

UMaine Today

CREATIVITY AND ACHIEVEMENT AT THE UNIVERSITY OF MAINE

FALL 2013



Back to the garden

Can we cultivate a
more perfect world?

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Photo by Edwin Remsburg



FIFTY YEARS AGO on Oct. 19, 1963, President John F. Kennedy received an Honorary Doctor of Laws Degree from the University of Maine and spoke to the many gathered on the football field. In his prelude to a discussion about current issues in foreign affairs, President Kennedy lauded the University of Maine and commented that, “I am convinced that our universities are an invaluable national asset which must be observed, conserved and expanded.”

In the spirit of President Kennedy’s affirmation, it is with great pride that we introduce this fall 2013 *UMaine Today* magazine edition as the first issue produced under the Division of Marketing and Communications in-house redesign. This striking and inspiring journal continues to highlight and honor some of the most interesting and notable scholarship and creativity at the University of Maine. This issue also supports the intent of Blue Sky Plan Pathway 3: Embracing a Culture of Excellence through the newly redesigned and soon-to-be digitized format.

Magazine managing editor Margaret Nagle indicates that the fall 2013 redesign and digitization project preserves the successful historical elements of *UMaine Today* as the principal marketing product of Maine’s land grant, Flagship University, yet will increase accessibility in traditional and digital formats beyond the current 80,000 circulation, ensure financial sustainability and provide readers with a graphic design consistent with contemporary best practices.

This inaugural, redesigned edition of *UMaine Today* is another sterling example of our Blue Sky commitment to regularly represent the University of Maine as a distinctive 21st-century land grant university of high quality, value and relevance — a commitment that fully reflects the desire, as President Kennedy aptly stated, to observe, conserve and expand the success and impact of UMaine.

Paul W. Ferguson
President

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ON THE COVER: University of Maine physicist Sam Hess snapped the cover photograph in the Bangor City Forest in July 2011 using a Canon EOS 5D Mark II body, a Canon EF 50mm f/2.5 compact macro lens with life-size converter, ISO 1600, shutter speed 1/500 second, manual focus and aperture f/10. His images illustrate the *UMaine Today* story on gardens and gardening in pursuit of utopia that begins on page 32.



In March 2013, Rhian Waller was featured as a risk taker in “New Age of Exploration” in *National Geographic Magazine*. She has pressed the limits of diving during more than 40 expeditions around the planet.

In hot water

IN THE WAKE of dramatic glacier retreat and ice shelf collapses on the Western Antarctic Peninsula, University of Maine marine scientist Rhian Waller will explore how cold-water corals, which provide habitat for thousands of connected species, cope with warming ocean water.

Waller, an associate research professor in the School of Marine Sciences, received a National Science Foundation grant of more than \$381,380 for her two-year project. Cold-water corals are “important ecosystem engineers” that benefit many organisms, including commercially important species such as rockfish, orange roughy, young cod and crabs, she says.

Accelerated climate change “is likely to affect in presently unidentified ways the many benthic (organisms living on or in sea or lake bottoms) marine invertebrates that live within narrow temperature windows along the Antarctic Continental Shelf,” says Waller.

In this first systematic study of the larval stages of polar cold-water corals, Waller will examine whether larvae can develop normally in the next century. Scientists predict water around the Western Antarctic Peninsula, which has warmed nearly 1 degree Celsius the last 50 years, could warm at an even more accelerated pace in the next 50 years.

Waller will conduct climate change experiments on coral larvae at Palmer Station on Anvers Island in Antarctica, just north of the Antarctic Circle, beginning in November 2014. ■

UMAINE MARINE scientist Rhian Waller scanned the never-before-seen ocean floor during a deep-sea dive in August in Heezen Canyon near the U.S.-Canadian maritime border. She spied *Paragorgia arborea*, aka bubblegum coral, as well as hatchetfish, shrimp and other marine life at a depth of around 2,460 feet. And she never left her office. On this Okeanos Explorer Northeast U.S. Canyons Expedition, Waller was a “scientist from shore,” part of an international team that explored the relatively undisturbed ecosystem in hopes of being able to inform decisions about using and protecting the ocean and its resources. While colleagues from the National Oceanic and Atmospheric Administration and the U.S. Geologic Survey dove in NOAA’s 6,000-meter remotely operated vehicle (ROV) *Deep Discoverer*, Waller shared her expertise from either her office at UMaine’s Darling Marine Center in Walpole, Maine, or from the Inner Space Center at the University of Rhode Island.



Current events

THE UNIVERSITY OF MAINE is one of 15 recipients to split \$16 million from the U.S. Department of Energy to fund projects related to efficiently capturing energy from waves, tides and currents. The projects are expected to increase the power production and reliability of wave and tidal devices and help collect data on how deployed devices interact with the surrounding environment.

The UMaine project is one of seven “Environmental Monitoring of Marine and Hydrokinetic Projects” under the funding. The \$494,000 UMaine project received \$394,000 from the Department of Energy to use data on fish interactions with Ocean Renewable Power Company’s TidGen Power System in Cobscook Bay, Maine, to predict the probability of fish naturally encountering deployed energy devices.

The project will build on research that began in 2009 that established baseline patterns of fish abundance and distribution at the turbine location, according to the project proposal.

The project will provide post-deployment data for comparison, improve techniques for distinguishing fish species using undersea acoustic sensors and implement a probability-of-encounter model. The research also will aid in understanding the effects of marine and hydrokinetic devices on local fish populations, says principal investigator Gayle Zydlewski, associate professor and researcher in the UMaine School of Marine Sciences and member of the Maine Tidal Power Initiative. ■



This funding will enable our research team to provide quantitative data on fish behavior in tidally dynamic regions and how fish interact with a tidal power device **that’s not being collected anywhere else in the U.S. or globally.** Gayle Zydlewski



UMaine School of Marine Sciences Associate Research Professor Gayle Zydlewski and undergraduate student Alexander Jensen monitor fish interactions with a turbine in

AN 11-MEMBER delegation of scientists and industry officials from Japan, including the president of Hirosaki University, were at the University of Maine in September for the second Marine Energy International Symposium. The symposium is a collaborative exchange between researchers in the Maine Tidal Power Initiative, based at UMaine, and various Japanese institutions. Highlights of the three-day visit included presentations focused on Japan’s marine energy development, and the work of UMaine and other researchers of the Maine Tidal Power Initiative, including director Michael Peterson. The Japanese delegation also traveled to Eastport to visit Ocean Renewable Power Company’s generation site. Last year, UMaine researchers traveled to Japan to discuss tidal power development and potential research opportunities in Maine and Aomori Prefecture. Maine and the prefecture have similar geography, climate and industrial structure, and a common interest in ocean energy development.

A SSESSING THE potential for emergence of new cropland weeds in northern New England as a result of climate change is the focus of the first study to be supported by the Northern New England Collaborative Research Funding Program.

The program is a partnership of the Maine Agricultural and Forest Experiment Station at the University of Maine, the New Hampshire Agricultural Experiment Station at the University of New Hampshire, and the Vermont Agricultural Experiment Station at the University of Vermont. The goal of the program is to mobilize coordinated research on high-priority needs for the region, awarding a two-year seed grant to regional research teams through an annual competition, with priority given to teams that have the potential to serve northern New England beyond the proposed study.

The program's initial priority focuses on adaptation to and mitigation of climate change in relation to agriculture — understanding the effects of climate change, such as changing temperature and precipitation, on current agricultural practices and determining how to take advantage of those changes to improve agriculture in the future.

“One of the reasons we chose to encourage more research related to climate change is that it has the potential to impact almost every element of agriculture,” says Frederick Servello, associate director of the Maine Agricultural and Forest Experiment Station. “Whether it’s crops or livestock or pest problems or disease problems, all have a potential to be affected by changes in climate.”

The proposed research may address specific agricultural issues, needs or opportunities within the context of climate change and variability or address the topic more broadly. The research must address issues or needs important to all three participating states, and must be more effectively and efficiently conducted as a regional project than it would be as independent state projects.

Eric Gallandt, UMaine associate professor of weed ecology and management, is one of five co-principal investigators of the cropland weeds study, along with researchers from UNH and UVM. The project will assess the potential for and prediction of range expansion in a variety of common and rare weed species as a consequence of climate change, and develop strategies to reduce effects on growers.

THE SCHOOL OF FOOD AND AGRICULTURE was established July 1, merging three departments — Animal and Veterinary Sciences; Food Science and Human Nutrition; and Plant, Soils, and Environmental Sciences. According to Director Susan Erich, the school builds on a natural synergy between disciplines that address food-related issues. “The formation of the school is a change in Maine, and the disciplines we represent are of great interest to students — dietetics, sustainable agriculture, animal science, including pre-vet, to name a few — as well as very important to the general public,” Erich says. The new school also is better aligned with trends in federal funding.



Crabgrass
(*Digitaria spp.*)



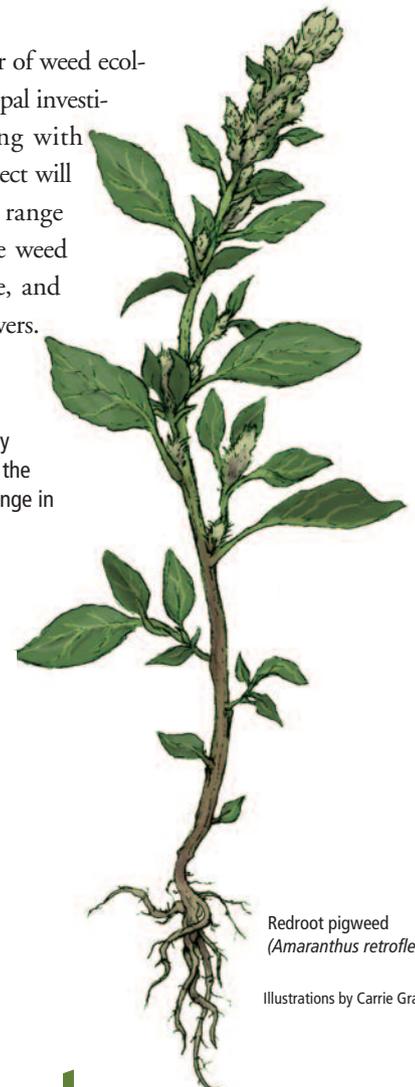
Hairy galinsoga
(*Galinsoga ciliata*)



Common lambsquarters
(*Chenopodium album*)



Quackgrass
(*Elymus repens*)



Redroot pigweed
(*Amaranthus retroflexus*)

Illustrations by Carrie Graham

Food futures



VoltturnUS 1:8 is sited off the Maine coast, deployed by Maine Maritime Academy June 2.

VOLTURNUS 1:8, a 65-foot-tall offshore floating wind turbine prototype, was connected to Central Maine Power Co., June 13. It is the first grid-connected offshore wind turbine in the Americas. Sited off the coast of Castine, Maine, it is one-eighth the scale of a 6-megawatt (MW), 152-meter rotor diameter design.

VoltturnUS technology is the culmination of more than five years of collaborative research and development conducted by the University of Maine-led DeepCwind Consortium. DeepCwind is a public-private partnership funded by the U.S. Department of Energy (DOE), the National Science Foundation-Partners for Innovation, Maine Technology Institute, the state of Maine and the University of Maine. It also includes Maine-based partners Maine Maritime Academy, Cianbro and more than 30 other industry partners.

VoltturnUS 1:8 was launched in the Penobscot River in Brewer, Maine, May 31 by UMaine's Advanced Structures and Composites Center and its partners. The event was hosted by Cianbro.

Data from the 2013 deployments will be used to optimize the design of a full-scale version of UMaine's patent-pending VoltturnUS system. The goal is to reduce the cost of offshore wind-generated electricity to compete with other forms of electricity generation without subsidies.

The UMaine Advanced Structures and Composites Center has partnered with industry leaders to develop a 12-MW pilot farm. The 1:8 scale deployment this summer will de-risk UMaine's VoltturnUS technology in preparation for connecting the first full-scale unit to the grid by 2017.

Maine has 156 gigawatts (GW) of offshore wind capacity within 50 miles of its shores and a plan to deploy 5 GW

Winds



of offshore wind by 2030. The 5-GW plan could potentially attract \$20 billion of private investment to the state, creating thousands of jobs.

Last year, the UMaine Advanced Structures and Composites Center-led consortium was awarded the first phase of a potential \$93.2 million DOE Offshore Wind Advanced Technology Demonstration Program. The consortium of industry leaders and national laboratories was one of seven national awardees selected from more than 70 competing proposals.

Each project received up to \$4 million to complete the first half of the Front End Engineering and Design (FEED) phase. This April, DOE will select up to three projects for follow-on FEED phases — construction and installation, to achieve commercial operation by 2017. The final projects could receive \$46.6 million each over four years. ■

THE UNIVERSITY of Maine will expand its offshore wind research and development facilities in the next year, constructing an addition for wind and wave testing at the Advanced Structures and Composites Center. The new 13,000-square-foot, \$6 million facility is funded by a \$3 million Department of Commerce Economic Development Administration grant and a Maine bond. In addition, UMaine, Maine Maritime Academy, Sandia National Laboratories and National Renewable Energy Laboratory received a nearly \$984,000 Major Research Instrumentation (MRI) grant from the National Science Foundation to create a new wind and wave generating system — W².

W² will be a unique, multidirectional system with a rotating open-jet wind tunnel positioned over a 30-meter by 9-meter wide, 5-meter deep ocean wave basin located in the new facility. Using a programmable directional wave maker, it will simulate conditions similar to those in the Gulf of Maine and beyond.

Data collected from the system — the only one of its kind in the United States — will be used to develop test standards for floating structures, particularly those requiring wind and wave interaction, such as offshore floating wind turbines, says Krish Thiagarajan, UMaine’s Alston D. and Ada Lee Correll Presidential Chair in Energy and mechanical engineering professor, who is the principal investigator of the project. Other uses include testing by ocean energy developers and those in the offshore oil and gas industry; studying wave interaction with beaches and structures by coastal engineers; and examining wind dispersal of marine pollutants by oil spill management companies.

WITH FUNDING from the Maine Technology Institute and the U.S. Department of Energy, the University of Maine’s Advanced Structures and Composites Center is leading the effort to enable cost-effective measurements of hub-height wind speeds in deepwater where fixed-based towers are not feasible. The UMaine Composites Center’s buoy-based floating LIDAR system is collecting hub-height wind and other metocean measurements in the Gulf of Maine.

In October 2012, UMaine’s Composites Center, NRG Systems Inc., AWS Truepower LLC, UMaine’s Physical Oceanography Group and Leosphere SAS established a research and development partnership to gather deepwater metocean data in the gulf. UMaine has designed a floating system to house a modified WINDCUBE® v2 Offshore LIDAR Remote Sensor.

The floating system, which incorporates a proven LIDAR system that detects wind conditions using laser technology up to 200 meters above the ocean surface, is based on buoy technology developed and tested by UMaine’s Physical Oceanography Group in the past decade in the Gulf of Maine and abroad. AWS Truepower and UMaine will conduct a campaign to validate data collected by the floating system.

The buoy was deployed alongside UMaine’s VoltturnUS 1:8 floating offshore wind turbine in June off the coast of Castine, Maine.



of change

WILL WARMING WATERS CHANGE MAINE MARINE LIFE AS WE KNOW IT?

The gulf

MAINE'S RUGGED COASTLINE looks a lot like it did when Bob Steneck arrived in the mid-1970s. But the same isn't the case underwater.

The University of Maine marine scientist says beneath the surface, out of sight, the Gulf of Maine has changed. A lot.

Cue the *Jaws* music.

Formerly mighty and plentiful Atlantic cod are now rare in some parts of the Gulf of Maine. Those that do remain are considerably

smaller than the record-holder — a 212-pounder caught in 1895 off the coast of Massachusetts.

North American Atlantic salmon — often called the king of fish — struggle to survive to return to their home rivers to spawn.

And green sea urchins are fodder for hoards of Jonah crabs.

Lobsters, though, are thriving. Maine fishermen have been landing record-setting haul after record-setting haul.

But even that good news is tempered.

Researchers and fishermen say it's perilous that one species is propping up the entire fishery in Maine. And the shell disease that has decimated lobsters in Rhode Island and Long Island Sound is creeping into the Gulf of Maine.

Lobster, cod, salmon and sea urchins are subjects of interest and study for Steneck and his peers in the UMaine School of Marine Sciences

— Rick Wahle, a research professor based at UMaine's Darling Marine Center, and Andrew Pershing and Katherine Mills, who also have joint appointments at the Gulf of Maine Research Institute (GMRI).

The consensus, says Pershing, is overfishing and warming ocean water, as well as the resulting ripple effects, have altered the Gulf of Maine and impacted its iconic species. While commercial fisheries have operated in the region for hundreds of years, climate change is a new influence on fish populations.

"Regardless of where people attribute blame, whether it's the result of human activities or not, it's important to know we are seeing major changes in the ocean system," Mills says.

And the carbon dioxide that's already in the pipeline, so to speak, will continue to increase ocean temperatures for another decade or more, Pershing says.

In the face of this "brave new

By Beth Staples



Georgia O'Keeffe (1887–1986)

Wave, Night

Ogunquit, Maine, 1928

oil on canvas

30 in. x 36 in. (76.2 cm x 91.44 cm)

Addison Gallery of American Art, Phillips Academy, Andover, Massachusetts,
purchased as the gift of Charles L. Stillman (PA 1922), 1947.33

© 2013 Georgia O'Keeffe Museum / Artists Rights Society (ARS), New York

The gulf

ocean,” UMaine marine scientists say it’s important to promote species resiliency. It’s also critical that fishermen have the flexibility to adapt to changing conditions and that fisheries management quickly adjusts.

Adaptability is crucial, Pershing says, because the ocean will continue to warm and the ensuing effects will be increasingly unpredictable.

Summer 2012 is a case in point. While scientists continually monitor ocean temperature, the 2012 ocean heat wave was still a surprise.

“Trends are important but events can bite you,” he said at the Island Institute’s “A Climate of Change” conference this summer on the Portland waterfront.

IN 2012, the Northeast Shelf Ecosystem (NSE), which extends along the East Coast between Cape Hatteras, N.C. and the Gulf of Maine, experienced the warmest sea surface temperatures in 150 years, according to NOAA’s Northeast Fisheries Science Center. The record-high average was 57.2°F (14°C); the previous 30-year average was 54.3°F (12.4°C).

“This ocean heat wave was nothing we’ve ever seen before,” says Pershing, who became fascinated with the sea as a preschooler when he saw



Regardless of where people attribute blame, whether it’s the result of human activities or not, it’s important to know we are seeing major changes in the ocean system.”

Katherine Mills

Jaws with his parents at a drive-in theater in his home state of Nebraska.

The 2012 increase in ocean temperature was the largest single-year hike since record keeping commenced in 1854 — when Franklin Pierce was

president, the California Gold Rush was on and Florence Nightingale nursed soldiers in the Crimean War.

The warming produced interconnected ripple effects. It triggered changes in biology, Pershing says, which, in turn, influenced fisheries, which impacted the economy.

Due to the warm water, in 2012 lobsters in the Gulf of Maine molted a month or more earlier than usual. While lobstermen landed a record number of crustaceans — more than 126 million pounds according to the Maine Department of Marine Resources (DMR) — processors and consumers weren’t prepared for the large early catch and the price of lobsters plummeted.

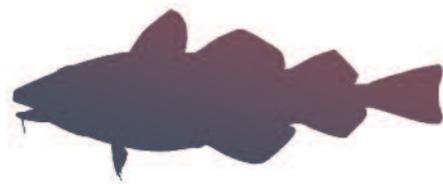
The price crash hit lobstermen hard. These days, lobsters are equivalent to a big fish in a big pond — they are the only major fishery left in many parts of Maine’s coast.

The condition of lobsters is a study in contrasts, Wahle says. The past decade, they’ve thrived in the conditions in the Gulf, but have had massive die-offs and incurred shell disease in southern New England.

