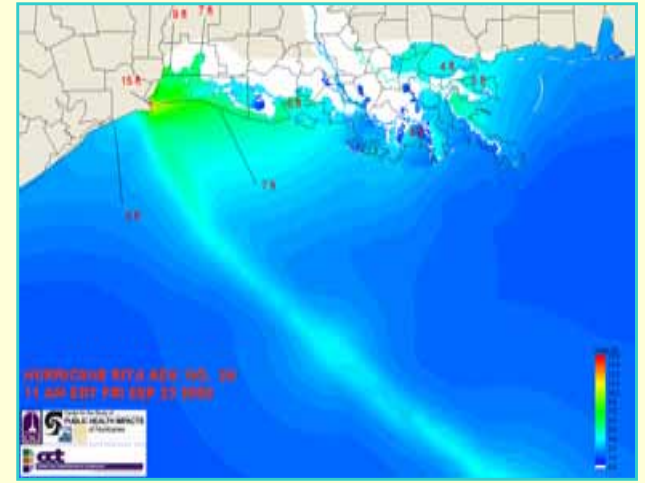
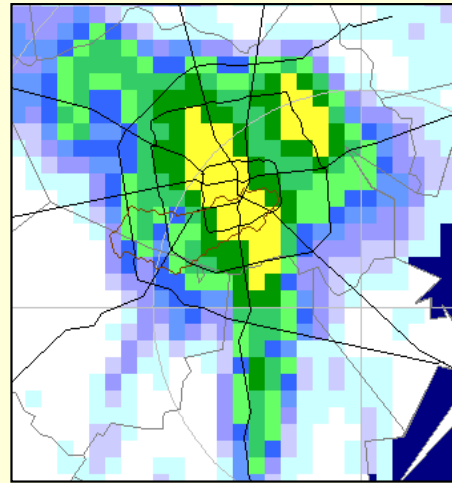




# Coastal Resiliency Conference SSPEED Center

May 26, 2010



**Philip Bedient – Ph.D.**  
*Herman Brown Professor  
Civil and Environmental Engineering  
Department, Rice University*

# SSPEED Center Partner Universities

**Rice University** - (Lead) - Flood prediction, infrastructure risk, surge impacts and public response

**Univ. of Houston** - Infrastructure risk analysis, education for public outreach and internship training

**Univ. of Texas** - Surge modeling, disaster planning, evacuation, advanced data coordination and computer systems

**Texas A&M Univ.** - Coastal land use planning, projected flood damages

**Texas Southern University** - evacuation planning

**Louisiana State University** – coastal processes

# Need for Flood Prediction

- Rapidly moving weather systems - explosive rainfalls
- Low lying coastal areas subject to hurricane and surge threat
- Urban developments exceeded the original design capacity of the channels
- Severe street flooding occurs during routine rainfalls
- Timely information for flood warning and evacuatiions
- Critical infrastructure concerns - medical, industry
- Damage costs continue to increase thru time



# Hurricane Summary

- September 13, 2008
- Category 2
- \$ 24 billion
- 4th costliest
- 112 deaths, 3000 destroyed houses
- 2.6 million lost power



# What does a Flood ALERT System (FAS3) do?

- Increase lead time for flood warning using radar rainfall
- Provide accurate real-time rainfall estimates (1998-2010)
- Provide frequent updates via the web site [fas3.flood-alert.org](http://fas3.flood-alert.org)
- Provide communication – emergency response and operations



