CONIFER CLASSROOM  What are the roles of Maine’s University Forests?
Forestlands for the future

LOVE OF THE OUTDOORS AND NATURE draws faculty, staff and students to the University of Maine College of Natural Sciences, Forestry, and Agriculture. The University of Maine Foundation Green Endowment is an opportunity for those who share a love of forestlands to give to UMaine in a special way.

The college seeks quality forestlands that can be managed to supply a long-term source of income. The lands will be managed for sustained yield of marketable resources, for wildlife habitat and recreational potential, aligned with the teaching, research and public service mission of the state’s public research university.

The goal for Green Endowment gifts of forestland is to provide long-term educational opportunities for students at the University of Maine. The professional staff at the University of Maine Foundation is available to assist landowners with gift options and estate planning ideas.

Jeffery Mills, President/CEO
University of Maine Foundation
Two Alumni Place
Orono, Maine 04469-5792
207.581.5100 or 800.982.8503
umainefoundation.org • umainefoundation@maine.edu

The University of Maine formed an innovation team to help evaluate and develop solutions to the shortages of supplies and challenges faced by Maine’s health care centers since the beginning of the COVID-19 pandemic. The group includes UMaine faculty, staff and students, representatives from the Maine Department of Economic and Community Development, the Maine Manufacturing Extension Partnership, MaineHealth, St. Joseph Hospital and Northern Light Health. Other collaborating partners include the Maine Manufacturing Extension Partnership, the Maine Department of Economic and Community Development, the Maine Procurement Technical Assistance Center. The first UMaine-led initiative in support of health care workers focuses on production of hospital-grade hand sanitizer. A team led by UMaine’s Process Development Center (PDC) and faculty in chemical and biomedical engineering set up production of hospital-grade alcohol-based sanitizer in accordance with FDA Temporary Guidance. PDC is working with the Maine Distillers Guild, which is coordinating the ethanol supply from area distillers. UMaine’s production has focused on 55-gallon and 5-gallon containers for use by hospitals. As production increases, the team is supplying other health-related facilities and first responders to meet demand. The three-member on-site production team is Nick Hill, Nayereh Dadoo and Donna Johnson.

These are extraordinary times. I hope you and those you love are healthy and safe. Our hearts go out to those who have lost their lives and those whose well-being has been impacted by the coronavirus. COVID-19 has touched all of us and has forever changed us. Despite the uncertainty, there are many simple truths and underlying principles that make us strong. Most important: We are in this together.

In spite of this virus that is transforming our lives in unprecedented ways, we at the University of Maine continue to plan, perform and persevere every day. We are making important decisions in as timely a manner as possible, and supporting our students and employees in all the ways possible. And we enact our values of fostering learner success, discovering and innovating, and growing and advancing partnerships, every day, everywhere — from online instruction, to research on coronavirus immunity, to partnerships with the Maine Center for Disease Control and Maine Emergency Management Agency.

The very best of Black Bear Nation is coming through at this very difficult time. Despite their own professional and personal challenges, faculty and staff continue to focus on helping ensure student success and service to the state. In the UMaine community, the examples of innovation, vision and goodwill are endless, firm in the commitment that we must come together and work in partnership to come through the significant challenges and to continue to define tomorrow.

As the state’s only public research university, we have formed an innovation team to help evaluate and develop solutions to the shortages of supplies faced by Maine’s health care centers since the beginning of the COVID-19 pandemic. As many of our researchers as possible have turned their efforts to supporting the coronavirus fight in partnership with businesses, agencies and organizations statewide. And it is making a difference.

UMaine Today magazine will share stories of that leadership and collaboration in subsequent issues. In this issue, we wanted to offer some UMaine stories that provide familiar context in these uncertain times. These stories get to the breadth and depth of the state’s land grant university, and reaffirm that the University of Maine is here for you and all we serve as members of Black Bear Nation.

Take care of yourselves. Be well.

Joan Ferrini-Mundy
President
Leaders in the making
Interdisciplinary leadership studies courses turbocharge students’ worlds and encourage them to behave with integrity, empathy and optimism.

Conifer classroom
The 1,865-acre Dwight B. Demeritt Forest features mixed forest stands, fields and waterways. Its mission, as it is with all the University Forests, is research, demonstration and education.

Learning through discovery
Researchers across different disciplines are investigating today’s most pressing questions through the Interdisciplinary Undergraduate Research Collaborative.

Worldview
The School of Policy and International Affairs gives students the tools to succeed in a global context.

Sick of sexism
In Shannon McCoy’s psychology lab, students examine whether sexism affects women’s well-being, as well as how they confront it.

On ice
UMaine offers a six-credit field course in which students learn how to study glaciers, including the field skills to conduct polar research. An online exclusive.

Features

13 Leaders in the making
Interdisciplinary leadership studies courses turbocharge students’ worlds and encourage them to behave with integrity, empathy and optimism.

22 Conifer classroom
The 1,865-acre Dwight B. Demeritt Forest features mixed forest stands, fields and waterways. Its mission, as it is with all the University Forests: research, demonstration and education.

42 Learning through discovery
Researchers across different disciplines are investigating today’s most pressing questions through the Interdisciplinary Undergraduate Research Collaborative.

50 Worldview
The School of Policy and International Affairs gives students the tools to succeed in a global context.

54 Sick of sexism
In Shannon McCoy’s psychology lab, students examine whether sexism affects women’s well-being, as well as how they confront it.

On ice
UMaine offers a six-credit field course in which students learn how to study glaciers, including the field skills to conduct polar research. An online exclusive.

Departments

Black Bear Success
10 Seeing the light
UMaine Engaged
18 Schoolwork
Students First
49 Setting the pace
Insights
58 UMaine news briefs

On the cover
Haley Harlow, a first-year student from Boxford, Massachusetts, is one of about 70 University of Maine students who were enrolled in a vegetation course led by Bill Livingston, associate director for undergraduate education and associate professor of forest resources. For the first eight weeks of the fall semester, the students were in the Dwight B. Demeritt Forest adjacent to the UMaine campus. A photo essay about the more than 1,860-acre living laboratory, used year-round for education, research and recreation, begins on page 22.

Photo by Adam Küykendal

UMaine Today online
umainetoday.umaine.edu

UMaine Today magazine online provides web-exclusive features, including videos, photo galleries, full-length versions of articles and a comprehensive editorial archive.

Video magazine
umainetoday.umaine.edu/videos

About UMaine
Leadership
Joan Ferrini-Mundy, President
Robert Dana, Vice President for
Student Life and Dean of Students
Pete Giblin, Associate Vice President for
Academic Affairs and Provost; Dean of the
Undergraduate Business School
Chris Ludden, Vice President of Human Resources
Ken Ralph, Director of Athletics
Claire Strickland, Chief Business Officer
Kody Varahramyan, Vice President for
Research and Dean of the Graduate School
Jake Ward, Vice President for
Innovation and Economic Development
Kimberly Whitehead, Chief of Staff

Research centers
Advanced Manufacturing Center
Advanced Structures and Composite Center
Aquaculture Research Institute
Center for Community Inclusion and Disability Studies
Center for Research on Sustainable Forests
Climate Change Institute
Forest Resources Research Institute
Innovative Media Research and Commercialization Center
Laboratory for Surface Science and Technology
Maine Center for Research in STEM Education
Maine Sea Grant
Margaret Chace Smith Policy Center
Senator George J. Mitchell Center for Sustainability Solutions

University Today Magazine
Managing editor
Margaret Nigle

Digital/print content coordinator
Amanda Lesieur

Designers
Joanne Bauer
Shennah Derstine
Valerie Ireland

UMaine Today is produced twice a year by the
Division of Marketing and Communications,
University of Maine, 5703 Alumni Hall, Room 213, Orono,
Maine 04469-5703, 207.581.3745.

Printing and distribution of UMaine Today are
underwritten by the University of Maine Foundation.

Volume 20 Issue 1
©2020 University of Maine System
The University of Maine is an EEO/AA employer, and does not discriminate on the basis of race, color, national origin, religion, sex, age, marital status, sexual orientation, gender identity, disability, veteran status, political affiliation, or any other status protected by applicable local, state, or Federal laws.

Inquiries regarding non-discrimination policies: Director of Equal Opportunity, 101 North Stevens Hall, University of Maine, Orono, ME 04469-5759, 207.581.1226, TTY 711 (Maine Relay System)
New molecular tools

DEVELOPMENT OF NEW MOLECULAR TOOLS to advance understanding of calcium release activated calcium (CRAC) channels in the plasma membrane is the focus of a nearly $800,000 grant from the National Science Foundation (NSF) to a University of Maine-led research team.

The molecular tools — novel compounds called light-operated CRAC channel inhibitors (LOCIs) — will allow researchers to control the function of CRAC channels to better understand their role in cell biology.

CRAC channels are key proteins that affect calcium entry and signaling in cells. The channels control such cellular activities as cell migration and proliferation, and gene expression. However, little is known about the molecular, biophysical and biochemical mechanisms that regulate the highly selective release of calcium. Calcium is one of the most important signaling molecules in living cells.

The grant, funded by NSF and the U.S.-Israel Binational Science Foundation, enables an international collaboration between Michael Kienzler, UMaine assistant professor of chemistry, and assistant professor Raz Palty at the Technion in Haifa, Israel.

Kienzler’s research focuses on the synthesis and evaluation of new light-activated molecules for biological applications. His lab is developing a series of LOCIs photoswitches designed to modulate CRAC channel activity. By incorporating photoswitches into the LOCI compounds, their activity can be turned on and off by shining different colors of light on them, providing a high degree of precision and control in experiments.

The UMaine Chemistry Department recently upgraded its facilities with a state-of-the-art, 500 MHz nuclear magnetic resonance spectrometer, made possible by a more than $535,000 grant from NSF’s Major Research Instrumentation and Chemistry Research Instrumentation programs. This new instrument is an essential tool for characterizing the LOCI compounds.

The goal of the research is to determine if LOCIs can be used to control calcium-dependent cellular responses and, ultimately, manipulate such functions as gene expression and cellular migration. The research team’s novel opto-genetic and opto-pharmacological approaches could provide rapid and reversible remote control of CRAC channel signals — an important component in a wide range of cellular processes and particularly immune system function.

Museum of Art naming gift

A $1.3 MILLION NAMING GIFT from education leaders and arts supporters Donald and Linda Zillman will expand and enhance the University of Maine Museum of Art.

The museum is now the Linda G. and Donald N. Zillman Art Museum – University of Maine. The Zillmans, longtime Maine residents who now live in Santa Fe, pledged the gift to the University of Maine Foundation for the construction and operation of five new galleries to showcase the museum’s collection of more than 4,000 works of modern and contemporary art.

A long-term lease agreement will increase the square footage of the museum’s public gallery space by 40%. Construction of five new galleries will bring the total number to 12, with more than 4,700 square feet for exhibitions.

Donald Zillman has been a leader in the University of Maine System for 30 years. Linda Zillman is an art historian who has written two catalogues and curated two exhibitions on Andy Warhol at the University of Maine at Presque Isle.

The Zillmans were instrumental in moving the University of Maine Museum of Art from the Orono campus to its current location in downtown Bangor. Linda Zillman has served on the UMMA support board of directors for more than 10 years. They are members of the University of Maine Foundation Stillwater Society, and have funded several key museum projects through the years, including a vibrant sculptural welcome sign erected in fall 2019.

The UMaine Museum of Art advances the university’s land grant mission of service to citizens through its cultural engagement activities that include exhibitions, a permanent collection and educational programming.
Personalities studying personalities

SMALL MAMMALS HAVE DIFFERENT PERSONALITIES, just like people do — and this can influence their decisions, leading to wide-ranging impacts on the environment. Alessio Mortelliti, associate professor of wildlife habitat conservation, has been awarded an $875,000 National Science Foundation (NSF) CAREER Award to study how small animal personalities — whether shy, outgoing or in between — affect the ecosystem.

He plans to focus on the specific traits of individuals to find out how those traits and their expressions influence population trends and ecosystem processes like forest regeneration. This individual variation also could impact the response of populations and communities to land use and climate change.

A team of graduate and undergraduate students, collaborators and citizen scientists will assess how changes in land-use practices affect the distribution of different animal personality types, and assess whether diversity in personalities can influence population dynamics, such as whether a high proportion of bold individuals in the population leads to a different dynamic than a population of mainly shy individuals.

The project also will encompass a new teaching model called “personalities studying personalities,” in which Mortelliti will encourage undergraduate students to analyze, improve and capitalize on their own personality traits and communication methods. Students will then utilize those skills and knowledge to engage high school students in citizen science projects that are part of Mortelliti’s research.

“The insights and models generated by this project will illuminate the link between individual variation and population, community and ecosystem dynamics,” says Mortelliti.

The insights and models generated by this project will illuminate the link between individual variation and population, community and ecosystem dynamics.

