

THE REMOTE SENSING AND OCEANOGRAPHIC DATA COLLECTION PROGRAMS AND SATELLITE DATA NEEDS OF THE INSTITUTE OF MARINE SCIENCES, METU

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The Institute of Marine Sciences of the Middle East Technical University (IMS-METU) has been carrying out national and cooperative international research projects since the time of its initial founding in 1975. The Institute has collected voluminous amounts of oceanographic data in the seas surrounding Turkey, with its main research vessel RV BILIM continuously operating in these seas during the last decade.

The main part of the research activity is supported by projects based on intensive data collection in each of the neighboring seas. The data is then analysed to build a sufficient understanding of the natural processes and dynamics of these seas as well as their state of health and potential as natural resources.

Part of the work addresses the physical and chemical features of the Black Sea, Marmara Sea, Aegean Sea and the Mediterranean Sea all of which are adjacent to the extensive coasts of Turkey. A number of projects, including a series of national monitoring projects, have been instrumental to yield an integrated scientific exploration.

The IMS-METU has been a major contributor in the multinational collaborative scientific programme of POEM (Physical Oceanography of the Eastern Mediterranean). Its contribution to this programme has been the collection and analyses of data during the 5 year initial phase. In the present phase, the dynamics of the region are being studied through scientific investigations based on a series of models. The IMS-METU is continuing the collaborative effort to develop and use appropriate numerical models. The development of these models are at a stage where the POEM data, combined with the predictive and analytical capabilities of the models, are about to yield a first-hand scientific understanding of the complex dynamical mechanisms.

Data assimilation, model initialization, and dynamical analyses are part of the ongoing activities. In this context, it is of importance to incorporate all types of data to further elaborate the scientific understanding of the processes involved.

Satellite data proves to be of utmost importance in supporting the various other types of observations in the Sea. When combined, the satellite and oceanographic data have a synergistic relationship in filling the gaps in our understanding of ocean systems. Qualitative use of satellite data seems to yield important tools in studying Black Sea Fisheries. It also provides the missing detail in both oceanography and model results of the structure of dynamical systems such as eddies, fronts and jets. Its quantita-

tive use in model initializations require careful study. In this context the use of satellite altimetry in providing dynamical height estimates for models is a major issue. Successful applications of this methodology have been made for larger ocean areas, but the development of the methods of data processing and analyses for its potential use in the Mediterranean region is an issue that the IMS-METU would like to cooperate in and if possible utilize in the future. Other satellite data such as surface temperature, chlorophyll, and surface winds are also of use in models and oceanographic assessments.

Various laboratories and scientific facilities accompany the work of the IMS-METU scientists. The main computing facility is a HP Series 9000 Model 845/S running under HP-UX, with a number of user terminals and peripherals. Numerous personal computers and other equipment are used in data processing.

Oceanographic instrumentation include CTD profiling systems, current-meters, rosette sampler, vessel mounted 150 KHz ADCP, hydro-acoustic instruments for fishery surveys, auto-analysers, gas chromatography, atomic absorption and other laboratory analysis equipment. The research vessel RV BILIM and two smaller vessels are equipped with up-to-date navigation and positioning instruments.

The satellite data receiving and analyses facilities include the following systems:

- A PC-based system for the direct reception and storage of APT images from NOAA9/11 IR/VS and METEOR Visible bands at full resolution. Zooming, animation and temperature related colour processing of images are possible. The images in APT format can also be transferred to the PC-SEAPAK system for more complete analyses.

- PC-SEAPAK, which is a user-interactive satellite data analysis package that is designed to operate on an IBM PC-AT class personal computer. Its primary applications are the processing and analyses of satellite imagery data from the Nimbus-7 Coastal Zone Color Scanner (CZCS) and the TIROS-N/NOAA satellite series Advanced Very High Resolution Radiometer (AVHRR). The PC-SEAPAK system allows a high degree of data manipulation by the user. It is organised into several categories of programs in menus that include level-1 data ingest, CZCS level-2 analyses, statistical analyses, data extraction, remapping to standard projections, graphics manipulation, image board memory manipulation and general utilities.

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