Search

Fly To Find Businesses Directions

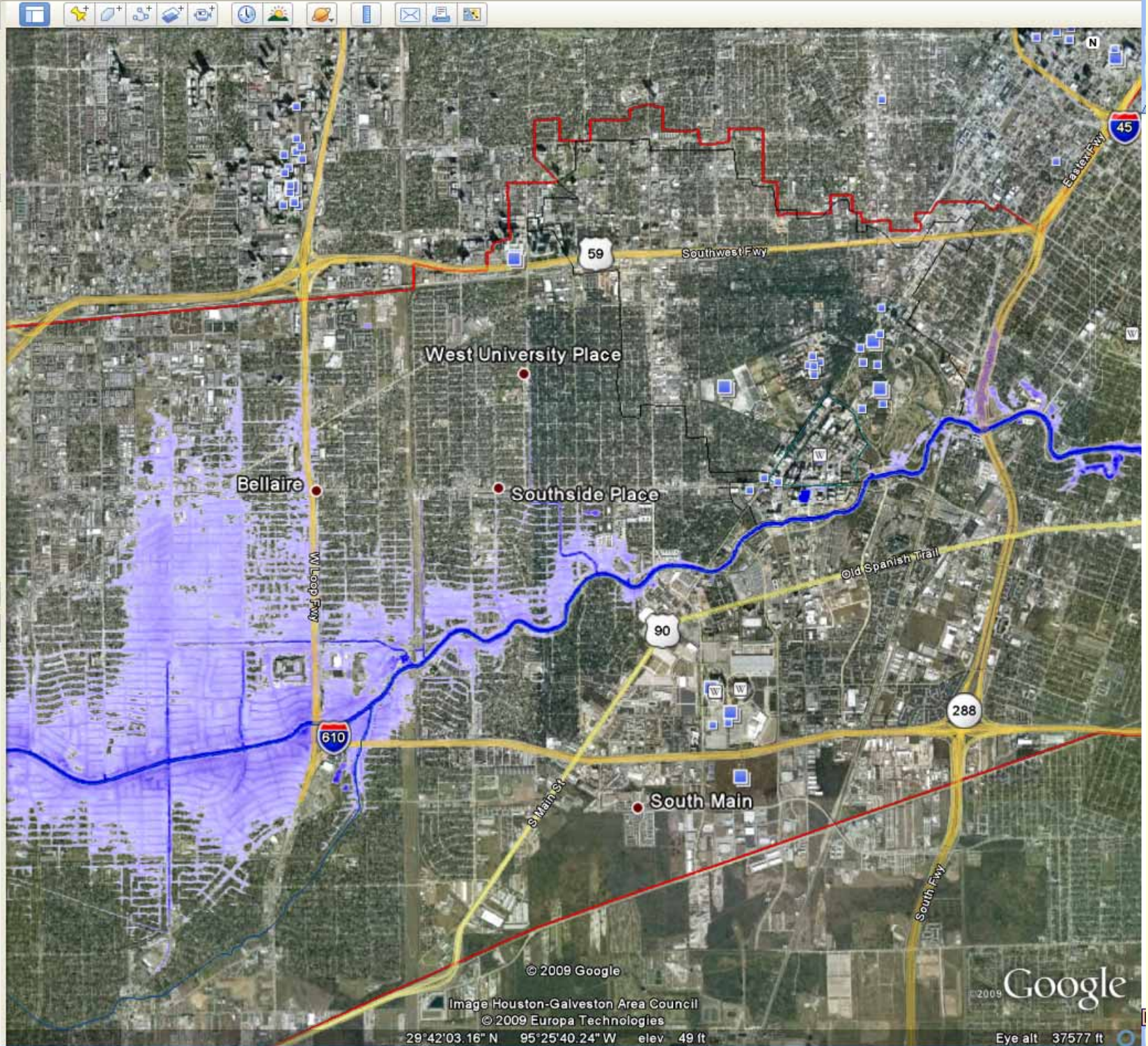
Fly to e.g., 37 25' 19.1"N, 122 05' 06"W

Places Add Content

- My Places
  - Sightseeing Tour
    - Make sure 3D Buildings layer is checked
- Temporary Places
  - Layers
    - tmc\_outline
    - Brays\_tribs
    - brays\_main\_stream
    - tmc\_polygon
    - HG\_outline
    - tsarp\_brays\_dissovle
  - dp010
    - dp010

