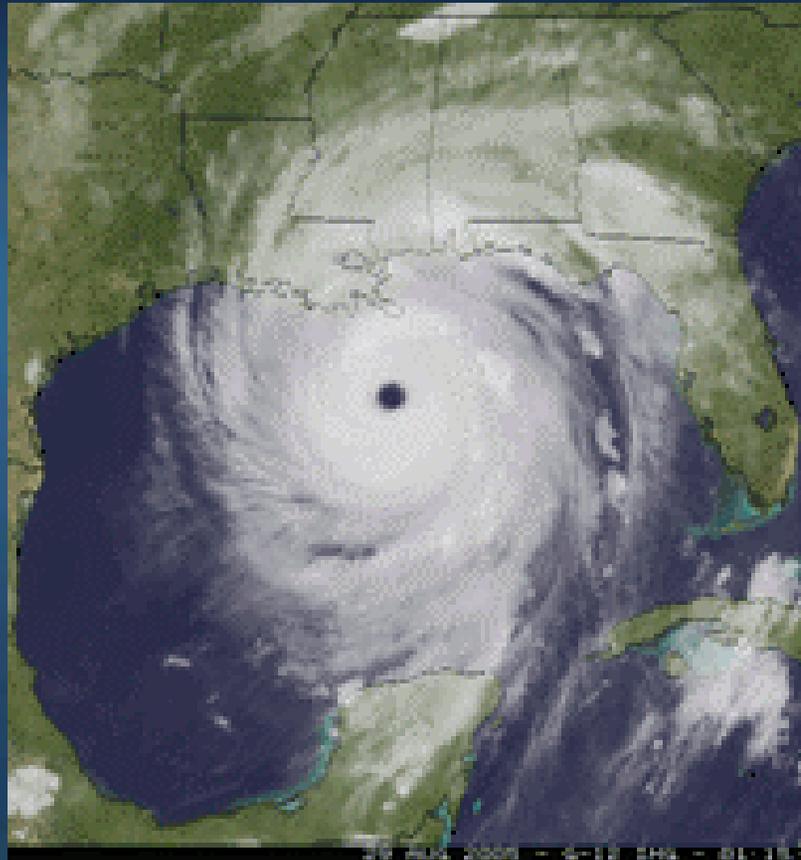


# Hurricane Katrina Flood Impacts



K. Van Wilson, P.E.  
USGS Mississippi Water Science Center

# The Inevitable Comparison



Hurricane Camille

Category 5

August 17, 1969

Hurricane Katrina

Category 4

August 29, 2005



# The Inevitable Comparison

## Hurricane Camille

- Most intense hurricane in US history
- Maximum winds - 190+ mph
- Central pressure – 909 mb (2<sup>nd</sup> lowest on record)
- Maximum storm surge – 25 ft (nr Pass Christian, MS)
- Width of storm - 110 miles
- Death toll - 256
- Damage - \$1.4 Billion

# The Inevitable Comparison

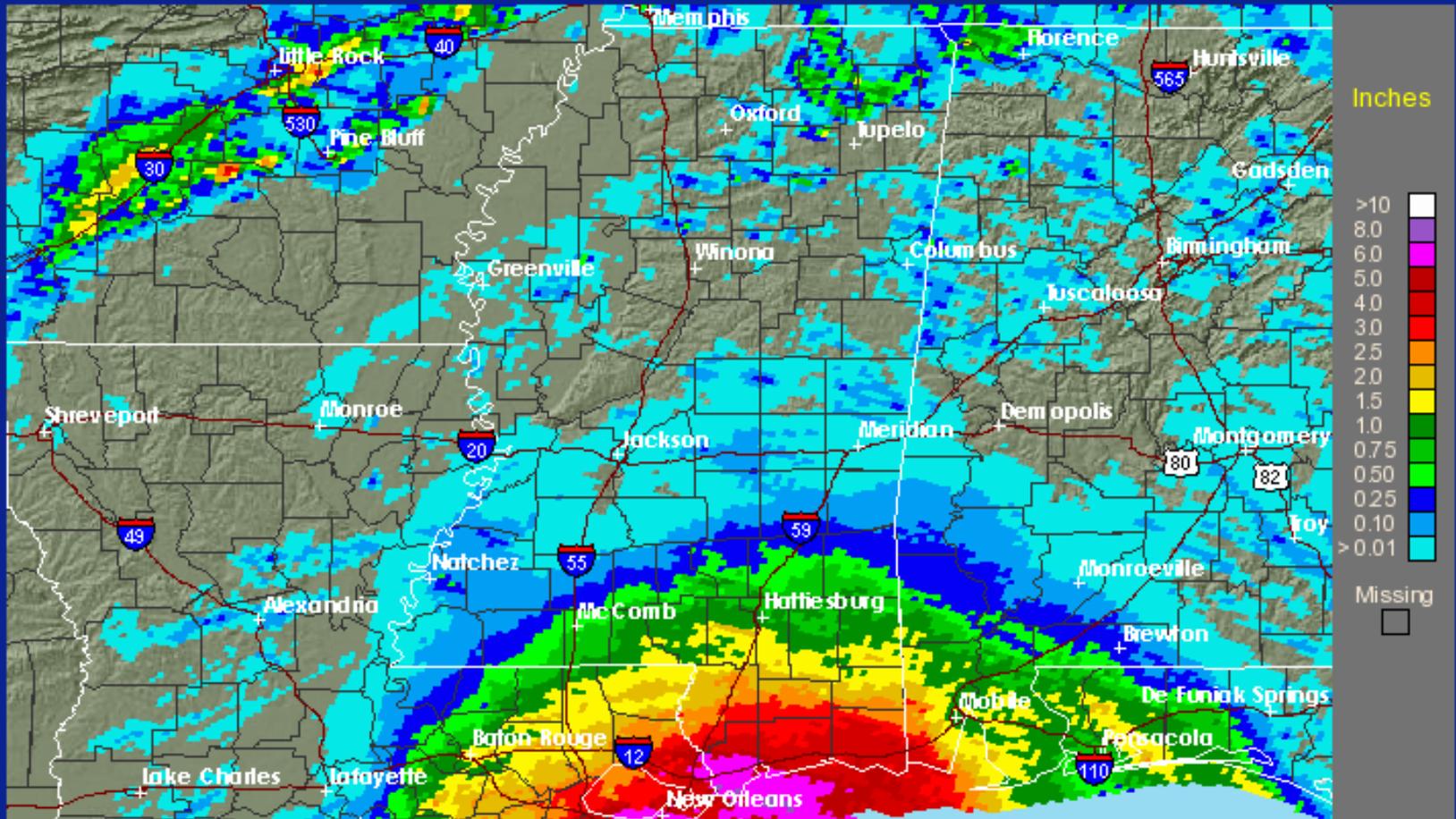
## Hurricane Katrina

- Most destructive hurricane in US history
- Maximum winds - 140 mph
- Central pressure – 920 mb (3<sup>rd</sup> lowest on record)
- Maximum storm surge – 29 ft (nr Bay St. Louis, MS)
- Width of storm - 250 miles
- Death toll – 1300 ?
- Damage - \$200 Billion ?

# Rainfall and Flooding

Mississippi  
1-Day Observed Precipitation - Valid 8/29/2005 1200 UTC

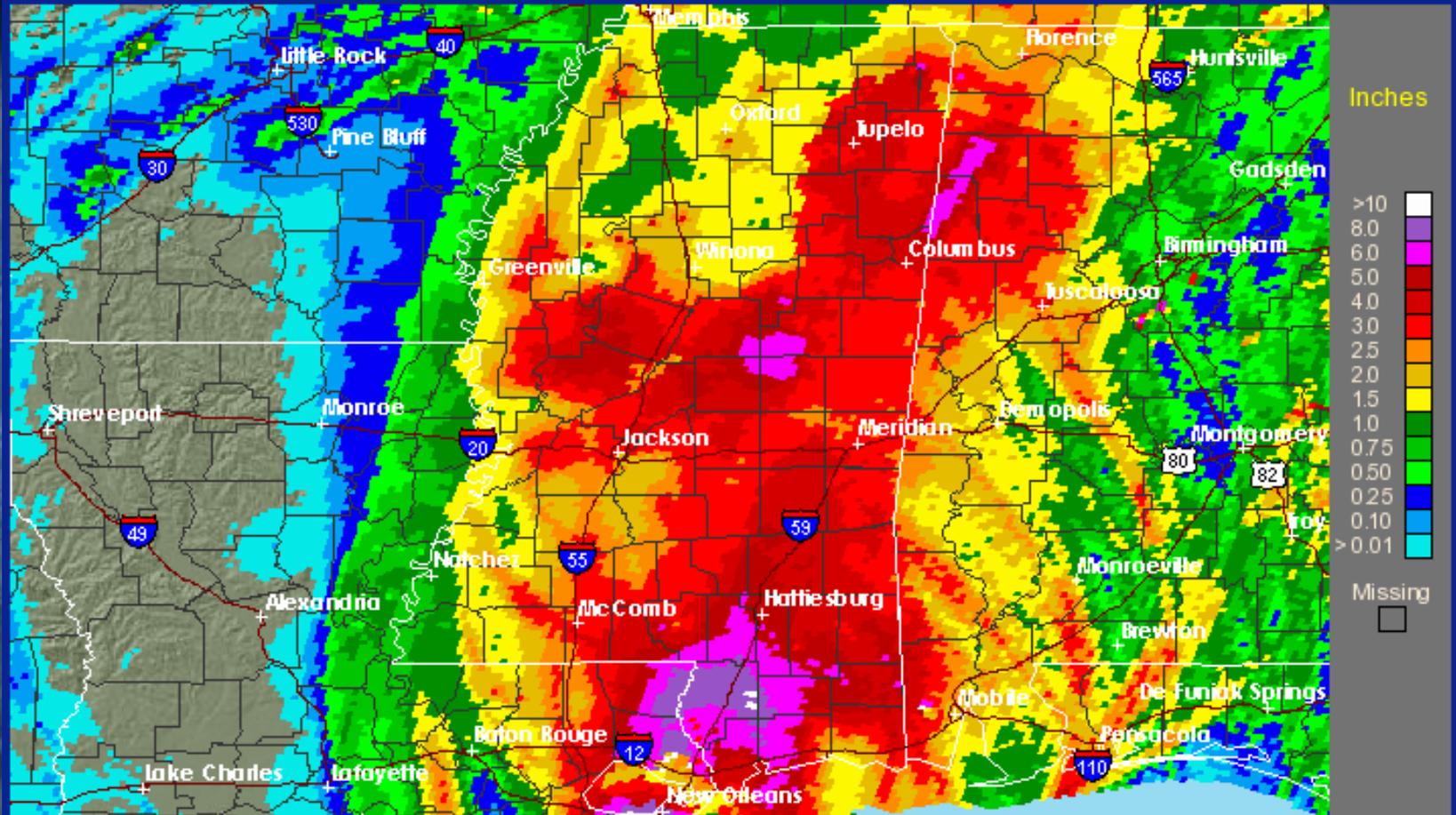
*Click on the image to zoom in  
Click on "States" to zoom out*



