Geophysical Research Abstracts, Vol. 9, 06330, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-06330

The influence of large-scale circulation on the variability of temperature, salinity and nutrients at Helgoland-Roads station

M. Ionita(1,2), G. Lohmann (1), K. Wiltshire(3) and N. Rimbu(1,4)

(1) Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany (Monica.Ionita@awi.de), (2) National Meteorological Administration, Bucharest, Romania ,(3) Alfred Wegener Institute for Polar and Marine Research, Helgoland, Germany, (4) University of Bucharest, Faculty of Physics, Bucharest, Romania

The variability of mean air temperature, salinity and phosphate recorded at Helgoland Road station, Germany (54.18°N, 7.88°E) is related to the large-scale atmospheric circulation for the 1962-2005 boreal winters (JF) and springs (MA). Applying correlation and composite analyses, it has been found that the variability of JF mean temperature is influenced by an Arctic Oscillation (AO) like pattern and for MA this pattern persists but is shifted towards west. Positive anomalies of temperature are associated with negative anomalies of sea level pressure (SLP) and 500 hPa geopotential height (G500) centred over the north-western part of Europe and North Sea and positive anomalies centred over the mid Atlantic Ocean and the west coast of Africa. Positive anomalies of salinity for JF are associated with positive anomalies of SLP and G500 centred over the north-west part of Europe and North Sea and negative anomalies centred over south-western part of Europe and the northern part of the Atlantic Ocean. For MA positive anomalies of salinity are associated with a tripole-like pattern with positive anomalies of SLP and G500 centred over the northern part of Europe and southern Atlantic Ocean and negative anomalies centred over the mid Atlantic Ocean. Positive anomalies of phosphate for JF and MA are associated with negative anomalies of SLP and G500 over the northern part of Europe and the northern part of the South American continent and positive anomalies centred over the mid Atlantic Ocean. Finally, we seek for stationarities and shifts in the time series. A non-parametric statistical test reveals positive significant shifts in the mean temperature in 1987 for JF and 1986 for MA. Negative and significant shifts are found for phosphate in 1986 for JF and 1983

for MA, respectively. These changes are put into the framework of the large-scale circulation, implications for climate reconstructions are discussed.