

A small county's response to a big disaster: Bolivar County, MS and Hurricane Katrina

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Bolivar County Emergency
Management Agency

Topics

- ▶ About Bolivar County EMA and the EOC Response Team
 - Storm tracking group
 - Communications group
 - K-9 Search and Rescue group
 - Fire/Rescue strike team
 - Mapping response team
- ▶ Katrina response
 - Overview maps
 - Before/after aerial imagery
 - Before/after ground imagery
- ▶ Rita response
 - Overview map
 - Ground imagery

About Bolivar County EOC

- ▶ The Bolivar County Civil Defense Agency was formed in 1960 to protect and prepare citizens in the event of war or natural disaster.
- ▶ Became the Emergency Management Agency in 1989 when mission expanded to include
 - Preparedness
 - Response
 - Recovery
 - Mitigation
- ▶ Current organization is modular allowing for an immediate and customized response to any emergency type
- ▶ **Severe weather is the #1 cause for mobilization of EOC resources**

Current Modules

- ▶ K9 Urban/rural search and rescue
- ▶ Communications
- ▶ Storm spotting/tracking
- ▶ Mapping
- ▶ Fire/rescue

Storm Tracking

► Objectives:

- Field observation at the bounds of WX-88D coverage areas (at the edges of Jackson, Memphis, and Little Rock radar sites)
- Field verification / real-time feedback of radar imagery
- Immediate intervention – on scene as soon as storm has cleared area
- Public protection – re-route traffic around probable storm paths, improved warning/re-enforced warning, and “showing the flag”

Storm Tracking

► Capabilities

- All members must complete NWS Storm Spotter training
- Field mobile with 3 pickup/utility trucks and 2 Suburbans equipped with radios, warning lights and sirens, chain saws, and box lights
- Managed through Emergency Operations Center equipped with base radios, direct communications to NWS Jackson, and local weather radar
- Typical tornado response may include activation of mapping team and Fire/Rescue (use of their thermal imagers has saved lives in Bolivar County)

No Dorothy, that isn't a twister...



No Tom, it isn't War of the Worlds II



Now that's a twister...



Mapping

- ▶ In partnership with Delta State University's Center for Interdisciplinary Geospatial Information Technologies (GIS Center)
- ▶ Objectives
 - Integration of field observations with radar and satellite images
 - Assistance with command and control
 - Critical incident support/visualization
 - Responder maps and routing

Mapping

► Capabilities

- Self supporting and field mobile. Can be anywhere in MS in 2 ½ hours using fleet of aircraft from DSU Flight School
- May deploy field teams with laptops and/or command and control group for integration with ESF-5 or HQ Groups
- Will deploy with servers, projectors, and plotters as needed
- 10 WAAS enabled combination GPS/2-way radio Garmin Rino devices (3-m accuracy) and 1-survey grade GPS system (10 mm accuracy)

Mapping: Katrina Response

- ▶ Started by Bolivar County EOC/Fire Dept. member Talbot Brooks using DSU students Leonard Locke, Kimani Waweru, and Pierre Roy
- ▶ They assembled and managed more than 60 volunteers from across the nation through educational/professional contacts and URISA's GIS Corps



Mapping: Katrina Response

► National

- The translation of hundreds of street addresses to latitude/longitude for the US Coast Guard for helicopter and ground-based rescue.
- The provision of cartographic, analysis, and printing support for the Federal Emergency Management Agency (FEMA) from 27 August through 8 September when FEMA resources were finally in place within the region
- The coordination of data sharing among responding agencies at the Federal level, including FEMA, EPA, FL SERT, NY CERT, and many others.
- Maps created by the GIT response team at MEMA were provided as briefing materials before Congress and the President, as seen on CNN and other major news networks.

Mapping: Katrina Response

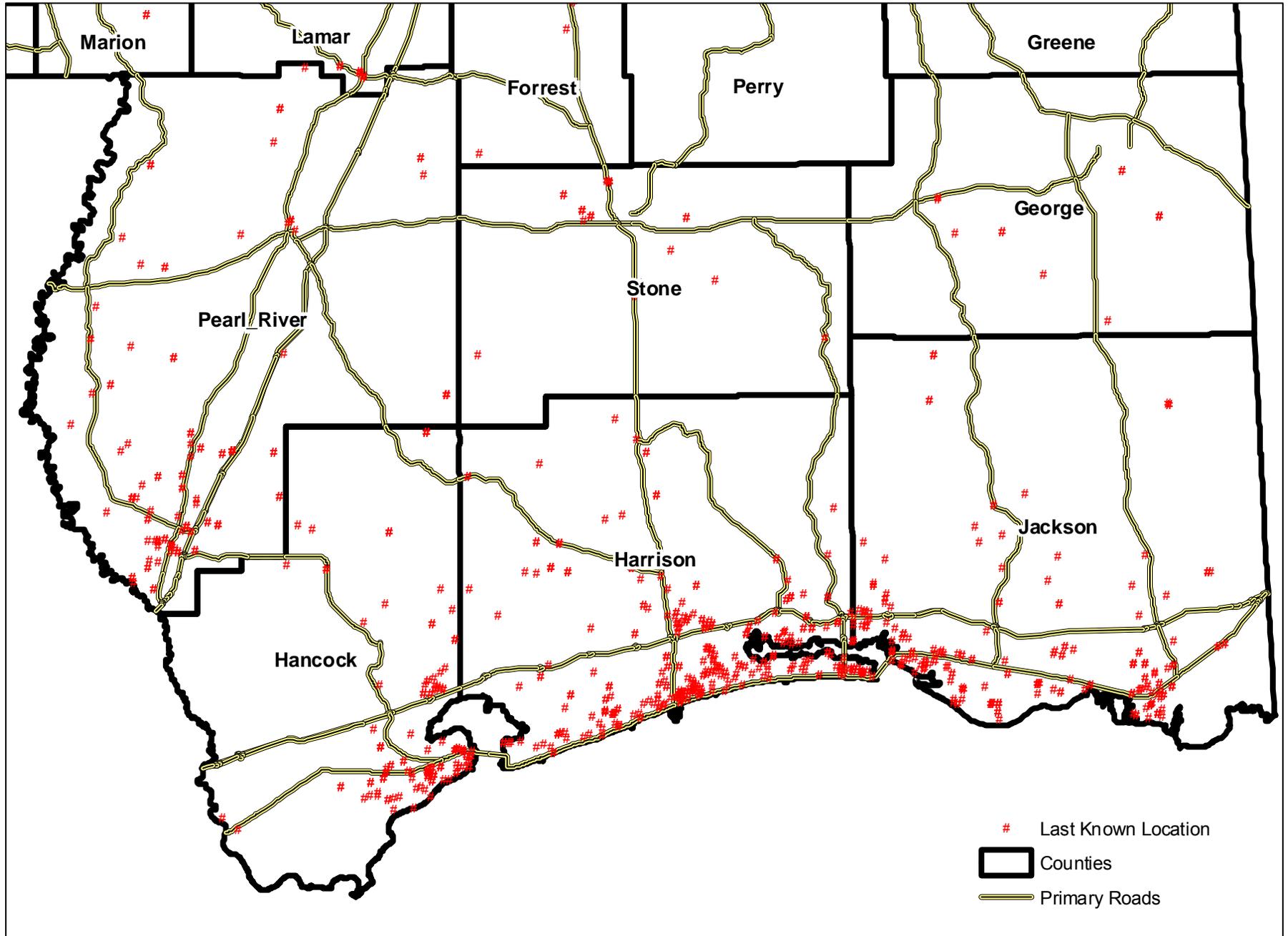
- ▶ State: GIT mapping activities for decision makers at the Jackson Emergency Operations Center (EOC) included:
 - Assisted with the creation and integration of the missing-persons database and subsequent mapping.
 - Energy: power outage maps, power restoration maps, location of major electric transmission and oil/gas pipelines.
 - Communications: cell phone tower and coverage maps
 - Public Safety: provided more than 250 search and street maps to initial responders during first 24 hour operational period alone. Created index street map books for 6 southern counties.
 - Department of Environmental Quality: Provided hazards location map (underground gas storage, location of facilities with HAZMAT inventories....)
 - Public Works: Location of DOH wells, electric substations, and other critical infrastructure for restoration of services
 - Department of Health/Emergency Medical Services: power outages, hospital status, and other life safety concerns.
 - Red Cross, Salvation Army, Mental Health: maps of shelter, food, and water distribution points and capacities

