BEHIND THE 33-foot planetarium dome; Construction is nearing completion on the Emera Astronomy Centre at the University of Maine. This fall, the Emera Center will open the universe to youngsters, astronomers, researchers and students at UMaine and beyond. The facility will serve as a critical mass of astronomy STEM education resources for Maine. As the home of the Maynard F. Jordan Planetarium and Observatory, the center will expand opportunities for students and educators to access leading-edge equipment, including the largest telescope in the state. Undergraduate and graduate students will undertake projects never before possible at UMaine’s astronomy facilities. Emera Astronomy Center is a LEED-certified building and the first geothermal facility on campus.

What’s ahead at Maine’s Flagship University
Emera Astronomy Center
IN A RECENT ARTICLE published in the Presidential Perspectives Series on Elevating Sustainability Through Academic Leadership, I referred to Marten and Samels’ book, The Sustainable University: A Need to Move Forward and the vision of Anthony Corteze, founding president of Second Nature, in calling for the placement of sustainability within higher education’s priorities. This integration of sustainability into the fabric of the core mission of the university — developing a campus “sustainability state of mind,” if you will — is precisely the commitment of the University of Maine. UMaine’s strategic plan, the Blue Sky Project, embraces the guiding principles and areas of distinction for Maine’s land grant university — innovation, interdisciplinary, inclusivity, sustainability, stewardship and renewability.

As proposed in the University of Maine Climate Action Plan, such transformation toward a sustainability state of mind can be accomplished by an “overarching institutional focus on climate protection and sustainability in our own research, public policy development, public outreach and student training, and, in so doing, mount a significant challenge to the widespread but nonetheless specious notion that sustainability is ‘soft’ and generally at odds with ‘hard’ economic development and technological progress.”

Higher education leaders are best positioned to foster a vital cultural and societal change, and move intentionally in shaping a comprehensive sustainability state of mind. Such a state of mind will clearly benefit our bottom line, saving dollars and cents in an environment of fiscal challenge while also preserving our sense of mission and place promoting communities of enlightened citizens. This approach, which at UMaine we now refer to as Blue Sky Thinking, requires creative conversations and a focused return on investment, coupled to a positive outlook for the future — a future dependent upon strategic sustainability.

Paul W. Ferguson
President
ON THE COVER: UM aine's sustainability story is comprehensive, multifaceted and complex. The cover illustration by Robin Moline captures some of the many landmarks across the UM aine landscape that represent the pillars of sustainability at the state’s flagship university — from lessons in the classroom and green living on campus to national leadership and global research.

features
16 Innovating Maine
Blackstone Accelerates Growth has advanced the "collision" of people, ideas and resources, giving UM aine students and state businesses clear advantages.

28 How sweet it is
UM aine researchers are engaged in helping the third-largest maple industry in the United States thrive — now and in the future.

34 Collected works
Some of the best works in realism, pop art, abstract expressionism and cubism are found in the University of Maine Museum of Art’s permanent collection.

44 Blue is green
Sustainability has a long legacy at the state’s land grant university and, today more than ever, is an important part of UM aine’s institutional identity.

.departments
3 Flagship difference
For the birds
Healthy coasts
Leasing R&D
Quality data
Writer’s toolbox
Concept to reality

10 UM aine engaged
A call to action

25 Black Bear success
HV+ behind bars

43 Students first
Future scapes

52 UM aine engaged
A fish tale

57 Students first
Active citizen

58 Insights

C ANARIES ARE no longer used to detect unsafe levels of carbon dioxide in mines, but birds are still sentinels of a region’s health, says Brian Olsen, University of Maine evolutionary and behavioral ecologist.

Few animals and even fewer vertebrates offer a window into their private worlds like birds. So, when bird watchers in Maine spot warms, screech owls, turkey vultures, mockingbirds, cardinals and tunicies, they’re observing species that have adapted to changing climate and landscape.

Climate change and habitat loss are the two biggest threats to birds in North America, Olsen says. How birds respond to change — and which species do it well and which don’t — are central questions for Olsen.

One species facing a survival threat is the saltmarsh sparrow, which breeds exclusively from Maine to North Carolina. Olsen says population viability models indicate the species could face extinction in the next 30 or so years because the birds build their nests within centimeters of high-tide marks, and sea levels are expected to continue to rise.

“We have a responsibility for being the caretakers of life’s diversity on this planet,” Olsen says. “From a more utilitarian perspective, we simply do not understand completely yet the role that every species plays in its ecosystem, and the loss of any species could have far-reaching consequences.”

WHEN LOOKING for a mate outside of their pair bond, female coastal plain swamp sparrows (Melospiza georgiana nigrescens) choose males with large bills, according to a University of Maine-led study conducted along Delaware Bay. Small-billed males are more at risk of being cheated on by their mates. Males with larger bills than their avian neighbors, on the other hand, sire a greater percentage of young birds in their territory, says Brian Olsen, assistant professor in UM aine’s School of Biology and Ecology, and the Climate Change Institute. Thus, Olsen says, sexual selection may explain why males have larger bills than females along the Delaware coast. Conventionally, bird bills have been considered one of the premier examples of how diet shapes morphology: the right tool for the right job, he says. For the past 40 years, researchers have explained differences between the shapes of male and female bills by differences in diet. But Olsen and his colleagues say their research suggests that female mating preferences alone could do it.
HE UNIVERSITY of Maine’s Modular Ballistic Protection System saved lives inside the United States consulate during a September 2013 attack in Afghanistan’s Herat province, according to a U.S. State Department official, who notified Tex Tech Industries (TTI), the commercial manufacturer of the ballistic panels, of the news.

“There’s a great deal of satisfaction knowing that something we developed and designed is being used and is helping to save lives,” says Paul Melrose, engineering manager in the university’s Advanced Structures and Composite Center.

The Modular Ballistic Protection System project began in 2005 at UMaine when the U.S. Natick Army Soldier Research, Development & Engineering Center contracted with the university for five years to develop a product to safeguard soldiers from enemy fire and projectiles as they worked, slept and ate in military vinyl tents. Two years later, UMaine unveiled its creation.

At that time, the panels had wood cores surrounded by advanced textiles and fibers. In 30 minutes and with no tools, four soldiers could up-arm a 20-foot-by-32-foot tent with the lightweight portable composite ballistic panels. The ballistic panel system won the 2007 American Composites Manufacturers Association’s Best of Show Award and the People’s Choice Award for the highest degree of design and innovation, and best use of composite materials.

University researchers have continued to develop and improve the ballistic panels for use in military tents with various functions, shapes and sizes. UMaine students, including veterans who served in Afghanistan and Iraq, assist the researchers.

Healthy icons

UMAINE OPERATES the Animal Health Lab with support from Cooperative Extension as a service to the state’s veterinarians, livestock producers and animal owners. The lab is used to perform diagnostic services in necropsy, microbiology, virology and pathology. The lab is part of the Northeast Wildlife Disease Cooperative (NWDC), a diagnostic and research collaborative composed of a regional group of wildlife health laboratories. Through the cooperative, multiple institutions contribute skills and knowledge, and pool resources to fund a cost-effective and efficient means of detecting, diagnosing and addressing wildlife disease events, according to the group’s website. “We’re using each other as colleagues and resources more than we used to. I think it will have important impacts,” UMaine’s Dr. Anne Lichtenwalner says of NWDC and the database it’s creating for sharing information.

IN 2009, UMaine approached Tex Tech Industries (TTI), a major manufacturer of ballistic body armor with a facility in North Monmouth, Maine, to produce ballistic panels on a commercial scale. Moe Mabrouk, TTI’s executive director of operations, says the collaboration is a perfect fit. Now TTI is developing partnerships with other Maine-based companies and is working to sell the ballistic panels to agencies and corporations that have employees in high-risk locations worldwide. In 2010, UMaine signed another contract with the U.S. Army.

HE HEALTH of Maine’s moose is a top priority for researchers and students at the University of Maine’s Animal Health Laboratory. Lab director Dr. Anne Lichtenwalner was approached five years ago by a Maine Department of Inland Fisheries and Wildlife moose biologist who wanted to know the cause of occasional calf deaths.

In the past two years, Lichtenwalner, a veterinarian and assistant professor of animal science, and her students have examined over 150 sets of lungs from Maine moose. Many were infected with lungworms, winter ticks and lung cysts. Lungworms, which can cause pathology and pneumonia, and may contribute to death, were found in over 25 percent of moose evaluated in 2012–13.

Echinococcus granulosus (EG), the intermediate stage of a tapeworm, was found in the form of lung cysts. The lab published information about EG online and informed state veterinarians to remind clients that tapeworm medication is advised for dogs that may eat infected moose meat or viscera.

The lab is also part of a two-year tracking study assessing the health of moose in Maine and New Hampshire. The lab conducts blood work and processes tissues from the 90 radio-collared Maine moose to test for diseases and parasites.

UMaine Today Spring 2014
Today Spring 2014

Quality data

UNIVERSITY OF Maine researchers have designed a handheld device that can quickly detect disease-causing and toxin-producing pathogens, including algal species that can cause paralytic shellfish poisoning. The device — a colorimeter — could be instrumental in monitoring coastal water in real-time, thereby preventing human deaths and beach closures, says lead researcher Janice Duy, a recent graduate of UMaine’s Graduate School of Biomedical Science and Engineering. Duy is now conducting postdoctoral research at Fort Detrick in Maryland.

The research team, which includes UMaine professors Rosemary Smith, Scott Collins and Laurie Connell, built a prototype two-wavelength colorimeter using primarily off-the-shelf commercial parts. The water-resistant apparatus produces results comparable to those obtained with an expensive benchtop spectrophotometer — a top-shelf spectrophotometer can cost about $10,000.

A touch screen prompts users at each step of the protocol. Researchers note that an Android app is available to enable smartphone integration of the measurement system.

The colorimeter is being used in fresh and marine water testing in the Republic of Korea, and several devices will be field tested by state officials in Maine this summer.

A NEW app developed by a University of Maine graduate student allows iPhone users to take water quality measurements. The goal is to crowdsource water quality data, says Thomas Leeuw, an oceanography student from Lincoln, VT. As part of his master’s thesis, Leeuw developed HydroColor, an app that uses three photos to measure the reflectance of natural water bodies. Based on the reflectance values, the turbidity or level of suspended sediment in a given water body can be measured. “What we’re measuring is the reflectance of the water and the particles inside it,” Leeuw says. “To make reflectance measurements, oceanographers use precision instruments called radiometers. HydroColor is taking what a lot of ocean scientists do with radiometers and satellites, and applying it to an iPhone camera.” The process requires three photographs — a photographer’s gray card, and photos of the sky and water. By aggregating data from many people over large spatial and temporal scales, HydroColor can determine the typical turbidity or chlorophyll values for different environments. The interactive online database can then be used by laypeople or lake association officials to help monitor changes, such as increased algal bloom occurrences or erosion leading to higher suspended sediment.

“TAKING APART” a broken laptop, learning how to repair it and putting it back together is a typical exercise in one University of Maine English class. For students in ENG416: Technical Editing and Document Design, learning how to diagnose and repair electronics is essential to writing about the process in the form of easy-to-use consumer guides.

Since 2011, students in Charlye Dua’s class have been required to create an e-manual for iFixit, a website that offers free step-by-step guides to help consumers repair devices to keep more electronics in use and out of landfills. “This experience is important because it is messy,” says Dua, an associate professor of English and coordinator of UMaine’s professional and technical writing program. “When things ‘fall apart’ or the projects don’t go as well as I would like, I love it, because they’ll face those obstacles on the job every day.”

Students work with iFixit’s technical writers to adhere to the company’s guidelines. As a result, they receive feedback from someone besides the professor while working in a supportive classroom setting.