# Rainfall and Flooding

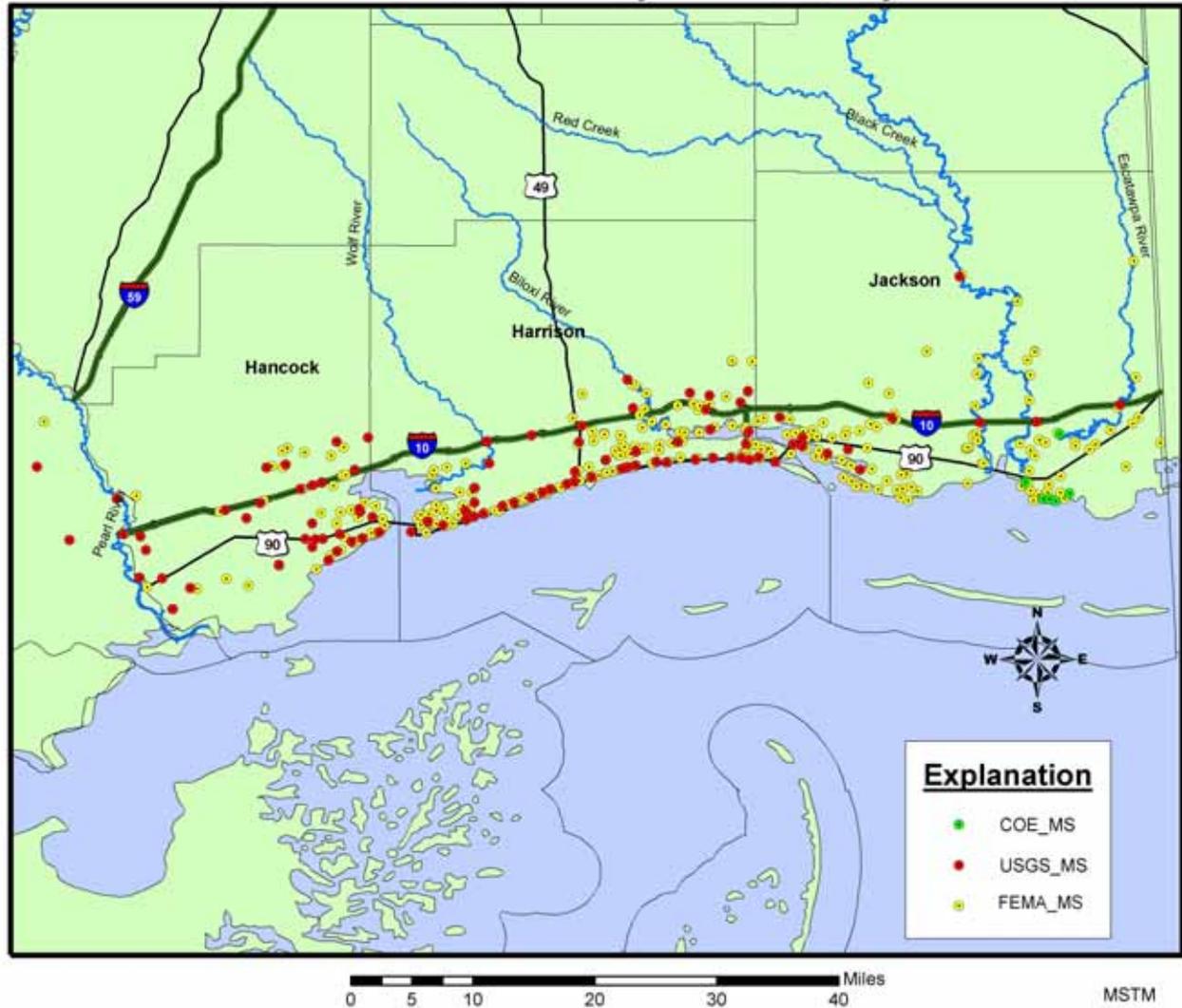
Mississippi  
1-Day Observed Precipitation - Valid 8/30/2005 1200 UTC

*Click on the image to zoom in*  
*Click on "States" to zoom out*



# Storm Surge

Katrina Preliminary HWM Recovery



# High Water Mark (HWM) Examples



# Storm Surge

## USGS Recovery of Preliminary Hurricane Katrina HWM'S



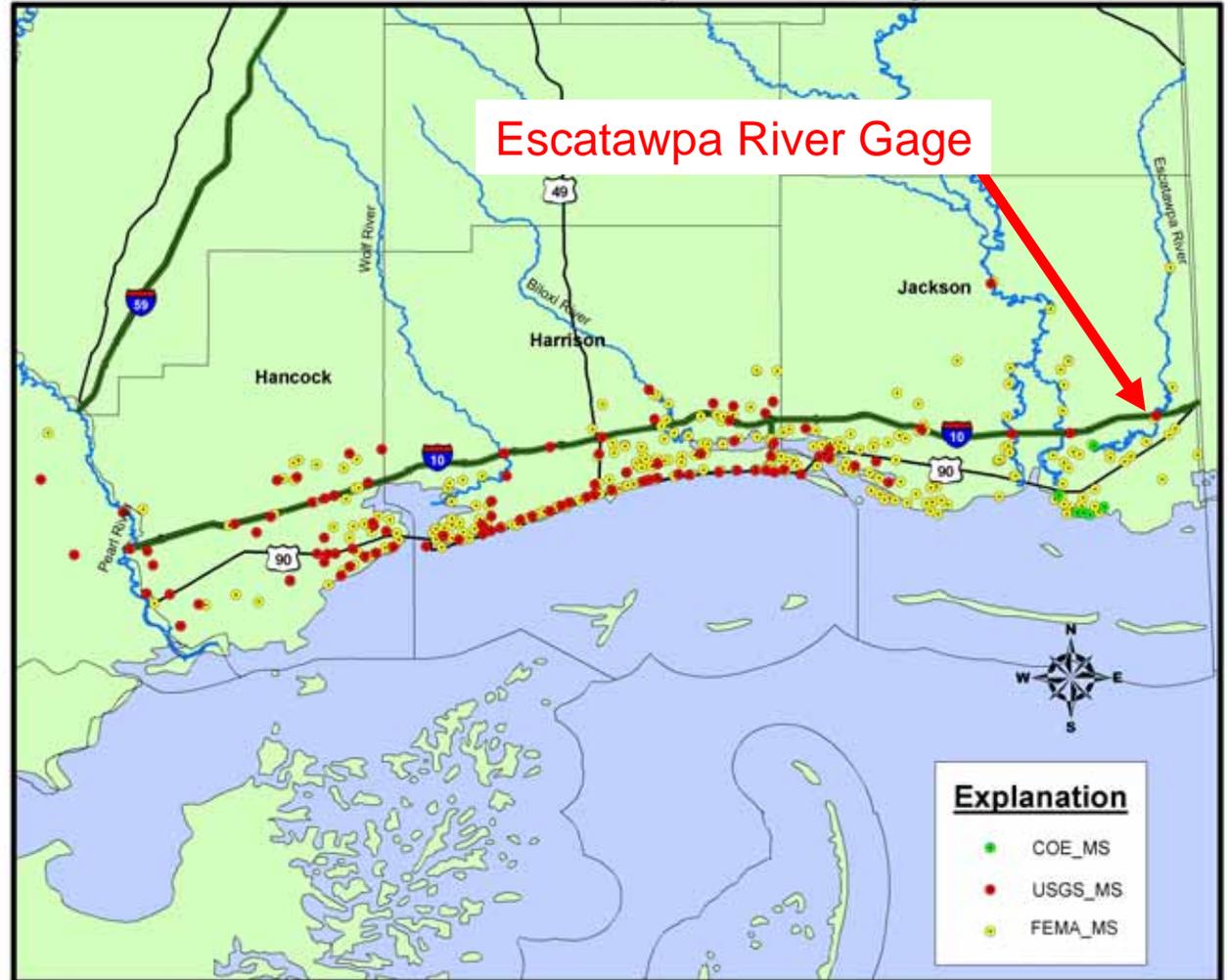
# Recorded Storm-Surge Hydrographs at Selected River Gages

