

**FESP CHILE 2025****10th conference on Fire Effects  
on Soil Properties****1. TITLE****WILDFIRE EFFECTS ON SOILS IN FOREST ECOSYSTEMS OF RUSSIAN NORTH-WEST****2. NAMES OF THE AUTHORS IN ORDER OF AUTHORSHIP AND AFFILIATION OF EACH AUTHOR***Ekaterina Chebykina, Timur Nizamutdinov, Evgeny Abakumov**Saint-Petersburg State University, Saint-Petersburg, Russian Federation***3. ABSTRACT**

The area occupied by undisturbed ecosystems because of wildfires has been noticeably decreasing in recent years. According to official data, the area of forest fires in Russia annually amounts to 2.5-3 million hectares.

Modern studies describing soil changes during fires in the European North and North-West of the Russian Federation are few, with a predominance of publications on vegetation dynamics during postpyrogenic succession. Therefore, a comprehensive regional ecological assessment of postpyrogenic soils in forest ecosystems was carried out, using the Northwest of Russia as an example.

The results obtained showed that forest fires change the morphological and physicochemical properties of soils, leading to the complete or partial degradation of organic horizons and the formation of so-called pyrogenic horizons. The influence of fire can be traced approximately to a depth of 20-30 cm. Wildfire effects are in the increase of pH values, decrease of carbon content and in the significant increase of phosphorus and potassium content in pyrogenic horizons. Fire causes an increase in heavy metal stocks and concentrations, mainly in the surface layers. Further fires will contribute to the removal of chemical elements from landscapes, especially in boreal regions, as a significant part of the ecosystem pool of chemical elements in this region is concentrated in organic soil horizons. After its burning, this pool becomes vulnerable to leaching from ash. A significant influence on soil microbial community was revealed, expressed by a decrease in microbial production of carbon dioxide and changes in the structure of the soil microbiome.

Thus, interesting data on the influence of forest fire on soil properties within representative plots on the territory of several regions of North-West Russia were obtained, which can serve as a scientific basis for further development of programmes to combat forest fires and their consequences.

**4. ACKNOWLEDGMENTS**



# FESP CHILE 2025

## 10th conference on Fire Effects on Soil Properties

This work was supported by the Russian Scientific Foundation, the agreement from 20 April 2023 No. 23-16-20003, and the Saint Petersburg Scientific Foundation, the agreement from 5 May 2023 No. 23-16-20003.

This work is dedicated to the 300th anniversary of Saint-Petersburg State University.