

***BARRY S. GOODELL, Ph.D.***

Professor and Program Leader, Wood Science and Technology  
 Project Director, Wood Utilization Research (WUR) Center - UMaine  
 Professor, Advanced Engineered Wood Composites Center,  
 and Forest Operations Science.

Cooperating Professor, Biological & Chemical Engineering; and  
 Microbial Ecology, and Environmental Microbiology.

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 Bangor, Maine 04401. **Home Telephone:** 207 942-6662 [www.woodscience.umaine.edu/goodell/](http://www.woodscience.umaine.edu/goodell/)

**EDUCATION:**

Ph.D – 1984: Wood Science. Wood Science and Engineering, Oregon State University.  
 Minors: Biochem/Biophys; Plant Pathology  
 M.S – 1980: Wood Science. Wood Science and Engineering, Oregon State University.  
 B.S – 1976: Botany and Plant Pathology. University of New Hampshire.

**EMPLOYMENT:**

**Professor**, Wood Science and Technology/Forest Products Laboratory, University of Maine, Orono, (1994-present). Personal research and teaching specialization: Materials biodeterioration and bioprocessing, Carbon nanotube synthesis from plant biomaterials, Wood composites and FRP composites fabrication, Wood preservation and protection.

**Project Director**, Wood Utilization Research (WUR) Center. University of Maine, Orono. 1993-94, 2006-present. The WUR Center is part of a 12-state Congressional initiative to create and disseminate knowledge of wood use and innovations that strengthen America's competitiveness and extend our natural resources.

**One of four founding faculty members** of the Advanced Engineered Wood Composites Center, UMaine, 1996 - present.

**Head of Forest Products Laboratory**, UMaine 1990-1996: Coordinate the teaching, research and public service efforts of the University of Maine's Forest Products Lab/ Wood Science and Technology faculty. Wood Science and Technology Program Leader - 1990-1996, 2004-present.

**Project Leader:** NSF/EPSCoR Wood Sciences and Engineering Research Cluster at UMaine 1991-95.

**Director**, Wood Sciences and Engineering Institute, University of Maine, Orono. 1/91- 6/93.  
 Responsible for coordination of cross-disciplinary activities of 16 faculty in the sciences and engineering fields who work on projects ranging from timber design and engineering, to pulp and paper chemistry, to the pharmaceutical uses of extracts from tree bark.

**Associate Professor and Head of Forest Products Laboratory**, UMaine 1990-95.

**Assistant Professor**, Wood Science and Technology, Univ. of Maine, Orono, 1983 - 1989.

**Cooperating Professor**, Chemical Engineering Department, Pulp and Paper. University of Maine

(1996-present).

**Cooperating Professor, Microbial Ecology and Environmental Microbiology (MEEM).** University of Maine. 2000-present.

**Cooperating Professor, Forest Operations Science Program.** University of Maine. 1999-present.

**Visiting Scientist on Sabbatical Leave:**

- 1) Forestry and Forest Products Research Institute, Tsukuba, Japan, 12/90 - 6/91.
- 2) Swedish University of Agricultural Science, Uppsala, Sweden 9/95 -1/96.

**NSERC Postdoctoral Research Associate,** Université Laval, Canada. Faculté de Foresterie et de Géomatique, 1983.

**Project Researcher, Pesticides Control Division,** State of New Hampshire. Training, Testing, Evaluation and Field Certification of Commercial PCO's and Agricultural Pesticide Users. 1976-77.

**TEACHING:**

Wood Science and Technology I. WSC 212. Introductory course, 20 - 30 students/ semester, 3-credit course. 1984-present.

Wood Deterioration and Protection. WSC 319. Undergraduate course, 8-16 students/semester, 3 credits. 1993-present.

Advanced Wood Deterioration and Protection. WSC 519. Graduate course. 3-5 students/semester. 3 credits. 1997-present.

Wood Science Seminar. WSC 630. Graduate level course. 12-15/semester. 1 credit, jointly taught. 1996-present.

Wood Physics. (graduate level course, approx. 6 students/semester, 4-credit course with laboratory).1983-1991.

Wood Drying and Preservation. (Includes wood deterioration and protection). 4-credit course with laboratory.1991-1992.

Wood Identification Laboratory. Oregon State University. 1982-1983.

**PROFESSIONAL AWARDS AND ACTIVITIES:**

**Teaching:**

College of Forest Resources "Distinguished Forest Resources Professor Award" 1987-1988, for excellence in teaching and student interaction.

## Service (National – International):

**Gottschalk Award** - Forest Products Society. 2006. “The purpose of this prestigious Award is to bestow the Society's highest level of recognition on an individual that has served the Society with great distinction and dedication.”

**Board of Directors (International Executive Board member)** for *both* the Forest Products Society, and the Society of Wood Science and Technology.

**Selected author** for five entries in separate materials science encyclopedias (Pergamon press, John Wiley & Sons) on the subjects of Wood Decay/Biodegradation, Biotechnology in the Forest Products Industry, and Insect and Marine Borer Deterioration of Wood.

Service on six review panels for **NSF** (International Programs; and Materials Processing and Manufacturing, Engineering Directorate), **USDA-NRI**, and **SBIR** grants.

**Review team** member for CSREES and SAF/SWST Wood Science programs reviews of:

- Virginia Tech (1994), and
- Clemson University (1992)

**Co-Chair**, 48<sup>th</sup> Annual Forest Products Society. Recognition Award. 1994.

“**Outstanding Leadership**” Recognition Award. Forest Products Research Society. 1990-1991. Northeast Region Board. Chair, Northeast Section.

**Commemoration Award**. Lecture tour of Korean Forest Products programs at Chungbuk University, Seoul National University, and Chonnam National University. 1991.

### **Society of Wood Science and Technology:**

- Chair, Education Committee, 2006-present.
- Communications Committee, 1997-98
- Director, SWST International Executive Board. 1994-95**
- Visiting Scientist Committee. 1994-95
- Chair, Accreditation Committee, 1991- 93. Ex-officio as Executive Board Director, 1994-95**
- Chair**, Critical Matters Committee, 1990
- Chair, Symposium Committee**, 1987- 91 & 1988-89
- Nominating Committee, 1987-88**

### **Forest Products Society:**

- **Chair**, “Wood Award” selection committee, 2002-2003.
- Publications committee 1997-98.
- Field Editor, **Wood Preservation, 1994-1998.**
- Treated Wood Technical Interest Group, **Vice-Chair, 1993-1994, Chair 1994-1997**
- Chair**, 1994 National Annual Meeting
- Executive Board Member National FPS, NE Board Member, 1990-91**
- NE Section **Chair**, 1988-1989
- NE Section **Vice-Chair**, 1987-1988

**National Planning Committee (NPC) on Forest Products Research (USDA Forest Service)**  
-**Northeast Region Representative**, 1991-1994.  
-**National Co-Chair**, 1993.

**TAPPI - Technical Association of the Pulp and Paper Industry:**  
-**Co-Chair of TAPPI Biotechnology in the Pulp and Paper Industry Symposium sessions.**  
November 1998. San Francisco.

**International Research Group on Wood Preservation:**  
-**Remedial Treatments Chair**, 1993.

## **Research:**

- “Outstanding Researcher Award”** 2004-05: College NSFA
- “Outstanding Researcher in Forest Resources Award”**: College of Natural Sciences, Forestry and Agriculture. G. Peirce and Florence Pitts Weber Award 2000-2001.
- Over 100 journal publications** in the field of Forest Products, Wood Protection and Degradation and FRP Composites Production.
- My collaborative research funding exceeds **\$23 million** over the last 20 years.
- Two patents. One patent application. One trade-mark (ComPRIS)**
- Symposia (2) **Co-Chair**, “Recent Developments in the Chemistry of Wood Degradation and Preservation” A multi-session, two-day symposium. American Chemical Society. San Diego, CA. 2001. and “Health, Environment and Efficacy Issues in the Development of Commercial Wood Protection Systems”2005. A 5-day multi-session American Chemical Society Symposium, San Diego, CA.
- Conference Coordinator - First International Conference on Advanced Engineered Wood Composites.** July 1999. Bar Harbor, Maine.

## **Institutional Development:**

Obtained UMaine Board of Trustee approval for the formation of the Wood Sciences and Engineering Institute, a 16 faculty member, cross-disciplinary administrative unit. 1991.

One of four founding faculty members of the UMaine, Advanced Engineered Wood Composites Center (**AEWC**), a World Class facility for education and research.

