Review of "Invited perspectives: An insurer's perspective on the knowns and unknowns to face in natural hazard risk modelling." By Madeline-Sophie Déroche

The paper provides i) an overview of current practices in NH (natural hazard) risk modelling in the insurance sector and ii) outlines some of the grand challenges that will need to be solved in order to make advances in NH risk modelling. Most of the paper focuses on the overview of the current practices, and rather less on the future challenges, which I think reduces the originality and potential impact of the paper. Nonetheless, since the paper is written from the perspective of the insurance industry, I imagine that it will be of wide interest to the wider community of NH researchers who would like some insight into the challenges and opportunities face by the insurance industry. Subsequently, I would recommend the paper be published subject to the comments below being addressed.

The following comments are not "major" in the sense of needing a major revision. A revised version of the manuscript should address each of these points.

1. The abstract reads more like a short introduction than an abstract. I appreciate that there are word limits, but it would be good to reword the abstract to cut down on the introductory sentences and to at least mention the future challenges facing NH risk modelling that are described later in the paper.

Agreed, the abstract has been rewritten.

Abstract has been reworded accordingly

2. Section 4.1: I fully agree that quantifying uncertainty is one of the grand challenges facing NH risk modelling in the insurance industry. However, a key component of assessing uncertainty is having transparent and openly accessible risk models that can be compared and evaluated. This isn't the norm in much of the insurance industry (important activities such as OASIS LMF being the exception). I think it would be very important to point this out in section 4.1.

I have added a comment on this in the new version. While I agree on the necessity of having more transparent models and loss modelling tools, uncertainty quantification is not done at all, even by private modelling firms. I believe the natural hazard modelling community has to systematically quantify and communicate on uncertainty and sensitivity tests to assess the impact on the losses.

3. There are a very large number of minor errors in the manuscript (e.g. repeated lines of text). I reviewed the Track Changes version of the revised manuscript as I could not find another version easily on the website, so perhaps there is another version with less errors. I would recommend that a revised manuscript receive a rigorous proof-read before being resubmitted.

Minor Comments

Title: I would suggest removing "to face" from the title for readability.

Agreed and modified

Line 14 "brokers and modelling firms" remove unnecessary "and" from the list

Agreed and modified

Line 21-24 This sentence is too long and difficult to read. It is also ambiguous, what are the two business sgements?

Rephrased: Though insurers develop ever-increasing products to respond to clients' specific needs, P&C insurance in essence consists of two segments, the (i) retail business for home and car owners and (ii) commercial business for corporate clients.

Line 26 A paragraph break is not needed here.

Agreed and modified .

Line 40-41 "be they natural hazards, financial or cyber" is repeated twice, which makes the sentences here very difficult to read. Please simplify the sentence structure to avoid repetition.

The repetition does not appear in this version

Line 57 “dire” a better word here would be “important”

“Dire” replaced with “pressing”

Line 113 “(e.g. non-modeled loss)” Do you have an example of what such a non-modeled loss would be?

Agreed and modified: (e.g. a non-modeled peril such as storm surge induced by windstorms)

Line 116 Replace with “As more data..” for readability

Sentence has been removed as it does not bring additional information. Lines 102 to 104 explain how the modelling now includes information in hazard and vulnerability modules to capture not only extreme events but also smaller events.

Line 116, 117 It’s not clear what is meant here. You need more data to look at extreme events, so the meaning is not clear. Can you rephrase?

Sentence has been removed as it does not bring additional information. Lines 102 to 104 explain how the modelling now includes information in hazard and vulnerability modules to capture not only extreme events but also smaller events.

Line 156 “was” should be “is”

Agreed and modified

Line 171 Should it be two or three components? Only two reasons are listed in the rest of the sentence.

Modified: The next section focuses on three of the loss modelling framework’s components highlighting where (i) a thorough and systematic data collection needs to be put in place, and (ii) the loss modelling framework requires investment to upgrade it and tailor it to respond to insurers’ business needs.

Line 179 Repeated lines Line

The repetition does not appear in this version

185-190 I’m not sure what is meant in this paragraph. What are these gaps?

This sentence has been removed. It referred to the gap mentioned in Section 2.2. the paragraph in Section 2.2 has been rephrased to give more precision:

Today’s IT computation constraints make it necessary to downgrade the quality and sophistication of the researchers’ modelling to obtain results within an acceptable period. This compromises the assessment that could be attained and engenders a precision gap between what research produces and the derivative data ultimately integrated in the loss modelling framework.

Line 214 Repeated lines

The repetition does not appear in this version

Line 216 What is the nature of these sensitivity tests?

These sensitivity tests consist in changing the physical properties of the building and assess the impact on the losses.

Sentence modified:

Any omission on the properties of a building’s construction induces an uncertainty on that given building(s)’s exposure that can be quantified through sensitivity tests that assess varying combinations of a building’s construction properties and the resulting impact on losses

Line 227 Repeated lines

The repetition does not appear in this version

Line 250 “ultimate” final would be a better word

Agreed and modified

Line 254 “rupture” damage would be a better word.

“Rupture” is kept, what is meant here is that the damage comes from a partly or complete rupture / breach of a building’s components (windows, roof, walls…)

Line 272 Repeated lines

The repetition does not appear in this version

Line 289 Repeated lines

The repetition does not appear in this version

Line 296 “societal matter” I’m not sure what is meant by this – can you clarify. It seems to more about modelling and data handling in insurance than a matter for wider society.

If tackled collectively, data collection, especially in the area of damages and claims, could contribute to better city planning and more effective prevention measures, that would in turn increase society resilience.

Line 300. “modelling of loss modelling frameworks” should be plural as you’re speaking more generally

It refers to the loss modelling framework, as defined in Section 2.2 and widely used in the (re)insurance market.

Line 315. I’m assuming your talking about ensemble modelling here? If not, can you be more specific what you are proposing for this “uncertainty component”

It is indeed the idea of ensemble modelling. It has been precised in the text:

How about introducing a specific “uncertainty component” that would deal with an ensemble of models combining multiple datasets from the different components and propagate the quantification all along the loss modelling process?

Section 4.3 It is important to explicitly use the words “climate change” in this section

Agreed and modified