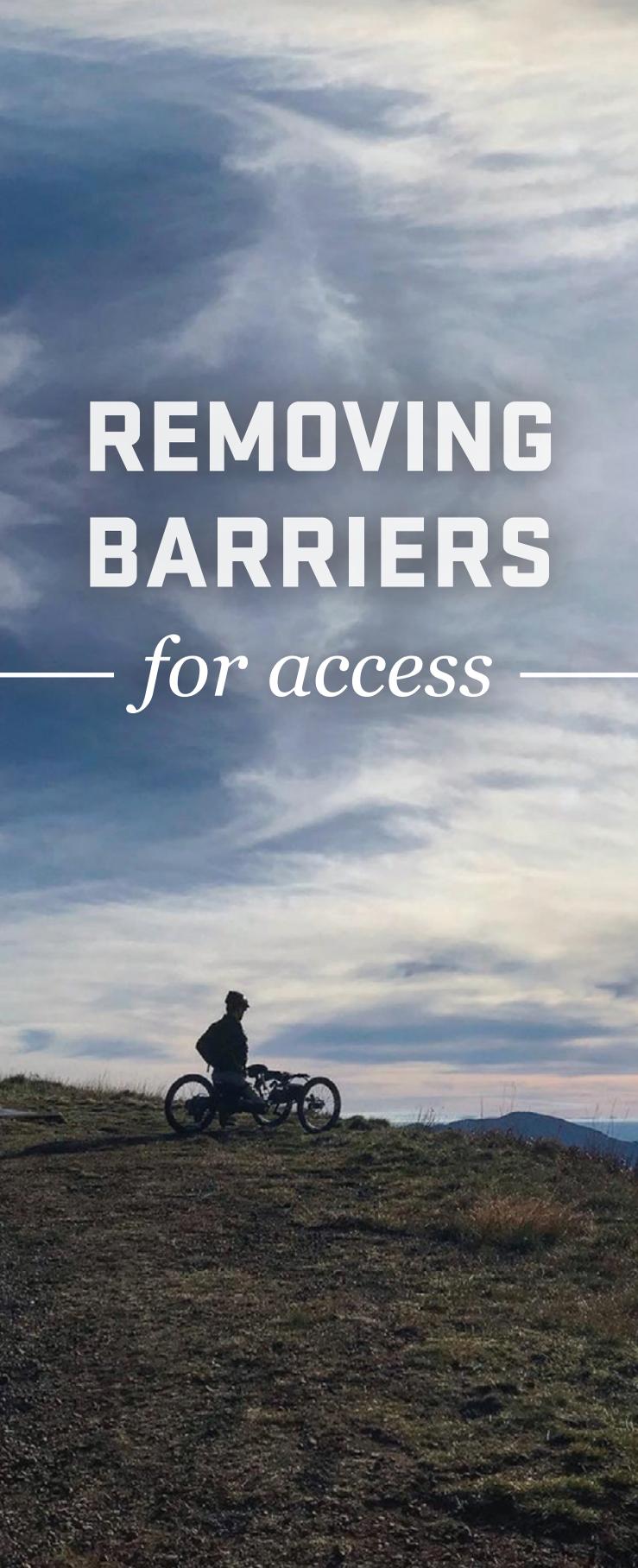
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to create a new kind of composite.



REMOVING BARRIERS

for access

Trevor Denning, class of 2022, uses a wheelchair and loves the outdoors. But sometimes, those two worlds aren't compatible. He wants to change that.

Denning is on a mission to make the outdoors more accessible to those with physical disabilities. He was inspired to pursue this goal after visiting Grand Teton National Park and realizing he wasn't able to do as much as non-disabled people.

"The greatest barrier or obstacle to accessibility is the lack of knowledge about the vast amounts of disabilities that exist," says Denning. "It is not a one shoe fits all type of problem to address."

Most of the time, he says, the people making decisions about accessibility issues are not disabled and have no firsthand knowledge on how to make a state, local or national park accessible.

