

Prehistoric Diet

Whose Woods?

Ancient Blue Ice

Early Literacy

UMaine *Today*

CREATIVITY AND ACHIEVEMENT AT THE UNIVERSITY OF MAINE

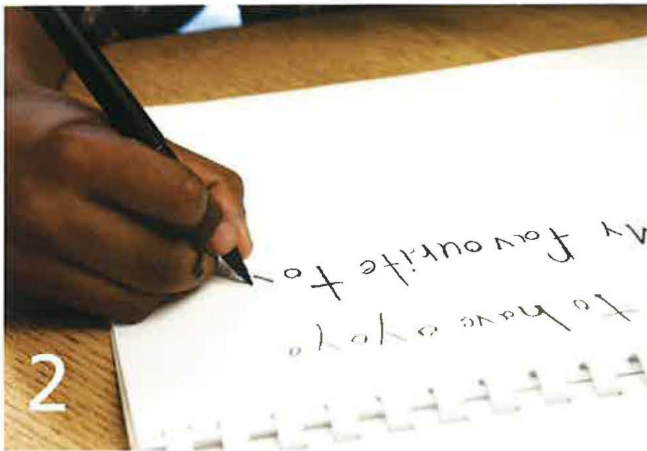
FALL 2010

Killing pain

**How have prescription narcotics
become the most deadly drugs
in rural America?**



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An early literacy intervention initiative led by a UMaine education researcher is making the difference for refugee children in Lewiston.



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The isolation in rural states like Maine works against the illicit drug trade. Filling the void are pharmaceutical narcotics diverted from their prescribed use. Today in Maine, more people die from prescription drugs than motor vehicle accidents or illicit drugs.

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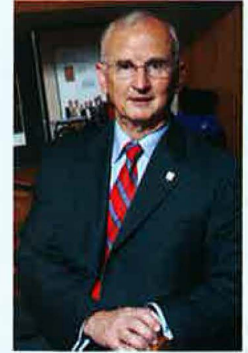
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In *UMaine Today* magazine, +Online indicates the availability of additional content — Web-exclusive stories, video and audio clips, photo galleries, full-length versions of articles, answers to questions posed to our In the Know experts, and a comprehensive editorial archive.

- In the Know**
Merrill Elias on cardiovascular risks related to cognitive function.
- Jane Haskell** on effective group facilitation skills.

President's Message

THIS ISSUE of *UMaine Today* draws attention to some of the unique ways in which the University of Maine is having a positive impact throughout our state. In addition to reports about research and scholarship related to our natural resources, a story about lessons we can learn from studying the eating habits of ancient peoples, and a piece examining the history of U.S. immigration policy over the past 70 years, three stories really demonstrate meaningful responsiveness to emerging state needs.



I'm referring to Marci Sorg's epidemiological study of issues related to prescription drug abuse, Mary Rosser's literacy work with young refugees in Lewiston and Jessica Leahy's research on the relationship between Maine's forest landowners and outdoor recreationists. This work addresses pressing issues in a changing Maine, and UMaine is taking a leadership role in helping individuals, communities and even state policymakers address them. At the same time, this work falls right in line with the historic role of our flagship university, applying our expertise and resources in ways that will improve lives.

We take pride in UMaine's important role and state-wide impact, and we all work hard every day to maximize the effect our institution is having all around Maine.


Robert A. Kennedy
President



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The Very Fiber of Our Being

In many ways, our prehistoric ancestors ate healthier than we do. Anthropologist Kristin Sobolik talks about what we can learn from the high-fiber flora and fauna variety found in the diets of hunter-gatherers.



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Video features

Maine Sea Grant at 30 A reflection on three decades of marine research.

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Wildlife Camp A May Term field course for wildlife ecology majors.



ON THE COVER: When the number of drug-related deaths in Maine jumped fourfold from 1997–2002, Dr. Margaret Greenwald, the state's chief medical examiner, and University of Maine medical and forensic anthropologist Marcella Sorg began compiling data on the relationship between substance abuse and mortalities. Their landmark report became the foundation for addressing drug abuse policies in Maine. See related story on page 8.

Photo by Adam Kuykendall



Lea

Early literacy intervention is making a difference for refugee children in Lewiston

By George Manlove

Photos by Keary Nichols

THE THREE SECOND GRADERS listen attentively as Jodi Smith, an English language learner teacher, reads a sentence aloud from a children's book about snow. Then the youngsters repeat the words.

Suddenly, one of the children can't contain her excitement any longer.

"I love it," announces 7-year-old Asma. "She is playing in the snow and is making a snowman."

That enthusiasm and comprehension please Mary Rosser, an internationally recognized researcher in early literacy education. As recently as a year ago, some of these children at the Gov. James B. Longley School in Lewiston, Maine, were living in makeshift refugee camps in Somalia. They had never been to school and were not fluent in English.

"Look at little Asma. She is really taking off," says Rosser, the University of Maine's coordina-

tor of literacy professional development programs and director for Reading Recovery, an early literacy intervention initiative for elementary schools. "This is telling us that the children are learning language, learning how texts work in English and comprehending the meaning."

ROSSER HAS DEVELOPED literacy curricula in seven African countries, and has worked as an educator in Australia as well as New Zealand, where she studied to become a Reading Recovery trainer. For the past six years, she has supported the work of Reading Recovery educators in schools across Maine. For the past two years, that has included Reading Recovery training for teachers who work with English language learner (ELL) students, many newly arrived from Africa with difficulty in literacy learning.

Several thousand refugees from Somalia, Kenya and Djibouti have relocated to the Lewiston area in the past decade. At the Longley

Eight-year-olds Oskar, left, and Mohammed are two of the 20 English language learner (ELL) students at the Gov. James B. Longley School in Lewiston, Maine, enrolled in Reading Recovery and Literacy Lessons Designed for Individuals — an early literacy intervention initiative for special populations of students. Their teachers are trained by internationally recognized literary educator Mary Rosser from the University of Maine.

Learning language

Learning Language



Jodi Smith, center, an ELL teacher at the Longley School who is trained in Reading Recovery and literacy intervention techniques, takes second graders Asma, 7, left, and Nasro, 8, through a 30-minute lesson on developing their oral language and literacy skills. The students meet with Smith four times weekly.

School, 58 percent of the students are learning English as a second language, according to Thomas Hood, the principal at the Longley School last spring. Most schools in Maine and nationwide have only a fraction of the Longley ELL population, according to Brian Doore, program evaluator at the Center for Research and Evaluation in UMaine's College of Education and Human Development.

In addition, statewide and nationally 37 percent of all students qualify for federally funded free lunch; at Longley, 98 percent. The "mobility" rate, or students transferring in or out of a school in a year, is 18

percent nationally; 67 percent at Longley. That disrupts the consistency of instruction, according to Doore.

"They really have a unique challenge in this school," says Doore, who tracks learning, literacy and other student test results in Maine. "Many characteristics of these students' prior experiences and knowledge of our language and culture make it difficult for them to do well."

Reading is a prerequisite to almost all other types of learning in school, he says. State tests are written in English, which makes the results less reliable measures of ELL students' knowledge. Those tests

determine which Maine schools are meeting achievement expectations

"If you can't read, how can you possibly do well with that test?" Doore says.

LONGLEY HAS BEEN NAMED one of the 10 lowest-performing schools in Maine by state education standards. It was falling short academically even before the refugee children arrived, and the challenge of integrating a non-English-speaking population into classes frustrated the teaching staff, says Jacque Grenier, a Reading Recovery teacher leader training at Longley.

Two years ago, the Longley staff

The aim is for students to develop skills that allow them to read, write, listen and think analytically about the meaning and structure of text.

decided to try a different approach. Lewiston School Superintendent Leon Levesque and Hood spoke with Rosser about Reading Recovery and Literacy Lessons Designed for Individuals — an early literacy intervention initiative for special populations of students.

In 2008, Levesque gave Rosser, Lynn Curran-Sargent, a Reading Recovery teacher leader, and 11 Reading Recovery teachers a year to pilot the initiative in the school. As a result, many of the children who would have ended up in special education classes because of their inability to keep up have been tutored in Reading Recovery. Most are now able to spend more time in regular classes performing at or above grade-level reading skill proficiency, according to Rosser and Doore.

Hood says referrals to special education have dropped as the ELL population has increased.

ROSSER'S READING RECOVERY and literacy intervention approach focuses on training teachers to work with students one-on-one and in small groups for a class period during each day. It also encourages teachers to collaborate in instructional consistency.

Classroom teachers, ELL teachers, special education staff and Reading Recovery teachers must adopt a “layering of instructional support within a Comprehen-



Mary Rosser has developed literacy curricula in seven African countries, and has worked as an educator in Australia as well as New Zealand. For the past six years, she has supported the work of Reading Recovery educators in Maine schools.

sive Intervention Model,” Rosser says. “When implemented as designed, the approach is comprehensive, cohesive and coordinated. Historically in schools, we had the ELL teacher over here doing her thing and the special ed teacher over there doing her thing, and that frequently resulted in a lack of curriculum unity.”

Reading Recovery and literacy intervention “is such a different paradigm from what people are used to,” Rosser says. “It’s really turning around the designs and systems as we know them. This is about

literacy education; it’s not about testing. For ELL students, testing and retesting are not the way to go.”

In the last year, Doore says, children who came to the school with little or no English — Level 1 by educational literacy standards (“I can run. I can play.”) — had in six months reached Level 14 (“James ran up to the soccer ball and tried to kick it past his friend Matt. ‘You won’t stop this one!’ he shouted. But Matt kicked the ball away.”)

“We teach children to anticipate text, to think about how text is constructed,” Rosser says. The aim is for students to develop skills that allow them to read, write, listen and think analytically about the meaning and structure of text.

Rosser is now training the staff at the Montello School in Lewiston in Reading Recovery and Literacy Lessons Designed for Individuals, and is talking with other schools statewide about instituting a similar system.

“It’s a lot of work. It’s a lot of new learning,” Hood says. “The key thing for me as an administrator is the amount of in-house staff development that people are receiving. You just can’t say enough about it.