Mapping: Katrina Response

▶ Local

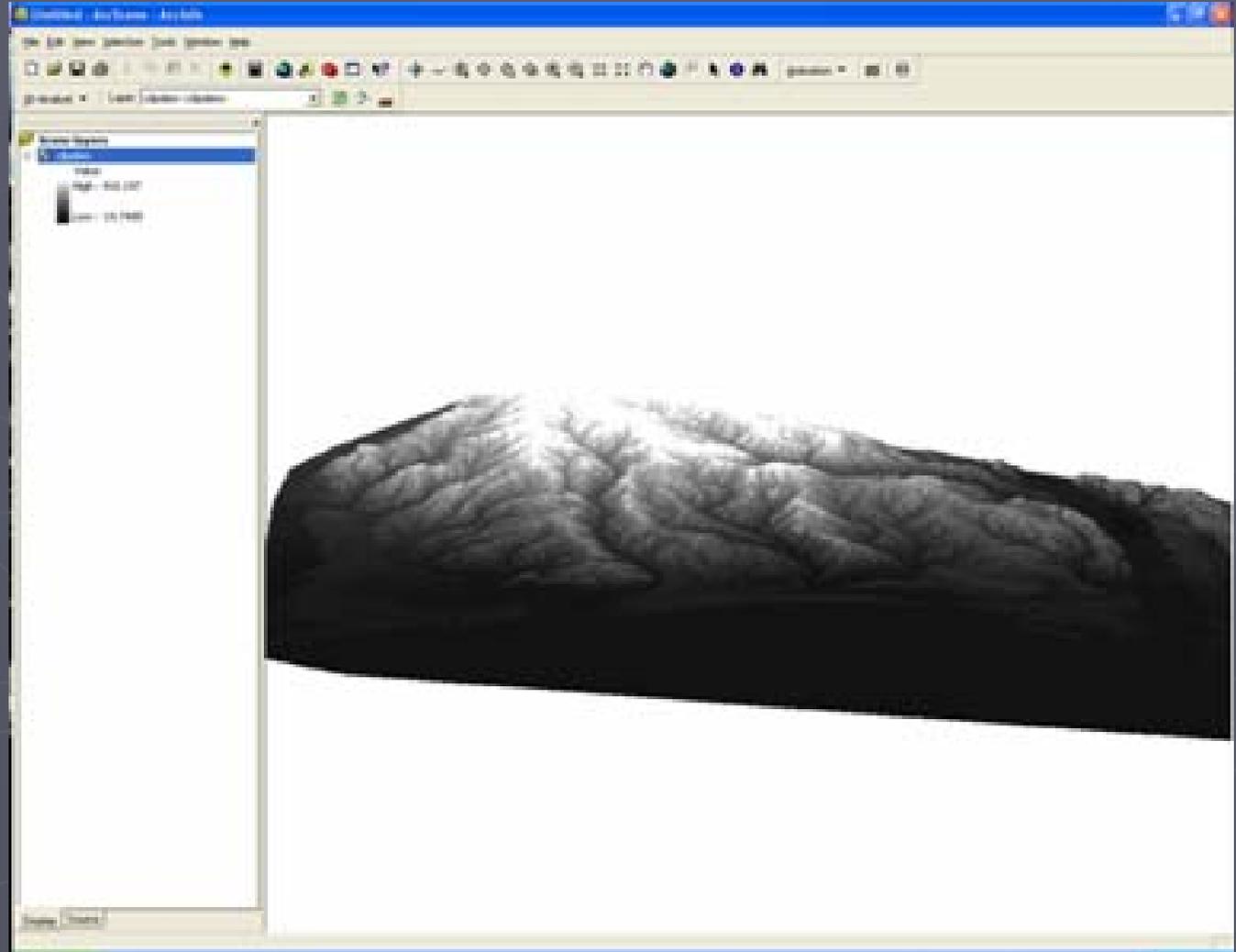
- Printing and GPS supplies were obtained in Jackson and flown to coastal counties for use by local EOC's
- Personnel were sent forward to Stone, Lincoln, and Hancock counties to assist with mapping needs.
- Street and search maps produced at the Jackson EOC were flown to all affected counties.

