



FOREST RESOURCES & ENVIRONMENTAL SCIENCE

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MichiganTech

Greetings from Houghton

Well I asked for it, didn't I? I said, "We would love to hear from you." So I offered another T-shirt contest. "Send in your worst camp experience," I said. I was thinking that someone would have a funny story about getting lost in the woods or being sprayed by a skunk, but NO! What I got were unpublishable stories about inebriation, public urination, wrecking expensive lab equipment and "fond" memories of a certain retired, faculty member.

I loved the stories ...it's just that that's not what I was expecting. I hope that you feel better now that you have aired your story. Thanks to Tom, Andy, and Bill—you know who you are!

As for Winter Carnival this year, our team, Return of the Wheezers, came out of retirement after resting last year to take second in the Community Division. We're #2! We're #2! It just doesn't have the same ring, but all things considered, we had a very good time and we don't mind getting beat too much by a church group.

New this year, we entered a beard candidate—thanks to **Jim Schmierer**. We also built a one-nighter snow statue. It was actually more like a five-hourer, but it was decent for a first try. Next year we need more everything: more snow, more equipment, more food, more people!

These are the events we took first in: Banner, Human Dog Sled, Ice Bowling, Cross-Country Skiing, Downhill Skiing, and Ice Skating. You can see a full list of our events, participants, and pictures at www.forest.mtu.edu/alumni. Thanks to everyone who helped or cheered us on. Everyone is invited to join us next year and help us regain our first-place trophy.

Here is something else new: we have decided to hold our annual Honor Academy inductions in August in conjunction with our reunion events. It was decided that this was a better time of year for most people to travel. Our spring banquet will now focus primarily on the students—their achievements and accomplishments over the year. Our students are doing some great things, and we are pleased to honor them at the banquet.

In August for reunion, we will be honoring our classes of 1955 and 1980, who will be celebrating their fiftieth and twenty-fifth anniversaries. Is there anyone out there who would like to be a part of the planning? Please get in touch with me—I want to make it the celebration you want! Check out the calendar of events on the back cover of the newsletter to see the reunion dates and to see what else is coming up.

See you in August, if not before!

—Carrie Richards '84

Faculty Focus: Jim Pickens—Forest Modeler and Fisherman

From classroom to the woods, **Jim Pickens'** interests lie in management science, harvest scheduling, operations research, and mathematical models—capturing the most potential value in each tree.

Pickens earned his BS in biology from Eastern Montana College, which is now MSU-Billings. Moving diagonally across the U.S. to the University of Georgia, he received an MS in forest biometrics. After two years in Washington, DC, working with the Forest Service, helping to prepare long-term projections of



Hardwood buckers begin their training.

the nation's renewable resource situation, Pickens returned to Georgia to pursue his PhD. Two days after completing his coursework and preliminary examinations, he packed up and moved to Fort Collins, Colorado, where he worked with the Rocky Mountain Experiment Station, tackling their forest planning models and tools. This work served as the basis of Pickens's PhD dissertation, which was completed in 1985, shortly after his arrival at the School of Forest Resources and Environmental Science. Pickens and his family, after moving five times in ten years, were ready to stay for a while. That was twenty years ago. Pickens quickly discovered that this is a great place to fish—in any season!

Pickens teaches Forest Management and Forest Economics to undergraduates and Design and Analysis of Experiments at the graduate level. He oversees the Master of Forestry (MF) program, which was new in June and graduated its first student, **Christa Cherava**, in December. This program is a terminal professional degree, where good students with undergraduate degrees from other fields receive intensive forestry training to prepare them for a career change. The MF is primarily a coursework *Continued on page 2*

Research Review: Peter Laks—What do Houghton and Hawaii have in common?

Certainly not the weather! Actually, they do have at least one thing in common—research is being conducted by SFRES faculty at both locations. Over the last 19 years, Professor **Peter Laks** has been using field sites in Hawaii for research on the durability of wood-based building products. Basically, samples of wood-based materials are exposed to Hawaii's weather, and their performance is monitored over several years. Durability evaluations range from simple qualitative (visual) ratings to complex quantitative measurements of strength properties along with microscopic examination.

The wood-protection research group has more than ten thousand test specimens at the Hawaii field sites. The group also has field sites in Florida, Texas, Washington, Michigan, and British Columbia. Just keeping track of all these specimens is a major job. Some are exposed to decay fungi in the ground or on above-ground racks, while others are being attacked by the infamous Formosan subterranean termite (FST) in specialized test boxes.

