



Holocene CO₂ increase: anthropogenic forcing or internal feedbacks?

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Recently, Ruddiman (2003) suggested that the anthropocene, the geological epoch of significant anthropospheric interference with the natural Earth system, has started much earlier than previously thought (Crutzen and Stoermer, 2000). Ruddiman proposed that due to human land use, atmospheric concentrations of CO₂ and CH₄ began to deviate from their natural declining trends some 8000 and 5000 years ago, respectively. Furthermore, Ruddiman concluded that greenhouse gas concentrations grew anomalously thereby preventing natural large-scale glaciation of northern North America that should have occurred some 4000 to 5000 years ago without human interference. Here we would like to suggest that (a) natural feedbacks could lead to an increase in atmospheric CO₂ concentration during the Holocene and (b) even with a (supposedly natural, according to Ruddiman) decline in atmospheric CO₂, there would be no early glaciation, simply because the current astronomical forcing differs considerably from that of the end of the previous three interglacials.