



**Major League Effort:
Alum Works to Make Baseball
Bats Safer**


**FERM Takes Students from the
Classroom to the Field**

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**Michigan Tech
Alumni Reunion**
August 6–8

**SFRES Reunion Event—
All-Class Lunch**
August 7



**Sixty-fourth Lake States
Logging Congress,
Escanaba, Michigan**
September 10–12

**Wildlife Society Annual
Conference,
Monterey, California**
September 20–24



**SAF National Convention,
Orlando, Florida**
September 30–October 4

Message from the Dean



Peg Gale '77

Dear Alumni and Friends,

This past year has provided some very interesting times. We have all witnessed falling world markets, rising unemployment, and overall financial insecurity.

Yet, we have also had some very exciting and uplifting moments. The School graduated X students in forestry, Y in applied ecology and environmental science, and Z in wildlife ecology and management, as well as X graduate students. Their education has prepared them to play a role in the new thrusts in natural resource fields: bioenergy, environmental education, conservation, climate change, wildlife population management, and managing and sustaining our natural resources, to name just a few.

These graduates reflect the words of Nelson Mandela: "Education is the most powerful weapon which you can use to change the world."

In talking with many of our students before they leave, I have found that most have jobs or are going on to graduate school. And they all are looking toward a positive future. They have worked hard in class, and many have taken on part-time jobs to pay their bills, but their financial needs are still great.

We work with our students to help meet those needs through scholarships, part-time work, and direct support from outside grants. You can help, too, by sending us job notices, financial gifts, and suggestions on how to improve our programs.

So from all of us, thank you for your support. We hope you enjoy the news from our School, particularly the activities of our wonderful students.

Peg

Greetings from Houghton

I should have known better. After all, I take pride in my organizational skills, efficient manner, and planning abilities. It drives my family crazy. And I have found a job within the realm of my forestry degrees to put all these skills to use. Life is great, right? Not last Monday.

I flipped on my home computer and saw darkness. I did not panic; this has happened before. Admittedly, I should have read this as a very bad sign. But, no, I'd just organize my resources and efficiently fix it. Again. Well, not this time.

The end result is that my hard drive crashed. My hard drive? Me, the one who can't eat with mismatched silverware? The one who shivers when I enter a room where the furniture is on an angle? The one who can't get her yin to yang in yoga class if her mat is not perfectly perpendicular to the floorboards? How could this have happened to organized, efficient me? I am so fastidious in so many parts of my life, how did I let my digital life get so sloppy?

As I lay in bed, I count lost files jumping over a fence; I try to figure a way out of this. What is gone and what can I do about getting it back? Financial information, web projects, old documents and spreadsheets can all be

recreated. It's a mess, but I can recover.

But then I get to the one thing I can't get a do-over on: my family pictures. I have lost everything from 2002 when I went digital. For me, that means our daughters' middle school and high school years are gone. No birthdays, no track meets, no proms! I will do anything to get them back.

The good news is that the data can *probably* be recovered. The bad news is that it costs easily as much as two semesters of college textbooks. I had to ask myself, is it worth it? Absolutely!

There is nothing like an expensive mistake to make you change your ways. So as soon as I get my digi-world back together, I am going to spend less time arranging the dishwasher for maximum effectiveness during the wash cycle and a lot more time making sure the things that are really important to me are taken care of. Maybe that should be my mantra for everything in my life: take care of the things that are really important.

I hope my little mini-calamity gets some of you burning back ups of your hard drive before sundown. It could be time well spent.

Carrie Richards '84

Development and Outreach

Strong Field Skills and Sharp Analytical Minds

One of the most rewarding parts of being on the School's team is awarding scholarships to our students. These are hard-working men and women who take the stewardship of our natural resources very seriously. They come from all over the country—and the world—to participate in programs U. J. Noblet, Eric Bourdo, Gene Hesterberg, Vern Johnson, "Hammer" Steinhelb, and many other faculty founded, built, and nurtured. They join a proud legacy.

Last year was my first opportunity to go through this process with our students. After getting to know them over a six-month period, I sat down with their records and a list of scholarships and weighed options very carefully. While rewarding, it was also a very sobering experience. Our unmet need for returning students (i.e., not counting the first-year students) was a staggering \$675,000.

Times have changed. There was a time when you could hustle and sweat your way through the academics, part-time jobs, and long summer hours and leave Michigan Tech with a degree debt-free. That is no longer the case. While our best students are awarded academic scholarships from the University, and our athletes receive athletic grants, our middle-of-the-road, happy-to-be-in-the-woods students sometimes leave here with significant debt.

This is not just Michigan Tech's problem—it is happening across the nation. Yet, we want to continue our proud tradition of producing natural resources professionals who have strong field skills coupled with sharp analytical minds. We lead the state in the production of these professionals. As most of you know, our graduates significantly influence more than the state of Michigan. Our reach is global, and we like it on top. We need your help to continue to attract the quality students we are so proud to embrace and teach.

