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Saving Maine's Basket Trees from an Invasive Insect



SSi researcher Darren Ranco meets with partners Ann Gibbs and Butch Jacobs to discuss the EAB threat.

For centuries, Wabanaki artisans have woven exquisite baskets from brown ash, which they call *wipiti*, or “basket trees.” Now, however, this ancient art form and the basketmakers’ livelihoods are at risk. An invasive beetle called the emerald ash borer has already killed tens of millions of ash trees in the Midwest and Canada, and it’s heading toward Maine.

The emerald ash borer (EAB) has spread to 15 states and two Canadian provinces since it was first detected in Michigan in 2002. Believed to have arrived on shipping pallets from China, it is now spread mainly by people transporting firewood and has been reported as far east as New York State and Quebec. In 2011, U.S. Forest Service entomologist Nathan Siegert told *The New York Times*, “Right now, the emerald ash borer is the most destructive insect we have in North America.”

Wabanaki basketmakers in Maine have watched and worried for years. “We were really afraid when the weavers from the Great Lakes started telling us about the emerald ash borer and what it’s doing to the ash trees in Michigan,” says Jennifer Neptune, a member of the Maine Indian Basketmakers Alliance. “If and when it comes here, it will be devastating if it kills all our trees. That will be another tradition that will just be lost.”

Maine’s basket trees, however, stand a decent chance. SSI researchers are teaming up with Wabanaki basketmakers like Neptune, along with tribes and state and federal agencies, to fight the destructive beetle. Launched in 2009 by Darren Ranco, associate professor of anthropology and Chair of Native American Programs at UMaine, this is the first project in the U.S. to work with tribes from the beginning to develop proactive policies and strategies to fight an EAB invasion.

Ranco’s team is helping state and tribal agencies develop emergency response plans, which outline steps for addressing a borer invasion, from monitoring and control to communication and quarantines. The researchers have developed guidelines based on an analysis of EAB emergency response plans in nine other states by SSI graduate student Erin Quigley. They are now sharing lessons learned with their partners, and helping them put best practices into action.

The SSI team’s analysis revealed an important oversight: none of the emergency response plans in other states addressed how an EAB invasion would affect tribes, or how to involve tribes in a response. Yet policies aimed at fighting the borer also would have an impact on tribes, particularly basketmakers and harvesters, says Ranco.

“Emergency response planning sometimes has a very top-down approach,” Ranco says. “We want to make sure that the planning in Maine allows for input from the bottom-up and that the basketmakers’ needs and interests are served and communicated along the chain of command.” (cont. pg 4)

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Dear Readers, SSI is making real progress in helping Maine communities tackle pressing challenges at the intersection of economic, social and environmental issues. This became especially clear to me at a National Academy of Sciences symposium in Washington, D.C., this spring, where I was invited to speak in a session showcasing four exemplary programs advancing sustainability science in the U.S. and abroad.

The meeting's central theme was the need to move from abstract talk about sustainability to a concrete focus on ways that science can help solve pressing societal problems. In other words, how do we link knowledge with action in ways that will make a real difference in the world?

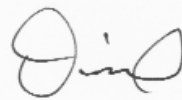
That's exactly where SSI's efforts are focused, and as I shared stories about the innovative work our research teams are doing, I realized just how far we've come. The pages that follow highlight a few milestones on the road to solutions. You'll see how one SSI research team is working with two Maine towns on innovative new ways to balance economic development and conservation on private land. Another team is helping Maine's coastal communities be better prepared for severe storms. A third team featured in this issue has forged the first partnership in the nation to proactively work with tribal communities to fight an invasive insect that threatens the trees at the center of their culture, art, and livelihoods.

These are just three of the dozen-plus SSI teams working with communities around the state on challenges ranging from developing alternative energy to creating improved planning tools for urban regions. As different as these projects are, they are all manifestations of what it means to roll up your sleeves and work with stakeholders

every step of the way to help solve problems in the real world.

When I returned from Washington, my SSI colleagues asked me how people at the National Academy symposium responded to the work we're doing. I came away with the strong sense that our work is viewed as a trail-blazing effort to show how universities can make a bigger difference in the world. A number of scientists at the symposium even told me that SSI's work was "inspiring."