This insect has had quite a bit of national press coverage over recent years as "the termite that is eating New Orleans." It was introduced into Louisiana *Continued on page 3*



Peg Gale '77

Message from the Dean

Dear alumni and friends—New faces, upcoming events, acknowledgement of the things we're doing well: Our school continues to flourish!

We have a new Recruitment, Outreach and Development Director, Stacy Cotey, who is quickly picking up on all our outreach and fundraising efforts. Read about her in her introduction on page 4. We are very happy to have her on board.

Our research efforts continue to be exceptional. The Ecosystem Science Center (ESC) and the Biotech Research Center (BRC) are excellent examples of the initiatives in research that our faculty have cultivated. The ESC's objectives are to foster ecosystem research and educate graduate and undergraduate students in the area of ecosystem science at Michigan Tech. More information is on the web at www.ecosystem.mtu.edu. The mission of the BRC is to promote education and research in the areas of molecular biology, biochemistry, genetics, genomics, bioinformatics and biotechnology for the benefit of society and the environment. More information is on the web at www.biotech.mtu.edu.

Also included in this newsletter is information about some of the recent research awards, funding and publications of our faculty and students. These attainments continue to place us in the top tier of forestry, ecology, and wood science/biotechnology universities.

Most important of all, we continue to excel at our teaching efforts. Great teaching and great faculty members are one of the things our alumni remember long after their graduations.

I am often reminded of teachers and students I have known and how they affected my life and my choices for the future. The recent passing of **Vern Johnson**, one of our former faculty members, in February, is one of those times. It reminds me of my education and how much Vern indirectly affected the choices I made. He mentored me through his teaching philosophies, how he related to people, and his actions in and out of his classes.

What Vern did was to show me I had the

potential to be whatever I wanted to be, especially in the profession of forestry. Vern imparted a professional "air" to my choices by making me confident I could function as a professional. There have been others who have influenced my professional life, but Vern got the ball rolling.

This memory of Vern comes back to me at interesting times—when I see one of our faculty talking with a student or group of students in the hallway; when I see a student working in a lab with a faculty member; when I see a group of students waiting for a van to take them out with one of our faculty into the field; when I get letters from our alumni saying how a class and a professor made them love their profession; and when I watch a faculty member introducing their graduate student at a seminar.

These teaching moments, in themselves, do not necessarily affect a student's future professional choices. And they do not always come naturally. Yet, they are part the equation that makes an effective and successful teacher. What is the key to effective, successful teaching? When I look at our current faculty members, I begin to see the characteristics that Vern had that initiated his influence on me—a passion for imparting knowledge to students, answering students' questions, making classes and conversations with students intellectually challenging, showing the applicability of what they are learning to everyday life, and new technologies to answer questions now and into the future.

Through their dedication to our students and to their profession, the School's faculty excel at teaching students to create the future.

Your special moments at Michigan Tech are always of interest to me, so please email me or just jot down some thoughts and mail them to me. I hope to see you all at our annual reunion in August. In particular, the class of 1955 will be celebrating its 50-year reunion, and the class of 1980, its 25-year reunion. Come celebrate with us; we would love to see you!

Margaret H. Gale

"...many forestry decisions must be made before the results of those decisions are known."

Pickens...(continued from page 1)

masters program, although an option for including a research component exists. There are four students who started the program this year and who will receive their degrees after camp next fall. Imagine squeezing nearly all the undergraduate forestry curriculum into three semesters!

In the past, Pickens focused his research on theoretical mathematical issues in harvest scheduling models, centering on the fact that many forestry decisions must be made before the results of those decisions are known. This addresses several types of random data used in planning models including random growth and

yield information and uncertain future timber prices. Early efforts concentrated on understanding the impacts of this uncertainty on the resulting decisions, while later efforts adapted the models to manage the risks associated with the unknown future information.

Pickens' focus has changed now, with the main emphasis on transferring the lessons learned from optimal bucking research, conducted by Pickens and graduate students **Andrew Lee** and **Scott Throop**, to the people who need it most—log buckers working in the woods. This team estimates that field log buckers often recover only about two-thirds to three-quarters of the potential value when cutting

Continued on page 3

Laks...(continued from page 1)

after World War II and has now invaded much of the South. Developing and testing building materials for resistance to this termite, and fungal decay in general, has generated quite a number of research projects for Laks' group.

Another major research area is the development of wood composites for exterior use. Durability research is being conducted with materials such as oriented strandboard exterior siding, termite-resistant wood I-joists, and wood/plastic composite decking. Laks has worked with all of the major forest products companies in the United States and most of the chemical companies with biocide business groups.

