earth scope

EarthScope: A National Program of Unprecedented Scale and Scientific Ambition

EarthScope takes a comprehensive approach to understanding the structure and evolution of the North American continent at many scales—from individual faults and volcanoes to the deforming plate boundary and the dynamics of Earth's mantle and core.

EarthScope Observatories

provide data for scientists, students, and the public to study earthquakes, volcanoes, and the structure of the continent.

USArray:

A network of seismometers deployed across the U.S. to record earthquakes and provide high-resolution images of the continent's structure and the Earth's deep interior.

Plate Boundary Observatory (PBO):

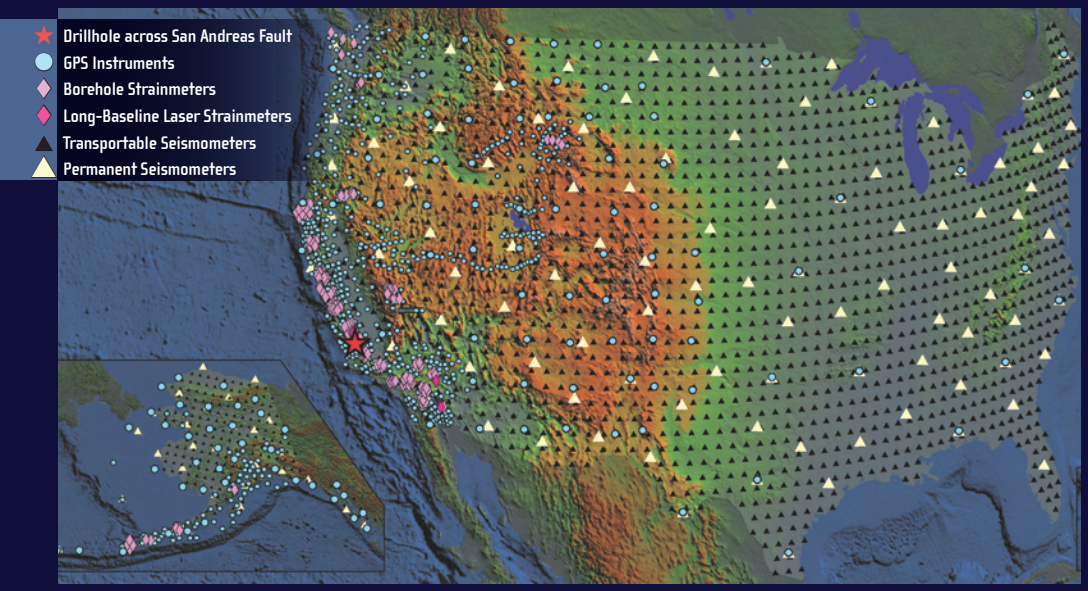
An array of GPS instruments positioned throughout the western U.S. to record motions of tectonic plates and deformation of the continent.

San Andreas Fault Observatory at Depth (SAFOD):

A 3 kilometer (2 mile) drillhole through California's famous fault to collect rock samples and to record the physical and chemical properties of an active earthquake zone.

EarthScope Science and Educational Activities

demonstrate how geological forces shape North America's landscape and contribute to the public's understanding of our dynamic Earth. EarthScope research helps us appreciate how the shape, size, and structure of North America change in ways that affect our lives. Teachers, park rangers and museum directors work with scientists to bring EarthScope discoveries to students and the public.



Locations of past, present, and future EarthScope instruments.

Examples of EarthScope Science

www.earthscope.org/brochure

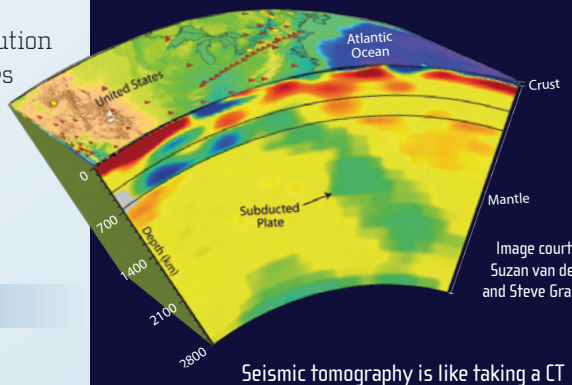
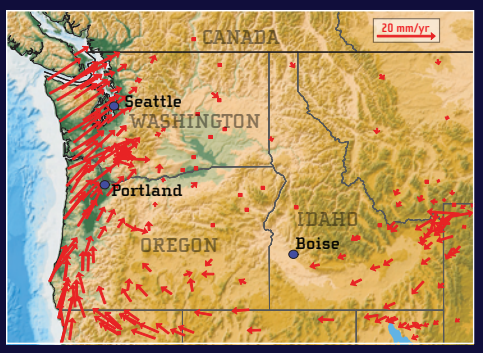
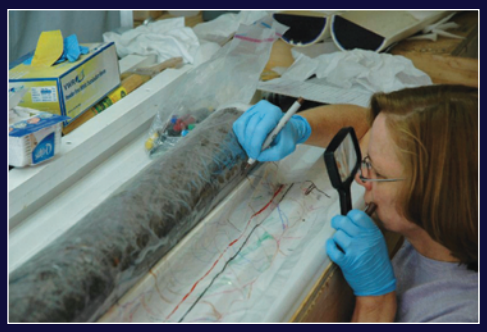


