

# 2018 HARVEY-RELATED RESEARCH

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## GREATER HOUSTON FLOOD MITIGATION CONSORTIUM (GHFMC)

SSPEED Center, Consortium Partner

**Overview:** The consortium's researchers are collaborating to compile, analyze, and share scientifically-informed data about flooding risk and mitigation opportunities. The consortium will be releasing reports and studies on an ongoing basis.

### GHFMC Analysis of Federal Flood Projects

**PI:** Philip Bedient, Ph.D., P.E. and Sam Brody, Ph.D.

**Overview:** Qualitatively analyze the effectiveness of current and planned structural projects (in terms of flood risk reduction) by comparing reductions in the FEMA floodplain against FEMA flood losses on Greens, Hunting, White Oak, and Brays Bayous.



## KINDER INSTITUTE FOR URBAN RESEARCH

### Coupled Flood Alert System and Infrastructure Risk Modeling for White Oak Bayou

**PI:** Jamie E. Padgett, Ph.D.

**Team:** Philip B. Bedient, Ph.D., P.E. and Andrew Juan, Ph.D.

### Small-Scale Applications of Distributed Hydrologic Model *Vflo*<sup>®</sup> to Characterize Impacts from Mitigation Projects and Site-scale Re-development on Street-level Flooding

**PI:** Philip B. Bedient, Ph.D., P.E.

**Team:** Samuel Brody, Ph.D., P.E., Andrew Juan, Ph.D., Russell Blessing, and Avantika Gori



## Rice Houston Engagement and Recovery Effort (HERE)

### Evaluating the Impact of Recent Extreme Precipitation Events on Rainfall Risk Estimates Through Updated Extreme Value Analysis Methods

**Rice Collaborators:** Kathy Ensor, Philip Bedient, and Chris Hakkenberg

**Overview:** This analysis will leverage the most up-to-date data and methods to provide new design rainfall estimates that can aid engineers and infrastructure planners in developing a more flood-resilient city. This

analysis will also quantify the increasing frequency of high-intensity events, which will better represent the true rainfall-risk in any given year.

### **Learning From Harvey: Temporal Evolution of Flooding and Transportation Accessibility**

**Rice Collaborators:** Jamie Padgett, Philip Bedient, and James Elliot

**Overview:** This project will develop new understanding of the spatial and temporal evolution of flood risks on transportation accessibility for vulnerable communities in the Greater Houston region.

### **Affect of Climate Change on Future Harvey-like Hurricanes and the Implications for Houston**

**Rice Collaborators:** Pedram Hassanzadeh, Phil Bedient, Daniel Cohan, and Laurence Yeung

**Overview:** This project will use the projections of future jet stream's wind, sea-surface temperature, and sea level as input in the hurricane track and surge models to produce the first-ever quantitative estimates of the potential impact of climate change on flooding, storm surge, and air pollution in Houston.