

STORM SURGE MODELING IN ESTUARINE TRIBUTARIES

The 7th UF Water Institute Symposium /
Climate Change and Coastal Resilience

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Motivation

About **19%** of the U.S. population (2017) lives in coastline counties of **Atlantic coast** and **Gulf of Mexico** (U.S. Census Bureau).

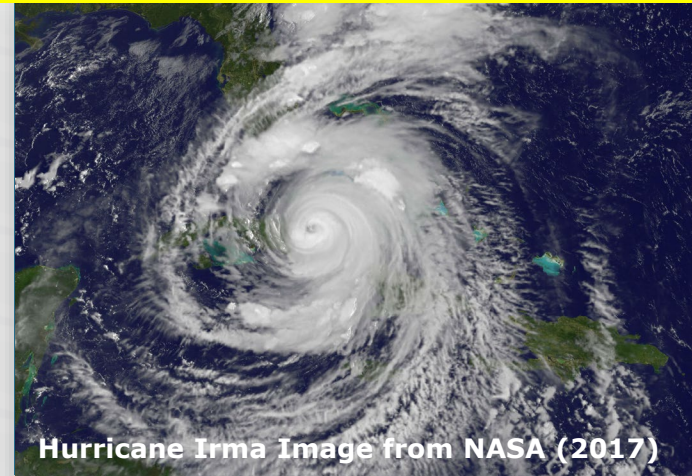
Coastline Counties by Coastline Region: 2017



Getting the Risk Wrong Costs Money



Florida has seen the greatest loss in home value (\$5.4 billion) due to increased tidal flooding. (First Street Foundation)

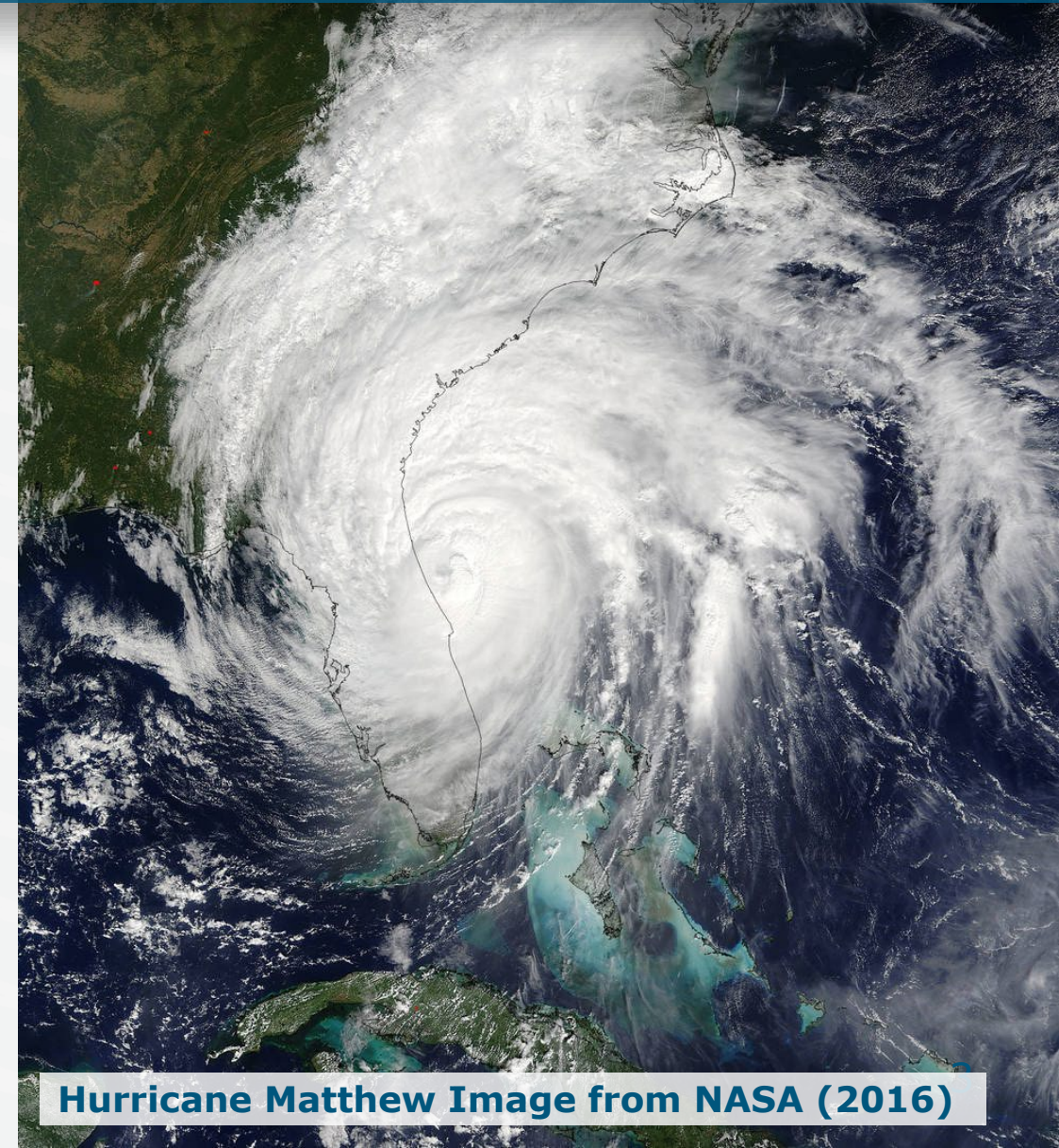


Hurricane Irma Image from NASA (2017)

