

**On the Relationship Between
Meteorological Factors and
Hurricane Damage to Oil
Infrastructure in the Gulf of Mexico**

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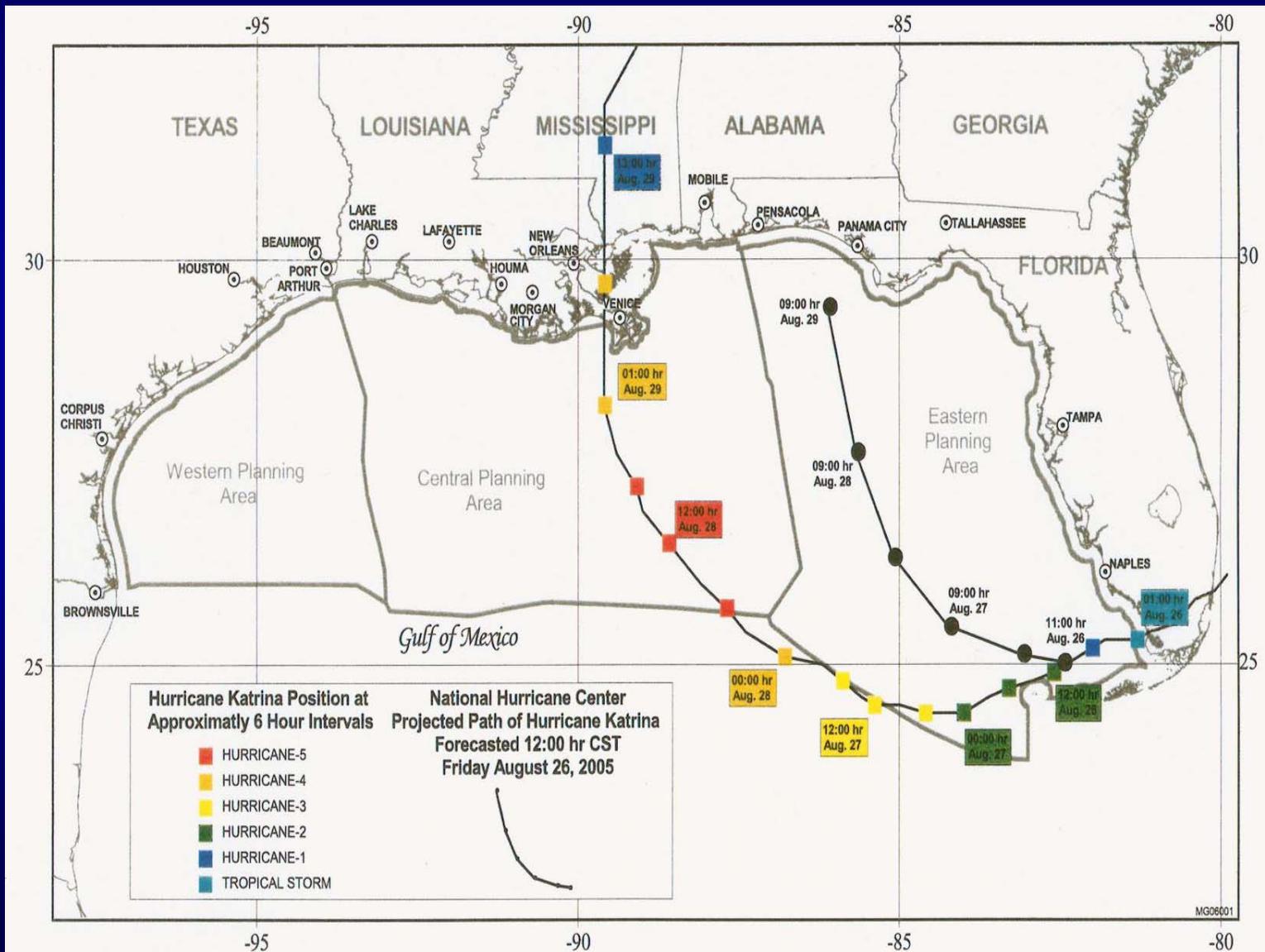
Introduction

The impacts of hurricanes on human activities in coastal areas can be dramatic, as shown by recent experience. Hurricane Katrina had devastating effects on human life and property, including offshore oil infrastructure.