We asked UMaine marine scientists to cite the top three facts the public should know about three of the sentinel species in the Gulf of Maine:

Andrew Pershing on Atlantic cod —

- Cod has historically been New England’s most valuable groundfish species.
- The quota for Gulf of Maine cod was reduced 78 percent this year in an effort to rebuild the stock. This is creating tremendous stress in the industry.
- The Gulf of Maine is near the southern limit for cod. Warming in the region is expected to decrease cod abundance.



In part, it's due to the same process — a widespread warming of ocean water across regions, he says.

Lobsters become thermally stressed — their systems shut down — in water above 20°C, Wahle says. In summer, the ocean water temperature in southern New England is 22°C to 24°C.

But the ocean water temperature in the Gulf of Maine, Wahle says, is, for the moment, in a sweet spot range for lobsters. East of Penobscot Bay, juvenile lobsters are even being found where previously there was no settlement, he says.

But, Wahle warns, continued ocean warming could bring the same problems that have plagued southern New England. In the last decade, a mass lobster mortality in Long Island Sound and the onset of shell disease have caused fishery collapses in southern New England. The industry has yet to recover.

In summer 2013, Wahle met Maine lobstermen who had hauled in crustaceans afflicted with shell disease, a leading cause of mortality. The disease digests the lobster's shell, leav-

ing it discolored and pitted, Wahle says. It also may blind them and prevent them from molting.

Wahle, Steneck and Stonington lobsterwoman Genevieve McDonald shudder when thinking about what could happen if the shell disease continues its northward creep.

Maine's working waterfront is already perilously dependent on the lobster, says Wahle.

Steneck calls the situation a ticking socioeconomic time bomb.

"We're on a one-legged stool," McDonald said at the Island Institute's summer conference.

If the one-legged stool crashes, so too does a way of life for some 5,000 lobstermen and women in the state. And that's for starters.

"It's a vital part of our economy," says McDonald. "On the coast, we are all connected to the fishing industry. I'm 30 years old and in 10 to 15 years, it may not be a viable industry to me."

THE GULF of Maine, says Steneck, has relatively few species anyway, which makes it prone to booms and

busts. The situation is exacerbated, he says, because of the lack of large cod — a major predator of lobster.

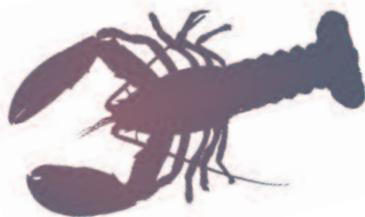
For thousands of years, cod maintained a powerful presence in the Gulf. Bone fragments unearthed in archeological digs in the region indicate that 4,000 years ago, cod averaged a meter in length. Old-time fishermen reportedly joked cod were so plentiful that people could walk across the ocean on their backs.

In the 1800s, Steneck says about 10,000 cod fishermen plied Maine waters. About 20 remain.

In the 1980s, fishermen with increasingly sophisticated equipment annually landed about 14,000 metric tons of the fish. Landings peaked in 1991 at more than 17,000 metric tons.

Between 1995 and 2008, as abundance declined and managers implemented stringent measures to curtail overfishing on the stocks, annual landings of the fish from the Gulf of Maine and Georges Bank plummeted to about 4,000 metric tons.

Despite stricter fishing quotas, cod have not recovered. The Gulf of



Rick Wahle on American lobsters —

- While lobsters are at record-breaking highs in the Gulf of Maine and parts of Atlantic Canada, they are at historic lows in southern New England. The diverging paths are most likely the result of the same process — a warming climate.

- Lobsters in New England straddle a steep north-south temperature gradient, and with a warming climate we are witnessing the northward shift of the species' prime thermal habitat and therefore its geographic range.

- The boom in Gulf of Maine lobsters has probably been enhanced by overfishing of their chief predators — groundfish. Coastal economies here are perilously dependent on lobster. With so few alternative fisheries, the prospect of a lobster collapse is unthinkable.

The gulf

Maine is already at the southernmost tip of their range and Steneck says they're now ecologically extinct here.

In 2013, quotas for cod in the Gulf have been reduced by 78 percent, which Pershing says deals “a sharp blow to an already struggling industry.”

Other big groundfish, halibut and haddock, for instance, have also been overharvested, Wahle says. In effect, humans have removed the apex predators from the Gulf's food web.

“The steep challenges facing cod and the cod fishery are shared by many other fisheries, and strategies to understand and rebuild this stock and its fishery should be transferable to other fisheries struggling to adapt to climate and economic changes,” Pershing and colleagues from GMRI and UMaine write in *The Future of Cod in the Gulf of Maine*, June 2013.

SEA URCHINS are also facing steep challenges. In the late 1980s, Maine fishermen sought to cash in on the Japanese market demand for their roe and abruptly began removing large

numbers of the prickly looking echinoderms from the Gulf of Maine.

In 1993, the sea urchin fishery in Maine was second only to the American lobster in value, and the local fishery supported more than 1,500 full-time urchin fishers. With few regulations initially in place, and soaring profits, some divers even died in pursuit of the food delicacy.

By 2000, the sea urchin population off Maine was effectively decimated and the seaweed on which they once grazed began to flourish. The abundance of seaweed, in turn, created a nursery habitat for Jonah crabs, says Steneck, and the crabs subsequently preyed on the few sea urchins that remained.

The entire coastal ecosystem flipped and “locked” into a seaweed-dominated state that has persisted for nearly 20 years.

Steneck says the sea urchin fishery in the Gulf of Maine declined 84 percent in value by 2012; no full-time fishermen remained. While Steneck has tried to reintroduce sea urchins in patches, he says voracious crabs

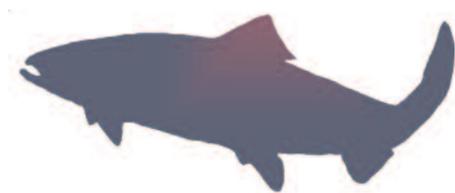
quickly move in, feast and wipe them out.

The crab population has been increasing for decades in the Gulf, Steneck says, because of the absence of one of their predators — Atlantic cod. Recovery “may be difficult or impossible to achieve” for decades.

Recovery is the goal for many fish species in the Gulf of Maine, Pershing says. For some species, like Atlantic salmon, this has included active intervention, including hatcheries, river restoration, and removal of dams, Mills says. Despite those attempts salmon populations declined sharply.

Atlantic salmon from rivers across North America spend a portion of their lives together in the Labrador Sea. They overwinter off of Newfoundland for at least a year, and some spend the following summer feeding off west Greenland before returning to their home rivers to spawn.

Mills noted that the pattern of declines observed in Maine were similar to the declines in rivers in Canada. The widespread pattern indicates that



Katherine Mills on North American Atlantic salmon —

- North American Atlantic salmon populations from regions as geographically separated as Maine and Labrador experienced coherent and substantial declines in abundance and productivity in the early 1990s, and they have persisted at low levels since that time.
- These declines were associated with marine conditions that salmon encountered while overwintering and feeding in the Labrador Sea, specifically increasing ocean temperatures and a reduction in the availability of capelin — a primary food source for Atlantic salmon.
- The experience of Atlantic salmon indicates that climate change is directly and indirectly structuring pelagic ecosystems in the northwest Atlantic, and these impacts need to be considered in identifying recovery opportunities for the species.

conditions at sea rather than local, river-specific factors are likely to blame. Those ocean conditions include warming ocean waters and a lack of food.

Ocean temperatures in the Labrador Sea have warmed rapidly since 1990. In addition, some of salmon's prey — notably capelin, the small fish at the center of the subarctic food web — have declined in the areas inhabited by salmon.

"It's imperative that we learn how climate and other ecosystem factors are influencing the species, so that we can identify opportunities to aid in its recovery," she says. "It's also important to align management processes with the dynamic changes."

MANAGEMENT AND conservation are best handled at the local level, where fishermen have boats in the water and a say and stake in fisheries management, Steneck says. It's a sharp diversion from how fisheries managers have operated in the past.

"If we have any hope of managing, we need to have a fundamental rethinking and reinventing," he says.

Pershing notes the challenges of managing species that shift in response to changes in the ocean. "We tend to want to manage the ocean like land and draw boundaries and assume things will always be that way," he says. "We need to move away from fishery management with rigid boundaries in space and time."

And, Steneck says, understanding the past is important. Species have disappeared before, he says, pointing



My best hope is that **we find a way** to manage the coastline in ways that **promote the lobster fishery** and at the same time **rebuild the scallop fishery** and **rebuild the groundfish fishery**. With diversity comes stability." Rick Wahle

to five mass extinctions. The Permian-Triassic extinction 251 million years ago was the most extreme — about 96 percent of the planet's species perished, he says.

The Ordovician-Silurian extinction about 439 million years ago was the earliest and the Cretaceous-Tertiary extinction about 65 million years ago — when dinosaurs disappeared — was the most recent.

Knowledge is power, Steneck says. So while it's possible to get "caught in the cul-de-sac of despair," it's important to deliver a clear message and focus on what can be done.

McDonald, captain of *F/V Hello Darlin'* is doing just that. "Climate change is not the end of our fishery," she says. "It's a change."

She was hauling traps in 2012 when the lobster catch exploded. She's

still hauling traps and she's enrolled in the marine science program at the University of Maine at Machias, with plans to earn a degree in June 2017.

"After graduation I'd like to coordinate and encourage collaboration between the science, regulatory and commercial fishing communities," she says.

And continue to fish. Even if it's not for lobster.

It might be other species that emerge from the north or south, perhaps squid. "Do we have flexibility in our management plans to consider these types of occurrences?" she asks. "If squid move up from the south and become an economically viable product, do we have a licensing plan to allow Maine fishermen to harvest them?"

McDonald appreciates that scientists, managers and fishermen and women are communicating now with each other.

Wahle agrees. His worst fear is that due to a calamity — shell disease or a natural disaster — the lobster industry could collapse before adaptations are implemented. If the unimaginable happened, he says the coastline that hasn't changed much since the 1970s would gentrify — and condominiums and yachts would replace bait shacks and fish wharfs.

"My best hope is that we find a way to manage the coastline in ways that promote the lobster fishery and at the same time rebuild the scallop fishery and rebuild the groundfish fishery," he says. "With diversity comes stability." ■



What's Possible

Maine AgrAbility helps farmers with disabilities remain active and independent

By Elyse Kahl

“HI ALEX, I’m by the Cortlands,” Naomi King says with a straight face into her walkie-talkie.

She puts her ear to the device waiting for a response.

The walkie-talkie clicks on.

“Ha-ha, very funny,” King’s assistant Alexandra Tomaso replies sarcastically.

King cracks a knowing smile. Saying “I’m by the Cortlands” on a 105-acre farm that’s home to 48 varieties of apples — predominantly Cortlands and McIntoshes — is a running joke among the 24 employees of Pietree Orchard, the business she manages on the crest of Waterford Road in Sweden, Maine.

A few minutes later, Tomaso drives up in a golf cart, emerging from the early autumn mist shrouding the orchard that overlooks New Hampshire’s White Mountains.

“That wasn’t fair,” Tomaso says to King, initiating a round of banter before the pair switch gears to talk business.

Tomaso started working for King in April 2013 at the suggestion of Maine AgrAbility, a USDA grant-funded state program that helps farmers with chronic health conditions and disabilities gain more control of their lives, continue to farm successfully and live independently. The Maine AgrAbility program is a nonprofit collaboration of University of Maine Cooperative Extension, Goodwill Industries of Northern New England and Alpha One.

Since receiving USDA funding in 2010, Maine AgrAbility has assisted more than 160 Maine farmers who have disabilities by offering services that range from answering agricultural questions, to suggesting ways to adapt tools or work sites, to referring farmers to other local support agencies.

King, a Unitarian Universalist minister and University of Southern Maine graduate, moved to Sweden in 2012 to be closer to her family after her rare muscular disorder started to advance.

Naomi King, far left, operates Pietree Orchard in Sweden, Maine, with the help of her assistant Alexandra Tomaso. Tomaso started working for King this past April at the suggestion of Maine AgrAbility.



What's possible

In June 2012, King, who uses a wheelchair, took the management job at the family-owned business after her aunt retired. Naomi's mother bought the orchard in 2008 to keep the business a working farm.

Naomi's mother and father, authors Tabitha and Stephen King, are UMaine alumni.

"I'm the business monkey," King says matter-of-factly, pointing at her nametag and the sign on the office door she shares with Tomaso. "It's how I'm registered at the bank, it's my official title. I monkey with the business."

After working with farmers through her ministry, King, who had viewed herself as a vegetable gardener rather than a farmer, wanted to stay connected to the local food movement. She found the learning curve was steep when taking over a 75-year-old expanding farm.

Improvements to the business in the past few years have included opening a brick oven for baking bread and pizza sold in the retail store that's open daily from June to Dec. 24; offering winter greens at area grocery stores and co-ops; making and selling maple syrup; and continuing to add

crops.

"In 2008, what was growing here were apples and pumpkins. Today we grow 48 varieties of apples, 11 varieties of peaches, five varieties of Asian pears, four kinds of plums, nectarines, blueberries, strawberries and 100 kinds of vegetables, including potatoes and beans," King says while petting her black cat McIntosh, or Mac, whom she jokingly refers to as "integrated pest control."

By February 2013, the challenges of managing a successful, growing mid-size farm began to take a toll.

"I was at the point where I could not work at all here anymore," King says. "I spent three months working by phone and going through the process of passing over the business after I had only been here about six months."

KING DISCOVERED a reference to the National AgrAbility Project online. When she learned there was a Maine program, King contacted Maine AgrAbility Project Coordinator Lani Carlson to determine if the program would apply to her.

Once King learned managing a farm counts as farming, she shared

“ In 2008, what was growing here were apples and pumpkins. Today we grow **48 varieties** of apples, **11 varieties** of peaches, **five varieties** of Asian pears, **four kinds** of plums, nectarines, blueberries, strawberries and **100 kinds** of vegetables, including potatoes and beans.” Naomi King



her needs to improve mobility on the farm, and to offer health and safety training to her employees.

One month later, Maine AgrAbility representatives were at Pietree to determine the needs of King and the business.

When someone contacts Maine AgrAbility, specialists conduct a farm assessment by observing work procedures and conditions, Carlson says. A report is then prepared that includes strengths, barriers and recommendations for improvement, as well as information on funding options, loan programs and support groups when



Naomi King, right, talks with Lani Carlson in Pietree Orchard's store that sells produce and maple syrup. It also includes a brick oven for baking bread and pizza.

needed.

"We give suggestions and it's up to the farmers to decide if they want to use it," Carlson says of the free program. "We don't just give them the report and walk away. We follow up and see if they need more help, and see how things have been implemented."

After Pietree's assessment, AgrAbility specialists made recommendations to King, such as hiring a personal assistant and getting a rugged outdoor wheelchair. Maine

AgrAbility also referred King to an accessibility architect to update entrances and bathrooms, and build ramps.

King says the outdoor wheelchair with under-inflated tires designed to go over ridges instead of crush them, and a seat that rises 5 feet off the ground, allows her to check crop densities and harvest, if necessary.

"It lets me do more than I had imagined possible," she says of the wheelchair that has a base painted John Deere green and yellow.

The program has also made the employees more aware of accessibility issues and they have applied it to other areas, such as planting with more space between rows to allow a wheelchair to get through.

In addition, the orchard now offers accommodations to visitors, such as poles that allow those sitting in chairs to pick from trees, and transportation to and from the pick-your-own strawberry, blueberry, apple and pumpkin fields.

King says the program allows her to remain active with the business and do more, despite the worsening of the disease.

"I was tremendously discouraged and convinced I couldn't do anything related to the farm anymore," King says. "So to be able to come to work six days a week is invaluable to me. It gives me a lot of purpose."

The improvements spurred from AgrAbility recommendations have also helped Pietree continue to expand and evolve. Next year, King hopes to add more crops, including switchgrass — a renewable energy source — and a grain, either buckwheat or a lower-elevation quinoa.

MAINE AGRABILITY addresses a variety of conditions including arthritis, spinal cord injuries/paralysis, back impairments, amputations, brain injuries, visual and hearing impairments, diseases, cerebral palsy, respiratory impairments and head injuries.

The program provides consultative services and technical assistance, such as suggestions for modifying or

What's possible

adapting the agricultural operation, buildings, equipment, and/or tools on a farm; works with rural agriculture, rehabilitation, and healthcare professionals to support Maine farmers with disabilities and their families; and shares information and resources statewide through networking events.

“AgrAbility is a big picture,” Carlson says. “It’s not just helping the farmers, it’s educating people.”

King is now a member of Maine AgrAbility’s advisory council and helps direct education and outreach. She says being a member allows her to serve a program that has helped her enormously.

“I think occupational therapists are taught how to work with a wide variety of occupations, and yet, occupational therapists in this area that I’ve met didn’t know anything about adaptation for agriculture,” King says.

King has also taken it upon herself to spread the word about the value of Maine AgrAbility.

“Since finding out about the program, I’ve been passing that information along to my caregivers and medical providers who work with farmers in the area,” King says.

“The wide range of services AgrAbility has set up — everything from (coping with) mental illness to mobility issues — makes it have broad applicability in this area.” ■

“

AgrAbility is a big picture.

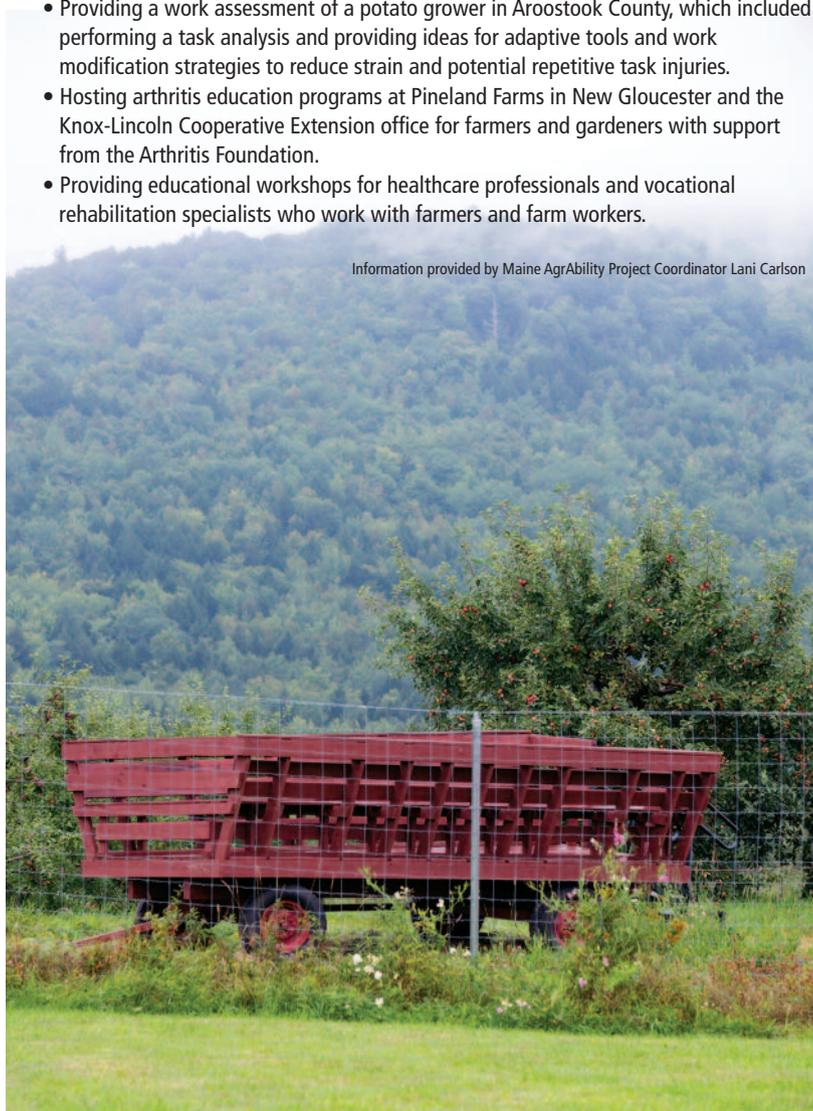
It’s not just helping the farmers, **it’s educating people.**” Lani Carlson

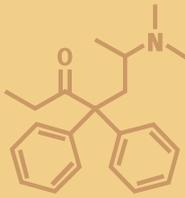
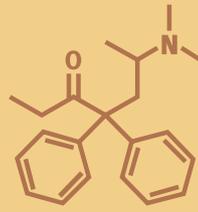
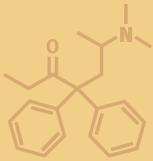
Enabled to stay on the farm

SINCE RECEIVING funding from the USDA in 2010, Maine AgrAbility staff has worked with more than 160 farmers from diverse agricultural pursuits with a variety of disabling conditions that include — but are not limited to — visual impairment, stroke, arthritis, multiple sclerosis, epilepsy, autism, post-traumatic stress disorder and traumatic brain injury. Some examples of Maine AgrAbility’s outreach are:

- Connecting the family of a farmer who has been losing his eyesight since 1985 with a counselor from the Division for the Blind and Visually Impaired, who respected the need for the farmer’s independence as well as his desire to be useful and productive. AgrAbility facilitated communication and resources for peer support, adaptive tools and other networking opportunities.
- Helping a farmer with a traumatic brain injury realize the difficulties he was experiencing, such as stress, lack of concentration and time management, were due to his injury. AgrAbility connected him with a neurorehabilitation program, and he is now working with Vocational Rehabilitation and is eligible for its long-term support.
- Conducting a farm tractor seating analysis for a dairy farmer who was mauled by a bull in 1992 and still experiences chronic pain. The AgrAbility report found each tractor had a specific use and couldn’t be interchanged, so the program helped coordinate the purchase of five air-cushioned tractor seats to relieve the pain from vibration due to worn-out seats.
- Working with three disabled veterans — two recently disabled and one from the Vietnam War — from Somerset, Sagadahoc and Oxford counties, who have varied agricultural experiences, but want to continue to serve their country by providing food for their families and communities.
- Providing a work assessment of a potato grower in Aroostook County, which included performing a task analysis and providing ideas for adaptive tools and work modification strategies to reduce strain and potential repetitive task injuries.
- Hosting arthritis education programs at Pineland Farms in New Gloucester and the Knox-Lincoln Cooperative Extension office for farmers and gardeners with support from the Arthritis Foundation.
- Providing educational workshops for healthcare professionals and vocational rehabilitation specialists who work with farmers and farm workers.

