

ACES MAGAZINE

COLLEGE OF AGRICULTURAL, CONSUMER AND ENVIRONMENTAL SCIENCES

VOLUME 2 | FALL 2019



TAKING FLIGHT

ACES researchers drive agriculture into the future with big data

DEAN'S LETTER

With Great Pride

In this second issue of *ACES Magazine*, you will find a story about how agriculture is becoming a leader in utilizing large data. The agricultural industry is harnessing technology to increase yields (thus enhancing food security) and to make sure food provides a proper balance of nutrition and energy. We are facing challenges to better understand how agriculture changes the environment and how farms and ranches are affected by the impacts of labor scarcity.

Working with large data gives us a foundation to solve these issues and move forward with new technologies. In the College of ACES, we have taken the initiative to work in artificial intelligence in a collaborative approach with the colleges of Arts and Sciences, Business and Engineering. New large data initiatives at NMSU are bringing prospects of working collaboratively with other knowledge and development centers, such as Sandia National Laboratories, specifically in managing large data. In late July, an advance group was put together to propose a white paper on artificial intelligence in agriculture.

In *ACES Magazine*, we present examples of the work the college does, and the impact those efforts have in the areas of food and fiber production, marketing, water use and conservation, environmental stewardships, health of New Mexicans, and education and training.

As a new initiative in New Mexico, the College of ACES is developing the Center of Excellence in Sustainable Food and Agricultural Systems. This is a statewide initiative being developed by the acting associate dean for the Agricultural Experiment Station, Natalie Goldberg. More details on the CESFAS will be coming in the next issues of the *ACES Magazine*.

Last, but by no means least, is the wonderful news of the well-deserved induction of Fabián García in the Agriculture Hall of Fame in October of 2019. This is an outstanding recognition for a pioneer who made ACES a strong college since the beginning. García is the first New Mexican and first Hispanic inducted into the Agriculture Hall of Fame.

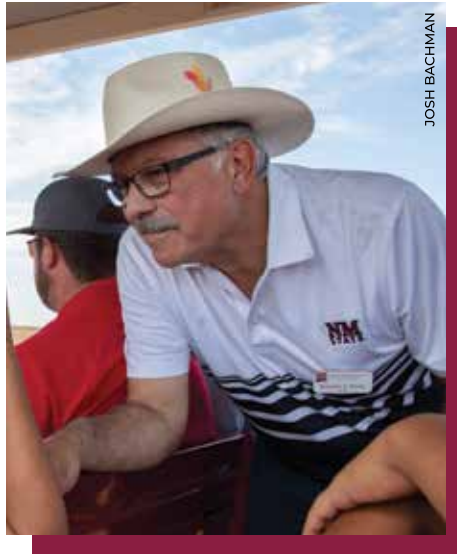
I want you to know that we appreciate your support and collaboration in giving New Mexicans a chance to improve their health, environment and economic wellbeing, and facilitate their social mobility via educational opportunities.

If you want to further explore what the college has to offer, come to the ACES Open House from 10 a.m. to 2 p.m. April 4, 2020. Buildings and facilities throughout the college will be open for you to experience firsthand all the great work done by our faculty, staff and students. This is a free, family-friendly event. Join us!

I hope you enjoy the second issue of *ACES Magazine*.



Rolando A. Flores
Dean and Chief Administrative Officer



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Photo by Josh Bachman



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NMSU students, faculty participate in global initiative programs

BY JANE MOORMAN

Attending college is more than preparing for a career, it is about expanding awareness of the world.

The ACES Global Initiative and Aggies Go Global, two programs based in the College of Agricultural, Consumer and Environmental Sciences, offer ways for students and faculty members to broaden their educational, professional and personal experiences by attending international events.

“We support trips associated with research, education and outreach,” said Manoj Shukla, coordinator of the programs. “If a student or faculty member wants to attend a workshop or conference, to do volunteer work, or teach a course, we are here to support them depending on the availability of the funds.”

During the past year, students and faculty members in the College of ACES have participated in trips to India, China and Costa Rica.

During the 2018-2019 academic year, 16 female students from NMSU received a global conference experience by attending the Women Economic Forum in New Delhi, India. Their experience included giving presentations at the conference; attending leadership workshops; sharing personal experiences; networking with global leaders; and learning how to become a Global Citizen Leader.

“This is the second year NMSU students have participated in this event, where women from around the world shared their inspirational experiences,” Shukla said. “It is a wonderful opportunity for our students to meet global leaders personally.”

A second Global Citizen project gave 10 students an opportunity to combine global citizenship training, leadership workshops and practice engaging in global and local communities during an eight-day trip in Costa Rica.



NMSU graduate students Vanaja Kankarla and Lindsey Keller visited Tel Aviv, Israel, to learn about the different technologies being used to desalinate brackish water to bring it into sustainable use. The trip is part of a new international effort between the College of Agricultural, Consumer and Environmental Sciences and Tel Aviv University to address common water issues.

“This non-credit, faculty-led trip includes culture and language immersion as well as volunteerism at Life Monteverde, a local agricultural and nature conservation organization,” said Abby Nayra, senior program specialist with Aggies Go Global.

Two groups also visited China Agricultural University in Beijing this past spring and summer. College of ACES Dean Rolando A. Flores was part of the faculty group that traveled in May, while five graduate students participated in the “Efficient Water Use” workshop in June.

“We have a longstanding collaboration with the China Agricultural University,” Shukla said. “Five years ago, we signed a memorandum of understanding with the

Chinese university to establish the NMSU -CAU Water Science and Engineering Joint Research Center.”

Participants visited the Shiyanghe Experiment Station, the Laohukou desertification and control project in Mingin Province, the ecological environmental protection area at Qingtu Lake, as well as the Great Wall of China.

“Through these programs and trips, the students and faculty get to see different types of culture and conditions,” Shukla said. “Hopefully, these opportunities will give the students insight into being a global citizen.”

To learn more about the global initiative programs visit aces.nmsu.edu/global/ and aces.nmsu.edu/aggiesgoglobal/.

Calvin ‘Herb’ Ward, wife create endowed chair in environmental and water sciences

BY MELISSA RUTTER

When faculty members provide guidance to students, it enables unique opportunities that can change their lives. This principle motivated Calvin “Herb” Ward and his wife, Barbara, to create the Dr. Calvin “Herb” and Barbara Ward Endowed Interdisciplinary Chair in Environmental and Water Sciences in the College of Agricultural, Consumer and Environmental Sciences.

Ward’s time at NMSU helped him excel and reach goals he didn’t know were possible until faculty members provided the guidance, encouragement and networks that fueled his achievements after graduation. Ward turned the strong foundation he received at NMSU into further academic success as a graduate student at Cornell University and as an award-winning faculty member at Rice University.

“When I was a junior,” Ward recalled, “the head of the Biology Department asked me to think about where I wanted to go to graduate school, and said when I returned in the fall, he would ask me again. The first day of school, he asked and I replied, ‘What about Cornell?’”

