

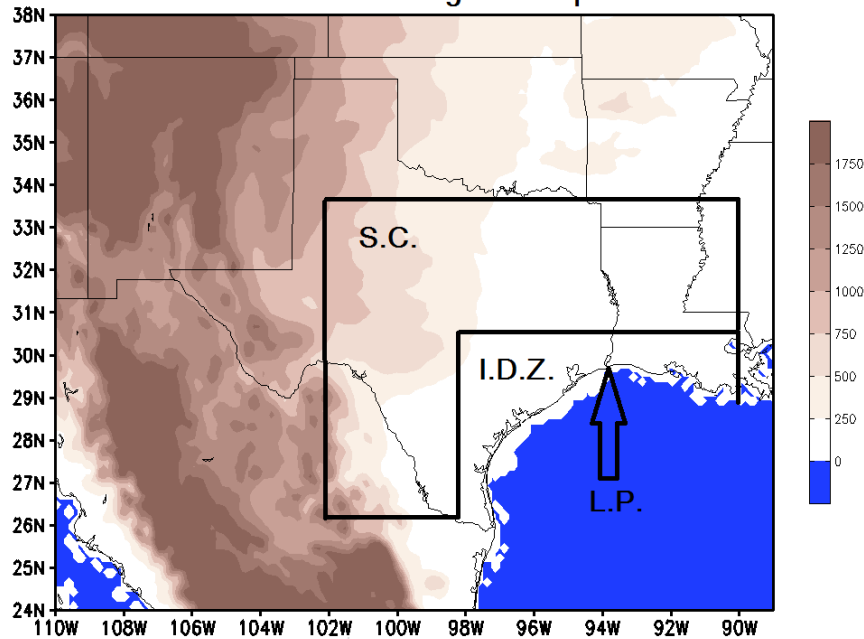
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Department: Energy & Environmental Systems

*Title: “Extreme Weather Studies Using
Dynamic Modeling & Management Tools”*

Major Professor: Dr. Yuh-Lang Lin

Evacuation Planning Technique



RESEARCH QUESTIONS / PROBLEMS:

- Although hurricane track/intensity forecasting has improved over the years, hurricane track forecasting is slightly more reliable than intensity forecasting. Emergency management personnel (both state and federal) have been known to act in the aftermath of hurricane disasters instead of making preparations in advance (for example Hurricane Katrina and Matthew).

METHODS:

- Hurricanes from 1981-2010 were categorized based on landfall angles along the Gulf and east coast and a damage assessment was developed called the hurricane intensity averaging, damage assessment and evacuation planning (HIADAEP) tool. Based on the expected landfall point (LP), an immediate danger zone (IDZ) can be identified (based on hurricane intensity/size) so that an accurate shelter count (SC) can be done outside the IDZ for the evacuees.

RESULTS / FINDINGS:

- This is not to say that areas outside the IDZ are not in any danger, but it is the area where the most extensive damage occurs (i.e. levee breaches, wind damage, flooding, etc.). Zone 1 in the Gulf of Mexico (from Texas to Mississippi) is the most expensive and deadliest landfall angle because it has a larger number of population areas below sea level.

SIGNIFICANCE / IMPLICATIONS:

- Being able to account for hurricane size/intensity variations and damages based on historic averages has its advantages. HIADAEP is easy to use because it does not involve modeling or long mathematical equations, its simple averaging that can be implemented across governmental and non-governmental agencies.