“Clearly, the one-on-one instruction for students is key,” he says, “and also knowing children’s skill levels and knowing what skills they’re lacking. Teachers have a more in-depth understanding of how kids learn and make connections.” ■



JOHN JEMISON sticks a trowel into a bed of crumbly, chocolate-brown soil, pushes a little aside and tucks an onion seedling into the hole. To his right, a sustainable agriculture student from the University of Maine prepares a bed for cabbage. Behind him, volunteers of all ages pull weeds and spread compost.

It's early spring, and soon the Orono Community Garden will yield bushels of produce — juicy tomatoes, succulent onions, crisp cukes and more — that rival the goods sold at farm stands and farmers markets. It's Jemison's way of helping to see that some of Orono's elderly and less fortunate have access to fresh, local, organically grown food.

For Jemison, a soil and water quality specialist with University of Maine Cooperative Extension, food is more than just sustenance. Since 2003, he has worked to help Mainers find a deeper connection to what they eat, where it comes from, who raises it and what all of that means to the health of the environment, the economy and the population.

"We were once the breadbasket of the Northeast, and I don't see why we

Agriculture

couldn't be the breadbasket again," he says.

Like many in his field, Jemison came through the traditional channels: he earned a Ph.D. in agronomy at Penn State before arriving in Orono in 1991. He's well-versed in the U.S. Department of Agriculture's approach to conventional farming. He can list the benefits of genetically modified crops as easily as he can list the drawbacks.

But in 2003, while on sabbatical in Italy, he had a foodie revelation — one that shifted his focus to sustainable food systems and had significant implications for his work in Maine.

"I saw how Italians seemed to have a much tighter connection to their food," Jemison recalls. "There were a lot of small farms, and people seemed to be very interested in supporting those farms. They were insistent that their food was better than the next region's food. There was a real sense of pride.

"How Italy managed land and land use was so critical. They knew if these farms were there, that beautiful landscape would continue to be there. That's what draws people to Italy."

Everyone he met had a garden, whether they were cultivating 6 square feet in front of their house or a massive plot at a villa. And they were growing varieties chosen for flavor, including many heirlooms.

"If you go over there and you're wild about the food, then naturally you buy a cookbook. When you get home, you almost wonder why you bought the cookbook because the recipes are really simple," he says. "It's all about the ingredients and where the food comes from. They've bred for flavor. Here, we've tended to breed vegetables for durability for transport across the country."

"We were once the breadbasket of the Northeast, and I don't see why we couldn't be the breadbasket again." John Jemison

In the United States, commercial agriculture has made an abundance of inexpensive produce available year-round. This, of course, has its benefits. But it also has drawbacks. For starters, vegetables that are bred for long-distance travel aren't always the tastiest and may lose some nutrients along the way.

In Italy, Jemison realized that the more thoughtful people are about where their food comes from, the more thoughtful they are about what they put in their bodies.

"That connection to the land makes

you think about your diet differently," he says. "I thought if we could create these models here, hopefully, these models would get carried on."

He could see parallels to Maine, which has a rich agricultural history and deep cultural connections to its traditional foodways. Here, fishing, hunting and growing crops such as blueberries are a celebrated way of life.

When he returned, he made it his mission to advocate for what some call "agriculture-supported community" — a riff on community-supported agriculture — in a way that combined his personal and professional interests. UMaine Cooperative Extension already had an expert on big-picture environmental sustainability, Cathy Elliott, so Jemison decided to focus on the food aspect.

The community garden was his first project, and it has grown in size and scope over the last seven summers. Today, Jemison and other volunteers deliver fresh produce to more than 50 seniors, most of whom live in two housing developments near the garden.

"You really don't get to know people until you bring food to them," Jemison says. "You go see them, you get hugs, you get much more involved in your community." **Online**

community supported

Strengthening Maine's connections to local foods

Prescription drug abuse in rural states has become a leading cause of deaths, arrests and treatment admissions. In Maine, policymakers are addressing the epidemic with the help of UMaine's Smith Policy Center.

Razor's edge

THIRTEEN YEARS AGO, when Dr. Margaret Greenwald came to Maine to be the state's chief medical examiner, she thought she'd found, in her words, paradise. Maine's 34 drug-related deaths a year were a fraction of what she saw in the San Francisco Medical Examiner's Office.

By Margaret Nagle

Then the epidemic began.

Within five years, the number of drug-related deaths in Maine had jumped fourfold. From 1997–2002, there were 374 drug-related deaths in Maine, most due to accidental overdose.

More than 90 percent of all the drug deaths, including suicides, involved prescription drugs.

“It was a frightening thing to see deaths increase at such an alarming



Razor's edge

pace and we weren't really seeing a lot of public knowledge about what was happening," says Greenwald. "People were talking about OxyContin issues in Washington County and drugs coming across the border, but the fact is this was not just a local problem. It was happening throughout Maine.

"It was not marginalized citizens with illegal drugs, but it was crossing into all categories of people. It involved our neighbors and friends. That's why we felt we needed to show them data. We needed to figure out a public health approach."

In 2001, with funding from the Maine Justice Assistance Council and state Office of Substance Abuse, Greenwald and University of Maine medical and forensic anthropologist Marcella Sorg began to compile data on the relationship between substance abuse and drug-related mortality in the state. The next year, their landmark report became what then Attorney General Steven Rowe called "the foundation upon which to build future drug abuse policy" in Maine.

It also escalated an ongoing effort by researchers at UMaine's Margaret Chase Smith Policy Center to track the epidemiological trends of prescription and illicit drug abuse in Maine. Those researchers in the center's Rural Drug and Alcohol Research Program are led by Sorg, who specializes in health policy, particularly as it concerns public health, public safety, and the investigation of death and injury.

Because of her expertise on the escalating abuse of prescription medications in rural states, Sorg has testified in recent years before Maine legislative and U.S. Senate committees, and presented her

findings to state and federal agencies. The Smith Center's pioneering epidemiological research has provided an important perspective on prescription drug abuse and mortalities in rural states — a frame of reference previously overshadowed by the war on illicit drugs in urban areas.

Sorg is now an invited member of the Community Epidemiology Work Group, a task force assigned by the National Institute on Drug Abuse to monitor national drug trends.

"(Prescription drug abuse) really is an epidemic and it appears to be a problem



In 2009, 179 Maine citizens died as a result of drugs. Of those deaths, 165 were due to pharmaceutical narcotics, either alone or in combination with other drugs or alcohol.

that is mirrored nationally as well as in other rural states," says Greenwald. "It's pretty overwhelming when you see the statistics and realize how pervasive the problem is."

IN MAINE, illicit drugs such as cocaine and heroin have a foothold. But like other rural areas, the social context and geography here aren't as conducive as they are in

states with denser populations and major metropolitan corridors where drug trafficking networks can really hum.

Isolation works against the illicit.

Filling the void are pharmaceuticals diverted from their prescribed use. Today in Maine, more people die from prescription drugs than motor vehicle accidents or illicit drugs, according to Sorg.

According to a recent U.S. Centers for Disease Control report, the number of accidental overdoses has exceeded motor vehicle fatalities nationally. Most of these drug deaths are due to pharmaceuticals, primarily narcotics.

Methadone and oxycodone are the top two narcotics causing prescription opiate deaths in Maine. Beyond that, nearly a third of Maine's drug-related deaths are caused by a second category of drugs, the benzodiazepines, including commonly prescribed tranquilizers such as Xanax, Klonopin or Valium.

In the fiscal year ending June 30, 2009, the Maine Prescription Monitoring Program (PMP) logged more than 2.4 million prescriptions for scheduled drugs — narcotic analgesics, sedatives and stimulants.

Between state fiscal years 2008 and 2009, the number of prescriptions for controlled drugs, those monitored by Maine's PMP, rose by 5.8 percent, according to Sorg's analysis of the Maine Office of Substance Abuse data.

The controlled drugs most prescribed in Maine are narcotic pain relievers.

The confluence of widespread use and associated abuse is what Sorg characterizes as the razor's edge.

"Prescription drugs are a very complex

issue because they occupy both sides of the razor's edge separating legitimate therapy from misuse and abuse. The leading edge of the problem is the diversion of prescribed drugs to people for whom they were not prescribed or using them for a different purpose," says Sorg. "Some of that diversion can be relatively innocent: You borrow your friend's pain medicine for your headache, and that's one level of diversion. That escalates when someone takes someone else's pills and sells them."

It's this level of diversion — that slippage over the razor's edge — that has Maine officials on high alert.

"We are a pretty typical rural state and, as such, we have more of a problem with prescription than illicit drugs," Sorg says. "Prescription drugs are more available. We are at the end of the trafficking highways from the major sources of illicit drugs. Maine, New Hampshire and Vermont have similar problems with prescription drug abuse."

THE PHILOSOPHY OF the medical community toward pain relief has changed in the last two decades, says Sorg, and this has played a role in the prescription drug problem. Healthcare providers have shifted from a reluctance to prescribe narcotic pain medications to the view that, in order for people to function, they have to be comfortable. Pain has become a quality issue in healthcare, with providers asking people about their pain levels and feeling freer — indeed, obligated — to treat them.

"When I was a nurse in the early '70s, one of the most difficult problems we dealt with was pain relief," Sorg says. "It

was a recurrent problem. Post-op surgical patients, for example, had a hard time being comfortable at the levels of their prescriptions, frequently given by injection at four-hour intervals. Drugs had an early peak and decline. At the end of four hours, patients were begging for their shots.

"So now, healthcare providers are doing a better job treating pain. We have made improvements, but those improvements come with baggage."

Unfortunately, there's a certain risk that a minority of people will get addicted when narcotics are prescribed, Sorg says.

"People's vulnerability to addiction varies greatly: Some people are more physically and behaviorally susceptible to addiction," Sorg says. "And the problem with narcotics is that people's tolerance may change over time. For example, some people who continue to take a drug at one dose may eventually need a higher dose to do the same job. Increased consumption carries increased risk, particularly if it's not medically supervised, including potentially fatal respiratory depression."

