

ACES MAGAZINE

COLLEGE OF AGRICULTURAL, CONSUMER AND ENVIRONMENTAL SCIENCES

VOLUME 3 | SPRING 2020



A HELPING HAND

Research to improve soil health takes root in ACES

DEAN'S LETTER

Impacting the lives of New Mexicans

With this edition of *ACES Magazine*, we hope you will learn more about what our faculty, staff and students are doing in the College of Agricultural, Consumer and Environmental Sciences. It is important to know that only 1.5 percent to 2 percent of the population in the United States is working in agriculture. Over the years, we have lost the understanding of where our food comes from.

The common effort to bring food from the fields to our tables, which keeps us fed and healthy, is extremely important and remains fundamental to the activities we do in ACES. This is why we need to communicate with our stakeholders about what we are doing to produce economic and community development.

In the following pages, you will meet new leaders who joined ACES during the last academic year and learn about important research projects related to soil health and sustainability, water conservation for turfgrass, and placental health.

We are delighted to announce that Leslie Edgar will join ACES as our new associate dean and director of the Agricultural Experiment Station, starting June 1. She comes to us with a wealth of academic, administrative, research and teaching experience. She is currently the department head of Agricultural Leadership, Education and Communication in the College of Agricultural and Environmental Sciences at the University of Georgia, where she has also served as professor and graduate coordinator. Our heartfelt thanks go to Natalie Goldberg for doing an outstanding job as the interim associate dean and director of the Agricultural Experiment Station.

Last but by no means least, the induction of Fabián García in the National Agricultural Center Hall of Fame will take place during National Hispanic Heritage Month this year. This is an outstanding recognition for the pioneer who made ACES a strong college since its beginnings. García is the first New Mexican and first Hispanic inducted into the National Agricultural Center Hall of Fame.

I want you to know that we appreciate your support and collaboration in giving New Mexicans a chance to improve their health, environment and economic wellbeing, and facilitate their social mobility through educational opportunities.

I hope you enjoy our third issue of *ACES Magazine*. Go Aggies!



Rolando A. Flores
Dean and Chief Administrative Officer



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Fraze seeks opportunities to grow AXED

BY CARLOS ANDRES LÓPEZ

Steven Frazee began the spring 2020 semester in a new job – at a new university. For more than 30 years, Frazee had been a fixture at Texas Tech University, having served in various

faculty and administrative positions in the College of Agricultural Sciences and Natural Resources and the Department of Agricultural Education and Communications.

He had not considered leaving Texas Tech until he learned of an opportunity to lead the Department of Agricultural and Extension Education, or AXED, in the College Agricultural, Consumer and Environmental Sciences at New Mexico State University.

“Dr. Frank Hodnett had called me to ask if I would be interested in applying for the job,” Frazee said. “I was happy at Texas Tech, but he kept calling me, and finally he talked me into checking things out. It turned out to be a good situation. So, I went on to apply and ended up getting the offer and came over.”

Frazee relocated to New Mexico and started his new job in January. He now oversees a department that has five faculty members, three staff members and more than 100 students. AXED currently offers two bachelor’s programs and a graduate program. But Frazee sees opportunities to grow.

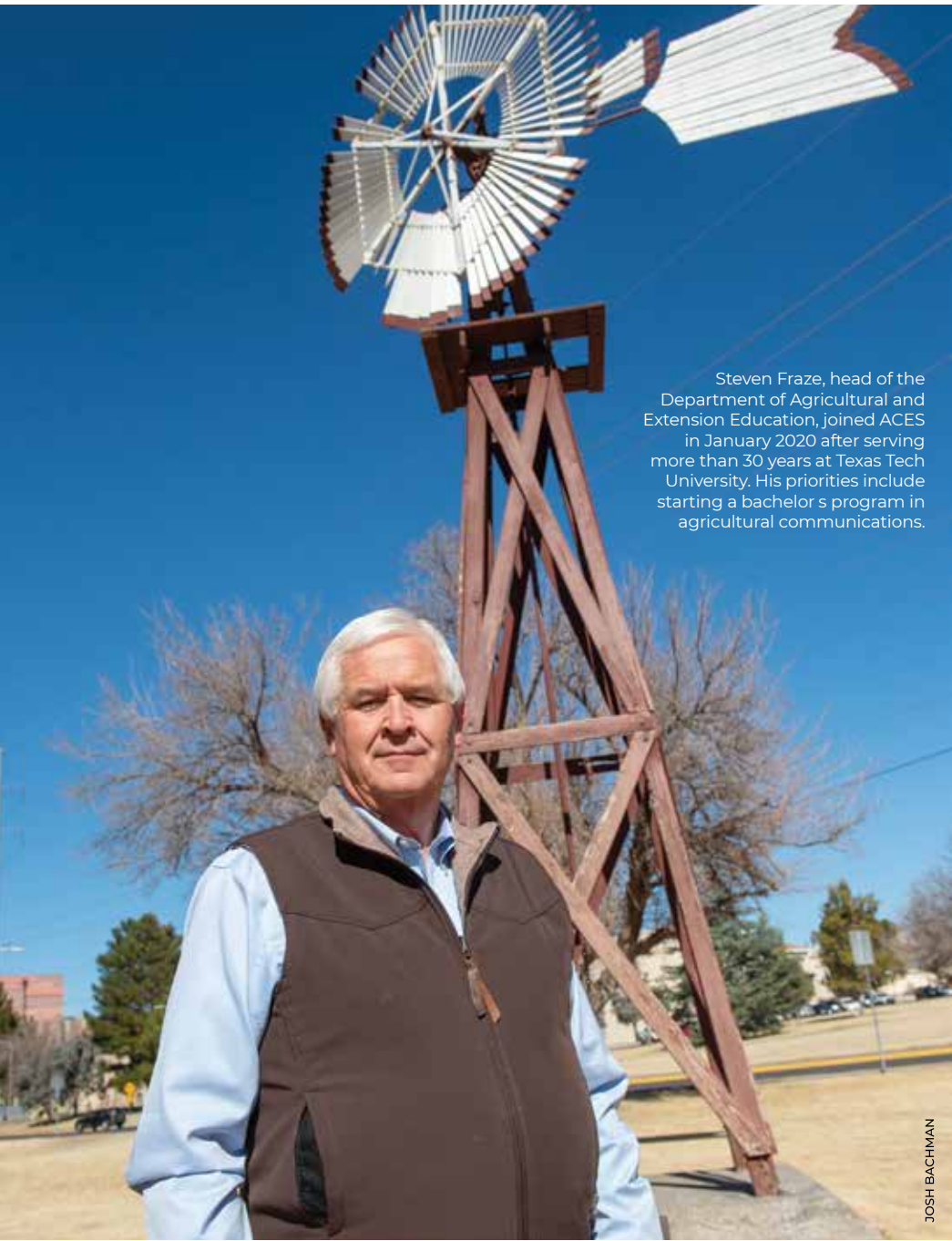
“I’d like to grow the department, especially in the area of communications,” he said.

Specifically, Frazee wants to start a bachelor’s program in agricultural communications, he said, noting the success of a similar program at Texas Tech.

“At Texas Tech, we went from 20 something students in our ag communications program to nearly 200 undergraduates by the time I left,” he said. “My vision is to get that going here at NMSU. But it has to be a degree option – not a minor – because it is just better for recruitment.”

Frazee, a New Mexico native originally from Dora in Roosevelt County, earned a bachelor’s degree in agriculture from Lubbock Christian University and a master’s degree, along with a teaching certificate, from Texas Tech. He received a doctorate in agricultural education from Texas A&M University.

Frazee joined Texas Tech in 1988 as an assistant professor and became a full professor in 2004. He served as chairman of the Department of Agricultural Education and Communications from 2008 to 2019. He also served as an interim dean from 2016 to 2018.