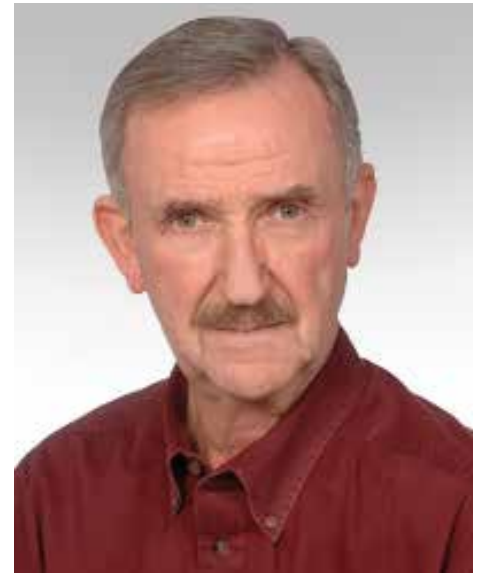
It wasn’t long before Ward saw his mentor’s support in action. “He told me I would hear from Cornell, and the next

day I did. They called and told me, on his recommendation, they wanted to offer me admission,” he said.

Ward believes this illustrates what professors can do for young students, and he has spent his entire professional life putting this into practice. The new chair will further his lifelong pursuit of helping students achieve their goals by enhancing the retention of strong faculty at NMSU – faculty who will extend their expertise, guidance and networks to Aggie students into the future.

During the spring, a call for nominations and applications went out for the inaugural awarding of the chair. Two of the nominations, one from the College of ACES and one from the College of Engineering, were exceptional. Kenneth “K.C.” Carroll, ACES associate professor of plant and environmental sciences, and Pei Xu, associate professor of civil engineering, were named co-chairs for the endowment. Their award will run until June 30, 2022.

Money received from the endowment will be used to provide resources to the co-chairs as they pursue research with an interdisciplinary approach and work in colleague partnerships across the entire university system to solve problems.



COURTESY PHOTO

Calvin “Herb” Ward and his wife, Barbara, have created the Dr. Calvin “Herb” and Barbara Ward Endowed Interdisciplinary Chair in Environmental and Water Sciences.

“I want whoever is chosen to set an example for younger faculty and to perhaps do something that they might not have had the resources or time to do. I want the award to allow them to do something positive in their career,” Ward said.



COURTESY PHOTO



VLADIMIR AVINA

Kenneth “K.C.” Carroll, an associate professor of plant and environmental sciences, and Pei Xu, an associate professor of civil engineering, are co-chairs for the Dr. Calvin “Herb” and Barbara Ward Endowed Interdisciplinary Chair in Environmental and Water Sciences. Their award will run until June 30, 2022.

Valencia County Extension Office provides innovative programs to underserved communities

BY JANE MOORMAN

The Cooperative Extension Service was created in 1914 for land-grant universities to take research-based information to people across the state to help them better their lives.

Times have changed in the last 105 years, and county Extension programs must go beyond the traditional, rural agricultural community to help better the lives of underserved people.

Innovative programs at the county level are crucial to meet the needs of New Mexico's diverse population.

The Valencia County Extension Office provides many innovative programs and serves traditional Extension audiences.

"With the wonderfully diverse and rapidly growing population in New Mexico, we have incredible opportunity to introduce new audiences to the many programs, services

and outreach efforts provided through Extension," said Laura Bittner, program director at the Valencia County Extension Office.

Bittner and agricultural agent Newt McCarty have created several one-of-a-kind programs. Some of the innovative programs include Food Camp for Kids, Meadow Lake Kids Club, Nutrition on Weekends and Foot in the Door.

Food Camp for Kids is a weeklong program that combines introducing youth to food sources through field trips to local agricultural producers with cooking experiences using the agricultural products. The students use iPads to document their experiences for a presentation at the end of the week to an audience of family members and industry professionals.

Meadow Lake Kids Club is a twice-monthly after-school program in



Maddie Montano, Juan Tobon, Daisy Tobon, Valeria Tobon and Isidro Tobon, all members of the Meadow Lake Kids Club, look at a display of insects, held by NMSU Extension entomologist Carol Sutherland, during the club's visit to the NMSU campus.

a rural community with limited access to activities for youth. Besides lessons on health, social responsibility, values and manners, the youth, ages 4 to 18, and their parents experience activities outside their community through field trips.

"This spring, we made a two-day trip to Las Cruces to explore the many opportunities and experiences of college life," Bittner said. "Now NMSU is not just a name, it is a place the youth feel connected to."

Nutrition on Weekends provides snack packs of nutritional food to students from Century High School in Los Lunas who may be experiencing food insecurity in their homes. The project has drawn together community groups that help provide the food items and pack the sacks.

Foot in the Door is a job-seeking program that provides a basic understanding of the steps involved in acquiring a job. The program was designed for people with felony convictions who are re-entering the workforce after completing a rehabilitation program, but has expanded to include any group or age of people preparing to enter or re-enter the workforce.

"All of the work we do through our Extension programs is rewarding," Bittner said. "But working with under-served audiences has a special place in my heart because of the way these programs can impact the lives of our participants and their families."



Laura Bittner, program director at the Valencia County Extension Office, hands out a snack pack to a student from Century High School in Los Lunas as part of the Nutrition on Weekends program, which provides food to students living with food insecurity issues.



JOSH BACHMAN

ACES hosts state's first hemp conference

This spring, more than 200 participants gathered in Las Cruces for a two-day hemp conference hosted by the New Mexico State University Cooperative Extension Service. It was the first conference of its kind in New Mexico following the nationwide legalization of hemp in December 2018 and the first educational hemp outreach effort sponsored by NMSU.

Hemp CBD can be used in a wide range of industrial applications, making it a potential economic driver for New Mexico. The conference featured various experts who discussed the legal and business aspects of producing hemp on an industrial scale. The conference will return for a second year in May 2020.



JANE MOORMAN

ACES receives \$3.6 million to repair off-campus science centers

During the 2019 legislative session, the College of Agricultural, Consumer and Environmental Sciences received \$3.6 million in appropriations to fund critical repairs at all of the off-campus science centers within the Agricultural Experiment Station.

Each of the 11 facilities will receive a portion of the funds to address infrastructure needs. Some facilities also received one-time funding, totaling \$357,000, to purchase specific equipment.

"These funds will be used to repair and restore our infrastructure to ensure a safe and functional working environment at the agricultural science centers," said Natalie Goldberg, College of ACES interim associate dean and director of the Agricultural Experiment Station.



DARRELL PEHR

Center in Tucumcari renamed for former superintendent

Rex E. Kirksey, former superintendent at New Mexico State University's Agricultural Science Center at Tucumcari, served for more than 30 years before retiring in 2012, and was the longest-serving superintendent in the center's 106-year history. Kirksey also led the center at Clovis for about 10 years.

Kirksey was tragically killed April 9, 2018, in an ATV rollover while checking cattle at his parents' farm near Tucumcari, as he had done since he was a child. The center's Advisory Committee proposed renaming the center as the "Rex E. Kirksey Agricultural Science Center at Tucumcari," in honor of his service. With the support of college administration, the name change was approved by the NMSU Board of Regents March 8, 2019, and consent was given by Kirksey's family.

Scholarship to honor Wayne Wilson, benefit rodeo students

Wayne Wilson never quit, and he lived long enough to show just how tough cowboys are, according to his mother, Julie Wilson. At the age of 19, while attending New Mexico State University in the 1980s, Wayne was diagnosed with Hodgkin's lymphoma, a cancer of the lymphatic system, which is part of the immune system.

Wayne was a strong advocate for young kids and inspired them to find something they were passionate about, like he was about rodeo. After he passed away in September 2018, his family created a scholarship to benefit NMSU rodeo students.

During a rodeo show in Los Lunas, Wayne's friends collected \$20,000 for the Wayne Wilson Memorial Rodeo Scholarship.



