SEA SURFACE TEMPERATURES AND CIRCULATION PATTERNS AT THE AEGEAN SEA USING AVHRR DATA

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This paper presents results from a joint project between the University of Dundee and the University of the Aegean. The project deals with the monitoring of the quality of the sea water environment using *in situ* measurements and satellite image data (CRACKNELL *et al.*, 1994). Part of the project was to analyse AVHRR images of the Aegean Sea because of their capacity for providing large area coverage of regional information regarding sea surface temperatures (SST) and circulation patterns. This information will provide more understanding of local marine process.

AVHRR scenes captured on 4 March 1992 and 5 June 1992 were acquired from the Dundee Satellite Station. Two AVHRR scenes captured on 11 July 1992 and 28 August 1992 were purchased from the National Remote Sensing Center Limited, United Kingdom.

Each sub-scene measuring an area of 512 by 512 pixels was extracted from each AVHRR scene which covered the sea water region of approximately between latitudes 27°N to 41°N and longitudes 23°E to 27°E including the Aegean Sea, Mytilene Sea and Saronikos Bay. The NOAA-11 Multi-Channel Sea Surface temperature (MCSST) algorithm was used for computing the SST value at each AVHRR pixel location. The land and cloud areas were masked out. The generated SST images for all the sub-scenes are shown in Figures 1 to 4 and were colour coded for displaying temperature values.

On all image dates the sea water south of Lesvos was relatively warmer than in the north. In the central area of the Aegean Sea the surface temperatures were relatively cooler than the surrounding areas on all scenes. This might be due to a cold current coming through the Dardanelia Strait towards the Aegean Sea. This cold pattern extending southward became progressively warmer with the distance southward.

The effect of land masses (islands) was observed in the SST images.Observation of the temperature images reveals that the temperatures south of these land masses were generally higher than the SSTs of the northern part of these land masses. This could be due to the north facing coastal waters being more exposed to the southerly flowing cool current whereas the south facing coastal waters were protected from this current. During the summer months the July and August scenes show higher SSTs as compared to the June surface temperature.

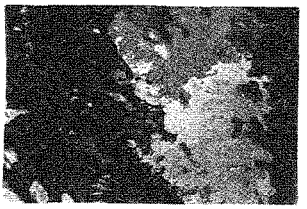

Figure 1. Temperature Distribution (°C) on 4 March 1992. Colour code: Dark blue<10; light blue 10-11, dark green 11-12; light green 12-13, yellow 13-14; orange 14-15; red>15.

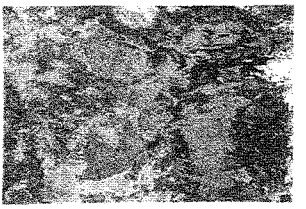

Figure 2. Temperature Distribution (°C) on 5 June 1992. Colour code: Dark blue<18; light blue 18-19, dark green 19-20; light green 20-21, yellow 21-22; orange 22-23; pink>24.

Figure 3. Temperature Distribution (°C) on 11 July 1992. Colour code: Dark blue<21; light blue 21-22, dark green 22-23; light green 23-24, yellow 24-25; orange 25-26; pink>27.

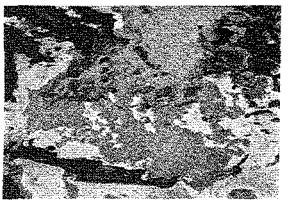

Figure 4. Temperature Distribution (°C) on 28 Aug. 1992. Colour code: Dark blue<22; light blue 22-23, dark green 23-24; light green 24-25, yellow 25-26; orange 26-27; red>27.

REFERENCES

CRACKNELL A.P. K. ABDULLAH, J.N. HATZOPOULOS, M. KARYDIS and D. GAZIS, 1994 : Monitoring for Protection of the Marine Environment Using Landsat TM and AVHRR Data. Final Report to the British Council of Athen,s Greece.