Geophysical Research Abstracts Vol. 20, EGU2018-6860, 2018 EGU General Assembly 2018 © Author(s) 2018. CC Attribution 4.0 license.



Using Random Forests to assess business interruption in the commercial sector in Germany

Zakia Sultana (1,2), Tobias Sieg (1,3), Patric Kellermann (1), Annegret Thieken (3), Meike Müller (4), and Heidi Kreibich (1)

(1) German Research Centre for Geosciences GFZ, Section 5.4 Hydrology, Potsdam, Germany

(heidi.kreibich@gfz-potsdam.de), (2) Technische Universität Darmstadt, Darmstadt, Germany, (3) Institute of Earth and Environmental Science, University of Potsdam, Potsdam, Germany, (4) Deutsche Rückversicherung AG, NatCat-Center, Düsseldorf, Germany

Losses due to floods have dramatically increased over the past decades and losses of companies, comprising direct and indirect losses, have a large share of the total economic losses. Thus there is an urgent need to gain more quantitative knowledge about direct flood losses and losses caused by business interruption in order to mitigate economic loss of companies. However, business interruption caused by floods is rarely assessed because of a lack of sufficiently detailed data. A survey was undertaken to explore important processes influencing business interruption, which collected information of 557 companies affected by the severe flood in June 2013 in Germany. Based on this data set, the study aims to assess the business interruption of directly affected companies by means of Random Forests. Variables that influence duration and costs of business interruption were identified by variable importance measures of Random Forests. Additionally, Random Forest based models were developed and tested for estimating business interruption duration and associated costs. The water depth was found to be the most important influencing variable for duration and costs of business interruption. Other important variables to predict business interruption duration are warning time, probability of flood recurrence and inundation duration. In contrast, the amount of business interruption costs is strongly influenced by the size of the company as assessed by the number of employees, emergency measures undertaken by the company and the fraction of customers within 50 km distance. These results provide some information and methods for companies to mitigate their losses from business interruption. However, heterogeneity of companies is relatively high and sector-specific analyses were not possible due to the small sample size. Therefore, further sector-specific analyses on basis of more flood loss data of companies are recommended.