JOSH BACHMAN



JOSH BACHMAN

ACES to showcase diverse programs at open house

The College of Agricultural, Consumer and Environmental Sciences will open its doors to the public for the third year in a row during its ACES Open House.

The free, fun and family-friendly event will take place from 9 a.m. to noon Saturday, April 4, 2020, at several of the college's buildings, labs, museums and auxiliary units. It will showcase many of the diverse areas of focus within the college such as wine, food, fashion, bedbug prevention, plant diagnostics and health-related programs, as well as the companion animal program.

"The main thing we are focusing on is showing people what we do in the college and the impact it has on their daily lives," said Natalie Goldberg, interim associate dean and director of the Agricultural Experiment Station at the College of ACES.



JANE MOORMAN

Certified cattle

ACES High value-added calf program yields better prices

BY JANE MOORMAN

Getting the best price possible at the sale is the goal of cattle producers. It can be tricky with the constantly changing market prices. However, a value-added program is a marketing tool that helps producers earn more dollars for their operation's bottom line.

New Mexico State University's College of Agricultural, Consumer and Environmental Sciences has established ACES High and ACES High+ calf certification programs to help producers prosper in the competitive market either through private sales or public auctions.

"By participating in the ACES High and ACES High+ programs, producers have

a better chance of obtaining top dollar when they sell their calves," said Craig Gifford, NMSU Cooperative Extension Service beef cattle specialist.

New Mexico cattle producers are impressed with the program.

"What I like about this program is that it is a market-driven program, not a government mandate," said Tom Sidwell, New Mexico Cattle Growers Association president. "This gives the producers the option that they can choose to participate and, consequently, the market will reward them."

Through the program, the producer adheres to the Beef Quality Assurance standards and follows a proven vaccination/immunization protocol.

"The value of the ACES High and ACES High+ programs goes well beyond earning better prices for producers' calves," said Dina Chacon-Reitzel, New Mexico Beef Council executive director. "It ultimately assures that our beef is the safest and highest quality for the consumer."

Plus, the calves' age and source verification are registered with IMI Global, a beef verification service that qualifies the beef for international export.

"Providing age and source verification data on our cattle opens doors to sale the beef to key international markets that wouldn't be accessible otherwise," Chacon-Reitzel said.

Age and source verification registered with the United States Department of

ACES High ear tag on a yearling indicates it is part of New Mexico State University's College of Agricultural, Consumer and Environmental Sciences' calf certification program, which helps producers prosper in the competitive market.



Carlsbad rancher Fred Beard found participating in the ACES High program profitable. The program, provided by New Mexico State University's College of Agricultural, Consumer and Environmental Sciences, helps ranchers prepare their cattle for an international market.

Agriculture data system allows the U.S. Meat Export Federation to sell the final product of beef internationally, where the markets bring top dollar.

“Usually having this verification is not financially feasible for herds of 50 or less calves because of the flat ranch fee, but IMI Global has adjusted their fees for the ACES High participants to a per head fee,” Gifford said.

Dealing with the paperwork required for the verification is simpler than one might think, according to Shad Cox, superintendent of NMSU's Corona Range and Livestock Research Center.

“IMI Global is real professional in the way they handle the paperwork quick and fast,” Cox said. “You email or fax your records to them, they look at the records and decide whether you meet the requirements, or not. They will even accept a copy of your

kitchen calendar with the dates of the first and last born marked.”

Another factor affecting the sale price is the physical condition of the animal. Bovine respiratory disease remains the largest challenge facing the beef industry, and calves who contract respiratory disease are a major revenue loss for feedlots.

To ensure the quality of the beef, ACES High requires the producers to practice Beef Quality Assurance standards and a prescribed vaccination protocol. Both the BQA training and the protocol are provided by John Wenzel, NMSU Extension veterinarian.

In promoting the protocol, Wenzel explained that producers are not just vaccinating the animals at branding, weaning and 45 days after weaning, but rather providing an immunization that helps the calf remain healthy, if it is done correctly.

Cox likes the ACES High program because he is able to recapture the costs of the vaccination program.

“We've always had a pretty state-of-the-art vaccination program, and have kept records,” Cox said of the 450-animal unit herd at the Corona ranch. “But in the past, we didn't really recoup that cost at the sale. Now that we are certified through ACES High, we do. Last year, we made 15 cents per pound more than the going sale price the day of the auction.”

Another benefit of the program for the smaller producer is combining sale lots to receive the truckload prices.

“Guys with 20 or 30 head for the sale miss out on the better price,” Cox said. “Now the buyer can combine several herds in the same area to have a full truckload because he knows the animals are ACES High certified.”

The auction barn in Clovis has worked with the ACES High program to have an annual sale. This year, a second option for sales is being offered by Superior Livestock Sales, an online auction service.

“We still have the agreement with the sale barns, but many of the people we have in the program are larger producers in terms of cattle numbers,” Gifford said. “They want to market directly from their ranch through Superior.”

Superior goes to the ranch and films the calves, then offers the calves nationally through an online sale.

“I like Superior because you get out into a wider audience,” Cox said. “It makes the bidding more competitive.”

Another added benefit for producers raising all-natural certified or hormone-free certified beef is that they can reach a bigger market.

“They can now reach the buyers in other parts of the county who are looking for those certification,” Gifford said.

WISE

Tucumcari researchers make the most of limited water

BY DARRELL J. PEHR

Tillage systems research is ongoing at New Mexico State University's Rex E. Kirksey Agricultural Science Center at Tucumcari. One three-year study evaluated the effectiveness of three tillage strategies – conventional, strip and no tillage – and two nitrogen rates on corn yield, water use and carry over residual water, and nitrogen characteristics.

In the semiarid climate of northeastern New Mexico, farmers and ranchers have no guarantee of water for their crops or livestock. In the Tucumcari area, dry weather patterns can mean little or no rain for fields, and inadequate rain to replenish reservoirs that feed farmers' irrigation canals.

Water conservation is a priority not only in this part of the state, but across New Mexico where water is seldom plentiful.

Such extremes are the kinds of challenges that researchers at New Mexico State University's Rex E. Kirksey Agricultural Science Center at Tucumcari are ideally suited to address.

The science center, one of a dozen off-campus science centers operated across New Mexico by NMSU's College of Agricultural, Consumer and Environmental Sciences, sits in a hilly area three miles northeast of Tucumcari.

Researchers at the science center approach water conservation in a variety of ways, and two recently published journal articles by assistant professor Murali K. Darapuneni illustrate projects geared toward helping farmers use scarce water resources more efficiently.

One three-year study evaluated the effectiveness of three tillage strategies – conventional, strip and no-tillage – and two nitrogen rates on corn yield, water use and carry-over residual water and nitrogen characteristics.

"Successful corn production in the semiarid and arid southwestern United States is limited by available resources, especially water and nitrogen," Darapuneni said. "Management of such limited resources needs efficient on-farm tillage and nitrogen management decisions."

Darapuneni and his colleagues found that implementation of strip tillage in semiarid regions offers farmers a significant advantage over other tillage practices in improving resource use efficiency in corn production.

The study, published in *Agronomy Journal*, was a collaboration between Darapuneni and other researchers, including Omololu "John" Idowu, Leonard M. Lauriault,



DARRELL PEHR

Leonard Lauriault is the superintendent of New Mexico State University's Rex E. Kirksey Agricultural Science Center at Tucumcari. He is leading a research project examining the impact of the source of water on alfalfa establishment and production.



