

The Anthropocene, both as a concept and as a proposed chronostratigraphic unit, has aroused considerable interest in recent years among both scientists in various fields and the general public. Despite the multidimensional human impact on the environment observed on a planetary scale, defining the Anthropocene is challenging. A number of pollutants occurring in the form of particles, molecules and components causing changes in the proportion of selected isotopes are cited as evidence of a permanent record of human impact on the environment. The Anthropocene, taking place in real time, provides a unique opportunity to conduct observations on how its record is created and how it relates to the changing situation drawn from direct surveys of the state of the environment.

As part of the project, soil and sediment profiles in Krakow and Vienna will be analyzed in detail. The project involves the realization of closely related scientific objectives. The first is to evaluate a wide range of potential indicators of the Anthropocene - particles, molecular and isotopic indicators - through an internal, comparative analysis of each of the sites selected for study, as well as a comparison between sites and between cities. Another is to assess the record of human activity in sediments and soils linked to the study of the persistence of selected contaminants in the environment. The final goal is to accurately characterize the predominant anthropogenic compounds in urban soils and link them to available environmental monitoring data and other quantitative records to calibrate the record of pollutant deposition history. The use of a variety of high-resolution methods is aimed at understanding the complex, but potentially consistent record, of the Anthropocene both of the urban areas studied and for specific locations. This comprehensive approach, supported by the combined expertise and resources of partner institutions, aims to assess the stratigraphic potential of various markers and the Anthropocene epoch itself. In addition, it aims to assess anthropogenic pressure through persistent land contamination and shed light on the formation of technogenic fossils.

The proposal for a new epoch, initially put forward by Crutzen in 2000, has sparked increased scientific discourse in various fields. The Anthropocene Working Group (AWG), which began its work in 2009, has been rigorously evaluating the case for officially recognizing the Anthropocene as a geologic time unit. As the AWG moves closer to a conclusion and proposes various markers and locations for the Global Boundary Stratotype Section and Point (GSSP), the Stratigraphy Commission's decision is looming. If the Anthropocene gains formal approval, it will herald a new chapter in the geologic time scale. At the same time, it will open the field for a wide discussion on the practicality and reliability of stratigraphic markers, requiring broad involvement of research groups around the world. The real challenge will be the widespread application of the AWG stratigraphic guidelines.

The project's results will have a significant impact on Earth and environmental science research. Leveraging the expertise of stratigraphers, sedimentologists (led by Michael Wagnreich's team at the University of Vienna), soil scientists, mineralogists and geochemists experienced in the study of anthropogenic contamination (led by Marek Michalik's team at Jagiellonian University in Krakow), as well as collaboration with materials scientists, archaeologists and geographers. This interdisciplinary approach is intended to provide the much-needed broad perspective needed to characterize contemporary sediments and interpret multifaceted data with historical references.