

# Wood Science & Forest Products



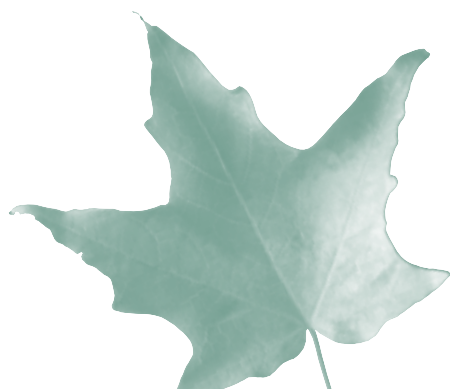
## Creative Achievements 2003

[www.woodscience.vt.edu](http://www.woodscience.vt.edu)

College of Natural Resources  
[www.cnr.vt.edu](http://www.cnr.vt.edu)

Virginia Tech  
[www.vt.edu](http://www.vt.edu)





# 2003 At A Glance

|  |  |
|--|--|
| <b>Number of Research Proposals Submitted</b>            | <b>25, Requesting a Total of \$1,804,149</b> |
| <b>Research Expenditures</b>                             | <b>\$1,760,402*</b>                          |
| <b>Number of Graduate Student Theses</b>                 | <b>9</b>                                     |
| <b>Number of Classes Offered by Department Faculty</b>   | <b>26</b>                                    |
| <b>Number of Students Taught in Departmental Classes</b> | <b>345</b>                                   |
| <b>Number of Continuing Education/Shortcourses</b>       | <b>32</b>                                    |
| <b>Refereed Journal Publications</b>                     | <b>28</b>                                    |
| <b>Other Publications</b>                                | <b>46</b>                                    |
| <b>Editorials</b>  | <b>4</b>                                     |
| <b>Editorships Held by Faculty</b>                       | <b>6</b>                                     |
| <b>Encyclopedia Articles Published</b>                   | <b>1</b>                                     |
| <b>Books Published</b>                                   | <b>1</b>                                     |
| <b>Chapters in Books</b>                                 | <b>1</b>                                     |
| <b>Conference Proceedings</b>                            | <b>10</b>                                    |
| <b>Presentations Made by Faculty</b>                     | <b>106</b>                                   |
| <b>Awards and Honors Received by Faculty</b>             | <b>13</b>                                    |

\*Includes \$405,076 in research expenditures by the Sustainable Engineered Materials Institute (SEMI). SEMI is a College-level Center affiliated with the departments of Computer Science, Forestry, and Wood Science and Forest Products.

## Department Head's Message



Welcome to our annual report of Creative Achievements for the calendar year 2003. This report summarizes our contributions in our outreach, research, and teaching activities. We could not accomplish our work without the support of the administration, alumni, industry cooperators, state and federal partners, graduate students, and under-

graduate students. We have a highly productive faculty whose creativity, enthusiasm, and commitment drive our mission. And we have a highly skilled and committed department staff that help us achieve our goals. Thanks to each of you for your role in supporting our program and our mission.

### Personnel

Dr. Daniel Hindman joined our faculty in September. Dan recently completed his Ph.D. at Penn State and works in the broad area of wood/timber engineering. Dan was immediately involved fall semester in undergraduate instruction and wrote a successful research proposal in his first few months on the job. We look forward to Dan's contributions in our timber engineering program.

Dr. Richard Helm moved to the department of Biochemistry at the end of 2003. Dr. Helm joined our program in 1992, working in the arena of wood chemistry. Rich's work had evolved over the years into fundamental basic science and innovative work in human cell dehydration. The move to Biochemistry was a positive action for all parties. Jody Jervis, a senior laboratory specialist working with Dr. Helm, was also transferred to Biochemistry. We wish Rich and Jody continued success in their highly productive research program. We redefined our faculty position as 'biopolymer materials,' and are currently in the midst of the search process for a new faculty member. We anticipate having a new person with us by August 2004.

Mr. Harrison Sizemore 'retired' during 2003. Harrison (Butch) has been in our department since 1985, providing tremendous support for our department at large in the areas of data acquisition, computing hardware, software, instrumentation and nearly everything you could imagine. Harrison voluntarily stepped aside during our budget crisis, and his action was immediately helpful to the department. He has not strayed far – he is working for the Sustainable Engineered Materials Institute (SEMI) affiliated with our department.

Angela G. Riegel, program specialist and a departmental secretary, was recognized as the outstanding staff person in the College of Natural Resources. Angie received the 2003 Dean's Award at the College Awards Banquet in March. Angie had many letters of strong support for her nomination from faculty she works with in the department. Congratulations, Angie!



Angela Riegel displays her 2003 Dean's Award plaque.

## Department Head's Message

### Students

We continue our efforts to recruit undergraduate students to our major. Our current enrollment hovers at about 40 in the major, and we need to increase our enrollment to meet the needs of the industry and continual opportunities for employment in many areas. We believe that changes in our undergraduate curriculum, and the addition of a dedicated student advisor/recruiter, will provide immediate return on our investment. Our students continue to participate in professional activities and be placed in permanent employment. Starting salaries for the B.S. during the past year have ranged from \$35,000-\$42,000. Students have a wide range of scholarship opportunities in the department. A complete list of scholarship sponsors is described beginning on page 42.

Our students continue to be involved in the Student Chapter of the Forest Products Society ([www.forprod.org](http://www.forprod.org)) and also continue to participate in the annual national timber bridge building competition. The National Timber Bridge Design Competition is coordinated by Southwest Mississippi Resource Conservation and Development (RC&D), Inc. For this year's competition, five universities from across the United States submitted entries. Our students won first place in the most innovative design category, second place in the best design category, and third place in most aesthetic design category, and were awarded \$1,200 in prize money.



From left to right: Katie Harrison, Dr. Frazier, Paul Duvall, Adam Bliss, Patrick Rappold, Paul McDaniel, and Dave Bailey.

### Curriculum

Faculty spent the entire year working on curriculum revision for our undergraduate major. This was a time-consuming and thoughtful effort. The end result was a large 'change package' submitted through university governance. The new curriculum will be in effect beginning August 2004. Important in our deliberations were the prevailing concepts of changing knowledge base for the discipline; earlier introduction of wood science and forest products course material in the curriculum; reinforcement of important concepts throughout the curriculum; continuity and consistent contact with our students throughout the four-year course of study in our major; employing more laboratory 'hand-on' activities and; building a curriculum that is attractive to students and reflects the context of wood materials knowledge and use in today's society. We are excited about the changes coming to our course of study in the department and believe that the students will surely benefit from these changes. Our industry is facing unprecedented challenges in the use of the raw material and our students will be the future industry leaders and researchers. Highlights of the curriculum revision package included:

We have consolidated eight concentrations within two options and one major to one major with five options. The new single major is **Wood Science and Forest Products** and the five options are:

- Adhesion Science
- Manufacturing Systems
- Marketing and Management
- Non-timber Forest Products
- Packaging Science

Each of the five options is made up of 15 credit hours of coursework in that option, in addition to the common department core curriculum for all departmental majors.

We have added or revised the following courses in our curriculum:

## Department Head's Message

- FORESTRY 2314 Forest Biology and Dendrology (added)
- CHEMISTRY 2514 Survey of Organic Chemistry (added)
- WOOD1234 Introduction to Wood Science and Forest Products (a new course)
- WOOD 2554 Wood Materials Science and Techniques (a new course)
- WOOD 2614 Forest Products Marketing (a revised course)
- WOOD 3534 Lumber Manufacturing and Drying (a new course)
- WOOD 3544 Secondary Wood Products Manufacturing (a new course)
- WOOD 3784 World Forests and Forest Products (a revised course)
- WOOD 4154 Computer Application Systems in Forest Products (a revised course)
- WOOD 4624 Wood Industry Production Operations Management (a revised course)
- WOOD 4634 Forest Products Business Management (a new course)
- WOOD 4534 Lumber Manufacturing and Machining (will no longer be offered, material absorbed into a new course, WOOD 3534 Lumber Manufacturing and Drying)
- WOOD 4524 Wood Drying and Durability (will no longer be offered, material absorbed into a new course, WOOD 3534 Lumber Manufacturing and Drying)
- WOOD 4514 Wood Products Industry Study
- WOOD 4614 Distribution and Marketing of Wood Products (will no longer be offered, material absorbed into a revised course, WOOD 2614 Forest Products Marketing)
- FORESTRY 2154 Introduction to Micro-computing
- FORESTRY 3714 Forest Harvesting

We will also offer four new courses associated with three of the options:

- WOOD3334 Survey of Non-timber Forest Products
- WOOD 4004 Senior Seminar in Forest Products Marketing and Management
- WOOD 4124 Paper and Paperboard Packaging
- WOOD 4224 Wood Pallet, Container, and Unit Load Design

We have dropped the following courses from our curriculum:

- BIOLOGY 1106 Principles of Biology and BIOLOGY 1116 Principles of Biology Lab
- WOOD 2114 Environment, Society, and Use of Wood (is no longer offered, material absorbed into WOOD 3784 World Forests and Forest Products)
- COMMUNICATIONS 2004 Public Speaking
- WOOD 3234 Wood Properties Lab

### Research

The entrepreneurial efforts of our faculty in their research endeavors drive our program. We have 100 percent participation of our department faculty in our research efforts. Our research is supported by and administered through the Virginia Agricultural Experiment Station in the form of faculty salaries, operating monies, and reporting. The pursuit of external funding to support our investigations is never-ending, and faculty should be recognized for their individual efforts to bring their creative ideas and inquiry to fruition. We are appreciative of the cooperative financial support we receive from our research partners.

There are many ways to evaluate our research impacts. You can read of our faculty accomplishments in this document in the areas of publications, grants procured, patents received, reporting of research findings in other publications, at conferences, and in short courses. Graduate students are a critical component of the research process and the names of those students successfully completing degree requirements in 2003 are shown herein, along with the titles of their research project.

Grants successfully garnered by faculty during 2003 are shown by title, sponsor, and grant amount. This listing does not include grants awarded in 2002 that carry over to 2003

## Department Head's Message

or beyond. This listing does not capture research expenditures or the amount spent on actual research. Research expenditures is an important metric used to assess the level of contribution of our program toward the research mission of the university. In calendar year 2003, research expenditures in our department totaled \$1,355,326. This does not include monies brought into our program through the Virginia Tech Foundation, or monies from outreach and continuing education. In addition to the department's overall expenditure, the Sustainable Engineered Materials Institute (SEMI), a college-level center with affiliations in our department and the departments of Forestry and Computer Science, had research expenditures of \$405,076 for the calendar year.

### Outreach

We continue to fulfill our outreach mission by offering timely and relevant continuing education programs, workshops and targeted programs, and by working with the wood industry in the state and region. We have three formal faculty appointments in our outreach mission, but have involvement of our total faculty in planning and delivering programs. Our faculty were involved in 32 program offerings during calendar year 2003 – a significant effort. Programs were delivered in 12 different states (including Virginia) and Bolivia. A complete listing of programs, locations, and dates is summarized in this document. Our outreach mission is partially supported by and administered through Virginia Cooperative Extension. Program Development of Outreach and International Affairs provides logistical and meeting support for our programs.

### Equipment

We procured a new laboratory dry kiln in the past year and established a dedicated drying laboratory at our Brooks Forest Products Center. The kiln was purchased with monies from the State Council of Higher Education in Virginia (SCHEV) Equipment Trust Fund allocation to the department. The new kiln was produced by Southeastern Installations Incorporated (SII) of Lexington, NC. The kiln is capable of holding 750 board feet of material, and has modern PLC controls with the option to control drying using SII's new SAMPLE WATCH weight-based system. The kiln

will be used for drying research, teaching students, and supporting Virginia's lumber drying industry. To facilitate research on developing new drying schedules, using high airflow for white woods, the kiln has frequency controlled fan drives that allow up to 1000 ft/min air-flow through a pack of lumber.

**Website – [www.woodscience.vt.edu](http://www.woodscience.vt.edu)**

We continue to improve on our website and rely on the site as a tool for communicating and doing business in the department. You can find Creative Achievements on-line under our publications link at [www.woodscience.vt.edu](http://www.woodscience.vt.edu).

### Mission of the Department

*The* mission of  
the Department of  
Wood Science and Forest Products  
is to create and disseminate  
knowledge about wood, forest  
products, and  
their utilization through  
programs of instruction,  
a forward-looking research  
agenda, and an active outreach  
program to provide continuing  
education opportunities to  
industries and individuals.

## Department Head's Message

### *WoodScapes*

We continue to distribute our departmental newsletter, *WoodScapes*, to all wood industry businesses in Virginia, and to alumni, friends of our program and colleagues. If you are not on our mail list please contact our main office (540) 231-8853 to be added to our distribution list. *WoodScapes* is also available on-line at [www.woodscience.vt.edu](http://www.woodscience.vt.edu)

### **USDA Forest Service Southern Research Station – Research Work Unit SRS-4702**

Throughout the past year we have benefited from our collaboration and cooperation with the Forest Service Southern Research Station – Research Work Unit SRS-4702. Phil Araman, project leader, and his team of scientists and staff add greatly to our educational, research, and outreach programs in the department. Many of the accomplishments of the research work unit are included in this Creative Achievements report.

### **Emerging Initiatives**

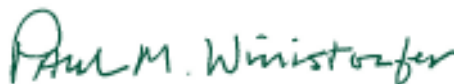
There are several emerging initiatives in the department. A collaborative partnership is evolving with our department, the department of Forestry, and the College of Business, department of Marketing, under the umbrella of a cross-college university center to be called the Virginia Tech Forest Industries Center. The umbrella for this initiative is the entire picture of sustainability and competitiveness of the forestry/forest industries sector in today's global marketplace. A planning grant has been received by Dr. David Brinberg in the department of Marketing, Pamplin College of Business, and Dr. Robert Bush of our department, from the Alfred P. Sloan Foundation earmarked for a planning conference that will lay the groundwork for a leading state and national initiative. Stay tuned for progress on this broad front.

We are also getting ready to launch efforts in packaging science to bolster our existing programs in pallet and container research and our Center for Unit Load Design. We anticipate adding a faculty position in packaging science during 2004 and in allocating laboratory space for packaging testing and evaluation. Our research in unit load design, and pallet and containers, continues to be unique and world-leading.

We have established a quantitative wood anatomy laboratory in Room 200 Cheatham Hall. The lab is under the direction of Dr. Audrey Zink-Sharp. This is the first time we have consolidated our equipment and programmatic thrust in quantitative wood anatomy into a single laboratory facility.

On a final note, Dr. Greg Brown, Dean of the College of Natural Resources, will be retiring from Virginia Tech in June 2004. We appreciate the support and guidance Dr. Brown has given our program. Dean Brown has actively participated in our professional societies in wood science and forest products and has been an active supporter of our overall effort. Greg, we wish you good health and relaxation in the coming years!

