

# **A High Resolution Coupled Riverine Flow, Tide, Wind, Wind Wave and Storm Surge Model for Southern Louisiana: Part III – Hurricane Rita Hindcast and Validation**

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V.J. Cardone, A. Cox; Oceanweather Inc.

C. Dawson; University of Texas at Austin

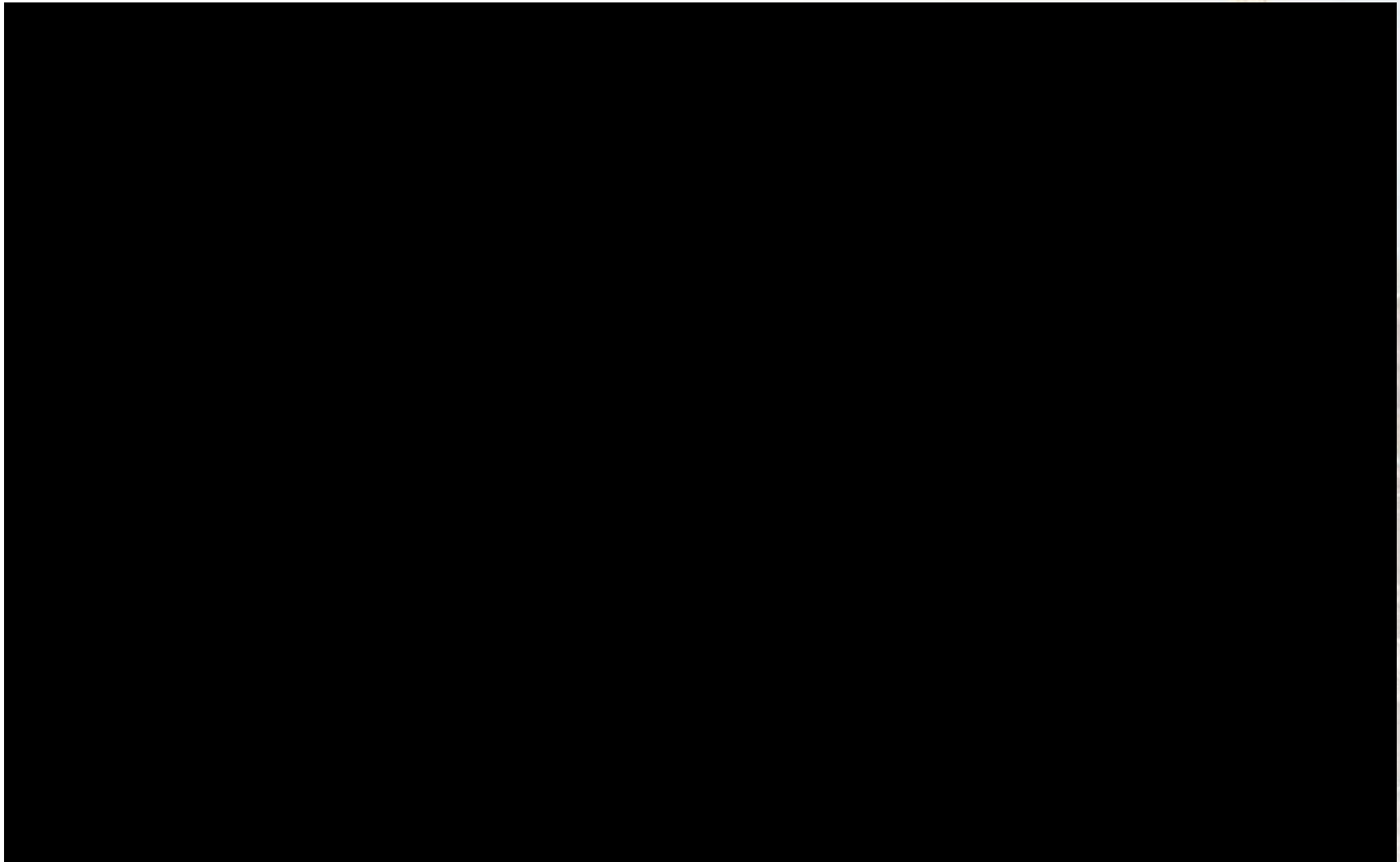
# Hurricane Rita

## Quick Facts ([http://en.wikipedia.org/wiki/Hurricane\\_Rita](http://en.wikipedia.org/wiki/Hurricane_Rita))

- Maximum winds: 175 mph (78 m/s)
- Fourth-most intense Atlantic hurricane (897 mbar)
  - Most intense: Wilma 2005 (882 mbar)
  - Sixth-most intense: Katrina 2005 (902 mbar)
- Landfall: ~0800 UTC September 24, 2006
  - Earliest 17<sup>th</sup> named storm

# Hurricane Rita

**NASA Satellite Movie** (<http://svs.gsfc.nasa.gov/vis/a000000/a003200/a003265/index.html>)



# Hurricane Rita

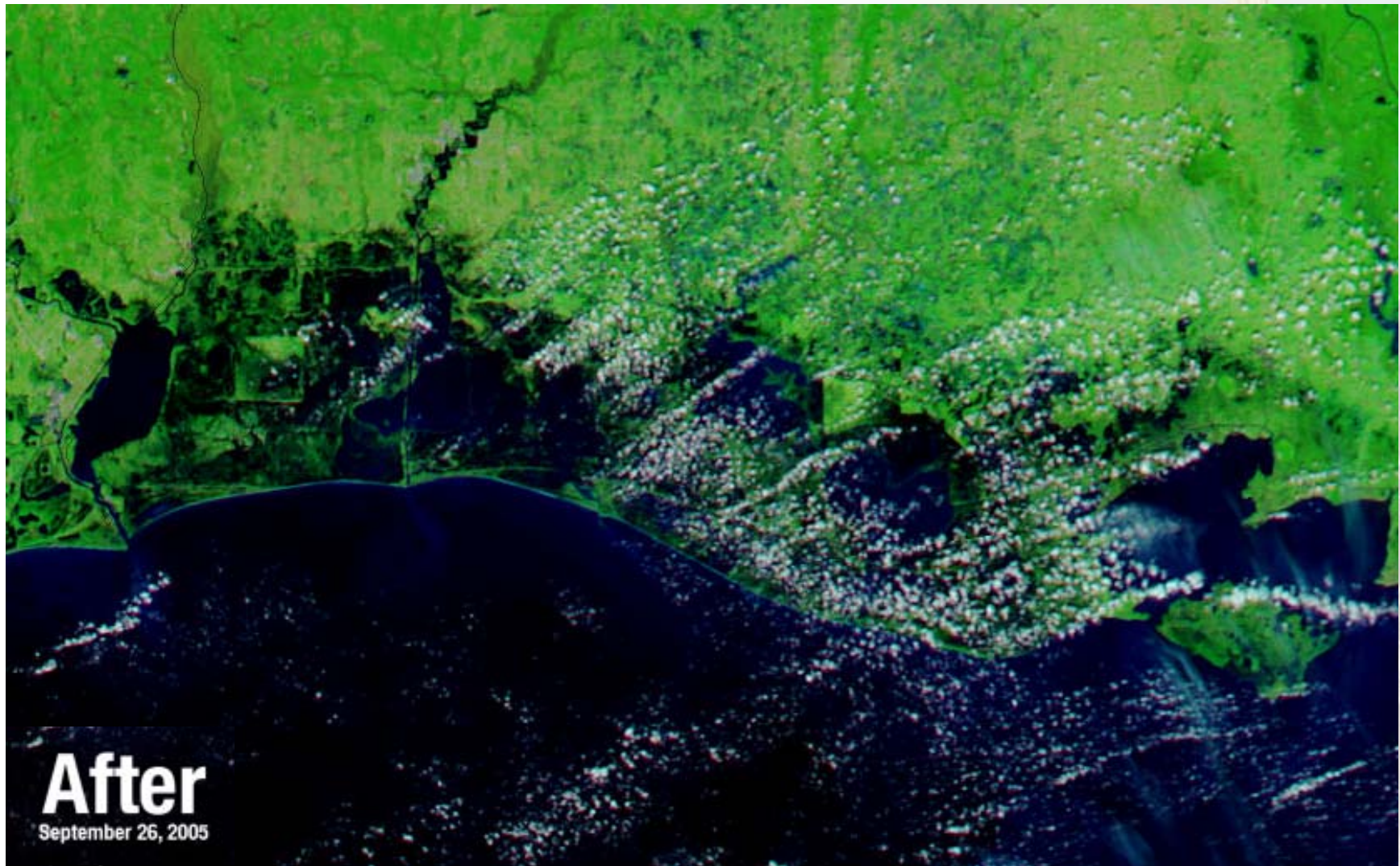
**NASA Satellite Image** ([http://www.nasa.gov/vision/earth/lookingatearth/h2005\\_rita.html](http://www.nasa.gov/vision/earth/lookingatearth/h2005_rita.html))





# Hurricane Rita

**NASA Satellite Image** ([http://www.nasa.gov/vision/earth/lookingatearth/h2005\\_rita.html](http://www.nasa.gov/vision/earth/lookingatearth/h2005_rita.html))



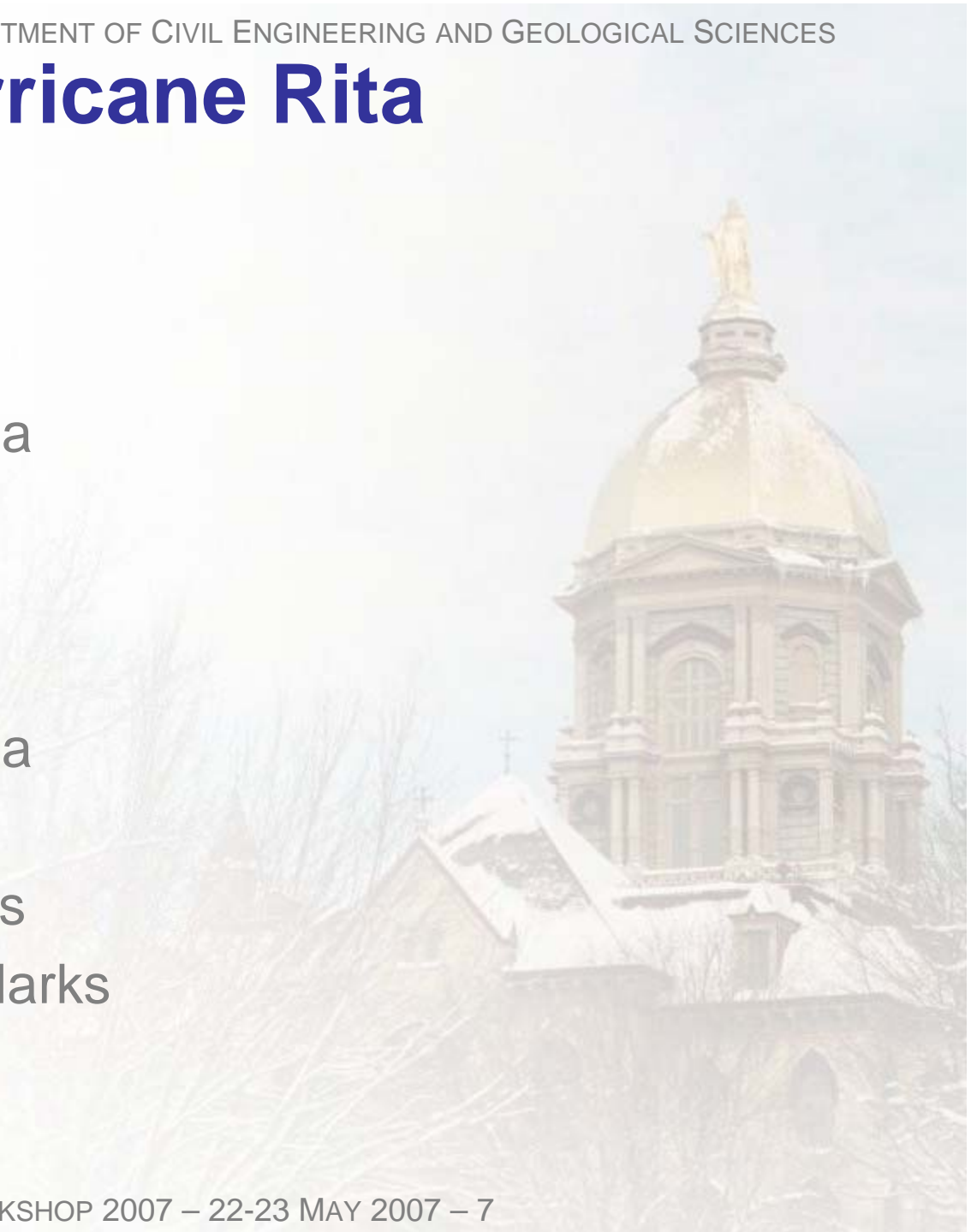
# Hurricane Rita

- SW Louisiana
  - Winds
  - Elevations
  - Contours of Maxima
- SE Louisiana
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  - Contours of Maxima
- Validation
  - USGS Hydrographs
  - URS High Water Marks



# Hurricane Rita

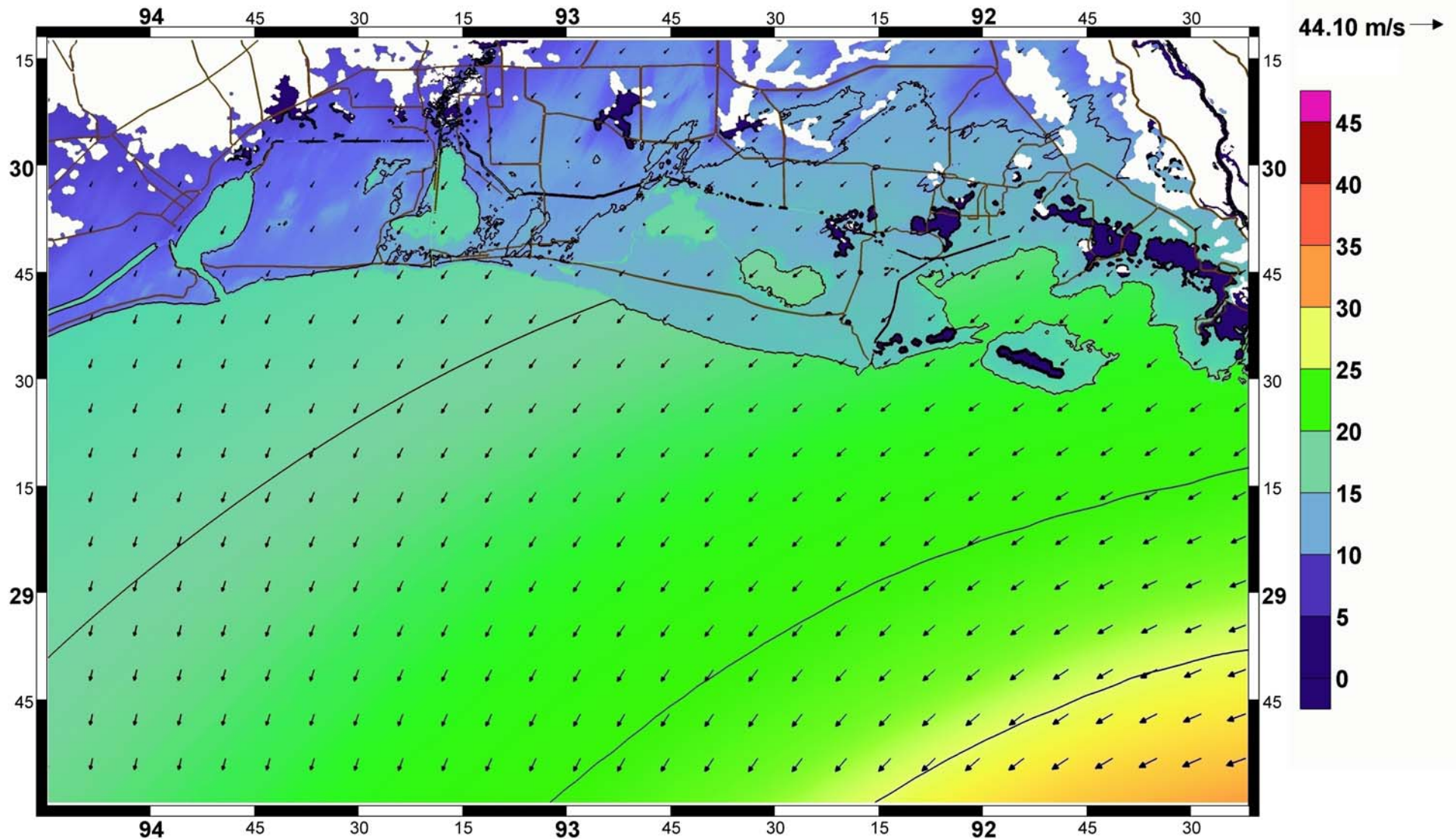
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# SW Louisiana

