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Earth System Dynamics
Discussions

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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If the tails of the distribution are affected so much by assumptions, then who else but WG1 authors or their peers can interpret them correctly? Physically Plausible High Impact Scenarios (PPHIS) can be a valuable tool for WG1 to demonstrate through example to the wider community what the sensible and less sensible ways are of interpreting the tail probabilities. Moreover, by asking the community of physical climate scientists to be explicit about the assumptions, the work on PPHIS may feed back into an improved understanding of what the tail ends signify.

If not WG1 authors or their peers, it is hard to see who else could be doing the inter-

pretation. Decision making that is informed by a probabilistic measure of uncertainty sooner or later in the decision making process has to take one (or at most a few) point measurement(s) of the underlying probabilistic measure. This "collapse" of the uncertainty generates one (or a few) number(s) that are then interpreted almost deterministically downstream from the point measurement. This may not be a desirable situation, but it is an almost inevitable aspect of decision making in the real world. Several factors contribute to this. People tend to be poor intuitive statisticians - see (Sanborn and Chater, 2016) for a recent review and explanation in terms of brain operation. In absence of a formal training in probability, collapsing the uncertainty is therefore a natural and often the only way for people (including many decision makers) to make sense of a problem. Many decision making problems also call for yes/no answers, for a choice between a limited set of options, or for a determinate boundary for which to design a solution for. This means that collapsing the uncertainty is a necessary part of coming to actionable decisions.

The solution that the IPCC (and specifically WG1) has adopted for the uncertainty inherent in climate science is to define a formal methodology to report the scientific uncertainty, and to leave the sense making (i.e., the collapsing) to its downstream users. To some degree, this is required as the question "What do we care about with regards to this decision?" can only be answered in the realm of values and politics, not in the realm of science.

However, this situation has also led to very unfortunate consequences, as it leaves the collapsing of the uncertainty to downstream users, regardless of their understanding or skill to do so. There are many signs that this has led to a wrong focus or misinterpretation downstream from WG1. Even in WG2 and other risk assessment reports, it appears that climate science focus on the most likely part of the distributions has led to collapsing the uncertainty around points (e.g., averages) that are inappropriate for formal risk management. That this makes climate change the odd one out in comparison to other risk domains has been pointed out elsewhere, including in references in

the main article in this thread, and in comments by other authors (notably, RC1, SC2 and SC3).

It seems to me that WG1 authors have an opportunity, dare one say responsibility, to help downstream users in the interpretation of the scientific uncertainty through practical demonstration of how to do this correctly. PPHIS could be a useful tool to turn this principle into practice. This could work alongside (not in opposition to) better collaboration between the different WGs in the IPCC.

References Sanborn, A. N., Chater, N. (2016). Bayesian brains without probabilities. Trends in cognitive sciences, 20(12), 883-893.

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