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Comment

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.

J. Hansen et al.

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Response to SC C6149: ‘Second Response to Thorne Comments’, Dale Berner, 22 Aug 2015

These are all relevant references. As I discuss in response to SC C5549 (Bill Ruddiman), I believe that Bill has misestimated how much anthropogenic CO₂ he needs in order to account for the stabilization of atmospheric CO₂ about 7500 years ago and then its slow increase. Because of the Southern Ocean’s dominant role in determin-

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ing atmospheric CO₂ amount (prior to human influence), and given that the Southern Ocean was still bathed in positive irradiance anomaly, it required little push from human-made GHGs to push the Southern Ocean to provide more CO₂. The Southern Ocean CO₂ has the right ¹³C to agree with data. There is no need to hypothesize such a large anthropogenic CO₂ source or such a large peat sink to try to fix the ¹³C problem. A 40 ppm anthropogenic CO₂ input is not needed. Of the order of 10 ppm is enough to overcome the slight orbital forcing that would tend to lower CO₂. I think the conclusion is that the Anthropocene began ~7500 years ago, and the Hyperanthropocene began with the coal use of the industrial revolution – you could put that at say 1750, depending on how large a signal you want it to produce.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 20059, 2015.

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