



## **Transformation of soil organics under extreme climate events: a project description**

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Recent climate scenarios predict not only continued global warming but also an increased frequency and intensity of extreme climatic events such as strong changes in temperature and precipitation with unusual regional dynamics. Weather anomalies at European territory of Russia are currently revealed as long-term drought and strong showers in summer and as an increased frequency of soil freezing-thawing cycles. Climate extremes totally change biogeochemical processes and elements cycling both at the ecosystem level and at the level of soil profile mainly affecting soil biota. Misbalance in these processes can cause a reduction of soil carbon stock and an increase of greenhouse gases emission. Our project aims to reveal the transformation mechanisms of soil organic matter caused by extreme weather events taking into consideration the role of biotic-abiotic interactions in regulation of formation, maintenance and turnover of soil carbon stock. Our research strategy is based on the novel concept considering extreme climatic events (showers after long-term droughts, soil flooding, freezing-thawing) as abiotic factors initiating a microbial succession. Study on stoichiometric flexibility of plants under climate extremes as well as on resulting response of soil heterotrophs on stoichiometric changes in substrate will be used for experimental prove and further development of the theory of ecological stoichiometry. The results enable us to reveal the mechanisms of biotic - abiotic interactions responsible for the balance between mobilization and stabilization of soil organic matter. Identified mechanisms will form the basis of an ecosystem model enabled to predict the effects of extreme climatic events on biogenic carbon cycle in the biosphere.