Alessio Mortelliti

MAINE’S OFFICE OF BEHAVIORAL HEALTH, in collaboration with the University of Maine, has released a free mobile app that provides key information to help reduce deaths from opioid overdoses. The app, OD-ME, contains naloxone administration instructions for both intranasal Narcan and intramuscular naloxone, and step-by-step audio and visual guidance on how to perform rescue breathing. The app, available through the Apple App Store and Google Play, also allows a user to dial 911 for emergency assistance and 211 for additional resources.

The app was developed by the Margaret Chase Smith Policy Center, and the Virtual Environment and Multimodal Interaction (VEMI) laboratory at the University of Maine, and is published by the University of Maine System. The goal of the app is to provide a free and easily accessible emergency response tool primarily aimed at educating active bystanders. Bystanders following instructions on the app could intercede on behalf of a person experiencing an opioid overdose.

“The app is not meant to be a stand-in for formal naloxone use training,” says Alexander Rezk, a research assistant at the Margaret Chase Smith Policy Center who was involved in the development. “Rather, it is a low-barrier, easy-to-use emergency response and educational tool for those who want to be prepared.”

The app complements the state’s public outreach campaign, haveitonhand.com, regarding naloxone distribution and use. Most opioid overdoses are accidental, and a bystander friend or family member could use the mobile application to recognize and confirm the signs of an overdose. If they have naloxone on hand, the app can walk them through the process of administering the life-saving medication.

“Ambient part of the Governor’s Executive Order on Opioid Response is providing education and training to friends and family of those who are at risk of overdose,” says Marcella Sorg, research professor at the Margaret Chase Smith Policy Center who led the app development. “This app makes naloxone administration instructions easier to get into the hands of Mainers than ever before.”
Headed into space as part of NASA initiative

NASA SELECTED 18 SMALL RESEARCH SATELLITES to fly as auxiliary payloads aboard rockets launching between 2021 and 2023.

And the University of Maine, University of Southern Maine, Saco Middle School, Fryeburg Academy and Falmouth High School are on board, so to speak.

NASA’s CubeSat Launch Initiative provides opportunities for nanosatellite science and technology payloads built by universities and schools to ride share on space launches. CubeSats — a small spacecraft — can measure 4 inches on each side and weigh less than 3 pounds.

Maine’s CubeSat is MESAT1. UMaine professor of electrical and computer engineering Ali Abedi leads the project with USM professor of physics Jeremy Qualls and Wells National Estuarine Research Reserve director Jason Goldstein.

Saco Middle School’s payload will compare temperature and albedo (fraction of solar irradiation reflected back into space) across urban and rural areas to determine whether urban heat islands can be mitigated through architectural designs that maximize albedo.

Fryeburg Academy will modify a digital camera to image shallow, coastal waters to distinguish water quality properties, including turbidity and phytoplankton concentration. The goal is to develop a low-cost remote sensing tool for coastal estuaries.

And Falmouth High School will examine whether harmful algal blooms increase atmospheric temperature and water vapor levels in the air above them. If a correlation is established, it will be easier to detect when an algal bloom is growing.

MESAT1 received $300,000 from NASA, $150,000 from the NASA Maine Space Grant Consortium for graduate student research, and $72,000 from UMaine and USM.

Life histories of fish

THE GOALS OF A RESEARCH CONSORTIUM funded by a $1.6 million award from NOAA Sea Grant are improving stock assessment, management and sustainability of highly migratory species such as tuna, swordfish and sharks. The consortium is led by Walt Golet, assistant professor in the School of Marine Sciences.

Funding to support the Pelagic Ecosystem Research Consortium was one of three competitive awards totaling $2 million in the 2019 Sea Grant Highly Migratory Species Research Initiative.

The Pelagic Ecosystem Research Consortium will conduct several projects focused on bycatch reduction, increased understanding of life history, post-release mortality and other objectives for multiple species of highly migratory fish in the Northwest Atlantic and Gulf of Mexico.

Co-principal investigators are David Kerstetter of Nova Southeastern University, Robert Hueter of Mote Marine Laboratory and Stephen Bullard of Auburn University.

Comprehensive information on the life history of highly migratory species is lacking, including data on age, growth, indices of abundance, reproduction, post-release and natural mortality, infectious disease, anthropogenic disturbance, habitat utilization/migratory behavior and stock structure.

Research by the consortium is expected to reduce uncertainty in stock assessment models and population status, and inform appropriate quotas to promote sustainability.

Walt Golet

Highly migratory species are some of the most sought-after fish in the world, both commercially and recreationally, and yet there is so much to learn about their life history in order to improve the stock assessments that determine their population status, the allocation of fishing quotas and, ultimately, their sustainability.
In the late 1970s, Don Holder was pursuing a forestry degree at the University of Maine. He also was engaged in a “self-designed” liberal arts education. That foundation is what the now Tony Award-winning lighting designer points to as his springboard for success on Broadway.

“I have an extraordinary informal training and experiences in the arts, as well as the sciences,” he says of his time at UMaine, where he was involved with Maine Masque, a student-led theater group open to all majors, and played the bass and tuba with several ensembles. “I don’t know if I would have gotten that anywhere else. It was sort of a perfect place for me.”

Holder, a native of Rockville Centre, New York, says he can vividly remember “Cat on a Hot Tin Roof,” the first show he worked on as a lighting operator at UMaine. UMaine also was the only place where he acted.

“I think the greatest thing that came out of my experience with Maine Masque was understanding that making theater was about being part of a community, and it’s the community aspect of theater making that’s always been what has attracted me more than anything else,” he says.
Above everything else, lighting has a powerful influence on perception,” Holder says. “We as human beings respond chemically to the quality of light, the intensity of light, the color of light. A lighting designer needs to understand this about the medium so you can manipulate it to achieve certain creative objectives.”

In addition to Broadway, Holder has worked on operas, television shows and films. His recent credits include several productions at the New York Metropolitan Opera, seasons one and two of the NBC drama “Smash,” and Warner Bros. Pictures’ “Ocean’s Eight.”

He currently is head of lighting design at Rutgers University. For high school and college students who are interested in lighting design, Holder suggests becoming exposed to a range of topics through school, theater, films and news. “Study art history, study history and politics, and philosophy, and psychology — anything that could feed your brain and make you understand the human condition in a more profound way. Because what designers do, we essentially crystallize work into something very, very precise that speaks profoundly to the human condition,” he says. “In order to be an articulate designer, you have to have a lot to draw from. Either it’s life experience or it’s experience in intellectual pursuits and intellectual curiosity.”

Being involved in the technical side of theater requires a passion for the art and understanding that it is a collaborative act. “Your role is to be an artisan, but also to support the artistic process,” he says of lighting electricians, costume makers and technical directors.

Holder says he has done what he has always wanted to do — work at the Metropolitan Opera, travel the world and light a Broadway musical. He plans to continue to seek out collaborative, challenging projects that take him out of his comfort zone and force him to think outside the box.

“I wanted to be a lighting designer when I was 13 years old,” he says. “I sensed that was what I wanted to do, and it took a while to get there, but I feel like every day, I’m living the dream.”

“...We as human beings respond chemically to the quality of light, the intensity of light, the color of light. A lighting designer needs to understand this about the medium so you can manipulate it to achieve certain creative objectives.”

Don Holder
I think leadership studies translates across different domains. Our goal is to turbocharge their world. Leaders listen, are perceptive, and communicate effectively. Leaders are honest and ethical. Leaders have to walk the walk. If they're inauthentic, people see through.

— Rich Powell
Declan Downey

"UMaine changed my life," says Declan Downey. The Dedham, Massachusetts native had a 2.8 grade-point average in high school and wasn't planning to attend college. But his mom persuaded him to fill out the Common App. And Downey decided to apply to be a Black Bear because he loved Maine. Growing up, he and his family vacationed each summer on Medomak Pond in Waldoboro. UMaine, he says, was the first to accept him.

Now the political science major, with minors in leadership studies and sociology, is a multi-time Dean’s List student. "I’ve become part of the community here," says the vice president of the UMaine College Democrats. Downey has wanted to be a police officer since he was 12 or 13. That’s when he witnessed the Boston Marathon bombing, and the ensuing heroic actions of law enforcement personnel, on TV.

After high school, Downey successfully completed the 10-week basic training at Fort Benning, Georgia. At UMaine, he takes Army ROTC courses and when he graduates in spring 2021, he’ll be commissioned as a second lieutenant.

The huge Red Sox fan says he’s hopeful that young, energetic, idealistic people with leadership skills will help make the world a better place. "I think the No. 1 quality of a leader is empathy," he says. "It’s not about being best, it’s about representing people and building a coalition of voices — not just one or two — and creating a better community.

"Leadership is found in the balance between listening and taking action."

— Genevieve McDonald

Declan Downey

Brody Haverly-Johndro

Growing up in Newport, Maine, Brody Haverly-Johndro’s parents taught him that character is revealed in how you treat others. They also taught him the importance of being a leader, especially when it matters most.

These days, the J.D. candidate at the University of Maine School of Law seeks to lead by example. He says working with Portland High School (PHS) students through the Portland Mentoring Alliance has been extraordinary and rewarding.

The alliance matches volunteer leaders from business and education with PHS students — often first-generation immigrants or refugees. "They are some of the truly brightest, most thoughtful students I have ever met," says Haverly-Johndro. "It’s an incredibly rewarding experience."

Much of the rest of the time, he’s either in first-year law classes or prepping for those classes. Haverly-Johndro’s well-prepared. He graduated magna cum laude with a bachelor’s in political science and a minor in leadership studies from UMaine in 2019.

At UMaine, he also served as president of his class for four years.

He’s volunteered on a number of political campaigns, was president of the Maine College Democrats and, in the spring of his senior year, he was selected as a UMaine Congressional Intern, working with U.S. Rep. Chellie Pingree in D.C. Haverly-Johndro says the Washington, D.C. Leadership Institute Travel Course, which had as its theme "Leadership in Chaotic Times," was instrumental in his development.

Meeting with U.S. Sen. Angus King and others at the national level opened his eyes to the ways people can be at the forefront. "Leaders aren’t always necessarily the loudest people in the room," he says. "It also taught me to approach every discussion open-minded, and to listen and to be heard."

The experience also fortified his desire to pursue a career in public policy. Haverly-Johndro’s also not ruling out a run for office. He believes in the adage: if you don’t like what’s going on, be the change you want to see.

“We need leaders in every segment of society."

Genevieve McDonald

In the Foundations of Leadership course, Genevieve McDonald better defined what type of leader she wanted to be. "Leadership is found in the balance between listening and taking action," she says. "I believe the key to successful leadership is in communication, collaboration and information."

McDonald had already been asked if she would consider running for state legislative office when she was in the nation’s capital for the 2017 Washington, D.C. Leadership Institute Travel Course.

"Washington is very different than serving in the Maine Legislature, but I thought experiencing an inside view of politics would help inform my decision of whether or not to run," says McDonald.

"I realized I wanted the opportunity to work on policy and issues impacting the people of Maine and that as a commercial fishing boat captain, I was uniquely qualified to represent the interests of the people in my district. The rest, as they say, is history."

That history includes 67% of House District 134 voters electing in 2018 to send her to Augusta. McDonald also completed classes in December 2018, graduating summa cum laude with a Bachelor of University Studies and a Maine studies minor. She planned to march with the class of 2018, but went into labor with her twins and marched in 2019 instead.

McDonald incorporates lessons she learned in D.C. into action in Augusta. "The variety of speakers (in D.C.) from different aspects of government and different political ideologies challenged my preconceived notions about who I could find common ground with," she says. McDonald often recalls advice of various people she met in D.C., especially former U.S. Sen. Bill Cohen, a Republican who served as Secretary of Defense under Democratic President Bill Clinton.

"I also reflect on the topic, which was civility in discourse, which for me means presenting facts-based information in a direct but respectful manner," she says. "I rarely tell people they are wrong. Instead, I explain why they should consider my position."

"Leadership in Chaotic Times," was instrumental in his development. Meeting with U.S. Sen. Angus King and others at the national level opened his eyes to the ways people can be at the forefront. "Leaders aren’t always necessarily the loudest people in the room," he says. "It also taught me to approach every discussion open-minded, and to listen and to be heard."

The experience also fortified his desire to pursue a career in public policy. Haverly-Johndro’s also not ruling out a run for office. He believes in the adage: if you don’t like what’s going on, be the change you want to see.

“We need leaders in every segment of society."

Genevieve McDonald

In the Foundations of Leadership course, Genevieve McDonald better defined what type of leader she wanted to be. "Leadership is found in the balance between listening and taking action," she says. "I believe the key to successful leadership is in communication, collaboration and information."

McDonald had already been asked if she would consider running for state legislative office when she was in the nation’s capital for the 2017 Washington, D.C. Leadership Institute Travel Course.

"Washington is very different than serving in the Maine Legislature, but I thought experiencing an inside view of politics would help inform my decision of whether or not to run," says McDonald.

"I realized I wanted the opportunity to work on policy and issues impacting the people of Maine and that as a commercial fishing boat captain, I was uniquely qualified to represent the interests of the people in my district. The rest, as they say, is history."

