

**Resilience Storm Development and Modeling for the IH-10 in TxDOT Beaumont District**

TFMA Spring Conference March 9, 2023

Rose Marie Klee, P.E., CFM – TxDOT Design Division  
 Allison Wood, P.E., CFM – Hult-Zollars  
 Nick Fang, Ph.D., P.E. – Fang Research Group, UTA

March 9, 2023

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**Presentation Outline**

- Project purpose and overview
- Summary of analysis
  - Hydrology
  - Hydraulic Modeling
  - Tropical Storm Imelda Calibration
- Conclusions

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**Project Goals**

1. Understand current hydraulic performance
2. Develop calibrated model for planning and development
3. Develop "resilience storm" to represent extreme events
4. Understand performance of IH 10 corridor in extreme events

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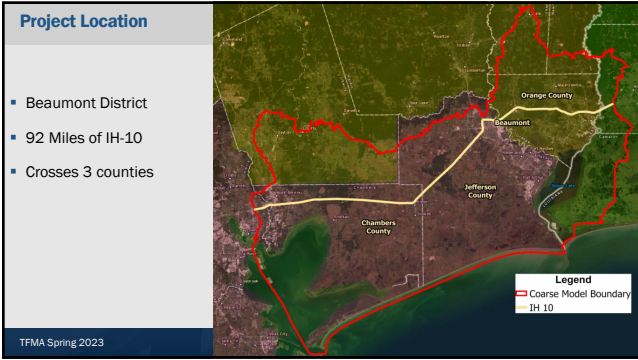
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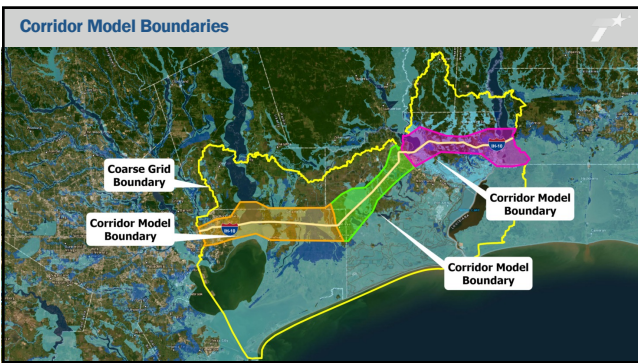
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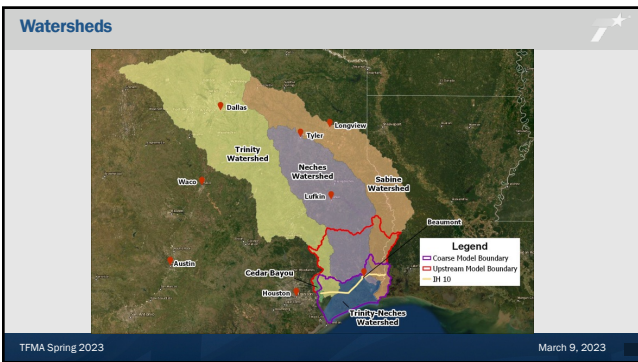
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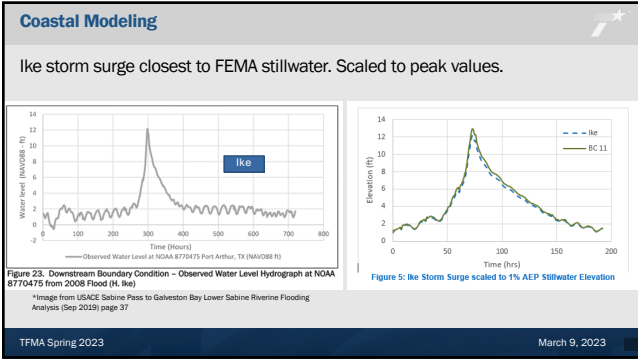
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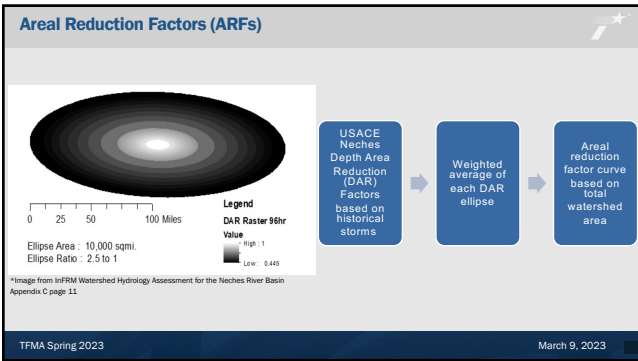
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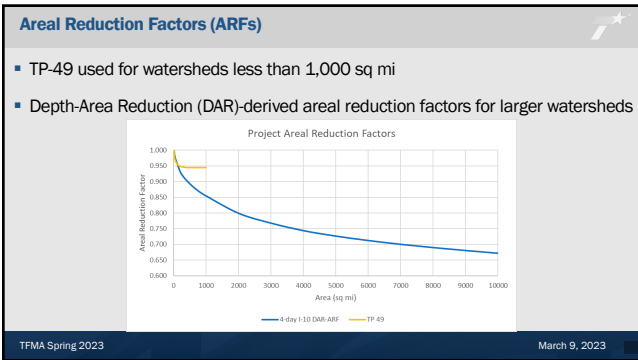
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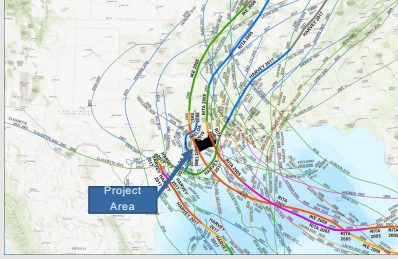
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### Regional Extreme Storm Event Approach (RESEA)

