IASC Report by Olga Bobrova
Saint-Petersburg State University, Saint-Petersburg, Russia, and
Arctic and Antarctic Research Institute, Saint-Petersburg, Russia

THAW 2014 - THermokarst Aquatic ecosystems Workshop: Freshwater ecosystems in changing permafrost landscapes

12-15 March 2014 - Quebec City, Quebec, Canada

Expectations and outcomes

This conference was a great opportunity for young researchers to communicate with the colleagues from other countries and see how permafrost hydrology works there.

For me the most interesting theme in the workshop was "Biogeochemical properties of permafrost aquatic ecosystems". I participated with poster presentation "Current dissolved organic carbon content in the Lena delta in comparison with historical data for East Siberia Arctic Rivers" (my abstract is in the end of the report) and I hoped that the participation would help me to understand better the processes that influence the carbon formation and fluxes in permafrost-affected areas.

Also this topic was the part of my master's thesis so this workshop was the opportunity to discuss it with the colleagues to find new ideas and correct the mistakes.

It was very interesting experience to participate in the group discussions and also to talk with researchers during the icebreaker and lunches. I get some information about the estimation of the parts of carbon cycle which I could use in my own work.

How the workshop enhanced my research goals

During the discussions I understood that there is a significant difference between the ways of the research in Russian (and also European) and Canadian permafrost hydrology. So the articles of Canadian colleagues will be the source of some new ideas about methods of research.

Also I discussed with German colleagues the perspectives of joint work in the expedition in the Lena River Delta this summer to get new data for their and mine research topics.

Abstract

Current dissolved organic carbon content in the Lena delta in comparison with historical data for East Siberian Arctic Rivers

O. Bobrova[1,2], I. Fedorova[2,1], A. Chetverova[1,2], T. Potapova[1], V. Dmitriev[1], B. Runkle[3], A. Morgenstern[4], A. Eulenburg[4]

[1] *Saint-Petersburg State University, Saint-Petersburg, Russia*
[2] *Arctic and Antarctic Research Institute, Saint-Petersburg, Russia*
[3] *University of Hamburg, Hamburg, Germany*

[4] *Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Potsdam, Germany*

One of the main aims of the permafrost hydrology is estimation of dissolved organic carbon formation and runoff to the Arctic Ocean by rivers. For East Siberian Russian Arctic Rivers it could be done according to current measured in expedition data as well as historical data which have been carried out on the Roshydromet polar stations.

The source of the historical data about organic carbon contains the values of the permanganate oxidation (PO). According to historical data a mean PO value for the Lena River for 1960-1975 in Kachyug station (upstream of the river) is 10.2 mg/l, for the Yana River in Verkhoyansk station (upstream of the river) – 7.3 mg/l, for the Indigirka River in Indigirskiy station – 5.6 mg/l and in Vorontsovo station – 7.4 mg/l. PO is the closest to the modern useful parameter DOC (dissolved organic concentration) but not equal. There are special local coefficients of conversation, we used an average value (DOC=0.5*PO). Based on recalculation mean annual DOC discharge for Lena, Kachyug could be 85,6 kg/s.

During the Russian-German expedition “Lena-2012” to the Lena River delta in August several measurements of DOC and PO were made in the river channels, lakes and pore waters on the catchment of the Fish Lake of Samoylovsky Island of the delta. Special studies to compare PO and DOC were done too. PO for the river channels was 18-22 mg/l, for lakes - 15 - 22 mg/l, in pore waters (the Fish lake catchment) the concentration was higher - 47-48 mg/l. DOC concentrations in pore water ranged from 8 to 51 mg/l and average DOC concentration in the catchment of the Fish Lake was 25 mg/l.

So, following measurements PO and DOC allow understanding clearer processes of carbon formation, to receive current carbon runoff and to estimate its changes in Arctic Rivers.