That history includes 67% of House District 134 voters electing in 2018 to send her to Augusta. McDonald also completed classes in December 2018, graduating summa cum laude with a Bachelor of University Studies and a Maine studies minor. She planned to march with the class of 2018, but went into labor with her twins and marched in 2019 instead.

McDonald incorporates lessons she learned in D.C. into action in Augusta. "The variety of speakers (in D.C.) from different aspects of government and different political ideologies challenged my preconceived notions about who I could find common ground with," she says. McDonald often recalls advice of various people she met in D.C., especially former U.S. Sen. Bill Cohen, a Republican who served as Secretary of Defense under Democratic President Bill Clinton.

"I also reflect on the topic, which was civility in discourse, which for me means presenting facts-based information in a direct but respectful manner," she says. "I rarely tell people they are wrong. Instead, I explain why they should consider my position."

"Leadership is found in the balance between listening and taking action."

— Genevieve McDonald

Declan Downey

Brody Haverly-Johndro

Growing up in Newport, Maine, Brody Haverly-Johndro’s parents taught him that character is revealed in how you treat others. They also taught him the importance of being a leader, especially when it matters most.

These days, the J.D. candidate at the University of Maine School of Law seeks to lead by example. He says working with Portland High School (PHS) students through the Portland Mentoring Alliance has been extraordinary and rewarding.

The alliance matches volunteer leaders from business and education with PHS students — often first-generation immigrants or refugees. "They are some of the truly brightest, most thoughtful students I have ever met," says Haverly-Johndro. "It’s an incredibly rewarding experience."

Much of the rest of the time, he’s either in first-year law classes or prepping for those classes. Haverly-Johndro’s well-prepared. He graduated magna cum laude with a bachelor’s in political science and a minor in leadership studies from UMaine in 2019.

At UMaine, he also served as president of his class for four years.

He’s volunteered on a number of political campaigns, was president of the Maine College Democrats and, in the spring of his senior year, he was selected as a UMaine Congressional Intern, working with U.S. Rep. Chellie Pingree in D.C.

Haverly-Johndro says the Washington, D.C. Leadership Institute Travel Course, which had as its theme “Leadership in Chaotic Times,” was instrumental in his development.

Meeting with U.S. Sen. Angus King and others at the national level opened his eyes to the ways people can be at the forefront. “Leaders aren’t always necessarily the loudest people in the room,” he says. “It also taught me to approach every discussion open-minded, and to listen and to be heard.”

The experience also fortified his desire to pursue a career in public policy. Haverly-Johndro’s also not ruling out a run for office. He believes in the adage: if you don’t like what’s going on, be the change you want to see.

“We need leaders in every segment of society.”

— Genevieve McDonald

In the Foundations of Leadership course, Genevieve McDonald better defined what type of leader she wanted to be. "Leadership is found in the balance between listening and taking action," she says. "I believe the key to successful leadership is in communication, collaboration and information."

McDonald had already been asked if she would consider running for state legislative office when she was in the nation’s capital for the 2017 Washington, D.C. Leadership Institute Travel Course.

"Washington is very different than serving in the Maine Legislature, but I thought experiencing an inside view of politics would help inform my decision of whether or not to run," says McDonald.

"I realized I wanted the opportunity to work on policy and issues impacting the people of Maine and that as a commercial fishing boat captain, I was uniquely qualified to represent the interests of the people in my district. The rest, as they say, is history."

That history includes 67% of House District 134 voters electing in 2018 to send her to Augusta. McDonald also completed classes in December 2018, graduating summa cum laude with a Bachelor of University Studies and a Maine studies minor. She planned to march with the class of 2018, but went into labor with her twins and marched in 2019 instead.

McDonald incorporates lessons she learned in D.C. into action in Augusta. "The variety of speakers (in D.C.) from different aspects of government and different political ideologies challenged my preconceived notions about who I could find common ground with," she says. McDonald often recalls advice of various people she met in D.C., especially former U.S. Sen. Bill Cohen, a Republican who served as Secretary of Defense under Democratic President Bill Clinton.

"I also reflect on the topic, which was civility in discourse, which for me means presenting facts-based information in a direct but respectful manner," she says. "I rarely tell people they are wrong. Instead, I explain why they should consider my position."

"Leadership is found in the balance between listening and taking action."

— Genevieve McDonald
Maine faces numerous challenges when it comes to developing leaders in public schools, including difficulties identifying, nurturing, recruiting, and retaining people in leadership positions. Other states have similar problems, but Maine's largely rural, economically and socially diverse population creates unique issues for educational leaders, says Janet Fairman, associate professor in the University of Maine College of Education and Human Development.

“We’ll go into a school one year, and when we come back the next year, they have a new principal, a new superintendent, a new special education director. It’s hard to generate any kind of positive momentum when you have turnover like that at the top,” Fairman says.

The legislative task force’s final report, released in 2016, identified many of these challenges, and proposed solutions, including streamlining programs to prepare and license principals, and creating mentorship opportunities to encourage teachers to ease into leadership positions.

The task force’s work grew out of a multiyear project examining high-performing schools in the state. It was conducted by the Maine Education Policy Research Institute (MEPRI), a collaborative effort of the University of Maine System and the Legislature. But the report was not the end of lawmakers’ interest in the issue. Over the next few years, legislators tasked MEPRI with examining strategies and initiatives that could promote educational leadership development.

MEPRI co-director Fairman co-authored two recent reports with Ian Mette, a UMaine faculty member in educational leadership. They explored different aspects of school leadership in Maine.

The first report, based on a statewide survey of principals and central office personnel, found that while schools employed a variety of strategies to encourage teachers to take on leadership responsibilities, the focus was mostly on curriculum and instruction. In addition, the survey indicated a disconnect between the perceptions of district administrators and principals about support for leadership. While administrators thought there were adequate measures in place for leaders, principals said there should be more.

The follow-up report consisted of two case studies examining innovative models in Maine. The first looked at the Bangor School District, where a leadership pipeline provides interested teachers pathways to explore leadership positions, encouraging aspiring principals and creating new opportunities for teachers to lead within schools. The other case examined two schools in two Maine districts—one urban and one rural—that implemented a model where teachers serve as head administrators, rather than the traditional principal-led school.

“Legislators have indicated that they want MEPRI to continue exploring programs and strategies to support leadership development in the coming years,” says Fairman.

The nonpartisan research institute turns 25 this year. The Legislature established MEPRI in 1995 “to collect and analyze education information, and perform targeted education research for the Legislature.” Over the years, MEPRI has produced hundreds of reports on topics ranging from Maine’s statewide middle school laptop program to public preschool to teacher turnover and shortages.

As politicians and university officials increasingly talk about collaboration as not just a goal, but a necessity for the University of Maine System, MEPRI stands as a model of what is possible.

David Silvernail and Walter McIntire at the University of Southern Maine and UMaine, respectively, are MEPRI’s founding co-directors.

“It hasn’t strayed from the original goal of providing impartial, fact-based research and analyses,” says Silvernail, former director of USM’s Center for Education Policy, Applied Research, and Evaluation (CEPARE).
“That’s so important, because lawmakers will often hear from interest groups or from political appointees who may have an agenda when it comes to particular policy,” MEPRI doesn’t have an agenda, other than providing good information and data,” says Silvernail, who also was a USM professor of educational research and evaluation.

Since 2015, the institute has been led by Fairman and Amy Johnson, who took over at CEPARE when Silvernail retired. In addition to McInnis, UMaine faculty members Walter Harris and Craig Mason have directed MEPRI.

“Our model is built on sharing resources and taking advantage of the expertise at both institutions,” Johnson says.

In 2019, the Legislature appropriated $250,000 for MEPRI. The University of Maine System also contributed $125,000 by funding a portion of the salaries and benefits of the respective co-directors on each campus, and providing in-kind support.

The institute also has a contract with the Maine Department of Education to perform ongoing research related to school funding. Each year, faculty, staff and graduate students at both institutions with specific knowledge in different areas of education contribute to MEPRI’s work.

“Janet and I try to check in on a weekly basis to stay up-to-date, on our shared projects. If there’s a project that we are working on at UMaine or that they are working on at USM, we use each other as a sounding board for how things are going on those projects, as well,” Johnson says.

Another aspect of the institute’s governing structure that promotes collaboration is a steering committee, which serves in an advisory role as MEPRI develops its work plan each year. Representatives from the Legislature, Maine Department of Education (MDOE) and the state Board of Education, as well as from professional organizations such as the Maine School Management Association, the Maine Education Association and the Maine Municipal Association, serve on the committee.

These stakeholders help MEPRI brainstorm topics to study MDDE and the Legislature’s Joint Committee on Education and Cultural Affairs select the final list of projects based their priorities.

The steering committee also assists MEPRI in accessing individuals with specific knowledge related to a particular study, and with disseminating surveys statewide to its members. Since Fairman and Johnson became co-directors, MEPRI has produced seven to nine studies or reports per year. All of its publications since 2011 are available online, with select publications from 2010 and earlier on the MEPRI website.

**MEPRI Impact:**

- **Standardized testing**
- **School leadership**
- **School district reorganization**
- **School funding**
- **Proficiency-based standards**

MEPRI’s had an impact on education policy in Maine, not to mention nationally and internationally,” Fairman says, adding that she receives a handful of calls and emails every year from people in other states and abroad who have come across MEPRI reports online and want to discuss how the findings might apply to their circumstances or jurisdictions.

Lawmakers speak glowingly of MEPRI’s role in shaping education policy in Maine.

“MEPRI is essential to our work,” says Rep. Tori Kornfield of Bangor, who has served eight years in the Maine House of Representatives, six of them as House chair of the Education Committee.

“Every bill has a public hearing and a work session, and in the public hearing we get a lot of anecdotal testimony, which is wonderful,” Kornfield says. “But you can’t base policy on it. We need facts and data, and that’s what MEPRI gives us.”

Brian Langley of Ellsworth served 10 years in the Legislature — one term in the House and four terms in the Senate. He was on the Education Committee most of that time, including six years as Senate chair.

“By the end of my tenure, Dr. Johnson, Dr. Fairman and MEPRI had become very valued and trusted sources of information,” says Langley, now the executive director of Bridge Academy Maine.

“IT’s the link to the University of Maine (System) that gives it its credibility,” he adds.

Both Langley and Kornfield say they’ve spoken to lawmakers from other states who are fascinated by MEPRI, some of whom have tried to implement a similar research institute in their legislatures.

Fairman and Johnson say the trust policymakers have in MEPRI is a direct result of its longevity. This has allowed the institute to study perennial issues, including the state’s school funding formula, teacher shortages in STEM and special education, and long-term ramifications of policy choices, such as school district consolidation.

“MEPRI had an impact on education policy in Maine, not to mention nationally and internationally,” Fairman says, adding that she receives a handful of calls and emails every year from people in other states and abroad who have come across MEPRI reports online and want to discuss how the findings might apply to their circumstances or jurisdictions.

Lawmakers speak glowingly of MEPRI’s role in shaping education policy in Maine.

“MEPRI is essential to our work,” says Rep. Tori Kornfield of Bangor, who has served eight years in the Maine House of Representatives, six of them as House chair of the Education Committee.

“Every bill has a public hearing and a work session, and in the public hearing we get a lot of anecdotal testimony, which is wonderful,” Kornfield says. “But you can’t base policy on it. We need facts and data, and that’s what MEPRI gives us.”

Brian Langley of Ellsworth served 10 years in the Legislature — one term in the House and four terms in the Senate. He was on the Education Committee most of that time, including six years as Senate chair.

“By the end of my tenure, Dr. Johnson, Dr. Fairman and MEPRI had become very valued and trusted sources of information,” says Langley, now the executive director of Bridge Academy Maine.

“IT’s the link to the University of Maine (System) that gives it its credibility,” he adds.

Both Langley and Kornfield say they’ve spoken to lawmakers from other states who are fascinated by MEPRI, some of whom have tried to implement a similar research institute in their legislatures.

Fairman and Johnson say the trust policymakers have in MEPRI is a direct result of its longevity. This has allowed the institute to study perennial issues, including the state’s school funding formula, teacher shortages in STEM and special education, and long-term ramifications of policy choices, such as school district consolidation.

“MEPRI had an impact on education policy in Maine, not to mention nationally and internationally,” Fairman says, adding that she receives a handful of calls and emails every year from people in other states and abroad who have come across MEPRI reports online and want to discuss how the findings might apply to their circumstances or jurisdictions.

In many cases, MEPRI’s research has shown there aren’t one-size-fits-all solutions to thorny issues facing Maine’s schools. One recent example was a 2012 state law that required public schools to implement proficiency-based standards for high school graduation. MEPRI documented implementation problems in multiple studies that started as soon as the law went into effect. In 2018, lawmakers repealed the requirement.

“That’s an example of an issue where there was a silver bullet,” Johnson says.

In fact, a 2019 MEPRI survey of Maine superintendents found that while 38% of respondents said they would probably return to a system in which students are only required to take a certain number of credit hours to graduate, about a quarter said they planned to keep the proficiency-based standards in their districts. Another 25% said they were considering a “hybrid” system, and 11% were taking a wait-and-see approach.

