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Atmospheric Chemistry and Physics Discussions

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.

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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-

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.