"We get teased quite a bit for doing research work in Hawaii, and it doesn't help that we tend to schedule trips there over the winter!" Laks said. But it is serious work. The research sites are definitely not on the beach and are chosen for their high rainfall and warm temperatures. Laks commented, "One of our sites gets over 180 inches of rain a year. It is almost always raining, and the mosquitoes can be worse than in the U.P." Definitely not the stuff of dream vacations to Hawaii!

"Many of our research sponsors want to work with us at these field sites; after all it's Hawaii, right? They are quickly introduced to the realities—for example, in November 2004 one of our sites experienced more than fifteen inches of rain in just over six hours. We worked right through it, as we always do!"

Other people in the School working with Laks on these projects are **Glenn Larkin**, **Dana Richter**, **Erik Keranen**, **Bill Yrjana**, and many graduate and undergraduate students. The Wood Protection Group website can be found at www.forest.mtu.edu/research/woodprotection/home.html. ■



Peter Laks inspects some of his field plots in Hawaii. Not shown: the fire ants!

Tsai Leads Team to Sequence First Tree Genome

A team of Michigan Tech researchers, led by Associate Professor and Director of the Biotech Research Center **Chung-Jui Tsai**, has played a key role in an international effort to sequence the first tree genome.

The team was part of a consortium that has deciphered the genetic code of the black cottonwood or *Populus trichocarpa*, a fast-growing, commercially useful species. In addition to furthering basic science, determining the black cottonwood's genetic blueprint could give scientists the tools to develop faster-growing trees.

Fast-growing trees could help buffer global warming by mopping up more of the greenhouse gas carbon dioxide, a process known as carbon sequestration. This natural process suggests opportunities to clean up the air by engineering trees so that they more effectively shuttle and store carbon below ground in their roots and the soil.

The MTU effort was made possible by a grant from the Michigan Life Sciences Corridor, which provided the microarray equipment used to validate the expressed sequence tags (EST). The co-principal investigators on the project are Research Assistant Professor **Scott Harding** and Associate Professor **Shekhar Joshi**. Others involved were graduate student **Priya Ranjan**, Research Scientist **Hongying Jiang** and former postdoctoral scientist **Yu-Ying Kao**. Their work was published in the August issue of the journal, "Planta."

Several universities and national labs participated in mapping the *Populus trichocarpa* genome. The lead members of this international consortium were the U.S. Department of Energy, Genome Canada, and the Umea Plant Science Centre in Sweden. ■

Pickens...(continued from page 2)

hardwood stems into logs.

The primary reason for these large losses is associated with a lack of training that is needed to do a very difficult job. Bucking hardwood logs may seem like a straightforward task, but the complex grading rules, difficulty of identifying defects, and a lack of effective rules-of-thumb make it very difficult to capture all of the potential value in a stem.

A recent study demonstrated that a training session lasting a few days could reduce losses by about 50 percent. The training includes coverage of hardwood log defects and their internal implications for wood quality, an overview of

grading and scaling, and rules-of-thumb that produce logs of higher quality and value. Jim is currently working with the Wood Education Resource Center (WERC) of the Forest Service in Princeton, WV to transfer his training approach and tools throughout the eastern hardwood region. An overview of some of this work can be seen at www.forest.mtu.edu/research/hwbuck/. The site includes a defect identification and implications trainer at www.forest.mtu.edu/research/hardwood_defects.

Though a lot of things have changed in the last 20 years: Pickens has stayed in one place, and he still loves to fish! ■

Michigan Tech researchers have played a key role in an international effort to sequence the first tree genome.

Mushrooms in the Mountains

Research Scientist **Dana Richter** has been studying mushrooms on the 20,000-acre Huron Mountain Club property along the south shore of Lake Superior for the past 10 years, concentrating on the 7,000 acres of old growth forest. His article, "Rare and Unusual Fungi (*Basidiomycota*) of the Huron Mountains, Marquette County, Michigan," builds on the works of the world famous late Dr. Alexander H. Smith of the University of Michigan, who collected extensively in the Huron Mountains in the 1960s and 1970s and named many new species from the area.



A rare mushroom from the Huron Mountains, the silky *Volvariella*, on a maple log where it causes a white-rot decay. (Photo by D. Richter)

"It's an area of ancient mountains with a unique geology," Richter says. "There are no vehicles or disturbance, so the forest is very quiet and dark. This is a unique opportunity. It makes quite a special field research station," Richter said.

