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Seasonal and interannual changes of hydrological regime of the Western Siberia

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Western Siberia is a large region with mostly flat relief, that lead to the formation of a multitude of interconnected natural objects - large and small rivers streams, large floodplains, lakes, bogs etc. . Flooded areas and bogs also act as a buffer zone, providing a dampening "sponge" effect on the water redistribution within the river system. Large area covered by rivers and wetlands results in high rate of evaporation compared to any other large boreal watershed. Two contrasting processes are actually occurring in the Southern and Northern parts of the region. In the south, there is a progressive swamping which leads to forest death. In the north, there is a thermokarst activity or thawing permafrost in palsas of sub-arctic zone of Western Siberia.

We present the results of systematization and classification of landscape patterns, as well as study of variability of hydrological processes in the study region at different temporal (from multi-year to seasonal) and spatial (from local to regional) scales through a multidisciplinary approach based on in situ and remote sensing data. Radar altimetry (TOPEX/Poseidon, Jason-1, GFO, ENVISAT), radiometry (SMMR, SSM/I) and optical data (Landsat) are used in combination with the in situ observations and the recent field studies done in 2008 and 2009. We present the variability of water level (from radar altimetry) and surface properties (from altimeter waveforms parameters) for the 21 mid-size watersheds of the Ob' river system and Nadym, Pur and Taz rivers. Seasonal and interannual variability of water abundance is studied using radar altimetry and radiometry. We analyse the role of the snow cover in the formation and seasonal distribution of runoff in the region of Poluy, Nadym, Pur and Taz rivers by using in situ and satellite estimates of the snow water equivalent.

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