"I believe that there need to be more people that are disabled in these positions because they are the ones with the real-world experience and know what needs to change," says Denning. "On many occasions, I have visited an area that is deemed 'accessible,' and in fact, it is not."

Originally from Florence, Oregon, Denning is pursuing his bachelor's degree in tourism, recreation and adventure leadership with a double minor in natural resources and leadership. Denning chose OSU because of the TRAL major, and also because of the welcoming community and college town feel of Corvallis.

"One of the best things about OSU is meeting so many students on campus that come from diverse backgrounds such as international students, military and veteran personnel, folks with the same passion I have for the outdoors

and plenty of students with disabilities,” says Denning. “OSU is very welcoming to all students.”

When not in class, Denning likes to explore the outdoors with his partner, something he’s able to do on his ReActive Adaptations custom off-road handcycle.

The handcycle was custom-built for Denning and funded by a local community fundraising effort, including donations and grants. The handcycle includes an electric assist that can support Denning as he explores areas previously inaccessible.

“My favorite part about having my ReActive Adaptations off-road handcycle is the fact that I can do so much more by myself now,” says Denning. “When I want to explore a new area, I do not need someone there to push me in my daily wheelchair because I can now transfer into my handcycle and ride until I want to stop and go over, down and around terrain that I am not able to with my wheelchair.”

Denning still gets emotional when he rides his handcycle, which he received in 2019. He’s been in a wheelchair since he suffered a spinal injury in 2011 when he was just 15 years old. For nearly ten years, he could not do the things he loved, like being outdoors and accessing the backcountry.

“Now I can, and that is such a freeing experience,” says Denning. “It’s one thing not to get outside and explore. It’s a whole other thing when it is taken away from

you, and you cannot do those simple activities that a lot of people take for granted.”

In addition to loving the land, Denning also loves the skies. He’s a licensed pilot and tries to fly planes as often as possible.

He grew up flying on the weekends with his pilot grandfather. They would fly to small airports around Eastern Washington, eating breakfast at the diners located across the street. After Denning’s accident, his grandfather showed Denning an article from his Aircraft Owners and Pilots Association (AOPA) magazine about the Able Flight program. Able Flight’s mission is to offer people with disabilities a unique way to challenge themselves through flight and aviation career training, and by doing so, to gain greater self-confidence and self-reliance.

“Seeing pictures of students learning to fly that looked like me and using a wheelchair was very inspiring, so I applied,” says

Denning. “On Christmas day in 2015, I was contacted by the program director to inform me that I was accepted to the class of 2016 Able Flight students at Purdue University.”

Denning says he is proud having the title of “pilot” and it is one of his greatest achievements.

After graduation, Denning hopes to work for a federal agency such as the United States Forest Service, Bureau of Land Management, National Park Service or the Army Corps of Engineers to help make outdoor areas more accessible to people with physical disabilities.

“Navigating a non-disabled world is tough,” says Denning. “Restaurants, grocery stores, bookstores, classrooms, and housing are some of the many things that need to be fixed and made more accessible. The first step is having people that are disabled in a position to make these changes. I want to be one of those people.” ●



Oregon State University assistant professor of global change conservation Takuya Iwamura wants to address the pressing matters of biodiversity conservation and a sustainable future through his research.

“International agreements such as the United Nations Sustainable Development Goals have brought global attention to the importance of ecological integrity for our survival. I believe our research can contribute to turning the tide to increase the chance of a better existence in the future under global change,” Iwamura says.

To address the sustainability issues arising from human and nature interactions, he applies a holistic approach based on quantitative methods such as remote sensing, GIS and computational modeling to forest, animal and human activities.

Iwamura thinks this mixed approach is more appealing to a broader audience who is not necessarily interested in traditional scientific communication such as mathematical formulas.

“Computational modeling and simulation is a more accessible format to tell a strong and moving story about science and research,” Iwamura says. “Many people want

to know about biodiversity extinction and human health risks, and when you see a human character moving in an actual landscape and encountering, for example, snakes in the field in our model, it captures your imagination.”

