



Progress Report

Transition of the Coastal and Estuarine Storm Tide Model (CEST) to an Operational Model for Forecasting Storm Surges

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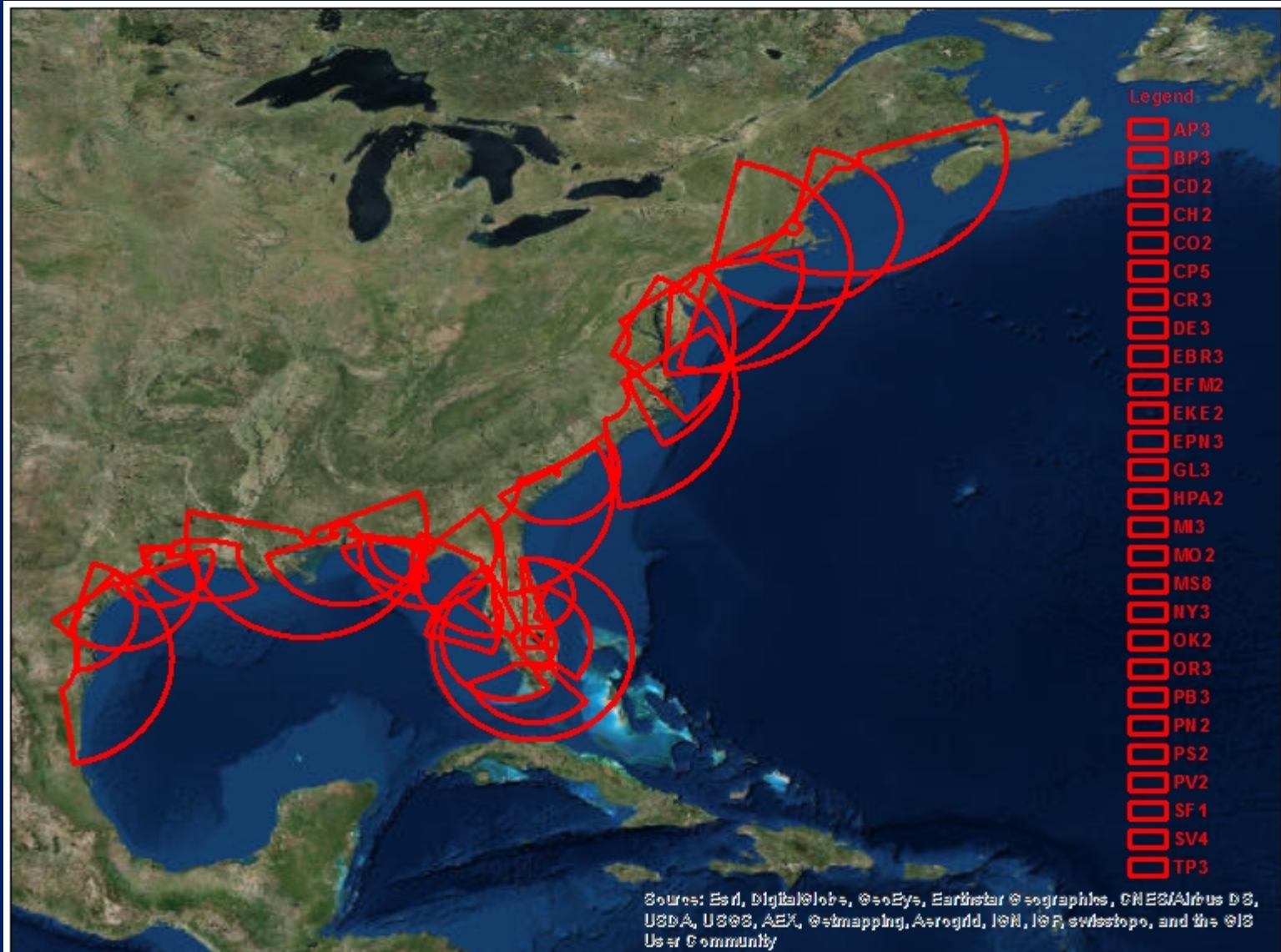
Acknowledgments

- ◆ The Joint Hurricane Testbed Program of NHC for supporting the project
- ◆ Storm Surge Unit of National Hurricane Center
- ◆ Meteorological Development Laboratory of National Weather Service

Outlines

- ◆ Convert SLOSH Basins into CEST Grids
- ◆ MOM (Maximum of the Maximum) Comparison
- ◆ TX3 (Texas) Basin
 - Hurricane Rita
 - Time series comparison
 - Cross section comparison
- ◆ Future Work