Obtained federal support in 1993 through the State Congressional delegation for a multidisciplinary wood utilization grant (initially known as FORTEC, and now the New England Wood Utilization Research -WUR- grant program) for the long-term funding of wood research in Maine, New Hampshire and Vermont.

## **International:**

Invited visits to Japan (sabbatical), Sweden (sabbatical), Chile, Austria, Korea and China for extended research/lecture visits.

Conducting collaborative research currently with scientists in Sweden, Australia, Chile and Japan as well as other institutions in the US.

Part of the Host Team for the Maine International Trade Center and UM International Programs office sponsored visit of Guests from Aomori Prefecture of Japan. Two visits 1996 and 2002.

Hosted sabbatical leaves at UMaine for:

**Dr. Masaya Nakamura**, Head of Microbial Bioprocessing Section. Forestry and Forest Products Research Institute. Tsukuba, Japan. 1999-2000.

**Dr. Akio Enoki**, Professor and Head of Agricultural Chemistry, Kin-ki University, Nara, Japan. 1993.

**Dr. Geoffrey Daniel**, Sveriges Lantbruksuniversitet, Dept. of Forest Products, Swedish University of Agricultural Science, Uppsala, Sweden - 1987, 1988, 1994.

**Dr. Yoon Soo Kim**, Dept. of Forest Products and Technology, Chonnam University, Kwangju, Korea - 1988-1989.

#### **PATENTS AND PATENT APPLICATIONS:**

Patent: Goodell, B., J. Jellison, J. Liu and S. Krishnamurthy. ***Degradation and protection of organic compounds mediated by low molecular weight chelators.*** Patent #6,046,375 awarded April 4, 2000.

Patent pending: Goodell, B. and J. Jellison. ***Oxidation using a non-enzymatic free radical system mediated by redox cycling chelators.*** Filing date Sept 2000.

Patent pending: Goodell, B., R. Lopez-Anido and B. Herzog. ***Composites Pressure Resin Infusion System (ComPRIS) to produce Fiber Reinforced Polymer Composite Laminates and other Hybrid Composite Products.*** Dec. 30, 2003. Patent Application 017625-000500US

Provisional patent: Goodell, B., X. Xie, Y. Qian, D. Zhang, M. Peterson and J. Jellison. ***Method of producing carbon nanotubes using natural fiber as the starting substrate.*** USPTO Serial Number 60/898,884. February 1, 2007.

Pre-Patent Disclosure: Jellison, J., V. Chandhoke, B. Goodell and F. Fekete. 1990. ***Biological control of microorganisms in wood and soil by siderophores produced by basidiomycetous fungi and/or by modification of transition metal concentrations.***

Pre-Patent Disclosure: Jellison, J., F. Fekete, V. Chandhoke and B. Goodell. 1989. ***Use of biological chelators for biological pulping and biological bleaching of wood pulp chips.***

Trademark: **ComPRIS**. United States Patent and Trademark. SERIAL NO: 78/337521. 2004.

## **PROFESSIONAL AFFILIATIONS / ORGANIZATIONS :**

- American Chemical Society
- International Association of Wood Anatomists
- Forest Products (Research) Society
- International Research Group on Wood Protection
- National Planning Committee (NPC) on Forest Products Research (USDA Forest Service)
- Sigma XI - Scientific Research Society
- Society of Wood Science and Technology (SWST)
- TAPPI - Technical Association of the Pulp and Paper Industry
- Xi Sigma Pi - Honorary Scholastic Forest Society

## **SELECTED RESEARCH GRANTS AND OTHER SUPPORT (From 1985):**

2006. Goodell, B., Y. Qian, M. Peterson, J. Jellison, R. Lopez-Anido, G. Daniel, L. Thompson and X. Xie. Office of Naval Research.- BAA06-001. A Novel Process to Produce Multi-walled Carbon Nanotubes from Natural Cellulosic Materials. \$151,113.
2006. Frazier, C., B. Goodell, J. Jellison. Novel rheological tools for xylem structure property determination and formation. USDA-NRI. \$400,000.
- 2006-2007. Y. Qian, Y., B. Goodell, M. Peterson, J. Jellison. Novel Processes to Prepare and Utilize Carbon Nanotubes from Cellulosic Materials. Maine Technology Institute. Seed Grant. \$10,000.
- 2005-2006. Y. Qian, Y., B. Goodell, M. Peterson, J. Jellison. A Novel Process to Produce Multi-walled Carbon Nanotubes from Natural Cellulosic Materials. Maine Technology Institute. Seed Grant. \$10,000.
- 2005-2008. Shaler, S., Goodell, B., Cole, B., Jellison, J., Dagher, H., and R. Rice. USDA-WUR. Wood Utilization Research. Research Task: Goodell, Qian. Fenton chemistry-wood decay mechanisms and their potential applications in biomimetic processes for wood protection and hazardous waste remediation. \$716,952.
- 2004-2007. Shaler, S., Goodell, B., Cole, B., Jellison, J., Dagher, H., and R. Rice. USDA-WUR. Wood Utilization Research. Research Task: Goodell, Peterson, Qian. The Composites Pressure Resin Infusion System (ComPRIS).\$736,009
- 2003-2006. Shaler, S., Goodell, B., Cole, B., Jellison, J., Dagher, H., and R. Rice. USDA-WUR. Wood Utilization Research. Research Task: Goodell, Qian. Basic Decay Mechanisms: Detection of Oxygen Based Free Radicals by Chemiluminescence and Scintillation Measurement. \$807,486.
- 2002-2005. Shaler, Goodell, et al. New England Wood Utilization Research. Research task: USDA-WUR. Goodell. Improved Fluid Penetration in Impermeable Northeastern Woods and Composites. \$807,486.
- 2001-2004. Shaler, Goodell, et al. New England Wood Utilization Research. Research task:

- USDA-WUR. Goodell. Autoactivation of lignocellulose for bonding using free radical systems. Also: J. Jellison , B. Goodell and A. Armirbahman. Metal transport and toxicity in the brown rot fungi. \$824,066.
- 2000-2003. Jellison, J. and B. Goodell. USDA Competitive Grant, Wood Utilization. Wood Modification by Brown Rot Fungi. Improved Utilization of Wood and Wood Fiber Programs. NRICGP. \$176,000.
- 2000-2003. Shaler, Goodell, et al. New England Wood Utilization Research. Research task: USDA – WUR. Goodell, Amirbahman. Mechanisms involved in non-enzymatic free radical production in brown rot fungi. \$731,860.
- 2000-2003. Dagher, H., R. Lopez-Anido, B. Goodell, D. Gardner, E. Landis, and W. Davids. Federal Highway Administration. FRP-Reinforced Glulams. \$1,485,000.
- 1999-2001. Shaler, Goodell, et al. New England Wood Utilization Research. USDA-WUR. Goodell. Research task: Performance of Wood-Fiber Reinforced Composite Products Treated with Wood Preservatives. \$824,233.
- 1998-1999 . Dagher, Shaler, Goodell, Landis. NSF. Major Research Initiative. Equipment. Advanced Engineered Wood Composites Center Instrumentation. \$280,000.
- 1998-2000. Goodell, B. and J. Jellison. Clariant Corp. Non-enzymatic generation of oxygen radicals - Applications for pulp and paper and bioremediation of wastes. \$100,000.
- 1998-2000. Landis, E., H. Dagher, S. Shaler, B. Goodell. Undergraduate Research Experience in Advanced Engineered Wood Composites. NSF (REU). \$148,402.
1998. Shaler, Goodell et al. 1998-2000. USDA-CREES- WUR. Research task: Goodell. Ultrastructural investigations of wood in early degradation stages by wood decay fungi. \$801,000.
- 1997-2000. H. Dagher, B. Goodell, E. Landis, S. Shaler. Acquisition of Advanced Engineered Wood Composites Manufacturing & Science Laboratory. NSF (3 years). \$1,113,816 + \$700,000.
- 1997-2000. Dagher, H., B. Goodell, S. Shaler, E. Landis. Composite Reinforced Wood Hybrids for Civil Infrastructure Systems. National Science Foundation (through Maine Science and Technology Foundation). \$3,189,906.
- 1997-1999. Shaler, Goodell, et al. New England Wood Research. USDA-WUR. Research task: Goodell, Czerwinski. Bioremediation of xenobiotics in the environment with wood degrading fungi. \$703,915.
- 1996-1998. Shaler, Goodell, et al. New England Wood Research. USDA-WUR . Research task: B. Goodell, A. Paszczyński, K. Czerwinski, J. Liu. Wood deterioration studies: Lignocellulose degradation by oxygen radicals, and metal binding/reduction mediated by low molecular weight compounds for wood decay fungi. \$751,937.