IN RURAL COMMUNITIES, pharmaceutical narcotics have become a commodity people are willing to pay for on the black market, often to satisfy an addiction. In turn, others are willing to sell these drugs as a source of income, Sorg says.

Rural areas can be particularly susceptible, especially where poverty is an



In 2009 in Maine, 54 percent of the substance abuse treatment admissions (excluding alcohol) had a primary problem of prescription narcotic addiction. In contrast, 16 percent of the admissions were for heroin addiction.

important factor and where there may be more blue-collar jobs associated with occupational injuries that may be treated with prescription narcotics.

"There is a cultural aspect to this, in that rural populations don't look kindly on things like heroin abuse," Sorg says. "However, pills just don't come with the same cultural baggage. People feel safer with pills and see them in a different realm than illicit drugs. With prescription drugs, there's a perception of safety because they're associated with the medical establishment."

But prescription drugs are only safe if taken as directed. In 2009 in Maine, the number of deaths from drugs — both illegal and prescribed — reached 179 — an all-time high. Between 1997 and 2009 a

"Prescription drugs are a very complex issue because they occupy both sides of the razor's edge separating legitimate therapy from misuse and abuse." Marcella Sorg

Razor's edge

total of 1,625 Maine citizens died as a result of drugs. About 90 percent of those deaths — 29 percent of which are suicides — are due to at least one prescription drug, either with or without other drugs or alcohol, Sorg says.

Pharmaceutical narcotics have other negative effects in Maine communities. According to Sorg's analysis of Maine Drug Enforcement Agency data, prescription drug arrests constituted 37 percent of all 2009 drug arrests — up from 19 percent in 2003. Trafficking of prescription drugs has outpaced cocaine in Maine.

Attorney General Janet Mills, speaking this past February to the Maine chiefs of police, noted that in the past 19 months, at least six of the murders committed in Maine were related to prescription drugs. Pharmaceutical narcotics also are at the root of many robberies, thefts, burglaries, home invasions and assaults.

"Prescription drug diversion is an epidemic in our state, in our nation today," Mills said. "This is a public health issue, an economic issue, a public safety issue. Prescription drug diversion is the number one cause of crime in Maine. It is one of the major causes of death in Maine."

RECENTLY, THE RANGE of medically accepted alternatives to narcotics for pain relief has increased, Sorg says. Acupuncture, benzocaine and spinal treatments, relaxation and massage techniques, and physical therapy help with pain in some people.

"What we need is a broad approach to pain," Sorg says. "We need to do a better job of discriminating people at risk for

addiction and there are no good ways to do it now except by patient history. Genetics research is not there yet (to determine who is predisposed to addiction), but may someday help. We also need to work for better coordination of care. When multiple providers are involved — say, if a person who is vulnerable to addiction goes to a dentist and a knee surgeon — coordinating care becomes critical. That's where prescription monitoring is helpful."

"It was not marginalized citizens with illegal drugs, but it was crossing into all categories of people. It involved our neighbors and friends." Dr. Margaret Greenwald

In 2003–04, Maine implemented a Prescription Monitoring Program designed to prevent and detect prescription drug misuse and diversion. Overseen by the Office of Substance Abuse in the Maine Department of Health and Human Services, the database details all prescriptions for controlled substances dispensed in the state. The Prescription Monitoring Program includes an online service that allows prescribing clinicians and pharmacists to check the controlled substance treatment history for new and existing patients.

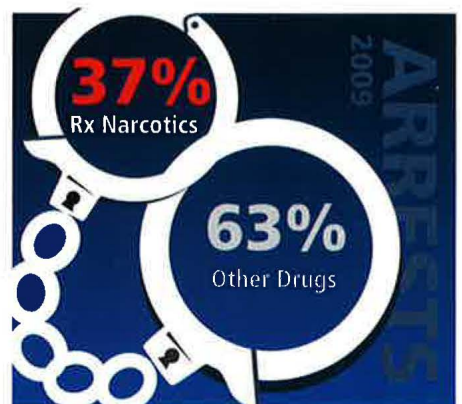
Sorg's research demonstrates that, while healthcare providers in Maine write most of the prescriptions, many out-of-state healthcare providers (at least one in

every state) are writing prescriptions filled in Maine pharmacies.

The research illustrates why policies involving prescription drugs can't be done effectively by one state acting alone, says Sorg. State prescription monitoring needs some national coordination.

"It's nearly impossible for providers to really know what their patients do with the drugs they prescribe. Some drugs are obviously being diverted," Sorg says. "Doctors may develop suspicions when a patient is doing what is known as drug seeking (requesting prescriptions for increasing amounts or going from provider to provider to get multiple prescriptions). Patients may be harder to deal with if they become addicted and need opiates or they'll go into withdrawal.

"The physicians caring for these patients are caught between a rock and a hard place. They want to do what is best for their patients, but sometimes find themselves having to deal with addicted patients who engage in illegal activities."



During 2009, 37 percent of the arrests by the Maine Drug Enforcement Agency were for trafficking or illegal possession of prescription narcotics.

The answer to the dilemma is multifaceted. It includes better patient education about the adverse effects of narcotics, prescriber education about effective ways to prescribe controlled substances, centralized prescription monitoring, and improved feedback to physicians and other prescribers about the problems of pharmaceutical abuse, Sorg says.

“Prescriptions are on the supply side for a lot of things that end up badly,” says Sorg. “Physicians and other prescribers need to pay attention to the downstream effects of prescribing. That includes being better informed if a patient is doctor shopping, using the Prescription Drug Monitoring Program, and doing better patient education and safer in-office prescribing practices.”

CHANCES ARE television viewers are familiar with the side effects of drugs advertised on TV, but the adverse effects of narcotics are not as well publicized, Sorg says. “The assumption is that everyone knows what the risks are, but that’s not the case. Prescribers need to inform patients. We also need more research on how to identify individualized risks for addiction.”


On the one hand, Sorg says, patients need to know the risks. On the other hand, we have to treat pain so people can be comfortable.

“We’ve become a consumer medical society. We are no longer just ‘patients’ but ‘consumers,’ with medical care now administered on a business model,” Sorg says. “Most practitioners are no longer in private practice; they are required by their employers to maximize the number of

patient visits. As a result, many patient visits are limited to only a few minutes. It’s very hard to do patient education in six minutes.”

As informed consumers, people should know as much as possible about the medications they’re taking, Sorg says. They need to be aware of the potential environmental and safety risks to others, taking such steps as participating in mail-backs for unused drugs and putting medicines with a high risk of abuse in a secure location in the home.

Sorg, Greenwald and others continually give talks to professionals on the front lines. Their audiences are physicians, dentists, pharmacists and law enforcement officials. They also include those who work with people for whom drugs may pose unanticipated risks — hospice and homeless shelter administrators, for example, who need to protect their vulnerable clients from being victims of prescription drug thefts. The drug analysis data has brought to the attention of law enforcement agencies, schools, drug rehab areas and families the need to look for prescription drug abuse problems and understand how they affect communities.

“We keep looking for evidence that the pendulum has stopped swinging in a negative direction,” Sorg says. “We have made improvements at the policy level. The Prescription Drug Monitoring Program is a good example. More provider education is happening. However, as long as the number of prescriptions for narcotics and other controlled substances is high, our society is at risk for potential consequences, and we need to be vigilant.” ■ 

Informing policymakers

ESTABLISHED IN 1989, the Margaret Chase Smith Policy Center at the University of Maine seeks innovative solutions to practical problems. Through its applied policy research and projects, the center promotes and improves the quality of public dialogue about issues confronting the state and the nation.

In addition to rural substance abuse, research initiatives focus on such areas as poverty in Maine, energy and the environment, education, health and community development.

The Smith Center provides an independent, interdisciplinary and nonpartisan voice in addressing policy issues. The result is comprehensive research that is relevant to Maine citizens and makes a difference in shaping public policy — and the state’s future.

The center serves as a bridge between the university and policymakers and the public. It brings the strengths and talents of UMaine and other nationally recognized researchers to bear on public policy matters, and is recognized by policymakers for its role in enhancing policy deliberations on local, state and national levels.

Most of the center’s research investigators also serve as faculty members, integrating policy research into the classroom, as well as disseminating research results to professional publications and other venues for public dialogue.

The Smith Center’s publications include *Maine Policy Review*, a journal of independent analysis of public policy issues relevant to Maine. Published twice a year, *Maine Policy Review* features articles written largely by Maine citizens.

Refugee status

A Ph.D. researcher looks at America's shifting perspective on huddled masses



IN THE AFTERMATH of Hurricane Katrina, another storm erupted, this one over the use of the term “refugee” to refer to those displaced by the devastation.

The outcry from Louisiana residents and others was that the word demeaned the victims, many of whom were African American and economically disadvantaged. The controversy prompted then President George W. Bush to affirm that the evacuees were not refugees but Americans. Rev. Jesse Jackson said it was racist to call American citizens refugees.

The discourse didn’t surprise historian Katherine O’Flaherty, who had been studying past United States immigration policies for her graduate degrees. But it did prompt her to focus her doctoral research on the cultural and political context of U.S. refugee policy, and look at the changing concept of the term “refugee” between World War II and the Refugee Act of 1980.

By legal definition, those displaced by Hurricane Katrina were not refugees, says O’Flaherty. But circumstances rendered them refuge seekers. That complex interaction between the legal and social dimensions of the definition intrigues O’Flaherty. It also informs her interdisciplinary exploration of just how people “fit in” and “the popular perceptions and invisible narratives everyone subscribes to.”

Hungarian refugees boarding a plane for America at Schwechat Airport, Austria, 1956. During the Hungarian Revolution, the United States instituted a resettlement initiative. During World War II and the Vietnam War, refugees were not met with similar support.

Photo by Imagno/Getty Images

“I see myself helping people figure out their place,” says O’Flaherty, who completed her Ph.D. in history this past May and is now finishing an Ed.D. in higher education leadership at UMaine. “My research on refugees and the words we use also helps people think about the world and their place in it.”

