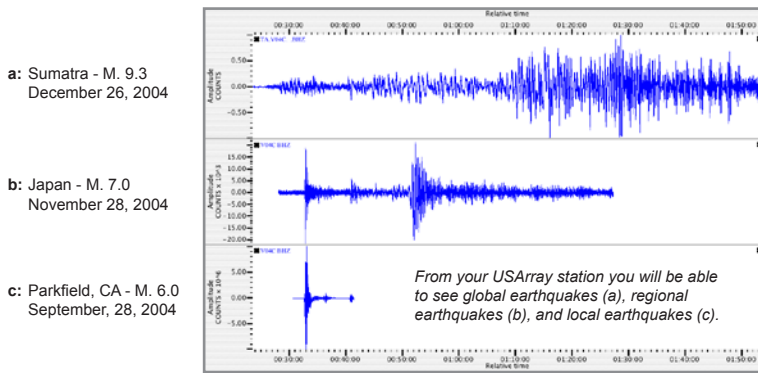
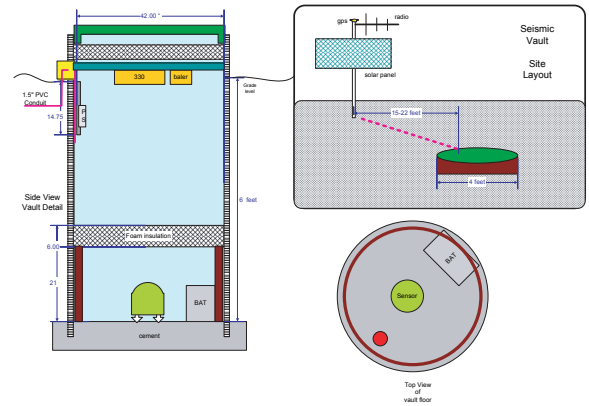


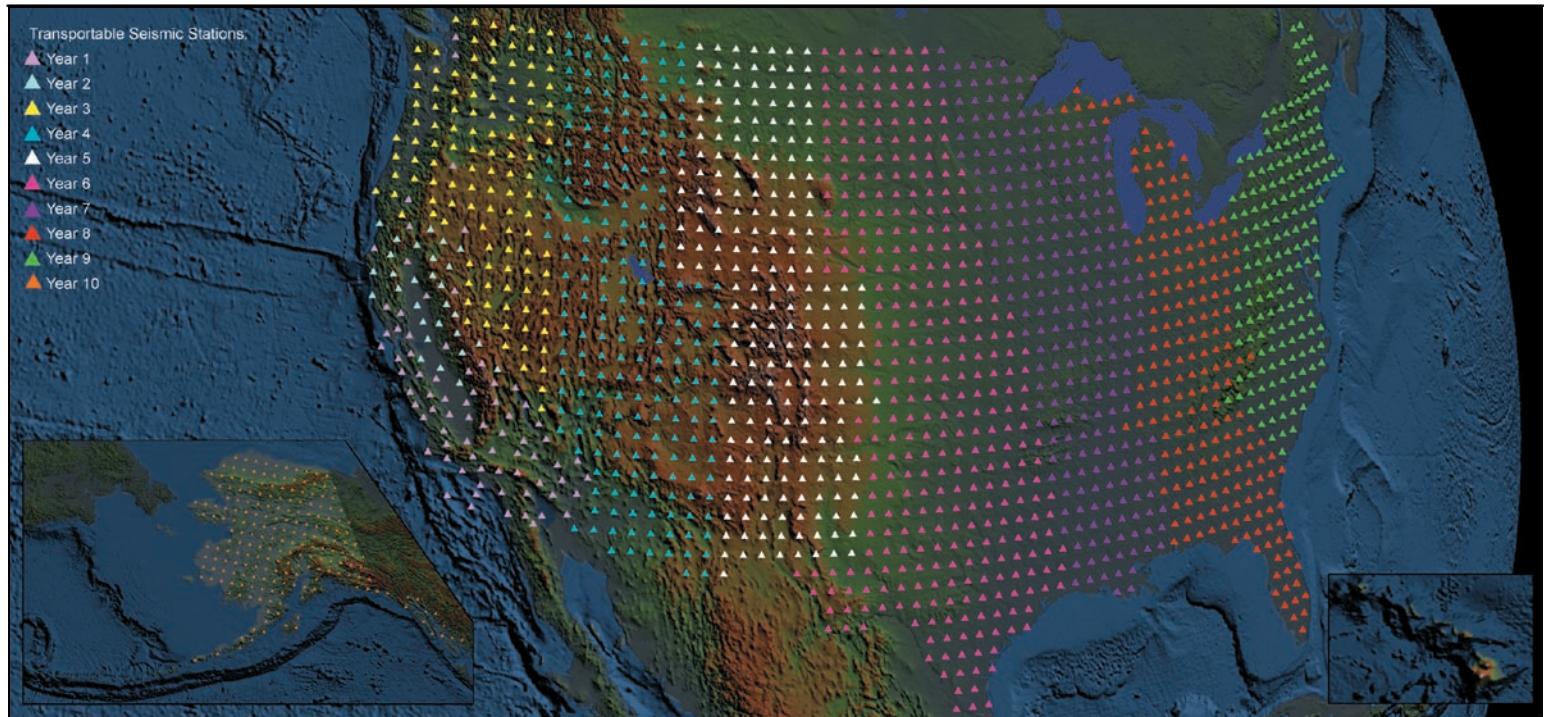
Transportable Seismic Network:

