

FACULTY NEWS 2004

RICHARD ALLEN

The Oregon Array for Teleseismic Study (OATS) has continued operation during 2004. The experiment consists of 11 seismic stations deployed in a line across Oregon and recording ground motions continuously. The network was deployed in 2003 but requires periodic maintenance in the field which has been provided by **Neal Lord** and **Lee Powell**. Graduate student **Mei Xue** has helped with data archival and has finished a preliminary study of seismic anisotropy beneath the region. Seismic anisotropy can be used to tell us about the direction of flow in the mantle. The seismic stations are deployed along a line of age progressive volcanism—a hotspot track. Popular models for hotspot formation require mantle flow along the length of resulting volcanic lines. However, our results suggest there is no flow along the hotspot. Therefore our results call for new models for hotspot formation—more next year!

Another area of research my group is pursuing is earthquake early warning (EEW) for the purpose of hazard mitigation. Graduate student **Andrew Lockman** completed his Masters thesis on early warning methodologies this year producing two papers that are currently under review. 2004 has also seen progress toward EEW implementation on a global basis. At a workshop in September we formed an International Consortium for Earthquake Early Warning which includes groups from the United States, Europe and the Western Pacific. This consortium facilitates communication of ideas and methodologies between members. The recent tsunami disaster in the Indian Ocean has offered a reminder of the importance of implementing technologies to mitigate natural hazards as they become available. The renewed concern about natural

hazards by governments around the world has led to additional funding for our EEW efforts.

Finally, an offshoot of the EEW work is currently being explored by graduate student **Erik Olson**. In an earthquake the rupture propagates across some fault plane starting at the hypocenter. In large (magnitude > 7) earthquakes this rupture can last tens of seconds. However, our EEW research has shown that we can determine the magnitude of the earthquake—which tells us how large the fault plan will be—in 4 sec, before the rupture has stopped. This surprising observation will hopefully lead to a new understanding of the earthquake rupture process.

MARY ANDERSON

In December 2004 I completed my first three years as Editor-in-Chief of the journal *Ground Water*, with three more years to go. Fortunately I am still enjoying the job; I'm told that burn out begins in year six. Journal business took me to Boston in December and Charles and I took the opportunity to spend Christmas in a lovely inn in Salem, Massachusetts, and to experience a winter "nor'easter". We highly recommend visiting Salem's Peabody-Essex Museum, which is world class. Working back through the year. . . . At the end of the fall semester I finally finished a review paper on heat as a ground water tracer. Watch for it in a future issue of *Ground Water*. Earlier in the fall, **Michael Cobb** joined our hydro group to pursue the MS. Mike is working with **Dave LePain** and **Ken Bradbury** (WGNHS) on a carbonate project. He plans to revisit the hydrogeology of the Bass Lake area, studied by **Marjory Rinaldo-Lee** in her MS thesis in 1978. **Chris Lowry** completed the MS degree over the summer. I am very pleased that he is staying for the PhD to pursue research in the Trout Lake basin, co-advised by **Randy Hunt** (USGS, Middleton office). **Melissa Masbruch** will complete the MS in 2005 with work at Trout Lake. Other current hydros include **Raycine Hodo** and **Rahul John**. Inspiration from the fall hydro seminar on the History of Hydrogeology yielded a publication in the History column of *Ground Water*. A shorter version of the article is printed in this issue of *The Outcrop* (see p. 21). Visiting Professor Kunihide Miyaoka from Mie University, Japan, returned to Japan in August, after we had a chance to meet his family (wife, sons, and parents) who all came to Madison for short visits. I am hoping for a reunion when I go to Japan for a few weeks during my sabbatical in 2005-06. To end these ramblings with a Japanese theme, I must report that in March 2004, I passed the 2nd kyu test in aikido (a Japanese martial art), putting me two steps away from black belt.



Alan Carroll and Toni Simo in Java, waiting for the bus.