Steven Frazee, head of the Department of Agricultural and Extension Education, joined ACES in January 2020 after serving more than 30 years at Texas Tech University. His priorities include starting a bachelor’s program in agricultural communications.

JOSH BACHMAN

Gompper aims to tackle wildlife issues in New Mexico

Matthew Gompper, head of Department of Fish, Wildlife and Conservation Ecology, joined ACES in December 2019 after an 18-year stint at the University of Missouri. His priorities include helping to address wildlife issues throughout New Mexico.

BY CARLOS ANDRES LÓPEZ

In a state as geographically large as New Mexico, wildlife and environmental issues can have wide-ranging impacts.

As the new head of the Department of Fish, Wildlife and Conservation Ecology in the College of Agricultural, Consumer and Environmental Sciences at New Mexico State University, Matthew Gompper wants to help address these critical issues throughout the state.

“In New Mexico, we have a lot of public lands and a lot of pressing wildlife issues. Virtually everyone in the state, whether they live in an urban or rural landscape, has strong opinions on these issues,” he said. “They may not always agree on how to address these issues, but they’re vested. That’s a good thing. People recognize that these very issues contribute to the uniqueness of the state.”

Gompper added, “NMSU is a great place to work because it’s a place where the

things that I do, and the people I work with, can make a difference.”

Gompper joined ACES in December 2019 after an 18-year stint at the University of Missouri, where he served as the Rucker Chair for Wildlife Conservation, among other positions.

Gompper’s priority for his first full year at NMSU is to learn about the university and its culture, he said. He also wants to identify the most important issues facing his department, which has more than 170 undergraduate students, 30 graduate students and nine faculty members.

“For me, the first year is really about learning. Yes, I’ll be doing some teaching. Yes, I’ll try to get my research program running,” he said. “But my biggest concern will be trying to figure out, in collaboration with those people who are already here, how to improve on the good things that are being done and

provide additional opportunities for students and faculty.”

Gompper earned a Ph.D. in life sciences from the University of Tennessee in 1994 and a bachelor’s degree in biology from the University of Virginia in 1985. His research areas include wildlife disease ecology, mammalian ecology, conservation and management.

In addition to starting new projects in New Mexico, Gompper also plans to continue his international work in places like Brazil and Nepal, he said.

“If we are doing good work here in New Mexico, that work will be of interest to those trying to address similar concerns in other states and other nations,” he said, “and (our) success will further attract excellent students and collaborators to NMSU.”

Moreno calls for FCS to ‘think bigger’

BY CARLOS ANDRES LÓPEZ

Robert Moreno is now in his second semester as the head of the Department of Family and Consumer Sciences in the College of Agricultural, Consumer and Environmental Sciences at New Mexico State University. He joined ACES in September 2019, bringing with him more than 25 years of experience in higher education.

In effect, Moreno oversees not one but two departments.

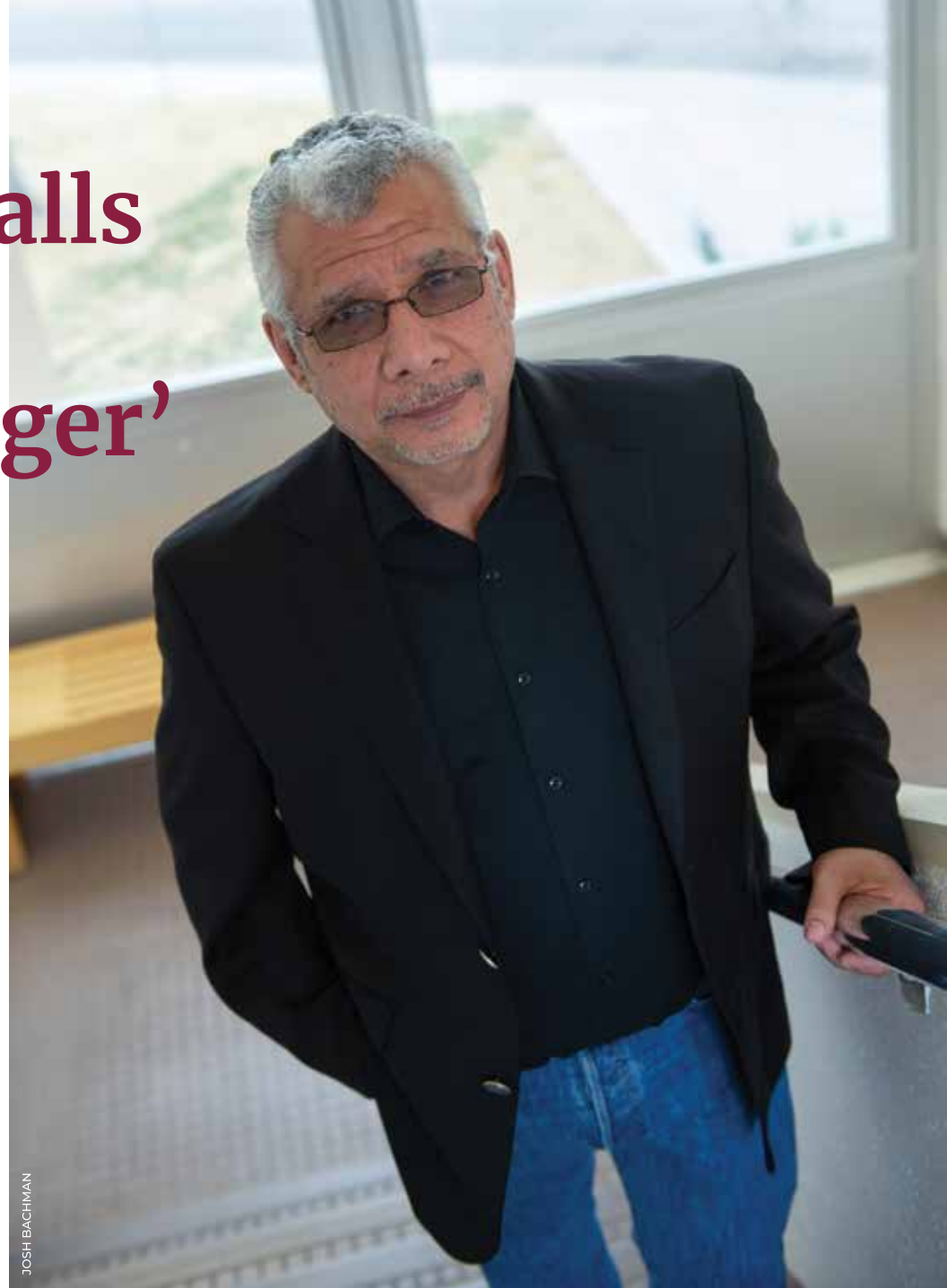
“On the academic side, we have Family and Consumer Sciences, which has very diverse programs for undergraduate and graduate students,” he said. “Then, we have Extension Family and Consumer Sciences – our Extension education and outreach arm.”

Altogether, the department has more than 30 faculty and staff members between its academic and Extension units and serves more than 350 students, as of the spring 2020 semester. The department has five undergraduate programs – Fashion Merchandising and Design; Family and Child Science; Family and Consumer Science Education; Human Nutrition and Dietetic Science; and Food Science and Technology – and a graduate program that offers seven areas of emphasis.

“My goal is for the two departments to work more as one so that we utilize and draw resources from each other,” he said. “This will increase our productivity and also help NMSU achieve its strategic goal of once again becoming an R1-status research university.”

Moreno’s other top priority includes refining the department’s identity.

“What’s our area of expertise? What’s our signature issue? Right now, it’s not clear what our signature issue is,” he said. “We need to exploit our strengths and have dis-



Robert Moreno, head of the Department of Family and Consumer Sciences, joined ACES in September 2019. His priorities include refining the department's identity and unifying its academic and Extension sides.

cussions about that. I think that’s consistent with the university’s broader strategic plan.”

