



Crowd-sourced data: how valuable and reliable are they for real-time urban flood monitoring and forecasting?

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Abstract

The use of crowd-sourced data in urban flood management has gained momentum in recent years. For instance, crowd-sourced flood reporting greatly aided victims in receiving real-time warnings and providing flood-related information during the recent Hurricane Irma¹. In the EU-funded project-FloodCitiSense, we aim to investigate the value of crowd-sourced data, especially from citizen observatories, to support early warning services for urban pluvial flood management. In our study, we will explore two types of citizen sensing in Rotterdam, Birmingham and Brussels: rainfall measurements and flood reporting. Citizen science workshops have been designed to train citizens on the use of a low-cost rainfall sensor, the Raindrop Counter, which they will install in their backyards, to measure the rainfall across the cities. Additionally, citizens will install a co-created smartphone app that they will use to report weather conditions and floods, including locations, descriptions, photos, etc. Data collected from the sensors and mobile app, in addition to existing rainfall data from radar, gauges and citizen reports, will be fed into a data-driven model to create a real-time map of pluvial flood risk that will assist water managers in responding to events. The early warning system will also alert citizens and civil services of pluvial flood conditions so that they can take any actions as needed. An important question we aim to investigate is how citizen observations can contribute to improving the quality of rainfall and flood information over urban areas. Another aim of the project is to develop early-warning services for extreme rainfall and pluvial flooding, by mining various sources of flood-related data. We aim to identify rainfall thresholds, beyond which the pluvial flood is likely to occur at a given location. Lastly, when new citizens' observatories are incorporated in the forecasting model over time, a filtering algorithm will be designed to increase the reliability of the forecasting model, by minimizing the rate of false flood alerts.

¹<http://news.mit.edu/2017/map-real-time-crowd-sourced-flood-reporting-hurricane-irma-0908>