Toward Integration of Educational Seismology Programs: The U.S. Educational Seismology Network

Michael W. Hamburger
Indiana University

John Taber
IRIS Consortium

Over the course of the past decade, a growing movement in science education circles has sought to address perceived gaps in the scientific literacy of America’s students. Among the primary concerns of this educational reform movement is the need for in-depth, interdisciplinary, inquiry-oriented learning in science classrooms, combined with improved access to technology for all students (e.g., National Commission on Mathematics and Science Teaching for the 21st Century, 2000). Seismology, by nature interdisciplinary, technology-oriented, and applicable to critical societal problems, is ideally suited to answer this calling.

A number of science education programs have stepped up to the challenge and are defining a new coalition between scientific research and science education. They have refined a simple mechanism to engage students actively in research: deployment of seismological sensors in an educational setting. These science education programs, while diverse in their approach, have a common goal: to use seismographs and seismic data to improve scientific literacy, spark student interest in scientific research, and provide students with tools to delve into real-world scientific investigations. This paper describes a new initiative that is directed at organizing and energizing this new approach to earth science education—the U.S. Educational Seismology Network.

The U.S. programs involved in the educational seismology movement are shown in Figure 1. Now numbering more than 300, these seismograph stations are as technically diverse as they are geographically dispersed. They range from tightly focused regional research and education programs (e.g., MichSeis/OhioSeis, the South Carolina Earth Physics Project, the Nevada Educational Seismic Network, and the Los Angeles area’s LAPTAG network) to loosely linked national coalitions (e.g., Princeton Earth Physics Project, Public Seismic Network, IRIS Seismographs in Schools). The instrumentation ranges from broadband digital instruments, such as those employed by MichSeis, PEPP, and SCEPP programs, to lower-cost, nonnetworked units, such as those used by IRIS’ Seismographs in Schools program, University of Arizona’s SPINET, and Michigan Tech’s UPSis project. Many of the programs share their data via the Internet in near real-time, while others store data locally. Of course, the U.S. is not the only site of educational innovation; similar programs have developed elsewhere, including Italy and France’s EduSeis project, the SeisSchool Norway project, and New Zealand’s QuakeTrackers program.

Whatever their specific approaches, these programs promise to bring seismological data—and with them, insights into the world of scientific research—into classrooms across the country and around the world. At the same time, they are contributing to the infrastructure serving the global seismological research community. When earthquakes occur, particularly in areas of sparse seismological coverage, these seismic stations play an important role in constraining earthquake locations, depths, and source mechanisms. For instance, Kim (2003) made extensive use of the Indiana PEPP seismic network to define the source location and depth for the 18 June 2002 Evansville, Indiana earthquake and to make up for gaps in a sparse regional network.

In an attempt to share the fruits of these diverse educational programs, and to broaden their educational value, the U.S. Educational Seismology Network (USESN) is seeking to bring these projects together under a single organizational umbrella. This newly formed educational coalition operates under the auspices of IRIS’ Education and Outreach program (see Braile et al., 2003, this issue). The USESN seeks to (1) promote the installation and effective use of educational seismographs and seismic data; (2) disseminate high-quality curricular materials and educational services that promote the use of seismology in science education; and (3) provide an organizational framework for coordination and advocacy of educational seismology across the country. It seeks to address a number of limitations of the current distributed system: provide enhanced technical support available for existing and prospective seismograph stations; improve the availability and quality of educational materials; exploit opportunities for coordination with other science education initiatives, such as...
the EarthScope Education and Outreach Network; and provide coordinated assessment of existing and planned educational initiatives. Efforts currently underway include development of a comprehensive database of participating schools; a "Buyer's Guide" which provides technical information for prospective participants; and development of installation and operation guides for station operators.

The coalition's broad goals are summarized in a white paper, *Shaking Up America's Classroom: A Vision for Educational Seismology in the United States*, which summarizes the mission, vision, and goals of the consortium, as well as an ambitious list of needs for the educational seismology community. These long-term goals will be honed into a short-term strategic plan at a September workshop for educational seismology practitioners. Further information about the consortium, the white paper, and the workshop can be found at http://www.indiana.edu/~uesn/. New players are welcome to join a growing international movement in seismology education and outreach.

**REFERENCES**


Department of Geological Sciences
Indiana University
Bloomington, IN 47405
(M.W.H.)

IRIS Consortium
1200 NW New York Avenue Suite 800
Washington, DC 20005
(J.T.)