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### METEOROLOGICAL CONDITIONS OF THE AREA OF THE BARENTS AND KARA SEAS IN THE EARLY INSTRUMENTAL PERIOD

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One of the oldest meteorological data for Novaya Zemlya and surrounding seas come from exploratory and scientific yacht expeditions. A large part of these boats sailed from Norway. In the Regional State Archives in Stavanger, which is a part of the National Archives of Norway, logbooks were found containing series of meteorological data, such as air temperature, water temperature, atmospheric pressure, wind speed and its direction. Data from some yachts were earlier included into the ICOADS (International Comprehensive Ocean-Atmosphere Data Set) database. It was necessary to compare those logbooks and the ICOADS data. As a result of the comparison, only the data that had not been included in the ICOADS were selected for digitization. The digitization process consisted of two steps. The first step was to copy information about the yachts' positions from the logbooks, in an appropriate format, and then data for the area of 32-68°E and 68-80°N were only selected. GIS tools were used for this purpose. The second step of digitization was to assign the meteorological data to the yachts' positions for the selected area. The transcribed data were also verified by merging together metadata from the ICOADS with the data appearing in the original logbooks. In this way, a verified database of uniform structure was established and temporarily named *Marine Early Instrumental Dataset for the Arctic (MEIDA)*.

All data are presented in a grid format. The analysed area was divided into 66 grids with a spatial resolution of 2x4 degrees. The distribution of daily positions of the yachts and grid borders is shown in Figure 1. In many cases it was necessary to introduce longitudinal corrections of the yachts' positions. During historical measurements different scales of temperature were used. Therefore, all temperature data in the database were converted to Celsius degrees. In general, the air temperature was measured six times a day (at 04.00, 08.00, 12.00, 16.00, 20.00, and 00.00 local time). In total, the database contains 3789 daily means of air temperature for the years 1867-1912. The data covered mainly the warm part of the year (from May to September). Most of the meteorological measurements carried out on 53 yachts during 67 expeditions were taken in June (881) and the fewest of them in September (291).

The main objective of the present paper is to roughly describe air temperature conditions in Novaya Zemlya and surrounding seas from 1867 to 1912 on the basis of all available early instrumental data gathered during both exploratory and scientific expeditions. Having obtained this information, the results will be compared with contemporary climatic conditions (1981-2010) to estimate the range of air temperature changes between historical and present times.

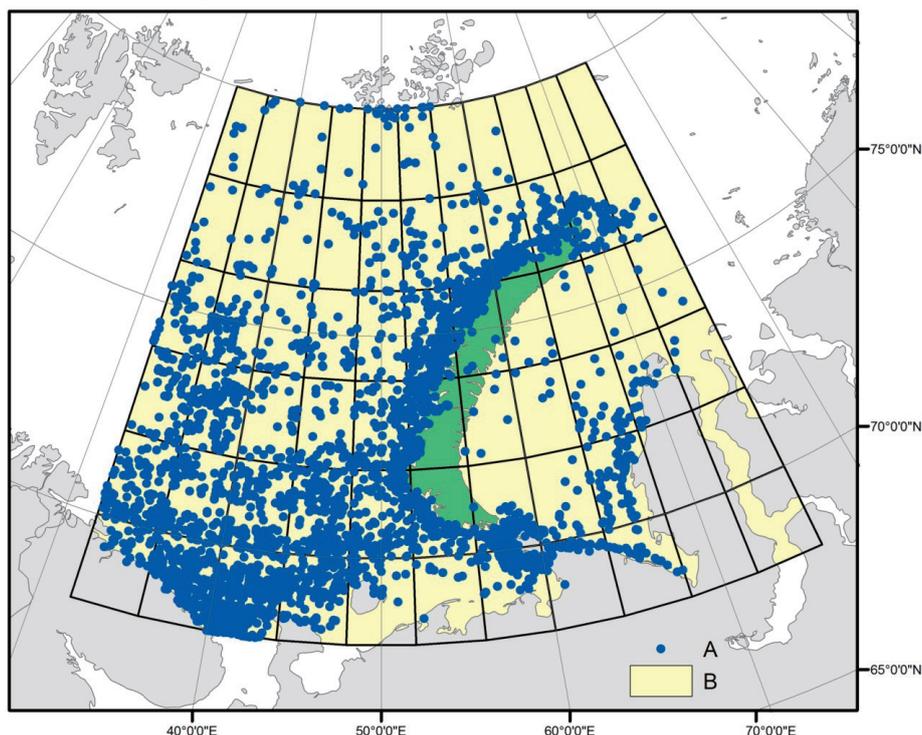


Fig. 1. Spatial distribution of the yachts' daily positions in the period 1867-1912. A – position, B – grid borders.