If you can help us through contributions for scholarships, land holdings, or job notices, please give me a call, send an email (cahohnho@mtu.edu) or use the enclosed envelope. I would cherish an opportunity to talk with you about our programs or the mechanisms we use to support our students.

Chris Hohnholt

Director of Development, Outreach, and Recruitment

In the News

To read more about any of these articles, visit www.forest.mtu.edu/news.

■ RenewableEnergyWorld.com ran an article on research led by Associate Professor **Robert Froese**, "Michigan Utility and Michigan Tech Join Forces to Study Biomass-Powered Electricity," along with a gallery of photos.

■ Grad student **Chris Miller** and Associate Professor **Robert Froese** are featured in a *Daily Mining Gazette* story by Layla Aslani, "Exploring Bioenergy Crop Potential."

■ Articles on bone deformities among Isle Royale's wolves have been published widely since John Flesher's AP story on **Rolf Peterson** and **John Vucetich's** research was distributed nationally. *Wolf-Moose Research Science 360 News*, published by the National Science Foundation, featured the wolf-moose research in a breaking news story, "Wolves

Suffer Bone Deformities from Too Much Inbreeding." The wolf-moose research was also the topic of a *Scientific American* story, "Gene Pool Jeopardy: Can Isle Royale's Wolves Be Saved?"

■ Associate Professor **Andrew Burton's** work on the nitrogen cycle and its potential effect on climate is featured in this *Scientific American* article, "Can Nitrogen Be Used to Combat Climate Change?"

■ *The Kansas City InfoZine* ran an article about Assistant Professor **John Vucetich's** essay on hope, coauthored by Michael Nelson (Michigan State), which was published in the March issue of the journal *The Ecologist*.

■ Associate Professor **Robert Froese** is featured in this story in the (Marquette, Michigan) *Mining Journal*, "Expert: UP Prime Area for Biomass Production."

Alumni Sightings



The 2009 Minnesota SAF meeting was a good place for these School alumni to get together for a picture. They are (left to right) **Art Widerstrom** (1967), **Bernie Hubbard** (1967) and **Gary Anderson** (1966) with District 5 Council member **Greg Russell** (1994) at the 2009 Minnesota SAF meeting. Art chairs the SAF Fire Working Group.



Pat Orent (1999) visited the School in May with his son Carter. Dean **Peg Gale** gave Carter a Husky dog stuffed animal to remember his visit. Maybe someday Carter will be a Michigan Tech forestry graduate just like Dad!

Submit your Alumni News update to **Carrie Richards**, carrie@mtu.edu, or at www.forest.mtu.edu/alumni.

Alumni News Keeping Connected

1974

Michael Robinson stopped by the School and visited with Dean **Peg Gale** and Professor **Marty Jurgensen**. He enjoyed, “reliving some early memories.”

1980

Del Barton completed the certified arborist, municipal specialist competency exam through the International Society of Arboriculture. The ISA is a professional scientific and educational organization devoted to disseminating information on the care and preservation of shade and ornamental trees. Del is city forester, parks maintenance supervisor, and chief park ranger in Lima, Ohio. He also carries an Ohio peace officer commission.

1981

Mark Jamieson and his wife, Martena, have relocated to Jackson, Mississippi, where he works for the Forest Service as the assistant fire management officer in the national forests. He is involved in prescribed fire and wildfire projects and participates as branch director for a type one overhead team on national incidents. Their son, Tristan, attends Mississippi State University.

1983

Lauri (Winquist) LaBumbard was at the School recently to participate in the National Advanced Silviculture program for the Forest Service. She enjoyed seeing the improvements to the building, but the “old parts” are where her memories are. Lauri works for Hiawatha National Forest out of Munising, Michigan, and her husband **Kevin LaBumbard** (1983) works for the Michigan DNR out of Gwinn. They live in Skandia.

1984

Keith Graboske held several short-term jobs early in his career, but was fortunate to find a job in Soil Erosion and Sedimentation Control with Macomb County Public Works. To advance his career, he worked full time while he went to college at night and eventually earned a civil engineering degree from Lawrence Tech in 1995.

Awards and Recognitions

■ **David Reed**, vice president for research, recently announced this year’s recipients of the Research Excellence Fund Awards. Two professors from the School were selected to receive Research Seed Awards. **Rod Chimner**, along with Casey Huckins from Biological Sciences, received \$28,530 for their project, “Developing Restoration Techniques for Coastal Wetlands.” **Audrey Mayer** was awarded \$5,450 for “Using Data from Second Life to Develop and Test Multidisciplinary Sustainability Indices.”

■ With approximately thirty-four graduate students serving in the Peace Corps around the world while earning their master’s degrees, Michigan Tech has the most Peace Corps Master’s International (PCMI) students in the nation for the second year in a row. The program is directed by Professor **Blair Orr** of the School.