- Stage
- Specific Conductance (saltwater intrusion identifier)

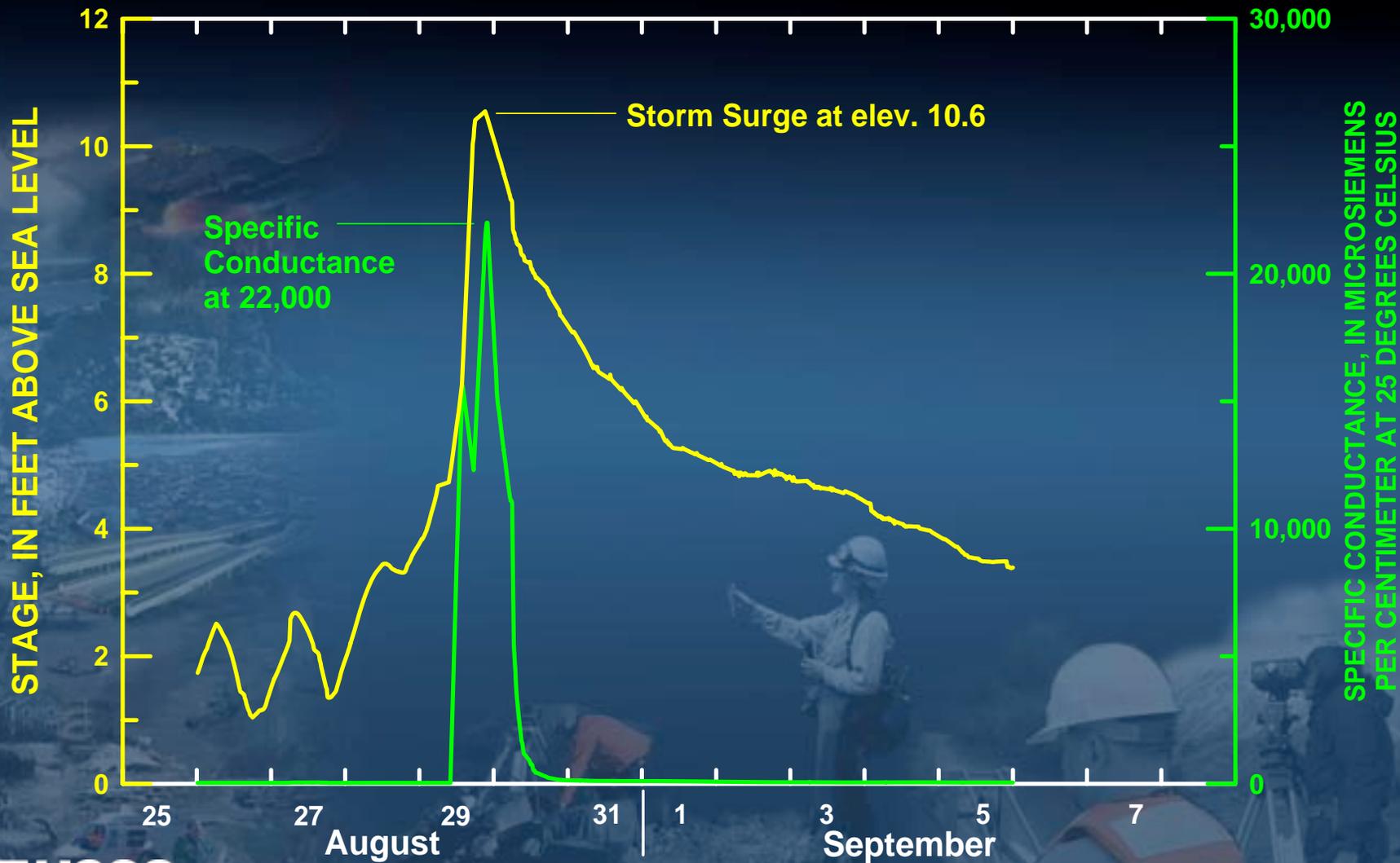
# Storm Surge



Katrina Preliminary HWM Recovery

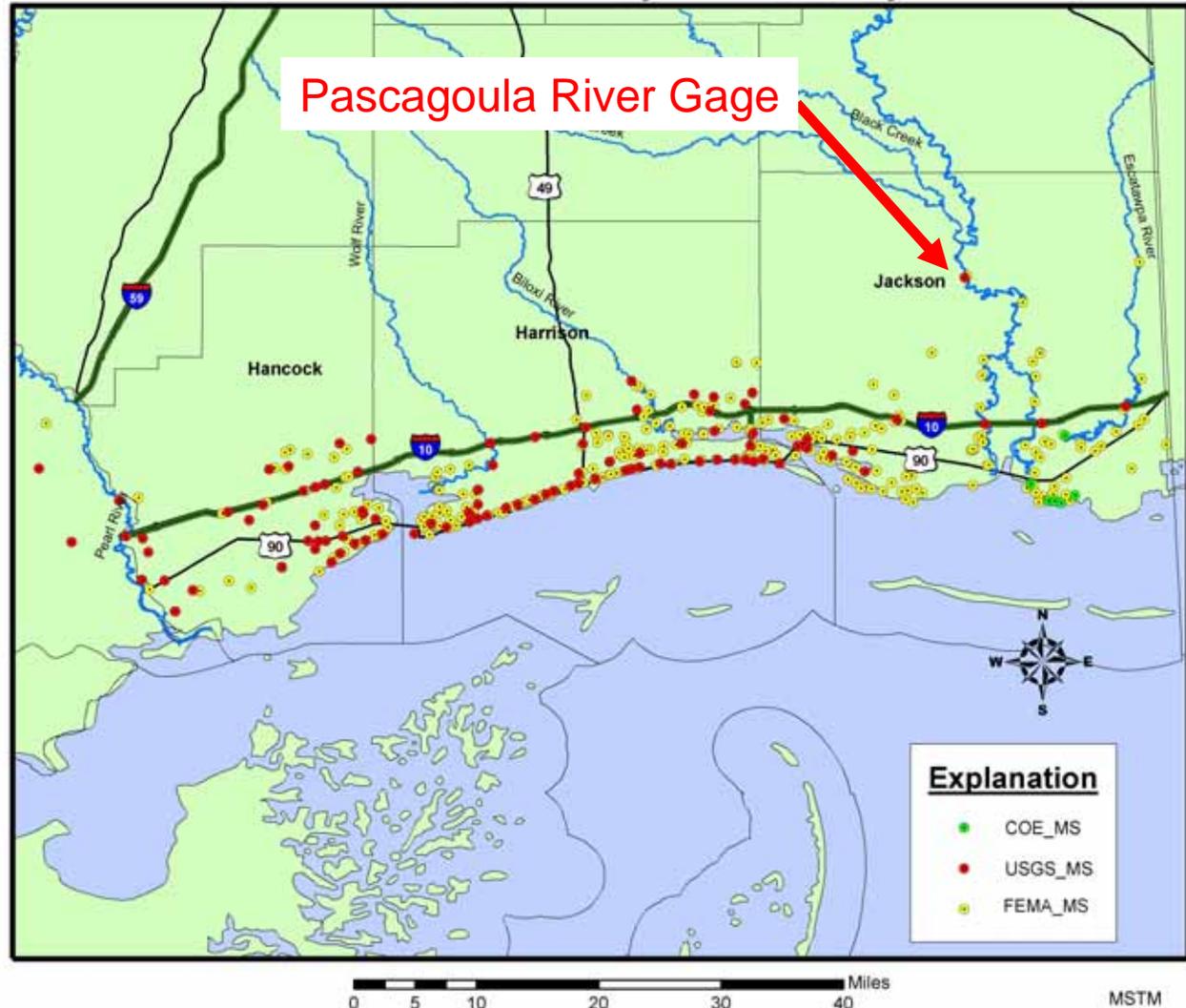


# Escatawpa River about 10.5 miles upstream of mouth (Station no. 0248018020)

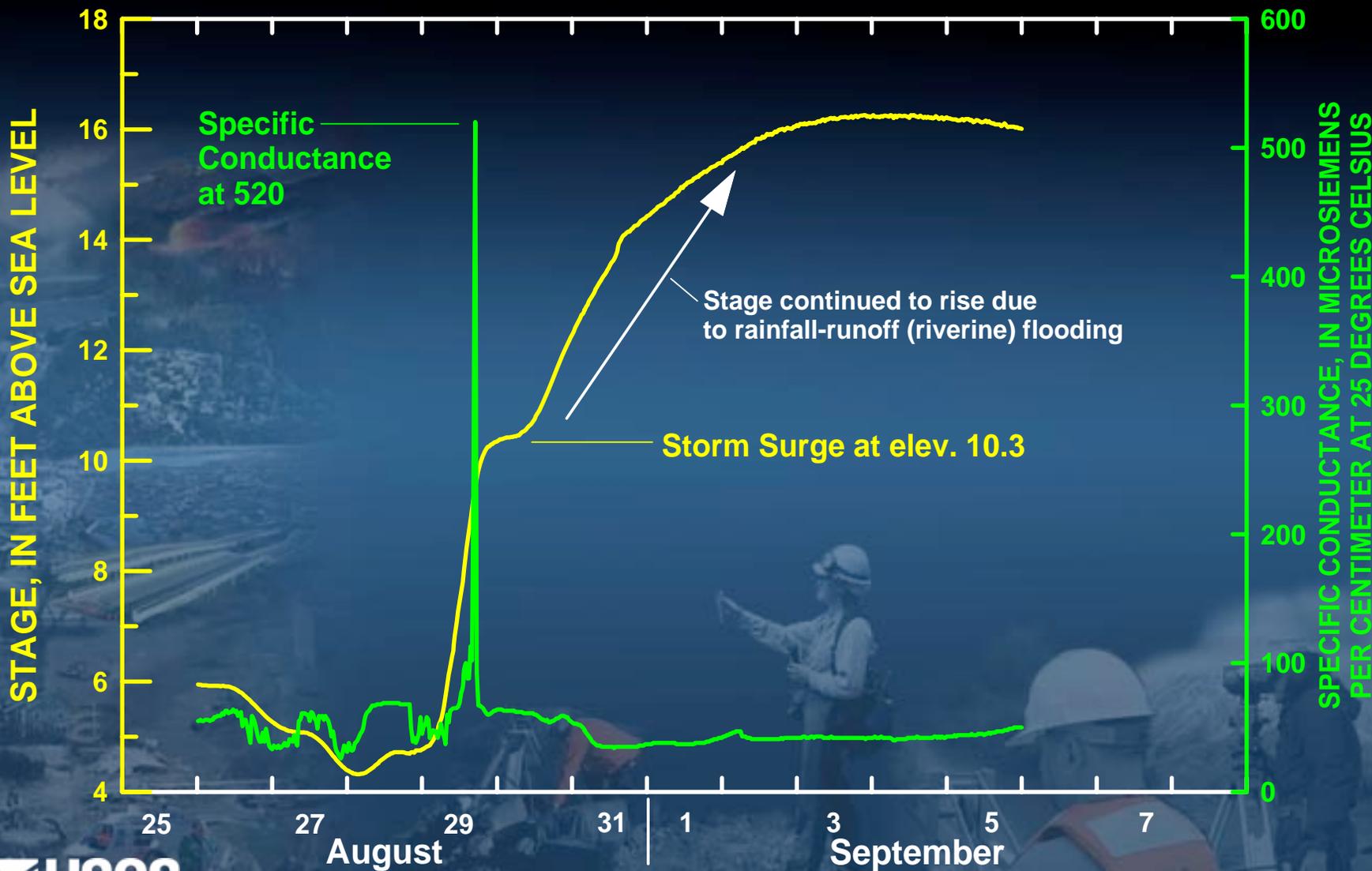


# Storm Surge

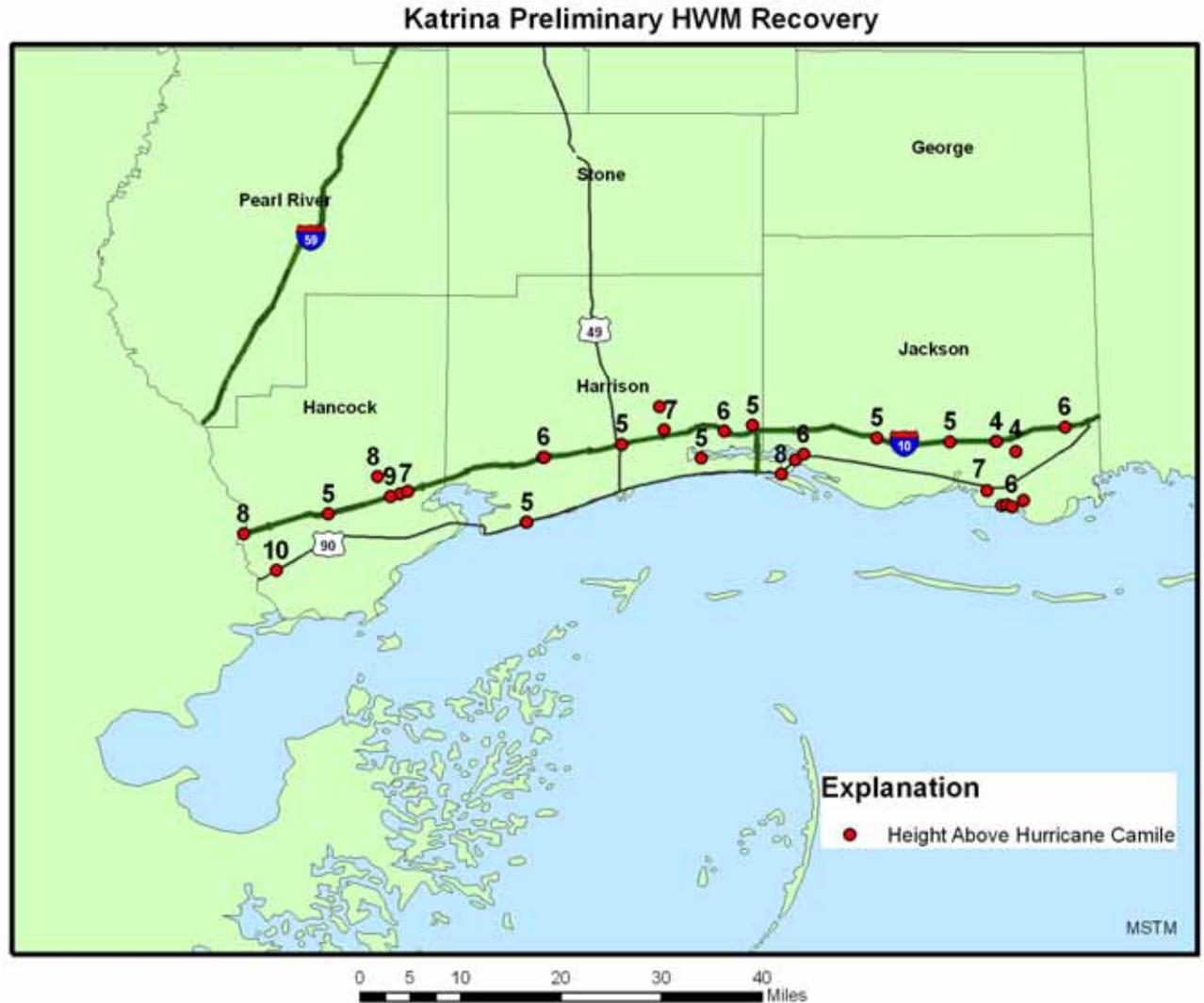
Katrina Preliminary HWM Recovery



### Pascagoula River about 34.4 miles upstream of mouth (Station no. 02479310)



# Storm Surge above Camille

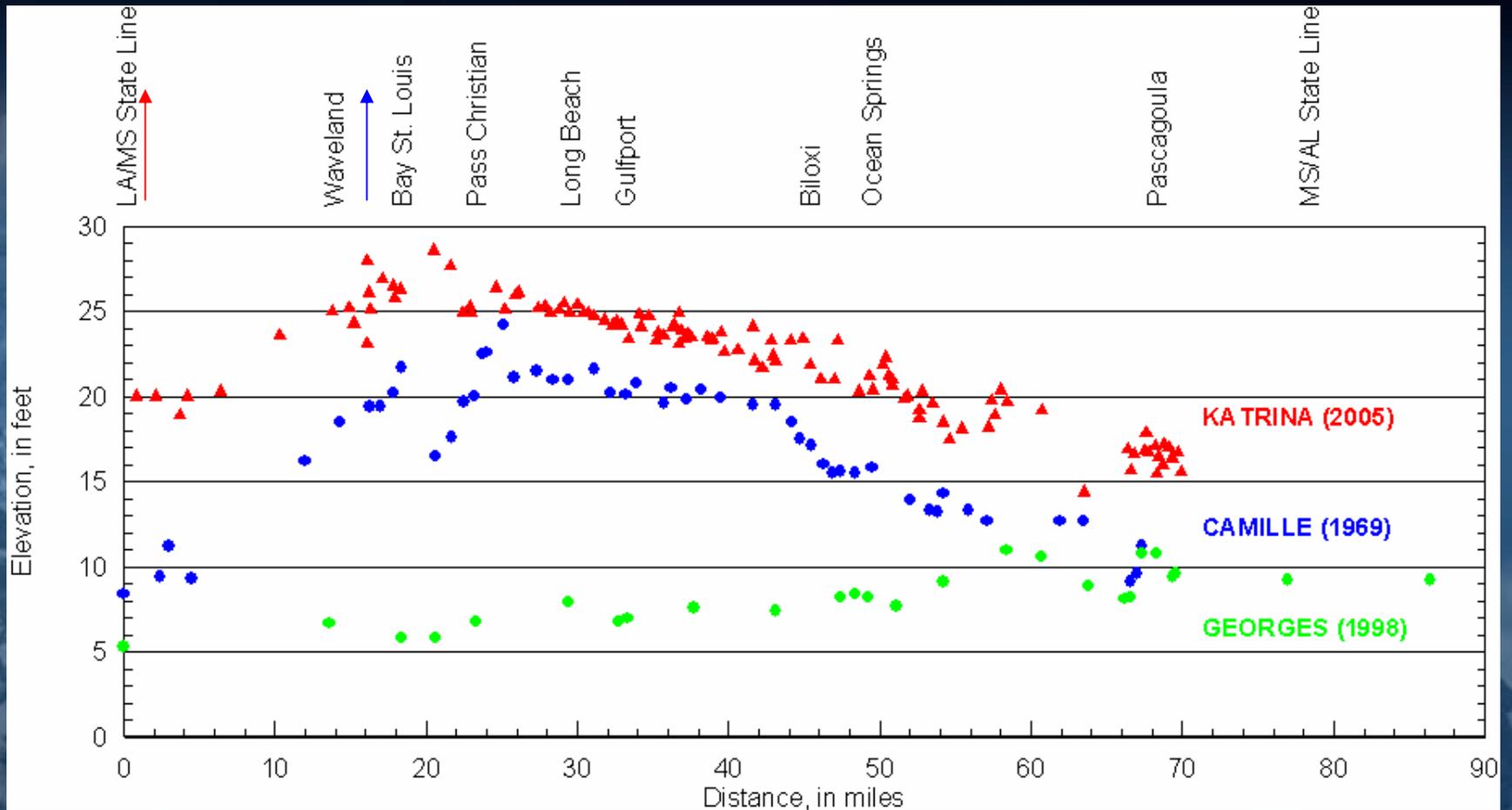