In 2003, iFixit was started by two California Polytechnic State University students who struggled to fix an iBook without instructions. In 2009, the company started the iFixit Technical Writing Program as a way to engage students with a hands-on, repair-focused technical writing project. Students from 20 universities — including UMaine — have created 5,000 repair guides for electronics, which have helped more than 9 million people fix their devices, according to the company’s website.

Dua says the project also benefits potential employers by sending students into the workforce with real-world experience. “It’s one thing to go to an interview and claim to be able to write instructions because you practiced during a class assignment. It’s another thing to say you took apart a scanner and wrote instructions for replacing the scanner lamp, and then provide a link to a published guide that people use,” Dua says.

KC Collins Cook, a 2013 UMaine graduate who earned an undergraduate degree in English with a concentration in professional and technical writing, is an information developer for IBM in North Carolina. She says every day she applies the knowledge she learned from Dua’s class.

We leave campus with a competitive skill set that sets us apart from other new college graduates in our field.”

KC Collins Cook

UMaine English students have written step-by-step, how-to-yourself manuals for:

- Sony Ericsson QuickShare T630 (cell phone)
- Visioneer OneTouch 7400 USB (scanner)
- Motorola Adventure V750 (cell phone)
- Olympus Camedia D-560 (camera)
- IBM ThinkPad R40 (laptop)
- iMac (computer)

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- iMac (computer)
The new Innovative Media Research and Commercialization (IMRC) Center was dedicated with a ribbon-cutting ceremony and afternoon conference celebrating innovation and the state’s creative economy Jan. 9.

The 15,000-square-foot IMRC Center in the recently renovated Stewart Commons is home to UMaine’s Department of New Media and the MFA in Intermedia Program. Students and other Maine entrepreneurs benefit from its resources, including state-of-the-art equipment, professional expertise and mentoring, and technical support in creative production and prototyping.

The goal of the IMRC Center is to re-envision creative teaching, learning and research, linking new media and innovative problem solving with science and technology.

The more than $10 million renovation of Stewart Commons, also home to the Wyeth Family Studios Art Center, was funded in part by a Maine Technology Asset Fund award from the Maine Technology Institute.

“Concept to reality

IMRC CENTER resources support cutting-edge research and technological experimentation, advancement and production. The center includes an electronics lab, where students design and print circuit boards and build other electronics; audio and video production labs that include video editing studios, an electronic music studio and recording post-production studios; a fabrication studio that includes traditional tools, such as a table saw and drill press, as well as more innovative tools like a plastics forming machine and computer numerical control (CNC) equipment; a prototyping studio with 3-D and large-format printers, and a laser-cutter engraver; and a large multipurpose production space that includes a projection screen for movies inside or outside, a stage to host concerts and a 360-immersive video room for virtual reality experimentation.

"The level of energy and excitement that can come out of providing these services to the university, the area and the state is really important.” Owen Smith

"It’s neither just a pure research facility nor is it an auxiliary facility that might just be connected to outside sources,” says Smith, the Alston D. and Ada Lee Correll Chair in New Media, and director of the Intermedia MFA Program. “The basic idea is that by bringing together professionals — whether it be individuals or businesses — with students, faculty and staff, we can create a real hub of activity in new media.”

The center includes two high-end computer classrooms, a PC- and Apple-capable classroom, and a nontraditional wireless classroom to support students with laptops, cell phones or tablets.

“We have a full range of production facilities and digital media production tools that connect to physical production,” Smith says. “We’re providing access to tools and equipment to the range of innovative, creative people who have ideas and need help putting the ideas into form.”
SEVERAL YEARS ago, Dennis Willette thought he was king of the world when, for $1, he scored three cans of dog food to eat. He was homeless, hungry and drinking alcohol to dampen his bipolar disorder. Then a farm manager at a local organic homestead enrolled Willette in the University of Maine Cooperative Extension's Master Gardener Volunteers Program.

“I liked being outside, but the only thing I had ever grown were tomatoes in a white bucket,” says Willette. During the 40-hour Master Gardener Program, he fell in love with horticulture, was inspired by people he met and was motivated by the ability to help feed himself and others. He learned to can fresh vegetables and he built a root cellar.

“It was life-changing for me,” says Willette, who once owned a catering company.

Now 55 and a Master Gardener Volunteer, Willette has a place to call home and is enrolled at York County Community College. He plans to transfer to UMaine or Unity College to study sustainable agriculture and/or renewable energy.

This October, Willette will share his experiences at the Maine Hunger Dialogue at UMaine. Students and staff from colleges statewide will gather at the conference.

“A call to action
Reenvisioning food to address Maine’s need

By Beth Staples
Oct. 16–17 to brainstorm and take action to eradicate hunger, a scourge that affects 200,000 Mainer, 49 million Americans and 892 million people on the planet who do not have enough to eat, according to Good Shepherd Food Bank, Feed America and stopthehunger.com.

COLLEGE STUDENTS are among the hungry. Hunger plagues those attending class in ivy-covered brick buildings just as it afflicts veterans, babies and the elderly who make choices about whether to buy medication, heating fuel or food.

Hunger is the world’s No. 1 health risk, killing more people each year than HIV/AIDS, malaria and tuberculosis combined; 60 percent of all hungry people are women; and every 10 seconds, a child dies from hunger-related diseases, according to World Food Programme.

Lisa Morin, coordinator of the University of Maine Bodwell Center for Service and Volunteerism, says some graduate and upperclass students living off campus struggle trying to balance tuition, rent and food costs.

In 2009, UMaine opened a campus food pantry to help. In the fall 2013 semester, Morin said 27 new clients were among those who made the 300 visits to the Black Bear Exchange in York Complex. Because food is donated and supply is limited, each client is restricted to 15 food items once a week. Morin said faculty have told her they buy food for students in need.

That generosity is important because an estimated 35 percent of Mainer who are food insecure do not qualify for government assistance, says Barbara Murphy, a UMaine Extension educator.

In 2000, UMaine Extension initiated Maine Harvest for Hunger as a way to address food insecurity by encouraging farmers and gardeners to donate fresh fruits and vegetables to soup kitchens, food pantries and people in need. Murphy said UMaine Extension’s enthusiastic Master Gardener Volunteers, including Willette, are vital to the program’s success.

IN THE last 13 Harvest for Hunger growing seasons, UMaine Extension and participating gardeners, farmers, civic organizations, schools, businesses and volunteers have donated more than 600 tons of fresh produce. Maine Hunger Dialogue grew out of a desire to do more.

UMaine Extension contributes to a well-functioning food system in which policy, research, production, processing, commerce, nutrition, and food security and safety are integral and integrated.

University of Maine Cooperative Extension is a significant part of the food system in Maine, which has the largest and most diverse agricultural economy in New England.
Compact—a coalition of 17 member campuses whose purpose is “to catalyze and lead a movement to reinvigorate the public purposes and civic mission of higher education.”

Colleges, according to the Campus Compact, are “vital agents and architects of a flourishing democracy.” Murphy says students and staff at these colleges will plan this October what they can do collectively to eradicate hunger.

“Our dialogue will be all about action,” Murphy says. Part of the action includes packaging 10,000 meals (each of which will feed six people) that will be donated to campus-based food pantries in Maine.

MAINE HUNGER Dialogue participants have plenty of inspiration and ideas from which to draw. There’s L.A. Kitchen in Los Angeles, which collects fresh restaurant food that would otherwise go to waste and uses it in a 15-week culinary arts job training program for youth emerging from foster care and adults released from incarceration.

There’s an Arizona State University student team that developed FlashFood app as restaurant managers with extra unserved food can enter their location, and the type and amount of leftovers. Flashfood drivers then send a mass text to app subscribers (churches/food pantries) alerting them to where they will be transporting food for pickup. Their motto: “Fighting Hunger. Reducing Food Waste. Faster.”

And there’s the Food Recovery Network, initiated by students at the University of Maryland in College Park. They collect leftover food from dining halls and donate it to shelters in the Washington, D.C. area. In 2011–12, students provided 30,000 meals for the hungry. The network, which has chapters at 46 colleges in 21 states, strives to be on 1,000 campuses and donate 10 million pounds of food by 2018.

RICHARD BORRINS, author, anthropologist and professor at State University of New York at Plattsburgh, says to understand hunger, it’s necessary to know that food is viewed as a commodity produced for people to purchase, rather than a provision for life. Just as people wouldn’t expect “The Gap to manufacture clothes, Adidas to manufacture sneakers, or IBM to provide computers for those people earning $1 a day or less; likewise, you would not expect ADM (Supermarket to the World) to produce food for them,” he writes on his website.

Eradicating poverty, he says, is necessary to eliminating hunger. Murphy agrees that, in order to solve hunger in the long-term, people need to earn livable wages.

Willette said it’s empowering to do things for himself and others. That includes growing food, weeding a community garden, shopping for bargains and preparing healthy meals on a budget.

“Little steps are the same as a big step,” he says. “It’s about moving forward and giving back.”

In the summer, Willette donates produce to a shelter in South Berwick. In the winter, he stands in line outside a food pantry in Alfred, talking with others waiting for sustenance, including retirees and single working mothers.

Anger, he says, is also a motivator. “We live in a country of great wealth. My story is just one. There are 1,000 different stories and faces. The common denominator is we’re all hungry.”

Food for thought

AT THE 2013 Maine Food Summit, University of Maine President Paul Ferguson said sustainability is a core value of the land grant institution.

“It’s our role to produce graduates who understand and who are committed to sustainability and shaping a vibrant society,” he said. “If we don’t, we’ve missed our mark.”

Members of Food Solutions New England followed with a presentation on a sustainable New England food system based on food as a human right.

Mark Lapping, Distinguished University Professor at the Muskie School of Public Service at the University of Southern Maine; Molly Anderson, Partridge Chair in Food and Sustainable Agriculture Systems at the College of the Atlantic; and Amanda Food, sustainable food systems research and policy consultant, said the vision calls for New England to develop the capacity to produce at least 50 percent of “clean, fair and accessible food” for New Engandians by 2060.

Swedes, the researchers noted, is 80 percent self-sufficient in food products. The researchers presented three possible scenarios, intended to inspire discussion and further study:

• Business-as-usual model: If farmland expanded from 2 million to 6 million acres and people’s diets remain much like they are now—a lot of beef and other animal products, fat and sugar, and few vegetables, fruits and whole grains, as much as 40 percent of people’s food could be produced in New England by 2060.

• Omnivore’s Delight model: If farmland expands to 6 million acres and recovery of the Gulf of Maine fishery is assumed, and if people eat more fruits and vegetables and consume less meat, sugar, saturated fat and processed foods, 50 percent of the diet could be produced in New England.

• Regional Reliance model: If farmland expanded to 7 million acres and people ate even less meat and more legumes and nuts, as much as 70 percent could be produced regionally.

UMaine Extension’s role in fighting hunger in Maine ranges from school and children’s gardening programs to helping the state’s potato industry save more than $20 million annually by managing late blight disease.

The U.S. Department of Agriculture estimates that 200,000 Mainers don’t have enough to eat. That’s why UMaine Extension is committed to initiatives such as Maine Harvest for Hunger.
When University of Maine student Sam Albert signed up for the Blackstone Accelerates Growth Innovate for Maine Fellows Program offered through UMaine’s Foster Center for Student Innovation, he was majoring in computer science and had doubts about his creative abilities.

Two years into the internship program, Albert has changed his major to marketing and is confident that anyone is capable of innovating when given proper training. “The first time I interned was absolutely amazing, so I decided to come back,” says the Eagle Lake, Maine, native. “A lot of other places treat interns like they’re still learning and with us, they gave us high-responsibility jobs. We had major encouragement and motivation.”

Innovate for Maine internships are one facet of Blackstone Accelerates Growth (BxG), an outreach effort to create and sustain jobs and economic development in Maine by supporting entrepreneurship and innovation.

The $3 million effort launched in October 2011 was part of the New York-based Blackstone Charitable Foundation’s five-year, $50 million Entrepreneurship Initiative. The goal: to support innovative programs and spur job creation nationwide.

