«Influence of river water expansion on the spatial distribution of chlorophyll-a in the Kara Sea»

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One of the most important hydrological structures of the Kara Sea is the surface desalinated layer (SDL). Depending on the hydrological and meteorological processes prevailing in a certain period of time, the spread of desalinated waters can occur according to three different scenarios: western, central or eastern. In the case of the western type of distribution, the layer of desalinated waters reaches the eastern coast of arch. Novaya Zemlya; with the central scenario - desalinated waters penetrate far to the north; at the east scenario - river waters along the coast are transferred to the east, reaching arch. Severnaya Zemlya, and are carried out into the Laptev Sea.

The effect exerted on the phytoplankton community by possible SDL distribution scenarios (western, central, eastern) has not been sufficiently studied.

The aim of our study was to determine the direction of the distribution of SDL in the Kara Sea during the survey period and the degree of its impact on the spatial distribution of chlorophyll-a.
Solution methods

The studies in 2013 in the Kara Sea were carried out from August 28 to September 23 during the expedition "Yamal-Arctic - 2013 ".

Research vessel " Professor Molchanov "

During the research period in the open sea, 3 latitudinal transects were made, including 48 hydrological stations, as well as 45 stations in the gulfs of the Kara Sea and at the outlet from them.

- The concentration of chlorophyll-a (Chl) was determined spectrophotometrically.
- The temperature (T, °C) and salinity (S, PSU) of the water masses were determined by SBE 19 plus STD probe.
Conclusions

During the survey period in August-September 2013 in the Kara Sea, desalinated waters spread by the central type in the northern direction. According to the degree of influence of SDL on the concentration and distribution of chlorophyll-a in the studied water area, three different areas have been identified:

• In the water masses outside the runoff front (34.9 PSU), Chl in the surface layer varied in the range 0.24-0.60 mg/m³. On average, Chl values were 0.42±0.13 mg/m³. The main share of chlorophyll-a was concentrated in the 0-50 m layer. At depths from 75 m and in the near-bottom horizon, Chl decreased almost by two times.

• The highest chlorophyll concentration was located in the SDL (10-17 m): 0m – 1.04±0.27 mg/m³, 5m – 0.97±0.27 mg/m³, 10 m – 0.69±0.36 mg/m³. Below SDL Chl on average was 0.31±0.17 mg/m³.

• In the gulfs of the Kara Sea in the SDL, the concentration of chlorophyll-a varied from 2.06±0.38 to 2.70±1.11 mg/m³. The highest rates were observed in the Ob (4.22 mg/m³) and Yenisei gulfs (3.22 mg/m³).
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