Geophysical Research Abstracts, Vol. 9, 00522, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-00522
© European Geosciences Union 2007

Dense water formation in the Gulf of Lion: impact of interannual variability and climate change

M. Herrmann (1), C. Estournel (1), S. Somot (2), F. Sevault (2)

(1) Laboratoire d'Aérologie - CNRS, Toulouse, France , (2)CNRM - Météo-France, Toulouse, France

Strong cold northerly winter winds are responsible for dense water formation on the shelf of the Gulf of Lions. The fate of this water depends on its density which itself depends on the intensity and length of the wind gusts. A part of this water is exported alongslope southwestward by the main current of the zone, the Northern Current. During extreme events, dense water cascading is funnelled by the canyons indenting the slope and can reach the bottom of the basin as shown by recent observations. Previous modelling studies and observations have shown the essential role of dense water cascading in dissolved and particulate matter transport.
A 140 years simulation (1960-2100) was performed in a former study using the $1/8^o$ resolution oceanic model OPAMED8 forced by the atmospheric climate model ARPEGE-Climat. The aim of this study was to investigate climate change impact on the whole Mediterranean Sea circulation. Results of this study are used to force the 3 km resolution regional oceanic model SYMPHONIE in the Northwestern Mediterranean Sea (NWMS). Typical years have been selected in the present period (constant atmospheric CO_2, 1960-2000) and at the end of the 21st century (increasing atmospheric CO_2). Our objective is to study more precisely the impact of interannual variability and climate change on the NWMS circulation and ecosystems by comparing these typical years. Our first results concerning these impacts on dense shelf water formation and exportation will be presented here.