“Ideas of Blackstone is to work with start-ups and current companies to help them be more innovative,” says Foster Center Coordinator Jesse MacKay.

The internship program has to be the most successful new program that was started since Blackstone came to Maine. It brings needed expertise into companies that could not afford it.”

Susan MacKay

Innovating Maine
Blackstone invests in businesses, students to accelerate growth
By Elyse Kahl
Innovating Maine

Statewide reach
AS OF APRIL 2014, 179 Maine companies have participated in a major BxG program, such as Accelerated Ventures, Top Gun or the Innovate for Maine internship program. Seventy-four of those companies participated in multiple offerings, according to BxG partner Maine Technology Institute (MTI). BxG has hosted, sponsored or presented 89 events, including innovation roundtables, Maine Mentor Network matching events and Top Gun showcase, with more than 1,000 attendees. BxG has also conducted more than 400 one-on-one meetings, connecting entrepreneurs with resources. “In various programs, we have reached every corner of the state,” says Scott Burnett, director of marketing and analytics at MTI. Burnett says he has already seen the positive influence of BxG programs on Maine communities.”

Mortuary. “We’re really looking to help these companies — to make them more competitive.”

FOUNDED IN 1985, Blackstone is a global investment and advisory firm. The Blackstone Charitable Foundation was established in 2007 to use the company’s resources to foster entrepreneurship globally, according to the company’s website. To reach this goal, the foundation created the Blackstone Entrepreneurship Initiative, which includes four models to promote economic gains: Blackstone Accelerates Growth, Blackstone LaunchPad, Blackstone Entrepreneurs Network and Blackstone Organizational Grants.

“Maine’s Blackstone Accelerates Growth was the third project they funded in the country, and they looked to us as a potential model for rural states to support entrepreneurial innovation,” Kelly says. Blackstone Charitable Foundation is also sponsoring programs in North Carolina, Michigan, Ohio, Pennsylvania and Montana.

“Maine and other mostly rural states were chosen for the program with the intent to create growth in rural economies,” says Scott Burnett, director of marketing and analytics at Maine Technology Institute. “The Blackstone Charitable Foundation is trying to make an impact in places that are lagging in business formation and development.”

Kelly, who is also the director of economic development initiatives at UMaine, says the Foster Center and the university play a role in all of BxG’s objectives — accelerating companies, connections, and the next generation of innovators and entrepreneurs.

UMaine’s partnership with BxG is also helping reach the goals of the university’s five-year strategic plan, the Blue Sky Project, including serving the state by catalyzing Maine’s future. The goal is to ensure that the university’s teaching, research, outreach, workforce and economic development programs are in close alignment with Maine’s priority needs, says Jake Ward, UMaine vice president for innovation and economic development.

UMaine’s Foster Center for Student Innovation is responsible for pluging its Innovation Engineering Program into BxG, as well as managing the Blackstone Fellows Innovate for Maine internship program.

Kelly says the university is leading the next generation aspect of the initiative by offering the internship program and awarding scholarships for Innovation Engineering courses at any of the University of Maine System’s seven campuses. Innovation Engineering courses provide a systematic approach to innovation with fundamental concepts, including tools and methods for creating, communicating and commercializing unique ideas.

Crowd-funding champion
PRODUCTS FOR A CLEANER ENVIRONMENT: University of Maine student Emma Wilson has spent most of her senior year working as an intern for Zeomatrix, a small Orono business focused on bringing its patented zeolite technology in odor-absorbing paper products to market. Zeolites are naturally occurring members of a family of volcanic minerals with unique chemical and physical qualities, according to Zeomatrix. The company was founded in 2006 by Susan MacKay to “engineer products for a cleaner environment” while commercializing technologies developed by the company and UMaine faculty, according to Wilson.

BACKING BIODEGRADABLE BAGS: Wilson, of Greenville, Maine, is a double major in management and marketing, with a concentration in international business. She’s also a member of the Honors College. She applied for the Innovate for Maine Fellows Program because she knew it helped local start-up businesses and taught students about innovation. As an intern, Wilson’s major responsibility has been handling the marketing launch of the Zeo Litter Bag — a bag lined with the company’s zeolite technology that absorbs the odor of used cat litter. The bag is also biodegradable and better for landfills, for the marketing campaign, Wilson has done SWOT analyses (a technique used to understand the strengths, weaknesses, opportunities and threats of a company), sales forecasts, usability tests and market research designed and launched the product’s website; shot a crowd-funding video; and started a crowd-funding campaign. The crowd-funding campaign aims to raise money for the first production run of the bags and to spread the word about the product.

CREATE SESSIONS: Wilson says the internship has taught her the importance of teamwork and colleague support. It was fun to come together for “create sessions,” where everyone collaborated and came up with ideas — no matter how crazy — for projects, she says.

ALWAYS WELCOME: Wilson says in the program she learned about marketing and job opportunities in Maine. After graduation, she would like to work first for a marketing firm in Boston or a study abroad company that helps students discover the world, then move back to Maine.

Emma Wilson

My professional goal is to find a career that I genuinely love and am excited about going to every morning. The Innovate for Maine program has taught me that whenever I decide to move back to Maine, I will always be able to find a well-paying job.” Emma Wilson

BACKING BIODEGRADABLE BAGS: Wilson, of Greenville, Maine, is a double major in management and marketing, with a concentration in international business. She’s also a member of the Honors College. She applied for the Innovate for Maine Fellows Program because she knew it helped local start-up businesses and taught students about innovation. As an intern, Wilson’s major responsibility has been handling the marketing launch of the Zeo Litter Bag — a bag lined with the company’s zeolite technology that absorbs the odor of used cat litter. The bag is also biodegradable and better for landfills, for the marketing campaign, Wilson has done SWOT analyses (a technique used to understand the strengths, weaknesses, opportunities and threats of a company), sales forecasts, usability tests and market research designed and launched the product’s website; shot a crowd-funding video; and started a crowd-funding campaign. The crowd-funding campaign aims to raise money for the first production run of the bags and to spread the word about the product.

CREATE SESSIONS: Wilson says the internship has taught her the importance of teamwork and colleague support. It was fun to come together for “create sessions,” where everyone collaborated and came up with ideas — no matter how crazy — for projects, she says.

ALWAYS WELCOME: Wilson says in the program she learned about marketing and job opportunities in Maine. After graduation, she would like to work first for a marketing firm in Boston or a study abroad company that helps students discover the world, then move back to Maine.

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PRODUCTS FOR A CLEANER ENVIRONMENT: University of Maine student Emma Wilson has spent most of her senior year working as an intern for Zeomatrix, a small Orono business focused on bringing its patented zeolite technology in odor-absorbing paper products to market. Zeolites are naturally occurring members of a family of volcanic minerals with unique chemical and physical qualities, according to Zeomatrix. The company was founded in 2006 by Susan MacKay to “engineer products for a cleaner environment” while commercializing technologies developed by the company and UMaine faculty, according to Wilson.

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Igniting innovation
WITH FUNDING FROM Blackstone Accelerates Growth, the University of Maine has awarded more than 150 scholarships — 119 for Innovation Engineering courses, 43 for professional training in Innovation Engineering for businesses and nine to Top Gun Prep entrepreneurs. Since it began in 2012, the Innovative for Maine internship program has offered work to 52 students. Students come from at least 17 colleges or universities with at least 36 majors, including business, marketing, English, new media, engineering, studio art, anthropology, psychology, political science, math, marine science, economics and physics. About 40 companies are participating in the program, providing work to interns and learning from the students’ Innovation Engineering expertise. This coming year, about 50 students and 60 companies are expected to be accepted into the Innovative for Maine internship program.

“Blackstone enabled us to create programs we thought would be important to the state,” Kelly says. “The scholarships have attracted more students, which help build the program, but also build a bigger cohort of students who will be able to create their own company or innovate within an established organization when they get into the workforce.”

She estimates with funding from BAG, the university has awarded more than 150 scholarships to students and entrepreneurs for Innovation Engineering courses and workshops.

The Innovative for Maine internship program is offered as a fellowship to college students who are either from Maine or attending a Maine institution. The students come to the center to get trained in Innovation Engineering before being placed in an internship with a Maine business.

“The Innovative for Maine program is important to provide students with practical opportunities to apply their innovation expertise,” Kelly says. In 2012, the program’s first year, 20 students were selected. In the second year, 30 students were chosen. Today, about 40 Maine companies are participating.

LIKE SAM Albert, Jordan Nickerson, a psychology major from Brewer, is a 2013 Innovative for Maine Fellow. Nickerson says the internship program is important to provide students with practical opportunities to apply their innovation expertise.”

Kelly says. “These companies know other companies and you end up getting to know so many people,” Albert says. “Not only does the program help develop these businesses and industries, but it also prepares us for creating our own business in the future.”

Besides gaining practical work skills, Kelly says the program shows college students they don’t have to leave the state to have a successful career. It also allows the university to show local companies what services and skills UMaine and its students have to offer.

“The internship program is making such a great connection between Blackstone, the University of Maine and Innovation Engineering expertise to the business world,” says Kelly. “The internship program is making such a great connection between Blackstone, the University of Maine and Innovation Engineering expertise to the business world.”

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THE INTERMEDIA MFA Program offered them a $500 scholarship fund that could really turn a small, home, Internet-only business into something that could really turn a profit for us and potentially change our lives, which is pretty awesome.”

The Foster Center is giving us the opportunity to go from a small, home, Internet-only business to something that could really turn a profit for us and potentially change our lives, which is pretty awesome.”

ZOMBIES, NINJAS AND CUPCAKES: One night, the pair was looking at zombie cutouts John had made using the IMRC Center’s laser cutter. He envisioned putting bases on the figures and selling them as board game pieces. But then they asked: “What if we put a spike on this and stick it in a cake?” Christine says they then joked about having a lone survivor among a bunch of zombie-tripped cupcakes. “And that was sort of like our aha moment,” Christine says.

LIFE-CHANGING POTENTIAL: The Intermedia MFA Program offered them a $500 scholarship fund grant under a few conditions: They had to write a statement about their business and their intentions, show receipts and talk to Foster Center coordinator Jesse Moriarity. Foster Center supplied office space, and helped with the necessary paperwork, business contacts and publicity. During the 2012 holiday season, the business took off, with 100 Etsy orders in the first month for ornaments and zombie, ninja and octopus teatime toppers.
that there are faculty, students and people in the community who are entrepreneurial and innovative. It gives them an opportunity to get together and learn about what each other is doing,” Kelly says.

Sarah Newcomb, a UMaine doctoral student in behavioral economics and a research assistant in Maine’s Sustainability Solutions Initiative, won the Big Gig’s first pitch-off event in October with “Who’s Your Daddy?” The app she wants to develop allows shoppers to scan products to learn more about parent companies. UMaine students John and Christine Carney won the second pitch-off with their business, Thick & Thin LLC, which sells quirky acrylic cupcake toppers, jewelry and ornaments.

Maine’s Blackstone Accelerates Growth was the third program they funded in the country, and they looked to us as a potential model for rural states to support entrepreneurship and innovation.” Renee Kelly

Innovation central

FOSTER CENTER for Student Innovation at the University of Maine is the home of the Innovate for Maine internship program and the campus hub of Blackstone Accelerates Growth (BIG). Innovation Engineering courses taught at the center are key in helping the growth of Maine companies and the future workforce — two major goals of the BIG initiative.

Innovation Engineering provides a systematic approach to innovation with fundamental concepts, including tools and methods for creating, communicating and commercializing unique ideas. The courses, open to all students in any major, are designed to explore methods of communication, validating ideas, business planning, collaborating and creative thinking — concepts that can be applied in any career. The program aims to spark student’s ability and desire to use their education in a professional setting. For businesses, Innovation Engineering can help address problems and opportunities — from sales and profits to transforming company culture.

