

## Distributed Data Analytics for Real-Time Monitoring and Detection of Flash Floods in Smart City

### Challenge:

- Flash floods are instantaneous
  - response time is critical
- Real-time decision making
  - measure the rising level of water for just-in-time notification and emergency announcement



Source of Images: Maryland State Archives, MPSC Lab@UMBC

### Solution:

- Fuse social feeds with sensor network data streams
  - constrained topic modeling on heterogeneous data streams
  - structured & un-structured cross-modal factor analysis
  - unsupervised distributed deep learning models

### Scientific Impact:

- Real-time situational awareness of physical events
  - harnessing the combined power of sensor network data streams with social networking feeds
  - modeling spatiotemporal and semantic evolution

### Broader Impact:

- City partners
  - Baltimore County Dept of Public Works
  - Howard County Office of Community Sustainability & Bureau of Environmental Services
  - improve operational efficiency & manpower management
  - smartphone based real time notifications to municipal officials
  - ensure safety & security of human lives & critical infrastructures

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