Michigan Tech offers PCMI degrees in three fields that are the only ones of their kind in the US—mechanical engineering–engineering mechanics, natural geological hazards, and applied science education—as well as in forestry, civil and environmental engineering, and rhetoric and technical communication.

■ Dean **Peg Gale** has been appointed by Governor Jennifer Granholm to the Great Lakes Wind Council. The Great Lakes Wind Council is an advisory group within the Michigan Department of Energy, Labor, and Economic Growth.

■ Research Professor **Rolf Peterson** has been named to a chair endowed by Tech alumnus Richard Robbins and his wife, Bonnie. Rolf will hold the Robbins Chair in Sustainable Management of the Environment, formerly held by the late **David Karnosky**. Michigan Tech President **Glenn Mroz** said, “Dick and Bonnie Robbins recognize that our students’ understanding of the fragile nature of the world around them depends on their direct experience with today’s environmental challenges, both in the classroom and in research.”

■ Congratulations to **Chris Webster** and **Robert Froese** for being finalists in the selection process for the University’s Distinguished Teaching Awards.

■ Congratulations to Robert, Ann, and Andrew on their accomplishments and hard work to achieve their promotions. **Robert Froese** was promoted to associate professor with tenure; **Ann Maclean** and **Andrew Storer** were promoted to professor.

■ Professor **Marty Jurgensen** received a fellowship award from the Organization for Economic Co-operation and Development for a research study at the University of Valencia in Spain.

■ Professor **Blair Orr** was appointed to the World Forestry Committee of the Society of American Foresters. He will serve a three-year term.

■ After twenty years keeping sixty-nine fungus cultures from the surrounding forests in a lab refrigerator in the School, remarkably, most were still alive, so Research Scientist II **Dana L. Richter** published a paper, “Revival of Saprotrophic and Mycorrhizal Basidiomycete Cultures after Twenty Years in Cold Storage in Sterile Water,” in *The Canadian Journal of Microbiology*, volume 54, number 8, pages 595–599.

■ **Roswell K. Miller**, professor emeritus and a member of the School’s faculty for over twenty-nine years, received his fifty-year



membership certificate from the Society of American Foresters. Miller began his work with the SAF as a student member and then continued in chapters in Oregon, New Mexico, and Michigan.

New Arrivals

Rachel Tarpey has joined the School as a research associate. She comes to Michigan Tech from Cold Springs Forestry, where she was a staff forester. She was also employed by the Houghton-Keweenaw Conservation District as a forester. Tarpey holds an MS in Forest Ecology and Management from Michigan Tech and a BS in Forest Ecosystem Restoration and Management from the University of Wisconsin–Steven’s Point.



Xiaohong Zhu joins the faculty of the School as a research assistant professor. She comes to Michigan Tech from Yale University. Zhu holds a PhD in Plant Molecular Biology from the Weizmann Institute of Science, Israel, an MS in Plant Physiology and Biochemistry from Yangzhou University, China, and a BS in Agronomy from Anhui Agricultural College, China. Her publications include chapters for both *Plant Virology Protocols Volume 2* and *RNAi Methods*, and she has lectured on crop culture, plant physiology, and biochemistry.

Evan Kane has joined the School as a research assistant professor. He obtained his BS and MS degrees from the School in 1999 and 2001, respectively. He earned his PhD in Forest Ecology from the University of Alaska, Fairbanks, in 2006. Evan will be focusing on belowground and ecosystem nutrient cycling collaboratively with Michigan Tech and the US Forest Service and will be teaching the undergraduate soils course in the fall.



Joseph Bump has joined the School as an assistant professor of wildlife ecology. He earned his BS in Biology from the University of Michigan in 1999, an MS in Zoology and Physiology from the University of Wyoming in 2003, and his PhD in Forest Science at Michigan Tech in 2008. His research combines population biology, ecosystem science, and landscape ecology and involves both aquatic and terrestrial systems. He will be teaching three courses: Wildlife Ecology, Wildlife Habitat, and Stable Isotopes in Environmental Science.



Ken Vrana is director, Isle Royale Institute, a component of the Ecosystem Science Center. The institute is a joint program of Michigan Tech and the National Park Service to enhance research and education opportunities at Isle Royale National Park. Ken earned an MS in Park, Recreation, and Tourism Resources in 1992 from Michigan State University and also completed several years of graduate study in fisheries and wildlife and anthropology. Ken is actively involved in underwater archaeology and undersea technology development through his nonprofit corporation and limited liability company.



Dan Haskell has joined the School staff as a research associate scientist. Haskell was previously employed in wildlife research at Tech. He has also worked for various agencies on lynx research. Haskell holds an AS from Kirkwood Community College, a BS in Wildlife Biology from the University of Montana, and an MS in Applied Ecology from Michigan Tech.