He added, “We have a mission to serve the state. But we need to think bigger because if we think nationally and internationally, we’re going to have a greater impact.”

After earning a bachelor’s degree in psychology from UCLA in 1987 and a Ph.D. in child and adolescent development from Stanford University in 1995, Moreno ventured east. He spent eight years at the University of Illinois at Urbana-Champaign, working first as an Extension specialist in

the area of applied human development and later as an assistant professor.

He joined Syracuse University in 2001 as an associate professor in the Department of Child and Family Studies, where he spent 15 years, including eight as a department chair. From 2016 to 2019, he served as a professor and department chair at Towson University in Baltimore.

As part of his previous research, Moreno has examined familial and cultural influences on children’s learning among Latino families.

NMSU, UNM team up for study involving Master Gardeners, cancer survivors



ADRIAN GAYTAN

New Mexico State University will team up with the University of New Mexico Comprehensive Cancer Center for a Southwest Harvest for Health research study.

The study will pair cancer survivors who have completed their primary cancer treatment with Master Gardeners from NMSU's Master Gardeners program, part of the College of Agricultural, Consumer and Environmental Sciences. The teams will work together to plan, plant, maintain and harvest three seasonal gardens at the survivors' homes. The study will measure the effects of gardening on overall health and functioning, quality of life and more.

ACES to help develop state forest restoration program

Owen Burney, superintendent of the John T. Harrington Forestry Research Center in Mora, will partner with New Mexico Highlands University and the New Mexico Forest and Watershed Restoration Institute to create a new forestry research center in New Mexico called Forest Restoration Triangle, or FORT.

A \$5 million grant from the National Science Foundation will fund the development of the Center of Excellence in Forest Restoration, which will house FORT. The center will advance the understanding of the effects of restoration activities on forested areas in New Mexico through multidisciplinary research, education and stakeholder collaborations.



JANE MOORMAN

HRTM launches new hospitality career center with \$400,000 investment



JOSH BACHMAN

The School of Hotel, Restaurant and Tourism Management now has a new center dedicated to fostering hospitality career development and promoting the importance of hospitality education.

The Marriott Hospitality Futures Center opened in January 2020 and received funding through a four-year, \$400,000 investment from The J. Willard and Alice S. Marriott Foundation.

The center's key initiatives include refining existing recruitment, outreach and professional development programs and creating career workshops targeted toward high school students, teachers, guidance counselors and community college students.

Puppies raised at NMSU now working as guide dogs

NMSU Community Puppy Raisers, a student organization led by associate professor Gaylene Fasenko from the Department of Animal and Range Sciences, raised two Labrador retrievers that are now working as certified guide dogs.

Both dogs – Shuttle and Koi – spent about 14 months at NMSU learning basic obedience and good public behavior before graduating from the California-based Guide Dogs for the Blind in November 2019. They were the first puppies raised at NMSU to become working guide dogs.



GAYLENE FASENKO

Dream Keepers summer camp returns this summer in Albuquerque



INDIAN RESOURCES DEVELOPMENT

In June, Indian Resources Development will host Dream Keepers, a two-week residential summer camp for Native American high school students from New Mexico, at the University of New Mexico in Albuquerque.

Dream Keepers introduces participants to college and career opportunities in agriculture, natural resources, engineering and business. They visit different campuses to experience what college is like, engage in hands-on activities to explore different careers, and meet professionals, entrepreneurs, faculty and tribal representatives. They also have the opportunity to reflect on their individual skills, personality and identity and develop a plan to get to college.

Ryan Ashley is exploring ways of helping livestock and humans carry out successful pregnancies.

PREVENTING PREGNANCY PERILS

Animal science professor uses sheep to examine placental development

BY ADRIANA M. CHÁVEZ

Most expectant mothers know that a placenta is something that forms around fetuses to nourish and protect them. However, what they may not realize is that a placenta is considered an organ that only appears during pregnancy.

Ryan Ashley, associate professor of animal science in the College of Agricultural, Consumer and Environmental Sciences, is exploring placental development and ways of preventing placental dysfunction, which leads to pregnancy complications in both humans and livestock. He also is researching the role of a progesterone receptor commonly seen in the development of cancerous breast tumors, as placental development actually shares several similarities with how tumors form.

“When we look at some of the key events of what has to happen when the placenta forms, it’s really interesting how similar it is to how a tumor forms,” Ashley said.

An interesting aspect of placental development, Ashley said, is how trophoblast cells undergo a high rate of mitosis, essentially actively dividing and trying to invade tissue inside a mother’s uterus to attach and begin placental development. Meanwhile, these trophoblast cells can avoid attacks from the mother’s immune system.

“If we think about the cells of the embryo, these cells have different genetic makeups,” Ashley said. “The mom’s genome in her uterus is actually quite different from the embryo because the embryo’s got half of its DNA from mom and the other half from dad. So there’s always been this question in the reproductive field of why the mom’s immune system does not attack that embryo because, in essence, this would really be a foreign object the immune system should try to get rid of.”

Ashley’s research aims to help women experience successful pregnancies. To thoroughly study placenta development in humans, biomedical researchers have often turned to animals as models. Ashley is relying on sheep, which experience a similar placental development to humans. Because Ashley uses animals in his research, he also can explore ways of helping livestock carry out successful pregnancies and help avoid future health problems in both humans and animals.

“We now know that the offspring that result from placental dysfunction are at increased risk for Type 2 diabetes, obesity, stroke and cardiovascular disease. All of these health problems have some correlation with how well that placenta formed and functioned in utero,” Ashley said. “That concept, that the placenta can not only impact the health of mom and baby during the pregnancy but can also impact that individual later in life, I think really underscores just how important the placenta is.”

To determine how to maintain placental health, Ashley has referred to cancer studies to figure out how cells function in the placenta. He has focused on the CXCR4 receptor, a receptor commonly seen in various types of cancers. He also has focused on an FDA-approved compound called AMD3100, which acts as an antagonist to inhibit the CXCR4 receptor’s functions.

“We’re using the same compound to inhibit the receptor in sheep during the time

the placenta is forming to try and determine the role this particular receptor is playing,” he said. “This receptor is playing pretty important roles in vascularization, immune cell recruitment, a lot of things that are important in how the placenta forms.”

Ashley said he hopes his research using sheep helps answer questions both from a biomedical research side to help women who are struggling with carrying a successful pregnancy and also from an agricultural side.

“In couples who are struggling to have children, women most often will lose their pregnancy early in gestation,” he said. “It’s the same thing with livestock. Cattle, pigs, sheep and goats most often lose their offspring early in gestation. Pregnancy loss is a major factor affecting the livestock industry, and thus economic efficiency in livestock meat and milk production. Placental dysfunction is a frequent source of pregnancy loss in livestock and humans, but the underlying causes of impaired placental function are not well characterized. To dually improve animal and human health as well as farm animal production, it is imperative to elucidate the mechanisms causing impaired placental development.” Any loss there is detrimental to their livelihood, so there’s always that push for trying to increase reproductive efficiency in livestock.”

Shanna Lodge-Ivey, head of the department of Animal and Range Sciences and Extension Animal Science and Natural Resources, said, “Dr. Ashley and his laboratory are doing amazing work in the field of pregnancy and cancer research. However, the greatest contribution Dr. Ashley makes to research is the care and dedication he puts forth to student training. He is training the next generation of scientists.”

Jon Boren, associate dean and director of the Cooperative Extension Service, said Ashley’s research exemplifies the important nexus between agriculture and human health. “Thanks to the great work of Dr. Ashley,” Boren said, “the College of ACES is addressing significant issues for our agricultural producers and major health concerns for all New Mexicans.”



Ryan Ashley, associate professor in the Department of Animal and Range Sciences, discusses his research on placental development and placental dysfunction. His research aims to help women experience successful pregnancies.

