

Organic carbon in permafrost

With ongoing climate change, the Arctic will continue to warm approximately twice as fast as the lower latitudes. As large parts of the Arctic are affected by permafrost, large-scale degradation processes such as thermokarst and thermal erosion are expected. Ice-rich permafrost, such as yedoma permafrost, covers large areas in Alaska and Siberia. These deposits reach thickness up to 50 m and include large ice-wedges. Therefore, warming can trigger especially rapid and deep thaw processes, which can mobilize organic carbon even well below 1 m soil depth. Undisturbed yedoma deposits are characterized by relatively high quality organic carbon stored and are presumably highly susceptible for future degradation. To improve the estimates of the rate and amount of organic carbon that can be released from permafrost thaw with warming, the quantity and quality of the organic carbon needs to be identified.