Xinhua He has joined the School as an assistant research scientist. He will be studying the availability of nitrogen to white spruce as affected by ectomycorrhizal fungi, with Adjunct Professor **Erik Lilleskov** and Dean **Peg Gale**. He earned a BS in Soil Science from Southwest China Agricultural University in 1982, an MS in Plant Physiology from South China Agricultural University in 1991, and a PhD from University of Queensland in Plant Ecophysiology in 2002. He worked as a postdoc at the University of California

at Davis on nutrient transfers in paired trees in oak woodlands. Xinhua welcomes potential scientific and cultural exchanges.

Oliver Gailing has joined the School as assistant professor in ecogenomics. He earned his MS in Biology from the University of Bochum (Germany) in 1994 and his PhD from the University of Halle (Germany) in 2000. After two years of postdoctoral studies at the Institute of Plant Genetics and Crop Plant Research (IPK-Gaterleben), he moved to the Institute of Forest Genetics at Goettingen University. In 2009 he got his “post lecturer qualification” (*veni legendi*) at the Faculty of Forest Sciences. He is interested in the study of evolutionary forces acting on plant populations and species during their history and in the evolution of adaptive and species-specific characters.



Alumni News Keeping Connected

1992

Andy Londo (PhD 2000) sent some conclave memoirs—most can’t be printed here—but he does have fond memories of the snowball fight of 1990, throwing “Fred” into the showers in 1991, and beating Missouri at Purdue in 1992. Andy is now an associate professor at Mississippi State.

1993

Brenda (Haskill) Owen sent an email to say that it looks as if her eleven-year-old son Tate will be an ornithologist; he pours over bird manuals of all sorts when he’s not playing on the Newberry fifth-grade basketball team. Brenda is starting an organic apple orchard this summer on her homestead’s thirty-five acres of old farming ground, but first she has to build a deer fence.

1998

Joseph Allen was married in December 2007 to Melissa Hooper in Blackstone, Virginia. The reception was held at the Fort Picket Officer’s Club. Joseph works for the federal government in Washington, DC, and Melissa, who has a master’s degree in wildlife science from Virginia Tech, works for the John Marshall Soil and Water Conservation District in Warrenton, Virginia.

1999

Stephanie Stapleton was accepted to Boston University Medical School. She has been working, going to grad school, volunteering and TAing at BU for the past few years and will start medical school in the fall.

2000

Thomas Seablom (MS 2001) was named Young Forester of the Year at the Michigan SAF meeting in fall 2008.

2001

Heather (Shaski) and Jason Gagnon (2000) have relocated to Chassell, Michigan. Heather works for Portage Health as the employee health and safety coordinator. Jason is now a realtor for RE/MAX in Houghton. Braden will be four in January and now attends preschool at Michigan Tech. “Whenever we drive past Tech he says that he wants to go to that school when he gets big,” say his parents.

Alumni News Keeping Connected

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2001

Patrick and Lisa (Johnson) Smith had their second child, Kyle John, on December 12, 2008. He joins his older brother, Jacob Patrick. The family lives in Florence, Wisconsin, where Pat is the Florence County forest administrator.

2002

Jason Caron is working for the Michigan DNR and is located in Sault Ste. Marie, Michigan. He is really enjoying his work as a forester.

Elaine Billy-Kraft, with her secondary teaching certification, taught high school in Colorado for five years. She is now with Cliffs Natural Resources in Western Australia. She and her husband, Joseph Kraft, a 2002 geo engineer, will be there for two years working and travelling. She says, "I cannot tell you how much Michigan Tech prepared us for all of our adventures."

Melissa Powers is employed as an inventory specialist for the Minnesota DNR Resource Assessment office in Grand Rapids, Minnesota. She is involved with both state and federal forest inventories, aerial photography acquisition, and interpretation. She also supervises many of the office's twenty-three student interns during the summer.

2003

Marla Rader is working with National Park Service on Cumberland Island National Seashore in Georgia. The island is located on the Florida/Georgia border and is about 36,000 acres and a 45-minute ferry ride from the mainland. She is assisting with the Volunteers in Parks Program (VIP) and with other internship and volunteer opportunities.

2006

Patrick Marolla was hired by Hancock Timber Resource Group as a forester to manage their 128,000 acres in Pennsylvania and New York. He oversees timber harvesting and silvicultural activities for a portion of the property and helps to support GIS, inventory, and general reporting. He is also working toward his MBA at St. Bonaventure University.

2007

Matthew Abbotts and **Hannah Williams** (2010) embarked on an adventure this summer to kayak the Lake Superior shoreline beginning in Houghton. Visit their website at www.asuperioradventure.com.

Faculty Focus: Hairong Wei

The School welcomed Assistant Professor **Hairong Wei** as one of its newest faculty members in fall 2008.

Hairong received both his undergraduate and graduate degrees from Beijing Forestry University and then served as a faculty member there. He was engaged in poplar and elm research aimed at increasing biomass productivity and resistance to pests. The triploid hybrid poplar trees, developed by his group, are now widely used in short-rotation plantations in northern China. He enjoyed his time in Beijing, where he was a member of a basketball team and frequently played Chinese chess with friends.