JOSH BACHMAN

NMSU student Camila Prieto visited the Taj Mahal in Agra, India, in 2019 when she participated in the Women Economic Forum, which is designed to empower and lift up the voices of women.



COURTESY PHOTO

GLOBETROTTING

New Mexico State University students have gone global to 70 countries and six continents through the Aggies Go Global program since 2009.

NMSU students experience the world through Aggies Go Global

BY JANE MOORMAN

Aggies Go Global, part of the College of Agricultural, Consumer and Environmental Sciences' Global Initiatives, is available to all NMSU students who want to travel abroad.

"The program's mission is to provide every student an opportunity to have an inspiring international experience prior to graduation with an aim of stimulating their educational, professional and interpersonal development," said Manoj Shukla, ACES Global Initiative program director. "The program also encourages and recognizes faculty members' international activities that advance their professional development."

These activities support NMSU's LEADS 2025 goals by increasing the presence of ACES in the global arena to attract students and get them involved in international programs.

They also increase New Mexico's potential for economic development through ACES and global market interaction activities.

"We support trips associated with research, education, outreach and volunteering," Shukla said. "If a student or faculty member wants to attend a workshop or conference, do volunteer

work or teach a course, we are here to support them, depending on the availability of funds."

Between the fiscal years 2016-2017 and 2018-2019, 290 students

traveled internationally to 37 countries. Of those students, in 2019, 34 were first-time international or overseas travelers.

"We work with NMSU alumni in foreign countries to explore their assistance to recruit students, organize training sessions, and find opportunities for students and faculty exchanges through memorandums of understanding and programs in foreign institutions," Shukla said.

The most recent group trips included the China Agricultural University Exchange; the Global Citizens Project in Costa Rica; the Indigenous Environmental Leadership Exchange in Guatemala; and the Women Economic Forum in India.

ACES has created three awards to recognize the international work of the faculty and students: the Outstanding Global Work Award for a faculty member or student; the Global Activity Award for international student recruitment; and the International Distinguished Alumni Award to honor ACES alumni who have made outstanding achievements in their home country.

For more information about Aggies Go Global, visit aces.nmsu.edu/aggiesgoglobal/.

STUDENTS REFLECT ON THEIR TRAVELS



JOSH BACHMAN

Shanelle Trail, Business
China Agriculture
University Exchange

“I think it’s a good experience to learn about your field, but how it’s applied in another country, and to see those differences. You always learn a lot when you’re in another culture. I would definitely recommend – to anyone – to expand beyond their local area.”



ZACH ABBOTT

Guadalupe Ochoa, Education
Global Citizen Project: Costa Rica

“After this trip, I was able to take more leaps in my life, and I’m looking for more opportunities to do things instead of just waiting for things to fall in my lap, like I used to.”



JOSH BACHMAN

Jeremy Schallner, ACES
China Agriculture
University Exchange

“No matter what cultural differences there are, we are still people, and everyone’s doing the best they can. Another thing would be the hospitality of our host from exchange. I don’t know if I’ve ever been treated as well in my life.”



REBEKAH MCCARTY

Olivia Riblett, ACES
Women Economic Forum: India

“We have a very diverse university, which is really cool. It really inspired me—just meeting people from different places and cultures—to go out and see what else there is in the world. Aggie Go Global has been one of the best choices in my entire life, and it was just because of the people here that inspired me to go there. Programs like Aggies Go Global – it’s so accessible, and it’s so affordable to do these things.”



AGGIES GO GLOBAL

Kimberly Pestovich, Engineering
Global Citizens Project: Costa Rica

“(B)eing a global citizen ... means to acknowledge the interconnectedness between (one’s self) and others in the world ... (it) also means recognizing the value of the natural environment and the delicacy of the global ecosystem. Global citizens hold themselves accountable for their impact in the world.”



NICOLETTE YOUNG

Camila Prieto, ACES
Women Economic Forum: India

“Coming from New Mexico State and from a different country, it was very difficult for me. And then (coming) into the College of ACES, I’ve never had so many opportunities in my life. I’ve traveled within the U.S. now that I’m in college and, now, abroad. This would not have been possible without the help from ACES or Aggies Go Global.”

FROM THE GROUND UP

BY MELISSA RUTTER AND
CARLOS ANDRES LÓPEZ

Bernd Leinauer extrudes a soil sample of Bermuda grass treated with surfactants. Leinauer takes measurements to examine if biological and microbial activities have any impact on the soil.

JOSH BACHMAN

Turf study looks at surfactants' impact on water conservation, soil health

A few weeks before spring, Bernd Leinauer extruded a perfectly round cylinder of soil from a bed of dormant Bermuda grass growing on a three-acre research field at New Mexico State University. He examined the piece of damp earth and pointed to the sprouting roots, a telltale sign of healthy soil.

“Clearly, we have a healthy root system from just a visual examination,” said Leinauer, a turfgrass professor in the College of Agricultural, Consumer and Environmental Sciences.

But this sample would have to undergo a thorough biological analysis to fully measure the soil’s health, said Leinauer, who is in the third year of a multiyear study on soil health.

“This particular study covers two aspects,” he said. “Number one is the soil, and number two is the grass itself, because whatever happens in the soil indirectly also affects the grass.”

For this project, Leinauer is treating turfgrass with chemical surfactants to study their effects on water use, irrigation requirements and overall soil health. He’s leading the study with a team of researchers who include assistant professors Matteo Serena and Elena Sevostianova, Extension agronomy specialist John Idowu and graduate assistant Will Bosland.

The researchers are using surfactants that are chemically similar to dishwashing soap. Dishwashing soap is toxic to plants, Leinauer said, but chemical surfactants have been modified and can be used frequently without having a detrimental impact on grass.

“The chemical surfactants help to break the surface tension of the water, which then allows the water to penetrate more easily into the soil,” he said. “The water distributes more evenly and allows for the roots to access more of it, which then reduces the need for irrigation water.”

Previously, Leinauer conducted and published two similar studies, which documented a lower irrigation requirement of about 15 percent to 30 percent when researchers applied surfactants.

During the study, the team takes measurements of the soil to examine if biological and microbial activities have any impact on

the soil. While most of the chemical surfactants in the study are commercially available products, Leinauer is adding a slight twist to his research.

“We have our plots where we use some of these soil surfactants on Bermuda grass and Kentucky bluegrass,” he said. “However, our study is unique because we not only look at commonly used products but are also including organic products. The two organic surfactants are one produced by bacteria, and the other one comes from yucca plants. These are very similar to biodegradable soaps.”



JOSH BACHMAN

Turfgrass professor Bernd Leinauer holds a soil sample taken from a bed of dormant Bermuda grass growing on a research field at NMSU. Leinauer and his research team are studying the effects of soil surfactants on water use, irrigation requirements and overall soil health.

Although it takes time to document changes throughout the research process, Leinauer and his team are already seeing some changes.

“On the water conservation side at least, one of the products we have is showing results. Whether or not they are having any impact, negative or positive, on the microbiological activity is too early to say,” he said.

“We can only indirectly assume that when you have adequate soil moisture, the microbes also benefit,” he continued. “Microbes need water, just like plants, and if the soil is dry, the microbes can’t be active. So, indirectly, we would assume that having more water available benefits the microbes, but we don’t have the data to document that just yet.”

Leinauer and his team received funding for four years, but they would like to continue their research for as long as possible to collect more data. Right now, he said, their biggest supporters are the United States Golf Association and the Colorado Golf Course Superintendent Association.

“The longer we can keep this project going, the more data we can collect on the long-term effects of these chemicals on soil health and irrigation water conservation. Ultimately, we would like to look at this for five years or longer,” he said. “On a larger scale, products like these could benefit and enhance arid soils, which would allow other crops, not just turf, to be grown more sustainably with less water.”



Jeremy Schallner, a Ph.D. student in the Department of Animal and Range Sciences, holds a handful of soil while visiting the Aguirre Spring Campground in February.