- Purpose: Assess IH-10 resilience against extreme events
- Historical tropical cyclone tracks since 1992



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### Regional Extreme Storm Event Approach (RESEA)

- 20 rain gauges in project area
- 20 rain gauges in 10 mi buffer
- Analyzed data post 1946
- Includes TS Imelda



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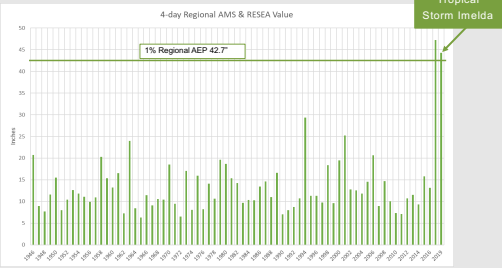
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### Regional Extreme Storm Event Approach (RESEA)

- Annual maximum series for the region



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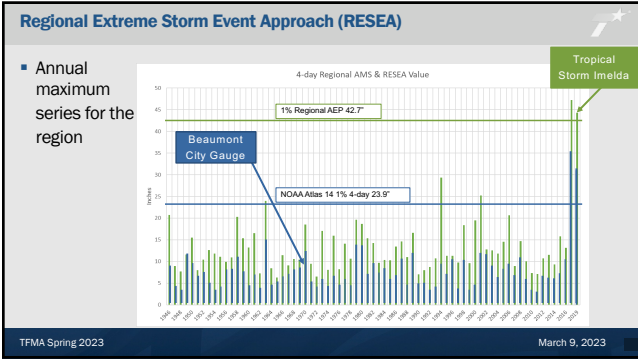
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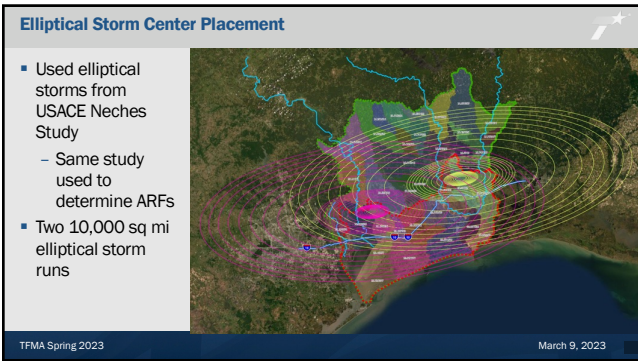
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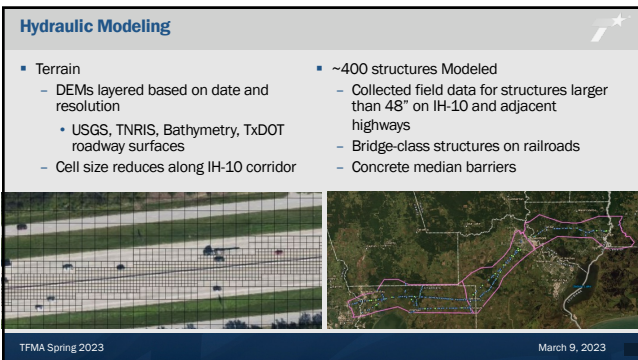
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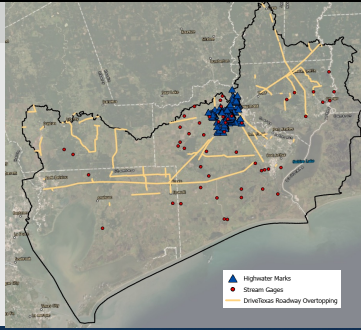
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### Calibration Data

