

Geohazards Visualizations and Teaching Materials Just-In-Time

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The Collections

In order to take advantage of the powerful teachable moments associated with major geologic events and natural disasters, educators need high-quality topical resources related to current earth science events. On the Cutting Edge has developed collections of visualizations for use in teaching geoscience topics as a part of its Teaching Geoscience with Visualizations website. We had great success in developing a new collection as a quick response to the 2004 Indian Ocean Tsunami as well as after the record breaking 2005 hurricanes, so we began developing collections directed at other specific geohazards that educators would want to discuss in their classes. We also began updating existing collections with new materials from current events. This suite of collections covers a wide range of important of hazards topics and, in as a part of the full set of geoscience collections, constitutes a considerable set of visuals and materials educators need for their classes. Providing easy access to these timely resources means that educators do not have to devote as much time themselves to finding quality materials to augment their teaching.

The Visualizations

The links presented on each page are selected to provide a variety of different types of visualizations (e.g. still images, animations, model output) and to highlight multiple aspects of the phenomena involved. The aim is to assist educators in teaching about a geologic event reported in the news, associated Earth science concepts, and related topics. The cited links are culled from internet searches and are reviewed by SERC staff for quality and clarity before being included on the page. These collections bring together resources created by researchers, government agencies, and respected media sources and organize them for easy discovery and use.

Tornado Visualizations

Compiled by Rob Thomas of SERC.

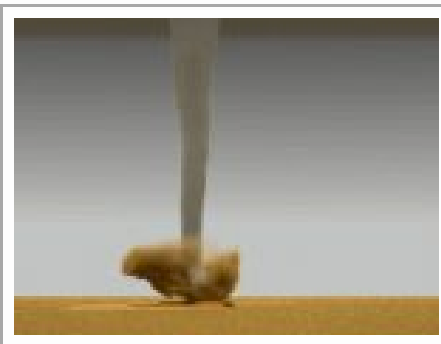
Animations and films that illustrate or help students investigate how tornados form, current research about the science involved, and the effects of tornados of different strengths.

Click here to browse the complete set of [Visualization Collections](#).

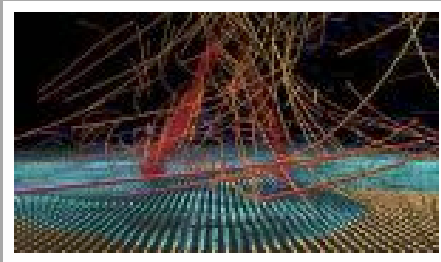
Jump to: [Simulations & Films](#) | [Tornado Formation](#) | [Interactive Visualizations](#) | [Maps](#)

Simulations & Films

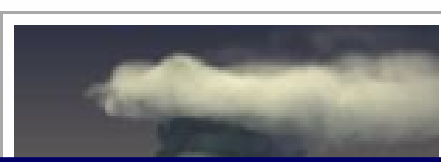
Catching a Tornado, National Geographic: A series of three Flash-based movies captured from a meteorological probe placed in the path of an oncoming tornado, documenting the high wind speeds, the debris carried by the storm, and the motion of the funnel as it passes along the ground. The film features footage from six different on-board cameras, each facing in a different direction to give a 360° view of the storm.



Tornado Research Pages, simulations of tornados are available as wireframe models from a variety of perspectives.



Tornado Simulation, NOAA: A series of three Flash-based movies captured from a meteorological probe placed in the path of an oncoming tornado, documenting the high wind speeds, the debris carried by the storm, and the motion of the funnel as it passes along the ground. The film features footage from six different on-board cameras, each facing in a different direction to give a 360° view of the storm.



Tornado-forming supercell, a simulation of a supercell storm, including the formation of a supercell.