1996. Dagher, Shaler, Goodell, Landis. National Science Foundation. EPSCoR. Fiber Reinforced Polymer Laminate / Wood Composites. Awarded from NSF with Non-Federal Match from State/University and Industry sources. \$3.36 million from NSF with \$1.+ million industrial match.
1996. Broderna Edlunds Donationfund. Understanding the mechanisms required for function and control of brown-rot decay in wood. G. Daniel, B. Henningsson, T. Nilson, B. Goodell, and J. Jellison 112,000 SEK (Swedish Kronar).
- 1995-1997. Shaler, Goodell, et al. New England Wood Research. USDA-WUR. Research task: Goodell. Electrochemical Analysis of Fungal Biochelator Chemistry and Analysis of Cellulosic Breakdown Products. Also Research task: Jellison, Goodell, Kropp. Novel technology for the detection of wood degrading fungi . Also: Goodell, Cole, Jellison- Equipment Grant: Purchase of GC/Mass Spectrometer. \$795,482.
1995. Dagher, Shaler, Goodell. USDA-CSRS.WUR. Fiber Reinforced Polymer / Wood Composites. \$91,979.
- 1994-1996. Shaler, Goodell, et al. New England Wood Research. USDA-WUR. Research Task: Goodell et al. Oxidative degradation of lignocellulose by chelators. Also, Research Task: Jellison, Goodell, Fekete. Biological degradation of wood by brown rot fungi. \$839,764.
1993. Dagher, Caccese, Shaler, and Goodell. Maine Department of Transportation. Glulam Bridges Using Hemlock, Red Pine, and Red Maple. \$71,984.
1993. Shaler, Goodell, Rice. NSF-Engineering. Renovation of a Wood Science and Processing Facility. \$191,980. (Match funds from State and non-federal sources obtained 1997). \$383,960.
1993. Goodell, Jellison, and Fekete. USDA-NRI Competitive grant. The role of biological chelators produced by fungi in lignocellulose degradation. \$68,940.
1993. Goodell. Lecture-Research tour in Japan. One month visit to Nara and Tsukuba Science City. Japanese funding from Kin-ki University. Lecturing and research on wood deterioration and protection. \$4,000.
1993. Goodell. USDA-CSRS. The Forest Products Research and Technology Transfer Center (FORTEC) Wood Utilization Research grant: Improved Utilization of Northeastern Wood Species. Developed with the Board of the Wood Sciences and Engineering Institute in cooperation with the Maine Science and Technology Commission; and with the Forest Products laboratory and extension groups in Maine, New Hampshire and Vermont. \$616,478.
1992. Dagher, Caccese, Goodell. Timber Bridge Research. Coordinated efforts with state agencies and congressional representatives for support of proposal on timber bridge research. National competitive/discretionary support of timber bridge development. \$173,553.
1991. Goodell, Dagher, Jellison, Cole. National Science Foundation. Maine EPSCoR grant. Wood Science and Engineering Research Cluster. \$1.1 million.
1990. Goodell. National Science Foundation/Science and Technology Association of Japan. Award

- to conduct research in Japan. Six-month funding for research on wood deterioration. ~\$20,000.
1990. Goodell, Jellison, and Fekete. NRI- USDA Competitive grant. Fungal siderophores and their role in wood biodegradation. \$52,000.
1989. Faculty Research Funds, UM. Support for immuno-TEM research of decay in wood/Visiting Korean Scientist. \$4,000.
1988. Goodell. OECD grant. Support for Visiting Scientist from Sweden. \$1,240.
1988. Goodell. Electric Power Research Institute, Palo Alto, CA. Formulation and testing of a long-term fumigant release system for the remedial preservative treatment of utility poles. (EPRI RFP2881-1). (3-yr. funds awarded, first year funds only expended). \$804,857.
- 1985-90. Goodell. Electrical Utility Consortium in the Northeastern United States. Preservative treatment of northeastern timber species. \$350,000.
1987. Goodell. Distinguished Visitor Committee funds. Support for visit of Dr. Geoffrey Daniel, Swedish Univ. of Agricultural Sciences, Forest Products Dept., for 3-1/2 weeks in Oct., Nov., 1987. \$800.
1985. Goodell, Jellison and Huang. NRI-USDA. Competitive Research Grants - Enzymatic wood degradation by hymenomycetous decay fungi: Immunochemical and physico-chemical investigations. \$182,830.

**PUBLICATIONS:** (\* = *Refereed publication*. # = *Presentation given in addition to publication*)

**Books:**

\*Schultz, T. D. D. Nicholas, B. Goodell, H. Militz and M. Freeman. 2007. Wood Protection Systems. American Chemical Society Series. Oxford University Press. Textbook. In press.

\*Goodell, B., D. Nicholas, and T. Schultz. 2003. Wood Deterioration and Preservation: Advances in Our Changing World. American Chemical Society Series. Oxford University Press. Textbook. 465p.

**Invited Book Chapters, Encyclopedia Entries:**

\*#Goodell, B. 2007. Fungal Decay of Wood: Soft rot – Brown rot – White rot. (Eds.) Schultz, T. D. D. Nicholas, B. Goodell, H. Militz and M. Freeman. Wood Protection Systems. American Chemical Society Series. Oxford University Press. Textbook. In press.

\*Jellison, J, Goodell, B. and Y. Qian. 2007. Methods useful in assessing biological and chemical activity of low-molecular-weight brown rot fungal metabolites. Manual of Environmental Microbiology. 3rd Edition Editor C. J. Hurst. ASM Press Section title Biotransformation and Biodegradation. In Press.

\*Jellison, J. B. Goodell and G. Daniel. 2007. Molds and the indoor environment: Biology and microscopy. Invited submission. American Chemical Society Press Accepted.

\*#Goodell, B. 2003. Brown rot degradation of wood: Our evolving view. (Eds): Goodell, B., D. Nicholas, and T. Schultz. Wood Deterioration and Preservation: Advances in Our Changing World. American Chemical Society Series. Oxford University Press. Textbook. pp. 97-118.

\*Goodell, B. 2001. Wood products: Deterioration by insects and marine organisms. (Ed.) F. Beal. Encyclopedia entry for Encyclopedia of Materials: Science and Technology. Elsevier Science Ltd. 6 pp.

\*Jellison, J., B. Goodell, J. Connolly, and A. Ostrofsky. 2000. Wood decay. *in* The Encyclopedia of Plant Pathology John Wiley and Sons, N.Y. Eds. O. C. Maloy and T.D. Murray. Invited submission. pp.1201 -1204.

\*Goodell, B. and J. Jellison. 1990. Immunological characterization of fungal enzymes and biological chelators involved in lignocellulose degradation. Book chapter. Biodeterioration Research 3. 361-375. Plenum Publishing.

\*Goodell, B. 1989. The potential of biotechnology applications in the forest products industry. In: Advances in Materials Science and Engineering, Encyclopedia of Wood and Wood-Based Materials. Invited chapter. A. Schniewind, editor.

\*Goodell, B., and J. Jellison. 1998. Role of biological metal chelators in wood biodeterioration. (Eds.) A. Bruce and J. Palfreyman. Forest Products Biotechnology. Taylor and Francis Publishers. London. pp. 235-250.