JOSH BACHMAN

A HELPING HAND

Research to improve soil health takes root in ACES

BY CARLOS ANDRES LÓPEZ

Soil is a natural resource that supports human civilization and plays a vital role in global food security. So, while we may not be ranchers, crop growers or researchers, we all have a vested interest in soil – especially soil health.

Soil health, as defined by a team of researchers in the College of Agricultural, Consumer and Environmental Sciences at New Mexico State University, is “the state of the soil being in sound physical, chemical, and biological condition, having the capability to sustain the growth and development of land plants.”

Rajan Ghimire, a cropping systems agronomist at the Agricultural Science Center in Clovis, put it more simply: “Healthy soil leads to healthy human beings.”

But soil degradation is becoming a growing concern. Worldwide, cropland, forest land, grassland and rangeland areas are declining in productivity due to degrading soil, according to the United Nations. If left unaddressed, soil degradation may affect food production systems that feed the human population.

“We have many degraded soils across the globe that are no longer productive and can only be regenerated to a fruitful state by applying soil health principles,” said John Idowu, an agronomist in the Department of Extension Plant Sciences.

“There has been an increasing demand from stakeholders to know more about soil health,” Idowu added, “and this demand has led NMSU to increase research and Extension efforts on soil health assessment and management.”

Idowu and other ACES researchers have identified several management strategies that will improve soil health. These methods include crop rotation, cover cropping, diversifying production, adding organic amendments, integrating livestock, reducing soil disturbance, using diverse plant species and practicing sustainable grazing.

But before committing to a management strategy, Idowu said, crop and rangeland producers should first assess the physical, chemical and biological attributes of their soil. Soil health management is a long-term strategy that requires education,

ACES researchers have identified several management strategies that will improve soil health. These methods include crop rotation, cover cropping, diversifying production, adding organic amendments, integrating livestock, reducing soil disturbance, using diverse plant species and practicing sustainable grazing.



JOSH BACHMAN

thinking, planning, reading, discussion and investment, he added.

“Since each farm and ranch is unique,” he said, “the specific soil health practices that will deliver optimal performance will differ from place to place. Farmers and ranchers need to inform themselves and carefully plan an appropriate soil health

management strategy that will work for their specific conditions.”

Idowu encourages land users and managers in New Mexico to connect with their local Cooperative Extension Service office when seeking guidance on soil health practices. To contact the office in your area, visit aces.nmsu.edu/county/.

HEALTH AND SUSTAINABILITY

In eastern New Mexico, Ghimire is leading research projects that aim to understand the linkages between soil health and sustainable crop production, using soil organic matter as the centerpiece of his research.

“Sustainable agriculture aims to optimize resource use while maximizing crop production, economic profitability and environmental quality,” he said. “Healthy soils provide a foundation not only for better crop production but also for improving environmental quality through reduced soil erosion, improved organic matter and nutrient storage.”

Ghimire is studying how various tillage, fertility, crop rotation, cover cropping and crop residue management practices affect different soil organic matter fractions. He’s also looking at the rate of carbon sequestration, nutrient cycling, greenhouse gas emissions and soil microbial activity related to cycling of essential nutrients as indicators of soil health in grain- and forage-based cropping systems.

In agronomic settings, Ghimire said, soil health is more important in soils that have eroded, have low fertility, or have other less-ideal crop-growing conditions, such as high variability in precipitation and temperature. These conditions exist in New Mexico.

“With the rapid rate of decline in water level in the Ogallala Aquifer,” he said, “producers in eastern New Mexico are facing challenges in irrigated crop production, which include increased fallow frequency, increased erosion, lost soil organic carbon and nutrients, and reduced production potential of the land.”

The soil health management practices Ghimire is studying could reduce such losses and maintain crop production and help farmers stay in business, he added.

“Our study finds a loss in soil organic carbon and nitrogen by 24 percent to 36 percent after the conversion of irrigated crop fields into dryland production, and crop production went down by at least the same proportion,” he said. “The loss of soil organic carbon and nutrients have both agronomic and environmental impacts. The part of lost carbon and nitrogen goes into the atmosphere as CO₂ and N₂O, potent greenhouse gases that cause global warming.”

THERE'S AN APP FOR THAT

Amy Ganguli, associate professor in the Department of Animal and Rangeland Sciences, is an ecologist who researches conservation strategies to promote rangeland and watershed health.

Her research has taken her to rangelands across New Mexico, where she works directly with producers. These field interactions will often focus on rangeland health and questions about soil carbon, she said, because semi-arid rangelands inherently have low levels of soil carbon and often have limited resources.

“If you can understand what the potential of your soil is to produce ecosystem services like forage production and carbon capture, you can make smarter decisions,” she said. “When people set levels for achieving certain soil health goals on rangelands, they’ll have a better idea of what’s actually possible.”

In a 21st-century move, Ganguli uses a free mobile app designed to help rangeland producers understand land potential.

Jeffrey Herrick, a research soil scientist at the U.S. Department of Agriculture-Agricultural Research Service Jornada Experimental Range, developed the app as part of a suite of cloud-computing apps called the Land-Potential Knowledge System, or Land-PKS, which supports field- and pasture-scale data collection and decision-making.

“This app allows you to assess land potential while you’re in the field, and use it for monitoring and science communication,” said Ganguli who, along with Herrick, co-advised a Ph.D. student at NMSU who used the app for research in Kenya.

Herrick initially developed the app for international use, but now it has a broad

network of users in the U.S., including in New Mexico.

“When I use the app with ranchers, we plug in all the information and characterize the soil at different depths,” she said. “It then generates a report that automatically pulls the climate for the area and other things like the typical growing degree days and aridity index.”

She added, “This tool provides meaningful information like available

water-holding capacity that we can then relate to certain things that would give you an indicator of soil water retention and potential productivity.”

The app is available on the Apple App Store and Google Play. For information about the app, visit landpotential.org/landpks-the-app/landpks/.

To learn more about soil health and soil health management practices, visit aces.nmsu.edu/pubs/_circulars/CR694B.pdf.

JOSH BACHMAN



Amy Ganguli, associate professor in the Department of Animal and Rangeland Sciences, collects soil samples while visiting the Aguirre Spring Campground area in February. Ganguli's research focuses on conservation strategies to promote rangeland and watershed health.

RAJAN CHIMIRE



Cover crop and wheat fields at the Agricultural Science Center in Clovis, where researchers are working on projects that aim to understand the linkages between soil health and sustainable crop production.

CREATING OPPORTUNITY

IRD boosts economic development through education and internships for Native American students

BY IRD STAFF

Indian Resources Development is a statewide program housed within the College of Agricultural, Consumer and Environmental Sciences at New Mexico State University.

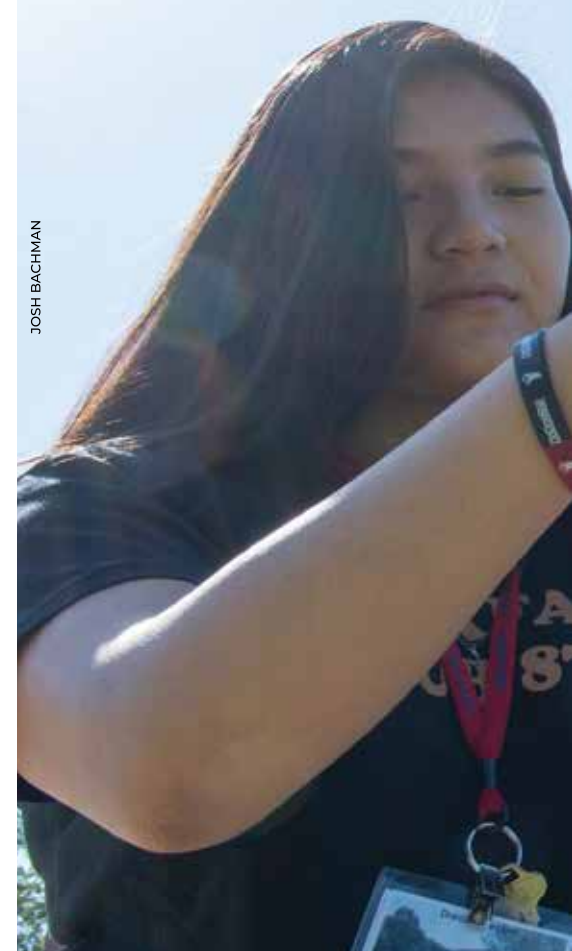
IRD offers educational and professional development opportunities for Native American students from New Mexico who are in middle school, high school and college. In this way, the program supports New Mexico tribal entities in developing their own technical and managerial expertise.