One of the 23 rare mushrooms found there is *Laetiporus huroniensis*, a ruffled, bright yellow-and-orange sulfur-shelf mushroom usually found on oak. It was recently named a separate species, based in part upon Richter's collection; this one decays hemlock. One of his favorites is the American Matsutake, *Tricholoma magnivalare*, which he describes as "a robust, firm, cream-colored mushroom with a sharp fragrance." Says Richter, "It is a gourmet mushroom used in Japanese cuisine; it's very uncommon here." Another is a

maple brown rot, *Volvariella bombycina*, a mushroom so rare that Richter himself has only found it twice in all his years of collecting. With its velvety, alabaster caps and stems growing out of light brown, scalloped cups, it is, as he says, "strikingly beautiful."

Along with the School of Forest Resources and Environmental Science, Richter's work is made possible by the Huron Mountain Wildlife Foundation, which facilitates scientific research within the Huron Mountain Club. "Yes," he says, "it is an extraordinary place to study these fascinating fungi. They are so diverse in their textures and colors. It's truly a wonderful world." ■

Blair Orr Honored for Service to Peace Corps



"Professor Orr is truly an incredible, tireless, and supportive advisor."

Blair Orr (associate professor) received a Returned Peace Corps Volunteer Recognition Award, Peace Corps Director Gaddi H. Vasquez announced.

Orr received the Peace Corps' individual award for returned volunteer service for his contributions in creating educational opportunities for returned volunteers. In 1995, Orr developed the first Master's International program at Michigan Tech and is currently the program's coordinator. He has also helped initiate two other Master's International programs at MTU and helped establish the university's Fellows/USA program.

As coordinator of the forestry Master's International program, Orr offers preparation and support to his students. One returned volunteer commented, "Professor Orr is truly an incredible, tireless, and supportive advisor. He is one of the main reasons I feel my program was fulfilling, challenging and successful."

Blair Orr

Orr, a Peace Corps volunteer himself, served from 1978 to 1981 in Lesotho, where he worked on community woodlot projects. Upon his return to the U.S., he received his master's degree in economics and his PhD in Forest Economics from the University of Wisconsin at Madison.

Since 1961, more than 171,000 volunteers have served in the Peace Corps, working in such diverse fields as education, health, HIV/AIDS education and prevention, information technology, business development, the environment and agriculture. Peace Corps volunteers must be U.S. citizens and at least 18 years of age. Peace Corps service is a two-year commitment. Visit www.peacecorps.mtu.edu for more information on the Master's International programs. ■

Development, Outreach and Recruiting

Stacy Cotey, Working with You!

It is great to be joining the School of Forest Resources and Environmental Science team, and I look forward to working with past, present, and future students as director of recruitment, outreach, and development.

My background is in natural resources and environmental education. In my previous position, I developed an after-school and summer-enrichment program at Lake Linden-Hubbell Schools. Before moving to the Copper Country, I was a watershed project manager in Dickinson County, where I formed partnerships with more than 60 stakeholders. I have taught biology and natural resource courses at Ridgewater College, Northern Michigan University, Upward Bound, and Clear Lake Environmental Center. Throughout my career, I have worked on wildlife and ecology studies in Pictured Rocks National Lakeshore, Copper Country State Forest, Hiawatha

National Forest, Chequamegon National Forest, Isle Royale National Park and Voyageurs National Park.

I plan to use my experiences and skills to increase awareness of the School's programs and hope you will participate in this effort with me. Future articles in the newsletter will be devoted to updating you on our progress. Please feel free to give me a call or stop in to say hi. I would love to hear about your experiences here at Tech and beyond.

Stacy Cotey
906-487-2417
srcotey@mtu.edu



Stacy Cotey

Researchers Seek Balance between Growth and Fitness

Michigan Tech researchers have been awarded a \$2.1 million grant to study a critical mechanism for trees' survival that may also stunt their growth.

Since the time of Hippocrates, people have chewed on willow leaves and bark to alleviate pain. About 2,000 years later, they began manufacturing aspirin from a compound extracted from the tree. As it turns out, that family of compounds, called phenolic glycosides, also plays a key role in plant health, making many plants tough and disease-resistant.

However, plants spend a lot of energy producing phenolic glycosides, energy they could use to grow bigger. In nature, that's not a problem. But, where trees are grown for lumber and pulp, size does matter.

A Plant Genome Research grant from the National Science Foundation allows a team of researchers, led by Associate Professor **Chung-Jui Tsai**, to investigate the genetic underpinnings of these compounds and how they relate to plant growth.

"Our goal isn't to produce new trees," said Tsai, director of the Biotechnology Research Center. "It's to identify the genes that control the balance between growth and fitness."

