



## **Better earlier than late? Mining-related geochemical anomalies from 3500 to 2000 BP as potential stratigraphic markers for the beginning of the Anthropocene**

Erich Draganits and Michael Wagneich

University of Vienna, Department of Geodynamics and Sedimentology, Vienna, Austria (erich.draganits@univie.ac.at)

This research investigates possible lower boundary geological signals of an early Anthropocene. Though noticeable environmental impact of humans related to hunting, use of fire, wood clearance, domestication and agriculture started already early in the Neolithic, these early stratigraphic signals are extremely diachronous and local. Looking for possible markers for an early start of the Anthropocene, metal contamination from mining/smelting represents a potential regional stratigraphic signal. During the (Eastern Mediterranean) Late Bronze Age to Early Iron Age between 3500-2800 BP a first regional lead contamination event in the northern hemisphere is recognized with a peak at around 3000 BP. Another distinct anthropogenic lead peak is recorded during the Roman period around 2000 BP. These events are defined by lead enrichment and changes in lead isotope ratios and accompanied by other trace metal enrichments; indications are found in several types of geological archives, i.e. Arctic ice cores, European peat bogs, speleothems, fluvial, lake and marine records. Potential stratigraphic correlations and secondary markers may be present using tephrochronology, climate events, and magnetostratigraphy. A definition of the base of a formally defined (early) Anthropocene, based on these early chemical/isotopic markers, allows the use of a GSSP (Global Stratotype Section and Point) concept by using a point in a physical archive, and – in contrast to the late Anthropocene – includes a significant quantity of anthropogenic strata as evidence for an Anthropocene chronostratigraphic unit.

### References

Wagneich, M. & Draganits, E. 2018. Early mining and smelting lead anomalies in geological archives as potential stratigraphic markers for the base of an early Anthropocene. *The Anthropocene Review*, 5(2), 177-201. <https://doi.org/10.1177/2053019618756682>