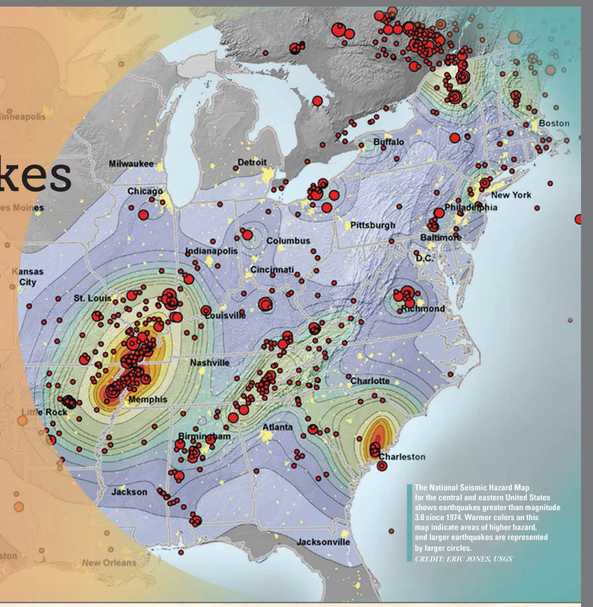
USGS
science for a changing world

Eastern Earthquakes



"In the West, seismic hazard is generally high and research needs are obvious. However, there is also hazard in the East, and research is seriously challenged by lack of data, which leads to more uncertain societal risk. A great synergy between USGS and NRC has resulted in the development of a new product, Nuclear ShakeCast, which is providing the nuclear power community with notifications of potential damage from earthquakes to nuclear power plants around the world."

Annie Kammerer
SENIOR SEISMOLOGIST,
NUCLEAR REGULATORY COMMISSION

The National Seismic Hazard Map for the central and eastern United States shows earthquakes greater than magnitude 3.0 since 1974. Warmer colors on this map indicate areas of higher hazard, and larger earthquakes are represented by larger circles.
CREDIT: ERIC JONES, USGS

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AUGUST 2013

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

On August 23, 2011, a magnitude 5.8 earthquake in central Virginia shook 30 million people in 20 States. This earthquake shut down a nuclear power plant for several months and resulted in over $100 million in property damage. Damaging earthquakes occur in the United States east of the Rocky Mountains about every 20 years. To support earthquake preparedness, monitoring, and response, the USGS performs research on the causes of eastern earthquakes, refines assessments of future seismic shaking, and works with engineers to incorporate this knowledge into building codes and other public safety measures.

earthquake.usgs.gov

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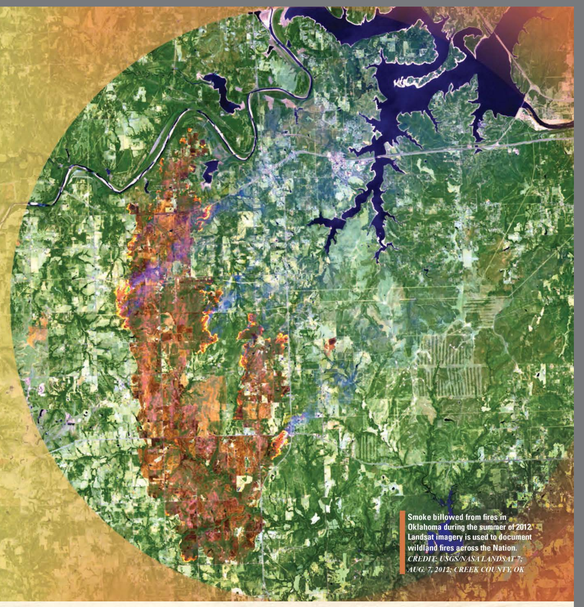
Land Imaging

"The first 40 years of the Landsat program have delivered the most consistent and reliable record of the Earth's changing landscape."