# Katrina Storm-Surge Inundation

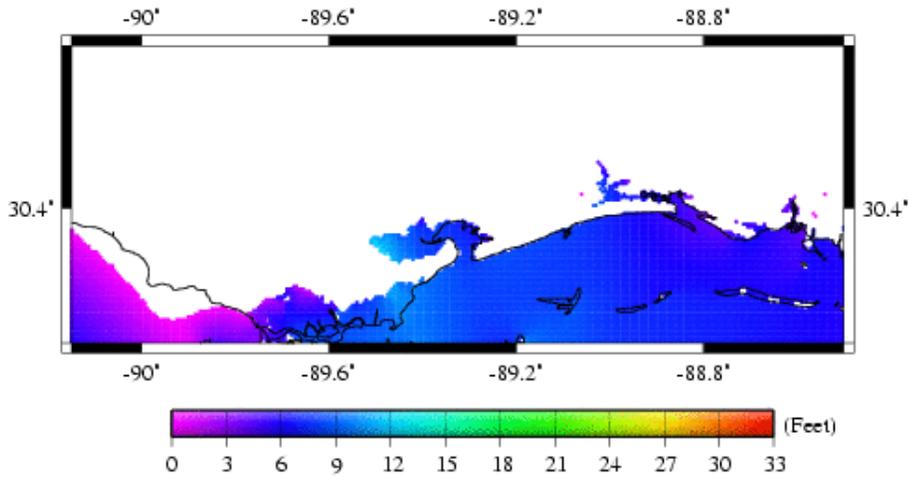
Comparison of Storm-Surge Inundation caused by Hurricane Katrina (2005) to inundation caused by Camille (1969)



# Comparison of selected Katrina HWMs along a coastal baseline



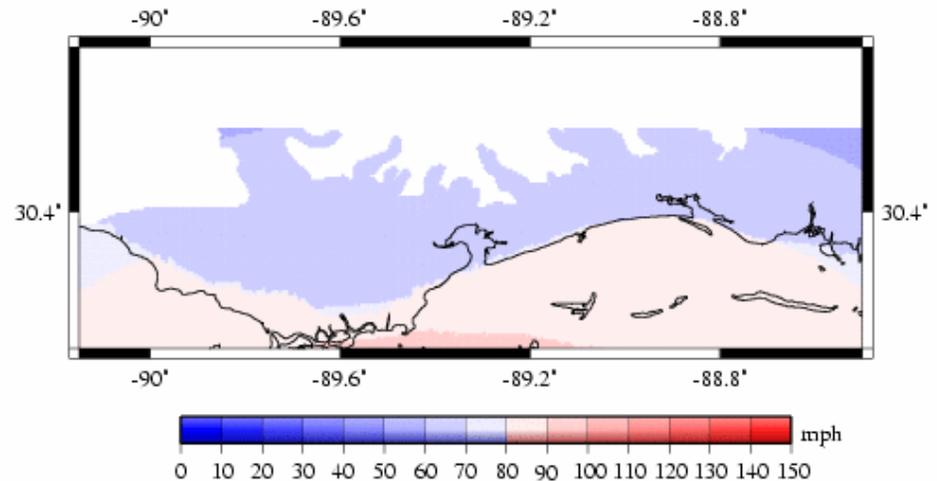
Water\_Elevation\_Katrina(Feet) August 29, 2005 10hrs



Water\_Elevation\_Katrina

# Storm Surge

Hurricane\_Katrina August 29, 2005 10Z



Wind-Speed

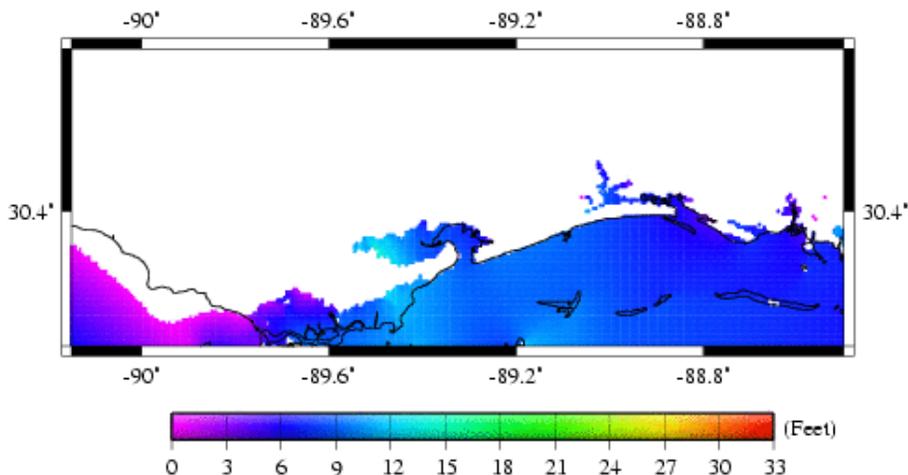
