

## LOFERSKI AND WOESTE UPDATE DECK SAFETY REGULATIONS

Within the United States, millions of homes are equipped with exterior decks and balconies made from treated wood products. Although decks and balconies frequently are the preferred location for a variety of enjoyable outdoor activities, many accidents also occur on decks and balconies causing severe injuries and fatalities.

In an effort to improve deck safety, wood science and forest products professor Joe Loferski along with wood science and forest products adjunct professor and biological systems engineering professor emeritus Frank Woeste have been conducting research for nearly six years on the structural engineering of decks and balconies. Their research and subsequent recommendations have directly led to changes in the Virginia Uniform Statewide Building Code.

Loferski and Woeste have identified two major points of failure for decks and balconies. Decks commonly fail due to the connection between the deck and the

house, which typically causes a sudden and total collapse of the deck. Research has shown that many cases of deck collapse occur at loads that are much smaller than what the design should have supported. Loferski pointed out that, "If a deck is designed and constructed to carry the intended loads, very few failures would occur. Decks can be built to handle many people, but past design and construction standards weren't always adequate."

Until recently, building codes have offered little guidance on how to produce connections that are capable of safely supporting the deck's design load. By reconstructing various types of deck-to-house connections in the college's Wood Engineering Laboratory at the Brooks Forest Products Center, Loferski and Woeste were able to measure the load needed to break the connections. They also identified safe connections using bolts and lag screws for a variety of joist spans. The Virginia Building Code has recently adopted new standards based on the results of Loferski's and Woeste's testing.



Wood science professor Joe Loferski and his engineering research partner Frank Woeste offer short courses in deck safety to building inspectors at the college's Brooks Forest Products Center.

An even safer option than using bolts and lag screws to connect the deck to the house, is using what Loferski called "a freestanding deck," which uses columns near the house as well as away from the house, so that the bulk of the deck's load is transferred directly through the columns to the ground, instead of through the deck-to-house connection.

The second major area of concern in deck safety identified by Loferski and Woeste is the deck guardrail system. The building code requirement for a residential deck guardrail is 200 pounds of force applied 36 inches above the deck's surface in any direction. "We tested numerous commonly used post-to-deck connection designs and didn't find any that could safely carry the design load," stated Loferski.



Critical connections along the underside of the deck

After months of research, the two deck researchers developed a connection that uses a hot-dipped, galvanized steel connector to attach the post to the deck. These connections were the only ones that were strong enough to carry the required loads. (cont. pg. 2, DECK SAFETY)



Picket spacing no wider than four inches prevents falling and choking hazards.

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Circled in red is the deck-to-house connection, which is a common point of failure for many decks.

### WHAT CAN HOMEOWNERS DO TO DETERMINE IF THEIR DECK IS SAFE?

Determining whether or not a deck is safe is very complex and involves many factors. Wood science and forest products professor Joe Loferski recommends that in many cases a qualified inspector should be used. The local building inspection department can be contacted to arrange an inspection. Some things to examine in any inspection include:

- Wood species and condition: Approved preservative pressure treated wood should be used for the structural components of the deck. Building code approved heartwood of naturally durable wood species (redwood, cedars, and black locust) can also be used. If any decay is found, the deck components and possibly the entire deck should be replaced since decayed wood is extremely weak and unpredictable.
- Connections: All structural connections should be inspected for proper size and spacing of fasteners. Nails alone should not be used to attach a deck or balcony to a house because they are simply not strong enough. Use fastener schedules found in the Virginia Building Code for bolts and lag screws. Critical connections include deck-to-house, girder-to-column, post-to-deck, rail-to-post, and picket-to-rail.
- Guardrails should be at least 36 inches high above the deck surface and should be able to safely resist 200 pounds of force applied 36 inches above the surface. It is not useful to simply wiggle a deck guardrail to determine if it safe. The entire guardrail system must be evaluated to determine if each and every connection is adequate.
- The picket spacing should be no wider than four inches to keep children from falling through the guardrail.

- A guardrail is required if the deck is higher than 30 inches above the ground.
- Notched guardrail posts are not safe and can break at the notch with little warning. Surprisingly, notched posts are very common and are found on many decks, but they are very weak when horizontal loads are applied to the top of the rail.
- Condition of fasteners: Corrosion of metal fasteners is another possible problem. Some preservative chemicals have been found to be highly corrosive to steel and aluminum. Aluminum flashing, which was commonly used, should not be used in contact with the new preservative chemicals. Steel fasteners should be hot-dipped galvanized or 316 stainless steel.
- Steps should have a graspable handrail.

Other inspection points should also be examined and can be found in the book, *A Manual for the Inspection of Residential Decks and Balconies*, written by former master's student in biological systems engineering Cheryl Anderson, under the guidance of Loferski and wood science and forest products adjunct professor and biological systems engineering professor emeritus Frank Woeste.



The cover of *A Manual for the Inspection of Residential Decks and Balconies*, written by former biological systems engineering graduate student Cheryl Anderson under the guidance of Loferski and Woeste.



VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

## WoodLINKS USA ELECTS WINISTORFER AS PRESIDENT



Paul Winistorfer, department head of wood science and forest products, has been elected president of WoodLINKS USA effective January 2006. WoodLINKS is an educational programming effort in modern wood manufacturing systems targeted at high schools, technical schools, and community colleges in the United States.

