



February 2008

Coming OWIC events:

April 24-25: [Selling Forest Products](#) Corvallis, OR

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## How Does a House Fair in a Tsunami?

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Oregon State University Professor Rakesh Gupta and graduate student Jebediah Wilson are trying to improve the way we build homes in Tsunami and Hurricane prone regions. The events of Hurricane Katrina and the Asian Tsunami of 2004 have generated interest in protect-

ing the lives and homes of people in coastal regions. Previously, little testing had been done on residen-

tial structures, and this work represents a first step in looking at the forces developed during such events. Due to the high expense involved in testing a full sized structure, such as residential dwellings, their team is testing model structures at 1/6th the size of a regular home. Professor John van de Lindt and graduate student Rachel Garcia of Colorado State University (CSU) built a computer model of the 1/6th scale home using a

new program developed at CSU, called SapWood. This computer model determined what size sheathing, framing, and fasteners were required to simulate the real structure. The 1/6th scale model house was then built by CSU and assembled by OSU's Wood Science and Engineering Department and tested at the OH Hinsdale Wave Lab in December of 2007.

Professors Rakesh Gupta and

high forces developed by waves of this magnitude. The purpose of this research is to develop an understanding of the forces that a structure undergoes during these extreme weather events. Although we are familiar with the devastating results of ocean waves, the forces due to wave loading on residential structures are predominantly unknown. Historical testing of wave loading was aimed at off-shore structures, the forces developed



when a wave breaks and travels inland are significantly different. This knowl-

edge will lead to better detailing and construction practices, with the aim of protecting people's primary investment, their homes. The testing involved impacting the structure with model scale waves in increasing magnitude, eventually leading to failure of the structure. The model was wired with load cells and other instruments to record the forces

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## Featured Researcher: Dr. John Nairn

The featured researcher for the month of February is Dr. John Nairn. John has been at OSU for two years and serves as a Professor and the Richardson Chair in the Department of Wood Science and Engineering. John is also an adjunct professor in the department of mechanical engineering at OSU and the departments of Materials Science and Engineering and Mechanical Engineering at the University of Utah. Prior to joining OSU, John was on the faculty at the University of Utah.

John current research interests include deformation and fracture properties of solid wood and wood-based composites, numerical modeling using the material point method, micromechanics of solid wood including fracture at the annular ring level and transverse compression at the cellular level, fracture mechanics analysis of all kinds of composites including matrix cracking, delamination, interfacial failure, fiber failure, damage modeling, and

fatigue failure, effect of residual thermal stresses in composites, adhesive applications, and multilayered structures, analysis of single-fiber model composites and experiments on interfaces between natural fibers and polymer matrices, modeling mechanical properties of adhesive bond, glue lines in wood, and any interface in composite materials, durability of composites, and cracking of coatings and paint systems applied to a variety of substrates.

John currently has three graduate students working on the performance of composites in fire, fracture properties of MDF, and on a numerical modeling of OSB.

John teaches several classes at OSU including Polymer Composites and Polymer Synthesis and Structure.

When John is not conducting research, mentoring students, or teaching classes, he writes software



for use on the Macintosh platform. An example of his software can be viewed at <http://www.geditcom.com>.

You can find more information on Dr. Nairn at <http://woodscience.oregonstate.edu/faculty/Nairn/index.htm>.

## Tsunami Research (continued from Page 1)

and deflections during wave impact, as well as the wave speed and height. This data was recorded during several different conditions, such as having the house in a flooded condition prior to wave impact or simulating boarded windows versus broken windows. The data is being analyzed to develop relationships between wave height, wave speed and impact force on the model. This data can then be compared to and improve theoretical predictions of these loads. Professors Rakesh Gupta and John van de Lindt hope to continue research in this area,

eventually testing large models to further understand these forces.



More information about this research can be found at <http://owic.oregonstate.edu/tsunami/> and <http://oregonstate.edu/dept/ncs/newsarch/2007/Dec07/stormsurge.html>.

# Ask the Expert



Have questions related to wood? The faculty of the Wood Science and Engineering Department at OSU have the expertise to handle almost any question about wood. Simply submit your question using the Ask the Expert form (<http://owic.oregonstate.edu/askexpert.php>). In order to assure that your question is answered correctly, please be as specific as possible when submitting your questions.