Objectives:

- Evaluate potential relationships between meteorological factors and platform damage
- Use meteorological factors for assessing hurricane damage to oil platform and for helping in establishing design criteria for offshore structure

Hurricane Katrina Best Track and Forecasted Track



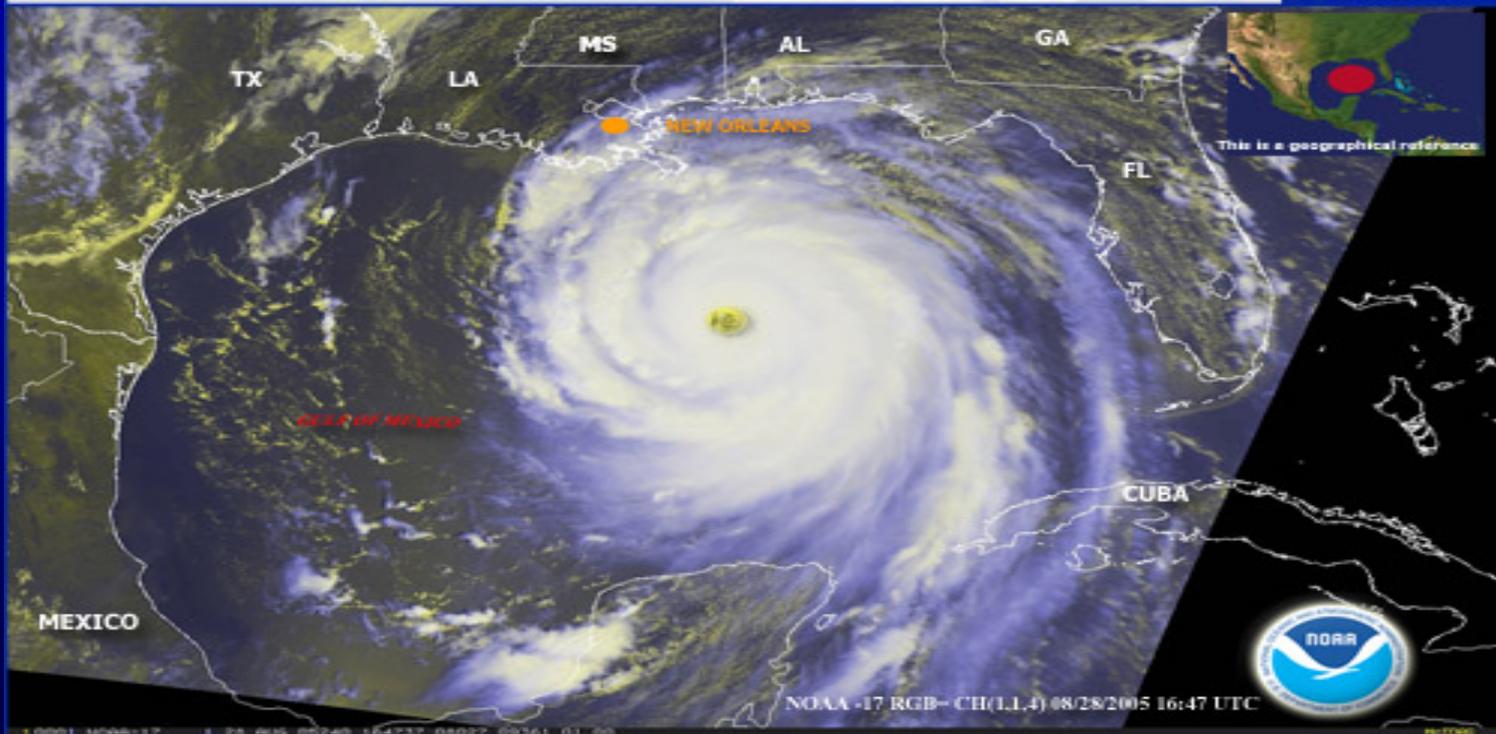
Synoptics of Hurricane Katrina

- A Category 5 hurricane
- Maximum wind speed: 175 mph
- Minimum central pressure: 902 mb

As of 1800 UTC (1PM CDT), Hurricane Katrina was located 180 mi (290km) SSE of the mouth of the Mississippi River and was moving NW at 13 MPH (21 KPH).

Maximum sustained winds were 175 MPH (282KPH) making Katrina a category 5 storm on the Saffir-Simpson scale.