DARRELL PEHR

Murali Darapuneni is an assistant professor of semi-arid cropping systems in New Mexico State University's Department of Plant and Environmental Sciences. He recently published two journal articles that illustrate two projects geared toward helping farmers use scarce water resources more efficiently.

Syam K. Dodla, Kiran Pavuluri, Srinvasulu Ale, Kulbhushan Grover and Sangamesh V. Angadi.

A second study, published in the *Soil & Tillage Research* journal, looked at variations in plant and soil characteristics

following the application of manure in strip-till zones of dryland farming fields.

“Utilizing manure as a cost-effective plant nutrient source under dryland farming is often undermined by transportation and application costs of large quantities

of manure,” Darapuneni said. “Our study compared the effectiveness of a one-time application of manure in the strip-till zone using dryland sorghum as the test crop.”

The project, also a three-year study, determined that even three years after a single application of manure, significant agricultural benefits were evident.

Darapuneni collaborated on the project with Lauriault, Dodla, Idowu, Grover, Gasper Martinez, Koffi Djaman and Angadi.

Other projects at the center are focusing on cover crops, winter cover crops and the impact of the source of water – whether from an irrigation canal or from a municipal wastewater treatment plant – on alfalfa establishment and production.

“Municipalities seek uses for treated wastewater, which is generally safe to apply to animal feed and fiber crops, to minimize the release of potential pollutants into the surface and groundwater bodies,” said Lauriault, who is leading the study.

In addition to his role as a forage crop management scientist, Lauriault is superintendent of the center. He notes that with alfalfa being the most important forage crop worldwide, determining the potential impact of using treated municipal water could assist farmers with making good decisions.

“Preliminary results of ongoing research at the center have discovered a potential effect of wastewater on established alfalfa nutritive value and soil fertility characteristics,” Lauriault said.

Research continues on the wastewater project.

Another project at Tucumcari, soon to be published in *Agronomy Journal*, with Darapuneni, Lauriault and Angadi as coauthors, found that farmers who had irrigated alfalfa through the growing season could skip irrigation for the harvest of fall growth without any negative effect, thus saving a tremendous amount of water.

“These research findings can have significant practical applications in budgeting annual water applications during the growing season in many semiarid regions to improve the dry matter yield and irrigation water use efficiency in alfalfa,” Lauriault said.

For farmers, that can mean significant cost savings, whether their fields are in Tucumcari or elsewhere across the southwestern U.S. Helping farmers and ranchers be more efficient and productive, while at the same time saving precious water resources, are the kinds of challenges the researchers at the Rex E. Kirksey Agricultural Science Center at Tucumcari are meeting every day.

TAKING FLIGHT

ACES researchers drive agriculture into the future with big data

BY CARLOS ANDRES LÓPEZ

Researchers in the College of Agricultural, Consumer and Environmental Sciences at New Mexico State University are working to solve an array of real-world challenges – from tracking livestock behavior to improving agricultural sustainability and developing artificial intelligence for agriculture – by using big data.

Big data is a loosely defined term for large datasets collected and analyzed by researchers to reveal patterns, trends and associations, and predict behaviors and interactions. Many industries, including agriculture and farming, use big-data and supercomputing methods to identify solutions for some of the world's most pressing challenges.

“With the world's population expected to grow to more than 9 billion by 2050, there is an urgent need to produce more food on less land with less water and fewer inputs,” said Natalie Goldberg, College of ACES interim associate dean and director of the Agricultural Experiment Station.

“The ability to collect enormous amounts of data is a reality,” Goldberg added. “Big data science moves that information to data analysis, machine learning, the develop-



WENJIE JI



MA

Horvat Shadgou Rhein, a Ph.D. student of microbiology, looks over large datasets in the Randall Lab with Jennifer Randall, a professor in the Department of Entomology, Plant Pathology and Weed Science.

ment of decision-making tools, and the use of artificial intelligence and autonomous systems, including robotics. Implementation of big data science into agriculture will move technology development into solutions that will help solve some of agriculture's most complex problems."

By implementing big data and emerging technologies, Goldberg said, agricultural producers can maximize efficient farming and ranching, save water, reduce chemical use, solve labor problems, and reduce food waste and contamination.

Currently, 10 faculty members in the College of ACES and the Jornada Experimental Range are leading collaborative research efforts that utilize big data and supercomputing.

Derek Bailey, a professor in the Department of Animal and Range Science, is using GPS tracking and other sensors to monitor the welfare, productivity and sustainability of cattle and sheep on rangelands.

"Our lab is testing real-time and near real-time GPS tracking systems, accelerometer ear tags and other sensors that have promise for use by ranchers," said Bailey,

who has been tracking cattle since 1998. "We combine these on-animal sensors with satellite imagery to simultaneously monitor forage resources and livestock behavior. Our group is working with animal breeding scientists at Colorado State University to identify genetic markers associated with cattle movement patterns grazing rugged rangelands."

Bailey also plans to develop genomic-based breeding values for cattle terrain use. This will allow ranchers to select animals that use steep slopes and roam areas far from water sources, which are typically avoided. His goal, he said, is to use GPS tracking, sensor monitoring, satellite imagery and genomics to develop "precision livestock management" systems – an approach that requires collecting, processing and analyzing large datasets.

"In the past, we could rely on conventional software and desktop computers," Bailey said. "With technical improvements of sensors and associated reductions in equipment price, we can now track entire herds of cattle and collect movement data from accelerometers at a rate of 24 hertz."

In future studies, Bailey hopes to start using drones to collect data. When that time comes, he will join other faculty members, including Niall Hanan, who are already using unmanned aerial vehicles, or drones, in their research.

Hanan, a professor in the Department of Plant and Environmental Sciences, and his research group are working on environmental and ecological data analysis using cloud-based computing as well as the high-performance computing facilities available at NMSU.

"Our work includes analysis of satellite imagery using Google Earth Engine to better understand vegetation change in the drylands of the southwestern United States, Africa and globally," Hanan explained. "We also carry out computer-intensive analysis of UAV images and terrestrial lidar data to derive detailed three-dimensional vegetation structure information relevant to the productivity of shrublands in the southwestern U.S. and globally," he added.

Lara Prihodko, a college associate professor in the Department of Animal and Range Science, works with very large datasets in her research centered on regional and global-scale ecology. Two of her current projects include mapping and modeling tree cover and woody biomass for the entire Sub-Saharan Africa region and modeling regional land surface fluxes, including water, energy and carbon, over the Jornada Basin.

"Our data sets include large geospatial and climate data, such as optical and radar

satellite imagery and global climate re-analyses. As satellite systems have developed, data volumes have increased exponentially, Prihodko said, "so we increasingly rely on big-data analysis techniques, high performance computers and cloud computing to process and analyze it."

Earlier this year, College of ACES Dean Rolando Flores established an interdisciplinary team of 12 researchers from four colleges – ACES, Arts and Sciences, Engineering and Business – to collaborate on a white paper focused on developing artificial intelligence for agriculture.

"Over the next several years, these technologies will become increasingly prevalent in farming and ranching operations, which will likely lead to the greatest increase in farming and ranching since mechanization," Goldberg said. "These problems are complex, and development and implementation of big data and artificial intelligence into agriculture requires researchers from across diverse disciplines to work together for solutions."