Image courtesy of Suzan van der Lee and Steve Grand

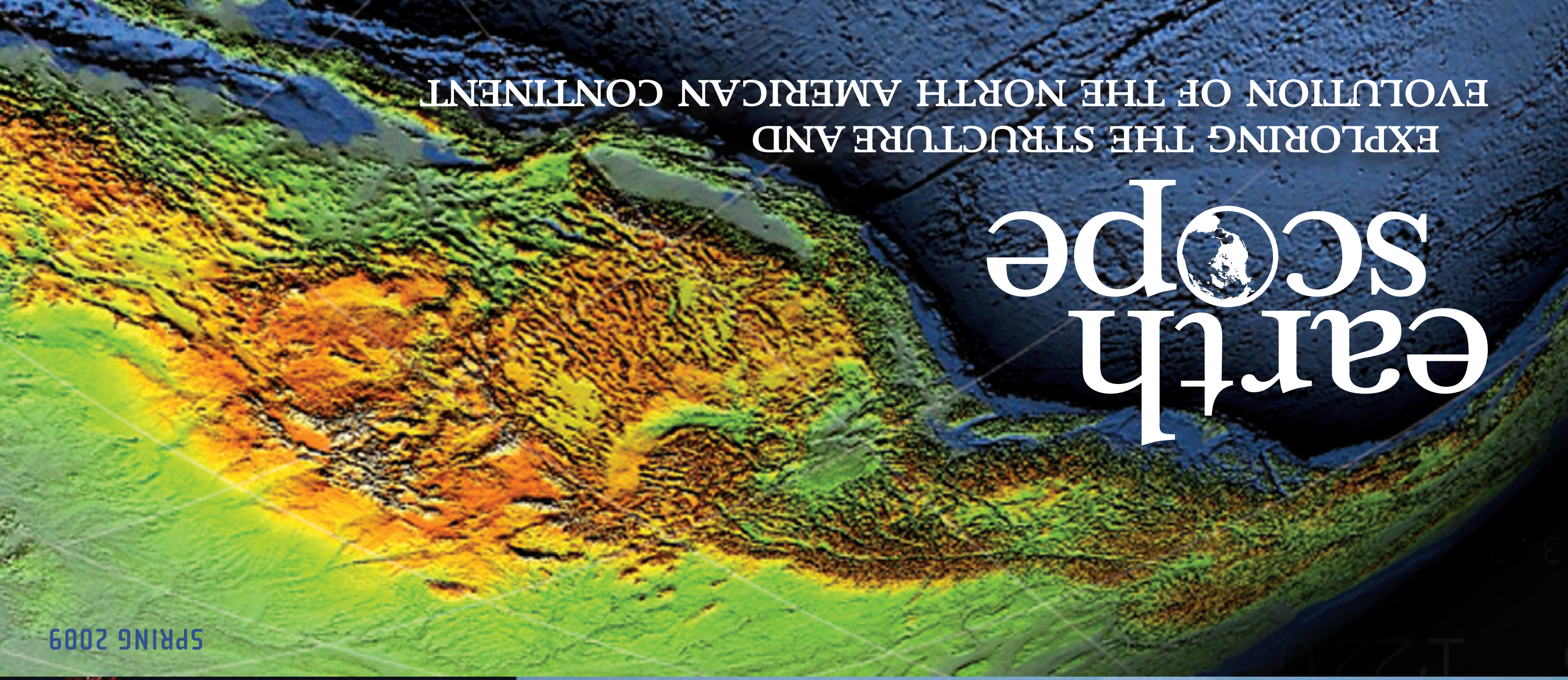
Seismic tomography is like taking a CT scan of the Earth. This image shows an ancient tectonic plate (green region) beneath North America. Data from **USArray stations** will sharpen this image.



PBO GPS stations reveal how the surface of North America is deforming. The red arrows, which represent motion relative to the stable part of the continent, show that western Washington and Oregon are rotating and colliding with Canada at a rate of up to 20 millimeters (about one inch) per year!



SAFOD is the first drillhole across an active plate boundary designed to recover intact rock samples from the depths where earthquakes originate. Laboratory analyses of these rocks reveal how fault zones work and lead to a better understanding of earthquakes and their hazards.



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EXPLORING THE STRUCTURE AND EVOLUTION OF THE NORTH AMERICAN CONTINENT

SPRING 2009

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Free Resources!
All EarthScope data and educational resources are available without restriction or cost to the scientific community, students, teachers, and the public. Visit www.earthscope.org.

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EarthScope National Office (ESNO)
COAS, Oregon State University
104 COAS Administration Building
Corvallis, OR 97331-5503
earthscope@coas.oregonstate.edu

www.earthscope.org

- A community of scientists conducting multidisciplinary research on geological processes affecting North America.
- Scientists and educators bringing the excitement of cutting-edge research into classrooms, museums, and parks.
- Thousands of instruments measuring motions of Earth's surface, seismic waves, and rock properties at depths where earthquakes occur.

EarthScope is...