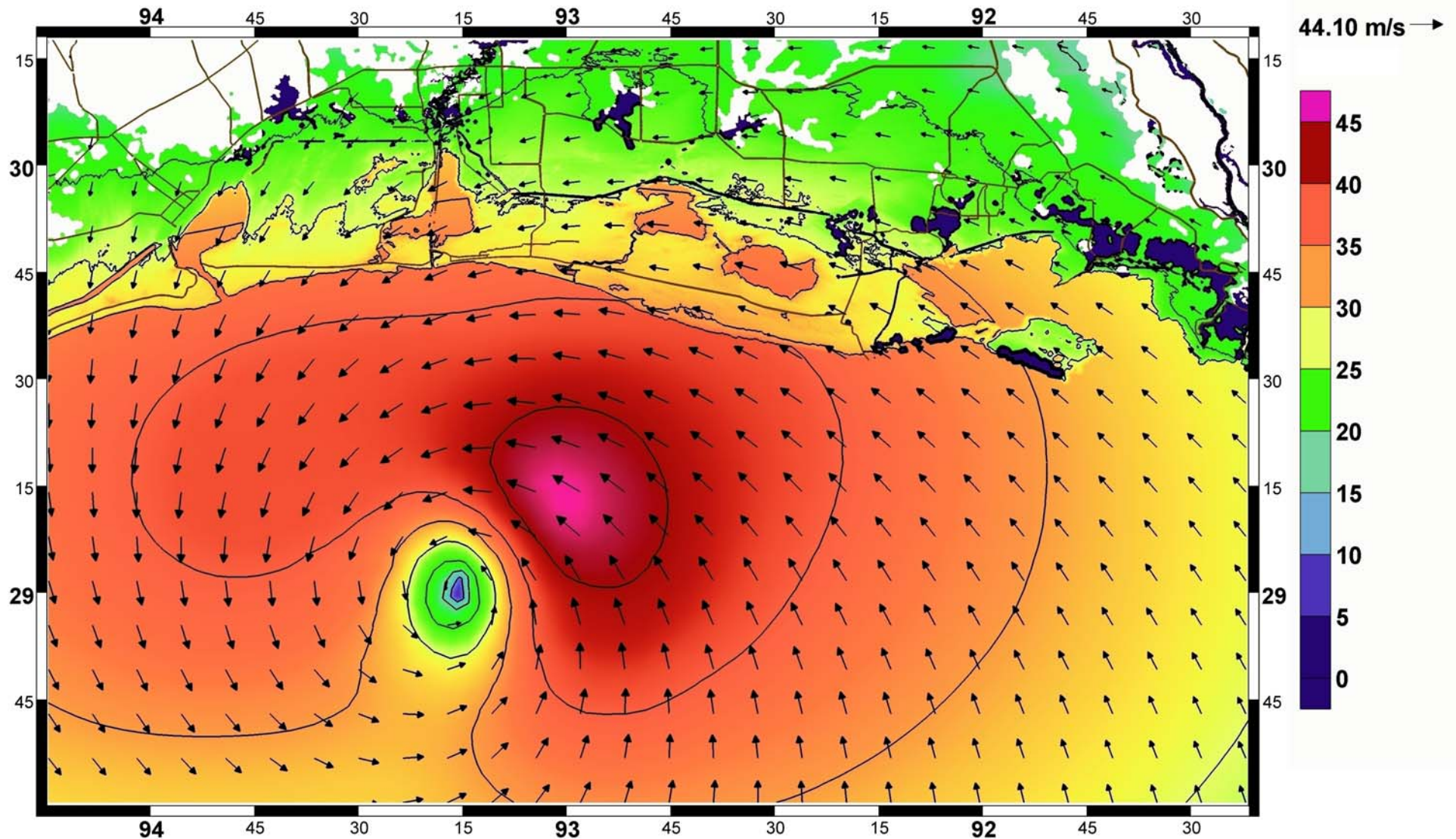
**Winds – 1200 UTC 23 September 2005**





# SW Louisiana

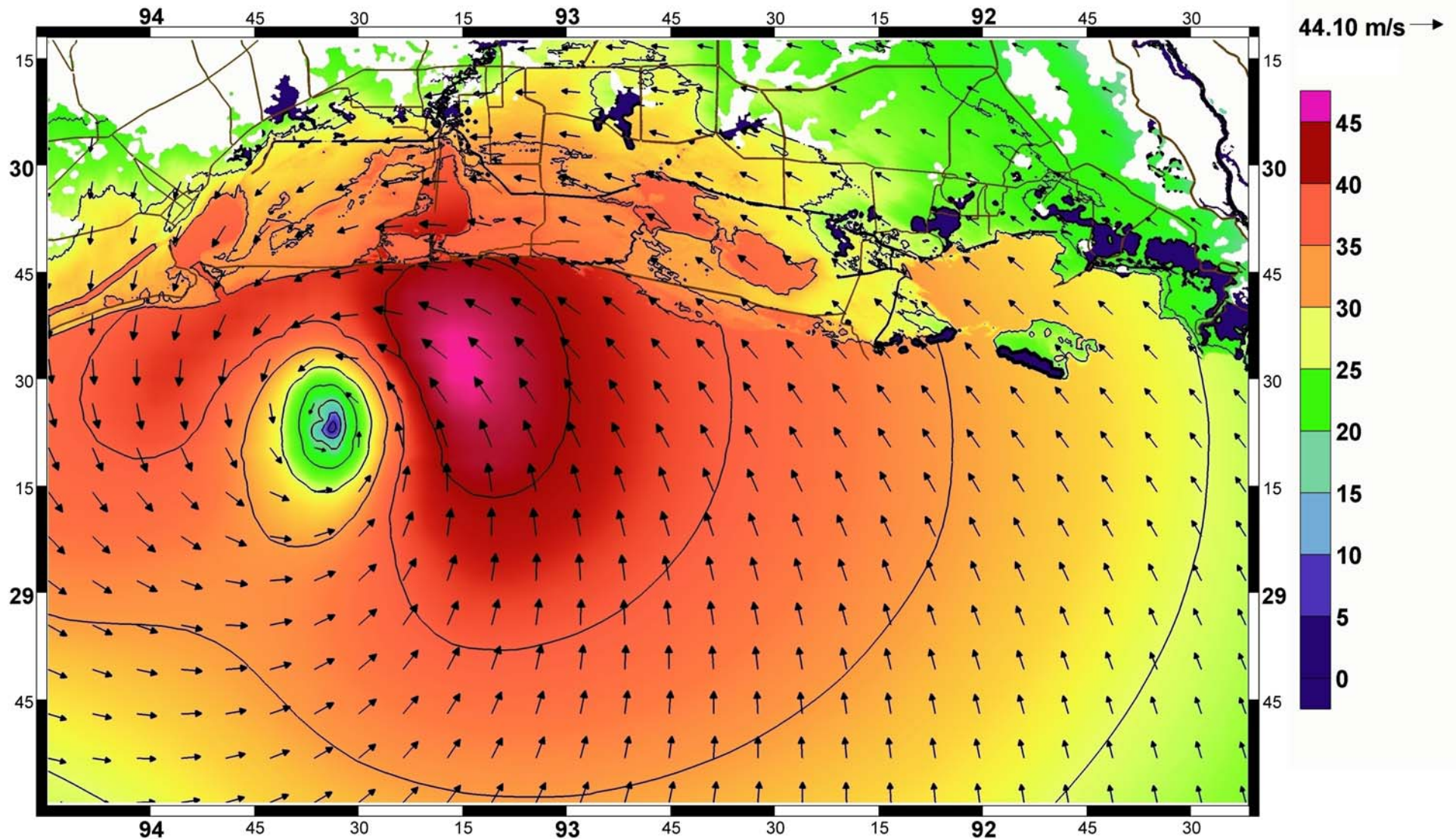
**Winds – 0300 UTC 24 September 2005**





# SW Louisiana

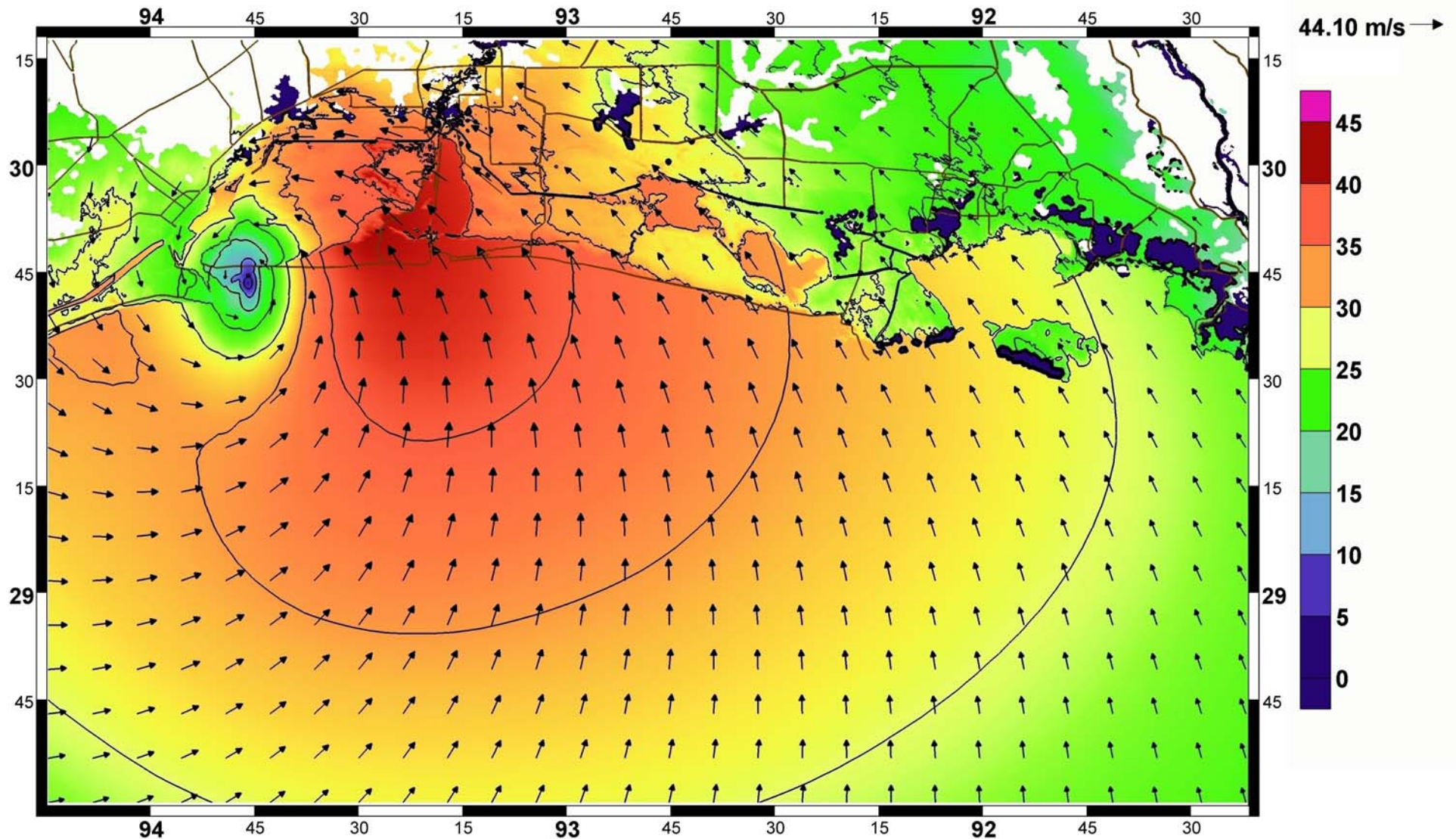
## Winds – 0600 UTC 24 September 2005





# SW Louisiana

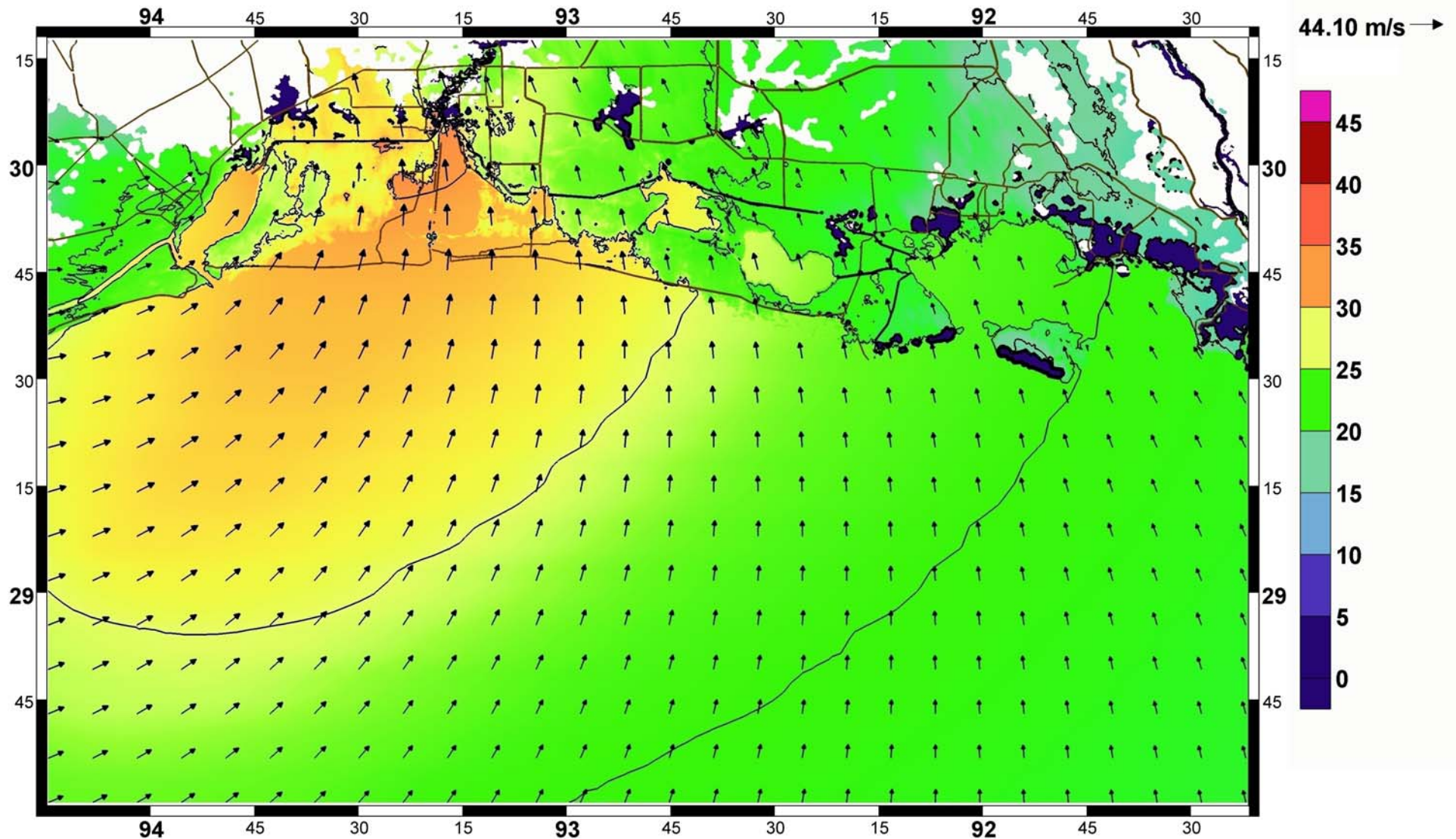
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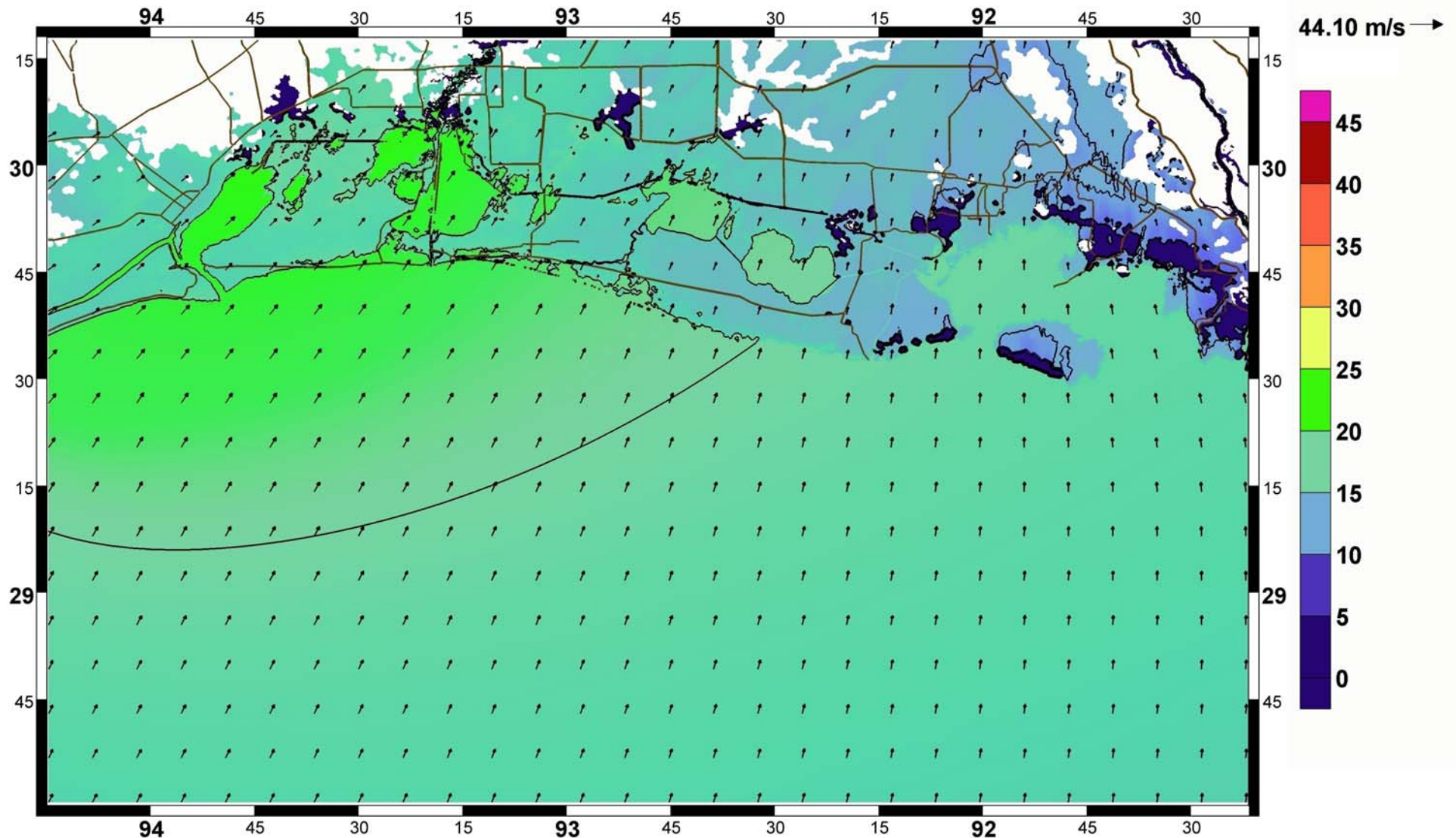
# SW Louisiana

**Winds – 1100 UTC 24 September 2005**



# SW Louisiana

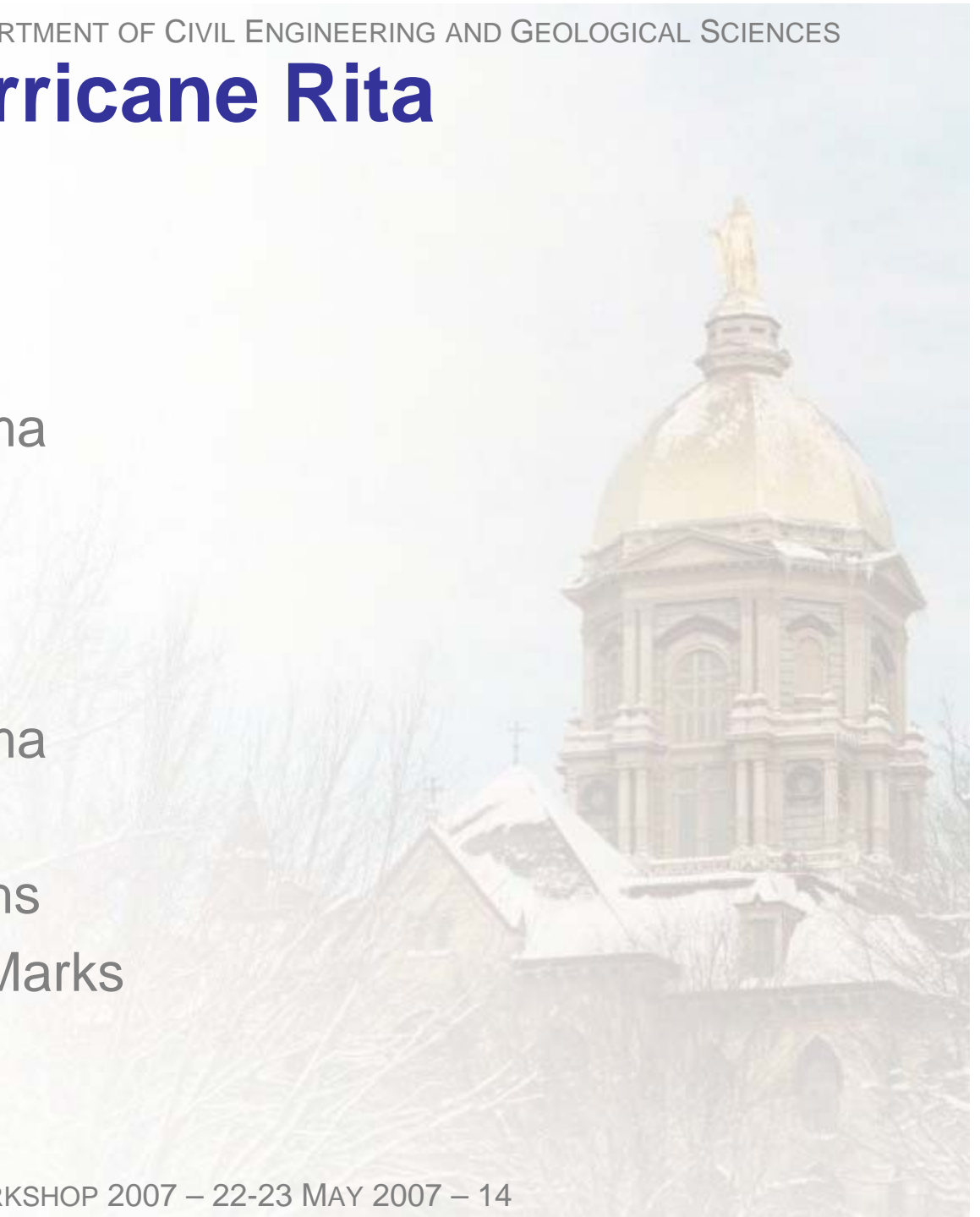
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# Hurricane Rita