## Journals and other Papers:

- \*Dria, K. J, T. R. Filley, L. Tremblay, W. Cooper, L. Milligan, A. Stenson, B. Goodell and J. Jellison. 2007. The examination of leachable organic matter from wood after progressive fungal decay using ultra-high resolution FT-ICR mass spectrometry. Accepted. *Organic Geochemistry*.
- \*Goodell, B., Y. Qian and D. Gardner. 2006. The Effect of Wood Preservatives and Wood Deterioration Agents on Wood Composites and Advanced Hybrid Wood Composite Materials. Proceedings: Wood Protection Conference. Forest Products Society, New Orleans, LA, March 21-23, 2006.
- \*Goodell, B., G. Daniel, J. Jellison, and Y. Qian. 2006. Iron-reducing capacity of low-molecular-weight compounds produced in wood by fungi. *Holzforschung*. 60, 630–636.
- #Goodell, B., P. Merrick, J. Jellison and Y. Qian. 2006. Exposure of CCA and ACZA treated parallel strand lumber to marine borer attack in northeastern and southeastern waters of the United States of America. International Research Group on Wood Protection. Series document. IRG/WP 06-30400.
- \*Qian, Y., and B. Goodell. 2005. Deinking of laser printed copy paper with a mediated free radical system. *Bioresource Technology*. 96(8)913-920.
- \*Liu, R., Goodell, B., Jellison, J., and A. Amirbahman. 2005. Electrochemical study of 2,3-dihydroxybenzoic acid and its interaction with Cu(II) and H<sub>2</sub>O<sub>2</sub> in aqueous solutions: Implications for wood decay. *Environmental Science and Technology*. 39,170-175.
- \*Schultz, T. P.; D. D. Nicholas; W. P. Henry; C. U. Pittman; D. O. Wipf and B. Goodell. 2005. Results of organic biocide: antioxidant combinations, an initial economic analysis and discussion of a proposed mechanism. *Wood and Fiber Science*, 37(1), pp. 175–184.
- \*Lopez-Anido, R., Lech Muszynski, L., Gardner, D., Goodell, B., and Herzog, B. 2005. Performance-Based Material Evaluation of FRP-Wood Interfaces in Reinforced Glulam Members. *Journal of Testing and Evaluation (JOTE)*, ASTM 33(6). <http://www.astm.org/cgi-bin/SoftCart.exe/JOURNALS/TESTEVAL/TOC/3362005.htm?E+mystore>
- \*Herzog, B., Gardner D.J., Lopez-Anido, R., and Goodell, B. 2005. Glass Transition Temperature Based on DMTA Techniques as an Indicator of Adhesive Performance of Vinyl Ester Resin. *Journal of Applied Polymer Science*. 97, 2221-2229.
- \*Herzog, B., Goodell, B., Lopez-Anido, R., and Gardner, D.J. 2005. Durability of FRP-Wood Hybrid Products Fabricated using the Composites Pressure Resin Infusion System (ComPRIS). *Forest Products Journal* 55(11):54-60.
- \*Yelle, D., B. Goodell, D.J. Gardner, A. Amirbahman, P. Winistorfer, and S. Shaler. 2004. Bonding of wood fiber composites using a synthetic chelator-lignin activation system. *Forest Products Journal*. 54(4):73-78.
- Goodell, B., Lopez-Anido, R., and Herzog, B. 2004. ComPRIS: The Composites Pressure Resin Infusion System. *Composites Manufacturing (CM Magazine)*. Published by American

Composites Manufacturers Association (ACMA), pp. 10-15, Apr. 2004.

\*Herzog, B., Goodell, B., and Lopez-Anido, R. 2004. Electron Microprobe Imaging for the Characterization of Polymer Matrix Composites. *Composites Part A: Applied Science and Manufacturing*. 35 (1075-1080).

# Jellison, J., C. Howell, B. Goodell and S. Quarles. 2004. Investigations into the biology of *Meruliporia incrassata*. International Research Group on Wood Preservation. Series document 04-10508.

# Qian, Y., B. Goodell and J. Jellison. 2004. The effect of a chelator mediated fenton system on activation of TMP fibers and decolorization of synthesized dyes. International Research Group on Wood Preservation. Series document. IRG/WP 04-50223. 15 pp.

# Schultz, T., D. Nicholas, W. Henry, C. Pittman, D. Wipf and B. Goodell. 2004. Environmentally-benign wood preservatives based on organic biocide: antioxidant combinations: A brief review of laboratory and field exposure results and discussion of a proposed mechanism. International Research Group on Wood Preservation. Series document. IRG/WP 04-30335.

\*Herzog, B., Goodell, B., Lopez-Anido, R., Muszyński, L., Gardner, D., Halteman, W., and Qian, Y. 2004. The Effect of Creosote and Copper Naphthanate Preservative Systems on the Adhesive Bondlines of FRP/Glulam Composite Beams. *Forest Products Journal*. 54(10) 82-90.

\*Tascioglu, C., Goodell, B., Lopez-Anido, R., and Gardner, D. 2004. Surface Energy Characterization of Preservative Treated Wood and E-glass/Phenolic Composite. *Forest Products Journal*. 54 (12) 262-268.

\*Goodell, B., Qian, Y., Jellison, J., Richard, M. 2004. Decolorization and degradation of dyes with mediated Fenton reaction. *Water Environment Research* 76(6) 2703-2707.

\*Qian, Y., Goodell, B., Jellison, J., and Felix, C. C. 2004. The effect of hydroxyl radical generation on free-radical activation of TMP fibers. *Journal of Polymers and the Environment*. 12(3) 147-155.

\*Davis, E., S. M. Shaler, and Goodell, B. 2003. The incorporation of paper deinking sludge into fiberboard. *Forest Products Journal*. 11/12.

\*Tascioglu, C., Goodell, B. and R. Lopez-Anido, R. 2003. Bond durability characterization of preservative treated wood and e-glass/phenolic composite interfaces. *Composites Science and Technology*. Vol 16. No. 4 pp. 257-274.

\*Jagels, R., Visscher, G., Lucas J., and Goodell, B. 2003. Paleo-adaptive properties of the xylem of *Metasequoia* mechanical/hydraulic compromises. *Annals of Botany*. 92(79-88).

\*Lopez-Anido, R., Michael, A.P., Sandford, T.C., and Goodell, B. 2003. Repair of Wood Piles with Prefabricated FRP Composite Shells, In Press, Paper No. CF-22068, *Journal of Performance of Constructed Facilities*, ASCE.

\* Tascioglu, C., Goodell, B., Lopez-Anido, R., Peterson, M., Halteman, W. and Jellison, J. 2003.

Monitoring Fungal Degradation of E-Glass / Phenolic Fiber Reinforced Polymer (FRP) Composites used in Wood Reinforcement. *International Biodeterioration and Biodegradation*. Vol. 51, No. 3, pp. 157-165, 2003.

2003. Herzog, B., Goodell, B., and Lopez-Anido, R. "The Effect of Oil-Borne Preservative Treatments on the Shear Strength of FRP/Wood Composite Adhesive Bonds," The International Research Group on Wood Preservation, 34th Annual Meeting, Brisbane, Queensland, Australia, May 18-23, 2003. (Published in IRG documents. I was unable to attend to present the talk).

\*Tascioglu, C., Goodell, B., and Lopez-Anido, R. 2002. Effects of Wood Preservative Treatments on Mechanical Properties of E-glass / Phenolic Pultruded Composite Reinforcement for Wood. *Forest Products Journal*. 52(11/12).

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## PRESENTATIONS:

**PRESENTATIONS:** (several of the publications listed above also were given as talks but are not double listed below as presentations):

2007. Invited seminars: Chinese Academy of Forestry. Beijing, China. March 5, 2007

- 1) Goodell, B. UMaine - Wood Utilization Research. An overview.
- 2) Goodell, B. Fungal degradation and bioprocessing of wood – an overview.

2007. Invited seminars: Beijing Forestry University. Beijing, China. March 6, 2007.

- 1) Goodell, B. UMaine Wood Utilization Research - overview.
- 2) Goodell, B. Characterization of Fiber Reinforced Polymer (FRP) composite materials and adhesive bondlines fabricated by the Composites Pressure Resin Infusion System (ComPRIS).

2007. Invited Seminars. Central-South University of Forest Science and Technology (CSUFT). Changsha, Hunan, China. March 8, 2007.

- 1) Goodell, B. Fungal degradation and bioprocessing of wood – an overview.
- 2) Goodell, B. The UMaine “Wood Utilization Research Center”.
- 3) Xie, X., B. Goodell. Production of carbon nanotubes from plant/wood cell walls.

2006. Goodell, B., S.Quarles. The largest mold litigation case in the country. Was it Mold? Forest Products Society International Convention, Newport Beach, CA, USA. June 25-28, 2006. Abstr

2006. Goodell, B., Y. Qian, D. Gardner and Cihat Tascioglu. Enhancing composite durability by understanding biocides and adhesive-biocide interactions. Presented at the Conference on Wood Protection, Forest Products Society, New Orleans, LA, March 21-23, 2006.

2005. Qian, Y., B. Goodell and J. Jellison. “Basic wood decay mechanisms and their application to the remediation of environmental contamination.” Forest Products Society International Convention, Quebec City, Canada June 19-22, 2005. Abstr.

2005. Ostrofsky, A., J. Jellison and B. Goodell. “Decay of oak, pine and COMPRIS composites by eight brown-rot fungi”. Annual American Phytopathological Society, Austin, Texas, August. Abstr.

2004. Goodell, B., Herzog, B., and R. Lopez-Anido. "The Composites Pressure Resin Infusion System (ComPRIS)", 2004 Northeast Composites Conference. American Composites Manufacturers Association. Portland, ME, June 21-22, 2004.

2004. Goodell, B. Herzog, B., Lopez-Anido, R., and J. Jellison. "ComPRIS: A Method of Fabricating, Reinforcing, and Protecting Wood Composites," Session 15: Preservative Treatments for Structural Panels. Forest Products Society, 58th Annual Meeting. Grand Rapids, MI, June 27-30, 2004.

