Forest Products Laboratory

Building a world of possibility
Welcome to the Forest Products Laboratory (FPL), home to many of America’s greatest scientific breakthroughs and also one of its best-kept secrets.

Now into its second century of innovation, FPL wood research has played a major part in helping build this great country, while also promoting and aiding in the healthy, sustainable growth of our Nation’s beautiful forests. As you go through this guide, and get to know us a little better, you’ll get a taste of some of the groundbreaking research we’ve spearheaded, what our researchers are up to now, and where we are going as the Nation’s only wood research facility tasked with such a unique, singular mission.

You’ll learn that some of our studies into the teeny-tiniest things on the planet have garnered some of our most influential and mammoth results! Nanotechnology is proving to be a real game-changer and one of our country’s next big things. Our innovative research work with construction materials and preservatives continues to help build this country from the ground up, even a century after it helped the railroads open up America’s West.

FPL research had a hand in solving the infamous Lindbergh kidnapping, cracked a case that confounded Major League Baseball, and made recycling our postage stamps a lot less sticky.

We are proud of the work we have done on behalf of the American public over the years and are excited to have our hands in new and exciting research going forward.

Thank you for your support, and welcome to the Forest Products Laboratory!

Cindi West, Director
Forest Products Laboratory and Northern Research Station

FPL research benefits virtually every sector of American society
- Creates jobs
- Boosts rural communities
- Strengthens the housing market
- Promotes forest health
- Reduces wildfire risk
A century of success

Since 1910, FPL has championed innovative wood use—from housing to transportation to packaging. These are a few examples of historic research accomplishments that improved people’s lives and promoted forest health.

- Cooperatively developed **engineered wood products** (glulam beams, oriented strandboard) to create valuable products from low-value wood
- Formulated recycling-compatible self-stick **stamp adhesive**, freeing 20 million tons of waste paper for recycling each year
- Designed stronger and lighter **WWI aircraft parts**; discovered the effects of humidity and temperature on laminated wood propellers
- Developed the first **wood preservatives** to extend the life of railroad ties and slow harvesting rates as rail lines spread across the country
- Built the first all-wood **prefabricated house** in 1937—More than 300,000 of these low-cost homes housed production center workers during WWII
- Redesigned **packaging** (boxes, crates, paper cartons) for more protection and less volume to help meet WWI and WWII shipping demands; developed packaging **manuals and training courses** for thousands of military personnel
- Studied and adapted European-style **timber connectors** (plates, rings, dowels) for introduction to American construction practice during the 1930s
- Developed “**Best Opening Face**” computer sawmilling program, saving a billion board feet of lumber each year
Today’s timber technology

Forest products are a large part of our daily lives—more than we often realize. FPL research contributes to the sound science that makes these products safe and effective.

- Constructed weathering chamber to simulate effects of wind-driven rain on wood-framed walls to help determine best building practices
- Continuously study and collect performance data on countless wood products to update building codes and standards to keep people safe and healthy in the spaces they occupy
- Designed easy-to-assemble tornado safe room for homes
- Developed inspection technologies and procedures to ensure long service life and safety of thousands of timber bridges in use across the United States
- Performed five fire scenarios in a two-story test building constructed of cross-laminated timber to demonstrate the fire-safety of CLT construction
- Applied life-cycle analysis to develop environmental declarations for wood products and whole buildings, summarizing their environmental impact from production through disposal
- Designed and built cellulose nanoparticle (CN) pilot-scale production plant, which greatly stimulated research and development around the United States by making CN materials available at reasonable cost
FPL researchers have used nondestructive testing to examine many historic objects, including the USS Constitution (the oldest ship in the U.S. Navy) and a 2,500-year-old mummy coffin.

Eleanor Roosevelt attended the 1937 dedication of the all-wood prefabricated house at FPL. She was excited about the potential of this low-cost housing system.

A severe termite infestation in a small Wisconsin town was controlled after FPL researchers used a novel community-wide treatment approach.
The future of forest products

Cutting edge science and technology is allowing wood to improve products that are far removed from traditional forest products. One of the oldest building materials is resurfacing as the material of the future.

- In cooperation with University of Wisconsin, developed flexible electronics using biodegradable wood-cellulose supporting films, which can reduce the huge volume of electronic waste going into landfills.
- In cooperation with University of Wisconsin, developed nanocellulose-based aerogel “smart sponge” that soaks up oil and chemicals from contaminated water.
- Researched forensic wood science and developed the XyloTron—a handheld device to help curb trade of protected wood species.
- Developed process to formulate the world’s first renewable, alternative jet fuel from forest residuals, used by Alaska Airlines to make historic commercial flight.
- In cooperation with University of Wisconsin, developed nanocellulose-enhanced flooring that converts footsteps to useable electricity.
- Applied mechanical engineering, fastener, fire, moisture, and seismic performance research to develop tall buildings made from wood—“plyscrapers” of future city skylines.
Tall buildings made from wood—"plycrapers"

FPL researchers helped Major League Baseball reduce the shattering of maple bats by nearly 60%, making the game safer for both fans and players.

FPL scientist Arthur Koehler studied the wooden ladder used in the 1932 Lindbergh kidnapping and connected it to Bruno Hauptmann, who was subsequently convicted of the crime.

Aldo Leopold, famed conservationist and author of A Sand County Almanac, was Assistant Director of FPL from 1924 to 1928.