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Three observational data sets are used to construct a continuous record (1850—2001) of April ice edge position in the Barents Sea: two sets of Norwegian ice charts (one from 1850 to 1949 and the other from 1966 to 2001) and Soviet aircraft reconnaissance ice extent charts from 1950 to 1966.

The study's geographic domain is limited to the Barents Sea, a region of the Arctic Ocean extending from Svalbard to Novaya Zemlya and southward to the Kola Peninsula, roughly bounded by 5° E to 60° E in longitude, and 67° N to 80° N in latitude.

Ice edge positions are defined by a set of geographic coordinates, latitudes and longitudes, specifying the observed points along the ice edge.

The 152-year April ice extent series is subdivided into three periods: 1850—1899, 1900—1949 and 1950—2001. For each of these study sub-periods we computed a mean April ice edge and a set of anomalies. We define anomalies as differences in position between a given April and the ensemble mean of all April ice edges over the corresponding study sub-period. Figure 1 illustrates an example, the April anomaly for 1924.

The mean ice edge positions for each study sub-period are shown in Fig. 2. The calculations show the mean ice edge position retreated northeastward over the 152-year period, with the greater retreat seen in the changes from the 1850—1899 sub-period to the 1900—1949 sub-period.

The distribution of the standard deviation of the ice edge anomaly over the linear distance along the mean ice edge shows no substantial

difference between any of the three periods of the study. Within each study period, the maximum variation is observed in the sector bounded by the 25°E meridian and 49°E meridian, which covers the main pathway of the warmer water flow from the Norwegian Sea.

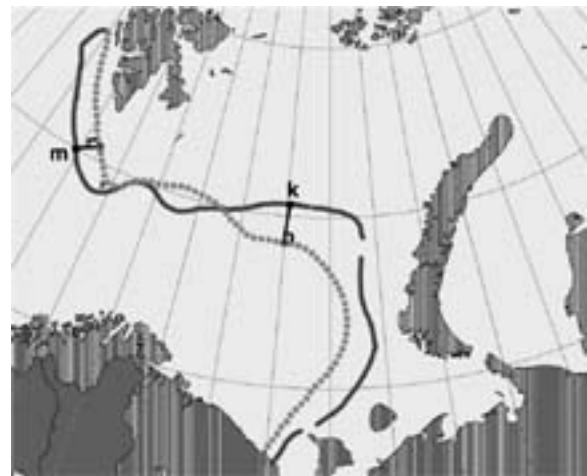


Figure 1. Mean ice edge, April 1900 – 1949 (dotted line), and observed ice edge, April 1924.

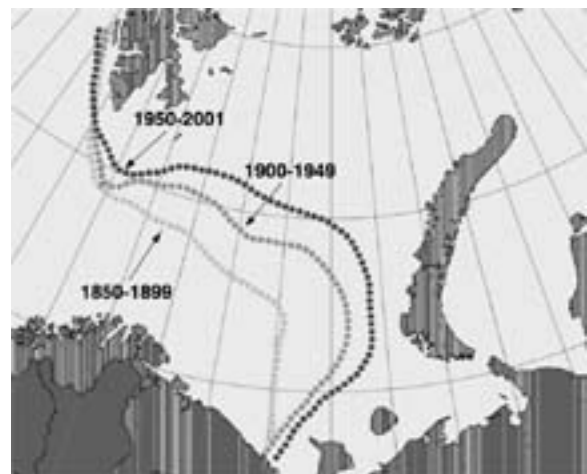


Figure 2. Mean April ice extent: 1850—1899, 1900—1949 and 1950—2001.

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