Information provided by Maine AgrAbility Project Coordinator Lani Carlson





Exposed risks

Identifying gene variations could help predict severity of opioid withdrawal symptoms in newborns

By Elyse Kahl and Margaret Nagle

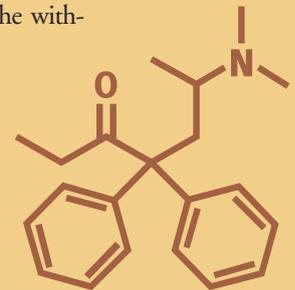
IN THE BRIGHTLY lit hospital room flooded with sunshine, giddy family members take their turns at the bedside of the mother and newborn, just hours old. The swaddled bundle of joy sleeps soundly as she's passed back and forth among the well-wishers. If she awakens to be fed, her cries are quickly soothed.

Down the hall, another new mother attempts to soothe her baby born the same morning. The dim hospital room is lit only by a bedside lamp. Window shades are drawn. Overhead lights and television are off. Visitors wait outside the door for their turn to peek at the restless newborn, her muscles clenched.

Tightness in the muscles of a newborn is often the first sign of withdrawal from opioids, according to Dr. Mark Brown, chief of pediatrics and director of nurseries at Eastern Maine Medical Center (EMMC) in Bangor, Maine.

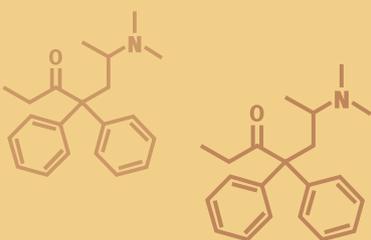
If the newborn has been exposed to opioids, the withdrawal symptoms can be life threatening.

Within 72 hours, upward of three-quarters of the newborns who are opioid-exposed will exhibit tremors, irritability and sleeplessness. In the Continuing Care Unit, nurses closely monitor the baby and comfort her as much as possible. If she develops neonatal abstinence syndrome (NAS), she will need treatment to help her cope with worsening withdrawal symptoms.



Seventy percent of babies born to mothers with opiate addiction, including those in methadone programs, experience the same abstinence symptoms as adults.

Exposed risks



By day three, the newborn with NAS may continue to have muscle tremors. She also begins to have trouble eating and keeping food down, fever and rapid breathing. The baby spends most of her time crying, especially during diaper changes, and can't be soothed. When the baby finally manages to fall asleep for a few minutes, she jerks herself awake and the crying continues. Any slight noise or external stimuli is an upset.

The Finnegan scoring system — which includes about 20 items related to the baby's physical state — is used by staff to determine if the baby's withdrawal symptoms are improving by physical comfort measures alone. If the severity of withdrawal symptoms can't be kept at a manageable level, the staff will begin administering medication.

The observation period of the newborn with NAS continues for five days, at which time hospital staff determine whether she has made it through the worst of the withdrawal and can be released without further treatment.

According to Brown, about 80 percent of the babies who don't need medication treatment are discharged within five days. When babies are allowed to go home, he warns mothers that the newborns may be a little more irritable than most, and won't have the best emotional control. For those babies still struggling with withdrawal symptoms after five days, drug treatment is required that could last up to 16 days.

At EMMC, Brown sees nearly 200 babies with NAS

At issue are the severe, potentially life-threatening withdrawal symptoms in newborns that can lead to complications, such as seizures and regulatory instability in feeding and sleep.

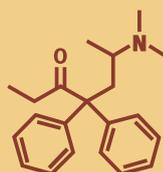
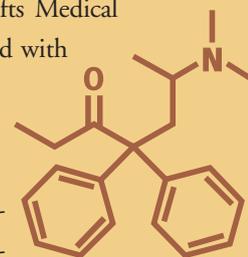
each year. Approximately 60 to 80 percent of infants exposed to opiate drugs in utero develop some or all withdrawal symptoms shortly after birth.

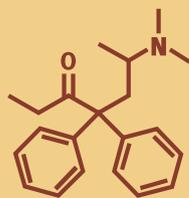
BROWN COLLABORATES with a research team from the University of Maine led by Marie Hayes, a professor in psychology and UMaine's Graduate School of Biomedical Science and Engineering (GSBSE). Her team has been studying the genetics of newborns experiencing opioid withdrawal in an effort to better understand NAS and detect early warning signs that a baby is at risk for severe withdrawal symptoms. She and Jonathan Paul, a member of Hayes' lab and a recent UMaine Ph.D. from the GSBSE program, and colleagues at Tufts Medical Center, found that gene variations associated with risk of opioid addiction could aid the treatment of babies' withdrawal symptoms in the critical hours after birth.

Their study found single-nucleotide polymorphisms (SNPs) predict withdrawal symptoms' severity in infants prenatally exposed to methadone, an opiate used to treat maternal dependence. Hospital stays were shorter for those newborns who had gene variants or polymorphisms in their OPRM1, related to opiate addiction in adults, and COMT, associated with brain neurotransmitter dopamine and frontal cortex function, according to the study.

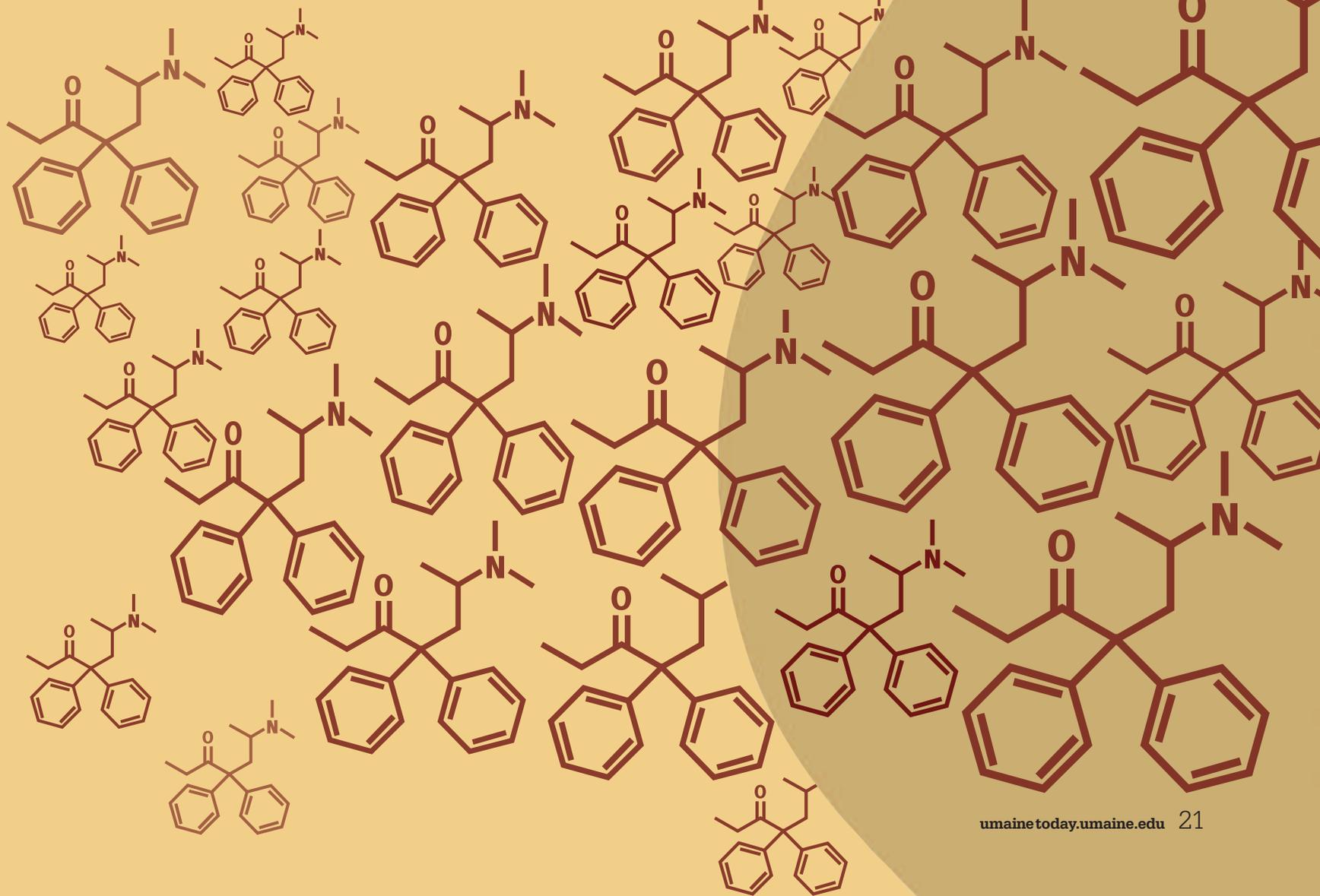
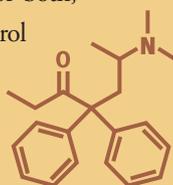
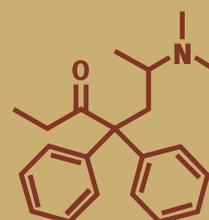
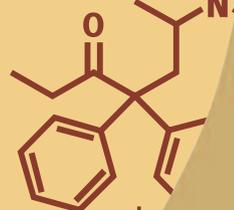
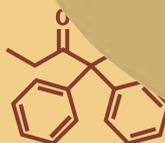
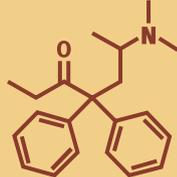
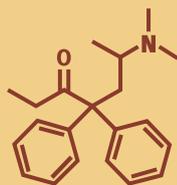
The findings of the study of 86 opiate dependent mothers and their newborns were published on May 1, 2013 in the *Journal of the American Medical Association (JAMA)*. The study is considered the first to examine the association of genetics and opioid withdrawal in newborns in an effort to better understand NAS.

"OPRM1 and COMT SNPS may help us determine

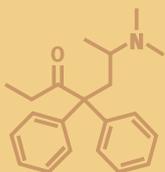




whether an infant is likely to have an easier withdrawal process based on having the addiction risk genetic profile,” says Hayes, who also has a joint appointment in GSBSE. “Adults with OPRM1 and COMT alleles may have variability in need for opioids to control the pain of chronic disease, such as cancer. If babies have one or both, they may require more or less opioid to control their withdrawal. We found babies with the risk alleles had less need for treatment and shorter lengths of stay.

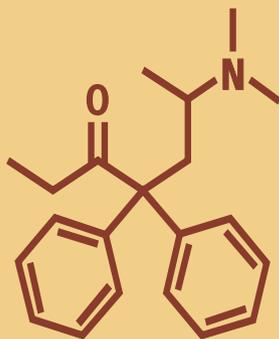


Exposed risks



“The clinical significance is that mothers’ genetic signature often includes the same risk alleles as the infant, so if we test the mothers (for these genes) or the babies in the postnatal period, we may be able to predict if the opioid-exposed babies will have easy or difficult withdrawal and plan replacement medications accordingly,” says Hayes, who is an allied scientist in pediatrics, family medicine and psychiatry at EMMC.

Within 72 hours, upward of three-quarters of the newborns who are opioid-exposed will exhibit tremors, irritability and sleeplessness.



At issue are the severe, potentially life-threatening withdrawal symptoms in newborns that can lead to complications, such as seizures and regulatory instability in feeding and sleep. Understanding which newborns are genetically more at risk and in need of aggressive treatment could temper potential long-term outcomes of severe withdrawal on child brain development.

Mothers’ variation in OPRM1 and COMT genes were tested and correlated with their infants’ profile. Knowing a mother’s variant could provide early medical warning that the baby is at risk for severe withdrawal symptoms and allow parents and caregivers to plan accordingly.

Seventy percent of babies born to mothers with opiate addiction, including those in methadone programs, experience the same abstinence symptoms as adults. Withdrawal symptoms can begin in the first 48 to 72 hours after birth and last for weeks or months, interfering with neuronal and respiratory development, says Hayes, who has been studying prenatal opiate exposure on newborns for the last seven years, and prenatal exposures, such as alcohol, for 15 years.

SINCE 2009, that research has included the collection of genetic data as part of a longitudinal study of mothers and their substance-exposed newborns, led by Hayes and Brown. In 2011, the two researchers began collaborating with Drs. Jonathan Davis and Elisha Wachman at Tufts Medical Center to test the OPRM1 and COMT gene hypothesis for predicting the severity of withdrawal.

Their research is part of a \$3 million, multi-institution National Institutes of Health (NIH) study led by Davis at Tufts Medical Center and Barry Lester at Brown Medical School. Hayes is a member of the steering committee on the associated clinical trial, providing expertise on genetic polymorphisms and developmental outcomes in NAS infants.

The first findings of the collaborative research with Wachman and Davis at Tufts Medical Center, and Hayes were reported in *JAMA*. The research team also included Jonathan Paul, the former UMaine doctoral researcher under Hayes who helped develop the genetic model and who is now an NIH postdoc at the University of Texas Medical Branch.

This is the second time in the past year that Hayes’ NAS research has been highlighted in the prestigious medical journal. A year ago, *JAMA* featured an editorial by Hayes and Brown, “The Epidemic of Prescription Opiate Abuse and Neonatal Abstinence,” detailing the challenges of caring for this vulnerable population, cautioning against defunding maternal treatment programs, and calling for stepped-up research into effective medications and other protocols.

More research is needed to better understand just what NAS treatment should be — and the results without it, Hayes says.

“I feel strongly that babies should be treated early and

aggressively (with opioids) so that excessive excitation of the brain associated with withdrawal is mitigated. Evaluation of genetic risk may help us decide which infants to treat aggressively to prevent potential brain damage. Treating aggressively prevents potential neurotoxicity that could be incurred when experiencing withdrawal symptoms, with opioids being, perhaps, the lesser of two evils,” says Hayes, who organized a May 2013 symposium on NAS, chaired by *JAMA* editor Howard Bauchner, in conjunction with the Pediatric Academic Societies conference in Washington, D.C.

“The type of postnatal opiate used for treatment is critical. Additionally, although more opiate exposure should be avoided in the postnatal period, this goal must be balanced with the need to treat withdrawal,” she says.

In the UMaine longitudinal study that has been ongoing since 2005, Hayes and her team — recent Ph.D. Beth Logan and grad students Nicole Heller, Deb Morrison and Hira Shrestha — have collected follow-up data on more than 200 NAS infants, tracking their development up to 3 years of age. Upcoming research papers will focus on methadone-related prenatal exposure and its effects on an NAS infant’s brain development, including what EEG results reveal about the neurocognitive effects of NAS in the first three years of life, and neurobehavioral findings at later ages. ■

Help for NAS infants

A TEAM OF University of Maine graduate students and their faculty adviser received UMaine’s 2013 President’s Research Impact Award for the research project “What Happens Next? Examining Child Protection Outcomes in a Cohort of Opioid-Exposed Infants.”

Alison Mitchell, Meagan Foss, Leah Agren and Jenifer Koch, and faculty adviser Jennifer Middleton won the annual President’s Research Impact Award at the 2013 GradExpo. The award is given to a graduate student and adviser who best exemplify the UMaine mission of teaching, research and outreach.

The community-engaged research project, part of a research methods series for the Master in Social Work curriculum, is being conducted by the graduate students in collaboration with Middleton, a UMaine assistant professor of social work.

Middleton is the lead researcher and co-director of evaluation on the Penquis Regional Linking Project: Improving the Safety, Permanency, and Wellbeing of Substance Affected Babies in Rural Maine, a five-year, \$3.9 million project led by the Bangor-based Families And Children Together (F.A.C.T.), UMaine’s School of Social Work, and a coalition of community organizations and agencies. The newly funded Penquis Regional Linking Project is a “community engaged” research project and one of the first of its kind in the nation to implement and evaluate a trauma-informed system of care for substance-exposed infants and their families.

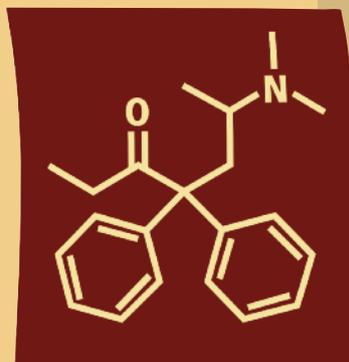
The student project aims to clarify what happens, from a child welfare system perspective, after the infant is discharged. The team plans to explore rates and reasons families with opioid-exposed infants become subsequently involved with child protective services through the Office of Child and Family Services at the Maine Department of Health and Human Services.

In the Linking Project, a specially trained “navigator” will partner with families dealing with substance abuse issues to assess their strengths and needs, build formal and informal supports, and reduce barriers to accessing resources. Services will include individualized and group prenatal and parenting education, access to substance abuse screening, and assistance with transportation.

With such services, the youngest children in families struggling with substance abuse will be safer, and have a better chance of staying with their families and reducing their foster care system involvement, according to the project coordinators. Initially, an estimated 500 children up to age 5 and their parents or caregivers will receive navigator services, outreach and referral services, parenting education and trauma-informed family support.

Maine has the highest opiate addiction rate per capita in the country at 386 per 100,000, compared to 45 per 100,000 for the U.S. and 131 for New England, according to Middleton. In addition, a recent and growing problem is the use of bath salts; of the state’s 152 bath salts overdoses in 2011, 30 percent were in Penobscot County.

The high opiate addiction rate has resulted in a sharp increase in the number of babies born with intrauterine exposure to drugs, say the researchers. The statewide number has jumped from 165 babies affected in 2005 to 667 in 2011. At Eastern Maine Medical Center (EMMC), the primary birthing hospital in the Penquis region, there were 195 substance-exposed births in 2011, accounting for a third of all drug-exposed infants in Maine. Of those, 173 were opioid-exposed, which represents about 11 percent of all births in 2011 at EMMC.



