

Recent advances in oceanographic data management of the Mediterranean and Black Seas: the MEDAR/MEDATLAS 2002 database

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As the marine biological ecosystem is the most sensitive to any climatic change, the availability of basic oceanographic data like temperature, salinity, oxygen concentration and nutrients are necessary for monitoring the system. For the Mediterranean and Black Seas, temperature, salinity, oxygen, nitrate, nitrite, ammonia, total nitrogen, phosphate, total phosphorus, silicate, H_2S , pH, alkalinity, and chlorophyll-a vertical profiles have been collected for several decades by about 150 laboratories of 33 countries, most of them from the bordering countries. However, many remained dispersed in scientific laboratories and national data centres at different format and various level of documentation. To facilitate the access to these dispersed data, an EU concerted action MEDAR/MEDATLAS (MAS3-CT98-0174 & ERBIC20-CT98-0103) was initiated for developing a joint comprehensive database through a wide co-operation of Mediterranean and Black Sea countries. The partners were mainly National Oceanographic Data Centre or Designated National Agencies for International Oceanographic Data and Information Exchange (IODE) of UNESCO Intergovernmental Oceanographic Commission (IOC), and had the duty to compile and safeguard copies of the data sets collected at sea by the scientific laboratories of their country. These data have been reformatted at the common MEDATLAS format, and checked for quality according to a common protocol based on the international IOC, ICES and EC/MAST recommendations, with automatic (objective) and visual (subjective) checks.

This international cooperation work was successful in doubling the volume of available data, which includes 286426 stations (vertical profiles from bottle casts, CTD, Xbt, Mbt), and presently represents the most complete database for the Mediterranean and Black Sea studies. Among these stations, the spatial coverage of each parameter is not homogeneous. The coverage of the nutrients decreases dramatically from phosphate, which is considered by the biologists as a control parameter of the biota (20808 profiles) to total nitrogen (153 available profiles only). H_2S is measured only in the Black Sea, in relation with the lack of oxygen in the subsurface layers. The middle of the deep basins and on the Lybian shelf is poorly covered, even for temperature. Data selected with acceptable quality flags have been interpolated at 25 horizontal levels and objectively analysed to produce the gridded climatological fields, vertical sections and horizontal maps, by using a variational model for objective analysis. Finally, all the meta-data (cruise inventory), observed data, gridded data, maps, documentation and software are to be published on a set of four CD-ROMS.

There are plans to maintain and further develop this data system. New data produced by recent projects and real time data produced by operational oceanography programmes will be integrated. Easy integrated on line access to distributed datasets will be provided by using enhanced standards and information technology tools. Furthermore, the quality control protocol will be improved by incorporating in routine checks, theoretical relationships between nutrients such as the Redfield ratio. However the QC of the nutrients in areas with poor data coverage remains difficult and there is still a need for a better data coverage as the quality checks are based on the pre-existing knowledge of the distributions. This is critical in the middle of the deep basins and along the Southern Mediterranean coasts. As this action provides an innovative and leading system for data exchange, it will represent a key action in the broader data management system for Europe and Mediterranean oceanography. MEDAR/MEDATLAS co-ordinating website: www.ifremer.fr/medar/