One example of Iwamura’s work is building a spatially explicit human-snake interaction model to explain snakebite risk in Sri Lanka.

He and his team applied mixed research methods based on remote sensing, snake observation, and social interviews related to farmer behaviors. They combined this information using agent-based modeling (ABM), a bottom-up computational simulation approach to model human agents in a realistic landscape.

“We created a computational unit to represent a farmer’s behavior and see how they move across a virtual landscape,” says Iwamura. “We then estimated snakebite occurrences based on potential snake distribution and overlap with humans, which is temperature and precipitation sensitive.”

Iwamura and his team discovered that the type of farming a farmer does, whether rice, rubber or tea, significantly affects the risks associated with snakebites.



EXPANDING THE REACH OF SCIENCE

As farmers choose different farming methods to adapt to a changing climate and snakes also shift spatially and temporally to adapt to climate change scenarios, snakebite risk adjusts.

“Revealing the mechanism of human and nature interactions is the key to many pressing problems that our planet faces,” says Iwamura. “I believe our approach will be useful to understand how society and ecology adapt to recent global changes, including climatic and land-use changes.”

As a faculty member in the forest, ecosystems and society department, Iwamura researches ways for human beings and nature to coexist. After studying complex systems and artificial intelligence, he worked as a business consultant in Tokyo to learn problem-solving with the hope of applying tools for business management to solve environmental issues.

He moved to the United States to study environmental management at Duke University. He discovered his interest in biodiversity conservation, working first as an intern at World Wildlife Fund (WWF) in Washington, D.C. He was intrigued by academics and research, which led him to Australia to pursue his PhD in spatial resource allocation with Professor Hugh Possingham, who later served as chief scientist at the Nature Conservancy.

“Working with Hugh taught me a lot, especially about impactful science for environmental problem solving,” says Iwamura.

After his time in Australia, Iwamura moved back to the U.S. for a postdoctoral position at Stanford University. He studied geography with Professor Eric Lambin and gained experience working with and researching Indigenous communities with Dr. José Fragoso.

“This was a perfect transition, and it broadened my horizon quite a bit into the human side of things,” says Iwamura.

Iwamura then moved to Israel to be an assistant professor at Tel Aviv University. All those moves forced Iwamura to do the hard work of learning a different language and culture, shaping him into a global citizen adept at navigating human and social dimensions and viewing experiences and life through multiple lenses.

Iwamura believes an interdisciplinary approach is the key for solving ecological problems. He is interested in revealing the mechanism to explain how nature and humans interact using the scientific domain of social-ecological systems.

Iwamura joined the OSU College of Forestry in January 2021 and looks forward to an in-person fall resumption and working with many people across campus.

“I am particularly excited with the collaborative nature of OSU. I have already started some work at the H.J. Andrews Experimental Forest, where I met many researchers and friends. It feels good to know we have such a strong community,” says Iwamura. ●



IWAMURA



CENTERING INDIGENOUS FIRE STEWARDSHIP

For **Skye Greenler**, a fire ecologist and PhD candidate, fire management has been part of her life from a very young age.

“I grew up on a family farm in Wisconsin that was half organic cropland and half restored tall-grass prairie,” says Greenler. “Conducting prescribed prairie burns was a celebration of the changing seasons, and balancing production with sustainability and conservation was an integral part of working on the land.”

Her family’s prairie management emulated that of upper Midwest and great plains tribes, which instilled a deep interest in the practices of Indigenous fire managers. The farm also taught Greenler to think critically about sustainably using the land, building healthy ecosystems to buffer resources through bad years, and balancing a range of seemingly contradictory objectives—the questions she’s still thinking about today.

Greenler is at the forefront of a more holistic perspective in scientific inquiry. She is working to understand how systemically entrenched bureaucracy, patriarchal mindsets of command and control and injustices to underrepresented communities

inhibit adaptation to our current fire challenge.