WoodLINKS was started in the U.S. by a group of industry and association representatives as a method to build a better workforce for the U.S. wood industry. Supported by enrollment fees and sponsorship from local industry along with significant support of major

U.S. wood industry trade associations, WoodLINKS now is present in over 75 schools in the U.S.—reaching thousands of young people with a modern and exciting curriculum in wood and wood processing.

Winistorfer will serve as president for two years, leading development efforts and relationships with supporting and sponsoring industry and associations. He said, “The success of these local grass-roots efforts really hinges on the local teacher and the support of the local industry to bring resources to bear on the educational effort. What these teachers are achieving is significant. There is a level of excitement I’ve not seen across the sector at this level ever before.”

Winistorfer added, “WoodLINKS could become the best example of a bottom-up programming effort for the wood industry – something we’ve never had. While reaching young people with skills and knowledge that enable them to enter the workforce directly, I hope WoodLINKS will become a transformative bridge that creates higher education opportunities for many of the WoodLINKS students.”

Hoping to establish several WoodLINKS sites in Virginia in the coming year, Winistorfer may be reached at (540) 231- 8853 if you want to learn more about WoodLINKS, its mission, and educational platform for the wood industry.



## ROMAN KEYNOTE SPEAKER AT CHEMICAL MEETING

Maren Roman, assistant professor of wood science and forest products, delivered the keynote lecture on “Cellulose Nanocrystals: From Discovery to Application” at the joint meeting of the Northeast Tennessee Local Section and the Cellulose and Renewable Materials Division of the American Chemical Society, held in November at the Eastman Lodge in Kingsport, Tenn.

Cellulose nanocrystals, Roman’s research expertise, are an emerging type of bio-based nanoparticles with great potential in biomedical applications. Roman was asked to present the current state of knowledge on preparation methods and properties of the nanoparticles and to discuss potential applications in various fields. The dinner meeting was attended by academic and industrial scientists of the Tennessee Tri-Cities area.

Roman joined the Department of Wood Science and Forest Products in the fall of 2004. She earned her Ph.D. in polymer chemistry from Syracuse (SUNY) in 2003.

## 10 P.M. CLASS AT VIRGINIA TECH MET 10 A.M. NEXT DAY IN TAIWAN

Both English and Mandarin developed over thousands of years, but the products of that development are two basically very different languages. Personal competence in scientific communication in both Mandarin and English is rare. Consequently, the emergence of English as the international lingua franca in science has left many Chinese scientists isolated from the world’s scientific mainstream when they have much to contribute, and others have much to learn.

When Bob Youngs, now a “retired” professor of wood science and forest products, was introduced to scientists and universities in Taiwan in the course of his work in international forestry, his background as a researcher, research administrator, teacher, and editor, all with a strong interest in professional scientific writing, was noted.

During his service as editor of the scientific journal *Wood and Fiber Science* he had to reject many manuscripts by Chinese authors, not because of scientific deficiencies, but rather because of poor English. That meant a loss at both ends – America’s loss to learn about and build on scientific advances by Chinese scientists, and their inability to publish their work in English language journals and become recognized as part of the international scientific community. This led to Youngs’ study of Mandarin and his work with a Taiwanese colleague, Professor Hsiu Hwa Wang, to develop a course, *Scientific Writing in English for Chinese Scientists* at the National Pingtung University of Science and Technology (NPUST) in southern Taiwan.

Youngs’ next question was how to conduct such a course while continuing his activities in Blacksburg. Electronic communication provided the answer. With the assistance of Virginia Tech’s Institute for Distance and Distributed Learning (IDDL), the English Language Institute (ELI), the Department of English, and others concerned with scientific writing in English, Youngs delivered a course electronically to a classroom at NPUST.

The course has been presented three times. Those typically taking the course have been about 45 graduate students in many diverse departments of NPUST – veterinary medicine, plant industry,



*Youngs with his wife Esther at the International Peace Garden that they developed and care for at the Cranwell International Center on campus.*

business management, mechanical engineering, forestry, wood science, education, animal science, and others. Youngs and Wang supplemented the course with a book in English and Chinese entitled *Scientific Writing in English for Chinese Authors*. During a visit last year by Youngs to NPUST, several of the faculty sat with him for an intensive three-week course to help them with the students.

Youngs kept up with the course on the Internet, including reviewing the homework and explaining problem areas.

Thanks to IDDL and CentraOne, Youngs could talk occasionally with students in the class and present some of the lectures in real time, even though a 10 a.m. class at NPUST meets at 10 p.m. the previous day in Blacksburg.

Youngs stated that, “The world becomes smaller, more interdependent, and cooperative as a result of a program like this. I find it a fascinating way to keep an international perspective in my retirement.”

## WOOD SCIENCE CONTINUES EXCHANGE PROGRAM



*Niva (left) and Kline*

This fall wood science and forest products professor Earl Kline mentored his third Swedish exchange student in as many years. Simon Niva arrived in Blacksburg in early August and spent the fall semester taking courses that will be applied toward a master’s degree at his home school of Lulea University.

When asked about his experience at Virginia Tech, Niva noted, “Time has been flying. A small-town boy from Sweden like myself really feels safe here.” Niva also noticed how the educational experience is different from his home university. “Back home, we have one test in each class for the entire semester. Here, you have homework, papers, and multiple tests. This makes it easier to plan ahead.”

Niva learned about the opportunity to participate in the exchange program from other Swedish students that Kline has mentored. Kline did his sabbatical at Lulea University and has since maintained strong ties with the students and faculty at the Swedish university.