We have a great program in wood science and forest products at Virginia Tech, and we are proud of our many accomplishments. We appreciate your support and interest in our work. Please contact me, or our faculty directly, if you have any questions about these creative achievements or other aspects of our program.



Paul M. Winistorfer, Ph.D.  
Professor and Department Head

### *You're Invited!*

Please mark your calendar for October 1, 2004, and join us for the 25th anniversary celebration of our department! This event will coincide with the College of Natural Resources Homecoming Weekend event. Our event will happen on Friday afternoon/evening. Program information will be available soon. We hope you can join us for this landmark anniversary.

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Chair: Daniel DiCarlo

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## Graduate Theses–Dissertations Completed: 2003

**David S. Bailey.** 2003. M.S. The Feasibility of Recycling CCA Treated Wood From Spent Residential Decks.  
*Major Professor: Robert L. Smith*

**Marc Barany.** 2003. M.S. HIV/AIDS Coping Strategies and MTFPs in Sub-Saharan, Africa.  
*Major Professor: A. L. Hammett*

**Danny Bredel.** 2003. M.S. Performance Capabilities of Light-Frame Shear Walls Sheathed With Long OSB Panels.  
*Major Professor: J. Daniel Dolan*

**Nicole R. Brown.** 2003. Ph.D. The influence of NMA latex distribution on the performance of crosslinking-PVA adhesives.  
*Major Professors: Charles E. Frazier and Joseph R. Loferski*

**Stephanie J. Gomon.** 2003. M.S. The Influence of Promotion and Pricing on Consumer Purchase Decisions for FSC Certified Hardwood Boards in Home Centers.  
*Major Professor: Robert L. Smith*



**Will Jacobs.** 2003. M.S. Title: Performance of Pressure Sensitive Adhesive Tapes in Wood Light-Frame Shear Walls.  
*Major Professor: J. Daniel Dolan*

**Jessica Jennings.** 2003. M.S. Investigating the Surface Energy, Fracture Toughness, and Bond Durability of Compression Densified Wood.  
*Major Professor: Audrey Zink-Sharp*

**Paul W. McDaniel.** 2003. M.S. Opportunities for the Utilization of Non-Traditional Species in Wood-Based Component Manufacturing.  
*Major Professor: Robert L. Smith*

**Adam Toothman.** 2003. M.S. Monotonic and Cyclic Performance of Light-Frame Shear Walls With Various Sheathing Materials.  
*Major Professor: J. Daniel Dolan*



## Wood is Organic

A complete database of all graduate thesis and dissertation research projects completed in the Department of Wood Science and Forest products is available on-line via the department website ([www.woodscience.vt.edu](http://www.woodscience.vt.edu)), and is searchable by degree, year, and major professor.

## Proposals Funded

Impact of Elliptical Log Form on Sawmill Value and Volume Recovery

Sponsor: USDA Forest Service  
(Subcontract through Ohio State University Research Fund)

Investigator: **Brian H. Bond**

Amount: \$36,000  
7/03 to 6/05

Increasing Yield of Hardwood Lumber Through Precision End Trimming

Sponsor: USDA Forest Service  
(Subcontract through University of Tennessee)

Investigator: **Brian H. Bond**

Amount: \$18,945  
5/03 to 5/04

Wood Material Use and Product Trends in the US Flooring Industry

Sponsor: USDA Forest Service  
(Subcontract through University of Tennessee)

Investigator: **Brian H. Bond**

Amount: \$33,980  
7/03 to 11/04

Lean Rough Mill Management

Sponsor: Northeastern Research Station, USDA Forest Service

Investigators: **Dan W. Cumbo, D. Earl Kline, and Robert L. Smith**

Amount: \$15,145  
8/03 to 7/04

Building Sustainable Mountain Livelihoods Initiative

Investigator: **A. L. Hammett**

Sponsor: The Mountain Institute  
Amount: \$27,318  
3/03 to 3/04

Distributed Learning Portal Project

Sponsor: Sandia National Laboratories

Investigator: **A. L. Hammett**

Amount: \$17,628  
11/03 to 2/04

Manufacturing and Marketing Natural Hardwood Charcoal in Virginia

Sponsor: Virginia Department of Forestry, Charlottesville, VA

Investigators: Philip Radtke and **A. L. Hammett**

Amount: \$17,270 (\$8,635 directly controlled)  
11/03 to 11/04

Natural Resources Information Center (NRIC)

Sponsor: BIOFOR task order funded by USAID through Chemonics, Inc.

Investigator: **A. L. Hammett**

Amount: \$366,451  
10/02 to 3/07

Novel Educational Strategies to Assess and Improve Critical Thinking Skills in Natural Resources Undergraduates

Sponsor: USDA, Higher Educational Challenge Grants Program

Investigators: James Parkhurst, **A. L. Hammett**, Steve McMullin, and Brian Murphy

Amount: \$99,831 (\$25,000 directly controlled)  
9/03 to 9/06

Sustainable Management in El Salvador

Investigator: **A. L. Hammett**

Sponsor: Chemonics, Inc.

Amount: \$23,765  
11/03 to 3/04

Method for Determining Torsional Stiffness of Wood Members

Investigator: **Daniel P. Hindman**

Sponsor: American Forest and Paper Association

Amount: \$20,000  
11/03 to 6/04

Wood-Based Composites Center

Investigator(s): **Fred A. Kamke,**

**Charles E. Frazier, Joseph R.**

**Loferski, Robert L. Smith, and**

**Audrey Zink-Sharp**

Sponsor: Various corporations

Amount: \$207,000  
1/03 to 12/03

Sustainable Engineered Materials from Renewable Resources: Resource Assessment

Investigators: **Fred A. Kamke;**

Shepard M. Zedaker; **Joseph R.**

**Loferski; Charles E. Frazier;**

**Robert L. Smith; Wolfgang G.**

**Glasser; Audrey G. Zink-Sharp;**

Thomas R. Fox; Thomas V. Gallagher;

Stephen P. Prisley; Philip J. Radtke;

Layne T. Watson

Sponsor: USDA

Amount: \$557,232

7/03 to 6/04

\*The Feasibility of Wood Residue Use for Energy Production in Southside, Virginia

Investigators: **Robert L. Smith and**

**Dan W. Cumbo**

Sponsor: Virginia Department of Forestry

Amount: \$32,000

6/02 to 5/04

\*Not listed in Creative Achievements 2002.

## Proposals Funded

\*Assessing the Success of the NWIT Timber Bridge Commercialization Program

Investigators: **Robert L. Smith** and **Dan W. Cumbo**

Sponsor: National Wood in Transportation Program (NWIT)

Amount: \$45,000  
6/02 to 5/04

The Effects of Phytosanitary Standards on Wood Packaging Users

Investigator: **Robert L. Smith** and **Dan W. Cumbo**

Sponsor: University of Minnesota

Amount: \$7,500  
1/03 to 12/03

Wood in Transportation Technology Transfer: Analysis of Web Server Statistics

Investigator: **Robert L. Smith**

Sponsor: USDA Forest Service

Amount: \$11,500  
9/03 to 9/05

Wood Residues, Waste Wood and Woody Biomass Generation in Virginia

Investigator: **Robert L. Smith**

Sponsor: Virginia Department of Forestry

Amount: \$19,992  
8/03 to 8/05

Wood Residues, Waste Wood and Woody Biomass Generation in Virginia

Investigator: **Robert L. Smith**

Sponsor: Department of Mines, Minerals and Energy

Amount: \$24,998  
8/03 to 8/05

Application of Vacuum to Control Insects in Raw Wood Packaging Materials

Investigator: **Marshall S. White**

Sponsor: Limestone Bluffs Resource Conservation & Development

Amount: \$21,860  
1/03 to 12/03

Crown Analysis Using Digital Imaging from the Ground for FIA/FHM Indicator Assessment

Investigator: **Paul M. Winistorfer**

Sponsor: USDA Forest Service

Amount: \$41,000  
9/03 to 6/04

Forest Products Conservation

Investigator: **Paul M. Winistorfer**

Sponsor: USDA Forest Service

Amount: \$77,000  
10/03 to 9/04

\*Bringing the Magic of Wood to Your Community

Investigator: **Audrey Zink-Sharp**

Sponsor: USDA Forest Service Wood Education Resource Center

Amount: \$13,700  
7/02 to 8/03

Re-Engineering the Wood Cell Wall

Investigators: **Audrey Zink-Sharp** and R. B. Hanna

Sponsor: USDA NRI CSREES

Amount: \$140,000  
9/03 to 8/05

Wood Magic at Virginia Tech

Investigator: **Audrey Zink-Sharp**

Sponsor: Various trade associations, industry, agency, and private donors.

Amount: \$12,500  
Date: On-going

## Refereed Journal Publications

Abbott, A. Lynn and **D. Earl Kline**. 2003. Imaging and analysis of logs and lumber. *Computers and Electronics in Agriculture* 41(1-3):1-6.

Ahmad, Mansur and **Fred A. Kamke**. 2003. Analysis of Calcutta bamboo for structural composite materials: surface characteristics. *Wood and Fiber Science* 37(3-4):233-240.

Alderman, Jr., Delton R., **Robert L. Smith**, and **Philip A. Araman**.

2003. A profile of CCA-treated lumber removed from service in the Southeastern United States decking market. *Forest Products Journal* 53(1):38-45.

Anderson, Cheryl A., **Frank E.**

**Woeste**, and **Joseph R. Loferski**.

2003. Practical engineering: Attaching deck ledgers. *Journal of Light Construction* 21(11):8-87.

**Araman, Philip A., Matthew Winn,**

**Firoz Kabir**, Xavier Torcheux and Guillaume Loizeaud. 2003. Unsound defect volume in hardwood pallet cants. *Forest Products Journal* 53(2):45-49.

Barany, Marc E., **A. L. Hammett**, and **Philip A. Araman**.

2003. Lesser used wood species of Bolivia and their relevance to sustainable forest management. *Forest Products Journal* 53 (7/8):28-33.

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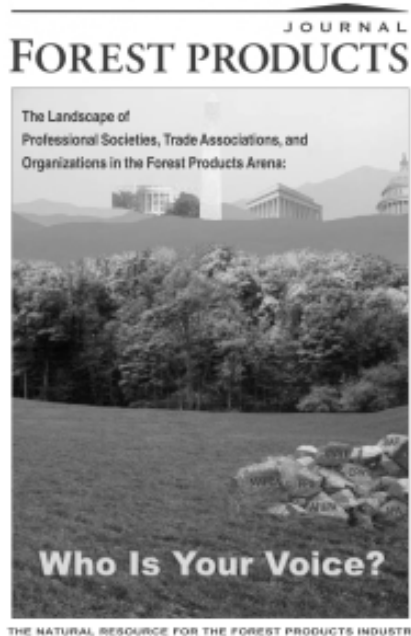
Roger R. B. Leakey, and Keith Moore. 2003. Income generating opportunities for smallholders affected by HIV/AIDS: Linking agro-ecological change and non-timber forest product markets. *Journal of Management Studies* 39:26-39.

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- Bond, Brian H. and Peter C. Hamner.** 2003. Lumber stacking practices of hardwood manufacturing industries in Tennessee. *Forest Products Journal* 53(5):38-42.
- Buehlmann, Urs, Janice K. Wiedenbeck, and **D. Earl Kline.** 2003. Effect of cutting bill requirements on lumber yield in a rip-first rough mill. *Wood and Fiber Science* 35(2):187-200.
- Cumbo, Dan W., Robert L. Smith, and Philip A. Araman.** 2003. Low-grade hardwood lumber production, markets and issues. *Forest Products Journal* 53(9):17-24.
- Kabir, Firoz,** Daniel Schmoltdt, **Philip A. Araman,** Schafer and Lee. 2003. Classifying defects in pallet stringers by ultrasonic scanning. *Wood and Fiber Science* 35(3):341-350.
- Kline, D. Earl,** Chris Surak, and **Philip A. Araman.** 2003. Automated hardwood lumber grading utilizing a multiple sensor machine vision technology. *Computers and Electronics in Agriculture* 41(1-3):139-155.
- Lockee, Barbara B., Christina E. Pugh, and **A. Zink-Sharp.** 2003. Instructional design model for a Wood Magic distance education program. *Forest Products Journal* 53(9):6-14.
- Olah, David., **Robert L. Smith,** and Bruce G. Hansen. 2003. Wood material use in the U.S. cabinet industry 1999 to 2001. *Forest Products Journal* 53(1):25-31.
- Potts, Malcolm B., B. T. Solow, K. M. Bischoff, D. E. Graham, B. H. Lower, **Richard F. Helm,** and P. J. Kennelly. 2003. A phosphoprotein with phosphoglycerate mutase activity from the archeon *Sulfolobus solfataricus*. *Journal of Bacteriology* 185:2112-2121.
- Sepulveda, Paul, **D. Earl Kline,** and Johan Oja. 2003. Prediction of fiber orientation in Norway spruce logs using an X-ray log scanner: A preliminary study. *Wood and Fiber Science* 35(3):409-428.
- Shirkey, B., N. J. McMaster, S. C. Smith, D. J. Wright, H. Rodriguez, P. Jaruga, M. Birincioglu, **Richard F. Helm,** and Malcolm Potts. 2003. DNA of *Nostoc commune* (Cyanobacteria) becomes covalently modified during long-term (decades) desiccation but is protected from oxidative damage and degradation. *Nucleic Acids Research* 31:2995-3005.
- Smart, Jason V., **Frank E. Woeste,** and **Joseph R. Loferski.** 2003. Potential thermal degradation of attic framing and wood sheathing. *ASCE Practice Periodical on Structural Design and Construction* 8(4):203-208.
- Smith, Robert L.,** David Olah, Bruce G. Hansen, **Dan W. Cumbo.** 2003. The Effect of Questionnaire Length on Participant Response Rate: A Case Study in the U.S. Cabinet Industry. *Forest Products Journal* 53(11/120):33-37.
- Steidl, C. M., Siqun Wang, R. M. Bennett, and **Paul M. Winistorfer.** 2003. Tensile and compression properties through the thickness of oriented strandboard. *Forest Products Journal* 53(6):1-9.
- Vaca-Garcia, Carlos, Gerard Gozzelino, **Wolfgang G. Glasser,** and Mary E. Borredon. 2003. Dynamic mechanical thermal analysis transitions of partially and fully-substituted cellulose fatty esters. *Journal of Polymer Science, Pt. B: Physics* 41:281-288.
- Van Houts, J. H., **Paul M. Winistorfer,** Siqun Wang. 2003. Improving dimensional stability by acetylation of discrete layers within flakeboard. *Forest Products Journal* 53(1):82-88.
- Wang, Siqun and **Paul M. Winistorfer.** 2003. Monitoring resin cure during particleboard manufacture using a dielectric system. *Wood and Fiber Science* 35(4):532-539.
- Wang, Siqun and **Paul M. Winistorfer.** 2003. An optical technique for determination of layer thickness swell of MDF and OSB. *Forest Products Journal* 53(9):64-71.
- Winistorfer, Paul M.** 2003. Associations and organizations in the forest products arena: Understanding the landscape. *Forest Products Journal* 53(6):2-11.

