



The impact of atmospheric blocking in Western Siberia on the methane emissions in summer

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We estimated a change in the methane emission during the periods of atmospheric blocking observed in summer-time. Methane fluxes have been derived from continuous measurements carried from 2006 to 2013 in Siberia at Japan-Russia Siberian Tall Tower Inland Observation Network (JR-STATION). The blocking events were identified in accordance with Tibaldi and Molteni criteria with the use of the Era-interim reanalysis data. The events lasting more than five days have been included in the blocking event list.

We examined 8 blocking events in all. After a detailed analysis, we divided all events into three groups. Blocking events observed in 2005, 2010, 2012 (two events) and 2013 were classified to the first group. The increase of methane emission during these events was caused by the biomass burning. The second group consists of only one event of summer 2007, which is unique. The increase of methane concentration in 2007 occurred due to the alternation of high precipitation periods in June and high temperature in July. The high soil moisture observed in summer 2007 led to the high methane flux [1]. But probably, the temperature factor role underestimated. The third group consists of 2006 and 2008 events. During these periods, centre of blocking anticyclones was shifted to the Ural, and covered only negligible part of West Siberia. The wild fires were not observed during these events, and the amount of precipitation did not exceed the usual norm, so no high methane concentrations were observed.

1. Sasakawa, M. et al. Annual variation of CH₄ emissions from the middle taiga in West Siberian Lowland (2005–2009): a case of high CH₄ flux and precipitation rate in the summer of 2007. Tellus B2012,64,17514,DOI:10.3402/tellusb.v64i0.17514

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