

The link between the Barents Sea and ENSO events reproduced by NEMO modelVladimir Stepanov[†]; Hao Zuo; Keith Haines[†] University of Reading, United KingdomLeading author: vlntst@hotmail.co.uk

An analysis of observation data along a section in the Barents Sea shows a negative correlation between ENSO events and water temperature in the top 200 m: the temperature drops about 0.5°C during warm ENSO events while the top 200 m layer of the Barents Sea is warmer during cold ENSO events. Results from 1 and °-degree global NEMO models show similar response for the whole Barents Sea. There are three strong ENSO events for the model period 1989-2008: a warm ENSO event in 1997-1998 and two cold ones in 1999-2000 and 2007 (when the value of NINO3-index exceeds its standard deviation). During warm ENSO events due to global atmospheric teleconnections an anticyclonic atmospheric circulation is settled over the Barents Sea instead of a usual cyclonic circulation observed here. The change of the atmospheric circulation enhances heat losses in the Barents Sea. Besides, these processes are accompanied by the reduction of the heat entering from the North Atlantic leading to greater cooling. While during a cold ENSO event an atmospheric cyclonic circulation becomes more intensive and the heat inflow from the North Atlantic increases that leads warming the top 200 m layer in the Barents Sea. During the warm ENSO events the annual model temperature averaged in the top 200 m of the Barents Sea decreased about 0.5°C (1°C) for °-degree (1-degree) model (in comparison with the value averaged for the whole period) that results in a higher sea ice volume. While the cold ENSO events have been accompanied by a lower sea ice volume, and higher annual temperature in the upper layer of the Barents Sea of about 0.5°C. However, the Barents Sea temperature extrema are broader than NINO3 ones and often (for two from three events) the temperature extrema start developing before the onset of strong ENSO events. Further work needs to investigate the teleconnections between ENSO and the Barents Sea.