Testing CEST on existing and recently updated SLOSH basins

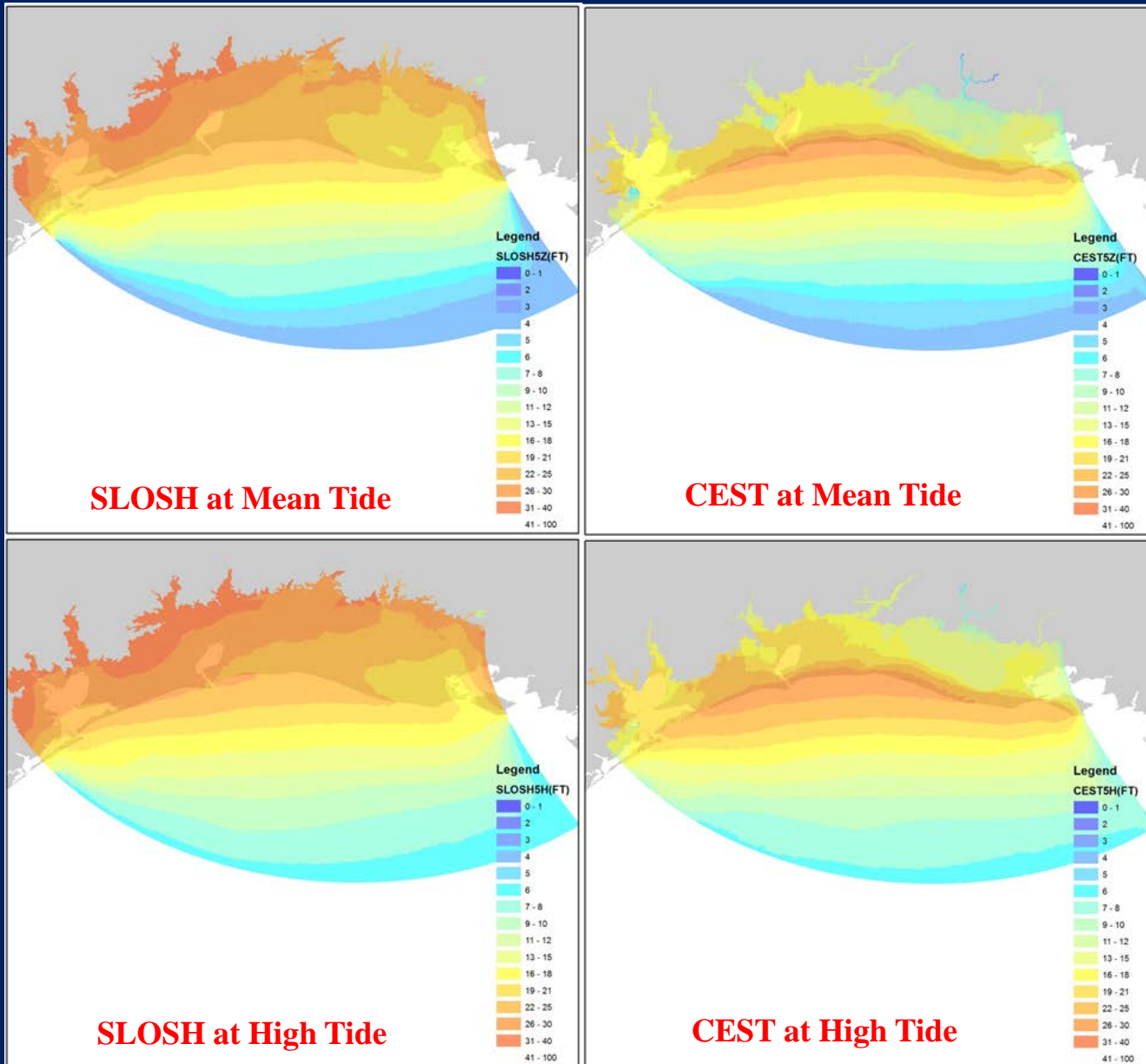


All SLOSH Basins (30)

Converted into CEST at 2016

SLOSH Name	BASIN	Version	Track Files
AP3	Apalachicola Bay	V3	Old Format
CD2	Cedar Key	V2	Old Format
CO2	Cape Canaveral	V2	Old Format
CP5	Chesapeake Bay	V4	New Format
CR3	Corpus Christi Bay	V3	Old Format
DE3	Delaware Bay	V3	Old Format
EBP3	Sabine Lake	V5	Old Format
EBR3	Laguna Madre	V3	Old Format
EFM2	Fort Myers	V3	Old Format
EGL3	Galveston Bay	V4	Old Format
HT3	Pamlico Sound	V4	Old Format
EJX3	Jacksonville	V3	Old Format
EKE2	Florida Key	V3	Old Format
EMO2	Mobile Bay	V3	Old Format
EOK3	Lake Okeechobee	V4	Old Format
OR3	Norfolk	V3	Old Format
EPN3	Pensacola Bay	V4	Old Format
ESV4	Savannah/Hilton Head	V4	Old Format
ETP3	Tampa Bay	V3	Old Format
HCH2	Charleston Harbor	V3	Old Format
HMI3	Biscayne Bay	V4	Old Format
HPA2	Panama City	V3	Old Format
IL3	Wilmington/Myrtle Beach	V3	Old Format
LF2	Vermilion Bay	V2	Old Format
MS8	New Orleans	V10	New Format
NY3	New York	V3	Old Format
PB3	Palm Beach	V3	Old Format
PN2	Penobscot Bay	V2	Old Format
PS2	Matagorda Bay	V2	Old Format
PV2	Providence Boston	V2	Old Format