Modeling conducted by:  
Mississippi State University  
GeoResources Institute  
Stennis Space Center

Model and Supercomputer provided by:  
WorldWinds Inc.  
Stennis Space Center

# Wind Speed



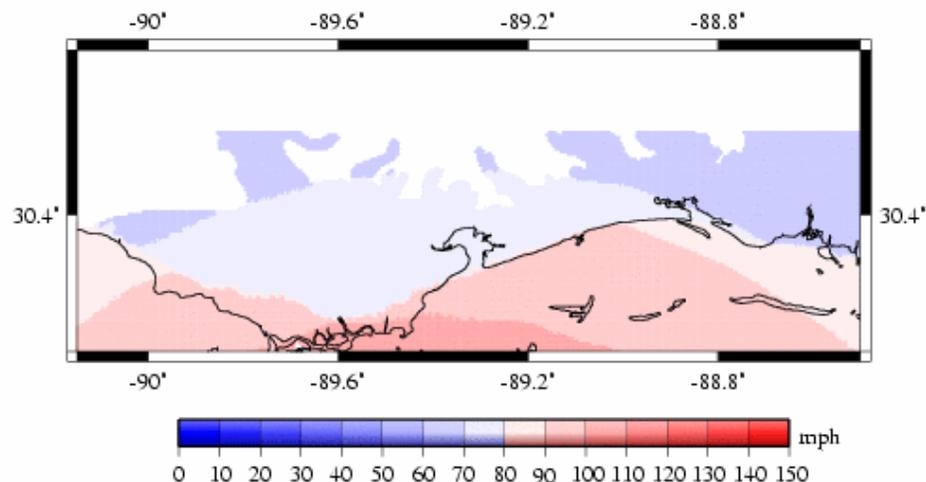
Water\_Elevation\_Katrina(Feet) August 29, 2005 11hrs



Water\_Elevation\_Katrina

# Storm Surge

Hurricane\_Katrina August 29, 2005 11Z



Wind-Speed

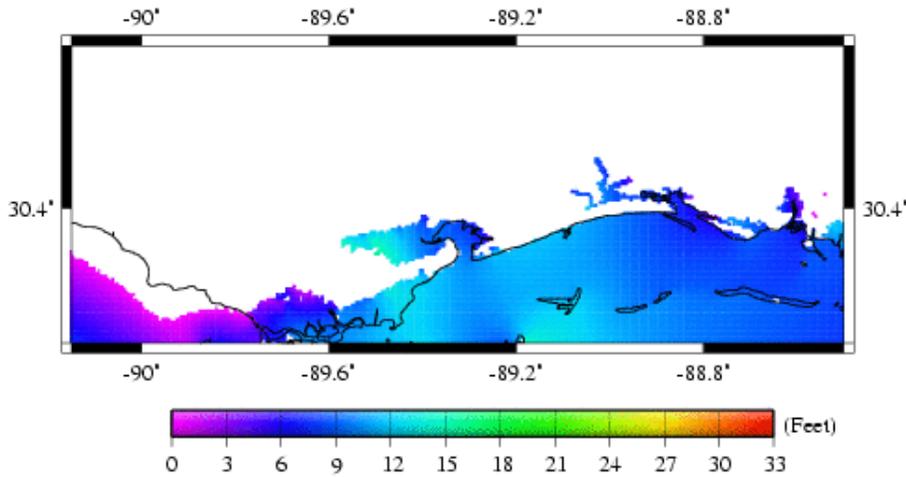
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# Wind Speed



