

# CHARTING a **SUSTAINABLE FUTURE**

*A journey across the college to reveal our embedded values of sustainability*

According to the Oregon state legislature, in defining the Oregon Sustainability Act of 2001, sustainability is defined as “using, developing and protecting resources in a manner that enables people to meet current needs while providing for future generations to meet their needs, from the joint perspectives of environmental, economic and community objectives.” That broad-reaching definition is found throughout the work at the college in every aspect of its land-grant mission of teaching, research, and extension.

This story uncovers just a handful of examples of how sustainability reveals itself in all of what we do. From food and food packaging to the importance of how we name our work, to the challenges of combatting drought and other impacts of climate change. From our vibrant valleys to the sagebrush steppe to the ocean, and beyond. Sustainability is the common thread that ties it all together as it runs across our most recognized strengths and strategic advantages—our coastal food systems and conservation efforts, our food innovation for health, markets and access, our agricultural competitiveness and resilience, and our working and natural landscapes. Sustainability, in all its varied forms and descriptions, is embedded in it all.

By Heidi Happonen



## A Saucy Jumping Off Point

Our story starts at the Corvallis campus pilot plant. A photo of Ernest Herman Wiegand, the first department head for Food Science who started the plant at OSU in 1955, hangs on the wall behind his great grandson, Zak Wiegand, who now manages it.

“I love carrying on this tradition as a resource for the Oregon food industry, training students and improving products and processes, facilitating innovation for companies and entrepreneurs of all sizes,” he said.

One example of the impact of that tradition was recently noted by Craig Reinhart, owner of the family-run hot sauce company, Bend Sauce.

After perfecting his family’s chipotle sauce recipe and ensuring its shelf stability with OSU scientists at the Food Innovation Center in Portland, Reinhart’s business began to boom. As his hot sauce sales soared, he started making new products from the pulp materials left behind in transforming the chipotle pepper into their signature smooth, thick and rich sauce.

Soon, the infrastructure he had at his manufacturing facility just wasn’t keeping up with demand and his effort to turn processing waste into added value products slowed. In turning to OSU’s pilot plant, he found a partner who could help him keep up with demand. Today, he sends up to 200 pounds of pulp and seeds at a time to the plant where they dehydrate the pulp and seeds efficiently and ship the “Lava Rocks” back to Bend where Reinhart’s team grinds and packages it into a unique seasoning called Cinder Dust™.

Reinhart noted, “Oregon State has been instrumental in our success, and very early on gave us the encouragement that we were on the right track, providing the tools we needed to bring our product to market efficiently without compromising quality.”

The Bend Sauce story is one of countless similar tales of how OSU scientists work with food entrepreneurs to enhance the sustainable use of their products to not only reduce waste but increase added-value and create new economic opportunities.

## From Trash to Treasure

Transforming waste into something valuable is increasingly becoming a common practice because of the win-win modality it offers. Not just in creating consumable products, but in creating packaging materials as well.

Continuing our sustainability journey, we visit food scientist, Yanyun Zhao, whose recently patented apple pomace packaging material is capturing national attention.

**Below left:** Co-founders Craig and Niki Reinhart worked with OSU to find value-added products using waste from the processing of their Bend Sauce.

**Below:** Zak Wiegand dries chipotle pulp and seed to create “lava rocks” used to make seasoning.

**Below right:** Yanyun Zhao demonstrates one of her food-based edible packaging solutions.



This byproduct from fruit juice and concentrate processes uses molded pulp as protective packaging in products such as floral containers, nursery pots, food trays, and beverage containers. This results in a full circle cycle of taking the byproducts from juicing to make packaging that is then returned to the soil to feed agricultural production that in turn comes back to the consumer in the form of edible products.

There are countless examples of sustainable food manufacturing efforts taking shape in the department. So many, in fact, that the Food Science and Technology degree has now been renamed Food Science and Sustainable Technologies.