Innovation Engineering courses began at the University of Maine in 2005, and four years later, were approved for a minor. Since 2010, the Foster Center has also provided training to more than 1,000 Maine business, government and nonprofit leaders. The center’s programs cover topics taught in the classroom in a compressed format, with a focus on how to innovate new product and service ideas.

Doug Hall’s top tips for innovating

1. FILL YOUR BRAIN
   - Think of your brain as an immense database of wisdom, experience, emotion, facts and solutions. When faced with a challenge, your brain searches the library in your head to make a connection and find a solution.

2. DIVERSITY
   - While group brainstorming isn’t always effective, leveraging diverse opinions and perspectives has an exponential effect on your ability to create ideas. By calling experts or requesting advice from colleagues or customers via email for additional thoughtful responses.

3. DRIVE OUT FEAR
   - Research finds that as fear increases, the number of big ideas generated decreases. Fear of the unknown, fear of rejection and fear of exposure are all real threats to innovation. The best way to combat fear is to take action. Take the unknowns and break them down into small pieces that can be tackled to build momentum. We call it “fail fast, fail cheap.” Instead of trying to build something perfect from the start, learn what works and what doesn’t in manageable doses.

4. PROBLEM, PROMISE, PROOF
   - Almost all innovations solve problems. Know who your audience is and solve their problem with a better solution than currently exists. That’s what we call meaningful uniqueness. Be sure to understand and communicate the promise that your innovation has to solve the problem, and proof of how it works.

5. CLEARLY AT THE START
   - Many organizations try to innovate without real forethought of what they want to accomplish and how. That is like trying to drive across the country without a GPS or road signs. Before you start to create ideas, think about the mission of the organization and its important opportunities. What are the constraints of the organization? What kinds of ideas are you not interested in? With this kind of thinking at the beginning of the process, you stay focused on the right course when the inevitable roadblocks turn up.
Innovating Maine

“The nice thing about what I’ve learned is that it can be applied anywhere. Everybody in every company can be innovative.”

Jordan Nickerson

...together that will make those companies successful and help them overcome their biggest obstacles to growth,” Kelly says.

Accelerated Ventures companies usually use the program for three to nine months, and receive subsidies of up to $10,000 each. Some companies remain BxG community leaders, helping build a community of professionals by serving as role models at Innovation Hub events and providing work for Innovate for Maine Fellows.

Burnett describes the Accelerated Ventures as “having the right stuff.” He says they were chosen for being entrepreneurial and innovative, with opportunities for growth and a strong management team.

BxG expects to add another dozen Accelerated Ventures by the end of 2014 through a competitive nomination process. One of the eight companies in the Accelerated Ventures Program is Cerahelix, based at the university’s Target Technology Incubator in Orono, which has developed a nanoceramic coating to make efficient filters. CEO Susan MacKay says opportunities provided by BxG are essential to growing a successful entrepreneurial community in the state.

Cerahelix was selected as an Accelerating Venture in the program’s first year. BxG has provided an Entrepreneur in Residence, assistance with commercialization and interns. In return, Cerahelix has participated in BxG events.

“The internship program has to be the most successful new program that was started since Blackstone came to Maine,” MacKay says. “It brings needed expertise into companies that could not afford it.”

The Innovate for Maine internship program recruits and interviews students, pays a share of the intern stipend, and provides additional supervision and instruction for the interns, MacKay says.

“I could not afford the time, nor attract the caliber of intern that I received with my own resources,” says MacKay. “I hope the programs that have initiated and expanded with the Blackstone resources continue after this initial phase. I believe this is the best way to create a diverse and vibrant economy for the state.”

Burnett believes BxG is gaining momentum, and he has high hopes for the program in 2014.

“Last year was a very strong year in helping build the foundation, and 2014 is really the year for acceleration,” says Burnett, who credits BxG Operations Director Martha Bentley, and BxG strategy and leadership team members — Kelly of UMaine, Don Gooding of MCED and Joe Migliaccio of MTI — with bringing the partner organizations together.

The long-term goal of BxG is to create a sustainable entrepreneurial community, Burnett says. He sees BxG continuing beyond the four pilot years in some form, evolving to best address the needs of Maine’s entrepreneurs.

Alumnus studies healthcare communication as an intervention to combat recidivism and untreated substance abuse in the growing global prison population

By Margaret Nagle
How did your research in communication come to dovetail into the public health field?

There’s a strong link between communication of health-related information (e.g., sex-risk behaviors or drug-risk behaviors) and health outcomes (e.g., reduction of risk-taking behaviors) in a variety of contexts. During graduate school (both M.A. and Ph.D.), my research and training focused on how communication about one’s gender and sexual identities influences how others perceive and evaluate one another. During that time, I regularly came across evidence of drug use as a coping strategy among LGBT youth, which is obviously a risk factor for adverse health outcomes, including HIV. I also discovered that research on novel approaches to treating drug abuse among this population, including HIV, has proven to be an invaluable skill. John Sherblom provided me the strength to approach this problem of drug abuse, favoring incarceration over treatment. This approach has led to explosive growth in the global prison population, untreated substance use disorders and high rates of recidivism.

Why was communication your field of study?

Consistent with my current interest in gender, my master’s thesis examined the relationship between gay men’s childhood interactions with family members and their present-day perceptions about themselves and the gay community. During that time, I regularly came across evidence of drug use as a coping strategy among LGBT youth, which is obviously a risk factor for adverse health outcomes, including HIV. I also discovered that research on novel approaches to treating drug abuse among this population, including HIV, has proven to be an invaluable skill. John Sherblom provided me the strength to approach this problem of drug abuse, favoring incarceration over treatment. This approach has led to explosive growth in the global prison population, untreated substance use disorders and high rates of recidivism.

Telling about your research in substance abuse, infectious diseases and health outcomes.

My current research addresses the syndemic of incarceration, substance use and HIV. Many nations, including the U.S., have taken a punitive approach to the problem of drug abuse, favoring incarceration over treatment. This approach has led to explosive growth in the global prison population, untreated substance use disorders and high rates of recidivism.

In Malaysia, our research team is studying the efficacy of initiating individuals into medication-assisted treatment for opioid (e.g., heroin) dependence in order to stabilize them before they re-enter the community, thereby reducing the likelihood of relapse to drugs. We also aim to link them to healthcare and support services in the community. Likewise, in Ukraine, my colleagues and I are studying new communication-based interventions among people who inject drugs. The goal is to increase their motivation to enter treatment and counseling for their addiction. In addition to these projects, I am also planning a large-scale study of sex workers in Malaysia to determine the prevalence of sexually transmitted infections, including HIV, and evaluate the accessibility of healthcare services to this population. The goal of this study is to identify potential interventions to increase access to — and use of — healthcare services among persons engaged in sex work, and also to understand what factors influence health-seeking behavior (e.g., violence, poverty, police harassment).

Why was communication your field of study?

Communication is a dynamic, challenging and adaptive area of study. It’s at the core of nearly all our interactions and has enormous power on our attitudes, beliefs and behaviors, including those related to our health. I chose communication for these very reasons — it defines who we are.

Why UMaine for a master’s?

In addition to having outstanding and prolific faculty, I chose UMaine’s master’s program in communication because it provided training across research methodologies, including quantitative, qualitative, as well as critical, which, looking back on it, has proven to be an invaluable skill. Whereas most social science programs train students in one particular mode of academic inquiry (e.g., experimental design, ethnography), UMaine provided training across these methods. This invaluable approach has given me the strength to work across disciplines and has framed how I approach all of my research today.

What research were you involved in for your master’s?

The goal of this study is to identify potential interventions to increase access to — and use of — healthcare services among persons engaged in sex work, and also to understand what factors influence health-seeking behavior (e.g., violence, poverty, police harassment).

Who was your favorite UMaine professor — and why?

UMaine’s communication faculty are what make the program so exceptional. John Sherblom provided me outstanding training and mentorship in research methods and statistics. He also gave me the opportunity to serve as an editorial assistant to the journal Communication Research Reports.

How does UMaine continue to influence your life?

UMaine is at the heart of my work — the training I received there is at the center of all my work today.
How sweet it is

By Beth Staples and Elyse Kahl

THE MAINЕ maple syrup that enhances the flavor of pancakes and ice cream also sweetens the statewide economy. University of Maine economist Todd Gabe says that, including multiplier effects, Maine’s maple industry annually contributes about $49 million in revenue, 805 full- and part-time jobs, and $25 million in wages to the state’s economy.

Multiplier effects occur when an increase in one economic activity initiates a chain reaction of additional spending. In this case, the additional spending is by maple farms, businesses that are part of the maple industry and their employees.

Maple producers provided information about their operations, which allowed for a detailed economic impact analysis, says Gabe, whose study was released in February. Each year, the industry directly contributes about $27.7 million in revenue, 567 full- and part-time jobs, and $17.3 million in wages to Maine’s economy, he says.

Maple producers earn about 75 percent of the revenue through sales of syrup and other maple products, including maple candy, maple taffy, maple whoopie pies and maple-coated nuts, he says.

Retail sales at food stores and the estimated spending of Maine Maple Sunday visitors on items such as gasoline and meals accounts for the remainder of revenue. This year, Maine Maple Sunday was celebrated March 23 at 88 sugar shacks and farms statewide.

Maine has the third-largest maple industry in the United States. According to the United States Department of Agriculture, maple syrup is produced in 10 states — Connecticut, Maine, Massachusetts, Michigan, New Hampshire, New York, Ohio, Pennsylvania, Vermont and Wisconsin.

In 2013, Maine accounted for 450,000 gallons, or 14 percent, of the more than 3.25 million gallons produced in the U.S. Vermont (1.32 million gallons) and New York (574,000) were the top two producers.

Among the three top-producing states, Maine had the highest growth rate — 25 percent — of production between 2011 and 2013, Gabe reports.

In Maine, the maple production industry appears to be dominated by a few large operations; the 10 percent of maple farms with 10,000 or more taps account for 86 percent of the total number of taps in the state, he says.

While the maple producers who participated in Gabe’s study had an average of 4,109 taps, almost 40 percent of Maine’s maple producers had fewer than 250 taps. The study participants have been tapping trees and boiling sap for an average of 24 years.

Depending on temperature and water availability, the length of the sap flow season varies. In Maine in 2013, it ran from March 4 to April 12.

Close to 40 percent of the maple producers licensed in Maine returned surveys for the study, which received financial support from the Maine Agricultural Development Grant Fund and Maine Maple Producers Association.
How sweet it is

Making the grade

Maple school ensures a top-quality product

DECADE AGO, New England maple syrup industry experts offered a presentation for producers, bulk syrup buyers, state inspectors and others who need to accurately grade maple syrup or maple products for contest judging, commercial distribution or personal use. Continued requests from interested participants convinced the organizers to offer the presentation annually as a class, and the International Maple Syrup Institute adopted the program as a signature event — the Maple Grading School.

In 2004, Kathryn Hopkins, a University of Maine Cooperative Extension educator and professor; Henry Mardikes, of the Vermont Agency of Agriculture, Food and Markets; and Sunner Dole, a University of New Hampshire Cooperative Extension forest resources educator, offered their first presentation on maple grading in Lancaster, N.H.

“We held the first school and thought we’d be done,” Hopkins says. “We enrolled 35 people — which was too many — and had a waiting list, so we decided to offer two years of the school. After that, we still had a waiting list and people started asking for the school to come to them.”

The two-day school, also known as a maple quality assurance program, aims to help U.S. and Canadian maple producers achieve consistent understanding of grading and quality standards to benefit consumers. It is offered by UMaine Cooperative Extension; the Vermont Agency of Agriculture, Food and Markets; and the International Maple Syrup Institute — a nonprofit organization founded in 1975 to promote and protect maple syrup and other maple products, according to the institute’s website.

The grading school’s location changes annually, with classes held in Maine, Vermont, New Hampshire, Ohio, Connecticut, Minnesota and Canada. Participants receive the latest information on grading, equipment calibration, food safety, quality control and best management practices from Canada and the U.S. A strong scientific base with hands-on exercises provide the foundation for increasing grading knowledge, with the long-term goal of helping save money by increasing profits and sales, or reducing costs and waste.