Related Links
[Weather and Climate Visualizations](#)
[Atmospheric Pressure and Wind Visualizations](#)
[Starting Point: Teaching with Visualizations](#)
[Geohazards Visualization Collections](#)

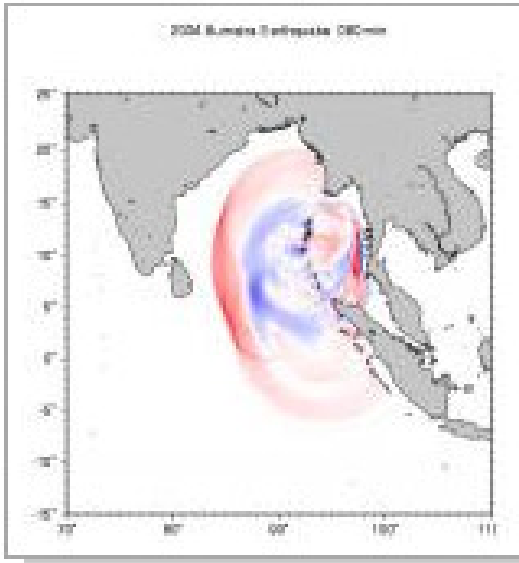
The individual collections give a brief description of the types of visualizations available, some links to related resources on other On the Cutting Edge or SERC websites, and then an annotated list of links to the visualizations. The links refer users to the original source of the visualizations as they are not hosted on SERC servers.

Suite of Geohazards Collections

Geohazards Visualization Collections

There are a number of visualization collections developed for this website that deal with different types of Geohazards. Browse through the different collections below or go to the [complete set of visualization collections](#).

Related Links
[Starting Point: Teaching with Visualizations](#)



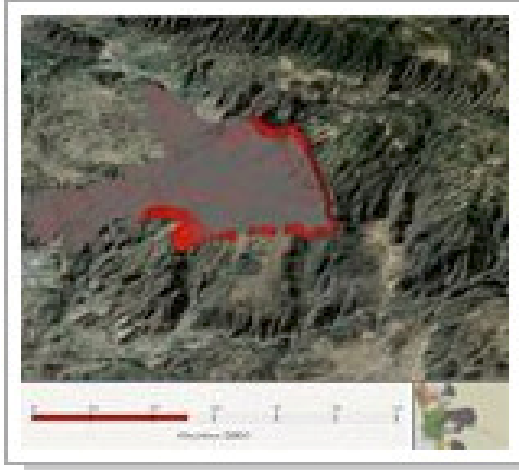
Tsunami Visualizations and Other Teaching Materials

These two pages contain a number of animations and movies about tsunamis in general as well as specific events such as the 26 December 2004 Indian Ocean Tsunami. Other materials and URLs were submitted by faculty in response to a request sent out via the web and the Geo-Ed listserv.



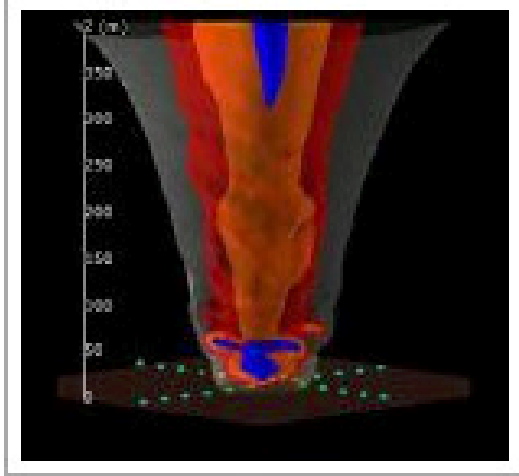
Hurricane Visualizations and Other Teaching Materials

Find satellite images, visualizations and other educational materials that illustrate how these violent weather systems form and function, as well as their effects on the natural and human landscapes. There are links about the August 2005 Hurricane Katrina, other past hurricanes, and visualizations of model and hypothetical hurricanes used in research.



