Abstract

The sea surface temperature (SST) of the North Atlantic (NA) has a demonstrable impact on Europe's climate. The main purpose of this final thesis is to investigate the long-term evolution of SST in SA and to describe the influence of SST change in NA on temperatures and precipitation in Europe. For this purpose, the freely available HadISST database from the Met Office Hadley Centre Observations datasets was chosen. The study period 1980-2019 was chosen so that the data would not be affected by switching to a different measurement type or processing method, and also by the inclusion of satellite measurements. This means that the data was acquired after the start of satellite measurements, which provides a much higher quality and more comprehensive coverage of the area. The next step was to calculate the average monthly and annual SSTs in the NA area of interest. Monthly mean SSTs ranged from 2,3 °C in the coldest month of March to the highest measured mean SST of 18,5 °C in August. The average annual SST of the area of interest was 10,5 °C over the 40 years analysed. Next, monthly and annual trends were detected from 1980-2019. The trends range from -0,7 °C to 1,5 °C, but it was confirmed that the area of interest is warming in all months over the 40 year period. The final objective was to establish a specific correlation between SST in the SA region of interest with temperature and precipitation in Europe. The highest positive correlations of annual precipitation with SST are in northern Europe and along the Black Sea coast. The strongest negative correlations of annual precipitation with SST are detected in central Europe. Annual mean temperatures are positively correlated with SST throughout the study area, with maximum correlations in Ireland. In individual months, SST correlates most strongly with temperatures in January and July, and with precipitation in January. The field of correlations is homogeneous for temperature, while it is highly variable for precipitation.

The results of this work make an important contribution to the topic under investigation, as they analyse the evolution of SST with its climatic components over Europe not only through annual averages, but also focus on monthly values.