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**Youngs, Robert L.** 2003. Wood Science and Technology in North America: Reviewing Our Contributions and Our Uniqueness. *Forest Products Journal* 53(11/12):12-21.

Zombori, Balazs G., **Fred A. Kamke**, and Layne T. Watson. 2003. Simulation of internal mat conditions during the hot-pressing process. *Wood and Fiber Science* 35(1):2-23.

Zombori, Balazs G., **Fred A. Kamke**, and Layne T. Watson. 2003. Simulation of internal conditions during the hot-pressing process. *Wood and Fiber Science* 35(1):2-23.

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## Trade Journal Publications

**Hamner, Peter C. and Marshall S. White.** 2003. Mold, Mildew on Pallets, Lumber, Can be Prevented, Eliminated. *Pallet Enterprise*, September. Pp. 40-43.

**Lamb, Fred M.** 2003. Troubleshooting Gluing Issues. Part 1. The Basics of Wood Gluing. *Modern Woodworking* 17(1):21-22, 24.

**Lamb, Fred M.** 2003. Troubleshooting Gluing Issues. Part 2. Some Causes of Glue Line Failures. *Modern Woodworking* 17(2):20-22.

**Lamb, Fred M.** 2003. Techniques for Drying Oak Lumber. Part 1. *Modern Woodworking* 17(3):19-21.

**Lamb, Fred M.** 2003. Techniques for Drying Oak Lumber. Part 2. *Modern Woodworking* 17(4):20-22.

**Lamb, Fred M.** 2003. What is Raising Your Grain? *Modern Woodworking* 17(5):18-20.

**Lamb, Fred M.** 2003. What Every Drying Operation Should Know about Wood and Water. Part 1. *Modern Woodworking* 17(6):79-80.

**Lamb, Fred M.** 2003. What Every Drying Operation Should Know about Wood and Water. Part 2. *Modern Woodworking* 17(7):22, 24-25.

**Lamb, Fred M.** 2003. Controlling the Drying: Samples and Sample Boards. *Modern Woodworking* 17(8):22-24.

**Lamb, Fred M.** 2003. Marking for the Chop Saws. *Modern Woodworking* 17(9):27-28.

**Lamb, Fred M.** 2003. Some Do's and Don'ts for Downdraft Predryers. *Modern Woodworking* 17(10):31-32.





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Anderson, Cheryl A., **Joseph R. Loferski**, and Frank E. Woeste. 2003. Detecting early wood decay. ICBO Building Standards. July/August.

Anderson, Cheryl A., **Frank E. Woeste**, and **Joseph R. Loferski**. 2003. Practical engineering: Attaching ledgers. *Journal of Light Construction* 21(11):81-87.

Bailey, David S., **Robert L. Smith**, **Philip A. Araman**, and **Dan W. Cumbo**. 2003. The feasibility of recycling CCA treated wood from residential decks. Report to Center for Forest Products Marketing and Management membership. 24 pp.

Denig, Joe, and **Brian Bond**. 2003. Heat sterilization of hardwood pallets and pallet material. Pallet Phytosanitary Project Technical Paper. TP-1. September.

Chen, Zhangjing, **Marshall S. White**, and W. H. Robinson. 2003. The application of vacuum to control insects in raw wood packaging materials. Report submitted to research sponsor Limestone Bluffs RC&D, Mequoketa, Iowa. 30 pp.

**Cumbo, Dan W., D. Earl Kline**, and **Robert L. Smith**. 2003. Advanced lean manufacturing in wood products. Center for Forest Products Marketing and Management, Virginia Tech. September.

**Cumbo, Dan W.** and **Robert L. Smith**. 2003. Value analysis of lumber produced from small diameter timber. Final Report submitted to the Commonwealth of Virginia, Department of Forestry, Charlottesville, Virginia. 28 pp.

**Cumbo, Dan W., D. Earl Kline**, and **Robert L. Smith**. 2003. An introduction to lean manufacturing with emphasis on the wood products industry. Research Report to Center for Forest Products Marketing and Management membership. 24 pp.

**Cumbo, Dan W.** 2003. Members Rate Center Performance, Research Update, Center for Forest Products Marketing and Management, April. 2 pp.

**Cumbo, Dan W.** and **D. Earl Kline**. 2003. Benchmarking Management Systems in Wood Products Manufacturing, Research Update, Center for Forest Products Marketing and Management, May. 2 pp.

**Cumbo, D.W., D. Earl Kline**, and **Robert L. Smith**. 2003. Managing Production Under Changing Demand, Research Update, Center for Forest Products Marketing and Management, October. 2 pp.

**Cumbo, Dan W., D. Earl Kline**, and **Robert L. Smith**. 2003. A Fresh Look at Communication in the Workplace, Research Update, Center for Forest Products Marketing and Management, December. 2 pp.

Hager, E. Bradley, **A. L. Hammett**, and **Philip A. Araman**. 2003. PROACT User's Guide: How to use the pallet recovery opportunity analysis computer tool. USDA Forest Service, Southern Research Station, Asheville, North Carolina. General Technical Report SRS-69, 30 pp.

**Kabir, Firoz, Philip A. Araman**, and Mark Schafer. 2003. Pallet part and cant evaluation for grading and processing using high-speed ultrasound. Proceedings, ScanTech 2003, The Tenth International Conference on Scanning Technology and Process Optimization in the Wood Industry. Pp. 133-138.

**Kline, D. Earl, Dan W. Cumbo**, and Rick Lovorn. 2003. VFPA 2003 Summer Conference – Lean manufacturing: Doing more with less. Virginia Forest Products Association Newsletter. July-August.

**Kline, D. Earl**. 2003. Life cycle performance of wood building materials – Southeastern oriented strandboard production. Final Report. Submitted to Consortium for Research on Renewable Industrial Materials (CORRIM, Inc.), Seattle, Washington. December.

**Lee, Sank-Mook**, Lynn Abbott, **Philip A. Araman**, and Daniel Schmoldt. 2003. A prototype scanning system for optimal edging and trimming of rough hardwood lumber. Proceedings, ScanTech 2003, The Tenth International Conference on Scanning Technology and Process Optimization in the Wood Industry. Pp. 49-58.

## Other Publications

**Loferski, Joseph R.** 2003. Evaluation of timbers in the Anderson Forge Blacksmith Shop at Colonial Williamsburg in Williamsburg, Virginia. Report to Colonial Williamsburg Foundation. 35 pp.

\***Parsons, Brigitte A.**, Michael J. Mortimer, and **A. L. Hammett.** 2002. Land access for growing and foraging non-timber forest products, Wood Science and Forest Products. Publication #420-131 Virginia Tech Extension. 10 pp.

Pugh, Christina E. and **Audrey Zink-Sharp.** 2003. Wood Magic: An Instruction Manual. <http://www.woodmagic.vt.edu>.

**Rupert, Ralph L.** 2003. Memo Report submitted to Williamsburg Millwork Corporation, Inc. of Bowling Green, Virginia. April 2. 3 pp.

**Rupert, Ralph L.** 2003. Memo Report submitted to Millwood, Inc. of Girard, Ohio. February 10. 2 pp.

**Rupert, Ralph L.** 2003. Memo Report submitted to Packaging Unlimited of Louisville, Kentucky. March 3. 3 pp.

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Smart, Jason V., **Frank E. Woeste**, and **Joseph R. Loferski.** 2003. Potential thermal degradation of attic framing and wood sheathing. ASCE. Practice Periodical on Structural Design and Construction. November. 6 pp.

**Smith, Robert L.** and Delton R. Alderman. 2003. An investigation into attitudes towards recycling CCA treated lumber. Final Report: USDA Forest Service, Southern Forest Experiment Stations, Blacksburg, Virginia. 212 pp.

**Smith, Robert L.** 2003. Book Review (Strategic Marketing in the Global Forest Industries by Heikki Juslin and Eric Hansen). *Wood and Fiber Science* 35(1):148-150.

**Smith, Robert L.** 2003. Enhancing market intelligence for the Australian forest and wood products sector. Final Phase 1 report for the Forest & Wood Products Research & Development Corporation. The Australian National University – Forestry Program and the University of Melbourne – School of Forestry. January 15. 35 pp.

Stanturf, John, Robert Rummer, Michael Wimberly, Timothy Rials, **Philip A. Araman**, Rodney Busby, James Granskog and Les Groom. 2003. Developing an integrated system for mechanical reduction of fuel loads at the wildland/urban interface in the southern United States. Proceedings, 2nd Forest Engineering Conference. Pp. 135-138.

Supúlveda, Paul, **D. Earl Kline**, and J Nyström. 2003. Measurement of spiral grain in Norway spruce using the tracheid-effect and concentric surface imaging. In: Non-Destructive Measurement of Spiral Grain with X-rays in Laboratory and Industry, Doctoral Thesis 2003:14, Luleå University of Technology, Skellefteå, Sweden. 12 pp.

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**White, Marshall S.** 2003. Guidelines. Helped develop guidelines to regulate treatment, storage, and disposal of wood by-product materials for the Virginia Department of Environmental Quality, as required in the code of Virginia. 15 pp.

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**White, Marshall S.** and **Ralph L. Rupert.** 2003. Preliminary performance evaluation of the prototype BCI 48x40-inch paperboard pallet design. Report submitted to BCI Engineering of Newark, New Jersey. January 17. 14 pp.

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**White, Marshall S. and Ralph L. Rupert.** 2003. Preliminary evaluation of a Mark 55 pallet design manufactured with Brazilian grown pinus taeda. Report submitted to CHEP Brazil. March 17. 20 pp.

**White, Marshall S. and Ralph L. Rupert.** 2003. Relative stacking strength of three Basalite used, repaired pallet designs (48x48, 40x48, 34x48) used to ship concrete block and bagged concrete mix. Report submitted to Basalite. July 24. 10 pp.

**White, Marshall S. and Ralph L. Rupert.** 2003. The effect of radio frequency heat treatment of green hardwood pallet parts on pallet performance. Report submitted to MSU. August 15. 19 pp.

**White, Marshall S. and Ralph L. Rupert.** 2003. Comparative performance evaluation of Stanley fastening systems pallet plus nails. Report submitted to Stanley of East Greenwich, Rhode Island. October 5. 28 pp.

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**Zink-Sharp, Audrey.** 2003. Reviewed, edited, and contributed sections to two books for children: "Wood" and "Paper." Published by Capstone Press, Mankato, Minnesota. 24 pp. for "Wood" and 24 pp. for "Paper."

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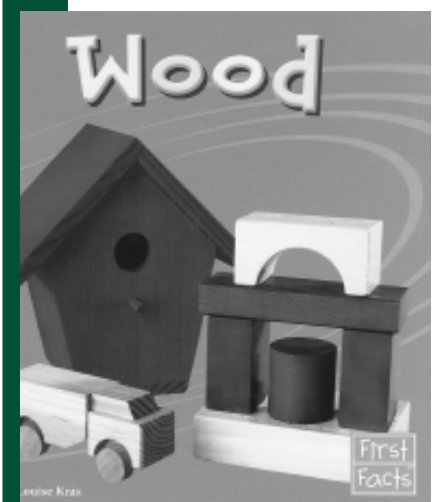
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Exposing Children to  
the Wonders of  
Wood



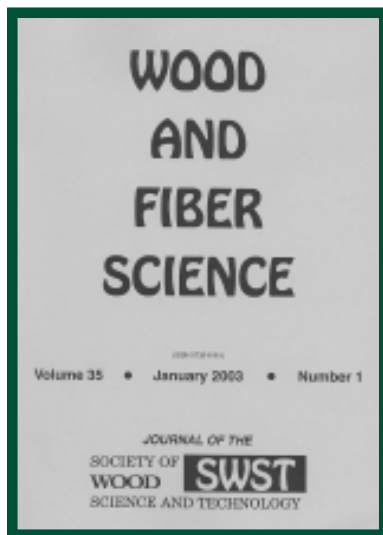
## Editorials

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## Editorships

**Glasser, Wolfgang G.** Editor-in-Chief, *CELLULOSE*.

**Ifju, Geza.** Editor, *Wood and Fiber Science*.

**Kamke, Fred A.** Editorial Board – *Wood Science and Technology*, Journal of the International Academy of Wood Science, Springer Publishing.

**Kline, D. Earl.** Associate Editor, *Computers and Electronics in Agriculture*.

**Kline, D. Earl.** Associate Editor, *Wood and Fiber Science*.

**Youngs, Robert L.** Editorial Board, *Encyclopedia of Forestry Sciences*, Elsevier Press, London.

## Encyclopedia Articles

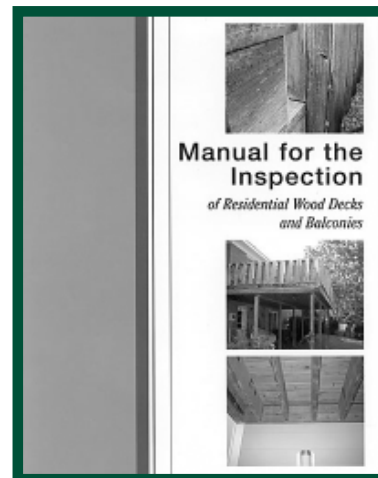
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## Patent

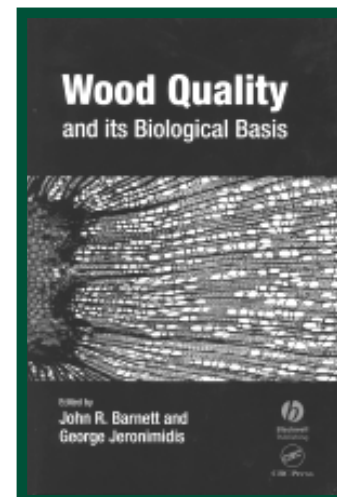
Chen, Zhangjing and **Fred M. Lamb.** Method and Apparatus for Vacuum Drying Wood in a Collapsible Container in a Heated Bath. Patent Number 6,634,118. October 21, 2003.

## Books

Anderson, Cheryl A., Frank E. Woeste, and **Joseph R. Loferski.** 2003. *Manual for the Inspection of Residential Decks and Balconies*. Publisher: Forest Products Society and International Code Council. Publication No. 7243, ISBN 0-892529-34-3. 76 pp.



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## Conference Proceedings

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**Kabir, Firoz, Philip A. Araman**, and Mark Shafer. 2003. Pallet part and cant evaluation for grading and processing using high-speed ultrasound. Proceedings of the ScanTech 2003, The Tenth International Conference on Scanning Technology and Process Optimization in the Wood Industry, Seattle, Washington, November 4-5. Pp. 133-138.

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**Lee, Sang-Mook**, Lynn Abbott, **Philip A. Araman**, and Daniel Schmoltdt. 2003. A prototype scanning system for optimal edging and trimming of rough hardwood lumber. Proceedings, ScanTech 2003, The Tenth International Conference on Scanning Technology and Process Optimization in the Wood Industry. November. Pp. 49-58.