PRIOR TO WORLD WAR II, the U.S. demonstrated little in the way of “refugee politics” and resettlement efforts, despite the existence of hundreds of thousands of refugees worldwide, says O’Flaherty. Refugees were generally perceived to be a temporary population — receiving aid and returning to a homeland. There was little legal, political or social distinction between the refugee and immigrant.

Refugees as a distinct immigration category remained convoluted during the Cold War. It was not until 1980 that the U.S. fully codified a definition of refugee. The reliance on ad hoc policy had a direct impact on which groups and individuals were admitted into the U.S. That legal posture also informed the nation’s cultural images of refugees, says O’Flaherty.

In her research, O’Flaherty studied four groups of refugees, starting with the European Jews fleeing Nazi advancement in Europe, who faced strict U.S. immigration policies and little public support. Their reception stood in sharp contrast to the U.S. response to Hungarian and Eastern Bloc refugees a decade later, “illustrating new conceptualizations of who a refugee was,” according to O’Flaherty.

“In the case of Hungarians, the refugee was fashioned into a triumphant symbol — that of a freedom fighter,” she says.

Indeed, the Hungarian freedom fighter was *TIME* magazine’s 1956 Man of the Year.

Also in the 1950s came the first waves of Cuban refugees, who largely entered the U.S. freely into the 1980s. Through the years, public support for the Cuban refugees shifted with changes in the U.S. economic and social climate.

But legislation in the late 1970s mirrored the changing popular attitudes about refugees. Amid national calls for refugee aid and human rights advocacy were media reports of a backlash against refugees and “compassion fatigue.” The dichotomy set the stage for passage of the Refugee Act of 1980, which came five years after the Fall of Saigon.

O’Flaherty says this is a particularly important period in the current conceptualization of American political and social refugee consciousness. During this time, public perceptions shifted dramatically as displaced Southeast Asians came to epitomize the painful legacy of war.

“No longer was the refugee portrayed as an anticommunist in need of sanctuary from communist oppression or the victim of Castro’s politics,” according to O’Flaherty. “Instead, the refugee was portrayed as a helpless victim, the legacy of war and communist aggression, arriving in the United States with nothing.”

O’Flaherty argues that “refugee” is not simply a legal term or a synonym for immigrant. Instead, it is a complex cultural construction managed and negotiated differently at different times.

“Thinking of the meaning of words leads to a critical assessment of refugees and issues of race,” she says.



The very fiber of our being

What's lacking in the modern human diet may have our species at a crossroads

By Kristen Andresen

UNIVERSITY OF MAINE anthropologist Kristin Sobolik argues that you are what you eat — and what your ancestors ate, and what their ancestors ate, and so on, for millennia. For that reason, today's human diet is in a sad state of affairs and, quite frankly, our bodies weren't designed for this.

Problem is, it could be too late — and too complicated — to do anything about it, she says.

Our long-ago ancestors hunted, foraged and gathered whatever sustenance they could find. Today, despite the relative abundance at the grocery store — and despite the global food system that attempts to feed a mass population efficiently and inexpensively — humans aren't getting the same variety of flora and fauna in their diets as they used to.

In a recent article in the *British Journal of Nutrition*, Sobolik and Jeff Leach of the New Orleans-based Paleobiotics Laboratory note that our forebears had a much higher concentration of fiber — particularly undigested fiber — in their diets than we do today. Humans evolved in synchrony with their intestinal anaerobes, and undigested fiber promotes the growth of positive microbiota, which helps process food efficiently.

However, such high amounts of fiber are missing from most modern diets.

A more “Westernized” diet, consisting of easily digested carbohydrates, promotes negative intestinal flora, which leads to numerous digestive problems and an inability to efficiently process our food — ultimately lending credence to the need for a prebiotic and probiotic dietary change.

“From an archaeological and anthropological standpoint, this has led us to the brink of being able to destroy ourselves,” says Sobolik, one of the world's leading author-



Mescal beans (*Sophora secundiflora*) have been found in numerous archaeological sites and were probably used as beads or trade items, or ground into powder for an intoxicating drink.

The very fiber of our being

ities on paleonutrition — the analysis of prehistoric diets and their relation to modern health and nutrition. “We chose a particular path with our nutrition, with our subsistence strategies (that included domesticating plants and animals), which has led us to where we are today. I think we are way worse off now than we would’ve been if we hadn’t chosen that path.”

THE CHANGE didn’t happen all at once. It’s the result of a series of seemingly small decisions over a very long period of time. Taken together, these small steps have left a big footprint on the evolution of the human diet — and the way we obtain our food.

In the past as hunter-gatherers, humans foraged off the landscape, had a varied diet and lived in small groups.

Kristin Sobolik’s research focuses on the analysis of paleofeces, human skeletal material, and faunal and botanical remains from sites in the American Southwest and Maine.

Once they evolved a system of animal and plant domestication, the population increased at such a rate that it would be impossible to go back to the past, Sobolik argues. We are now very dependent on massive food production to feed a burgeoning population, which allows little leeway in production choice.

“We, in essence, need to produce large amounts of food quickly, which has led us to the large systems of monocropping, and

pesticide and herbicide use we see today, as well as the huge industrialized domestic animal factories, where growth hormones and poor living conditions are rampant,” says Sobolik, chair of the University of Maine Anthropology Department and associate director of UMaine’s Climate Change Institute.

These industrial-scale processes have changed the landscape, changed the plants and animals, and, ultimately, changed us.

“I consider this to be one of the, if not the, most important turning points in human evolution,” says Sobolik, who has reconstructed prehistoric diets using the latest innovative technologies to collect data from human remains and human paleofeces. “With such a large population and with such a modified landscape, we can’t go back.”



Remains of the day

“Hard-tissue” faunal remains can include bone, feathers, hair, eggshell fragments, marine and freshwater shell fragments, insect exoskeletons, egg and pupal casings, and fish and reptile scales. The bones of many small animals, including birds, bats, rodents and reptiles were often consumed whole.



Botanical remains can include undigested materials (e.g. maize kernels) or indigestible remains (e.g. fruit pits), some of which can even show evidence of preparation techniques, such as grinding. Pollen and phytoliths (siliceous particles) can help identify some of the plant species consumed, and provide insight into plant domestication, management and persistent use.

In order to move forward — or at least toward a more sustainable future — we need to change the current dietary and nutritional system to decrease some of the very negative health aspects, but in a way that maintains or expands current production, Sobolik says. In essence, this means using fewer pollutants in and on our food, and increasing crop diversity, all while maintaining or increasing our level of food production. No easy task.

AFTER MORE THAN two decades in the field, the issues and questions surrounding human nutrition and evolution are even more compelling to Sobolik than when she started her research.

As an undergraduate biology student at the University of Iowa, she went on a summerlong archaeological excavation for



Mesquite (*Prosopis sp.*), a member of the bean family, was eaten by prehistoric peoples for thousands of years.

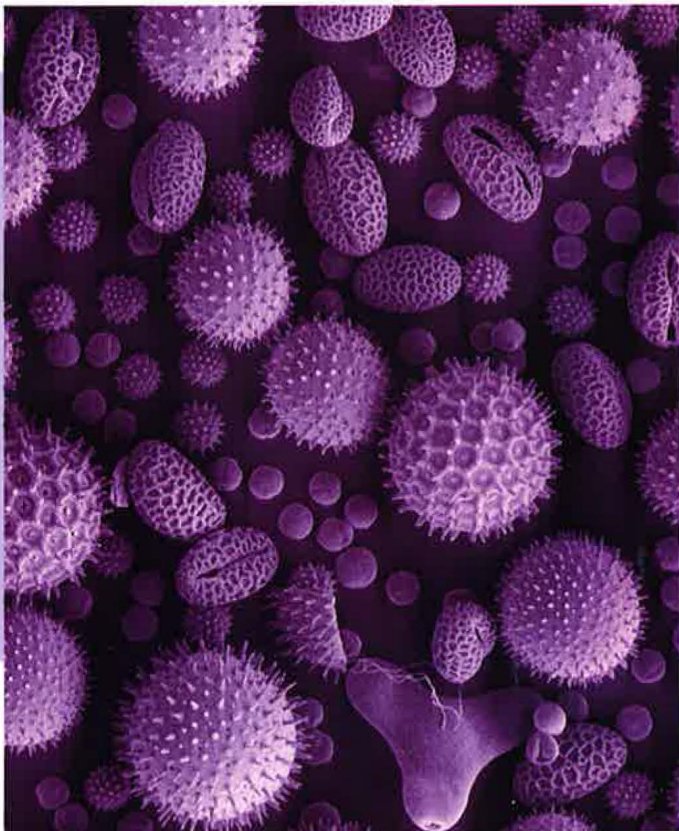
extra credit. She fell in love with the work and, ultimately, ended up shaping the field of archaeological biology, of which paleonutrition is a part. She went on to earn her master's and Ph.D. at Texas A&M, whose Anthropology Department is known for interdisciplinary study.

At UMaine, Sobolik joined the anthro-

pology faculty and UMaine's interdisciplinary team of climate change scientists who bring diverse perspectives from many academic backgrounds.

Paleonutrition is a small but significant component of climate change research, says Sobolik, who recently co-authored the most comprehensive book on paleonutrition since 1979 with Mark Sutton, professor emeritus of anthropology at California State University – Bakersfield, and Jill Gardner, principal investigator for ASM Affiliates.

“The development of agriculture was one of the biggest decisions we have made in changing how we interact with the planet,” she says. “Then there was the industrial revolution, and now we have



The edible landscape

University of Maine anthropologist Kristin Sobolik applies pollen analysis in her paleofecal research to better understand the types of plants ingested for dietary and medicinal purposes. For instance, from pollen analyses, it's now known that the flowers of squash, as well as its fruits and seeds, were eaten. Sobolik's analyses of the pollen and seeds in paleofeces found in Salts Cave and Mammoth Cave, Mammoth Cave National Park, Kentucky, revealed at least 17 plants consumed by prehistoric forager-farmers of eastern North America.

