



## WISCONSIN

### FOREST SERVICE RESEARCH AND DEVELOPMENT

STATE FUNDING HISTORY	Enacted FY 2003 (\$)	Enacted FY 2004 (\$)	Pres. Budg. FY 2005 (\$)
<b>MADISON</b>			
FPL-4501 Center for Forest Mycology Research	992,000	975,000	967,000
FPL-4502 Biodeterioration of Wood	1,031,000	1,151,000	1,141,000
FPL-4701 Center for Wood Anatomy Research	553,000	532,000	528,000
FPL-4703 Wood Adhesives Sci and Technology	987,000	1,107,000	1,097,000
FPL-4706 Performance Designed Composites	1,188,000	1,265,000	1,253,000
FPL-4707 Wood Surface Chemistry	616,000	697,000	681,000
FPL-4709 Chemistry and Pulping	1,389,000	1,877,000	1,859,000
FPL-4710 Fiber Processes and Products	2,236,000	2,231,000	2,211,000
FPL-4712 Inst for Microbial/Biochemic Tech	1,476,000	1,474,000	1,460,000
FPL-4714 Engineering Properties of Wood	1,118,000	1,193,000	1,183,000
FPL-4716 Engineered Wood Products/Struct.	2,461,000	2,555,000	2,548,000
FPL-4719 Wood Processing and Drying Sys	1,327,000	1,308,000	1,302,000
FPL-4722 Modification of Lignocellulosics	1,028,000	1,013,000	1,003,000
FPL-4723 Wood Preservation	1,397,000	1,394,000	782,000
FPL-4724 Stats Methods in Wood/Fiber Res.	655,000	638,000	630,000
FPL-4725 Fire Safety	0	0	590,000
FPL-4851 Timber Demand/Tech Assess. Res.	2,150,000	2,150,000	2,142,000
<b>WISCONSIN TOTAL</b>	<b>20,604,000</b>	<b>21,560,000</b>	<b>21,377,000</b>

**RESEARCH & DEVELOPMENT**, a division of the USDA Forest Service (FS R&D), strives to be the “go to” organization for information and solutions to sustain forests and rangelands and the values they provide people. FS R&D has the flexibility to address today's issues effectively and to respond to tomorrow's needs. Among the world's leaders in forest conservation research, scientists contribute to the stewardship of land, real property and society by providing research results that help create jobs and affordable homes, and improve the health of trees, forests and forest ecosystems.

Innovative research products permit the Forest Service and other public and private land managers to monitor and manage forest responses to environmental change, contributing significantly to the sustainability of the nation's forests and rangelands and improving human health.

FS R&D operates six research stations, the Forest Products Laboratory, and the International Institute of Tropical Forestry located in Puerto Rico. It employs over 500 scientists and hundreds of

technical and support personnel at 67 field sites throughout the nation. The FY 2005 President's Budget includes \$280,654,000 for Forest and Rangeland Research.

The **Forest Products Laboratory (FPL)**, located in Madison, Wisconsin, is the Nation's leading Federal wood utilization research laboratory and serves the entire United States. The FPL develops science and technology to conserve, extend, and sustainably utilize forest resources in order to improve the health, diversity, and productivity of the Nation's forests to meet the needs of current and future generations. FPL is nationally and internationally recognized as an unbiased technical authority on wood science and use. FPL staff regularly cooperate with government agencies, universities, and the private sector to develop and implement problem-solving technologies that ensure the long-term sustainability of forests and forest-based economies. The FY 2005 President's Budget proposes \$21,377,000 for research at the FPL.

#### **MADISON**

**FPL-4501, Center for Forest Mycology Research.** This unit's mission is to obtain, describe, identify, classify, preserve, and utilize specimens and cultures of important wood-inhabiting fungi.

**FPL-4502, Biodeterioration of Wood.** The unit's mission is to increase wood efficiency of use, protection, and serviceability through basic and applied research on the nature and control of biodeterioration within the context of changing environmental needs.

#### **FPL-4701, Center for Wood Anatomy Research.**

This unit's mission is to accumulate and disseminate information on the anatomical, biochemical, and physical characteristics of wood species that affect their utilization and decay, and to develop new and improved techniques for wood identification.

#### **FPL-4703, Wood Adhesives Science and Technology.**

This unit improves the utilization of wood through a combination of basic and applied research that seeks to ensure more efficient processing and performance of bonded wood materials.

#### **FPL-4706, Performance Designed Composites.**

The mission of this unit is to conserve wood, alone or in combination with other renewable fiber resources. Fundamental relationships between base materials and product performance are defined and then processes are derived to engineer reliable, high-performance composites from wood and wood-lignocellulosics, including new hybrid composites melding wood and alternative materials.

#### **FPL-4707, Wood Surface Chemistry.**

This unit's mission is to determine the basic mechanisms of deterioration of wood and wood-based composites used outdoors and to develop innovative technologies for modifying wood surfaces to increase durability.

#### **FPL-4709, Chemistry and Pulping.**

This unit's mission is to develop more efficient, environmentally benign and resource-conserving processes for the conversion of wood fibers and chemicals, and to improve our understanding of the chemical, molecular and physical

characteristics of wood and fibers to provide a basis for sustainable conversion of wood into value added products.

**FPL-4710, Fiber Processing and Paper Performance.** This unit's mission is to conserve forest resources through paper performance research aimed at increasing the use of small diameter and underutilized tree species, recycled fiber, and a wide range of biomass resources, addressing environmental and energy concerns.