Category 5 MOMs for the EBP3 Basin



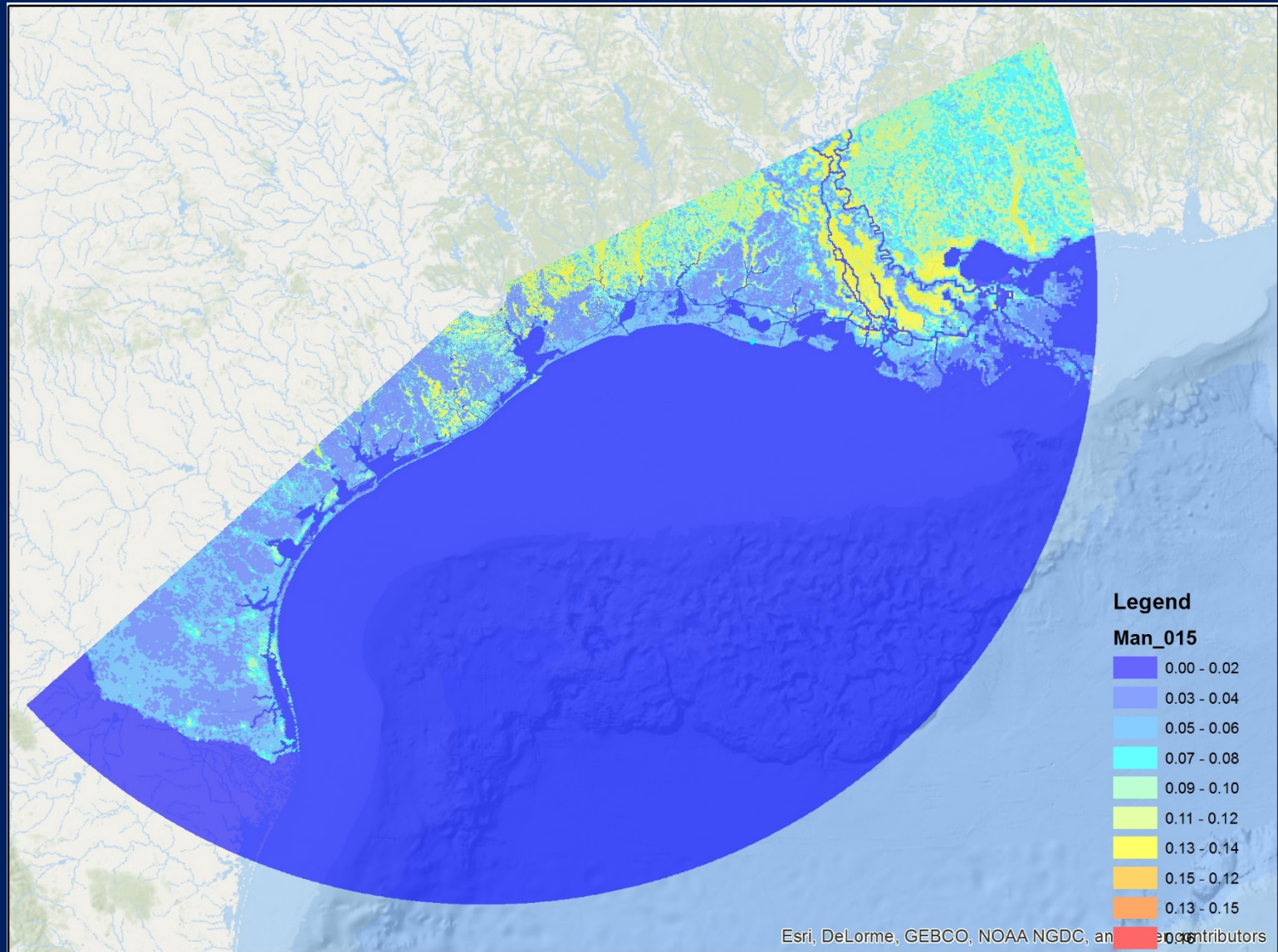
Comparison of Maximum Surges at the EBP3 Basin

MOMs	SLOSH (mean)	CEST (mean)	SLOSH (high)	CEST (high)
Category 1 (ft)	6	6	9	6
Category 2 (ft)	12	14	16	15
Category 3 (ft)	21	19	27	22
Category 4 (ft)	31	24	32	26
Category 5 (ft)	36	28	37	29

