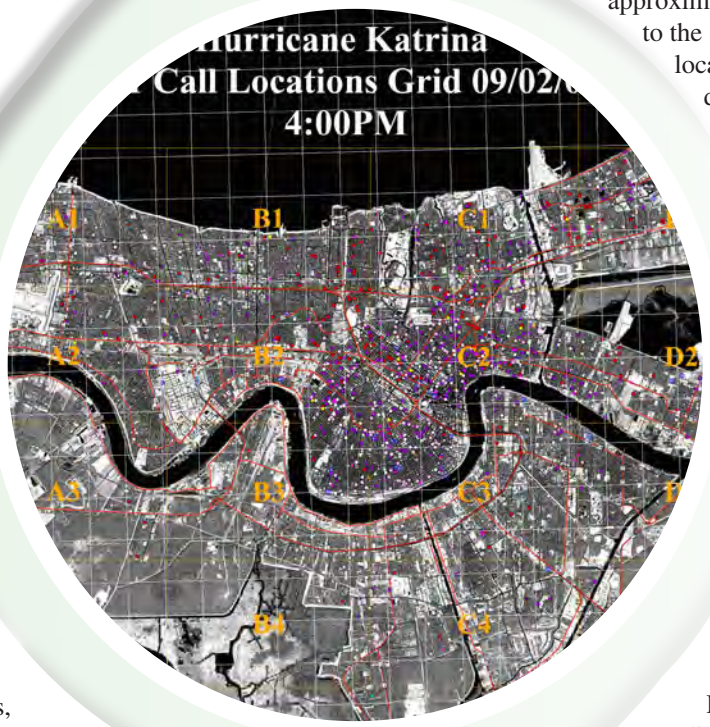
Data Access and Dissemination for Emergency Response and Long-term Recovery Efforts Related to Hurricanes Katrina and Rita

By Scott Wilson and Chris Cretini

The U.S. Geological Survey's (USGS) National Wetlands Research Center (NWRC) responded to Hurricanes Katrina and Rita by providing geospatial support to Federal, State, and local partners. The NWRC used its data and information management systems to deliver aerial photography and maps to emergency responders in a time of critical need.

Introduction

The unprecedented effects of Katrina and Rita on the landscape, infrastructure, and population overwhelmed the Gulf Coast region and hampered the efforts of many who were called upon to respond. The NWRC's history of developing geospatial technology and applications for the Gulf of Mexico region, along with its proximity to the storms, heightened its ability to act quickly. With New Orleans, La., located 130 mi (209.2 km) to the east and Cameron, La., located approximately 115 mi (185 km) to the southwest, NWRC's central location in Lafayette, La., allowed direct communication with Federal, State, and local partners responding to the emergency. The NWRC staff's familiarity with the geographic region, data, and people facilitated a rapid and effective response.



The actions of the NWRC combined the efforts of its Lafayette, Baton Rouge, La., and New Orleans offices and included approximately 65 staff members providing 24-hour-per-day support when needed. Data management and dissemination at the NWRC are aided by several applications, including multiple Web sites, ArcIMS® (Arc Internet Map Server), databases, and tracking systems. Geospatial data are managed to allow simultaneous access by multiple users, and large data sets are replicated across field offices to allow more efficient access. Tasks included geocoding 911 calls for search and rescue, establishing mobile geographic information system (GIS) offices in New Orleans, Baton Rouge, and Cameron, La., and delivering data and information to local

responders. Electricity and Internet connectivity were limited following the storm; thus, NWRC staff hand-delivered data on a daily basis. Data deliveries along the Mississippi Gulf Coast and to New Orleans, Baton Rouge, and Cameron were frequent, often several times per day.

Federal and State partners that the NWRC assisted in coastal recovery included the Louisiana Coastal Area (LCA) Study; Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Task Force; and the Gulf of Mexico Alliance. The New Orleans District U.S. Army Corps of Engineers (USACE) facilities were shut down in advance of Katrina and remained closed during the flooding that followed Katrina. A number of USACE personnel working on the LCA program, along with a USACE emergency response team based in St. Louis, Mo., mobilized at their Lafayette office adjacent to the NWRC. The team's responsibilities included an assessment of levees, breach locations, and infrastructure such as pump station locations. The USACE requested that the NWRC support this task by producing parish-level maps for the field crews responsible for assessing conditions. The team also requested maps showing Mississippi River mile marker locations of levee breaches for use when conducting helicopter surveys south of New Orleans. The Center supported the Louisiana Department of Homeland Security and Emergency Preparedness in Baton Rouge by delivering National Oceanic and Atmospheric Administration aerial photography, which was obtained 3 days following Katrina.