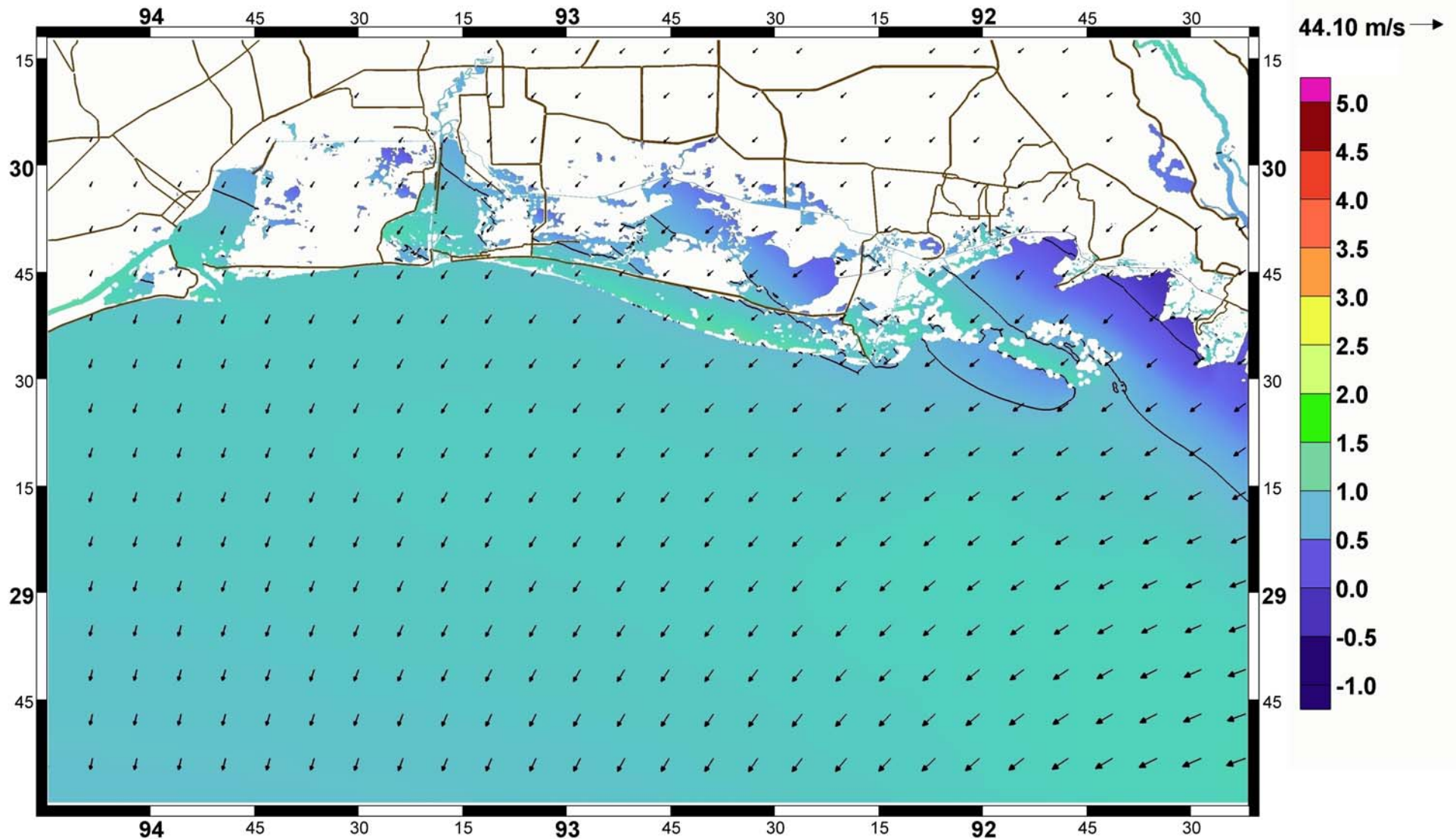
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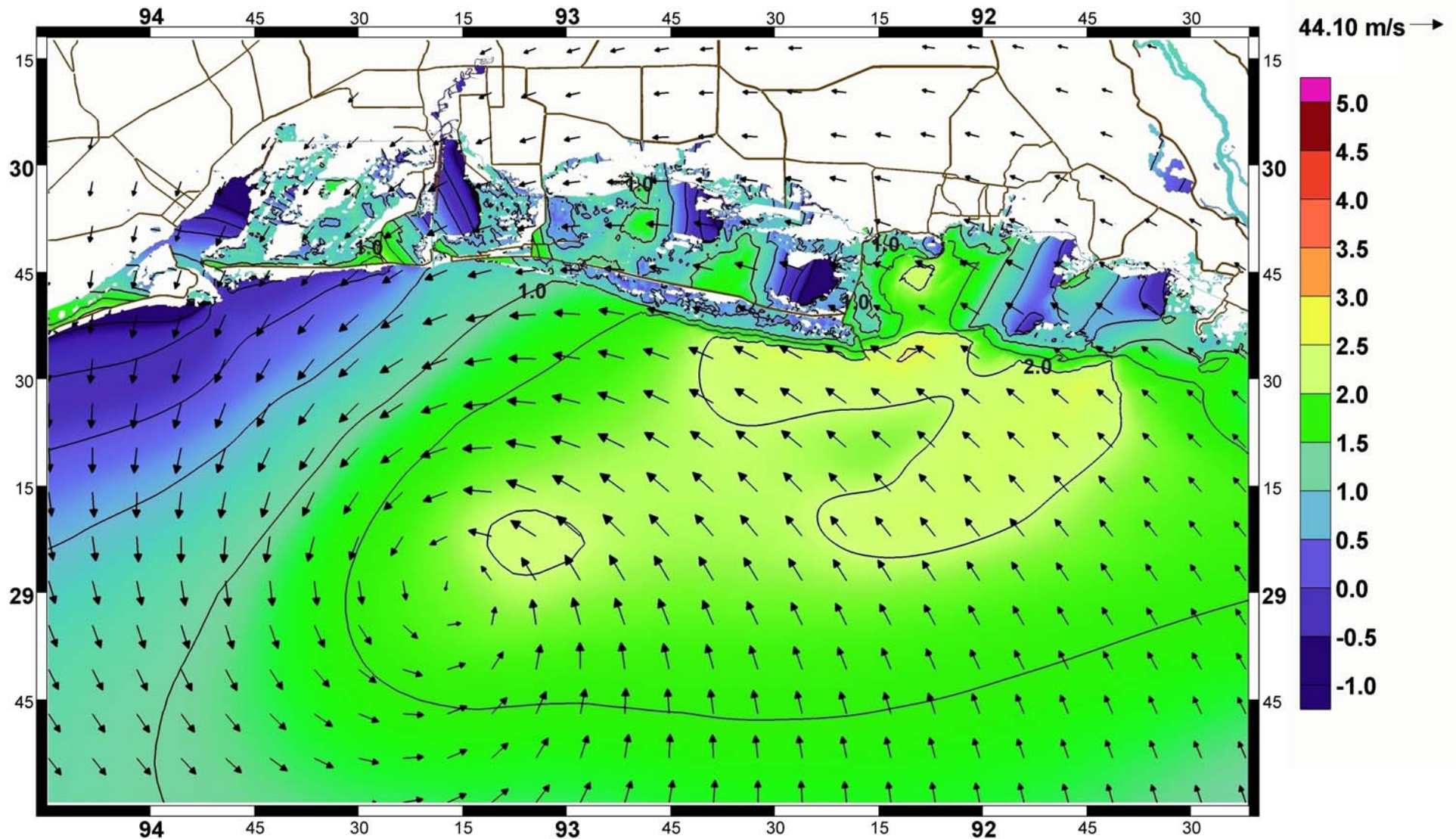
# SW Louisiana