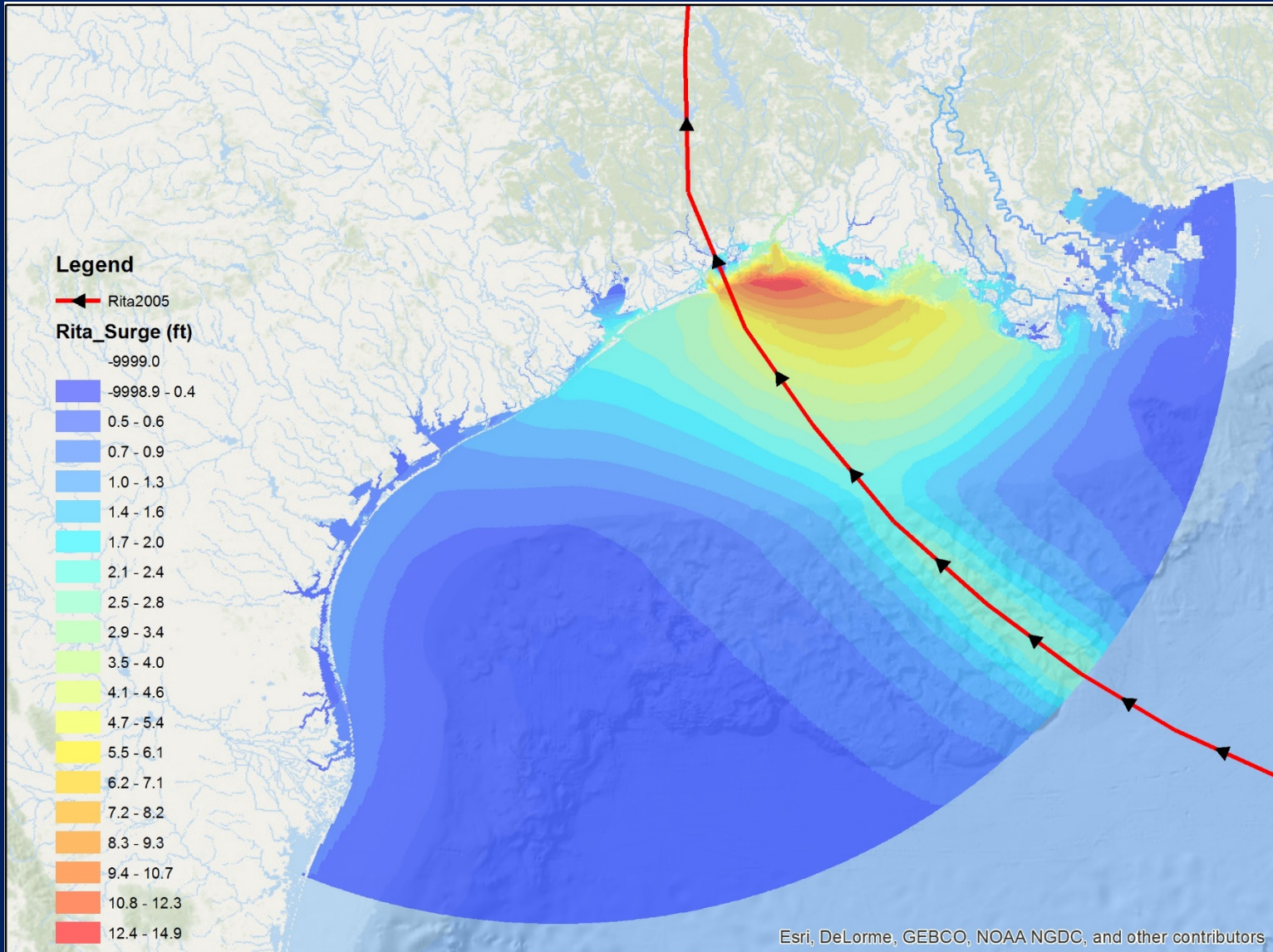
Comparison of Inundation Areas at the EBP3 Basin

Inundation Area	SLOSH (mean)	CEST (mean)	SLOSH (high)	CEST (high)
Category 1 (km ²)	5490	1761	7906	4214
Category 2 (km ²)	9593	5338	11093	6821
Category 3 (km ²)	13628	7984	14739	9052
Category 4 (km ²)	16145	9660	16978	10666
Category 5 (km ²)	17924	11157	18513	11941