Pollen analysis
Photo courtesy of Kristin Sobolik

The very fiber of our being

Prehistoric burial flowers

MORE THAN 50,000 years ago, sometime between May and July, the body of a Neanderthal was buried in a cave in the Zagros Mountains in Iraq.

On that, most archaeologists agree.

It's the pollen found with the skeletal remains that has had scientists for nearly a quarter-century speculating as to whether Neanderthals had a sense of beauty and ritual that would lead them to bury their dead with flowers.

In 1999, it was University of Maine master's student Jeff Sommer, working with anthropologist Kristin Sobolik, who set the prehistoric record straight with the help of the latest technology.

Using data from the analyses of pollen and animal bone excavated from the burial, in conjunction with the field notes from Ralph and Rose Solecki, whose archaeological team excavated Shanidar Cave in the late 1950s, Sommer determined that the asters and other flowers most likely were brought there not by mourners, but by small rodents called Persian jirds.

Jirds like to store flower heads, seeds, sand burrs and other plant material in the side tunnels of its burrows, typically dug in soft substrate such as burial earth.

Sommer published his findings in the *Cambridge Archaeological Journal* in 1999. Today he is the curator of archaeology for the Historical Society of Saginaw County in Michigan.



“The development of agriculture was one of the biggest decisions we have made in changing how we interact with the planet.” Kristen Sobolik

the industrial revolution to the extreme.”

Today, technological advances in paleonutrition have given researchers better tools to relate the past to the present. For instance, the ability to analyze DNA in paleofeces provides a comprehensive look at everything humans ate — plants, animals, bacteria and viruses. It also allows researchers to be certain that biological samples came from humans and not some other creature.

“It's like a microcosm,” Sobolik says. “It's a perfect sample. The DNA of the human and everything else preserves much better in paleofeces than in bone.”

SOBOLIK'S RESEARCH focuses on the analysis of paleofeces, human skeletal material, and faunal and botanical remains from sites in the American Southwest and Maine. She has traded fieldwork for a bigger-picture view on archaeology, and she finds the advent of new technologies and methods exciting. They have raised fundamental questions and caused researchers to rethink some key findings.

“We're reanalyzing some of our big ideas that we thought were a done deal,” she says. “I think this is the development of a new future.”

That is, a future steeped in the past.

For instance, in 1959, when Louis and Mary Leakey discovered hominid fossils at Olduvai Gorge in Africa, they spent countless hours mapping where rocks and bones were clustered, and they came to

the conclusion that the remains they found were probably one of the earliest family units. Back then, taphonomy — the study of site formation processes and how they affect what, where and when things are preserved — wasn't a huge concern.

Sobolik's book underscores why taphonomy should be the first thing researchers consider before they start their fieldwork. Unlike Pompeii, where everything was entombed and preserved instantly in a thick coat of lava, most archaeological sites change over time due to a variety of factors.

In the case of Olduvai Gorge, researchers with a taphonomic viewpoint argue that the bones may not have been clustered together because they belonged to members of a family. The bones were found at the edge of Lake Turkana, and as the waters lapped the shore, they may have kept the remains together.

For anthropologists such as Sobolik, taphonomy and paleonutrition are intricately linked. If researchers don't know why biological remains are in a site, then they don't know whether there is relevant cultural context. That's why the potential for the latest DNA technology is so exciting.

“Everything has to be reanalyzed. There's so much to be done. We are learning with leaps and bounds what has happened with humans in the past,” Sobolik says. ■ [Online](#)

Out of the blue

The ice archive at Allan Hills could be the impetus for an 'international climate park'

By Margaret Nagle

THE SNOW-FREE LANDSCAPE of Allan Hills has been a scientific destination for decades. Explorers have made the hour-long plane ride from McMurdo Station, the primary base of U.S. operations in Antarctica, to look for evidence of prehistoric and extraterrestrial remains in the form of dinosaur bones and meteorites.

Paleoclimate scientist Andrei Kurbatov comes for some of the oldest ice on the planet. There are indications that it could be more than 2.5 million years old. And near the surface.

For Kurbatov, the blue ice here is gold.

"The maximum achievement is to find the oldest ice and demonstrate its suitability for reconstructing quality environmental records beyond what we currently get in ice core records," says Kurbatov, an assistant research professor with the University of Maine Climate Change Institute, who heads a four-year, \$460,000 National Science Foundation, Office of Polar Programs collaborative research project called 2MBIA to explore the ice archive at Allan Hills.

The Allan Hills Ice Field contains some of the most ancient ice on the planet.

Out of the blue

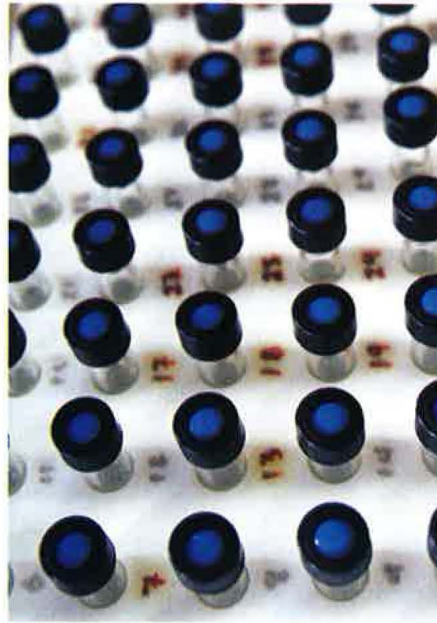


Last winter, during the first field season of the 2MBIA project at Allan Hills, University of Maine graduate students Nicole Spaulding, left, and Kristin Schild collected surface samples in the Blue Ice Area. The research expedition, led by Andrei Kurbatov, an assistant research professor with UMaine's Climate Change Institute, spent nearly seven weeks in Antarctica drilling shallow cores from 10 sites that will be used in dating the ice. At some locations, trenches were made to sample large volumes of ice from

the surface, a method Kurbatov hopes will one day be the most efficient means of retrieving the oldest ice. For Spaulding, it was her third trip to Antarctica. As a UMaine master's student, she studied the physical properties of ice cores using a scanning electron microscope. Now as a first-year Ph.D. student, her laboratory work in the Climate Change Institute involves measuring the isotopic content and chemistry of ice collected in the field, as well as processing GPS data from the Allan Hills ice flow.

Antarctica photos courtesy of Andrei Kurbatov





The old ice from Allan Hills has the potential to extend the deep ice core records, which now stand at 800,000 years.

“Our goal is to collect records not reachable by existing ice cores,” he says.

What’s particularly important at Allan Hills is that massive ice flow has been obstructed by subsurface terrain, pushing ice to the surface. Snow is swept away by wind or vaporized in a process called sublimation. What’s revealed is old blue ice that came from miles away.

The fact that such old ice layers are accessible on and near the surface means that trenching and surface sampling rather than coring techniques could be used. Like ice taken in cores from around the globe by UMaine Climate Change Director Paul Mayewski, a co-investigator on the 2MBIA project, the Allan Hills samples will be analyzed for ice chemistry, particles and stable isotopes of water to reconstruct details of past climate change.

A unique part of the analysis is the dating of the old air trapped in the ice. Princeton University geoscientist Michael

Bender, also a 2MBIA investigator, has developed new methods for dating such trapped gas bubbles in old glacial ice using argon isotopes.

Collaborators on the project are Kuni Nishiizumi from the University of California – Berkeley, who will help date meteorite fragments found in the area to correlate with the ages of the ice, and Vandy Spikes from the Earth Science Agency, a consulting group in Nevada.

Spikes was one of the first to speculate that the Allan Hills Ice Field yielded ancient ice at its surface. He was introduced to the Allan Hills Blue Ice Area when he was a student at Ohio State, and revisited it as a UMaine graduate student researcher.

He confirmed that the ice flow in the Allan Hills area is very slow and correlated the ages of meteorites with the age of the ice.

For years, scientists have collected

pieces of meteorites from this area, where the extraterrestrial materials get buried on impact but are later exposed, unlike other places on Earth. Some meteorite fragments are as much as 2.8 million years old, giving scientists like Kurbatov hope that the ice has a similar vintage.

Last November and December, Kurbatov’s research team completed its first field season at Allan Hills, taking ice samples from a 3-mile by 6-mile area on the single, massive flow. A second field season will be this November through January.

The old ice has the potential to extend the deep ice core records, which now stand at 800,000 years. The project’s long-term goal is to establish an “international climate park” at Allan Hills, where scientists from around the globe can sample large quantities of ice of known ages.

“This has implications for climate research, expanding our understanding of global cycles,” says Kurbatov. ■

Flannel attraction

An upstart zine about Maine finds a following



The cover of the first issue of *Flannel* featured a black-and-white photograph of a man's forearms tattooed with an outline of the state of Maine. It was gritty in a hipster kind of way, and the fact that the 54 copies of the first edition were printed on a photocopier, cut by hand and bound with a piece of red twine made it even more so.

THE STORY OF *FLANNEL* begins in the way these stories always do: in the basement of some dude's apartment in a college town.

Two years ago, it debuted as a zine featuring photography, artwork and creative writing. The cover featured a black-and-white photograph of a man's forearms tattooed with an outline of the state of Maine. It was gritty in a hipster kind of way, and the fact that the 54 copies of the first edition were printed on a photocopier, cut by hand and bound with a piece of red twine made it even more so.

"The craftiness was by necessity," says *Flannel* co-founder Travis Bourassa from Waterville, Maine, who graduated from the University of Maine in 2009 with a degree in broadcast journalism.

Bourassa and new media major Sean Collinson from Albion, Maine, who graduated in May 2010, had tried a zine before, but they found that all of the contributors wanted to review things. This time around, they wanted contributors to *make* things. Like art. And poetry.

Collinson and Bourassa wanted the publication to celebrate the Maine they know and love, which is more the stuff of cigarettes and shotguns than lighthouses and lobster boats.

"We're both from Maine, we both like Maine, so we decided to make something based around that," says Bourassa. "We have had a difficult time describing the tone of our publication. We hope the name says enough. The name *Flannel* just reeks of Maine — outdoors, cold weather and hard-working people."