“In a few words, IRD strives to be a key connector among tribes, businesses, high schools, colleges and universities throughout New Mexico,” IRD Director Claudia Trueblood said.

Created by the Indian Resources Development Act in 1978, IRD is guided by this act and by the education plan of each tribal entity in New Mexico. In addition, the program seeks regular feedback and guidance from tribal and education leaders as well as from the program’s Tribal Advisory Committee.

Over the years, IRD has provided pathways to higher education in agriculture, natural resources, engineering and business. Through career discovery camps, internships and professional development experiences, middle and high school students become more aware of their skills and interests and open up their horizons to more opportunities.

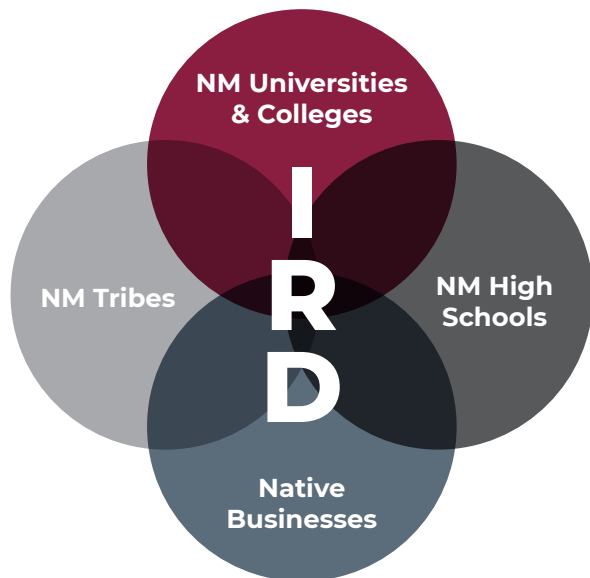
For this, IRD partners with numerous New Mexico higher education institutions, schools and organizations to promote, fund or help



JOSH BACHMAN

develop educational camps and on-the-job training. Once students have completed their studies and training experiences, they could go back to their tribal communities and offer their skills as professionals.

“Both high school and college students benefit from participating in internships. They can be a lab for interns to find out what a certain job entails and what skills may be required,” said Monita Chip, IRD senior program specialist. “In this way, internships serve as career-exploration





Students came from across New Mexico last year to participate in the 2019 Dream Keepers camp at NMSU in Las Cruces. Dream Keepers is an annual summer camp organized by Indian Resources Development that introduces participants to college and career opportunities in agriculture, natural resources, engineering and business.

opportunities. On the other hand, they could also be on-the-job training experiences, which help college students apply already-acquired knowledge and learn to work out of the school setting.”

Jennifer Lujan participated in IRD’s internship program and praised her experience.

“Because of the IRD’s internship program, I was able to apply the new skills I acquired from a formal education,” Lujan said. “I was able to financially support my family and, ultimately, was able to earn a

full-time position with Roanhorse Consulting LLC. I am excited to begin my career with such an awesome organization.”

Education, whether in the way of internships or professional development opportunities like participation in relevant conferences, is a building block for economic development. Last fall, IRD supported 17 tribal representatives in attending the 2019 New Mexico Water Conference on Tribal Perspectives. This spring, another group was part of the New

Mexico Organic Farming Conference as presenters or participants.

“IRD helps with opportunity creation and funding,” Trueblood said. “For that, we seek and foster relationships among key entities so intellectual, technical, human and financial resources are leveraged, contributing to the advancement of economic development in the state.”

For more information about IRD, visit ird.nmsu.edu or email ird@nmsu.edu.



Daren Bloomquist started teaching in the School of Hotel, Restaurant and Tourism Management as an adjunct professor in 1999. He is now a part time college assistant professor.

THE FOUNDATION OF HOSPITALITY

HRTM faculty member Daren Bloomquist
advocates for facilities management education

BY CARLOS ANDRES LÓPEZ

For much of his three-decade career, Daren Bloomquist has been a fixture in classrooms, educating and mentoring future hospitality and tourism leaders at New Mexico State University.

Bloomquist is a 20-year veteran of the School of Hotel, Restaurant and Tourism Management in the College of Agricultural, Consumer and Environmental Sciences, where he began teaching as an adjunct instructor in 1999 after establishing hospitality and tourism programs at Doña Ana Community College and El Paso Community College.

Before entering academia, Bloomquist worked in corporate sales for a Canadian travel management company based in Vancouver, British Columbia – a job he landed after earning a master’s degree in hospitality and tourism from the University of Wisconsin-Stout in 1987.

“Right out of graduate school, I started working in the industry, and then I got into teaching shortly after,” he said. “My wife, Priscilla Bloomquist, and Dr. Ron Cox established the program here at NMSU in 1988, and I came down in 1989 to start the hospitality program at EPCC. After that, I started the program at DACC, where I spent five years before I started teaching in the HRTM department.”

Now a part-time college assistant professor, Bloomquist juggles his time between teaching online classes and working on projects that promote career opportunities in facilities management for hospitality and tourism venues. His other areas of focus include hospitality marketing and international outreach.

Facilities management is an important, albeit lesser-known, aspect of the hospitality industry, Bloomquist said. His facilities management class, HRTM 430, explores the engineering and maintenance requirements specific to the hospitality industry, emphasizing sustainable operations and understanding systems within facilities.

“For instance, if you work for a restaurant and you have the facilities understanding, you can identify solutions to problems and improve your bottom line,” he said. “It will also help you run a more sustainable operation and improve your ability to communicate with employees on that side of operations. In lectures, we stress water use and conservation, along with environmental stewardship, which

happen to be two of the ACES Pillars for economic and community development.”

Bloomquist also advocates for facilities management education in his role as board president for the International Facility Management Association’s Hospitality Council. He was elected president in 2018.

For his work at IFMA, Bloomquist seeks to develop internship opportunities for hospitality students by building relationships with industry professionals and the IFMA Foundation. He’s also working on an initiative to increase the number of two-year facility management programs in California, in collaboration with Joy Hermsen, an economic workforce

managing hotels, restaurants, resorts or the myriad of other hospitality businesses in need of someone with a good understanding of facility management.”

During his time at NMSU, Bloomquist also spearheaded several international outreach projects.

One of his career highlights occurred in 2014 when he taught an experientially based coursework program to students visiting from Ecuador as part of the Go Yachay partnership between NMSU and the Secretaría Nacional de Educación Superior, Ciencia, Tecnología e Innovación.

“I gave them a three-month intensive course covering multiple hospitality



Bloomquist holds photos of a group of Ecuadorian students he taught in 2014 as part of the Go Yachay partnership between NMSU and the Secretaría Nacional de Educación Superior, Ciencia, Tecnología e Innovación.

development director for the California Community Colleges system.

In March, Bloomquist contributed to a presentation about the initiative at the Golden One Experience conference in Sacramento, California.

“We’re working together to increase the number of facility management programs at the two-year level in California and help students find a career pathway from those programs into the hospitality industry,” he said.