He pursued his doctorate at the University of Hawaii at Manoa with advisor Henrik Albert and received his degree in 2001. Hairong isolated two gene promoters and two nuclear matrix attachment regions (MARs) from sugarcane and demonstrated their values in driving gene expression in other agriculturally important monocotyledon species, including maize, rice, banana, pineapple, sorghum, and garlic. This work led to the issue of three US patents, which were recently licensed by Syngenta Biotechnology Inc. While pursuing his PhD, he became fascinated with the idea of using computers to aid biological research and enrolled in computer classes in Honolulu.

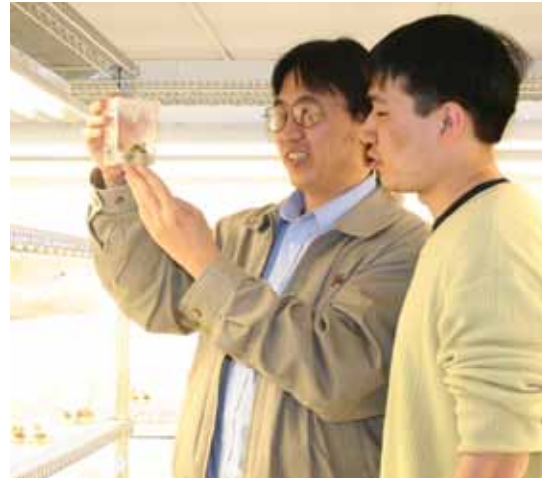
"I cannot help but pursue my interest in learning skills that are required for bioinformatics," Hairong said. He enrolled in computer science at the University of Chicago and spent nearly two years whetting his skills in computer programming and bioinformatics.

He did his first postdoc at Minnesota Supercomputing Institute, where he worked on gene regulatory network construction while serving as a database consultant to students, staff, and faculty. He developed a pattern-recognition algorithm by which hundreds of gene regulatory relationships in yeast were inferred. He did a second postdoc at the University of Alabama, where he developed a regression-based method for microarray data analysis and used it to find twenty-five genes involved in secondary cell wall synthesis. He also developed a new algorithm to study the 219 biological pathways in *Arabidopsis* and identified and prioritized novel candidate pathway members, regulators, and cross-pathway transcriptional control points for over 140 metabolic pathways.

In 2005 he began working for Operon Biotechnologies and WiCell Research Institute on dozens of bioinformatics projects, including microarray chip design, DNA sequence analysis, gene annotation, microarray data analysis, and gene network construction for novel knowledge discovery.

Hairong was pleased to join the School's faculty. "I am glad to get an opportunity to work on forest trees again," he said. He is interested in network-guided gene function inference and identifying gene networks and key regulators for controlling cambial growth and enhancing multiple stress tolerance. "There is no magic answer, no silver bullet—the single gene that can do all we desire," he added. Almost all traits of interest are controlled by a subnetwork containing a few dozen to hundreds of genes. Identifying the subnetworks and the key regulators therein is the first step to improving the traits.

In fall 2009, Hairong will teach Bioinformatics Programming and Skills, which is an elective for computer science students. He also will be teaching Gene Expression Data Analysis. He is looking forward to the challenge. "I would not be here if I did not enjoy teaching and mentoring," he said.



Hairong observes new growth with Tong Wang and Bin Li in the School's greenhouse

Around the School

Learning from Worms

The worms crawl in, the worms crawl out, and in their new underground lab known as a "mesocosm," faculty, students and scientists can monitor their impact on a simulated forest floor under varying conditions.

It's the only one of its kind for northern forest research and one of very few anywhere in the country.

A mesocosm is an experimental enclosure designed to simulate natural conditions while environmental factors are manipulated. Its name refers to its size: it's larger than a microcosm, or miniature model, but smaller than a macrocosm, or large-scale representation of reality. This mesocosm is an underground tunnel containing twenty-four one-meter stainless steel cubes. The surface will be open to the air, but the temperature, moisture, soil type, organisms such as worms, and other belowground variables can be controlled independently in each cube. Researchers and their students will be able to monitor the effects of their manipulations of the environment in each cube visually through portholes and windows, as well as by data collected remotely.

In their first mesocosm research project, Forest Service research ecologists and adjunct faculty members **Erik Lilleskov** and **Chris Swanston** will track what they call "the ecosystem engineers" of the forest floor. Their research will be a uniquely integrated analysis of the impact of invasive earthworms on the ecology of northern forests.

"We know the worms have a major impact on the soil," Chris said. In soil without worms, the rich humus, or decomposed organic matter, on the forest floor remains in a distinct mat. Worms eat the humus, and as they move through it, they move it around. "The worms don't make the forest better or worse, just different. They change the way roots grow, where they grow and how they grow," he added.

This will be the first mesocosm-scale study of the effects of nonnative earthworms on northern forest ecology. The researchers can manipulate and study carbon cycling above and below ground, hydrology, biochemical interactions of the worms with the soil, nutrient levels in the soil, and plant responses.