These comments puzzled me at first, because "inspiring" isn't a word scientists use very often. But I realized they meant that SSI is helping motivate them to make their science matter. So if we can use our science to help solve challenging problems in Maine while inspiring others to do the same, that's a really good sign that we're on the right track. 🌱



David Hart,
Research Leader, Maine's Sustainability Solutions Initiative
and Director, Senator George J. Mitchell Center



SSI Highlights

🌱 Research by the **Ecological & Social Change: Adaptation, Place and Evaluation team** influenced LD 1613, "An Act to Strengthen the Relationship between Landowners and Land Users." The team documented problems between landowners and land users and then evaluated policy tools to find innovative solutions to manage these conflicts and recognize and support the role of private landowners in providing recreational opportunities, wildlife habitat, and other services. The team shared research findings with stakeholders at a public meeting attended by 77 people, including seven legislators. As a result, the bill passed, providing strategic direction and funding mechanisms that benefit both landowners and land users in Maine.

🌱 The **Sustainable Urban Regions Project (SURP)**, led by Charles Colgan, professor of public policy at the Muskie School of Public Service, University of Southern Maine, is developing computer simulation models to examine the interaction of eco-



nom, social and ecological systems in Portland and Bangor to help regional stakeholders better understand the choices they face in seeking a more sustainable future.

SURP faculty member Jack Kartez is coordinating this work with another large sustainability project, a 3-year, \$1.6 million grant to the Portland region from the U.S. Dept. of Housing & Urban Development for development of the first region-wide sustainable communities plan for York and Cumberland counties. SSI's SURP group helped design the project and is contributing technology through extending its new data commons tools to this **SustainSouthernMaine (SSM)** partnership.

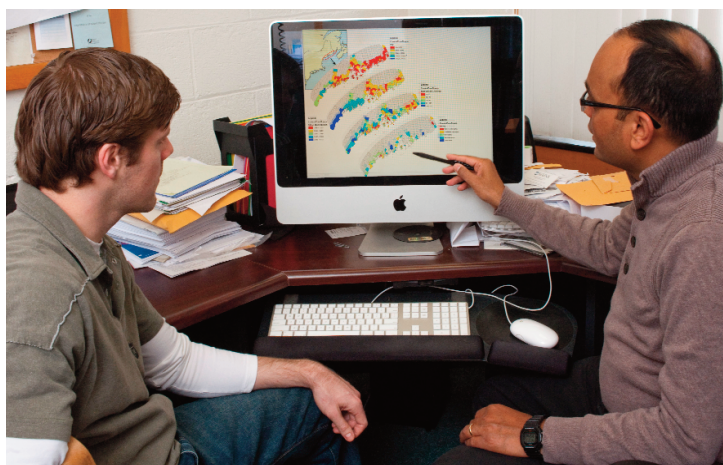
🌱 Students at the University of Maine Fort Kent have produced a new documentary, *Burning Green: In Search of Affordable Heat*, through an SSI project led by Soraya Cardenas, assistant professor of sociology. This documentary, which explores biomass and home heating, is part of the SSI project **Biomass Energy Resources in the St. John Valley, Aroostook County, Maine.**



Helping Coastal Communities Weather the Storms

Like indoor plumbing, culverts are easy to take for granted until they fail. That's likely to happen more often as more intense and frequent storms drench New England. Excess storm water runoff can quickly overwhelm aging and undersized culverts. The result: washed out roads, flooded down towns, and other damage that claims lives, disrupts businesses and costs millions of dollars to repair.

For instance, the Patriot's Day Storm of 2007 caused an estimated \$45 million in damage to roads and other infrastructure. More recently, a thunderstorm that dumped eight inches of rain in western Maine this summer caused one death and more than \$4 million in damage in the town of Brownville alone.



Graduate student Alexander Gray and SSI researcher Shaleen Jain review a map incorporating survey results from a questionnaire sent to municipal officials in Maine's coastal towns and communities.

Maine's coastal communities are particularly vulnerable to wetter and wilder weather, and that has people like Lincolnville Town Administrator David Kinney anxiously trying to figure out how to prepare. "We can respond relatively quickly in a crisis if we can obtain the materials," Kinney says of repairing failed culverts. "But we'd prefer not to act in a crisis mode and do some planning instead."