Wonders of science

UMaine researchers who have changed our views of life on Earth

By Margaret Nagle

ANNUALLY, THE American Association for the Advancement of Science (AAAS), the world's largest scientific society, recognizes researchers who advance our understanding of life on Earth. AAAS Fellows, nominated by their peers and chosen by the AAAS Council, are women and men who are pioneers in science, engineering and innovation. Their scientifically or socially distinguished efforts advance science or its applications, ultimately benefiting all people, according to the international nonprofit, founded in 1848.

In the history of Maine's research university, there have been at least nine AAAS Fellows on the faculty. And the work of other AAAS Fellows in Maine, including Robert Kates, Presidential Professor of Sustainability Science, dovetails into the research of the University of Maine.

UMaine's AAAS Fellows include professor emeritus Ronald Davis of the School of Biology and Ecology, and the Climate Change Institute. Davis was the first North American ecologist to study charcoal in lake sediment to detect past forest fires, and to relate pollen in surface sediments to vegetation on a continental scale. For Maine, firsts include mapping postglacial re-establishment of vegetation, and presenting ecological descriptions of the state's peatlands and coastal spruce-fir forests.

AAAS Fellow Bruce Sidell, founding director of UMaine's School of Marine Sciences, died in 2011. Three of his colleagues, writing about Sidell's legacy in *The Journal of Experimental Biology*, noted that "he spotted questions that others in his field had missed and taught us many lessons about 'how animals work' that we otherwise might not have learned."

Indeed, that view of our world — the ability to see, ask and explore passionately — is what unites all of UMaine's AAAS Fellows, providing unique perspectives on the wonders of science.



I get the greatest satisfaction solving problems in marine sciences that help people who depend on the sea."

Bob Steneck

MARINE ECOSYSTEMS ARE CHANGING at an unprecedented rate worldwide. This causes uncertainty in the availability and sustainability of marine resources. While changes in some marine plants and animals may be easy to describe, the same cannot be said for how we describe them collectively as marine communities or ecosystems. In the 1980s to early 1990s, Bob Steneck and co-authors published a series of papers suggesting that groups of unrelated organisms can share functional similarities and thus can be treated together as a component of the natural community. This “functional group” approach helped us understand both the structure and functioning of marine ecosystems today and in the past. In 1995, AAAS recognized his research on “the ancient and contemporary processes that influence marine communities.” Although the approach Steneck developed was rooted in basic research, the application he has sought since relates to how it can best be used to solve human resource-related problems. Specifically, Steneck applied an ecological approach to the management of lobsters on the coast of Maine. He found that lobstermen have an innate ecological understanding of the ecosystem in which they fish so his approach resonated with them. He has gone on to study Maine’s sea urchin fishery and the lasting impact it has had on coastal marine ecosystems. Recently, he warned that managers may have become too comfortable with the lucrative monoculture of Maine’s lobster fishery for which the consequences of decline are serious. Steneck’s current focus is on how we can work effectively toward ecosystem-based management by first understanding the structure and function of these ecosystems and then how we can better manage them for biological and economic diversity.



The age of climate decision is here, and our actions will define the course of civilization and the health of our planet.”



Photo by Joan Myers

Paul Mayewski

PAUL MAYEWSKI CONDUCTS RESEARCH about past and modern climate in some of the coldest and highest places on Earth to help us understand the implications for our future water resources, storm patterns and health. Mayewski has revolutionized the collection and analysis of ice cores as tools to inform our understanding of climate change. The internationally recognized explorer and climate scientist directs the University of Maine Climate Change Institute. As a professor, he also has academic affiliations with the university's School of Earth and Climate Sciences, School of Policy and International Affairs, and School of Marine Sciences. Mayewski has led more than 50 expeditions to some of the most remote reaches of the globe, including many field seasons traversing Antarctica and Greenland, and work throughout the Himalayas, Tibetan Plateau and the Andes. His contributions to science include the discovery of human impacts on the chemistry of the atmosphere, and documentation of modern Antarctic and Himalayan ice loss. His research provided the first evidence of abrupt change in atmospheric circulation patterns leading to greater understanding of the impact of climate change on past civilizations and the potential for future abrupt climate change. Mayewski's numerous honors include the first-ever internationally awarded Medal for Excellence in Antarctic Research, the Seligman Crystal for excellence in glaciology, and the Explorers Club Lowell Thomas Medal. Mayewski has developed several prominent international research programs and public outreach efforts with organizations, such as the American Museum of Natural History and the Boston Museum of Science. Findings from his pioneering climate change research are reported in his more than 350 scientific publications. Mayewski's passion for translating science for a lay audience is evident in his two popular books, *The Ice Chronicles* and *Journey Into Climate*, and his numerous invited public lectures and media appearances, including NOVA, NPR, BBC and CBS' *60 Minutes*.



When I began to work with chytrids, I questioned my mentor about the value of pure research on this seemingly innocuous group. He replied that pure research skills prepare one to be able to contribute when something new arises. My experience and ability to work with chytrids did just that — beyond my wildest expectations.”

Joyce Longcore

IN THE LAST 30 YEARS, more than 100 amphibian species around the globe have become extinct. Associate research professor Joyce Longcore is tracking the killer. Last year, AAAS recognized Longcore for her scientific contributions to mycology and microbiology on aquatic fungi known as chytrids. In her more than quarter-century of research, Longcore has developed extensive chytrid collections and, in 1997, she isolated a pure culture of *Batrachochytrium dendrobatidis* (Bd), fungus believed to be responsible for the ongoing worldwide decimation of frogs. The breakthrough occurred after the simultaneous die-off of exotic frogs in captivity at the Smithsonian National Zoological Park in Washington, D.C., and in the wild in Australia and Central America. At that time, Longcore and her Smithsonian colleagues recognized the chytrid as a new genus and species. Today, as one of the world's leading authorities on chytrids, Longcore and other top scientists in the specialized field of amphibian disease research are collaborating to study populations of Bd throughout the natural world. Much of the genetic work to track the killer is possible with the help the UMaine Chytrid Laboratory, where Longcore maintains one of the most comprehensive collections of frog fungus cultures in the world. Not only are Longcore's cultures key to understanding origins and implications of Bd, but her methods for culturing the problematic pathogen bring international researchers to her door. Researchers continue to seek answers about the origins of Bd and why it kills certain amphibian species and not others. Just as important, scientists continue to fathom what the loss — and, in some cases, the extinction — of amphibian species means to the environment.



I study the youngest, most sensitive stages of marine organisms and the processes that affect their survival. These pivotal stages are often at the heart of predicting the effects of human-mediated or natural disturbance on a species and its ecosystem."



Susan Brawley

SUSAN BRAWLEY'S RESEARCH FOCUSES on marine algae. She and her students have informed our understanding of natural fertilization success in marine algae, including finding unexpected adaptations that allow rockweeds to reproduce successfully from wave-exposed habitats such as the Maine shore to low salinity habitats such as the Baltic Sea in Europe. She used historical shipping records from the 17th and 18th centuries, combined with molecular genotyping, to trace the localities in the British Isles and Ireland from which the rockweed *Fucus serratus* and the periwinkle *Littorina littorea* were introduced to North America. Her work now includes aquaculture research on sea vegetables such as dulse (*Palmaria palmata*) and laver (*Porphyra umbilicalis*) to increase economic benefits in the aquaculture sector to Mainers, while providing additional nutritious and tasty food on Americans' plates. Brawley leads the *Porphyra* Genome Project and has begun studies of microbial symbionts of macroalgae. Brawley, a professor of plant biology in the School of Marine Sciences and a cooperating professor in the School of Biology and Ecology, conducts most of her research in her campus laboratory and at UMaine's Center for Cooperative Aquaculture Research in Franklin, Maine, but her research has extended to Canada, China, the British Isles and Ireland, and Scandinavia. Last year, AAAS recognized Brawley for "innovative and interdisciplinary approaches in elucidating critical factors in rocky seaweed distribution, and for inspiring and training students at all levels." That included co-leadership of a recent National Science Foundation grant that trained numerous UMaine science and engineering graduate students while providing inquiry-based science in Maine schools; this project won the New England Board of Higher Education's Regional Excellence Award.



Edward Grew

IN THE PAST THREE DECADES, Ed Grew and his collaborators have discovered seven new boron and beryllium minerals. That's important in understanding where it all began. One scenario for the origin of life posits the presence of boron minerals on early Earth as one key for self-assembly of critical prebiotic compounds. Recently, Grew has turned his attention to the question of whether boron was present in sufficient quantities 4 billion years ago on the Earth's surface for stabilization of the sugar ribose, a critical component of ribonucleic acid, as envisaged in the scenario. Boron, together with lithium and beryllium, are much less abundant in the solar system than most other elements lighter than iron, and thus its appearance in distinct minerals required concentration by several orders of magnitude by geologic processes. The oldest boron mineral so far discovered on Earth is the borosilicate tourmaline found in the Isua area of Greenland. This area is underlain by a suite of metamorphosed sedimentary and volcanic rocks 3.7–3.8 billion years in age, not sufficiently ancient to have played a role in the origin of life. Grew has a new research grant from the Carnegie Institution of Washington to measure relative proportions of the two isotopes of boron in Isua tourmaline to see whether there is any evidence for predecessor boron minerals older than the Isua tourmaline, but not preserved — minerals that might have been present at the time of the critical juncture in the self-assembly of organic compounds for life to arise. In 2007, AAAS recognized Grew for distinguished research on the role of lithium, beryllium and boron in metamorphism at high temperatures and pressures, with emphasis on the Precambrian of Antarctica.



When I began my research on boron minerals, I never expected that it would lead me to question the assumption that there had been enough boron on early Earth to facilitate the self-assembly of organic compounds critical to life. Scientists who contend that boron played this key role now suggest that if there were insufficient boron on early Earth, then life may have started on Mars."



My undergraduate mentor encouraged me to study comparative physiology, to learn how animals work. An interest in sea anemones and their symbiotic algae led me to learn also how algae work. Physiology is not only fascinating, but the knowledge can help to produce more informed models about how individual marine organisms — the first things affected when conditions in seawater change — will fare during projected changes in climate and the oceans.”



Malcolm Shick

FOR MALCOLM SHICK, marine organisms are the canaries in the coal mine of global climate change. His comparative physiology research of the ocean's creatures, especially corals, helps forecast how they will be affected by environmental change. The professor of zoology and oceanography investigates how marine invertebrates in shallow seas avoid damage from intense ultraviolet radiation and from active forms of oxygen produced by UV radiation. A variety of marine plants and animals have compounds that serve as natural sunscreens, often produced in animals such as sea anemones and corals by the symbiotic algae living within their tissues. In other cases, Shick and his students showed that animals obtain the sunscreens from their algal diets, and that when incorporated into the eggs, the sunscreens afford protection from UV during larval development in the plankton. Shick and his colleagues also have discovered that genes coding production of the UV protectants have been transferred from microbes into some species of animals. In addition, as part of an international research team working at the Australian Institute of Marine Science studying coral bleaching on the Great Barrier Reef, Shick and UMaine Professor of Marine Sciences Mark Wells provided the first evidence that limited iron in the ocean exacerbated high-temperature-induced photooxidative stress in the symbiotic coral *Stylophora pistillata*, thereby affecting photosynthetic performance and antioxidant defenses. The implication is that the degree of coral stress in natural environments under high light and temperature may be modulated by trace-metal nutrition.

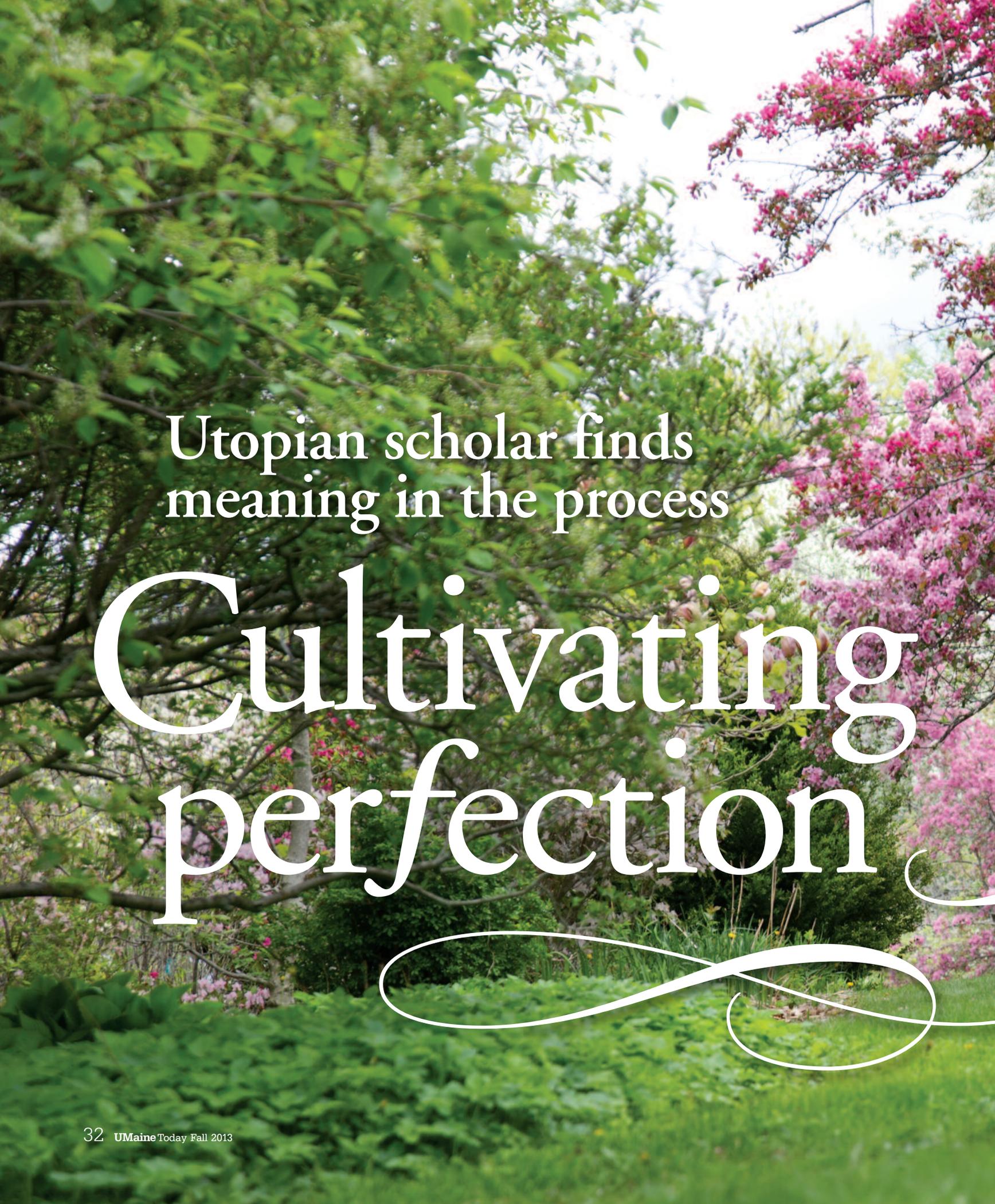


Irving Kornfield

IRVING KORNFIELD'S EVALUATION of DNA evidence and its interpretation have provided opportunities to improve the criminal justice system. Kornfield's applied research investigates the genetics of evidence found at human crime scenes. He conducts laboratory experiments on detection and transfer of body fluids and helps inform the defense bar. Kornfield is an expert in DNA and DNA transfer, and testifies for public defenders representing indigent clients. In instances where DNA is central to alleged crimes, his critical reviews have provided compelling rationales for acquittal and helped to improve lab protocols. More broadly, recommendations from his forensic work on mitigating bias in DNA analysis have been adopted by crime labs nationwide. Kornfield is an evolutionary biologist whose fundamental research examining populations of freshwater fishes in Africa has made significant contributions to the field of molecular evolution. He uses DNA and molecular markers to trace relationships among species and sub-populations of the same species in a wide diversity of animals, including microscopic marine organisms, whales, black bears and people. In the UMaine Molecular Forensics Laboratory he founded in 1997, Kornfield uses advanced technology to help determine the genetic mechanisms underlying complex organismic and population attributes. His lab has helped establish an extensive reference database of genetic markers that have contributed to understanding the genetic complexities of New England's deer and moose populations. He and his students routinely testify for the prosecution in trials involving wildlife violations. ■

“

My teaching and research in evolutionary biology provided me with an expansive view of forensics. Providing evidence of guilt or innocence in court, tracing the decimation of species or illuminating genetic disorders — all these interests stem from the adventure of science. I consider myself exceptionally fortunate to have been given the opportunity to pursue new areas of knowledge.”

A vibrant garden scene featuring a dense canopy of green leaves and branches. On the right side, there are clusters of bright pink flowers, possibly cherry blossoms. The foreground is filled with a thick layer of green, leafy plants, likely a vegetable garden. The overall atmosphere is bright and natural.

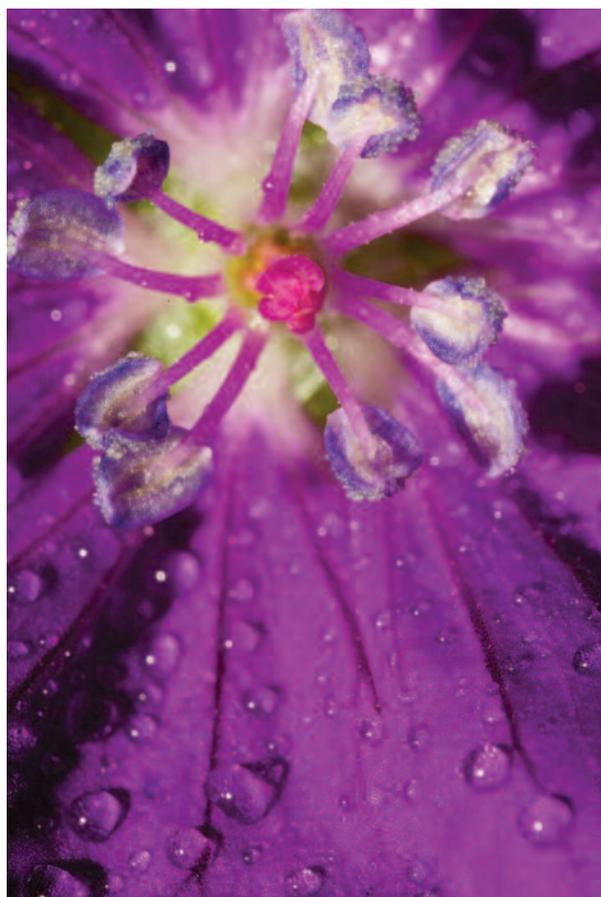
Utopian scholar finds
meaning in the process

Cultivating perfection

A decorative white flourish graphic consisting of a long, flowing line that loops and curves, positioned below the main title.



Cultivating perfection



By Beth Staples
Photographs by Sam Hess

*We are stardust
We are golden
And we've got to get ourselves
Back to the garden*

— Joni Mitchell, “Woodstock”

WHEN NAOMI JACOBS seeks serenity, she tends her ever-expanding flower beds and kitchen garden at her Bangor home. Weeding and planting nourish the University of Maine English professor's soul.

“For me, it's a very meditative place. Definitely a stress reliever and just beautiful,” says Jacobs, whose research focuses on utopian and women's literature.

When Jacobs chaired UMaine's Department of English, her responsibilities dug into her time to till, as well as to develop a paper for the 2009 annual meeting of the Society for Utopian Studies. As the conference deadline loomed, Jacobs opted to propose an essay on gardens in utopian literature. Writing and gardening are similar, she says, in that they both involve seeing the larger plot, paying attention to individual details and weeding out what doesn't fit. Gardening addresses the ubiquitous utopian impulse to create a perfect place and make the world better.

At the conference, Jacobs and Annette Giesecke, an expert on Ancient Greek and Roman gardens, professor of classics and chair of the Classics program at the University of Delaware, decided to continue to explore the intersect between nature, utopia and the garden.

They invited other gardeners and scholars to do the same. The result is the 305-page, 18-essay, *Earth Perfect? Nature, Utopia and the Garden*, which was put forth in 2012 from Black Dog Publishing in London.

