Bringing the Gulf Coast Back to Life

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Are You Ready to Shift Up?

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THALES

A Picture...
IS WORTH
A THOUSAND LIVES

JoAnne Castagna, Ed.D.

We've all seen the images of Hurricane Katrina's destruction—flooded streets, destroyed homes, shattered families. It's these same images that will help rebuild the lives of our fellow Americans in the Gulf Coast.

The U.S. Army Corps of Engineers is using a Geographic Information System (GIS) to create maps that are needed before the Corps can perform recovery efforts in support of the Federal Emergency Management Agency (FEMA) and other state, federal, and volunteer agencies.

The Corps has more than 1,600 employees actively engaged in the recovery efforts throughout Mississippi, New Orleans, and Louisiana that includes providing residents' temporary housing and roofing, power, debris removal, water, ice, as well as repairing the levees around New Orleans and pumping floodwater out of the region.

"The region needs to be mapped out first before these recovery efforts can begin because the hurricane blew away most of the street signs so rescue teams and recovery teams have no idea what streets they are on," said Stephen Mcdevitt, GIS, USACE, New York District, who is one of three national action officers responsible for deploying and managing GIS teams throughout the disaster region.

Maps can be created using a GIS, a computer-based information system and analytical tool. Mcdevitt said, "The GIS takes data from various sources, including aerial photography, flood zones and demographic data, and combines these layers of information in various ways as overlays to perform spatial analysis and produce a map which depicts the results of that analysis."

Creating GIS images is the first step to performing recovery efforts that include:

- **Assessing post-disaster damage:** To assess damage, maps are created of the entire region. First aerial photos must be taken of the entire region. These photos are then laid over geographic coordinates and this information is brought into a computer mapping system to create a map.
- **Rescue & recovery:** The GIS teams are gathering data of where hurricane victims are located and feeding this information into the GIS database. This data is being combined with the aerial photography and other geographic data to produce maps that search and rescue workers can use to locate and recover stranded individuals.
- **Building temporary homes:** Temporary housing is only allowed to be created on land that is not prone to flooding, is safe and is in the proximity of services, such as hospitals and schools. Data on the flood zones is combined with other data types to produce maps, which show the best locations for temporary housing.


Hurricane Katrina's Path. Image courtesy: U.S. Army Corps of Engineers

The GIS Response Team looks over the mapping with a Corps customer at the Baton Rouge, La. Joint Field Office. The field office was established in September to provide GIS mapping support to the Hurricane Katrina Corps mission. Image courtesy: Jared Andre, GIS specialist, C-K Associates, LLC

■ **Removing debris:** The GIS maps can show engineers where debris is located. Engineers can calculate how much debris there is from these maps and determine how much it would cost to remove it. These maps can also show where the land is clear. Clear land is needed for "staging areas" to hold the equipment that will be used to remove the debris. In addition, GIS can show engineers the optimal routes for removing and transporting the debris.