Following Katrina and Rita, the Federal Emergency Management Agency (FEMA) coordinated aerial flyovers of the affected areas to gather information for emergency response and damage assessments. Post-Katrina imagery was acquired over a 3-week period beginning in early September 2005, and post-Rita imagery was collected in late September through mid-October. During the flight periods, available Tagged Image File Format (TIFF) imagery was delivered to the NWRC daily from the USGS Earth Resources Observation and Science (EROS) Data Center. The 1-ft (0.3-m) natural color photography was converted to Joint Photographic Experts Group (JPEG) file format for easy accessibility and viewing over the Internet. Over 6,000 frames of posthurricane imagery are available on the CWPPRA Web site (*http://www.lacoast.gov*) (fig. 1). Aerial photography downloads

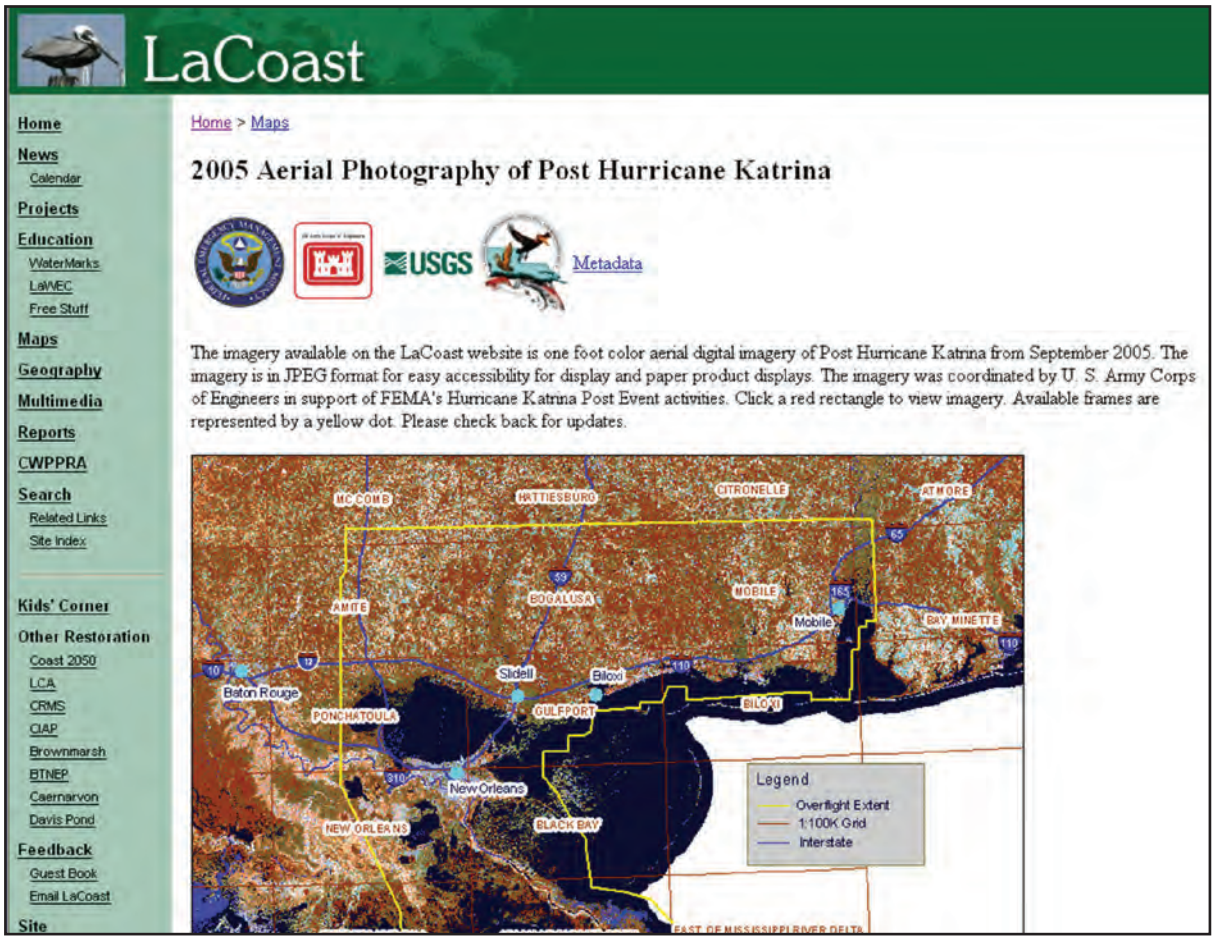


Figure 1. Aerial photography of areas impacted by Hurricanes Katrina and Rita is available at *http://www.lacoast.gov*. The extent of the Hurricane Katrina overflight is outlined in yellow.

averaged about 1 gigabyte (1024^3 bytes)/day for several weeks following the storms. The CWPPRA Web site is recognized as a source for data and information relating to coastal Louisiana and includes a special Hurricane Information Center offering links to USGS data as well as Federal and State agency resources for hurricane data and reports. The Breaux Act Newsflash is a subscriber-based email newsletter associated with the CWPPRA Web site. In the months after the hurricanes, the newsflash was used to keep thousands of subscribers apprised of coastal restoration activities and recovery efforts.