“Sometimes you have policies where the intentions are good, but the requirements can be burdensome. What our research showed was that it was better to give districts a choice,” Fairman says. As MEPRI marks 25 years of service to the state, Fairman and Johnson say the institute’s best years are ahead. They’re committed to continuing the productive partnership between the two university campuses, as well as the service to the state.

“We’re maybe not the biggest initiative,” says Johnson, “but I’d argue we have a pretty big impact.”
UMaine’s mission — teaching, research and public engagement — FLOURISHES in University Forests like the Dwight B. Demeritt

There are more than 14,000 acres of forestland owned by the University of Maine System and University of Maine Foundation can be found statewide — from Chapman in the north near Presque Isle, to Bethel in the west, the midcoast near Damariscotta and Down East in Whitingville.

However, the heart of the University Forests is located adjacent to or near the UMaine campus. The 1,865-acre Dwight B. Demeritt Forest in Old Town and Orono features mixed forest stands, fields and waterways. Its mission, as it is with all the University Forests: research, demonstration and education. All in keeping with the stewardship role and sustainability emphasis of the state’s public research and land grant university.

Keith Kanoti, University Forests manager with the University of Maine School of Forest Resources, surveys an Eastern white pine in the Demeritt Forest. In Demeritt, approximately 6,451 trees are greater than 24 inches in diameter and 73% of those are white pine. The more than 1,860-acre Demeritt Forest includes 91 acres of forest reserve with no timber harvesting, 87 acres of formal research areas, 129 acres of forested wetlands, 169 acres of riparian forest and 1,444 acres of managed timberland, according to Kanoti. Tree species include Eastern white pine, Eastern hemlock, red maple, red spruce, Northern white cedar, balsam fir and aspen.

By Elve Catalano | Photographs by Adam Kipkendall
UMaine has MANAGED DEMERITT FOREST for 80 years. The federal government purchased land in 1939 during the Great Depression that later became the forest.

It was leased to the university to be managed by the forestry department before being deeded to UMaine in the 1950s, according to Keith Kanoti, University Forests manager with the School of Forest Resources.

“It’s the primary teaching forest for the university,” says Kanoti, adding the land is where students from a variety of disciplines, including forestry and wildlife, have labs and outdoor classes. “Not every university forest is located right on campus like ours is, which is a great benefit. Their laboratory space — the outdoors, the woods — is right close by.”

Research is made convenient by the forest’s proximity to campus, and owning land around the state allows researchers, including undergraduate and graduate students, access to varied forest types, according to Kanoti.

“From a research perspective, we can have lands that may have different issues down on the coast as opposed to up in Aroostook County because the climate is different,” he says. “It’s also nice just to have the diverse land base because with insects and diseases and threats like that, it’s always good to have your portfolio spread out a little bit.”

The Demeritt supports research on forest resources, according to manager Keith Kanoti. Faculty and students from a variety of disciplines take advantage of the living laboratory year-round. Kelly French (right), a graduate student pursuing a master’s degree in forest resources, collaborates with Jay Wason, assistant professor of forest ecosystem physiology, on research looking at relationships between tree structures and how trees function physiologically. The researchers collect tree cores (above), branches and leaves to study the cells (left) to better understand wood’s ability to store, transport and release water during a drought.
Jay Wason (right), assistant professor of forest ecosystem physiology, and Ruth van Kampen, a master’s student in forest resources, simulate an extreme drought to study the effects in four tree species in the forest. Preliminary results show red maple is able to store more water in its wood, and that water can easily be released to the leaves during dry conditions, according to Wason. “This may be one of the reasons why red maple is able to be so competitive in the forest and could lead to its continued dominance with future climate change,” he says. Other recent projects include tick prevalence (above) and studying personalities and nut-caching decisions of small mammals (below).

While the research, education and demonstration MISSION IS CLEAR IN THE DEMERITT, some of the outlying lands have additional management objectives depending on how the acreage was acquired.

Gifts of additional forestland are encouraged through the Green Endowment of forestland held at the University of Maine Foundation. The land can be managed with the donor’s specific priority in mind, such as wildlife management. Over a dozen UMaine forestry and wildlife classes use the Demeritt for multiple labs each year. Classes that convene in the woods focus on a range of topics, including forest management, silviculture, forest vegetation, remote sensing, coordinate geometry, wildlife ecology, outdoor leadership, forestland navigation and GPS, and outdoor preparedness. In addition, high school students from throughout the state visit for events such as the Maine Envirothon, a natural resource problem-solving competition. Old Town High School students also are using the land for watershed research.
Bill Livingston, associate director for undergraduate education and associate professor of forest resources, has been studying white pine in the Demeritt for more than two decades. White pine, the fastest-growing conifer in the Northeast, is used in several of the state’s mills. He is researching improved tree growth through active management and thinning, and the common diseases found in white pine (below). “With pine forests like these, you can put in a study and you know it’s going to be maintained for the long term,” Livingston says of research in the Demeritt. “And when you’re dealing with trees, long term means you’re looking at decades for it to have any meaning. Having a resource like this for studies on trees is essential.” Beyond research and education, students can enjoy the forest year-round, from snowshoeing in the winter to swimming in the summer (left).
Members of the UMaine community FREQUENTLY VISIT THE FOREST to walk, run, mountain bike, snowshoe, cross-country ski and even swim in the river.

Sports teams, clubs and student groups, including Army ROTC, conduct physical and tactical training, as well as navigation, in the forest.

"The forest is in everybody's backyard in Orono and Old Town," Kanoti says. "It's a big chunk of undeveloped land that people can use and recreate on."

UMaine Campus Recreation maintains the more than 15 miles of groomed ski trails on campus (right), and a local mountain bike group keeps up 10 miles of single-track trails. Additional running and walking paths, managed by the University Forests office, are located throughout the forest (left). Facilities Maintenance and UMaine Athletics, whose cross-country teams use the forest for practice and races, also help improve and clean up the on-campus trails after storms, says Jeff Hunt, director of Campus Recreation.

A Challenge Course, which includes a zip line (far left), offers team-building programs for groups. "(The forest) gives students an outdoor recreation opportunity within walking distance from their dorm," Hunt says. Here, recreation coexists with active forest management.

FREQUENTLY VISIT THE FOREST to walk, run, mountain bike, snowshoe, cross-country ski and even swim in the river.

Sports teams, clubs and student groups, including Army ROTC, conduct physical and tactical training, as well as navigation, in the forest.

"The forest is in everybody's backyard in Orono and Old Town," Kanoti says. "It's a big chunk of undeveloped land that people can use and recreate on."

UMaine Campus Recreation maintains the more than 15 miles of groomed ski trails on campus (right), and a local mountain bike group keeps up 10 miles of single-track trails. Additional running and walking paths, managed by the University Forests office, are located throughout the forest (left). Facilities Maintenance and UMaine Athletics, whose cross-country teams use the forest for practice and races, also help improve and clean up the on-campus trails after storms, says Jeff Hunt, director of Campus Recreation.

A Challenge Course, which includes a zip line (far left), offers team-building programs for groups. "(The forest) gives students an outdoor recreation opportunity within walking distance from their dorm," Hunt says. Here, recreation coexists with active forest management.

Photo by Ben Tero
UMaine classes that convene in the woods focus on a range of topics, including outdoor leadership. Lauren Jacobs (this page), a lecturer in kinesiology and physical education, leads the outdoor and adventure activities course, which focuses on helping students become confident and competent in environmental conditions and outdoor activities, such as safely using camp stoves and building shelters (right). “In order to be a leader in outdoor settings, you need to be able to take care of yourself so that you can then take care of others,” Jacobs says.
Tony Guay, a remote sensing technical specialist, teaches a course on forestland navigation and outdoor preparedness for students majoring in natural resources. In fall 2019, Guay had more than 50 students in the course that focused on mapping a forest boundary traverse using a tablet app (far left). “The close proximity of the Demeritt Forest to campus is essential to providing students with easy access to this ‘forest laboratory,’ which allows ample time to learn and practice forestland navigation during the semester,” he says. “We’re extremely lucky and grateful to have such an amazing resource for teaching and research so close to campus.” Being a working forest with timber harvesting allows for the demonstration of practices. In the Demeritt, the public can see forestry in action. The School of Forest Resources follows a forest management plan based on an inventory every 10 years. Eastern white pine is the primary species managed in the forest. Using a shelterwood system, the harvest is timed to abundant seed years to achieve natural regeneration, Kanoti says. “We don’t plant trees, we don’t need to,” he says. “They come back on their own, if we do it properly.” The Demeritt also has a forestry best management demonstration practice area, and is a setting for professional foresters and loggers in the region to complete required training (above and left).
Thomas J. Corcoran Sugar House attracts more than 250 schoolchildren a year. Each spring, students and University Forests staff, including forest technician Charlie Koch (from left) and manager Keith Kanoti, tap and collect sap from more than 400 maple trees in the university’s sugarbush, and boil it into maple syrup at the sugar house. “We’re open on Maine Maple Sunday,” Kanoti says. “People just stop by and discover us, and get to see the sugar house. Everyone likes it, that’s a fun part of the season. A lot of work, but it’s fun.” Research involving the maple sugar operation includes geographic information system projects to map tubing systems, physiology studies on trees and food safety studies on sap. The original sugar house was built in the 1980s and was replaced with a larger, more modern structure in spring 2020.

With spring comes collecting and boiling sap FOR MAPLE SYRUP.

“After sugaring, we tend to fix everything we broke in the winter because winter is our busiest season,” says Kanoti, referring to equipment and building maintenance. Students are hired over the summer to assist with harvest planning, inventories and maintaining boundary lines on acreage throughout the state.
“We’re very fortunate. There aren’t that many (forestry) programs in the country where you have miles and miles of forest adjacent to campus,” says Bill Livingston (right), associate director for undergraduate education and associate professor of forest resources. “Teaching forestry here in Maine is not an abstract effort trying to let students imagine what it’s like to be out in the woods. We bring them out here and they have their hands-on education.” Livingston conducts labs in the woods for courses including forest vegetation, forest measurement, and tree pests and diseases. For the first eight weeks of the fall semester, Livingston estimates that about 70 students have come to the forest for his vegetation course.

The most challenging aspect of Kanoti’s job is juggling the many uses of the forest and interacting with all the people who have an interest in the land, he says. “That’s why we’re here, to assist with the research, assist with the education and manage recreation,” Kanoti says. “It’s way more about managing people than managing trees, which forestry is in general. That’s what we tell the students all the time. The sooner they figure out it’s more about people than trees, the better off they’re going to be.”

In the fall, staff and students PREPARE FOR HARVESTING SEASON, with tasks including pre-commercial thinning, timber harvest layout and marking timber for harvest.
“I can tell you from firsthand experience that the Demeritt Forest served as a building block of my budding career in forestry,” says Patty Cormier, director of the Maine Forest Service and a 1988 UMaine alumnus. “I can think of many classes and labs in that particular forest of which I still use the knowledge gained there. It gives me much pleasure to congratulate Keith and the university for the outstanding stewardship of the University Forests, and the learning that happens in them. May they continue as outdoor classrooms for many years to come.”
Learning through discovery

Interdisciplinary research initiative gives undergraduates experience in real-world problem-solving

By Cleo Barker

I

n the Interdisciplinary Undergraduate Research Collaborative (IURC) at the University of Maine, students and faculty contribute their unique perspectives and diverse expertise to address pressing questions related to muscular dystrophy, fall prevention in elders, zoonotic diseases, farming practices, hunger and food waste, and more.

IURC is a particularly enriching opportunity for undergraduates, some of whom may be conducting research for the first time. And the program connects seemingly disparate disciplines — for example, agriculture and computer science — that come together today to solve issues of tomorrow.

The UMaine initiative launched in 2018 with nine interdisciplinary research teams comprising 26 faculty members and 47 students. Two of those teams returned in 2019, along with two new cohorts and their respective projects. Last year, 27 students participated in research pursued by four IURC teams.

“We are delighted to provide this type of high-impact experiential learning programs to our undergraduate students,” says Kody Varahramyan, vice president for research and dean of the Graduate School. “Being at Maine’s research university, they have the advantage and the unique opportunity to acquire a highly effective, quality education through interdisciplinary cutting-edge research experiential learning.”

IURC research, which aligns with the University of Maine System “Research and Development Plan,” is funded by the Office of the Vice President for Research and Dean of the Graduate School, and the University of Maine System Research Reinvestment Fund. The teams’ investigations typically build on work that has received university, state and federal funding.

The breadth, depth and potential of IURC are evident in the profiles of the 11 projects in the past two years.

What’s in the water

NISHAD JAYASUNDARA, assistant professor of marine physiology, and Zheng Wei, assistant professor of statistics, led research combining biology and data science to analyze biological responses to environmental stressors.

“Drinking water sources are increasingly contaminated with various chemicals, and developing rapid screening tools to assess biological effects of exposure is critical for determining adverse health outcomes,” says Jayasundara.

