



On a Short-Term Climate Change in the North Atlantic Ocean

M.V. Anisimov (1), V.I. Byshev (1), S.N. Moshonkin (2), V.G. Neiman (1), Ju.A. Romanov (1), I.V. Serykh (1), and V.B. Zalesny (2)

(1) P.P.Shirshov Institute of Oceanology, Russian Academy of Sciences, MOSCOW, Russian Federation (mva@ocean.ru), (2) Institute of Numerical Mathematics, Russian Academy of Sciences, MOSCOW, Russian Federation (mva@ocean.ru)

It was conducted a study of some modern climate change traits in North Atlantic for 1900-2009. Statistical processing of the long-term air temperature and atmospheric pressure data shown that a secular set of climatic system phase states forms three separated clusters of the thermo-baric indices. On this background we suggested to consider three sequential climate scenarios which were matched during the last century. A determinacy of the scenarios is followed from certain limits of two-dimensional phase space occupied by each of them. The phase space itself was drafted by the near-surface temperature and atmospheric pressure gradients between Azores high and Island low. Thus three climatic scenarios were attributed to periods of 1905-1935 (relative warm phase), 1940-1970 (cool phase) and 1980-2000 (warm phase).

The numerical modeling of the Ocean active layer heat content oscillation in the latter half of XX century showed its close correlation with revealed climate scenario alternation. It was found that inter-decade phases of relatively mild climate on Eurasian continent corresponded to the periods of ocean heat content shortage and vice versa – a more continental type of the climate was accompanied by a rise of the ocean heat content. The presented results seem to witness that two first decades of the XXI century should be suggested a turning point for North Atlantic climate system to change its scenario for the new one which appears to be followed up to 2030-2035.