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Impacts of global climate change on the Mediterranean Region: Adana as a case study

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Abstract

The effects of climate change on Mediterranean region are known to include increases in temperature, decreases in precipitation and water exiguity. The original Mediterranean climate prevails along the southern coast of Turkey causes alterations in both climate parameters and perceived temperature by changes in the temperature, precipitation, and humidity values. In this study Adana which is located in the eastern part of the Mediterranean region, was chosen because of being the best indicator of changes in and the effects on the Mediterranean climate. As for the method, the Mann-Kendall rank correlation test (M-K) was applied to temperature, precipitation and humidity variables in Adana and then with the help of the Humidex index, perceived temperature values of the area were calculated in order to apply trend analysis. Especially in terms of average and minimum temperature values, strong positive trends were observed in temperature variables, while both strong positive and strong negative trends were observed in humidity variables. During the summer season strong increases were observed in perceived temperature at all weather stations except for Karataş and Tufanbeyli. Insignificant decreases in winter precipitation, and increases were observed during the dry period. These results were interpreted as increasing number and severity of heat waves due to climate changes.

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Keywords: Climate change; Mediterranean climate; perceived temperature; trend analysis; climate of Adana.

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1. Introduction

Throughout history, the climate of the world has altered many times. This process occurred slowly in the past. However, with the industrialization which started in the 19th century, people started to affect the natural climate. The world's energy balance is based on the overuse of fossil-fuels. This degradation has started to affect climates by global warming which has been especially observed from the second half of the 20th century. In other words, long-term climate change is being experienced within the short time period of human influence. Climate changes that occurred in the short period have very important negative effects (Türkeş et al., 2000).

The warming trend observed in average global temperature is not distributed evenly on a worldwide scale. Long-term warming trends occur much more at 40°-70° North latitudes than in the rest of world. Indeed, the biggest effects of climate changes are observed in countries located at middle and high latitudes. In the list of countries, Turkey and especially the Mediterranean region would be the most affected side because of its geographical location (Cosun and Karabulut, 2009).

In this study, alterations were observed in the parameters of temperature, humidity and precipitation in Adana which is located on the Mediterranean coast of Turkey. Adana was chosen because of the fact that its climate features represent both its own climate and Mediterranean climate.

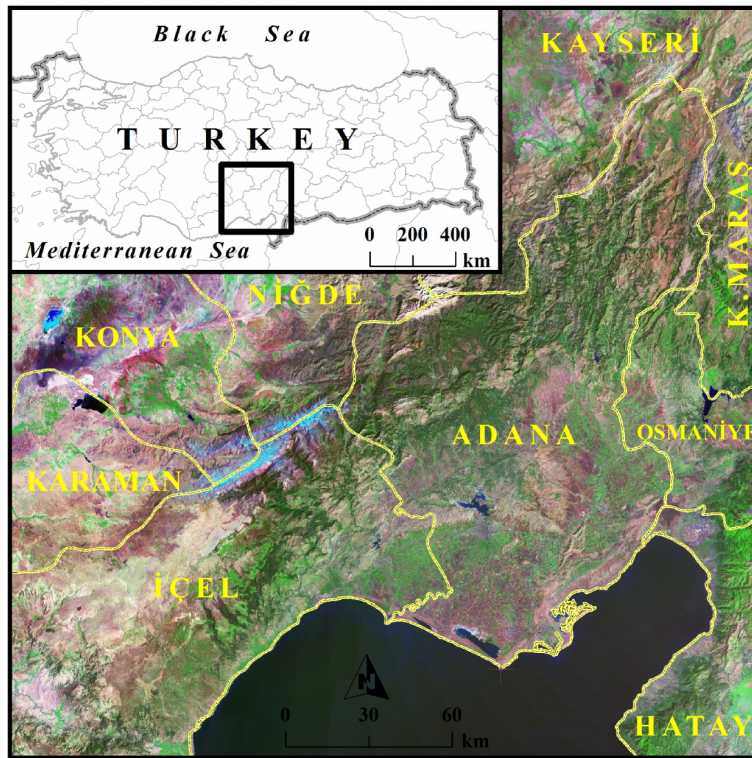


Fig. 1. Location of Study Area.

2. Description of the Study Area

Adana is located on the south coast of Turkey, in the eastern part of the East Mediterranean basin, and also in the Taurus orogenic system, between the Ecişehir and Yumurtalık faults. It is bordered by Kahramanmaraş and Osmaniye to the east, Hatay to the southwest, Mersin and Niğde to the west, Kayseri to the north and the Mediterranean to the south (Fig. 1).

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