The goal was to develop a new method to evaluate biological effects of chemical contaminants in drinking water and better understand how chemicals can affect fundamental cellular processes.

The researchers placed developing zebrafish eggs in a very small amount of water and used a high-throughput system to measure changes in oxygen levels of the water. With the use of various inhibitors, they applied this method to determine changes in the egg’s mitochondrial function. This serves as a proxy for how well the egg can meet its energy demand under different chemical contaminant exposure scenarios, says Jayasundara.

The research team developed statistical tools to analyze this data and predict potential outcomes, including forecasting potential health effects of chemical exposure.

“Maine waters are especially of concern, given the high levels of arsenic found in well water, and we are using this method now in a citizen science study in collaboration with MDI Biological Laboratory. The goal is to measure how well water collected from Maine may affect cellular energy-producing processes,” Jayasundara says.

“This project would not have been successful without the dedication from the students,” he says. “They brought several fresh perspectives and critical insights to the project. The students never hesitated to take initiative and were always a step ahead in the process, which created a highly productive research environment.”

It was extremely rewarding to be so involved in a research project. The professors working on the project made sure students felt involved and properly understood the different aspects of the project, not just those related to our respective fields. As a result, I got a lot of valuable hands-on research experience.”

Maddy Dorr, then a mathematics major, minors in psychology and neuroscience (Hometown: McLean, Virginia)
MUSCULAR DYSTROPHIES, a large group of debrilitative diseases of result in weakened skeletal muscle, affects approximately 250,000 individuals in the U.S., according to the Muscular Dystrophy Association. The long-term goal of UMaine research is to understand the molecular mechanisms of the disorders that will help to inform development of new therapies.

“Some of these mechanisms may be involved with other neuromuscular diseases. Learning how to promote muscle health is not only important in these diseases, but also in muscle wasting after traumatic injury, cancer, and aging,” says Benjamin King, an assistant professor of bioinformatics.

King and Claudia Henz, a professor of biological sciences, are examining one form of the disease that causes mutations in the GMPPPB gene. To discover the impaired mechanisms, the research team is applying developmental biology, genomics and computational methods to a novel zebrafish model of the disease.

A team of five undergraduate research assistants from the Honors College, and recent Ph.D. graduate Erin Carter, collected zebrafish embryos, characterized their phenotypes, extracted RNA for sequencing, and analyzed data to characterize the expression of genes. The study resulted in the identification of several promising candidate genes. King says.

The interdisciplinary approach combined expertise in developmental biology, genomics and computational biology. Genomic and computational analysis informed new hypotheses. The IURC work led to a research proposal for the UMaine Medicine initiative and two proposals for the National Institutes of Health. All three were awarded for a total of more than $2 million for their theses and dissertation.

Winter ticks are a suspected contributor to periodic, widespread moose calf deaths. However, little is known about the role of other parasites, such as blood-borne Anaplasmabacteria that may exacerbate stress in moose experiencing heavy tick loads, says Kamath, an assistant professor of nature-based tourism.

Smart farming

RECURRING COSTS and increasing profitability are important for Maine growers and farmers, says Juliana Blais, whose team built an app to help produce food year-round. The associate professor of new media led the research project connecting computer science with agriculture to help Maine farmers monitor food production in four-season greenhouses.

“We hope that our mobile app will help greenhouse growers answer questions about what is happening in their growing environment,” Blais says. “This technology will take some of the guesswork out of growing plants in greenhouses.”

The research team, which included one graduate and eight undergraduate students, examined the prevalence and intensity of parasite infections in Maine moose, and the effects of infections on calves. They also assessed how Native Americans, hunters, recreationists, wildlife management agencies, and others perceive and respond to disease threats in moose.

Anaplasma bacteria that may exacerbate stress in moose experiencing heavy tick loads, says Kamath, an assistant professor of nature-based tourism.

Working in an interdisciplinary team has allowed for a more robust research model to address this complex problem while integrating social and biological data,” says De Unito-Stroke, associate professor of nature-based tourism.

For more information, please visit:

https://www.umaine.edu/}

Molecular mechanisms of muscular dystrophy

RESEARCHERS PAULINE KAMATH and Sandra De Unito-Stroke led a project examining risk of zoonotic disease (diseases that can be transmitted from animals to people) in moose. They were joined by Anne Lichtenthaler, associate professor with University of Maine Cooperative Extension and the School of Food and Agriculture, and director of the Veterinary Diagnostic Laboratory. They partnered with Maine Department of Inland Fisheries and Wildlife, and the Penobscot Nation.

The research team, which included one graduate and eight undergraduate students, examined the prevalence and intensity of parasite infections in Maine moose, and the effects of infections on calves. They also assessed how Native Americans, hunters, recreationists, wildlife management agencies, and others perceive and respond to disease threats in moose.

Working with people with different strengths on the same team allowed me to have a pretty expansive learning experience because I was able to learn from my teammates who had different roles on the team. The multidisciplinary aspect was probably the most rewarding part of working with this team because I was able to show my strengths while learning from other strengths on the team.”

Eliza Bennett, new media major, minors in studio art, and film and video (Hometown: Windham, Maine)

Sensing instability for fall prevention

ALL ABDI, a professor of electrical and computer engineering, led a project blending research in health and engineering to detect and prevent falls.

Abdi, who also is assistant vice president for research and director of the Center for Undergraduate Research, partnered with Northern Light Health; Vincent Caccese, a professor of mechanical engineering; and Marie Hayes, a professor of psychology, Babak Hejrati, an assistant professor of mechanical engineering, also helped with tests and data collection.

The IURC project cites the genes types of sensors placed on the body to monitor posture, movement and muscle activity to attempt to predict — and prevent — falls before they happen.

“Maine has one of the largest populations of older adults in the nation, with falls being the leading cause of injury, hospitalization or death,” says Abdi. “We hope this new line of research can help alleviate some of these preventable falls.”

He says an interdisciplinary approach is useful here because falls can have many different causes.

“Our team is composed of electrical, computer and mechanical engineers, as well as students from biology and psychology to look at the problem from multiple different perspectives and find solutions together as a team.”

According to Abdi, the team had promising results through preliminary testing, and there are plans for further research and development, including working with federal agencies and local industry to move toward commercialization.

“IURC has been a catalyst to bring students and faculty together, addressing some of the most complex problems of our society, says Abdi. “Students learn using real-world problems and contribute to solutions that may not be possible otherwise.”

“We hope with the development of these technologies and research around them, we can impact quality of life and lower health care costs.”
Local food system sustainability

DEBORAH SABER, an assistant professor of nursing, led a 2019 project focused on food loss, food waste, and barriers to establishing a circular food system and environmental sustainability while addressing food insecurity.

In 2017, approximately 41 million tons of food waste were generated in the United States, which constitutes 22% of municipal solid waste, according to the United States Environmental Protection Agency. Food waste leads to the production of greenhouse gases and contributes to climate change, says Saber. And since the problem of food waste is multifaceted and dynamic, it requires an interdisciplinary team to work toward effective, sustainable solutions.

Researchers came from the disciplines of nursing, engineering, business, and more, and from multiple University of Maine System campuses.

“The problem of food waste is far reaching to include Maine, the country and world. It is important to Maine because we contribute to food waste and can be part of the solution,” Saber says. “For example, Maine researchers are working to develop (wood fiber-based) packaging products to increase shelf life and decrease food waste.”

Other faculty members involved in the research were John MacRae, associate professor of civil and environmental engineering; Cindy Brotherton, associate professor of anthropology and climate change; Balakrishnaray Nayar, associate professor of food processing; Travis Blackmer, lecturer of economics; and Linda Silka, senior fellow at the Senator Jean MacRae, associate professor of civil and environmental engineering, working to develop (wood fiber-based) packaging products because we contribute to food waste and can be part of the University of Maine System campuses.

“People are using forest resources differently than they were a few decades ago, and there is a lack of awareness of the range of career opportunities in the forest economy. Those changes are occurring in the context of a national discourse that encourages migration to where jobs already exist rather than creating opportunities in place, according to the researchers.

And as the economic profiles of these communities change, residents could struggle to fund schools, and the possibility of consolidations and closures increases.

The research examined how to retain and attract highly educated people to a region, how to understand the multifaceted relationship between communities and forest ecologies, how sustainable relationships between communities and forests are built and maintained, and what the best way is for students to learn needed skills.

They identified four key themes: a transition in the way people use forest resources, uneven knowledge about the new forest economy, uncertainty about pathways to individual and economic vitality, and fiscal autonomy and national prosperity.

Based on these findings, the researchers recommend school and community leaders take steps to “strengthen the relationship between the school and local workforce needs.”

The big takeaway, she says, is the difference between “the old way of thinking about how forest resources are used, and what opportunity looks like” for youth now. Ideally, this research would inform professional development programs for school employees, and curriculum at different stages, beginning at the elementary level, to make sure students are getting exposure to the information, Biddle says.

“We will continue to foster and build interdisciplinary teams that include stakeholders, industries and governmental leaders,” says Saber.

An interdisciplinary team’s greatest advantage is perspective. Diversity of backgrounds provides several perspectives and allows for the creation of new ideas and methods of solving long-lasting problems. … The overall teamwork and long-lasting networks that I developed on the project were the most rewarding things about it.”

Owen Van Denk, ecology and environmental studies and economics double major, concentration in sustainability, environmental policy and natural resource management (Hersommore Acting, Massachusetts).

Dimensions of tidal power

KRISTINA CAMMEN, a project investigator, physical, biological and social dynamics of the Western Passage to create a better understanding of the coastal ecosystem, and to provide knowledge to inform policy and management decisions.

The project spanned disciplines in natural and social sciences, including marine biology, coastal engineering, human dimensions of natural resources and geospatial science.

The project studied the fish, marine mammals, birds, humans and hydrodynamics of the Western Passage, located between Maine and New Brunswick, Canada.

“Near the gateway to one of North America’s prominent tidal energy resources, Western Passage is considered one of the top sites in the United States for coastal development of renewable energy,” says Cammen, assistant professor of marine mammal science.

“We are working on a climate change initiative, and the goal is to reduce the likelihood of park visitors and staff encountering ticks, as well as improving the outdoors, says Cammen.

She and De Utrata-Porter worked with Sean Birkel, research assistant professor in the Climate Change Institute, and Danielle Levesque, assistant professor of mammalogy and mammalian health. Also participating: researchers from the National Park Service, Maine Medical Center Research Institute and Cornell University.

The focus of the project is understanding the interacting ecological and social drivers of tick-borne disease exposure risk in Acadia National Park. The researchers identified tick-friendly habitat, collected ticks in the park, and measured variables such as leaf litter depth, tree species, canopy cover, small mammal densities and deer sex ratios.

The team also explored visitors’ perceptions of tick-borne disease risk, their personal protective behaviors to minimize the risk of tick bites, and obstacles to engaging in these protective behaviors.

“Maine has experienced a five-fold increase in incidence of Lyme disease in humans over the past decade, and multiple emerging tick-borne diseases also are on the rise, including human babesiosis, human granulocytic anaplasmosis, and Powassan virus,” Gardner says. “Tick-borne disease poses a major public health concern to both Mainers and out-of-state visitors, and it is critical to understand the ecological and social drivers of tick-borne disease exposure risk.”

Last summer, the project included not only UMaine students but three undergraduates from other universities who are part of the university’s One Health initiative.

“Our findings will inform evidence-based intervention strategies that can be implemented in cooperation with our National Park Service partners to reduce tick-borne disease risk on MDI,” says Gardner, noting that the research also could have implications for the study of other zoonotic (diseases that can be transmitted from animals to people) disease systems.

‘The most rewarding part of this experience is getting to collaborate with so many wonderful and diverse minds. … Being involved in something bigger than myself and learning from all of my advisors and collaborators was not only rewarding but also inspiring.’

Sarah Billton, marine sciences major, concentration in marine biology, minor in fisheries science (Hersommore Acting, Washington)
Forests and streams

HAMISH GREIG, an associate professor of stream ecology, led a project looking at the effectiveness of forest management in balancing forest and freshwater resources and economies. “Forests and freshwaters are two of Maine’s most iconic natural resources,” says Greig. “They are our cultural heritage, are critically important to Maine’s economy, and they support biodiversity and ecosystem services that we all rely on. Our research is generating information to help better manage and balance these resources.”

From 2001–07, Manomet and UMaine’s Cooperative Forestry Research Unit (CFRU) conducted an experiment involving harvesting the forest around 15 streams in one of five different riparian management approaches, says Greig. For the URC project, he returned to this area to document how stream and forest ecosystems have responded, and assess the value of timber remaining in the riparian zone.

Greig was joined in the research by Amanda Klemmer, assistant professor of forest ecology, Mindy Cran dall, Robert Northington, now an assistant professor of biology and environmental science at Husson University; and Shawn Fraver, associate professor of forest ecology. The team credits several partners in the forest industry who supported multiple field seasons. The team measured forest canopy trees and saplings, stream insects and fish, and ecosystem processes like leaf litter breakdown and nutrient supply — all in the same streams at the same time — to document the dynamics of the watershed.

