

## Communicating the Risk of Tropical Storm Surge to the Public in Charleston, SC

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Climate change is projected to increase the number of intense hurricanes in the future. Furthermore, sea-level rise would increase storm surge from these hurricanes, which then can travel well inland in low-lying coastal areas. However, the vast majority of the public is not aware of their exposure to this risk. Attempting to make the threat of surge more understandable, an interactive website was developed that combines SLOSH estimated surge with elevation and tide data and then simulates the level of surge on photographs of a thousand landmarks throughout the Charleston metropolitan area. The intent of the surge visualization model is to allow anyone to find a landmark near a location of their choosing, and then to see approximate water depths on photographs of that location for a variety of hurricane scenarios. The model is definitely not perfect; with several glitches and approximations, but it is good enough to test the approach and then refine the model in later versions.

The effectiveness of our approach was examined by surveying randomly-selected members of the public. A series of web pages have links to background information on hurricanes, background information on the project, information on how to use the model and a link to the model itself. Before accessing the visualization model, users are directed to a survey that assesses their current understanding of storm surge as well as collects standard demographic data. Once the survey is completed, users are connected to the model and allowed to navigate the model to any extent that they desire. Users are then surveyed on their understanding of hurricane surge again, problems they encountered while using the model, and their understanding of uncertainties in hurricane prediction and model development.

Survey results show that use of the simulator increased the likelihood of evacuation for intense hurricanes, particularly for young adults. Use of the simulator before purchasing their home would have caused 25% of respondents to reconsider their choice. Most felt that the NWS overstates the dangers associated with hurricanes.

The visualization model could easily be modified to incorporate the latest SLOSH projections to provide real-time surge estimates. Thus, the NWS could issue a hurricane warning with a link to the model, potentially making the warning more effective at communicating the danger. Our approach could easily be adapted to other cities along the eastern seaboard and the Gulf coast. Additionally, we envision the public using the model while no hurricane is present to improve their understanding of hurricane surge while also assessing which areas are particularly vulnerable to surge. This will assist in land use planning, home construction and other uses.