“Some of these students,” he added, “might use their facility management education as a strong foundation for a career

management topics,” he said, “so these students could go back to Ecuador and put those skills to use. It was a lot of hands-on learning, and it was a huge success.”

His other international outreach efforts included a dual-delivery hospitality training program for indigenous employees at the Laguna Development Corporation; a sustainable tourism education program for NMSU students in Turrialba, Costa Rica; and an educational exchange between the United States, Canada and Mexico, focusing on native populations and indigenous tourism.

FOOD LAB GETS A FACE-LIFT

Newly renovated research space benefits students, faculty

BY ADRIANA M. CHÁVEZ

Gone are the dated counters and cabinets that made up a former lab room in the Department of Family and Consumer Sciences inside Gerald Thomas Hall.

Where once students crammed inside what was mainly a kitchen-type environment, now stands a clean, white, spacious science lab, where graduate students can conduct their research and have new equipment within their reach.

Departmental research also is benefiting from the new food microbiology lab, said Efrén Delgado, assistant professor of food science and technology.

“We used to call it the orange kitchen,” Delgado said jokingly. “It was more geared towards the concept of home economics classes at that time, so students learned cooking. It’s a totally new concept now.”

Renovations started in February 2019 for the new lab, which houses classes for the food science and technology and human nutrition programs. Renovations were completed in time for classes beginning in fall 2019.

Funding for the renovations came from the university, but the department is currently searching for a donor who is interested in naming the lab and providing funds for additional new equipment.

“Students have access now to pressured gas and a vacuum that they can use for class and for research,” Delgado said. “We have more space because before we were sharing



Efrén Delgado, assistant professor of food science and technology, discusses the newly renovated food microbiology lab in Gerald Thomas Hall, which houses classes for the food science and technology and human nutrition programs.

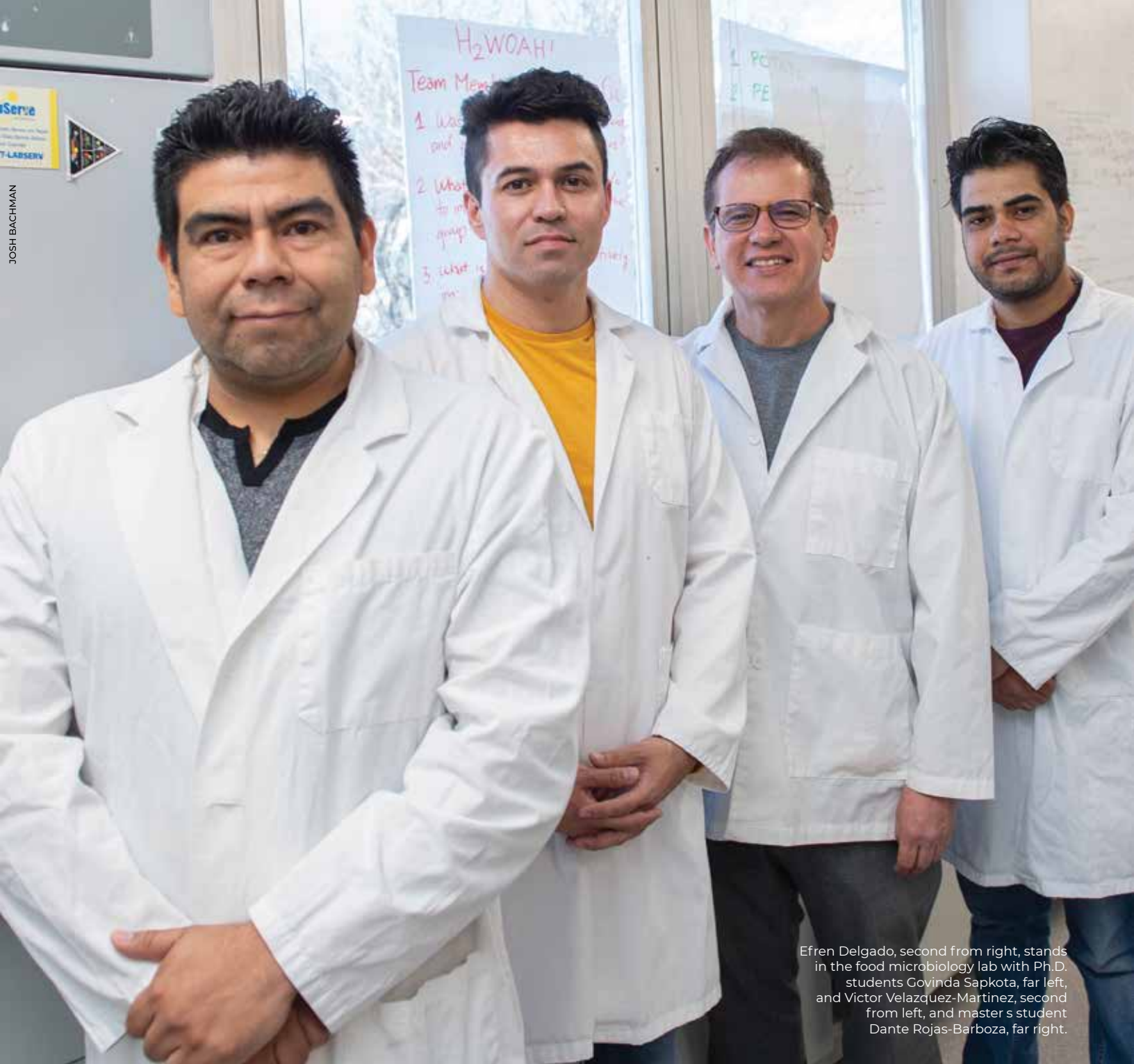
one lab for food chemistry and food microbiology. Now, we have separate labs so students can do different types of research in the different labs. We prevent cross-contamination from the food microbiology lab into the chemistry lab and the other way around.”

The lab also has helped Delgado work with students on some of his research. Currently, he and his research team are working with the cotton and chile industries on extracting bioactive compounds from industrial waste.

“We take waste that these industries produce and extract phenolic compounds, such as proteins from the cottonseed,” he said.

Their research has led to the development of a new, non-GMO protein that may be used as an animal protein substitute in food products. Delgado also is conducting research with aquaculture, developing new feed products for shrimp.

“We substitute all of the fish meal with plant protein from the cotton. We have positive results right now,” Delgado said. “We have really good growth in the shrimp. Now that we’ve reached that level, we’re going to analyze how the new plant protein affects the microbiota of the shrimp – if it changes or not, and if it affects the fatty acid content of the end



Efren Delgado, second from right, stands in the food microbiology lab with Ph.D. students Govinda Sapkota, far left, and Victor Velazquez-Martinez, second from left, and master's student Dante Rojas-Barboza, far right.

product of the shrimp and the amino acid distribution within the muscle of the shrimp.”

Delgado and plant science Ph.D. student Govinda Sapkota also are working on a project to extract phenolic compounds of the jujube fruit to create new functional foods that can help prevent certain types of cancers or even high blood pressure.

“We take the phenolic compounds of the jujube fruit, which is one of the fruits with the highest amount of the phenolic compounds, we extract them, and we microencapsulate those compounds to

protect them from oxidation so they can be active through a long period of time,” Delgado said. “Once they are protected, we can incorporate it into food products such as salami or burger type of meats, and bread products or even tortilla products, which will have a high amount of phenolic compounds, antioxidants and healthy products.”

Sapkota has been working with Delgado on his research since he started his Ph.D. two years ago. Sapkota said the jujube, which is native to Asia and new to New Mexico, is very beneficial to human health.

“My project basically deals with the dynamics of nutrients in the jujube with different maturity status, what stages of maturity the nutrient is highest in jujubes,” he said. “I’m also comparing the nutrient content of jujubes from different locations in New Mexico, which includes Leyendecker, Los Lunas and Alcalde.”

