Federal Agency:	National Oceanic and Atmospheric Administration
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Title:	Transition of the Coastal and Estuarine Storm Tide Model to an Operational Model for Forecasting Storm Surges
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Recipient Organization:	Florida International University 11200 SW 8Th Street, MARC 430, Miami, FL 33199
Project Period:	(03/01/2016 - 08/31/2017)
Reporting Period End Date:	September 30, 2017
Report Term or Frequency:	Semi-annual
Final Annual Report:	No

1. ACCOMPLISHMENTS

Little progress was made on "Developing CEST P-Surge" after we talked to Arthur Taylor of the NOAA/NWS's Meteorological Development Laboratory in March 2017. The main reason for the delay is that Dr. Yi-Cheng Teng, who was the leading person for this task, left Florida International University (FIU) for a tenure track position early this year. We are in the process of recruiting the surge modeler to fill Dr. Teng's position and hope that we will get the new person in the next two weeks. The secondary reason is that PI Dr. Keqi Zhang hasn't been able to recover fully after a long-term illness to fill the gap. Also, Dr. Brian Zachary, who is the major contact person for this project at the National Hurricane Center (NHC), left NHC in July 2017. A no-cost extension was filed and received for this project. The new end date is August 31, 2018.

Table 1. Status of proposed tasks and deliverables.

Tasks	**Proposed Timeline**	**Actual Status**
Task 1: Testing CEST on existing and recently developed SLOSH basins	2016 Q2	Completed
Task 2: Developing CEST P-Surge	2017 Q4, 2018 Q1-Q3	Ongoing
Task 3: Conducting real-time surge forecasting during hurricane seasons	2015 Q3 & Q4 2016 Q3 & Q4	completed
Task 4: Porting CEST to NHC forecast environment	2017 Q4, 2018 Q1-Q3	Delivered the CEST code to NHC and ongoing

Tasks 1 and 3 are on schedule, but Tasks 2 and 4 are delayed because of the investigation of the SLOSH and CEST difference and a prolonged illness of the principal investigator. The percentage of proposed tasks and deliverables are presented in Table 2.

The proposed project fits the NHC-6/JTWC11 priority "Advanced coastal inundation modeling and/or applications, visualization, or dissemination technology that enhances operational storm surge forecast accuracy or delivery". The project deliverables are the CEST forecast system and associated documents and training materials.

Table 2. Completion percentage of proposed tasks and deliverables.

Tasks	**Cumulative percent toward Completion**
Task 1: Testing CEST on existing and recently developed SLOSH basins	100%
Task 2: Developing CEST P-Surge	30%
Task 3: Conducting real-time surge forecasting during hurricane seasons	100%
Task 4: Porting CEST to NHC forecast environment	70%

For the next step, we will have a meeting with the Storm Surge Unit at NHC to discuss what we can/cannot do for the reminder portion of the project. The scheduled meeting in August was

canceled because of Hurricanes Harvey, Irma, and Maria. We will have a meeting as soon as there is no active tropical storms in the Atlantic basin.

2. PRODUCTS

No product was generated during this period.

3. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

Drs. Keqi Zhang and Yuepeng Li at International Hurricane Research Center (IHRC) of FIU have worked on this project. The FIU team met the storm surge team of National Hurricane Center two times to discuss the project, deliver the product, and exchange the files and documents for the work of this stage.

4. IMPACT

What was the impact on the development of the principal discipline(s) of the project?
NA during this period.

What was the impact on other disciplines?
NA.

What was the impact on the development of human resources?
NA.

What was the impact on teaching and educational experiences?
NA

What was the impact on physical, institutional, and information resources that form infrastructure?
NA

What was the impact on technology transfer?
NOAA will receive the CEST storm surge model for forecasting storm surges at the end of this project. Currently, SLOSH is the only real-time storm surge forecast model used by NHC. The CEST model will add an alternative model for cross-validation of SLOSH's forecasts and set a basis for producing ensemble surge forecasts using multiple models

What was the impact on society beyond science and technology?
An additional forecast model will help validate the NHC's storm surge inundation prediction affecting evacuation strategies and coastal flooding warnings.

What percentage of the award's budget was spent in a foreign country(ies)?
No budget was spent in a foreign country.

5. CHANGES/PROBLEMS

The task 2 "Developing CEST P-Surge" and task 4 "Porting CEST to NHC forecast environment" were delayed because of the leaving of the critical participants from FIU and NHC, and the prolonged illness of the principal investigator. A no-cost extension was filed and received. The new end date for this project is August 31, 2018.

6. SPECIAL REPORTING REQUIREMENTS

The Readiness Level for this project is assessed at RL4-Rl5. All other items are covered in previous sections of this report.

7. BUDGETARY INFORMATION

The quantitative budget information is submitted separately in the Federal Financial Report. Due to the delay in Tasks 2 and 4, the prolonged illness of the principal investigator, and the on-going recruitment to replace both Brian Zachary (NHC) and Yi-Cheng Teng (FIU) a no-cost extension was requested.

8. PROJECT OUTCOMES

The CEST storm surge forecasting system will be transferred to NHC and operated within the organization after the completion of this project