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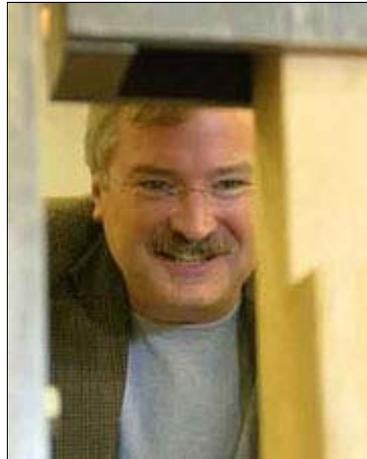
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A force to be reckoned with
Wind, quake studies sway building codes
worldwide

By Evan Epstein
WSU Today intern



While the 2004 hurricane season has put Florida's buildings and building codes to the test, on the other side of the country a WSU professor is trying to understand how destruction like that wrought in Florida can be curbed.

Hurricane Charley flattened more than 12,000 homes in Florida, according to the Associated Press. The damage from Hurricane Jeanne alone has been estimated as high as \$9 billion. The four Florida storms have so far produced 2 million insurance claims, said the Insurance Information Institute. That's the equivalent of one claim for every five

homes in Florida.

Few of these homes were built under the state's three-year-old residential building code, said **Dan Dolan**, a WSU professor of structural engineering. Dolan is working on a program with Ph.D. candidate **Jain Xu** that simulates the structural response of low-rise buildings, like homes, to dynamic loads of wind.

The two have found that little things make a big difference. Gluing down a roof, in addition to nailing it, can increase its resistance to blowing off by a factor of 10. However, missing one nail on a sheet of plywood can weaken its blow-off resistance by 30 percent.

One of the biggest issues facing structural scientists today is cost. "For every \$1,000 increase in the cost of a home, there are about 300 people who can no longer afford to buy it," said Dolan. "So we have to take that into consideration when making improvements to building codes."

But why do hurricane research in Pullman? "Anything above 85 miles per hour is considered hurricane-force wind," Dolan said. "And we certainly get that here."

WSU is one of the only accredited universities in the country capable of conducting tests of materials used in construction for compliance with building codes. And the Wood Materials and Engineering Laboratory at the Pullman campus is the only laboratory in the country to have such an extensive technical staff of engineers to support the International Building Code.

In addition to wind force, Dolan studies structural needs for stability against seismic force, or earthquakes. He is one of nine experts from across the country who review proposals for technical changes to the residential building code that determines a building's integrity against seismic forces. He also is the project coordinator for updating the Home Builder's Guide to Seismic Restraint Construction.

Due out on the Federal Emergency Management Agency website in a couple months, the guide will give suggestions for homeowners, designers and builders to improve the performance of their houses. It will provide an idea of how much damage to expect depending on which seismic mitigation steps they employ, as well as the associated costs.

This is the first guide of its kind. There is nothing yet like it for hurricanes. The National Institute of Standards and Technology sponsored a similar study to understand hurricane loss and reduction; however, funding ended as the country went to war, Dolan said.

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