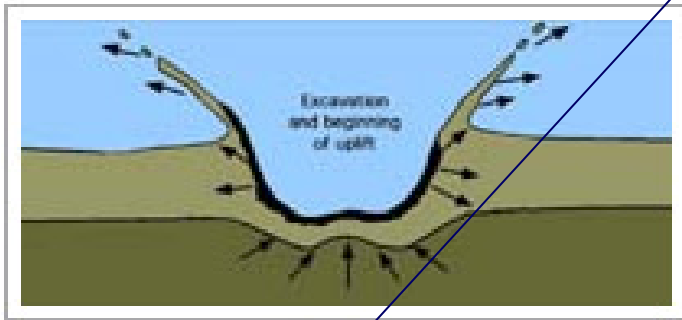
Wildfire Visualizations

Wildfires are a particularly paradoxical geohazard—they are crucial to fire-dependent ecosystems, but when poorly managed these fires can destroy the very ecosystems that rely on fire for rebirth. These simulations, images, and interactive animations seek to explain wildfires and their complex relationship with atmosphere, terrain, and human management.



Tornado Visualizations

Animations and films that illustrate or help students investigate how tornados form, current research about the science involved, and the effects of tornados of different strengths.



Impact Crater Visualizations

This page has links to visualizations of impact events and the structures they form.



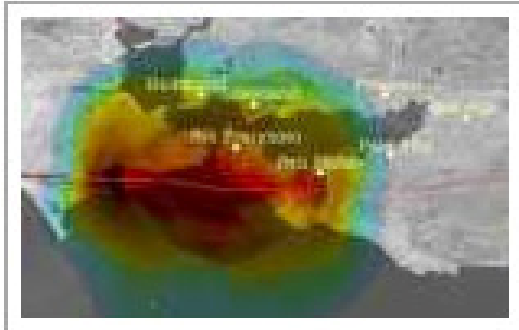
Mass Wasting/Landslide Visualizations

Animations showing different types of landslides like slumps, slides, and falls in a variety of environments.



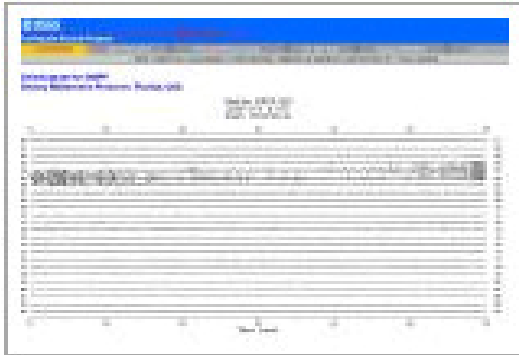
Flood Visualizations

These animations, images, and film clips illustrate the nature and extent of flooding events. They show a variety of ways flooding can be generated as well as the effects on people and infrastructure.



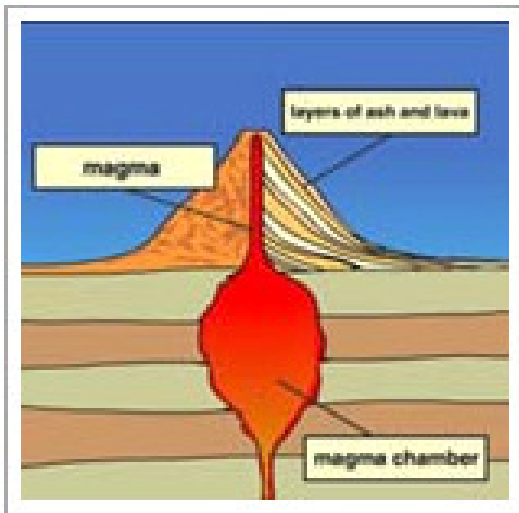
1906 San Francisco Earthquake and Fire Visualizations

The earthquake that struck San Francisco on April 18, 1906 remains one of the strongest and most significant earthquakes in US history. The fire that developed in its aftermath brought the city to its knees. This collection presents links to images, films, panoramas and animations about the earthquake and fire.



Earthquake Visualizations

Animations showing seismograph operation, tsunami, P and S Waves, earthquake focus versus epicenter, and actual footage of an earthquake.

