

United States Geological Survey (USGS) Natural Hazards Response

The primary goal of U.S. Geological Survey (USGS) Natural Hazards Response is to ensure that the disaster response community has access to timely, accurate, and relevant geospatial products, imagery, and services during and after an emergency event. To accomplish this goal, products and services provided by the National Geospatial Program (NGP) and Land Remote Sensing (LRS) Program serve as a geospatial framework for mapping activities of the emergency response community. Post-event imagery and analysis can provide important and timely information about the extent and severity of an event. USGS Natural Hazards Response will also support the coordination of remotely sensed data acquisitions, image distribution, and authoritative geospatial information production as required for use in disaster preparedness, response, and recovery operations.

USGS Natural Hazards Response Products and Services

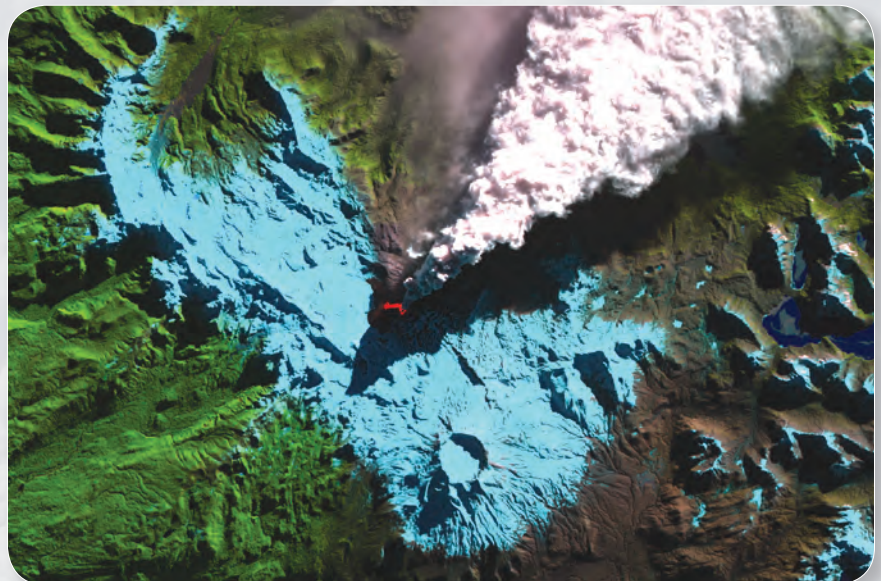
When disaster strikes there is often an urgent need and high demand for rapid acquisition and coordinated distribution of pre- and post-event geospatial products, services, and imagery. These products and services are necessary to record change, analyze impacts, and facilitate response to the highly dynamic conditions on the ground. The coordination and timely provision of relevant datasets have become especially important as geospatial technologies continue to advance and evolve in support of emergency responders.

Depending on requirements, USGS Natural Hazards Response can provide the following types of support for disaster response:

- Acquire and coordinate remotely sensed (satellite and aerial) imagery.
- Provide the primary data distribution portal for pre- and post-event satellite and aerial imagery.
- Coordinate with Federal, State, and local emergency response agencies as required.
- Provide timely and effective image and geospatial analysis.
- Provide rapid deployment and services of USGS geospatial experts, including the Science Response Vehicle (SRV) for onsite deployment.
- Provide United States representation, event activation, and event support through the International Charter “Space and Major Disasters”.

