

Interactive comment on “Ice melt, sea level rise and superstorms: evidence from paleoclimate data, climate modeling, and modern observations that 2 °C global warming is highly dangerous” by J. Hansen et al.

D. Berner

dale.berner@gmail.com

Received and published: 21 August 2015

You make several points that I fully agree with including that Hansen et al. (2015)'s draft paper could be improved both by editing to reduce redundant statements and by adding a section on "what next". For a topic as complex as projecting future climate change responses certainly further analyses are required, both by the authors and by other researchers. That said, while the US DOE's program on Accelerated Climate Modeling for Energy, or ACME, may soon become the most advanced tool for projecting climate

C6113

change response; modelers for advanced programs such as ACME are still seeking guidance from skilled researchers such as Hansen et al. (2015). Therefore, I believe that it would be a disservice to the scientific community to recommend that the final edited version of this paper not be published; as it clearly identifies the plausibility of significant feedback mechanisms associated with the rapid introduction of ice sheet meltwater, and/or icebergs, into the high latitude oceans this century.

Furthermore, I do not believe that it is incumbent upon the authors to provide "extraordinary evidence" that rapid ice sheet degradation may occur this century. I believe that it is sufficient for them to discuss reasons why it may occur and then to investigate several of the significant associated feedback mechanisms; in the same way that many scientists believe that the chances of RCP 8.5 occurring are small, but the IPCC still investigates such a plausible scenario. Certainly, the findings of researchers such as Pollard et al. (2015) have demonstrated that if society were to follow the RCP 8.5 pathway long enough to reach Pliocene conditions (which according to IPCC AR5 would occur well before the end of this century) then multiple meters of sea level rise, SLR, contribution would occur from key Antarctic marine glaciers due to cliff failures and hydrofracture iceberg calving, in less than a century. As the Jakobshavn Glacier is currently experiencing rapid calving due to cliff failures; it seems plausible that a Pollard et al. (2015)-type of cliff failure and hydrofracturing collapse of key Antarctic marine glaciers could produce an armada of icebergs in the Southern Ocean that might take decades to melt but which would raise sea levels as soon as the icebergs calved.

Again, it is my belief that the evidence that the authors present are not intended to "prove" their projected climate responses are precisely accurate; but rather are intended to demonstrate the plausibility of such climate responses so that other researchers, and policymakers, can make further evaluations in a timely manner.

Pollard, D., DeConto, R. M., and Alley, R. B.: Potential Antarctic ice sheet retreat driven by hydrofracturing and ice cliff failure, *Earth Planet. Sci. Lett.*, 412, 112–121, 2015

C6114

C6115