



Changes of the heat content in the West Spitsbergen Current region in 1998 – 2017.

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The aim of the study was to investigate the changes in the heat content in the surface, intermediate and deep water layers in the West Spitsbergen Current region in 1998-2017.

In the presented study, the hydrographic data obtained during the annual r/v Oceania cruises to the Nordic Seas region in the years 1998-2017 was used. Each summer the Institute of Oceanology, Polish Academy of Sciences performs measurements along more than 10 hydrographic sections, including about 200 stations and covering the area between northern Norway and the northern Fram Strait. Hydrographic measurements to collect CTD (conductivity, temperature, pressure) profiles were performed using a SBE 911plus probe and extend from the surface to the bottom.

The results show that not only surface water is a great reservoir of heat, but also intermediate and deep water store a large amount of heat. The average increase in heat content in the examined region of the West Spitsbergen Current between latitudes 75° and 80° N, increased by 7972 MJ/m² over the last two decades, requires an additional 12.64 W/m² heat flux between the atmosphere and the ocean. It is over 5 times more than the average forcing caused by the greenhouse effect.

The studied region is an effective reservoir of heat, whereby part of this heat, which is transported by the West Spitsbergen Current to the Arctic Ocean, can additionally affect the melting of the Arctic sea ice and climate change.

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