Last Known Positions of Missing Persons (as reported through MEMA, 4 Sept 05)



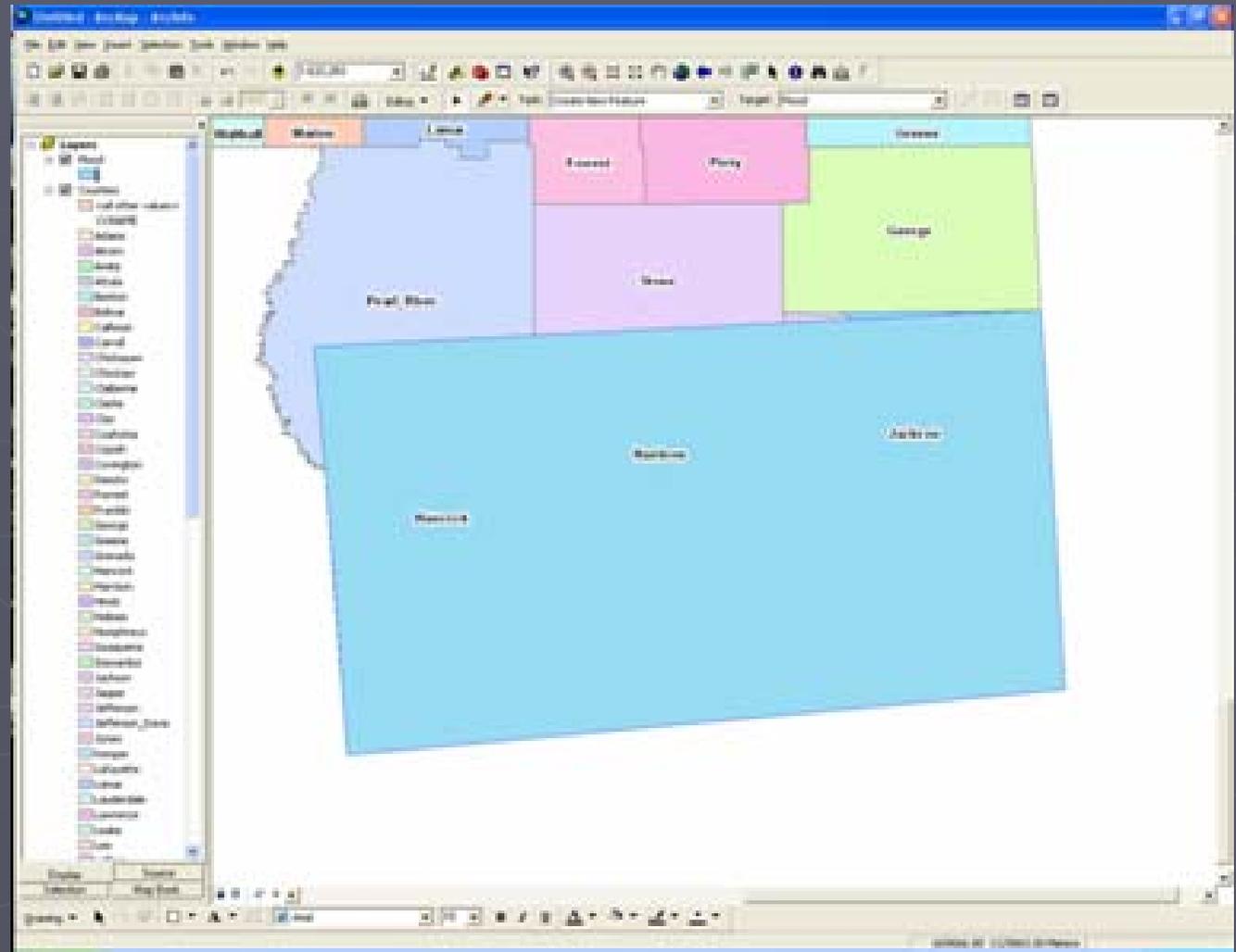
Storm Surge Prediction with NWS

We were in constant communication with NWS Jackson and on-site NWS reps. used their modeled surge heights to create predicted surge maps. Maps, unfortunately, validated well after the storm. This image shows the capture of elevations using a digital elevation model. Sorry gang – HAZUS crashed whenever we tried to use its flood capabilities.



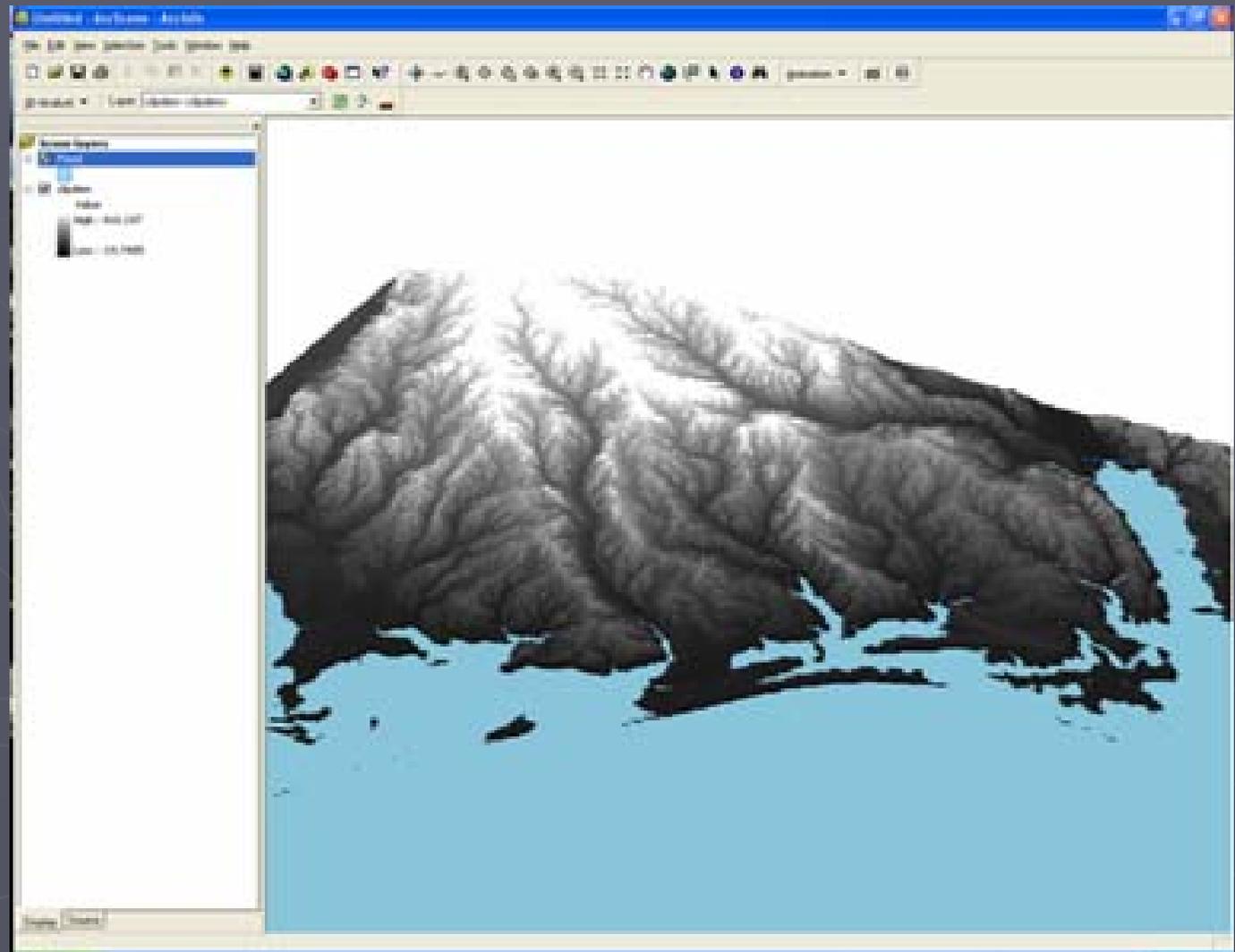
Storm Surge Mapping

After the elevation model was made, we draw a simple polygon and laid it on top of the coastal counties. This polygon would be used to represent sea level.



