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Discussions

Interactive comment on "Telling the boiling frog what he needs to know: why climate change risks should be plotted as probability over time" *by* Simon Sharpe

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This discussion piece raises some important issues. I'd be happy to see it published.

I don't have any specific corrections or requested changes but I'll make a few comments.

The article argues that research should start by identifying what it is that we most want to avoid and then go on to assess the likelihood of this as a function of time. The author suggests that research funders have a key role to play in this endeavour "by structuring research calls in a way that mandates the inter-disciplinary approach and

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Discussion paper

the pre-research engagement with decision-makers". I see significant merit in adopting measures of this type and I support the author in these goals. Nevertheless there are risks in such an approach and I think the article would benefit from more nuance on certain points.

It is certainly true that left to its own devices climate change science can focus on issues that are more removed from societal relevance than they should be. However, the article seems to argue that climate change science has a simplistic role of answering the questions asked by society, as if it is simply a matter of turning a prediction handle. Pre-research engagement with decision makers is something I agree would have significant value but by structuring calls towards answering specific decision-relevant questions one can inadvertently encourage research which makes whatever assumptions are necessary to output an answer. What can get lost in this process is reflexion on whether the question asked is currently answerable with any reasonable degree of confidence. Are the assumptions justified? Researchers or research disciplines that perceive the need for more fundamental research in order to answer the question simply don't apply because they can't address the terms of the call; as a result the outputs can become biased and over confident. The approach treats research as simply an extended form of consultancy. It risks undermining consideration of which questions can currently be answered.

A related issue is the "fuzziness" referred to in Dr. Tebaldi's review. I strongly agree that such uncertainties are a critical part of communication but it is important that these uncertainties receive the consideration they require. By demanding that climate science answers specific questions in terms of time dependent probabilities the author is encouraging a situation where computer model ensembles are interpreted as providing such information. Maybe he has other ideas of how it would be provided but this is the most common and simplest approach. I have concerns that the approach recommended provides no pressure to robustly consider the reliability of such uncertainty assessments because this is difficult, time consuming and unlikely to be prioritised in

a funder's calls if they are principally driven by the need to answer specific questions.

Although I support most aspects of the recommendations in the paper they are not a panacea and if not addressed carefully could do more harm than good. Substantial rebalancing towards the approaches proposed would be extremely valuable but this article would be even more useful if the difficulties and risks were more thoroughly explored.

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