“Sustainability is really at the heart of everything we do in food science,” noted department head, Lisbeth Goddik. “We had organically devel-

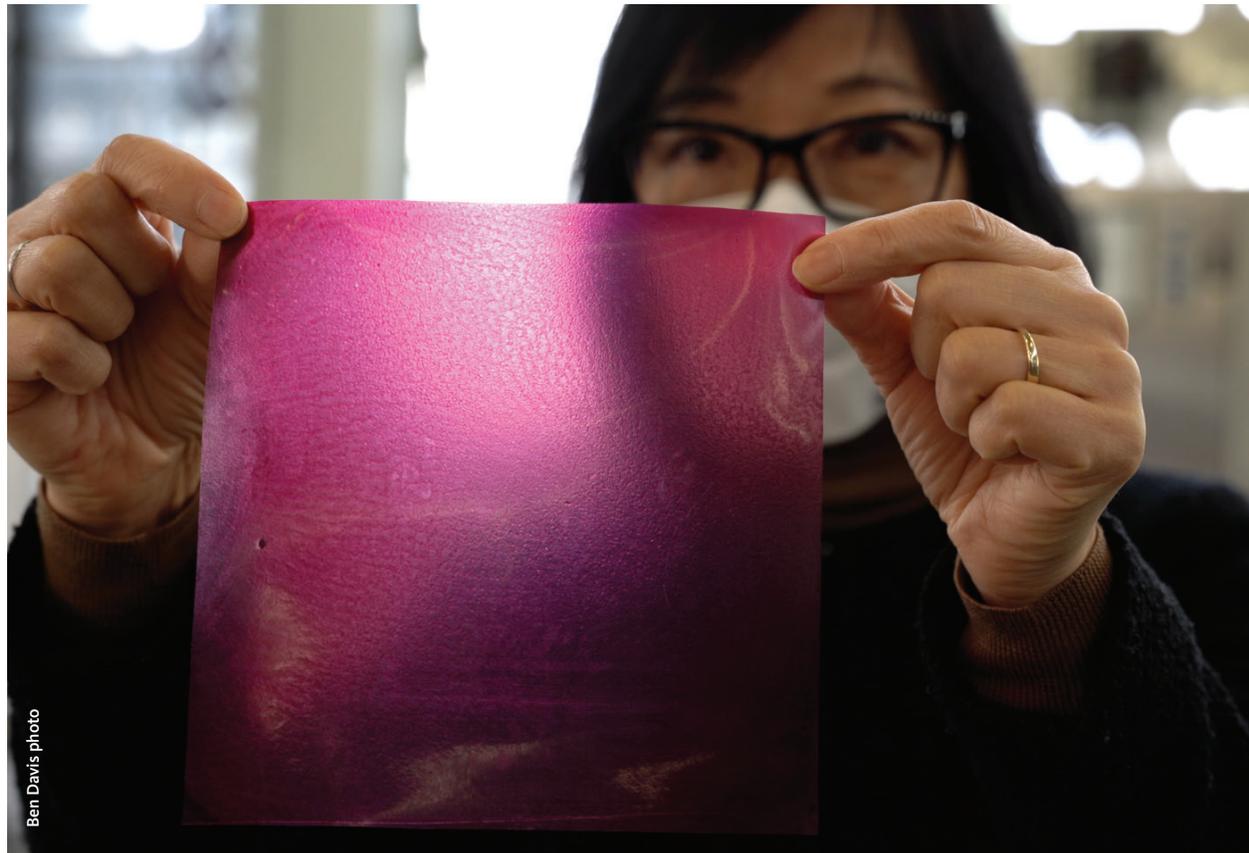
oped that practice but when we took the time to step back and assess our work and the needs of the stakeholders we serve, it became clear that it was time to make sustainability front and center.”

That desire to have a name better reflect the mission was also paramount in the Fisheries and Wildlife Department which officially changed its name to Fisheries, Wildlife, and Conservation Sciences earlier this year.

Selina Heppell, head of the department, explained some of the rationale for this name change.

“Fisheries and Wildlife Science has always been about conservation and sustainable use of natural resources. Sustainability is ingrained in our work. Expanding our department name encompasses the broader view of fisheries and wildlife science—strategies to conserve non-game species and

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habitats, for example—that are a major focus of our research, teaching, and outreach. It also embraces the human dimensions of our work, because biological science alone will not help resolve difficult conservation issues.”