To give their process a little structure, Collinson enrolled in a graphic design class, where the assignment was to make a book. With Bourassa's help, he did. The initial print run? Four copies — one for each of them and the issue's other two contributors, Jessica Harvey, a University of Southern Maine student who is the third member of the *Flannel* team, and James Grindle, a graduate of the New England School of Communications.

"It hadn't even occurred to us to make a mass edition," Collinson says.

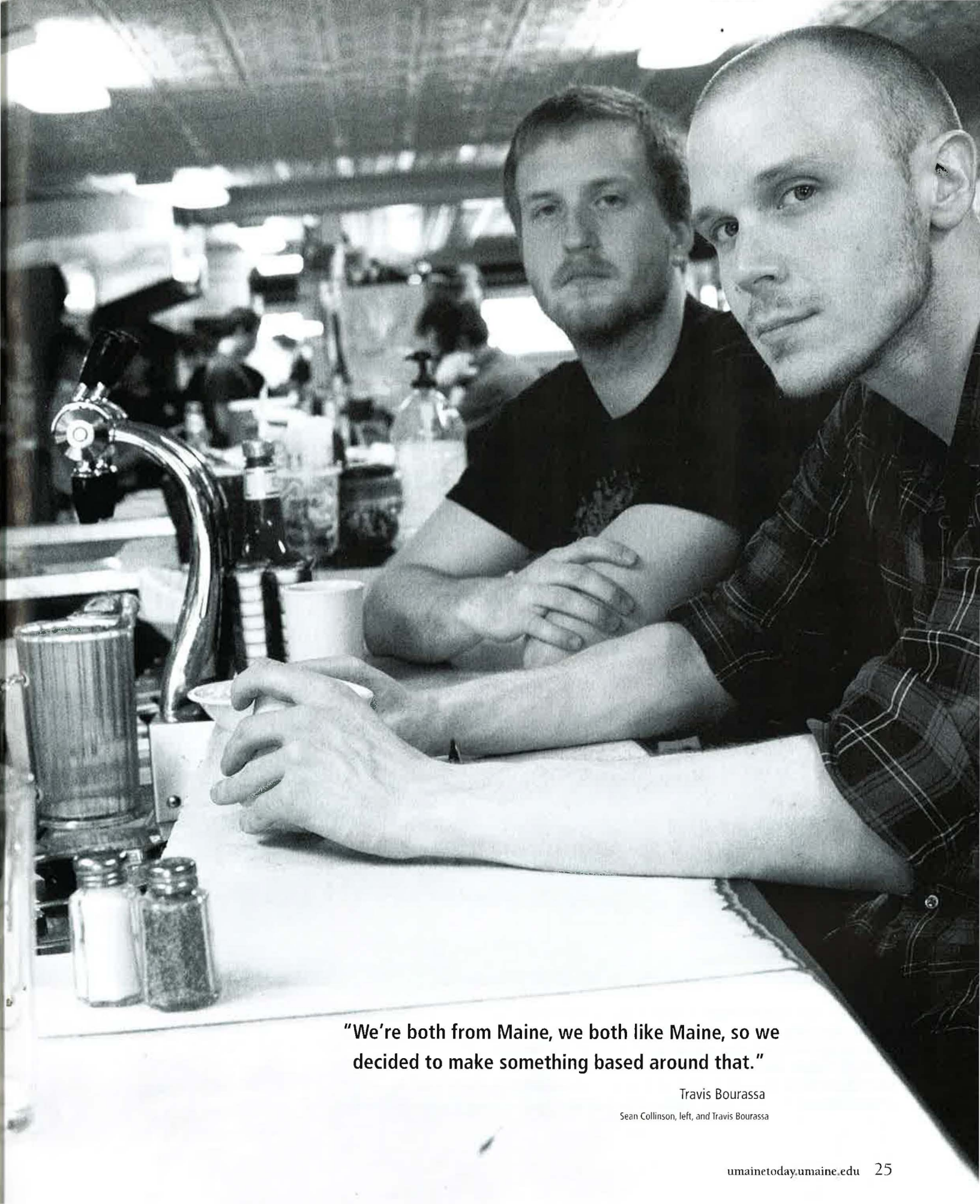
But four wasn't nearly enough. As soon as people saw it, *Flannel* amassed a cult-like following. For that first issue of *Flannel*, Collinson and Bourassa ran an extra 50 copies. They upped the next issue's run to 100. Then 150.

They started a Facebook page and soon had 1,000 fans — and they only knew 100 of them. Queries from would-be contributors started pouring in from around the state.

The next issue, their fifth, is expected in November.

Now that *Flannel* has taken off, photocopying, and page trimming and binding by hand don't cut it anymore. The spring 2010 issue is more of a book — softbound, professionally printed, slick. And Collinson and Bourassa have started marketing it, based on advice from UMaine's Foster Center for Student Innovation.

This past spring, issues of *Flannel* sold for \$5 a copy in several retail locations in the state. And Bourassa and Collinson are moving their base of operations to Portland, Maine.



"We're both from Maine, we both like Maine, so we decided to make something based around that."

Travis Bourassa

Sean Collinson, left, and Travis Bourassa



According to Tom Doak, executive director of the Small Woodland Owners Association of Maine, 45 percent of private land in the state is owned by people 65 and older, and he expects to see a lot of turnover in the next several years — including purchases by people who live in other states. That is expected to affect land access, exacerbating the conflicts between landowners and outdoor recreationists.



Whose woods?

By Kristen Andresen

Research is bridging differences between Maine forest landowners and outdoor recreationists

A FATHER AND SON are enjoying a leisurely ride on their ATV through the woods near their home in a southern Maine suburb.

They know these trails like they know their backyard because they ride them almost every weekend. Have been for years. But this weekend, something is different. In the distance, a sign catches their attention: No Trespassing.

Miles away in a northern township, a couple sets out for a walk on their land. The nearly 200 acres have been in the family for four generations, and hunters and snowmobilers have always been allowed. This day, in a clearing a quarter-mile from the nearest road, the owners are greeted with a pile of household debris: a refrigerator, a television, bags of trash. They know the mess likely came from a few locals who didn't want to pay dump fees, but this is the third time this has happened and they are fed up. They gate the access road and post the land.

Stories like these are becoming all too common in Maine, a place where private landowners have traditionally — and unconditionally — allowed access to recreational users. Some 94 percent of the state's land is privately owned, and there's an entire tourism-based economy built on the assumption land access will continue.

But recreation has become more motorized and property that has been in families for centuries is beginning to change hands. As a result, the state is at a crossroads — one that is rife with the potential for conflict.

That's where Jessica Leahy comes in. Leahy is trying to bridge the differences between landowners and recreational land users as part of her work with the University of Maine's new Family Forest Research Unit in the Center for Research on Sustainable Forests, and UMaine's Sustainability Solutions Initiative — a research-to-action program to help Maine meet environmental, economic and "quality of place" issues.

Whose woods?

“There can be a lot of head-butting between landowners and recreational users,” says Leahy, an assistant professor of human dimensions of natural resources in the School of Forest Resources, who specializes in research related to recreational access to private forestlands. “The university, through scientific research, can help understand the issues on both sides and find policies that might help landowners benefit in some way and let recreators recreate.”

IN MAINE, there are more than 120,000 family forest landowners — those who own parcels between 10 acres and 1,000 acres that are at least partially wooded. About 90 percent of them don’t realize they own forestland, according to Leahy. Instead, they simply think of themselves as landowners. But while they may not be harvesting timber off their land, they do have an important role to play in Maine’s forest landscape.

“Combined, they create a great diversity of wildlife habitat,” Leahy says. “They help maintain water quality and they do a lot for tourism.”

But doing a lot for tourism can come with a price. By opening their land to such activities as hunting, fishing, hiking, bird-watching or swimming, landowners may open themselves up to a variety of undesirable situations. According to a survey conducted by graduate student Gretchen Heldmann, whom Leahy advises, some of the top complaints among landowners include litter dumping, tree damage and illegal cutting, vandalism, illegal construction, fires, loss of privacy, loss of personal safety, violation of state game laws,

damage to buildings and equipment, and recreational users ignoring signs.

“Landowners aren’t getting any compensation,” Leahy says. “They’re doing it because it’s cultural, it’s tradition in Maine, but there can be burdens.”



Jessica Leahy

“There can be a lot of head-butting between landowners and recreational users. Through scientific research, the university can help understand the issues on both sides.” Jessica Leahy

LEAHY HAS RECEIVED support from the Northeastern States Research Cooperative, UMaine’s Center for Tourism Research and Outreach, and the Environmental Funders Network to identify problems and research ways to ease those burdens. She and graduate student Martha Willand have spent months working with

the Small Woodland Owners Association of Maine (SWOAM), the Maine Forest Service, the Department of Inland Fisheries and Wildlife, recreational user groups such as ATV Maine and the Sportsman’s Alliance of Maine, and other partners. Next year, their pilot project will put the research into action.

“We’re trying to find an incentive program or policy to get landowners to increase the amount of land available for recreation. It could be monetary or it could include other benefits,” Leahy says.

If illegal dumping turns out to be the biggest issue, the solution may be to allow landowners to dispose of items without having to pay for their removal — an arrangement that many transfer stations and landowners have already informally established. Though landowners would love to be paid for opening their property to recreational use, none of Maine’s outdoor agencies has the budget to do so, Leahy says. But the grant-funded pilot program could include a mitigation fund to help landowners deal with dumping, vandalism or environmental degradation.

Another solution could be as simple as creating an alternative to traditional “No Trespassing” signs, which often aren’t specific enough to state a landowner’s true preferences. For a hunting family, it may be that they want exclusive access to their land during the first part of the deer season, but they don’t mind if someone hunts there later on. Some landowners may be OK with snowmobiles but not ATVs; others may be fine with bow hunting but not guns. The problem is, it’s difficult to convey that with current signage, so they may just post the land.

