

Hazards and storm surge risk

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Communicating Hazard Information in the Modern Environment (CHIME) project

- **How do evolving forecasts and warnings interact with societal information flow and decisions, as a hurricane approaches and arrives?**
 - What does this dynamic information system look like?
 - How can we build understanding of this system?
 - How can we improve risk communication and response?
- **Integrates geophysical sciences, social and behavioral sciences, computer and information science**
- **Morss et al. (*BAMS*, 2017)**

CHIME project: Interconnected research streams

- Modeling of the dynamic information system
 - Hurricane and storm surge modeling
 - Agent-based modeling of information flow and protective decisions
- Empirical analysis of the dynamic information system
 - Analysis of social media (Twitter) data
 - Focus groups with vulnerable populations
- Integration across findings to design and test **prototype storm surge risk communications**
 - **Communication storm surge risk through maps**

Storm surge predictability

- ❖ **Uncertainty in storm surge forecast**
- ❖ **Predictability of storm surge at specific locations is limited – as little as 12-24 hours before landfall**
 - Depends on landfall location and storm characteristics – especially storm size
 - Limiting factors include error in storm track, storm intensity errors, storm speed errors
- ❖ **Fossell et al. Mon. Wea. Rev. submitted**

Developing and testing storm surge risk communication prototypes

❖ Case study: Hurricane Matthew

❖ Focus groups in coastal communities in Georgia and South Carolina in June 2017

- Understanding storm surge
- Experience with Hurricane Matthew
- Use of information prior to landfall
- Testing visual risk communication
 - Map literacy, visual cognition
 - Communicating uncertain information
 - Sense-making
 - Decision-making

Developing and testing storm surge maps

- ❖ **48 hours forecast time**
- ❖ **Regional, city and sub-urban scales**
- ❖ **Static 2D maps and 3D visualizations**
 - Location
 - Flood levels and speed of storm surge
 - Risk interpretation
 - Additional info (images, text, labeling features)
- ❖ **Software**
 - ArcMap
 - City Engine

Focus groups

- ❖ **7 focus groups (6-12 people in each FG) in Beaufort, South Carolina, Brunswick and Savannah, Georgia on June 12-15, 2017**
 - Watching the process of making meaning
 - Observing differing interpretations
 - Dynamic feedback on a variety of communication messages and formats (2D and 3D)
- ❖ **Input from FG participants for map design and risk communication**

Next steps

- ❖ **Updating risk communication prototypes**
- ❖ **Reporting back to communities and decision-makers**

Thank You!

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