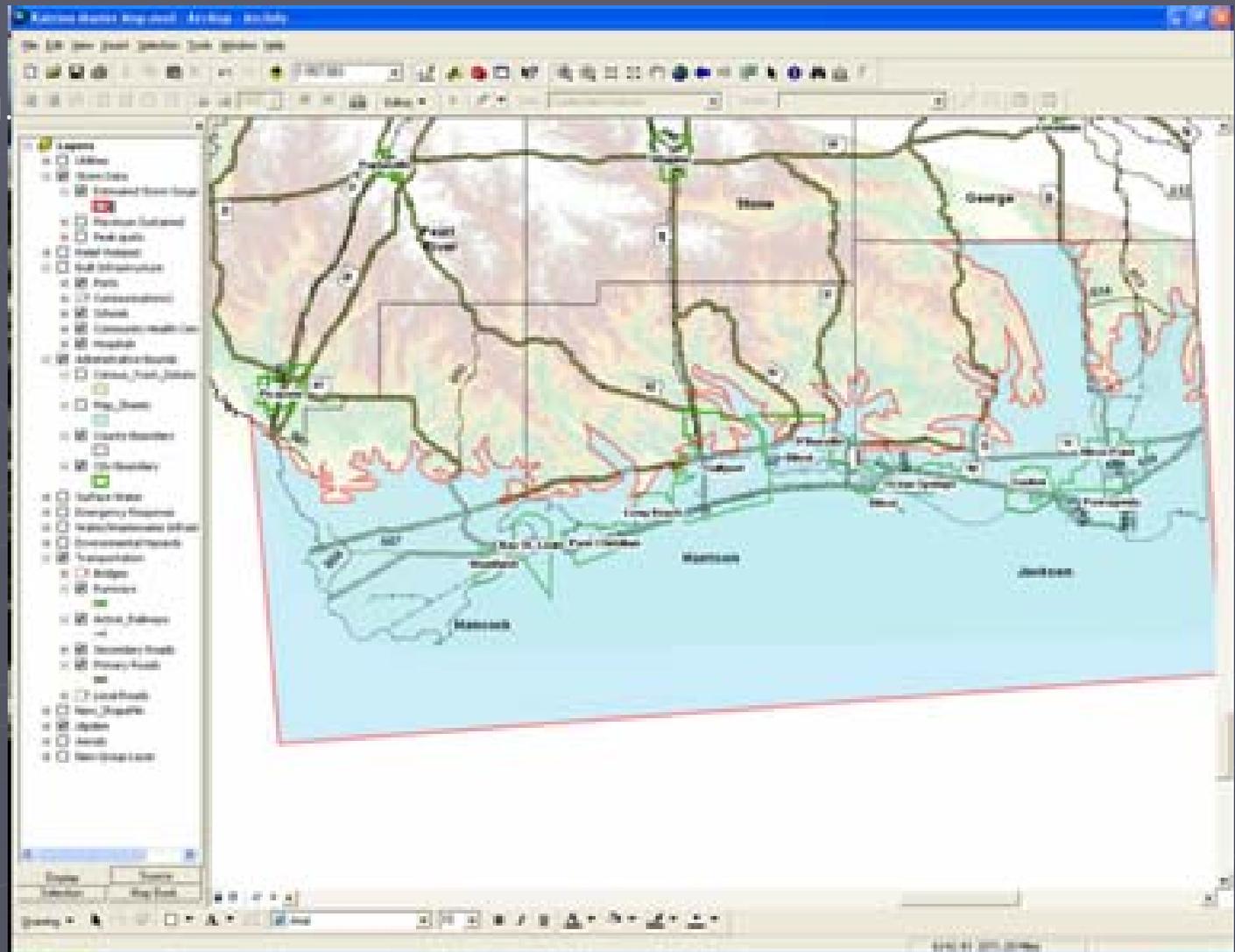
Storm Surge Mapping

The polygon was then elevated to the predicted storm surge heights being fed to us in the EOC by NWS. Where the polygon intersected with the elevation model indicated the areas most likely to become inundated by storm surge.



