

**CASE STUDY****PROVIDING RELIEF IN THE AFTERMATH OF HURRICANE KATRINA**

Hurricane Katrina struck the U.S. Gulf Coast states on Aug. 29, 2005. Recorded as the third most powerful storm of the 2005 season, Katrina's storm surge caused catastrophic damage along the coastlines of Louisiana, Mississippi and Alabama. Levees separating Lake Pontchartrain from New Orleans were breached by the surge, ultimately flooding about 80 percent of the city. Hurricane Katrina is estimated to be responsible for \$75 billion in damages, making it the costliest hurricane in U.S. history, and killing 1,418 people.

Countless relief organizations made themselves available to help the impacted regions. Several of them turned to DigitalGlobe's satellite imagery to help map damage and aid in reconstruction efforts.



**This QuickBird image, collected August 31, 2005, shows the New Orleans levee break at Surekote Road.**

San Diego State University (SDSU) partnered with the California Institute for Telecommunications and Information Technology (Calit2) to aid relief efforts, and ImageCat teamed with Risk Management Solutions (RMS) to map wind, storm surge and flooding damage resulting from the hurricane.

DigitalGlobe's QuickBird satellite collected 60-centimeter resolution imagery of New Orleans on Aug. 31, just two days after Hurricane Katrina struck, and again on Sept. 3, nearly one week later. The imagery shows

flooding extent, levee break locations, and damage to structures such as bridges and buildings. It also pinpoints landmarks such as the Louisiana Superdome.

Imagery was also collected over Biloxi, Miss. and the surrounding region. Imagery collected over the same New Orleans and Biloxi regions in March 2004 created critical capabilities for comparing the landscape and infrastructure of the Gulf Coast region before and after the disaster occurred.

**SDSU's Viz Center and Calit2** used the imagery initially to assess the damage and support clean-up efforts by enabling a regional situational awareness campaign for the detailed damage to infrastructure and personal property. The imagery can also be used to estimate impacts on public health due to water volume, damaged infrastructure and storm debris. In the weeks following the hurricane, the imagery was used to support response and reconstruction efforts by front-line responders and command-center groups, including the National Red Cross. Displayed as Web-based interactive maps, the imagery supported initiatives by the National Institute of Urban Search and Rescue (NIUSR, [www.niusr.org](http://www.niusr.org)) to assist with the recovery effort by integrating location information about housing and people.

SDSU initiated the creation of an online clearinghouse, [katrina.telascience.org](http://katrina.telascience.org), to house imagery and geographic information systems data related to the Hurricane Katrina disaster. By typing in a New Orleans- or Biloxi-area street address, the user is able to view satellite imagery of an area of interest. Three-dimensional image displays were created in GeoFusion, whose GeoMatrix format enables rapid flythrough of more than 10 terabytes of data. Additional processing on the SGI Prism ([www.geoplayer.com/gateways/](http://www.geoplayer.com/gateways/)) transformed the large image files into a format that was served up to millions of viewers per day over a standard Internet connection.

According to Eric Frost, director of the Viz Center for SDSU, "The QuickBird imagery became a powerful asset for aiding in critical relief efforts, and the 3D image displays and rapid flythroughs we created with the imagery provided visualization tools to support all of our collaborative efforts with partner agencies."

**ImageCat and the RMS** catastrophe response team used QuickBird imagery and ImageCat's hand-held VIEWS™ reconnaissance system to map and assess damage caused by wind, storm surge and flooding in New Orleans and the entire Gulf Coast region.

One day after the hurricane made landfall, ImageCat used an airplane to fly over the region and record the devastation using ImageCat's VIEWS field data collection and visualization system. Geo-referenced video and still photographs recorded the initial storm flooding and subsequent overtopping of the levees that surround New Orleans. This information provided some of the earliest indications of the extensive damage.

Dr. Beverley Adams, remote sensing group leader for ImageCat, said, "QuickBird enabled us to map in detail the full extent of flooding in New Orleans, view the hurricane's effects using our VIEWS visualization mode, and provide storm surge damage maps for the Mississippi coast. This information was invaluable for calibrating initial damage and loss estimates for the Gulf Coast and New Orleans regions."

####