Elevations – 1200 UTC 23 September 2005



# SW Louisiana

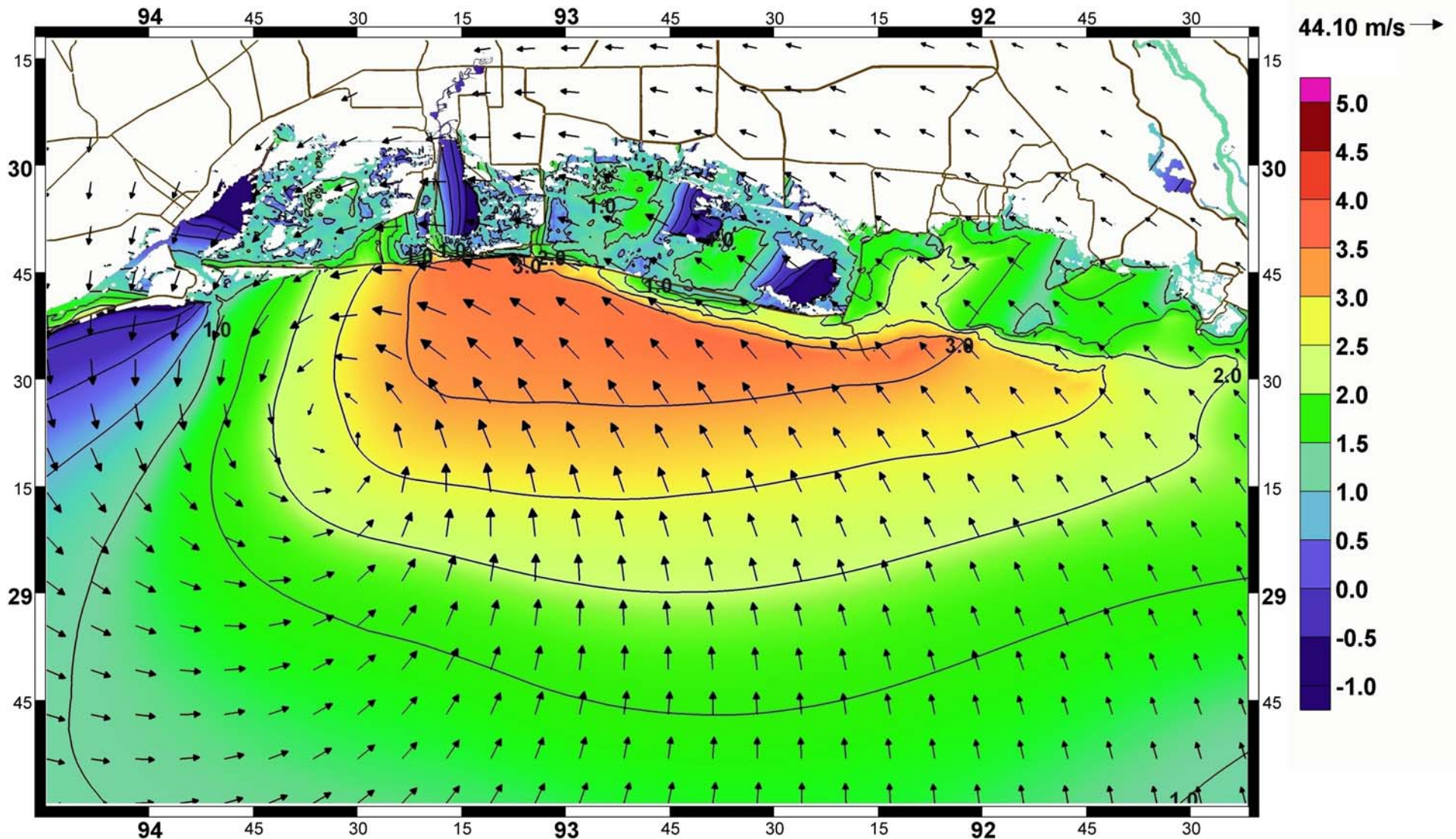
Elevations – 0300 UTC 24 September 2005





# SW Louisiana

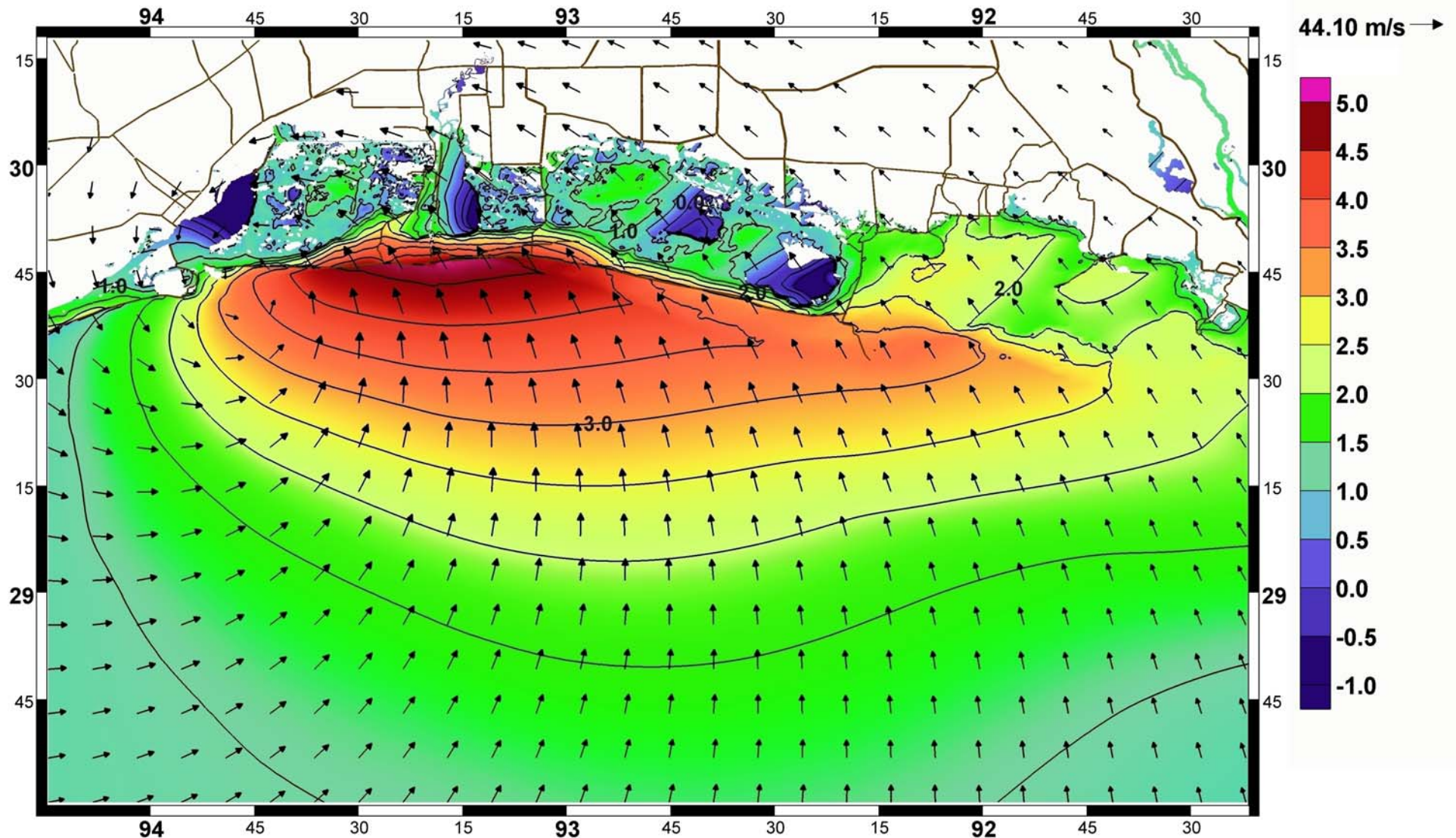
Elevations – 0600 UTC 24 September 2005





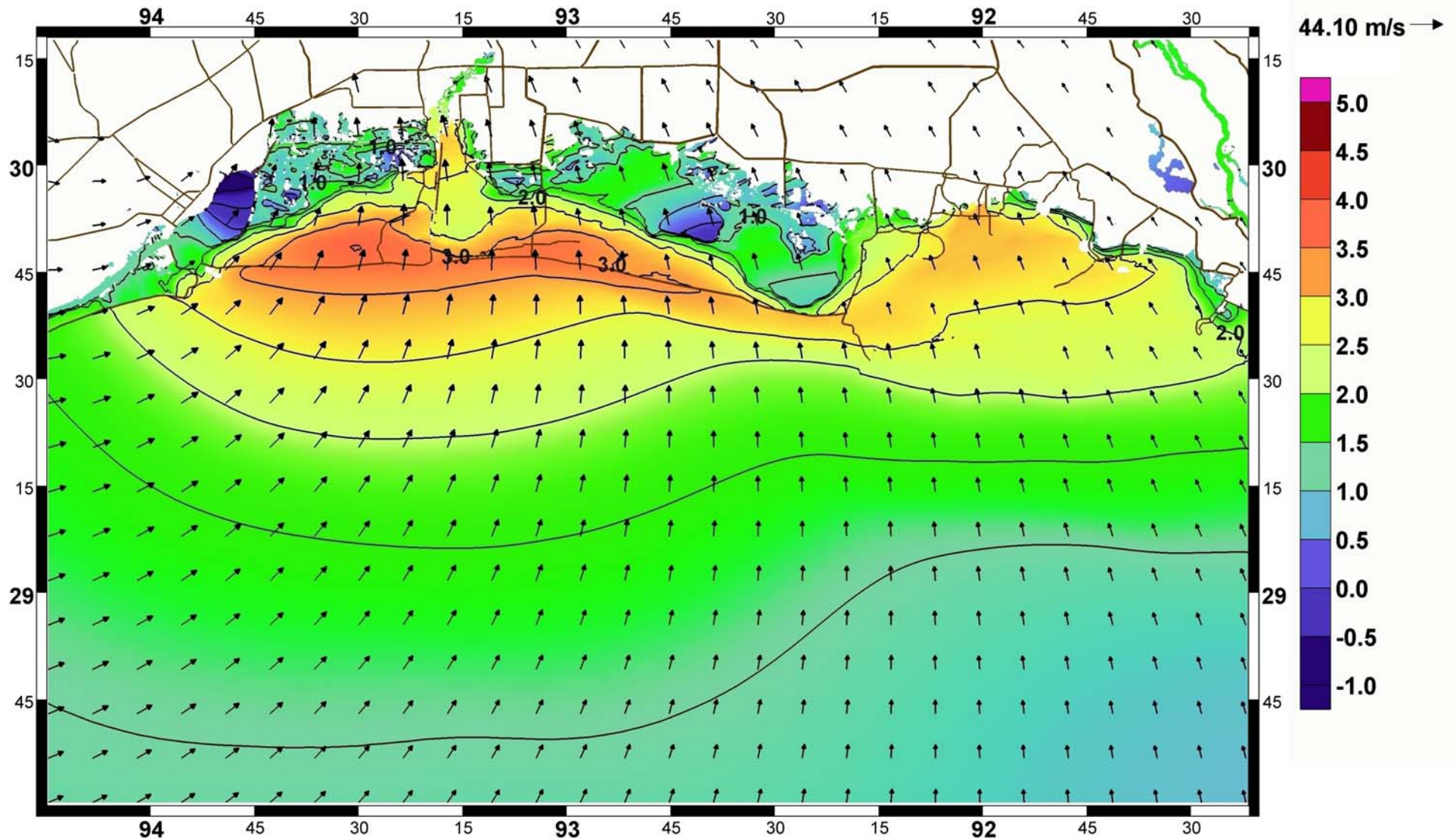
# SW Louisiana

Elevations – 0800 UTC 24 September 2005



# SW Louisiana

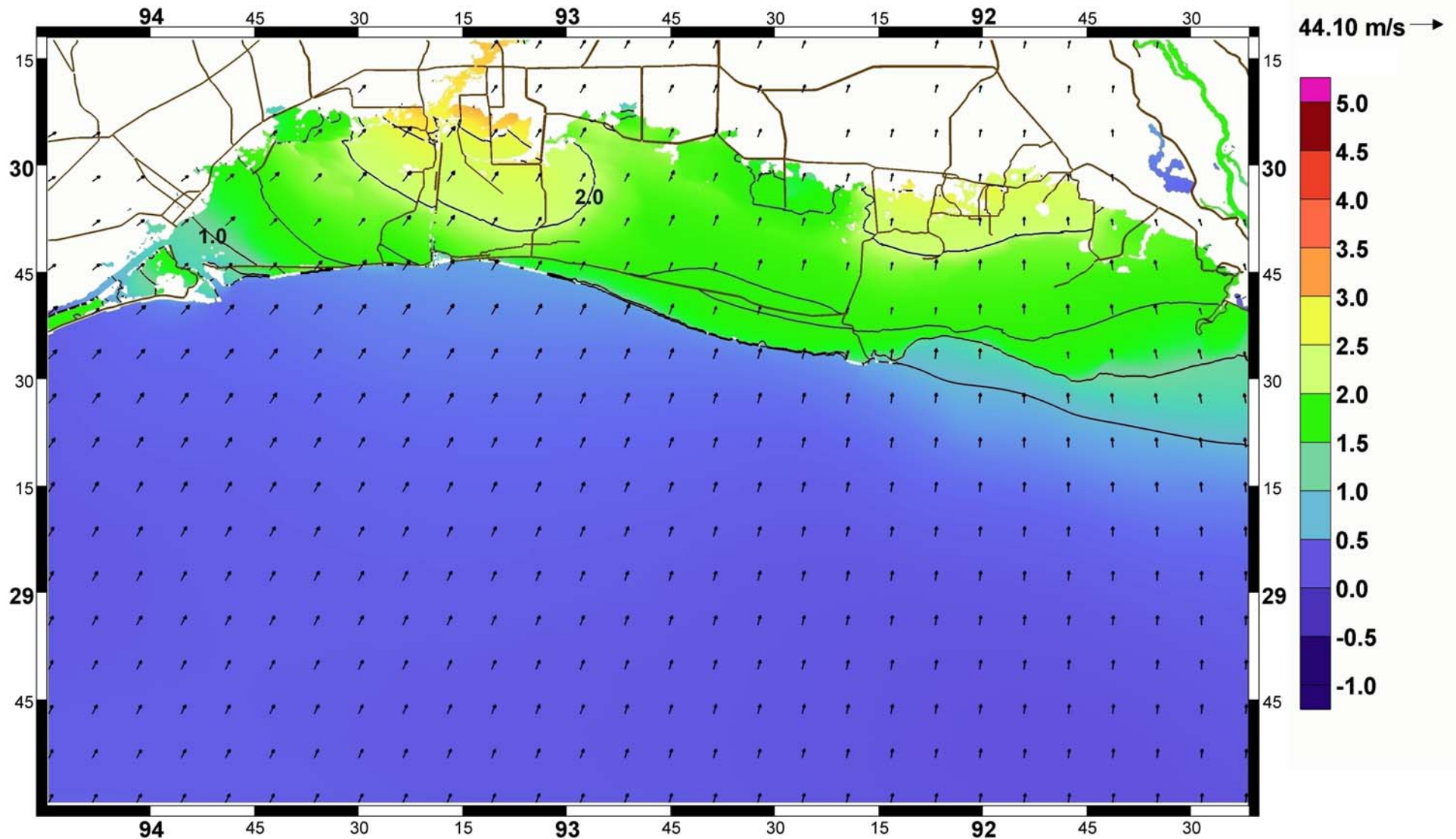
Elevations – 1100 UTC 24 September 2005





# SW Louisiana

Elevations – 2100 UTC 24 September 2005





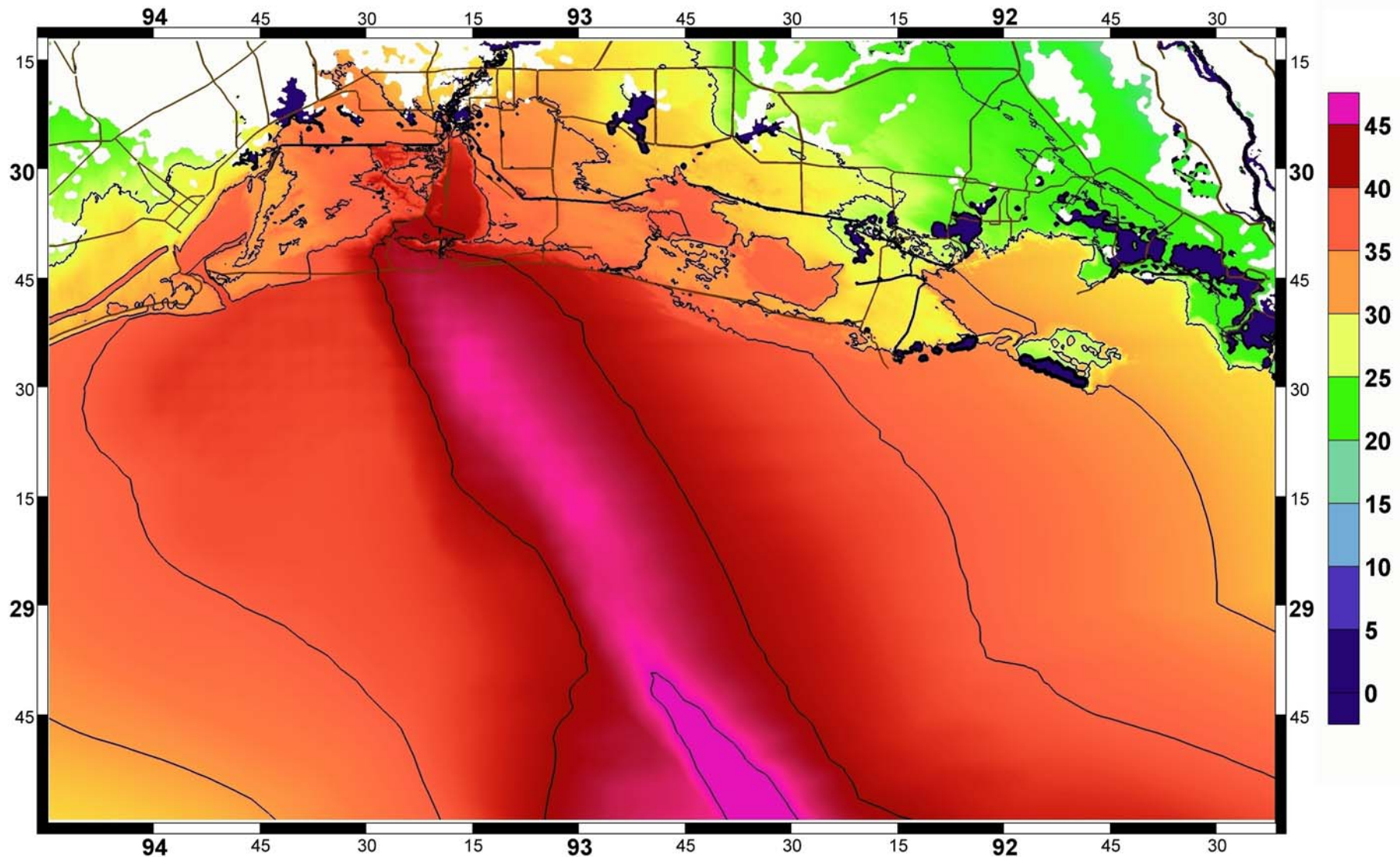
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# SW Louisiana