Several faculty members, including Stan Gregory, Ivan Arismendi, and Scott Mitchell, with input from Jim Hall, Howard Horton, Bob Jarvis, and Andy Landforce, contributed to an article in the department’s summer newsletter about the name change and noted that: “Names matter. Names represent how we view ourselves, become part of our identity, and in time create a legacy.”

This department name change is yet another example of how programs within the college are formally recognizing how the work they are already doing serves increasingly growing demands from the public to elevate sustainability.

### **From Changing Names to Changing Climates**

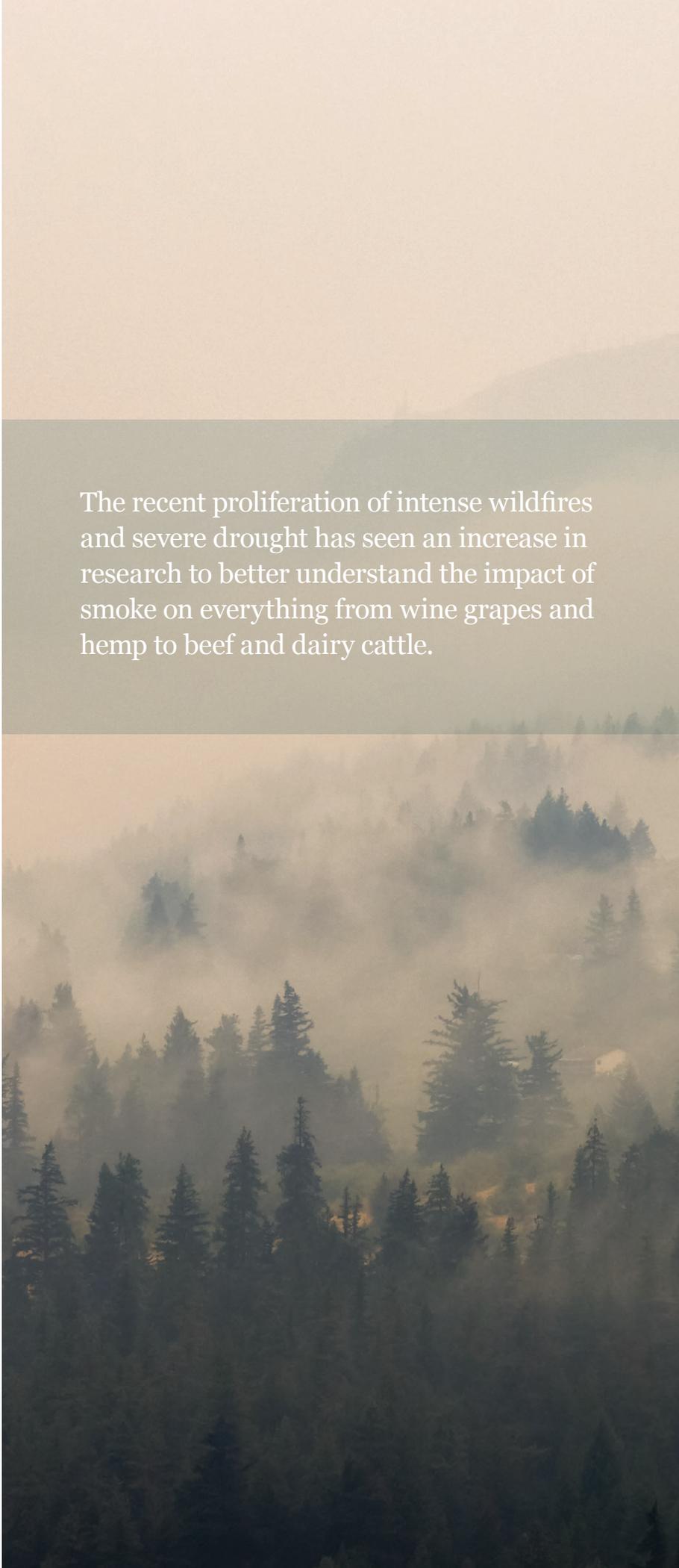
The work of sustainability is evident across the campus and around the state. Nearly every department is involved in combatting the effects of climate change, and nearly all the 14 experiment station locations are invested in this work.

