The 36th International Symposium on Remote Sensing of Environment,
11 – 15 May 2015, Berlin, Germany, ISRSE36-259

COMBINING OPTICAL AND RADAR REMOTE SENSING DATA FOR THE STUDY OF ORGANIC TRANSPORT IN "THERMOKARST LAKE – CATCHMENT" SYSTEMS OF RUSSIAN ARCTIC

Y. Dvornikov [a, b], M. Leibman [a, c], B. Heim [b], A. Bartsch [d, e], H.-W. Hubberten [b]

[a] Earth Cryosphere Institute, Tyumen, Russia
[b] Alfred-Wegener-Institute for Polar and Marine Research, Potsdam, Germany
[c] Tyumen State Oil and Gas University, Russia
[d] Vienna University of Technology, Vienna, Austria
[e] Department of Geoinformatics and Z_GIS, University of Salzburg, Salzburg, Austria

THEME: POLA (Polar and cold regions)

KEY WORDS: CDOM, thermokarst lakes, cryogenic processes, vegetation, landform dynamic, Arctic

ABSTRACT:

In this study a number of approaches was used to understand the process of organic transport to the lakes in several key sites of Russian Arctic. Among these approaches were i) direct field observations of "lake – catchment" systems, water sampling (2011-2014), geodetic (2011, 2014) and bathymetric (2012,2014), and snow (2013) measurements; ii) very high spatial resolution (GeoEye, QuickBird) optical remote sensing data application in lake water state investigations as well as the analysis of vegetation properties of catchments; iii) radar remote sensing (TerraSAR-X) data application to assess lake extent form year to year as well as to detect seasonal surface movements. It was established, that geochemical properties of thermokarst lakes could vary a lot in the different key sites depending on the geographic position and geomorphology. Climatic fluctuations led to various cryogenic activations (cryogenic landslides, thermocirques) and as a consequence, these activations resulted in a strong impact on redistribution of substances and changes in biochemical composition of the water bodies.