She arrived at OSU excited about the opportunity to study wildfires in one of the most fire-prone landscapes in the nation, where science, management and policy decisions often drive changes in the region and across the country.

Her dissertation focuses on identifying when wildfires can help restore historical and healthy forest conditions in eastern Oregon and northern California. A major part of her dissertation focuses on developing landscape-scale fire models for northern California that incorporate Indigenous fire management practices into cutting-edge fire modeling and management tools.

“This work is a collaboration with Karuk tribal experts, resource managers and scientists. Working together, we will better understand historical forest conditions, implications of different management decisions, and the changes necessary to build future climate and wildfire resilient ecosystems and communities,” says Greenler.

Greenler says there is an urgent need to reassess how we manage and live with fire in Oregon and many places across the globe.

“Understanding when, where, and how fire is beneficial on landscapes is critical for us to work towards promoting good fire and coexisting with fire rather than needing to fight and fear all fire,” says Greenler.

There is also increasing recognition of the importance of Indigenous fire management in restoring landscape resilience, reducing risk to communities and promoting critical first foods and medicines.

“This work is very place-based and needs to be led by local tribes, not Western scientists, but I see a lot of hope in collaborative work that centers Indigenous fire stewardship and land management,” says Greenler.

Greenler hopes that fire scientists can transition to uplifting Indigenous fire management in the following decade and collaboratively create a tangible and substantial space for cultural burning within fire management and landscape restoration.

“In the western United States, wildfire is a natural process that is foundational to maintaining ecosystem health but is increasingly a destructive event that can result in loss of life, property, and valued natural

resources,” says Greenler. “Science, management, and policy that together can reduce the risk of uncharacteristic, destructive fires, while promoting natural fire and forest processes is critical to restore forest resilience and reduce risk.”

Greenler’s major professor **John Bailey**, professor of silviculture and fire management, says she exemplifies the combination of intellectual ability, talent, drive and heart to advance the College of Forestry’s mission for research, teaching and outreach.

After receiving a Provost Fellowship, Greenler helped found the Traditional Ecological Knowledge Club, which supports Tribal rights and inclusion in natural resource stewardship, including hosting a recurring conference on Traditional Ecological Knowledge in ecosystem sustainability. She served as the President of the Student Association for Fire Ecology and is one of 100 doctoral students in the U.S. and Canada selected to receive the Scholar Award from the P.E.O. Sisterhood.

Greenler received a master of science degree from Purdue University in 2018 and a bachelor of arts degree in ecology from Colorado College in 2014. ●



GREENLER



CREATING INCLUSIVE OUTDOOR EXPERIENCES *that are accessible to all*

Research indicates that nature-based experiences are crucial for our health and well-being – especially for children.

The national ‘Get Outdoors Day’ program creates opportunities that encourage healthy and active outdoor fun for families and children – particularly on public lands and natural areas. The event emphasizes engaging underserved communities while providing a welcoming environment for first-time visitors.

For the past eight years, the OSU College of Forestry, OSU Research Forests, OSU Extension Service, and Community Health Centers of Linn and Benton County have partnered to host Get Outdoors Day at Peavy Arboretum.

“We focus on hosting a bilingual (Spanish and English) event and conducting outreach to Title 1 schools while providing free transportation and bussing to the forest. We also coordinate with dozens of local agencies and organizations to provide opportunities to learn about natural resources, forestry, cultural history, and healthy

lifestyles,” says Jenna Baker, recreation and engagement program manager at the OSU Research Forests.

But, how do you hold a Get Outdoors Day during a global pandemic?

“It was tough to think of creative alternatives that encouraged outdoor exploration and remained inclusive and accessible,” says Baker. “For example, we couldn’t assume every child had access to a backyard, outdoor equipment, or vehicle. Plus – it is a bit of an oxymoron to say it’s a ‘virtual’ Get Outdoors Day.”

The planning team for Get Outdoors Day included a diverse group of outreach faculty, foresters, educators, bilingual school health navigators, extension specialists, and parents, which allowed the team to examine the virtual format from different perspectives.