Dean **Peg Gale** said the mesocosm "will continue to strengthen the ties between Forest Service researchers and Michigan Tech faculty and students. It will excite our students and faculty about discovering new ways of looking at forested ecosystems and help us explain the complexities of belowground processes."

Thirty Years and Then No More

After more than thirty years of bowling fun, the School's recreational bowling teams, led by **Marty Jurgensen**, have rolled their last strike.

This sad outcome is not due to lack of enthusiasm or a shift to Wii games, and certainly not due to a lack of desire to consume adult beverages with colleagues while enjoying a night out. It is due to the demise of all viable venues. The Copper Bowl Lanes in Ripley closed its doors last year and yielded to the larger, flashier Mine Shaft lanes in Houghton. However, the Mine Shaft succumbed to tough economic times and closed at the beginning of this year.

That left only the basement of the Memorial Union, where a major "ingredient" of bowling prowess is not served, or the bowling alley at the Ojibwa Casino in Baraga, which is too far to drive in the long Copper Country winter. This sad reality led to the folding of the School's teams. However, the twenty-plus members gathered for a farewell meeting in April and one last night of "rigorous" competition.

We would love to hear from any of you who participated over the years. Marty sends his fond regards to all who rolled their way into his heart as a team member, sub, or supporter.



The mesocosm will help researchers learn more about how earthworms contribute to ecosystems.



Adjunct Professor Erik Lilleskov observes the construction progress at the mesocosm site.



Chris Swanston and Marty Jurgensen on the final night of bowling fun.



Chris and Mary Webster will miss bowling night.

In the Field

Idle Farmlands Could Become Profitable Carbon Storage Banks

Michigan's recently enacted renewable energy portfolio legislation sets new requirements for green energy production in the state. Michigan policymakers believe energy plantations could be a major source of biomass fuels. But could northern Michigan farmers earn a profit converting idle farmland to tree plantations as biomass energy crops?

Answering this question was the goal of graduate student **Chris Miller's** master's degree thesis research. Chris and his advisor, **Robert Froese**, a professor in the School, examined whether aspen trees planted on idle farmland in Presque Isle County could be sold profitably as chips used as biomass for electric power generation.

"The Michigan Climate Action Council draft policy options note that biomass from energy crops is an important part of the renewable energy solution," Robert said. "But more importantly, putting idle lands back into production is a way to bring economic opportunities to northern Michigan communities."

Chris developed detailed cultivation and cost models for planting, tending, and harvesting aspen trees and adapted existing models that predict forest growth to estimate the amount of chips that could be produced on lands of different quality. Though the current market price for coal and wood chips is low, Chris found that farmers should be able to turn a profit on the very best lands in the northern lower part of the state.

But the price of chips is just one of the potential revenues from biomass crop production, Chris said. Tree plantings not only produce biomass that can be harvested for fuel, but root growth and years of fallen leaves incorporated in the soil also store carbon from the atmosphere that was released from fossil fuels burned elsewhere.

"Michigan's Conservation and Climate Initiative allows farmers to plant trees and get credit for the carbon dioxide sequestered in plantation soils," Miller noted. "These credits can be sold on the Chicago Climate Exchange and will become more and more valuable in the future."

When Chris took carbon credits into consideration in his cost models, an entirely different picture emerged. He found that a net credit of only \$6 per metric ton would make aspen plantations economically feasible on all of the lands studied in Presque Isle County, including lands of relatively low quality.

"Our research shows that we're surprisingly close to the tipping point where tree plantations on large areas of idle farmlands would be profitable," said Robert. "If chip prices increase because of increased demand for wood fiber from a number of bioenergy projects being developed in Michigan, this alone could be sufficient."

Michigan Tech Wins Two Chiefs Partnership Award

The Natural Resources Conservation Service has announced that Michigan Tech has received a Two Chiefs Partnership Award for participation in a conservation project called Biomass Utilization and Restoration Network in the Upper Peninsula (BURN-UP). Fourteen other partners participated in the project.

Robert Froese, Maria Janowiak, and Jim Schmierer from the School represented Michigan Tech on the project.

BURN-UP's primary goal is to keep local wood businesses globally competitive and to help them sustainably use the lower-value wood byproducts of their harvest operations.

The Two Chiefs Partnership Awards recognize exemplary collaborative projects supporting conservation and forest stewardship.

Left to right, Jim Schmierer, Maria Janowiak, and Robert Froese accept the Two Chiefs Partnership Award on behalf of Michigan Tech.



Oh Deer: Grad Student Studies Effect of Whitetails on Hemlock

Graduate student **Nicholas Jensen** likes hemlocks. "They're my favorite tree," he says, both for their graceful, arching tops and branches and for the shady, uncluttered forest floor they create.

But hemlocks are in trouble, down about 99 percent throughout their regional historic range. So Nicholas, a master's student in forest ecology and management, advised by Associate Professor **Chris Webster**, is studying how one particular animal species might impact the survival of the remaining 1 percent.