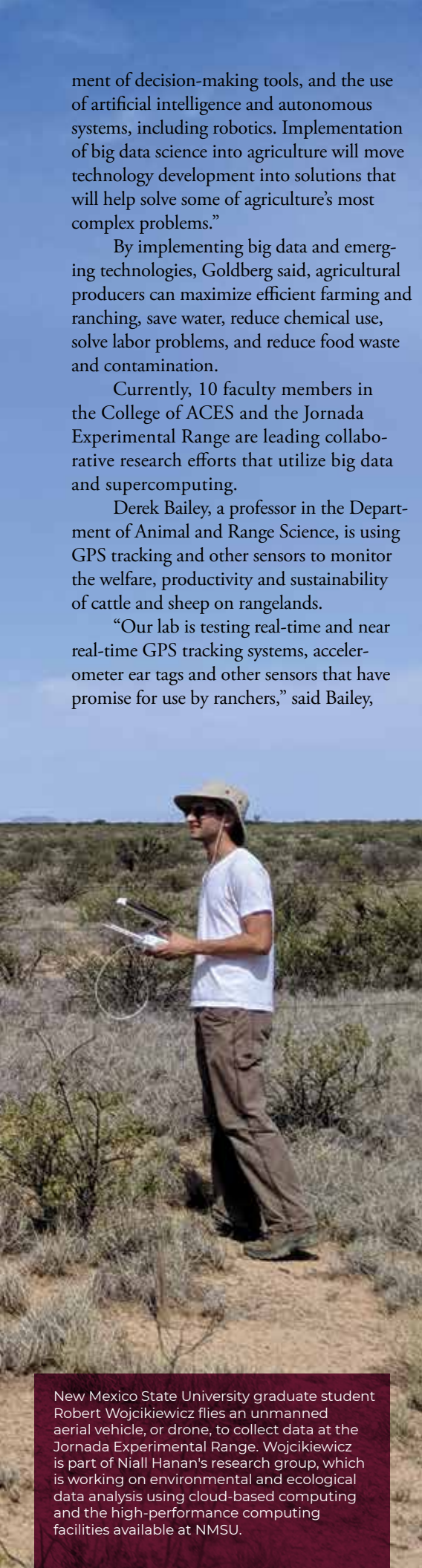
Jennifer Randall, a professor in the Department of Entomology, Plant Pathology and Weed Science, was part of the research group that drafted the white paper. She also oversees research in the Randall Lab, which she founded to focus on the genetic and molecular mechanisms of plant development and plant-microbe interactions.

Randall is specifically interested in pecan development, including the molecular mechanisms involved in floral initiation, nutrient acquisition and salinity tolerance, she said.

"We are working with large RNA-sequencing datasets for gene expression elucidation," she said, noting the big data methods used by her and her students. "Our lab is involved in many collaborative efforts with pecan trees, including genome sequencing efforts, genome-wide association studies with large data sets for marker development."

At NMSU, Flores said, scientists and engineers are working together in the College of ACES to solve the challenging problems facing farmers, ranchers and food processors in New Mexico.

"Those problems deal with environmental issues, accentuated by global warming, lack of farm and ranch labor that makes our products more expensive and less competitive in global markets, and a plethora of issues that only advanced science and new technologies can solve in agriculture in the years to come," he said. "However, the College of ACES has taken the challenge and is getting ready to develop solutions to the problems."



New Mexico State University graduate student Robert Wojcikiewicz flies an unmanned aerial vehicle, or drone, to collect data at the Jornada Experimental Range. Wojcikiewicz is part of Niall Hanan's research group, which is working on environmental and ecological data analysis using cloud-based computing and the high-performance computing facilities available at NMSU.

AN EQUINE EDUCATION

NMSU 4-H program teaches riding, animal care, much more

BY JANE MOORMAN

Each summer young people and their horses have attended the New Mexico 4-H Horse School to learn and improve the communication between human and horse.

The school has been hosted by the College of Agricultural, Consumer and Environmental Sciences' 4-H Youth Development program since 1985. When the school began it was held at the New Mexico Military Institute in Roswell, then it moved to the state fairgrounds in Albuquerque. This summer it was held in Las Cruces at NMSU's equine facility.

"It's great having the youth on campus," said Craig Painter, NMSU's 4-H state agriculture and natural resource agent and director of the school. "Besides improving their horsemanship skills they got to see the equine education program and horse farm that is here on campus."

The school is three days of hands-on learning associated with caring for and riding a horse. From sunup to sundown the youth, ages 8 to 18, learn the biological science of the horse and hone their horsemanship skills.

"For about half of the youth, this is their first horse school," Painter said.

"This is my first time," said Addison Alguire of Catron County, who has been riding for only four months. "My older sister, Savanna Finley, told me about when she came and what I would learn."

This is Brooke Becker of Catron County's second time to attend the school, but the first time for her 3-year-old horse Silver, a cremello paint with white eyes.

"I like how they instruct you," Becker said. "They are very patient and are able to get the point across clearly."

Horsemanship is the communication between rider and the animal to where they become one with each other.

"We are teaching the youth how to communicate with their horse by using leg pressure, reining, weight placement in the saddle and their voice," said John Allen, Socorro County agricultural agent and one of 10 instructors.

The youth's riding skills are evaluated before they are grouped in three levels so instructors are able to address their abilities. With experience, they advance through the skill levels of the school.

"Each level is building on the basic skills they learned as beginners, by developing more technical maneuvers," said Hannah Swarthout, NMSU equine instructor. "Ultimately, we want them to refine their skills to where the rider is invisible. Where it looks like the rider is just sitting on the horse, yet they are in control of the animal at all times."

Five advanced 4-H riders participated in training a 2-year-old horse, which they purchased and broke for riding.

"They work with the horse each day so it can be shown in Western Pleasure," said Joby Priest, NMSU Horse Farm manager and equine instructor. "They must do all of the training themselves."

The five riders and their horses will participate in the State Fair 4-H Horse Show Futurity Division this September,



Leslie Cheran of Sierra County puts a boot on her horse at the University 4-H Horse School.



E RMA

Denny Turner rides his horse during 4-H Horse School practices.

and again in the three-year-old futurity in 2020.

There is more to owning a horse than just the fun of riding. The youth learn about horse nutrition, and selecting the proper tack for their horse and how to use it properly.

“This is my fourth year at horse school,” said Leslie Cheran of Sierra County, who has been riding for eight years. “I’ve learned a lot about horses by attending.”

Horse school is not just about riding, the youth also participated in educational workshops. They learned about large animal rescue techniques, and participated in a Horse Bowl quiz show game and public speaking to prepare for their district competition and the State 4-H Conference in July.

They also did a fun activity of decorating a T-shirt by spinning paint on the fabric with centrifugal force generated by pedaling a stationary bicycle.

In the evenings they were entertained by a trick roping demonstration, a tour of NMSU’s horse farm and a dance.

“I like coming to horse school because I get to meet other kids from around the state,” said Noelani Meador of San Juan County, who has attended the school four times. “At home there are only a few people who can teach you. Here there are a lot of people to learn from.”



JA

Sissy before riding during the New Mexico State



JANE MOORMAN

Riding instructor John Allen checks the bridle on Theresa Cardiel’s horse prior to the rider going into the ring at the New Mexico State University 4-H Horse School.



Researchers developed a metric for water use called the GSRA, which is the groundwater: surface water ratio of application. It can be used by farmers, water policymakers and water managers to make more informed choices about groundwater resilience and sustainability of water in aquifer storage.

