

Mapping West Siberian wetlands using Landsat imagery for methane emission inventory

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High latitude wetlands are important for understanding climate change risks because of projected growth of methane emissions. Fine scale heterogeneity of wetland landscapes pose challenges for producing the greenhouse gas flux inventories based on point observations. To reduce flux uncertainties at the regional scale, we mapped wetlands in the taiga zone of West Siberia (WS) on a scene-by-scene basis using a supervised classification of Landsat imagery. The training dataset was based on high-resolution images and field data that were collected at 28 test areas distributed across the region. Classification scheme was oriented on methane inventory applications and included 7 wetland ecosystem types composing 9 wetland complexes in different proportions. Accuracy assessment based on 1082 validation polygons indicated an overall map accuracy of 79%. The total area of the wetlands and water bodies was estimated to be 52.4 Mha. Various bogs prevail in the region and occupy 84% of the wetland area, while fens cover only 16% of the wetland area. A new Landsat-based map of WS's taiga wetlands can be used as a benchmark for validation of coarse-resolution global land cover products and wetland datasets in high latitudes.

Keywords: methane emissions, wetland mapping, Landsat