Leveraging Educational, Research and Facility Expertise to Improve Global Seismic Monitoring: Preparing a Guide on Sustainable Networks

Nyblade, A	(andy@geosc.psu.edu; Pennsylvania State Univ., Dept. of Geosciences, 503 Deike Bldg., University Park, PA 16802)
Aster, R	(aster@dutchman.nmt.edu; New Mexico Inst. of Mining & Technology, Dept. of Earth and Environmental Science, 801 Leroy Place, Socorro, NM 87801)
Beck, S	(beck@geo.arizona.edu; Univ. of Arizona, Dept. of Geosciences, Gould-Simpson Bldg. #77, 1040 East 4th Street, Tucson, AZ 8572)
Ekstrom, G	(ekstrom@ldeo.columbia.edu; Lamont-Doherty Earth Obs., 61 Route 9W, Palisades, NY 10964)
Fisher, K	(karen_fischer@brown.edu; Dept. Geological Sci., PO Box 1846, Brown Univ., Providence, RI 02912)
Lerner-Lam, A	(lerner@ldeo.columbia.edu; Lamont-Doherty Earth Obs., 61 Route 9W, Palisades, NY 10964)
Meltzer, A	(ameltzer@lehigh.edu; Coll. of Arts and Sciences, 9 West Packer Ave., Bethlehem, PA 18015)
Sandvol, E	(sandvole@missouri.edu; Univ. of Missouri-Columbia, Dept. of Geological Sciences, 101 Geology Building, Columbia, MO 65211)
Willemann, R J	(ray@iris.edu; IRIS, 1200 New York Ave. NW, suite 800, Washington, DC 20005)

Building a sustainable earthquake monitoring system requires well-informed cooperation between commercial companies that manufacture components or deliver complete systems and the government or other agencies that will be responsible for operating them. Many nations or regions with significant earthquake hazard lack the financial, technical, and human resources to establish and sustain permanent observatory networks required to return the data needed for hazard mitigation. Government agencies may not be well-informed about the short-term and long-term challenges of managing technologically advanced monitoring systems, much less the details of how they are built and operated. On the relatively compressed time scale of disaster recovery efforts, it can be difficult to find a reliable, disinterested source of information, without which government agencies may be dependent on partial information. If system delivery fails to include sufficient development of indigenous expertise, the performance of local and regional networks may decline quickly, and even data collected during an early high-performance period may be degraded or lost.

Drawing on unsurpassed educational capabilities of its members working in close cooperation with its facility staff, IRIS is well prepared to contribute to sustainability through a wide variety of training and service activities that further promote standards for network installation, data exchange protocols, and free and open access to data. Members of the Consortium and staff of its Core Programs together could write a guide on decisions about network design, installation and operation. The intended primary audience would be government officials seeking to understand system requirements, the acquisition and installation process, and the expertise needed operate a system. The guide would cover network design, procurement, set-up, data use and archiving. Chapters could include advice on network data processing, archiving data (including information on the value of standards), installing and servicing stations, building a data processing and management center (including information on evaluating bids), using results from earthquake monitoring, and sustaining an earthquake monitoring system. Appendices might include profiles of well-configured and well-run networks and sample RFPs. Establishing permanent networks could provide a foundation for international research and educational collaborations and critical new data for imaging Earth structure while supporting scientific capacity building and strengthening hazard monitoring around the globe.