Geophysical Research Abstracts,
Vol. 11, EGU2009-9360, 2009
EGU General Assembly 2009

Sea surface temperature and salinity variability in the Levantine Basin during the last decade, 1996 to 2006

Y. Samuel-Rhoads (1), S. Iona (2), G. Zodiatis (1), D. Hayes (1), I. Gertman (3), and G. Georgiou (1)

(1) Oceanography Centre, University of Cyprus, P. O. Box 20537, 1678 Nicosia, Cyprus (rhoads.yianna@ucy.ac.cy / +357-22-892575), (2) Hellenic Centre for Marine Research, Institute of Oceanography, Hellenic National Oceanographic Data Centre, P.O. Box 712, 190 13, Anavyssos, Greece, (3) Israel Oceanographic and Limnological Research, Tel-Shikmona, P. O. Box 8030, Haifa 31080, Israel

The reality of global warming since the industrial era is manifested in part by changes in global surface temperatures. Regional temperature increases have also been reported in the Mediterranean Sea, where sea surface temperatures (SSTs) across the Mediterranean as a whole, have been rising about twice as much as those of the global oceans. Here we analyse and compare satellite remote sensing SST data with in-situ data for the period 1996-2006 in the Levantine Basin. Satellite data were collected by the NOAA/NASA Advanced Very High Resolution Radiometers (AVHRR) and processed by the SST Pathfinder program. For our analyses we obtained monthly averaged Level 3, version 5.0, global SST data from the nighttime pass of the satellite at a 4-km resolution and an equal-angle grid of 8192 pixels/360º from January 1996 through December 2006. Monthly quality control flag files for the SST data were also obtained from January 1996 through December 2006 from the same source. Further, 23,000 vertical profiles of temperature and salinity from 160 oceanographic cruises were extracted from the MEDAR/MEDATLAS, WDC-A and the Coriolis databases for the period 1996-2006, in order to study the interannual variability in this basin at the surface layer (0-10m). Annual gridded fields were calculated by averaging the top 10m of the in-situ data, and then interpolated horizontally by the Variational Inverse Method (VIM) and a finite element technique using the SeaDataNet Geostatistical Analysis Tool – DIVA. Satellite SST data indicate that over the last 11 years a general warming has occurred over the Levantine Basin, both at interannual and seasonal time scales. This increase in average SSTs is also seen in the seasonal averages, especially during the spring and summer. Moreover, the averages from the top 10m of in-situ SST, using the relevant data from the above oceanographic databases, show a correlation with the satellite SST data particularly at seasonal time scales. Satellite remote sensing data are thus a very good indicator of environmental conditions. We also analyse in-situ sea surface salinity (SSS) data collected over the same period of time to determine any similarities in the patterns of variability with SSTs. The pattern of SST variability is shared by the patterns of SSS. Therefore, it can be expected that the Levantine Basin has also undergone salinity increases during the last 11 years. Finally, we investigate the variability in regional wind speeds and latent heat fluxes as possible driving mechanisms of the changes observed in SST and SSS. It will be valuable to investigate future trends in SSTs to determine whether the observed patterns of SSTs represent a continued pattern of persistent warming or a new direction for an ever-changing Levantine Basin.