The volume was the inspiration for a June 6–9 interdisciplinary symposium at the University of Delaware showcasing the garden as an emblem of the ideal human relation with nature. Giesecke and Jacobs co-chaired the symposium, which included tours of important public gardens in Delaware and Pennsylvania.

“For many of us, the creation of a garden is a small candle lit in the darkness of impending ecological collapse,” write Jacobs and Giesecke in the book's introduction. “Since the garden and gardening practices define human-

Left to right:

Pink Flower
Stillwater, Maine
2012

*Dreaming of
Lupines and
Buttercups*
Somesville, Maine
2013

Before the Concert
Orono, Maine
2012



ity's relation to the natural environment, it's important to retrace and re-examine the garden's symbolism, history and life-sustaining potency."

And that's what the essayists do. From Biblical passages to city planning and from royal gardens to plots tended by homeless people, the scholars explore gardens and utopia, and disconnections and dystopia.

EVERY GARDEN, JACOBS writes, is a utopian text "expressing the desire for a more perfect world, as well as an implicit critique of the less-lovely world in which it is located."

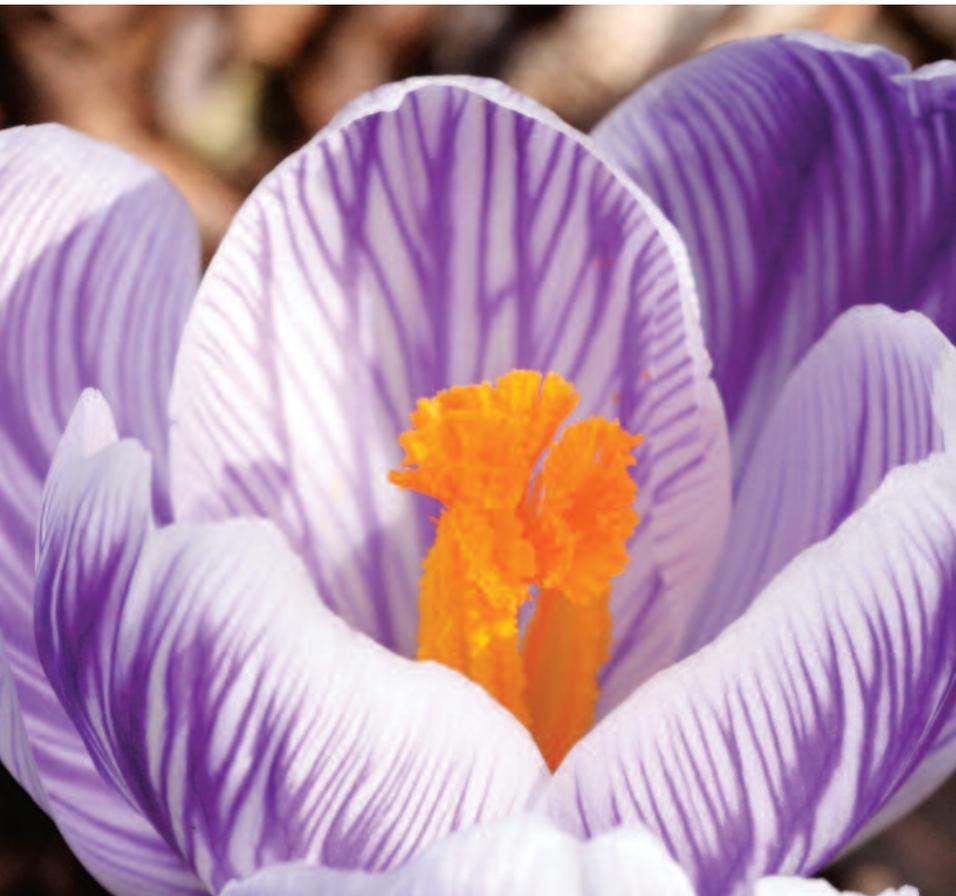
In much of suburban America, less-lovely land exists

because appearance, neatness and order trump food webs, plant diversity and ecological health, says Douglas Tallamy, professor of wildlife ecology at the University of Delaware.

In his essay, "Achieving Ecological Utopia in the Garden," Tallamy writes that while species' diversity is imperative for long-term sustainability of ecosystems, "we have reduced the organisms that keep us and all other animals on earth alive to mere ornaments."

Pavement and row after row of chemically treated, manicured lawns are ways that humans signal victories in the fight with encroaching vegetation and predators, says Tallamy. "In neat landscapes, we, rather than nature, are in control; we feel safe and secure," he writes.

Cultivating perfection



But it's false security. The approach is ecologically dangerous and puts the planet in peril. Cornerstones of utopias, Tallamy says, are balance, diversity and harmony. Ecological utopias can be created by returning native plants to the barren landscape.

"It is not an esoteric experiment. It is an imperative for us all if we want to be sustained by our planet. We have become so accustomed to our lifeless landscapes that we are not alarmed by the absence of what is no longer there," he writes. "In fact if we see life in our gardens — an insect, a rabbit, a groundhog — we usually do our best to exterminate it. We have removed 90 percent of the trees from our living spaces, not because we had to in order to live

comfortably but because we did not think we needed to share our yard with other species."

Zoos are examples of creations of sanitized worlds "subordinate to the controlling vision of the spectator." People pay to see endangered animals behind gates — oftentimes the very animals whose natural habitats they've destroyed, says Irus Braverman, associate professor of law at the University at Buffalo, State University of New York.

"The zoogoer moves through species, landscapes and temporalities in whatever pattern and pace she chooses," Braverman writes in her essay "Zootopia: Utopia and Dystopia in the Zoological Garden." "It is like switching television channels at random."

Visitors don't see animals preying on each other as they do in nature and they don't make the connection "between a piece of hamburger on a Styrofoam plate and a cow," says Jim Breheny, director of the Bronx Zoo.

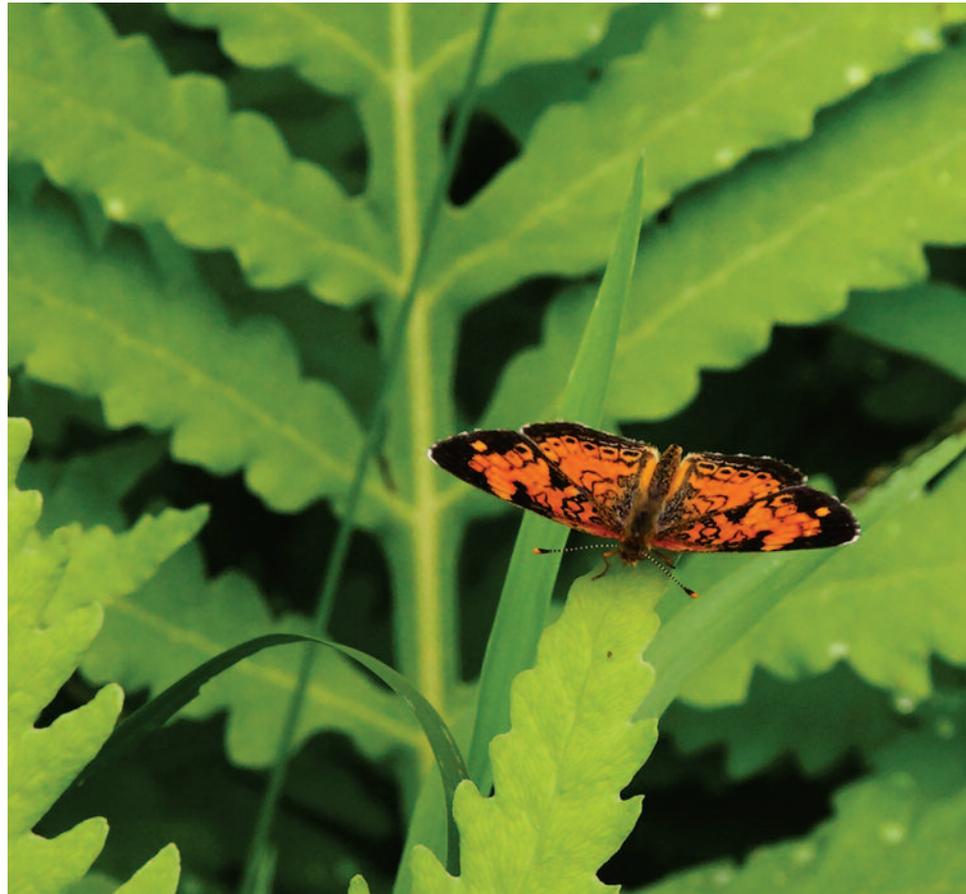
"PEOPLE HAVE BEEN taught that the transition from a hunting/gathering lifestyle in which humans were connected with and a part of nature to a lifestyle in which humans are removed from and elevated above nature "is the tale of progress that created civilization," writes Lynda Schneekloth in her essay "Paradise Lost."

But results of that transition are food insecurity, hierarchical society and loss of community life, says Schneekloth, professor emerita of the University at Buffalo School of Architecture and Planning. Schneekloth cites author and environmentalist Bill McKibben, who says humans were given Eden and have been running Genesis backward by ruining the world in which we live.

Society, she says, has "pushed and exploited the natural world, destroying life-support systems that sustain us and other creatures, the air, the land, the water and living things." The human race is committing suicide, Schneekloth says, and choices it makes in the very near future will determine its ultimate fate.

She quotes Tallamy: "Humans cannot live as the only species on this planet because it is other species that create the ecosystem services essential to our survival. Every time we force a species to extinction we promote our own demise. Biodiversity is not optional."

Susan Willis, associate professor in the literature program at Duke University, strives to live sustainably and in harmony with the world around her at Bitta-Blue Farm, where she grows organic vegetables for the 25 subscribers to her Community Supported Agriculture association. But, in "Bitta-Blue Farm and the Summer of BP," Willis worries whether her efforts matter in the big



When well and thoughtfully done, the gardener's practice of care extends to the soil and insects, the birds, the mice and the groundhogs, and beyond that to the self, the family, the neighborhood, the community, and the planet."

Naomi Jacobs

Left to right:

Spring Is Here, Orono, Maine, 2012

Grape Hyacinth, Orono, Maine, 2010

Sitting Pretty, Bangor City Forest, Maine, 2011

Cultivating perfection

picture. In an essay drawn from her 2010 journal, Willis compares and contrasts her daily life on the organic farm with the BP oil spill, when, for 87 days, more than 170 million gallons of oil spewed into the Gulf of Mexico from BP's Deepwater Horizon rig.

While such environmental destruction can seem insurmountable, Jacobs says that Willis' efforts, and the efforts of all gardeners, are relevant.

"Perhaps our ecological situation demands that we think of the garden not as a utopia in the sense of a vision of perfection, but as what Tom Moylan named the 'critical utopia,' which 'reject(s) utopia as a blueprint while 'preserving it as a dream,'" says Jacobs, now the interim dean of UMaine's College of Liberal Arts and Sciences.

Urban gardeners, she says, can find strength in regarding their gardens "as part of a much larger, decentered and dispersed utopian project — one that has no grand plan, no coherent vision, but finds its meaning in process rather than product."

Gradually increasing the size of her flowerbeds and replacing lawn with native plants is both soothing and addictive, Jacobs says.

"For the longer one gardens, the better one understands that a gardener's work is not limited to care of the plants themselves," she writes in her essay "Consuming Beauty: The Urban Garden as Ambiguous Utopia."

"When well and thoughtfully done, the gardener's practice of care extends to the soil and insects, the birds, the mice and the groundhogs, and beyond that to the self, the family, the neighborhood, the community, and the planet."

All gardeners, she says, are utopianists, including neighbors she's never met who plant sunflowers every spring on the parking strip in front of their house.

"For by entering into an intimate relation of care with the natural world — however fallen — in their own backyards, they cultivate a larger space of perfection," Jacobs writes. ■



Physicist and photographer



UNIVERSITY OF MAINE physicist Sam Hess uses microscopes to make discoveries and illuminate interesting details.

He uses his Canon DSLR camera to do the same.

Since Hess began enthusiastically exploring photography in 2010, he's snapped stunning pictures of the moon, land and seascapes, as well as sunrises, sunsets and sunflowers.

"I love being in a place and focusing on

that place," Hess says. "I'm not pushing to reach the end of a trail to get a good workout. I'm looking and thinking about the beauty. It's a good way to enjoy nature."

Others also are appreciating his views of nature. Last September, *National Geographic* selected his photo of Mount Katahdin foliage to accompany an online blog; the *Washington Post* named the same photograph an honorable mention in its 2012 Travel Photo contest.

Maine, Hess says, is an ideal location in which to become immersed and develop an appreciation for photography.

"I really feel like beautiful things are given to us to look at. And if I just try to see them, I can experience them fully," he says. "Beauty is a gift."

Hess says he prepares to fully appreciate and capture nature's gifts. He reads about photography and experiments with his camera's manual settings. And he's also patient. Very patient.



Left to right:
Northern Lights
 Old Town, Maine
 2012
Roaring Brook
Foliage
 Baxter State Park,
 Maine
 2012

"I'm so passionate about it that I'll stand for three hours to really see the scenery and get the best possible composition," he says. "It's challenging and it's very exciting. There's all this training and prior planning. There's a lot of lead-up to a great shot."

Hess says he's a visual person and that his interest in photography meshes with his career as a biophysicist exploring physical properties and perspectives.

The technical side of photography is physics, Hess says, and that's helped him learn how to operate a camera to achieve a certain result. In addition, he says photography has helped him better understand and explain some technical aspects of his research.

In 2005, Hess and UMaine professor Michael Mason invented a technique called Fluorescence Photoactivation Localization Microscopy (FPALM), which images below the diffraction limit. *Science Magazine* called the development one of the top 10 breakthroughs

of 2006; the science journal *Nature Methods* awarded it Method of the Year in 2008.

"We essentially do time-lapse photography of molecules in our lab, and sometimes this involves 3-D structures," he says.

And then there's the execution. Hess recently monitored online reports of particle fluxes from the sun heading toward Earth. When those charged particles collide with particles in the Earth's atmosphere, the result is the dazzling Aurora Borealis or Northern Lights. Hess lectures on this phenomenon in *Electricity and Magnetism II*, a physics course offered in the spring semester.

One evening when scientific reports indicated a strong possibility for a Northern Lights show, Hess headed to the Penobscot River.

"The light became suddenly brighter as I was standing there. For about 10 to 20 seconds, patterns were sweeping across the sky," he says. "Nobody else was around. I was shaking to get the camera ready. I was such a lucky person to see it; it felt almost religious."

At other times, opportunity simply knocks. And Hess, who carries a camera with him much of the time, relishes capturing a fleeting moment. One winter morning as he drove over a bridge in Orono on his way to campus, he noticed trees sparkling with frost. He parked his vehicle and ran to get the shot.

"Considering all the possibilities, I feel like I'm just scratching the surface. I wish I had discovered this passion sooner," he says.

University of Maine English professor Naomi Jacobs is just pleased her academic colleague discovered his passion when he did.

Jacobs was online looking for nature photos to accompany essays in *Earth Perfect? Nature, Utopia and the Garden*, a book she co-edited, when she came across Hess' photos on flickr.

Two images — one of Acadia National Park and one of a pitcher plant in the Orono Bog — accompany Jacobs' essay, "Consuming Beauty: The Urban Garden as Ambiguous Utopia."



UMaine alumnus Arthur Serota established the Northern Uganda Education Program of the United Movement to End Child Soldiering in 2005.

THIRTEEN YEARS ago, the 12-year-old boy was kidnapped by Joseph Kony's Lord's Resistance Army in northern Uganda. He spent two and a half years being coerced under threat of death to kill civilians, raid villages and steal cattle. He was forced to hack off his parents' heads with a machete.

Then he escaped.

In 2004, Arthur Serota, a 1966 graduate of the University of Maine, met and talked with the youth at a crowded Internally Displaced Persons camp in northern Uganda. Serota founded the United Movement to End Child Soldiering (UMECS) in 2001 to help transition cultures of war to cultures of peace and prevent additional wars, genocides and child soldiering.

During their talks, the teen told Serota that UMECS' peace objective was noble, but that for peace to last, children had to be educated.

Serota agreed. And in 2005, UMECS established the Northern Uganda Education Program. It sponsors the education of war-affected youth from secondary school through their higher education graduation, providing full financial payment for school fees and tuitions, along with culturally connected mentorship, guidance and counseling.

UMECS sponsored the teen boy's education, including vocational school, for seven years. He also received counseling and mentoring. Now 25, this former child soldier is a

master builder and small farmer. He plans to study architecture, which UMECS will fund. He and his wife, who also was a child soldier, have two children.

UMECS' Northern Uganda Education Program is in its ninth year and Serota says many sponsored students are in higher education programs preparing for careers as health care professionals, educators, engineers, accountants, artisans, agriculturalists and early childhood professionals.

"These children can bounce back if given the education and rehabilitation," he says. "Most don't get the chance."

UMECS AND the Council on Foreign Relations estimate 300,000 child soldiers are involved in conflicts worldwide — many in Africa. Millions more youth are traumatized, orphaned and displaced by conflicts. The world, says Serota, has an ethical responsibility to provide these youth with a chance.

Many people, without hesitation, act to save endangered children who are family members or neighbors, Serota says. And while the lives of children on other continents are just as precious, people often look the other way.

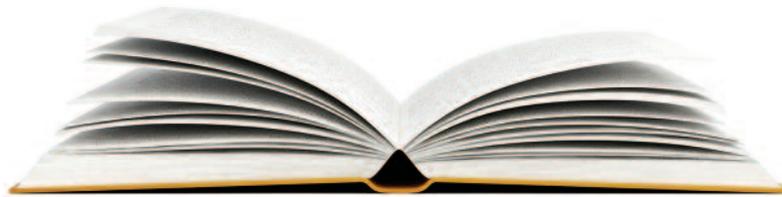
Serota does not.

"It's a global world and all the world's children are our children," says Serota, who in April delivered UMaine's 2013 John M. Rezendes Ethics Lecture titled "To Look the Other Way or Not: Ethical Choices We Make."

Out of Africa

By Beth Staples

Arthur Serota wields education as a powerful weapon in the struggle for peace



Good, clean water, a healthy environment and education are nonnegotiable, says Serota, who earned a degree in animal sciences at UMaine and a law degree from Suffolk University Law School. “If you don’t eat, you die, and if you are not educated, your life is horrible,” says Serota, citing early marriage of girls, human trafficking and child labor exploitation (in some countries) as typical outcomes when children and youth remain uneducated.

The case for global education needs to be so strongly made that nearly everyone acknowledges its benefit to the world, he says. If universities, organizations and well-funded foundations pooled resources to create pockets of educational success and change worldwide, he says more policymakers and game changers would get on board.

An ethical framework also needs to be in place to eradicate war and build peace, Serota says. And including peace education in worldwide education of youth is imperative.

UMECS, in conjunction with the Ministry of Education and Sports, implemented the Peace Education and Guidance and Counseling in Secondary Schools program in seven schools in northern Uganda. The program’s goals are to build cultures of peace to prevent new wars, build cultures of peace and reconciliation in schools and communities, and provide psychosocial counseling and life skills for children affected by war.

USAID/Uganda supported the 2010 pilot program, now in its fourth year. Thus far, Serota says nearly 95 teachers have been trained as peace educators and guidance counselors, and nearly 3,000 students have been trained as peer mediators and peer counselors.

The result, he says, is that in schools where it’s been implemented, bullying has been eradicated, academic performances have improved and restorative justice has replaced punishment. Cultures of peace are forming.

For three years in the 1980s Serota lived and worked in rural Zimbabwe, helping build a secondary school, administering agricultural and reforestation projects and teaching at the school he helped to build. When he visited Zimbabwe in 1990, RENAMO (Resistência Nacional Moçambicana) forces, which included child soldiers, raided the area. Serota says family members of people he knew were killed and kidnapped.

“That was my wake-up call,” he says.

And in 2001, after attending the World Conference Against Racism, Racial Discrimination, Xenophobia and Related Intolerance in South Africa, Serota and others formed UMECS.