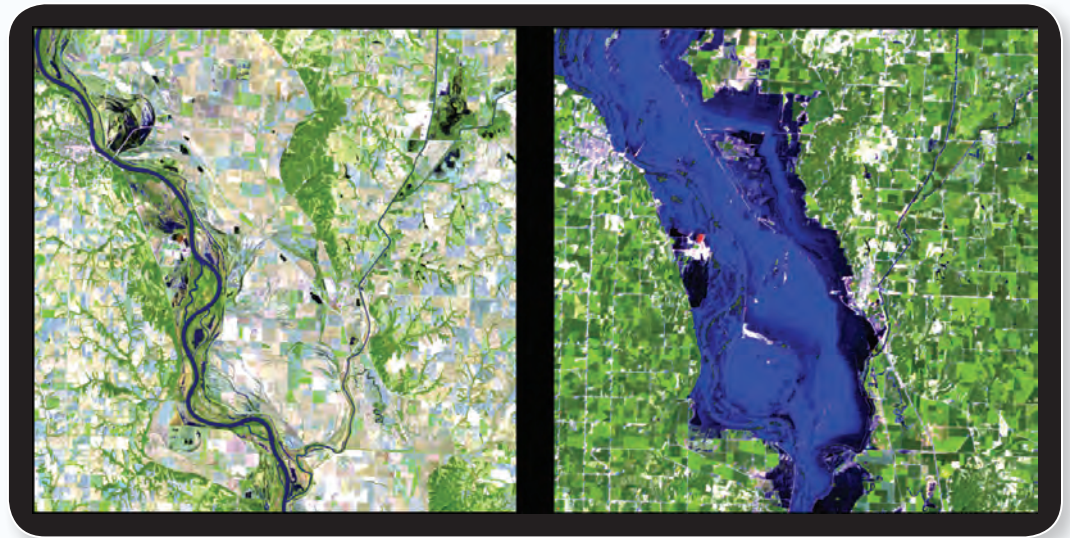
Past Emergency Events

Over the past decade, USGS Natural Hazards Response staff have supported hundreds of domestic and international disaster events by providing critically needed pre- and post-event geospatial products, remotely sensed imagery, and other related geospatial information services as required by the emergency response community. Some of the largest national event responses supported by the USGS have included Hurricane Katrina (2005) and the Deepwater Horizon Oil Spill (2010). In addition to these very large, complex, and long-duration events, the USGS has also supported many other



Landsat 5 satellite image of the 2011 eruption of Puyehue-Cordón Caulle Volcanic Complex (Chile). The white ash cloud and bright orange-red region within this image shows active eruption occurring from the Cordón Caulle fissure, while the circular snow-covered Puyehue caldera (blue) remains dormant. Image acquired on June 26, 2011, hosted on HDDS (Event ID: 201106_Volcano_Chile).

Landsat 5 and 7 satellite images acquired before and after the 2011 Missouri River flooding near Hamburg, Iowa. The large blue region in the right-hand image shows the flooded area. Images acquired on September 24, 2010, and August 2, 2011, hosted on HDDS (Event ID: 201104_Floods_Central_US).



emergency events across the United States, such as the persistent and dangerous wildfires in Texas and Southwestern United States (2011), devastating tornadoes in the Southeastern United States (2011), flood events caused by Hurricane Irene across the Mid-Atlantic and New England (2011), and the historic flooding along the Mississippi and Missouri Rivers (2011). Some examples of international events supported by the USGS have included the earthquake in Haiti (2010), the Japan earthquake/tsunami/nuclear event (2011), and the historic flood event in Pakistan (2010).

Access to Pre- and Post-Event Geospatial Information

When an emergency occurs, first responders and disaster response teams often need rapid access to aerial photography and satellite imagery that are acquired immediately after the event. When paired with pre-event imagery, the resulting product can facilitate change assessment and provide critical information to response personnel. The USGS Hazards Data Distribution System (HDDS) provides quick and easy access to the remotely sensed imagery and geospatial datasets that are essential for emergency response and recovery operations.



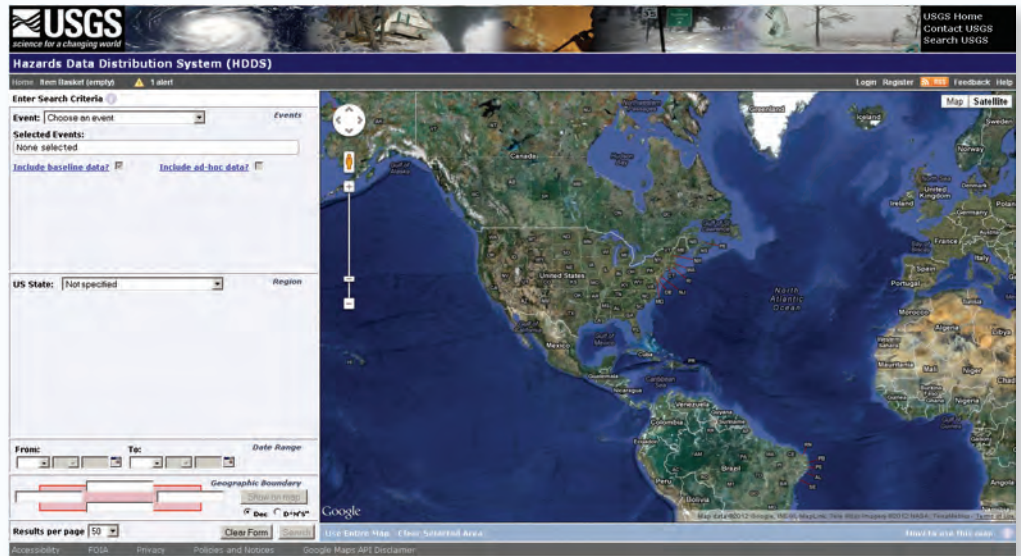
Aerial photograph showing a flooded region in New Orleans after Hurricane Katrina. Image acquired on September 16, 2005, hosted on HDDS (Event ID: 200508_Hurricane_Katrina).