Credit: NOAA



Katrina and Its Impact

- Loss of lives: 2000
- Property damage: \$80 billion
- Destroyed oil platforms: 47
- Loss of wetlands due to Katrina and Rita: 100 square miles
- Evacuation of offshore workers : 25,000

Determination of Meteorological Factors Used for Assessing Hurricane Damage to Oil Platforms

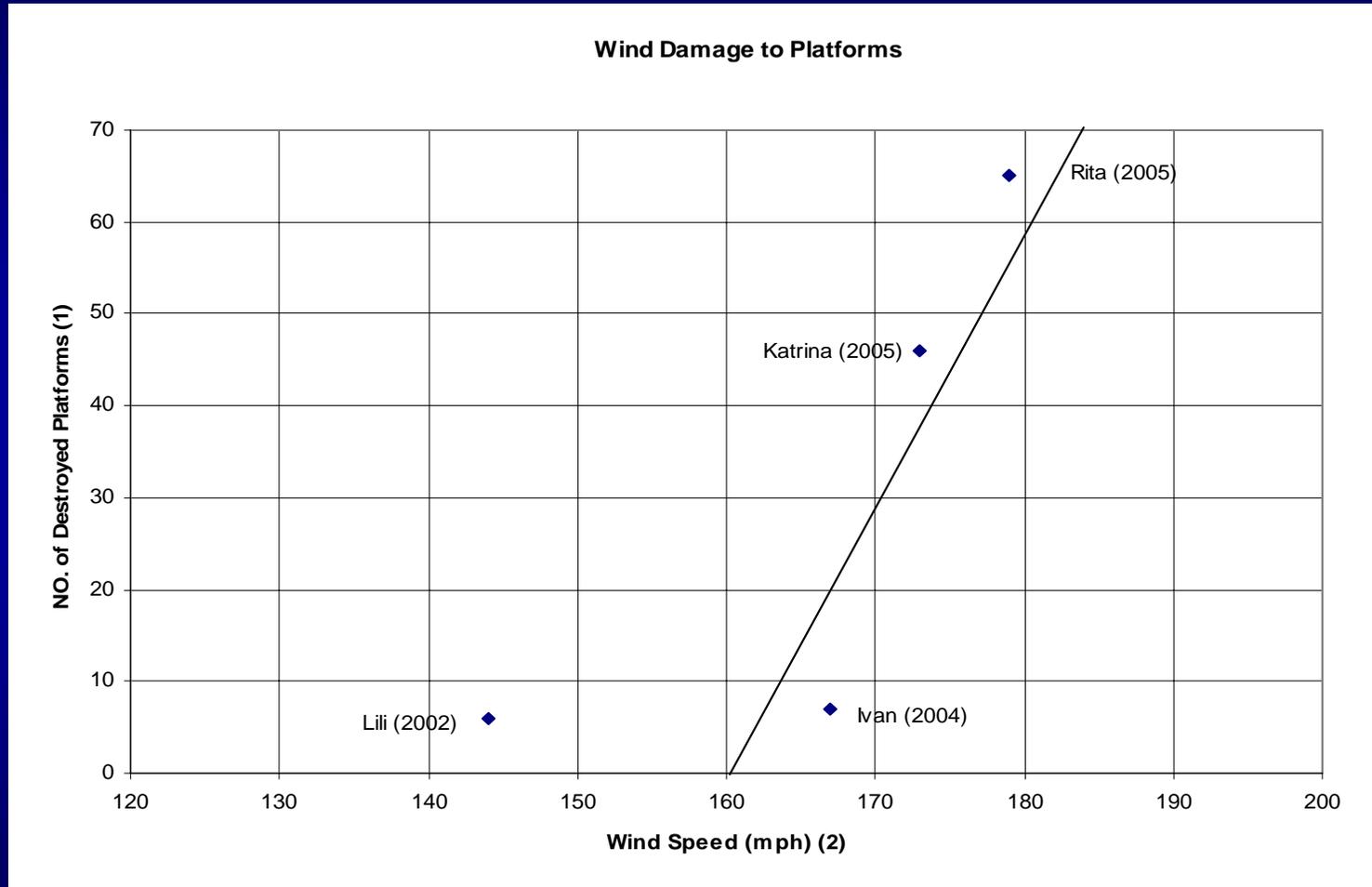
Approaches:

- Meteorological measurements
 - 1) Wind speed
 - 2) Hurricane central pressure
- Dropsonde
- Dvorak Technique: satellite images
- Numerical models

Results and Conclusion

- Number of destroyed oil platforms vs. hurricane maximum wind speed
- Number of destroyed oil platforms vs. hurricane central pressure