The recent proliferation of intense wildfires and severe drought has seen an increase in research to better understand the impact of smoke on everything from wine grapes and hemp to beef and dairy cattle. At the same time, new technologies are being developed to reduce the amount of water needed in irrigation or in some cases, even introducing dry farming—the practice of farming without irrigation—to reduce the dependence on water.

In regions like the Klamath Basin, where water access has been shut off in recent growing seasons due to concerns over impacts to threatened fish species in the local waterways, that research is becoming critical to sustaining not just the environment, but the community and culture of the region.

Home to the highest farmgate value of organic agriculture in the state, Klamath County points to many of the trends that are taking shape across agricultural production to reduce dependence on water and pesticides.

“These sustainability practices are not just good for the environment, but they save money in production,” added Brian Charlton, director of the Klamath Basin Research and Extension Station. “This in turn helps more of Oregon’s farms stay in business—95% of which are family held.”



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In eastern Oregon, rangeland scientists are working with local ranchers to adapt land management practices to not only improve habitat but help combat wildfire with foraging practices to reduce fuels that propagate the spread of wildfires.

Fire is a natural component of the sagebrush steppe ecosystem, but it also is a threat to wildlife habitat, forage for grazing and it can encourage invasive plant establishment. Wildfire suppression

as distribution and access across our complex food system.

Historically, when we have talked about the food system in terms of sustainability it has been under the concept of food security. This is where the food bank models and other similar structures have taken shape to meet the needs of people whose access to healthy food is limited by geographic, economic, or societal challenges.



Stephen Ward photo



OSUEC photo

**Above:** The sagebrush steppe ecosystem is vital to Oregon's livestock production.

**Above right:** Cattle in eastern Oregon often graze on native plants.

responsibilities have historically fallen across multiple groups and organizations, but fire doesn't see invisible boundaries of land ownership so collaboration across these organizations is key.

This is one reason why a growing number of animal and rangeland science students are gravitating toward the sustainable livestock ranching program. Many ranchers strive to balance sustainable land stewardship with livestock production goals and other ranch enterprise operations. In addition, land conservation NGOs and consultancy firms are increasingly looking to use grazing as a management tool.

There are countless evolving systems and technologies being deployed to advance sustainable agriculture: from monitoring cattle movements from outer space to investing in solar-powered agrivoltaic systems to help producers improve crop production while generating power to run their farms to using GPS systems to track irrigation and chemical use.

Sustainability is a shared value that is bringing together diverse groups who understand that by working together they can solve problems more effectively than going it alone. This is true for both the management of agricultural production as well

Increasingly, that conversation is shifting through the lens of equity, and we are now starting to see the value of access in a new light.

### **Pivoting from Security to Sovereignty**

Food sovereignty is gaining traction in the conversations about sustainability. It emphasizes ecological production, distribution and consumption, social economic justice and food systems to improve food security for all people.

According to Garry Stephenson, director of OSU's Small Farms program, "It's not reductionist. It's a whole system of production and distribution involving the community and social justice."

He went on to explain that food sovereignty and healthy food systems requires a diverse approach to agricultural production.

"We need large farms, medium sized farms, and small farms—we need global, national, regional, and local food systems. There is no 'one best way'. When we have a diversified approach, it's good for people and good for business."

Another element of that diversity is what Stephenson refers to as agroecology—defined by the Food and Agriculture Organization of the United Nations as "a holistic and integrated



approach that simultaneously applies ecological and social concepts and principles to the design and management of sustainable agriculture and food systems.”

Because so much of food production is connected to access to land and opportunity to grow foods, there is an inextricable link between the future of agriculture and social justice. There are communities of people who have been denied access to land ownership for generations and the work of food sovereignty and agroecology aims in part to address some of those historic inequities.

Rodrigo Ruiz Corona recently joined this effort with OSU’s Small Farms program at the Learning Gardens Lab in in Portland. OSU shares this space with several other organizations, including Black Futures Farm, Portland State University, and Community Gardens

Corona works with local communities to practice and teach methods for regenerative soil, minimal tillage, and intensive production in an urban environment—from seed to plate to seed again.

