

A Summer of "Shakes and Quakes"

by Meghan Myers

The majority of Notre Dame students never experience a lazy summer. Instead they travel around the world pursuing educational, service, or internship opportunities. I spent most of my summer in the Research Experiences for Undergraduates (REU) program at Notre Dame, working in the Earthquake Engineering Laboratory under the direction of B.F. Spencer Jr., Leo and Patti Ruth Linbeck Professor of Civil Engineering and Geological Sciences. But for two weeks this June I was able to explore earthquake engineering in Japan.

My trip really began last spring when I worked with Professor Spencer on an outreach program called "Shakes and Quakes." The program introduces local elementary and middle school students to civil engineering through hands-on "construction" projects. After an initial presentation that outlines the parameters, a team of students uses LEGOS® and K'Nex® to plan and build an aesthetically pleasing and profitable, yet earthquake-proof, building. Each building is then tested on a portable shaker table to see how well the students learned about civil engineering, earthquakes, structures, and some of the damping concepts used today to keep buildings and bridges more stable during seismic events.

My trip to Japan was part of the 2001 Natural Hazard Mitigation in Japan (NHMJ) program; I traveled with several graduate students from across the country and one elementary school teacher, a local instructor who has participated in

"Shakes and Quakes." The 10-day program provided additional background for the "Shakes and Quakes" building project while also allowing us to network with other universities and share the idea with them. We traveled to six different cities, touring the Akashi Kaikyo bridge, Landmark Tower, laboratory facilities at Kyoto University, the preserved Nojima fault, and much more. During one of the two student symposiums that were also part of the program, I had the opportunity to make a formal presentation of "Shakes and Quakes" to an international audience. My experience as part of the NHMJ helped to broaden "Shakes and Quakes" resources,

and it also increased my understanding of civil engineering. I was able to see a portion of the vast amount of research being done in earthquake engineering and became more aware of the possibilities available through graduate school. Seeing textbook concepts in application was incredible.

In addition to the NHMJ and other projects which were part of the REU experience, I published "Shakes and Quakes" on the web, building a site around a three-minute animated overview of the program. The website now provides nearly all the resources a teacher would need for his or her class to have a unit on natural hazard mitigation. Using the "Shakes and Quakes" web, instructors can access a detailed three-week lesson plan, handouts, related earthquake and engineering web sites, and recommendations on how to obtain a shaker table, possibly via a university-sponsored program such as the one at Notre Dame. Why? Universities have resources most school systems do not, especially on the elementary and middle school levels. Placing "Shakes and Quakes" on the web and promoting college or university involvement with local schools magnifies the program's resources, reach, and effectiveness. From my personal experience being able to share my studies with eager, excited kids is an outstanding opportunity and one that I would highly recommend.

Editor's Note: Working with the University's student chapter of the Earthquake Engineering Research Institute (EERI/UND), Myers will continue to develop the "Shakes and Quakes" program. EERI/UND also sponsors Ms. Wizard. This annual career fair at Notre Dame encourages young girls to pursue careers in engineering. During Ms. Wizard local school children, girls in grades 4 through 6, participate in a variety of interactive displays as they learn about the opportunities available to them as engineers. For more information about these outreach programs or EERI/UND, visit <http://www.nd.edu/~eeriund>.



One of the goals of "Shakes and Quakes" is to enhance math and science curricula at the elementary and middle school levels through the introduction of engineering concepts. Students design and build their own structures, which are then tested on a shaker table to demonstrate real-life applications of natural hazard mitigation.