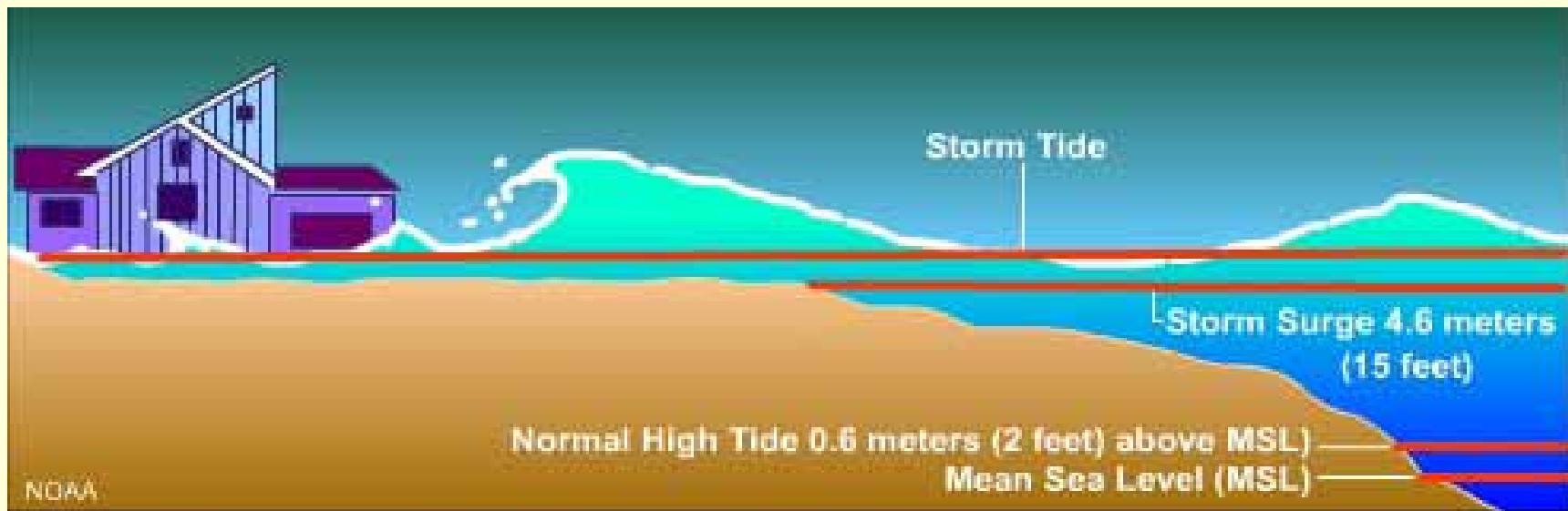
Layers

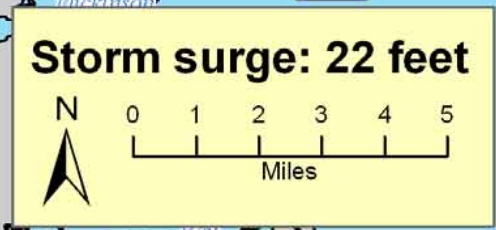
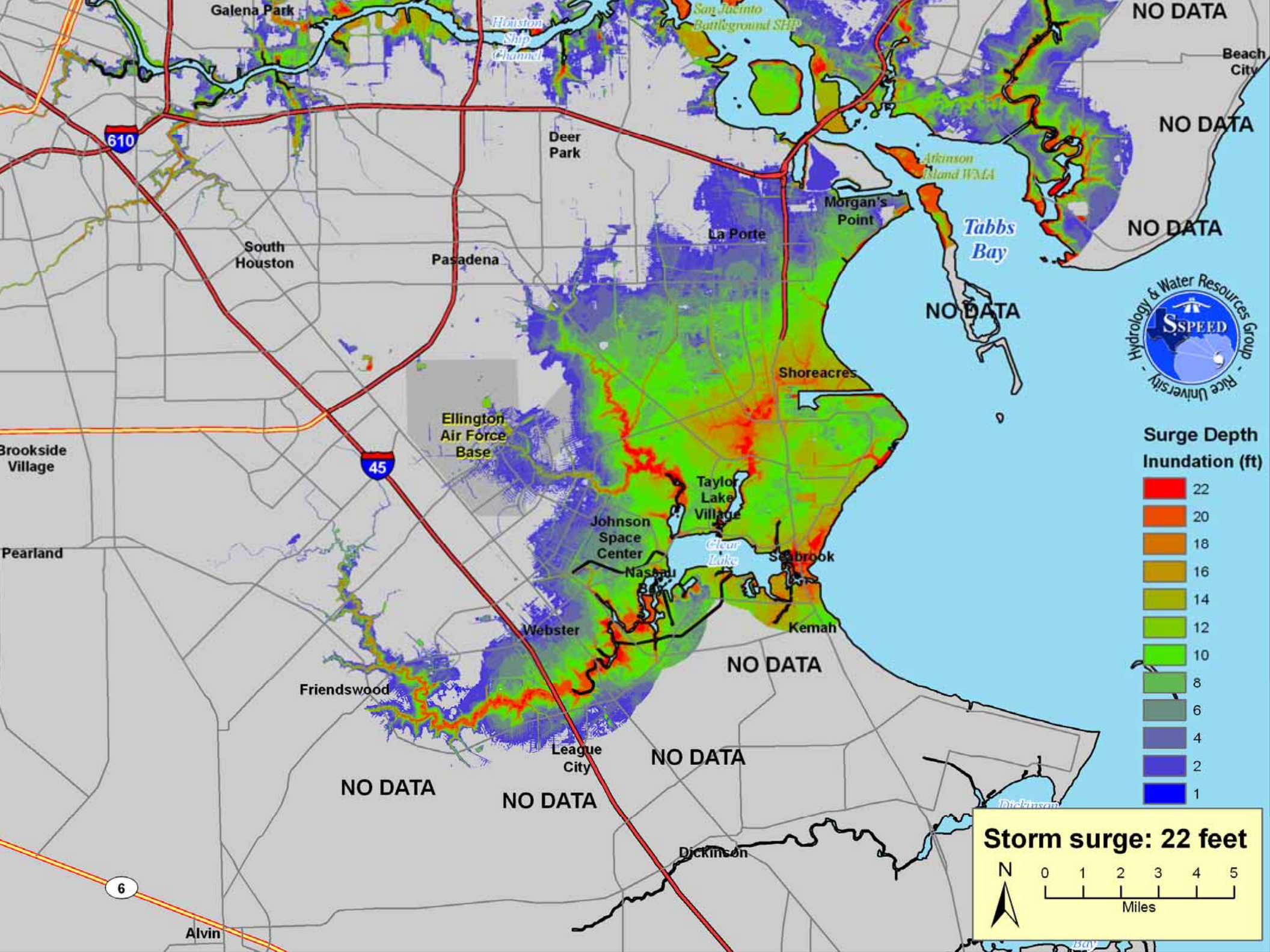
- Primary Database
  - Geographic Web
  - Roads
  - 3D Buildings
  - Street View
  - Borders and Labels
  - Traffic
  - Weather
  - Gallery
  - Ocean
  - Global Awareness
  - Places of Interest
  - More
  - Terrain