Estimated costs for improved infrastructure in Florida to protect from invading seas is \$76 billion. (Center for Climate Integrity)

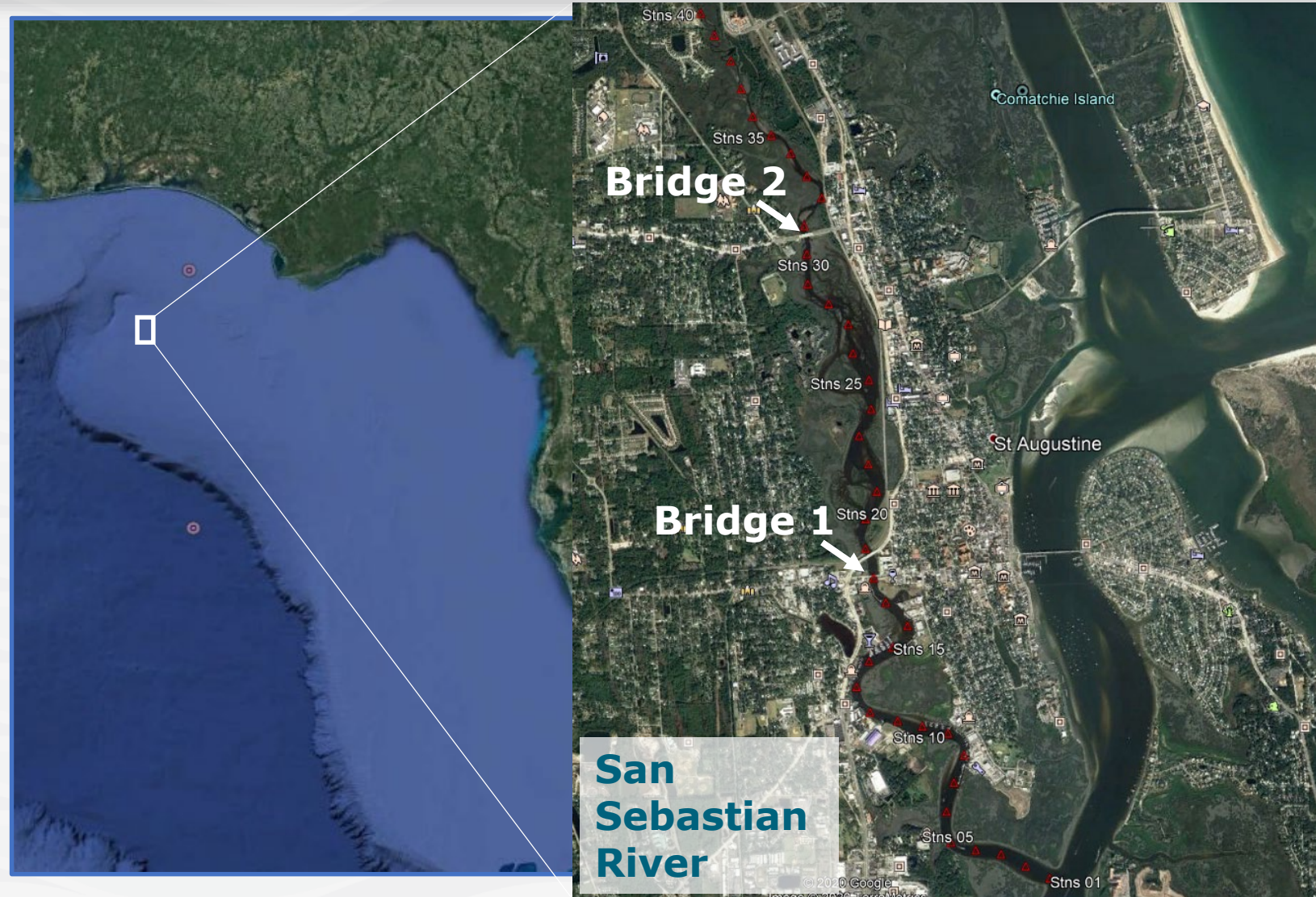
Topics for Discussion

- Limitations of FEMA projections in smaller tributaries
- Effects of the grid resolution on the simulation of storm surge
- Local wind set-up and set-down along small tributaries

