

Deep time evidence for climate sensitivity increase with warming - DTU Orbit (09/11/2017)

Deep time evidence for climate sensitivity increase with warming: Climate Sensitivity Rise With Warming

Future global warming from anthropogenic greenhouse gas emissions will depend on climate feedbacks, the effect of which is expressed by climate sensitivity, the warming for a doubling of atmospheric CO₂ content. It is not clear how feedbacks, sensitivity, and temperature will evolve in our warming world, but past warming events may provide insight. Here we employ paleoreconstructions and new climate-carbon model simulations in a novel framework to explore a wide scenario range for the Paleocene-Eocene Thermal Maximum (PETM) carbon release and global warming event 55.8Ma ago, a possible future warming analogue. We obtain constrained estimates of CO₂ and climate sensitivity before and during the PETM and of the PETM carbon input amount and nature. Sensitivity increased from 3.3-5.6 to 3.7-6.5K (Kelvin) into the PETM. When taken together with Last Glacial Maximum and modern estimates, this result indicates climate sensitivity increase with global warming.

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