For example, initial plans involved online activities that kids could complete throughout the summer. One parent noted the extreme screen-fatigue that kids and parents were feeling from the pandemic.



Another educator highlighted that many families might not have consistent access to a computer or internet. The team provided a free bilingual printed Get Outdoors Day magazine as an additional option to address these constraints.

Throughout the entire process the planning team constantly addressed core questions: Will this be equitable? Would this approach exclude anyone?

These are complex and salient questions that outdoor professionals must think critically about to address barriers that prevent people from participating in outdoor recreation.

Baker says we need to broaden the narrative about what it means to connect with and enjoy the outdoors – and who is enjoying it.

“If we frame outdoor recreation as a primarily white endeavor, or if the focus is on activities that require lots of expensive gear, hard-to-access areas, or specific knowledge sets, then we continue to reinforce these patterns and exclude others,” says Baker.

Time, money and access are three barriers that can prevent people from accessing outdoor areas.

“The reality is, it takes time to go on a long hike. You need money to purchase or rent a kayak, life jacket and paddles. You often need a vehicle to access your nearest national park or forest. Unfortunately, many people work on weekends, have little to no time off, or don’t have reliable access to a vehicle. We can’t expect to make our outdoor areas and national parks more inclusive, for instance, without thinking critically about what it takes to get there,” says Baker.

Parks and outdoor areas also need to adapt their messaging by thinking critically about how information is shared, and the assumptions held about a person’s outdoor interests, comfort levels, and feelings of safety.

“We can’t assume that people want to experience solitude while visiting the outdoors,” says Baker. “For some, this experience may trigger real fears about encountering violence and prejudice.”

At the crux of addressing this shift in narrative is having more diverse and representative leadership at all levels of decision making, marketing, and outreach to better represent the demographics of our nation for Get Outdoors Day and outdoor recreation as a whole. Leadership must balance diverse perspectives, identities, and values, including Indigenous communities and other groups historically underrepresented in the outdoors.

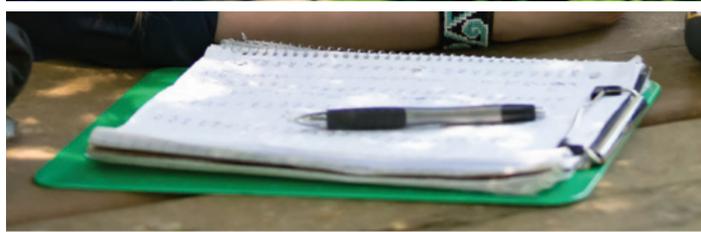
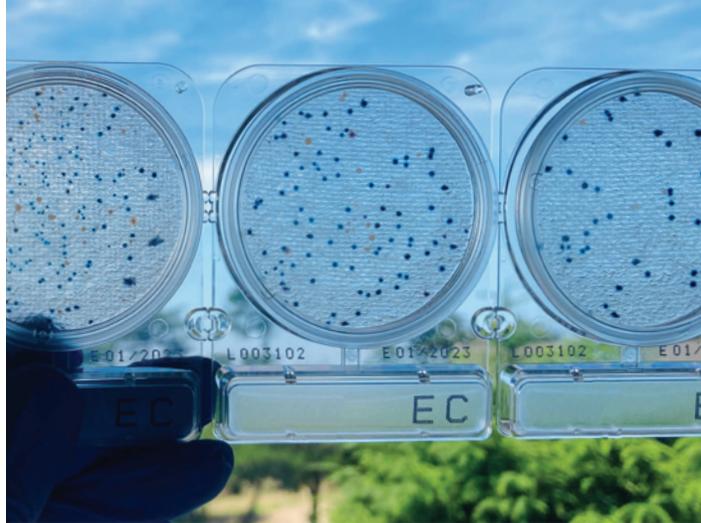
Over the years, Get Outdoors Day has made an impact; most kids and families that attend the event are visiting the Research Forests for the first time.