■ **Pumping floodwater:** The GIS can perform 3D analysis and modeling, which shows how long it will take for floodwaters to subside, using different rates of pumping. In addition, GIS teams in the field can provide data of where pump stations are located and which ones are working and not working. This data can be
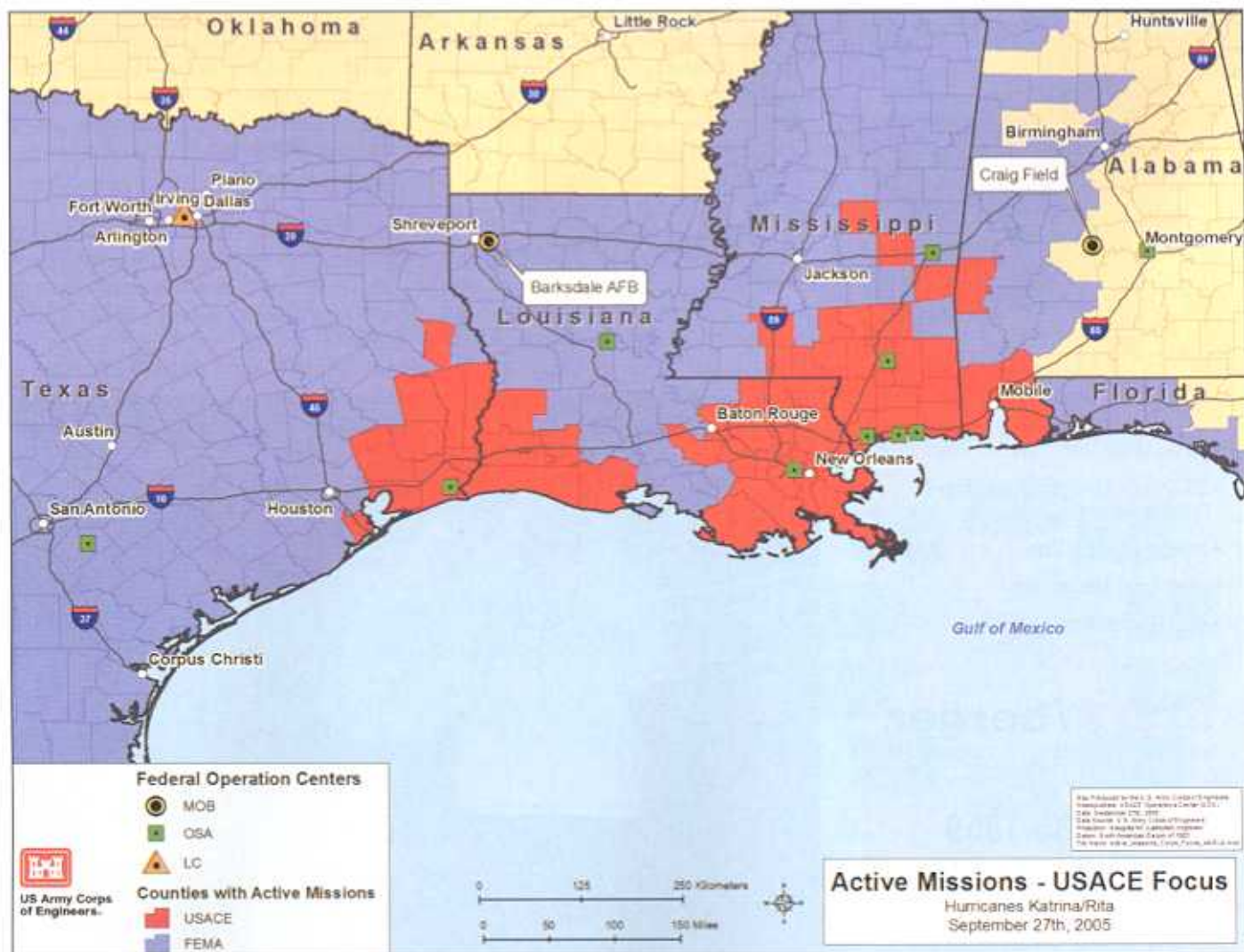
Regions where the Corps is performing its missions. Image courtesy: U.S. Army Corps of Engineers

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used to help figure out how long it will take to pump water out of the region.

■ **Identifying impacted communities:** The GIS can create demographic maps that identify what economic and racial groups are impacted the most. These maps can be created by taking hurricane path data and combining this with the aerial images, wind speed data, and census data. These maps are used by various groups involved in the rescue and recovery efforts, such as The American Red Cross.

GIS is one of several tasks that must be initiated immediately when acting on a disaster relief situation.

Mcdevitt said, "Communicate, co-ordinate, and cooperate are the three essential Cs for getting things going and accomplishing what you need to in a short amount of time in disaster situations." He suggests the following to engineers faced with initiating a disaster relief mission:

Plan ahead.

Create a team of diversified specialists: Many of the GIS team members are non-GIS specialists, but come from other disciplines. These other additional skills can meet the many needs during a disaster.

Organize and utilize available resources: The Corps called upon existing contractors in order to be able to begin work immediately. "In the beginning we needed to take aerial photography of the disaster and were able to immediately call an existing contractor to perform this work," said Mcdevitt.

Keep lines of communication open: The Corps has been working closely with other agencies and so far the working relationship has been great and Mcdevitt believes it's due to their frequent communication, "I have two teleconference meetings with FEMA and other federal and state agencies daily."

Mcdevitt said, "There is an incredible variety of ways that GIS can be used to help support disaster missions. A picture is worth a thousand words and if that picture has a lot of useful information on it people do relate to them." ∜

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Corps GIS team in Jackson, Mississippi. Image courtesy: U.S. Army Corps of Engineers