

CLIMATE

The climate in Sørkapp Land and throughout Spitsbergen is Arctic and marine-type. Average annual temperatures vary from -9°C to -3°C in the west of Sørkapp Land, i.e. the temperatures are quite high in relation to the latitude of almost 77°N , due to the warm West Spitsbergen Current. Average summer (July and August) temperatures are usually in the range of $3\text{--}5^{\circ}\text{C}$, thus they are relatively low due to the ocean's influence. Average annual precipitation totals are usually in the range of 300–500 mm. Average summer (July and August) precipitation totals are much more variable and range from 30 to 200 mm in different years. Since the beginning of the 20th century, no yearly meteorological observations have been carried out in western Sørkapp Land. Hence, the aforementioned climate characteristics were based on meteorological observations carried out at the station on Isbjørnhamna bay, which belongs to the Institute of Geophysics of the Polish Academy of Sciences (Marsz, Styszyńska 2007). The station is located north of Hornsund Fjord at a 10 km distance from the northern coast of western Sørkapp Land. The data from this station are compatible with the results of meteorological observations carried out at different locations in western Sørkapp Land during selected summer seasons in the 20th century (Ziaja 1999).

Climate fluctuations during the 20th century are very important in the context of this book's subject matter, especially the last fluctuation, which has occurred since the 1980s and is described below in the chapter on environmental changes.

The climate in western Sørkapp Land is unique in terms of the entire peninsula and southern Spitsbergen because its features indicate a lack of glaciers in the local mountains throughout the Holocene. These mountains are not lower than mountains in the rest of the peninsula, which are more or less covered by glaciers. The mountains in northwest Sørkapp Land remain free of glaciers due to their exposure to relatively warm and dry eastern foehn winds, which melt the winter snow cover. This occurs not only today but has been occurring since the beginning of the Holocene, even during periods of climate cooling. The lack of glaciers in the Holocene has been shown by geological (Salvigsen, Elgersma 1993) and geomorphological (Ziaja 1989) investigations. The other course of Late Quaternary evolution of the area was outlined by Lindner and Marks (1993). The foehn effect was detected on the basis of meteorological observations (Kalicki 1985; Ziaja 1985).