## DECK SAFETY (cont. from page 1)

In addition to making recommendations that have been adopted by the Virginia Building Code, Loferski and Woeste are also working to have the results of their research included in the International Residential Building Code.

To further the work of their safety research, Loferski and Woeste teach many short courses on the structural design and inspection of decks and balconies for builders, engineers, architects, and building inspectors.

“Virginia is the leader in code development because folks like Woeste and Loferski care about the life safety issues that safeguard our buildings,” remarked Roger Robertson,

chief of inspections with the Chesterfield County Department of Building Inspections. “This is one more example of how Virginia Tech’s College of Natural Resources not only has significant impact on the state, but also leads the nation in important research,” said wood science department head Paul Winistorfer.

## FROM THE DEAN'S PERSPECTIVE

As we begin a new year it is appropriate to take stock of where we are and where we hope to be in the coming year. By most measures 2005 was a good year for the college. We have added four new faculty positions to the college in the key growth areas of water resources, environmental toxicology, marine fisheries, and plant biotechnology. We have new resources for an additional senior level position in bio-materials and have a search underway for that position.

We anticipate an additional allocation of funding in the coming year for two new positions in the area of remote sensing and environmental analysis. We are also nearing the end of the paper work needed to create a new interdepartmental doctoral program in remote sensing. These increases in faculty constitute a 10 percent increase in numbers during a time when many of our peer institutions are reducing the number of faculty.

As noted in the last issue of our newsletter, we are very pleased to now provide the home for the Virginia Water Center. Water issues will only grow in importance in the coming years, and having the center housed within the college will help to provide the college with a strong presence and leadership role in this area. I recently attended a national workshop on the future of research in natural resources, and there was a clear consensus that water is the number one issue. Bio-based materials and urban forestry are other areas that garnered top billing in addition to water. So from an academic and research program perspective, we are well positioned to address the future.

The excellent quality of our faculty was again confirmed with the recognition of several individuals with prestigious national awards. Such awards speak volumes about the quality of our college and the individual faculty members who compose it. This quality is also reflected in the significant growth in new research grants to a broad spectrum of the faculty.

We will continue our concerted efforts to grow our research further. When the new Agriculture and Natural Resources research building comes on line later this year, it will provide excellent new space in which to grow our research program further. This new space will also give us the opportunity to refurbish and reprogram some of the research space in Cheatham Hall.



Our efforts to increase our endowments and gifts are beginning to pay off. We had a number of generous gifts that will lead to future scholarships or provide us with the means to do other things that help to keep our programs well-rounded and vibrant. Gift support is a critical part of the overall funding picture of the college. The scholarships we have available help us to attract top students to our programs and provide a means to both assist and reward existing students. In the coming year we will redouble our efforts in this area and hopefully will have some major gifts to report before the end of the year. In order for this to happen, we need the help of all of our alumni and friends. This college has some important contributions to make to the future of natural resource management, and we need to be a member of the team that makes that a reality.

We are all increasingly aware of the growing impact that globalization is having on our economy in general and forest-based industries in particular. During the past year I have had the privilege of traveling to China and Chile on behalf of the college. Any lingering doubts that I may have had concerning the world-flattening impacts of advanced communication technology on the global economy were fully erased by these two trips. Both of these countries are experiencing phenomenal growth in their economies and natural resource issues loom large in both.

While there were a number of take home messages from this experience, the most important to the college was an affirmation of the need to better prepare our graduates to function in a global economy by providing more opportunities to gain international experience and enhance language skills through academic exchange programs and research partnerships. Future generations of graduates must function as citizens of the world, and we need to help them prepare for this very important paradigm shift.

*J. M. Kelly*

## COLLEGE STRENGTHENS CONNECTION WITH CHILEAN UNIVERSITY

The college in conjunction with the College of Veterinary Medicine and the College of Agriculture and Life Sciences recently fortified their exchange programs with University of Southern Chile (UACH) by offering a two-way exchange for faculty, undergraduate and graduate students to study and conduct research.

The university, which has been partnering with the Chilean university for 10 years now has three institutional agreements. The most recent agreement between the two universities aims at promoting research and collaboration in the areas of forest management, wood science, agriculture, biotechnology, nutrition, and animal disease.

"Along with offering new opportunities for students to study abroad and to learn from different perspectives, the college's alliance with UACH will also help establish a stronger presence in a region that is rapidly becoming an important contributor to the worldwide supply of wood coming from managed forests," remarked Mike Kelly, dean of the college.



*Virginia Tech and Chilean administrative faculty gather at UACH (left to right): Victor Cubilos, dean of veterinary medicine; Daniel Alomar, dean of agronomy; Gerhardt Schurig, dean of the College of Veterinary Medicine at Virginia Tech; Carlos Mayano, rector; Mike Kelly, dean of the College of Natural Resources at Virginia Tech; and Roberto Juacida, dean of forestry.*

## IN MEMORIAM

### Clem Fay

Clem Fay, a 1982 graduate of the college who earned an M.S. in fisheries science, unexpectedly passed away in October while walking his much loved dog, Sydney, near his home in Enfield, Maine. He was only 48.

Clem Fay focused over 20 years of his career on the Penobscot River watershed area in Maine. He had been working at the Penobscot Indian Nation as a fisheries biologist and fisheries program manager for 18 years when he passed away. Friend and colleague Joan Trial of the Atlantic Salmon Commission said that Fay "was a dedicated fisheries biologist who advocated for native species, habitat connectivity, and ecosystem integrity."

