FloodAdapt

CHALLENGES OF FLOODING

Flooding remains one of the leading weather-related causes of death in the United States according to the National Oceanic and Atmospheric Administration (NOAA). NOAA's Natural Hazards Statistics reflect an annual average of 82 flood-related deaths from 1985-2016, while the yearly averages for tornadoes and lightning are 72 and 49, respectively. According to the U.S. Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA), Louisiana has the highest percentage of flood insurance claims, with 2.4 million damage claims filed since the 1970s.

Instances of flooding appear to be increasing and are currently the nation's costliest natural hazard. Compounding flood frequency is the complication of high tides at the coastal interface and rising sea levels. Increasing community resilience will require innovation in flood forecasting, modeling, and monitoring capabilities that can perform in near real-time, over large areas, and with a higher degree of accuracy and precision.

COMMUNITY-DRIVEN FLOOD PREVENTION

The prevalence and severity of flooding risks has led the DHS Science and Technology Directorate to pursue Community-Oriented Decision Support for Compound Flood Events. The purpose of this project is to develop, deliver, and demonstrate a community-oriented, flood hazard modeling and impact assessment tool designed to support planning processes for compound flood events.

Compound flood events result from the combination of rain-driven inland flooding, storm surge flooding, and high tides. Events of this breadth are devastating because their dual origin can result in an inundation of water throughout entire communities. Regional planning to protect communities from such events is difficult due to the complexity of natural processes and the inherent uncertainty and unpredictability of storm intensity and tracking.

This project will establish a flood modeling system, providing communities with the necessary capabilities to develop planning strategies to better predict and resist floods, as well as model the results of these efforts.

PROJECT IMPACT

- When modeling compound flooding scenarios, multiple applications may be required to fully address riverine flooding, high tides, sea-level rise, and changes to mitigation structures.
- Using FloodAdapt, communities can save time and effort with a single model and community-driven scenario. Users can run the same scenario to explore virtual mitigation activities and improvements to determine productive mitigation planning activities.

ACCOMPLISHMENTS

- User Community Test Event
- Updated Super-Fast INundation of CoastS (SFINCS) and Flood Impact Assessment Tool (FIAT) Software

UPCOMING MILESTONES

- Graphical User Interface (GUI) and Workflow Enhancements Demonstration (Q4 FY23)
- User Community Test (Q4 FY23)
- Executive Summary Report (Q4 FY24)

PERFORMERS/PARTNERS

- FEMA, Washington, DC
- Deltares USA, Silver Spring, MD
- Maryland Department of Emergency Management, Reisterstown, MD