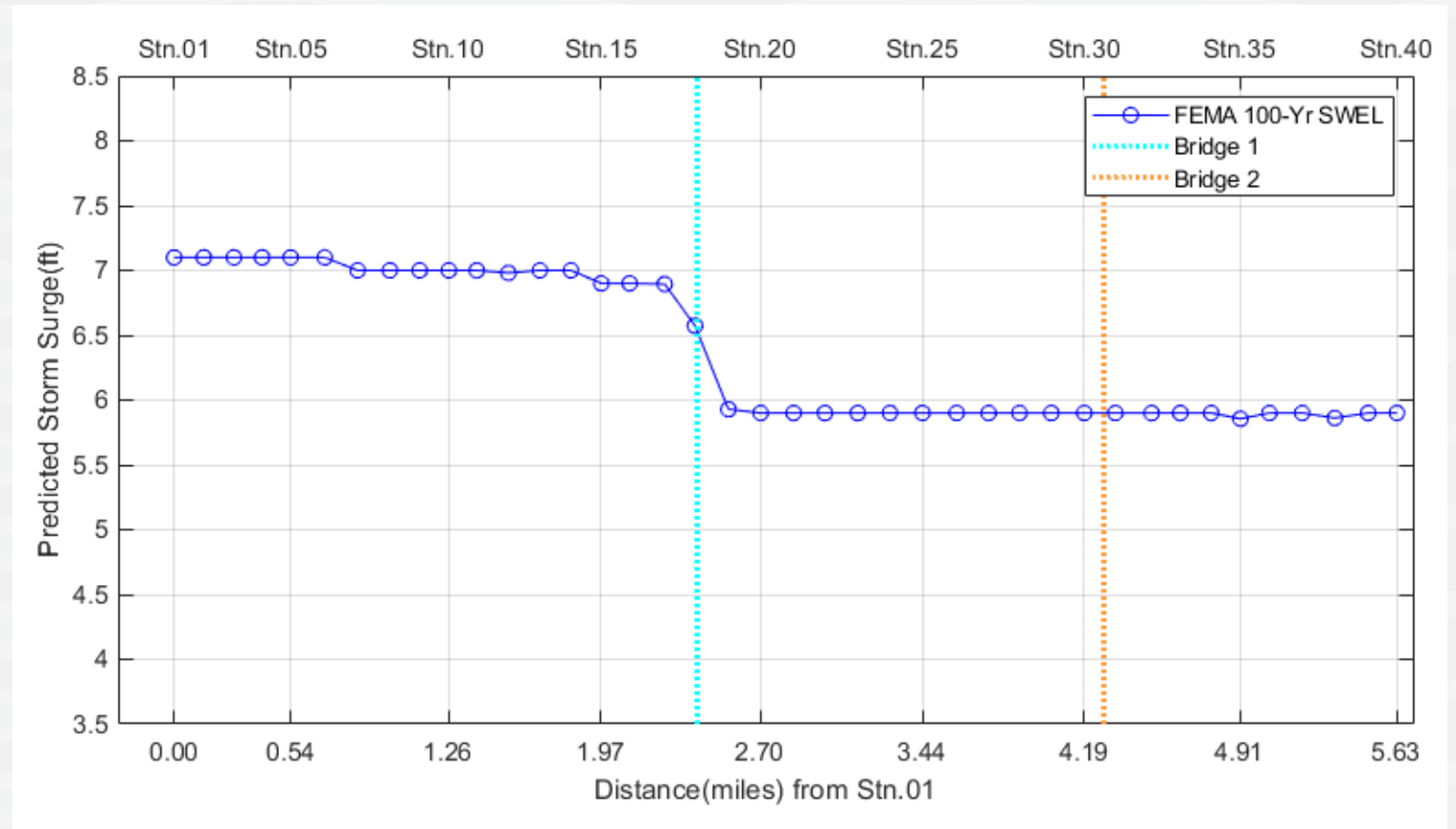
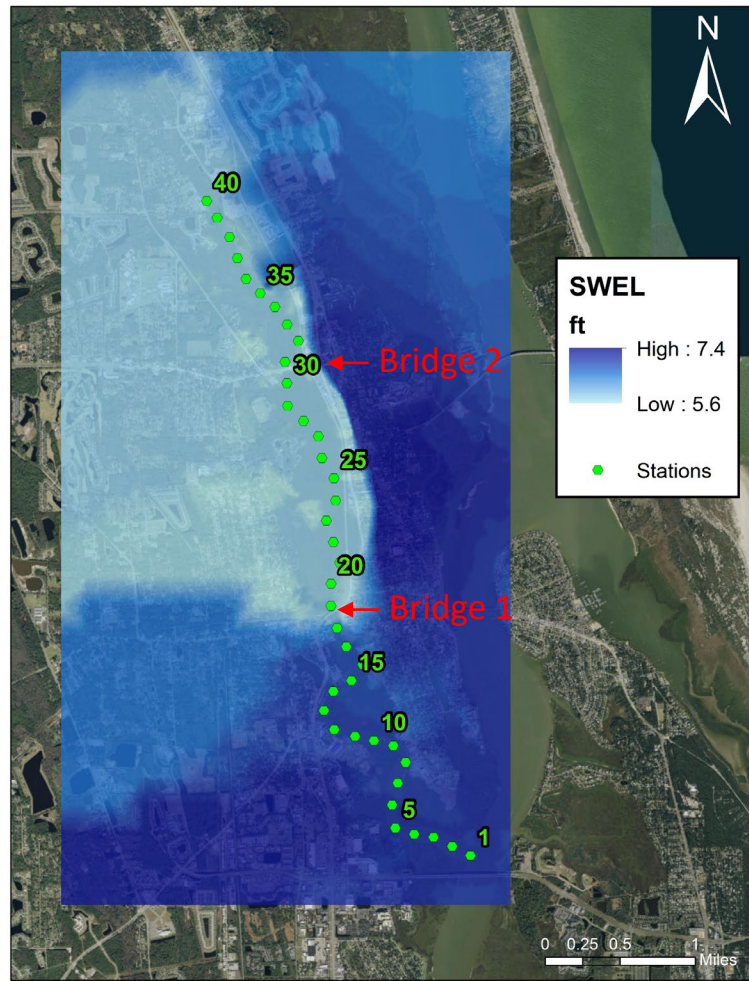