“The environment is not static. We can’t just reduce footprints. If a house is on fire because we

poured gas on it, the solution isn’t to pour less gas on it.”

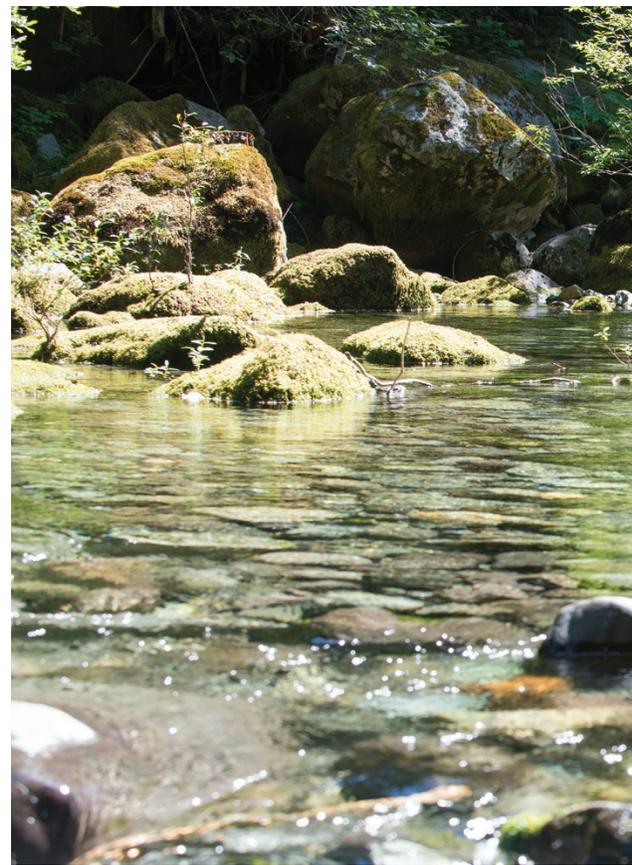
He went on to explain:

“It’s not possible to go back to the way we used to do things, we just don’t have the environment for that. There are lessons we can learn, but we must do the work to recreate culture. This is about earning the right to become ancestors.”

The view of seeing sustainability as a responsibility to ourselves and future generations is a theme that permeates throughout the sustainability work taking shape across the college. It is also echoed by many students, the majority of whom when surveyed note sustainability as a core value and a significant reason for pursuing their degree in the College of Agricultural Sciences. Whether it’s in our pilot plant or the rangeland, from urban farms to drought-stricken communities—sustainability is top-of-mind and embedded in the teaching, research and outreach efforts at OSU.

