USGS
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Rocky Mountain Geographic Science Center

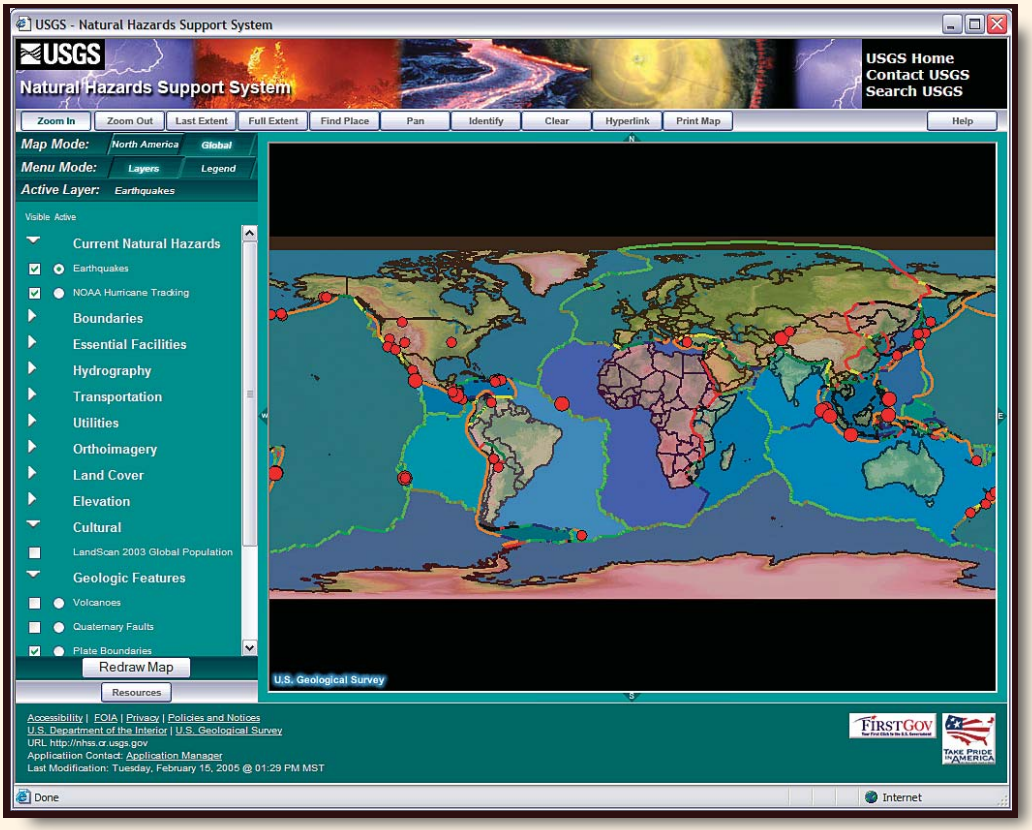
Natural Hazards Support System (NHSS)

Dynamic Natural Hazards Monitoring

The U.S. Geological Survey (USGS) Natural Hazards Support System (NHSS) helps monitor and analyze natural hazards events, including earthquakes, hurricanes, severe weather, floods, wildfires, and tsunamis. The NHSS provides a Web-based portal to current natural hazards information, geospatial data, and detailed information directly from expert sources. This Web-based synthesis of information provides decision makers and the public with a tool to track and analyze numerous events related to natural hazards across the country and around the world.