Hurricane Matthew Image from NASA (2016)

Case Study

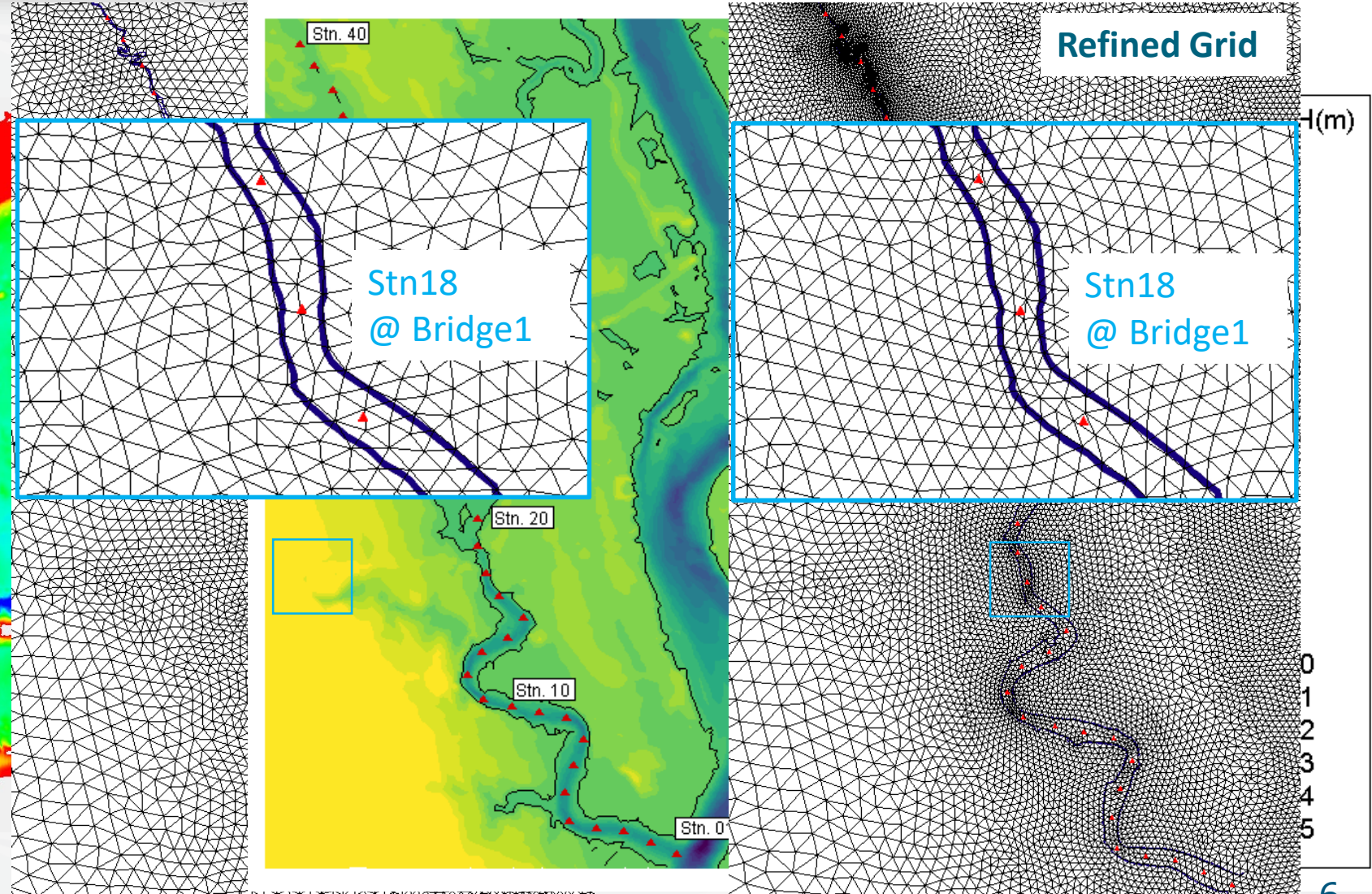
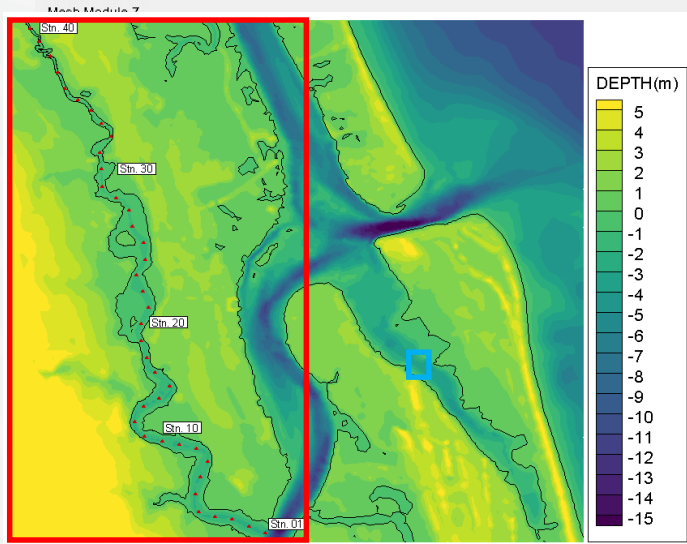