“We hope that this event can motivate outdoor engagement and plant initial seeds of inspiration for future forest stewards, scientists, and professionals,” says Baker. “I also hope that people join us for Get Outdoors Day next year – or let us know how we can continue to work towards our goal of creating a more inclusive and welcoming outdoor experience for all.” ●

For additional information visit cf.forestry.oregonstate.edu/go-day



BAKER



INVESTIGATING THE IMPACTS

OF RECREATION USING A CULTURAL IMPACT LENS

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

Jacobs, who is pursuing her PhD in forest ecosystems and society, works 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 that 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 Treaty obligations that the U.S. government holds to manage the Tribe's non-reservation lands in manners that maintain 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.

After completing her master’s degree, Jacobs wanted to continue researching outdoor recreation science but was more interested in the ecological impacts of outdoor recreation.

“There are five recreation ecology lab groups at universities worldwide, four of which are in the U.S., and one at OSU,” says Jacobs. “Dr. **Ashley D’Antonio**’s recreation ecology lab group is where the best GIS work is coming from in this field. So, it was a natural choice for me to apply to be in her lab group.”

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. Jacob’s 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 for the past year, she 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, Dr. D’Antonio.

“She 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.”

During her spare time, Jacobs loves to hike, backpack, kayak, and explore different ecosystems. She also enjoys time with family.

“Family means so much to me, and so does my culture,” says Jacobs.

“I work with a cultural guide to connect with my Tribe and spend time learning our Mvskoke language and histories. I also love to create beadwork that is inspired by my people and our connections with the land. In the summer, I spend my time gardening and harvesting foods and medicines. In fall, I spend countless hours canning, drying, and preparing food for my family and Tribal Elders.”

The College of Forestry has supported Jacobs’ education through multiple scholarships, including covering equipment costs for her research.

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 and generate more information about recreation impacts in 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, too, belong in the academy and help them realize their potential and achieve their dreams. ●



ADAPTING TECHNOLOGY

For Innovation

A lumna **Balkis Bakar**, an Oregon State University graduate who received her PhD in wood science in 2019, is adapting wood-based composite manufacturing technology to create a new kind of composite material made from grape cane fibers.

Bakar came to OSU as a sponsored student from the Ministry of Higher Education Malaysia and Universiti Putra Malaysia. She had a general idea of what she wanted to research, but it wasn't until a service project with a local Oregon vineyard that she found a suitable material to work with. The company wanted to do something with their agricultural waste, which triggered an interest for Bakar.

"We often see the commercial product produced from the crop or plantation such as wine or cotton fibers. But what happens to the necessary byproduct produced from activities like pruning or harvesting?" asks Bakar.

Bakar says some byproduct is used for fuel, as mulch, left in the field or burned. But there is a growing interest and effort in many countries to use underutilized fibers or non-wood fibers.

"Balkis saw an opportunity to study the resource and then create a product," says Professor **Fred Kamke**, the JELD-WEN Chair of Wood-based Composites Science and leader of the wood-based composites center at OSU. "Her greatest contribution is a thorough analysis of the raw material, including anatomical characteristics, cell wall structure, and chemistry."

Based on her analysis, Bakar devised a process to extract the usable fibers and manufacture a composite using 40% grape cane fiber and 60% polyester.

"No one had done that with grape cane before," says Kamke. "Grape cane is typically burned as waste."

"Adapting underutilized fibers like agricultural waste as an alternative material for wood in certain applications can have many benefits," says Bakar. "It can reduce the demand burden for wood, and growers can benefit if the plantation byproduct has some economic value."

Bakar, who obtained her bachelor's degree in bio-composite technology at Universiti Teknologi Mara Shah Alam and master's degree in the same field at Universiti



KAMKE + BAKAR

Putra Malaysia, explains that bio-based composites are not limited to wood fiber and include all plant materials. Previously she studied agricultural waste and byproducts from palm oil plantations.

