



## **Amounts and vulnerability of geogenic organic carbon in sedimentary rocks**

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Subsoils contain only low amounts of organic carbon but contribute to more than half of the total soil carbon stocks due their great thickness. There is a lively debate about the question why this subsoil organic matter seems so inert and old. A possible explanation could be the increasing contribution of geogenic organic carbon (GOC) from sedimentary rocks. It has already be shown that soil skeleton in sediment derived soils contains significant amounts of GOC. But currently there are no satisfying fractionation techniques to identify these amounts. Studies about the influence of GOC with increasing depth and its vulnerability are missing.

In order to fill this gap we extracted soil and bedrock cores at four sites down to 10 m depth with a 10 cm diameter corer from a single sedimentary substrate (bedrock). Extracted cores from two soft (loess and tertiary sand) and two hard sediments (red sandstone and limestone) have be separated into 9 depth increments ranging from 1 to 10 m depth. Their C<sub>Org</sub> contents range from 0.01 – 0.04 % (tertiary sand), 0.01 0.03 % (red sandstone), 0.02 – 0.29 % (limestone) and 0.08 – 0.29 % (loess) and thus may contribute to a large fraction of subsoil C. A 54 day incubation experiment with four depth increments and respectively four replications in closed jars has been conducted. Results showed that organic carbon from all depths is mineralised in loess and limestone samples. Whereas red sandstone samples showed no mineralisation and tertiary sand samples only down to 6 m depth. This may be due to the low contents and accessibility for microorganisms. We discuss and explore why geogenic carbon is stable for millennia and what may happen to this carbon if it becomes part of the soil.