Although the USDA has established maple syrup grades, many states and Canadian provinces have their own regulations for production, licensing and grading. The USDA and the Canadian Food Inspection Agency are changing their regulations to conform to new international grade standards.

“We’re not telling them anything they don’t know or can’t find in a book, but the hands-on element is key to the school’s success,” says Hopkins of the more than 200 participants who have attended the school since it began in 2004. Participants range from hobbyists and agricultural high school instructors to commercial producers and inspectors.

Hopkins, an agriculture and natural resources expert, works with maple syrup producers statewide, and with farmers, Master Gardener Volunteers and home gardeners in Somerset County, which produces more maple syrup than any other county in the United States. Hopkins’ research focuses on issues related to the maple industry, such as food safety and consumer acceptance of maple products.

People are really concerned about the quality of the product and are protective of its image. Producers are proactive on behalf of the industry and aren’t just waiting for something to go wrong. It has been great working for an industry that cares.” Kathryn Hopkins

Syrup safety

HELPING ENSURE that the beloved syrup of New England is safe from microbes, including those created in the storage process, is the focus of an independent research project by third-year food science student Kaitlyn Feeney, of Hiram, Maine. Last year, Feeney began looking at the toxic mycophenolic acid (MPA), MPA has its benefits. It is used with surgery patients who undergo a transplant to help suppress the immune system enough to save the body into accepting the organ. The same mold can grow on syrup after consumers fail to refrigerate open containers. Feeney is studying MPA found in syrup to further verify storage safety. Her work in the Food Chemical Safety Laboratory, directed by Assistant Research Professor Brian Perkins, is part of UMaine’s ongoing efforts to develop testing methods for syrup safety.

Have you worked closely with a mentor?
Dr. Brian Perkins offered me a job in his lab when I was a first-year student. At first I thought I would just be washing dishes and cleaning up the lab. I had no idea I would actually be learning so much about food science. Dr. Perkins has taught me how to use almost every piece of equipment in the lab and I have learned how to run tests and analyze data myself.

Have you had a UMaine experience that’s shaped how you see the world?
Absolutely. I never knew about food science until I came to UMaine. There are so many opportunities in the food industry that I never really thought about. I always took for granted that there would be a safe and abundant food supply here in the U.S. I never thought about who is helping to make sure our food supply is safe or what research has been done to conclude that blueberries are good for you. Now I am going to be one of those people.

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UNDERSTANDING MORE about the relationship between weather and maple sap flow, and how Maine syrup producers will adapt to climate change is the focus of research being conducted by University of Maine graduate student Jenny Shrum. The master’s student in ecology and environmental sciences is attempting to unravel the biophysical relationships between weather and sap flow. She wants to better understand what drives flow and how trends in climate may affect processes and harvesters.

This spring, Shrum collected on-site weather station data and sap flow rates at three test sites, and is interviewing small- and large-scale producers. The goal is to determine if longtime sugar maple stand managers will be more or less resilient to climate change, and if large-scale producers will be better equipped to adapt. Her research is supported by the National Science Foundation and EPSCoR through Maine’s Sustainability Solutions Initiative and its Effects of Climate Change on Organisms research project.

The physiological process for sap flow is not completely understood, Shrum says. It involves a complex interaction between freezing and thawing of the xylem tissue and the molecule sucrose, which maple trees produce during photosynthesis in the summer and convert to carbohydrates to store energy between seasons.

Sugar maple trees grow as far north as New Brunswick and as far south as Georgia, yet maple syrup is only produced commercially in the most northern states because of the colder weather, Shrum says. In Maine, the season usually starts sometime between the middle of February and the middle of March, and continues for about six weeks.

“Studies are starting to show that the preferred block of time for tapping is starting earlier if you base it on ideal temperatures,” Shrum says, citing a 2010 Cornell University study by Chris Skinner that found that by 2100, the sap season could start a month earlier than it does now. For big-time operations, Shrum says an earlier season probably won’t be a problem, but she’s not sure how smaller Maine operations will adapt.

To record weather and sap flow data, UMaine graduate student Jenny Shrum deploys weather stations at maple tree stands in Albion, Dixmont and Orono. She’s also using iButtons to record soil temperatures and time-lapse photography of the buckets to record hourly sap flow rates. She can then relate flow rates to variables the weather stations record, such as temperature, precipitation and sunlight.
Throughout 2014, the University of Maine Museum of Art is celebrating the permanent collection through a series of exhibitions, which this spring included, From Piranesi to Picasso: Master Prints from the Permanent Collection.

In 2014, the University of Maine Museum of Art launched a yearlong celebration of its permanent collection with From Piranesi to Picasso: Master Prints from the Permanent Collection. The exhibition was one of the collection’s largest installations featuring 70 of the museum’s finest works that highlight printmaking.

Two additional exhibitions in the coming year will showcase some of the newest acquisitions in photography, paintings, works on paper and sculpture. UMaine’s growing permanent collection contains more than 3,600 pieces.

“We’re celebrating the permanent collection — both its early development and its future growth,” says George Kinghorn, the museum’s director and curator.

The master prints exhibition contained original prints from the 18th century to the late 1980s by internationally renowned artists such as Winslow Homer, Andy Warhol, John Marin, Kathe Kollwitz, Susan Rothenberg and Edward Hopper. Exhibit highlights included Giovanni Battista Piranesi’s 1748–72 etchings that document Rome’s architectural landmarks; Francisco Goya’s aquatint and etchings from Los Caprichos; and Pablo Picasso’s Faun.
Unveiling a Woman, considered to be one of his most significant graphic works.

Kinghorn says UMMA is the region’s art museum, with a collection belonging to Maine residents. He says during the master prints exhibition, many visitors said they had no idea the stature of the museum’s collection, and were delighted to see work by artists such as Homer and Picasso in their own backyard.

“You don’t have to travel to New York City to see these works. That’s what makes it special,” Kinghorn says. For instance, the museum is home to the same impression of Picasso’s Jacqueline in a Straw Hat that is owned by the Metropolitan Museum of Art in New York City.

The beauty of the collection is its variety and range of work that includes realism, pop art, abstract expressionism and cubism, says Kinghorn. The museum’s collection features artwork created since 1900, with an emphasis on contemporary art (1945–present).

Original prints are created by the artist, sometimes working with the assistance of a master printer to make a limited set of prints without using mechanical processes. In an exhibition like the one earlier this year, students and the public learn about prints that demonstrate etching, silk-screen, woodcut, lithograph, drypoint and engraving. The museum, which serves the university, general public and Maine school systems, often hosts speakers or events related to exhibitions.

The university’s art collection was established in 1946 by founding museum director and UMaine art professor Vincent Hartgen. The collection became a museum in the 1980s and has been sited in downtown Bangor for more than a decade, extending UMaine’s reach and service to the community in keeping with the land grant mission of the university, Kinghorn says.

UMMA’s focus on modern and contemporary art distinguishes it from other Maine museums, Kinghorn says. It offers new exhibitions of contemporary art from across the country every three months. And since 2007, the museum has seen an annual attendance increase of more than 250 percent.

The majority of the works in the master prints collection were donated to the museum. Most of the prints were given by Robert Venn Carr Jr., a UMaine alumnus who donated 303 pieces starting in 1986.

“These donors have entrusted their works to us so we can conserve, interpret and exhibit them for the enjoyment and education of Maine residents and visitors to the state,” Kinghorn says. “Through their donation, they acknowledge the important role the museum plays in Maine’s cultural life.”

Collected works

You don’t have to travel to New York City to see these works. That’s what makes it special.”  George Kinghorn

Pablo Picasso
Jacqueline au Chapeau de Paille
(Jacqueline in a Straw Hat), 1962
Color woodcut
Gift of Robert Venn Carr Jr., Class of 1938
Collected works

Giovanni Battista Piranesi
Veduta della Basilica de S. Giovanni Laterano, 1750
Etching
Gift of Dr. and Mrs. Howard J. Means

Richard Estes
D Train, 1988
Screenprint
Gift of an anonymous donor

Jasper Johns
#6 (After "Untitled, 1975"), 1976
Lithograph
Gift of Robert Venn Carr Jr., Class of 1938

Francisco Goya
Nadie Se Conoce (Nobody Knows Himself) from Los Caprichos, 1799
Aquatint, etching
Museum Purchase

Käthe Kollwitz
Brustbild einer Arbeiterfrau mit blauem Tuch (Portrait of a Working Woman with Blue Shawl), 1903
Lithograph
Gift of Robert Venn Carr Jr., Class of 1938
Collected works

Pablo Picasso
Faune dévoilant une Femme (Faun Unveiling a Woman), 1916
Aquatint and etching
Gift of Robert Venn Carr Jr., Class of 1938

Roy Lichtenstein
Reclining Nude, 1962
Woodcut with embossing
Gift of Robert Venn Carr Jr., Class of 1938

David Hockney
Afternoon Swimming, 1979
Lithograph
Gift of Robert Venn Carr Jr., Class of 1938

Edward Hopper
Lonely House, 1922
Etching
Gift of Adeline F. and Caroline R. Wing
Working with Picasso

CHRISTOPHER BURNS is a senior English major from Winterport, Maine, who has explored many roles during his years at the University of Maine. He says his current position as student administrative assistant at the UMaine Museum of Art is easily the most rewarding. “If you had asked me a couple years ago if I would have a chance to carry a Picasso in my arms, I would’ve said no,” says the student literary magazine editor and aspiring writer.

Tell us about your role at the Museum of Art. It’s great to be able to take part in almost every stage of the museum process. One of my primary roles is in guest relations, so as people come in, I greet them, make them feel welcome and let them know whose work is on display. That means telling them what makes it significant or unique, or telling the story behind it. It’s about helping people understand and make the most of their art experience.

Do you have the opportunity to work directly with the art? I’ve helped install two shows so far, and there’ll be probably at least two more that I’ll be able to help work on. A couple years ago, I would’ve said there’s probably not a Picasso within a couple hundred miles of here, and it turns out there are several, not even 20 miles away.

Has your museum experience influenced your career plans? I’d like to write about art and culture — to highlight and share these places and events with other people, and make it accessible to people. Being able to write about art and culture for a newspaper, magazine or journal could help contextualize things for people in a way they can understand.

COLLECTED WORKS

Winlow Homer

Eight Bells, 1887
Etching
Gift of Adeline F. and Caroline R. Wing

John Marin

Chartres Cathedral, 1910
Etching
Museum of Art Alliance, Gift of Lisa Marie Marin

Christopher Burns

Future scapes
2014 President’s Research Impact Award recognizes mapping tool to aid community planning

SOPHISTICATED online mapping tool that allows Maine communities to visualize future landscape scenarios earned the 2014 President’s Research Impact Award for Spencer Meyer, a UMaine’s Sustainability Solutions Initiative (SSI) doctoral candidate in the University of Maine’s School of Forest Resources, along with faculty advisers Rob Lilieholm and Chris Cronan.

A member of SSI’s Alternative Futures Team, Meyer led the development of the Maine Futures Community Mapper (MFCM) over four years with team leader Lilieholm, associate professor of forest policy; Cronan, professor of plant biology and ecology, and Michelle Johnson, an SSI doctoral candidate in UMaine’s Ecology and Environmental Sciences Program. The groundbreaking tool will allow town planners, conservationists, developers and the public to better understand and manage community assets — both in terms of conservation and economic development — now and in the future.

MFCM is a web-based tool that helps Maineres identify locations that are most suitable for development, conservation, agriculture or forestry, as well as potential conflicts and compatibilities between land uses. It also helps envision future landscapes under different possible scenarios.

The tool was developed with the belief that Maine’s most important asset is its exceptional quality of place and that communities are at the heart of that asset. The goal is to help ensure a future in which Maineres can count on vibrant communities with vital economic development and a sustainable natural resource base.