Michael Freilich
DIRECTOR, NASA'S EARTH SCIENCE DIVISION
SCIENCE MISSION DIRECTORATE



Smoke billowed from fires in Oklahoma during the summer of 2012. Landsat imagery is used to document wildland fires across the Nation.
CREDIT: USGS/NASA LANDSAT 7, AUG. 7, 2012, CREEK COUNTY, OK

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SEPTEMBER 2013

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2 Labor Day	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5
6	7	8	9	10	11	12

The USGS has provided continuous, objective imaging of the Earth's surface for over four decades. These data are freely available from the USGS and are used for a wide range of activities, including agricultural irrigation management, climate change impact studies, coastal erosion mapping, crop-insurance fraud detection, drought tracking, ecosystem studies, fire-fuels mapping, forest management, invasive plant species detection, lake clarity surveys, land use/land cover change monitoring, and mineral exploration. One of the most important elements of USGS land imaging is the Landsat satellite, which has been a worldwide definitive source for documenting Earth's changes since 1972.

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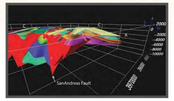
JANUARY

USGS scientists partner with Navajo Nation high school and middle school students, who learn about sand dunes while helping their community. Students distribute seed balls of culturally important plants to slow movement of an active sand dune. Drought has led to significant changes in sand dune mobility, threatening housing, transportation, and rangelands.
Credit: Lee Amoroso, USGS

FEBRUARY

The USGS is the primary source of information on geothermal resources across the Nation. Geothermal energy is an important but underutilized domestic renewable energy resource.
Credit: USGS

MARCH



Modern technology allows scientists to create a 3D map of the San Andreas Fault Zone in California. Maps like these can be used to visualize and interpret geologic information, to aid in hazard mitigation and energy and water planning, and to track changes through time.
Credit: USGS

APRIL

The USGS studies water quality and water availability throughout the Chesapeake Bay Watershed. In coordination with Calvert County, Maryland, USGS scientists monitor water levels in Calvert Cliffs State Park, where levels in the Aquia aquifer have dropped 85 feet since 1979.
Credit: Wendy S. McPherson, USGS

MAY

The Arkansas River runs dry at Great Bend, Kansas. In 2012 the Nation experienced one of the most widespread droughts in its history. USGS scientists monitor river levels as they drop so that water managers can mitigate shortages and best manage the resource.
Credit: Nathan Sullivan, USGS

JUNE

USGS and National Park Service scientists carry a 16.5-foot python that was captured in a thicket in Everglades National Park. This snake is being tracked as part of a research project on the biology of the Burmese python, led by the USGS, to support efforts to develop better control methods.
Credit: Catherine Puckett, USGS

JULY

Traditional Coast Salish canoes, carrying several USGS scientists, arrive in La Conner, Washington, after towing water-quality sampling instruments during the annual Tribal Canoe Journey.
Credit: Leslie Dierauf, USGS

AUGUST

The magnitude 5.8 earthquake that struck Virginia in August 2011 caused damage throughout the mid-Atlantic region. The earthquake shook several of the Nation's most iconic structures, including the Washington Monument, which closed for repairs.
Credit: Kara Capelli, USGS

SEPTEMBER

The USGS National Land Cover Database provides seamless land cover information, including land cover change throughout time, for the conterminous United States. This image demonstrates the detail of land cover change, shown in magenta, in an area where forest harvest cycles dominate the changing landscape along a segment of the Columbia River near Longview, Washington.
Credit: USGS

OCTOBER

A great egret stands in Franks Tract State Recreation Area in the California Delta.
Credit: Francis Parchaso, USGS

NOVEMBER

USGS field scientists, like this geologist examining a mineralized ridge at Goldfield, Nevada, collect data on mineral occurrences to support research on how and where mineral deposits form and to enable development of models that can be used to detect potential mineral resources.
Credit: John Mars, USGS

DECEMBER

A Marcellus Shale outcrop in Highland County, Virginia, shows at the surface the object of shale gas development drilling in nearby states. Assessing undiscovered gas resources, like the USGS 2011 assessment of the Marcellus Shale, uses geologic mapping of outcrops like this in addition to extensive drilling, production, and geophysical data.
Credit: James Coleman, USGS

What is the U.S. Geological Survey?

The USGS is a science organization that provides impartial information on the health of our ecosystems and environment, the natural hazards that threaten us, the natural resources we rely on, the impacts of climate and land-use change, and the core science systems that help us provide timely, relevant, and useable information.

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