

## **Abstract**

The objective of the thesis was to describe the changes in the extent of the sea ice and its influence on the air temperature in the Antarctic Peninsula. The analysis covered larger (200 km) and smaller (15 km) areas of the sea ice around the stations Mendel, Esperanza, Carlini and Vernadsky. The ability to study such small areas of the sea ice was made possible by accurate radiometric imagery with a resolution of 3,125 km.

The results showed significant changes over the 2013-2023 monitoring period. A decrease in sea ice area at a rate of 7.9 % to 33.5 % per 10 years and an increase in air temperature of 1,2 °C to 2,5 °C per 10 years were observed. Pearson correlation coefficient and linear regression showed a strong correlation between sea ice area and air temperature. The tightest correlations were determined for the spring season for the larger areas of the sea lock. Cross-correlations showed strong relationships between rapid changes in air temperature and the response of the sea ice with a lag of 3-5 days. Statistically insignificant correlations were revealed by Monte Carlo test and t-test for some smaller areas of sea ice in the surrounding of the stations mainly in summer months. Sea ice drift produced large interday differences in sea ice area in the vicinity of the stations and may have been the cause of the less close correlation.

The results of this work helped to improve understanding of the relationship between sea ice and air temperature and to show differences between smaller and larger areas in different geographical areas of the stations in the northern Antarctic Peninsula.