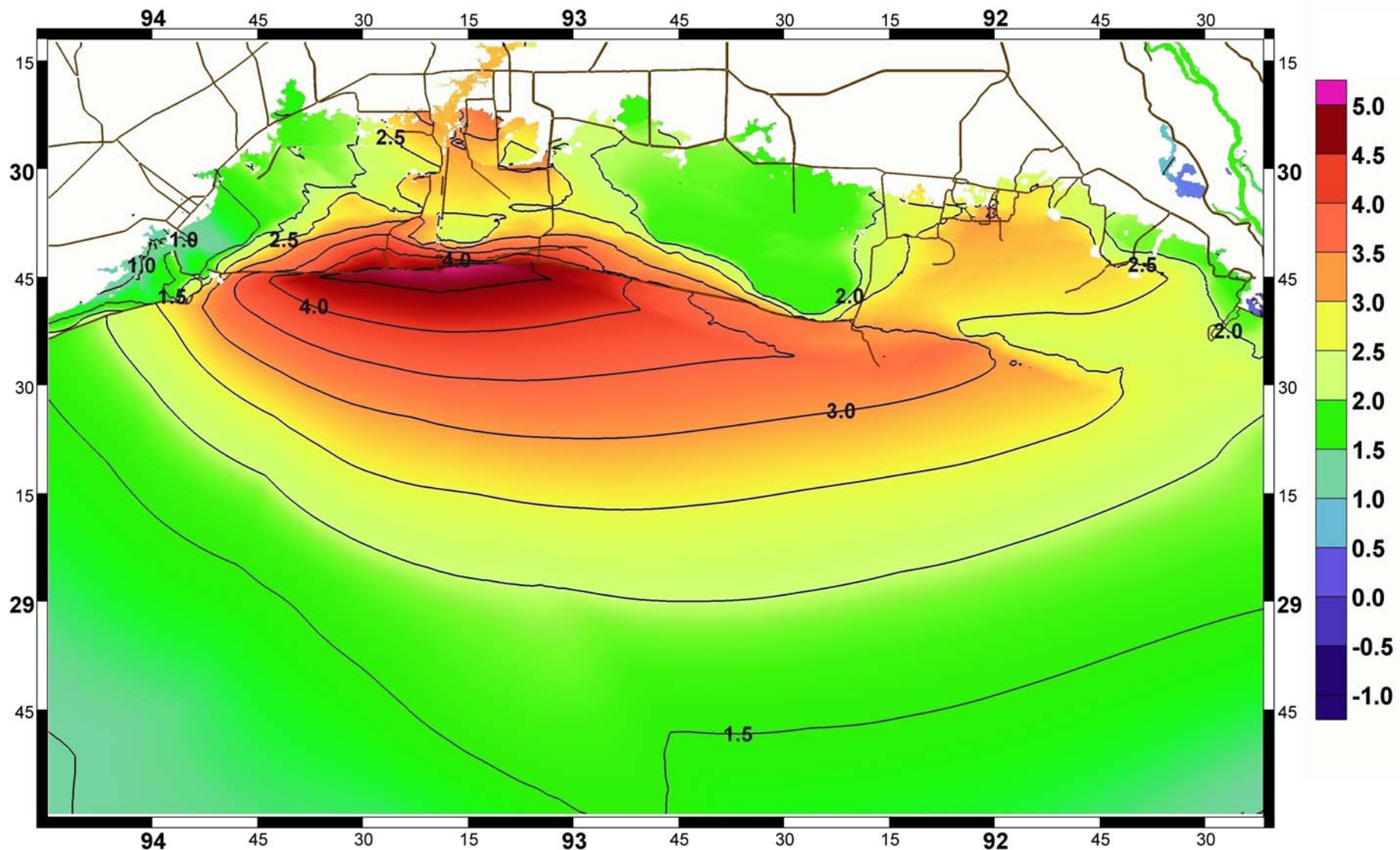
## Maximum Winds





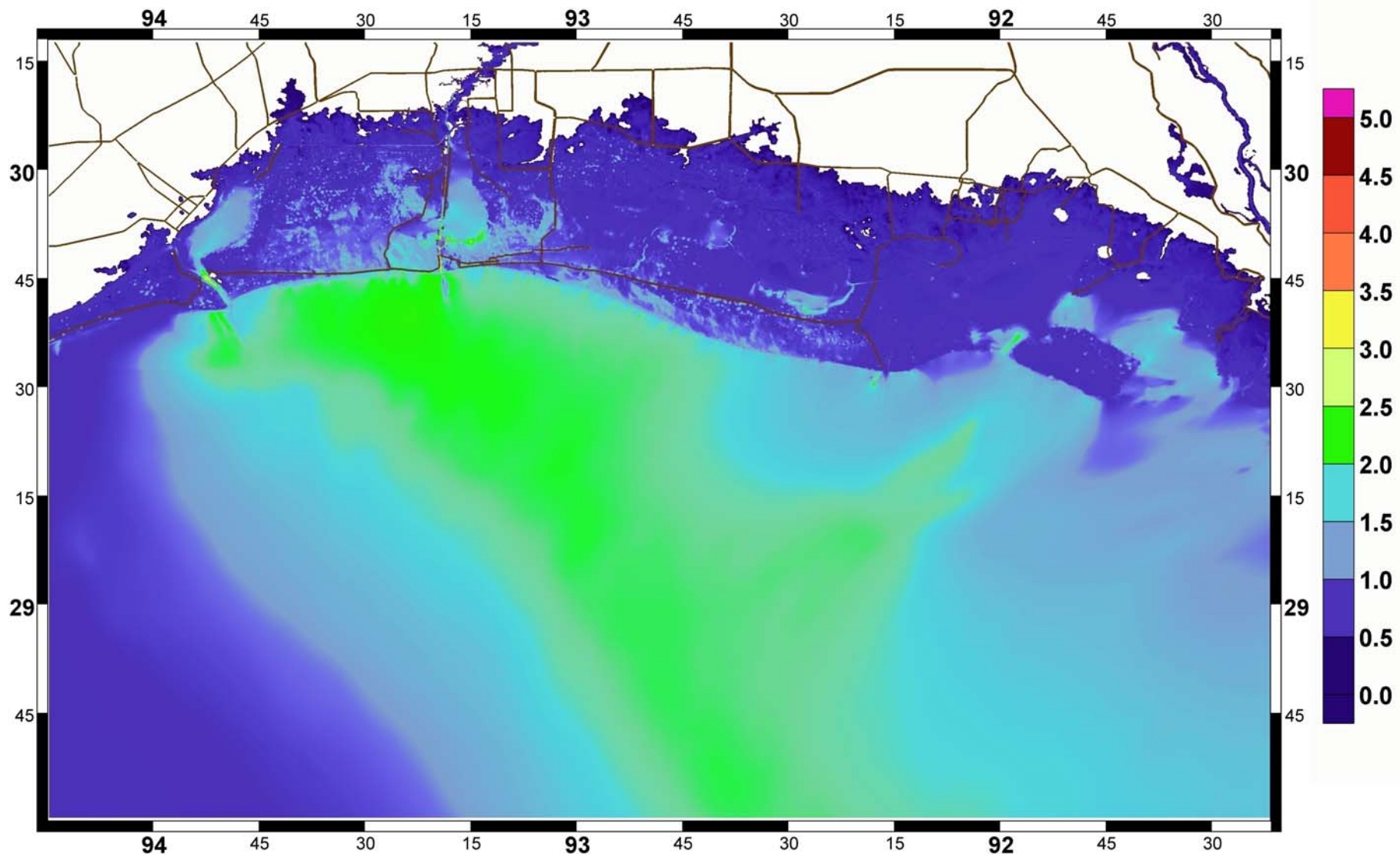
# SW Louisiana

## Maximum Elevations



# SW Louisiana

## Maximum Currents

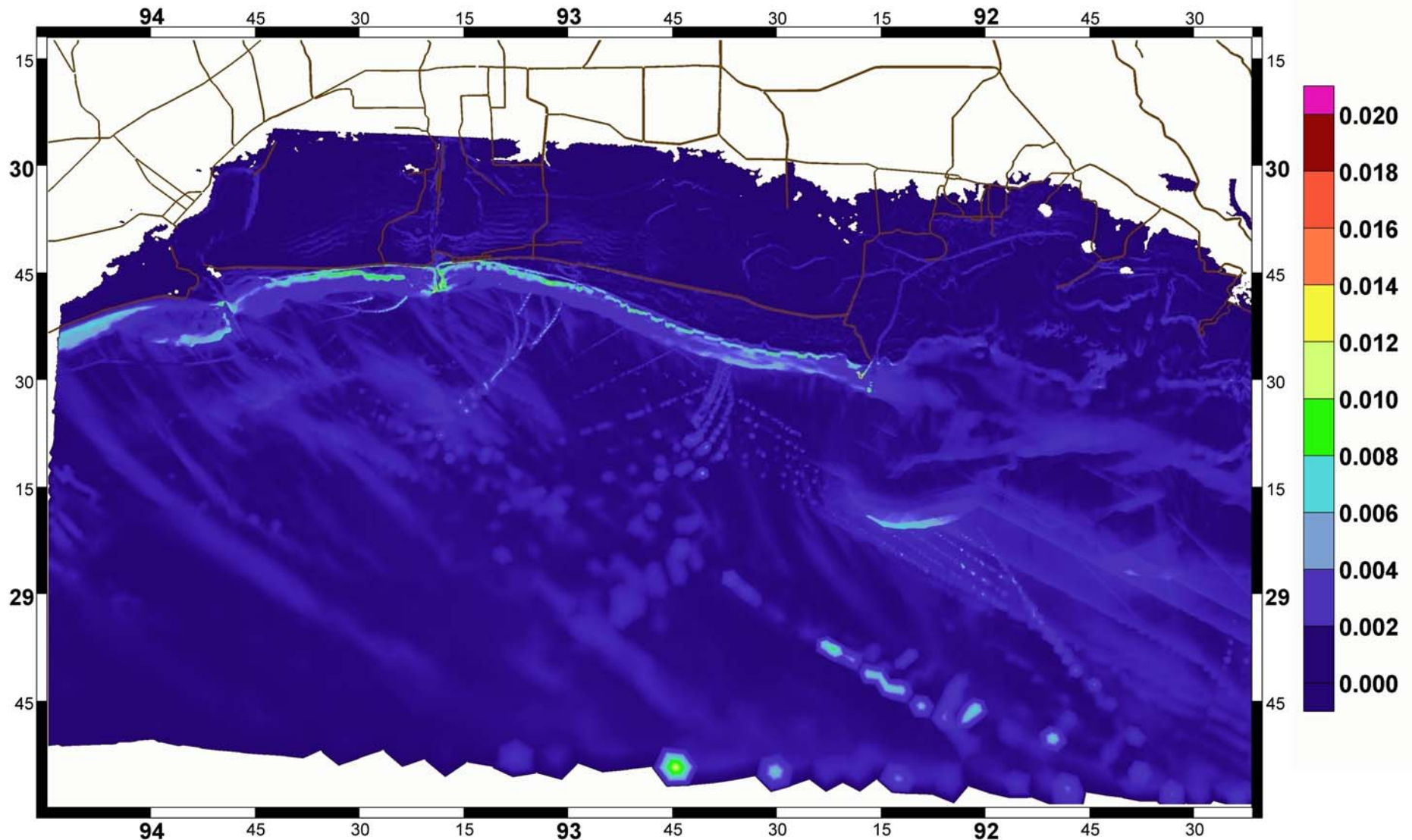


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# SW Louisiana

## Maximum Wave Radiation Stresses



# Hurricane Rita

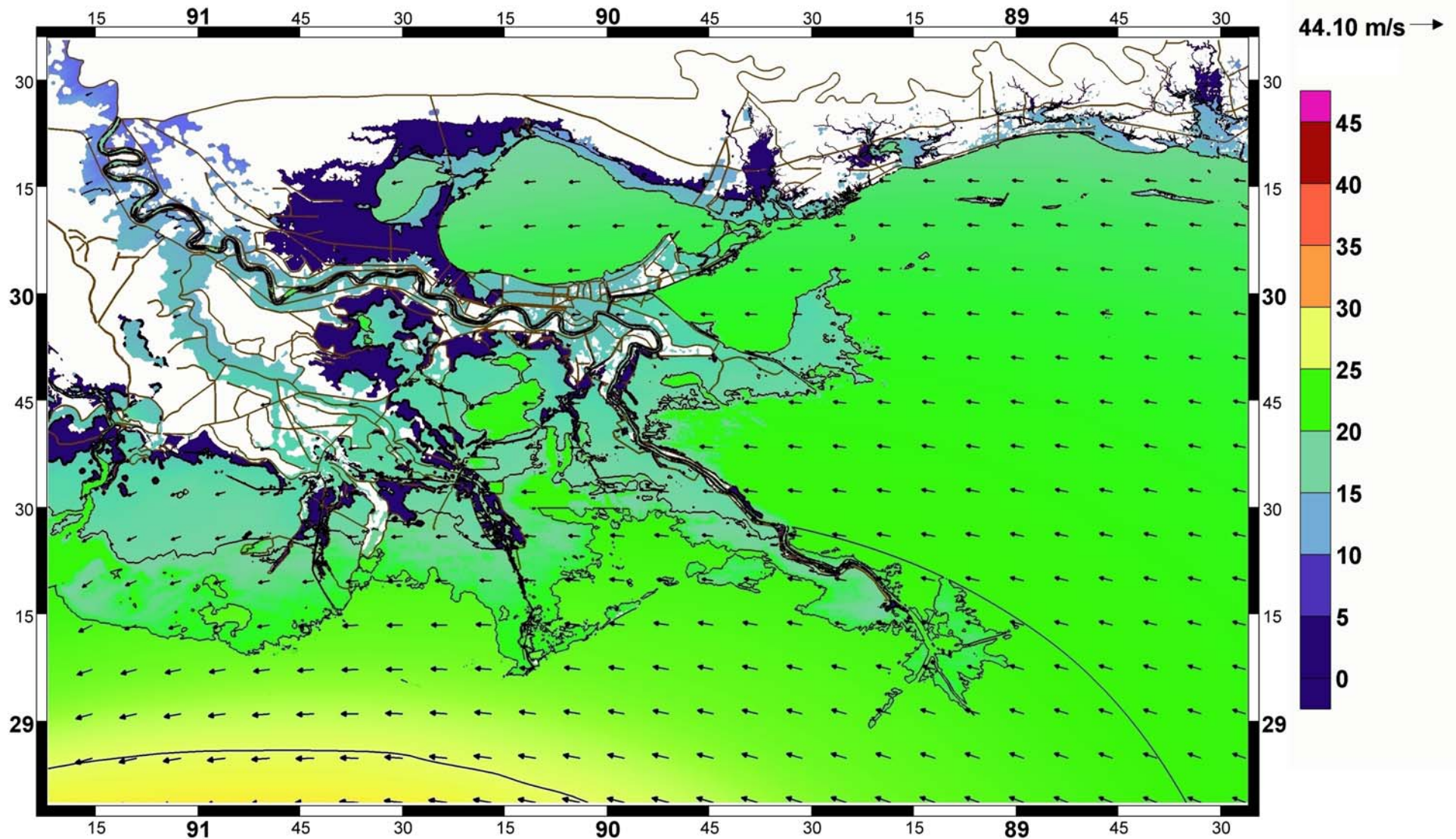
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# SE Louisiana