**FPL-4712, Institute for Microbial and Biochemical Technology.** The mission of the unit is to develop biotechnology for wood and fiber conversion through fundamental and applied research that contributes to efficient utilization and improved health of our forests.

**FPL-4714, Engineering Materials and Structures.** This unit's mission is to improve characterization of the mechanical and physical properties of solid-wood and composite structural products that are important in engineering design and to foster their efficient utilization in structures.

**FPL-4716, Building Moisture and Durability.** The mission of this unit is to extend the service life of wood products and improve the health of the occupants by improved building design and operation.

**FPL-4719, Structure Condition Assessment and Rehabilitation.** The mission of this unit is to develop nondestructive evaluation technologies, analysis procedures, structural inspection techniques, and rehabilitation methods for wood structures.

**FPL-4722, Modified Lignocellulosics Materials.**

The mission of this unit is to develop advanced environmentally friendly composite materials from chemically and physically modified wood-based resources alone or in combination with other resources to extend the use of our forest resources.

**FPL-4723, Wood Preservation.** The mission of this unit is to improve the durability of wood products while reducing environmental impacts of preservative treatments.

**FPL-4724, Statistical Methods in Wood and Fiber Research.** The mission of this unit is to enhance the integrity and efficiency of the FPL's research efforts through the development, evaluation, and promotion of modern statistical methods.

**FPL-4725, Fire Safety.** The mission of this unit is to develop data, methodologies, and technologies needed to insure that wood products and wood based structures do not adversely contribute to the loss of life and property in fires.

**FPL-4851, Timber Demand and Technology Assessment Research.** This unit's mission is to provide economic information, analysis, and projections indicating how wood is used in the economy, how and why wood use changes over time, changes in the kinds and amounts of wood and fiber needs, natural resource management needs, market equilibrium quantities and prices, and selected environmental impacts.

## **FIRE RESEARCH IN WISCONSIN SUPPORTS THE NATIONAL FIRE PLAN**

National Fire Plan funding continues the long tradition of Forest Service Research and Development building and leading federal, state, and local partnerships (the guiding principle of the 10-year Comprehensive Strategy) to develop and deliver the scientific foundation of modern management practices. The FY 2005 President's budget supports continued research in developing new science and technology to overcome technical barriers to producing value-added materials from small diameter and other woody biomass that must be removed from fire prone forests. Value-added materials applications include high performance building materials, advanced composites, pulping and papermaking end uses, chemical feedstock from wood, and engineered wood fiber.

### **FY 2005 PROGRAM CHANGES:**

The FY 2005 President's Budget calls for increased research in areas associated with the President's Healthy Forests Initiative, including invasive species impacts, and the expansion of technology transfer activities.

- The technology transfer program emphasis area will be to transfer high priority technology to a wide range of interests. The mission of research and development in the USDA Forest Service is knowledge discovery, technology development, and technology implementation. A pending competitive grant program will determine the specific allocation of these funds.
- Housing research will continue to provide technologies that improve housing affordability, disaster resistance, and energy

efficiency with special emphasis on moisture, mold and durability issues.

- Building deconstruction research at the Badger Army Depot will focus on the development of deconstruction standards and time-in-motion studies to improve deconstruction efficiency and cost effectiveness.

### **SIGNIFICANT RESEARCH PRODUCTS:**

- FPL is developing new uses and technologies for value-added materials from small diameter and other forest biomass that needs to be removed under the Healthy Forest Restoration Act to offset restoration costs, maximize economic opportunities, and provide land management options. FPL is working with small and medium size forest products companies in timber dependent communities, land managers, and community economic development organizations.
- Housing research continues at the research/demonstration house built at FPL in cooperation with the wood industry. Data on moisture movement in exterior walls is being analyzed and assessed. Performance results are being obtained for a recycled wood/plastic shingle roof system. The effects of high-wind loading on wood-frame housing is also being assessed. Research results will be available for builders and manufacturers.
- FPL is developing new technologies for producing biobased products and bioenergy from forest biomass. For example, FPL is developing new wood fractionation technologies to produce chemical feedstock; wood to hydrogen conversion technologies;

and improving yields and concentration of ethanol from wood-derived sugars

- FPL is making significant contributions to water quality by developing new technologies to eliminate the use of toxic chemicals in wood preservation, eliminate use of sulfur and chlorine compounds in pulping and bleaching, and develop efficient fiber-based water filters to remove toxic materials from point and non-point sources. Watershed clean up demonstrations using wood-based filters are ongoing on a number of sites including National Forests.
- FPL is developing new technologies for recycling post-consumer wood-based materials, including determining the material properties of recovered lumber and the effects defects have on lumber strength properties, restoring papermaking properties of wastepaper-derived fiber, and using recovered wood and paper in composites for housing applications

#### **SOME CLIENTS/COLLABORATORS:**

**The Forest Products Laboratory has clients and collaborators throughout the nation.**

#### **Examples include:**

American Plywood Association, Southern Forest Products Association, and American Forest and Paper Association  
Department of Defense  
Department of Energy  
Department of Housing and Urban Development  
Department of Transportation  
Forest products industries such as Georgia-Pacific, Stora-Enso, Weyerhaeuser  
National Network of Forest Practitioners  
U.S. Postal Service  
Universities in virtually every state