Storm Surge Mapping

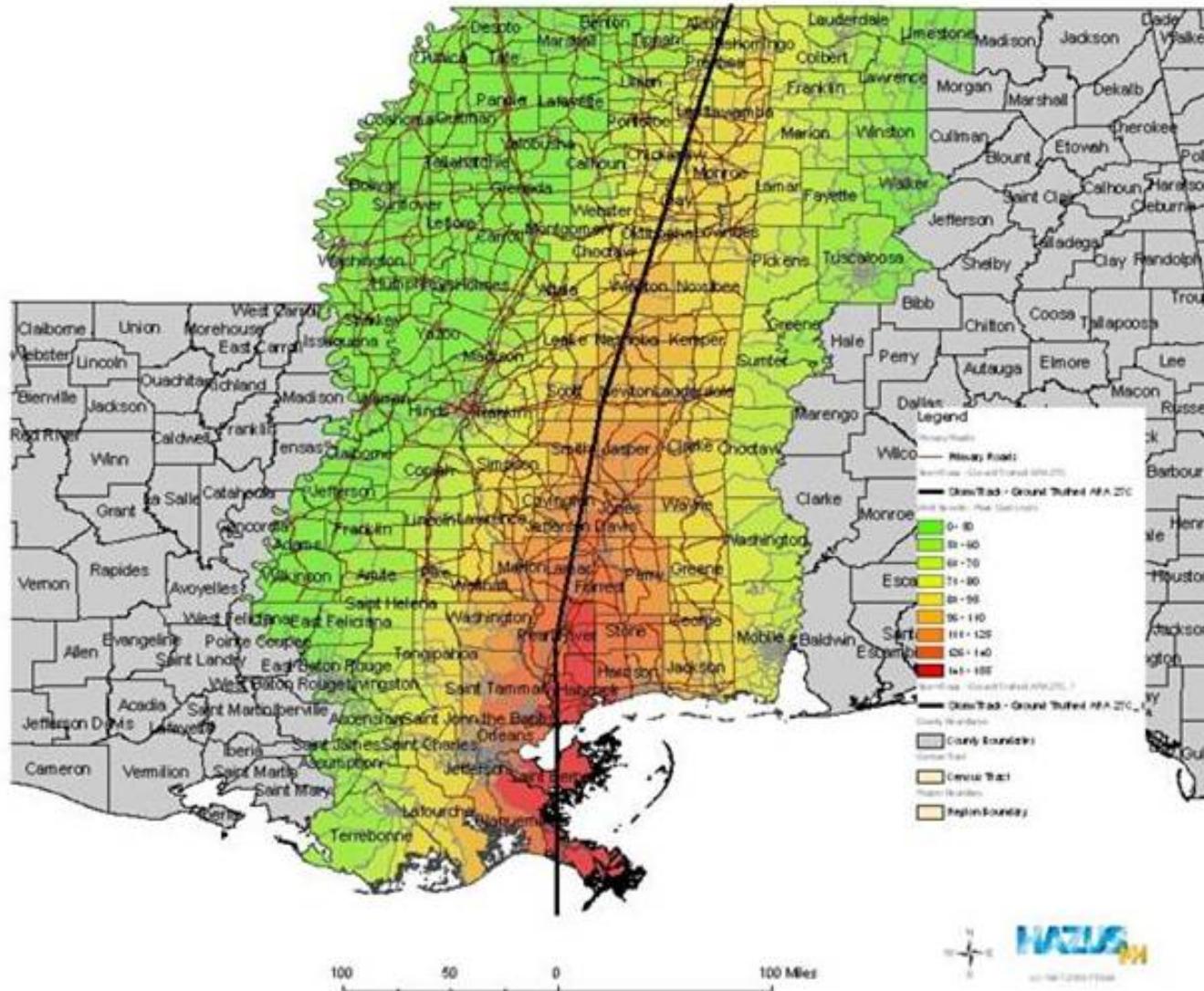
This is an example of the surge mapping. This map shows a worst-case scenario of 32' surge with 15' wave action. It was later validated for western Hancock County.

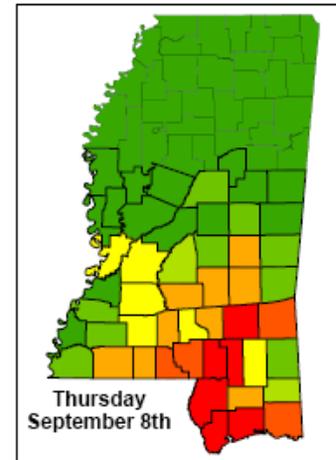
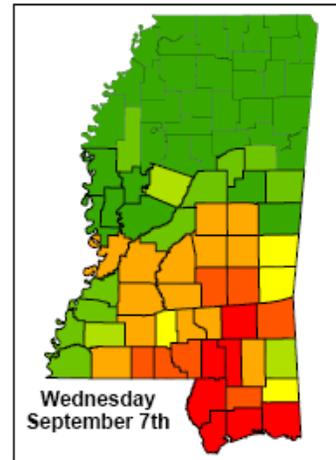
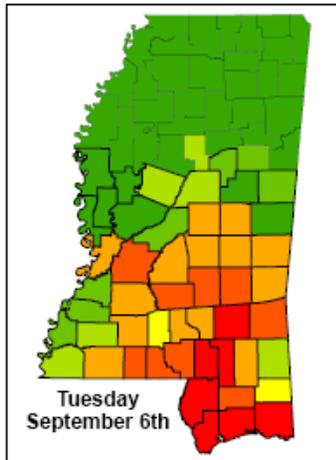
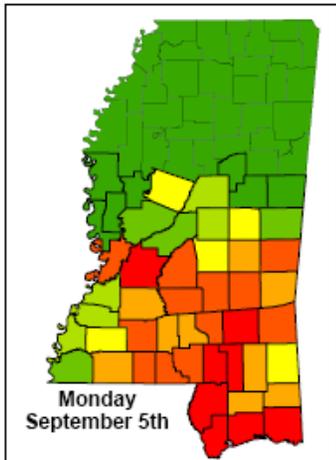
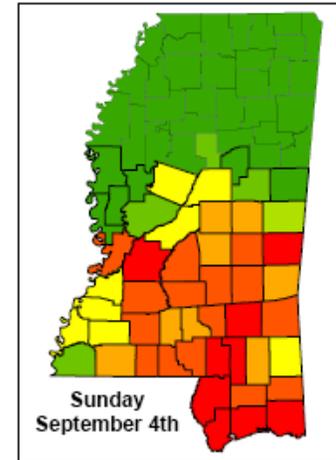
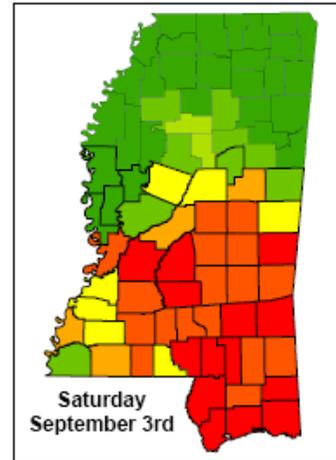
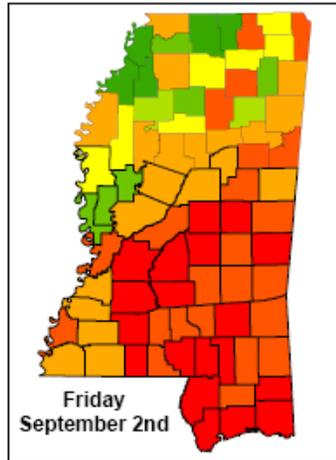
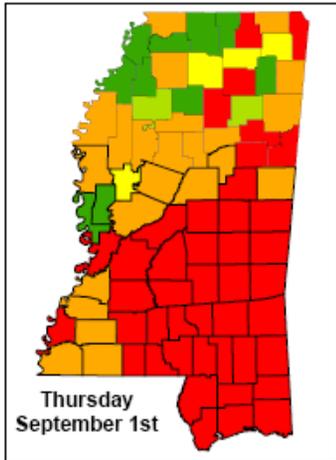


HAZUS Wind Fields

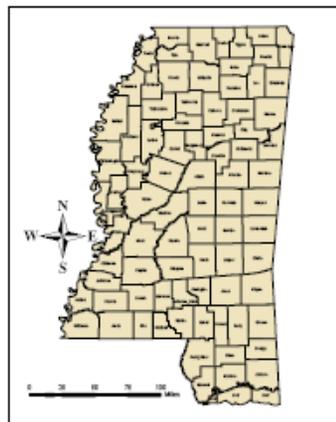
HAZUS-MH Ground Truth Wind Field
ARA 27C 8/29/05 16:00

Created by C. Jay Miller, UH/CCBP, and T. Peter Beck, DHS/DA/GE/C&E



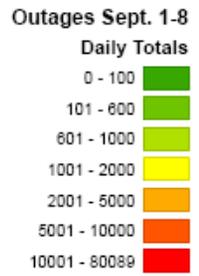


Map Contact: Hal Robinson - 1430 Hours, Sept. 9, 2005



Power Outages September 1 - 8, 2005

Data from EPA's, ENTERGY, MSPCO, TVA



Mapping team from across the nation!