**Winds – 1200 UTC 23 September 2005**

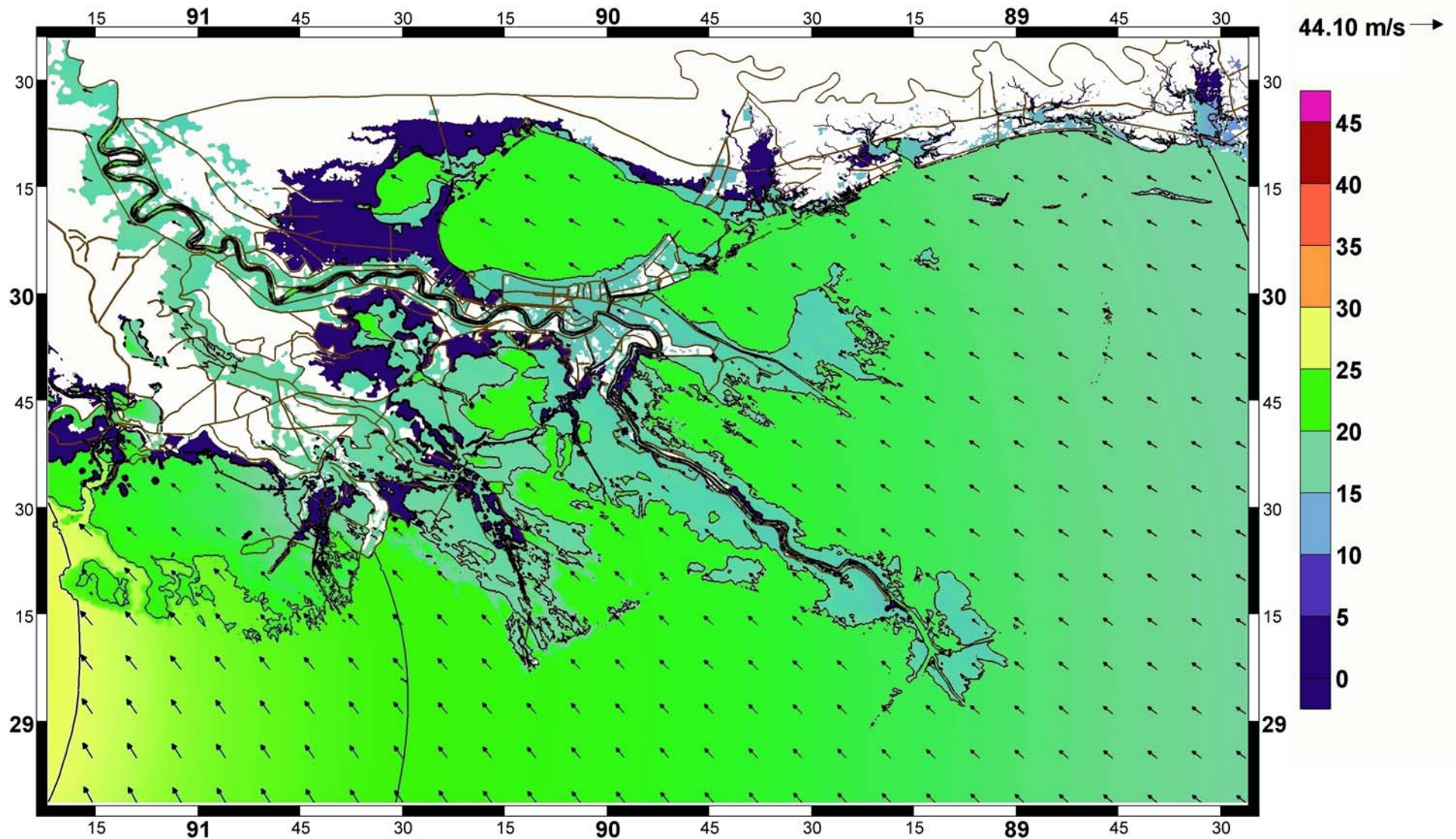


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# SE Louisiana

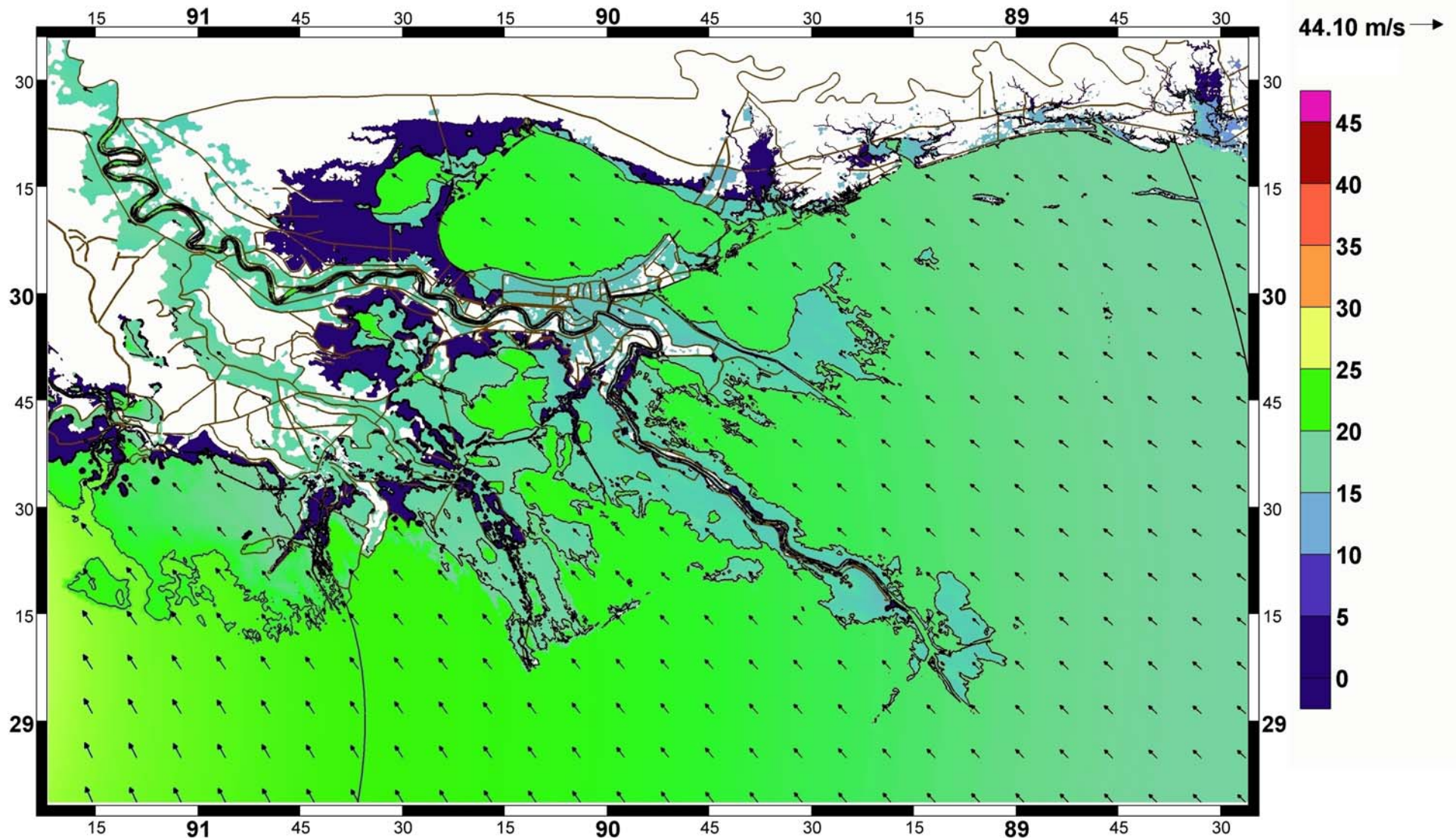
**Winds – 0300 UTC 24 September 2005**





# SE Louisiana

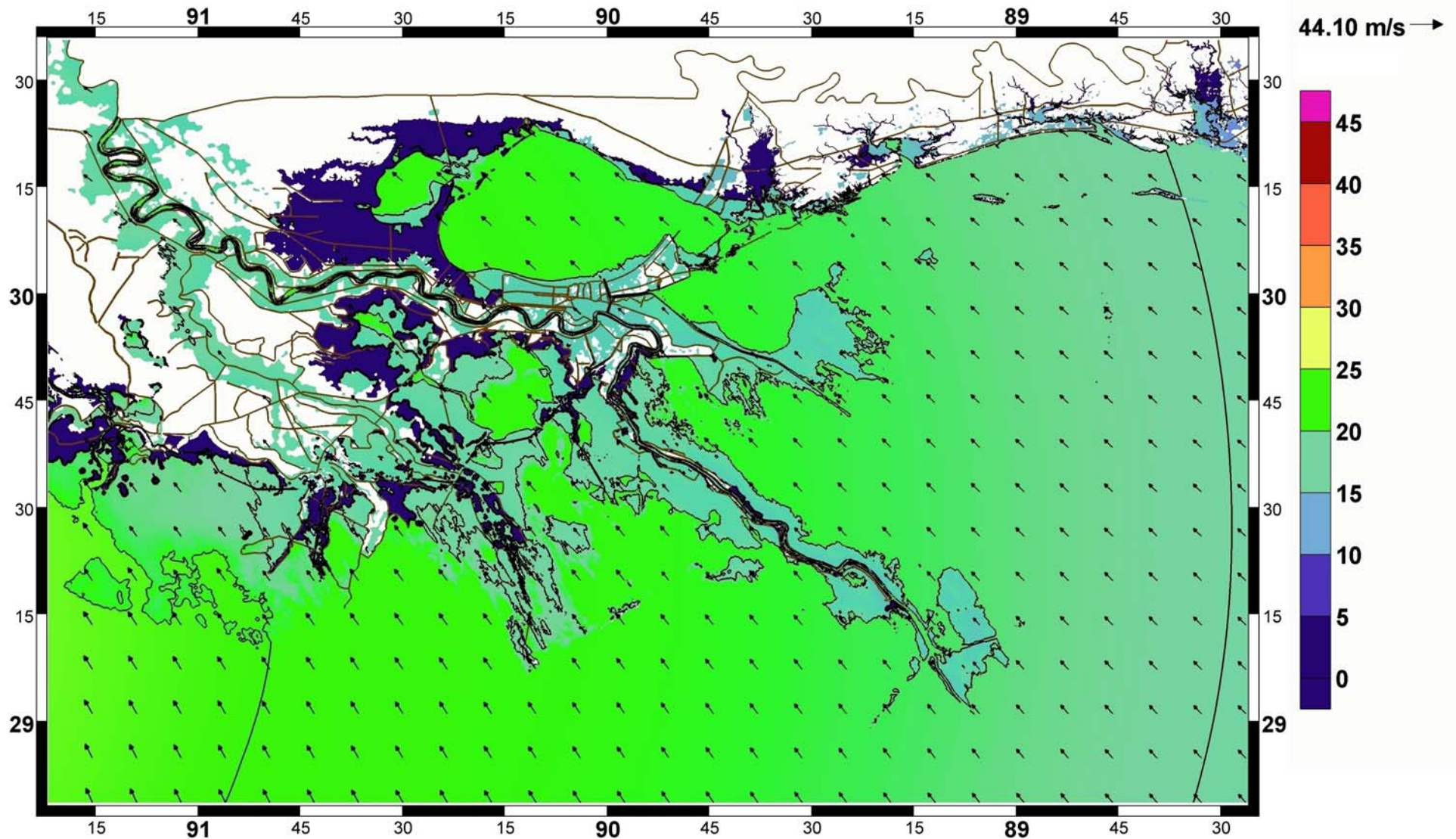
**Winds – 0600 UTC 24 September 2005**





# SE Louisiana

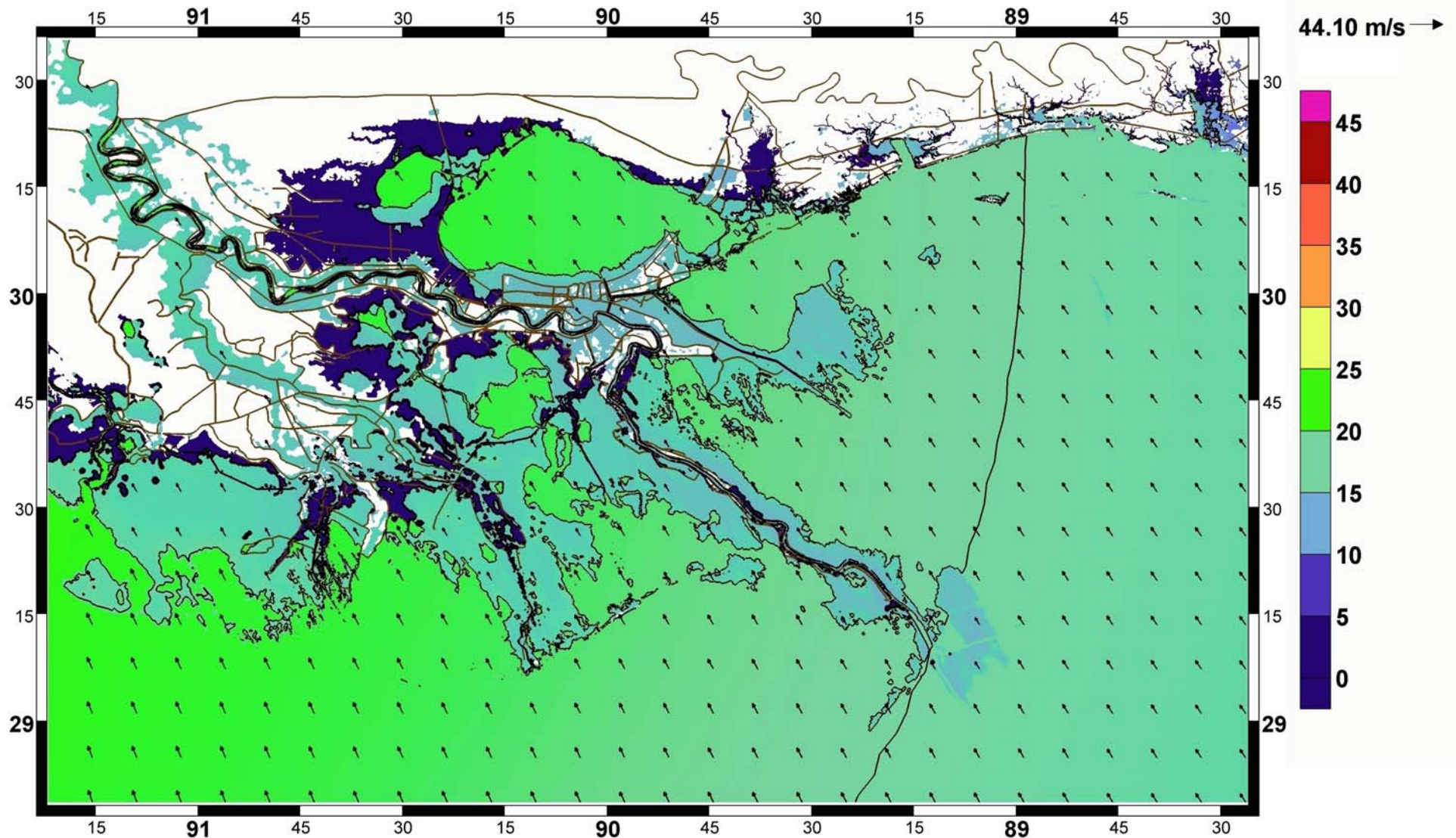
**Winds – 0800 UTC 24 September 2005**





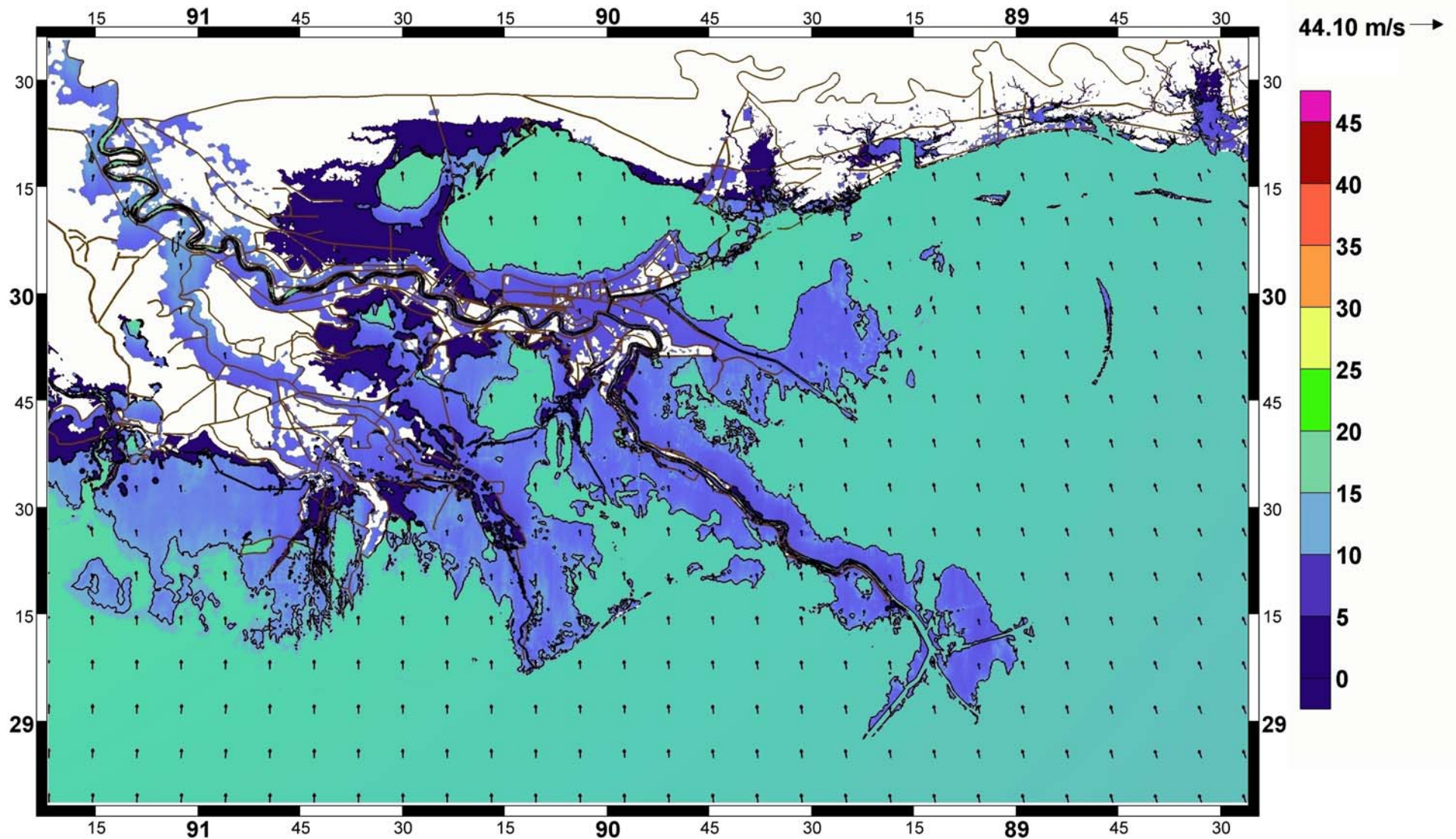
# SE Louisiana

**Winds – 1100 UTC 24 September 2005**



# SE Louisiana

**Winds – 2100 UTC 24 September 2005**





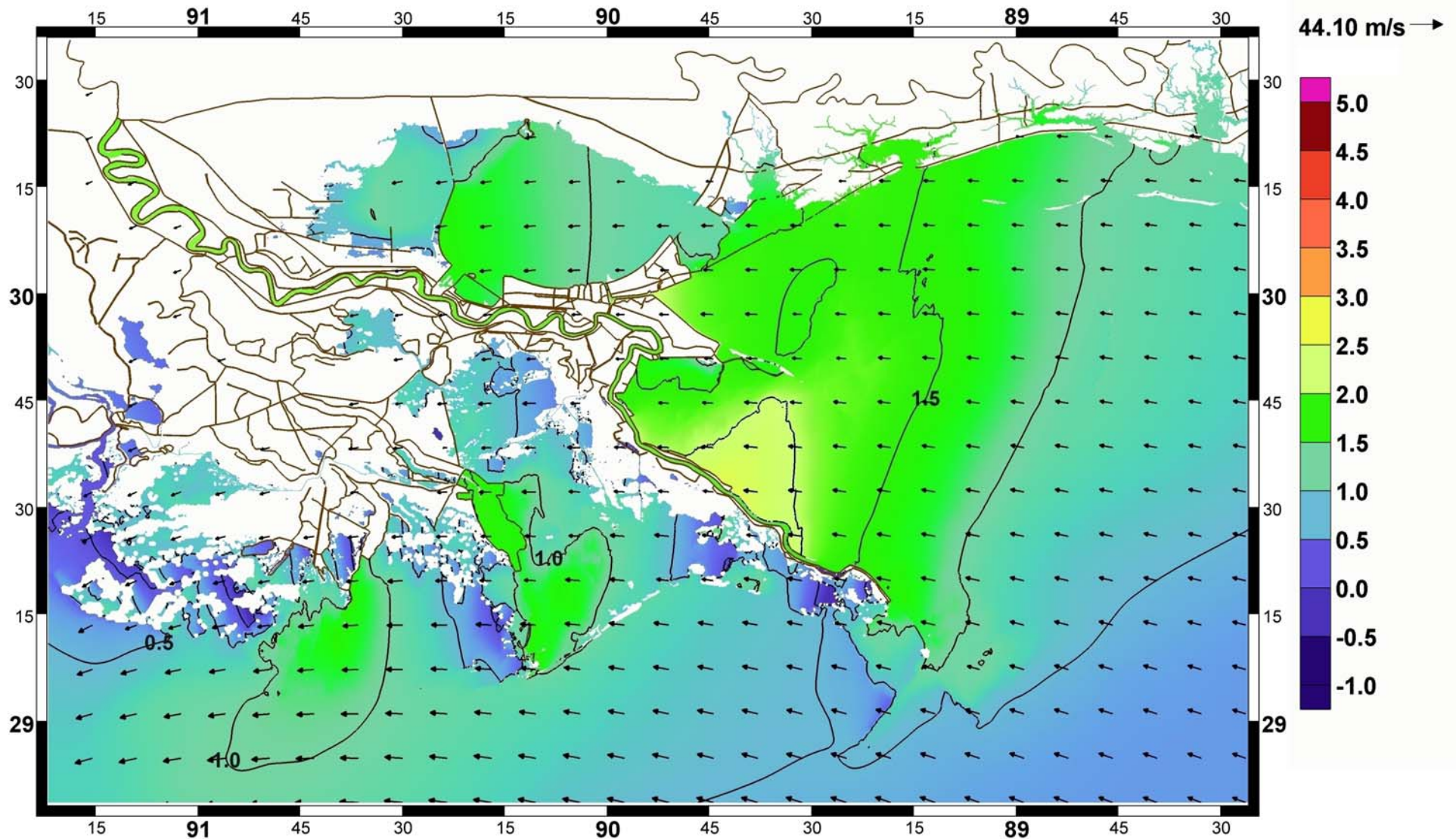
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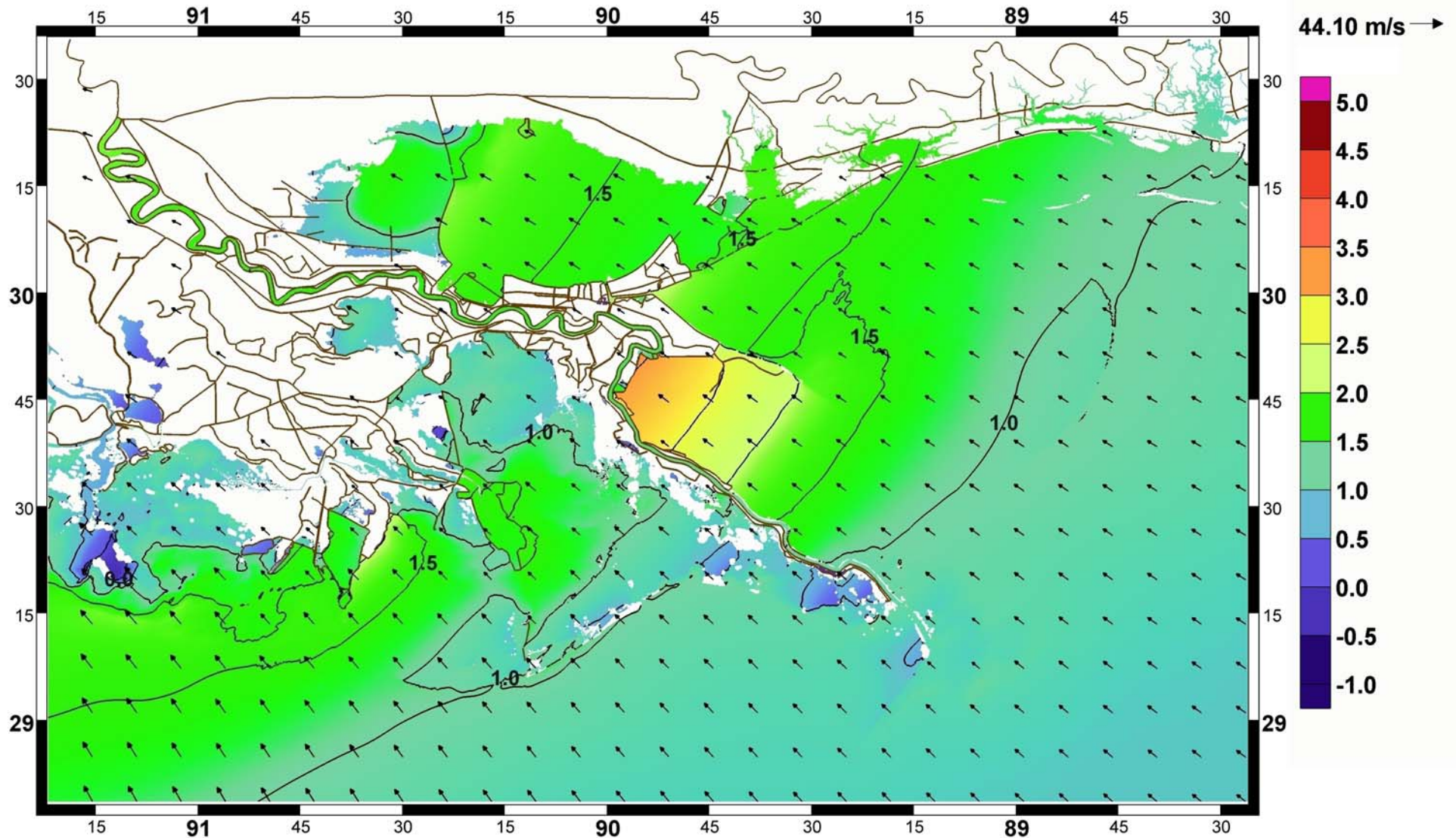
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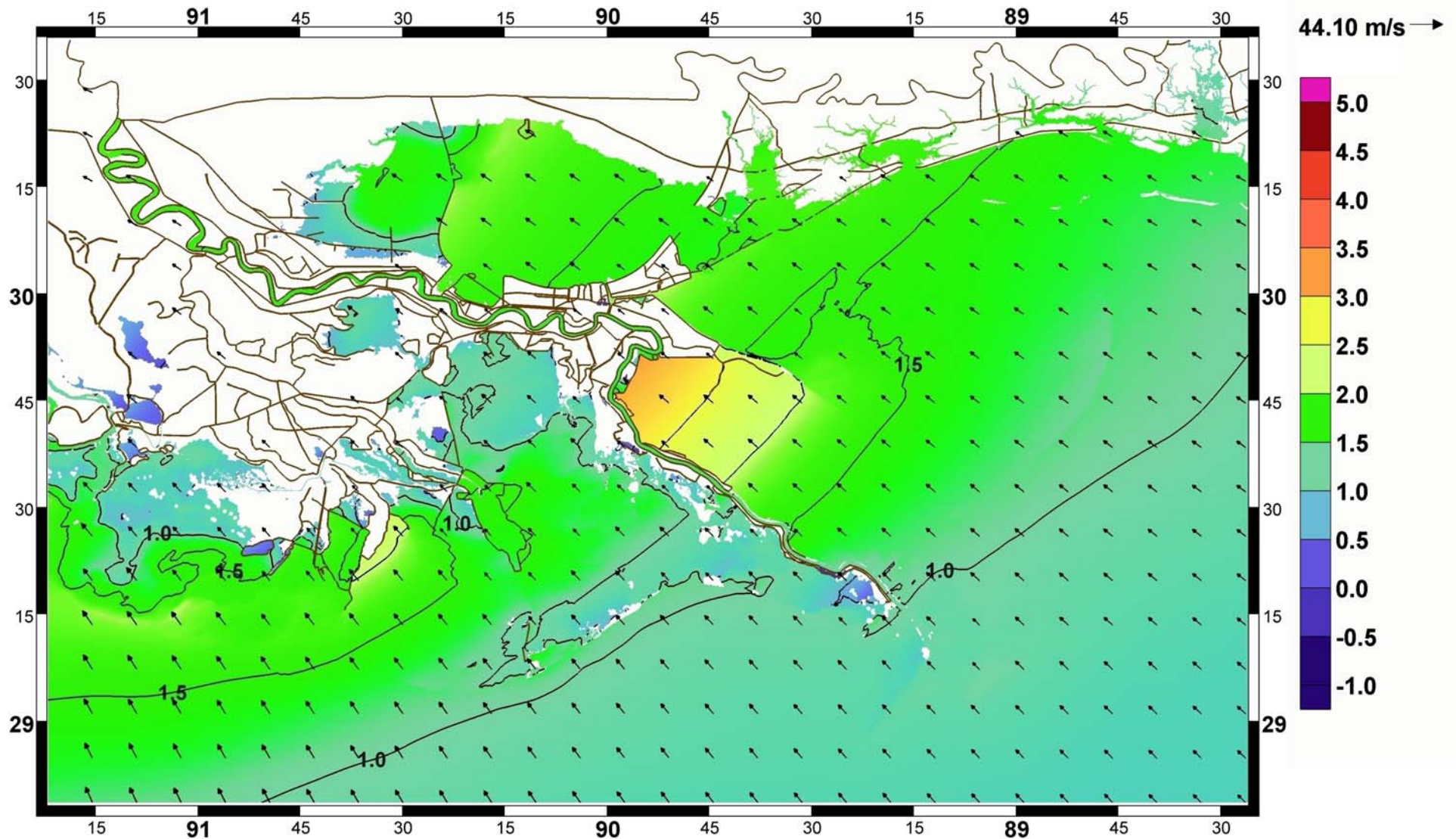
# SE Louisiana

Elevations – 0300 UTC 24 September 2005



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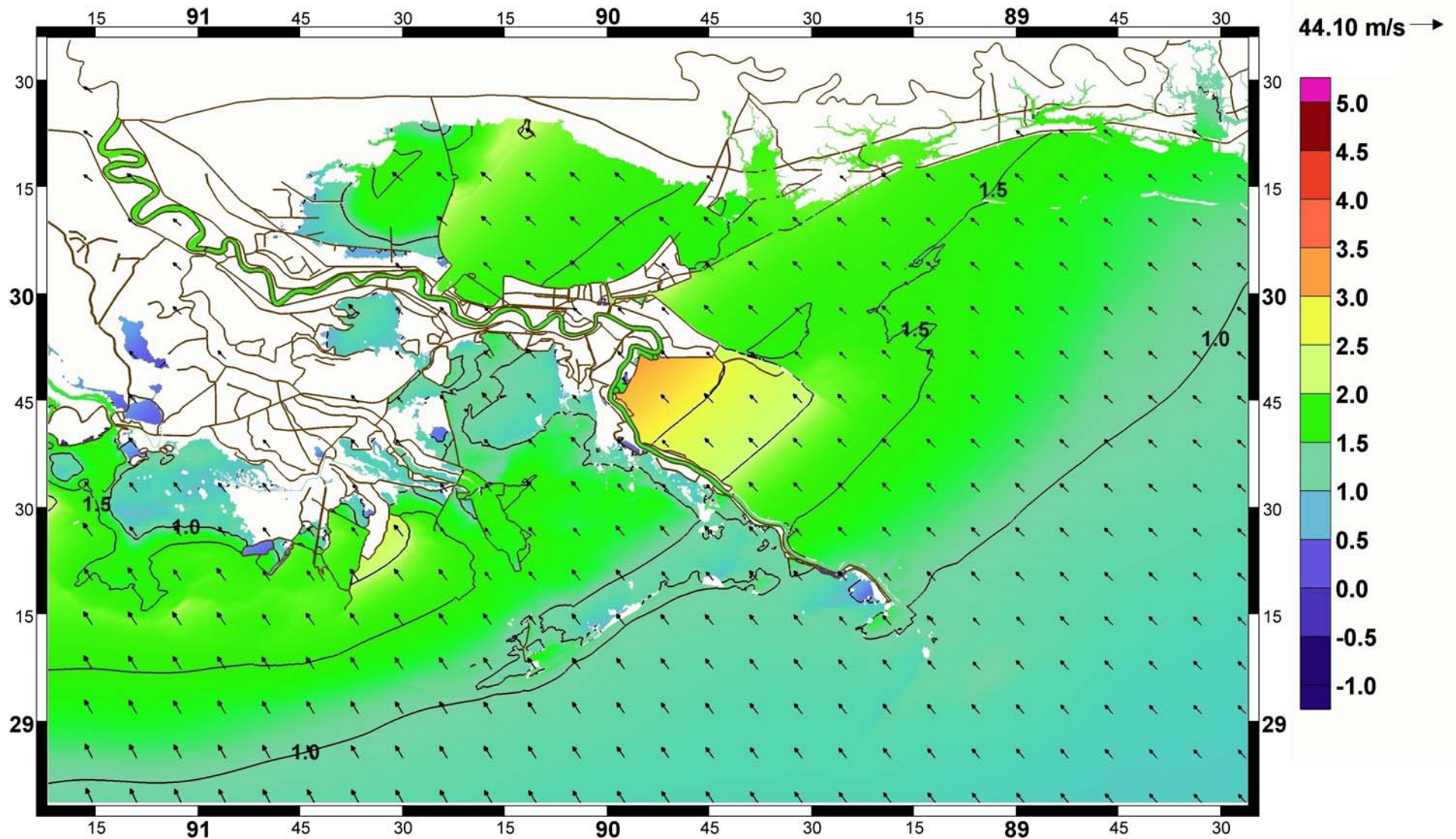
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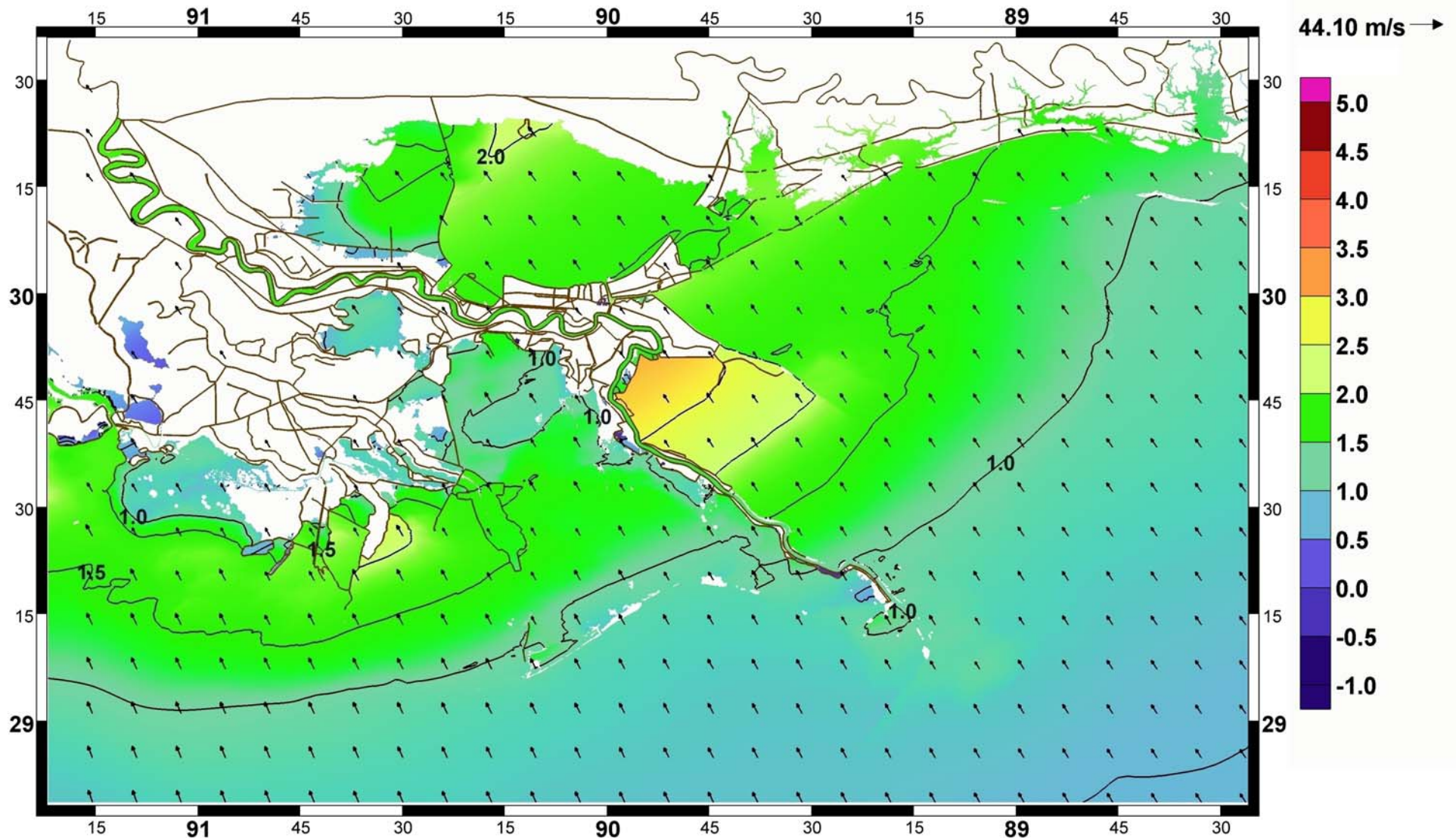
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Elevations – 0800 UTC 24 September 2005