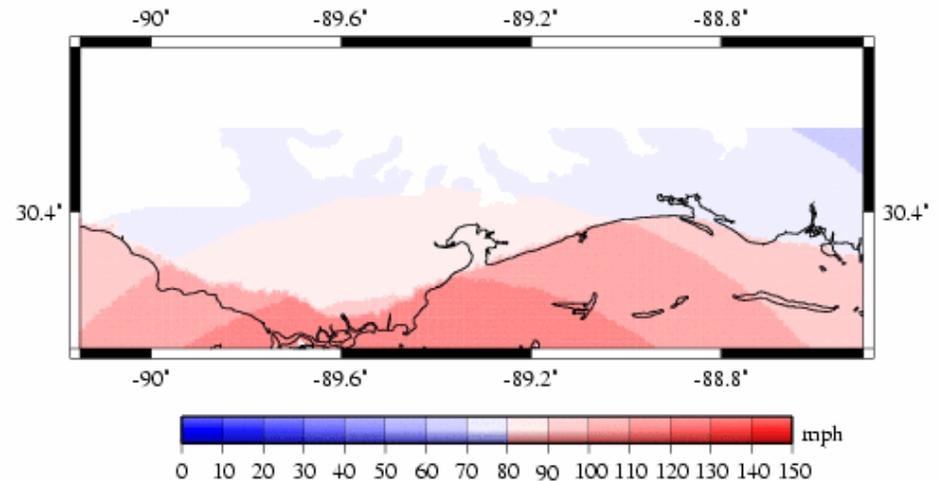
Water\_Elevation\_Katrina(Feet) August 29, 2005 12hrs



Water\_Elevation\_Katrina

# Storm Surge

Hurricane\_Katrina August 29, 2005 12Z



Wind-Speed

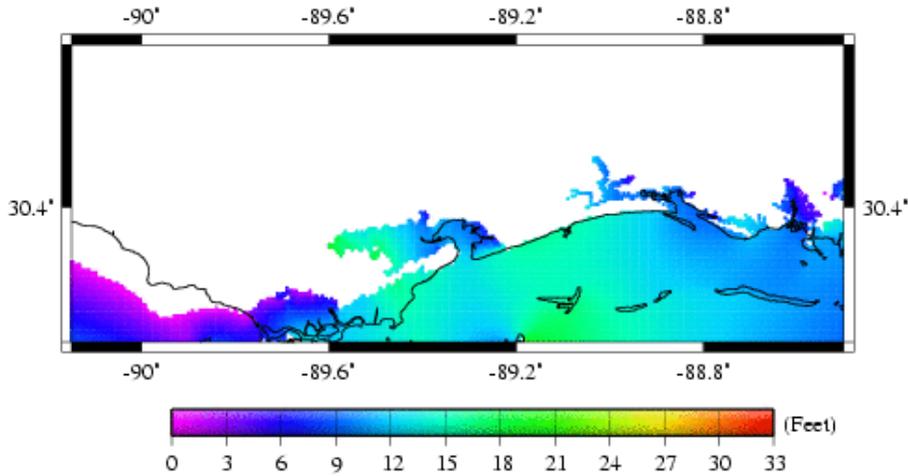
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# Wind Speed



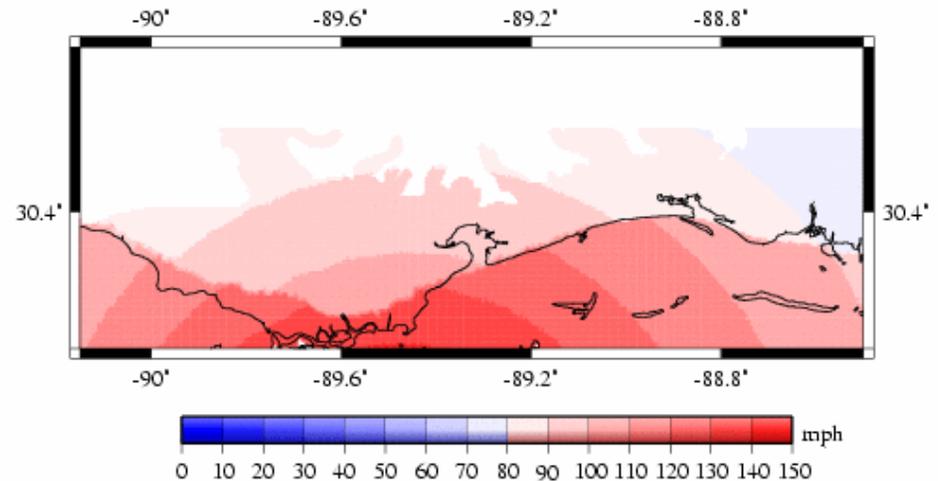
Water\_Elevation\_Katrina(Feet) August 29, 2005 13hrs



Water\_Elevation\_Katrina

# Storm Surge

Hurricane\_Katrina August 29, 2005 13Z



Wind-Speed

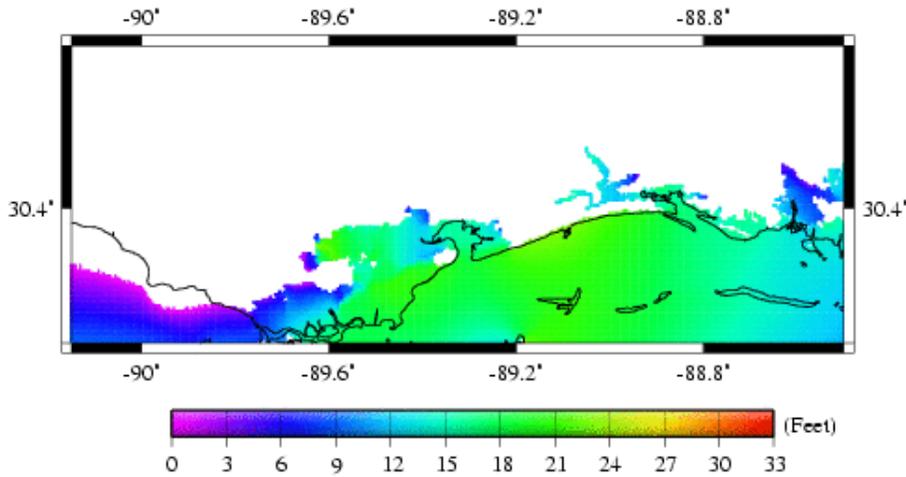
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Stennis Space Center

Model and Supercomputer provided by:  
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Stennis Space Center

# Wind Speed



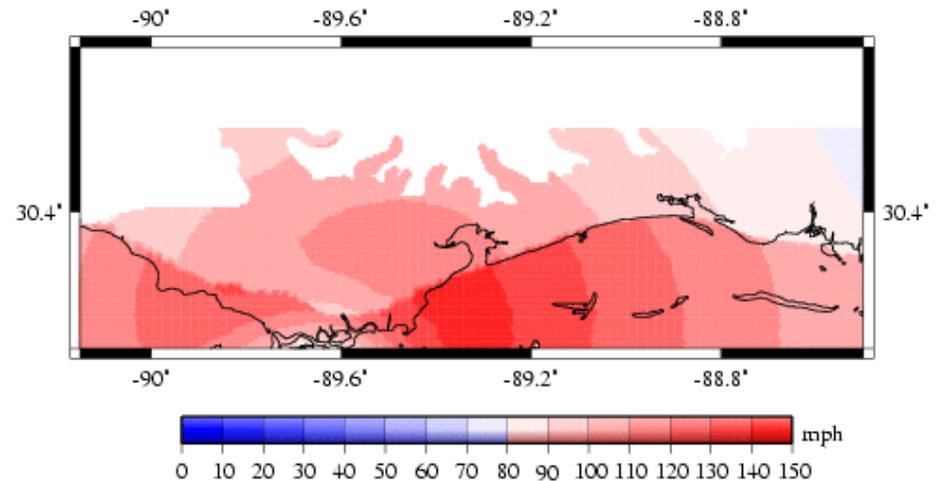
Water\_Elevation\_Katrina(Feet) August 29, 2005 14hrs



