

Interactive comment on “Estimate of climate sensitivity from carbonate microfossils dated near the Eocene-Oligocene global cooling” by M. W. Asten

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I thank Donald Rapp for his comments. I have to agree that the example of post-EOT climate sensitivity I discuss is a sparse example, but as I have commented in other discussion comments in reply I see this only as a starting point; other data sets will undoubtedly emerge from current and future geological studies and the result I quote may well change.

However the characteristic of the post-EOT (33.5-33.1 Ma) CO₂ pulse (similar to the PETM at 55 Ma) is a discharge of CO₂ into the atmosphere arguably similar in order of magnitude to anthropogenic discharge in the current century, and certainly it is in an

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instant of time when measured on the geological timescale. As such each data point of temperature change and contemporaneous pCO₂ is deserving of analysis for the benefit of current CS studies.

I also have to agree with Donald Rapp that “there are reasons to suspect that the earth’s climate sensitivity might vary considerably, depending on the starting conditions and state of the earth during a change in CO₂”, but I argue that the starting point for “suspecting” should be numerical data compiled from available data sets.

Having established the numbers we can then proceed to discuss starting conditions and state of the Earth; I make some observations about the position of the continents as they may affect the circum-polar current (obviously one very important factor), but the objective of the paper is primarily to establish a number which can be used as input to the debate about starting conditions and variable feedbacks which may have applied in past geological time.

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