Those most affected know the best solutions and should be at the forefront of leading that change, Serota says. “The world has an ethical responsibility to save lives and transform conditions.” ■

Spring awakening

UMaine students get hands-on experience with black bears in the North Woods

By Elyse Kahl

ON A COLD FEBRUARY day, with a cold mist in the air and mud and melting snow on the ground, University of Maine wildlife ecology professor Lindsay Seward and her students bundle up and head deep into the woods near Alton, Maine.

Led by Maine Department of Inland Fisheries and Wildlife (MDIF&W) biologist Randy Cross and his team — Phillip Adams, Lisa Bates and John Wood — the students are on a mission to find a bear's den, complete with a mother and her cubs. The trip, part of a wildlife ecology capstone course focusing on field, analytical and laboratory techniques for evaluating wildlife habitats, is one Seward has taken 11 times. But for most of the 12 students, it is their first opportunity to see a bear in the wild.

"I tell them to come with no expectations because you never know what could happen out here," Seward says on the 1.5-mile walk along the logging road.

Cross, a 1980 UMaine graduate, lets the class observe biologists assessing and tracking the bears in their Maine Black Bear Monitoring Program, which began as a study in 1975 and includes tagging the newest cubs.

"I basically contact Randy each year and ask if we can tag along," Seward says. "I feel a bit sheepish asking Randy to accommodate our large group each year. It's no small request. But the rewards of showing an undergraduate wildlife ecology student a black bear den is worth the coordination and effort."

MDIF&W has three study areas, one of which is the Bradford study area that includes Alton, and 93 collared bears — around 10 of them yearlings that were recently collared. Every winter the biologists make the rounds to dens of the collared bears to see how many cubs were born and to collar 1-year-olds. This year, the biologists visited 82 dens and handled 180 bears between early January and late March.

The den checks help biologists monitor the bears and their environment by tracking how many cubs are born and survive from year to year.

"Randy is willing to bring these focused, wildlife ecology seniors because he recognizes that it's an experience of a lifetime and looks to contribute to our students' education," Seward says.

“There is a distinct difference between studying nature and experiencing nature. Someone could teach you, in a classroom, about bears. They could diligently explain how bears select habitat, how bears interact with other species and how bears forage. Although this form of learning is vital in education, you cannot learn what it feels like to hold a bear cub while it fidgets nervously. The University of Maine offers a unique experience that will remain with me throughout my life and educational career.”

Katie Carroll

Spring awakening

When students first enroll in the wildlife ecology program, it's often because they're interested in animals and the outdoors, but most don't know specifically what that means in terms of a career, Seward says.

She says the program attracts a variety of students, but all of them think carnivore mammals are fascinating. Most of the students realize these animals are difficult to study because it usually involves expensive and logis-

tically complicated work, such as trapping, sedating and safe handling.

"To actually get to see this kind of work in action is a rare and special experience that most people will never experience due to the intrinsic challenges of working with carnivores," Seward says. "That's why I try to facilitate this trip each year — it means so much to the students to have this unique experience with a charismatic species."

Senior wildlife ecology major Joe Roy is one of the few who knows what to expect after the quiet walk into the woods. He has made the trek before.

Roy, who loves bears, spent two summers volunteering with Cross and his team to bait and trap the animals for radio collaring. The collars allow pilots to use a transmitter to track bears before den visits.

"It was the best job I've ever had," says Roy, a native of Jay, Maine, who plans to attend graduate school in preparation for pursuing a career as a bear biologist.

NOT ALL students prefer bears over other animals, but they all welcome the February field trip. Emily Patrick, a senior wildlife ecology major from



I feel a bit sheepish asking Randy to accommodate our large group each year. It's no small request. **But the rewards of showing an undergraduate wildlife ecology student a black bear den** are worth the coordination and effort." Lindsay Seward

Three decades of bear biology

UNIVERSITY OF MAINE alumnus Randy Cross, a biologist with the Maine Department of Inland Fisheries and Wildlife, shared more about his experience leading the nationally recognized Maine Black Bear Monitoring Program.

Why a wildlife biologist?

I always had a keen interest in wildlife and the outdoors. In my day, the only outdoor-oriented show on the three TV channels was *Mutual of Omaha's Wild Kingdom* with Marlin Perkins every Sunday night. This show enlightened me to the possibility of becoming a wildlife biologist.

Best part about your job?

There are many wonderful parts of my job.

Obviously, it is a real treat to be able to work on a daily basis outside and with such a fascinating animal as Maine's black bears. In addition, I am very lucky to be able to work with teams of highly talented and motivated young biologists.

How do you come up with nicknames for bears and co-workers?

Bears are most commonly named for where they were first captured or following a theme that helps us recognize relationships between bears. For example, Hubcap was first captured at the trap site by that name and her first daughter was named Lugnut. I have used nicknames for members of the crew mostly to have two options to get their attention when things

start happening quickly and I need to verbally direct our response. This is a habit I have carried forward from my canoe-guiding days.

What amazing things have you seen black bears do in your 30-plus years?

Bears continue to amaze me with their physiological adaptations, especially to our long winters. I honestly don't know where to start — or end — for all I have been privileged to witness while working with these bears. The list is endless.

What's the biggest misconception about bears?

There are many. Most of what the public believes they know about bears is not true.

Greenville, Maine, prefers elephants to bears, but she calls herself an “equal opportunity animal lover” and says she feels “lucky to get this opportunity.”

Once the group makes its way along the logging road and to the edge of the woods, Cross and his team go ahead to tranquilize the female bear and secure the site. The students wait patiently and quietly in an effort to not spook the mother.

Derek Trunfio, the lone zoology major in a class of wildlife ecology majors, whispers he is “stoked” about seeing and handling the bear cubs.

“I’ve never been up close and hands-on with any wildlife like that,” Trunfio says. “I’ve handled animals like squirrels, but nothing like a bear.”

Trunfio, from Billerica, Mass.,

knew coming out of high school he wanted to work with animals and the University of Maine seemed to have the best programs and hands-on opportunities.

He calls the bear den trip a “once-in-a-lifetime opportunity” and is most interested in seeing how the cubs react to humans.

ONCE CROSS gives the OK, the group climbs over and under branches on a twisting, overgrown path that leads to the ground den covered with branches — and four glossy-eyed, dark brown, fuzzy cubs.

The cubs cuddle together and snuggle close when held by the students, and let out cries and shiver in the cold, but don’t seem to mind the attention.

The students have their own comments while passing around the cubs:

“She’s so tiny.”

“This is amazing.”

“This is the first time I’ve seen a black bear.”

“I just want to put her in my jacket to keep her warm.”

“This is really exciting. It’s putting together what you learn in the classroom out here,” wildlife ecology major Olivia Reed says while holding a cub.

After juggling all four bears at once for a photo, Jennifer Hussey of Gray, Maine, calls the experience “exciting, definitely a highlight of the program.”

“They have a way of humbling us,” Hussey says of the critters. ■

Bears don’t hoot, they smell nice, they’re generally not aggressive and are significant predators only of newborn fawns and moose calves.

What questions do you still have about black bears?

I don’t have specific questions I’m seeking to answer, but the bears are continually showing me new things I didn’t recognize.

Have you thought about writing a book about your adventures?

I have. I have been very fortunate to have had the opportunity to observe bears over a long period of time — and all the adventures that come with this type of life. Maybe when I retire in four or five years.





Jordyn Lee, 16, and her great-great-great aunt Lucienne Cloutier, 104.

The state of Franco-Americans

THE GRASS was always ice cold on her bare feet and the hem of her nightgown wet with dew by the time Lucienne Cloutier padded her way from the dooryard of her family's Maine farmhouse to the edge of the nearby brook to fill a small glass jar with clear running water. The child's pilgrimage had to be done the moment she woke on Easter Sunday and the water had to be fresh, because it was saved for use throughout the year.

Holy water. Kept at the ready to meet any need in her Franco-American household.

That included some judicious sprinkles during thunderstorms when she and her brothers and sisters were afraid.

Cloutier, 104, remembers her childhood growing up in West Old Town as vividly as she does moving with her new husband at

the age of 24 to French Island in Old Town and raising four children. It was a life steeped in Franco-American heritage — from French spoken in the home and the staunch Catholicism to ever-present work ethic, the importance of family and ties to St. Cyprien, Quebec, where she and her 13 siblings were born.

But the pressure to assimilate was ever-present.

“Both my parents were Franco-American and it was French all the time. But when I went to school, my parents wanted me to learn English because they knew I needed it here,” says Cloutier. “I tried to teach my children French, but my husband didn’t agree. He said this is America and they talk English.”

While English became her children’s first language, Cloutier made sure that they never forgot their Franco-American heritage. She insisted on it.

“It’s very important to be French-American,” says Cloutier, who still lives next door to the house where her late sisters lived in the Franco-American enclave she has called home for six decades.

For 16-year-old Jordyn Lee, Cloutier’s great-great-niece who lives in a nearby town, her

New data provides unprecedented perspective on Maine’s largest ethnic group

By Margaret Nagle

The state of Franco-Americans

only clues to her Franco-American heritage are the French lullabies she remembers her grandmother singing. While her grandmother was religious, Lee says she “didn’t grow up in the church.” In Lee’s life, French is a required high school class and none of her friends talk about their Franco-American roots.

The Old Town High School junior hopes to go to college to study psychology.

“I’m proud of it,” she says of her ancestry, “but I don’t know much about it.”

WHAT IT means to be Franco-American in Maine today was the focus of a statewide survey last year, commissioned by a legislative task force. In 2012, the 12-member Task Force on Franco-Americans, co-chaired by Sen. Thomas Martin of Benton and Rep. Ken Fredette of Newport, was convened to define “who is a Franco-American,” gather demographic data, and find ways to promote and preserve Franco-American heritage.

In support of the task force, the Franco-American Centre at the University of Maine commissioned a survey of the current attitudes among Maine’s Franco-American population. The study, conducted by Command Research, a national public opinion survey company based in Harpswell, Maine, received nearly \$17,000 in funding from UMaine, the University of Maine System, the University of Maine at Fort Kent and the University of Southern Maine, among others.

The task force presented the



The survey reaffirms the **importance of their contributions** socially, politically and culturally to Maine.” Severin Beliveau

study’s findings to the legislature in March, and the first monograph based on the data, *Contemporary Attitudes of Maine’s Franco Americans*, by Jacob Albert, Tony Brinkley, Yvon Labbé and Christian Potholm, was published this spring.

In a “scientific approach to understanding Maine’s largest ethnic group,” the 55-question survey of 600 self-described Franco-American adults, randomly selected statewide, provided some of the first evidence of important distinctions about Maine’s Franco-Americans not found in U.S. Census Bureau data. The survey results offer an unprecedented glimpse into the lives of Franco-Americans today — almost a quarter of all Mainers, say the researchers.

“The poll’s ability to elicit public opinion is perhaps its greatest strength, for its discoveries challenge us to see the people around us with new eyes,” according to Albert, Brinkley and Labbé, who are affiliated with UMaine’s Franco-American Centre, and Potholm, founder of Command Research.

The study is the first of its kind in

Maine history, says Potholm in a report on the survey’s preliminary findings, noting that no other ethnic group in the state has ever been surveyed to this extent. As a result, “the unity, diversity and richness of Franco-American opinion are captured for the first time.”

The survey revealed information about Franco-Americans “we didn’t even know we didn’t know,” including findings of particular interest to policymakers, Brinkley says, such as changing work attitudes, the independence of Franco-American voters at the polls and variable language competencies.

“The survey reaffirms the importance of their contributions socially, politically and culturally to Maine,” says Severin Beliveau, a member of the task force, former legislator and Franco-American leader in Maine.

THROUGH THEIR four decades of community outreach and advocacy, UMaine Franco-American Centre researchers knew that a high percentage of Maine Franco-Americans identified with their culture. However, until the survey, the evidence was largely anecdotal.

And outside of the Franco-American community, public awareness of the dimensions of the French identity in Maine typically began and ended with historical accounts of Acadians, whose settlement in Maine began in 1604 with Samuel de Champlain and the founding of New France, and of Québécois, who came after 1850 to work in the burgeoning woods and

textile industries. The French were the first Europeans to settle in the region.

Many of the survey findings were reaffirming of their reality, such as the fact that 30 percent of the respondents said they are fluent in French, contrary to the perception that the language is disappearing in the state, Brinkley says.

The survey also found that the stronger the cultural sense of heritage, the greater the economic prosperity.

“One way to assimilate is to leave your working-class culture behind, thinking that’s what holds you back, but the numbers suggest that being part of the cultural realities and bringing culture with you correlates with success,” Brinkley says.

Other findings better defined the challenges and needs of the ethnic community. Nearly 40 percent of all respondents cited jobs and unemployment as the most crucial problem facing them today. Of greater concern, says Brinkley, are younger respondents who appear to feel the most disenfranchised because of higher unemployment, fewer educational opportunities, and questions about their heritage and its relevance.

Of the 20 percent of the survey respondents who reported that they are unemployed, most are between the ages of 18 and 25 and living in urban areas. According to the researchers, these unemployed are less politically engaged than the other employment groups — those who worked for companies, were self-employed or retired — and among the least religious. They also were less



Until now, questions being asked about French cultural realities in Maine **usually have revolved around language, religion or labor.** It is clear that these questions **are not enough to get at the realities they seek.”**

Jacob Albert

likely to find relevance in their cultural heritage, in French or in the educational opportunities the state could provide for their future.

While unemployed, when asked to cite the most crucial problems of Franco-Americans in Maine, 63 percent of the cohort responded that they did not know.

“The response ‘don’t know’ shows up more among younger respondents,” says Albert, a research associate at the Franco-American Centre. “That signals to me that these respondents aren’t quite sure how to answer questions like: What is important to you about being French? ‘Don’t know’ is the knee-jerk response to a question you’ve not thought of before — indicating a lack of awareness — or aren’t willing to talk about. Until now, questions being asked about French cultural realities in Maine

usually have revolved around language, religion or labor. It is clear that these questions are not enough to get at the realities they seek.”

Of those between the ages of 18 and 25, 13 percent judged a college education to be important, compared to 60 percent of all respondents. An estimated 17 percent of this age group goes immediately on to college, though 40 percent of those ages 26–45 have earned college degrees.

THE NUMBERS speak to the need to prioritize educational aspirations and achievement, according to the final report of the task force. More analysis is needed to “enable policymakers to develop more effective public policy targeting educational attainment and aspirations among Maine’s Franco-Americans.”

“The biggest challenge now is to reach out to young men and women, and remind them who they are and how they can play a higher profile role in Maine society,” says Beliveau.

The survey data also make it clear that Franco-American demographics have implications for Maine’s political scene with evidence that the Franco-American community can represent a swing vote. Among the findings: 45 percent were registered as Democrats, 32 percent as Independents and 14 percent as Republicans, with roughly 8 percent citing no party affiliation. Independents appeared to have “significant divisions in the cultural attitudes and political opinions of Franco-American voters,” say the researchers, with interests appearing

The state of Franco-Americans

to diverge from what some scholars have historically associated with Maine Franco-American heritage.

Brinkley takes that a step further, predicting an even greater force to be found in cultural awareness.

“If they get a clear sense of who they are and their potential power, they could be a determining force,” says Brinkley. “Obviously, they won’t all think in the same way. I believe the political future in Maine depends upon Maine’s Franco-American communities.”

SURVEY FINDINGS such as these are part of a growing body of research at the Franco-American Centre, which maintains an online library and an archive of oral histories and culturally relevant materials, many of them digitized and accessible by scholars and community members. The center works with partners in the Northeast and beyond as it advocates for Franco-Americans and the inclusion of their realities in Maine education.

“This is all fundamental to cultural development — as important as changing the perception for people in Maine about who we are and who we can be,” Brinkley says. “Economic development without cultural development has no soul. And cultural development without economic development is unrealistic.”



Economic development without cultural development **has no soul.** And cultural development without economic development **is unrealistic.”** Tony Brinkley

“The disempowered feel that the status quo will be against them, and people who benefit from the status quo benefit from perceived powerlessness,” Brinkley says. “People feel the power to change by finding it in themselves, feeling a strong affirmation in who they are and where they come from, and turning that understanding into a future. Isn’t this what the humanities should be about?”

In *Contemporary Attitudes*, the researchers wrote: “At first glance, statistics on education and family, and figures divided by age group, religious affiliation, or the urbanity/rurality of Franco-Americans tell us a great deal about how this population group’s concerns and circumstances are dependent on certain of its conditions.

“Findings that point to changing work attitudes, independence at the polls, and variable language competencies suggest that these three areas might also be important lenses through which to read the survey’s findings. Local news affiliations, opinions for job training, histories of discrimination: these are also points on which little attention has been given in research, but are now clear and available.”

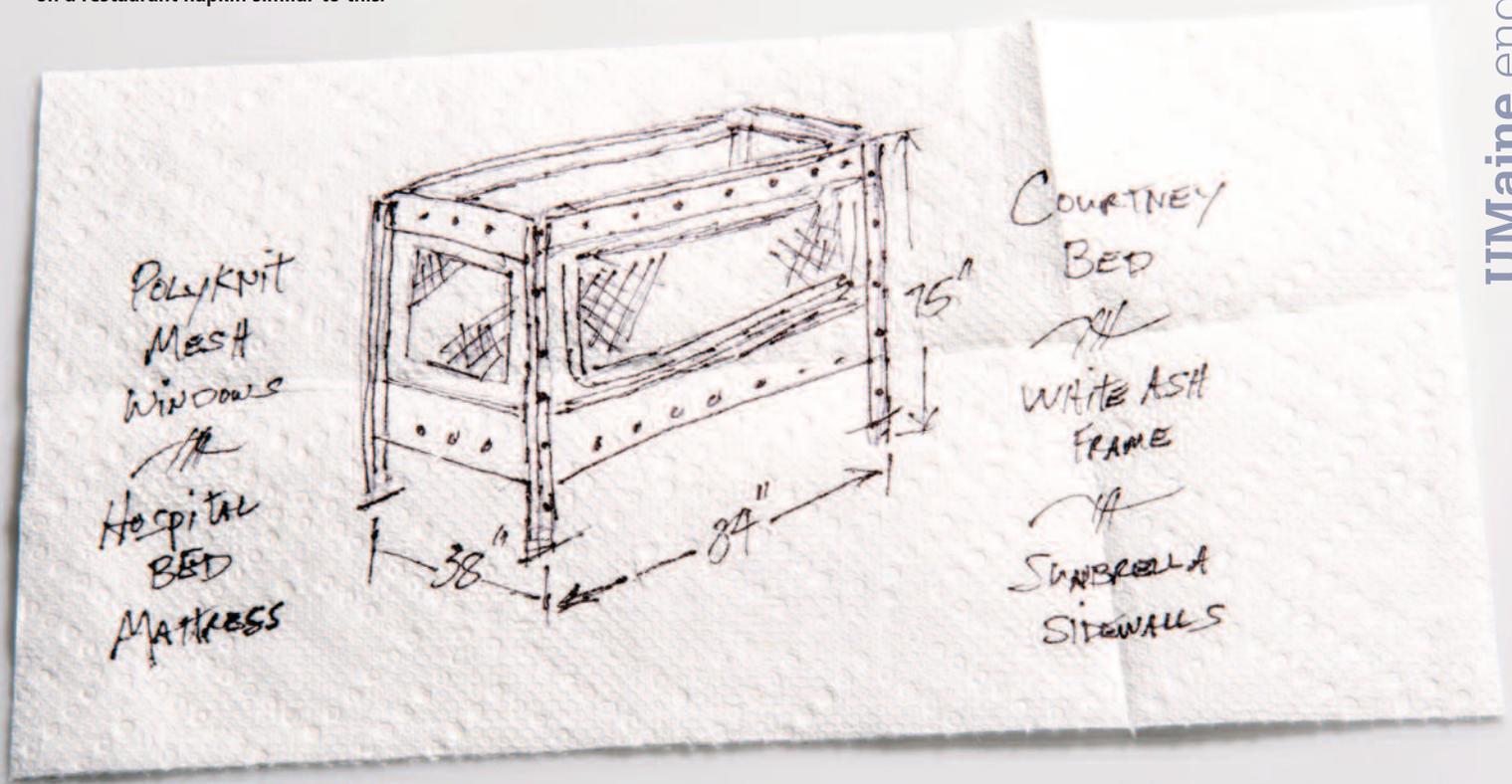
In its final report, the task force called for Franco-American history to be included in Maine Learning Results, and the educational progress of Franco-American youths to be tracked to help support academic achievement and aspirations.