Hazards Data Distribution System (HDDS)

The Hazards Data Distribution System (HDDS) provides a single, consolidated point-of-entry and distribution system for access to all available USGS-hosted datasets related to an emergency event response. HDDS provides data visibility and immediate download services through a complementary pair of graphical map-based and traditional directory-based interfaces. These interfaces allow emergency response personnel to rapidly select and obtain pre-event (“baseline”) and post-event emergency response imagery.

Some of the features included within the map-based, interactive HDDS interface include:

- Immediate download access to event-related imagery.
- Geographical data visualization with browse image and footprint area overlay.
- Extensive metadata available in multiple formats (for example, CSV, KML, SHP, XML, FGDC).
- XML-based Really Simple Syndication (RSS) feeds for newly ingested data.
- Registration service and login access for restricted datasets.
- Bulk data download capability.



Home page of the USGS Hazards Data Distribution System (HDDS). The HDDS site provides event-based download access to remotely sensed imagery and other datasets acquired for emergency response.



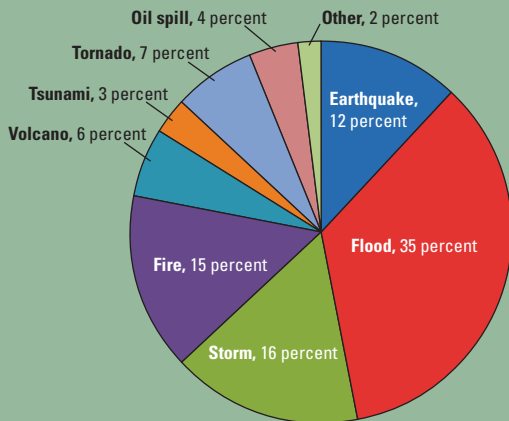
Oblique aerial photograph acquired after the Woodward, Oklahoma, tornado in Spring 2012. Image acquired on April 15, 2012, hosted on HDDS (Event ID: 201204_Tornadoes_Central_US).



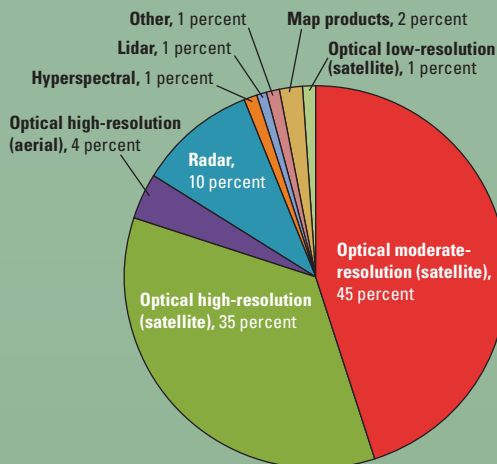
Aerial photograph showing highway damage and storm surge impacts on Cape Hatteras, North Carolina, after Hurricane Irene. Image acquired on September 2, 2011, hosted on HDDS (Event ID: 201108_Hurricane_Irene).

HDDS Event Support

Since its inception in 2005, the USGS HDDS system has grown to include over 170 terabytes of emergency response data (representing over 700 baseline and disaster events) and has distributed nearly 3 million files to the emergency response community.



Type of emergency events (percent) supported through Hazards Data Distribution System (HDDS) as of October 2012.



Type of datasets (percent) hosted and delivered through Hazards Data Distribution System (HDDS) as of October 2012.

SPOT-4 satellite image showing a fire scar (dark region) created by the 2012 Ash Creek Fire in southeastern Montana. Image acquired on July 29, 2012, hosted on HDDS (Event ID: 201207_Fires_MT). Includes material © CNES 2012, Distribution Spot Image S.A., France, SICORP, USA, all rights reserved.

Important Links

USGS Hazards Data Distribution System (HDDS)
<http://hdds.usgs.gov/hdds2/>

International Charter “Space and Major Disasters”
<http://www.disasterscharter.org/>

USGS Natural Hazards Response Portal
<http://eoportal.cr.usgs.gov/>

USGS Land Remote Sensing (LRS) Program
<http://remotesensing.usgs.gov/>

USGS National Geospatial Program (NGP)
<http://www.usgs.gov/ngpo/>

USGS Natural Hazards Program
http://www.usgs.gov/natural_hazards/

For more information:

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