The following are examples of recent 'Ask the Expert' questions:

**Question:** What is the desired ideal moisture content for moulding and machining ponderosa pine at industrial levels, especially concerning preparing the surface for paint or lacquer application after a base coating treatment.

**Answer:** The ideal moisture content (MC) is approximately 6-10% for machining and gluing most woods; most finishing processes can tolerate a higher MC - up to 15%.

Below about 6% MC you will see more problems with machining in the form of increased chipping/tear-out and machine burn.

While machining above 10% MC generally requires less energy given that the wood is softer, you will see more problems with raised or fuzzy grain because the surface will crush rather than cut cleanly. Higher MC's also lead to more

resin build-up on blades. Lastly, if you machine at the higher MC and there are knots (even pin knots) they will protrude from the surface when the board dries.

**Question:** Does anyone still extract the "wax" from Douglas Fir bark. I worked with it years ago and then the company dismantled the extraction equipment and quit doing it. Did whoever purchased the extraction equipment set up production again? Please let me know of anyone doing this currently.

There is a market for the sterol and stanol esters from waxes like these. They are used in food additives and it is preferred by many people that these additives do not originate from genetically modified vegetable sources.

**Answer:** Bohemia used to extract wax from bark, but they haven't for some time. We don't know of anyone doing this now. Part of the problem may be that the wax was obtained from older tree outer bark; yields of wax from the bark of younger trees is likely to be much lower.

**Question:** What laws/ regulations does Oregon have related to timber theft?

**Answer:** Oregon Revised Statutes Chapter 105 - Property Rights, specifically section 810 (Trespass damages for injury to or removal of produce, trees or shrubs; costs

and attorney fees; limitation on liability of contract logger) discusses issues related to timber theft/ timber trespass. See also <http://www.leg.state.or.us/ors/annos/105ano.htm>

For special forest products, see ORS 164.814

Oregon has other regulations that interact to make timber trespass difficult. One such statute is related to Oregon Revised Statutes Chapter 532 - Branding of Forest Products and Booming Equipment. The statutes provide that all logs traveling on public roads must be physically branded with a state licensed brand, identifying who the owner is. Further, purchasers of logs in Oregon must purchase them from operators who can provide an Oregon Department of Forestry notification of operations number for the harvest area that the logs came from, or be subject to fines and prosecution. Many purchasers have sequenced ticket books and even bar coded tags on the logs from the time they leave the forest.

A comprehensive list of all the 'Ask the Expert' questions with corresponding answers is available at <http://owic.oregonstate.edu/askexpert.php>.

## Slow markets are a great time to hone your selling skills!!!

Personal selling is the primary tool used in marketing most forest products. Yet, very few individuals in the industry have professional sales training when starting their career.

Those attending this short course will learn the basics of personal selling, methods of



identifying new customers, and will analyze their personal selling profile.

The course is designed to improve the efficiency and effectiveness of sales personnel. It is intended for

new sales and marketing personnel or those wishing to improve their selling skills in the forest products industry.

More information on the course is available at: <http://oregonstate.edu/conferences/sellingforestproducts/index.html>.

## Bioeconomy and Sustainable Technologies Research Center

The 2007 Legislature created a new Bioeconomy and Sustainable Technologies (BEST) Research Center to foster new innovation and economic development. BEST is now looking for proposals to fund Oregon University System (OUS) faculty and strategic academic/industrial partnerships. Private companies and non-profit organizations may part-

ner with a principal investigator at an OUS institution to seek funding. BEST has three research themes: (1) Clean Energy, (2) Bio-Products, and (3) Green Buildings/Infrastructure.

The proposed project must address one or more of the above themes. Proposals are due by the close of

business on March 3, 2008 for an initial round of funding. For more information on BEST, please see its website at: <http://www.oregonbest.org/>. Contact OWIC if you have an idea that you feel meets this program and are looking for an academic partner.

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Previous issues of the OWIC newsletter are available at <http://owic.oregonstate.edu/newsletter/>

