Geophysical Research Abstracts
Vol. 17, EGU2015-15180-1, 2015
EGU General Assembly 2015

Geochemical flows of heavy metals in the Don and Kuban Rivers deltas

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Don and Kuban are the two biggest rivers of the Azov sea basin. Deltaic areas of Don and Kuban Rivers have been influenced by agricultural and industry for a long time. A significant amount of heavy metals and biogenic elements comes into the rivers downstream annually. However, in the deltaic areas these geochemical flows are transformed due to changing of the environment conditions, some pollutions are excluded from the flows and accumulated in the deltaic landscapes. In this way Don and Kuban Rivers deltas can be considered as the biogeochemical filters on the way of the heavy metals and biogenic elements flows in to the Azov Sea.

The paper presents the results of the heavy metals flows investigation in the Don and Kuban Rivers deltas. This investigation is based on the field studies of the water flow and sediment load distributions and heavy metals (Fe, Mn, Zn, Cu, Cd, Ni, Cr, Co, Pb) content in the water and suspended matter of the deltas. Quantities arriving of heavy metals in the delta apex in the low water period are calculated; seasonal patterns of flows are considered. Is shown that greater number of heavy metals flow into the delta during the flood period, especially with respect to the dissolved forms of zinc and copper; it is also shown a significant increase of the heavy metals flows downstream of the large cities (Rostov-on-Don, Azov, Temryuk). All these facts indicate anthropogenic impact on the heavy metals inflow.

In comparing the heavy metals flow in the Don and Kuban Rivers deltas investigated that Don River flows is an order of magnitude greater than the Kuban River flows. When it comes about the structure of the flows, shown that Don River characterized increased content of dissolved form of heavy metals; Kuban River originates in the Caucasus Mountains so the proportion of suspended forms is higher.