



Energy and mass exchange between ocean and atmosphere in the area of winter polynya to the north of Svalbard

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The warm inflow of the West Spitsbergen Current keeps waters ice-free in winter to the north of Svalbard, an area also called the Whalers Bay. Here we present results of the winter expedition in the Arctic Ocean to the north of Svalbard on board a research vessel «Helmer Hanssen» in January 2012. The characteristics of the turbulent energy and mass exchange are calculated using an algorithm, which is based on semi-empirical theory of “Monin-Obukhov”, adapted to the conditions of marine meteorological observations. The results are compared with the data obtained in this area in February 1986 on board Russian research icebreaker "Otto Schmidt". The features of energy-mass exchange are explained by synoptic and ice conditions in the study area. Intense heat and mass exchange in the area leads to enhanced convective mixing and, thus, upwelling of nutrients to surface waters that can contribute to higher biological activity in the area throughout the food web.