# Storm Surge

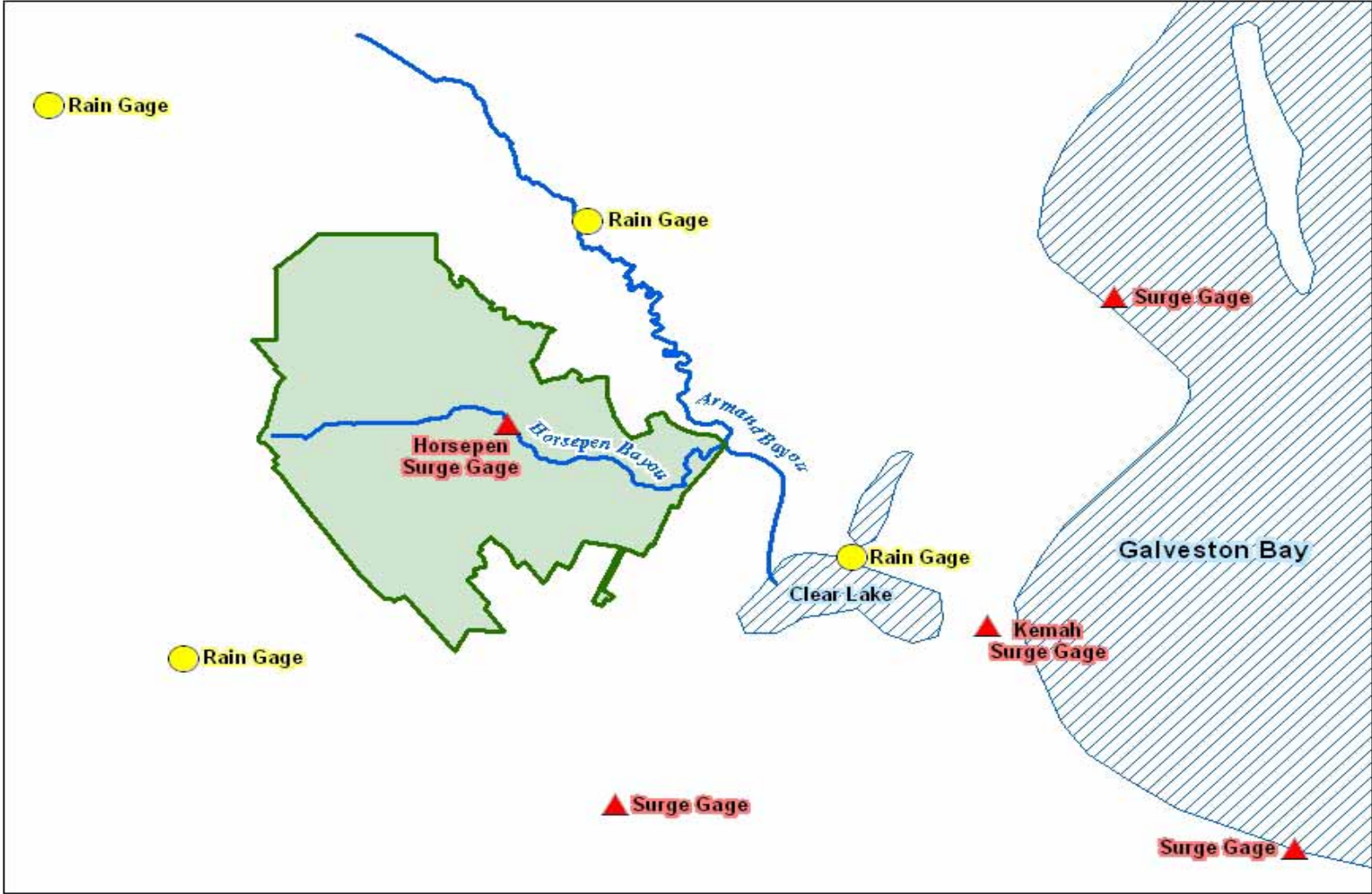
- Severe storms with heavy wind and pressure push large volumes of water ahead of them towards the shore
- The watershed's hydrologic connection to Galveston Bay gives surge a pathway inland