SSI researchers Shaleen Jain, Esperanza Stancioff and graduate student Alexander Gray have teamed up to help Lincolnville and other coastal communities better understand and prepare for the potential local impacts of climate change. They are developing new tools to help town officials plan, prioritize and better budget for storm water control methods like culvert work in order to prevent or minimize damage from future storms—potentially saving lives and millions of dollars.

"Our goal is to help towns make the best decisions with the best available information in the face of uncertainty," says Jain, UMaine assistant professor of civil and environmental engineering.

When the SSI team asked Kinney and officials in 70 other Maine coastal communities what they most needed help with in adapting

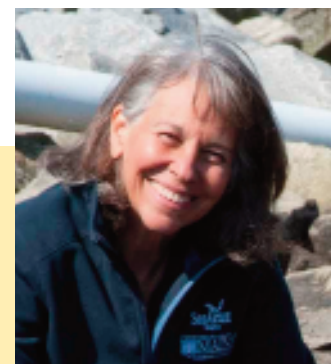
to climate change, planning and managing culvert work was at the top of their list. The information to do so, however, has been tough to track down at best and nonexistent at worst.

Culvert work, for instance, is regulated by various local, state and federal agencies, which often operate on different timetables. At the same time, current climate science and models are often too vague to be useful to local decision-makers and little place-based information exists. Add to this the sheer number of culverts in Maine—more than 100,000 under public roads—and it's clear that even officials like Kinney who want to be proactive lack the tools.

That's what the SSI team aims to change. They are creating new computer tools that combine data on everything from culvert governance to climate, land use and landscape information to help towns to plan and prioritize culvert work in the face of climate change. The researchers are designing these tools to respond to specific needs that towns have identified, including mapping culvert locations, scheduling maintenance, estimating the size of needed culverts, analyzing replacement and costs, and identifying funding sources, as well as obtaining forms and applications for permitting.

The researchers are working closely with Maine coastal towns to make sure these new tools are usable and relevant even as they're being developed. "One very important aspect of this project is that we're working together with municipal officials—we're asking them, 'what are your experiences and needs?'" says Stancioff, extension associate professor, University of Maine Cooperative Extension and Sea Grant, who has worked with Maine communities for 24 years. "The other important aspect is that Shaleen is right there at the table, bringing his expertise in the biophysical sciences. He's engaged with the community and not just sitting in his lab."

Ultimately, the team's findings will help reduce uncertainty for David Kinney and others who are seeking ways to help their communities better weather the coming storms. Although the researchers are focusing on coastal communities—major economic engines in a state that relies on tourism—the goal is research that will be relevant for towns throughout Maine and the nation. "The more knows we have, the better our ability to get decisions right that have long-term implications for the future of our towns," Kinney says. 🌿



"The thing that's unique about this project is that we're working together with municipal officials—we're asking them, 'what are your experiences and needs?' "
—Esperanza Stancioff

Saving Maine's Basket Trees (cont. from page 1)

To that end, the team has made recommendations such as coordinating communication between state, tribal and federal agencies on EAB policies and working out potentially sticky issues ahead of time, such as whether or not tribal lands would be included in county-wide quarantines of infested areas. The SSI researchers and their partners have formed working groups on communication and jurisdictional issues to act on these recommendations.

Nailing down such details ahead of time benefits everyone, Ranco observes. He gives the example of making sure tribes know whom to contact if they spot the borer. "Those gathering ash for basketmaking might be some of the first to detect an invasion," he says, "while those who are making hardwood pulp might not even notice it."

Western Science Meets Indigenous Knowledge

While Ranco and others make progress on policy, team member Bill Livingston and graduate student Kara Lorion are collaborating with tribes on another challenge: safeguarding the state's best stands of brown ash, which is uncommon in Maine. They are working with Wabanaki ash harvesters, who process the trees by hand into basket splints.

Livingston, UMaine associate professor of forest resources, joined the harvesters in the forest last summer to learn what makes the best quality basket trees. He is now combining that information with ecological data and GIS technology to map out areas of the state most likely to have the best basket trees.