- City of Beaumont Highwater Marks
- USGS and DD6 Stream Gages
- TxDOT DriveTexas.org Roadway Overtopping



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## Tropical Storm Imelda

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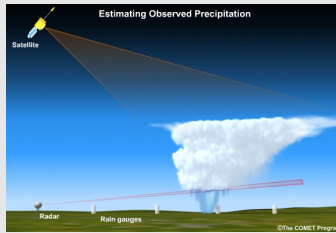
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### Methods of Measuring Rainfall

- Rain gauges - which measure precipitation amounts at given locations.
- Earth-observing satellites can provide frequent estimates of precipitation at a global scale, from a top-down view.
- Ground-based radars, of which measurements are used to estimate intensity, altitude, precipitation type (e.g., rain, snow, hail), and motion.



Source: <http://stream1.cmatc.cn/pub/comeU/QFQPE>

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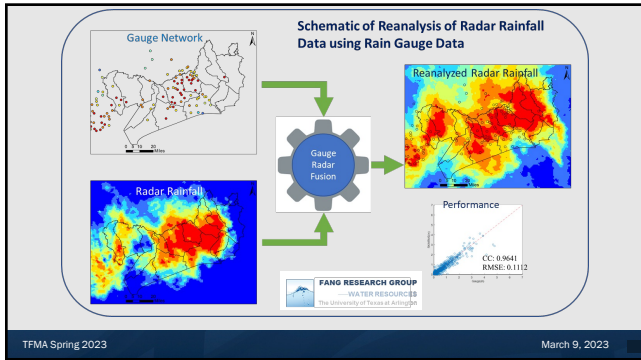
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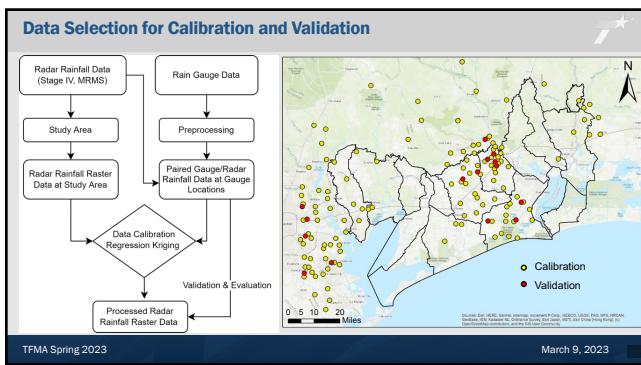
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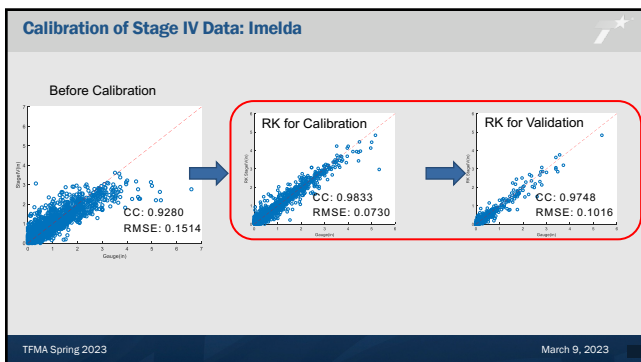
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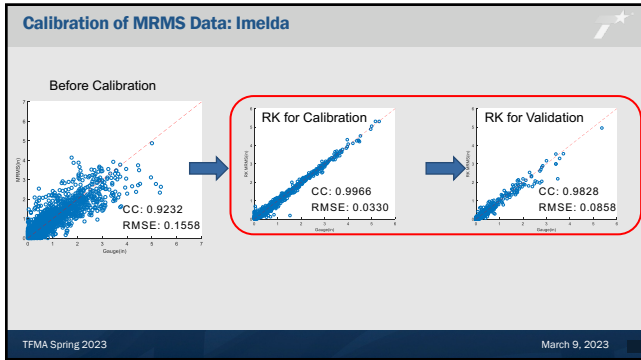
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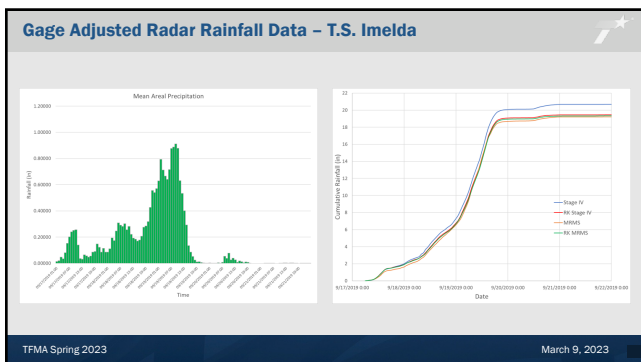
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## Conclusions

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**Questions and Discussion**

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