FEMA 100-Year SWEL

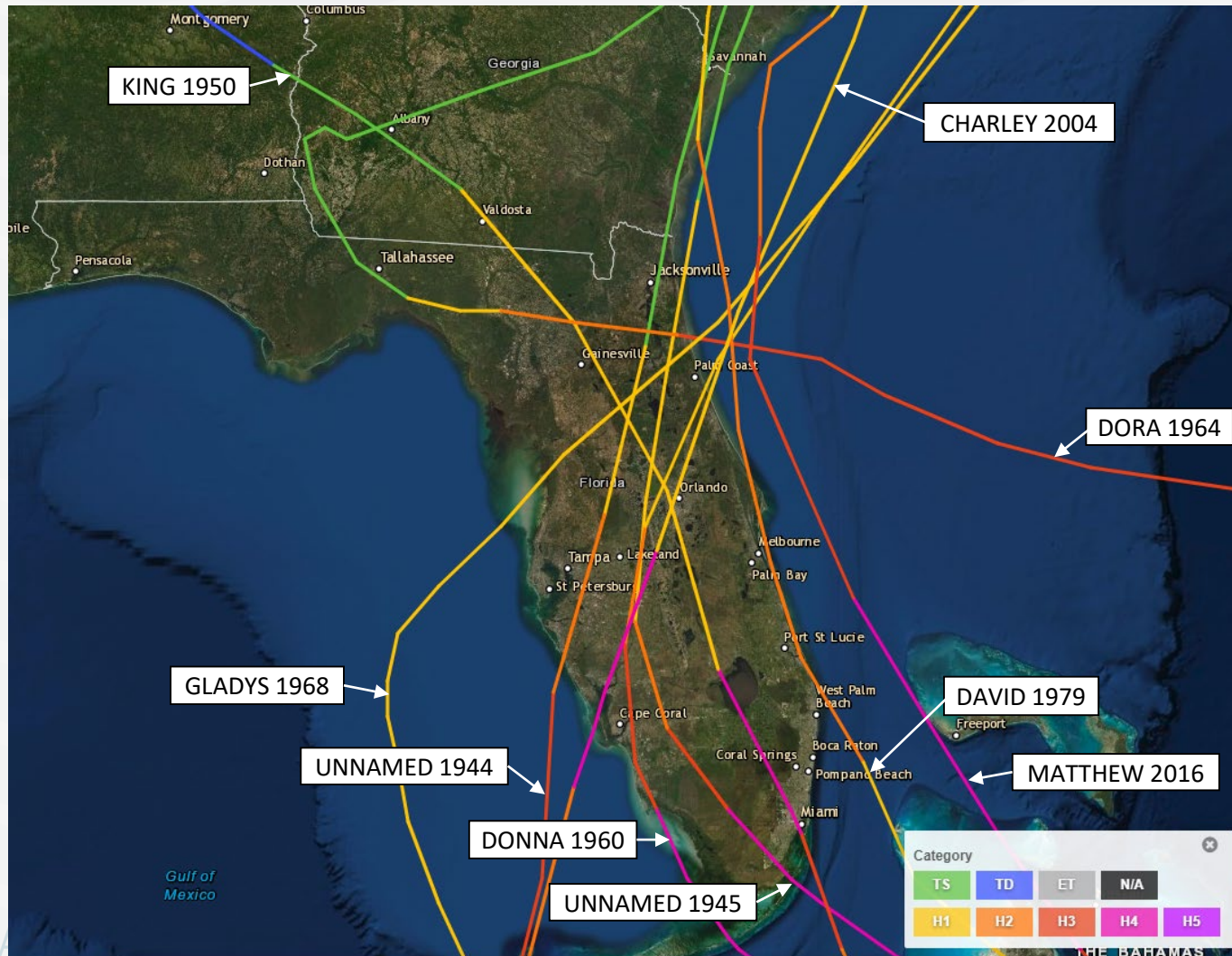


Model Description

FEMA Model Domain



