



Wetlands and methane emission in the XXI century: RCM-based projection for Northern Eurasia

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Russia has largest resources of wetlands in the world. Marshes and forested swamps occupy up to 20% of country's territory. The role of wetlands in the natural processes and human society is multifunctional: from providing wildlife habitat and biodiversity to determining water filtration and runoff control. Wetland is an important agent in the global cycling of greenhouse gases. Their exchanges with the atmosphere affects to the regional and global climates thus represent an essential component of environment.

In this study the changes in the spatial distributions of wetlands and methane emission are evaluated using the output from MGO GCM/RCM future climate projection. The calculations were performed for the late 20th century (1981-2000) and mid 21st century (2041-2060) under IPCC A2 GHG/aerosols emission scenario. Several characteristics including moisture coefficient and water table have been analysed in order to describe wetland distribution across Eurasia. It has been found that there is a considerable uncertainty in distributions of the analysed characteristics that complicates wetland identification. The water table depth has been adopted to approximate observed distribution of wetlands. As projected by the regional climate model for the mid 21st century the wetland area will expand, notably in May and September and shrink in summer. Evaluated are methane emissions for the late 20th century over wetlands and its possible changes by the mid 21st century. According to RCM projection the methane emission will likely increase in the forthcoming 50 years due to climate warming by approximately 30%. Modeling deficiencies in the wetland distributions and methane emission calculations are discussed. An attention in the analysis is also given to the expected changes in the methane emission potential due to taliks and lakes.