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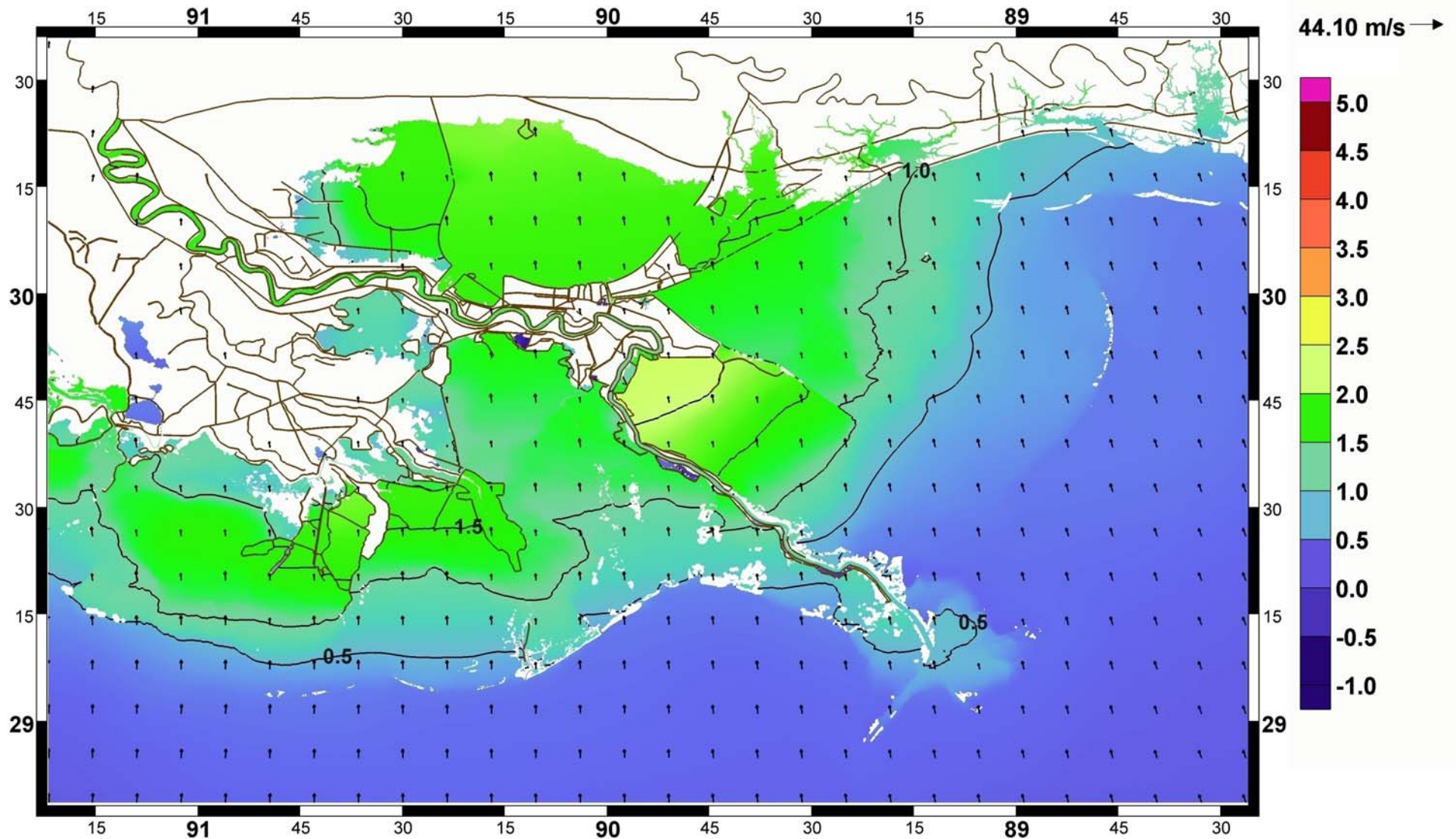
Elevations – 1100 UTC 24 September 2005





# SE Louisiana

Elevations – 2100 UTC 24 September 2005



# Hurricane Rita

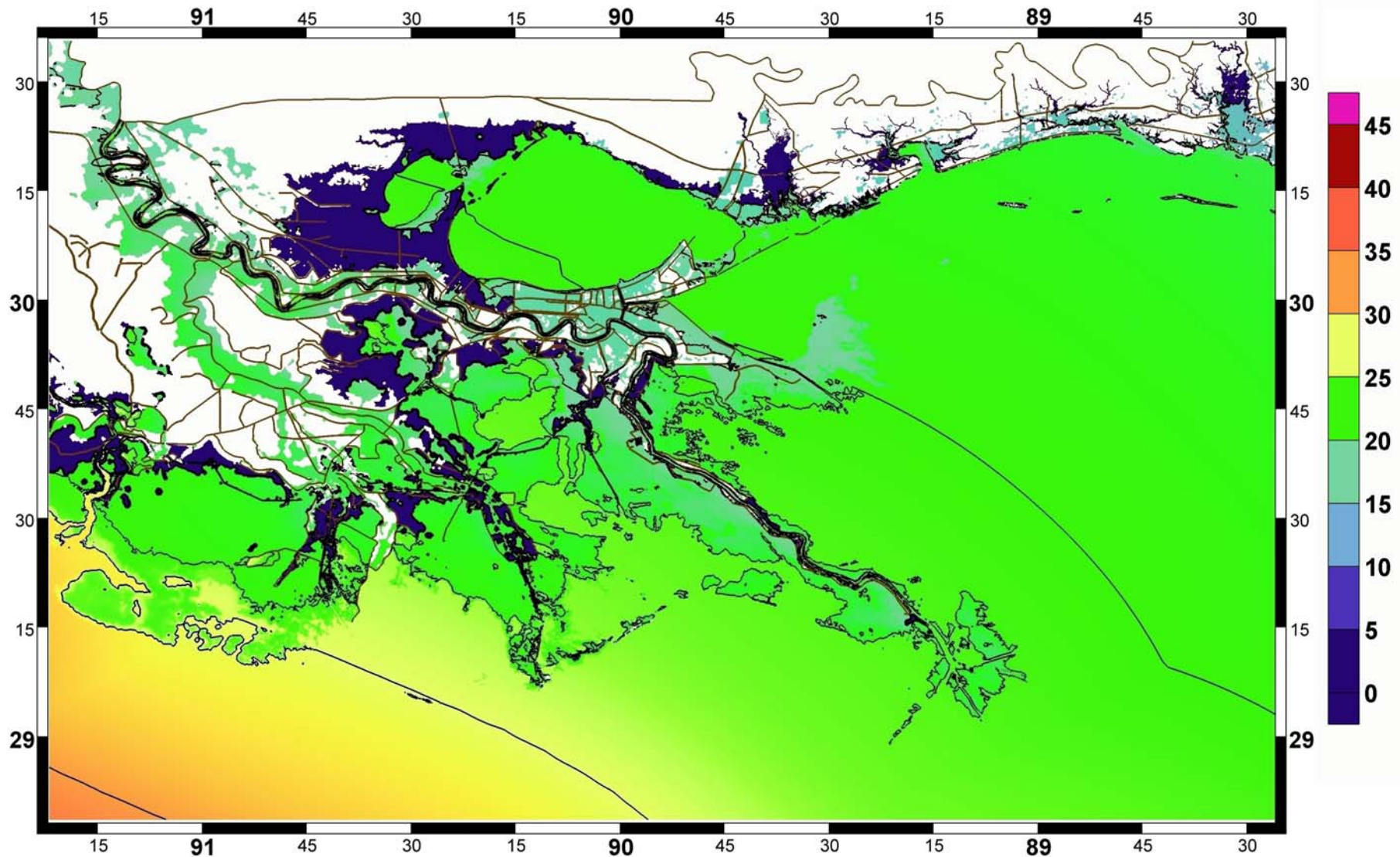
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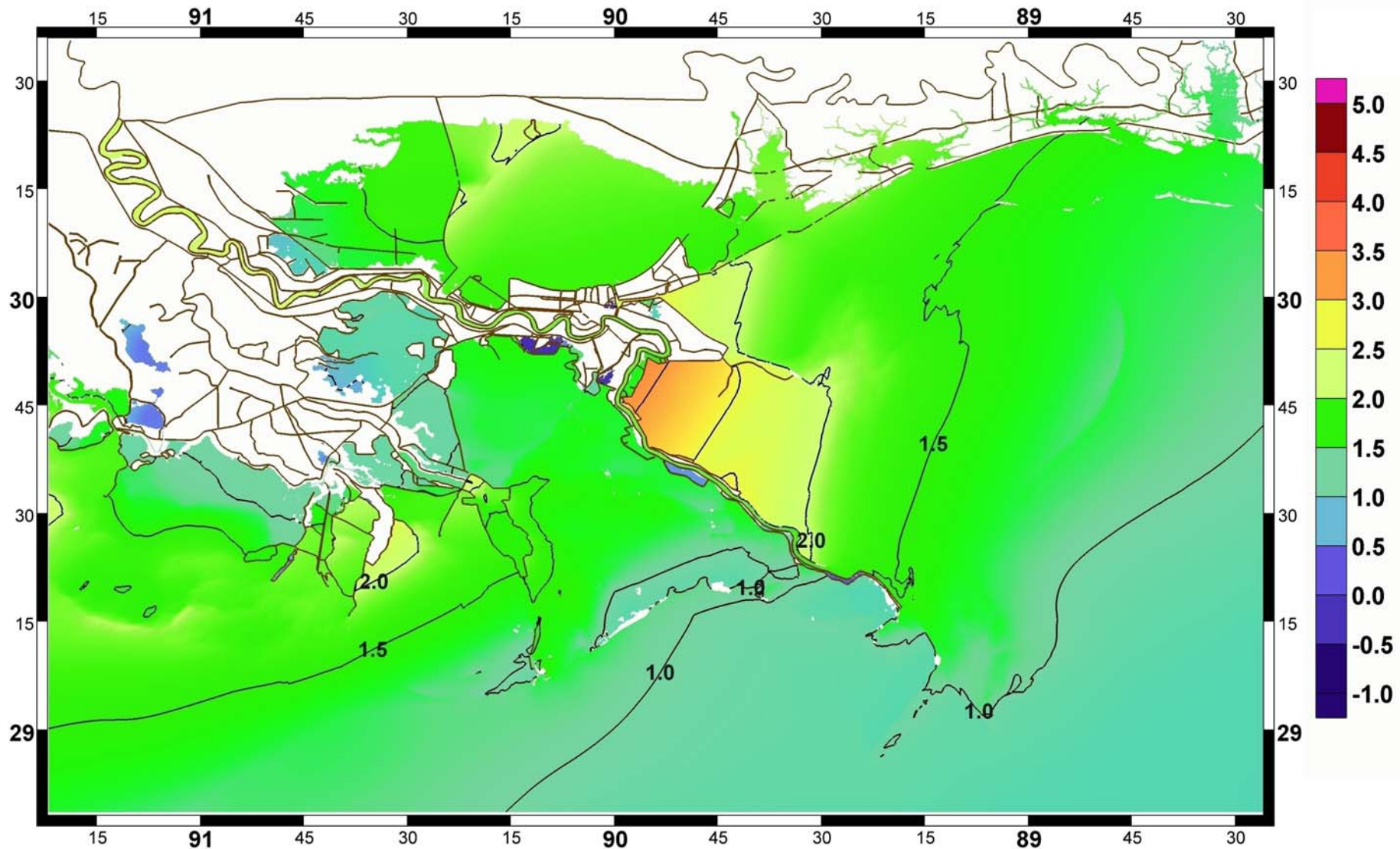
# SE Louisiana