Water\_Elevation\_Katrina

# Storm Surge

Hurricane\_Katrina August 29, 2005 14Z



Wind-Speed

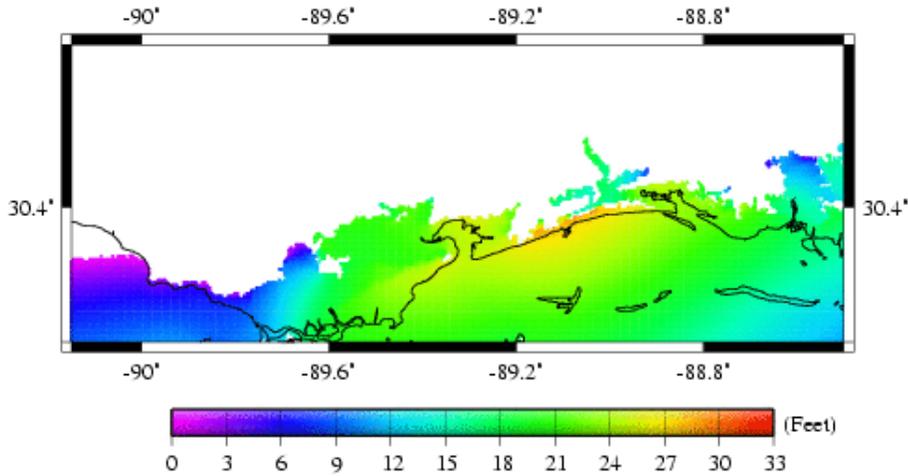
Modeling conducted by:  
Mississippi State University  
GeoResources Institute  
Stennis Space Center

Model and Supercomputer provided by:  
WorldWinds Inc.  
Stennis Space Center

# Wind Speed



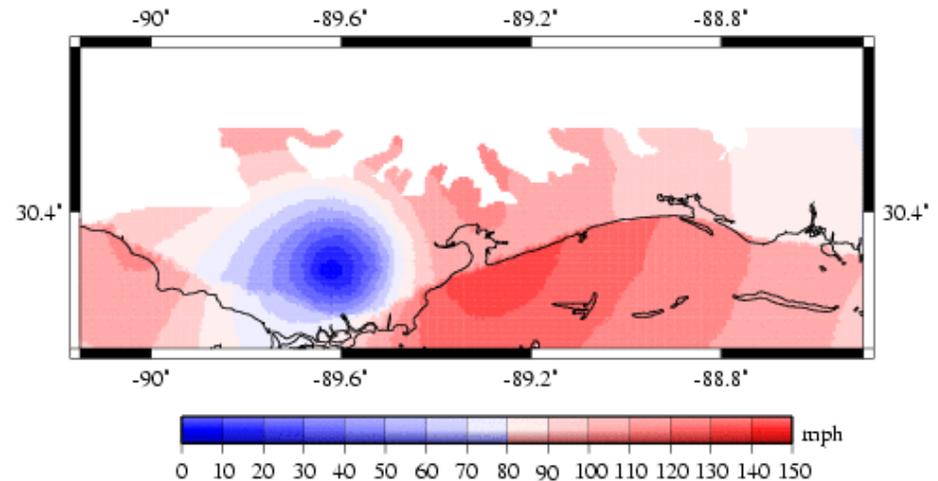
Water\_Elevation\_Katrina(Feet) August 29, 2005 15hrs



Water\_Elevation\_Katrina

# Storm Surge

Hurricane\_Katrina August 29, 2005 15Z



Wind-Speed

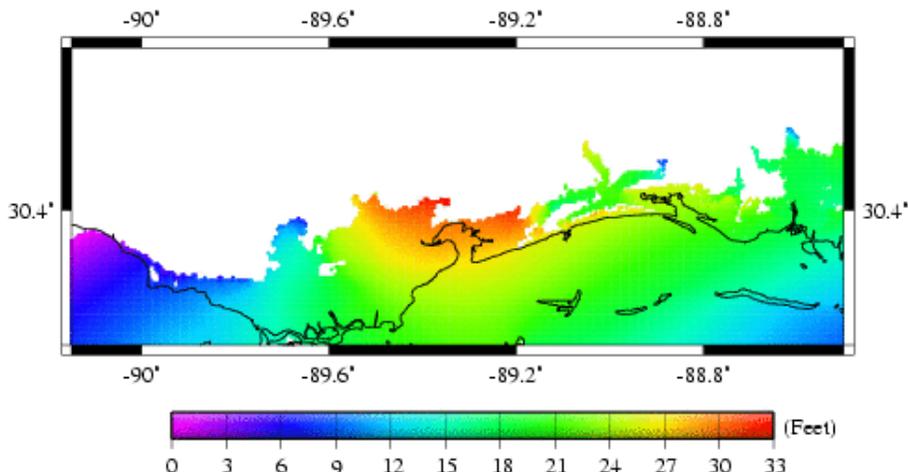
Modeling conducted by:  
Mississippi State University  
GeoResources Institute  
Stennis Space Center

Model and Supercomputer provided by:  
WorldWinds Inc.  
Stennis Space Center

# Wind Speed



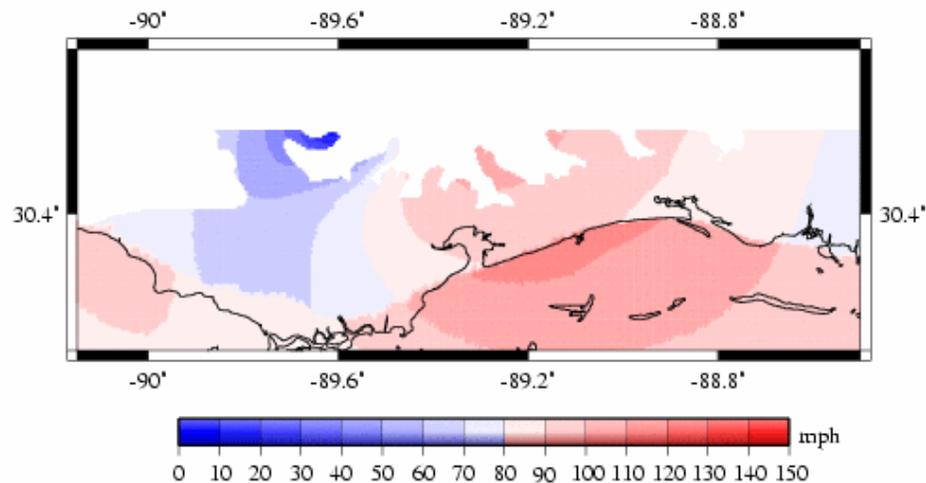
Water\_Elevation\_Katrina(Feet) August 29, 2005 16hrs



Water\_Elevation\_Katrina

# Storm Surge

Hurricane\_Katrina August 29, 2005 16Z



Wind-Speed

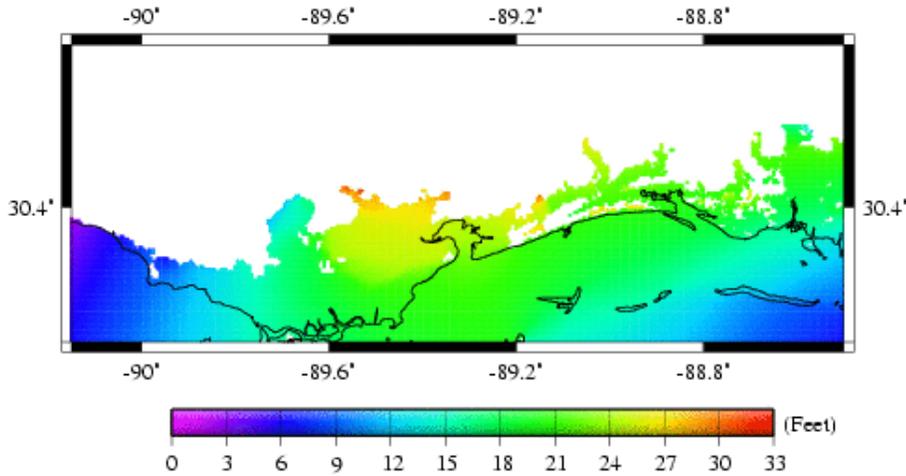
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Mississippi State University  
GeoResources Institute  
Stennis Space Center

Model and Supercomputer provided by:  
WorldWinds Inc.  
Stennis Space Center

# Wind Speed



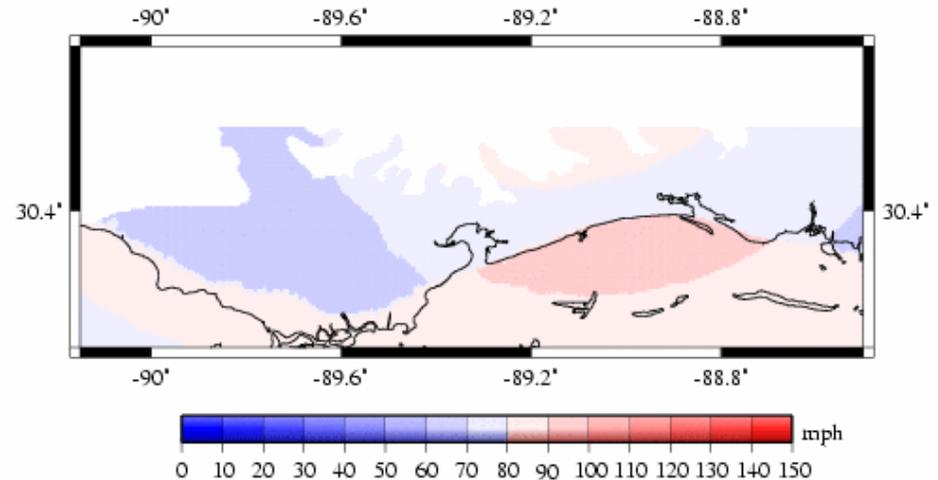
Water\_Elevation\_Katrina(Feet) August 29, 2005 17hrs



