O-VII7

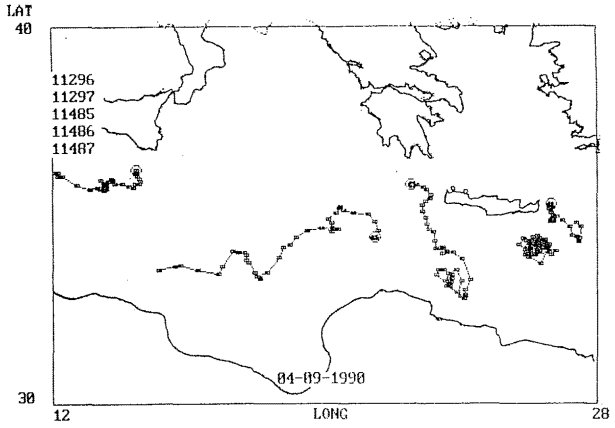
Satellite Infrared (thermal) Imagery and drifter buoy trajectories in the Eastern Mediterranean

James A. PRICE*, Bill BURNETT*, R.-L. PICKETT** and Paul E. LA VIOLETTE***

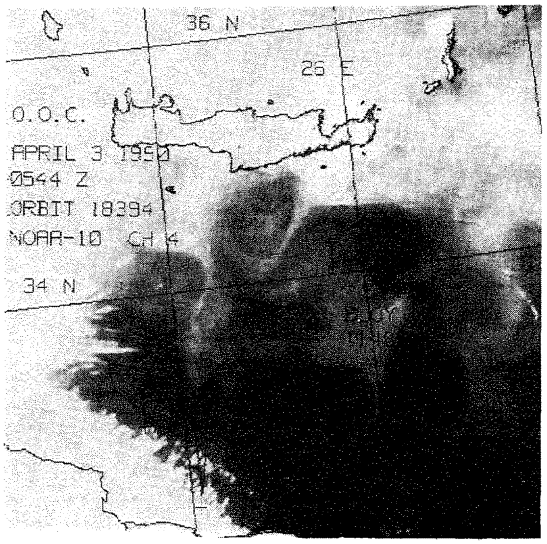
*Naval Oceanography Office, Stennis Space Center, MS 39529-5004 (U.S.A.)
**Naval Oceanographic and Atmospheric Research Laboratory, Stennis Space Center, MS 39529-5004 (U.S.A.)
***Mississippi State University, Stennis Space Center, MS 39529-5004 (U.S.A.)

Six satellite-tracked METOCEAN drifter buoys were air-dropped into prominent frontal features and eddies in the eastern Mediterranean on 25 February, 1990. The purpose of these releases was to monitor the movements of these ocean features over an extended period and to compare them with simultaneous surface thermal patterns of the ocean features provided by NOAA AVHRR-Infrared imagery. At the time of this writing (early April) five of the drifters are still transmitting. This short report will detail some information of oceanographic interest found in a preliminary analysis of this combination drifter buoy-satellite imagery data set.

Figure 1 below shows the trajectories of the five remaining buoys (the sixth buoy only remained operative for 26 days). Note that the westernmost drifter was dropped in the general location of the Maltese front, the second in the eastern Mediterranean East-West front, the third west of Crete, the fourth in the permanent eddy found south of Crete, and the remaining eddy positioned just east of Crete to detect the influence of the outflow of the Aegean sea water on the Cretean eddies. We will discuss the information provided by the buoys in that order.



Of all the drifters, the buoy contained in the warm, anticyclonic eddy south of Crete (which for convenience, we have called the Cretean Eddy) has shown the most interesting trajectory. Figure 2 below shows the trajectory of the buoy for the period 2 March through 9 April superimposed on a satellite image for 3 April. An eddy was first reported in this location by Unluata et al. (1989) during field work associated with POEM. Our preliminary examination of two years of cloud-free imagery of the region indicates that an eddy approximately 45 km in diameter is a permanent feature off the southeast corner of Crete.



We thought it odd that the buoy has remained entrained in the eddy since it was dropped in February, despite the fact that at times it was quite close to the thermal rim seen in the AVHRR imagery. The location of the feature is obviously related to the bathymetry of the region. The data shows the buoy making a complete loop within the eddy every three to five days, maintaining a fairly constant speed (50 cm/sec, the speed varying according to its distance from the center of rotation). The movement and imagery indicate the eddy has also moved closer to Crete during the buoy monitoring period.