2004. Goodell, B. Herzog, B., Lopez-Anido, R. and D. Gardner. "Durability and Shear Strength of Adhesive Bondlines Fabricated using the Composites Pressure Resin Infusion System (ComPRIS)," Forest Products Society, 58th Annual Meeting. Grand Rapids, MI, June 27-30, 2004.

2004. Goodell, B. Y. Qian, and J. Jellison. Brown-rot Degradation of Wood: Non-Enzymatic

## PRESENTATIONS:

Mechanisms, and Potential Applications. Invited Presentation. Universidad de Concepción. Chile. March 14 – 20, 2004.

2004. Goodell, B., B. Herzog, and C. Tascioglu. Effects of Preservative Treatment and Exposure to Wood Degrading Fungi on Fiber Reinforced Polymer (FRP) materials Used for Structural Wood Reinforcement. Invited Presentation. Universidad de Concepción. Chile. March 14 – 20, 2004.

2004. Goodell, B., R. Lopez-Anido and B. Herzog. ComPRIS: The composites pressure resin infusion system. Invited Presentation. Universidad de Concepción. Chile. March 14 – 20, 2004.

2004. Jellison, J and B. Goodell. Biological Degradation of Wood. Invited Seminar Oregon State University. March 3, 2004.

2004. Lopez-Anido, R., B. Goodell, H. Dagher, and B. Herzog. Performance-Based Material Specifications for Reinforced Glulam Bridges. Transportation Research Board 83<sup>rd</sup> Annual Meeting, Washington D.C., Jan. 11-15, 2004.

Schmutzer, M., J. Jellison, and B. Goodell. 2004. Biodegradation of lignocellulose fiber. The Fiber Society Annual meeting, Cornell University October 10-12, 2004. Abstr.

2003. Filley, T., J. Jellison, B. Goodell, S. Kelley and M. Davis. Formation of dissolved organic matter from the microbial decomposition of woody tissue. American Geophysical Union National Meeting-San Francisco, Jan. 2003. Biogeosciences division.

2003. Goodell, B., R. Lopez-Anido, and B. Herzog. The Composites Pressure Resin Infusion System (ComPRIS). Forest Products Society 57th Annual Meeting, Bellevue, WA, Jun. 22-25, 2003.

2003. Herzog, B., B. Goodell, R. Lopez-Anido, D. Gardner, and L. Muszyński. Evaluation of Preservative Treatments on Mechanical Properties of Wood-FRP Composite Materials. Session 11: Durability Issues: Challenges and Opportunities, Forest Products Society, 57th Annual Meeting, Bellevue, WA, Jun. 22 - 25, 2003.

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2001. Tascioglu, C., B. Goodell, and R. Lopez-Anido. The Effects of Preservative Treatment

## PRESENTATIONS:

and Exposure to Wood Degrading Fungi on Fiber Reinforced Polymer (FRP) Materials Used for Structural Wood Reinforcement. The International Research Group on Wood Preservation, 32<sup>nd</sup> Annual Meeting, 9 pp., Nara, Japan, May 20-25, 2001.

2001. Tascioglu, C., B. Goodell, R. Lopez-Anido, and M. Peterson. Biodegradation and Fungal Growth on Fiber Reinforced Polymer (FRP) Composites. 55th Annual Meeting of the Forest Products Society, Baltimore, MD, Jun. 24-27, 2001.

2001. Tascioglu, C., B. Goodell, R. Lopez-Anido, and M. Peterson. Degradation of E-Glass / Phenolic Pultruded Composite by Wood Decay Fungi. In Proceedings of Second International Conference on Advanced Engineered Wood Composites, Bethel, Maine, Aug. 14-16, 10 pp.

2001. Goodell, B. Overview of brown rots and non-enzymatic mechanisms. American Chemical Society National Meeting San Diego, CA April 1-5, 2001. Abstr. Invited symposium paper.

2001. Jellison, J, B. Goodell, J. Connolly, W. Shortle, C. Fuller, A. Ostrofsky. A. Amirbahman, T. Filley and S. Kelley. 2001. Fungal biodegradation of wood in soil contact. American Chemical Society National Meeting San Diego, CA April 1-5, 2001. Abstr. Invited symposium paper.

2001. Tascioglu, C., B. Goodell, and R. Lopez-Anido. 2001. Monitoring Fungal Decay in Fiber Glass Reinforced Polymer (GFRP) Composites for Wood Reinforcement. Invited presentation. Forest Products Society.

2001. Kelley, S., J. Jellison, B. Goodell. 2001. Use of NIR and MBMS for detecting the chemical changes associated with brown-rot biodegradation of spruce wood. American Chemical Society National Meeting San Diego, CA April 1-5, 2001. Abstr.

2001. Cody, G. D., B. Goodell, J. Jellison and T. Filley. 2001. Molecular spectroscopic investigations into microbial degradation of plants. American Chemical Society National Meeting San Diego, CA April 1-5, 2001. Abstr. Invited symposium paper.

2001. Filley, T., G. Cody, and B. Goodell. Degradation of lignin in gymnosperm woods by wood-rot fungi as observed by <sup>13</sup>C-labelled TMAH thermochemolysis. ACS National Meetings. Geochemistry Division April 1-5. San Diego.

2001. Goodell, B., Y. Qian, J. Jellison, M. Richard and W. Qi. Proposed mechanism of oxidation by low molecular weight binding compounds isolated from wood degrading fungi and potential application. International Conference on Biotechnology for the Pulp and Paper Industry. Finland, June 4-8, 2001. Abstr.

2001. Interview March Issue. Water Environment Federation. Industrial Wastewater Magazine. Alexandria, Va.,

2000. Oct. Interview. Maine Public Radio. Research on a new method related to our patent on effluent treatment in waste water.

2000. November. Interview. Maine Perspective. Campus Newsletter. Research on a new

## PRESENTATIONS:

method related to our patent on effluent treatment in waste water.

2000. Yelle, D., B. Goodell, D. Gardner, and J. Jellison. Bonding of wood fibers by lignin activation using free radical generating systems. University of Maine. Presentations to visiting Maine legislature, Nutting Hall, March, 2000 (Poster)

2000. Yelle, D., B. Goodell, D. Gardner, and J. Jellison. Lignin activation using chelator-mediated mechanisms. University of Maine, AEWC Center Grand Opening, June 3-5, 2000 (Poster)

2000. Tascioglu, C., B. Goodell, R. Lopez, and B. Magid. Effects of Preservative Treatments on FRP Reinforcement for Wood. Forest Products Society and Society of Wood Science and Technology, 2000 Annual Meetings, June 17-21, South Lake Tahoe, Nevada.

2000. Tascioglu, C. B. Goodell, R. Lopez. The Treatment of Fiber Reinforced Wood with Preservative Chemicals. Advanced Engineered Wood Composite Center (AEWC) Grand Opening Ceremony and Guided Public Tours, June 1-3, 2000, Orono, Maine.

2000. Tascioglu, C. B. Goodell, R. Lopez. "FRP Reinforcement of Pressure Treated Wood." 31st. Annual Meeting of International Research Group on Wood Preservation, May 14-19, Kona, Hawaii.

2000. Tascioglu, C. B. Goodell, R. Lopez. "FRP Reinforcement of Pressure Treated Wood." College of Natural Sciences, Forestry, and Agriculture Student Poster Competition and Exhibition to the State Maine Legislative. April 2000, Orono and Augusta, Maine. (Awarded with 3rd. place in the competition).

1999. Qian, Y., and B. Goodell. The Effect of Low Molecular Weight Chelators on Iron Chelation and Free Radical Generation as Studied by ESR Measurement. International Research Group on Wood Preservation. 31st Annual meeting held May 14-19, 2000, at Kona Surf, Hawaii, USA.

1999. Tascioglu, C., B. Goodell, R. Lopez, and B. Magid. "FRP Reinforcement of Pressure Treated Wood: Preservative Compatibility and Durability" Forest Products Society, 1999 Annual Meeting, June 27-30, Boise, Idaho.

1999. Tascioglu, C., B. Goodell, R. Anido-Lopez, B. Abdel-Magid. Surface Characterization of Preservative Treated FRP and Wood. Forest Products Society, Annual Meeting. Boise Idaho.

1999. Tascioglu, C., B. Goodell, R. Anido-Lopez, B. Abdel-Magid. Effects of Preservative Treatment on FRP Reinforcement for Wood. The Proceedings of First International Conference on Advanced Engineered Wood Composites, Bar Harbor, Maine July 5-8, 1999.