Quantifying water resilience

NMSU researchers, EBID develop metrics for water-resource management, sustainability

BY MELISSA RUTTER

Researchers from New Mexico State University, working in collaboration with the Elephant Butte Irrigation District, have determined that groundwater resilience can be quantified on a basin scale and have developed metrics to support integrated water-resource management and sustainability.

The research is a joint effort by Kenneth “K.C.” Carroll, an associate professor in NMSU’s College of Agricultural, Consumer and Environmental Sciences, James P. King, a professor and associate department head in NMSU’s College of Engineering, and Erik H. Fuchs, the groundwater resources director for EBID.

This summer, Carroll, King and Fuchs observed a significant amount of refilling of the Elephant Butte Reservoir after storage in the reservoir decreased to a very low level last summer. Although, they were not able to see the groundwater beneath the land surface that is used, they were able to confirm the resilience in groundwater storage with return of increased surface-water flows in the Rio Grande.

The research team began its work by looking at the multiyear drought that began in the early 2000s and extended drastically into the 2010s.

Currently, the drought is slowly easing up, according to the researchers, and there is now more water in the Elephant Butte Reservoir, which is about half full. But they cautioned that the area is not completely out of a drought and that a similar drought cycle is possible.

“One of the things we focused on is the irrigation and groundwater system in the Hatch area within the EBID. Hatch is centrally located in the Rincon Valley watershed, which features a small, geologically constrained and shallow groundwater system, but the Hatch population is also small and imports groundwater from the neighboring Nutt-Hockett basin,” Fuchs said.

According to the researchers, more and more farmers are pumping groundwater in the Southwest. The use of both surface water and groundwater is critical to agriculture in the EBID and the Hatch area,

and virtually all river-connected irrigation projects throughout the world.

“We wanted to look at quantifying impacts of using both surface water and groundwater,” Fuchs said, adding, “We wanted to look at the ability of the groundwater system, which we consider to be particularly vulnerable to drought given its limited groundwater resources, to rebound from a stress during the longer-term prolonged droughts, and we wanted to develop some of the metrics for groundwater resilience.”

Fuchs also explained that he and the researchers looked at shallow aquifer storage changes in the groundwater system because the surface water and a potential for aquifer recharge comes back each year in varying degrees.

“Surface water has a residence time that is short, and we are dependent on surface water that mainly originates mostly as annual snowpack and spring snowmelt. The groundwater residence time is typically much longer, and the process of aquifer recharge where we have replenishment of groundwater in storage can take many years,

if not decades. So, we looked at shallow groundwater storage changes as a metric for groundwater resilience,” he said.

The research team found a very strong correlation between the annual amount of groundwater extraction for irrigation and the annual availability of surface water.

“When we have more surface water, farmers extract less groundwater, and when we have less surface water, they extract more ground water. This by itself isn’t at all surprising, and is in keeping with conjunctive water resource use as it has occurred historically in this area. What is interesting is that it’s almost a one-to-one ratio,” King said.

The researchers also found that in the Rincon Valley, when there is additional surface water available for release, there is an increase in storage of the shallow alluvium aquifer within the year that the additional surface water is made available, which is attributable to recharge of the shallow alluvium.

When there is a decrease in available surface water, there is a decline in storage in the aquifer within the year the decrease occurs. All recharge and when and how much it occurs, depends on flows in the Rio

““ We wanted to look at the ability of the ground-water system, which we consider to be particularly vulnerable to drought given its limited groundwater resources to rebound from a stress during the longer-term prolonged droughts, and we wanted to develop some of the metrics for groundwater resilience. ””

Erek H. Fuchs, groundwater resources director for Elephant Butte Irrigation District

Grande and the diversion of that water for irrigation within the EBID.

The researchers created a metric to evaluate dependence on groundwater over time as a potential indicator of groundwater stress and, therefore, resilience.

“We developed a metric for water use called the GSRA, which is the groundwater: surface water ratio of application. The basic premise is that when we have more groundwater extraction than surface water

diversion over time, we are going to see a decrease in groundwater storage. When we have less groundwater extraction relative to surface water use over time, then we will see less declines in the aquifer,” Carroll said.

He added, “This metric can be used by farmers on an on-farm basis, water policy-makers and water managers alike to make more informed choices about groundwater resilience and sustainability of water in aquifer storage.”



SAMANTHA BARNCASTLE

Kenneth “K.C.” Carroll, an associate professor in the College of Agricultural, Consumer and Environmental Sciences, James P. King, professor and associate department head in the College of Engineering, and Erek H. Fuchs, the groundwater resources director for the Elephant Butte Irrigation District, observed a significant amount of refilling of the Elephant Butte Reservoir after storage in the reservoir decreased to a very low level in the summer of 2018. However, this summer it refilled to half-full storage.

OUTDOOR

Program for girls promotes STEM education, fellowship

BY ADRIANA M. CHÁVEZ

Area high school girls interested in STEM-related research and careers are getting a rare opportunity to hike in the Gila Wilderness thanks to a Fish, Wildlife and Conservation Ecology professor at New Mexico State University's College of Agricultural, Consumer and Environmental Sciences.

Professor Wiebke Boeing was inspired to start the southern New Mexico and West Texas chapter of Girls in outdoor Adventure for Leadership and Science, or GALS, by an email from the program's founders, a group of graduate students at Duke University. The program encourages students who are underrepresented in STEM fields to pursue science careers. Support for the program is provided by NMSU, local businesses and

community donations so that the program's participants and their families don't have to worry about purchasing special equipment like hiking shoes or backpacks.

"Seeing the majestic beauty of the Gila Wilderness through the eyes of teenagers who had never experienced anything similar is humbling and deeply touching, and forced me to pay attention to things I had stopped noticing," Boeing said.

In June, Boeing, along with four trip leaders consisting of NMSU and Duke University graduate students and a representative from the USDA Jornada Experimental Range, accompanied 12 high school girls in the Gila Wilderness during a weeklong hiking expedition. During the trip, the girls observed various wildlife while forming



JOSH BACHMAN

Wiebke Boeing, left, is the GALS program director and a Fish, Wildlife and Conservation Ecology professor at New Mexico State University's College of Agricultural, Consumer and Environmental Sciences. Graduate student Lauren Samaniego is a GALS program trip leader.



COURTESY PHOTO

OPP

friendships with one another and learning how to survive in the Gila's rugged terrain.

"Students backpacked up to five miles, navigating difficult terrain to camp at the Middle Fork and hiked to, and enjoyed, Jordan Hot Springs," Boeing said. "Additionally, students were taught skills like how to purify water and cook on camp stoves. Cold mashed potatoes with clumpy gravy and burned brownies have never tasted so good, and dinners progressed to perfectly baked deep-dish pizza."

The girls also collected data based on their scientific observations in the wild for a special presentation that took place after the group returned to the NMSU campus from



Twelve area high school girls interested in STEM-related research and careers hiked through the Gila Wilderness in June thanks to the GALS program at New Mexico State University. During the trip, the girls observed various wildlife while forming friendships with one another and learning how to survive in the Gila's rugged terrain.

OPPORTUNITY

their trip. Presentation attendees included family members, friends and faculty.

“We do some structured science activities, and then they design their own project,” said NMSU graduate assistant Lauren Samaniego. “We come back and stay one night in the dorms, then they present the next day in the classroom.”

Samaniego said that as a trip leader, she gets to witness a remarkable evolution among the girls on the trip.

