Earth System
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Interactive comment on "Ideas: a simple proposal to improve the contribution of IPCC WG1 to the assessment and communication of climate change risks" *by* Rowan T. Sutton

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I thank E. Sargent for his comments on my proposal. However, I fear he has missed the point of the schematic Figure 1. Its sole purpose in the paper is to provide a visual motivation for why paying specific attention to low likelihood high impact scenarios is a sensible thing to do from the perspective of risk assessment. One might argue that this is such an obvious truth that no illustration is needed to make the point, but it has not been standard practice in IPCC Working Group 1. For this reason, colleagues have found the Figure 1 illustration helpful. I note also that one comment on my proposal (SC5) suggested that the bottom (low impact) tail is "just as important" as the upper

(high impact) tail, which makes little sense from the perspective of risk assessment.

I am accused of a "naïve premise that risk would equal the likelihood times the impact". But this is not a premise I adopt. There is no single universally accepted metric of risk, but it certainly is the case that likelihood x impact is a commonly used measure, as is stated in the paper (and also in King et al, 2015). This means it is a relevant quantity to consider.

It is stated clearly in the caption to Figure 1 that it is a "schematic representation" and also that "The precise shape of the risk curve is dependent on assumptions about the shape of the likelihood and damage functions at high sensitivity (Weitzmann, 2011)". The reviewer appears to have overlooked these key statements.

With regard to whether one should examine a PDF or CDF, there is no simple right or wrong answer, it depends on what the user wants to know. If the user wants to know the risk associated with a specific parameter (such as ECS) exceeding some threshold value then some form of cumulative (integrated) risk estimate may well be useful. However, they may instead be interested to estimate the risk associated with a specific value of this parameter, in which case Figure 1 is an appropriate schematic representation. I note that many of the examples referred to in the King et al report plot the likelihood of exceeding some temperature threshold as a function of time in a warming climate. The likelihood of a fixed but unknown parameter such as ECS having a high or low value is an entirely different class of assessment.

I appreciate that my proposal may be confusing to someone not familiar with the procedures of the Intergovernmental Panel on Climate Change. These procedures were developed in the past for good reasons, but I believe they need to evolve to address more effectively low likelihood high impact scenarios. Further details of my proposal are provided in my response to the referee comments by S. Hallegatte and are attached again here.

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