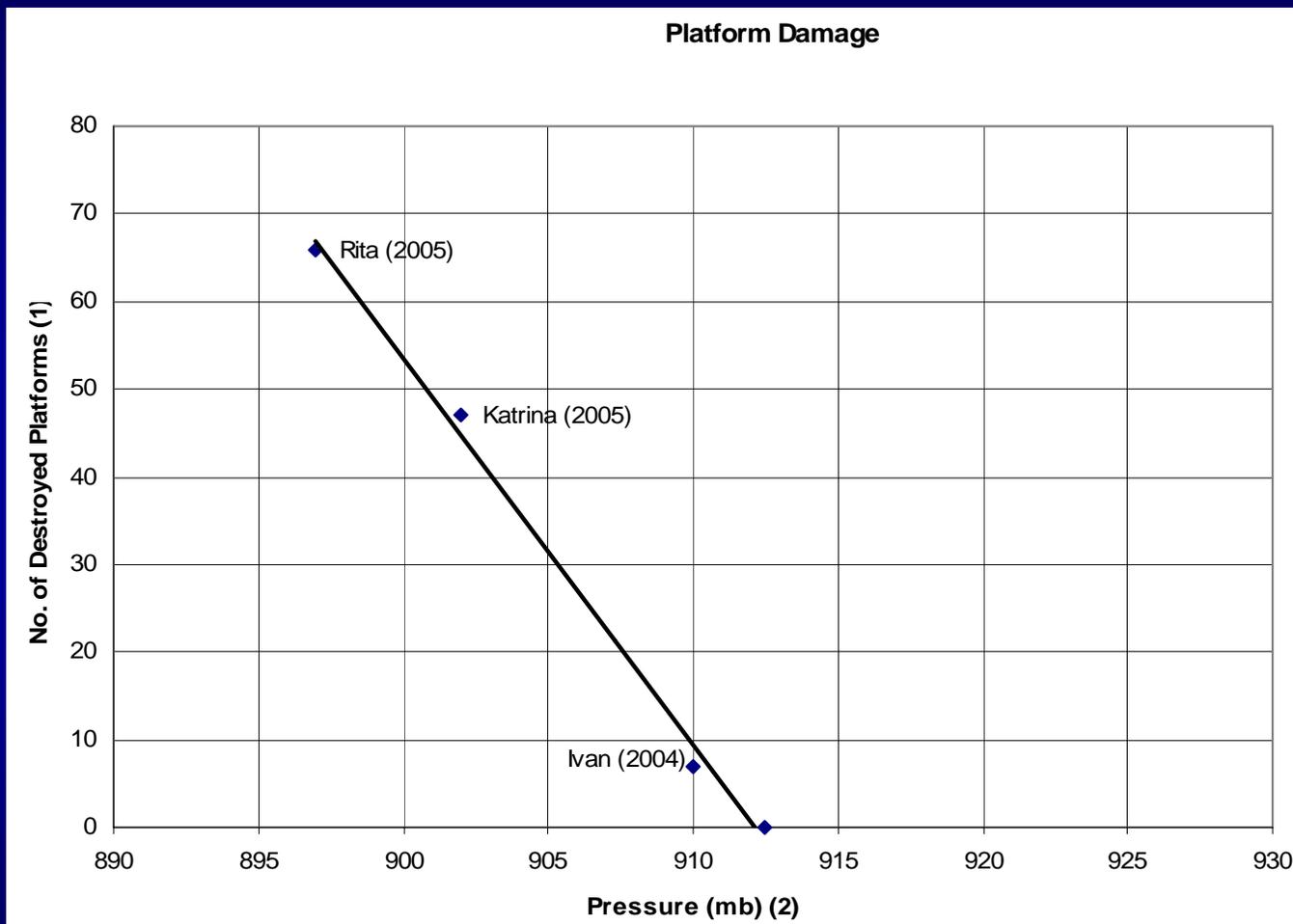
Correlation of Platform Damage to Wind Speed



Data Sources :

1. Chris Oynes. 2006. Oil, gas, and society: hurricane preparations after Katrina. Presented at Baker Institute at Rice University, 22 August 2006. Minerals Management Service.
2. National Hurricane Center: www.nhc.noaa.gov.

Better Correlation of Platform Damage to Hurricane Central Pressure



Data Sources :

1. Chris Oynes. 2006. Oil, gas, and society: hurricane preparations after Katrina. Presented at Baker Institute at Rice University, 22 August 2006. Minerals Management Service.
2. National Hurricane Center: www.nhc.noaa.gov.

Summary

- Hurricane central pressure may be a good indicator for establishing design criteria for offshore structures.
- The Katrina experience has shown that numerical models, for both track forecasting and intensity forecasting, need improvement.
- If current design calculations use a 100-year return period, does it follow that the 2004 Hurricane Ivan event in the OCS would have been expected to be followed by a period of 2,500 years?

Acknowledgments

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