**Lee, Sank-Mook**, Lynn Abbott, Daniel Schmoltdt and **Philip A. Araman**. 2003. A system for optimal edging and trimming of rough hardwood lumber. Proceedings, 5th International Conference on Image Processing and Scanning of Wood. March. Pp. 25-34.

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**Smith, Robert L.** and Stephanie J. Gomon. 2003. Is there a market in home centers for environmentally certified S4S hardwood lumber. Proceedings: International Conference on Forest Industry and Markets. Vaxjo University, Vaxjo, Sweden. May 19-22. 12 pp.

**Smith, Robert L.**, David S. Bailey, and **Philip A. Araman**. 2003. Evaluating spent CCA residential decks for second life products. Proceedings: Managing the Treated Wood Resource - II Special Seminar sponsored by American Wood Preservers Association Utility Solid Waste Activities Group. Boston Marriott Copley Place. Boston, Massachusetts. May 1. Pp 101-113.



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Alderman, Jr., Delton R., **Robert L. Smith**, **Robert J. Bush**, and **Philip A. Araman**. 2003. The theory of planned behavior and the recovery of CCA-treated lumber. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

\***Araman, Philip A.** 2002. Wood pallet use, repair and recycling. Pallet Recycling Workshop for Users, Recyclers and Administrators, Greensboro, North Carolina, September 18.

\***Araman, Philip A.** 2002. Wood opportunities for small wood pallet recovery. Pallet Recycling Workshop for Users, Recyclers and Administrators, Greensboro, North Carolina, September 18.

\***Araman, Philip A.** Pallet recycling opportunities in North Carolina. Pallet Recycling Workshop, Charlotte, North Carolina, September 24, 2002.

\***Araman, Philip A.** 2002. Wood pallet use, repair and recycling. Pallet Recycling Workshop for Users, Recyclers and Administrators, Raleigh, North Carolina, October 28.

\***Araman, Philip A.** 2002. Wood opportunities for small wood pallet recovery. Pallet Recycling Workshop for Users, Recyclers and Administrators, Raleigh, North Carolina, October 28.

**Araman, Philip A., Robert J. Bush, Robert L. Smith** and **Marshall S. White.** 2003. Current state of landfilling woody materials & selective recycling options. Carolinas Recycling Association 13<sup>th</sup> Annual Conference, Greenville, South Carolina, March 18-21.

**Araman, Philip A.** 2003. New technology in wood processing & wood recovery and reuse. 2003 Annual Meeting of the Kentucky Forest Industries Association, Lexington, Kentucky, April 3-4.

**Araman, Philip A.** 2003. Markets and utilization – what are the current and future utilization trends. Program of Advanced Studies in Silviculture (PASS), Bent Creek, North Carolina, June 11.

**Araman, Philip A.** 2003. SRS-4702 Forest Products Conservation R&D overview. Annual Forest Industry/Forest Service Research Liaison Meeting, Madison, Wisconsin, June 17-18.

**Araman, Philip A.** 2003. SRS-4702 Forest Products Conservation overview and opportunities to cooperate on wood processing R&D. Seminar presented at FORINTEK Canada Corp, Quebec City, Canada, June 27.

Bailey, David S., **Robert L. Smith**, and **Philip A. Araman.** 2003. The feasibility of recycling spent residential decks composed of CCA-treated wood. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

Barany, Marc E. and **A. L. Hammett.** 2003. Indigenous medicine, HIV/AIDS, and medicinal plant resources in sub-Saharan Africa, Global Health Council's 30<sup>th</sup> Annual Conference, "Health and the Environment," Washington, DC, May 27-30.

\*Barany, Marc E. and **A. L. Hammett.** 2002. Non-Timber Forest Products and HIV/AIDS in sub-Saharan Africa. OIRD invited seminar, October 9.

\*Barany, Marc E. and **A. L. Hammett.** 2002. Panel Chair, Land and Resource Use – Challenges and Impacts, Impacts of the HIV/AIDS Pandemic on the Management and the Conservation of Natural Resources in East and Southern Africa, Nairobi, Kenya, September 26-27.

**Bond, Brian H.** 2003. Air-dry yard layout and operation. Virginia Forest Products Association. 45<sup>th</sup> Annual Convention. Williamsburg, Virginia, January 31-February 2.

**Bond, Brian H.** 2003. Modern kiln control. Presented at the Virginia Forest Products Association 45<sup>th</sup> Annual Convention, Williamsburg, Virginia, January 31-February 2.

\*Not listed in Creative Achievements 2002.

## Presentations

**Bond, Brian H.** 2003. Air-drying; set-up, operation, and avoiding defects. Allegheny Dry Kiln Club Spring Meeting, Blacksburg, Virginia, April 10-11.

**Bond, Brian H.** 2003. The good, the bad and the ugly: The effects of over-length on degrade, kiln capacity, and rough mill yield. Presented at the Allegheny Dry Kiln Club Spring Meeting, Blacksburg, Virginia, April 10-11.

**Bond, Brian H.** and Janice K. Wiedenbeck. 2003. The effect of over-length on rough mill yield. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

**Bond, Brian H.** 2003. Kiln Drying Lumber for Managers and Operators. USAID/CADEFOR. La Paz, Bolivia, September 9.

**Bond, Brian H.** 2003. Kiln Drying Lumber for Managers and Operators. USAID/CADEFOR. Cochabamba, Bolivia, September 10.

**Bond, Brian H.** 2003. Kiln Drying Lumber for Managers and Operators. USAID/CADEFOR. Santa Cruz, Bolivia. September 11.

**Bond, Brian H.** 2003. Heat treatment schedules for hardwoods and softwoods. Presented at the National Wooden Pallet and Container Association Pallet Summit and Exposition, Memphis, Tennessee, October 1-4.

**Bond, Brian H.** 2003. Log Grading and Merchandising Workshop. Ontario, Virginia, October 17, 2003.

**Bond, Brian H.** 2003. Effect of over-length on drying and processing operations. Presented at the 4th Seminar on Drying Lumber of Appearance. Quebec, Canada, November 12.

\*Buehlmann, Urs and **Philip A. Araman.** 2002. Flooring, paneling and furniture from used pallets. Pallet Recycling Workshop for Users, Recyclers and Administrators, Greensboro, North Carolina, September 18.

\*Buehlmann, Urs and **Philip A. Araman.** 2002. Flooring, paneling and furniture from used pallets. Pallet Recycling Workshop for Users, Recyclers and Administrators, Raleigh, North Carolina, October 28.

Buehlmann, Urs, **Philip A. Araman,** Dave Lowles and Terry Albrecht. 2003. Discarded pallets to flooring: Putting the idea into practice. 57<sup>th</sup> Annual Meeting of the Forest Products Society, Seattle, Washington, June 22-25.

**Bush, Robert J.** 2003. Trends in the use of wood materials for containers. Presented at the Annual Leadership Conference and Expo, Lake Buena Vista, Florida, February 25.

**Bush, Robert J.** 2003. Material trends in the pallet and container industry: Opportunities for structural panels. Presented at the Annual Meeting of the Structural Board Association, Scottsdale, Arizona, May 13.

**Caudill, Linda C.** 2003. The wood-based composites center. Poster presented at the Engineered Wood Research Foundation Info Fair, San Diego, California, September 13-16.

**Cumbo, Dan W., Robert L. Smith,** and Charles W. Becker III. 2003. Value analysis of lumber produced from small-diameter timber. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

**Cumbo, Dan W., D. Earl Kline,** and **Robert L. Smith.** 2003. Virginia productivity and quality initiative in forest products. Technical Forum Presentation, 57<sup>th</sup> Annual Meeting, Forest Products Society, Bellevue, Washington, June 22-25.

**Cumbo, Dan W.** 2003. Reducing manufacturing waste in a lean wood products environment. Presented at the Virginia Forest Products Association Meeting, Homestead, Hot Springs, Virginia, July 11-13.

**Cumbo, Dan W.** 2003. Eliminating waste and smoothing production flow. Presented to the Moulding and Millwork Producers Association, Victoria, British Columbia, Canada, August 15.

**Das, Sudipto** and **Charles E. Frazier.** 2003. Characterization of wood-pMDI bondline by solid state NMR. Presented at the 26th Annual Meeting of the Adhesion Society, Myrtle Beach, South Carolina, February 23-26.

\*Not listed in Creative Achievements 2002.

## Presentations

Gilbert, David J., David S. Bailey, **Robert L. Smith**, and **Fred A. Kamke**. 2003. Incentives/barriers to the increased utilization of wood-based structural panels in industrial markets. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

**Glasser, Wolfgang G.** 2003. The chemistry of biobased materials. Invited seminar at the Institute of Paper Science and Technology of Georgia Tech, Atlanta, Georgia, March 21.

**Glasser, Wolfgang G.** 2003. Advanced biobased materials. Invited keynote lecture presented at the R&D Workshop on New Products & Processes – Enhancing and Diversifying the Value Chain, Alberta Forestry Research Institute, Edmonton, Alberta, Canada, June 16.

Gomon, Stephanie J., **Robert L. Smith**, and **Robert J. Bush**. 2003. The influence of promotional brochures and premium pricing on consumer purchase decisions for environmentally certified hardwood boards in home centers. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

Haas, Carola A., Thomas R. Fox, Shepard M. Zedaker, David W. Smith, Robert H. Jones, and **A. L. Hammett**. 2003. Alternative silvicultural practices in Appalachian forest ecosystems: Implications for diversity, resilience, and commercial production. Presented at Enhancing the Southern Appalachian Forest Resource: Engaging Economic, Ecological and Social Principles and Practices. Kanuga Conference Center, Hendersonville, North Carolina, October 3.

**Hammett, A. L.** 2003. Non-timber forest products in central Appalachia: market opportunities and sustainable forest-based development. Mountain State University, Beckley, West Virginia, January 23.

**Hammett, A. L.** 2003. Non-timber forest products: Opportunities for community revitalization and rehabilitation. Invited Seminar, Yale University, March.

**Hammett, A. L.** and Merv Stevens. 2003. Growing international demand for innovative wood products. North East Society of American Foresters 83rd Winter Meeting, Burlington, Vermont, March 18.

**Hammett, A. L.** 2003. Sustaining the common interest: What are the benefits and who gains through community managed forest enterprises in Nepal? Invited seminar, Yale University, April 23.

**Hammett, A. L.** 2003. Increasing forest-based incomes: Opportunities with special forest products. Presented at the 2003 Conference and Exposition “Forestry on the Grow,” Wagoner, Oklahoma, April 30.

**Hammett, A. L.** and **Robert J. Bush**. 2003. Using discarded pallets to product parts and other products: Assessing the operational and financial feasibility. Presented at the 2003 Conference and Exposition “Forestry on the Grow,” Wagoner, Oklahoma, April 30.

**Hammett, A. L.**, Jim McKenna, and Brian R. Murphy. 2003. Opportunities for student exchange and international study: Examples in natural resources and agriculture. Environment and Sustainable Systems Conference, Punta Cana, Dominican Republic, June 6-10.

**Hammett, A. L.**, Brigitte Parsons, and Bruce G. Hansen. 2003. Marketing strategies of Appalachian hardwood lumber exporters and non-exporters – 1989 and 2002. Theory and Applications in Forest Products Marketing Technical Interest Group Session at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

**Hammett, A. L.** Session Chair (organizer) and moderator. 2003. Renewable Resources: Opportunities, Impacts, Life Cycles, Energy and the Environment Technical Interest Group Session, Forest Products Society 57<sup>th</sup> Annual Meeting, Bellevue, Washington, June 24.



## Presentations

**Hammett, A. L.** Session Chair (organizer) and moderator. 2003. "A New Role for Forest Products Industry Professionals," Public Awareness Committee Technical Session and Workshop, Forest Products Society 57<sup>th</sup> Annual Meeting, Bellevue, Washington, June 25.

\***Hammett, A. L.**, Brigitte A. Parsons, and Bruce G. Hansen. 2002. Marketing strategies of Appalachian hardwood lumber exporters and non-exporters – 1989 and 2002. Society of American Foresters National Convention, Winston Salem, North Carolina, October 8.

**Hammett, A. L.** Session Chair, 2002 International Working Group Technical Session, Society of American Foresters National Convention, Winston-Salem, October 5-9.

Hanna, R. B. and **Audrey Zink-Sharp.** 2003. Modern microscopy methods for exploring wood. Presented at the Annual Meeting of the Society of Wood Science and Technology, Bellevue, Washington, June 23.

Hansen, Eric N., **Robert J. Bush,** Heikki Juslin, Robert Kozak, and Cynthia D. West. 2003. Introducing the Journal of Forest Products Business Research. Presented at the IUFRO Division 5 Conference, Rotorua, New Zealand, March 11-15.

Hansen, Eric N., **Robert J. Bush,** Robert Kozak, Heikki Juslin, and Cynthia D. West. 2003. The Journal of Forest Products Business Research. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

**Helm, Richard F.** and Malcolm Potts. 2003. Desiccation-tolerant human cells. Presented at the DARPA Principal Investigator Meeting, Santa Fe, New Mexico, February 24.

**Kamke, Fred A.,** Layne T. Watson and Jong N. Lee. 2003. Viscoelastic thermal compressed wood: a proposed simulation method. Presented at Oak Ridge National Laboratory, Oak Ridge, Tennessee, May 27.

**Kamke, Fred A.** (invited). 2003. Fundamentals of hot-pressing. Presented at Georgia-Pacific Resins Inc. Technical Center, Decatur, Georgia, July 21.

**Kamke, Fred A.** (invited). 2003. Modeling the OSB mat formation process. Presented at J.M. Huber Corporation Technical Center, Commerce, Georgia, October 8.

**Kline, D. Earl.** 2003. Management initiative for the Center for Forest Products Marketing and Management. Presented to the Annual meeting of the Center for Forest Products Marketing and Management, March 17.

**Kline, D. Earl.** 2003. Lean manufacturing and your business. Presented at the Virginia Forest Products Association 2003 Summer Conference, The Homestead, Hot Springs, Virginia, July 11-13.

**Kline, D. Earl.** 2003. Doing more with less. 2003 Summer Conference, Southeastern Lumber Manufacturers Association, August 2. Orlando, Florida.

**Lamb, Fred M.** 2003. Solid wood: Solid problems, solid future, mandatory changes. Presented at the meeting of the Carolina-Chesapeake Section of the Forest Products Society. Raleigh, North Carolina, September 11.

**Lee, Sang-Mook,** Lynn Abbott, Daniel Schmoltdt and **Philip A. Araman.** 2003. A system for optimal edging and trimming of rough hardwood lumber. 5<sup>th</sup> International Conference on Image Processing and Scanning of Wood, Bad Waltersdorf, Austria, March 23-26.

Lowles, Dave, Urs Buehlmann, **Philip A. Araman,** and Terry Albrecht. 2003. Recycling pallet materials to flooring. Carolinas Recycling Association 13<sup>th</sup> Annual Conference, Greenville, South Carolina, March 18-21.

