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# ANALYSIS OF SEA SURFACE TEMPERATURE INCREASE IN AEGEAN SEA BY USING LANDSAT THERMAL BAND IN LONG TERM PERIOD

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In this study, sea surface temperature (SST) changes in the Aegean Sea were investigated over a period of 30 years by using Landsat thermal bands. The study area is the Aegean Sea, which includes the Gökova, Güllük, Didim and Kuşadası Gulf (Figure 1.). Twenty-four Landsat 5 and 8 thermal images of April, May, June, November, August, September, October and November of 1986, 2010 and 2016 were used. To estimate the SST from the thermal band data, the digital number (DN) of bands were converted to the brightness temperature by using that metadata. First, DN of sensors were converted to spectral radiance, then, spectral radiance was converted to brightness temperature by using QGIS software. Throughout the four transects the SST values of the same month for different years were analyzed. Lengths of transects; T1 31.4 km, T2 30.9 km, T3 53.9 km and T4 93 km. The number of points sampled and analyzed throughout transects are 1024. In the selected months between 1987 and 2016, the difference between the minimum temperature averages and the maximum temperature averages in transects are: T1 3.363°C – 2.869°C, T2 3.654°C – 3.088°C, T3 3.610°C – 2.936°C, and T4 3.556°C – 2.256°C. The difference between the minimum temperature averages and the maximum temperature averages of all transects was determined as 3.546°C and 2.787°C. As can be seen in the graph (Figure 2.) according to year and month, it is seen that the SST in the selected research area in the Aegean Sea has increased by 2,787°C to 3,546°C in the last 30 years. Long-term field work will need to be undertaken in order to be able to understand whether this increase is due to climate change or other natural or human causes.

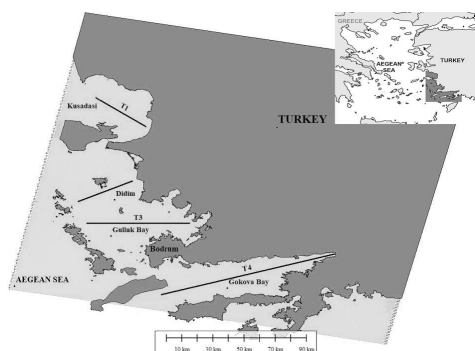
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Figure 1. The study area (T1,2,3 and 4 are transects)

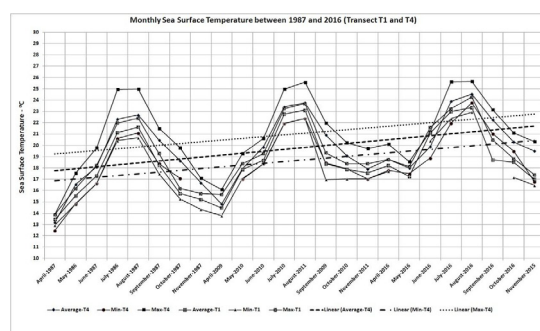


Figure 2. Monthly sea surface temperature between 1987 and 2016 (T1 and T2)