Characterizing the Hurricane Hazard for Southeastern Louisiana

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Steps

• Define what is possible – a set of hypothetical storms

• Estimate probabilities – storms and storm characteristics
  (central pressure – maximum wind speed, radius-to-maximum winds, track, forward speed, etc.)

• Apply wind, storm surge and wave models to compute responses

• Compute frequency of occurrence and uncertainty estimates
Severe Hurricane Tracks

Cat 2 and greater intensity hurricanes

Upper Cat 4 and Cat 5 intensity hurricanes (125 knots and greater)
Major hurricane probabilities are not spatially homogeneous.
Definition of values at landfall gives a consistent measure of storm intensity! Average decay is 15 – 20 millibars over last 90 nm.

Based on data from Oceanweather Inc., decay during approach to land is about the same as post-landfall decay.
Definition of Hypothetical Storms

Parameter Space
- Cp = 900 to 960 mb
- Rmax = 6 to 35.6 nm
- Vf = 6 to 17 knots

LaCPR & MsCIP

One Team: Relevant, Ready, Responsive, Reliable
Key Contributors to Storm Surge

- Wind Speed/ Direction
- Topographic Controls
- Short Wave – Momentum Transfers
- Atmospheric Pressure

Katrina Winds at Landfall
Counterclockwise Rotating Winds
Maximum Wind, Waves, Storm Surge Zone
Winds Depend on Storm Position

One Team: Relevant, Ready, Responsive, Reliable
Modeling Methodology

Wind Field – Wind Stresses

Surge Model

Wave Models

Unified Grid Surge model: ADCIRC

Coupling

Offcoast Waves: WAM
Nearshore Waves: STWAVE

Local Scale Waves: Boussinesq - Parametric
Water Levels – 1% Chance Exceedance
LaCPR Planning Unit 1

Note: All elevations shown are for storm surge only exterior to the existing levee system, and do not include waves, overtopping or rainfall.
Water Levels – 1% Chance Exceedance
LaCPR Planning Unit 2

Note: All elevations shown are for storm surge only, exterior to the existing levee system, and do not include waves, overtopping or rainfall.
Questions?