The team will study species and hybrids within the *Populus* genus, which includes quaking aspen and black cottonwood. Like their cousin the willow, these species are unusually high in phenolic glycosides and yet, are among the fastest-growing trees in nature. Researchers suspect that they have somehow evolved a way to compensate for the high energy cost of phenolic glycoside production.

And because the *Populus* genome was recently sequenced, the researchers have the DNA blueprint they need to begin fishing out the pertinent genes.

They will also examine whether some hybrids can turn on production of the protective compounds when they are under stress and turn off production when the stress is eliminated. "Ideally, you'd want 'smart trees' that produce phenolic glycosides only when and where they are needed," said Research Assistant Professor **Scott Harding**, a co-principal investigator on the project. ■



Other co-principal investigators on the project are former Research Scientist **Hongying Jiang**; Associate Professor **Shuanglin Zhang** (Math) and **Mark Davis** of (DOE-NREL and an adjunct professor of SFRES) pictured here with **Scott Harding** conducting non-destructive leaf chemistry analysis in the greenhouse.

Awards and Recognitions

Research Scientist II **Dana L. Richter** was appointed to the Keweenaw Point Advisory Committee by the Michigan DNR to help develop management guidelines for the recently acquired 6,275 acres at the tip of the Keweenaw Peninsula. The committee is made up of 15 members representing diverse interest groups in the U.P. and will provide recommendations regarding camping, trails, forestry, and motorized and non-motorized recreation uses for the new state lands.

Associate Professor **Chandrashekhkar Joshi** co-authored a paper with his former graduate student Anita Samuga in the journal, "Gene," Volume 334, titled "Expression Patterns of Two Primary Cell Wall-Related Cellulose Synthase cDNAs, PtrCesA6 and PtrCesA7 from Aspen." He also published an invited review article, "Genomics of Cellulose Biosynthesis in Poplars," in the journal, "New Phytologist," volume 164.

Recent Funding

Professor **Chung-Jui Tsai** has received \$12,500 from the USDA Cooperative State Research, Education, and Extension Service for "Acquisition of a Real-Time PCR System for Quantitative Gene Expression Analysis in Forest Genomics and Biotechnology Research."

Professor **Chung-Jui Tsai** received a \$564,803 grant, the first-year increment of a four-year project totaling \$2,114,091 from the National Science Foundation for her research titled "A Functional Genomics Approach to Investigate Regulation

of Phenolic Glycoside Metabolism in *Populus*."

Assistant Professor **Andrew Storer** has received a \$45,000 grant for three years from the United States Department of the Interior, National Park Service for his research titled "A Predictive Model for Exotic Plant Species for the Great Lakes Network of the U.S. National Park Service."

Associate Professor **Chandrashekhkar P. Joshi** has received a \$300,000, three-year grant from the USDA Cooperative State Research, Education, and Extension Service for his project, "Genetic Engineering of Cellulose Biosynthesis in Hardwood and Softwood Trees."

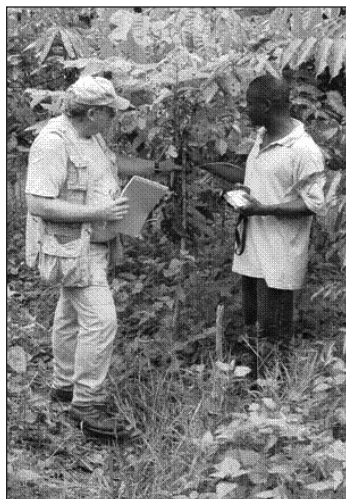
Assistant Professor **Victor Busov** has received a \$167,466 research grant for a five-year project from Oregon State University for "Field Evaluation of Semi-Dwarfism Transgenes for Biosafety of Transgenic Woody Plants," a potential three-year project totaling \$320,000.

Professor **Kurt Pregitzer** has received a renewal of the DOE project, "Impacts of Elevated CO₂ and O₃ alone and in combination, on the structure and functioning of a northern forest ecosystem: Operating the Aspen FACE user facility," in the amount of \$5,197,336 for three years. **Dave Karnosky** is a Co-PI on this award. In addition, researchers from the Canadian Forest Service, Forestry Sciences Lab in Rhineland, Brookhaven National Lab, New York, the University of Wisconsin, and the University of Michigan also were involved in this funding renewal.

Two School Scientists to Receive International Awards



Kurt Pregitzer and Eugénie Euskirchen discuss their research and the role of forests in carbon cycling.



Dave Karnosky works in the field with a student.