“The most powerful impact is seeing the girls’ evolution from beginning to end,” Samaniego said. “By the end of the trip, the girls are super conscious about cleaning up their trash. At the beginning of the trip, the

girls might have a little bit of anxiety about sleeping outside, but on our last night every one slept under the stars without a tent.”

Another noticeable difference is seeing some phone-obsessed teens totally forget about the devices once their trip commences.

“One girl said it was nice to not have their phones and to just be able to talk,” Boeing said.

Not only do the girls learn more about science and STEM fields, but they also learn about each other. Boeing said one feature of the trip is a nightly campfire where the girls sit around and anonymously discuss their biggest fears or life questions. A hat is passed around, and each girl writes down a fear or

a question, then drops it into the hat for someone else to pick out and read.

“Some of them write about not having friends or not belonging,” Boeing said. “But the bonding and friendships that happen during the trip are just mindblowing and amazing.”

Samaniego agreed, and said one girl at the beginning of the trip was quiet and withdrawn, but once she got out into the wilderness, she blossomed.

“In nature, she’s a different person,” Samaniego said.

For more information about the GALS program, visit aces.nmsu.edu/gals/, or email Boeing at wboeing@nmsu.edu.

Donald Conner joined the College of Agricultural, Consumer and Environmental Sciences as an associate dean and director of academic programs in May 2019. Conner says teaching entrepreneurial skills to students and making sure they each have an internship opportunity are two of his central goals.



JOSH BACHMAN

BY CARLOS ANDRES LÓPEZ

In May, Donald Conner joined the College of Agricultural, Consumer and Environmental Sciences as an associate dean and director of academic programs. During his first 100 days on the job, Conner dedicated much of his time to learning as much as he could about the college’s diverse instructional programs and outlining his vision to equip students with the knowledge to meet modern-day challenges.

“There are some real challenges related to agriculture, the environment and consumer issues – all the things that we tackle in this college,” said Conner, who spent more than 30 years at Auburn University in Alabama before joining New Mexico State

MEETING NEW CHALLENGES

Conner outlines vision for ACES academic programs

University. “Those of us who are involved in instructional programs need to make sure our teaching programs remain relevant, and that they’re meeting the needs of potential students,” he added.

In his new role in the College of ACES, Conner works closely with Dean Rolando Flores to administer the academic programs within the college. Conner also is responsible for promoting academic achieve-

ment, teaching excellence and leadership, and directing the college's recruitment, retention, advising, scholarship, internship and ambassador programs.

"My goal is twofold: first, that students have a great learning experience here, and two, that they're prepared to make a difference when they leave," Conner said, noting the challenges graduates may face when they start their careers. "We're going to have a lot of people in the world to feed; we have more pressure on natural resources than we've ever had; we have crazy economics going on now. So, our students will be asked to address a lot of different issues out there."

In particular, Conner sees the importance of teaching entrepreneurial skills to students in the college. More students today are interested in starting businesses, he said, but some lack the necessary professional and critical thinking skills.

"We will address this and begin to weave entrepreneurial teaching into our programs," he said.

Conner also believes that each student should have an internship opportunity and an international experience before they leave college.

Internships are "hugely critical," he explained, because "it gives students exposure in the workplace – and that can be good or bad." He added, "Sometimes, one of your best learning experiences is finding something that you don't want to do, along with discovering things you are passionate about."

To his surprise, Conner learned, after arriving at NMSU, that some students who



Donald Conner, associate dean and director of academic programs for the College of Agricultural, Consumer and Environmental Sciences, listens to research updates about sorghum and other crops during the 2019 Field Day at the Agricultural Science Center at Clovis.

attend the university have never traveled outside New Mexico.

"New Mexico has a diverse culture as it is, but there's more to the world than New Mexico and the Southwest," he said. "We want to make sure our students have some experience on a global basis, such as participating in a study abroad program or exchange program. In the long term, we will be working to increase these opportunities for students when they come here."

Conner plans to spend most of the fall semester evaluating the college's current academic programs and setting benchmarks for continual improvement.

"If we make any changes, it has to be for the right reasons," he said. "The big questions I'll be asking include: Are students learning what they need to learn? Are they prepared for a good career? And, are there things that we should be teaching that we aren't teaching?"

Conner added that he foresees the addition of new majors in the future. Currently, the college offers 23 different majors at the undergraduate level and 18 graduate and Ph.D. programs, and he views the variety in the programs as a major asset.

"It brings a lot of strength and diversity to our college that you don't find in a lot of other agricultural colleges," he said, "and I think there are opportunities we haven't fully explored in-depth yet."

For example, he said, students in the Fish, Wildlife and Conservation Department may want to consider taking classes in the School of Hotel, Restaurant and Tourism Management to learn additional skill sets that could help them start businesses tailored to their interests, such as lodges or fish camps.

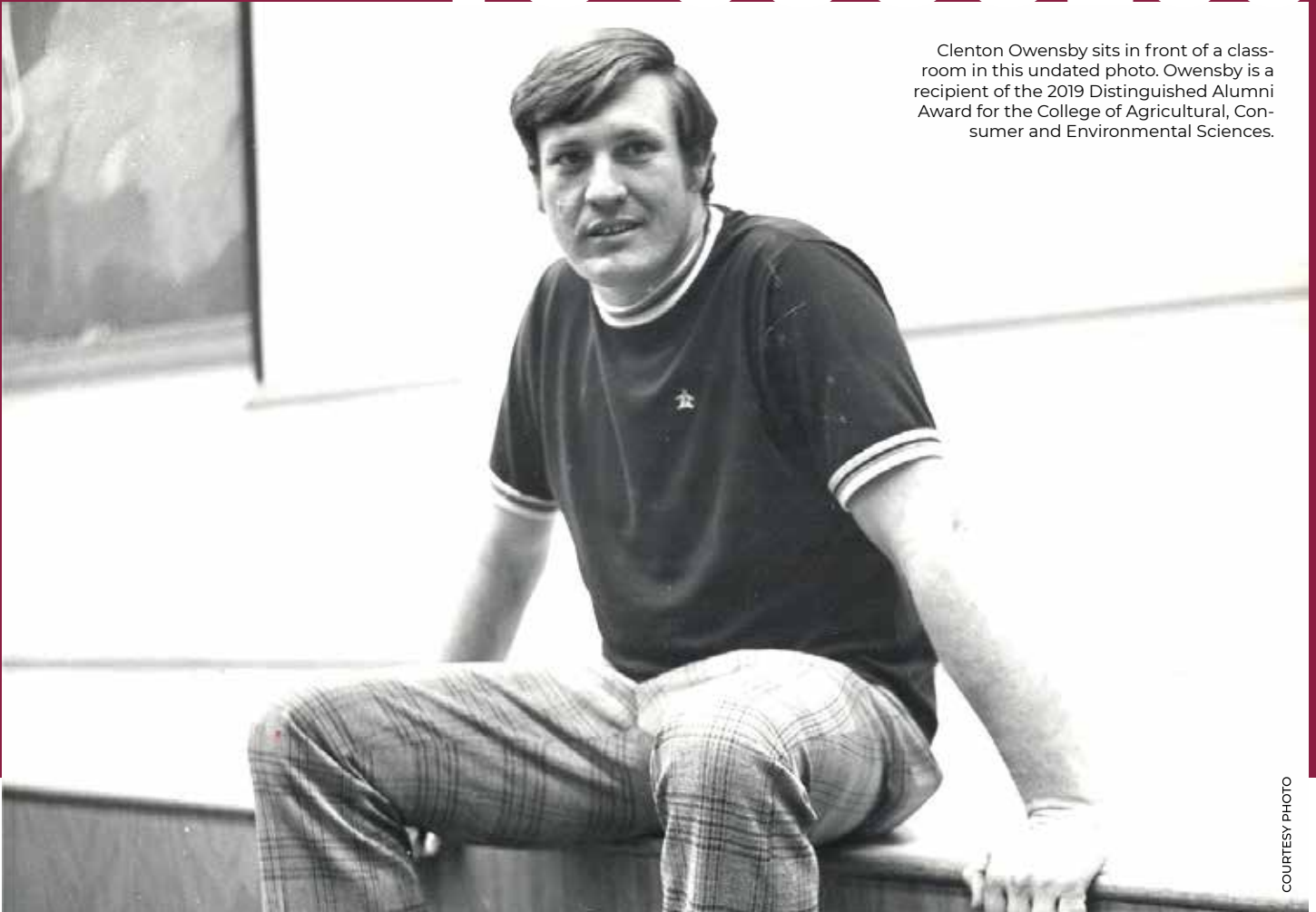
"There's all kind of possibilities like that, and we need to think about them," he said, adding, "When I interviewed here, I saw a lot of potential in our teaching program. I've been here a few months, and that hasn't changed in my mind. In fact, it's only gotten stronger. Our students have a lot of opportunity and a lot of potential, and what drives me is making sure each and every student reaches that potential."