Bakar sees potential for future grape fiber research, saying that some vineyard owners are already trying to utilize this material. Examples include weaving the cane into containers, creating decorations or converting the fiber into boards.

The Wood and Fiber Science Journal published Bakar's research in 2020 and the International Society of Wood Science and Technology (SWST) awarded Bakar and Kamke the 2021 George Marra first place award for excellence in writing.

Bakar currently works at Universiti Putra Malaysia as a lecturer in the Department of Natural Resource Industry at Faculty of Forestry and Environment.

Bakar chose OSU because of its reputation in the forestry field and the reputation of Dr. Kamke.

Dr. Kamke has led the Wood-Based Composites Center (WBC) for over 17 years. The WBC is an NSF Industry/University Cooperative Research Center with two main university sites, Oregon State University and Virginia Tech. Partner institutions North Carolina State University, Michigan State University, Auburn University and the University of Nevada Reno also conduct WBC research.

As head of the center, Kamke leads research involving the design, manufacture and performance of wood-based composites. His research group also explores the interaction of adhesives with wood and modified wood in composite applications.

Kamke says many people think of particle board when they hear the phrase wood-based composite, but it is so much more than that. Wood-based composites can be manufactured in various shapes and sizes and include composite lumber, structural panels, and 3D molded parts.

"Even cross laminated timber (CLT) is considered a composite and architects are now designing skyscrapers using CLT," says Kamke. "CLT is made from lumber, but a companion product

called mass plywood panels (MPP) is made from veneer by the Freres Lumber Company. I predict that we will see other types of wood composites used in the mass timber products market."

There are many advantages to wood-based composites. They are highly uniform in their properties, whereas solid wood varies from piece to piece. Pound for pound, a structural wood composite will have greater strength and stiffness than a solid-sawn beam or column. Perhaps the best advantage of composites is the ability to use nearly 100% of the log (excluding bark) while solid-sawn lumber has a yield of about 50%. In addition, producers cannot create another solid piece of lumber with recycled wood and sawmill residues, but producers can utilize the materials to create a composite.

Both Bakar and Kamke see massive opportunities in the broader field of bio-based composites, adhesives and modified wood composites.

"Wood-based composites and modified wood products can compete against synthetic composites like glass fiber composites, and also with steel and concrete," says Kamke. ●

CLASS OF 2021 GRADUATES HONORED AT VIRTUAL CELEBRATION

Dedicated to preparing the future leaders of our working forest landscapes, the college awarded 208 undergraduate degrees and 77 graduate degrees with a virtual celebration held in June. At the celebration, three graduates were presented with awards recognizing their exceptional work during their time at Oregon State:



Stacey Dunkley, bachelor's degree in forestry, earned the Paul & Neva Dunn Outstanding Senior Award in recognition of her outstanding scholastic achievement and professional ability.



Hanna Girod, bachelor's degree in renewable materials, received the Harold Bowerman Leadership Award for demonstrated leadership, outstanding contributions and enthusiastic participation in student club activities and college programs.



Paul Catino, bachelor's degree in forestry, received the Kelly Axe Award for tirelessly supporting professors, fellow students, clubs and college projects during his time at Oregon State.

IN MEMORIAM

The Oregon State College of Forestry mourns the loss of these alumni, friends of the college and former faculty. We wish peace and comfort to their family and friends.

Furthermore, we recognize that many people within the college and college community have lost loved ones this past year. We offer sincere condolences to all who are grieving during this time.

Gene Thompson

Class of 1959

Sept. 10, 1936 – March 16, 2021

James Gordon Fisher

Class of 1956

Feb. 20, 1935 – April 14, 2021

Gary Thad Springer

Class of 1970

Oct. 4, 1948 – May 25, 2021

COLLEGE OF FORESTRY

HOMECOMING TAILGATE CELEBRATION

2 HOURS
BEFORE
KICKOFF

SATURDAY
OCTOBER

23 2021



PEAVY FOREST SCIENCE CENTER

www.forestry.oregonstate.edu/homecoming