Geophysical Research Abstracts
Vol. 20, EGU2018-7512, 2018
EGU General Assembly 2018
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Social Sensing of Floods in the UK

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Floods are predicted to increase in frequency and severity due to the changing climate. While forecasting and traditional observation methods focus on water levels it is difficult to obtain a measurement of the social impact of a flood. “Social sensing” is a form of crowd-sourcing that involves systematic analysis of digital communications to detect real-world events. Here we present a case study that uses data from Twitter to detect and locate flood events in the UK. In order to improve data quality we apply a number of filters (timezone, simple text filters and a ‘relevance’ filter) to the data. We then use place names in the user profile and message text to infer the location of the tweets. These two steps remove most of the irrelevant tweets and yield orders of magnitude more located tweets than we have from geo-tagged data. We demonstrate that high resolution social sensing of floods is feasible and we can produce high-quality maps of floods using Twitter. We show that we can detect most or all of the floods recorded by the UK Met Office Flood Forecasting Centre as well as others that were not recorded. Thus social media provides a new source of forecast verification data. As a further novel use for this kind of data we study trends in social impacts in the days and weeks after a flood and how they are affected by flood severity.