The research project is being conducted in cooperation with NMSU associate professor and Extension fruit specialist Shengrui Yao.

ACES alumna Linda Rost, a science teacher at Baker High School in Baker, Montana, was named Montana's 2020 Teacher of the Year. In January, she was named as a finalist for the 2020 National Teacher of the Year award.

TOP *of the* CLASS

ACES alumna earns accolades as Montana's top teacher

BY MELISSA RUTTER

To be recognized for doing something you love is an exciting feeling, and it's one that Linda Rost knows very well. Rost, who is currently a science teacher at Baker High School in Montana, was named Montana's 2020 Teacher of the Year.

Rost received her bachelor's degree in rangeland science in 2006 from the College of Agricultural, Consumer and Environmental Sciences at New Mexico State University. During her time at NMSU, she became interested in education.

"I took a human growth and development class as an elective and enjoyed it. I also started tutoring some of my friends in their difficult science classes and realized I was good at it," she said.

"My training at NMSU gave me the ability to pursue a career completely outside of my degree, and I am thankful that it afforded me so much flexibility and excellent preparation," she added.

After receiving her bachelor's degree, Rost moved to Montana to teach at a high school in Baker, a small rural town. While working toward her teaching licensure, she realized how much she loved education and decided to pursue it further.

"At first, I was just in the program because I had to, but I soon started to enjoy it," she said. "It reinforced a lot of the views that I had developed about education from my time at NMSU and from working with my students."

Rost completed her master's degree in instruction and curriculum in 2010 and earned a second master's degree in science education from Montana State University-Bozeman in 2018. She is currently pursuing a Ph.D. in curriculum and instruction from Texas Tech University.

"While I was pursuing my second master's degree, many students did their capstone thesis on education, but I had been



Linda Rost and her family with Montana's superintendent of public instruction, Elsie Arntzen, when Rost was named Montana's 2020 Teacher of the Year in September 2019.

teaching science research for a while and wanted to conduct a study in microbiology," she said. "So, I chose a very challenging topic and grew from the experience. And that led me to my interest in pursuing a Ph.D. I wanted to continue conducting research and learning, but I wanted to shift to learn more about education."

Rost plans to research teacher retention and recruitment in rural areas with her Ph.D., she said.

In January, months after receiving Montana's 2020 Teacher of the Year honor, Rost was named as a finalist for the 2020 National Teacher of the Year award.

"I am still so shocked that I was named Montana Teacher of the Year and right after that to be named one of the four finalists for National Teacher of the Year," she said.

"I love teaching and working with my students. I think this recognition is a culmination of my students' incredible achievements and all of the collective efforts of teachers in our state. So many have impacted me, and I'm so thankful for all of their dedication."

Rost advises current NMSU students to treat each moment in school as a learning opportunity.

"Every single moment is a learning experience, and so many little moments during my time at NMSU contributed to my effectiveness in the classroom," she said. "The world is your oyster, and you can learn from all of it. Also, be intentional about pursuing opportunities to grow and set you apart. Work hard at everything you do, even if you don't like it, because then you will learn how to work hard at the things you do like."

WHERE ARE THEY NOW?

Shanna Lodge-Ivey, Animal Science

As head of the department of Animal and Range Sciences and Extension Animal Sciences and Natural Resources, Shanna Lodge-Ivey says her goal is “to serve our stakeholders and train students that are competitive in the workforce,” while encouraging young adults to pursue a career in animal sciences and range management through degrees offered in her department.

“Right now, we can’t graduate enough range science students for all the jobs that are out there,” Lodge-Ivey said. “With this degree, they can stay in New Mexico and really change their economic status, while helping our state be good stewards of our natural resources.”

With ruminant nutrition as her passion, Lodge-Ivey circled her career through Las Cruces twice before she joined the College of Agricultural, Consumer and Environmental Sciences in 2004 as a researcher and faculty member.

After graduating from New Mexico State University in 1993, Lodge-Ivey went to the University of Nebraska to obtain a master’s degree in ruminant nutrition. Afterward, she entered the private industry, working for Elanco Animal Health. She then completed a doctoral degree in rumen microbiology at NMSU before becoming a post-doctoral scholar at Oregon State University.

One of only a few rumen microbiologists in the western United States, Lodge-Ivey earned the Young Scientist Award in 2012 from the American Society of Animal Science, Western Section, for her research.

— Jane Moorman



DENNIS HALLFORD



MGM RESORTS INTERNATIONAL

Miguel Vigil III, HRTM

Miguel Vigil III is a two-time graduate of New Mexico State University, having earned a bachelor’s degree in hotel, restaurant and tourism management from the College of Agricultural, Consumer and Environmental Sciences in 2017 and a master’s degree in business administration from the College of Business in 2019.

After leaving NMSU, Vigil began participating in the MGM Resorts International Management Associate Program in Las Vegas, Nevada. Once Vigil completes the 12-month program, he will begin a management role in the company’s hotel operations.

“Right now, I’m working in as many positions as possible, rotating through different departments, and learning the roles of line employees, managers and even department directors,” he said.

At NMSU, Vigil served as president and treasurer of the National Society of Minorities in Hospitality, as well as vice president of Phi Eta Sigma, a national honor society for college freshmen.

In spring 2017, he received the NMSU Alumni Association’s Outstanding Graduate Award, which recognizes honorees for their exceptional academic achievements; active participation in activities that illustrate leadership skills; and extracurricular commitment to NMSU and the community through volunteerism.

“NMSU will always be a part of me, and I will always try to be a model Aggie,” he said.

— Carlos Andres López

ACES alums share their stories of success

Chris Ortiz, HRTM

Chris Ortiz has come a long way since his days in high school working at a Best Western. The New Mexico native is now a 15-year veteran at Hyatt Hotels Corporation, where he currently serves as the company's global support manager, overseeing a team that provides business support to more than 900 hotels globally.

Ortiz said he laid the groundwork for his career as a student in the School of Hotel, Restaurant and Tourism Management at New Mexico State University.

"HRTM set me up for success," he said. "In many ways, I owe a lot of my success to the professors and faculty who gave me an opportunity to be successful outside of the classroom."

After graduating from NMSU with a bachelor's degree and two minors in 2004, Ortiz moved to Albuquerque to begin his career with Hyatt. Since then, he's worked his way up the corporate ladder. He's held several leadership roles within the company's rooms operations, working in four different locations in the United States, and opened 15 properties in five countries.

Now based in Chicago, Ortiz has been in his current position for three years.

"I lead a global team that is responsible for optimizing existing technologies through an operations lens at over 900 hotels," he said. "We also work on identifying efficiencies through product delivery and activation, transitioning transactions into interactions."

— Carlos Andres López



BRANDIE MCCORD



ERIN GLASS

Nicolette Young, HRTM

As a student at New Mexico State University, Nicolette Young fostered interests in hospitality and economic development. Now, her two interests have taken her to Ohio, where she's working to grow a restaurant accelerator program that's cultivating a new generation of food entrepreneurs in Cincinnati.

After graduating with a bachelor's degree in hotel, restaurant and tourism management and a minor in marketing in 2018, Young started a two-year, post-graduate fellowship at Venture for America and landed a full-time job with the Corporation for Findlay Market.

"In my role as the food innovation program coordinator, I organize the curriculum for food entrepreneurs who will test their restaurant concepts in one of three Findlay Launch accelerator storefronts," she said. "The School of Hotel, Restaurant and Tourism Management fully prepared me for the role I now have, especially through its many hands-on courses. I often think about 100 West Café, the student-led restaurant, when I plan programming for Findlay Launch."

In addition to gaining restaurant experience at NMSU, Young also honed her leadership skills as a student, having served as a student ambassador for the College of Agricultural, Consumer and Environmental Sciences from 2017 to 2018. She also studied abroad at the Florence University of the Arts in Italy.

— Carlos Andres López

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