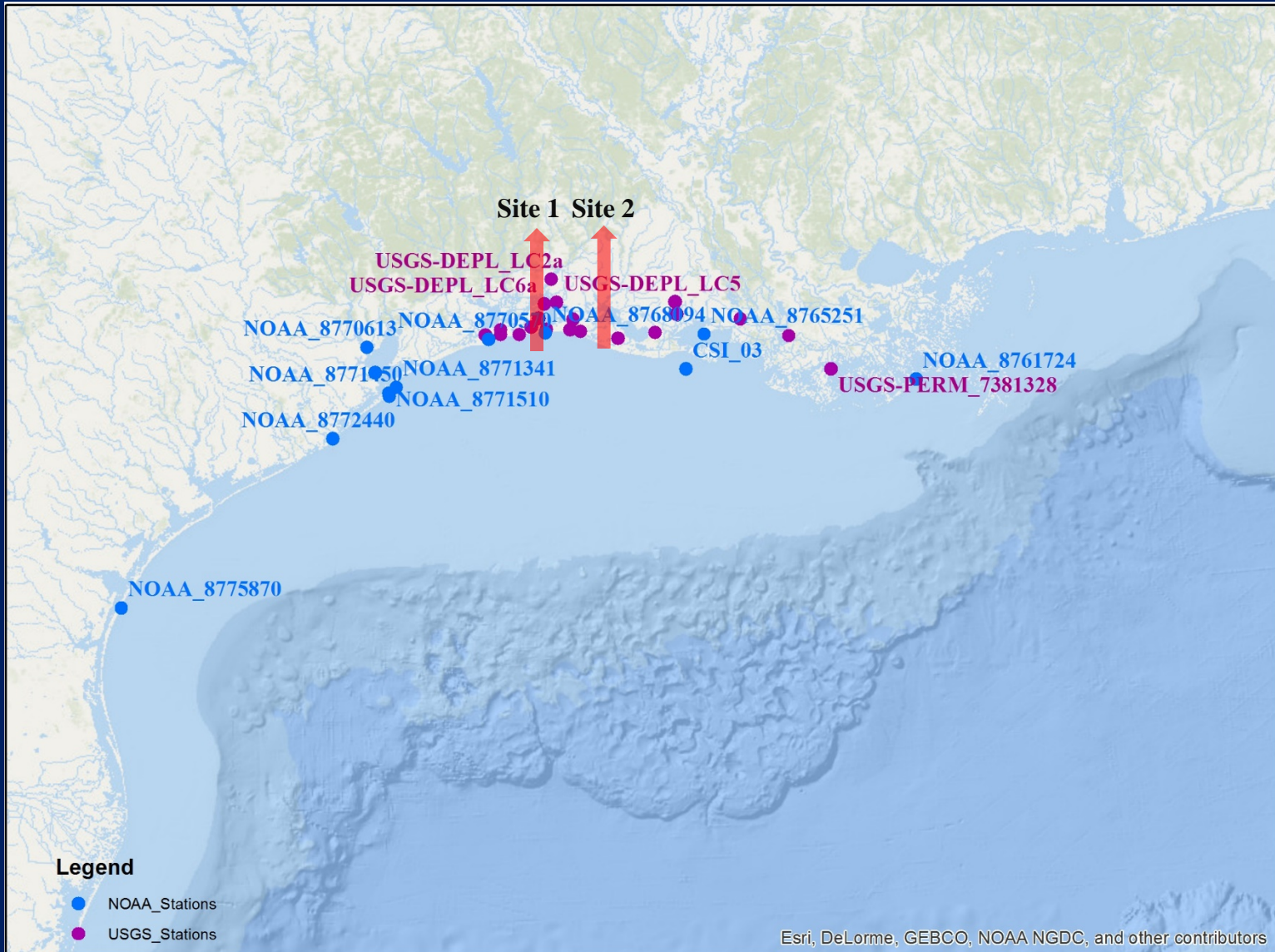
TX3 Manning Coefficient



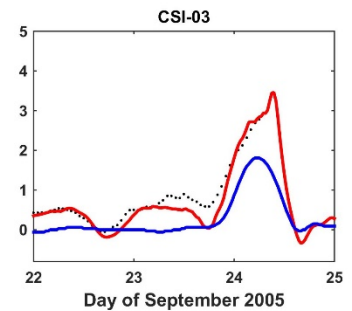
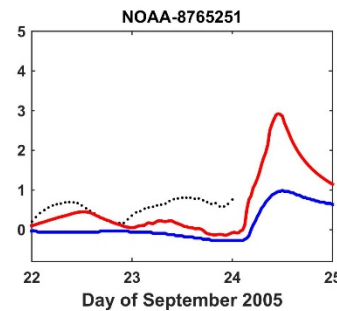
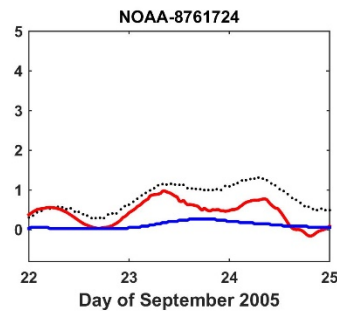
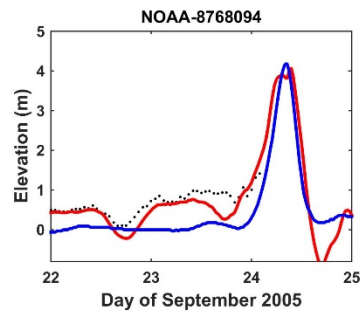
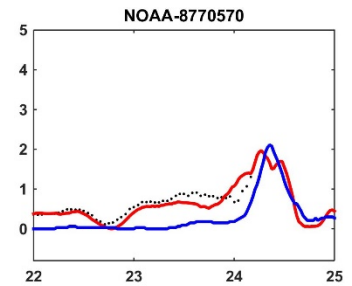
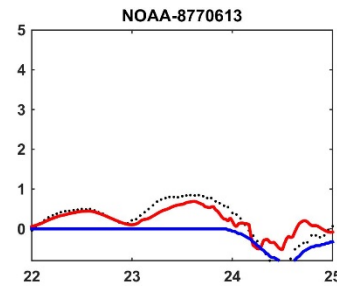
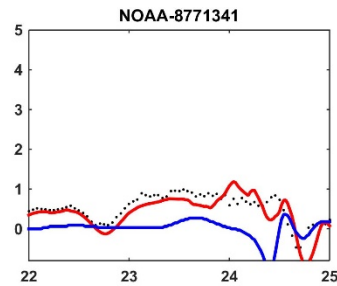
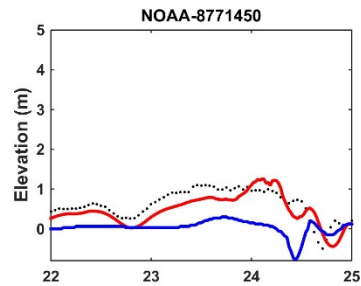
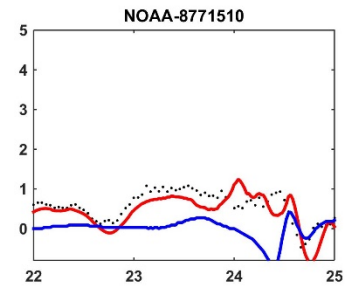
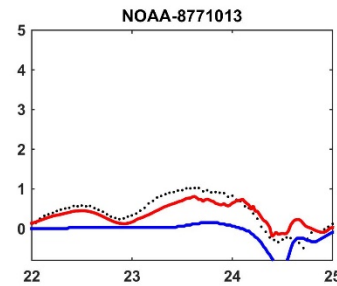
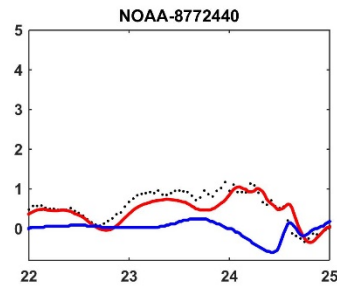
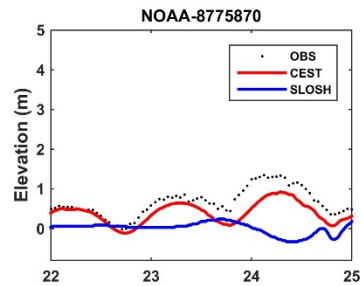
TX3 Maximum Surge of Rita 2005



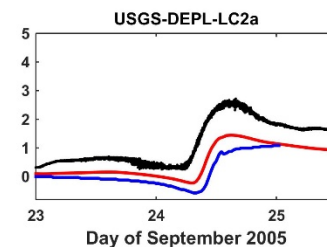