Imaging the Earth's Interior

EarthScope is installing a dense array of seismometers across the continental United States and Alaska. The seismometers will record local, regional, and teleseismic earthquakes to produce high-resolution images of the Earth's interior from the crust to the core and to study the origin and characteristics of earthquakes and earthquake faults. EarthScope scientists will integrate these images with a diversity of geological data to address unresolved issues of the continental structure, evolution, and dynamics.



The array will consist of 400 transportable broadband seismic stations that will advance across the country in a roll-along fashion. The stations will have an average residence time of 18-24 months to cover 2000 locations over a period of 10-12 years. With a station spacing of ~70km, the array will provide unprecedented coverage for producing 3-D images of the Earth's interior and new insights into the earthquake process.



High-resolution photos and illustrations with captions and credits are available for media use through the EarthScope office.

Participating in EarthScope:

Hosting a Transportable Seismic Station

EarthScope is installing transportable seismic stations to record earthquakes occurring locally, nationally, and worldwide. The data is used to image the Earth's interior and produce new insights into the earthquake process. Planned for over 2000 sites across the country, EarthScope is seeking participation from local landowners and schools to accomplish this university-based research experiment.

EarthScope will:

- Respect the property and privacy of landowners throughout the experiment, notifying the landowner whenever access is required.
- Be responsible for the security and operation of the station.
- Assume liability if the equipment is damaged or stolen, remain responsible for any damage done to the landowner's property, and hold the landowner harmless for any loss or injury.
- Remove the equipment completely after the experiment.
- Provide the landowner with updates about the project and sample recordings from their station.

Seismic Station Specifications

Transportable seismic stations have a low profile -- there is no noise or motion associated with the equipment. To reduce interference from surface vibrations and to protect the equipment, the seismometer and associated electronics are buried 6 feet below the ground inside a 42 inch diameter tank. Power is supplied by a solar panel mounted on a pole about 20 feet from the tank, with the cables buried inside a conduit. Data is transmitted to the EarthScope data processing centers via cellular, broadband, or satellite communication systems. When satellite systems are used, the 3 foot dish and an enclosure with electronics is located near a source of AC power -- linked by radio to the seismic station. The AC power required for the satellite dish is 25 watts or 220 kWh each year (about \$40 per year). In areas with livestock, we can erect a fence for protection. We can also paint the equipment to blend with the surroundings.

Installation, Maintenance, and Removal

Installation of an EarthScope transportable seismic station usually takes 3 days. On the first day, a backhoe digs a hole 4 feet wide and 7 feet deep. A plastic tank is placed in the hole and cement is poured into the bottom to make a sealed container for the equipment. On a second day, the seismograph electronics, sensor, and communications equipment are installed. An extra day is occasionally required for testing and reconditioning landscaping. The buried equipment is heavily insulated and the tank is often completely covered with soil or rocks to keep the temperature stable.

The seismic stations are temporary, remaining in place for about two years and are then reused at another site. The equipment operates continuously and requires no maintenance. If the equipment malfunctions, this is detected at the data processing center, and a service trip may be necessary.

Disassembling the seismic station takes one day. EarthScope removes all the equipment, cuts the plastic tank at the level of concrete (usually 6 feet below grade), removes the tube, and fills in the hole. If requested, the entire tank and concrete can also be removed.

The 42 inch diameter tank used to protect the seismic station.



Lowering the tank into the ground.



EarthScope technician assembling the electronics.



The completed seismic station.