The USGS is making an additional imagery data set available that covers the areas affected by Hurricanes Katrina and Rita. This coastwide flight was conducted during October–December 2005 and resulted in 3.28-ft (1-m) color composite infrared digital orthophoto quarter quadrangles (DOQQs). This imagery is being converted to JPEG file format and is available on the CWPPRA Web site (*http://www.lacoast.gov*) (fig. 2). The CWPPRA Web site was cross-referenced with the NWRC Web site (*http://www.nwrc.usgs.gov*) (fig. 3) throughout the hurricane response.

The NWRC's close working relationships with local, State, and Federal partners were key factors in responding to Katrina and Rita. They allowed NWRC to quickly make data available and participate in immediate response efforts such as search and rescue and mapping of infrastructure. The data will remain available for use in long-term recovery planning and to track ecological response to the storms. The NWRC will continue to be mindful of the secondary uses of data management systems, such as emergency response, when planning data access and delivery systems in the future.

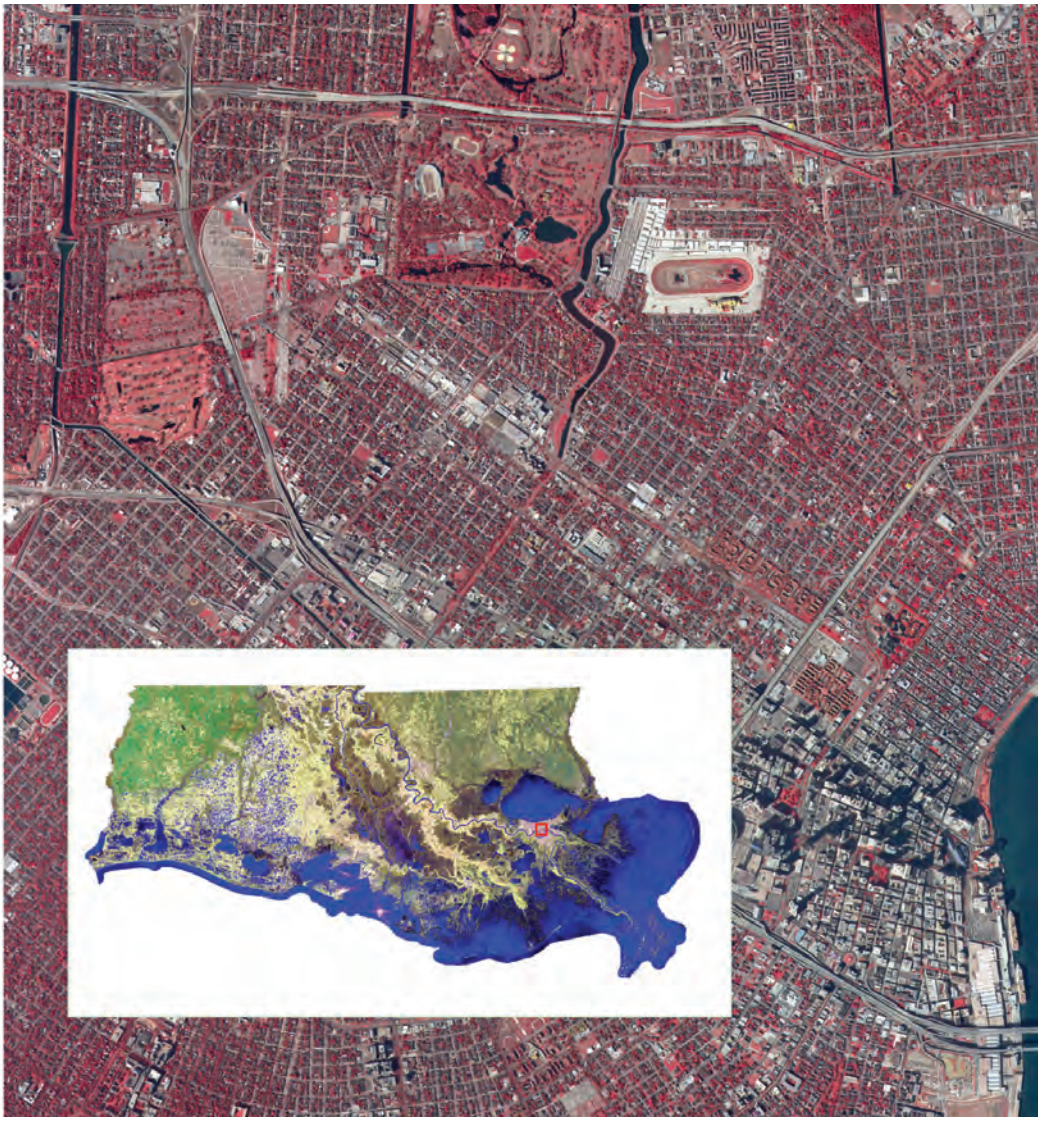


Figure 2. New Orleans, La., digital orthophoto quarter quadrangle. This 3.28-ft (1-m) color infrared image was acquired in November 2005.

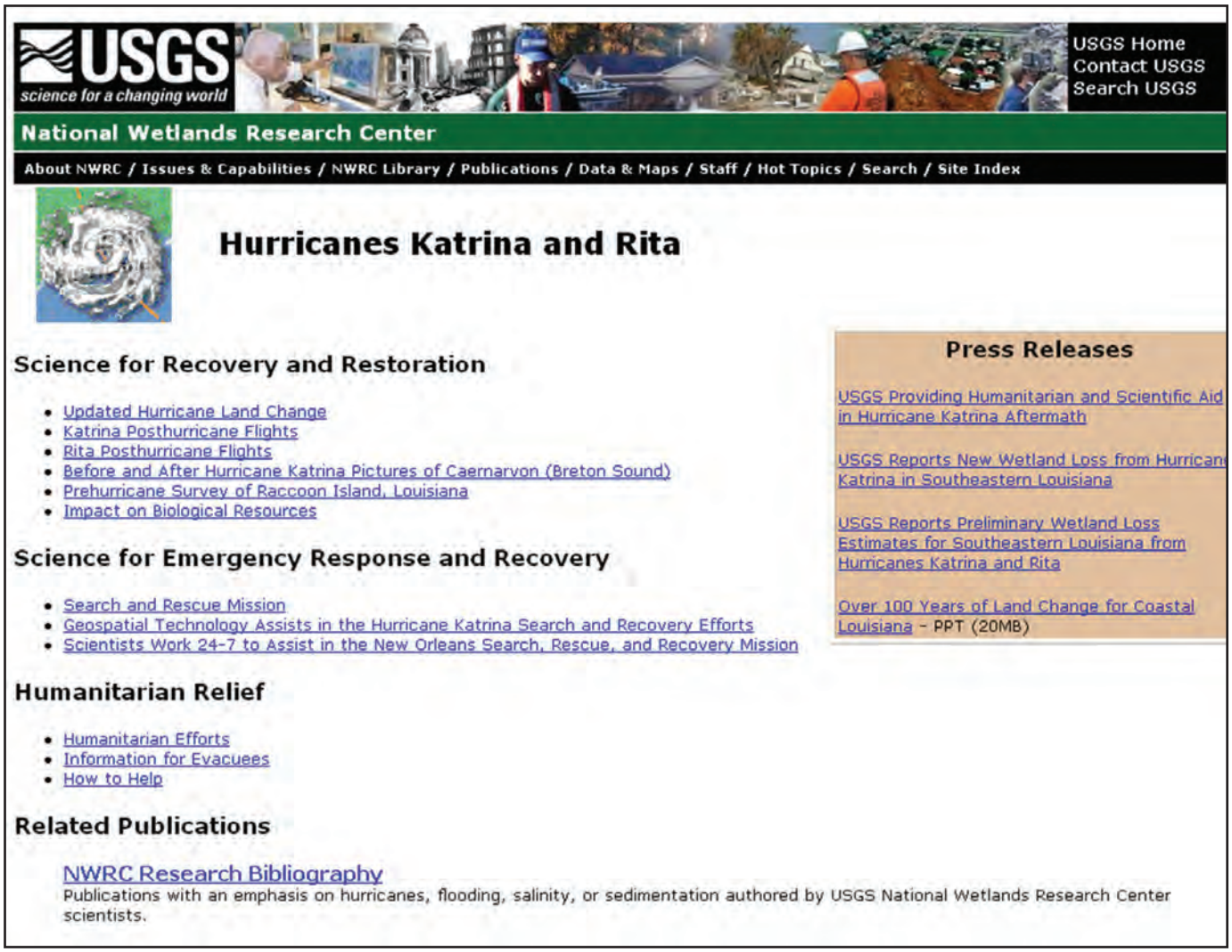


Figure 3. Hurricane section of the U.S. Geological Survey's National Wetlands Research Center Web site (*http://www.nwrc.usgs.gov/hurricane/katrina*).

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