Since 2010, the team creating MFCM has involved more than 75 community stakeholders, including policy-makers, conservationists, farmers, foresters, business leaders and scientists.

Spencer Meyer has been accepted into The Nature Conservancy’s Naturalist Fellowship Program and will begin a two-year fellowship at Yale University’s School of Forestry and Environmental Studies this fall.
FOR THE fifth consecutive year, the University of Maine has been named a “green college” by Princeton Review for its exemplary commitment to sustainability in academics, campus infrastructure and programming.

The Princeton Review’s Guide to 332 Green Colleges: 2014 Edition profiles 330 schools in the United States and two in Canada that are the most environmentally responsible. Other featured universities in the past five years include Georgia Tech, the University of Oregon and the University of Illinois Urbana-Champaign.

The annual guide, produced by Princeton Review in collaboration with the Center for Green Schools at the U.S. Green Building Council, surveys four-year colleges to measure their commitment to the environment and sustainability.

“The University of Maine’s sustainability focus is comprehensive and impactful,” says UMaine President Paul Ferguson, who, in April, was elected vice chair of the Steering Committee of the American College & University Presidents’ Climate Commitment (ACUPCC). “Maine’s flagship campus has a statewide and national leadership role in sustainability and stewardship in keeping with the university’s five-year Blue Sky strategic plan. At UMaine, sustainability helps define the institution.”

UMaine’s sustainability initiatives range from the Black Bear Orono Express shuttle and the campuswide single-stream recycling program to UMaine’s overarching goal of achieving carbon neutrality by 2040.

Today, the university is in a “smart-growth” period, says UMaine Sustainability Coordinator Daniel Dixon. Even with essential new construction and necessary upgrades to older infrastructure, multiple building renovations and energy-efficiency improvements are underway. The university’s sustainability legacy and leadership are rooted in values and vision for the future.

The University of Maine’s sustainability focus is comprehensive and impactful. At UMaine, sustainability helps define the institution.”

UMaine President Paul Ferguson

Blue is green

By Danielle Walczak and Margaret Nagle

UMaine’s sustainability legacy, leadership rooted in values and vision

illustration by Robin Moline

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Sustainable leadership

NATIONALLY, UMAINE has a leadership role in sustainability. In 2007, the university became a charter signatory of the American College & University President’s Climate Commitment (ACUPCC), which focuses on presidential leadership in promoting sustainability on college and university campuses, and in communities and society. For the past two years, UMaine President Paul Farnes has served on the ACUPCC Steering Committee. This spring, he was elected vice chair. UMaine participates in the Sustainability Tracking, Assessment & Rating System (STARS), a voluntary, self-reporting framework for helping colleges and universities track their performance in sustainability. In 2011, UMaine received a Second Nature Climate Leadership Award from the ACUPCC, which recognizes efforts to meet their own needs. WCEED’s definition arose from concerns that unhindered population growth and environmental degrada- tion would compromise the health, justice and prosperity of future generations. In 2013, the Environmental Protection Agency echoed a similar environmental concern: “Everything that we need for our survival and well-being depends either directly or indirectly on our natural environment. Sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony, (conditions) that permit fulfilling the social, economic and other requirements of present and future generations.”

Regardless of the definition one chooses, several key concepts apply, including: The Earth has environmental limits, modern humans have the responsibility of preventing environmental degradation; and environment, society and economy are interconnected and interdependent. Realizing true sustainability is essential for the future of society and all other life on the planet.

What forms does sustainability take at UMaine?

In leadership, UMaine President Paul Farnes is a dedicated champion of sustainability. In the classroom, more than 25 UMaine departments offer environmental and sustainability-related education opportunities. Our dedication to public service is exemplified by the University of Maine Cooperative Extension, the university’s internationally recognized Climate Change Institute, Maine’s Sustainabil- ity Solutions Initiative, the Advanced Structures and Composites Center, and the Forest Bioproducts Research Institute. Our dedication to public service is exemplified by the University of Maine Cooperative Extension, a community-supported agriculture initiative based at UMaine’s Rogers Farm. Across campus, the undergraduate UMaine Green Team supports and promotes sustainable and environmentally friendly campus initiatives.

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Maine College of Agriculture opened as a land grant institution

1903
Edith Marion Patch, UMaine’s first female scientist, arrived in Orono to start the Entomology Department

1912
University of Maine Cooperative Extension established

1934
Fay Hyland Ashwell created

1971
UMaine received first Sea Grant of $510,200

1972
UMaine professor Frank Eppert conducted research into organic growing methods

1973
UMaine Institute for Quarryman Studies founded; now called the Climate Change Institute

1980
UMaine-New Hampshire Sea Grant Program established

1986
Sustainable Agriculture Program created

GOING GREEN in the UMaine community means day-to-day campus life is as efficient and as sustainably designed as possible, including transportation options. For example, the student-run Blue Bikes Program rehabilitates abandoned bicycles and makes them available for use, free of charge. (Blue Bikes evolved from UMaine’s Green Bikes initiative started in 2001.) In addition, the Black Bear Orono Express is a free shuttle service on campus and in the local community. UMaine Housing and Housing Programs promote sustainable living for students, which includes occupancy sensors and high-efficiency lighting in residence rooms and throughout residence halls. “Trayless dining” with unlimited access to the dining commons has reduced food waste, and behind the scenes, a dishroom pulper has decreased water use by 400 gallons daily. Then there’s UMaine Dining’s commitment to buying local. An estimated 17 percent of all food served in campus dining halls is harvested at Maine farms — from meats to bees. In the last academic year, UMaine Dining served more than 26,700 pounds of Maine potatoes, over 16,300 pounds of state-grown apples, and 5,100 pounds of Maine blueberries. On the Memorial Union’s Boos’ Den salad bar, fresh greens are provided by the student-run hoophouse on campus. The hoophouse, home to the UM AINE Greens Project, is adjacent to UMaine’s new advanced composting facility, established by UMaine Dining and University of Maine Cooperative Extension. The composting facility has the potential to convert more than 1 ton of organic waste per day from campus dining facilities into a rich soil amendment for use by the UMaine Greens Project and in campus landscaping. UMaine Greens and the advanced composting facility build on UMaine’s Sustainable Agriculture Program, which includes the student-operated Black Bear Food Grant, a community-supported agriculture initiative based at UMaine’s Rogers Farm. Across campus, the undergraduate UMaine Green Team supports and promotes sustainable and environmentally friendly campus initiatives.

Governing Board

Blue is green

Sustainable Benchmarks

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Building sustainably

Since 2005, the university has required all new campus construction to be built to LEED silver standards or better. Currently, UMaine has five LEED-certified buildings. Leadership in Energy and Environmental Design (LEED) certification is an internationally recognized whole-building approach to sustainability, including water and energy, materials and resources, indoor environmental quality and awareness, through education. Among the sustainability hallmarks:

Offshore Wind Laboratory (Gold)
- The building project diverted 1,120 tons (95 percent) of on-site generated construction waste from landfills.
- Foot Center for Student Innovation (Silver)
- An estimated 46 percent of construction materials were manufactured within 500 miles.
- New Balance Student Recreation Center (Silver)
- The building facade, entry and stairway bases use 90 percent recycled copper and locally harvested stone.
- Wells Conference Center (Silver)
- Water use was reduced by 52 percent.

Advanced Structures and Composites Center (Certified)
- UMaine’s first LEED certified building, the facility has a 35 percent optimized energy performance.

Why is sustainability leadership important for universities, especially for state flagship research institutions like UMaine?
- Universities act as role models for society, and in all countries they have an explicit obligation to educate the leaders of tomorrow. As the hub for advanced learning, research and public service in the state, the University of Maine exerts a defining influence over a significant number of people.
- The moral values expressed by UMaine representatives throughout the world reflect directly on the principles of our campus community and, more importantly, the state of Maine.
- UMaine’s primary vehicle for advancing sustainability is education. UMaine offers over 70 classes that fulfill the Population and the Environment portion of students’ General Education Requirements. Those classes are offered in more than 25 academic departments.
- In any given year, there are over 10,000 UMaine students enrolled.
- The hope is that the majority of them will carry on our culture of sustainability, returning home with an understanding of the importance of environmental stewardship and equipped with the tools to take action.

How do we continue to heighten awareness and make sustainability a way of life in the UMaine community?
- Our goal is to inspire the core principles of sustainability in all our graduates, fostering a “sustainability state of mind” in successive generations of educators, leaders, innovators and informed citizens. If our community members make informed decisions using the knowledge gained through academic advances in the understanding of sustainability, we stand a good chance of limiting the environmental disruption that will inevitably result from a business-as-usual approach.

The UMaine Terrell House Permaculture Living and Learning Center is a good example of a small community working together to achieve sustainability. Student residents at Terrell House, located just off campus on College Avenue, share responsibilities through regular meetings, planning sessions, design and garden work, and experimentation with a variety of systems and approaches to make a positive difference.

Energy-saving efforts

Total Campus energy use and greenhouse gas emissions peaked in 2005. Since then, energy use has decreased and greenhouse gas emissions have fallen as a result of energy-efficiency improvements and fuel-switching. At the Central Steam Plant, a 608MW backpressure turbine was installed in 2010, reducing UMaine’s electric bill. Two years later, a 60,000lb/hr boiler completed the Steam Plant’s conversion to natural gas. The university’s sustainability plans call for reducing the campus carbon footprint to zero by 2040.

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Committed in the classroom

UMaine’s LAND grant mission and leadership as the state’s research university are inextricably linked to students’ academic experience. For instance, in 1995, UMaine’s Art Department was among the first to go green with nontoxic printmaking materials and processes. The History Department was home to one of the leading scholars in U.S. environmental history. The School of Economics has long studied the residential waste stream and value of recycling. And a National Science Foundation-funded doctoral program focuses on printmaking materials and processes.

How do we know when we have achieved a culture of sustainability?
To achieve a culture of sustainability, all members of a society must be in agreement with — and actively working toward achieving — the core principles of sustainability. We must become acutely aware of the consequences of our actions. A sustainable state of mind means we should be asking ourselves: Which of my options does not damage the environment? Which option will benefit me and those around me? Am I doing things as efficiently as possible? Are my efforts improving the world in which I live?

On a daily basis, these questions of sustainability are difficult to pose and more difficult to answer. For many people today, the reality is that the less sustainable alternatives are more viable because they are cheaper. Also, many of the impacts of an unsustainable lifestyle are not readily apparent, so “out of sight, out of mind” often unconsciously rules the day. A culture of sustainability has been achieved if members of society consider questions of sustainability automatically — if concerns for the environment and all life becomes second nature.

In recent years, UMaine’s sustainability legacy has been punctuated with LEED buildings, local food and free alternative transportation. What’s next? Perhaps the biggest challenge for the university will be disseminating or at least significantly reducing fossil fuel use. There are several approaches we can take to achieve this goal, the most likely of which is converting our Central Plant to burn renewable fuels, such as biogas, biofuel and landfill gas. We also need to acquire our electricity from renewable sources. This can realistically be achieved using a large-scale solar photovoltaic installation, hydropower or a combined heat and power installation at the Central Plant (powered by renewable fuel).

How does your science background inform your work as sustainability coordinator?
I have spent more than a decade studying the effects of climate change around the world, and I feel privileged to have had the opportunity to travel at one of the world’s foremost climate research facilities. I have peered into the Earth’s past over timescales of hundreds, thousands and tens of thousands of years, and I can say with certainty that climate change is real. It is something that we should all be taking very seriously. My knowledge of — and firm belief in — human-induced climate change provides me with a strong sense of purpose. I feel a real sense of urgency to communicate the importance of sustainability and ways to approach it. If we do not act soon to stop the environmental degradation we are causing, the consequences for the future of society are likely to be dire.

