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Is the Permafrost Pool of Greenhouse Gases Disastrous?

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Carbon dioxide and methane are distributed in permafrost in various concentrations up to 40 ml of gas per 1 kg of frozen ground. Geological horizons could be spatially characterized with certain variety of methane and carbon dioxide concentrations. Thickness and area of each geological body is calculated. The reservoir of carbon dioxide and methane is assessed. The greenhouse gases have been preserved in permafrost from soil cover in the past and are of biological origin. Together with the labile carbon they first will be consumed by microorganisms in case oà permafrost degradation and join modern carbon cycle. We assessed the pool of greenhouse gases in late Cenozoic permafrost of North-Eastern Sector of Arctic.

The result shows roughly 100 tons of organic carbon from 1 km^2 will be freed if 30 m thick permafrost is thaw. The current annual production of greenhouse gases in tundra zone is 1000 times more. That means the degradation of permafrost itself affects the carbon cycle insignificantly rather than the microbiological processes in thawed grounds (for example in thaw lake bottoms).