\*Not listed in Creative Achievements 2002.

## Presentations

**Loferski, Joseph R., Frank E. Woeste,** and Cheryl A. Anderson. 2003. The Safety of Wood Decks and Balconies. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

**Loferski, Joseph R.** 2003. National Frame Builders Association Workshop. Blacksburg, Virginia, October 15-16.

**Loferski, Joseph R.** 2003. Log Home Issues: Answers to Questions No One Wants to Ask. National Association of Home Builders Log Home Council. The Homestead, Hot Springs, Virginia, November 4.

**Maccubbin, Bonnie J., Ralph L. Rupert,** and **Marshall S. White.** 2003. Exhibitor at ProMat2003. Center for Unit Load Design participated as an exhibitor (booth #C3560) at the ProMat2003 tradeshow sponsored by the Material Handling Industry of America, Chicago, Illinois, February 10-13.

**McDaniel, Paul W., Robert L. Smith,** and David R. Fell. 2003. Opportunities for the utilization of non-traditional species in wood-based component manufacturing. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

**McLeod, John A.** 2003. PDS Pallet Component grades: What you need to know and why! Presented at the National Wooden Pallet and Container Association Pallet Summit, Memphis, Tennessee, October 3.

Rappold, Patrick M., **D. Earl Kline, Brian H. Bond,** and Janice K. Wiedenbeck. 2003. Determining hardwood sawmill efficiency factors. Presented at the Technical Forum of the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

Rennekar, Scott H., **Robert S. Wright, Audrey Zink-Sharp,** and **Wolfgang G. Glasser.** 2003. Wood fiber surface modification by steam-explosion with polyolefins. Paper presented at the Symposium on Composites from Renewable Resources, ACS, New Orleans, Louisiana, March 23-27.

Rennekar, Scott H., **Robert S. Wright, Audrey Zink-Sharp,** and **Wolfgang G. Glasser.** 2003. Wood fiber surface modification by steam-explosion with polyolefins. Presented at the Annual Meeting of the Society of Wood Science and Technology, Bellevue, Washington, June 23.

**Rupert, Ralph L.** 2003. Mechanical View of RFID Technology. Presented to the National Institute of Packaging, Handling, and Logistics Engineers (NIPLE) annual conference, Reno, Nevada, November 2-4.

Shu, Jiang, Layne T. Watson, N. Ramakrishnan, Balazs G. Zombori, and **Fred A. Kamke.** 2003. An experiment management component for the WBCSim problem solving environment. High Performance Computing Symposium, San Diego, California, April 1-3.

**\*Smith, Robert L.,** David S. Bailey and Philip A. Araman. 2002. Recovery and reuse of CCA treated wood decks. SRS/WO Technical Assistance Visit, Blacksburg, Virginia, October 15-16.

**Smith, Robert L.** 2003. Wood Molding and Millwork Association's advanced sales training seminar for the seasoned forest products salesperson. Presented at the WMMA Annual Meeting, New Orleans, Louisiana, February 20.

**Smith, Robert L.** 2003. From a contractor's perspective: What is needed to recover used CCA treated lumber. Presented at the Society of Wood Science and Technology's Spring Board Meeting, Boston, Massachusetts, March 28-30.

**Smith, Robert L.,** David Bailey, and **Philip A. Araman.** 2003. Evaluating spent CCA residential decks for second life products. Managing the Treated Wood Resource – II, Boston, Massachusetts, May 1.

**Smith, Robert L.** and Stephanie J. Gomon. 2003. Is there a market in home centers for environmentally certified S4S hardwood lumber. Presented at the International Conference on Forest Industry and Markets, Vaxjo University, Vaxjo, Sweden, May 19-22.

\*Not listed in Creative Achievements 2002.

## Presentations

**Smith, Robert L.,** Stephanie J. Gomon, and **Robert J. Bush.** 2003. The influence of promotional brochures and premium pricing on consumer purchase decisions for environmentally certified hardwood boards in home centers. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

**White, Marshall S.** 2003. Economics of reusable pallets. Presented at the Reuseable Pallet and Container Coalition, Dallas, Texas, January 14-15.

**White, Marshall S.** 2003. Implications of product standards on markets for wood containers. Presented at the ProMat2003 3rd Annual Wood Container Technology Coalition, Chicago, Illinois, February 13-15.

**White, Marshall S.** 2003. NM-II: PDS New release overview and challenging your business future. NWPCA Annual Leadership Conference. Also served as Panel Member to discuss future industry standards; served on Research and Standards Committees. Marco Island, Florida, February 22-25.

**White, Marshall S.** 2003. Business opportunities associated with new international phytosanitation regulations of raw wood packaging. Presented to the local Resource Conservation and Development (RC&D) group, Blacksburg, Virginia, May 15.

**White, Marshall S.** 2003. First International Symposium of Pallet Testing. Fraunhofer Institut Materialfluss und Logistik. The Sardo Pallet Lab served as manager of the project (Dr. White is convener of the ISO TC51 "Pallets for Unit-Load Methods of Materials Handling," working group 2). White was conference moderator and presented the paper Determining Pallet Maximum Working Loads from Nominal Load Measurements (Marshall S. White, Wilburg Dibling, Ralph Rupert, and John McLeod, 2003). Dortmund, Germany, June 24-25.

**White, Marshall S.** 2003. Technical developments in the pallet industry. Featured speaker to the 57th European Federation of Wooden Pallets and Packaging Manufacturers Congress, Edinburgh, Scotland, September 10-12.

**White, Marshall S.** 2003. ISO TC51 Working Group Meeting. Marshall White represents the USA on this working group and is the working group convener. Milan, Italy, November 25-28.

**Winistorfer, Paul M.** 2003. Wood and the environment. Presented at the Forest Products Society Northeast Section Meeting "Innovations in Wood Construction," Mashantucket, Connecticut, May 9.

**Winistorfer, Paul M.** 2003. Another approach to recruiting undergraduate students in wood science and forest products. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

**Winistorfer, Paul M.** 2003. Use and maintenance of residential structures: Energy and environmental considerations. Presented at the 57<sup>th</sup> Annual Meeting of the Forest Products Society, Bellevue, Washington, June 22-25.

**Winistorfer, Paul M.** 2003. The Forest Products Society. Presented at the Forest Products Society Carolina-Chesapeake Section Meeting "Wood Fiber – Supply, Demand, Quality and Potential" Raleigh, North Carolina, September 11.

**Winistorfer, Paul M.** 2003. A voice for the profession – understanding the landscape. Presented at the USDA Forest Products Laboratory Fall Conference, "Forest Products Priorities for the Future," Forest Products Laboratory, Madison, Wisconsin, October 28.

**Winistorfer, Paul M.** 2003. The Forest Products Society – Your Association. Presented at the Forest Products Society Mid-South Section Meeting "Softwood Utilization – Current Status and Strategies for the Future," Hot Spring, Arkansas, November 6, 2003.

**Woeste, Frank E.,** Donald Bender, and **Joseph R. Loferski.** 2003. Structural design with wood. Presented at Virginia Tech, Blacksburg, Virginia, May 12-14.

## Presentations

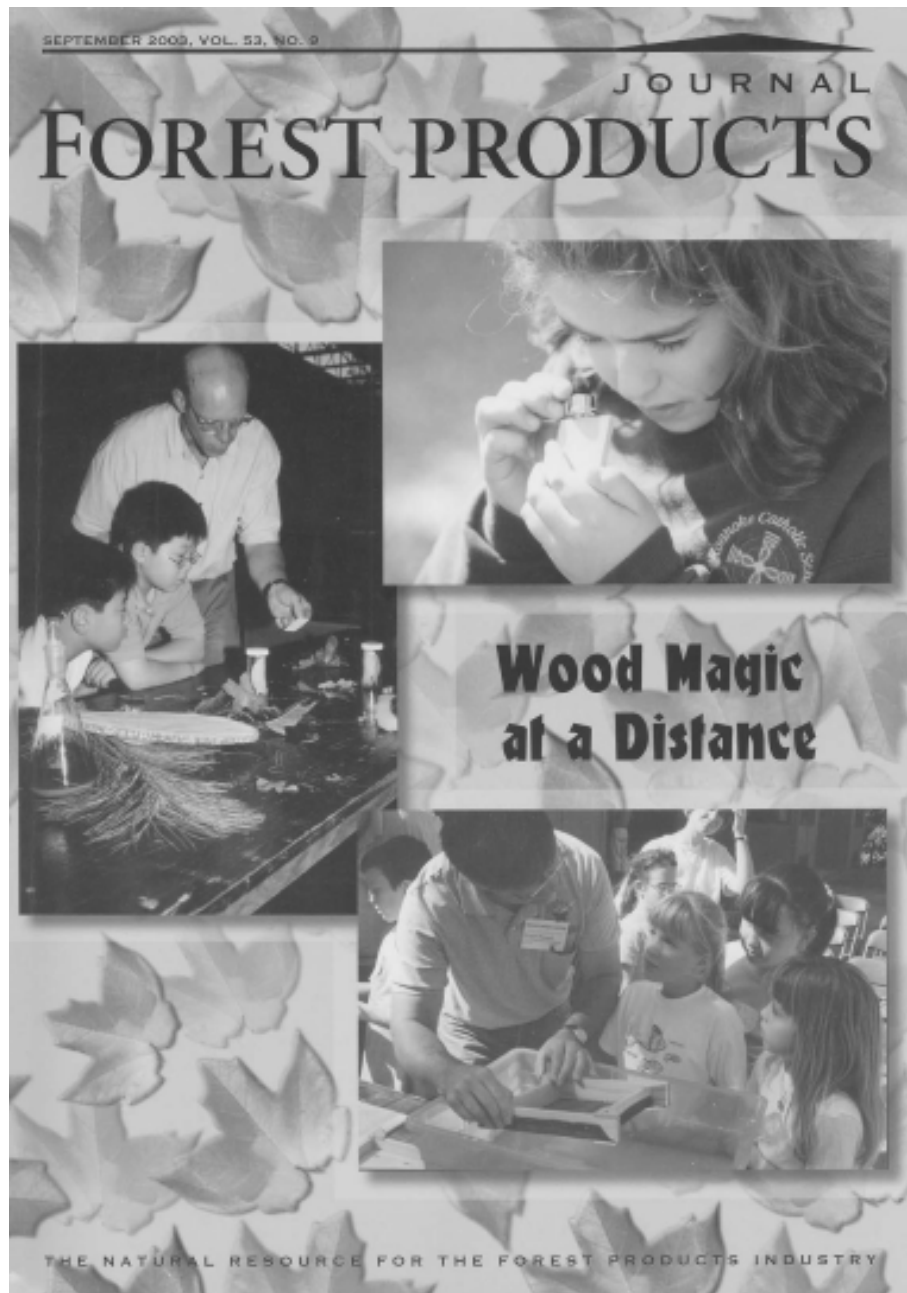
**Youngs, Robert L.** 2003 Scientific Writing in English for Chinese Scientists. Distance learning course at National Pingtung University of Science and Technology (NPUST), Pingtung, Taiwan, February – June. 60 students. Presentation to English students at NPUST, November 8. Presentation to Engineering students at National Cheng-Kung University, Tainan, Taiwan, November 5.

**Zink-Sharp, Audrey.** 2003. Wood Magic presentation to the Virginia Forestry Educational Foundation, Wintergreen, Virginia, April 5.

**Zink-Sharp, Audrey.** 2003. Trained staff at Holiday Lake 4-H Educational Center, Appomattox, Virginia to present Wood Magic traveling classroom programs at the Center. Summer.

**Zink-Sharp, Audrey.** 2003. Coordinated and presented Wood Magic traveling classroom programs at the 3<sup>rd</sup> Annual Virginia Tech Kentland Farm and Family Showcase.

**Zink-Sharp, Audrey.** 2003. Coordinated 6<sup>th</sup> Annual Wood Magic On-Campus program.



Wood Magic at a Distance can be found at [www.woodmagic.vt.edu](http://www.woodmagic.vt.edu)

## Awards and Honors – 2003



### **Wolfgang G. Glasser**

Appointed “Professeur Invité” of the University of Toulouse (INP), Toulouse, France (2 months).

Division Fellow Award, Cellulose and Renewable Materials Division. American Chemical Society

Reappointed as Member of the Advisory Board of HOLZFORSCHUNG (for 5 years).



### **A. L. Hammett**

Fellow, The Mountain Institute, Washington, DC.

Research Affiliate. Elected by the faculty of Yale University, School of Environmental Studies and Forestry, New Haven, Connecticut.



### **Fred A. Kamke**

Named the Thomas M. Brooks Professor of Wood Science.



### **Fred M. Lamb**

Received the Fred W. Gottschalk Memorial Award at the 57th Annual Meeting of the Forest Products Society held in Bellevue, Washington, June 22-25.

### **Marshall S. White**

Named advisor to the Reusable Pallet and Container Coalition (RPCC) pallet task force.

Named Convener of the International Organization of Standardization (Geneva, Switzerland) TC51 – Pallets for Unit-Load Methods of Materials Handling. Working Group 2

The William H. Sardo, Jr., Pallet and Container Research Laboratory was named the Manager of the International Pallet Testing Project for the International Organization of Standardization.



### **Paul M. Winistorfer**

Appointed president of the Forest Products Society. Forest Products Society 57th Annual Meeting, Bellevue, Washington, June 22-25.

Appointed Vice President WoodLINKS, USA.



### **Robert L. Youngs**

Award for continued distinguished service to IUFRO Forest Products Division.



### **Audrey Zink-Sharp**

Appointed President-Elect, Society of Wood Science and Technology.