1999. Goodell, B, and J. Jellison. Brown rot biodegradation of wood. International Society of Biodegradation and Biodeterioration. Washington, D.C. Aug 8-12.

1999. Yelle, Y. and B. Goodell. Bonding of wood fibers by lignin activation using free radical generating systems. CONFOR, Bar Harbor, Maine, 5-6 February 1999.

## PRESENTATIONS:

(Abstract).

1999. Goodell, B., J. Jellison, and Y. Qian. Understanding how structural timbers decay: Mechanisms involved in the brown rot decay process. First International Conference on Advanced Engineered Wood Composites. Bar Harbor, Maine. July 5-8, 1999.

1999. Goodell, B., J. Jellison, Y. Qian, J. Connolly and A. Paszczynski. 1999. Chelating phenolates and the generation of oxygen radicals in brown rot wood decay. FPS 1999 Annual Meeting held June 27-30, 1999, at the Grove Hotel & Boise Centre, Boise, Idaho.

1998. Goodell, B. Wood degradation and protection. Presentation to NSF REU students, University of Maine. July 1998.

1997. Jellison, J., J. Connolly, and B. Goodell. Basic mechanisms involved in wood fiber biomodification by brown rot fungi. TAPPI Biological Sciences Symposia. San Francisco. Abst.

1997. Jellison, J. J. Connolly, and B. Goodell. Non-enzymatic degradation of wood by the brown rot fungus. Annual meeting of the American Phytopathological Society. Rochester, NY Abst.

1997. Goodell, B. and J. Jellison. Wood degradation mechanisms. The 28<sup>th</sup> Annual Meeting of the International Research Group on Wood Preservation . Whistler, BC Canada. Abst.

1996. Jellison, J, J. Liu, and B. Goodell. Non-enzymatic biodegradation of cellulose by the brown-rot fungus *Gloeophyllum trabeum*. Annual meeting of the American Phytopathological Society. Indianapolis, IN. Abst.

1996. Goodell, B. Development and Significance of Attack by *Lasioldiplodia theobromae* (Pat.) Griff. & Maubl. in Caribbean Pine Wood and Some Other Wood Species. Presentation as 'Opponent' of the thesis of Osvaldo Encinas, Doctoral Candidate, Swedish University of Agricultural Sciences. Uppsala, Sweden. November 22, 1996. Invited Opponent Presentation.

1996. Goodell, B. Chelators isolated from wood degrading fungi; their role in the breakdown of cellulosic compounds and potential in bioprocessing. Distinguished Lecturer Series. Chemical Engineering Department, University of Maine. November 1, 1996. Invited lecture.

1996. Goodell, B. Low molecular weight, metal-binding phenolic compounds isolated from wood decay fungi and their role in the oxidation of phenolic and cellulosic materials. Institute of Paper Science and Technology. Atlanta, Georgia. August 19, 1996. Invited Presentation.

1996. Krishnamurthy, S. and B. Goodell. Biodegradation of pentachlorophenol mediated by chelators secreted by the wood-rot fungus *Gloeophyllum trabeum*. 1996 Annual Meeting, Forest Products Society. Minneapolis, Minnesota. June 23-26.

1995. Goodell, B. Oxygen radicals, chelators, and volcanoes: Their effect on wood. Department of Forest Products. Sveriges Lantbruksuniversitet. December 15, 1995. Uppsala, Sweden.

## PRESENTATIONS:

1995. Goodell, B. Protection of Fiber Reinforced Polymer (FRP) Laminates from deterioration. September. NSF/UMaine review panel. University of Maine.

1995. Goodell, B., J. Liu, J. Jellison, A. Bruce, M. Bruce, and A. Paszczynski. Radical production and redox chemistry associated with biochelators produced by the wood decay fungus *Gloeophyllum trabeum*. Mokuzai Gaikai, Japan.

1995. Goodell, B. Current status of wood preservation in the United States. Mokuzai Gaikai, Japan. Invited Presentation.

1995. Jellison, J., Y. Chen, J. Connolly, B. Goodell, and F. Fekete. 1995. Physiological factors influencing hyphal sheath formation and bio-chelator production by degradative fungi. Sixth International Conference on Biotechnology in the Pulp and Paper Industry. Vienna, Austria, June 11-15.

1995. Goodell, B., J. Liu, J. Jellison, J. Lu, and A. Paszczynski. 1995. Chelation activity and hydroxyl radical production mediated by low molecular weight phenolate compounds isolated from *Gloeophyllum trabeum*, Sixth International Conference on Biotechnology in the Pulp and Paper Industry, Vienna, Austria, June 11-15.

1994. Lu, J., B. Goodell, J. Liu, A. Enoki, J. Jellison, and F. Fekete. The role of oxygen and oxygen radicals in one-electron oxidation reactions mediated by low-molecular weight compounds isolated from *Gloeophyllum trabeum*. Presented at the 48th Annual Forest Products Society Meeting, June 26-29, 1994, Portland, Maine.

1994. Goodell, B., J. Jellison, A. Enoki, J. Liu, and J. Lu. Redox reactions associated with oxidative degradation mediated by fungal biochelators from *Gloeophyllum trabeum*. Presented at the 48th Annual Forest Products Society Meeting, June 26-29, 1994, Portland, Maine.

1994. Easwaran, V., J. Jellison, B. Goodell and J. Liu. Partial characterization of phenolate compounds produced by the wood decay fungus *Gloeophyllum trabeum* under conditions of iron stress. Presented at the 48th Annual Forest Products Society Meeting, June 26-29, 1994, Portland, Maine.

1994. Goodell, B., K. Yamamoto, J. Jellison, M. Nakamura, T. Fujii, K. Takabe, and N. Hayashi. Laccase immunolabelling and microanalytical analysis of wood degraded by *Lentinus edoides*. Presented at the 48th Annual Forest Products Society Meeting, June 26-29, 1994, Portland, Maine.

1994. Goodell, B., J. Liu and J. Slahor. Evaluating diffusible wood preservatives in an accelerated field simulator. Presented at the 48th Annual Forest Products Society Meeting, June 26-29, 1994, Portland, Maine.

1994. Goodell, B., K. Yamamoto, J. Jellison, M. Nakamura, T. Fuji, N. Hayashi, and K. Takabe. Laccase immunolabelling and microanalytical analysis of wood degraded by *Lentinus edoides*. Wood Preservation, Savannah, Georgia, Sept. 26-28, 1994.

1993. Goodell, B. Wood Protection and Deterioration Research at the University of Maine: 1) The role of metal chelators in the decay of wood by fungi. 2) Modelling of fumigant behavior

## PRESENTATIONS:

in wood poles. 3) Chemical ring stain of Mnt. St. Helens volcano damaged wood. Invited lecture. Kin-ki University. Nara, Japan. 3/93.

1993. Jellison, J. and B. Goodell. Microbial degradation of wood. Invited presentation, Dept. of Agricultural Chemistry, Kinki University, Nara, Japan

1993. Jellison, J., A. Enoki, B. Goodell, M. Ishihara, N. Hayashi, and H. Tanaka. Iron II and iron III chelators produced by the brown-rot fungus *Gloeophyllum trabeum*. American Phytopathological Society/Society of Nematologists Joint Meeting Nov. 6-10, 1993. Nashville, TN. Abstr.

1993. Goodell, B., and J. Howe. Introduction of the 1994 Forest Products Society Annual Meeting in Portland, Maine. Clearwater Beach, FL. 6/93.

1993. Goodell, B. Co-Chairs Welcome to the National Planning Committees', Forest Products Research Conference. 'Sustainable Economies and Sustainable Resources -- Roles for Forest Products Research.' Invited presentation. Sept 27-29, 1993. FPL Madison, Wisconsin

1992. Goodell, B. Enhancing Maine's research competitiveness. Presented at 1992 Maine EPSCoR Conference, "The Wood Sciences and Engineering Research Cluster at UMaine", Portland, ME.

1992. Goodell, B., H. Dagher and V. Caccese. The timber bridge program in Maine: preservative treatment of Maine's native timber species. Two talks at RC&D sponsored "Timber Bridge Conference" at the University of Maine at Farmington and Portland, ME.

1992. Jellison, J., B. Goodell, V. Easwaran, Y. Chen, V. Chandhoke, F. Fekete, M. Ishihara, and N. Hayashi. Transition metals and their role in fungal biodegradation. Northeastern Regional Phytopathological Society meetings, Oct. 28-30, 1992. Portland, ME. Abstr.

