



## **Fossil organic matter in heaped overburden of Sokolov post-mining sites: What do we know and what would we like to know**

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During brown coal open-cast mining in the Sokolov mining region, NW Czech Republic, the excavated overburden material is deposited in heaps that cover thousands of hectares. The continuous mining operation gives rise to a series of ecosystems of different well-defined age on similar substrate which provides a great opportunity to study long-term soil and ecosystem development using the chronosequence approach. The overburden here consists mainly of tertiary clays and claystones which contain significant amounts of fossil organic matter, mainly kerogen of type I and II, which is finely dispersed in the structure of these rocks. The heaped overburden becomes parent material for soil that is formed in these post-mining sites since no topsoil is applied during reclamation. Here we present our current knowledge on the quantity, quality and fate of the fossil organic component in the soils of the studied area. We compare methods for quantification of fossil organic carbon and present evidence that this fossil carbon enters the modern C cycle. We identify knowledge gaps and research questions that are essential in order to understand the modern biogeochemical cycles and long term soil and ecosystem development in these sites.