Delta K-9 Search and Rescue

► Objectives

- Search and rescue (locate missing persons)
- Locate fugitives
- Assist with law enforcement investigations

► Capabilities

- 100% CERT qualified
- Air scent tracking (bloodhounds)
- Cadaver
- Land/water trained
- Deploys with HQ trailer and generator

Gone to the dogs



A whole new meaning to the "dog found a bone"...



Delta K-9 SAR: Katrina Response

- ▶ Responded to Harrison and Hancock Counties
- ▶ Performed house-to-house searches
- ▶ Used dogs to search rubble piles
- ▶ Located 10 deceased victims (closure for families)
- ▶ Deployed for 10 days

Delta K-9 SAR: Katrina Response



Fire/Rescue

► Objectives

- Respond to all fire and rescue based emergencies
- Respond as Fire Dept. or with water-rescue team on Mississippi River or other bodies of water
- Vehicle and farm rescue specialists
- Rural first responders

Fire/Rescue

► Capabilities

- 13 Engines
- 5 Tankers
- 1 Rescue
- 1 HAZMAT Trailer
- 75 die hard, dedicated, get-it-done firefighters

Wet stuff on the red stuff...



The oven is pre-heated...



Fire/Rescue: Katrina Response

- ▶ Sent 1 Engine Co. and 10 firefighters to Biloxi
- ▶ Supplemented Biloxi fire crews so that they could go home and check on their families
- ▶ Deployed for 10 days

Communications

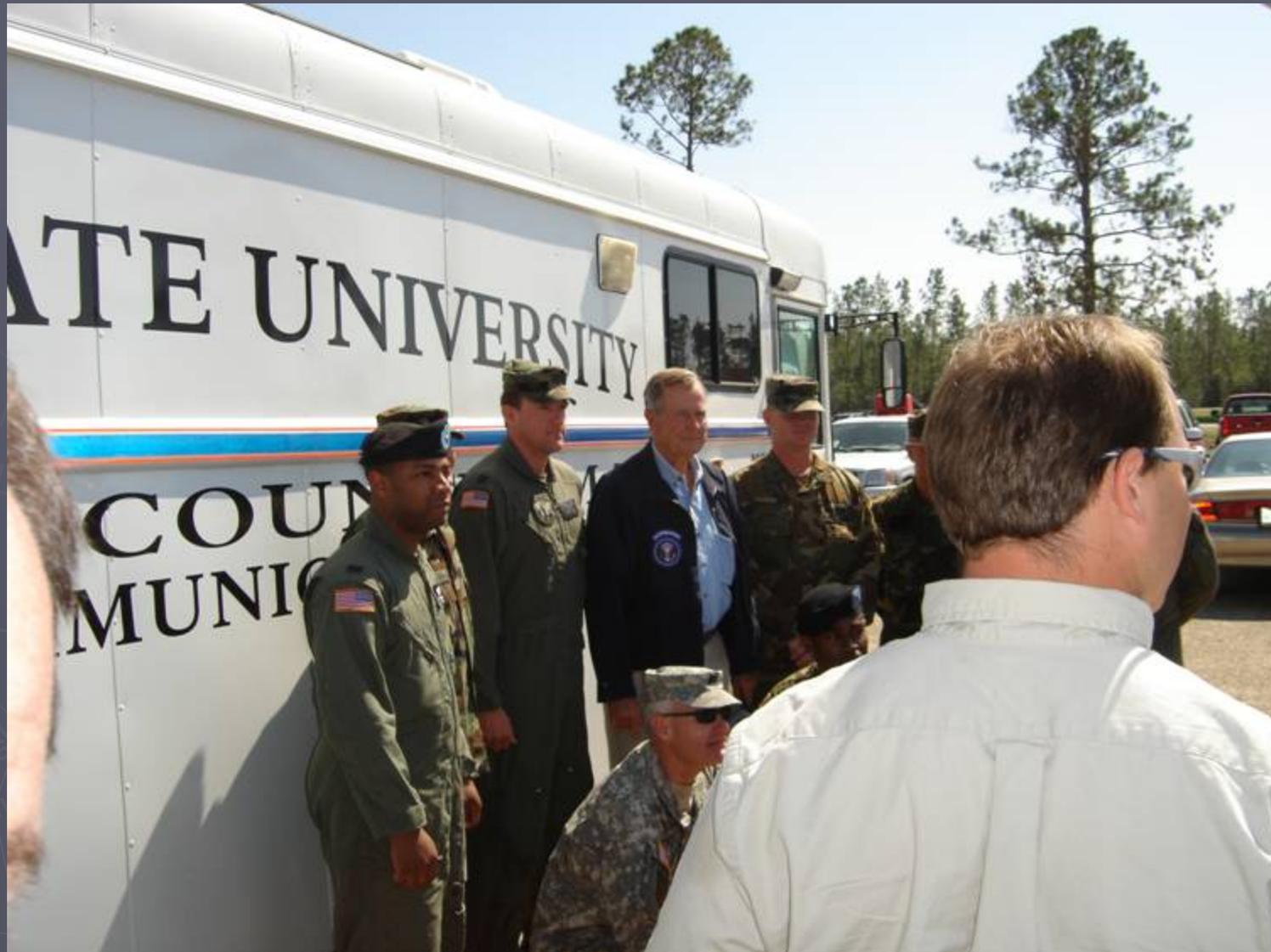
► Objectives

- Interoperability during crisis
- Backup communications for any location in state
- Command and control
- Dispatch/response
- Self-sufficient