1992. Goodell, B. The current status of wood protection and preservation research in the United States. Invited talk at the Dundee Institute of Technology, Dundee, Tayside, Scotland, UK. Invited presentation.

1992. Goodell, B. New developments in our understanding of wood deterioration. Presented at Forest Products Research Society meeting, Charleston, SC. Chaired: "Wood Deterioration" Plenary Session.

1992. Goodell, B. Status of the northern timber-utility pole development project. Presented to the New England Utility Company Consortium, Portsmouth, NH.

1992. Goodell, B., J. Jellison, V. Chandhoke, F. Fekete, K. Yamamoto, and N. Hayashi. The role of iron and iron-chelating compounds isolated from decay fungi in biological degradation. Presented at the annual Forest Products Research Society meeting, Charleston, SC.

1992. Goodell, B. Tales of wood decay, and other stories from the Far East. Presented at Forestry Noon-Time Seminar, University of Maine, Orono, ME.

1991. Goodell, B. Advances in our understanding of wood deterioration with regard to future

## PRESENTATIONS:

developments in bioprocessing and wood protection. Chunbuk University, S. Korea. 3/28/91; and Hokkaido University, Sapporo, Japan. 6/3/91.

1991. Goodell, B. Analysis of methods to improve the preservative penetration of *Picea rubrum* timber. Mokuzai Gakkaishi. Journal of the Japan Wood Research Society 37(2)A44. Presented in Matsue, Japan. 4/2/91.

1991. Goodell, B. Fungal biodeterioration and its preservation in wood. Hokkaido Forest Products Laboratory. Asahigawa, Hokkaido, Japan. 6/6/91.

1991. Goodell, B. Isolation of newly identified metabolites from decay fungi, and their potential role in bioprocessing. Soule National University. Soule, Korea. 3/27/91.

1991. Goodell, B. Lignocellulose biodegradation by decay fungi: Chemical and immunochemical analyses. Chonnam University, Kwangju, Korea. 3/25/91.

1991. Goodell, B. Wood preservation and deterioration research in North America. Forest Research Laboratory, Soule, Korea. 3/29/91.

1991. Goodell, B. Wood decay is initiated by siderophores in some brown-rot fungi. Forest Products Research Society Meeting, 45th Annual New Orleans, LA.

1991. Goodell, B. Wood preservation and deterioration research at the University of Maine. Jan. 23, 1991. Forestry and Forest Products Research Institute. Tsukuba, Japan.

1991. Goodell, B., J. Jellison, F. Fekete, V. Chandhoke, K. Yamamoto, and N. Hayashi. The role of iron and iron-chelating compounds isolated from decay fungi in biological degradation. Proceedings of Applications of Biotechnology to Tree Culture, Protection and Utilization. August 5-8, 1991. USFS, Columbus, Ohio. p. 106.

1991. Goodell, B., J. Jellison, V. Chandhoke, and F. Fekete. Degradation of cellulosic substrates by low molecular weight chelators isolated from the brown-rot fungus *Gloeophyllum trabeum*. In: Proceedings of the Symposium on cellulose and lignocellulosics chemistry, May, 1991, Guangzhou, China.

1990. Goodell, B., H. Dagher, J. Jellison, and B. Cole. A proposed Wood Sciences and Engineering Cluster for Maine's EPSCoR Program. Two presentations to the Maine Research Excellence Partnership. Augusta and Rockport, Maine.

1990. Goodell, B., V. Chandhoke, J. Jellison, and F. Fekete. Action of siderophores from *Gloeophyllum trabeum* on 2-keto-r-thiomethylbutyric acid and cellulose-azure substrates. Presented N.E. American Phytopathological Division meetings. Oct. 31-Nov. 2, Cromwell, CT.

1990. V. Chandhoke, B. Goodell, F. Fekete and J. Jellison. The role of siderophores in wood degradation. 44th Annual Meeting Forest Products Research Society (June 24-27), Salt Lake City, UT.

1990. Goodell, B., and A. J. Pendlebury. Preservative treatment and field test monitoring of

## PRESENTATIONS:

spruce pole stock: Pressure and diffusible chemical treatments. The International Biodeterioration and Biodegradation Symposium (August 26-31), Windsor, Ontario.

1990. Jellison, J., V. Chandhoke, Goodell, B., and F. Fekete). Biological chelators produced by wood decay fungi. Eighth International Biodeterioration and Biodegradation Symposium (August 26-31), Windsor, ONT.

1989. Daniel, G. and B. Goodell. Cell wall microdistribution of chloropicrin and methylisothiocyanate in treated spruce, 20th Annual Meeting of the International Research Group on Wood Preservation (May 22-26), Lappeenranta, Finland.

1989. Goodell, B., J. Jellison and G. Daniel. Probing peroxidase activity in *Phanerochaete chrysosporium* degraded birch wood. 4th International Conference on Biotechnology in the Pulp and Paper Industry (May 16-19), Raleigh, NC.

1989. Jellison, J. and B. Goodell. Detection and quantification of biodegradation in wood. Presented at Pan American Biodegradation Society, Aug. 3-6., Washington, DC. Invited plenary talk.

1989. Goodell, B., J. Jellison and G. Daniel. Immunological techniques for elucidation of the mechanism of wood biodeterioration. The 3rd Pan-American Biodeterioration Society Meeting (Aug. 3-6), George Washington University, Washington, DC. Invited plenary talk.

1989. Kim, Y-S., J. Jellison, and V. Tracy, and B. Goodell. The use of ELISA and immuno-TEM for the detection of microanalysis of white- and brown-rot decayed wood. 4th International Conference on Biotechnology in the Pulp and Paper Industry (May 16-19), Raleigh, NC.

1989. Goodell, B., and J. Pendlebury. Treatability of red spruce timber with waterborne and diffusible preservative systems for use as utility poles in the Northeast. 43rd Annual Meeting of the Forest Products Research Society (FPRS) (June 25-29), Reno, NV.

1988. Huang, T., B. Goodell, and J. Jellison. <sup>13</sup>CP/MAS nuclear magnetic resonance of white- and brown-rot decayed wood. Forest Products Research Society Annual Meeting, June 19-22, Quebec City, Canada. Abstr.

1988. Goodell, B., S. Carlson and J. Jellison. Parameters affecting the treatment of mill run red spruce timber. Forest Products Research Society Annual Meeting, June 19-22, Quebec City, Canada. Abstr.

1988. Goodell, B., G. Daniel, J. Jellison and T. Nilsson. Immuno-electron microscopy and fluorescent antibody microscopy of *Poria placenta* (brown-rot) infected wood. Forest Products Research Society Annual Meeting, June 19-22, Quebec City, Canada. Abstr.

1988. Jellison, J., B. Goodell, G. Daniel and T. Nilsson. Immunological characterization of wood decay. Forest Products Research Society Annual Meeting, June 19-22, Quebec City, Canada. Abstr.

1988. Goodell, B. Evaluation of encapsulated and gelled chloropicrin formulations for use in

## PRESENTATIONS:

wood poles. Forest Products Research Society Annual Meeting, June 19-22, Quebec City, Canada. Abst.

1987. Goodell, B. Biotechnology Applications in the Pulp and Paper Industry. Presented at S.D. Warren Research, Westbrook, ME. January, 1987. Invited presentation.

1987. Flynn, K. and B. Goodell. Computer process control of a pilot scale pressure retort. 83rd Annual Meeting of the American Wood Preservers' Association, Toronto, Ontario, Canada. Vol. 83, p. 177.

1987. Goodell, B. Formulation and testing of a long-term fumigant release system for the remedial preservative treatment of utility poles. New York State Electric and Gas Headquarters, New York, NY. February, 1987. \*Invited presentation for EPRI\*.

1987. Jellison, J., and B. Goodell. Immunochemical characterization of lignocellulose degradation. Presented July 9, 1987. 3rd Annual Northeast Symposium on Forest Products and Wood Science, Biotechnology for the Forest Based Industry. Invited paper.

1987. Goodell, B. Biotechnology for the forest-based industry. Presented at the 3rd Annual Northeast Symposium on Forest Products and Wood Science, Biotechnology for the Forest Based Industry. July 9, University of Maine, Orono, ME.

1987. Goodell, B. Wood Protection and Degradation Research at the University of Maine. Fortieth Annual Forest Products Research Society Meeting. Louisville, Kentucky, 6/87.

1987. Goodell, B. Wood Preservation Research at the University of Maine. 83rd Annual Meeting of the American Wood-Preservers Association Annual Meeting, Toronto, Canada. Vol. 83, p.174.