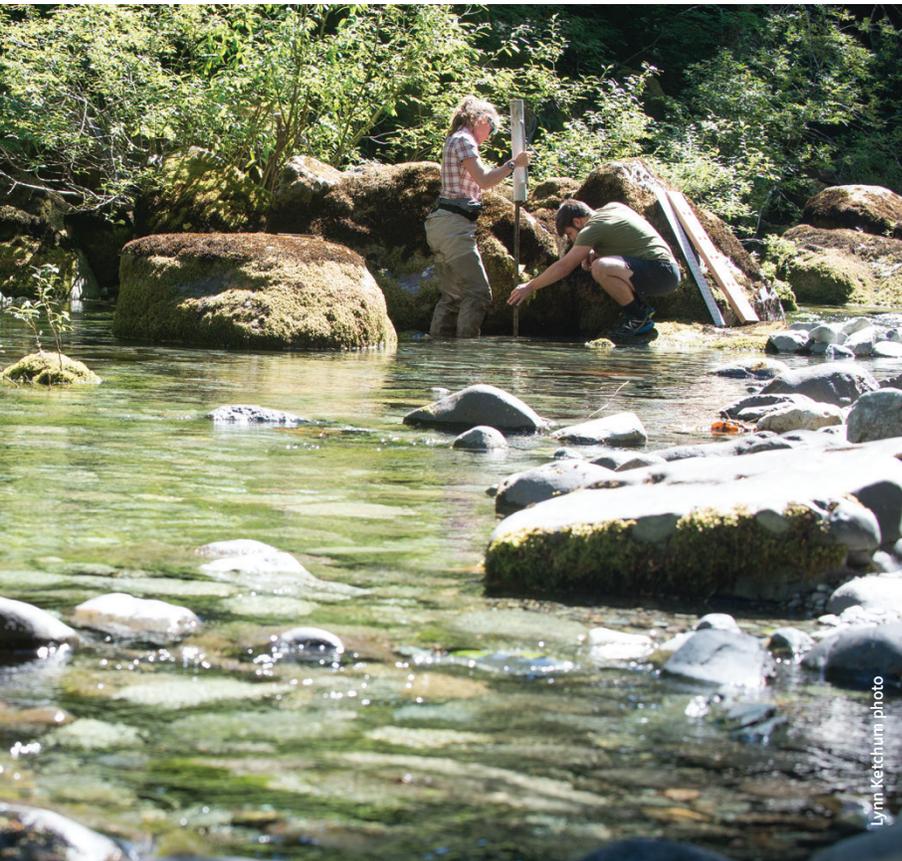
### Beyond the College

The move toward integrating sustainability in multiple facets of our land-grant mission has evolved



**Above left:** Garry Stephenson, director of OSU’s Small Farms program, is part of a growing movement around food sovereignty and agroecology.

**Above:** OSU researcher Desiree Tullos and graduate student Alan Stanton installing a water depth gauge as part of a citizen science project on the Little North Fork of the Santiam River near the Opal Creek Ancient Forest Center.



Lynn Ketchum photo

over time in response to demand from students, stakeholders, communities, and ourselves. Recently, Jen Alix-Garcia was tapped to lead OSU's sustainability double degree program. The department head for Applied Economics, Alix-Garcia notes that her entire career has been about sustainability.

"From the very beginning, sustainability has been central to my work. My undergraduate degree is in ecology, and when I went out working in the world, I recognized how critical it is that we strike a balance between conservation and people's livelihoods which is where my teaching and professional activities remain focused."

According to the degree website:

"The mission of the Sustainability Double Degree program is to provide all OSU students foundational understanding of coupled human-natural systems, critical thinking, and evidence-based analysis so that they can be agents of positive change supporting planetary health, social justice, and economic equity in any disciplinary or career path they choose."

According to Alix-Garcia, "The solutions to the biggest challenges we face as a society all involve

the intricate relationships between humans and natural systems. Facing these challenges requires marshalling knowledge across all disciplines."

Students enrolled in the double degree program represent a diverse cross-section of majors and colleges. Currently there are 171 students declaring a sustainability double degree major and many others pursuing the minor. Most of the majors are in ECampus but the program is also offered at the OSU Cascades and the Corvallis campus. Majors represented include students in the College of Agricultural Sciences, College of Business, College of Forestry, College of Liberal Arts and the College of Engineering.

In a recent student survey, participants noted that the main reason for pursuing this degree is to solve the world's problems with an understanding that those problems are complex and relate to humans interacting with environmental systems.

Clearly, future leaders across the University recognize the importance of sustainability and are seeking ways to integrate critical knowledge into diverse areas of study.

### Piloting a New Future

Sustainability in the College of Agricultural Sciences is not just pervasive, it is embedded in nearly every aspect of the work we do every day. And we haven't even mentioned the ocean.

The quite literal ocean of work researchers are undertaking in our coastal communities and beyond—from microplastics and whale entanglements to fisheries management. From the work being done in ocean acidification models impacting aquaculture and studies being conducted to better understand climate change on salmon spawning habitats. It's exhaustive and growing exponentially.

And all of it helps to inform policies and practices that advance shared goals in achieving the balance necessary to chart a sustainable future. Whether it's extracting pulp from food processing waste or monitoring cattle movements from outer space, we are in this journey together with a fundamental understanding that the pursuit of discovery is shared. It requires the skills, vision, and humility of all of us if we are to truly pilot ourselves to a sustainable future and, as Mr. Corona so aptly noted, "earn the right to become ancestors." 