In winter, whitetail deer—lots of them—yard up in groves of hemlock and cedar to escape the deep snow. They do eat hemlock, but they also deposit plenty of scat. Nicholas wondered if their presence in high numbers was in effect fertilizing the local ecosystem and changing what types of plants were growing there.

Eastern hemlocks thrive in poor soils that most other forest trees can't abide. If those soils become fertile, Nicholas thought, they might be colonized by other trees, like sugar maples, that could displace the hemlocks.

He based his research in part on a large-scale project being conducted by **Jill Witt**, a PhD student in forest science. She has been conducting pellet counts in thirty-nine hemlock groves in the western UP for the past three years for her research on how landscape and deer wintering behavior affect hemlock regeneration. Nicholas participated in the pellet counts last spring and tracked the types of plants growing on the forest floor.

Hemlock groves let very little light through to the ground. Only a few species of low-growing plants, including wild lily of the valley and wood ferns, grow under these conditions. However, Nicholas discovered that different species of plants grow in hemlock groves that shelter lots of deer in the winter.

Just why this is happening isn't clear. Maybe these new plants like the richer soils, maybe the deer are eating saplings and making way for additional low-growing plants.

What is clear is that something is going on, Nicholas says. "It's important to understand this. Hemlocks are an important resource, and they are really under pressure," he says. "My hope is that we'll be able to raise awareness of the effect deer may be having and that our findings will someday be considered in forest management. It could be relevant to the persistence of this forest type."

Discovery of Rare Giant Puffball Leads to Paper in *The Michigan Botanist*

Brad Morse, a third-year mechanical engineering student, collected a large puffball near his home in Hancock and brought it in to his work-study supervisor, Research Engineer/Scientist II **Dana Richter**. The specimen measured 12-by-8-by-6 inches. The mushroom was unusual because its surface was lumpy, unlike the other giant puffballs he had seen. With a little investigation, the specimen turned out to be the western giant puffball, usually found in sagebrush areas of the western US. The species had never before been documented in Houghton County, and only once before in the entire eastern half of North America. More specimens were collected in the yard in Hancock and compared microscopically and culturally to the common eastern giant puffball. Together, Richter and Morse published their discovery in *The Michigan Botanist*, volume 47, number 2, pages 49–56, "The Western Giant Puffball (*Calvatia booniana*) in Northern Michigan."

New Funding

■ Professor **Chandrashekhar Joshi** received \$56,000 from North Carolina State University for the first year of a four-year project totaling \$224,000, "EU-US Transatlantic Graduate Degree Program in Forest Resources."

■ **Robert Froese** received \$49,936 from the Michigan Department of Management and Budget for "Timber Inventory Plot Design for the Michigan Department of Natural Resources."

■ Assistant Professor **Thomas Pypker** has received \$44,549 from the Forest Service for the first year of a potential five-year, \$238,000 project, "Carbon, Water, and Soils Research Support."

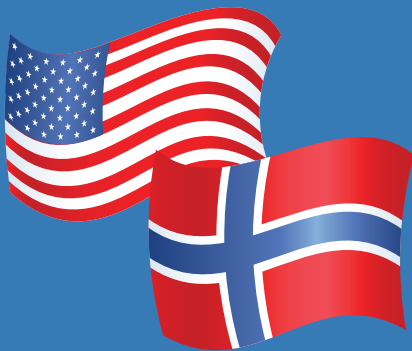
■ Professor **Martin Jurgensen** has received \$43,968 from the Forest Service for "Effects of Red Pine Thinning and Stand Age on Ecosystem Carbon Pools and Fluxes."



Students have been conducting pellet counts to study the effects of deer on hemlock groves.



Around the World



Hands Across the Water

Norway has the only alumni chapter outside of North America, and campus leaders are working with the group to enhance Michigan Tech's presence in that Scandinavian nation.

The fifty chapter members include the president, Sverre Sandberg, Class of '68, who promotes Tech in Norway, especially with an eye on exchanging more students.

"There are a lot of top students in Norway who are very interested in an international experience," he says. He'd like to direct them to his alma mater.

Dean **Peg Gale** is eager to expand the exchange of students beyond engineering and into natural resources. Last fall, she traveled to Oslo for a reception put on by the American Embassy. The featured guest: Michigan Tech. Diplomatic leaders and staff, members of the Norway alumni chapter, the Fulbright Association, industry, and representatives of Oslo University College and the Norwegian University of Life Sciences attended.

What resulted was a commitment: educators from the institutions involved taking the steps necessary to begin student and faculty exchanges, as well as online classes.

Brenda Rudiger, director of alumni relations, says that the outreach to Norway—and prospects for ties with Europe—go hand-in-hand with Michigan Tech's vision to become a world-class institution that engages alumni and provides global opportunities for students.

In the Classroom

A FERM Grasp on Experience

What is the FERM?