Communications: Katrina Response

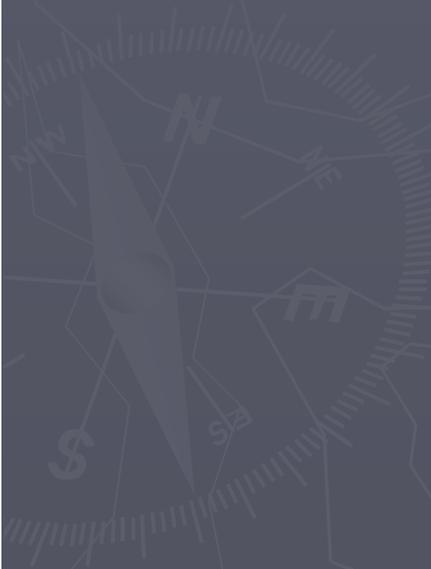
- ▶ Team of 2 dispatchers and EOC Director to Hancock County
- ▶ Were the entire 911 system for Hancock County – a 24/7 operation for 6 weeks
- ▶ Stepped in and completely replaced all emergency communications during initial response
- ▶ Coordinated communications for over 20 different agencies





Waveland: The eye of the storm

(or what's left of it)









Gulfport

In the middle of it all





Shipping Containers

Aquarium

Gulfport

Casino



Shipping Containers

Aquarium

Casino



Gulfport

Delta K-9 searched this

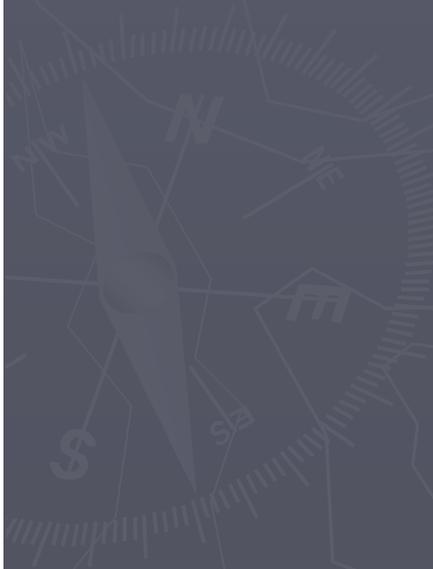
Shipping Containers