Students in an Introduction to Hospitality Management course listen as their instructor, college assistant professor Julie Correa, conducts class in Gerald Thomas Hall. Donald Conner wants College of ACES students to learn more entrepreneurial skills while in school.

FINDING THE PATH TO SUCCESS

Clenton Owensby sits in front of a classroom in this undated photo. Owensby is a recipient of the 2019 Distinguished Alumni Award for the College of Agricultural, Consumer and Environmental Sciences.



COURTESY PHOTO

Distinguished Alumnus Clenton Owensby credits faculty with helping to shape his career

BY MELISSA RUTTER

Without the influence of a handful of New Mexico State University faculty members, Clenton Owensby shudders to think what his life trajectory would have been like. After Owensby moved to Las Cruces in the 1960s, he took a job at the NMSU Horticulture Research Facility, working a variety of jobs. Little did he know, this was beginning of his journey in the academic world. He graduated from NMSU in 1964 with a bachelor's degree in range management.

"I owe my career to several faculty at NMSU, both academically and personally. I am humbled by the honor that NMSU gave me, and would like to acknowledge the opportunities afforded me to work in research at the NMSU Horticulture Research Facility," Owensby said. "That exposure set my path toward an advanced degree and 55-year tenure at Kansas State University. In addition, in my senior year, I was awarded a substantial scholarship that made a huge difference to a student with a family. The recognition of my efforts academically inspired me to redouble my dedication to get the most of my coursework."

Owensby said he owes the spark that ignited his career to several important people at NMSU, including Darrell Sullivan, who worked with Owensby at the Horticulture Research Facility.

"He chose to involve me in his research and gave me a variety of tasks and taught me research techniques, statistical necessity and academic integrity. He also gave me the freedom to carry out different projects on my own over the two years I worked for him," Owensby said. "I had greenhouse space to grow plants and bedding areas to plant native species that I collected to determine their potential as commercial varieties. I saw what a university professor did, and I wanted to be one."

Owensby credited professor Sandy Dick-Peddle for revealing the world of plant taxonomy to him.

"He became my go-to guy for identifying the plants I found on my continual search for beauty and uniqueness of the desert flora. That relationship fostered a lifelong love affair with plants. I eventually authored two books, 'Kansas Prairie Wildflowers' and 'Kansas Grasses.' I am forever in his debt for his patience, friendship and encouragement," Owensby said.

As a poor undergraduate with a son, Owensby needed all the money he could get. George Dawson asked the Horticul-

ture Research Facility if there was a student who could do yardwork for him.

"Not only did the Dawsons provide me much-needed wages, but they also became my family away from home. Being childless, they took a special interest in my son, even babysat on a few occasions. George was a wonderful man," Owensby said. "He and Marge bought me a term life insurance policy and paid for it for years following my moving on to Kansas. He knew I couldn't afford it and saw the need and met it. He nominated me for the Albert Mitchell Scholarship without my knowledge. That \$600 was huge. His graduation gift to me was a briefcase; he said I needed to look professional."

John Norris and Ken Valentine introduced Owensby to range management. Later, he developed a grazing scheme that has changed the way the Kansas Flint Hills is grazed due to the increased economic efficiency of the system.

Maude Guthrie also had an impact on Owensby's career.

"Because of laziness, couched as being busy, I did poorly on one of her exams. She called me in and asked me why I had suddenly done poorly. She responded that she would not let that happen again," he said. "Before I could take the next exam, I had to come to see her and show her my preparation was adequate. I did that. Made near perfect exam scores from that time forward. She taught me that you cannot allow a student's apathy to continue. I have used her example for the last 53 years that I have taught the introductory course in range management. It still works wonders."

Owensby said the best piece of advice that he has for current NMSU students is to take academics seriously, but also to enjoy their university years.

"My best advice is to avail yourself of the opportunity to get

involved with the faculty in your chosen career. Best of all, get a job working with them. That was the most valuable experience I got at NMSU," Owensby said.



COURTESY PHOTO

Clenton Owensby earned a bachelor's degree in range management from New Mexico State University in 1964. He credits several faculty members with laying a strong foundation for his future in academics. This year, he is celebrating 55 years as a professor of range management at Kansas State University.



COURTESY PHOTO

Clenton Owensby and Smokey the Bear during an Ag Day celebration at Kansas State University.

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HRTM, ACES praise hotel partnership BY CARLOS ANDRES LÓPEZ

A public-private collaboration more than a dozen years in the making became a reality this summer when the School of Hotel, Restaurant and Tourism Management, based in the College of Agricultural, Consumer and Environmental Sciences at New Mexico State University, celebrated the grand opening of the Courtyard by Marriott, a 126-room hotel built on NMSU property that will serve as an experiential learning environment for HRTM students.

New Mexico Gov. Michelle Lujan Grisham, New Mexico Tourism Secretary Jen Schroer, NMSU President John Floros and College of ACES Dean Rolando Flores were among the many dignitaries who attended the July 18 ribbon-cutting ceremony in celebration of the hotel's opening.

"This is a great occasion for all of us to see how the relationship between the university and the private business is making big changes," Flores said at the grand opening. "One of the goals that we have in the College of Agricultural, Consumer and Environmental Sciences is that every student who graduates from our programs has an opportunity to do an internship, and this is tremendously facilitated by this partnership."



New Mexico Gov. Michelle Lujan Grisham, right, gathered with College of ACES Dean Rolando Flores, left, and ACES faculty, including HRTM Director Jean Hertzman, in July to celebrate the grand opening of the Courtyard by Marriott, built on NMSU property west of the Las Cruces Convention Center.

The hotel, developed and managed by Total Management Systems based in Albuquerque, will offer real-world, hands-on experience to HRTM students through jobs and internships. Students also will receive career training from TMS executives as part of a classroom lecture series aimed to give insight into hotel management skills.

"Our students have been able to see the industry in action with the development of this hotel," HRTM Director Jean Hertzman said. "TMS is helping the students not just have a job, but launch their career in hospitality in the great state of New Mexico."