Geophysical Research Abstracts
Vol. 18, EGU2016-13600, 2016
EGU General Assembly 2016

The Selenga River delta – a geochemical barrier for the waters of Lake Baikal

Sergey Chalov (2), Josefin Thorslund (1), Jan Pietron (1), and Jerker Jarsjö (1)

(1) Dept. Physical Geography, and the Bolin Centre for Climate Research, Stockholm University, SE-106 91 Stockholm, Sweden (jerker.jarsjo@natgeo.su.se), (2) Faculty of Geography, Lomonosov Moscow State University, 119991 Leninskie gory 1, Moscow, Russia (hydroserg@mail.ru)

Delta systems play an important role in retention of sediments and contaminants to downstream recipients, through processes such as gravitational sedimentation, flocculation and biofiltration. The Selenga river delta is one of the world's largest inland deltas, providing a huge buffer zone between Lake Baikal and upstream waters of the Selenga river basin. Understanding the delta functioning is critical for the planning of water management measures in the Selenga River Basin and for protection of the waters of Lake Baikal. We here study the current state and functioning of the delta's ecosystem and hydrogeochemical processes. More specifically, we considered spatio-temporal changes in water flow, morphology and transport of sediments and metals within the delta and what potential impacts these changes may have on the delta functions. Results show that the delta network has a large influence on the mass of metals reaching the Lake Baikal at the delta outlet. Regions with high density of wetlands and small channels, in contrast to main channel regions, show a consistent pattern of considerable contaminant filtering and removal (between 77-99% for key metals), during both high and low flow conditions, following with a significant increase (2-3 times) of bottom sediment pollution. Geomorphological processes also governs the barrier function of the delta, due to partitioning of flow between different channel systems. These results are particularly relevant in the light of recent and expected future changes involving both the hydrology and water quality in the Lake Baikal basin. Taken together, this emphasizes the importance of understanding the interface between flow partitioning, delta morphology, and sediment and metal patterns and storage rates for fully capturing and quantifying the variety in delta functions. This is particularly relevant coupled to hydroclimatic changes in the region, which could lead to significant decline in barrier functions of the delta due to decrease in hydrological connectivity under low water conditions and due to channel degradation.