"The idea is to identify and protect the high quality basket trees," Livingston says, "so that if the EAB does get here, we'll be able to look for areas likely to have brown ash and focus on preventing the beetle from reaching them."

Creating a Statewide Safety Net

Ranco's team also is working on education and outreach. In 2009, Ranco brought a group of basketmakers to Michigan to learn how to identify an EAB infestation. In 2010, team member John Daigle, UMaine associate professor of forest recreation management, joined other experts in presenting testimony to the Maine State

Legislature, which led to a ban on imported firewood to help prevent the borer's spread. The team also is working with Indian Island youth and the Maliseet tribe in Houlton on collecting and saving brown ash seeds.

Each piece of the project fortifies a growing network that can make all the difference should the borer reach Maine, according to those on the front lines. "SSI brings everyone together," says Dave Struble, an entomologist with the Maine Forest Service, which is a project partner. "The community net is built, and that means the response to an emerald ash borer invasion can be much faster because we're working together. If we can find the insect early, we can start to contain it and slow its buildup and spread."

Slowing the EAB down could give scientists and nature more time to keep it in check.

While methods such as injecting insecticides and using quarantines help, so do natural predators like woodpeckers and parasitic wasps, as well as fungi. Buying time also would allow scientists to develop additional natural control methods.

In other words, there's hope. "We've got this program and we've got some tools. I see this as a model," Struble says. "The collaborative approach is the only way that's going to be effective, along with keeping the public engaged and involved."

Collaboration has been Ranco's priority from the beginning. The project began when he and Daigle, both members of the Penobscot Nation, met with tribes to learn about their biggest concern, which turned out to be the borer. They have been engaging new partners to help ever since.

"The different perspectives that people bring to our meetings are very exciting," Ranco says. "State foresters, university researchers, and basketmakers and tribal ash harvesters are each talking from their perspective, but we're all trying to solve the problem together."

What's at stake is much more than trees. The brown ash is at the center of Wabanaki culture. A Wabanaki creation story says humans were created when the trickster hero Gluskabe shot an arrow into a brown ash tree.



Purple traps will reveal borer's presence

In May, Darren Ranco's SSI team and their partners hung what looked like a purple kite in an ash tree on the UMaine mall. It was an emerald ash borer trap—one of 955 traps being set in Maine this year in a collaborative monitoring effort between state, federal and tribal agencies. The traps are intended to detect the leading edge of a borer invasion and help officials target efforts to slow the beetle's spread if and when it's found.

How you can help

Metallic green, bullet-shaped and about a half-inch long, the emerald ash borer is expected to cause billions of dollars in damage in the eastern U.S. The larvae kill ash trees by devouring the inner bark, the tree's main transport system for water and nutrients.



The first step to help keep the emerald ash borer out of Maine is to refrain from bringing in firewood from other states, which is now illegal. To learn more about identifying and reporting a possible EAB infestation, visit the Maine Forest Service website at http://www.maine.gov/doc/mfs/EAB_ID.htm.

If efforts to fight the beetle succeed, something truly irreplaceable will be sustained. “It’s one of the oldest artistry traditions in the state,” Jennifer Neptune says of basketmaking. “We have been here on this land, making baskets, and this tradition has been passed from father to son, mother to daughter, grandparents, grandchildren, for many thousands of years.” 🌿

Reclaiming a lost art

Last September, Darren Ranco and Jennifer Neptune traveled to Skinner Auctioneers and Appraisers in Boston on an urgent mission: bidding on Penobscot artifacts, including a rare 19th century carrying bag woven from the inner bark of basswood. To Neptune and other members of the Maine Indian Basketmakers Alliance (MIBA), the bag was the key to reviving a lost art.

“The basswood bag is an example of another way of weaving that people don’t do anymore, but that people are trying to learn and revive,” Neptune told *Maine Antiques Digest*. Neptune and other basketmakers wanted figure out how to make basswood bags in the event that the emerald ash borer destroyed the brown ash trees they use for their exquisite baskets.



MIBA members Theresa Secord and Jennifer Neptune display an ash basket made by Richard Silliboy.