John Kocik of the U.S. Department of Commerce National Oceanic and Atmospheric Administration said, "We will miss not only standing side-by-side with Clem on issues but also standing across the table and engaging in debate. His intense knowledge of the River and its fisheries will be sorely missed. We especially appreciated his efforts with Atlantic salmon conservation."

Clem was one of the most respected fisheries experts in the northeastern United States. His reputation was such that many called upon him for his expertise, including Maine Fisheries and Wildlife, the U.S. Fish and Wildlife Service, and colleges and universities.

Friends remember Fay as dedicated, passionate, knowledgeable, thoughtful, diligent, and good-hearted. Mark Chavaree said, "If I had the opportunity, I would let him know I appreciated all the energy he put forth on behalf of the Penobscot Nation, admired the passion he put into his work and the knowledge he possessed, enjoyed his booming voice and hearty laugh, was impressed by his devotion to protecting the Penobscot River and its resources, was proud of the way he represented the Penobscot Tribe, am greatly honored to have worked with him."

He is survived by his parents Willard and Lucy Fay.

### Dave Bryson

Dave Bryson (class of 1983, B.S. forestry and wildlife) passed away unexpectedly Nov. 11, 2005, at the age of 44. He is survived by his wife Lisa and two children, Jake and Amy.

Bryson was a dedicated family man, involved with supporting his wife's passion for raising and training horses and encouraging his children in their riding competitions. He was also an avid hunter and fisherman, and he raised Chesapeake Bay retrievers when not working in the New York Field Office for the U.S. Fish and Wildlife Service.

Bryson, an expert on hydropower, came to the office in 1990 from the Federal Energy Regulatory Commission to work on the relicensing of hydropower projects in New York. He was called upon many times to be an instructor for the hydropower course at the National Conservation Training Center and was also an expert on the emerging tidal power technology.

"As anyone who has sat across the negotiation table from him would tell you, his passion for conservation of the resource (hydropower) and command of the issues made him a formidable person to negotiate with," commented David Stilwell, field supervisor and colleague with the U.S. Fish and Wildlife Service.

The college would like to extend its deepest sympathies to the family of Daniel Lee Stevenson, a sophomore majoring in forestry from Silver Spring, Md., who passed away on Dec. 11, 2005.

**BUCKNER RETIRES FROM WOOD SCIENCE AND FOREST PRODUCTS**

Joanne Buckner retired January 31 after 21 years of service to the Department of Wood Science and Forest Products. She was instrumental in supporting Steve Sinclair in establishing the Center for Forest Products Marketing and Management in 1992 and worked with all three of its directors, Sinclair, Robert Bush, and now Bob Smith.



“Joanne was a regular reviewer and editor of all manuscripts produced by center faculty and students and reviewed more theses and dissertations for grammatical errors than she wants to remember,” declared department head Paul Winistorfer. “Joanne’s dedication to work was evident in her early arrivals and late departures.”

Winistorfer added, “Joanne was the contact person for so many students, industry partners, and Marketing Center members. She helped land many a career by her extra efforts in getting to know students and making industry opportunities known to them. She was like a mother to so many of our current students and alums, so she will be missed by everyone in our program.”

Joanne saw a lot of significant changes over her career with the introduction of computers and email, which have improved job efficiency. But she noted what others have also said, “Since computing has made the job easier and faster, there seems to be more work now than in previous years!”

Joanne has relocated to rural Ohio to be closer with her family and looks forward to “spoiling my grandchildren and great-grandchildren, crocheting, reading, yard sales, NASCAR, and bus tours.”

**HAMMETT’S OUTREACH EXTENDS TO TROPICAL FOREST BOARD AND OTHERS**

The Tropical Forest Foundation, headquartered in Alexandria, Va., has added Tom Hammett, professor of wood science and forest products, to its board. A non-profit education organization dedicated to the promotion of sustainable forests by teaching proper management practices and how to reduce logging impacts, the foundation has become widely recognized for its demonstration models and training schools.

At its annual meeting in the fall, the foundation’s program in Brazil was recognized as a central vehicle in the Amazon and in the world for changing the nature of on-the-ground activity in tropical forests.

In his expanding outreach activities, Hammett gave a major paper at a conference on human ecology and sustainable development held in Brussels, Belgium. The paper entitled “Indigenous Knowledge and Decision Making in Community Forestry User Groups in Nepal: Are there Lessons Learned for Africa?” was based on the research conducted during the summer and workshops he helped organize in June and August in Nepal.

The event was attended by over 100 researchers and natural resource and economic development practitioners from Africa in addition to representatives from other regions. The International Conference on Indigenous Knowledge Systems (IKS) in Africa and their Relevance for Sustainable Development was organized and hosted by the Human Ecology Department of Vrije Universiteit Brussel (VUB), Jette Campus. “The College of Natural Resources is now well positioned to take on other projects in with VUB and in Africa,” said Hammett.



*Tom Hammett presents a Virginia Tech Wood tee shirt to Emmanuel Boon, coordinator for the conference on human ecology and sustainable development held in Brussels, Belgium.*

In another outreach effort, during mid-2005, Yale University, ANSAB, Principia College, and Virginia Tech collaborated on a research-planning grant entitled “Assessing the Linkages between Community Conservation and Governance in Nepal’s Forest User Groups.” ANSAB, an NGO based in Nepal through the support of the SANREM project at Virginia Tech, focuses on local people’s governance in the management of local forests and community management of forests. A stake-holder’s workshop was conducted by Hammett and Dr. Bhishma Subedi with Dr. Bill Burch and Dr. Mike Rechlin at the ANSAB headquarters in Kathmandu.