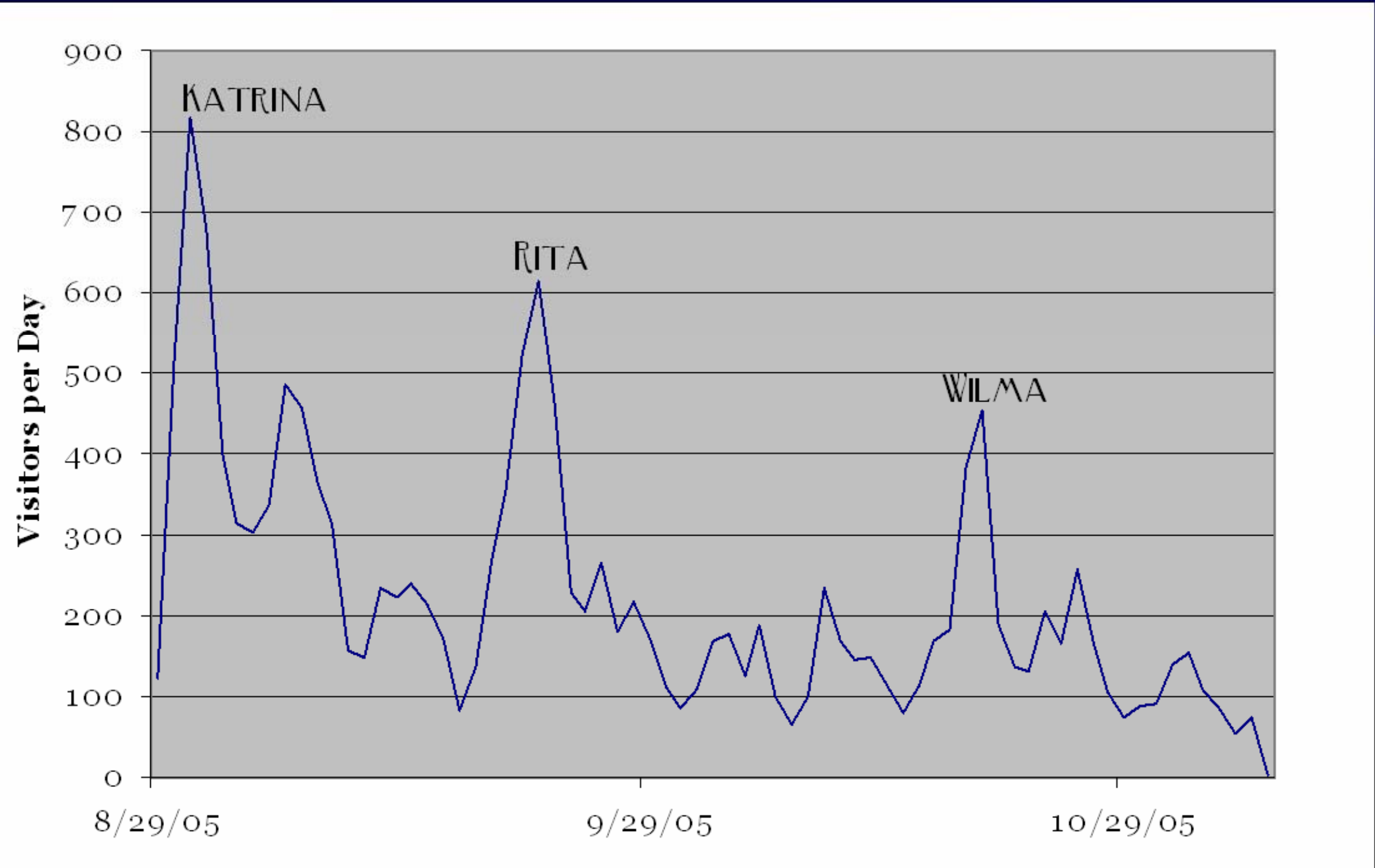


Volcano Visualizations

This collection presents links to visualizations of volcanoes and volcanic processes. Visualizations include general depictions of igneous processes as well as work done on real volcanoes on Earth and around the solar system.