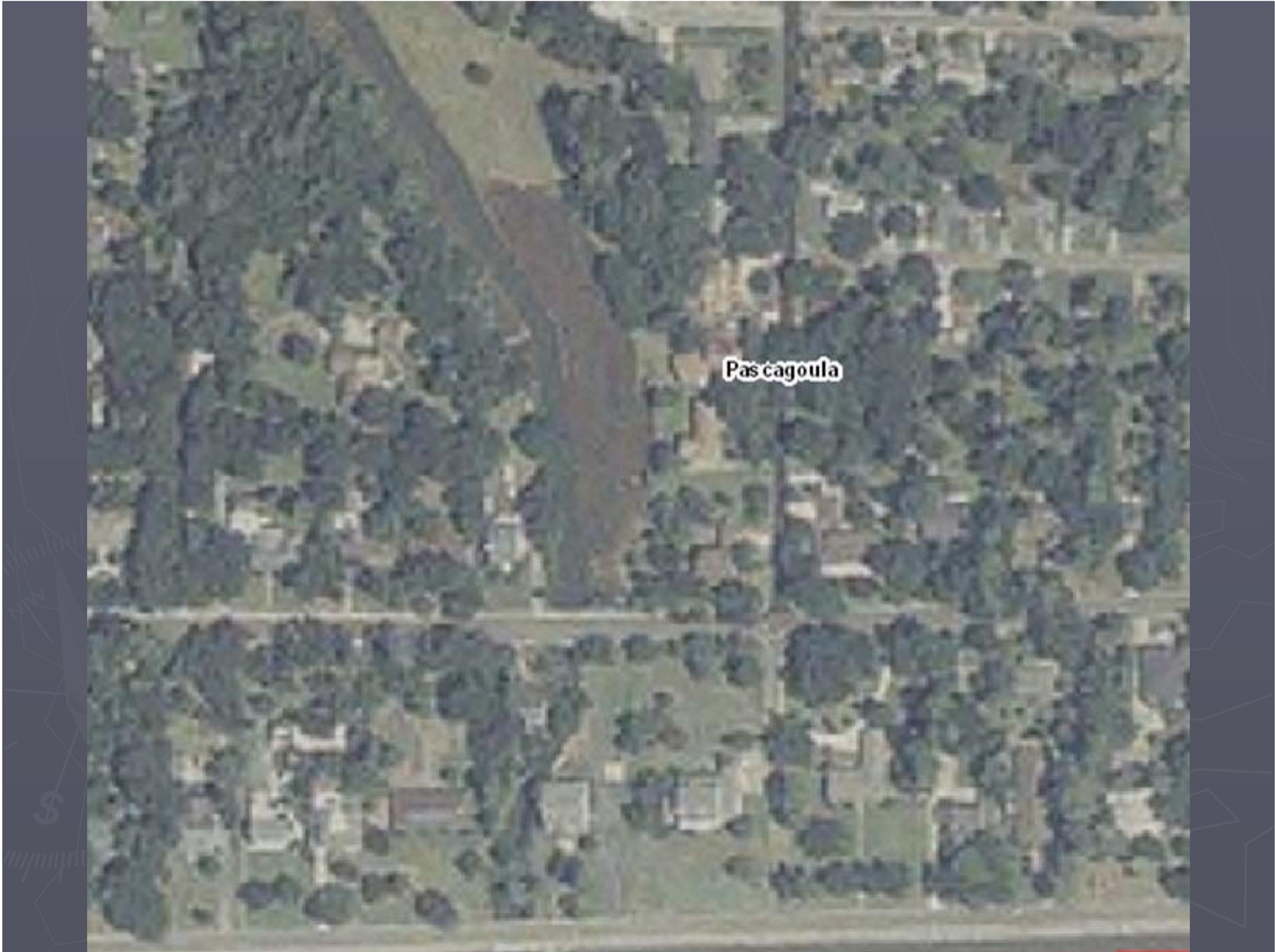
Casino

Aquarium

Pascagoula

~ 65 miles to the east





Pas cagoula



Pas cagoula



Pas cagoula





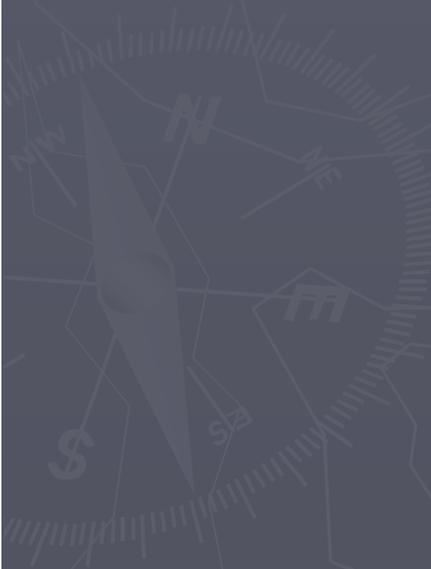








Rita: Insult to Injury

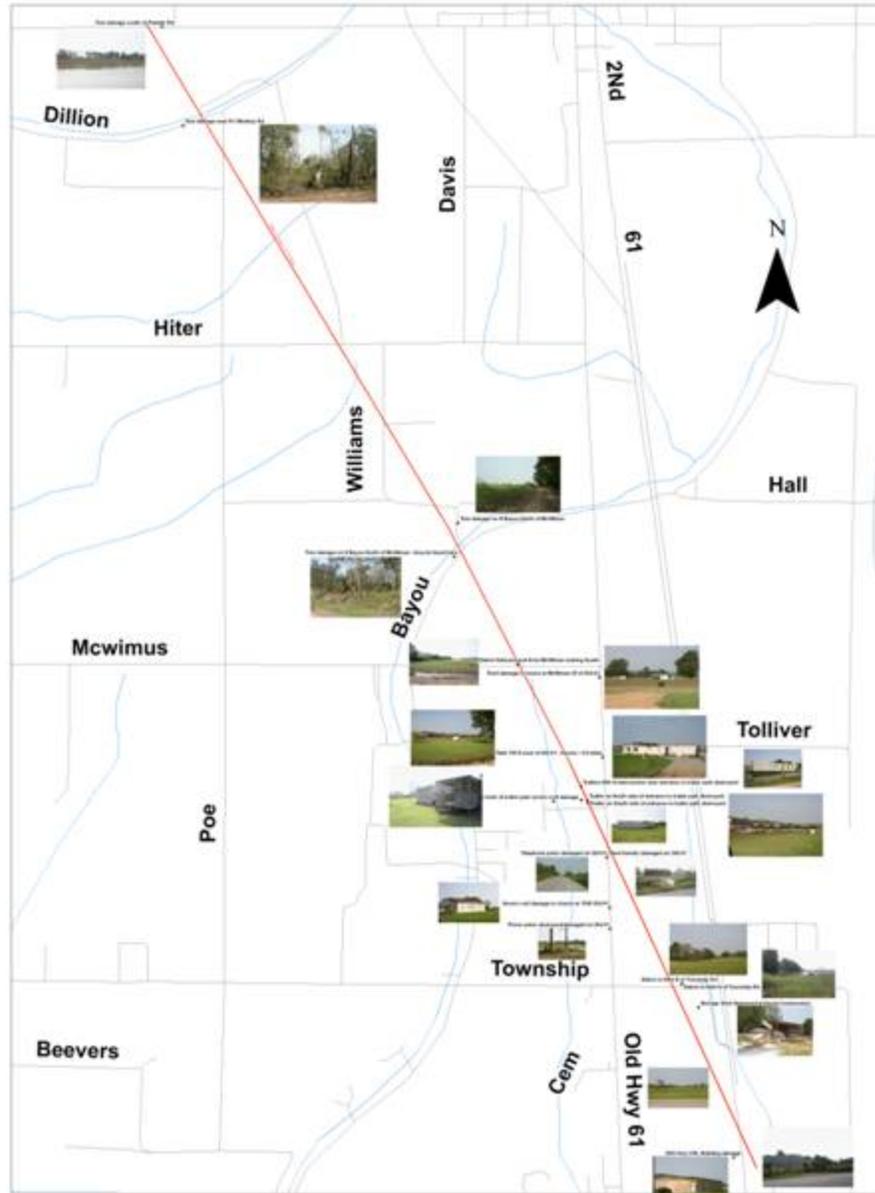


Rita

- ▶ Bolivar County was in the NE quadrant of Hurricane Rita
- ▶ Received 14" of rain in 12 hours
- ▶ 7 known tornados in Bolivar County between 1200 and 1600 hours that Saturday

Renova Tornado Damage Map

24 September 2005



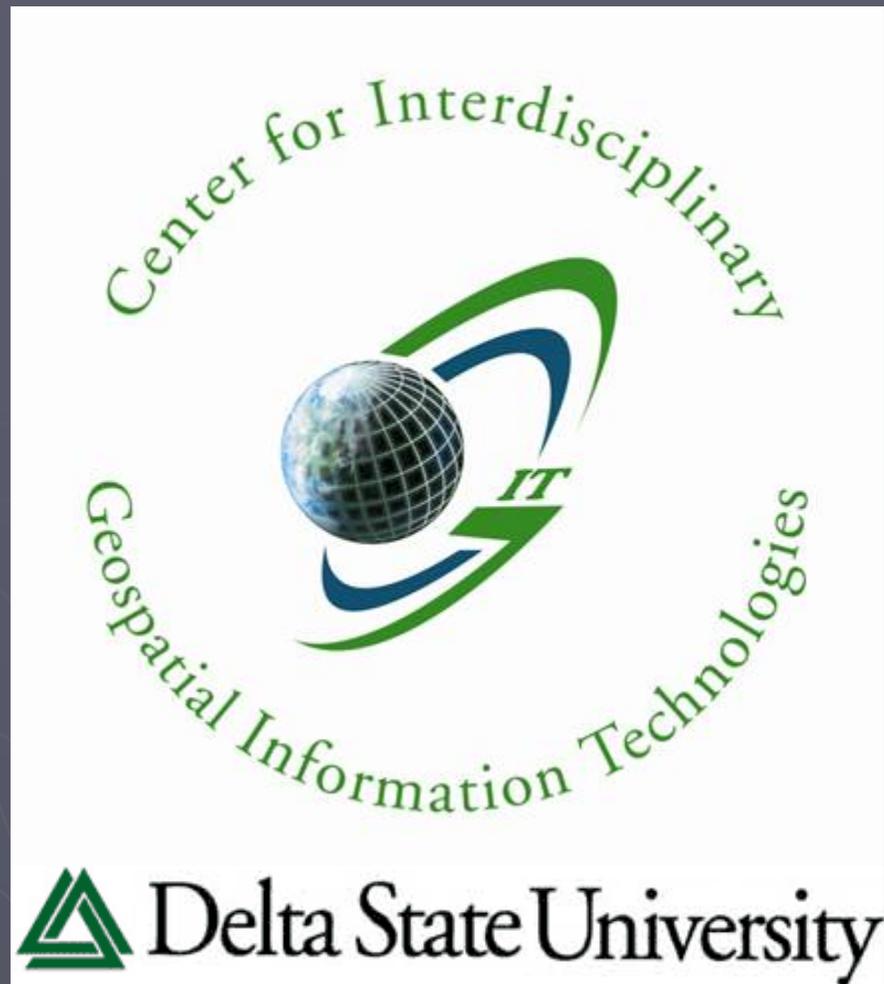
Damage mapped by Talbot Brooks and Eric Jackson, Delta State University, 26 September 2005.











Talbot Brooks

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