IN SOME INSTANCES, making the effort to talk to a landowner whose land is posted could go a long way. But while an “ask-first” ethic is standard in many states, it goes against Maine tradition. But as ownership changes, promoting an ask-first ethic might be necessary to avoid conflict.

According to SWOAM Executive Director Tom Doak, 45 percent of private land in Maine is owned by people 65 and older, and he expects to see a lot of turnover in the next several years — including purchases by people who live in other states.

“The new landowner has a very different view of land access than the traditional owner, and we need to be prepared for that,” Doak says.

Part of that preparation will be addressed in Leahy’s pilot program, but she’s also researching the gaps between public policy and the preferences of landowners and recreational users.

“There are a lot of anecdotal solutions out there, but it hasn’t worked very well that way,” Doak says. “In order to see what would work in terms of policy, let’s find some evidence to show what landowners want. Let’s back it up. We’re already finding interesting disconnects between what Jessica’s finding and what the people who are running (state) programs say landowners need.”

ONE OF THE BIGGEST misconceptions that has emerged from their research is that out-of-state landowners are more likely to post their land. In fact, just the opposite is true.

“People from away don’t always come up here in the fall, so they don’t see the hunters on their land,” Leahy says. “There’s this idea that we’ve got new landowners coming in and buying off the land and shutting down access, but that’s not the case. It’s the Mainers.”

Another misconception is that ATV riders cause more damage than other recreational users. Leahy found that littering, tree damage and gate damage topped the list of complaints.

“Despite everyone wanting to blame ATV riders, it was hunter behavior that was more severe,” Leahy says.

She attributes part of this to a shift in ATV laws in 2004–05 that increased penalties. But one rule-breaker who causes a landowner to shut down access to his or her land can ruin it for a whole group of rule-followers — especially when Maine’s extensive network of ATV trails is heavily dependent on the cooperation of private landowners.

To address that divide, Leahy and graduate student Marilynne Mann conducted extensive research with ATV riders. Many talked about riding as a family activity that was accessible to everyone, despite age or physical ability. Some saw it as a way to get-out into nature in a way they normally wouldn’t.

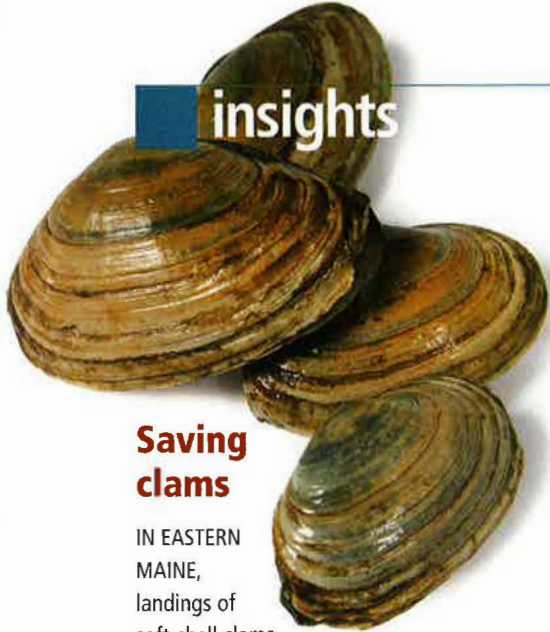
“We didn’t see it as a family cohesion kind of thing,” Leahy says. “And certain ATV clubs don’t frame what they do as a family activity, but communities and landowners may be more supportive if they understand that aspect.”

A greater understanding by stakeholders is what Leahy’s work is all about. According to Doak and others, research like this that goes beyond traditional forest resource work and gets to the relationships and traditions behind the issues is more important than ever.

“This is a great role for the university because we’re doing conflict resolution as part of the research,” Leahy says. ■



As part of the research, graduate students, left to right, Martha Willand, Gretchen Heldmann and Marilynne Mann survey the many stakeholders weighing in on the debate about recreational access to private forestlands in Maine.



Saving clams

IN EASTERN MAINE, landings of soft-shell clams

have been in steady decline for nearly three decades. Despite the \$12.25 million clam harvest in Maine in 2007, the fishery is but a shadow of its former self when compared to highs in the past century.

Particularly hard-hit is Washington County, once the state's largest source of clams. In contrast, landings have been relatively constant in southern Maine during the same period.

Restoration efforts hinge on just where the problem lies — in *Mya arenaria's* larval stage in the water or in the juvenile stage on the mudflats.

To begin to answer the question, University of Maine researchers have attempted to fathom Maine's regional differences in clam landings. Their most recent findings, published in the *Journal of Shellfish Research*, point primarily to reduced densities of larvae in near-shore waters in eastern Maine.

Small clam populations in eastern Maine appear to be unable to sufficiently repopulate local clam flats, the researchers write. Reestablishing a robust clam fishery and enhancing local breeding stocks will require intensive seeding of the flats with hatchery-raised juvenile clams, according to Tracy Vassiliev and Stephen Fegley, who conducted their research at UMaine and Maine Maritime Academy, respectively, and William Congleton, UMaine associate professor of animal and veterinary sciences.

Polling politics

PUBLIC OPINION POLLING has transformed 20th-century America's political institutions and democratic culture, creating a national market for political ideas and providing the infrastructure for measuring and mobilizing national sentiment, according to two political scientists who studied seven decades of polling history.

From the presidency of Franklin Roosevelt to the end of the 20th century, the increased

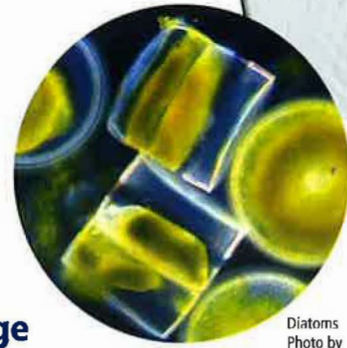


Despite proclamations about the lack of importance of polls, contemporary politicians in both branches employ them to forward their policy agendas, shape their public images, undermine opponents and sell their preferred alternatives.

Amy Fried and Douglas Harris



legitimacy of polling made public opinion itself more "real" and legitimate, write Amy Fried of the University of Maine and Douglas Harris of Loyola University Maryland in the journal *The Historian*. Over time, the uses and successes of polling were applied to such an extent that both the White House and Congress used them beyond the election season and, thus, saw campaigning as "permanent."



Diatoms
Photo by
David Townsend

Sea change

THE GULF OF MAINE waters are cooler, fresher and lower in nitrate than they were 30 years ago, causing a nutrient shift that has potential implications for the structure of the planktonic ecosystem, according to oceanographers at the University of Maine.

Based on recent oceanographic observations, coupled with a 50-year analysis of nutrients and hydrography, the UMaine research team hypothesizes that accelerated melting in the Arctic and freshening of the Labrador Sea have likely caused the Labrador Current to bring colder, fresher deep shelf waters into the gulf.

Until now, it was generally thought that the gulf's high biological productivity was fed by an influx of nutrient-rich deep slope water through the Northeast Channel between Georges Bank and Nova Scotia. The warm offshore slope water is higher in nitrate than silicate, helping determine the species composition of phytoplankton.

The UMaine data analysis, lead by oceanographer David Townsend, showed that from the 1960s to the 1970s, the deep waters of the eastern Gulf of Maine were saltier and warmer as a result of the slope water. But since the 1970s, the gulf's deep waters have become significantly fresher and cooler, and had lower nitrate and higher silicate concentrations.

The resulting altered nutrient regime may change the abundance of diatoms and dinoflagellates in the gulf, including the red tide dinoflagellate *Alexandrium fundyense* that grows best in high nitrate conditions, according to the researchers, writing in the journal *Continental Shelf Research*.



Safe return

IN ITS FIRST two years of operation, the first-in-the-nation pharmaceutical mailback program Safe Medicine Disposal for ME, administered by the University of Maine Center on Aging, collected and safely disposed of more than 2,373 pounds of unused, unneeded or expired drugs with an estimated wholesale value of \$573,000.

83% of the medications would have been discarded in an environmentally unfriendly manner — either flushed or trashed — if not for the mailback program.



THE UNIVERSITY OF MAINE and Cerealus Holdings LLC, a Waterville-based product development and technology commercialization company, have patented an innovation that can provide a sustainable, biodegradable alternative to fluorocarbon food packaging materials. The product, called Holdout, uses a corn protein to create a

A better package

thermoplastic biopolymer coating for oil and grease resistance. Michael Bilodeau, director of UMaine's Process Development Center, says paper companies, packaging converters and food companies have been looking for alternatives to fluorocarbon and synthetic compounds for some time. With the patent approval, they now have access to a renewable, nontoxic barrier coating that can be used in a wide array of applications.

A forest stand

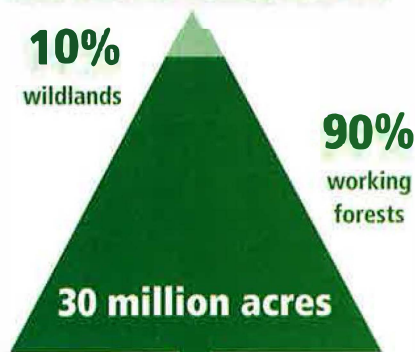
THE SIX-STATE New England region has more than 33 million acres of forestland — a greater wooded cover than has existed in the region in almost two centuries. But recent years have witnessed a reversal of this trend in all the states with a new wave of "hard deforestation" — the conversion of forests to development and other uses.

In a new report, researchers from Harvard University, the University of Maine and 10 other institutions call for a long-term effort to ensure that New England remains at least 70 percent forested (30 million acres).

The report, *Wildlands and Woodlands: A Vision for the New England Landscape* (wildlandsandwoodlands.org), calls for 90 percent of protected forest (27 million acres or 63 percent of New England) to be development-free, but continue to be managed as "working forestlands" that provide forest products, recreational opportunities, and a host of important natural functions, such as flood control, species habitat and carbon sequestration. The remaining 10 percent of protected forests would be reserved as "wildlands" (3 million acres or 7 percent of New England) where natural processes prevail.

