Center for Earthquake Research and Information

ceri overview

CERI faculty and students carry out challenging and cutting-edge research programs at the forefront of earth science. Theoretical and observational studies take them to many places around the world.

Earth Dynamics:
GPS geodetic monitoring of tectonic plate motion in South America and Antarctica, and of seismically active intraplate regions. The morphology of active landscapes and what it reveals about active deformations and surface processes that produce them in western Tibet and California.

Earth Structure and Composition:
Detailed analysis of seismic waveforms clarifies the structure and transmission characteristics of the Earth's crust.
Tomographic, receiver function, reflection, refraction, and surface wave studies reveal details of Earth structure in enigmatic seismic zones. Earthquake and controlled sources are used in both passive and active experiments.

Earthquake Processes:
Our permanent seismic networks monitor the most active seismic zones in eastern North America. Our portable rapid response instrumentation provides valuable data to deduce rupture processes of earthquakes from India to Mt. St. Helens. Studies of earthquake triggering help to sort out the physics of earthquake nucleation and rupture.

Seismic Hazard, Risk, and Earthquake Effects:
Paleoseismic studies reconstruct earthquake chronologies. Studies of earthquake damage patterns coupled with source, path, and site response research provides critical input to seismic hazard models. Shakemap provides rapid estimates of ground motion for earthquake disaster responders. Historical research documents physical and societal effects of large destructive earthquakes in eastern North America.

Theoretical and Instrumentation Advances:
CERI researchers have developed models and techniques to advance Earthquake science. High-sample-rate GPS seismology measures ground motion from the largest earthquakes. Deformation models facilitate the study of Earth strains. Our portable broadband and accelerometer arrays reveal fundamental characteristics of both linear and non-linear seismic wave propagation.

Geophysical Systems and Intraplate Source Zones:
Geophysical, geodynamical, and geological data are integrated to test hypotheses concerning intraplate earthquake zones. CERI researchers investigarte novel methods of seismic monitoring using array seismology, borehole installations, and infrasound. Diverse geophysical data sets are combined to infer the physical state and tectonic processes within intraplate source zones.