**Large river plumes and large-scale freshwater transport in the Eastern Arctic**

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Large Eurasian rivers (Ob, Yenisei, Lena, Kolyma, Khatanga and others) inflow to the Arctic Ocean and form large-scale river plumes. The resulting freshened surface layers located in the Kara, Laptev, and East-Siberian seas are among the largest in the World Ocean, their surface areas have order of hundred thousands of square kilometers. We study structure and variability of these freshened surface layers based on extensive in situ data collected during 27 oceanographic field surveys in the Eastern Arctic in 1999-2020.

The freshened surface layer in the Laptev and East-Siberian seas is formed mainly by deltaic rives among which the Lena River contributes about two thirds of the inflowing freshwater volume. The area of this freshened surface layer is much greater than the area of the freshened surface layer in the neighboring Kara Sea, while the total annual freshwater discharge to the Laptev and East-Siberian seas is 1.5 times less than to the Kara Sea (mainly from the estuaries of the Ob and Yenisei rivers). This feature is caused by differences in morphology of the estuaries and deltas. Shallow and narrow channels of the Lena Delta are limitedly affected by sea water. As a result, undiluted Lena discharge inflows to sea from multiple channels and forms relatively shallow plume, as compared to the Ob-Yenisei plumes which mix with subjacent saline sea water in deep and wide estuaries. Area and position of the shallow Lena plume have large variability governed by local wind forcing conditions, while deep Ob-Yenisei plume is relatively stable.

The large-scale zonal freshwater transport in the Eastern Arctic is governed by spreading patterns of the Ob-Yenisei and Lena plumes. The Ob-Yenisei plume is sporadically spreading eastward to the Laptev Sea in a narrow alongshore current during ice-free periods which is induced by strong and long-term southwesterly winds. The Lena plume is almost constantly spreading to the East-Siberian Sea as a large-scale surface water mass which intensity is governed by eastward Ekman transport and is prone to large synoptic variability.