Satellite Observations of Upwelling in the Gulf of Salerno

E. SALUSTI* and E. ZAMBIANCHI**

*INFN, Department of Physics, "La Sapienza" University, Rome (Italy)
**Earth Observation Division, Telespazio, Rome (Italy)

The northern Tyrrhenian Sea is characterized by rather strong dynamics: the steady presence of a large eddy in correspondence of the Strait of Bonifacio is at present under investigation (see Moen, 1984; Böhm et al., 1990). On the contrary, the dynamics of the southern Tyrrhenian Sea are rather weak, and only small scale phenomena are interesting from a physical oceanography viewpoint, such as the tidally generated internal waves in the Strait of Messina (Alpers and Salusti, 1983).

Here we describe a study performed on an area of the Southern Tyrrhenian sea, the Gulf of Salerno.

We analyzed the onset and the evolution of upwelling events by means of satellite-derived Sea Surface Temperatures of the Gulf. It appears as though the upwelling front observed in the SST fields present typical patterns of frontal instabilities, presumably due to the strong shear associated with the wind-induced flow. This hypothesis seems to be confirmed by the observed patterns generated by the intrusion of wind driven waters into a relatively calm hydrographic situation -- see for instance the mushroom-shaped features which can be frequently seen in this zone.

Therefore, the time evolution of the upwelling is studied in relationship with the meteorological forcing: particular attention is devoted to the role of orography in determining the prevalent wind direction.

We also show how bottom topography strongly affects the shape of the cold water patches.

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New observations on superficial waters circulation in the Western part of the Black Sea

G. SERPOIANU, F. SMOCOV and V. MALCIU

Romanian Marine Research Institute, Constantza (Romania)

The paper presents the results of a drifting floats (bottles) experiment effectuated on August 2nd 1988 in the central area of the Romanian continental shelf of the Black Sea (fig.1). A number of 870 drifting bottles have been launched and 225 of them were recovered, along the entire western part of the Black Sea from Odessa to Bosporus and in the southern part from Bosporus to Sinop. This experiment follows a more ample one (5000 drifting bottles launched in 3 stages, June, July and August 1976) - whose results were published by Serpoianu and Nae (1977).

For the explanation of the drifting floats traces, daily resultants of the wind direction and speed for the month of August at Constantza have been calculated, using hourly meteorological observations (fig.1 a). The obtained data reveal wind inconstancy, a cha - racteristic of summer season at Romanian coast. This explains the instability of sea currents, emphasized by the identification places of the drifting floats (see fig.1).

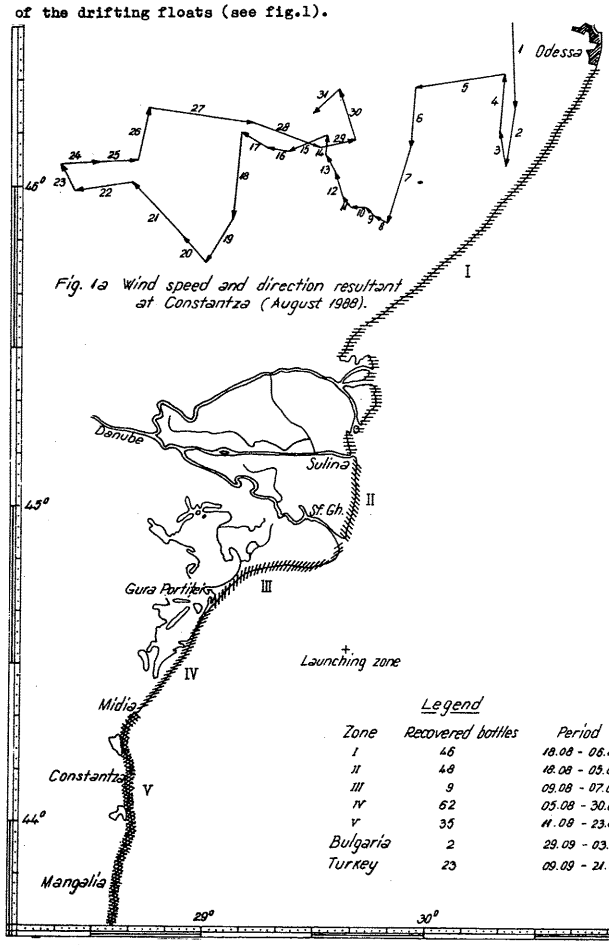

Fig. 1a Wind speed and direction resultant at Constantza (August 1988).

Fig. 1 Results of the drifting bottels experiment (August 1988).

We must notify that 67 % of the total recovered floats have been identified in August, exclusively from Odessa to Mangalia. At Bulgarian coasts 3 drifting bottles have been recovered and at the Turkey coasts 23. One should remark that after the first 3 days from the launching, the winds induced southward and northward currents. On 5 August, after strong easterly winds, the first drifting bottles reached the shore. Between 6 and 14 August the wind blew strong from north in the first two days and from south-east after that but with reduced intensity. Than, in 3 consecutive days (15, 16, 17 August) easterly winds determined the presence of the drifting bottles in the entire zone from Odessa to Mangalia (see fig.1 and 1 a). We consider that all the recovered floats in this area reached the shore until 24 August but a part of them were identified after that.

The constant westerly winds between 24 and 29 August determined a seaward drift of the bottles which had not reached the shore yet and than they were carried southward by the western cyclonic Black Sea current, a fact proved by the identified floats at Bulgarian and Turkey coasts.