Thirty years ago, when **David Karnosky** began documenting the harmful effects of ozone on forests, not everyone believed him. Now, however, his groundbreaking research is accepted as proof that this industrial pollutant can seriously impact many species of trees and forest ecosystems. For this—and much more—he has been chosen by the International Union of Forest Research Organizations to receive its Scientific Achievement Award.

IUFRO presents a maximum of ten awards once every five years at its World Congress, scheduled for August in Brisbane, Australia.

MTU President **Glenn Mroz**, who nominated David for the award, also remarked on David's capacity to build cooperation. "I believe that Dr. Karnosky's enthusiasm for working across borders is a distinction that has served the international forest research community well," he said.

David came to Michigan Tech in 1983, and, among his many other honors, earned the university's Research Award in 1993. He has authored or co-authored approximately 300 publications and edited four books. In addition to publishing in top-tier journals such as *Nature* and *Global Change Biology*, he has been effective in disseminating science to the general public; stories on his work have appeared in the *New York Times* and on ABC.com and *National Geographic Today*.

"Dr. Karnosky has exemplified the IUFRO ideals through the openness of his laboratory and his willingness to host visiting scientists from around the world," said Provost and Vice President for Research **David Reed**, who received a Scientific Achievement Award in 2000. "I can think of very few scientists that have the scientific credentials and who exemplify the IUFRO ideas to a greater extent than Dr. Karnosky."

Another affiliate of the school will also be receiving IUFRO awards this year. **Eugénie Euskirchen** will receive an Outstanding Doctoral Research Award for work leading to her PhD in Forest Science from the International Union of Forest Research Organizations. IUFRO makes Outstanding Doctoral Research Awards once every five years, and Euskirchen is one of seven recipients.

She is being honored for her work on the role of forests in carbon cycling. "There's tremendous interest in understanding the fate of atmospheric carbon because we are polluting the atmosphere with carbon dioxide by burning fossil fuels," said Professor **Kurt Pregitzer**, who was Euskirchen's co-advisor, along with former MTU faculty member Jiquan Chen.

In her thesis, she investigated how the age of forests determines the amount of carbon they withdraw from the atmosphere. "Middle-aged forests store carbon at a faster rate than older forests, while forests that have recently been disturbed, as by logging or wildfire, can actually lose carbon to the atmosphere," Pregitzer explained. Pregitzer and Euskirchen co-authored a paper based on her doctoral research, "Carbon Cycling and Storage in World Forests: Biome Patterns Related to Forest Age." It was published last year in *Global Change Biology*.

Pregitzer and Dave Reed, MTU's vice president for research, nominated Euskirchen for the IUFRO award. It will be presented in August at the organization's annual World Conference, in Brisbane, Australia. She will receive a medallion, a scroll, and \$1,500.

Now a postdoctoral scientist at the University of Alaska Fairbanks, Euskirchen is modeling the effects of soil temperature changes on the length of the growing season, productivity, and carbon sequestration in the Arctic.

"Eugénie's work was world-class," Pregitzer said. "And now she will be a world-class ambassador for Michigan Tech." ■

Faculty Publications

In the spring and fall issues of the school's newsletter, a list of Faculty, Staff and Researchers' publications are printed. Names in **bold** are scientist affiliated with the school. These publications appeared in print from October 1, 2004 to March 1, 2005.

Jeong M.L., Jiang H., Chen H.-S., **Tsai C.-J.**, **Harding S.A.** 2004 Metabolic profiling the sink to source transition in developing leaves of quaking aspen (*Populus tremuloides*). *Plant Physiology* 136: 3364-3375.

Jiang H., Deng Y., Chen H.-S., Tao L., Sha Q., Chen J., **Tsai C.-J.**, Zhang S. 2004 Joint analysis of two microarray gene-expression data sets to select lung adenocarcinoma marker genes. *BMC Bioinformatics* 5: 81.

Kalluri U. and **C.P. Joshi**: Differential expression of two cellulose synthase genes associated with primary wall and secondary wall development in aspen trees. *Planta* 220: 47-55, 2004.

Laks, P.E. 2004. Protection of Wood-Based Composites. Proceedings of the American Wood-Preservers' Association. Selma, Alabama. Volume 100, pp.78-82.

Marshall, JM, RA Burks, and **A.J. Storer**. 2004. First host record for *Pteromalus cardui* (Hymenoptera: Pteromalidae) on *Urophora quadrifasciata* (Diptera: Tephritidae) in spotted knapweed (*Centaurea biebersteinii*, Asteraceae) in Michigan, USA. *Entomological News* 115(5):273-278.