## Maximum Winds



# SE Louisiana

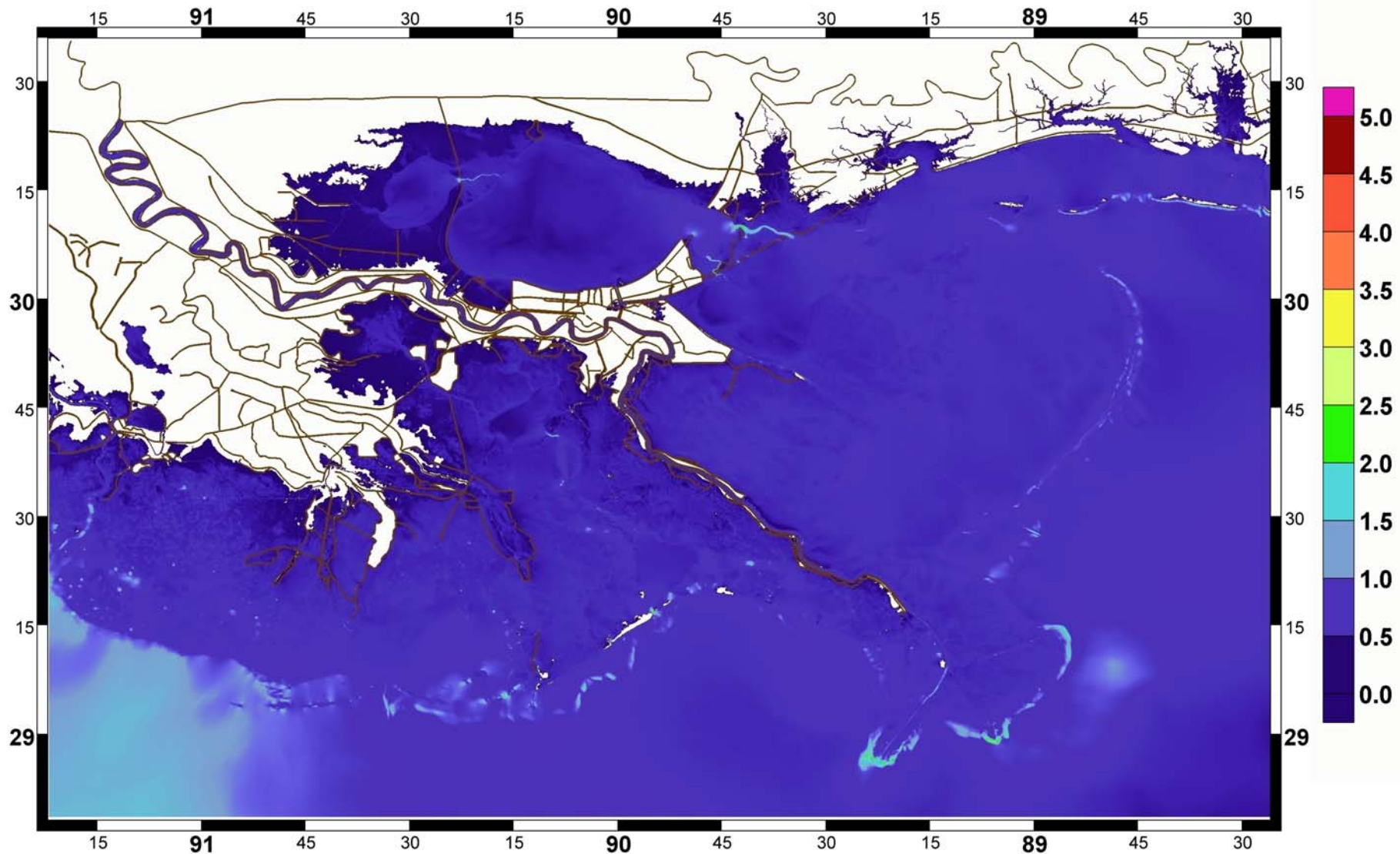
## Maximum Elevations





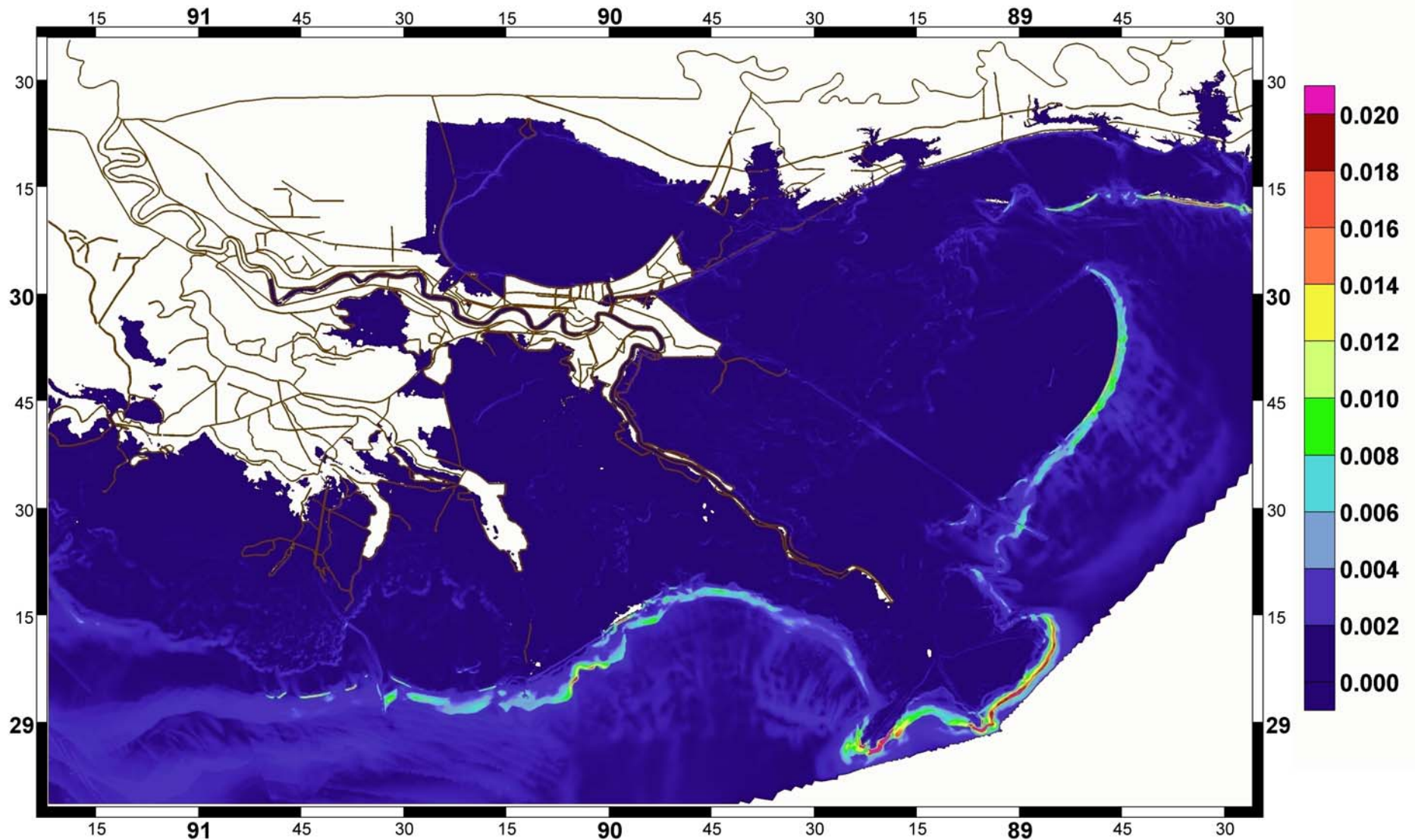
# SE Louisiana

## Maximum Currents



# SE Louisiana

## Maximum Wave Radiation Stresses





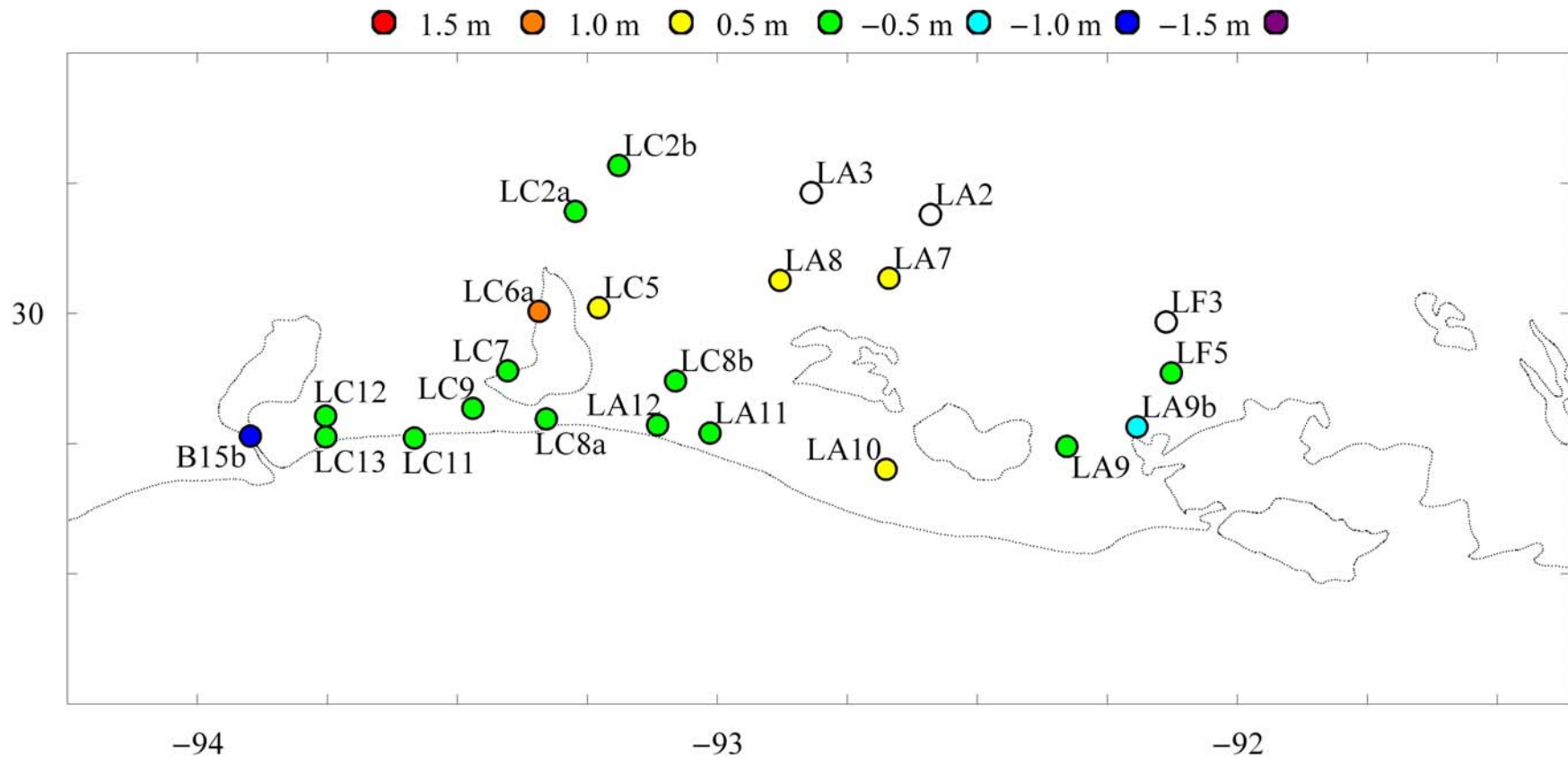
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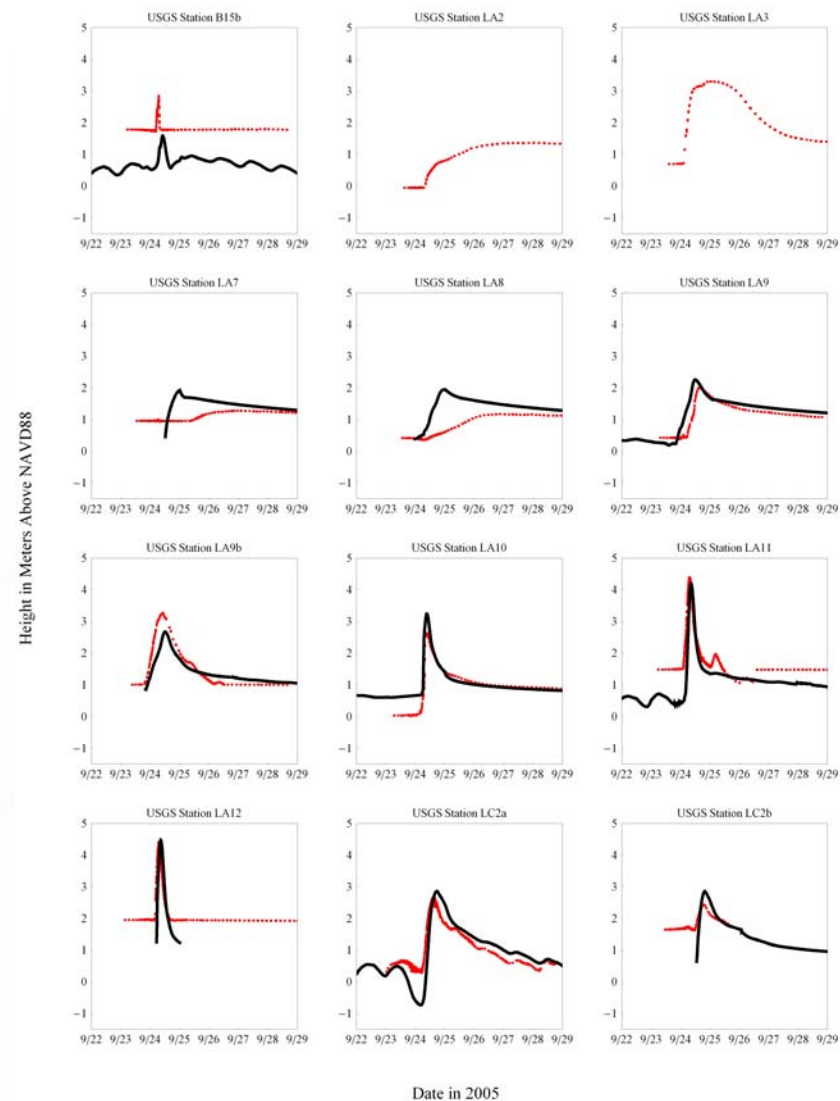
## USGS Hydrographs





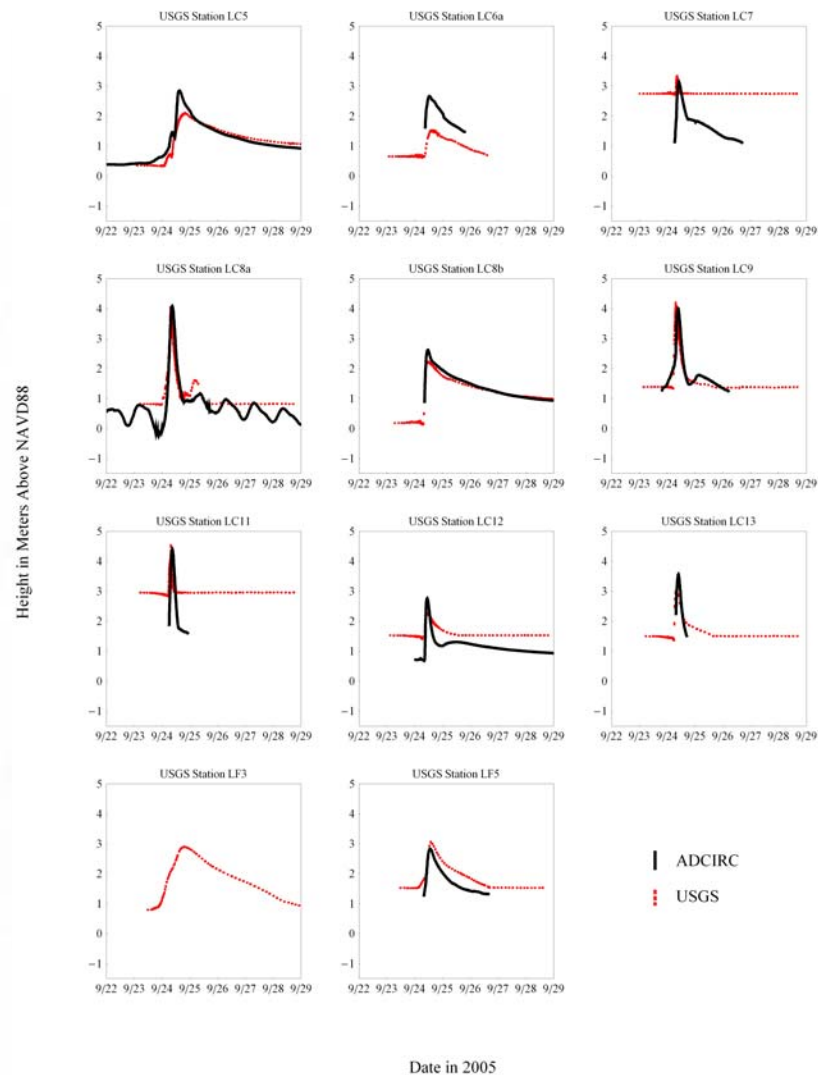
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## USGS Hydrographs



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## USGS Hydrographs





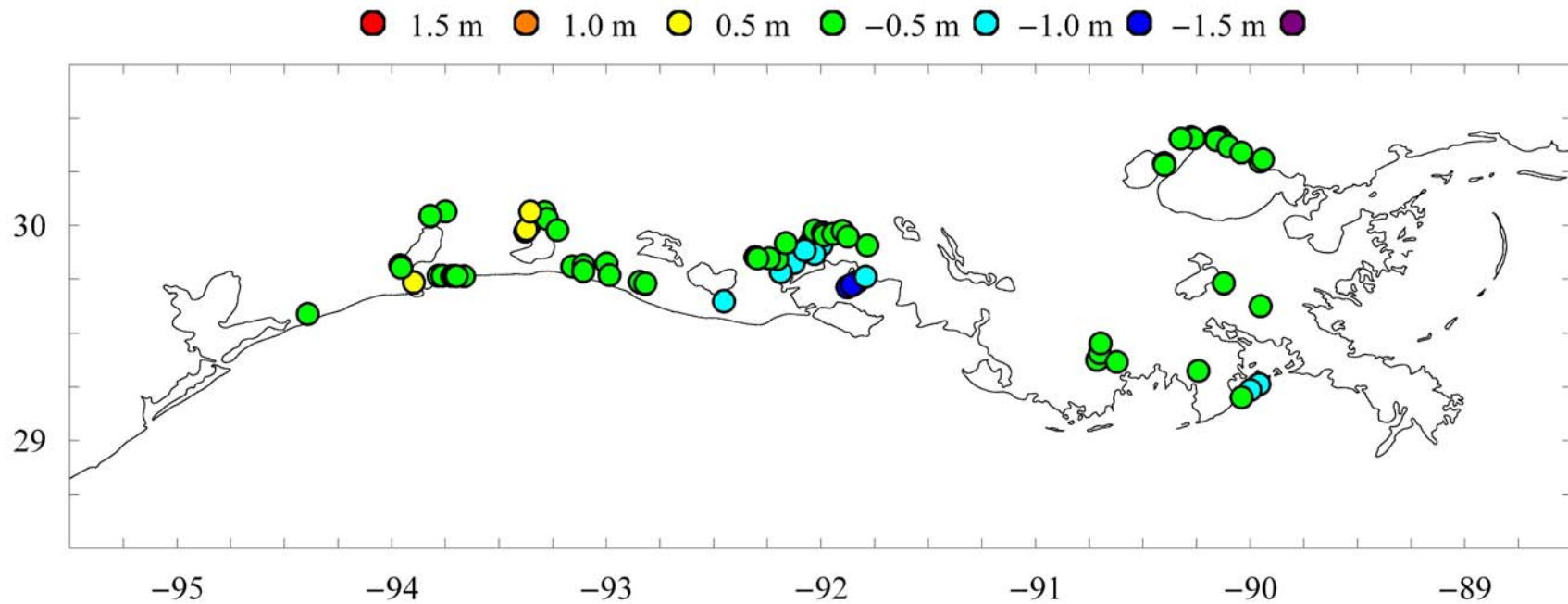
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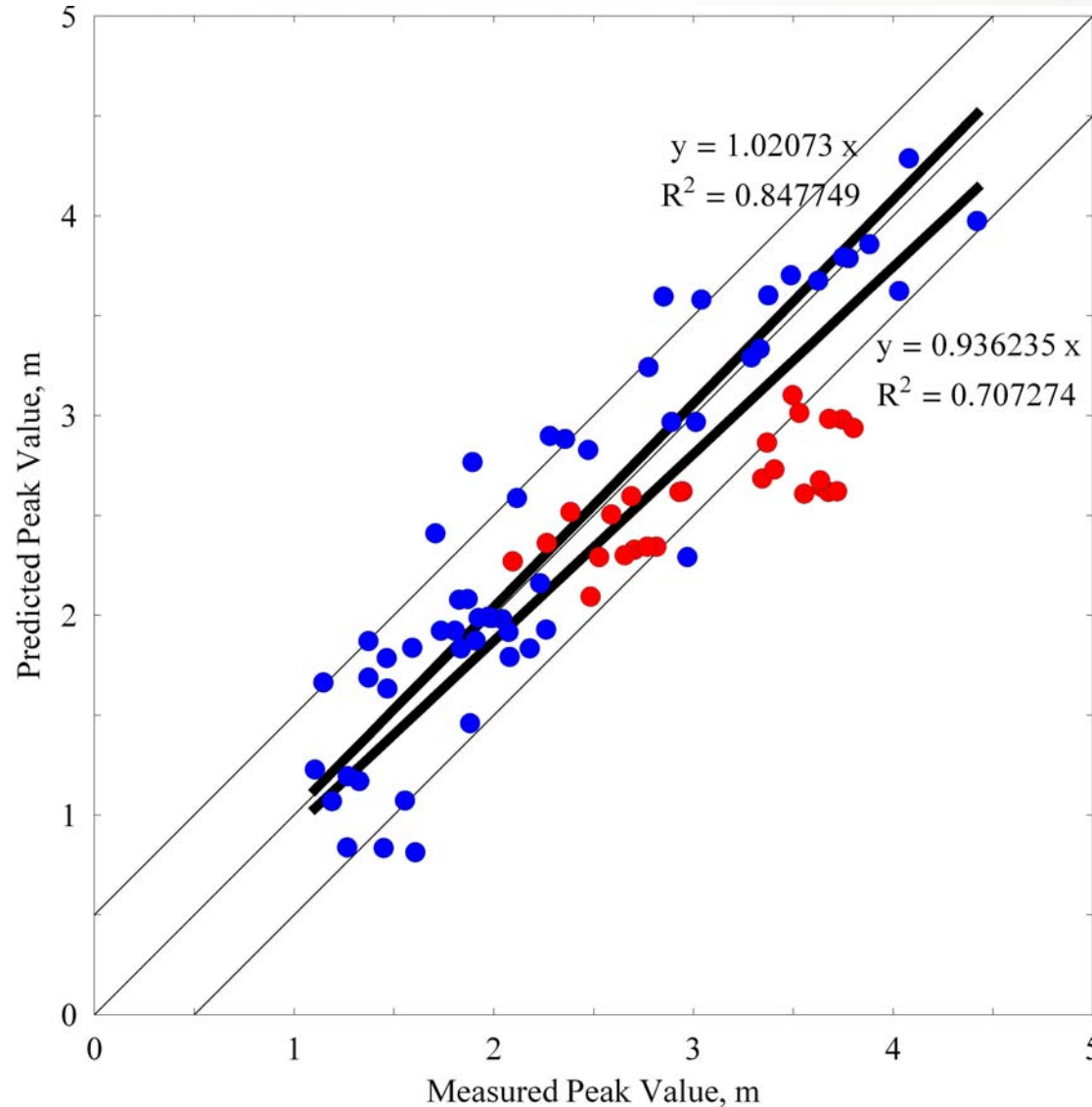
## URS High Water Marks





# Validation

## URS High Water Marks



# Conclusions

- Pushed water away from the coast in much of central and western Louisiana, then pushed water against the coast
  - Winds blew along or away from the shore in the early stages of the storm
  - Only when the winds were directed toward shore did significant surge build against the coast
  - Surge then spilled inland
- In lakes and bays, easterly winds blew water against west-facing shores and structures
- Consistent winds in SE Louisiana pushed water onto the shelf and against levees along the Mississippi River delta