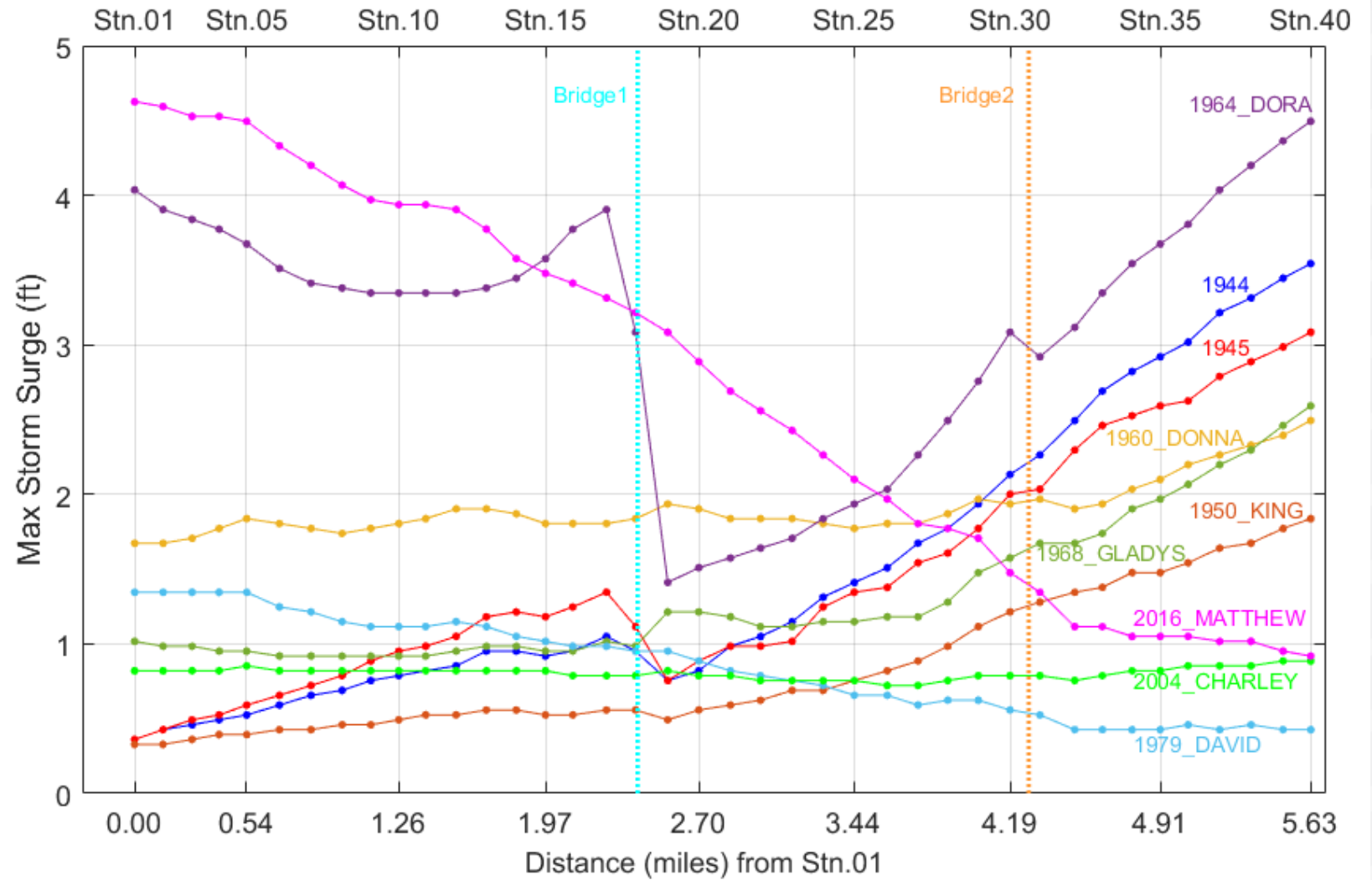
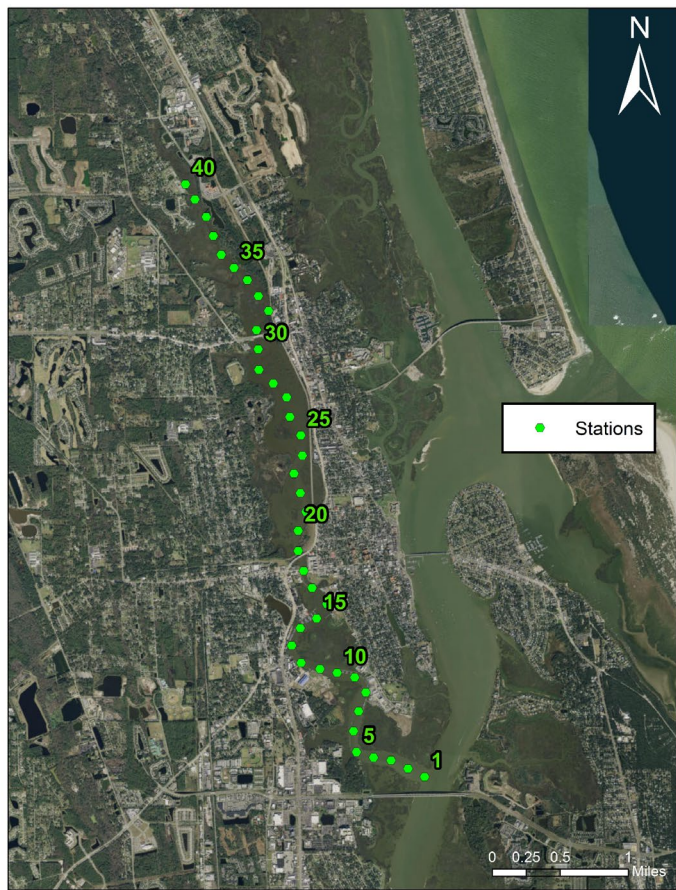
Historic Storm Simulations