The bag was part of a collection amassed by linguist Frank Siebert (1912-1998), who worked with the Penobscots to document their language. The collection had been on loan to the Abbe Museum when Siebert’s heirs decided to auction it off.

With little time to prepare, five organizations formed the Penobscot Material Culture Collaborative to raise funds to purchase the bag and other items from Siebert’s collection and bring them back to Maine. The organizations included MIBA, the Penobscot Nation Cultural and Historic Preservation Department, the Abbe Museum, the Hudson Museum at University of Maine, and the Bangor Center for History, with endorsement from the Maine State Museum.

Ranco was the designated bidder for the Hudson Museum and Neptune bid for MIBA. He watched the bidding on the bag with growing concern. “As the basswood bag increased in price, I knew Jennifer was reaching her limit,” he recalls.

Finally, Neptune placed the winning bid of \$10,073. The bag, which belongs to MIBA, is now on display at the Hudson Museum, along with artifacts Ranco had purchased.

“Jennifer and others had already started to figure out how to work with basswood bark,” Ranco says. “But to have this bag in a place where people can study it every day really makes that seem more possible.” 🌿

Student Spotlight: Gary Parent

Gary Parent was in his forties when he decided to pursue his undergraduate degree at the University of Maine Presque Isle in order to get a good job. A native of Aroostook County who lives in Fort Fairfield, Parent says he has long been concerned about the region’s sustainability. “I would like to remain here and help provide a future for my children so the County’s rich history can be preserved,” he says.



Gary Parent collects GPS data with Town of Mapleton Code Enforcement Officer Lewis Cousins

About to enter his senior year, Parent already is contributing to the region’s future—and gaining marketable skills—as an SSI undergraduate researcher. He is one of several UMPI students who have helped rural communities in Aroostook County to transfer paper tax maps into a digital format, which will enable them to more easily and efficiently manage their data with free Google Earth software.

“Many of these smaller communities don’t have the fiscal ability to purchase software or pay a salary for someone to complete a project like this,” says Parent, who has worked on maps of five towns in Aroostook County including Easton, Mapleton, Chapman, Castle Hill, and New Sweden.

Parent and his fellow students have been working with Chunzeng Wang, associate professor of earth and environmental science at UMPI, who is overseeing mapping of land ownership in the Aroostook River watershed and creating a GIS database that links land use to land ownership. “Gary’s role was basically providing GPS and GIS service to our team,” Wang says. “He helped a lot in developing our large land parcel GIS database.”

Wang’s work is part of an SSI research project on sustainable development of the Aroostook River watershed led by Jason Johnston, assistant professor of wildlife ecology at UMPI. The SSI researchers are studying various aspects of sustainable development including historical and current land use and its impacts, promoting the region’s unmotorized trails, and identifying the best land for producing biofuels in ways that minimize potential effects on grassland birds and other wildlife.

Students working on the project have the rare opportunity to gain hands-on experience in helping to solve real-world problems. For Parent, who also has done GIS mapping for Fort Fairfield, this has made all the difference. “As a 45-year-old, it has taken me a long time to find my niche,” he says. “Using the skills I have learned at UMPI and through some connections I have made through this work, I hope to start a career in a field that focuses on sustainability. This project has definitely given me a head start on that.” 🌿

Balancing Growth and Conservation to Benefit People and Wildlife

Like many towns in Maine, Topsham is contending with a common dilemma: how to grow in ways that don't diminish the very things that people cherish about their community, like open space, wildlife and special landscapes.

"There is the constant tug between conservation and economic development," says Rich Roedner, Topsham planning director. "How do you preserve or protect resources while still providing for local growth opportunities?"

That question is at the center of an SSI research project led by UMaine wetlands ecologist Aram Calhoun. Her team is using local vernal pool conservation as a model to examine how towns can plan future development in ways that benefit people and wildlife alike.

Vernal pools are central to healthy ecosystems—and to town planning and economic development. A state law passed in 2007 requires a permit for development activity within 250 feet of "significant" vernal pools. These pools provide critical breeding habitat for wood frogs and spotted and blue-spotted salamanders and help sustain other wildlife by serving as snack bars and rest stops in the forest.



Orono town manager Evan Richert discusses vernal pool locations with SSI researchers Aram Calhoun, Vanessa Levesque and Dawn Morgan.

