GINIS - URI
DHS Coastal Resilience Center
Year 6 ADCIRC Project Workplan
[July 1, 2020 – June 30, 2021]

1. **Title**. Modeling the combined coastal and inland hazards from high-impact hurricanes
2. **Principal Investigator**. Isaac Ginis, University of Rhode Island (URI), Graduate School of Oceanography (GSO)
3. **Other Participants/Partners**.
   Participants: Tetsu Hara, URI/GSO, David Ullman, URI/GSO, Pam Rubinoff, URI Coastal Resources Center
   Partners: Austin Becker, URI Marine Affairs, PI on another DHS/CRC project, Wenrui Huang, Florida State University, Jason Fleming, Seahorse Coastal Consulting, PI on another DHS/CRC project, David Vallee, NOAA Northeast River Forecast Center, Andre van der Westhuysen, NOAA National Centers for Environmental Prediction/Environmental Modeling Center.
4. **Short Description**. This project advances modeling capabilities of the real-time ADCIRC Prediction System for predicting hazards and potential impacts from tropical and extratropical cyclones on critical infrastructure and communities in the U.S. The primary focus is on improving wind, coastal ocean circulation, wave, and hydrological modeling of combined multiple hazard impacts in the Northeast region, including coastal flooding due to storm surge and inland flooding due to rainfall.
5. **Abstract**. The major goal of this project is to develop and transition to operations new and improved modeling capabilities for the real-time ADCIRC Prediction System (APS™). With prior DHS/CRC support, we developed an ADCIRC mesh with very high resolution in the Southern New England region and demonstrated its utility in simulating storm surge and riverine flooding for selected historical and synthetic tropical and extratropical storms. We propose to further modify the ADCIRC mesh in the upland areas around the major rivers in the region to enhance the model's capability to interface with observations and forecasts of river discharge in order to better simulate the flooding resulting from the combination of wind/wave-driven surge and high river discharge. We also propose to implement and transition to the APS™ an advanced wave coupling framework based on the ADCIRC-WAVEWATCH III modeling system and to add surface wave effects on storm surge that are not currently in the ASGS. In addition, we will transition to the ASGS new capabilities for predicting surface wind during hurricane landfall using the URI boundary layer model. We will continue to participate in the collaborative effort to integrate hazard consequence threshold modeling into the ASGS and implement a prototype system at the Rhode Island Emergency Management Agency.