The result of these workshops was incorporated into a funding proposal for a long-term research project entitled “Assessing the Linkages between Community-Based Natural Resource Management, Governance, and the Provision of Products and Ecosystem Services.”

**DIVERSITY MANAGEMENT WORKSHOP FOR EMPLOYERS IN FOREST INDUSTRIES**

Virginia Tech’s Sloan Foundation Forest Industries Center and the USDA Forest Service’s Wood Education and Resource Center are sponsoring a two-day workshop in Princeton, W.Va., March 27-28 entitled “Managing and Understanding the Hispanic Workforce: A Diversity Management Workshop for Employers in Forest Industries.”

The workshop is designed for any employer in the forest industry that employs or is considering employing members of the Hispanic workforce. The workshop will provide the employer the opportunity to increase understanding and improve management skills while meeting the cultural, communication, and legal challenges of working with a diverse Hispanic workforce.

Interactive sessions will focus on topics such as overcoming communication barriers, factors for successful employee training, hiring a legal workforce, and job safety in a multicultural work environment. Participants will also have the opportunity to share their solutions to common management problems with the goal of developing a list of best practices specific to diverse workplaces within the forest industry.

For more information about the workshop contact Anne-Collins Albimino at [aalbimin@vt.edu](mailto:aalbimin@vt.edu) and visit Virginia Tech’s Sloan Foundation Forest Industries Center website at [www.forestindustries.vt.edu](http://www.forestindustries.vt.edu).



*Zhangjing Chen (left) and professor Yves Fortin of Laval University, Quebec, Canada. Fortin served on the scientific committee for wood processing at the conference.*

**CHEN COORDINATES INTERNATIONAL WOOD DRYING CONFERENCE**

Zhangjing Chen, doctoral research associate in wood science and forest products, helped coordinate the Ninth International IUFRO Wood Drying Conference in Nanjing, China, in the fall. The conference, which drew 120 participants from 20 countries, focused on energy conservation in wood drying and quality control to avoid product loss due to drying-induced damaged. IUFRO is the International Union of Forest Research Organizations.

Chen received his Ph.D. at Virginia Tech in 1997 with a dissertation on “Primary Driving Force in Wood Vacuum Drying.” Prior to that, he earned a master’s in 1993 investigating wood moisture content above saturation. His work with vacuum wood drying has resulted in patented technology licensed to a firm in North Carolina. His technology reduces the time required for drying certain hardwood species from as long as 40 days to five days.

In addition to wood drying, the technology is being seriously considered as a means for decontamination of certain wood, which might be affected by wood-boring invertebrates. One example of this might be the type of invasive introduction of species that could result from the transport of wooden shipping pallets between continents.

**TORSIONAL STABILITY OF WOOD BEAMS OF INTEREST**

*Wood science and forest products grad student Katie Harrison with engineering lab manager Rick Caudill.*



Katie Harrison, who hopes to earn a M.S. this May in wood science and forest products under the direction of assistant professor Dan Hindman, is researching how to determine the shear modulus of solid-sawn lumber and laminated veneer lumber.

Knowing more about shear property will help wood scientists improve the predictive power of lateral torsional stability design equations,

allowing for the use of wood products in more demanding structural applications. Such information may also be used to assist in the development of new wood-based composites with enhanced performance characteristics.

This research is currently being performed at the Brooks Forest Products Center’s wood engineering laboratory with engineering lab manager, Rick Caudill.

## CAPITAL REGION'S NATURAL RESOURCES PROGRAM HOSTS "SIMPLE LIVING" EXPERT



Director of the National Capital Region's natural resources program David Trauger (third from right) speaks to a group of graduate students during Wanda Urbanska's (left of Trauger) visit to the campus.

In the fall, the National Capital Region's natural resources program played host to Wanda Urbanska, a nationally known author and expert on the simple living movement. Urbanska has appeared on national television broadcasts including The Oprah Winfrey Show, The Today Show, and CBS This Morning. She also authored the popular book *Simple Living: One Couple's Search for a Better Life* and currently has her own television series airing nationwide on PBS titled Simple Living with Wanda Urbanska.

David Trauger, head of the college's program in the D.C area, along with nine graduate students had dinner and the opportunity to discuss sustainable, environmentally friendly ways of living with Urbanska. Later in Urbanska's online

diary, she noted, "Trauger had a gracious and enthusiastic graduate assistant named Margie Burks meet me at the airport and squire me around that day. What a luxury! The presentation around a long table was equally rewarding, with students asking questions about simple living and suggesting ideas for the TV series this season."

"It was truly a great honor to have such a distinguished guest visit our program. She has helped to identify and define one of the top trends of our time: the quest for simplicity in our over-booked, environmentally challenged, high-tech era," remarked Trauger. A student of Trauger's added, "Reading one of Urbanska's books several years ago turned my life around."



### SCOTT RENNEKAR JOINS COLLEGE FACULTY

In November the college welcomed Scott Rennekar to the Department of Wood Science and

Forest Products as an assistant professor. Rennekar earned a Ph.D. in wood science and forest products and a B.S. in forestry and wildlife science from the college, and received his M.S. in wood science and technology from the University of California at Berkeley.

Rennekar has a strong background in wood science with an emphasis on polymer chemistry. His research focuses on the application of nanotechnology in the creation of wood and bio-based composites. His long-term research goal is to create a wood-like material from any biomass source to be used in the wood composites industry.

