



## Viewpoint

## The Palaeoanthropocene – The beginnings of anthropogenic environmental change

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## ABSTRACT

As efforts to recognize the Anthropocene as a new epoch of geological time are mounting, the controversial debate about the time of its beginning continues. Here, we suggest the term *Palaeoanthropocene* for the period between the first, barely recognizable, anthropogenic environmental changes and the industrial revolution when anthropogenically induced changes of climate, land use and biodiversity began to increase very rapidly. The concept of the Palaeoanthropocene recognizes that humans are an integral part of the Earth system rather than merely an external forcing factor. The delineation of the beginning of the Palaeoanthropocene will require an increase in the understanding and precision of palaeoclimate indicators, the recognition of archaeological sites as environmental archives, and inter-linking palaeoclimate, palaeoenvironmental changes and human development with changes in the distribution of Quaternary plant and animal species and socio-economic models of population subsistence and demise.

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## 1. The Anthropocene – climate or environment?

Eleven years after Crutzen (2002) suggested the term Anthropocene as a new epoch of geological time (Zalasiewicz et al., 2011a), the magnitude and timing of human-induced change on climate and environment have been widely debated, culminating in the establishment of this new journal. Debate has centred around whether to use the industrial revolution as the start of the

Anthropocene as suggested by Crutzen, or to include earlier anthropogenic effects on landscape, the environment (Ellis et al., 2013), and possibly climate (Ruddiman, 2003, 2013), thus back-dating it to the Neolithic revolution and possibly beyond Pleistocene megafauna extinctions around 50,000 years ago (Koch and Barnosky, 2006). Here, we appeal for leaving the beginning of the Anthropocene at around 1780 AD; this time marks the beginning of immense rises in human population and carbon emissions as well as atmospheric CO<sub>2</sub> levels, the so-called “great acceleration”. This also anchors the Anthropocene on the first measurements of atmospheric CO<sub>2</sub>, confirming the maximum level of around 280 ppm recognized from ice cores to be typical for the centuries preceding the Anthropocene (Lüthi et al., 2008). The cause of the great acceleration was the *increase* in burning of fossil

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