## Undergraduate and Graduate Courses Taught by Department Faculty – 2003

| <b>*Course Number</b>  | <b>Course Title</b>                                | <b>Credit Hours</b> | <b>Instructor</b>                                     | <b>Number of Students</b> |
|------------------------|--|---------------------|---|---------------------------|
| <u>Spring Semester</u> |  |                     |   |                           |
| NR 3954/5954           | Study Abroad                                       | 3                   | Tom Hammett/Brian Murphy                              | 10                        |
| NR 3964/5964           | The Global Seminar                                 | 3                   | Tom Hammett   | 6                         |
| NR 5114                | Global Issues in Natural Resources                 | 3                   | Tom Hammett   | 15                        |
| WOOD 3114              | Wood Structure, Properties, and Processing Lab     | 3                   | Audrey Zink-Sharp                                     | 35                        |
| WOOD 3234              | Wood Structure and Properties Lab                  | 1                   | Audrey Zink-Sharp                                     | 17                        |
| WOOD 3434              | Wood Chemistry, Products, and Processes            | 3                   | Rich Helm   | 11                        |
| WOOD 3784              | World Forestry and Forest Products                 | 3                   | Tom Hammett   | 31                        |
| WOOD 4154              | Computer Control Systems in Forest Products        | 3                   | Earl Kline  | 6                         |
| WOOD 4316              | Mechanical Properties of Wood II                   | 3                   | Joe Loferski  | 8                         |
| WOOD 4446              | Wood Adhesion and Composites                       | 4                   | Fred Kamke  | 11                        |
| WOOD 4524              | Wood Drying and Durability                         | 3                   | Brian Bond/Rich Helm/<br>Bob Smith                    | 10                        |
| WOOD 4614              | Distribution and Marketing of Wood Products        | 3                   | Bob Bush  | 10                        |
| WOOD 4714              | Wood Performance in Building Construction          | 3                   | Joe Loferski  | 12                        |
| WOOD 5004              | Graduate Seminar                                   | 1                   | Paul Winistorfer                                      | 12                        |
| WOOD 5614              | Forest Products Marketing and Management           | 3                   | Bob Smith   | 6                         |
| <u>Fall Semester</u>   |  |                     |   |                           |
| NR 1114                | Introduction to Renewable Natural Resources        | 2                   | Dan Hindman   | 14                        |
| NR 1114                | Introduction to Renewable Natural Resources        | 2                   | Phil Araman/Bob Bush/<br>Tom Hammett/Paul Winistorfer | 18                        |
| NR 4404                | Skills and Approaches in International Development | 1                   | Tom Hammett   | 10                        |
| WOOD 3784              | World Forestry & Forest Products                   | 3                   | Tom Hammett   | 27                        |
| WOOD 4315              | Mechanical Properties of Wood                      | 3                   | Bob Wright  | 16                        |
| WOOD 4445              | Wood Adhesion and Composites                       | 3                   | Chip Frazier  | 10                        |
| WOOD 4534              | Lumber Manufacturing and Machining                 | 3                   | Mark White  | 16                        |
| WOOD 4624              | Wood Industry Management                           | 3                   | Earl Kline  | 10                        |
| WOOD 5004              | Graduate Seminar                                   | 1                   | Paul Winistorfer                                      | 15                        |
| WOOD 5314              | Physical and Mechanical Properties of Wood         | 4                   | Joe Loferski/Fred Kamke                               | 5                         |
| WOOD 5414              | Advanced Wood Chemistry and Structures             | 4                   | Audrey Zink-Sharp/<br>Wolfgang Glasser                | 4                         |

\*These course number designations reflect the academic department where the course originates and level of the course.

WOOD is the designation for courses originating from the Department of Wood Science and Forest Products. NR is the designation for courses originating from the College of Natural Resources.

## Short Courses/Continuing Education Programs – 2003

| <u>Course Title</u>   | <u>Instructor</u>  | <u>Location</u> | <u>Dates</u>   |
|---|--|-----------------|--|
| Wood Adhesion, Structure and Properties                                 | Fred Kamke and Charles Frazier   | Athens, GA      | January 8-9  |
| Weyerhaeuser Corrugated Packaging Workshop                              | Ralph L. Rupert  | Aurora, IL      | February 12-14, April 9-11, June 11-13, August 6-8, September 10-12, October 1-3, and November 5-7 |
| Hot-pressing Fundamentals   | Fred A. Kamke  | Madison, WI     | February 13-14   |
| Introductory Pallet Design System Short Course                          | Marshall S. White and John A. McLeod, III  | Blacksburg, VA  | March 5-7  |
| Advanced Pallet Design System Short Course for PalletOne                | Marshall S. White  | Bartow, FL      | April 1-3  |
| Business Opportunities in Non-Timber Forest Products                    | A. L. Hammett  | Wagoner, OK     | April  |
| Niche Markets   | A. L. Hammett  | Wagoner, OK     | April  |
| Unit Load Design Short Course   | Mark S. White and Ralph L. Rupert  | Blacksburg, VA  | April 23-25  |
| Lean Manufacturing - First Wood Management Series Workshop              | D. Earl Kline, Dan W. Cumbo, and Robert L. Smith   | Blacksburg, VA  | May 5-6  |
| Wood Design Conference  | Frank E. Woeste, Donald A. Bender, and Joseph R. Loferski                                    | Blacksburg, VA  | May 12-14  |
| Wood Adhesion   | Charles E. Frazier, Fred A. Kamke, and Joseph R. Loferski                                    | Blacksburg, VA  | May 13-14  |
| Adhesion Science Short Course   | Thomas Ward, David Dillard, John Dillard, Timothy Long, Richey Davis, and Charles E. Frazier | Blacksburg, VA  | June 2-6   |
| Wood Structure and Properties   | Audrey Zink-Sharp and Ruben Shmulsky   | Blacksburg, VA  | July 22-23   |
| Contemporary Analytical Tools and Methods for Wood-Based Composites R&D | Charles E. Frazier, Timothy Rials, and Audrey Zink-Sharp                                     | Blacksburg, VA  | August 13-14   |

## Short Courses/Continuing Education Programs – 2003

| <u>Course Title</u>   | <u>Instructor</u>   | <u>Location</u>     | <u>Dates</u>    |
|---|---|---------------------|-----------------|
| Kiln Drying Lumber for Managers and Operators for USAID/CADEFOR                               | Brian H. Bond   | La Paz, Bolivia     | September 9     |
| Kiln Drying Lumber for Managers and Operators for USAID/CADEFOR                               | Brian H. Bond   | Cochabamba, Bolivia | September 10    |
| Kiln Drying Lumber for Managers and Operators for USAID/CADEFOR                               | Brian H. Bond   | Santa Cruz, Bolivia | September 11    |
| Selling Forest Products   | Robert J. Bush and Robert L. Smith  | Blacksburg, VA      | September 11-12 |
| Wood Design Conference  | Frank E. Woeste, Donald A. Bender, and Joseph R. Loferski   | Blacksburg, VA      | September 16-18 |
| Unit Load Design Short Course   | Marshall S. White and Ralph L. Rupert   | Blacksburg, VA      | September 24-26 |
| 2nd Workshop on Drying Lumber with a Solar Dry Kiln   | Brian H. Bond   | Blacksburg, VA      | September 25-26 |
| Hardwood lumber drying and log grading. Presented at the National Hardwood Lumber Association | Brian H. Bond   | Memphis, TN         | November 4-6    |
| Fundamentals of Composites Processing   | Fred Kamke, Charles Frazier, Siqun Wang, Chunping Dai, Chuck Frihart, Heiko Thoeman, and Jerry Winnandy | Madison, WI         | November 5-6    |
| Advanced Pallet Design System Short Course  | Marshall S. White and John A. McLeod, III   | Alexandria, VA      | November 13-14  |
| Wood Adhesion Problem Solving: The Phenol-Formaldehyde Dimension                              | Fred Kamke, Rob Schmidt, C. R. Davis, Barbara Gartner, Joseph Karchesy, Philip Humphrey                 | Corvallis, OR       | December 2-3    |
| 21st Oak Drying Workshop  | Brian H. Bond and Fred M. Lamb  | Roanoke, VA         | December 2-4    |



## Faculty Involvement in Professional Service

Faculty are involved in a variety professional service activities. These contributions are recognized here to reflect the considerable time and energy faculty devote to the profession.

### **Brian H. Bond**

- Chairman of the Temperate and Tropical Hardwood Target Interest Group for the Forest Products Society.

### **A. L. Hammett**

- 2003 (through 2006) Science Liaison Officer. Center for International Forestry Research (CIFOR). As the U. S. representative to the Board of Trustees link U.S. institutions to this international research and global knowledge institution committed to conserving forests and improving the livelihoods in the tropics. CIFOR employs over 150 staff at its headquarters in Bogor, Indonesia and regional offices in Brazil, Cameroon and Zimbabwe, coordinates and supports 300 researchers working in over 30 countries for 50 international organizations, and is supported by contributions from over 50 governments and funding agencies.
- Referee for *Forest Products Journal* and *Journal of Forestry*.
- Research Grant Application Reviewer for USDA-SBIR Program.

### **Daniel P. Hindman**

- Serves as the Vice-Chair of the SE-201 Wood Structures committee for ASAE, the Society for Engineering in Agricultural, Food and Biological Systems.

### **Geza Ifju**

- Ex-officio member of the Executive Board of the Society of Wood Science and Technology.

### **Fred A. Kamke**

- Served on the Composite Panel Association Scholarship Selection Committee, October 2003.
- Served on the Executive Board of the Forest Products Society.
- Referee for *Forest Products Journal*, *Wood and Fiber Science*, and *Wood Science and Technology*.
- Reviewer of proposals for USDA/CSREES NRI Grants Program and USDA Small Business Innovative Research Grants Program.

### **D. Earl Kline**

- Associate Editor, *Wood and Fiber Science*, Society of Wood Science and Technology, 1996-2003.
- Associate Editor, Elsevier Science, *Computers and Electronics in Agriculture*, 1997-2003.
- Board Member on the Consortium for Research on Renewable Industrial Materials (CORRIM).
- Examiner, U.S. Senate Productivity and Quality Award for Virginia (SPQA).
- Technical Assistance Visit. June 4-5, 2003. Planning session for the Northeastern Research Station's NE-4701 technical program, Princeton, WV.
- Participant, Skill Standards in the Wood Manufacturing Industry, WoodLINKS Partnership. September 23, 2003.
- Participant, Teachers' Professional Masters Degree, WoodLINKS Partnership, December 5.
- Referee for *Wood and Fiber Science*, *Forest Products Journal*, and *Computers and Electronics in Agriculture*.
- Research Grant Application Reviewer for USDA-SBIR Program, USDA-CSRS National Research Initiative Competitive Grants Program, Improved Utilization of Wood and Wood Fiber.

## Faculty Involvement in Professional Service

### Robert L. Smith

- Director for the Society of Wood Science and Technology.
- Chair, Virginia Forest Based Economic Development Council.

### Robert L. Youngs

- Chair, Publication Policy Committee, Society of Wood Science and Technology.
- Member, Marra Award Committee, Society of Wood Science and Technology.

### Audrey Zink-Sharp

- Appointed President-Elect, Society of Wood Science and Technology.
- Completed SWST Teaching Units 1 and 2 as part of the Education Committee.  
[www.swst.org/teach1.html](http://www.swst.org/teach1.html)  
[www.swst.org/teach2.html](http://www.swst.org/teach2.html)
- Served as Vice Chair, Society of Wood Science and Technology Accreditation Committee.
- Served as Team Leader, Society of Wood Science and Technology, re-accreditation site visit to the University of Maine.

### Paul M. Winistorfer

- President, Forest Products Society.
- Vice President and Board Member, WoodLINKS, U.S.A.
- Research Grant Application Reviewer for USDA-SBIR Program, USDA-CSRS National Research Initiative Competitive Grants Program, Improved Utilization of Wood and Wood Fiber.
- Referee for *Forest Products Journal*.

## Report of Activities – 2003

### Center for Forest Products Marketing and Management

Director: Dr. Robert L. Smith

Market Analyst: Mr. Dan Cumbo

Participating Virginia Tech Faculty:

Dr. Robert Bush, Dr. A. L. Hammett, and Dr. Earl Kline

[www.cfpmm.vt.edu](http://www.cfpmm.vt.edu)



The Center for Forest Products Marketing and Management (CFPMM) was established in 1991 by the late Dr. Steven Sinclair. The Center was established to bridge a gap between academia and industry and to support the marketing efforts of member companies. It is a cooperative between the Department of Wood Science and Forest Products, trade associations, and companies related to many different aspects of the forest products industry. There is increased international and domestic competition within the forest products industry in the United States. The CFPMM strives to assist member companies in this area by providing marketing and management education and conducting specific marketing/management research for the industry. *The mission of the Center is to assist firms in the forest products industry to improve the management of their operations and the marketing of their products.*

Forty-nine companies and associations supported the Center in 2003. Gifts from these corporations and associations totaled over \$30,000. In addition, over \$25,000 in donations was raised for the market analyst position. During 2003, the CFPMM awarded 15 scholarships sponsored by member companies and associations. The scholarships range from \$500 to \$2000, and a total of \$17,250 was awarded to qualified students.

The CFPMM offered four short courses on the Virginia Tech campus during 2003: "Selling Forest Products," "Forest Products Marketing," "Advanced Sales Training for Forest Products Industry," and "Lean Manufacturing." A number of off-campus and on-site courses were also offered to member companies. In addition to these short courses, an on-line short course, "Selling Forest Products," was also offered.

## Report of Activities – 2003

The Research Steering Committee for the Market Analyst position met twice in 2003, once in the spring and once in the fall. The annual meeting for all center members was held in March on the Virginia Tech campus, and the Research Steering Committee met before the general membership meeting. The spring meeting included a banquet, at which Ed Brindley of Pallet Enterprise was the keynote speaker. The banquet was well-attended by students, faculty and staff as well as member companies. Scholarships were also awarded at the banquet. The fall meeting of the Research Steering Committee was conducted by means of conference call. Research reports, three Market Updates and four Research Updates, were published in 2003.

The CFPMM was represented at many professional meetings, association meetings, and trade shows throughout the United States in 2003, including: the Hardwood Manufacturers Association annual meeting in Charleston, SC; the National Hardwood Lumber Association annual meeting in Atlanta, GA; the Virginia Forest Products Association summer and winter meetings, and the 57<sup>th</sup> annual Forest Products Society meeting in Seattle, WA.

For further information on the Center for Forest Products Marketing and Management, contact Bob Smith at (540) 231-5876 or by email at [rsmith4@vt.edu](mailto:rsmith4@vt.edu).



### Center for Unit Load Design

Director: Dr. Marshall S. White

Managing Director of Member Services  
and Marketing: Bonnie Maccubbin

Research Associates:

Peter Hamner, John A. McLeod, III, and Ralph Rupert

[www.unitload.vt.edu](http://www.unitload.vt.edu)

The Center for Unit Load Design was created in 1996 – a natural outgrowth of the long time activities of the William H. Sardo Jr. Pallet and Container Research Laboratory – to expand pallet and container research into the evaluation of all elements of materials handling systems. *The mission of the Center for Unit Load Design is to take a systems approach in developing information and technologies that*

*optimize the relationship between the design and performance of unit loads and maximize the efficiency of unit load material handling systems.* Center facilities include the Sardo Pallet Lab, which focuses on pallet design and performance, and the Unit Load Testing Laboratory, which studies packaging, material handling equipment, and their interactions with pallets.

The Center was pleased to welcome Dr. Jae Eom, associate professor in the Department of Industrial Engineering, Myongji College of Seoul, Korea, who was on sabbatical with the Center during 2003. Dr. Eom assisted center director, Dr. Marshall S. White, in his role of convener of ISO/TC 51/WG2, “Pallets for Materials Handling,” by reviewing international pallet test results collected by the Sardo Pallet Lab, manager of the International Pallet Testing Project, to compare actual pallet use to the ISO test procedures and standards. Dr. White also presided over the First International Symposium of Pallet Testing in Dortmund, Germany, where selected papers from the International Pallet Testing Project were presented.