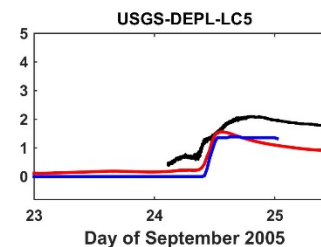
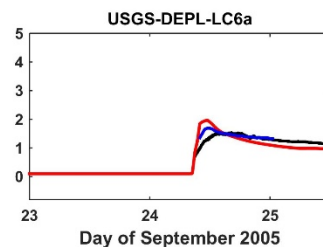
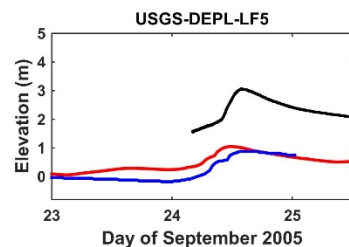
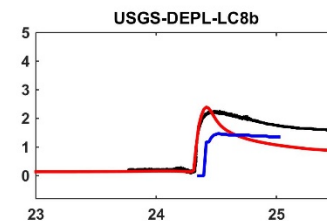
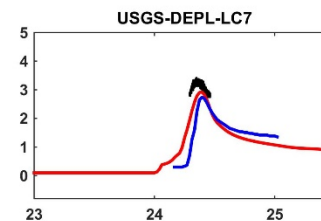
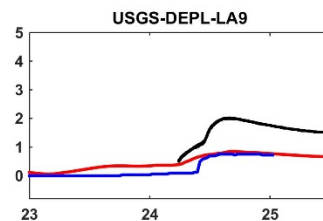
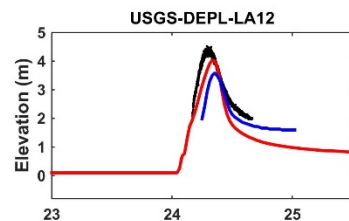
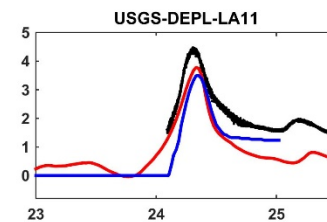
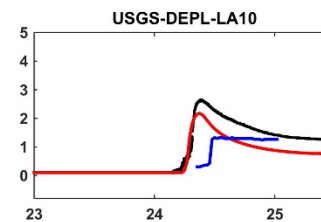
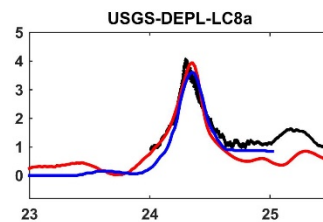
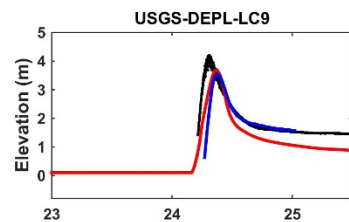
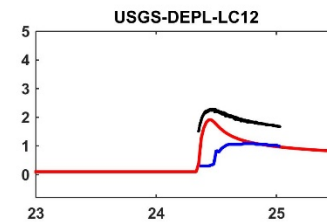
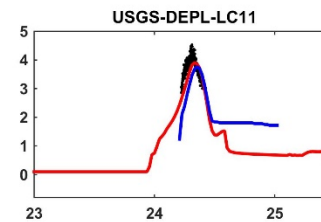
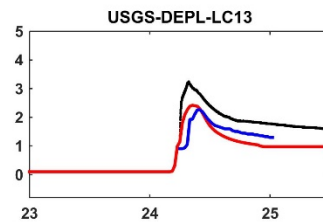
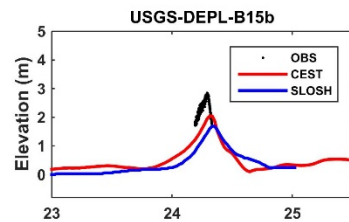
NOAA and USGS Tide Stations



