

Application of remotely-sensed data for hydrological modelling after wildfire at permafrost basin

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The study aimed to assess the impact of fire-induced landscape transformation on hydrological processes in permafrost basin and extend the abilities of hydrological model to simulate runoff in post-fire conditions. Vitimkan River watershed (969 km², Upper Lena River basin) was burned in May 2003 by 70 %. The highest for the period 1958–2004 flood was observed in following summer months. The analysis of the data allowed attributing the magnitude of the flood to the fire impact on landscape properties and corresponding changes of runoff formation mechanisms. For simulations we applied the Hydrograph model which describes hydrological and shallow subsurface permafrost processes and uses landscape properties as its key parameters. Based on remotely sensed data the set of dynamic parameters interpreting the changes of vegetation cover in post-fire period was developed. It resulted in better agreement between observed and simulated runoff.