Preliminary results suggest that aquatic insect communities are relatively resilient to forest harvest as long as some unharvested riparian forest is retained, he says. The hope is that the research can serve as a model for collaborating with industry and public partners to guide management.

The project was a catalyst for collaboration on a watershed-scale forest management experiment at the University of Maine at Fort Kent, led by Irving Woodlands Forestry Professor Neil Thompson. Greig hopes that experiment will open more opportunities for UMaine faculty and students.

Setting the pace

Valedictorian, salutatorian share a passion for the highest academic achievement — and running

I really enjoyed coming together in one room and collaborating with students, faculty and staff from all over campus. It demonstrated quite well how a diverse group of thinkers is often better equipped to answer big system/ picture questions and, consequently, find better solutions. This experience definitely prepared me for the workforce.”

Kathleen Brown, then ecology and environmental sciences major, concentration in soil and water science (Keteltas Portland, Rhode Island)

HEATHER LEslIE, director of the Darling Marine Center and an associate professor of marine sciences, led a project focused on the environmental and human dimensions of seafood production in the Damariscotta River estuary.

The study of town-managed shellfish resources connected students, researchers and other project partners statewide, including faculty from the University of Maine and University of Maine at Machias. It also involved local harvesters, and the towns of Damariscotta and Newcastle.

The goal was to figure out how soft-shell clams and oyster shellfish are distributed in the upper estuary, and how those patterns of abundance and species composition changed over time.

Data came from biological surveys and interviews with harvesters, enabling the researchers to gather complementary data about historical and current use patterns.

“This was the first systematic survey of these intertidal fisheries, to our knowledge,” says Leslie. “We were able to fill a data gap identified by local harvesters and towns regarding the health of Damariscotta River shellfish resources.”

The project also has established a foundation for a growing partnership between UMaine, local harvesters, and leaders in surrounding towns.

The research found that shellfish populations varied among locations and by tidal heights, with higher densities in the high intertidal zone. More young soft-shell clams also were found in the predator-protected nursery boxes placed by researchers in the high intertidal zone than in the lower zone. And very few young clams were found in the mud next to the boxes, she says, which indicates that protection enables the clams to survive and thrive.

In interviews, harvesters said that shellfish populations have experienced change in the past 20 years, including an increase in wild oyster abundance and a decrease in soft-shell clam abundance. Their responses to these changes include targeting species not previously harvested, according to Leslie.

In summer 2020, the team plans to expand the research to the neighboring Medomak estuary in partnership with the town of Bremen, as well as continue the work with the communities of Newcastle and Damariscotta.

I was really happy going into my senior year because I had discovered this research project and really enjoyed the process, the data collection and the lab work. It wasn’t always easy, but you do have to be persistent and it was rewarding looking at my results in the end. This research will probably be published in the near future, which will be very exciting.

— HEATHER LESTE

I’m really glad that I have the opportunity to continue my education in New England after I graduate for both work experience and a good living. I think if I choose to stay in Maine, I will have the opportunity to work on research projects in natural resources because that is so important to our economic and cultural heritage.

— HEATHER LESTON

This experience definitely prepared me for the workforce.”

Kathleen Brown, then ecology and environmental sciences major, concentration in soil and water science (Keteltas Portland, Rhode Island)

HEATHER LEslIE, director of the Darling Marine Center and an associate professor of marine sciences, led a project focused on the environmental and human dimensions of seafood production in the Damariscotta River estuary.

The study of town-managed shellfish resources connected students, researchers and other project partners statewide, including faculty from the University of Maine and University of Maine at Machias. It also involved local harvesters, and the towns of Damariscotta and Newcastle.

The goal was to figure out how soft-shell clams and oyster shellfish are distributed in the upper estuary, and how those patterns of abundance and species composition changed over time.

Data came from biological surveys and interviews with harvesters, enabling the researchers to gather complementary data about historical and current use patterns.

“This was the first systematic survey of these intertidal fisheries, to our knowledge,” says Leslie. “We were able to fill a data gap identified by local harvesters and towns regarding the health of Damariscotta River shellfish resources.”

The project also has established a foundation for a growing partnership between UMaine, local harvesters, and leaders in surrounding towns.

The research found that shellfish populations varied among locations and by tidal heights, with higher densities in the high intertidal zone. More young soft-shell clams also were found in the predator-protected nursery boxes placed by researchers in the high intertidal zone than in the lower zone. And very few young clams were found in the mud next to the boxes, she says, which indicates that protection enables the clams to survive and thrive.

In interviews, harvesters said that shellfish populations have experienced change in the past 20 years, including an increase in wild oyster abundance and a decrease in soft-shell clam abundance. Their responses to these changes include targeting species not previously harvested, according to Leslie.

In summer 2020, the team plans to expand the research to the neighboring Medomak estuary in partnership with the town of Bremen, as well as continue the work with the communities of Newcastle and Damariscotta.

“I was really happy going into my senior year because I had discovered this research project and really enjoyed the process, the data collection and the lab work. It wasn’t always easy, but you do have to be persistent and it was rewarding looking at my results in the end. This research will probably be published in the near future, which will be very exciting.

— HEATHER LESTE

I’m really glad that I have the opportunity to continue my education in New England after I graduate for both work experience and a good living. I think if I choose to stay in Maine, I will have the opportunity to work on research projects in natural resources because that is so important to our economic and cultural heritage.

— HEATHER LESTON

This experience definitely prepared me for the workforce.”

Kathleen Brown, then ecology and environmental sciences major, concentration in soil and water science (Keteltas Portland, Rhode Island)
School of Policy and International Affairs prepares students for global engagement

By Cleo Barker | Photograph by Holland Hawerkamp

Many people choose to continue their education because they want to change the world. At the University of Maine, students in the School of Policy and International Affairs (SPIA) are preparing to do just that.

SPIA was established in spring 2007 to offer a Master of Arts in Global Policy. The program stands out for its flexible interdisciplinary curriculum and myriad opportunities for hands-on experiences. Students can tailor the program to align with their interests and career goals.

And their passion and high level of engagement are apparent in all areas of the program, in and out of the classroom. “Students are always talking about global context and impact,” says James Settele, executive director of SPIA and retired U.S. Navy captain. “Hearing of the experiences of students from the Ivory Coast, Iran, Greece or Sri Lanka puts the learning in context and energizes them to impact the world.”

It is interesting to connect much of what they learn to the change we need right here in Maine.

SPIA faculty are a great mix of practitioners and academics, bringing international issues with real-world solutions to the SPIA students. Students are connected to former ambassadors, and current government leaders and CEOs who help prepare them for genuine global engagement.

The first cohort of eight began its studies in fall 2010. The incoming class in fall 2019 was the largest in program history, with 31 students and two more who joined in January to make 33 from 14 countries. During their time in SPIA, in addition to getting a firm grounding in the important history and theory of their field, students learn practical and applied skills in diplomacy, international development, environmental politics, political economy, and more, says Kristin Vekasi, assistant professor in SPIA and the Department of Political Science.

“They take these skills around the state, country and world, creating change, whether based in tiny NGOs or (in) huge national or international organizations.”

Of four program concentrations, most students choose security and foreign policy, while others elect to study environmental policy, trade and commerce, or climate policy. SPIA also partners with the Maine Business School and the School of Economics to offer a dual master’s degree in global policy and other business administration or resource economics.

All SPIA students complete an internship, often abroad. To date, students have interned in 26 countries. In 2019, eight students held internships in the U.S., Bulgaria, Germany and Kenya.

Alumni go on to work in a wide range of public, private and nonprofit sectors. Two are currently working in Maine Congressional delegation offices and more than a dozen others also are working in the Washington, D.C. area. Fifteen are working in Maine in a variety of fields, including education, business, environment, law enforcement, and trade and shipping.

SPIA regularly invites guest speakers on campus, as well as conferences like the second biennial conference “Can We Live with a Nuclear North Korea?” in October 2019 through a partnership with the William S. Cohen Institute for Leadership and Public Service.

“As a program that stresses the application of theory to practical issues, it helps prepare students to make meaningful change in the world and enriches the learning experience of UMaine,” says Settele.

As of December 2019, 75 students have graduated from the program. Nine students will graduate from the program in May 2020 — three from Maine, two from other states and four from other countries. Meet four of them below.

**Change agent**

David Valls-Manclus, from Valencia, Spain, says the 2008 economic recession in his home country spurred his interest in policy and international affairs. He saw how it affected his family and friends, and wanted to be able to help.

“I’m very passionate about change in the world,” he says.

As an undergraduate studying business and finance at Husson University, Valls-Manclus had a friend in SPIA. Valls-Manclus decided to apply, drawn to the “small, personalized” nature of the program that could tailor to his interests.

For example, a class could focus on factors involved in terrorism, and students bring different perspectives based on their backgrounds and specific interests, from the environment to international aid or animal rights.

“One person can’t learn in depth about all areas. Those points of view balance each other, and we learn where people are coming from,” says Valls-Manclus, who has a concentration in trade and commerce, and is doing an independent study on the financing of terrorism.

Valls-Manclus says SPIA class discussions are “civil, respectful” and “how diplomacy should work,” allowing everyone to hear and learn from different perspectives and their applications to current events. “People can disagree while debating and representing a country, NGO or school’s position, but then still get along as people,” he says.

Valls-Manclus says he’s always had an open mind, which has taken him to dozens of places in recent years.

As a junior at Husson, Valls-Manclus studied in Korea in 2016. As a senior at the University of Maine, Valls-Manclus studied in Sri Lanka in 2018.

As of December 2019, 75 students have graduated from the program. Nine students will graduate from the program in May 2020 — three from Maine, two from other states and four from other countries. Meet four of them below.

**Change agent**

David Valls-Manclus, from Valencia, Spain, says the 2008 economic recession in his home country spurred his interest in policy and international affairs. He saw how it affected his family and friends, and wanted to be able to help.

“I’m very passionate about change in the world,” he says.

As an undergraduate studying business and finance at Husson University, Valls-Manclus had a friend in SPIA. Valls-Manclus decided to apply, drawn to the “small, personalized” nature of the program that could tailor to his interests.

For example, a class could focus on factors involved in terrorism, and students bring different perspectives based on their backgrounds and specific interests, from the environment to international aid or animal rights.

“One person can’t learn in depth about all areas. Those points of view balance each other, and we learn where people are coming from,” says Valls-Manclus, who has a concentration in trade and commerce, and is doing an independent study on the financing of terrorism.

Valls-Manclus says SPIA class discussions are “civil, respectful” and “how diplomacy should work,” allowing everyone to hear and learn from different perspectives and their applications to current events. “People can disagree while debating and representing a country, NGO or school’s position, but then still get along as people,” he says.

Valls-Manclus says he’s always had an open mind, which has taken him to dozens of places in recent years.

As a junior at Husson, Valls-Manclus studied in Korea in 2016. As a senior at the University of Maine, Valls-Manclus studied in Sri Lanka in 2018.
Lacey Darling’s interest in international affairs was sparked by news of the tsunami in Sri Lanka in 2004. “My dream job was to work on the USS Comfort, one of the Naval hospital ships that formed an offshore, emergency response following the disaster,” she says. In her first three years as an undergraduate, Darling studied nursing. Then she found inspiration in the policy side of the health care field.

“I began to develop an intense interest in the policies that create an unhealthy, exclusive nature of good health, and the structure of the health care system that too frequently loses sight of both its own health care practitioners and the patients themselves,” says Darling, who is from Norway, Maine.

Now she’s well on her way to reaching her goal of a career in the international development field.

In SPIA, Darling’s studies focus on the health care and education sectors of society and policy, as well as international assistance and development — development programs, foreign direct assistance, and other forms of state and private, nongovernmental interventions in developing countries, and marginalized and vulnerable populations.

“In the absence of reliable, adequate and affordable health care services, I look at the phenomenon of disinfranchise- ment, and particularly how disparate combinations with disease and disability to produce push/pull factors for certain members of a population into emigration,” she says. In 2018, Darling interned in Washington, D.C. with the Women’s Democracy Network, where she focused on women’s political and economic empowerment.

Darling worked largely in program development. She also helped organize and manage an international delegation of women serving in leadership positions, and the 2018 International Women’s Day Celebration.

“Working in this space was a dream come true in many ways,” she says. “The exposure I gained through my experience was immense. Often, it still shocks me how much I brought back from my placement, and how that experience has shaped who I am as a graduate student and professional.”

Darling, the mother of a dinosaur-loving 3-year-old, is a graduate assistant in the UMaine Center for Innovation and Entrepreneurship. She also has a leadership studies minor.

In her first three years as an undergraduate, Darling studied nursing. Then she found inspiration in the policy side of the health care field.

“I began to develop an intense interest in the policies that create an unhealthy, exclusive nature of good health, and the structure of the health care system that too frequently loses sight of both its own health care practitioners and the patients themselves,” says Darling, who is from Norway, Maine.

There, she took a political negotiations class, which he says was influential and helped form his political views.