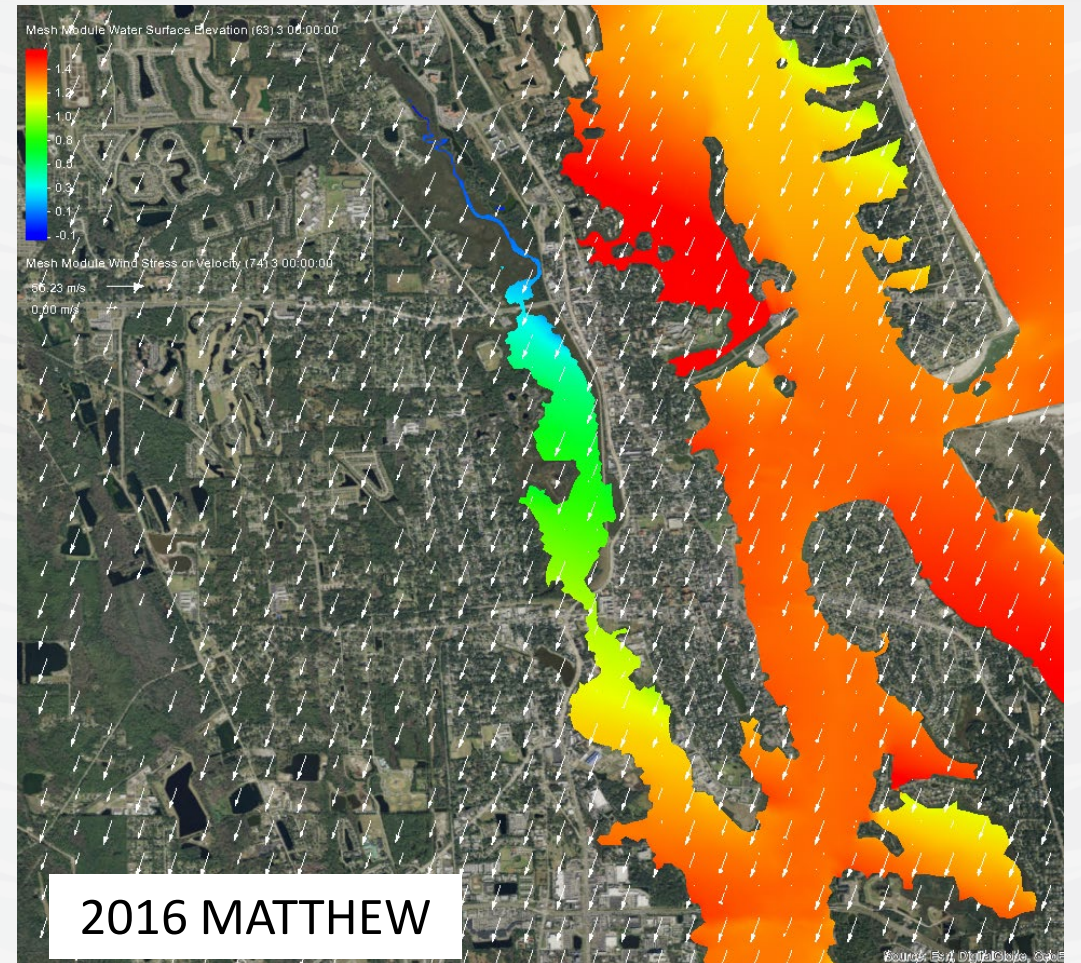
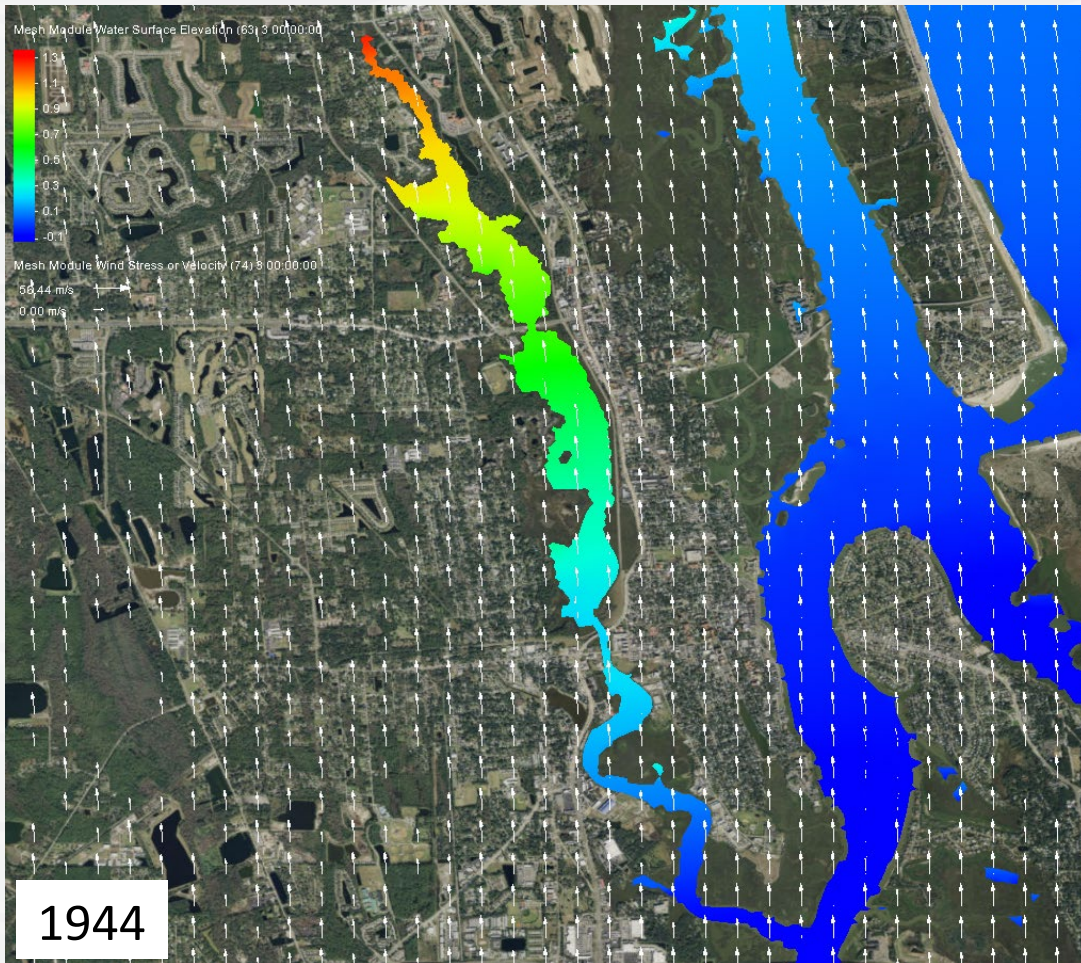
Synthetic Storms (Total 14)

