Kai kurios klimatinės pasekmės dėl „British Petroleum“ kompanijos naftos išsiliejimo

On some climatic consequences of the BP oil spill

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A start of the global warming was observed in the beginning of 90-ies of the last century. In Scandinavian countries, climate warming processes visibly increased after 2010. It is known that soft climatic conditions of the region are significantly affected by warm waters of the Gulf Stream. Interaction of the Gulf Stream warm waters with the frozen wastes of the Arctic results in the auto-oscillations of average annual temperatures [1]. Data on the annual course of those temperatures [2] for Kirkenes (N 69.73º; E 29.9º) and Jan Mayen (N 70.93º; E -8.66º) meteorological stations in Norway, respectively, are shown in Fig.1. In spite of the fact that data in 2002 and 2005 were unavailable, it is evidently seen that after 2010 the extreme oscillation amplitudes in both cases are elevated. The same view can be seen at the other numerous stations in Norway, Sweden and Finland [2].

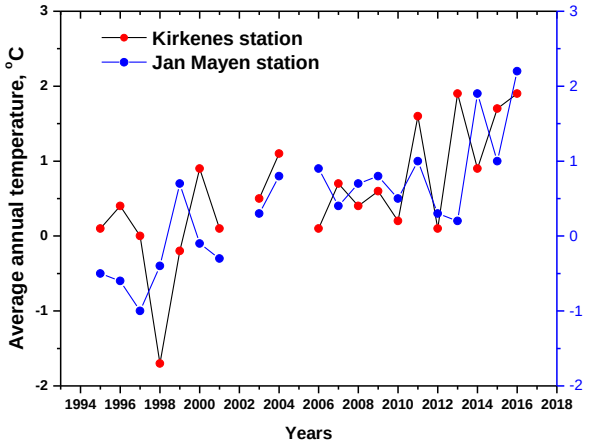

Fig. 1. A course of average annual temperatures at Kirkenes (N 69.73º; E 29.9º) and Jan Mayen (N 70.93º; E -8.66º) meteorological stations in Norway.

The analysis of the seasonal course of the Gulf Stream temperature latitudinal distribution showed that after the British Petroleum (BP) oil spill in May 2010 the situation in the latitudinal interval of the Scandinavian countries and Great Britain sharply changed from June 2010 [3], Table 1.

Already in June 2010 (Table 1), temperatures in that latitudinal interval reached 28 - 28.5 ºC. However, they usually varied in summer in the 10-15 ºC interval (Table 1). Later, in January 2011 and up to 2015, the temperatures were elevated (28 - 28.5 ºC interval) reaching 28.5 – 29 ºC in summer. Only just in July 2015, the temperatures decreased down to their usual range.

Table 1. Average month temperatures (°C) in the Atlantic Ocean in the latitudinal interval of Great Britain and Scandinavia

Year	May	June	July
2000	10 - 5	10 - 5	15 - 10
2001-2009	10 - 5	15 - 10	15 - 10
2010	10 - 5	**28.5 - 28**	29 - 28.5
2011	28.5 - 28	28.5 - 28	29 - 28.5
2012	28.5 - 28	28.5 - 28	29 - 28.5
2013	28.5 - 28	28.5 - 28	29 28.5
2014	28.5 - 28	28.5 - 29	29 28.5
2015	28.5 - 28	28.5 - 28	**15 - 10**
2016	10 - 5	15 - 10	15 - 10

Temperature of the ocean surface water mainly depends on two components – the absorbed solar radiation and on energy losses related to evaporation. The influence of the solar activity on the absorbed radiation is too small and during the last years it was decreasing. Thus, the solar activity in terms of the Wolf number [4] for 23 solar cycles (August 1996 - 2008) was higher than that during the 24-th cycle (from December 2008 - in progress), but surface temperatures of the Atlantic Ocean in the latitudinal interval of Scandinavia till June 2010 were usual. Evidently, the main cause of the increase in the Gulf Stream water temperatures is related to the decrease of evaporation. It means that the oil spill in the Gulf of Mexico was not completely localized and practically during one month the surface waters of the Atlantic were covered with a film of the surface-active substances. With the main velocity of the Golf Stream surface waters of ~5 knots [5], it is surely possible.

Due to the wave breaking processes, the respective substances of the surface film might be found in aerosol particles during 2010-2015 and can be identified according to their origin.

Keywords: global warming, temperature, the Gulf Stream, oil spill.

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