Rennekar teaches Wood Adhesion and Composites II and co-instructs Wood Materials Science and Techniques.

### FALL '05 GRADUATION



Kristin Morales and Larry Grossman, head of the geography department, enjoy the college's fall graduation reception. Although she graduated, Morales remains a student of the geography department as she pursues a master's degree.

## FACULTY BRIEFS

### CGIT LOCATES HISTORICAL SITES HIT BY KATRINA

Director of the Center for Geospatial Information Technology (CGIT) and civil engineering associate professor and adjunct professor in geography Randy Dymond and associate director of the CGIT and geography professor Bill Carstensen, led the effort in using emerging technologies to assist the American Association for State and Local History (AASLH) in the aftermath of Katrina.

The center has been working to provide the AASLH with maps to prioritize assistance to those organizations that are protecting significant U.S. historical sites and collections, especially those involved in the preservation of Gulf Coastal history. Carstensen reports, "The CGIT completed mapping 200 of the 248 address sites sent to us by the AASLH in Nashville."

With the help of geography and civil and environmental engineering students who volunteered their time and effort, the CGIT was able to place

points onto maps to allow the AASLH to view which of their affiliated organizations were located in the affected Katrina region. This map helps the AASLH assist historical sites in the Gulf region and to organizations helping restore them.

After removing post office boxes and other non-locatable addresses, the CGIT was able to successfully map about 80 percent of the addresses. The maps provided locations to organizations that assist the AASLH in supporting and repairing the historic sites hit by Katrina.

## EXTENSION AND OUTREACH

### YOUNOS EMPHASIZES IMPORTANCE OF WATER SECURITY

Tamim Younos, president of the Universities Council on Water Resources, Renewable Natural Resources Foundation board member, and interim director of the college's Virginia Water Resources Research Center (VWRRC), presented a policy briefing on "Imperatives for Water Research and Education for the 21st Century" last fall at the headquarters of the American Geophysical Union in Washington, D.C.

In his remarks, Younos emphasized, "Water security ensures the availability of adequate and safe water for all uses at local, regional, national and global levels." He examined three contemporary water issues: water source development, water availability, and emerging problems.

Water source development deals with sources of water such as groundwater systems, rivers, dams, and reservoirs. He also discussed issues surrounding freshwater supplies like conservation, reuse, and desalination (removing salt from seawater). Water

availability concerns how much water is available as well as the quality of water.

Some of the emerging problems Younos highlighted were storm water management, emerging chemicals and bacteria, atmospheric deposition (chemicals being deposited by rain, i.e. acid rain), and possible climate changes.

He noted that challenges for coming years were the need for establishing research priorities and funding, developing dynamic curricula, developing science-based water policies, and engaging society in water issues. He prescribed some actions that can be taken to achieve these water resources goals, including the formation of a national and state water commission and public-private partnerships for the support of water research.

In addition to serving as interim director of the VWRRC, Younos is newly appointed to the university's multicultural fellows program. "As a fellow, he will not only provide the campus with perspectives on diversity and multicultural issues, but will also help the university fulfill its mission of being a welcoming community for everyone," commented Vice President of Multicultural Affairs Ben Dixon.

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TRANSFORMATION

Virginia Tech

## EVANS KICKS OFF LAND USE PLANNING LECTURES IN CHINA

Gary Evans, director of the college's natural resources distance-learning consortium for the Capital Region, presented the opening lecture at the SINO-U.S. Training Program of Land Use Planning in Chengdu, Sechuan Province, China, this past November. Evans' lecture focused on the history of America's public lands from the colonial period to the present Federal Land Planning Management Act.

The lecture was based largely on the distance-learning course Foundation of Public Lands, which is a joint venture between the U.S.D.A Forest Service and the university. The distance-learning course is taught by James Snow, senior counsel for the Office of General Counsel with the U.S.D.A. Evans stated, "I credit Jim's passion for the history of public lands for making this course a delight to teach."

After the conference, Evans and Mark Schaffer with the U.S. Bureau of Land Management traveled to the Jiuzhaigon National Nature Reserve and Huanglong World Heritage Site along the northern edge of the Sechuan Province border. Both sites fall within a remote autonomous region of Tibet. China and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) are working together to develop tourism in this region with plans focusing on preservation of the unique Tibetan cultures and montane ecosystems.



Gary Evans, director of the college's natural resources distance-learning consortium for the Capital Region, speaks at the SINO-U.S. Training Program of Land Use Planning in Chengdu, Sechuan Province, China

## RESEARCH SPOTLIGHT

### TREE STABILIZATION FOCUS OF URBAN FORESTRY RESEARCH

Assistant professor of forestry Eric Wiseman and forestry graduate student Alexis Alvey have been investigating the common landscaping practice of staking young trees once they've been transplanted. Traditionally, wooden or metal stakes have been attached to newly transplanted trees with wire or various materials to help stabilize young trees and keep them upright while their root systems develop.

Staking, however, is not always the healthiest method of stabilizing a young, newly transplanted tree. As Alvey pointed out, "Stakes are often left on young trees for too long, causing girdling and permanent damage to the growing tree trunks." Evidence has also surfaced that staking can also lead to negative physiological effects on the transplanted trees, such as the development of poor stem taper.

In light of the consequences of staking, this method of tree stabilization can at times be beneficial.

Wiseman and Alvey are working on quantifying these benefits and comparing tree-staking's benefits to the measurable benefits of other tree support systems such as guying and root ball anchoring.

