

## ***Interactive comment on “A statistical analysis of insurance damage claims related to rainfall extremes” by M. H. Spekkers et al.***

**H. Kreibich (Referee)**

kreib@gfz-potsdam.de

Received and published: 28 November 2012

### General comments

The paper “A statistical analysis of insurance damage claims related to rainfall extremes” presents statistical analyses including a logistic regression model between the fraction of insurance claims and maximum rainfall intensities. The following main results are given: “Rainfall intensity proved to be a significant damage predictor; however, the explained variance was at most 34% for property damage and at most 30% for content damage.”

The statistical analyses and presentation of the results is well structured. However,

C5500

the whole paper and particularly the discussion and conclusions of the paper are too much only focused on the statistical analyses. It is difficult for the reader to extract what we can learn from the analyses. Thus, my main concern is the following: relating the fraction of insurance claims with rainfall intensities is not per se a research question. I even doubt that it is particularly interesting for the insurance industry from a practical point of view to have a model to predict of e.g. 20% or 50% of their clients in a certain district will ask for compensation at a particular day.

A model to predict the amount of pluvial flood damage would of course be very interesting for risk analyses, but the paper does not say anything about the amount of damage, and it remains unclear, if the development of a pluvial flood damage estimation model would be possible on basis of the available data.

Nonetheless, the paper needs more focus on a clear research question and more related interpretation of the results. Thus, I suggest focusing on a question like “From which maximum rainfall intensity onwards a rainfall event becomes a “damaging rainfall event”.” Single sentences in the paper already point into this direction, e.g. “Most observations without damage ( $Y = 0$ ) are associated with low-intensity rainfall, e.g. 99% of the observations without damage are below 6.9mm in 10 min” (page 11625 line 10-11) or “The need to reduce Type 1 and Type 2 errors can be different for different stakeholders. An example from the water manager’s perspective: a decision to open or not to open a water storage facility may lead to unpreparedness in case of a Type 1 error or unnecessary costs in case of a Type 2 error” (page 11627, lines 19-22). However, to answer this suggested research question more focus on rainfall events and the identification of thresholds would be necessary.

### Specific comments:

Page 11618, line 13: Since the study of Ririassa and Hoen (2010) might not be available to everyone, more detail about its results and about the differences to the presented study should be given.

C5501

Page 11619, lines 2-5: These sentences are not necessary and basically repeat what has been written in the paragraph before.

Page 11620, line 6: What is with other flood types besides pluvial flooding; e.g. inundation due to riverine flooding, due to high groundwater levels or due to coastal flooding which would also not be related to rainfall intensities in the same district. Are these flood type impossible in the Netherlands due to high flood protection?

Page 11620, lines 20 and following: Does the data contain information about the total asset values of the building or contents (total insured value)?

Page 11621, line 15: Did the districts change over the years? If yes, how did you deal with it?

Chapter 2.4: Could changes of insurance coverage or contract conditions over the years influence/disturb the identification of “dry claims” versus “wet claims”? What means “high claim numbers”?

Page 11624, line 19: “maximum rainfall intensity is a significant predictor for damage” Might be misleading, since not amount of damage is estimated but the fraction of insurance claims.

Page 11625, lines 23-25: “There is a slight improvement in the model predictability if rainfall intensity is based on longer time windows, with an “optimum” between two and four hours.” What does this tell us? What can be concluded from this finding?

Page 11626, lines 4-5: “The results indicate that higher damage observations are more likely to be associated with rainfall data than lower damage observations.” Isn't this trivial, since the data has been selected according to this criterion (chapter 2.4)?

Page 11627, lines 8-10: It is a quite important discussion what other factors are influencing the fraction of insurance claims. More effort to describe and discuss other influencing parameters should be undertaken. For instance, what is with the capacity of the sewer systems, topography, emergency or precautionary measures? What is

C5502

with insurance contract conditions like deductibles?

Page 11628, lines 5-6: Since the analyses are focused on the fraction of insurance claims I wonder why you separate building and contents claims?

Page 11628, lines 9-11: My impression is that better damage data would be by far more important in comparison with better rainfall data. Maybe a scientifically based collection of damage data would be necessary to gain more knowledge about the damaging processes during pluvial flooding. It should be discussed for what analyses insurance data are suitable and where their limitations are.

---

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 11615, 2012.

C5503