Ranjan P., Kao Y.-Y., Jiang H., **Joshi C.P.**, **Harding S.A.**, **Tsai C.-J.** 2004 Suppression subtractive hybridization-mediated transcriptome analysis from multiple tissues of aspen (*Populus tremuloides*) trees altered in phenylpropanoid metabolism. *Planta* 219: 694-704.

Richter, D.L., **P.E. Laks**, K.M. Larsen, and A.L. Stephens. 2005. Comparison of isolates and strains within the brown rot fungus genus *Gloeophyllum* using the soil block decay method. *Forest Products Journal*. 55(1):72-75.

Richter, Dana L. 2004. Rare and unusual fungi (Basidiomycota) of the Huron Mountains, Marquette Co. Michigan. *Michigan Botanist*, Vol. 43 (2):65-80. The paper describes 23 rare species of mushrooms found during eight years of study and collecting in the Huron Mountains.

Saunders, S.C., J. Chen, T.D. Drummer, E.J. Gustafson, and **K.D. Brosofske**. 2005. Identifying scales of pattern in ecological data: a comparison of lacunarity, spectral and wavelet analyses. *Ecological Complexity* 2:87-105.

Storer, A.J., D.L. Wood and T.R. Gordon. 2004. Twig beetles, *Pityophthorus* spp. (Coleoptera: Scolytidae), as vectors of the pitch canker pathogen in California. *The Canadian Entomologist*. 136: 685-693.

Tillman, J.A., F. Lu, L.M. Goddard, Z.R. Donaldson, S.C. Dwinell, C. Tittiger, G.M. Hall, **A.J. Storer**, G.J. Blomquist and S.J. Seybold. 2004. Juvenile hormone regulates de novo isoprenoid aggregation pheromone biosynthesis in pine bark beetles, *Ips* spp. (Coleoptera: Scolytidae), through transitional control of HMG-CoA reductase. *Journal of Chemical Ecology*: 30 (12): 2459-2494.

Tsai, C.-J., Davis, M.F., Zhang D. and Chiang V.L. 2004 Genetic augmentation of syringyl lignin in low-lignin aspen trees. In: 2004 TAPPI Paper Summit and Spring Technical and International Environmental Conference. Atlanta, GA. Paper no. PS0438.

Tsai C.-J. and **Hubscher S.L.** 2004 Cryopreservation in *Populus* functional genomics. *New Phytologist* 164: 73-81.

Congratulations to former dean, Ed Frayer, who shot a hole-in-one in February in Florida!

1963

Floyd Roberts, Jr. retired in 2000 after 20 years as the city of Mankato's Parks and Forestry Superintendent. Last fall, he was honored by the city council and mayor. The Floyd Roberts, Jr. Pavilion in Land of Memories Park was named in his honor. Congratulations, Floyd!

1970

Louis Best was ordained in Dallas in February and is finalizing his fundraising support in pledges and money and then moving to Killeen, Texas to "set up shop." He hopes to visit Houghton sometime later in the spring or early summer to, "See Gene and all of you."

1980

Doug Jones is the ranger on the Clinch Ranger District of the George Washington and Jefferson National Forest in Wise, Virginia. Before accepting this position in April of 2004, he was the Timber Program Manager on the Manti-La Sal National forest in Price, Utah. He now lives in Big Stone Gap, Virginia.

1992

Todd and Tonja (1993) **Opperman** and son Zander have moved to Christchurch, New Zealand for one year where Tonja was offered a temporary job in fire research and Todd will do forestry field work.

1994

Jessica (Turino) and Wes Windover stopped at the school last summer to visit. Jessica is with Weyerhaeuser in Grayling, and Wes is the procurement manager at Biewer Sawmill in McBain.

They have a daughter, Elise, who is three, and a son, Caden, who is one year.

Amy Collick finished her PhD research in northern Ethiopia and has returned to Ethiopia to work at a university for 10 months. She is working on integrated watershed management and development of Lake Tana, the largest lake in Ethiopia. She will also be teaching a course or two in water resources and hydrology. Amy hopes to continue her work in Africa after she completes her schooling.

Patrick Orent and his wife, Jodi, are the proud parents of a one-year-old son, Carter Edward. Pat took a position with Potlatch in Cook, Minnesota and started last June. When Potlatch sold its three OSB mills to Ainsworth Lumber, Pat was retained by Ainsworth. He and Jodi bought a house in Eveleth, about 45 minutes north of Duluth.