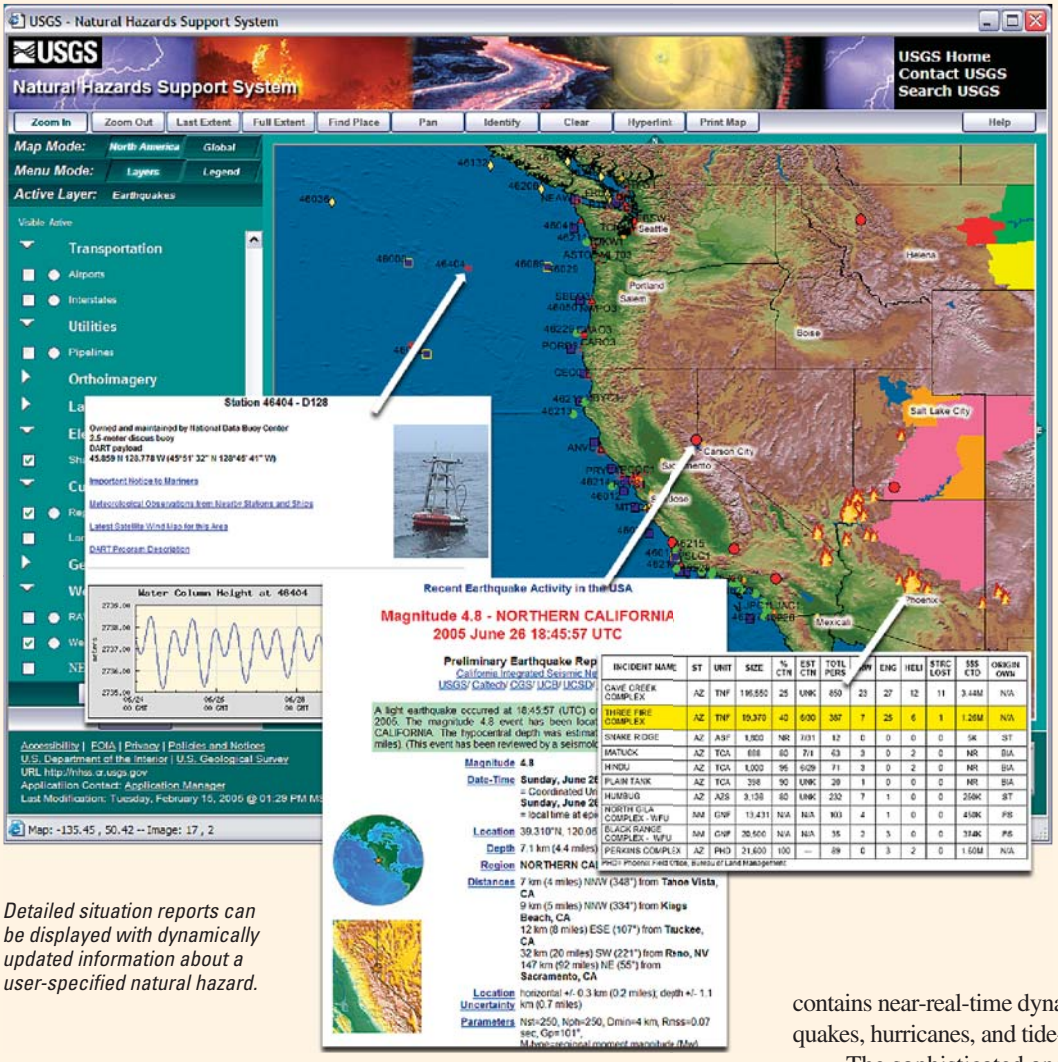
Background

In 2000, the USGS and its partners developed a Web-based application called Geospatial Multi-Agency Coordination (GeoMAC) that provides up-to-date information about the locations of wildfires. The success of that application demonstrated the value of combining geospatial data with near-real-time wildfire information and providing this product via the Internet to both the public and the emergency response community. This success also set the stage for the next step in natural hazards monitoring: combining multiple types of natural hazards into a single application.



The NHSS Viewer can display maps in either national or global mode. The above image displays the global map mode with recent earthquake locations and neotectonic plate boundaries on a color shaded-relief base.

The NHSS takes this next step of combining a wide range of natural hazards events into a single geospatial, Web-based viewer. The NHSS allows users to easily see the geospatial relationships of different events related to natural hazards. The system's information also contributes to the analysis of the potential impacts of multiple natural hazards. For example, in December 2003 when the 6.5-magnitude San Simeon earthquake hit southern California, the combination of earthquake information and dynamic weather warnings supplied by NHSS emphasized that heavy rains were predicted in the area affected by the earthquake. This NHSS ouput increased the awareness level of both the public and emergency responders to the threat of flooding and mudslides in the area.



Detailed situation reports can be displayed with dynamically updated information about a user-specified natural hazard.

Natural Hazards Support System

For each event related to a natural hazard, the NHSS offers a direct link to the source agency for more detailed information. This approach allows the NHSS to provide an overview of all events, while at the same time easily directing users to the appropriate agency for more specific information.

The NHSS presents dynamic near-real-time natural hazards information from a wide range of sources:

- global earthquakes with a magnitude greater than 3.0 from the USGS National Earthquake Information Center
- volcano warnings from the USGS Volcano Hazards Program
- weather watches and warnings for North America from the National Oceanic and Atmospheric Administration (NOAA)
- hurricane tracking points from the National Hurricane Center
- wildfires from the National Interagency Fire Center
- tide-monitoring buoys from a variety of sources including NOAA's National Data Buoy Center.

Geospatial data are presented to users in two separate, easily accessible map modes, North America (default) and global.

The North America view provides the user with access to national seamless geospatial data for boundaries, bodies of water, transportation, utilities, land cover, elevation, cities, and population data. Essential-facilities data (such as hospitals, fire stations), using the Federal Emergency Management Agency (FEMA) HAZUS as a primary source, have also been integrated into the application. The North America map mode contains near-real-time dynamic data for earthquakes, wildfires, hurricanes, weather watches and warnings, tide-monitoring buoys, Remote Automated Weather Stations (RAWS), NEXRAD severe weather radar, and USGS stream gauges.

The global map mode presents globally seamless reference data for boundaries, bodies of water, transportation, elevation, cities, and population data. In addition, the global map mode contains near-real-time dynamic data for earthquakes, hurricanes, and tide-monitoring buoys.

The sophisticated and yet easy-to-use tools of the NHSS include the "Find Place" tool, which allows users to quickly and easily find a location based on a named North American geographic feature or specific latitude and longitude. The "Identify" tool allows users to display all of the attribute information associated with any feature in the map.

Summary

The advanced capabilities and wealth of dynamic near-real-time natural hazards information provided by the NHSS continue to grow in order to better support the monitoring and analysis of events related to natural hazards around the world.

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