

**How stable is stabilized carbon in soils when the world heats up?  
(An organic geochemist's perspective on lessons from past climates)**

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Ancient soils preserve highly stabilized carbon in trace amounts. Fossil molecules, or biomarkers, allow us to quantify changes in soil organic matter, as illustrated for the Paleocene-Eocene Thermal Maximum (PETM, ~56 million years ago). Preserved carbon stocks became unstable during the abruptly warm climate event, and our findings reveal gaps in our understanding of how soil carbon is sequestered on long time scales.