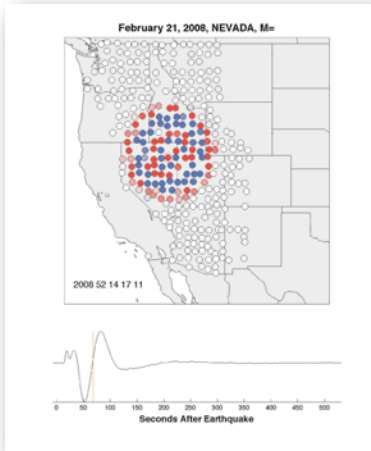




IRIS Educational Affiliate Newsletter

A community uniquely positioned to address seismology educational issues across a spectrum of learners.



USArray Wave Visualizations

As earthquake waves travel along the surface of the Earth, they cause the ground to move. The ground motions can be captured and displayed as a movie, providing a visual demonstration of these often indiscernible movements. Charles Ammon, a professor at Penn State University, has developed animations of earthquake waves using actual earthquake data. The visualizations show how the ground moves as seismic waves sweep across about 400 earthquake recording stations in EarthScope's Transportable Array. These innovative visualizations have been created for selected large earthquakes that have taken place in the US and around the world.

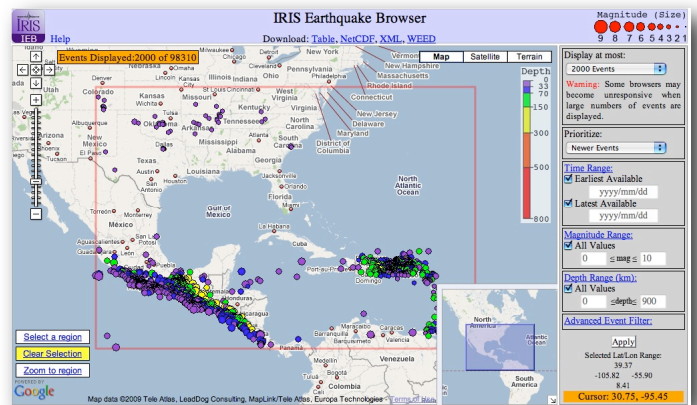
This earthquake occurred in the center of EarthScope's Transportable Array. The visualization clearly shows seismic waves radiating outward from the epicenter like ripples from a pebble dropped into a pond.

A collection of these visualizations along with an associated tutorial are now available from the IRIS website:

http://www.iris.edu/hq/programs/education_and_outreach/visualizations

The IRIS Earthquake Browser (IEB)

The IRIS Earthquake Browser (IEB - <http://www.iris.edu/ieb/>) is an interactive map service for viewing Earthquake Epicenters superimposed on a map of the world. This web-service accesses several earthquake catalogs stored in the IRIS database. In total, the database contains around 2 million unique events dating from the early 1960s until present. By filtering the data, the user can interrogate the catalogues by controlling a number of different parameters (magnitude, depth, timeframe etc), and determining how many matching events are shown. Because of practical limitations, only a small subset of all earthquakes may be shown in any given map view. However, by zooming and panning, the user can quickly discover all of the earthquakes held in the IRIS database for any region of the globe. Earthquakes shown on an IEB map may be viewed in a table, or exported in XML formats. Additionally, data can be exported in an NetCDF format and viewed in 3D with the GEON Integrated Data Viewer (free download - http://geon.unavco.org/unavco/IDV_for_GEON.html). Please see http://www.iris.edu/hq/resource/explore_rates_of_earthquake_occurrence for an idea on classroom applications for this tool. If you create your own, please share them with us!



Member News

The member news below represents responses to a request for news. To have your news included in the next issues please contact Michael Hubenthal - hubenth@iris.edu



MORAVIAN
COLLEGE

Moravian College - Students in the senior computer science course "System Design" worked with us to develop a prototype of software that allows users to share AS-1 data in real-time over the Internet. At the same time, a student in an independent study began development of a cross-platform version of AmaSeis. Work on both projects was presented at the IRIS Annual workshop, as well as in a paper presentation to the Midstates Conference on Undergraduate Research in Computer Science and Mathematics (MCURCSM '08). One of the students who worked on the original prototype presented an additional paper, "A Pedagogical Aid for Seismology Instruction" on Saturday, November 1 at The College of Wooster. During the summer of 2009 we plan to continue work on the streaming software and to combine it with the cross-platform version of AmaSeis. The end result will be a new version of AmaSeis that allows users to view, share, and manipulate multiple streams of data.



Potsdam
The State University of New York

SUNY Potsdam - During the past year with the use of the AS1, we have detected and compiled many earthquakes. Posters were presented at the Seismological Society of America and Geological Society of America meetings in Portland, ME and Kingston, ONT, Canada. Many attendees, especially from elementary and secondary schools and colleges showed interest in the AS1 and how it is used in teaching and research. Several teachers asked for the availability of the AS1 to order for their schools. Presently, we have ordered another AS1 for classroom use and are assisting the Potsdam High School in the installation and use of the AS1.



TRINITY
UNIVERSITY
SAN ANTONIO • 1889

Trinity University - We teach a senior capstone course in Tectonics which emphasizes the interaction between geochemistry and geophysics in probing questions about plate tectonics. One of the strategies has been to use the short summaries of recent research from the "accomplishments" section of the IRIS 2001 and 2006 as introductions to these papers (http://www.iris.washington.edu/hq/publications/proposals_and_reviews). A short two-pager combined with an underlying research paper makes an excellent module for teaching these majors not only current ideas about the Earth, but also the methods being used to study these problems. This semester we are using parts of the recently released long range science plan, "Seismological Grand Challenges in Understanding Earth's Dynamic Systems" in the course (<http://www.iris.edu/hq/lrsps/>).