A decade from now, what will we point to as further evidence of UMaine’s sustainability leadership?
My hope is that a decade from now — if not sooner — efficiency, recycling and composting will be second nature to each and every member of the University of Maine community. More than ever, students will be drawn to UMaine for its national reputation as a hub of environmental consciousness and sustainability innovation. All our graduates will go into the world with a sustainability state of mind. Their decisions will be based not only on what is good for them, but what is right for the community at large and the world population in general. They will work to spread their knowledge and help bring about a new era of health, justice and prosperity.

Leading research

UMaine has a statewide commitment and an international reputation for research and outreach that address needs, contribute to understanding and provide leadership in achieving greater sustainability. Among the highlights:

Advanced Structures and Composites Center
Cutting-edge technology to develop dependable offshore wind as an alternative energy source.

Climate Change Institute
Integrating transformational field, laboratory and modeling activities to understand the physical, chemical, biological and social components of the climate system.

Forest Bioproducts Research Institute
Advancing ecologically sustainable forest-based bioproduct production.

Maine’s Sustainability Solutions Initiative (SSI)
Connecting knowledge with action to promote strong economies, vibrant communities and healthy ecosystems.

University of Maine Cooperative Extension
For over 100 years, conducting community-driven, research-based programs in every Maine county.

Blue is green
A sunny, frigid February afternoon, self-described foodie John McConochie buys a California amberjack at Herring Gut Learning Center’s (HGLC) School of Roots in Port Clyde, Maine. McConochie, owner of Green Bean Catering, is eager to roast the fish in his wood-fired oven that evening.

While California amberjacks are generally found in the Pacific and Indian oceans, it would be difficult for McConochie to find a fresher fish unless he caught one himself. It is one of 36 California amberjacks harvested that morning at the University of Maine’s Center for Cooperative Aquaculture Research (CCAR) in Franklin, Maine, 127 miles northeast of the fishing village of Port Clyde. The 36 fish, which tip the scale at about 4.5 pounds each — 160 pounds collectively — had been packed in fresh snow and trucked to Port Clyde Fresh Catch, a cooperative perched adjacent to a dock on the bay, next to HGLC.

Since Glen Libby helped form the cooperative about four years ago, he’s filleted more than a few fish. But this is the first time the fisherman has taken a knife to a California amberjack.

Libby isn’t fazed. Earlier that afternoon, he watched a YouTube video demonstrating how to fillet the fish that can be found on restaurant menus in a roll with jalapeño, cilantro and sautéed cashews.

Libby peers over the top of his glasses, sharpens a knife and gets to work on the first fish.

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More than a few dreamers, old salts, young fry, marine scientists and investors had monitored its 18-month journey from a hatchery in New Hampshire to a processing facility in Port Clyde.

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52

UMaine Today Spring 2014

umaine.today.umaine.edu

53
A fish tale

I don’t believe we could learn any more from one batch of fish. We’ve been growing along with the fish. We hope this puts us ahead of the business growth curve.”

Chris Heinig

A dozen middle-school youths in the School of Roots at Herring Gut Learning Center in Port Clyde, Maine, helped Acadia Harvest Inc., sell the California amberjacks raised at UMaine’s Center for Cooperative Aquaculture Research.

While AHI is striving to break new ground in Maine with a recirculating aquaculture system, closed-loop production structures have been in operation for a decade or more in Saudi Arabia, Norway, Massachusetts, Wyoming, Canada and Japan.

In the next two years, AHI (formerly called RAS Corp. — Recirculating Aquaculture Systems) will be doing more planning, research and preparation. And like AHI’s efforts the previous two years, much of it will be done in collaboration with CCAR. UMaine’s aquaculture research center has been instrumental in helping AHI prepare by providing sophisticated marine recirculation facilities, expertise in recirculation technology and business incubation.

CCAR DIRECTOR Nick Brown, who earned his doctorate in aquaculture at the University of Stirling, Institute of Aquaculture in Scotland, is an authority on commercial aquaculture. The head of CCAR since 2001, Brown has designed a number of large-scale recirculation systems, including the center’s 24,000-square-foot marine hatchery. Brown and UMaine staff acquire juvenile fish and other marine necessities, and assist with applications for research funding. They help AHI manage projects and plan for its full-scale commercial farm, and lend expertise in developing business plans and securing investment capital.

“It’s one-stop shopping for those serious about entering the fish-farming business.”

Nick and his staff are absolutely phenomenal,” says Heinig, CEO of AHI. “Their expertise and knowledge are extremely useful. He knows what to do and then gets it done. He gives us confidence to move forward in an area we’ve never gone before.”

Heinig — whose resume includes oyster farming, managing a shellfish hatchery, and designing and constructing a fish hatchery in France — says he has learned a lot about black sea bass and California amberjack, from growth rates to proper feeding and from temperature control to pH tolerance.

“I don’t believe we could learn any more from one batch of fish,” says Heinig of the California amberjacks AHI purchased in 2012. “We’ve been growing along with the fish. We hope this puts us ahead of the business growth curve.”

About 60 of the original 1,000 New Hampshire hatchery fish have been added to CCAR’s brood stock, which are in an adjacent building at CCAR. Some California amberjacks there weigh as much as 30 pounds each.

“We have to have access to a convenient, reliable source of juveniles and we want to keep improving the gene pool group,” Heinig says, adding that like buying fresh vegetables from a local farmer, consumers can be similarly confident when buying high-quality fish raised close to home.

AHI, Heinig says, is considering using gill tags with bar codes so consumers can access a host of information about the fish they purchase, including the date the fish egg was fertilized, where the fish was farmed and the date it was harvested.

At CCAR, AHI also is working on approaches to dealing with waste and aquafeed made from ocean forage fish.

“It’s a moral and ethical obligation,” says Pryor, whom President Lyndon Johnson named to a commission that created the National Oceanic and Atmospheric Administration.

Organic farmers have demonstrated the value of biodiversity and Pryor says aquaculture can do the same. AHI is running fish growth trials incorporating oysters, sandworms, seaweed and algae. The fish waste serves as a nutrient for the other species, and is consumed within an ecologically balanced system.

AHI is striving to develop a nutritional plant-based feed to raise the farmed fish. Currently, fish meal and oil are major components of commercial aquafeeds, made using wild-caught forage fish. Anchovies, herring and menhaden are overharvested in some oceans and it’s a priority for aquafarmers to find new feed formulations using other components.

Finding solutions and prepping to become a commercial-scale aquafarm take capital. Funding, to date, has come from a variety of sources, including Maine Technology Institute (MTI), Coastal Enterprises Inc. (CEI) and the National Science Foundation.

Both private nonprofits — MTI in Brunswick and CEI in Wiscasset — invest in innovation to help create high-quality jobs, and economically and environmentally healthy communities.

Representatives from MTI and CEI joined Pryor, Heinig and Robinson to watch Libby fillet the fish. Students from the School of Roots at HGLC also crowded around
A fish tale

Libby in the processing room. The middle-schoolers had prepared the 36 harvested fish to families and area stores.

School of Roots students first met the AHI crew a couple of years ago. Tony Barrett, AHI’s commercial adviser, talked with Brown about AHI being the first in Maine to grow black sea bass and amberjack in recirculating systems. CCAR was already growing sandworms, sea urchins and cold-water marine fish, including Atlantic halibut and Atlantic cod in these types of systems. And HGLC was already growing tilapia in an aquaponics system that includes plants and freshwater fish.

So AHI officials toured the aquaponics fish hatchery and greenhouse at HGLC, a nonprofit organization that strives to sustain and strengthen the economic and social vitality of Port Clyde and other coastal communities.

Two days a week, 12 middle-school youth in RSU 13’s alternative education program attend the School of Roots at HGLC, where, as part of their studies, they grow, harvest and market tilapia and lettuce. After that venture’s success, AHI asked the youths to sell California amberjacks.

Kevin Neville of Acadia Harvest retrieves California amberjack from CCAR’s 300-gallon recirculating tanks.

Seafood source

ABOUT 90 percent of the 4.5 billion pounds of seafood Americans consume annually is imported, according to the National Oceanic and Atmospheric Administration. The United States needs to produce more of what it eats, says Nick Brown, who directs the University of Maine Center for Cooperative Aquaculture Research Center (CCAR). CCAR is a state-of-the-art business incubation facility and center for aquaculture research, development and demonstration on a 25-acre campus on the island of Mount Desert, Maine.

Brown about AHI being the first in Maine to grow black sea bass, before that venture’s success, AHI asked the youths to sell California amberjacks.

Eighth grader Will Saunders says he enjoys the hands-on learning, one-on-one instruction and motivation he receives at HGLC. Lead teacher Ann Booher says the active-learning approach and individualized attention have helped many students academically thrive, as well as develop confidence and social interaction skills.

While Port Clyde is a picturesque coastal village, it is not idyllic. Slashed education budgets, worrisome school dropout rates, and depleted fishing and employment opportunities are challenges there, as they are in other communities.

To help people succeed in the face of these challenges, HGLC provides academic courses that mesh with real-world experience, and encourages preservation and economic development in coastal communities.

With UMaine, AHI, HGLC and funding agencies pooling their strengths — vision, business acumen, innovative technology, research knowledge, funding and traditional customs — a number of Mainers may benefit when a new look, indoor fishing village is open for business in Down East, Maine.

This spring, Ariel Bothen of Mount Desert, Maine, graduated from the University of Maine with two bachelor’s degrees — one in international affairs, another in anthropology. The honors student had a concentration in political science, and minors in Spanish and history. Next stop: Capitol Hill. ON CAMPUS: Bothen was involved in the Community Governing Board, International Affairs Association, Alternative Breaks and the Provost Council. She served as president of the UMaine chapter of Amnesty International and as a Student Government senator. Bothen also was a resident assistant, a certified lifeguard with Campus Recreation, and a peer advisor in the Office of International Programs. GOING PLACES: In 2012, she participated in the University of Virginia’s Semester at Sea, which took her to 12 countries across three continents, and last summer she studied abroad at the Universidad del Pais Vasco in Spain. Subsequently, Bothen wrote her honors thesis on the politics of the Basque region. D.C.-BOUND: In summer 2012, Bothen interned with the Elizabeth Warren for Senate Campaign in Boston. This summer, she will intern in the Washington, D.C., office of Sen. Angus King. She plans to pursue graduate work in international affairs.

COMMUNITY ENGAGED: UMaine fosters community involvement, and Bothen has become, as is said in Alternative Breaks, an “active citizen.” Now, community engagement is an invaluable part of her life that will continue throughout her career.

Active citizen

Two degrees, two study abroad trips, two internships — and more

Ariel Bothen says joining campus organizations is the best way to make friends, feel engaged and find your passion.
NEW BALANCE Field House reopened in late January for use by the University of Maine track and field team, as well as more than 500 students from 17 high schools in the Penobscot Valley Conference – Eastern Maine Indoor Track League. Completion of the Field House interior is a milestone in the $15 million renovation project that includes Memorial Gym. The project is one of UMaine’s major initiatives under Pathway 5, Stewardship of Place: Restoring the Dream, of the Blue Sky Plan. The Gym and Field House renovations are expected to be completed in full 2014. Renovations to the Field House include numerous upgrades. Among the highlights:

• Newly surfaced track (shortened from 218 meters to 191 meters to meet NCAA requirements) with a fourth running lane and a second long jump/triple jump pit added
• Updated mechanical, lighting, life safety and ADA accessibility
• New spectator area with Bleachers
• New press/operations area for event management
• Permanent throwing circle, with a retractable throwing cage
• New sports netting system to enclose the entire infield
• UMaine-branded color scheme on walls, trusses and floor

TWO UNIVERSITY of Maine researchers are teaming up with a University of California-Berkeley professor to study the sinking and rising rates and trajectories of phytoplankton in relation to particle shape and water turbulence. Phytoplankton form the base of the marine food web and help maintain atmospheric health by absorbing and sequestering carbon dioxide and producing oxygen. The microscopic plant-like organisms account for about half of the oxygen we breathe. Their trajectories determine their access to nutrients and light, and encounter with grazers. Lee Karp-Boss, a marine scientist and associate professor in the UMaine School of Marine Sciences, is a principal investigator of the project, along with Evan Variano, a researcher in the Civil and Environmental Engineering Department at UC Berkeley. Pete Jumars, a UMaine professor of marine sciences and investigator of the study.