- DORA (1964) shifted about 10 km to the North and South (5 storms to each direction)
- MATTHEW (2016) shifted about 15 km to the East (1 storm) and West (3 storms).

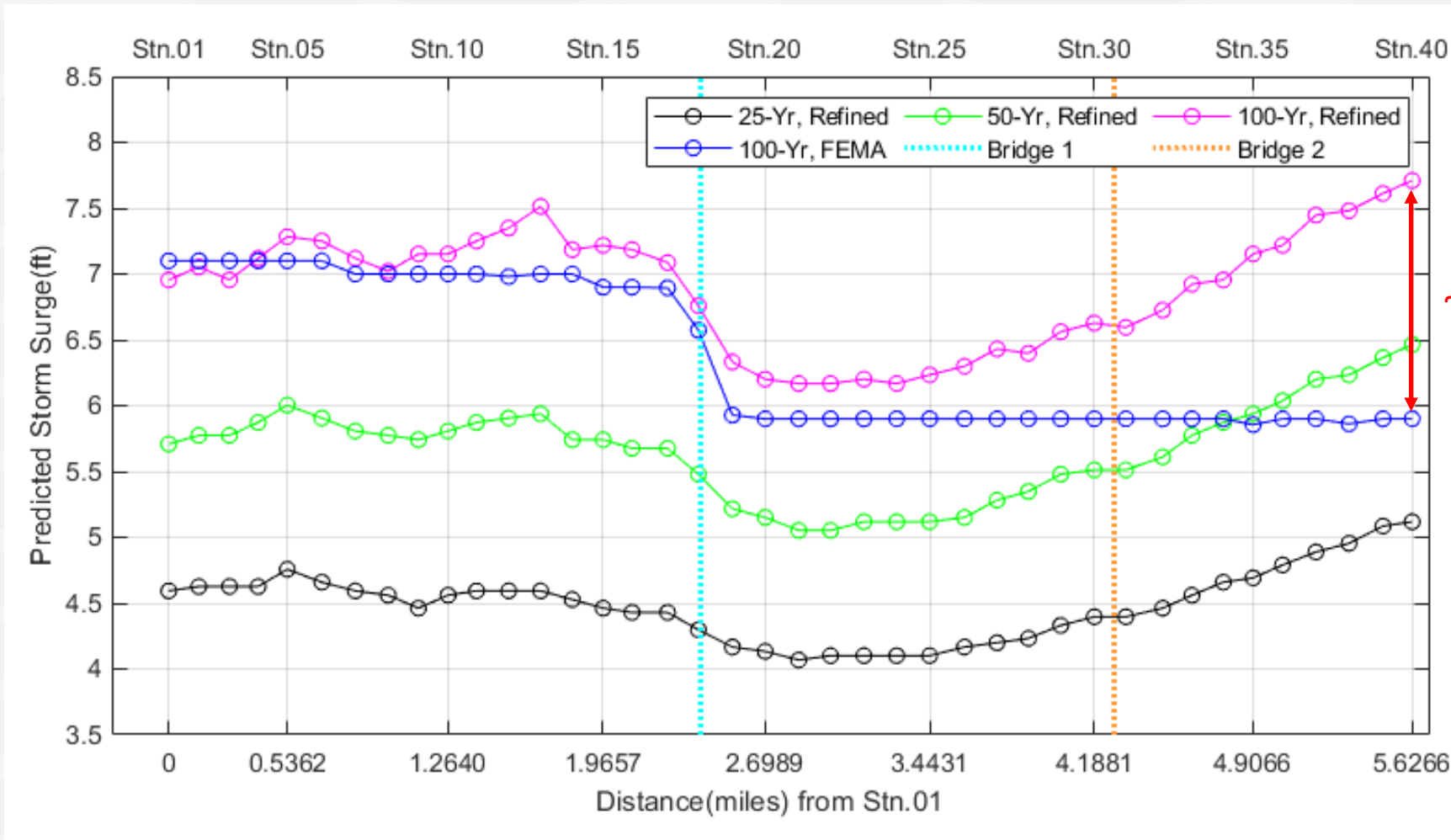
Storm Surge



Local Wind Setup



Annual Exceedance Probability (AEP)



~1.8ft

**Thank
you!**