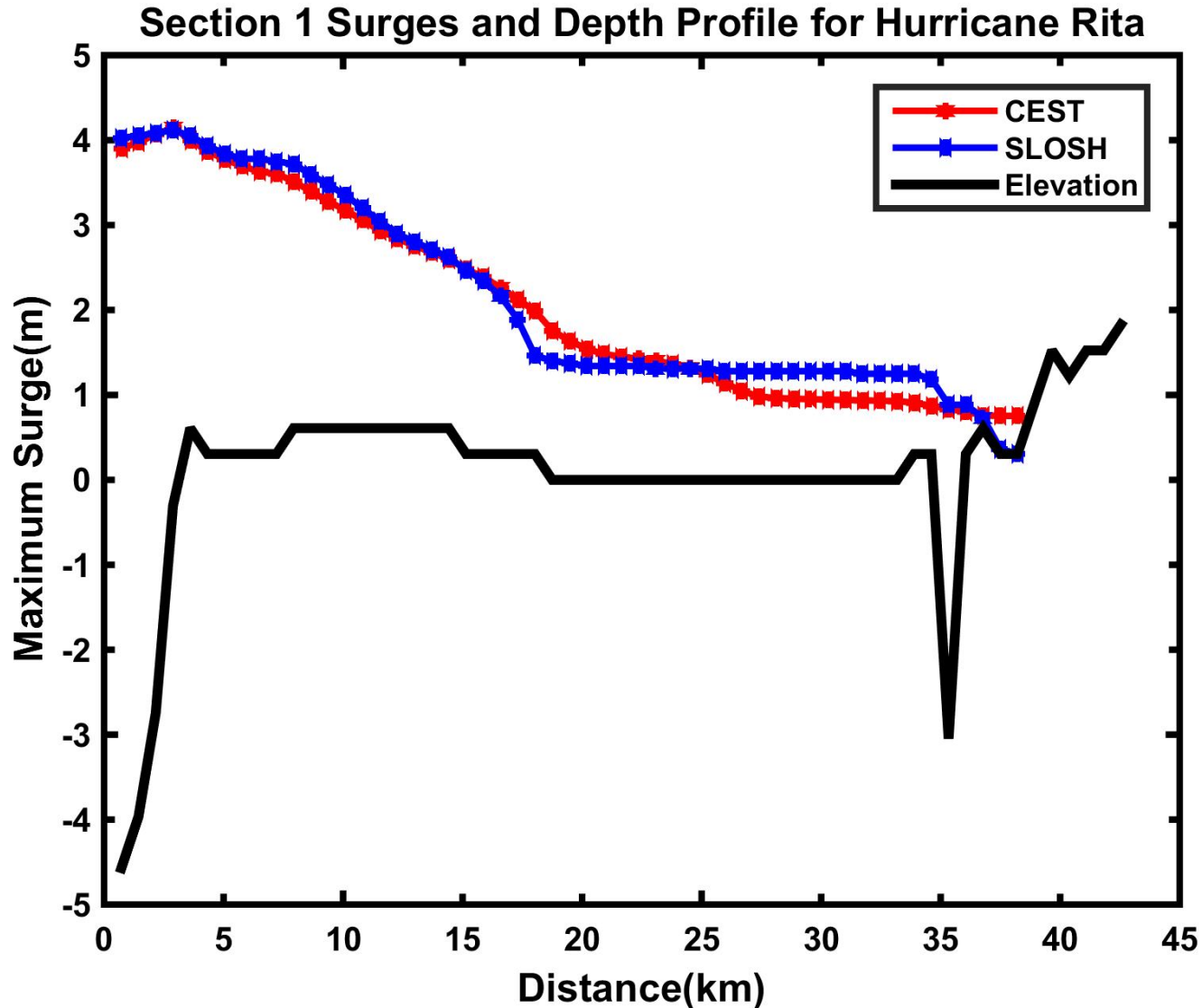
Storm Surge Time Series at NOAA Stations (Rita)