Center research for 2003 included a vacuum technology project conducted by Dr. Zhangjing Chen, Dr. Marshall White, and Dr. William H. Robinson, a local entomologist. The project was a phytosanitary study involving the vacuum control of insects in solid wood packaging materials, which could serve as an alternative to heat treatment or fumigation processes described in IPPC ISPM #15 “Guidelines for Regulating Wood Packaging Material in International Trade.”

Many projects with corporate clients were completed during 2003, including work with new center members: Advanced Applied Structures, Armacel Technology Group, Basalite Concrete Products, BTM Manufacturing, Greenpac, Key Tech, Menasha, Oldcastle, PECO Pallet, Inc., Potomac Supply, Rafsec, and Stanley Fastening Systems. The Center’s most notable project of the year was awarded by the Reusable Pallet and Container Coalition (RPCC), along with the Corrugated Packaging Alliance (CPA), to evaluate the compatibility between returnable plastic containers (RPCs) and corrugated packaging in the transportation of produce. Also of particular interest is the RFID (radio frequency identification) technology testing, in conjunction with Rafsec, to study the application of RFID tags to wood

## Report of Activities – 2003

pallets. Ralph Rupert, center testing manager, is frequently quoted in national material handling publications for alerting the industry to the potential challenges in the mechanical application of RFID tags.

During 2003, the Center offered short courses in Unit Load Design and introductory and advanced courses on the Pallet Design System®. Center activities also included a new version release of the Pallet Design System®, a redesigned website, and an exhibit at ProMat2003 – a materials handling tradeshow in Chicago, Illinois.



### Wood Magic

Program Coordinator: Dr. Audrey Zink-Sharp  
[www.woodmagic.vt.edu](http://www.woodmagic.vt.edu)

Often elementary school students receive only a general foundation in the area of wood science, forestry, and natural resource utilization. As a result, confusion and widespread misperceptions are created regarding the use and sustainability of America's forest resources. Recognizing this problem, Virginia Tech and a few other universities and organizations have developed youth education programs such as Wood Magic. Very popular with elementary schools, the programs present active, hands-on, and engaging science-based education to fourth and fifth grade students and teachers.

Our 6<sup>th</sup> annual on-campus program was our largest to date. Almost 600 children and 70 teachers and aides participated with us this year. The 33 classes were from 7 different local schools. This brings the six-year on-campus totals to 2,780 children and 297 teachers and aides. Requests to participate in Wood Magic 7 (2004) have come in already. All events and activities were similar to previous years and ran very smoothly, thanks to the many volunteers that help put on this program. We had strong participation from staff and students this year, for which we are extremely grateful.



Highlighting the traveling program this year was a successful partnership with the Holiday Lake 4-H Educational Center in Appomattox, Virginia. To make this work, we trained camp personnel to deliver Wood Magic programs and provided all materials, equipment, and supplies. Approximately 1,000 campers, plus about 100 adult counselors, learned from Wood Magic at the Center during the summer of 2003. This is an outstanding opportunity for us to interact with thousands of young people and educators across Virginia, and we plan to continue with this partnership next summer at Holiday Lake. The traveling classroom was also part of Virginia Tech's Kentland Farm and Family Showcase 2003. In spite of heavy rain the first day, we had a good experience at the Showcase. Approximately 250 young people, plus another 100 or so adults, participated in Wood Magic Shows or made paper with us during down times. The Showcase is attended by thousands of people over a three-day period and Wood Magic is one of the more popular events for the young people.

A distance education version of the on-campus Wood Magic Program, utilizing interactive videoconferencing and instructions via videotape, is in the final stages of completion. An instructional design model was developed to meet the needs of designers and educators looking to expand into the distance education environment. Our work was featured in the September issue of the *Forest Products Journal* (Lockee, B.B., C.E. Pugh, and A. Zink-Sharp. 2003. Wood Magic at a Distance. For Prod J. 53(9):6-14).

## Report of Activities – 2003

An instruction manual, activities, experiments, links, and updates are continually added to the website ([www.woodmagic.vt.edu](http://www.woodmagic.vt.edu)). We continue to publicize, expand, and edit the Kids' section. A pdf version of the *Forest Products Journal* mentioned on page 35 is available on the website. The website also contains additional information on the traveling classroom, policy, and setup requirements.

Plans for Wood Magic for next year include writing a short book to give to the student participants upon completion of a Wood Magic program, expanding the offerings of all four components, and conducting a training workshop in January 2004 for Virginia 4-H Extension agents.



### Wood-Based Composites Center

Director: Dr. Fred Kamke

Managing Director: Ms. Linda Caudill

Participating Virginia Tech Faculty:

Dr. Chip Frazier,

Dr. Wolfgang Glasser,

Dr. Daniel Hindman,

Dr. Joe Loferski, Dr. Bob Smith,

and Dr. Audrey Zink-Sharp

[www.wbc.vt.edu](http://www.wbc.vt.edu)

Wood-based composites play an ever-increasing role in the wood products industry. In order to support the needs of the industry today and in the future, the Wood-Based Composites (WBC) Center was established in 1999. The Center is a cooperative effort between the Department of Wood Science and Forest Products at Virginia Tech, its member companies, and several affiliated universities, including Mississippi State, Oregon State, and the University of Minnesota. Its activities are focused on meeting the educational and research needs of the wood and fiber-based composites, and related industries.

One new company, Grant Forest Products, joined the WBC Center in 2003. Grant is a Canadian-based manufacturer of Oriented Strand Board (OSB) headquartered in Earlton, Ontario. The total number of corporations supporting the

efforts of the Center in 2003 was 12, including Bayer Polymers, Boise, Borden Chemical, Columbia Forest Products, Dow Chemical, Dynea, Georgia-Pacific Resins, Grant Forest Products, Huntsman Polyurethanes, J. M. Huber Corporation, National Starch and Chemical, and Weyerhaeuser Company. Gifts from these corporations totaled over \$200,000.

During 2003, the Center supported eight graduate fellows, at least one at each of its four universities. Borden Chemical Fellow, Jessica Jennings, completed her M.S. program. Undergraduate scholarships totaling \$20,500 were awarded to thirteen students at the four center universities in 2003. Several students completed internships at participating company facilities during the summer.

The WBC Center offered four short courses during the year, with a total of 74 participants from 37 companies and organizations. The Wood Adhesion, and Wood Structure and Properties Short Courses were held at Virginia Tech in May and July, respectively. A new short course, Contemporary Analytical Tools and Methods for Wood-Based Composites R&D, was offered to Center members only in August. Finally, the Wood Adhesion Problem Solving Course, which focused this year on phenol-formaldehyde adhesives, was held at Oregon State University in December. In addition to Center short courses, the WBC Center offered several workshops and conferences in 2003. Most notably, a workshop, entitled Fundamentals of Composites Processing, was co-sponsored by the Forest Products Laboratory in Madison, Wisconsin, in November. Additional courses, including a new Wood Adhesion Problem Solving Short Course focusing on isocyanate adhesives, are planned for 2004.

The WBC Center Industry Advisory Board met twice in 2003. The spring meeting was held at Mississippi State University in Starkville in April, and included a Student Reception that was well attended by MSU faculty and students. The fall meeting and Technical Forum was held in Blacksburg in September. Eighteen students and faculty members presented posters and talks at the meeting, highlighted by guest speaker Kevin Powell of the National Association of Home Builders. The Advisory Board plans to meet at the University of Minnesota in St. Paul in the spring of 2004.

WBC

## Report of Activities – 2003

The Wood-Based Composites Center was represented at several professional meetings throughout the year, including the 26<sup>th</sup> Annual Meeting of the Adhesion Society in Myrtle Beach, SC, the Symposium on Composites from Renewable Resources for the American Chemical Society in New Orleans, the High Performance Computing Symposium, San Diego, the Alberta Forestry Research Institute, Edmonton, Alberta, Canada, the Annual Meeting of the Society of Wood Science and Technology, and the 57<sup>th</sup> Annual Meeting of the Forest Products Society, both held in Bellevue, Washington, and the Annual Info Fair of the Engineered Wood Research Foundation, San Diego.



### Quantitative Wood Anatomy Lab

Program Coordinator: Dr. Audrey Zink-Sharp

Email: agzink@vt.edu

A Quantitative Wood Anatomy laboratory has been established in Room 200 Cheatham Hall for the express purposes of wood cell wall research and education. Our present concept of wood cell wall structure originated nearly 40 years ago almost entirely through the use of a single microscope technique. Recent research is revealing significant deficiencies in that concept. The macro-molecular organization is considerably more complex than previously thought and there are several levels of micro-structure yet to be completely mastered. In addition, detailed information on earlywood and latewood properties is currently unavailable in public literature.



The lab is uniquely equipped with a customized micro-testing system that can test static and cyclic tension, compression, and bending properties of wood fiber and small specimens of wood taken from earlywood or latewood regions. Among the major items of equipment in the new lab are an Amray 1810D Scanning Electron Microscope, several light microscopes, specimen preparation equipment, and a specialized wood cell image analysis system.

## Report of Activities – 2003

Research conducted in the new Quantitative Wood Anatomy Lab will focus on micro-mechanical and physical properties of wood fiber, quantitative wood anatomy, and determination of adhesion and surface properties at the microscopic level. The micro-testing system will also be used to provide information on the mechanical properties of individual growth ring regions. We will research the latest concepts in wood anatomy and ultimately provide a comprehensive, up-to-date representation of wood cell wall architecture that captures the full complexity and possibilities.

### Steam Explosion Pilot Plant

Pilot Plant Manager: Robert S. Wright

Email: [rswright@vt.edu](mailto:rswright@vt.edu)

The steam explosion laboratory is equipped with three different process vessels and several pieces of ancillary equipment. The process vessels, in size order from large to small, begin with our Stake Technologies Ltd. Continuous steam explosion reactor with co-axial feeder assembly. This is a stainless steel pressure vessel with agitation and measures 2 ft. diameter x 24 ft. long (70 ft<sup>3</sup> volume). Material can be processed at pressures up to and including 450 psig working steam pressure (WSP) and 500°F.



The coaxial, mechanical feeder attached has a 6 in. diameter bore and a capacity of 1,750 lbs/hr (oven dry basis) with green, 3/4 pulpwood wood chips. We also have the capability to work with properly sized agricultural residues of any type, properly sized paper products for re-pulping, food waste blended with ligno-cellulose waste materials, thin film plastic waste blended with ligno-cellulose materials, and many other materials.

Another piece of steam explosion equipment is our 0.9 ft<sup>3</sup> volume, stainless steel, non-stirred, batch steam explosion vessel capable of 450 psig WSP and 500°F. The mass capacity depends upon the bulk density of the material being tested. Typically for green wood chips it would be a maximum of 5 lbs, dry basis.

The third steam explosion vessel is a stirred batch-style reactor. It has a volume of 0.13 ft<sup>3</sup>, is made of extra-heavy wall stainless steel with a working pressure capability in excess of 1,000 psig, and is configured in a manner that permits in situ addition of catalysts and alternate reaction atmospheres.

In calendar year 2003 the steam explosion laboratory supported 15 full days of steam explosion processing to serve the variety of needs for faculty on campus, graduate students on campus, faculty from other universities, students from other schools, and commercial clients.

Funded research support has been ongoing with Foster Agblevor, Ph.D., the Department of Biological Systems Engineering, for his research project entitled, "Scale-up of ethanol production from cotton gin residues". The support comes through the Southeastern Regional Biomass Energy Program (SERBEP). The contract number is SERBEP-SSEB1003VA-VAT-002. A paper was presented on this project at the, "Beltwide Cotton Conferences," San Antonio, TX, January 5-9, 2004.

Graduate student research has been ongoing with Ph.D. candidates Scott Rennecker and Richard Johnson, both in the Department of Wood Science and Forest Products. Efforts are supported through the project titled, "Engineering the wood fiber-plastic interface by steam explosion," sponsored

## Report of Activities – 2003

by the USDA/CSREES. This project required modification of a conventional stirred pressure reaction vessel (Parr, Inc.) into a three liter-volume batch steam explosion reactor and product recovery system. The performance of this system, judged by the product quality, has been very close to the performance of the very large-scale continuous steam explosion reactor we operate. The latter piece of equipment has consistently produced the benchmark product by which our other steam explosion systems are judged.

Cooperative work with the University of Tennessee, Institute of Agriculture has provided them with steam exploded research material in an effort to utilize pinewood recovered from southern pine beetle-killed trees.

A project for a high school student in Canada was supported with a small amount of feed stock preparation and some steam explosion services.

Occasionally the steam explosion facility is contracted by commercial clients for larger, industrial pilot-scale testing. Some years see multiple clients for large blocks of time. This year promised to be a single client for a multi-phase project involving hardwood chips, recycled polypropylene and recycled polyethylene. An initial test run of 20,000 lbs was accomplished and a second phase was in final planning. A small project for a commercial client utilized the three-liter stirred batch steam explosion reactor to explore co-steam explosion of paper pulp and a variety of thermoplastic materials.

### **Wood Engineering Lab** Engineering Lab Manager: Rick Caudill

The Wood Engineering Laboratory located at the Thomas M. Brooks Forest Products Center is a 2,600 square foot high-bay laboratory. Equipment in the laboratory includes a MTS (model 826.75) 50,000 lbs servo hydraulic test system, a MTS (model OME) 20,000 lbs servo hydraulic test system, a MTS (model GL-10) 10,000 lbs screw driven test system, a Endure Tec 50,000 lbs shear wall hydraulic test system, a Environmental Specialists (model CER9-17) walk-in conditioning chamber and a Parameter Generation (model

AA-5460A) portable conditioning unit. The Wood Engineering laboratory functions as a flexible testing laboratory and is used by faculty and students for research, graduate student research, demonstrations, and short courses.

Two ongoing major projects highlighted the research activities in the lab during the past year. A study of the durability of wood-based composites sheathing connections when subjected to moisture content changes is being conducted by master's candidate Jeffrey Smith. Jeff constructed a temporary stability chamber in which he can monitor and control the environment for oriented strandboard and plywood nailed samples. Following several cycles in the conditioning chamber, a 20,000 lb. MTS testing machine, with a 1000 lbs. load cell is used to evaluate mechanical properties. The data is captured and stored in a Labtech data collection system.



Test setup for analyzing the durability of wood-based composites sheathing connections following exposure to moisture content changes.



## Report of Activities – 2003

A second major project underway during the past year, conducted by master's candidate Mary Billings, is studying the effect of fastener spacing on bolted connections in timber construction. Mary conditioned 2 by 6 SYP lumber to 12% moisture content before bolting two pieces together using grade 2 bolts. She then tested the samples using a CUREE profile, loading to failure on a 50,000 lb. MTS machine. Mary will also be conducting embedment and bolt bending tests on the 20,000 lb. MTS machine.

Summer intern Quintin Smith, a MAOP participant from Mississippi State University under the direction of Dr. Joseph Lofierski, also used the laboratory to load-test lag screw and bolted deck connections in pressure treated lumber. This testing was performed on a 20,000 lb. MTS machine. The displacement was recorded using a separate LVDT and Labtech data collection system.