The National Science Foundation recently awarded more than $409,000 to the UMaine researchers and over $315,000 to Variano for the three-year project. The study will advance understanding of how turbulence and particle shape affect the sinking velocity and paths of phytoplankton — specifically diatoms.

KARLTON CREECH, who joined the University of Maine community as director of athletics Feb. 10, has 20 years of senior athletics administration experience. Since 2012, Creech had been senior associate director of athletics at the University of North Carolina. Chapel Hill (UNC), serving as chief of staff and overseen the department’s capital projects, human resources and facilities. From 2004—12, he was associate executive director for UNC’s Educational Foundation Inc., where he managed capital projects — including coordination of the $88 million football stadium expansion, the Annual Fund, marketing, fundraising and ticket sales programs, as well as donor stewardship and development. He also worked for the Student-Aid Association at North Carolina State.

I look forward to leading our department in support of the university’s Blue Sky Plan. Our goals will be centered on the student-athlete experience and engaging the many constituents that make up our university community.” Karlton Creech

OPPOSITION TO same-sex marriage is greater on Election Day than indicated in pre-election polls, according to research by a University of Maine political scientist. That’s because people being surveyed tend to say they’ll vote the way they think is socially desirable, regardless of their real position on the issue.

Social desirability bias has largely disappeared on issues of race and gender, but not same-sex marriage.

Richard Powell, UMaine associate professor of political science, says polling systematically minimizes resistance to same-sex marriage. Opposition to it at the ballot box on Election Day is about 5 percent greater than in pre-election polls. Powell examined the accuracy of polling on same-sex marriage ballot measures relative to polling on other statewide ballot issues in 33 states from 1998—2012. He says social desirability bias on ballot measures such as same-sex marriage is more prevalent in states with larger populations of Republican and highly religious voters.
The Black Bear football team captured 10 wins for the first time since 2002 and made its seventh overall NCAA postseason appearance. Coach of the Year and the New England Football Writers’ Association (FCS) Region 1 Co-Coach of the Year. Cosgrove led the Black Bears to a No. 10 –2 regular season and a 7 –1 mark in conference play. Cosgrove was named the Colonial Athletic Association (CAA) Football preseason poll, and the Black Bears finished the season ranked 15th in the final CAA Football poll. The team also pulled off a dramatic win over the University of Maine in the season finale to cap off a successful year.

The Black Bear football team captured 10 wins for the first time since 2002 and made its seventh overall NCAA postseason appearance.

**A $1.8 MILLION National Science Foundation grant** will allow a multidisciplinary team of researchers to examine the impact of rising ocean temperatures on Gulf of Maine ecology and economics. Led by Andrew Pershing from the University of Maine and Gulf of Maine Research Institute, the team will conduct a four-year project as part of the NSF’s Coastal SEES (Science, Engineering, and Education for Sustainability) Initiative to support collaborative studies. Climate change is impacting the distribution of fish and lobsters in the Gulf of Maine and these ecological changes can have significant economic consequences, Pershing says. For instance, record warm ocean temperatures during 2012 prompted lobstermen in the Gulf of Maine to migrate shoreward about a month earlier, making them easier to catch. Lobstermen proceeded to haul in record numbers of the crustaceans, but the overabundance of product on the market tanked the price paid to lobstermen.

The kits are really just the vehicle for this change in thinking about libraries as a source of support for family literacy.

Susan Bennett-Armstead, Cornell Professor of Early Literacy, UMaine College of Education and Human Development
It’s an innovative, highly experimental, never-been-done-before project that’s bridging forestry and social work in an effort to better engage and serve rural families who own forestland in southern Maine.”

Jessica Leahy

Many conservation problems are related to social and economic factors. While foresters and other natural resource professionals help landowners make decisions about land management, they may not be equipped to handle the challenges landowners face that involve family dynamics. A social work approach could be the answer to solving these conservation problems, Leahy says.

Leahy, the project’s forestry expert, hired Doug Robertson and Chris Young, students in the UMaine School of Social Work who grew up around Maine woodlands. They are interested in connecting with landowners through the project, learning more about the land that many families rely on and how community organizations can help.

More than 85,000 families in Maine own at least 10 acres

**UVAC**

THE UNIVERSITY volunteer Ambulance Corps (UVAC) at the University of Maine was named the 2013 Region 4 EMS Service of the Year by the Atlantic Partners EMS. UVAC is one of 79 state-licensed EMS providers in Region 4, which includes emergency service providers in Hancock, Penobscot, Piscataquis and Washington counties. This is the first time the UMaine group has won the award. UVAC was recognized for its members’ dedication to serve others, for the more than 30,000 volunteer hours it provides annually, and for establishing a comprehensive CPR program on campus, which has included the placement of more than 20 automated external defibrillators (AED), and relevant training for staff and students. UVAC, which operates as part of the university’s Auxiliary Services, is composed of 62 UMaine students, in addition to a dozen staff and neighboring EMS providers. More than 60 percent of the members are EMTs, while others are drivers and assistants.

**THE UNIVERSITY** of Maine has launched an innovative leadership program that will prepare a group of faculty from across campus to serve as ambassadors to Maine communities and constituents. The Blue Sky Faculty Fellows Program is helping to strengthen UMaine’s contributions to the state by building a network of 20 faculty leaders who can communicate UMaine’s importance, and build stronger bridges to people and organizations statewide. The program, funded by the Office of the President, is providing training in media relationships, interpersonal communication, audience analysis and partnership building, creating better pathways for making UMaine’s work matter more to the state.

**RESEARCHERS AT** the University of Maine hope to improve the teaching and learning of two central topics—taught in both physics and engineering—that are critical to undergraduate programs. John Thompson and Mackenzie Stelzer, faculty in the Department of Physics and Astronomy, have received nearly $600,000 from the National Science Foundation to investigate student learning of thermodynamics and electronics in the two disciplines. The project emphasizes interdisciplinary research, especially in courses beyond the introductory level, well aligned with a recent National Research Council report on the status and future of discipline-based education research. The researchers, along with their colleagues in engineering, are examining student conceptual understanding in parallel courses before and after instruction in order to identify important differences in student learning that may be linked to the treatment of similar ideas in each discipline. They plan to apply their findings to develop and refine instructional materials across disciplines.

**TWO NEW** potato varieties — Easton and Sebec — have been developed by the University of Maine in partnership with the Maine Potato Board. While appropriate for fresh market consumption, Easton was developed as a new french fry processing potato variety. Sebec is expected to primarily be used for potato chip production in growing areas that currently rely on the standard chipping variety, Atlantic. Easton and Sebec are the first varieties to be released by the University of Maine in a decade. Tim Hobbs, director of development and grower relations for the Maine Potato Board, says potatoes are bred for certain characteristics, including disease resistance and improved fry color. Getting the right combination of characteristics in one variety is a large investment of time and resources. The initial results of the investment in Maine is the release of these two varieties, from the UMaine breeding program led by Greg Porter, professor of plant, soil and environmental sciences, and agronomy. Easton is named after a northern Maine town in Aroostook County that is in the heart of Maine’s most intensively cropped potato production area, Sebec for a lake in Piscataquis County. Several other potato varieties are being evaluated for commercialization.

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More than 85,000 families in Maine own at least 10 acres
Today Spring 2014

A Climate Change Institute conference focused on building a shared and expanded through a Climate Adaptation and Sustainability (CLAS) Planning for Maine community CLAS planning.

The purpose of the study was to use public data sources to identify programs that excel at graduate training in professional psychology as evidenced by two emerging professional benchmarks — internship matching rate and examination for Professional Practice in Psychology pass rate. UMaine’s program was ranked ninth out of 233 accredited clinical psychology doctoral programs in the category that combined both benchmarks.

UMaine’s Clinical Psychology Doctoral Training Program prepares students for a doctorate in psychology and for careers that combine research and practice. Since 1990, it has graduated 85 Ph.D. students. Twenty-one of them now have careers in Maine and have had clear impacts on direct care provision, says Douglas Nangle, a professor and director of the Clinical Training Program at UMaine.

There are currently 22 students in the program.

Building a Framework and Platform for Climate Adaptation and Sustainability (CLAS) Planning for Maine Communities

A Climate Change Institute conference Oct. 25, University of Maine

Expertise and tools will be introduced, shared and expanded through a conference focused on building a Web-based framework and a Google Earth-based platform for Maine community CLAS planning.

A TEAM of University of Maine scientists studying a nearly 100,000-year long ice core record from Greenland found history repeating. Paul Mayewski, director of UMaine’s Climate Change Institute, says today’s climate situation in the Arctic is equivalent to, but more localized, than the warming during the Younger Dryas/Holocene shift about 11,700 years ago.

Mayewski led the research team that examined Arctic ice formed during a rapid climate transition from the Younger Dryas (near-glacial) period to the Holocene era (period of relative warm since then). The abrupt shift then included a northward shift in the jet stream, an abrupt decrease in North Atlantic sea ice and more moisture in Greenland. These changes resulted in milder weather, fewer storms and, initially, more than a doubling of the length of the summer season around Greenland, the team says.

Ice formed during that one-year onset of the Holocene climate sheds light on the structure of past abrupt climate changes and provides unparalleled perspective with which to assess the potential for near-term rapid shifts in atmospheric circulation and seasonality, Mayewski says. Additional exploration of the ice cores, with respect to the length of seasons, is expected to yield information about precipitators for abrupt climate shifts. Ice cores, in essence, are timelines of past climates.

The UNIVERSITY of Maine’s Clinical Psychology Doctoral Training Program was recently ranked as one of the best clinical psychology programs nationwide in a journal article based on a University of North Texas study.

The program was identified as performing exceptionally well in the article “Hidden gems among clinical psychology training programs,” in the American Psychological Association journal Training and Education in Professional Psychology.

In celebration of the 80th anniversary of the University of Maine Foundation, the Foundation Board has announced a 25 percent matching program to encourage gifts to existing Foundation endowments and the creation of new funds. The Foundation will match a minimum gift of $8,000 with $2,000 for an endowed fund. The program extends to a maximum match of $20,000 for an $80,000 gift. Commitments may be pledged over four years (2014–17); all gifts must be received by Dec. 31, 2017 to qualify for the match. The matching gift offer will be in effect until Dec. 31, 2014, or until the limited matching funds are allocated — whichever comes first. Consider taking advantage of this offer and contact the University of Maine Foundation today.

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There are currently 22 students in the program.

Emeritus vice president and professor John Alexander is taking this opportunity to increase his ongoing support of the Margaret Chase Morrill ’43 Civil Engineering Scholarship Fund.

In 1992, the Margaret Chase Morrill ’43 Civil Engineering Scholarship Fund was established at the University of Maine Foundation in honor of Margaret Chase Morrill, the first female civil engineering graduate at the University of Maine.
BEHIND THE 33-foot planetarium dome: Construction is nearing completion on the Emera Astronomy Center at the University of Maine. This fall, the Emera Center will open the universe to youngsters, astronomers, researchers and students at UMaine and beyond. The facility will serve as a critical mass of astronomy STEM education resources for Maine. As the home of the Maynard F. Jordan Planetarium and Observatory, the center will expand opportunities for students and educators to access leading-edge equipment, including the largest telescope in the state. Undergraduate and graduate students will undertake projects never before possible at UMaine’s astronomy facilities. Emera Astronomy Center is a LEED-certified building and the first geothermal facility on campus.

What’s ahead at Maine’s Flagship University
Emera Astronomy Center

Blue is green
A legacy of sustainability