# Gage Map



**Rainfall and Surge Gage Map**

# Measured Surge at Kemah and Horsepen

## Storm Surge vs Rainfall

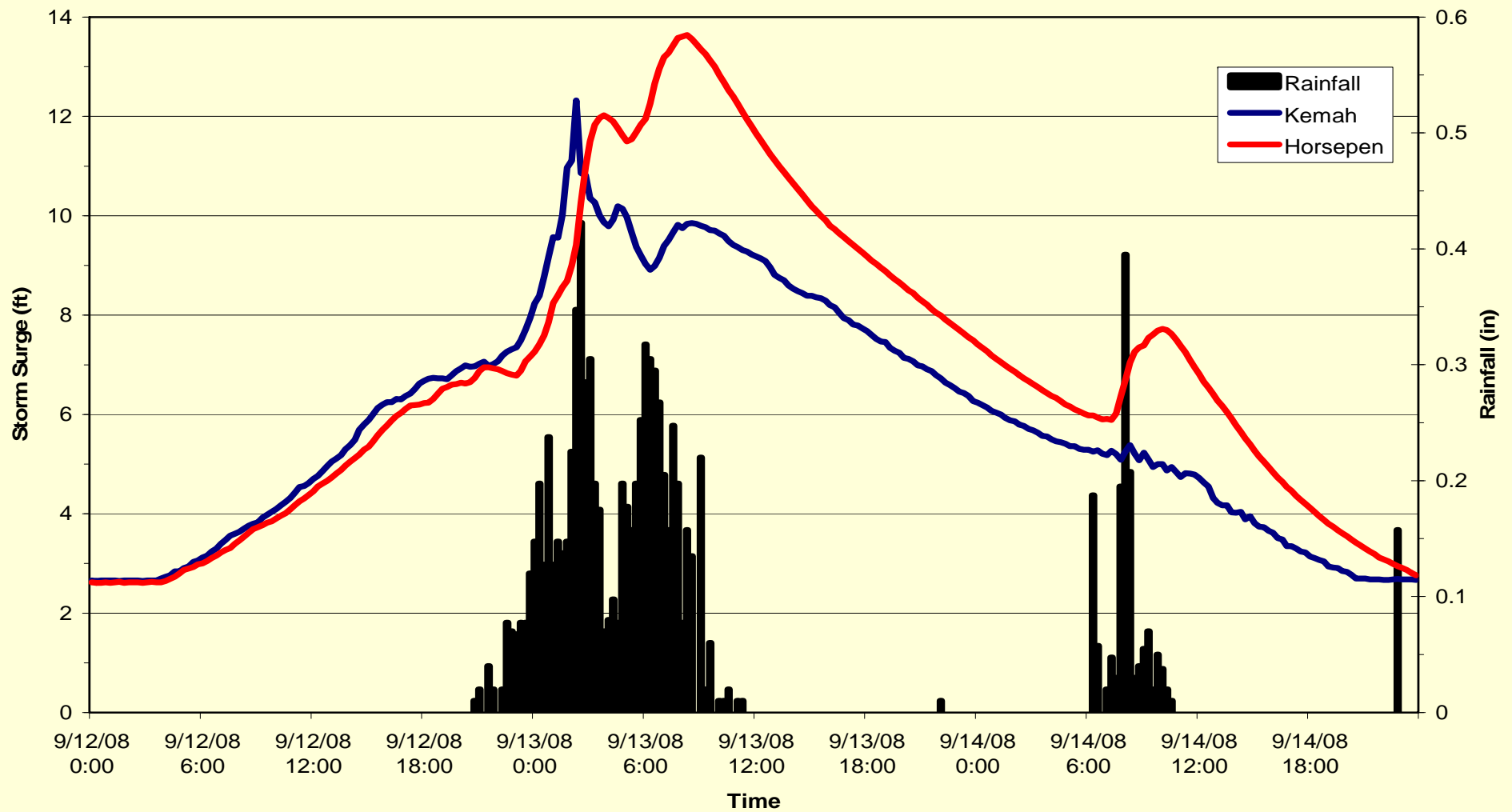


Figure 5.8: Storm Surge vs Rainfall

# Modeled Surge at Horsepen Bayou

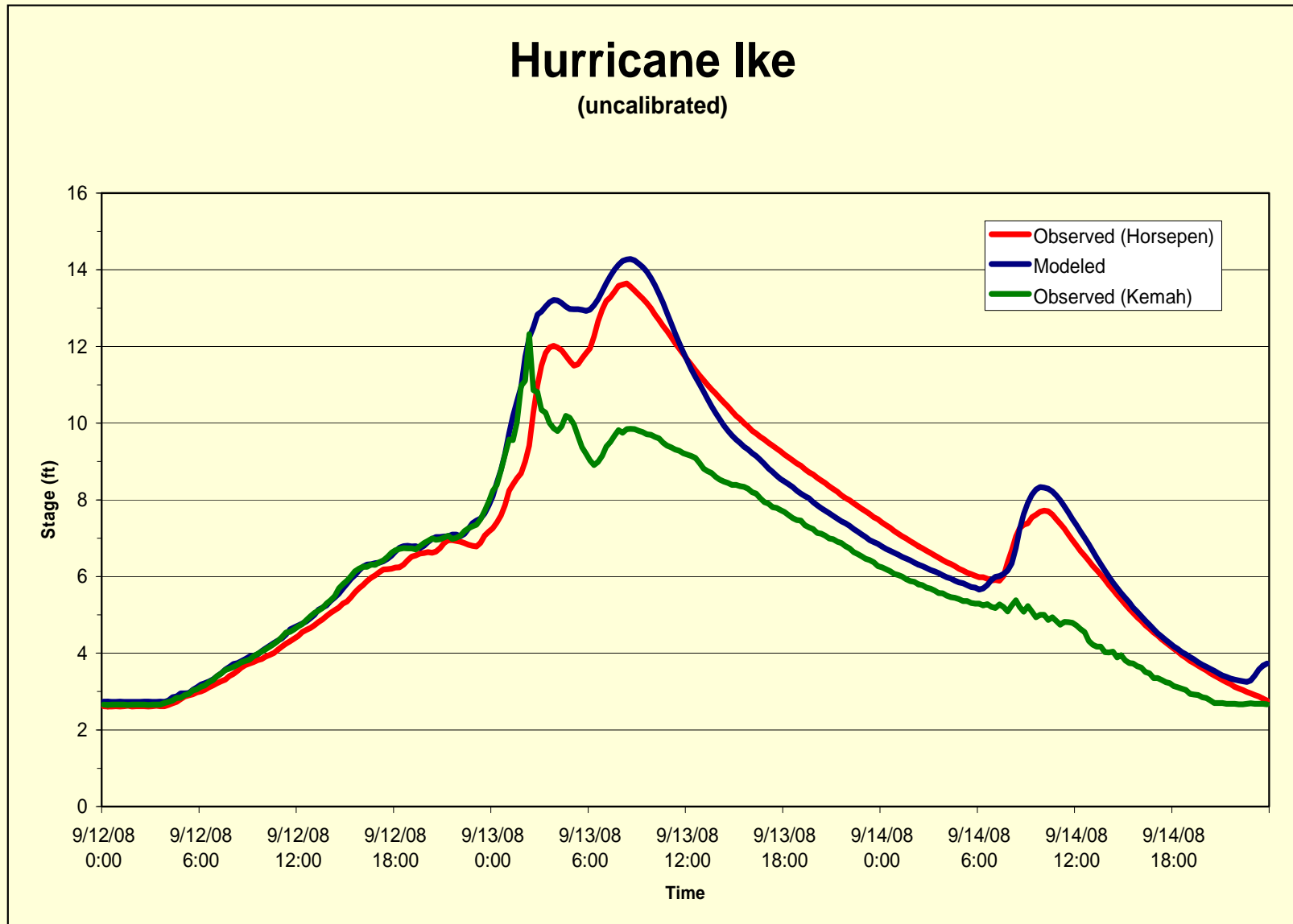


Figure 5.7: Hurricane Ike – Initial Run






N  
 0 5 10  
 Miles

● Observation Points  
**Hurricane Ike Path**  
 ■ Original  
 ■ 30 Miles SW

Without Ike Dike		Landfall: Original		Landfall: 30 Miles SW	
Obs	Location	Max (ft)	Date	Max (ft)	Date
1	Ship Channel Entrance	13.0	09/13 12PM	17.8	09/13 12PM
2	Port of Houston	13.5	09/13 12PM	19.0	09/13 12PM
3	Kemah	11.5	09/13 12PM	15.1	09/13 09AM
4	Clear Lake at Taylor Lake	11.5	09/13 12PM	15.1	09/13 09AM
5	League City	11.5	09/13 12PM	15.2	09/13 09AM
6	Texas City Levee	11.5	09/13 06AM	14.0	09/13 06AM
7	I-45 Bridge	12.0	09/13 06AM	13.5	09/13 09AM
8	Galveston Bay	12.0	09/13 12PM	15.0	09/13 12PM
9	Upper Trinity Bay	15.5	09/13 12PM	18.0	09/13 12PM

# SSPEED Center Highlights

- **SSPEED** has assembled some of the best experts in the region to address coastal flooding and resiliency.
- The **Center** will provide for customized prediction for coastal flood inundation from approaching storms and hurricanes.
- Improved storm forecasting surge/flood models will allow emergency officials to better handle evacuation strategies.
- The public needs to be better informed and prepared to deal with such disasters as population explodes in our coastal region.
- The **Center** coordinates with governmental officials to ensure proper access to vital predictions, training, and public education