Other research and testing work supported by the laboratory in 2003 included work on understanding the fundamental aspects of fracture testing, evaluation of plastic wood components, shear and compression testing of OSB material, three point loading of Bradford pear tree limb specimens to evaluate the reaction to snow loads, three and four point loading of structural and composite lumber, and shear and withdraw testing of various nails for use in pallets construction.

Academic courses using the lab in this past year included WOOD 5314 Physical and Mechanical Behavior of Wood, WOOD 4316 Mechanical Properties of Wood, NR-1114 Introduction to Renewable Natural Resources and CE-5944 Civil Engineering Seminar. The on-campus Wood Magic show used the laboratory for demonstrations and in conducting the Rock Stars learning module.

The lab was also used for several short courses and group demonstrations in 2003, including the Architecture Woodworkers Institute, the Frame Builders Association of Virginia, Structural Design with Wood 1, Structural Design with Wood 2 (short courses), and Wood-Based Composites Center Short Courses Wood Adhesion and Wood Structures and Properties.

Upcoming testing is planned by Dr. Daniel Hindman in the field of torque loading of composite structural I-joist and beams. Dr. Hindman has purchased several AccuStar dual axis clinometers instruments for use in future work. Further testing is also scheduled for deck structure performance by Drs. Joseph Lofierski and Frank Woeste.

Tours of the laboratory, testing demonstrations, and contractual research support are all available. Please contact Rick Caudill, Wood Engineering Laboratory Manager, at (540) 231-7453 or email at rcaudill@vt.edu.



### **Wood Machining Laboratory** Woodshop Laboratory Manager: David Jones

David Jones manages all aspects of our woodshop and wood machining operations from our laboratory located at the Thomas M. Brooks Forest Products Center. David oversees all aspects of wood procurement and machining in our teaching, research and outreach activities. David is the first technical person to hold this position which was created two years ago. He received his B.S. in Wood Science from Virginia Tech in 1987. Since then he has worked in all aspects of the wood industry: procurement of logs and timber, furniture manufacturing management and high-end cabinet and furniture construction. Additionally, he has earned a masters degree and spent time teaching. With this experience David offers a valuable resource for the department in that he has a background in management, wood processing at the primary and secondary level, research protocols and teaching and working in educational settings.

A wood processing facility is maintained at our Thomas M. Brooks Forest Products Center. We have capabilities ranging from producing grade lumber from logs to wood adhesion test specimens measured in millimeters. Additionally two dry kilns are available for the drying of lumber and wood products made at the Center.

## Report of Activities – 2003

Logs are processed on a Timber King B-16 portable band saw mill. This saw has a cutting capacity of 27 inches, is powered by a 25 horsepower gasoline engine, and is equipped with hydraulic log loaders and turners. The mill is used in teaching Lumber Manufacturing and Machining and for custom cutting lumber for lumber drying research. Upon completion of the lumber manufacturing class the green lumber is then kiln dried by students enrolled in Lumber Drying and Durability. Once dried, the lumber is used by the department for teaching, research, and outreach projects.

Wood machining is done in the 250 square foot woodworking shop. This facility is fully stocked with heavy duty stationary machinery: 10" Powermatic table saw, 20" Laguna band saw, 14" Powermatic band saw, 800 Maggi Engineering radial arm saw, 12" Makita sliding-compound miter saw, Milwaukee 8" panel saw, 8" Powermatic jointer, 18" Powermatic planer, 13" Delta planer, Craftsman floor drill press, and 6" belt/12" disc Delta sanding machine.

The wood shop is utilized for a variety of projects in research, teaching and outreach. Almost all activities in the department are dependent on the wood shop in some capacity.

During 2003, the wood processing facilities at the Brooks Center provided a wide range of services to faculty and students.

### Teaching

- Selected and milled logs for our Lumber Manufacturing and Machining course.
- Assembled samples and conducted the Lumber Manufacturing and Machining planing laboratory exercise.
- Prepared lumber for our Lumber Drying and Durability course.

- Assisted students in sample preparation for our Mechanical Properties of Wood course.
- Initiated a formal training program for all persons using the wood shop.

### Research

- Prepared adhesion fracture samples.
- Prepared bending specimens for street tree study.
- Supervised the primary machining for material in composite studies.
- Procured various species of wood at various moisture contents for research projects.

### Outreach

- Wood Magic Show demonstration specimen preparation.
- Short Course sample preparation for wood composites and wood drying short courses.

For tours, demonstrations, or cooperative use of our wood machining and woodshop facilities, please contact David Jones, laboratory manager, at (540) 231-7342 or by email at [dajones@vt.edu](mailto:dajones@vt.edu).

## Scholarship Opportunities through the Generous Support of Industry Partners and Individuals

The department of Wood Science and Forest Products and our students receive substantial scholarship support from our industry partners and individual supporters. The following is a list of recent scholarship opportunities in the department. A full description and list of student recipients is available on our website at [www.woodscience.vt.edu](http://www.woodscience.vt.edu). We thank all of our scholarship supporters for your financial contributions to the education of the future industry leaders. We could not do it without you!

### **Appalachian Hardwood Manufacturers, Inc. Scholarship**

Appalachian Hardwood Manufacturers, Inc., founded in 1928, is an association of Appalachian lumbermen wholesalers, landowners, and hardwood consumers. Their focus is to promote the distinct advantages of hardwoods produced in the Appalachian region of the United States, and promote sound forestry practices to ensure a steady supply of wood for the future. The Appalachian Hardwood Manufacturers, Inc. Scholarship is designed for an outstanding in the department.

### **B. A. Mullican, Sr. Scholarship in Forest Products**

Mr. B. A. Mullican, Jr. generously funds this scholarship in honor of his father, B. A. Mullican, Sr., a leader in the hardwood industry. The scholarship provides the cost of tuition for an outstanding student in Wood Science and Forest Products.

### **Baillie Lumber Company Scholarship**

Baillie Lumber Company, founded in 1923, is a large producer and distributor of high quality hardwoods, recognized both domestically and internationally. Acknowledging the need for scholarships to attract, retain, encourage, and support students in the field of forest products, Baillie Lumber Company provides financial support to an outstanding students enrolled in the department.

### **Boehm-Madisen Lumber Company, Inc. Scholarship**

Boehm-Madisen Lumber Company, Inc., founded in 1934, is a wholesale distributor of hardwood and softwood lumber as well as a number of specialty products. The Boehm-Madisen Lumber Company, Inc. Scholarship was established to provide financial assistance to an outstanding student in the department.

### **Bryan Graeser Memorial Scholarship**

This scholarship is given by the Graeser family in memory of the late Bryan Graeser, a student enrolled in the Department of Wood Science and Forest Products and the son of Hank and Peggy Graeser of Chester Virginia. The award is made based on academic performance, financial needs and professional promise.

### **Columbia Forest Products Company Scholarship**

The Columbia Forest Products Company Scholarship is awarded to an outstanding student in the Department of Wood Science and Forest Products. Preference will be given to any candidate who successfully completes a summer internship with Columbia Forest Products. Further preference will be given to a student from the areas of Danville, Virginia and Pittsylvania County, Virginia; Thomasville, North Carolina; McDowell County, North Carolina; and Craigsville, West Virginia.

### **Danzer Group Scholarship**

The Danzer Group Scholarship is intended to recognize, encourage, and provide financial assistance to outstanding students enrolled in the Department of Wood Science and Forest Products who plan a career with in the forest products industry. Recipients for the Danzer Group Scholarship can be selected from graduate or undergraduate students in the department based on academic achievement and the desire to pursue a career in the forest products industry.

### **Frank Miller Lumber Company Freshman Scholarship**

The Frank Miller Lumber Company Freshman Scholarship is intended to recruit and provide financial assistance to an outstanding student enrolled in the Department of Wood Science and Forest Products at Virginia Tech and who plans to have a career in the forest products industry. The scholarship provides financial support to an outstanding freshman.

### **George E. Stern Memorial Scholarship**

This scholarship is in memory of the late Dr. George E. Stern, former director of the Sardo Pallet and Container Research Laboratory. The scholarship was endowed by Mrs. Marianne Stern and the Stern family and is awarded to a deserving student in the Department of Wood Science and Forest Products, based on academic performance, financial need, and professional accomplishment.

## Scholarship Opportunities through the Generous Support of Industry Partners and Individuals

### **J. T. Shannon Lumber Company Scholarship**

J. T. Shannon Lumber Company is a manufacturer and distributor of hardwood lumber, with locations in Tennessee, Mississippi, Kentucky, Pennsylvania, Indiana, and Arkansas. This scholarship is offered to an outstanding undergraduate or graduate student in the Department of Wood Science and Forest Products.

### **James W. Howard/Atlanta Hardwood Corporation Internship Scholarship**

Recognizing the need for scholarships to attract, retain, encourage, and support students in the field of forest products, the donor established the James W. Howard/Atlanta Hardwood Corporation Internship Scholarship to be awarded to an outstanding summer intern.

### **Jeld-Wen Scholarship(s)**

Jeld-Wen awards two scholarships over fall and spring semesters. The scholarships are to be used for tuition, fees, and books. Entering freshman students will be given preference for the scholarships. Although there are no Jeld-Wen facilities in Virginia, preference will be given to those facilities located in neighboring states. These communities are: Craigsville, WV; Sparta, TN; and Lexington and Marion, NC. Merit and academic performance will be significant factors in selecting the scholarship recipients. Preference will be given to students with demonstrated financial need.

### **Joseph W. Fitzpatrick Scholarship**

The scholarship is in honor of Joseph W. Fitzpatrick and given by Fitzpatrick and Weller, Inc. Fitzpatrick and Weller, Inc. is a leader in the hardwood dimension industry and is managed by the brothers of Joseph W. Fitzpatrick, Dana and Gerald Fitzpatrick. The scholarship provides financial support to an outstanding student in the Department of Wood Science and Forest Products.

### **Kitchens Brothers Manufacturing Company Scholarship**

The Kitchens Brothers Manufacturing Company Scholarship is offered to an outstanding student in the Department of Wood Science and Forest Products to provide financial assistance and afford him/her the opportunity to further

their education in anticipation of employment in the wood products industry. The scholarship provides support towards the cost of the recipient's tuition.

### **Linden Lumber Company Scholarship in Forest Products**

Linden Lumber Company is a nationally recognized hardwood lumber manufacturer located throughout the South. The Linden Lumber Company Scholarship in Forest Products was established to provide financial assistance to an outstanding student in the Department of Wood Science and Forest Products.

### **Morgan Lumber Company Scholarship**

Morgan Lumber Company is a privately held manufacturer of southern yellow pine lumber. The scholarship assists with the cost of tuition to an outstanding student in the Department of Wood Science and Forest Products. The recipient must have some type of prior work experience, through a previous job, summer internship, or co-op. Preference will be given to students with experience in softwoods and solid wood products. The Morgan Lumber Company Scholarship is the second scholarship to be endowed with the Center of Forest Products Marketing and Management.

### **Robert R. Bushman/The Mann and Parker Lumber Company Scholarship**

This scholarship is in honor of Robert R. Bushman, Chairman and Chief Executive Officer of the Mann and Parker Lumber Company. The Mann and Parker Company is a major wholesaler of wood products and specializes in hardwood lumber. This scholarship provides support to an outstanding student in the Department of Wood Science and Forest Products.

### **SE Dry Kiln Club Scholarship**

This scholarship is provided to an outstanding student enrolled in an institution of higher education in the Southeastern United States who is pursuing a career in the wood products industry.

### **Snavelly Forest Products Scholarship**

The Snavelly Forest Products Scholarship is intended to recognize, encourage, and provide financial assistance to an

## Scholarship Opportunities through the Generous Support of Industry Partners and Individuals

outstanding student enrolled in the Forest Products Marketing option in the Department of Wood Science and Forest Products. The scholarship will provide a student with financial support for tuition for each semester.

### **Steven A. Sinclair Scholarship in Forest Products Marketing and Management**

Steven A. Sinclair was a Professor with the Department of Wood Science and Forest Products and an internationally recognized leader in the field of Forest Products Marketing. Dr. Sinclair started the Forest Products Marketing Program at Virginia Tech in the early 1980s. Also, he initiated the Center for Forest Products Marketing and Management and served as its first Director. Upon his death in 1993, many friends, colleagues, former students, and Center for Forest Products Marketing and Management members contributed to a scholarship fund in Dr. Sinclair's name. Because of Dr. Sinclair's interest and leadership in forest products marketing research, the scholarship is awarded to an outstanding graduate student studying in this area or to an outstanding undergraduate who plans to attend graduate school to study forest products marketing.

### **Victor Clay Barringer Scholarships**

These scholarships are in honor of Victor Clay Barringer and given by Costal Lumber Company, Inc. Victor Barringer founded Costal Lumber Company in 1937. Today it is one of the largest privately held forest products companies in the United States. Victor Barringer's father, Paul B. Barringer, was President of Virginia Tech from 1907 to 1913. Costal Lumber Company is now guided by Victor Barringer's son, Paul B. Barringer II, Chairman and CEO, and his grandson, Victor C. Barringer II, Vice Chairman. The scholarships provide support to two outstanding students in the Department of Wood Science and Forest Products. The Victor Clay Barringer Scholarships were the first to be endowed with the Center of Forest Products Marketing and Management.

### **Virginia Forest Products Association Scholarship**

This scholarship is presented by the Virginia Forest Products Association, an industry group that supports forest products

enterprises in the Commonwealth of Virginia. The scholarship supports a promising Wood Science and Forest Products student who has an interest in working with the Virginia forest products industry.

### **Wood Component Manufacturers Association Scholarship**

The Wood Component Manufacturers Association Scholarship provides support to an outstanding student enrolled full-time in wood products. Preference is given to students with a strong desire to pursue a career in the secondary wood products manufacturing field.

### **The Wood-Based Composites Center Scholarships**

The Wood-Based Composites (WBC) Center, in addition to the department, offers undergraduate scholarship and graduate fellowship funding through the generous support of its member companies, including:

- Bayer Corporation
- Boise
- Borden Chemicals, Inc.
- Columbia Forest Products
- Dow Chemical Company
- Dynea
- Georgia-Pacific Resins, Inc.
- Grant Forest Products
- J. M. Huber Corporation
- Huntsman Polyurethanes
- National Starch and Chemical
- Weyerhaeuser Company

Industry support for the WBC Center comes from businesses involved in the manufacture of wood and fiber-based composites throughout North America. Scholarships have been awarded through the Center since its inception in 1999. Internships with member companies are often available to qualified students interested in pursuing a career in the composites industry. To learn more about the members and activities of the Center, as well as opportunities for fellowship and scholarship funding, please visit the WBC website at [www.wbc.vt.edu](http://www.wbc.vt.edu).

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# NOTES





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Department of Wood Science and  
Forest Products

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Virginia Tech  
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April 2004

## Acknowledgments

Contents, information  
gathering and verification  
by Angela Riegel

Document design and layout  
by Arlice K. Banks