Visitors to Hurricane Collection

September and October, 2005



This snapshot of web traffic to one of our collections is a great illustration of the Teachable Moment. Traffic to the Hurricane Collection spiked in concert with the landfall of the three major US-affecting hurricanes of the 2005 hurricane season. The graph shows not only the intense interest around the storms but also how short the window of interest is surrounding each event. Responding with high-quality materials to new events on this kind of timescale puts a powerful tool in the hands of educators.

1906 San Francisco Earthquake and Fire Visualizations

Compiled by Rob Thomas of SERC.

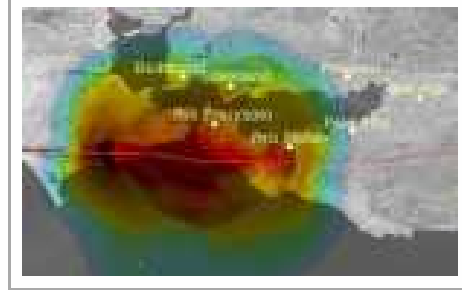
The earthquake that struck San Francisco on April 18, 1906 remains one of the strongest and most significant earthquakes in US history. The fire that developed in its aftermath brought the city to its knees. This collection presents links to images, films, panoramas and animations about the earthquake and fire. Even more information can be found at sites like the [USGS 1906 San Francisco Quake site](#) and the [1906 Earthquake Centennial Alliance](#).

Related Links
[Plate Tectonic Movement Visualizations](#)
[Starting Point: Teaching with Visualizations](#)
[Geohazards Visualization Collections](#)

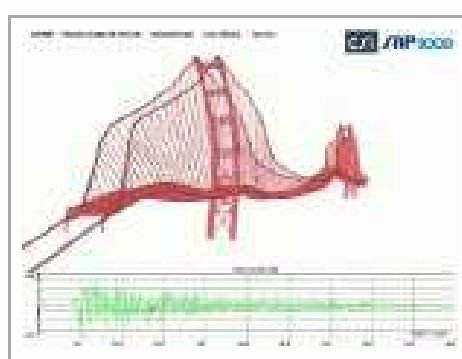
Click here to browse the complete set of [Visualization Collections](#).

Jump to: [animations](#) | [maps & diagrams](#) | [films](#) | [photos](#)

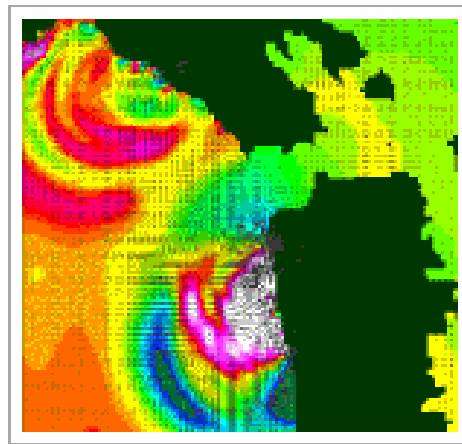
Animations



1906 Ground Motion Simulations, USGS: A series of visualizations of ground motion and fault slip during the 1906 earthquake. Included are several movies that animate the ground motion's growing intensity as it radiates from the epicenter in the seconds after the earthquake. Available movies show not only the whole fault, but also the shaking in specific locations, including San Francisco and surrounding towns. The movies are in QuickTime format.



Modern Structures in the 1906 Quake, Computers & Structures, Inc.: A series of QuickTime movies illustrating the deformation of modern Californian structures subjected to the 1906 earthquake. The deformation, exaggerated 100 times, is shown for the Golden Gate Bridge, the SF International Airport, and the San Francisco Marriott. Los Angeles City Hall is also simulated in order to show how buildings further from the epicenter were affected.



The collections can be generated relatively quickly. This allows us to provide quick access to quality resources in response to current events and natural disasters. It also means that we can develop collections about special topics, such as the 100th anniversary of the 1906 San Francisco Earthquake and Fire, timed to coincide with the anniversaries or observances.