It said the state should invest in recruiting Maine residents who are first-generation college students, no matter their ethnicity, and require Maine public universities and community colleges to improve post-secondary graduation rates for this population.

The task force also called for the creation of a statewide Franco-American Leadership Council to continue addressing the socioeconomic challenges facing Maine Franco-Americans, and to promote opportunities for a renewed recognition of Franco-American achievements, culture, language and future in Maine. ■



Pat Cyr first sketched a Courtney Bed design on a restaurant napkin similar to this.



Alliance by design

Courtney Bed gives father, families peace of mind

By Beth Staples

PAT AND BARB CYR of Millinocket slept in shifts after their daughter Courtney was born in 1992.

Courtney was diagnosed with impaired cognition function, cerebral palsy and autism, and she required constant care when she was awake, which was most of the time. Courtney slept a few hours a day, if that. Barb says when Courtney was 18 months old, she was hospitalized and treated after barely closing her eyes for 11 days.

When Courtney was 3 and becoming more mobile, the couple sought to buy her a protective pediatric bed but their insurance company wouldn't help with the purchase.

Soon after, Pat sketched a design of a special bed on a napkin while having lunch at Applebee's. He tweaked the pattern, then built Courtney a 7-foot-long, 6-foot-high four-poster bed. He used sturdy awning fabric — with built-in window netting — as side and end panels. The internal sleeping



Pat and Barb Cyr in the production area where Courtney Beds are made.

Since 2009, Knowledge Transfer Alliance has **assisted about 300 Maine businesses**. Its motto is “Helping Maine communities and businesses **overcome hardships — one business at a time.**”

Hugh Stevens

compartment was designed to keep Courtney from falling out of bed and wandering at night. The front panel had a large zippered opening. The hardwood frame was plenty sturdy to support her when she bounced. And the interior compartment was padded and tightly fitted to protect her from banging her head or burrowing under the mattress.

Courtney felt safe and was content in her special bed, Pat says. She slept more, and so too did Pat and Barb.

IN 2003, Great Northern Paper laid off 48-year-old Pat, and 1,400 other employees. Pat had been at the mill 30 years; he started soon after he graduated from Stearns High School. Pat loved being a beater engineer, mixing pulp with water, chemicals and dye to turn it into paper.

He knew the job and did it well.

While contemplating his future, Pat discovered he had a knack for repairing PCs; he fixed a computer Barb bought to use for her college classes. He subsequently enrolled and excelled in courses at Eastern Maine Community College, then started a computer repair business, ComputerFixx. The business, he says, is very enjoyable and thriving.

But his invention that had changed his family's life was never far from his mind. Pat realized if a bed could so drastically improve Courtney's life, it could also help other families in similar circumstances.

He dusted off the napkin design, and he and his cousin Ron Cyr, a furniture maker, began building Courtney Beds. After obtaining a patent and approval from the U.S. Food and Drug Administration on the design in 2008, they built and sold seven beds. In 2009, they built and sold seven more.

While Pat was confident in his and Ron's carpentry skills and work ethic, he knew he needed help with a business plan. So he asked for it. U.S. Congressman Mike Michaud, who had previously worked 29 years at Great Northern Paper, listened.

In 2009, help arrived.

Michaud was instrumental in securing a \$1.82 million U.S. Economic Development Administration grant to launch the Knowledge Transfer Alliance (KTA) at the University of Maine.

THE GRANT, created to help communities and businesses like Cyr's prevail through economic hardships caused by the Great Recession and natural disasters, has grown to assist all Maine companies seeking engineering, manufacturing or business expertise.

Hugh Stevens directs KTA, which is overseen by George Criner, director of the School of Economics; and John Mahon, a professor in the Maine Business School.

UMaine business and economics students, as well as faculty members from business, economics, engineering, University of Maine Cooperative Extension, the Foster Center for Student Innovation and Forest Bioproducts Research Institute, all pitch in.

"We get them (business owners) to the right place on their terms," says Stevens of the KTA staff. "We're serving them. It's gratifying to help them through their rough spots."

Pat says he received considerable free expert advice from KTA, in particular from previous employees Bernardita Silva and Sue Medley. "They helped me create and facilitate my business acumen," he says.

KTA provides a range of valuable services, including consulting, market and financial analyses, software training, website management, branding, sales strategy, and production and accounting guidance.

That's the goal of the initiative — to transfer the knowledge and information of UMaine professors and staff to Maine businesspeople. Since 2009, Stevens says KTA has assisted about 300 Maine businesses. Its motto is "Helping Maine communities and businesses overcome hardships — one business at a time."

Since utilizing KTA's counsel, Pat has steadily increased



Each Courtney Bed is made from 27 pieces of Maine ash. Since utilizing the counsel of UMaine's Knowledge Transfer Alliance, Courtney Bed Inc., has grown steadily, now operating out of two shops with six employees.

the number of Courtney Beds he's constructed and sold. After selling seven beds in 2009, he sold 16 in 2010; 37 in 2011; and 50 in 2012. Courtney Bed Inc., now operates out of two shops with six employees.

Children in the United States, Canada and Australia are sleeping in Courtney Beds. Families from Israel, Japan, Mexico, Guatemala and most of Western Europe have inquired about the invention. Five families requested and received help through the Make-A-Wish Foundation to purchase beds, Pat says.

The FDA-approved hospital beds, which are composed of 27 pieces of Maine ash, sell for \$4,400.

The customer feedback, Pat says, is priceless. With each Courtney Bed he ships out the door, he knows he's helping improve lives, one family at a time.

"Some folks have called and started crying," Pat says. "They say they can't believe how our bed has changed their lives."

Pat says Courtney, who turns 21 in December, is thriving. She still sleeps in a bed named in her honor. "Barb and I have been God-blessed," Pat says. "Courtney has a good life. She's growing at her own pace and tee-hees and giggles much of every day."

And she sleeps at night. ■

A person wearing a green hoodie and blue jeans stands in a grassy field, looking towards a dense forest of green trees. In the background, there are rolling hills under a blue sky with scattered white clouds. A single, bare tree stands in the middle ground to the right. The overall scene is a natural, outdoor setting.

Perspective of pres

**New doctoral program adopts
holistic approach in implementing
environmental policy**

ervation

By Beth Staples

MANY MAINERS earn their livelihoods from harvesting bounty — including blueberries and lobsters — from the land and sea. And Samuel Belknap and Kourtney Collum, the first students to enroll in the University of Maine’s recently launched anthropology and environmental policy doctoral program, want to preserve those storied traditions, as well as the state’s natural resources.

Belknap and Collum say the doctorate, which focuses on “understanding human society and culture in cross-cultural perspective and their pivotal role in implementing successful environmental policy,” suits their interests.

“It is so applicable and has an interdisciplinary framework,” says Collum. “I can look at issues holistically.”

Belknap agrees. He earned both his bachelor’s degree in anthropology, and a master’s in quaternary and climate studies from UMaine. “No problem is one-dimensional and no one person can solve everything,” he says.

His doctoral thesis on abrupt climate change and Maine’s lobster industry proposes collaboration between lobstermen and policymakers to better protect the state’s iconic industry, especially in the wake of abrupt environmental changes.

Experienced lobstermen possess valuable information, says Belknap. They have knowledge of the industry. And

they have concerns about both climate change and fishing regulations, and about how they’ve adapted their behavior in response to both.

Policymakers will be better informed and better positioned to craft policies customized for various situations if they routinely involve lobstermen in the regulatory process, he says.

BELKNAP, WHO grew up in Damariscotta, Maine, knows his way around a lobster buoy. He learned to haul traps from his grandfather, a retired physician, and worked as dock manager at his family’s lobster pound prior to starting his doctorate.

Abrupt climate change could threaten that way of life for the roughly 5,000 lobstermen in the state, as well as for coastal communities in Maine and globally, he says.

In summer 2012, warmer water temperature in the Gulf of Maine contributed to lobsters molting a month or more earlier than usual, which resulted in a glut of lobsters

Research suggests that, through conservation efforts, **native bees can provide a significant amount of pollination** without the cost associated with renting commercial hives. Kourtney Collum

Perspective of preservation

on the market. And then the price per pound plummeted.

“It’s humbling,” Belknap says of how quickly a temperature fluctuation of 1.5 to 2 degrees caused the drastic ripple effect. Another sudden change in temperature might have the opposite effect.

Belknap doesn’t have to look far in space or time to see examples of that.

In September 1999, huge numbers of lobsters died within a few days in Long Island Sound. It devastated the local industry, which languished for more than a decade. Scientific reports have indicated warmer ocean water was and is a culprit.

In 2012, lobsters in waters off New York, Rhode Island and Connecticut were afflicted with a shell disease, and warming ocean water was again cited as a factor.

How policymakers and Maine lobstermen work together to deal with abrupt climate changes could be a model for other fisheries regionally, nationally and globally, says Belknap.

PRACTICAL APPLICATION of knowledge is also important for Collum, whose doctoral dissertation will explore the impact of the declining bee population on wild blueberry growers and the growers’ ability to

conserve wild pollinators.

Because many crops rely on insect pollination to produce fruits and vegetables, the global decline of bees — from pesticides, habitat loss and disease — threatens food security and the livelihoods of farmers who produce food.

The lowbush blueberries that grow in Maine are dependent on insect — mostly bee — pollination to produce fruit. Without bees, there are no blueberries for Sal — or anyone else.

Commercial honeybees are crucial for the intensive agriculture practiced in the U.S., says Collum. But research suggests, through conservation efforts, native bees can provide a significant amount of pollination without the cost associated with renting commercial hives, she says.

Last year, Maine blueberry growers imported 70,000 commercial honeybee hives to pollinate about 60,000 acres of wild blueberries, she says. The busy bees trucked to Maine generally start their trek in California, where they pollinate almonds, and make multiple work stops en route.

The declining health of commercial bees brings into question whether relying on commercial bees alone is sustainable, says Collum. She’ll therefore explore the ability of farmers to

How policymakers and Maine lobstermen **work together** to deal with abrupt climate changes **could be a model for other fisheries** regionally, nationally and globally. Samuel





integrate both wild and commercial bees to pollinate crops and increase yields.

Because Maine has more than 220 bee species — 75 of which are associated with lowbush blueberries — Collum says it's a good place for farmers and researchers to collaboratively figure out the best practices to protect, promote and utilize wild, native bees to pollinate crops.

Collum will explore obstacles growers in Maine and Canada have to increasing their use of wild bees to pollinate lowbush blueberries. She'll also study what influence government policies and programs have on the way growers manage pollination of crops and how they can adapt to changing ecological conditions.

Growers of other crops who want to transition to utilizing wild bees, where applicable, could apply the findings, she says.

Collum, who grew up in Monroe, Mich., is used to working in the field and on the trails. She fell in love with Maine as a college intern working on a trail crew at Baxter State Park in Millinocket. As a field coordinator for Rocky Mountain Youth Corps in Colorado, Collum battled the pine beetle infestation. And she worked on an ecotourism project in New Zealand, building trails, battling invasive gorse and planting native trees.

Collum and Belknap both want to make a positive difference in the state they love and ensure that ensuing generations of lobstermen, farmers and foresters have the opportunity to make livings from the land and sea.

Samuel Belknap and Kourtney Collum are the first students to enroll in the University of Maine's recently launched anthropology and environmental policy doctoral program.



“

If just one student walks into that studio space — as I did over 40 years ago in my grandfather’s studio — and catches fire, it will all be worth everything.” Artist Jamie Wyeth



THE WYETH FAMILY STUDIO ART CENTER was dedicated Sept. 29 at the University of Maine honoring the legacy of the three generations of internationally recognized artists intrinsically linked to the state’s storied visual arts tradition.

“This is a remarkable gathering of people who love art and love the University of Maine,” said UMaine President Paul Ferguson, looking out over the audience of more than 275. “We want to use this day to reaffirm the central role of art and the appreciation of art in who we are as humans.”

Artist Jamie Wyeth, the son of Andrew Wyeth and grandson of N.C. Wyeth, was among the dignitaries attending the ceremony. In his remarks, he reflected on his first tour of UMaine’s art facilities in 2001, when he was on campus to receive an honorary degree, and the progress made since then to create a new center for art education named in his family’s honor, which he called “quite extraordinary.”

The dedication ceremony included tours of the new facility led by UMaine faculty and students. Works by students who had never before taken brush to canvas were on display in one of the painting studios.

“We get a lot of students who are first-generation college students and going to be first-generation artists,” said UMaine artist and professor James Linehan. “That’s what I love about teaching — and about teaching in Maine. It’s our hope and desire that our new art facility will become a beacon for young artists from everywhere, but especially from small towns in Maine, that they can get a first-rate art education in first-rate studios right here in Maine at a public university open to everyone.”

The Wyeth Center is UMaine’s new studio art facility, located in the recently renovated Stewart new media/art complex on campus. The more than \$10 million renovation of Stewart was made possible with funding from gifts; grants, primarily from the Maine Technology Institute; and state bonds. The private donations as part of the ongoing fundraising included the \$1 million naming gift made possible through the efforts of Maine business leader Charles Cawley and Bank of America. Generous gifts also were received from Bangor Savings Bank and members of the UMaine Class of 1963.

DESPITE FINANCIAL CHALLENGES, and contrary to long-held misperceptions, Maine’s low-income woodland owners share a sense of stewardship based on a love of their land, rarely viewing their acreage as an investment, according to a study conducted by forestry researchers at the University of Maine.

UMaine graduate student Britt Townsend and professor Jessica Leahy led the study to learn more about this often underrepresented group. They determined an affordable and interactive program offering advice from professional foresters would be welcome and beneficial to this group.

Leahy, associate professor of human dimensions of natural resources in the School of Forest Resources, and Townsend interviewed 20 low-income landowners around the state in summer 2012. The research is part of Townsend’s master’s project in forestry.

Little scientific research on low-income landowners exists, and according to Townsend and Leahy, this is the first study in Maine to focus on this group. With the highest percentage of private land ownership in the United States and some of the highest poverty rates, the state provides an ideal setting for the study, according to the researchers’ final technical report.





IMPROVING PROTECTION of small natural landscape features that significantly impact the larger ecosystem is the focus of a \$1.49 million National Science Foundation grant to the University of Maine.

The four-year Senator George J. Mitchell Center Sustainability Solutions Initiative project, “Of Pools and People,” will inform conservation management of relatively tiny natural resources such as vernal pools that maintain biodiversity in urbanizing landscapes, says Aram Calhoun, professor of wetland ecology and director of the Ecology and Environmental Sciences Program.

The eight-member research team will offer insights to safeguarding these important resources, particularly on private lands. Small natural resources often can be saved while development, forestry and agriculture activities continue, Calhoun says.

Prevailing conservation strategies often don’t fully utilize management opportunities, she says, sometimes because interactions among biophysical and socioeconomic components — regulator, community and landowner decision-making — aren’t understood.

Maine’s Sustainability Solutions Initiative is a partnership between UMaine and other higher education institutions that seeks to produce knowledge and initiate action that addresses human needs and preserves the planet’s life-support systems.

In addition to giving stakeholders efficient and flexible management tools, researchers will share results and mentor a range of students and faculty, including those in rural and Native American schools, and integrate findings into interdisciplinary courses and citizen-science programs.

A TEAM OF RESEARCHERS led by the University of Maine and the University of New Hampshire will conduct a three-year study of the many factors affecting the health of their shared coastal ecosystem. The collaboration, funded by a \$6 million award from the National Science Foundation (NSF), aims to strengthen the scientific basis for decision making related to the management of recreational beaches and shellfish harvesting. The research is a direct outgrowth of Maine’s Sustainability Solutions Initiative, supported by the NSF EPSCoR program. The project is managed by the EPSCoR programs at UMaine and UNH in partnership with six other colleges and universities.

“This grant will help fund the vital research performed by faculty and students at the University of Maine as they seek to find ways to **reduce pollution caused by coastal runoff** and assist local governments in making informed decisions regarding the closure of beaches and shellfish beds.

U.S. Sen. Susan Collins



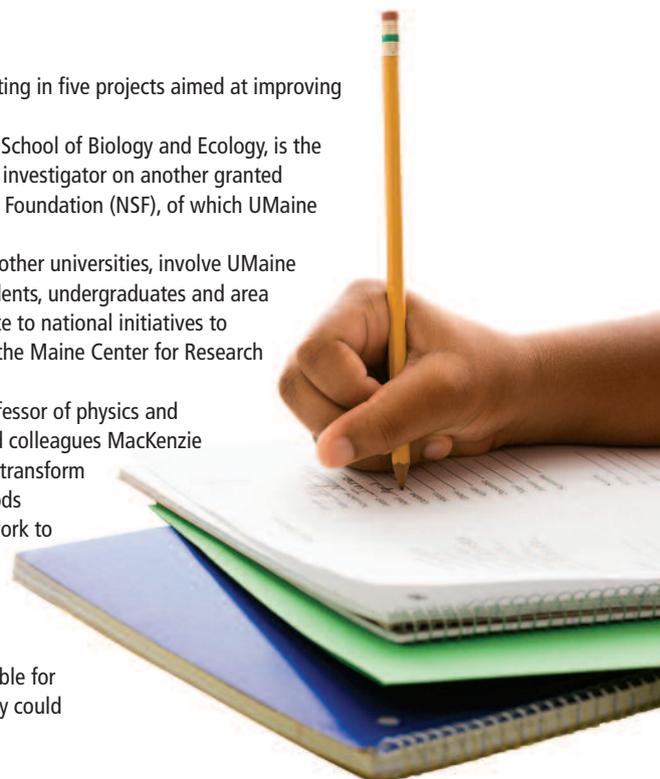
A UNIVERSITY OF MAINE researcher is participating in five projects aimed at improving nationwide science instruction and assessments.

Michelle Smith, an assistant professor in UMaine’s School of Biology and Ecology, is the principal investigator on four projects and co-principal investigator on another granted \$6.8 million in total funding from the National Science Foundation (NSF), of which UMaine will receive more than \$1 million.

The projects, three of which are collaborative with other universities, involve UMaine administrators, faculty, postdoctoral and graduate students, undergraduates and area K–12 teachers. “All of these stakeholders will contribute to national initiatives to improve science education,” says Smith, a member of the Maine Center for Research in STEM Education (Maine RiSE Center).

In one of the projects, Susan McKay, a UMaine professor of physics and director of the Maine RiSE Center, as well as Smith and colleagues MacKenzie Stetzer, Jon Shemwell and Cathy Menard, will work to transform K–12 STEM education by restructuring teaching methods courses to align with national standards. They’ll also work to attract and retain STEM majors in college as educators and form partnerships with area school districts.

The researchers say the project could make a difference in Maine, where more than 50 percent of students in more than half the school districts are eligible for free or reduced lunch, and the resource-based economy could benefit from more technology jobs.





THE EFFECTS OF HURRICANE SANDY'S devastation on plant and bird communities in coastal marshes from Maine to Virginia are the focus of a 10-state study by researchers from the University of Maine, University of Connecticut, University of Delaware, and Maine Department of Inland Fisheries and Wildlife.

Information gathered from more than 1,700 sites before and after the October 2012 hurricane will advance researchers' understanding of how major disturbances affect these populations and what characteristics make a marsh more vulnerable. The data will also provide information on the allocation of millions of dollars of federal restoration funds, coastal management planning and the status of species at risk of endangerment.

The yearlong study was awarded nearly \$200,000 from the National Science Foundation and is part of the Saltmarsh Habitat and Avian Research Program, which was founded by a group of academic, governmental and nonprofit collaborators — including UMaine — to provide tidal-marsh bird conservation information.

