

The World's Source for Earthquake Information

The USGS National Earthquake Information Center

By George Choy and Heather Friesen

The USGS National Earthquake Information Center (NEIC) is responsible for the comprehensive monitoring and reporting of earthquake activity for our nation and the world. Nearly 30,000 worldwide earthquakes are located each year by NEIC. Rapid reports are issued for those earthquakes that register at least a magnitude 4.5 in the United States, a magnitude 6.5 anywhere else in the world or any magnitude if the earthquake is known to have caused damage.

This information is communicated to federal and state government agencies that are responsible for emergency response, to government public information channels, to national and international news media, to scientific groups and to private citizens who request information. When a damaging earthquake occurs in a foreign country, the earthquake information is passed to the staffs of the American embassies and consulates in the affected countries and to the United Nations Department of Humanitarian Affairs.

NEIC has come a long way since its beginnings in 1966 in Rockville, Md., as part of the National Ocean Survey of the Department of Commerce. Before 1966, the U.S. Coast and Geodetic Survey, a forerunner of the National Ocean Survey, had coordinated the collection of seismological data in the United States. In 1972, the NEIC was transferred to Boulder, Colo., and in the following year, it was made part of the USGS. NEIC was moved again in 1974 to its present location in Golden, Colo.

In the 1960s, NEIC received most of its data from analog stations via telegraph or telephone circuits. It could take several days for the location and magnitude of an earthquake to be finalized. Today, NEIC receives more than 1,000 channels of digital waveform data in real time from approximately 475 digital seismic stations worldwide using dedicated satellite circuits and Internet links. For the largest events, locations and magnitudes are determined in minutes. While NEIC once provided only the basic information on the location and size of the earthquake, it now provides information on the extent of the affected area, on the location and degree of damage potential and on the tectonic and historical context.

The urgency for assessing the extent of natural disasters as quickly as possible

was painfully evident in the aftermath of the Sumatra-Andaman earthquake in late December 2004. In order to determine the location and magnitude of significant earthquakes as rapidly and accurately as possible, NEIC implemented round-the-clock-on-site staffing in January 2006. This was complemented with a state-of-the-art processing system that became fully operational in March 2006. This new seismic-event processing system identifies, locates and measures the size of earthquakes with unprecedented speed and accuracy.

impact of an earthquake.

The Community Internet Intensity Map (or "Did You Feel It?") project collects information about ground shaking following significant earthquakes. Persons who experience an earthquake can go online to share information about its effects. A Community Internet Intensity Map is then generated and automatically updated with real-time data from these first-hand accounts. [See page 33].

A new system, the Prompt Assessment of Global Earthquakes for Response (PAGER), is being designed to estimate

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Left to right: U.S. Congressman Bob Beauprez listens to NEIC director Harley Benz describe new earthquake technology. Joan Fitzpatrick, Linda Pratt and Jill McCarthy observe.

“After devastating earthquakes, like the 2004 Sumatra earthquake and subsequent tsunami, as well as other natural hazards in recent times, society calls for immediate information, and the new manned 24/7 operation at the USGS NEIC helps do this,” said P. Patrick Leahy, USGS.

It took an hour to process the information about the December 2004 Sumatra earthquake. With the new system, it will take 12 to 13 minutes to process the same information. The immediate transmission of this information to cooperative agencies such as tsunami warning centers is critical. Previously, there were 25,000 contacts to notify; now the list is up to 54,000, and the demand for rapid notification keeps growing.

“We are improving all the time,” said Harley Benz, director of the NEIC. “The new systems are more robust, accurate and contain new information critical for emergency-response applications. We’re essentially replacing 20-year-old technology.”

Location and magnitude, the staples of earthquake reporting, are now being supplemented by information equally important to describing and understanding the

damage from major earthquakes worldwide based on estimates of people and property exposed to potentially damaging levels of ground motion. The system promises to be a significant tool for emergency relief organizations such as the U.S. Agency for International Development. PAGER information will also be available to scientists and the public.

A new earthquake notification service sends out earthquake alerts to subscribers via e-mail. With the new service, users can customize the contents of the alerts they receive. For instance, they may define regions of interest, set magnitude thresholds, specify time periods such as day and night, opt for “Aftershock Exclusion,” and enter various notification addresses. Anyone can subscribe to the notification service.

“The USGS Earthquake Hazards Program Web site allows Internet users to find the information they need,” said Lisa Wald, USGS geophysicist and Webmaster at the NEIC.

The Web site receives more than one million hits per day. All products of the NEIC are available to the public via the USGS Earthquake Hazards Program Web site, <http://earthquake.usgs.gov>.