The FERM (Forest and Environmental Resource Management) is a Michigan Tech Enterprise program that provides hands-on learning and develops leadership and decision-making skills. The concept was developed by Tech President **Glenn Mroz**, a professor on the School's faculty, and implemented in 2002.

How does FERM work?

At the start of each semester, the class forms teams. The instructor chooses the team leaders, who are responsible for coordinating fieldwork and submitting periodic written evaluations of each team member. The leaders are accountable for the team's performance.

The teams then pick a project from a list provided by the instructor. All projects include timber sale preparation/administration (cruising, marking, boundaries, inspections) for forestry majors and some wildlife habitat improvement projects (bird boxes, fish cribs, snag retention, reserve wildlife tree selection) for wildlife majors.

The instructor accompanies the students until they can work independently in the field.

A recent example

The summer 2008 FERM project was a timber sale on approximately 100 acres of the 240 Wilkinson Tract near Nestoria, with harvest completion anticipated prior to June 2009. The tract was given to Michigan Tech in 1995

and was very diverse, with several stand types (northern hardwoods, white spruce/balsam fir, paper birch/aspen, black spruce, and white pine). The goals included timber management, improving wildlife habitat, and pine restoration. The students were able to implement a variety of management practices, including single tree selection, group selection, seed tree, patch cuts, aspen regeneration gaps, and clearcut with retention.

During fall 2008, several FERM teams completed the lion's share of the fieldwork, setting boundary lines, hardwood tree marking on fifty acres of diverse hardwood forest, cruising fifty acres of paper birch/spruce/fir dominated forest, sale unit delineation, wildlife tree retention, seed tree retention, and skid trail layout/installation. The sale was cut last winter, and the students conducted all of the inspections, marked some more trees, and rode in the processor with one of the loggers. This May the FERM planted 10,000 pine seedlings (white and red) in several of the management units and install demonstration plots for scarification techniques to facilitate yellow birch, white pine, and red oak regeneration.

Current status

The FERM is funded by a 2001 donation from a distinguished alumnus. To make a donation to support the FERM, go to forest.mtu.edu/development and click on "Give Now!"

On the job: Major League Work



TECO's Tech connection: left to right, alumni Scott Drake, Greg Dupuis, and Steve Verhey

You could say that alumnus **Scott Drake** has made it to the major leagues. And he's done it in a major way: by making it safer to enjoy America's favorite pastime.

Scott, who graduated in 1999 from the School with a BS in Wood Science, is the vice president of operations with TECO, a structural wood panel certification company. Scott also earned an MBA in 2002 from the University of Wisconsin-Madison.

One of the recent and most controversial projects that Scott has been working on is analyzing why wooden baseball bats break into multiple pieces. Anyone who has been in the stands at a baseball game when a bat breaks and goes hurtling toward the players or the fans can envision the damage it could do.

TECO, along with the Forest Products Laboratory in Madison, Wisconsin, and other scientists and researchers from other universities, have come up with recommendations for Major League Baseball and the players' association to make bats stronger and safer.

Species type (did you know Barry Bonds popularized maple bats on his way to hitting his 756th home run in 2007 to break Hank Aaron's career record?), grain angle, and where the ball contacts the bat are all factors that can affect whether a bat may break into multiple pieces.

The researchers conducted various tests and analyses, including the inspection of 2,232 broken bats from the 2008 season, to come up with several findings and recommendations. They found that maple is three times more

likely to fail than ash, and maple bats with poor-quality slope of grain were four times more likely to break.

One recommendation was to require that straighter-grained wood be used. The grain pattern of a maple bat is harder to discern, so TECO researchers developed a simple gauge that can be used to read the grain angle of a finished bat. Bats with poor slope of grain can be diverted from major and minor league use.

For diffuse porous woods, contacting the ball on the face grain increases the stress needed to break the bat. Researches recommended rotating the manufacturer logo on the bat 90 degrees to achieve this change, as players typically swing with the logo up.

The slope-of-grain concern stood out, and the researches knew it was something they could address immediately to improve a bat and decrease the likelihood of it breaking into multiple pieces. "The 2009 season is the first step in limiting bat failures," Scott said. "We hope to make a big impact this year and even more of an impact after that."

The shape of the bat, moisture content, and how the wood is dried are all variables that will be studied from this summer's broken bats, with more recommendations for increased bat safety expected for the 2010 Major League Baseball season.

TECO is located in Sun Prairie, Wisconsin, and also employs former School instructor and researcher **Steve Verhey** (PhD 2002). He is the technical manager of TECO. Alumnus and former Outstanding Senior **Greg Dupuis** (BS 2001) is the certification supervisor for TECO.

The School of Forest Resources and Environmental Science newsletter is published to inform alumni and friends. Comments and information to share should be directed to Carrie Richards, editor (906-487-3148 or carrie@mtu.edu). Contributing writers: John Gagnon, Marcia Goodrich and Jennifer Donovan, University Marketing and Communications. Contributing photographer: Jill Witt, PhD candidate.