

Diatom composition and distribution in surface sediments of the Laptev and East-Siberian seas and their changes during last decades

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The marine Arctic is warming in recent decades much faster than the rest of the planet (Kattsov, Semenov, 2014). There is mounting evidence that the Arctic is now experiencing an unprecedented degree of environmental change including sea-ice loss and other cryospheric features (Charkin et al., 2017). This region is characterized by unique ice-rafted sedimentogenesis, which is determined by the environment, climate and biota (Lisitzyn, 2010). Diatom algae are the main primary producer of organic matter in the Arctic seas. Diatom species composition and abundance in surface sediments mirror modern parameters of marine environments (Crosta, 2010; Krause et al., 2018, etc.) and can be used in paleoreconstructions.

The first extensive studies of diatoms in the surface sediments of the Laptev and East-Siberian seas were conducted using materials from the 80's and 90's of the last century (Polyakova, 1997; Cremer, 1998; Tsoy, 2001, etc.). We have studied diatoms from recent sediments obtained on the cruises of the Il'ichev Pacific Oceanological Institute in the Laptev and East-Siberian seas in 2016 and 2018 (R/V Akademik M.A. Lavrentyev), and 2019 (R/V A. Zhilinsky) and compare new and previous data. Diatom assemblages typical for different regions of studied seas were revealed using cluster analysis.

In the Laptev Sea, the maximum diatom content is observed to the east of the Lena River Delta, and minimum – on the continental slope. In the East Siberian Sea (ESS), the content of diatoms varied considerably, increasing from the west to the east.

The surface sediments of the continental slope of the Laptev Sea under the influence of the cold Transpolar Current and the warm North Atlantic Current are dominated by the planktonic-benthic species *Paralia sulcata* and subdominated by the pelagic arcto-boreal species *Actinocyclus curvatulus*. Further south, in the sediments of the outer shelf, the sub-dominant is the neritic cold-water species *Melosira arctica*, the predominance of which is a striking feature of Arctic-sub-ice community (Poulin et al., 2014). The surface sediments of these areas, sampled at the end of the last century, contained the diatom assemblage dominated by the arcto-boreal neritic species *Thalassiosira antarctica* (Cremer, 1999). We have identified a similar assemblage at stations located at 2.5° to the south, to the north-west of the Lena Delta. The assemblage dominated by freshwater *Aulacoseira subarctica* is common in the Lena River avandelt in the Buor-Khaya Gulf. The brackish-water species *Thalassiosira hyperborea* dominates in sediments of the eastern part of Buor-Khaya Gulf, the Dm. Laptev Strait, and the western part of the ESS. This region previously noted a high content of the brackish-water species *Thalassiosira baltica* (Obrezkova et al., 2014), in the samples obtained in 2018, its content is insignificant.

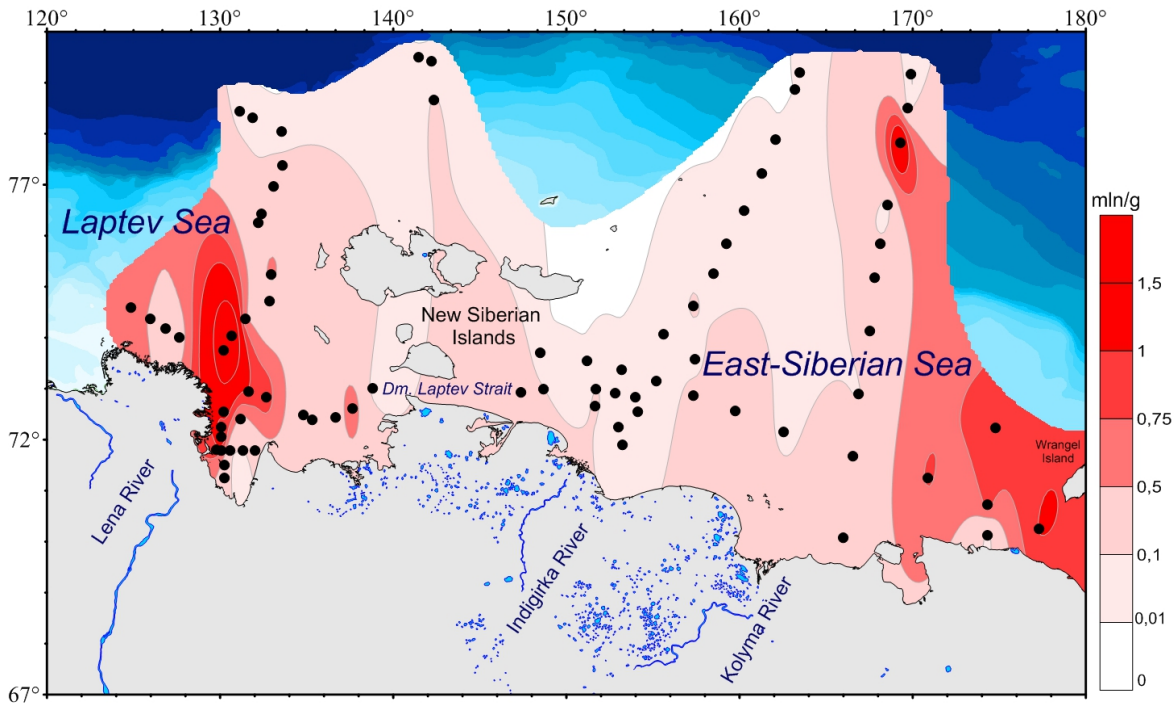
In the ESS, the area to the north of the Indigirka River is characterized by the dominance of *M. arctica*. Earlier in this area *T. hyperborea* was marked almost as a monodominant (Polyakova, 1997). In the eastern part of the ESS, *T. antarctica* dominates, and the content of cryophilic species is growing.

Change of dominant species observed in the surface sediments of the studied seas are noticeable in areas affected by the North Atlantic Current, which indicates that its influence may have increased in recent

decades due to global warming.

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The quantitative diatom distribution (valves per gram of dry sediment) in the surface sediments of the Laptev and East Siberian seas. Points mark sampling stations.