Water\_Elevation\_Katrina

# Storm Surge

Hurricane\_Katrina August 29, 2005 17Z



Wind-Speed

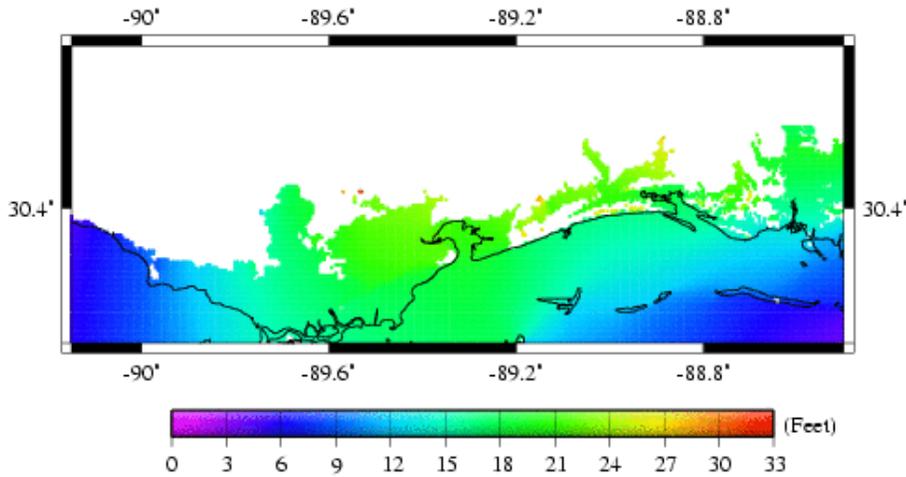
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# Wind Speed



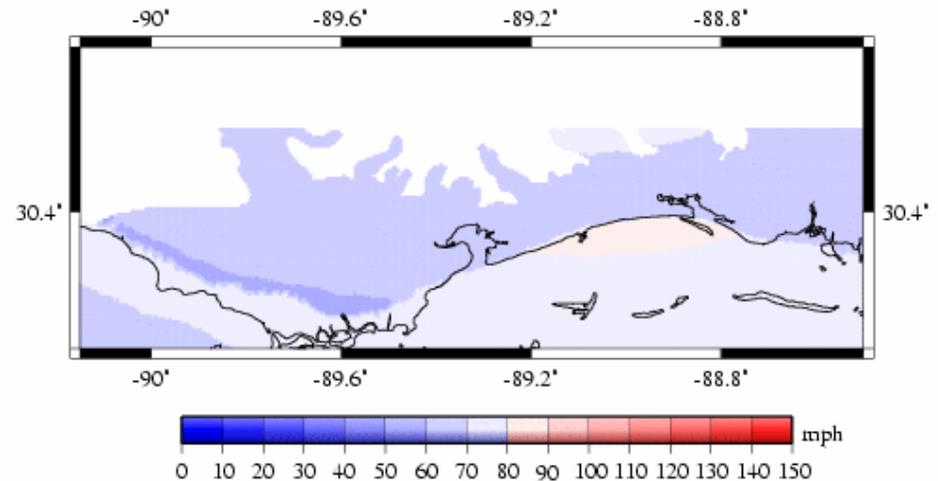
Water\_Elevation\_Katrina(Feet) August 29, 2005 18hrs



Water\_Elevation\_Katrina

# Storm Surge

Hurricane\_Katrina August 29, 2005 18Z



Wind-Speed

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# Wind Speed

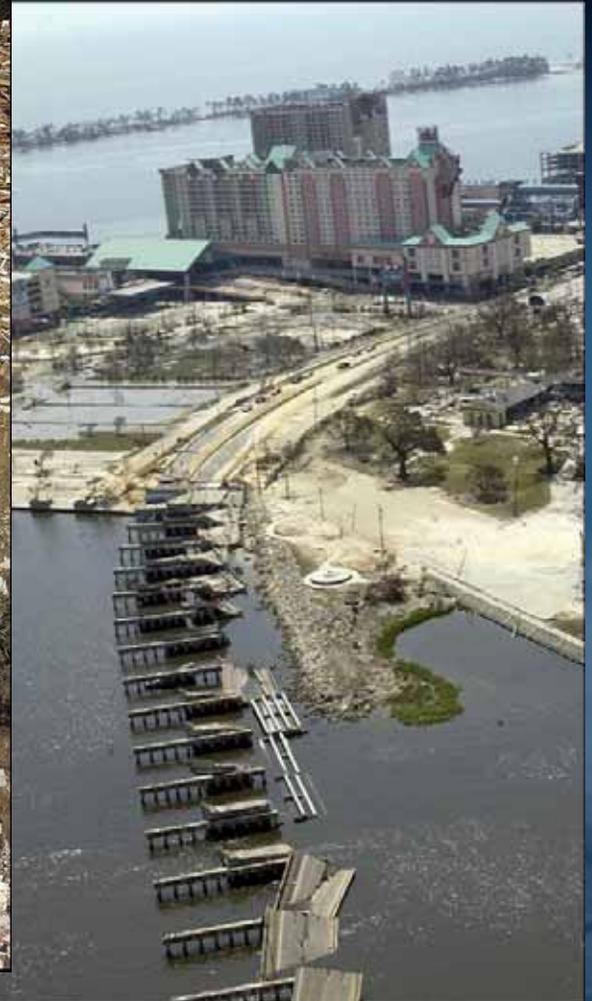














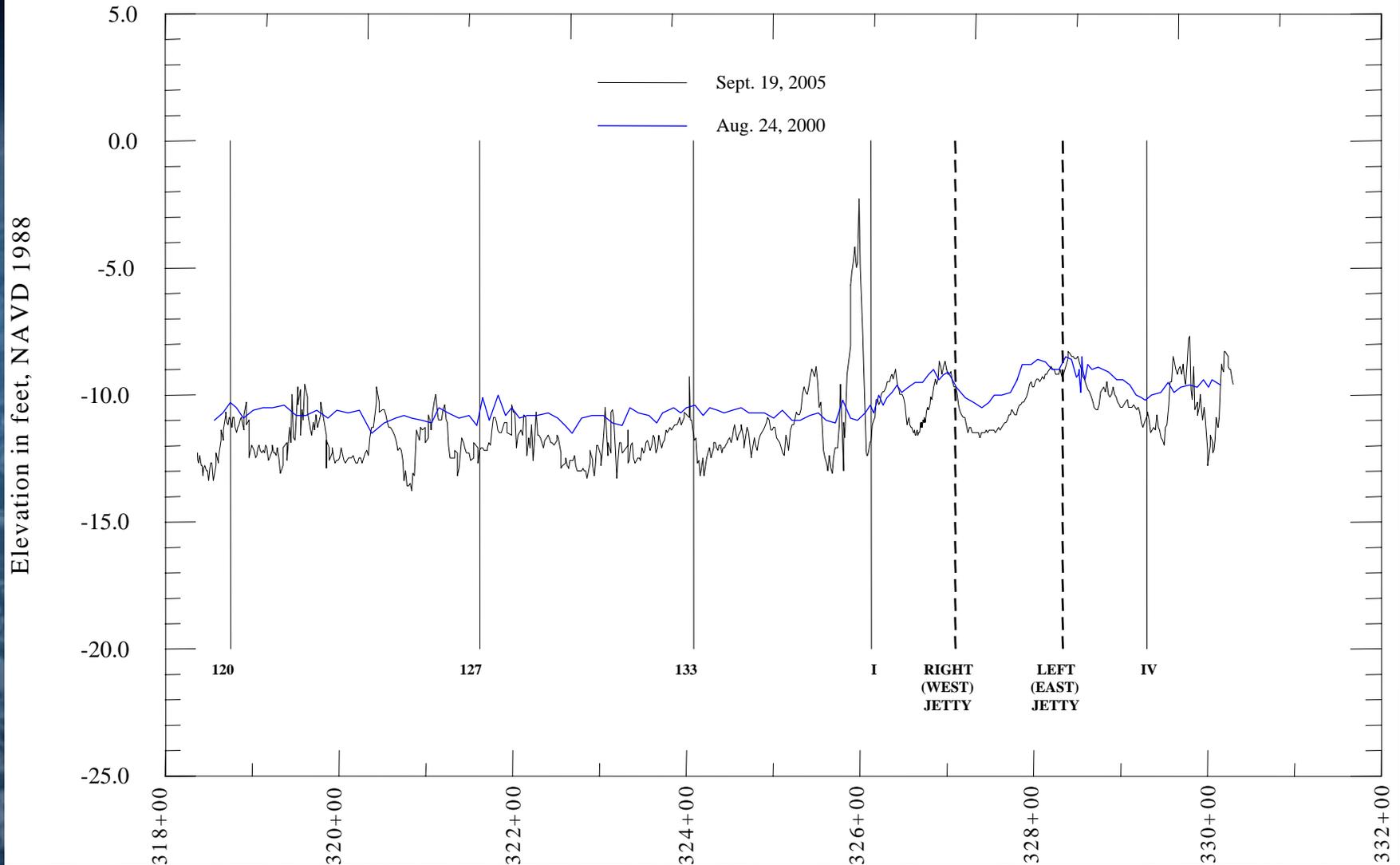
# Bridge Damage & Bed Scour

St. Louis Bay at U.S. Highway 90, Hancock County, Mississippi



# Bridge Damage & Bed Scour

Cross-section profile 150 feet North of U.S. Highway 90  
at St. Louis Bay.



# Comments or Questions?



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