Brian Olsen, assistant professor in UMaine's School of Biology and Ecology, is a co-principal investigator of the study. Maureen Correll, an ecology and environmental Ph.D. student in Olsen's lab, is working on the project as part of her dissertation. Two additional student researchers from UMaine also are participating in the study.

EMPOWERING FEMALE AND MINORITY HIGH SCHOOL STUDENTS,

their teachers and communities to create innovative solutions to environmental problems related to stormwater management is the goal of a new three-year project at the University of Maine, funded by the National Science Foundation (NSF). The more than \$735,000 award from NSF's Experimental Program to Stimulate Competitive Research (EPSCoR) is part of the portfolio of projects of Maine EPSCoR at UMaine. It is expected to involve approximately 180 Maine high school students and 45 teachers in hands-on projects led by science, technology, engineering and mathematics (STEM) professionals in areas such as engineering design, science, computer modeling and information technology to monitor and map water quality in several Maine communities.



A GROUNDBREAKING CEREMONY

for the new Emera Astronomy Center at the University of Maine was held in April. The \$5.2 million astronomy center is made possible with a \$1 million naming gift from Emera Inc., the parent company of Bangor Hydro and Maine Public Service. The Emera Astronomy Center will house the Maynard F. Jordan Planetarium and Observatory. The 7,400-square-foot center, with adjacent 618-square-foot observatory, could be open as early as fall 2014. The groundbreaking event also celebrated the investment and vision of an anonymous donor to the University of Maine Foundation who first proposed the astronomy facility to enhance the viewing of the night sky, and who provided \$3.2 million in funding to help make the project a reality. The Emera Center will feature a planetarium dome 33 feet in diameter and a 20-inch digital PlaneWave CDK20 telescope. Both will be the largest in Maine.

The center will include innovative exterior lighting designed **to help preserve the dark sky** critical to enhanced stargazing.



NATIONAL SCIENCE

FOUNDATION has awarded a \$722,500 grant to a team of researchers in the Laboratory for Surface Science and Technology (LASST) at the University of Maine to develop ceramic-based nanocomposite thin film materials to be used in sensors operating in harsh high-temperature environments.

Miniature sensors that can withstand the intense heat inside machinery such as turbine engines, combustion burners, power plant boilers, oil and gas drilling machinery, and ceramics manufacturing equipment can provide critical information to reduce overall energy usage and increase the lifetime of expensive machinery.

However, thin film materials used in the manufacture of sensors rapidly degrade in most industrial conditions, making the sensors unreliable and short-lived.

"There is a real need to develop stable films and reliable sensors for harsh environments above 1,000 degrees Celsius," says LASST Director Robert Lad, principal investigator for the project. "Significant cost-savings can be gotten by using sensor data to more efficiently operate complex high-temperature machinery."

UMaine researchers in LASST have been developing sensor technology for a number of years and in 2008 demonstrated the operation of a wireless high-temperature acoustic wave sensor as high as 800 degrees Celsius in a jet engine for the U.S. Air Force.

The NSF award is part of a new Sustainable Chemistry, Engineering, and Materials (SusChEM) initiative.



"The energy and passion within and surrounding UMaine hockey are inspiring. Red Gendron

DENNIS "RED" GENDRON, who has won two NCAA Hockey National Championships and an NHL Stanley Cup as an assistant coach, is in his first season as the University of Maine men's ice hockey head coach. Gendron's first college hockey coaching experience was with the Black Bears, where he assisted Coach Shawn Walsh with the 1993 NCAA Division I National Championship team. Gendron came to UMaine in 1990 as an assistant coach for three seasons. He also earned a master's degree in education administration from UMaine in 1993. In his 34-year coaching career, Gendron has worked with championship teams at all levels. USA Hockey uses Gendron's book, *Coaching Hockey Successfully*, as the advanced-level manual for its coaching education program.



A FIVE-STATE, FIVE-YEAR, \$2.5 million USDA study to combat childhood obesity, led by researchers at the University of Maine, is using an unlikely tool — cooking. The project, called iCook, is focused on improving culinary skills, promoting family meals and increasing physical activity. Being conducted at the five land grant universities in Maine, Nebraska, South Dakota, Tennessee and West Virginia, the study is designed to test the effect of a two-year intervention on body mass index (BMI) of youth ages 9 and 10.

In Maine, a team of researchers, students and University of Maine Cooperative Extension faculty members are led by Adrienne White, human nutrition professor, and Kate Yerxa, statewide educator for nutrition and physical activity.

"The long-range goal is obesity prevention by maintaining healthy weights in children that fall within the normal percentile curves," White says. "iCook is a unique program for youth and their parents to cook together, eat together and have fun together, both during the project and at home."

The American Medical Association recently announced it has adopted a new policy classifying obesity as a disease. Obesity affects 30 percent of American adults and has more than doubled in children and tripled in adolescents in the past 30 years, according to the Centers for Disease Control and Prevention.

Study results will be used in curriculum development that will be integrated into UMaine Extension youth programming.





\$118

million added to the statewide economy in 2010

MOVIE LIGHTS AND CAMERAS

have resulted in economic action in Maine. University of Maine economist Todd Gabe says including multiplier effects, film and photography sectors contributed nearly \$118 million to the statewide economy in 2010, as well as 2,057 full- and part-time jobs, and \$33.1 million in salaries. The total financial impact of movie production and photography in Maine in 2010 was similar to the amount grossed that year by *Shutter Island* — \$128 million.

A few scenes of that mystery-thriller starring Leonardo DiCaprio and Ben Kingsley were shot in Maine. The \$128 million grossed by *Shutter Island* was good for 20th overall among movies in 2010.

In 2010, Gabe says movie and photography industries directly supported 1,698 jobs in Maine — including people working full- and part-time for film production companies and photography businesses, as well as self-employed people. The jobs provided about \$19.6 million in salaries.

A RIBBON CUTTING in April marked the opening of the nation's first cellulose nanofiber pilot plant in the University of Maine Process Development Center, which is observing its 25th anniversary. The Cellulose Nanofiber Pilot Plant, funded by a \$1.5 million grant from the U.S. Forest Service, is the only one of its kind in the United States.

The pilot plant manufactures cellulose nanofibers, a wood-based reinforcing material that is increasingly of interest to researchers worldwide in the development of high-value materials. Cellulose nanofibers are an advanced biomaterial made from renewable forest- and agriculture-based sources. Primarily, they are valued for their strength; a strand of CNF is stronger than steel and takes on different structures depending on how it is dried.

Nanocellulose fibers are approximately 1,000 times smaller than traditional paper fibers. The material can be made from any lignocellulosic source, such as wood, grasses, corn stalks or wheat straw. Nanomaterial has applications in automobile components, paint and coating additives, composites and filtration media.

Last year, UMaine and the USDA Forest Products Laboratory began a research collaboration on the conversion of wood components into novel nanomaterials; the incorporation of an array of nanomaterials into forest products to increase their functionality, durability and end-use performance; and development of new generations of high-performance wood-based materials. UMaine is part of a consortium of universities and industrial partners, led by the Forest Products Laboratory.

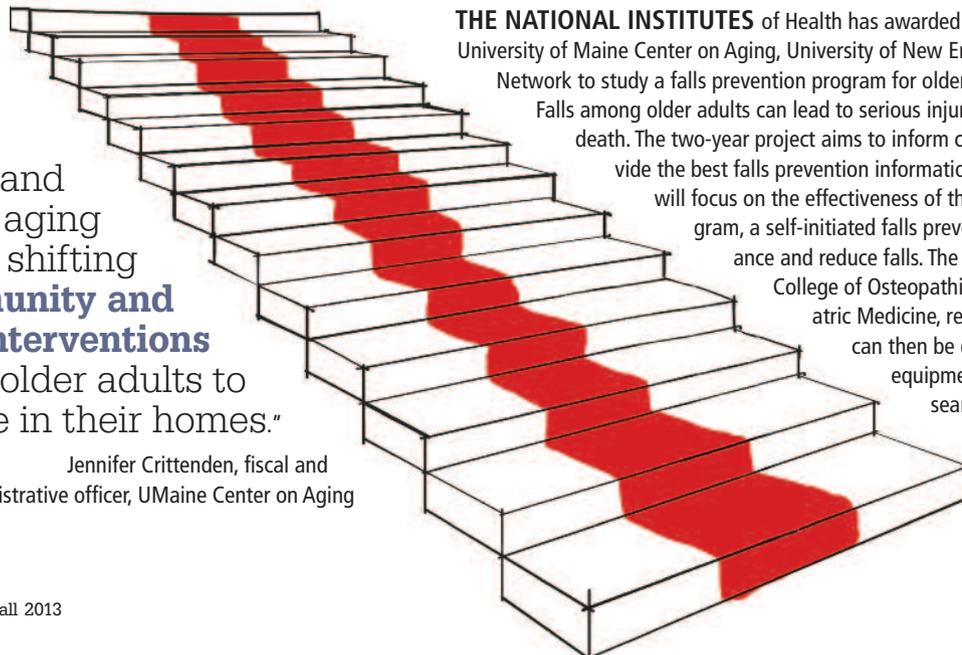


In Maine and nationwide, aging services are shifting toward **community and in-home interventions** allowing older adults to age in their homes."

Jennifer Crittenden, fiscal and administrative officer, UMaine Center on Aging

THE NATIONAL INSTITUTES of Health has awarded \$380,000 to researchers at the University of Maine Center on Aging, University of New England (UNE) and the Iris Network to study a falls prevention program for older citizens with vision impairment.

Falls among older adults can lead to serious injury, loss of independence or death. The two-year project aims to inform community programs how to provide the best falls prevention information for older citizens. The study will focus on the effectiveness of the UNECOM Balancing Act Program, a self-initiated falls prevention program to improve balance and reduce falls. The program, designed at UNE's College of Osteopathic Medicine Department of Geriatric Medicine, requires one training session and can then be done at home without special equipment or further instruction. Research findings and the UNECOM Balancing Act Program will be disseminated among human service organizations.





National studies have indicated
70 percent
 of academics and
83 percent
 of female scientists are in
 dual-career relationships.

AN INITIATIVE TO TRANSFORM the University of Maine by enhancing opportunities for women has received an additional \$284,093 from the National Science Foundation.

The supplemental funds will be used to develop a regional consortium to assist in the retention of science, technology, engineering and mathematics (STEM) faculty by facilitating dual-career hiring — providing opportunities for partners of UMaine faculty and staff members.

The new hiring consortium — Maine Career Connect — will help partners and professionals seeking employment in the region by connecting them with employers and resources, as well as supporting transitions.

“This funding will assist in recruiting and retaining dual-career couples at UMaine,” says Susan Gardner, director of UMaine’s Rising Tide Center. “In our study of faculty who left UMaine, up to half of those who did so in a given year was due to a lack of employment for their professional spouses and partners.”

UMaine’s ADVANCE Rising Tide Center, formed with the help of a five-year, \$3.2 million NSF grant, strives to improve opportunities for female faculty members in social-behavioral sciences and STEM to “create a rising tide for the entire university.”

THIS FALL, THE PORTLAND PUBLIC SCHOOLS SYSTEM opened an upgraded centralized kitchen with the help of University of Maine Cooperative Extension food safety specialist Jason Bolton.

Since 1987, the system’s food processing center has been housed in the Reed School building on Homestead Avenue. In 2010, Ron Adams, Portland Public Schools food service director, contacted Bolton for assistance with the design, layout, equipment and regulatory aspects of a new facility after architects and contractors determined the current building was beyond repair. Bolton, an assistant UMaine Extension professor with food processing facility experience, helped with the transition.

Adams and Bolton considered several sites before securing a 15-year-old building last year. The building, located about three miles from the current facility, used to house a seafood processing plant and required renovations before the commissary relocated.

The city of Portland approved a \$3 million bond to pay for the facility, real estate and equipment, according to Adams.

“They had done a lot of Band-Aid fixes on things because that’s what they had the money to do,” Bolton says of the current facility. “Nothing that was necessarily unsafe, just not all that efficient.”

The commissary’s 16 workers are responsible for making and shipping around 5,000 meals a day to K–12 students attending public schools in Portland, according to Adams. The meals are fully cooked at the commissary and are shipped to school cafeterias to be served to students.

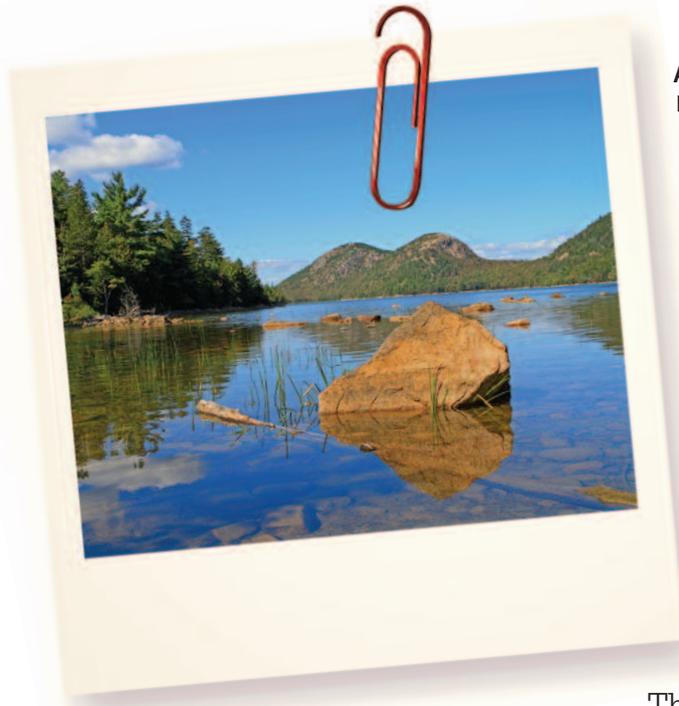
The food center wants to turn part of the building into a shared-use facility that could either be rented to other processing companies or used to co-pack; when not making school meals, the commissary workers could prepare and process food for other companies, Bolton says.

Bolton also expects efficiency to improve with new equipment, loading docks and overall flow of the building by reducing electricity and cook time.



“Quality control **will greatly improve** with the new facility.”

Jason Bolton



A STATE-OF-THE-ART sensor buoy system deployed in Jordan Pond at Acadia National Park is key to a high-tech water quality monitoring program launched in light of recent concerns about decreasing clarity in what is considered one of the clearest lakes in Maine.

The monitoring program is made possible by a partnership led by Friends of Acadia, Acadia National Park and the University of Maine's Climate Change Institute. Canon U.S.A., Inc., a leader in digital imaging solutions, is the official sponsor for the program.

Through Canon's support, Friends of Acadia purchased a NexSens CB-400 Data Buoy and hired a full-time aquatic scientist, Courtney Wigdahl of Topsham, Maine, to monitor the study. Wigdahl is a UMaine alumna who did her Ph.D. and postdoctoral research with Jasmine Saros, associate director of the Climate Change Institute.

The 187-acre Jordan Pond is 150 feet deep — the deepest and the second largest of the 26 lakes and ponds on the island. Described as one of Acadia's most pristine lakes with exceptional water quality, Jordan Pond is the water supply for Seal Harbor. The automated monitoring will provide a more comprehensive perspective on water conditions, and inform decisions about lake protection measures. It also will monitor conditions before, during and after major weather events to understand changes the pond undergoes.

The buoy will monitor **nearly 100 data points daily**, including the amount of algae and organic material in the water column, and water pH and temperature.

“

It's going to be a constant interaction. We're going to be meeting with the Penobscots regularly and hopefully provide them with resources for their language program as we prepare the dictionary for publication.”

Pauleena MacDougall

LANGUAGE REVIVAL and education are at the core of a three-year project by the University of Maine, Penobscot Nation and American Philosophical Society (APS) to create a comprehensive printed version of the Penobscot Dictionary, complete with an English index and searchable online database.

The project, which was awarded a National Endowment for the Humanities grant of more than \$339,000, will provide resources and linguistic training to the Penobscot Nation's language revitalization community through the creation of the language's first published comprehensive dictionary.

“I think it is important for the university to reach out to communities, aiding their cultural efforts and, in particular, to the Penobscots, who are our neighbors,” says Pauleena MacDougall, director of the Maine Folklife Center and a faculty associate in anthropology at UMaine.

A Penobscot Dictionary manuscript created by pathologist and linguist Frank T. Siebert Jr. and based on his work with native speakers from 1935–93 exists at APS. The 494-page work includes approximately 17,000 entries representing more than a half-century of a largely underdocumented language. Researchers hope to add 30,000–45,000 words, phrases, sentences and usage examples from field notes and other archived materials to Siebert's original manuscript — which was created from index cards, then entered into a digital text file format in the mid-1980s — to prepare an updated edition of the dictionary.

Co-principal investigators MacDougall and Conor Quinn, a linguist who earned his Ph.D. from Harvard University in 2006, and a project advisory committee will oversee the compilation and implementation of the dictionary. MacDougall and Quinn were both assistants of Siebert and have extensive backgrounds working with the Penobscot language.

kaya



The Millay Prize



THE FRANK AND HELENE CROHN Edna St. Vincent Millay Prize was established at the University of Maine Foundation in 2009. The goal of the fund is to build on the reputation of the National Poetry Foundation. The Millay Prize rewards achievement in poetry at a crucial stage in a writer's development while commemorating one of Maine's best-known and most-loved poets, Edna St. Vincent Millay.

The National Poetry Foundation (NPF), a signature program in the humanities at the University of Maine, has earned an international reputation for its innovative approach to scholarship in the fields of modern and contemporary poetry and poetics. Established in 1971 by UMaine professor Carroll F. Terrell (1917–2003) as a center for Pound scholarship, its mission was expanded by professor Burton Hatlen (director from 1990 until his death in 2008) to include the entire tradition of innovative poetry, from modernism to the present day. As it enters its fifth decade, NPF is led by English Department faculty members Carla Billitteri, Steve Evans and Benjamin Friedlander who, along with Jennifer Moxley, also make up UMaine's core faculty in poetry and poetics.

“

The National Poetry Foundation established its reputation by focusing scholarly attention on the work of poets like William Carlos Williams and Ezra Pound. **It is a real pleasure to welcome Millay**, a Maine native, into that company and to honor her legacy by supporting aspiring poets at a formative stage in their vocation.”

Steve Evans, UMaine professor of English and co-director of the National Poetry Foundation

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A new look at Maine's **Flagship University**

SINCE 2001, *UMaine Today* magazine has been the University of Maine's principal public relations and marketing anchor, highlighting exceptional creativity and achievement at Maine's Flagship University. In the past decade, *UMaine Today's* quarterly circulation has increased nearly 600 percent to almost 80,000 in an effort to reach as many alumni as possible. Today, the ever-increasing costs of printing and postage, coupled with technological advances that many readers prefer, have led us to a new redesign and circulation model.

This fall 2013 issue marks the first full redesign of *UMaine Today* as part of the innovation, efficiency and growth that hallmark UMaine's Blue Sky Project, the five-year strategic plan for Maine's Flagship University. *UMaine Today's* redesign and digitization project preserves and harnesses the successful elements of the magazine, while simultaneously increasing accessibility beyond the current circulation, updating the look and feel to provide essential and current messaging, and exemplifying UMaine's land grant status as a leader in the state, region and nation.

As part of the redesign effort, *UMaine Today* magazine is now published biannually with twice the amount of editorial content. Coming soon will be a redesigned, mobile-friendly online presence for *UMaine Today*.

This fall 2013 issue will be the last full-circulation edition of *UMaine Today* magazine. Readers who prefer to receive their issue online can visit the website (umainetoday.umaine.edu). Those who would like to continue to receive the print version of the magazine can subscribe for \$5 a year (checks payable to the University of Maine) by writing:

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We look forward to continuing to exemplify the Blue Sky Project theory that tradition, culture and independence can be preserved while streamlining limited UMaine funding and staff to create efficiency and modernization through the *UMaine Today* redesign and digitization project.

Thank you for your continued loyalty to and support of the University of Maine through *UMaine Today* magazine.

Margaret Nagle, Managing Editor