A year after joining SPIA, he interned in financial negotiations at the U.S. Agency for International Development (USAID) in the Office of Taiwan Economic Affairs. He interned as a policy and economic analyst.

“Working in this space was a dream come true in many ways,” he says. “The exposure I gained through my experience was immense. Often, it still shocks me how much I brought back from my placement, and how that experience has shaped who I am as a graduate student and professional.”

Pierce earned a bachelor’s degree in East Asian studies and international relations from Colby College in 2016. Since then, he has been working in Washington, D.C. with the State Department, working with the Office of Taiwan Economic Affairs. He interned as a policy and economic analyst.

“Working in this space was a dream come true in many ways,” he says. “The exposure I gained through my experience was immense. Often, it still shocks me how much I brought back from my placement, and how that experience has shaped who I am as a graduate student and professional.”
In Shannon McCoy’s psychology lab, the goal is to identify strategies for confronting the prejudice in order to improve outcomes for everyone.

Lots of women are sick of sexism.

Shelby Helwig is investigating whether that statement is true literally as well as figuratively: Does sexism affect women’s well-being? The University of Maine psychology doctoral candidate also is exploring when and how women confront sexism, and the consequences of that on their physiological and psychological health.

To learn more, Helwig developed a lab study that mimics real-world sexism. In a controlled environment, she records women’s blood pressure, heart rate and blood flow as they experience sexism. She also records their facial expressions and what they say in response to men’s sexist comments.

A total of 140 women have participated in the studies in associate professor of psychology Shannon McCoy’s lab.

The 18- to 24-year-olds were told they’re part of a mock search committee and were asked to review resumes of two candidates — a woman and a man — for a job as a research assistant. While both candidates were well-qualified, the woman was objectively the clear choice based on her qualifications for the job.

The women who chose the female candidate discussed their choices via intercom with two male committee members. The men were actually lab assistants who always picked the male candidate and read scripted lines.

The meetings were structured so one of the men spoke first, followed by the woman, then the other man. The process was repeated three times and the women were told that everyone’s microphones were muted while others talked.

In the first round, the men ignored the female committee member. For instance, when the second man spoke, he only addressed the other male committee member: “You made some good points, man. I picked Robert, too.”

Women’s heart rate variability — the fluctuation between heart beats — decreased as the sexism became more overt. Lower heart rate variability is correlated with increased efforts to manage emotions, including anxiety and anger, in a socially acceptable and personally beneficial manner.

Women who experienced sexism indicated on a 1-to-7 scale they thought the men’s decision to hire was driven by the applicants’ gender (6.89 out of 7) and they labeled the men as sexist (5.9 out of 7).

65% of women confronted the men’s sexist behavior in some way.
The results suggest that over a lifetime, sexism may take a toll. Decreased heart rate variability, if prolonged and repeated over time, is associated with decreased resilience to stress and increased risk for cardiovascular disease.

In the second round, the men made ambiguously sexist remarks; that is, their statements could be open to more than one interpretation. One line they said: “I think she’s probably a better team player than a leader.” In the third round, the men made blatantly sexist comments. “Most girls I know know just like to do what they’re told to do … they don’t really think up their own ideas.” And, “If they want someone who picks up on stuff, or maybe you know, better pick a guy.”

Helwig and the research team also conducted a comparison, or control, condition. While the women committee members were still in the minority opinion — they picked the female applicant and the men chose the male — the men didn’t ignore them or pick a guy.

The women who had experienced sexism had visceral responses that those in the comparison study did not. Helwig found women’s heart rates went up from a resting baseline through the rounds of increasingly blatant sexism.

This demonstrates that women differentiate between more subtle and blatant expressions of sexism. “The more overt the sexism the greater women’s autonomic arousal, suggesting greater intensity of emotional response,” says McCoy.

At the same time, the women’s heart rate variability — the fluctuation between heart beats — decreased as the sexism became more overt. Lower heart rate variability, says McCoy, is correlated with increased efforts to manage emotions, including anxiety and anger, in a socially acceptable and personally beneficial manner.

The results suggest that over a lifetime sexism may take a toll, says McCoy. Decreased heart rate variability, if prolonged and repeated over time, is associated with decreased resilience to stress and increased risk for cardiovascular disease.

When women thought they couldn’t be heard by the male committee members, they said, “I am loud” and “I am funny” and other statements consistent with the “physiological findings that sexism makes your blood boil,” says McCoy.

Also consistent with the cardiovascular findings, the women who faced sexism reported on a mood questionnaire that they felt more angry and less confident.

Helwig and McCoy also were curious whether women would confront the sexist behavior in real time. And if so, how?

Prior research has shown women often attempt to refocus attention on the task at hand, or ask a question regarding the sexist comment, says McCoy. In 1999 in a similar study, Janet Swim and Lauri Hyers found 55% of women directly confronted sexist remarks. While the more neutral approach could be perceived as letting the perpetrator off the hook, labeling him a sexist and humiliating him with jokes are “more likely to lead to backlash and entrenched bias rather than behavior change.”

Calling men drowned out or embarrassing them can result in backlash, or retaliation that could negatively affect a woman’s career or well-being, says McCoy.

Plus, a person can verbally state one thing while their nonverbal expressions say something else entirely, says assistant professor of psychology Mollie Ruben.

And nonverbal expressions speak much louder than words.

Nonverbal expressions are everything but the spoken words, including general impressions of surprise, anger, anxiety, sadness, engagement (with the speaker and the task), and smiling, says Ruben. Smiling is included because the researchers are interested in how smiling helps women cope with sexism.

Ruben is a certified Facial Action Coding System (FACS) coder, meaning she analyzes facial expressions to assess emotions. She’ll use videocaps of the study’s committee meetings to code the women’s nonverbal expressions in sync with their physiological reactions to, and recovery from, the sexist statements.

FACS is an anatomically based system for describing visually perceptible facial movements. The system breaks down facial expressions into individual components of muscle movements that encompass the brow, eyes, cheek, nose, lip, chin, jaw, mouth and more.

While some of the nonverbal expressions and behaviors are overt and easy to interpret — open mouths, rolling eyes, shaking heads — Ruben is helping the team develop a rigorous coding structure to differentiate anger from other negative emotions, like discomfort or anxiety.

Additionally related research in the lab will explore if physiological stress responses and nonverbal expressions are predictors of whether women will confront sexist behavior, and if confronting sexist behavior is beneficial for women’s well-being.

And, master’s psychology student Margaret Gauvreau will explore men’s experience with the various confrontational styles observed in the study.

The plan, says McCoy, is to identify strategies for confronting sexism that improve outcomes for everyone. Helwig, a Jane Walton Medical Research Fellowship recipient, is interested in the interpersonal consequences of bias, with a particular focus on conflict resolution.

While these studies are focused on learning about effects of sexism, Helwig says the paradigm could be used to examine physiological effects of various kinds of prejudice — including racism, classism, ageism, homophobia and religious discrimination.

“Shelby began to conceptualize confrontation as a potential coping strategy. Like many of our coping strategies — eating ice cream when we are stressed, for example — not all confrontations are likely to be beneficial for women’s well-being. And, master’s psychology student Margaret Gauvreau will explore men’s experience with the various confrontational styles observed in the study.”

“We’re interested in identifying confrontational styles that both protect the well-being of the target and reduce the potential for future conflict with the perpetrator.”

While the more neutral approach could be perceived as letting the perpetrator off the hook, labeling him a sexist and humiliating him with jokes are “more likely to lead to backlash and entrenched bias rather than behavior change.”

Shelby McCoy

The remaining 53% of women (including herself) indicated that hiring decisions shouldn’t be based on gender. McCoy says only about half of these women (29%) directly stated the men shouldn’t consider gender, and should not make these comments.

The remaining women (24%) were less direct and talked about how gender should not be a factor in the decision, or that “we” (including herself) shouldn’t consider gender in the decision.

Research intriguingly suggests that women who use this more neutral approach might be more effective in combating sexism, says McCoy.

And while McCoy says she can’t imagine not confronting the men who made such sexist comments, she knows — even though this is her area of study — that she doesn’t always speak up when something similar happens to her.

While the more neutral approach could be perceived as letting the perpetrator off the hook, labeling him a sexist and humiliating him with jokes are “more likely to lead to backlash and entrenched bias rather than behavior change.”
Synergizing health and environment: training One Health scientists

Advancing the understanding of disease dynamics at the intersection of human, animal, plant and environmental health is the focus of the One Health and the Environment initiative.

The National Science Foundation Research Traineeship program awarded nearly $1 million to the initiative.

Globally and in Maine, environmental changes, an aging human population, and increasing prevalence of infectious diseases of animals, plants and people highlight the need for training professionals in an interdisciplinary approach.

Mario Feid, director of the School of Economics, was principal investigator on the grant. Andre Alyokhin, professor of applied entomology, School of Biology and Ecology, and Anne Lichtenstein, associate professor of animal and veterinary sciences, School of Food and Agriculture; extension veterinarian, and director of the Veterinary Diagnostic Laboratory, co-Principal Investigators on the NSF-funded project.

Training in cross-disciplinary communication will enable students to engage with diverse scientific communities, stakeholders, citizen scientists and the public.

The project will encourage interdisciplinary-environmental research by trainees in a range of specialties. Involving faculty from multiple disciplines, and complement a current NSF-funded Research Experience for Undergraduates program.

It’s designed to increase the participation of women, first-generation students, veterans, students with disabilities and other traditionally under-represented groups.

TASTES GREAT, LESS ACRYLAMIDE

Mary Ellen Camire has some good news about French fries. These made with the new potato varieties AF4296-3 and Easton have much lower levels of a probable carcinogen than those made with the popular Russet Burbank variety.

Acrylamide is a probable carcinogen in fried potatoes. During the frying process, the chemical forms from sugars and an amino acid that are naturally in potatoes.

For those envisioning the saucer-to-eat, golden brown, crispy-on-the-outside, soft-on-the-inside fries with a sprinkle of sea salt and a splash of vinegar, hold that thought. The new spud varieties don’t turn golden brown when they’re fried. They turn white.

The University of Maine professor of food science and human nutrition says they still have the crispy texture, familiar flavor and smell of freshly cooked French fries. Forty-seven tater taste testers testified to that — rating the aroma, taste and texture of French fries made with AF4296-3 and Easton potato varieties similar to Russet Burbank.

But they rated the whitish color of the new varieties significantly lower. An education or promotion campaign is likely needed to let the public know about the merits of these fries will not take as long.”

Mary Ellen Camire

If successful, we could move away from the current reactive treatment status quo and toward a clinical strategy that empowers both patients and clinicians.”

Andrew Khalil

Breast cancer technology

The University of Maine has developed a computational approach that could assist in the early detection of breast cancer. The recently patented technology may help identify dormant, potentially cancerous tissue before it progresses to an aggressive metastatic cancer, thereby allowing clinicians to take a proactive treatment approach.

The invention is a method that analyzes the characteristics of different regions of breast tissue on a mammography image. An algorithm based on an underlying biophysical hypothesis can identify the physical markers believed to be linked to malignant tumor onset and growth.

The UMaine inventors are Andre Khalil, professor of chemical and biomedical engineering and founding director of the Computational Modeling, Analysis of Images, and Numerical Experiments Lab (CompuMAINE), and Kendra Ann Batchelor, former graduate student. The Maine Cancer Foundation provided funding.

The long-term goal for the technology is to allow providers to extract more valuable diagnostic information from a regularly performed test.

“Breast cancer is the second most common cancer among American women, and this technology has the potential to revolutionize the screening and treatment process,” says Jake Ward, UMaine vice president for innovation and economic development.

WHAT’S THE MAINE QUESTION?

The University of Maine’s podcast, “The Maine Question,” is now in its second season.

Host Ron Lisnet talks with UMaine pioneers, including those who explore backyard gardens, the depths of the oceans, Earth’s highest peaks — or beyond. They share why they’re passionate about their research and what it means for Maine and the world.

In the first season, Lisnet spoke with an assistant professor of human nutritional needs at the University of Maine Center on Aging and Senscio Systems, received a three-year, $750,000 award from the Administration for Community Living to establish and test an innovative, technology-driven, nutrition enhancement and self-management program for adults 60 and older with multiple chronic diseases.

The project aims to improve the nutrition and health status of rural participants immediately following hospital discharge. Improving their nutritional status and, in turn, positively impacting their health-related quality of life could make it easier for chronically ill older adults to age in place.

Project partners will create an in-home nutritional module that can be locally tailored to individual health and cultural considerations, including nutrition tips, coaching and healthy recipes. They also will work to create a practical program manual for use by Area Agencies on Aging nationwide.

“This project is a prime example of how medical and social services, higher education and business organizations can effectively join forces and work together,” says Lenard Kaye, director of the Center on Aging and professor of social work.

THE MAINE QUESTION

By Jake Ward, UMaine Today

NUTRITIONAL NEEDS

The Eastern Area Agency on Aging, in partnership with St. Joseph Healthcare, the University of Maine Center on Aging and Senscio Systems, received a three-year, $750,000 award from the Administration for Community Living to establish and test an innovative, technology-driven, nutrition enhancement and self-management program for adults 60 and older with multiple chronic diseases.