1987. Jellison, J., and B. Goodell. Preparation and use of antibody probes for wood decay fungi. Poster presentation, International Research Group on Wood Preservation, May 18-22nd, Ontario, Canada. IRG WP 1306.

1987. Goodell, B., and J. Jellison. Enzymatic degradation. Presented Feb. 4, 1987, TAPPI Technical Association of the Pulp and Paper Institute, N.E. Section. Invited paper.

1986. Jellison, J., and B. Goodell. Identification of wood rotting fungi and probes for enzyme activity. Presented Nov. 18, 1986, 2nd Ann. Biofor Meeting, Biotech. Network for the Canadian Forest Based Industries. Victoria, B.C. Invited paper.

1986. Goodell, B., and J. Jellison. Antibody production to fungal extra-cellular enzymes. American Institute of Chemical Engineers, 1986, National Meeting, Boston, MA., Aug. 25. Tech Program Summary. Invited paper.

1986. Jellison, J. and B. Goodell. Serological detection of *Poria placenta* (Fr.) Cke. using ELISA. APS NE Divisional Meeting Oct. 1985, Newport, R.I. Abstr.

1986. Jellison, J. and B. Goodell. Identification of wood rotting fungi and probes for enzyme activity. Presented Nov. 18, 1986, Second Annual Biofor Meeting, Biotechnology Network for

## PRESENTATIONS:

the Canadian Forest Based Industries. Victoria, B.C. Invited paper.

1986. Goodell, B. Detection of decay in wood using enzyme- and fluorescent-linked serological assays. For. Prod. Res. Soc., 40th Annual Meeting, June. Spokane, WA.

1986. Goodell, B. Immunological characterization of wood decay fungi. The 36th Ann. Pulp and Paper Open House. April. University of Maine, Orono, ME.

1985. Goodell, B. Fumigation of impermeable heartwood species for preservative treatment. The 1st Ann. Northeast Symp. on For. Products and Wood Sci.: Proc., Univ. of Maine at Orono. May 29.

1985. Goodell, B. Pulsation process treatment of spruce with CCA. The 1st Ann. Northeast Symp. on For. Prod. and Wood Sci.: Proc., Univ. of Maine at Orono. May 29.

1985. Goodell, B. Serological detection of wood decay fungi. For. Prod. Res. Soc., 39th Ann. Meeting, June. Orlando, FL.

1985. Goodell, B., M. Hunter, and A. Kimball. Application of wood science to the creation and maintenance of wildlife habitat. Northeast Section of the Soc. of Amer. Foresters, April. Portland, ME. Proc. Joint NE Chpt. Soc. of Amer. Foresters/Maine Wildlife Soc./Atlantic Chapt. Amer. Soc. of Fisheries meetings: Is Good Forestry Good Wildlife Management? Ed. by J. Bissonette. MAES pub. #689. \*Invited talk\*.

1985. Jellison, J., and B. Goodell. Serological detection of *Poria placenta* (Fr) Cke. using ELISA. NE Amer. Phytopath. Soc. Meetings. November. Newport, RI. Abstract. Phytopathology 76(7).

1984. Goodell, B. Prevention and control of fungal decay and marine borer damage in wooden waterfront structures on the coast of Maine. Sea Grant Advisory Council. October. Castine, ME. \*Invited presentation for Sea Grant\*.

1984. Goodell, B. Residue retention and fungal invasion of chloropicrin treated Douglas-fir. For. Prod. Res. Soc., 38th Ann. Meeting, June. St. Louis, MO.

1983. Goodell, B. Observations of Douglas-fir trees injected with the fumigant chloropicrin. NE Amer. Phytopath. Soc. Meeting, August. Quebec, Canada. Abstract, Can. J. Plant Path. 6(3):83.

1982. Goodell, B. Detecting incipient decay. For. Prod. Res. Soc., Pacific Northwest Section. Fall. Weyerhaeuser Tech. Center, Federal Way, WA. Invited talk.

1982. Goodell, B. Residue retention and fungal invasion of Douglas-fir treated with chloropicrin vapor. The Coop. Pole Research Prog. Bonneville Power Administration, Vancouver, WA.

1981. Goodell, B. Diffusion of fungitoxic chloropicrin vapors in the heartwood of living trees. The Coop. Pole Research Prog., Oregon State Univ., Corvallis, OR.

## PRESENTATIONS:

1981. Goodell, B. The use of neutron activation analysis for detection of residues in wood. Seminar, Spring. For. Prod. Dept., Oregon State University, Corvallis, OR.

## CONTRACT REPORTS:

Annual progress reports on the research project "Preservative Treatment of Spruce Timber in the Northeastern United States." Submitted from the College of Forest Resources, University of Maine to Northeast Utilities Co. and Central Maine Power Co. 12/86, 2 pp; 12/87, 24 pp; 1/89, 32 pp; and 1/90 40 pp.

Interim progress reports on the research project "Preservative Treatment of Spruce Timber in the Northeastern United States." Submitted from the College of Forest Resources, University of Maine to Northeast Utilities Co. and Central Maine Power Co. 5/87, 5 pp; 9/86, 3 pp.

Semi-annual progress reports on the research project "Preservative Treatment of Spruce Timber in the Northeastern United States." Submitted from the College of Forest Resources, University of Maine to Northeast Utilities Co. and Central Maine Power Co. 3/86, 15 pp; 8/87, 24 pp; 8/88, 35 pp; 8/89, 26 pp; 8/90; 17 pp.

Project Summary: Preservative treatment of spruce timber in the Northeastern United States." Submitted to the Electric Council of New England (ECNE, CT-3 Committee) November, 1986. 8 pp.

Annual Progress Report on the research project: "Improving the effectiveness of groundline treatments for utility poles." Submitted from the University of Maine, College of Forest Resources to Northeast Utilities Co. and Central Maine Power Co., December 22, 1986. 18 pp.

Interim Report to Northeast Utilities Company and Central Maine Power Co. on Wood Pole Preservation Progress. Submitted from the University of Maine, College of Forest Resources. May 8, 1987. 5 pp.

## SYMPOSIA/MEETINGS CHAIR:

2005. American Chemical Society. American Chemical Society; Symposium Co-Chair, "Health, environment and efficacy issues in the development of commercial wood protection systems", A two day symposium. With Schultz, Militz, Freeman, and Nicholas. San Diego, CA. 2005

2001. American Chemical Society. American Chemical Society; Symposium Co-Chair, "Recent Developments in the Chemistry of Wood Degradation and Preservation", A two day symposium. With Nicholas and Shultz. San Diego, CA. 2001

1997. TAPPI Biological Sciences Symposium: Biotechnology in the Pulp and Paper Industry. With R. Farrel, G. Daniel, T. Jeffries, and A. Ragauskas.

1995. Wood Deterioration Plenary Session. Session organized and Chaired for the 49th Annual Forest Products Society Meeting, June 1995, Portland, Oregon.

## PRESENTATIONS:

1994 National Annual Meeting, Co-Chair, Forest Products Society.

1993. The International Research Group on Wood Preservation. Session Chair on Remedial Wood Treatments. Orlando, Florida.

1992. Forest Products Research Society meeting, Charleston, SC. Chaired: "Wood Deterioration" Plenary Session.

1991. Chair of session on "Biotechnology". Symposium on Cellulose and Lignocellulosics Chemistry, May, 1991, Guangzhou, China.

1988. Forest Management Practice and Forest Products Manufacture: Working Toward a Common Goal. Nutting Hall, Univ. of Maine, Orono, ME. 39 pp. With M. Cyr.

1987. 3rd Annual Northeast Symposium on Forest Products and Wood Science. "Biotechnology for the Forest Based Industry." July 9 & 10, Nutting Hall, Univ. of Maine, Orono, ME. Published as one issue, Biomass J. 15(2). With M. Cyr and C. Murdoch.

1987. Proceedings of the 2nd Annual Northeast Symposium on Forest Products and Wood Science. "Wood Residue Processing: From Forest to the Boiler." May 12-13th, 1986. Nutting Hall, Univ. of Maine, Orono, ME. 39 pp. With M. Cyr.

1986. Proceedings: The Northeast Symposium on Forest Products and Wood Science. "Value Added in the Forest Products Industries." May 29, 1985. Nutting Hall, Univ. of Maine, Orono, ME. With M. Cyr.

## PERSONAL:

-Citizenship: U.S.A.; Date of Birth: 12/18/53; Birthplace: Hartford, Connecticut. Married:  
Wife - Jody Jellison (Goodell); Date of Birth 4/24/55; Birthplace: Charlottesville,  
Virginia  
Children: Nathaniel, Birth 5/1/85; and Matthew, Birth 5/11/89