The problem is that Maine's vernal pool law needs to work better for human communities and for the intricate ecosystems it is supposed to protect. Although the law was passed in response to federal mandates and is based on years of research and broad consensus, its one-size-fits-all approach doesn't give towns enough flexibility to guide development in the most cost-effective ways. In addition, the law doesn't adequately protect habitat for pool-breeding amphibians, which spend most of their lives on land.

Calhoun's team is seeking new solutions to these challenges in partnership with Topsham and Orono and local citizens, developers, nonprofits, and municipal, state and federal agencies. What they learn has potential to help towns around Maine and other states

strike a balance between economic development and conservation of vernal pools and other key elements of a healthy landscape.

"Our team is working on conservation options that are practical and flexible," Calhoun says. "You get effective land conservation when you address socioeconomic concerns together with ecological concerns."

While team biologists are solving some of the mysteries of amphibian ecology (see sidebar), their colleagues in economics and other social sciences are tackling the human side of vernal pool conservation. They're seeking ways to make the state regulations more adaptable to local needs, and they've discovered a promising approach.

"We realized that if vernal pool regulations could be relaxed in growth zones in exchange for greater protection of pools and associated habitat in the rural areas, we could potentially create a win-win situation," says Vanessa Levesque, a PhD student on the team who is working on economic analyses of vernal pool conservation.

As this idea circulated, town officials, state and federal regulatory agencies, and developers all expressed enthusiasm. "The biologists liked the idea because they could get better protection of vernal pools, while regulators who do the permitting said it could streamline the process, which is also why the developers liked it," says Levesque, who is working with team member Kathleen Bell, associate professor of economics at the University of Maine.

Calhoun's team is now working with planners in Topsham and Orono and state and federal regulatory agencies to create model mechanisms. Regulatory agencies are considering an approach that would allow qualified towns to require developers to pay a fee rather than apply for additional permits to build near vernal pools in growth zones. This money would then be transferred to willing rural landowners to compensate them for protecting significant vernal pools on their land, most likely through a land trust or similar organization.

If this approach succeeds, it will give communities greater flexibility in charting their own future rather than having it 'dictated' by one-



"We realized that if vernal pool regulations could be relaxed in growth zones in exchange for greater protection of pools and associated habitat in the rural areas, we could potentially create a win-win situation..."
—Vanessa Levesque

size-fits-all regulations. While the details are still being worked out in ongoing research and stakeholder meetings, this approach shows promise in helping communities address sustainability challenges.

This policy work builds on the Maine Vernal Pools Mapping Project, which Calhoun and other scientists created with Maine Audubon in 2001. Developed in response to requests from communities around the state, the project has so far trained citizen scientists and town officials in a dozen communities including Topsham and Orono on how to map and assess vernal pools for biological significance.

Such mapping can save communities and developers money and time by preventing expensive surprises, says Orono town planner Evan Richert. “Vernal pools can end up surprising people and stalling projects if not identified in advance,” Richert says. “The vernal pool project provided an economical way to gain much needed predictability for regulators and landowners alike.”

Reducing uncertainty and improving flexibility is key for planners like Richert and Rich Roedner. “The second phase of the project was of great interest to us,” says Roedner. “How to make vernal pool regulations more sensitive to local rules and needs, and how to adapt across-the-board environmental regulations to a more tailored set of regulations that address smart growth at the local level, not just at a regional or state level.”

Pool hopping: Solving a mystery of amphibian ecology



Britt Cline is a PhD student studying the dispersal of juvenile wood frogs.

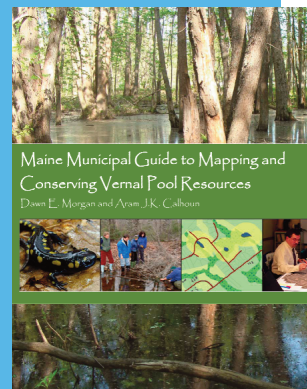
Juvenile wood frogs are the long-distance travelers of their species, keeping the gene pool healthy as they journey a half-mile or more from the vernal pools where they were born in search of suitable habitat to begin their lives on land. Increasingly, however, these froglets must traverse a landscape altered by humans.