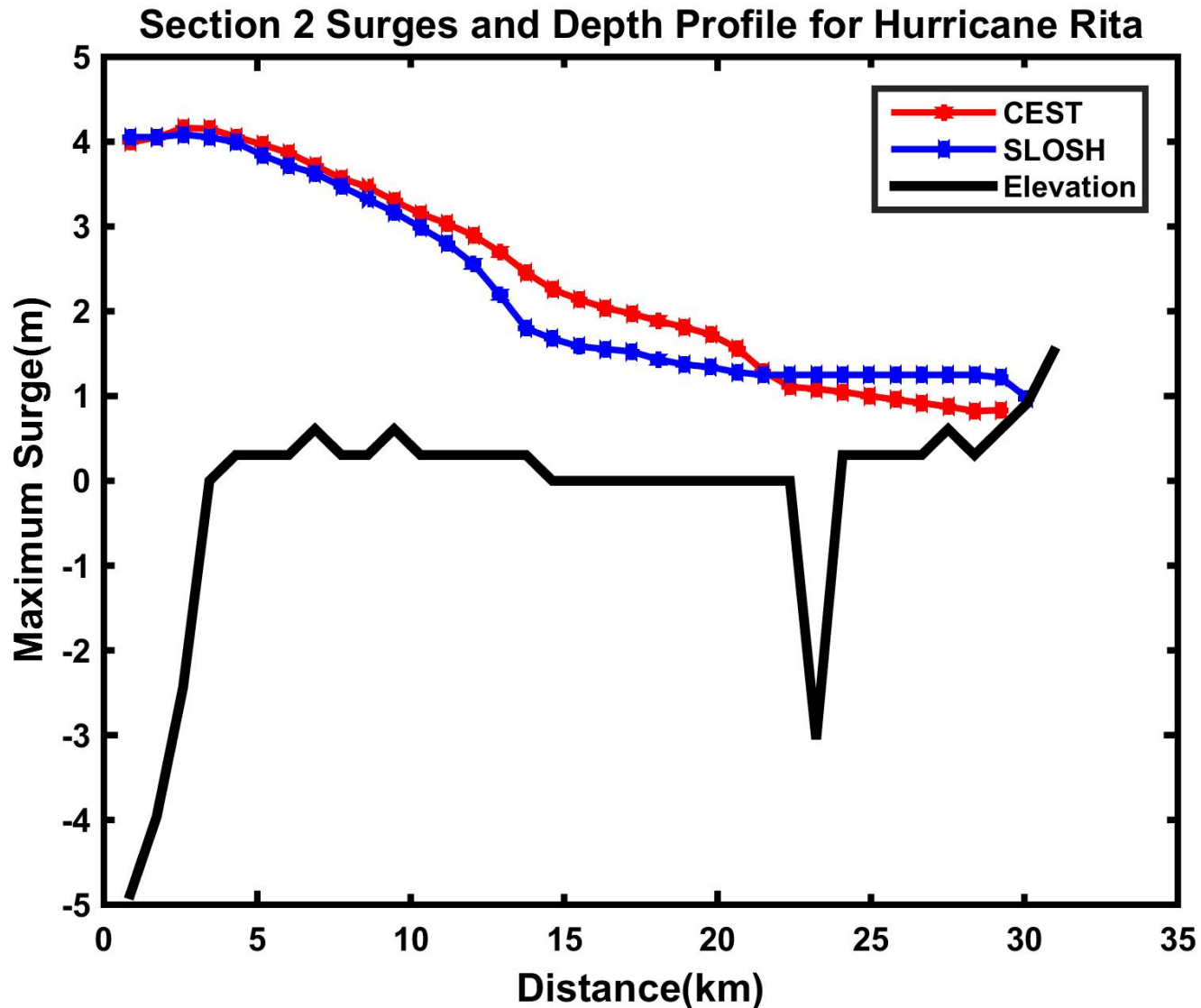
Storm Surge Time Series at USGS Stations (Rita)



Maximum Surge and Depth Profile at Site 1 (Rita)



Maximum Surge and Depth Profile at Site 2 (Rita)



Future Work

Tasks	Q3 (2015)	Q4	Q1 (2016)	Q2	Q3	Q4	Q1 (2017)	Q2
Task 1: Testing CEST on existing and recently developed SLOSH basins				Report on testing result				
Task 2: Developing CEST P-Surge				Initial report on P-Surge				Final report on P-Surge
Task 3: Conducting real-time surge forecasting during hurricane seasons	Surge maps and analysis	Surge maps and analysis			Surge maps and analysis	Surge maps and analysis		
Task 4: Porting CEST to NHC forecast environment				CEST code, initial set up and training documents				Final set up and training documents and Project report



Next step