Their goal is to determine which type of stabilization system offers the most protection from wind gusts during the tree establishment phase. "We hope the knowledge gained from our research will aid urban foresters and arborists in selecting a more targeted prescription of support systems, which will ultimately produce healthier, safer, and more attractive landscape trees," Wiseman explained.

Wiseman and Alvey are part of the young but growing urban forestry concentration within the forestry department. Their research is conducted at the university's Horticultural Research Center and is funded by the Mid-Atlantic Chapter of the International Society of Arboriculture.



Eric Wiseman (left) and Alexis Alvey stand in front of a staked tree that was recently planted on campus.

### GRAD STUDENT USES GIS TO FIND TIMBER RATTLESNAKES

Unlike many field researchers, for fisheries and wildlife graduate student David Garst a productive day of field research consists of running across as many snakes as possible. Garst's research for his master's thesis deals with identifying the current and historic ranges for timber rattlesnakes in Virginia and locating sites within the mountains of the Blue Ridge, Ridge and Valley, Cumberland Plateau, and small outlying mountains in the Upper Piedmont that are used as basking habitat for timber rattlesnakes.

Garst plans to create a model using a Geographic Information System (GIS) predicting where timber rattlesnakes can be found. His research also involves making management recommendations to the Virginia Department of Game and Inland Fisheries (DGIF).

The timber rattler is a large-bodied pit viper that is currently found in 30 states in the U.S. Within Virginia, the range of the timber rattler stretches to the north near Washington, D.C., and west to West Virginia, southwest to Kentucky and Tennessee along the Ridge and Valley region. The snake's range also includes the Blue Ridge, Cumberland Plateau, and parts of the Upper Piedmont physiographic regions, along with parts of Virginia along the North Carolina border.

One component of Garst's research consists of locating where the pregnant female timber rattlesnakes are basking and recording these locations into a Global Positioning System (GPS). Once Garst confirms that pregnant female timber rattlers occupy a specific location, he then takes a series of habitat measurements at the basking site and at a random point 50 meters away to see which habitat characteristics make the basking site different from the surrounding area. Already through his field observations, Garst has



A timber rattlesnake enjoys the afternoon basking on a rock in Franklin County, Va.

observed that the availability of rocks found in open areas within the forest is a very important factor in determining where the female timber rattlesnakes bask.

While working to identify the current and historic ranges of the timber rattlesnake in Virginia, Garst pointed out, "I don't always have to find a live one. A recently shed skin will help me confirm the presence of rattlesnakes in a particular area, whereas determining absence of the snake takes several trips to the same area. Even then you still can't say 100 percent that the snakes are not present."

After gathering GPS and field data on snake presence and preferred habitat conditions, Garst uses a GIS to analyze location data for developing a model to predict areas that potentially contain basking sites. "This model could be very useful for biologists and land managers interested in conserving timber

rattlesnakes by identifying areas potentially containing habitat critical to the timber rattlesnake. Biologists and land managers can then survey the area for timber rattlesnakes and see what conservation measures, if any, need to be put into place," stated Garst.

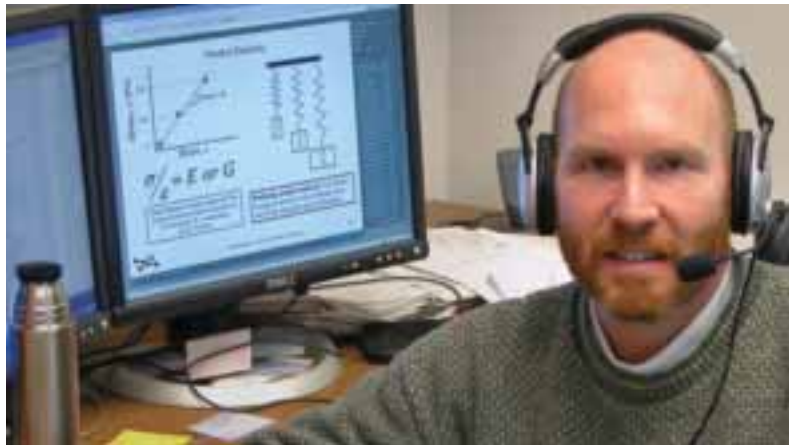
Currently the snake is protected under Virginia's non-game regulations, which means up to five reptiles of a single species or multiple species totaling five that do not have a legal status such as threatened or endangered, can be possessed live for personal use.

Garst will examine the management techniques and laws governing timber rattlesnakes in other states and apply basic biology principles to help formulate his management recommendations to the VDGIF. Aware that habitat loss and subsequent population decline for the snake in northern Virginia has resulted from expansion of urban areas, he acknowledged that in far southwestern Virginia the snake used to be a widely collected for sport, churches, and the pet trade. This could have reduced the number of timber rattlers in that portion of the state. Other known populations of the snake have also been extirpated throughout Virginia.



Fisheries and wildlife student David Garst gathers field data on timber rattlesnake habitat.

## FRAZIER DEVELOPS HYBRID TEACHING APPROACH



Wood science and forest products professor Chip Frazier works on developing his virtual classroom.

Chip Frazier, professor of wood science and forest products, has been teaching in a virtual classroom. As an experiment, he elected to place his Wood Adhesion and Composites class online for the 2005 fall semester. "I have to record my lectures and synchronize the audio with the visual presentation which includes graphics, text, and simple animations. The students like the flexibility it provides in their schedules, since they can view

the online lectures whenever they wish," commented Frazier.