1997

J. Christopher Nicolson (MS) works for a mining supply company as the field engineer and area manager in Duluth, Minnesota. He and his wife Allison have three children: a 9-year-old girl, Kaitlin, a 5-year-old boy, Benjamin, and a 1-year-old son, Aaron. They have lived in Duluth for the past seven years.

2000

Sheila Madahbee started a new position in January as forester/analyst for Ontario's State of the Forest Report project with the forest management branch of the Ontario Ministry of Natural Resources (OMNR) in Sault Ste Marie, Ontario.

2001

Heather (Shaski) and Jason (2000) Gagnon sent an update for the newsletter on the new addition to their family. Jason and Heather welcomed their first son,

Braden Blade Gagnon, on Jan. 7, 2005. He weighed 5 pounds, 4 ounces, was 18 inches long, and "he is perfect!" The family is settled in Rapid River where Jason is a forester for Upper Michigan Land Management, and he loves it. Heather is an RN at Tendercare nursing home in Munising, and she also loves her job.

Jamie Sheahan accepted a position as the Watershed Coordinator for the Yamhill Basin Council, based out of McMinnville, Oregon. McMinnville is approximately 40 miles southwest of Portland, nestled in a rural community based on agriculture, vineyards, and timber. Jamie commented, "My Applied Ecology and Environmental Sciences degree has provided me with a great deal of knowledge, skills, and understanding that gave me a competitive advantage for this position."

Kristen (Rahn) Thrall (MS) has been hired by the Recreation Solutions, a USDA Forest Service Enterprise team located in Troy, Montana.

2002

Thomas Wyse finished up his master's degree at Ohio State University and took a forester position with the Washington DNR in the northwest part of the state. Tom says, "Forestry out here seems less interesting than in the Upper Midwest—clear-cut and replant at 60 years! But, it is fine country with great hiking, cycling, fishing, skiing, kayaking, and hot-springing!"

Susan (Fox) Metcalfe (MS) and **Bryce Metcalfe** have a son! Parker Fox Metcalfe was born November 12, 2004 at 5:14 am. He weighs 7 pounds, 5 ounces and was 20 inches. Susan says, "He's really sweet and cute."

2003

C. Michael (MS) and **Anna Downs** had twins! Born on September 6, 2004, a daughter named Elara and a son named Leo.

Marla Rader is "in country" in Ecuador serving with the Peace Corps since February. As of publishing time, she was getting training. She is working with a habitat conservation program. She is "very excited," and she said, "This country is absolutely beautiful."

2004

Rebekka Federer is in Seward, Alaska and is pursuing some employment opportunities. She has some good prospects and is optimistic. She commented that she has gotten some good leads by volunteering first.

Vern Johnson, professor emeritus, passed away in January at the age of 89. He taught Forest Finance and Summer Camp for many years. Vern was an expert at combining a no-nonsense attitude toward learning with a gentle respect for his students. He also had a wonderful sense of humor. Dean **Peg Gale** remembers that Vern hired her as an assistant for Summer Camp when most faculty didn't want a female teaching forestry (and questioned him on it!). He believed very strongly that the individual made the difference, not the gender of that individual. Peg commented, "He was a great one in my book! He will be missed by a lot of people."



Vern Johnson in his teaching days.

Glenn Mroz (left) and Gene Hesterberg (right) present Vern with his Honor Academy plaque in 2000.

Unraveling the Mystery

"We are immersed," said Associate Professor **Chandrashekar (Shekhar) Joshi**, "in a sea of cellulose. It's like air. We are surrounded by it, but we are hardly aware of it. It's in furniture, paper, clothes, film, paint, medicine . . ."

Not to mention the billions of tons of cellulose stored in trees. "It's the number one organic material in the world, and plants have been making it for a very long time," says Shekhar, "and we still don't know how plants make it."

Shekhar, a member of the Biotech Research Center is unraveling that mystery with a \$584,000 National Science Foundation's Early Career Award. And with a second, \$300,000 grant from the U.S. Department of Agriculture, he will explore how to develop trees that produce better quality cellulose in the woody tissues, which would be a boon for the forest products industry.

Shekhar's research team has already isolated three enzymes needed to build cellulose in aspen. They are determining what roles these enzymes play with the aim

of growing trees that produce more cellulose in their trunks and less in their leaves. Fewer trees will be needed to produce the same amount of, say, newsprint, while saving on energy and other production costs. In addition, the amount of toxic chemicals needed to extract cellulose from wood pulp would be reduced.

"Since cellulose fibers are tightly interwoven with human civilization, this could translate into substantial benefits to our society and forest product industries worldwide," Shekhar said.



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Reunion	August 2005