Glenn Kroeger and several of his students are developing new cross-platform seismic software. The first program is a first-motion synthetic seismogram application that will generate synthetic P and SH waveforms for earthquakes in layered crustal models. The focal mechanism is interactive, allowing the user to simply manipulate the stereonet plot of fault and conjugate planes with the mouse. A companion program for general plotting, filtering and manipulation of seismograms is also in the works. These programs are designed to be simple to use, and visually informative. They are being developed in both Java and C++ with the final release versions available for Windows, Mac OS X and Linux.

University of Portland - The 2008 Teachers on the Leading Edge (TOTLE) - EarthScope Workshop took place July 27 – August 1 at the University of Portland. This immersion workshop for middle school Earth Science teachers involved three days of instruction on Pacific Northwest active continental margin tectonics, earthquakes and tsunami hazards, Cascade volcano hazards, and EarthScope science. The 2009 TOTLE - EarthScope Workshop for teachers in Washington State will take place July 26 – 31 at Pacific Lutheran University in Tacoma (<http://orgs.up.edu/totle/>).

Bob Butler, in coordination with IRIS E&O is developing and delivering earthquake notices to about 100 K-12 Earth Science teachers, community college Geology instructors, and university Geoscience instructors across the Pacific Northwest. Notices are developed for regional M5 and larger earthquakes and notable large earthquakes worldwide. Earthquake notices are also posted on the TOTLE home page and are available to download for classroom use.



University of Missouri-Kansas City - Working as a partner in the “Central Plains EarthScope Partnership” (CPEP), UMKC is actively working to coordinate the utilization of EarthScope data in our region and to strengthen earth science education by providing region specific learning modules for public display and for public distribution. Funds from an IRIS-supported E&O grant have supported several regional workshops including meetings at the New Madrid Seismic Zone Conference during August 12-14, 2008 held at the Missouri University of Science and Technology, Rolla, Missouri (Poster presentation by Kelly Liu, MS&T; Tina Niemi, UMKC), and a one-day workshop held on September 23, 2008 at UMKC on “USArray Station Siting and Adoption” in the Central Plains states. UMKC also hosted the Seismographs in Schools Operators Workshop September 19-22, 2008. Tina Niemie (UMKC) also presented a lecture on August 29, 2008 entitled “Monitoring Earthquakes in the U.S. Midcontinent: From Seismic Hazards to Crustal Structure” in the Department of Physics at UMKC.

Gao, S.S., Niemi, T.M., Black, R.A., Liu, K.H., Anderson, R.R., Joeckel, R.M., Busby, R.W., & Taber, J., 2008, Rationale for a permanent seismic network in the U.S. Central Plains utilizing USArray: *Eos*, v. 89, no. 9, p. 85-86.



University of Wisconsin-Whitewater - We have just recently finished setting-up our AS-1 system in the room mainly as the Intro Geology lab room. Students are intrigued by the local recordings of earthquakes half a world away. The instrument has already produced several teachable moments, e.g. the M 7.0 Tonga earthquake, which brings students down to the basement to examine the helicorder display. It is good to see non-geology students and even the housekeepers taking an interest in seismology because of the AS-1. Already one of my students has expressed interest in doing an independent study project next semester on the potential educational applications of the AS-1.



Waubonsee Community College - The AS1 at Waubonsee Community College was the 'focal point' of attention after the 18 April 2008 Mw5.2 Mt Carmel, IL event, associated with the nearby Wabash Valley Seismic Zone. The AS1 recorded a spectacular seismogram of the event (available through the Seismographs in Schools website), in addition to 2 of the couple of dozen aftershocks. The event was the second largest earthquake recorded in IL, and was naturally the subject of multiple 'teachable moments' through newspaper stories and informal discussions of the seismograms that were put on display by the AS1 and near the display of historical events recorded by the AS1 that is elsewhere in the Science Building. Assistant Professor of Earth Science and Geology, David Voorhees was interviewed by the local Beacon News, and was included in an article published on 19 April (although photos taken by the newspaper were not). Waubonsee is 3.374 degrees (375 km) away from the epicenter, which had a hypocenter of 11.6 km.

Educational Affiliate Institutions

Institution	Contact	Email
Arizona Western College	Michael Conway	Michael.Conway@AZAwestern.edu
Bridgewater State College	Robert Cicerone	rcicerone@bridgew.edu
Cal State Northridge	Gerry Simila	gerry.simila@csun.edu
Central Wyoming College	Suki Smaglik	ssmaglik@cw.edu
College of Charleston	Steve Jaume	jaumes@cofc.edu
Dine College	Margaret Mayer	mmayer@dinecollege.edu
Eckerd College	Laura Wetzel	wetzellr@eckerd.edu
Imperial Valley College	Kevin Marty	kevin.marty@imperial.edu
Islandwood	Greg Geehan	ggeehan@soundds1.com
Moravian College	Joe Gerencher	gerencher@moravian.edu
SUNY Potsdam	Frank Revetta	revettfa@potdam.edu
The College Of New Jersey	Margaret Benoit	benoit@tcnj.edu
Trinity University	Glenn Kroeger	gkroeger@trinity.edu
University of Missouri, Kansas City	Tina Niemi	NiemiT@umkc.edu
University of Pittsburgh	William Harbert	harbert@pitt.edu
University of Portland	Bob Butler	butler@up.edu
University of Wisconsin-Whitewater	Prajukti (juk) Bhatta	bhattacj@uww.edu
Waubonsee Community College	David Voorhees	DVoorhees@waubonsee.edu
Westminster College	Alan Goldin	Alan.Goldin@westminster-mo.edu