The project aims to improve the nutritional and health status of rural participants immediately following hospital discharge. Improving their nutritional status and, in turn, positively impacting their health-related quality of life could make it easier for chronically ill older adults to age in place.

Project partners will create an in-home nutritional module that can be locally tailored to individual health and cultural considerations, including nutrition tips, coaching and healthy recipes. They also will work to create a practical program manual for use by Area Agencies on Aging nationwide.

“This project is a prime example of how medical and social services, higher education and business organizations can effectively join forces and work together,” says Lenard Kaye, director of the Center on Aging and professor of social work.
Ice cores yield clues to past

A discovery by University of Maine researchers challenges what was believed to be the established volcanic source of particles found in an ice core from the South Pole. The new findings also add to the global record of volcanic activity and are relevant to several research disciplines.

Detailed records of past volcanic eruptions are often required to understand volcanic activity-climate system interactions, and reconstructions of how past volcanic events have affected human history.

Unfortunately, in many parts of the world, historical records are sporadic, short, and not well documented, according to Andrei Kurbatov, associate professor at the University of Maine School of Earth and Climate Sciences and Climate Change Institute.

In the last decade, Kurbatov and Martin Yates, electron beam laboratory manager and instructor of Earth sciences at UM, collaborated with Nelia Dunbar and Nels Iverson from the New Mexico Institute of Mining and Technology, developed a method of extracting volcanic ash particles from ice core samples to measure their geochemical composition.

The methodology provides additional means to refine the history of global volcanism captured in polar ice core records, says Kurbatov.

Graduate student Laura Hyman examined microscopic volcanic ash particles in ice core samples from Antarctica’s South Pole, and the data brought into question the existing paradigm on long-range transport of ultrafine volcanic particles in the atmosphere.

With funding from the National Science Foundation, Kurbatov and his team plan to continue to explore volcanic deposits in the South Pole ice core to further refine the global record of volcanism.
Heat waves

As the climate continues to warm, scientists expect the frequency, intensity and duration of heat waves — consecutive days with extremely high temperatures — to increase. Bradford Lyon found the spatial size of heat waves is also important.

By mid-century (2031–55), in a middle-of-the-road greenhouse gas emissions scenario, the average size of heat waves could increase by 50%. And if greenhouse emissions continue unabated, the average heat wave size could increase by 80%, says the associate research professor with the Climate Change Institute and School of Earth and Climate Sciences.

“As the physical size of these affected regions increases, more people will be exposed to heat stress,” Lyon says. “Larger heat waves would also increase electrical loads and peak energy demand on the grid as more people and businesses turn on air conditioning in response.”

Lyon’s study could provide a framework for utilities to stress test their energy system’s capacity to meet demand during spatially extensive heat waves. This could inform management decisions and planning.

More than 13.6% of Maine households — more than 182,000 people — are food insecure, according to a United States Department of Agriculture estimate.

PRODUCES RESULTS

Since 2000, Maine Harvest for Hunger has distributed more than 3 million pounds of food to citizens grappling with hunger. In 2019, the University of Maine Cooperative Extension-coordinated program donated more than 193,000 pounds of fresh produce from more than 120 farms.

The donations went to 207 hunger-alleviation distribution sites. Maine Harvest for Hunger had 365 volunteers in 2019, including UMaine Extension Master Gardeners, and eight corporate partners from 12 countries who logged more than 6,000 hours. The value of produce they harvested is estimated at more than $327,000.

Over two decades, Maine Harvest for Hunger has built partnerships to improve the efficiency of supplying fresh produce to food pantries across Maine. For example, through volunteer planning and communications, several food pantries now send trucks and vans directly to farms where leftover crops are being collected.

Brain McGirr joined 23 Nobel laureates and researchers from nearly 60 nations as one of the 2019 Highly Cited Researchers.

The University of Maine professor of biological sciences examines biodiversity at large scales — substantial areas of space, long periods of time, and across many species — that are critical to addressing conservation and management questions.

McGirr wants to be able to predict how species’ ranges will respond to climate change, as well as measure the impact of people on community structure. Since 2000, his 106 publications have cited 7,991 times. Highly Cited Researchers make up 0.1% of all researchers.

The list of more than 6,200 scientists “contributes to the identification of that small fraction of the research population that contributes disproportionately to extending the frontiers of knowledge and gaining for society innovations that make the world healthier, richer, more sustainable and more secure,” according to the Web of Science Group.

EXTENDS FRONTIERS

Maine’s forest has been in constant flux over the course of history, including the changing composition of tree species, insect outbreaks, land use change, shifting management practices and climate change,” he says. “This (archive) represents an unprecedented record of the continuing evolution of Maine’s forest landscape.”

The Old Town, Maine company provides services in aerial photography, surveying/GPS, photogrammetry, cadastral mapping, GIS, forestry consulting and engineering. It began offering aerial photography services in 1948.

UMaine History professor Anne Knowles says the aerial photos provide tremendous potential for study and examination across the university.

“They provide data about the growth and decline of the state’s great pulp and paper industry, urban development, transportation, forestry practices, tourism, the impact of the oil boom and other environmental issues,” she says. “Such a deep historical and visual record will support interdisciplinary research for decades to come.”

The Special Collections Department at Fogler Library will catalogue and manage the photo archive, which is expected to be available to the public in 2021.

“The purpose of this is to see what’s been done. In October, Guinness World Records agreed, documenting three World Records for: • The boat, printed in 72 hours, also is the largest sold 3D-printed object.

Record-breaking Habb Daghie says the Advanced Structures and Composites Center that he directs is doing what’s never been done. In October, Guinness World Records agreed, documenting three World Records for:

- The largest prototype polymer 3D printer, which is 60 feet long (and expands to 100 feet), 22 feet wide and 10 feet tall.
- The boat, printed in 72 hours, also is the largest sold 3D-printed object.
- The (archive) represents an unprecedented record of the continuing evolution of Maine’s forest landscape.”

“The purpose of this is to see what’s been done. In October, Guinness World Records agreed, documenting three World Records for:

- The largest prototype polymer 3D printer, which is 60 feet long (and expands to 100 feet), 22 feet wide and 10 feet tall.
- The boat, printed in 72 hours, also is the largest sold 3D-printed object.
- • • •

“Maine’s forest has been in constant flux over the course of history, including the changing composition of tree species, insect outbreaks, land use change, shifting management practices and climate change,” he says. “This (archive) represents an unprecedented record of the continuing evolution of Maine’s forest landscape.”

The Old Town, Maine company provides services in aerial photography, surveying/GPS, photogrammetry, cadastral mapping, GIS, forestry consulting and engineering. It began offering aerial photography services in 1948.

UMaine History professor Anne Knowles says the aerial photos provide tremendous potential for study and examination across the university.

“They provide data about the growth and decline of the state’s great pulp and paper industry, urban development, transportation, forestry practices, tourism, the impact of the oil boom and other environmental issues,” she says. “Such a deep historical and visual record will support interdisciplinary research for decades to come.”

The Special Collections Department at Fogler Library will catalogue and manage the photo archive, which is expected to be available to the public in 2021.

“The purpose of this is to see what’s been done. In October, Guinness World Records agreed, documenting three World Records for:

- The largest prototype polymer 3D printer, which is 60 feet long (and expands to 100 feet), 22 feet wide and 10 feet tall.
- The boat, printed in 72 hours, also is the largest sold 3D-printed object.

Record-breaking Habb Daghie says the Advanced Structures and Composites Center that he directs is doing what’s never been done. In October, Guinness World Records agreed, documenting three World Records for:

- The largest prototype polymer 3D printer, which is 60 feet long (and expands to 100 feet), 22 feet wide and 10 feet tall.
- The boat, printed in 72 hours, also is the largest sold 3D-printed object.

“AERIAL PERSPECTIVE

The James W. Sewall Co. donated more than 3,000 rolls of film containing about 1 million aerial images to the Raymond H. Fogler Library.

“In turning over these archival materials, the James W. Sewall Co. is essentially entrusting its DNA to the University of Maine,” says Sewall president George Campbell Jr.

Daniel Hayes, assistant professor in the School of Forest Resources, says the photo archive — which spans about 65 years of Maine and New England — presents an exciting opportunity for faculty, staff and students.

“Maine’s forest has been in constant flux over the course of history, including the changing composition of tree species, insect outbreaks, land use change, shifting management practices and climate change,” he says. “This (archive) represents an unprecedented record of the continuing evolution of Maine’s forest landscape.”

The Old Town, Maine company provides services in aerial photography, surveying/GPS, photogrammetry, cadastral mapping, GIS, forestry consulting and engineering. It began offering aerial photography services in 1948.

UMaine History professor Anne Knowles says the aerial photos provide tremendous potential for study and examination across the university.

“They provide data about the growth and decline of the state’s great pulp and paper industry, urban development, transportation, forestry practices, tourism, the impact of the oil boom and other environmental issues,” she says. “Such a deep historical and visual record will support interdisciplinary research for decades to come.”

The Special Collections Department at Fogler Library will catalogue and manage the photo archive, which is expected to be available to the public in 2021.

“The purpose of this is to see what’s been done. In October, Guinness World Records agreed, documenting three World Records for:

- The largest prototype polymer 3D printer, which is 60 feet long (and expands to 100 feet), 22 feet wide and 10 feet tall.
- The boat, printed in 72 hours, also is the largest sold 3D-printed object.

Record-breaking Habb Daghie says the Advanced Structures and Composites Center that he directs is doing what’s never been done. In October, Guinness World Records agreed, documenting three World Records for:

- The largest prototype polymer 3D printer, which is 60 feet long (and expands to 100 feet), 22 feet wide and 10 feet tall.
- The boat, printed in 72 hours, also is the largest sold 3D-printed object.
when mothers interact with their babies, and during labor and lactation.

Opioids and Maternal Behavior

The mothers’ sensitivity deficits showed less responsive maternal behaviors toward their babies than mothers not dependent on opioids but similar in socioeconomic and lifestyle factors. The mothers’ sensitivity deficits were associated with reduced oxytocin (OT) release. OT is made in the hypothalamus and normally released during childbirth, emotion, social bonding, and attachment. OT release facilitates the mother's response to her baby, such as nuzzling or licking. Low OT levels could negatively affect mother-infant attachment, child stress adaptation in the long term, and children’s social, emotional, behavioral and cognitive development. Katrina Daigle made the discoveries when she was a University of Maine psychology graduate student. Psychology professor Marie Hayes advised Daigle, now a clinical psychology doctoral student at Suffolk University. Collaborators Julie Goode and Ajoyany Shim performed the oxytocin assays. The paper was published in “Developmental Psychobiology.”

Game-changing technology

The Advanced Manufacturing Center (AMC) was awarded two grants totaling $2.5 million to upgrade equipment and accelerate the adoption of additive metal manufacturing in Maine. The Maine Manufacturing Extension Partnership received a $1 million National Institute of Standards and Technology Manufacturing Extension Partnership Competitive Awards Program grant to support and enhance AMC’s Center for Additive Manufacturing of Metals. AMC was awarded $1.5 million for equipment upgrades to better meet the needs of industry partners and the state’s workforce. The improvements will enable the center to build resilience into the state’s manufacturing businesses by providing access to new technology, as well as innovative technical assistance. The funding includes a $750,000 investment from the U.S. Economic Development Administration. Matching funds come from UMaine’s Office of the Vice President for Research and College of Engineering, as well as the Maine Technology Institute. The purchase and installation of state-of-the-art additive and subtractive manufacturing equipment will give AMC the capabilities that current manufacturing CAD demands, as well as increase efficiency, says John Belding, AMC director. The new equipment will be unique to the state and publicly available to entrepreneurs, businesses and their employees, he says. The technology will likely attract out-of-state companies, as well. The upgrades include a Desktop Metal FDM additive metal machine with testing equipment, 5-axis machining center, hybrid metal additive cell, wire EDM (electrical discharge machining), and 4-axis lathe with live tooling.

The goal for Green Endowment gifts of forestland is to provide long-term educational opportunities for students at the University of Maine. The professional staff at the University of Maine Foundation is available to assist landowners with gift options and estate planning ideas.

Jeffrey Miles, President/CEO
University of Maine Foundation

Forestlands for the future

LOVE OF THE OUTDOORS AND NATURE draws faculty, staff and students to the University of Maine College of Natural Sciences, Forestry, and Agriculture. The University of Maine Foundation Green Endowment is an opportunity for those who share a love of forestlands to give to UMaine in a special way.

The college seeks quality forestlands that can be managed to supply a long-term source of income. The lands will be managed for sustained yield of marketable resources, for wildlife habitat and recreational potential, aligned with the teaching, research and public service mission of the state’s public research university.
Traditional ecological knowledge: Suzanne Greenlaw, front, and Shantel Neptune research sustainable sweetgrass harvesting in Acadia National Park. The fragrant perennial grass that grows in salt marshes and wet meadows is a resource for Wabanaki people, including in basketmaking.