Britt Cline, a PhD student working with UMaine wildlife ecology professor Mac Hunter, is studying how forestry, agriculture and suburban development affect the dispersal of juvenile wood frogs. Her findings will yield information that could be used by municipal officials, regulatory agencies, landowners and others to more effectively manage land and habitat around vernal pools.

In central and mid-coast Maine, wood frogs typically use three kinds of habitat—the pools for breeding, forested wetlands for summering, and well-drained upland forests for hibernating—but little is understood about how land use practices affect their ability to travel between these places. The movements of the juvenile wood

New Guide Helps Towns Identify, Map and Assess Vernal Pools

Best practices from the Maine Vernal Pools Mapping Project are now available to all towns through *The Maine Municipal Guide to Mapping and Conserving Vernal Pool Resources*, co-written by SSI research associate Dawn Morgan and Aram Calhoun and published this spring. This comprehensive guide covers everything from vernal pool ecology to training citizen scientists how to identify and assess vernal pools. For more information, visit <http://www.umaine.edu/vernalpools/>.



The SSI team’s findings may help Maine communities meet often competing needs by striking a healthy balance. “Our work may begin to marry the concepts of conservation and economic development—making sustainable communities a concept that resonates with Maine municipalities,” Calhoun says. 🍃

frogs are particularly difficult to study because they are forest-floor brown and tiny—about the size of a human’s pinky fingernail.

Cline is collaborating with Nuri Emanetoglu, an assistant professor in the UMaine Dept. of Electrical and Computing Engineering, and Herb Aumann of Lincoln Labs at MIT on an ingenious way to solve this problem. They are tracking the movements of these tiny frogs across various landscapes by fitting them with harmonic radar transponder tags, an adaptation and miniaturization of the technology used to find lost golf balls. Their findings also could be used to study the movements of other small creatures throughout seasons and years because of the long lifespan of the tags.

Cline’s early findings suggest a complex picture. She has discovered, for instance, that juvenile wood frogs can quickly disperse through lawns, but may be at greater risk for dehydration and predation as they cross them. Future work will allow her to track individual wood frogs and discover their fates, as well as follow them to their breeding pools.



Ultimately, this research will shed light on how lawns, hayfields, clearcuts and other land uses affect the ability of juvenile wood frogs to disperse through the landscape. These findings could help address challenges ranging from seasonal land management practices to the improvement of vernal pool buffers that better connect and protect crucial habitat for pool breeding amphibians. 🍃

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SSI Highlights

Three new episodes of MPBN's Emmy-nominated Sustainable Maine series will air this fall, featuring SSI's **Belgrade Lakes Team**, the **Emerald Ash Borer Team** and the **Vernal Pools Team**. Check the MPBN website for program dates and times (<http://www.mpbn.net/>).



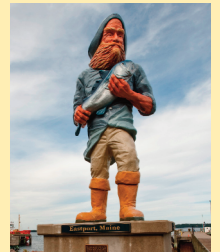
Save the Date! The **2012 Mitchell Lecture on Sustainability** will take place on Tuesday, September 25 at Hauck Auditorium, UMaine, Orono. Pamela Matson, Dean of the Stanford University School of Earth Sciences will be the speaker.

The **Rangeley Region Team** at the University of Maine Farmington, is developing a mobile application that will help boaters, anglers and others to report invasive aquatic plants in the region. Led by Wendy Harper, associate professor of economics, the team aims to develop

mobile applications that inform residents and visitors about stewardship practices that sustain the Rangeley landscape and region. This is part of their larger SSI project, Charting the Rangeley Region's Social-Ecological System and Identifying Community Sustainability Strategies.

SSI researchers Gayle Zydlewski and Teresa Johnson of the **Maine Tidal Power Initiative** were among those who met with Japanese officials this spring when they visited UMaine to sign a research agreement between MTPI and the North Japan Research Institute for Sustainable Energy of Hirosaki University. The groups aim to foster scientific cooperation and academic exchange between the two universities to advance the development of sustainable tidal energy in both the U.S. and Japan.

Zydlewski and Johnson traveled to Japan for further discussions with researchers this summer.



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