Achieving the vision would require a doubling of conservation efforts in the next 50 years, but still leave room for a doubling of the region's developed area.

The report's lead author is David Foster, director of Harvard Forest at Harvard University. The other 19 co-authors include UMaine professors Robert Liliholm of the School of Forest Resources and Malcolm Hunter of the Wildlife Ecology Department.



Healthy compassion

THE DALAI LAMA holds that compassion — concern for the well-being of others — leads to happiness. Now a new study has found that compassion may also have health benefits in the form of stress reduction for women.

The study involving 59 women found that those who demonstrated high levels of compassion for others were more receptive to social support, enabling them to better handle acute psychological stress and maintain overall well-being, according to psychologists at the University of Maine, University of California – Berkeley and University of California – San Francisco.

The higher the women's compassion, the lower their blood pressure and cortisol levels, and the higher their beneficial heart rate variability when an emotionally stressful task was buffered by social support — smiling, nodding and encouraging words — offered by another person. When the same stressor was not buffered by social support, women experienced significant increases in blood pressure and cortisol, regardless of their individual levels of compassion.

The research demonstrates that concern for the well-being of others does, indeed, benefit the self. By increasing the effectiveness of social support, compassion served a stress reduction function for women in the study.

The research findings by graduate student Brandon Cosley and psychologist Shannon McCoy at UMaine; Laura Saslow at UC–Berkeley; and Elissa Epel at UC–San Francisco were published in the *Journal of Experimental Social Psychology*.





School fitness

SUMMER IS TRADITIONALLY considered the time when children are most physically active, but a recent study by University of Maine physical education researchers and collaborating public school physical education teachers found that fitness can decrease when youngsters are not in school.

Stephen Butterfield, Robert Lehnhard and Craig Mason of UMaine's College of Education and Human Development tested the aerobic performance of 826 students in grades 4–8 on the PACER (Progressive Aerobic Cardiovascular Endurance Run) fitness measurement program, in which students run laps at increasing levels of intensity.

"We initially anticipated better performance in the summer because of greater physical activity levels," says Butterfield. "But in our literature review, we found a study done in Greece that found better aerobic performance during the school year than in the summer when kids are supposed to be more active."

Indeed, in the Maine school year testing, students improved their aerobic performance, which is important for cardiovascular health. Butterfield says the results are a tribute to schools' efforts to encourage physical fitness, especially after-school sports.



Science-based stock management

MANAGING THE GULF of Maine's \$300 million lobster industry has been a practice mostly reliant on the physical size of adult stocks, making policymaking largely reactive, with little environmental input.

Now a research team from the University of Maine School of Marine Sciences is developing a more science-based stock assessment model that can ingest information on lucrative lobster settlement areas and years, based on current patterns and density of drifting lobster larvae.

The oceanographers have added real-time sea surface temperatures, detected by satellites, to the settlement assessment process. The data is important to better calculate "recruitment" populations of adult lobsters big enough to catch, keep and sell.

With a two-year, \$430,000 grant from NASA, a research team led by researcher Andrew Thomas, associate director of the

School of Marine Sciences, says the new lobster stock assessment model will allow fisheries managers to include varying ocean environmental information in their forecasting. The result is much greater

accuracy in determining which years and locations will likely be good or bad for lobstering.

Water temperatures not only help drive the circulation model, but affect larval growth rate, which

influences where lobsters settle, Thomas says. Knowing the annual density of larval drift, currents, winds and water temperature enables researchers to create a model on which to base, for the first time, maps showing predictable lobster settlement locations.

Expanding the environmental factors in the forecasting model also allows scientists to include climate change variations in lobster settlement predictions. That's important in helping the Atlantic States Marine Fisheries Commission set management policies based on more realistic expectations.



The new lobster stock assessment model logs such environmental factors as abnormally cold or stormy years.

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It looks as though the schools are doing a good job. In the summer, children may be physically active, but not necessarily aerobically active.

Stephen Butterfield

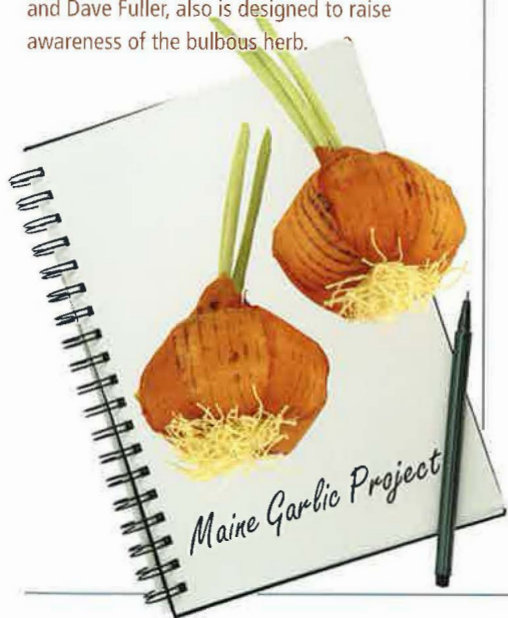
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Growing garlic

GARLIC IS a popular home garden crop in Maine, but little research-based information is available about optimal planting and harvest times. That's why University of Maine Cooperative Extension launched a participatory research initiative called the Maine Garlic Project.

For \$5, growers receive a garlic bulb, a data collection form and a discount on a soil sample test. Data ranging from planting, mulching and harvest dates to bulb size, appearance and flavor will be compiled.

The Maine Garlic Project, led by Extension staff members Steve Johnson and Dave Fuller, also is designed to raise awareness of the bulbous herb.



CONTRARY TO popular perception, forest biomass is not waste. In today's growing bioenergy industry, forest biomass is better described as "energy wood."

Usually energy wood includes the tops, limbs and stems of poor form or size removed during harvest. But if market conditions are right, a growing energy wood market could result in increased processing of standing dead trees or "snags," small-diameter stems and short-rotation stands, both natural and plantation — forest growth that provides food and shelter for wildlife, and helps reduce soil compaction and erosion.

With the increased demand on Northeastern forests to meet bioenergy needs, researchers in the University of Maine School of Forest Resources recommend developing guidelines to minimize environmental impact on soil productivity, water quality and forest biodiversity. Best management practices should focus on post-harvest conditions to mitigate environmental concerns at both the landscape and site levels, according to faculty researchers Jeffrey Benjamin and Robert Lilieholm, and graduate student Charles Coup, writing in the *Northern Journal of Applied Forestry*.

Energy wood harvests

Prehistoric temple mound

AN ELLIPTICAL LAND FORMATION in the northern Peruvian coastal desert long thought to be naturally formed of bedrock or sand may be one of the earliest monuments made by humans in prehistoric South America.

The discovery at Los Morteros was made by University of Maine anthropologists and geologists using ground-penetrating radar and high-resolution contour mapping to assess the mound's interior structure.

According to UMaine archaeologist Dan Sandweiss, who led the research team, temple mounds may have been used for rites to influence supernatural powers, as demonstrations of the organizational ability and power of early politicians, and/or as speaking platforms for those individuals to reach large crowds.

The ancient Peruvian structure was likely symmetrical and possibly rectangular, emulating other early mounds of the Late PreCeramic and Initial Periods on the arid coast. These monument mounds often were multiple construction sites, where expansion encased existing structures.

Coastal Peru, considered one of the six original centers of world civilization, is dotted with temple mounds, the earliest of which was estimated to be 5,500 years old. The earliest construction on the Los Morteros monument may be substantially older, according to the UMaine researchers, writing in the journal *Quaternary Research*.



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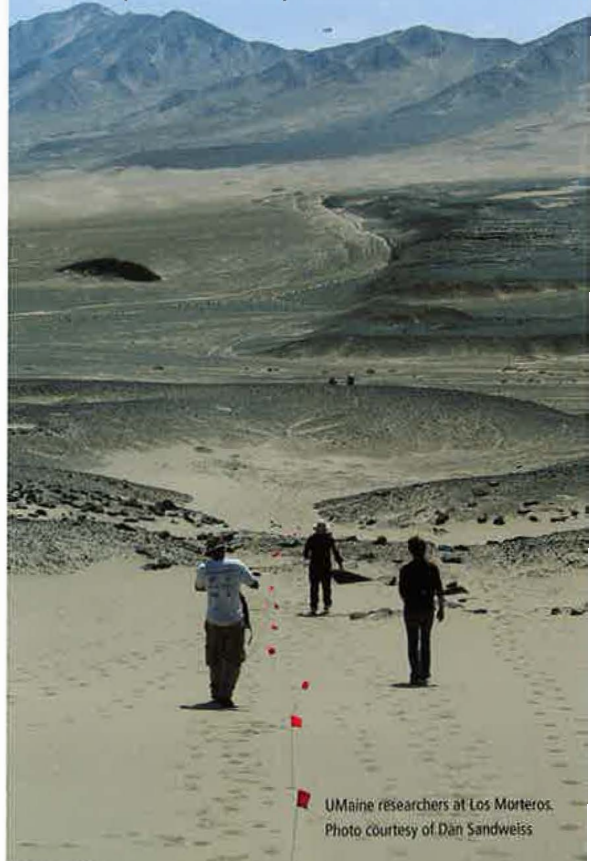
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UMaine researchers at Los Morteros.
Photo courtesy of Dan Sandweiss

Life lessons

AT THE UNIVERSITY OF MAINE, Chanrasme Neang discovered a way to let her history shape her future.

Neang grew up in Sanford, Maine, after her parents emigrated from Cambodia. Her mother was raised in a Khmer Rouge work camp, where the health conditions were substandard at best. When she arrived in the United States, it was challenging to adapt to a new lifestyle.

Neang wanted to find a way to make healthcare accessible so that no one would have to deal with the transition her mother had to make. Through her classes, volunteer work and research experience at UMaine, she found her calling: public health.

She graduated in May with a degree in biology and is headed to graduate school.

“That is the best way to improve the quality of someone’s life,” says Neang, who worked in the lab of UMaine mycologist Jody Jellison throughout her four years on campus. “I mainly want to help those who don’t have adequate healthcare get access.”

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