Frazier has not abandoned the traditional face-to-face teaching methods. Said Frazier, "The class is a hybrid of online and traditional instruction; we still conduct the hands-on laboratories as before, and I am still very demanding with the lab reports!"



Senior James Schwille was one of Frazier's students, who returned to finish his degree after serving in Afghanistan.

Frazier added, "It will take about three years to determine the utility and effectiveness of this teaching methods." Frazier is a former Sporn Award winner on campus, recognized for his teaching excellence in first-year subjects. Frazier won the Sporn Award in 1999 for his instruction of Survey of Organic Chemistry.

## ALUMNI UPDATE

### FISHERIES ALUMNUS RECEIVES RECOGNITION FOR RESTORATION PROJECT

The Fisheries Administrators Section of the American Fisheries Society awarded its annual Sports Fish Restoration (SFR) Outstanding Projects Award to the Virginia Department of Game and Inland Fisheries (DGIF) for success in restoring Laurel Bed Lake in Virginia. This annual award helps identify and showcase outstanding fisheries and management projects from across the country and helps continue to generate support for the SFR program.

Fisheries biologist Tom Hampton, '91 B.S. and '93 M.S. in fisheries and wildlife, was key to making the project a success. He currently manages reservoirs and rivers in a 10-county district in Southwest Virginia. Inspired by former fisheries and wildlife professor John Ney, Hampton designed and implemented this project to restore the lake's water quality and renovate the fishery.

Laurel Bed Lake, a Russell County reservoir constructed in 1967, was in poor condition due to low pH and unbalanced fish populations, which severely limited fishing opportunities. The two main goals of this restoration project were to restore the lake's habitat by increasing pH and acid neutralizing capacity to levels that would support a wider range of fish species, and establish a fishery that would provide angling opportunities parallel to the physical and aesthetic qualities of the impoundment.

"Water quality improved almost immediately,

and the fishery responded quickly," Hampton said. The successful project provided the means for the restoration of the unique, high-elevation reservoir fishery to produce quality fisheries for smallmouth bass, rock bass, and brook trout. "Even though it wasn't easy," Hampton declared, "Laurel Bed Lake is now one of the most beautiful places in Virginia. If you start with unparalleled scenery, then add comradery of good people, even hard work is fun."

Critical input from fisheries experts such as Ney, Dan Downey of James Madison University, and Dan Josephon of Cornell, helped make the project "a pure pleasure from day one," said Hampton. When asked about the success of the overall group effort, Hampton stated, "Without the hard work of DGIF staff from the Fisheries and Wildlife Divisions, none of this would have been possible. Applying 150 tons of powdered lime to a lake requires a lot of logistics and hard work. We have been blessed with the cooperation of many talented individuals over the years."

The DGIF is pleased and humbled by the success and recognition. Hampton affirmed, "It is very rewarding to see the hard work of so many people recognized. We are proud of the project, the people, the fishery, and the place. So, this award is a great opportunity to encourage people to visit and enjoy Laurel Bed Lake."



Fisheries and wildlife alumnus Tom Hampton (right) works with fellow Virginia Department of Game and Inland Fisheries personnel to restore abundant fishing opportunities at Laurel Bed Lake, Va.



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# ALUMNUS PREMIERS FILM ON THE OLD TOBACCO BELT

Before showing his film to the Virginia Legislature this winter, geography alumnus Jim Crawford of Roanoke, Va., premiered his voices from the tobacco south documentary, *Down in the Old Belt*, on campus in the fall. The event was sponsored by the geography, history, and the agricultural and applied economics departments.

The premiere featured guest speakers and a world champion tobacco auctioneer who demonstrated chanting. Crawford, who earned his Master's degree in geography in 1995, is a cultural geographer, writer, musician, and cabinetmaker who has traveled throughout Central America, the South Pacific, and North America. WVTF Public Radio broadcasted tapes of his travels through the South Pacific by sailboard and bicycle in 1988.

His new heart-touching film reveals the state's tobacco history as interwoven in the lives of Virginians from Jamestown to the recent buyout program. Tobacco was the essence of life for many farmers. With the crop now fading from the landscape, a whole culture is lost. Crawford spent several years taking oral histories of 26 Old Belt tobacco-farming families to tell a story no one else has told.

"Today, tobacco farmers in Southside Virginia, like coal miners in Appalachia, have come upon hard times," cultural geographer Crawford described. "Production moving overseas, declining quotas, society's changing attitudes toward tobacco, and the recent buyout ending the tobacco allotment program have forever altered the cultural landscape of the Old Belt, known as the birthplace of Bright Leaf tobacco," remarked Crawford.

The History Museum and Historical Society of Western Virginia sponsored the making of the hour-



*Tobacco farmers prepare tobacco leaves after harvest.*

long film. Dan Mirolli of Virginia Tech's visual and broadcast communications department was the videographer and post producer. Crawford served as writer and director. Broadcast colleagues Jerry Scheeler and Keith Thomas assisted Crawford in field production.

Funding was provided by the Virginia Foundation for the Humanities and Public Policy, Rural Economic Analysis Program of the Virginia Tech Department of Agriculture and Applied Economics, the Southern Tobacco Communities Project, Dreaming Hand Foundation, Woltz and Associates, the Virginia Tech geography department, and others.

Musicians included the Wolfe Brothers, the Celtibillies, Stacy Hobbs, Bill Ray, Jack Henshelwood, Tim Sauls, Jeff Hofmann, Wes Chappell, and Crawford himself.



*"Down in the Old Belt" film director and 1995 Master's in geography alumnus Jim Crawford*



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