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Research Article

Evaluation of Monthly Maximum, Minimum and Average Temperature Changes Observed for Many Years in Nevsehir Province of Turkey

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In this research, minimum, maximum and average temperature values between 1970 and 2019 in Center of Nevşehir Province, Ürgüp and Avanos districts in Turkey were examined. Sperman Rho and Mann Kendall statistical correlation tests were used in the analysis phase. As a result, the trends of temperature changes in years are revealed. According to trend analysis results, the average minimum temperature for long years in Avanos district is calculated as -1.20 °C. Maximum temperature is 26,6 °C and the average of all temperature values is 12.18 °C. The average minimum temperature for many years in center of Nevsehir province is calculated as -1.99 ^{0}C, the maximum temperature is 24 ^{0}C and the average of all temperature values is calculated as 10.73 ^{0}C. In Ürgüp district, the minimum temperature for long years was calculated as -4.20 ^{0}C, the maximum temperature is 18.48 ^{0}C, and the average of all temperature values are 10.32 ^{0}C. As a results; It has been observed that there were increasing trend in years of spring, winter, autumn and summer in Nevsehir province and No trend was observed in Avanos and Ürgüp districts at maximum temperature values. While increasing trend is observed in Avanos district and Nevşehir Province in minimum temperature parameters, no change was observed in Ürgüp district. Increasing changes were observed in the average temperatures in all districts.

Keywords: Temperature, Global Climate Change, Trend Analysis, Nevsehir Province, Turkey

INTRODUCTION

It endangers the whole world. All living things on Earth contain carbon. A carbon atom combines with two oxygen atoms to form carbon dioxide, and because carbon dioxide stays in the air, it is what comes from the sun and will reflect from the earth. It has been threatened by climate change under the effect of increased carbon emission and greenhouse gas. Carbon is one of the basic elements of life and shows search without being fixed. The amount of CO_2 reduces the protective use of the bard layer. With this effect, it causes irregular precipitation and excessive temperature increases.

It will prepare the environment to rise up to 1,5 - 4.5 ^{0}C (Ahrens, 1994). Research shows that the temperature will increase 0,1 ° C every ten years (Anonymous, 2001). Especially the energy obtained from fossil fuels tries to meet the demanded energy with the increase of the population. High amounts of gases emitted into the atmosphere under energy yield are somehow serious dangers. Fossil fuels, used unconsciously in excessive amounts, have become the main element of major problems such as human health, which coexist with environmental pollution. Replacing fossil fuel reserves, renewable energy sources such as solar, wind, and hydro energy, and strategic plans required for this requirement (Anonymous, 2013).

This research was carried out to analyze the trend of changes in terms of years, the maximum, minimum and average temperature values observed in the provincial center of Nevşehir and Avanos and Ürgüp districts between 1970-2017 and to reveal the increase or decrease tendencies.

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Figure 1. Location of the Research Area

MATERIAL AND METHOD

Research areas located in the Central Anatolia Region, Turkey's Nevsehir province, Avanos and Ürgüp districts. In this study, the maximum, minimum and average temperature values of the meteorological observation station of Nevsehir Province, Ürüp district (1970-2019) and Avanos district (1986-2019) were used as materials in the study. The location of Nevsehir Province, Avanos and Ürgüp districts that are the subject of the research are shown on the map given in Figure 1.

In the study, monthly changes of the temperature values observed between 1970-2019 in the meteorology station in Nevşehir province, Ürgüp district and Avanos district (1986-2019). Analysed tempetrature datas were taken Turkish General Directorate of Meteorology (Anonymous, 2018). Analyzed values were statistically based on graphs and charts.

In the study, minimum, maximum and average temperature changes were subjected to trend analysis for many years. In this sense, in order to evaluate the data, it was evaluated with Sperman's Rho, Mann-Kendall and Sen's Trend Slope Method. it was performed in the 95% confidence level (Mann 1945; Kendall 1975).

In the study, a software called "Trend Analysis for Windows" was used Mann-Kendall test, Spearman's Rho test, Mann-Kendall Correlation test and Sen's Trend Slope method are applied to the data and give the result as graphics and text (Gümüş ve Yenigün 2006).

RESEARCH RESULTS

Trend analysis results for the minimum, maximum and average temperature values of Nevsehir province, Avanos, and Ürgüp districts are presented in detail below.

2.1. Maximum Temperature Changes in Long Periods

The maximum temperature values in Avanos district, which were analyzed for many years (1986-2019), were evaluated seasonally (spring, autumn, summer and winter months) with trend analysis. The course of change of maximum temperature values for many years is also shown in detail in the graph given in Figure 2.

The highest maximum temperature in the average maximum temperature variations in the spring months of Avanos district was measured at 35,2 ^{0}C in 2010 and the lowest temperature was 22,8 ^{0}C in 2009 and 2011. In spring months; the maximum average temperature was recorded as 30,8 ^{0}C, while the highest maximum temperature for summer months was 38,5 ^{0}C in 2007 and the lowest temperature was 33,2 ^{0}C in 1988. In summer, the maximum temperature average was observed as 36.2 ^{0}C. The highest maximum temperature for autumn months was 30,7 ^{0}C in 1992, the lowest temperature was 24,5 ^{0}C in 2011 and the average temperature was 28 ^{0}C. The winter temperatures were highest at 19,8 ^{0}C in 2010, the lowest at 11,5 ^{0}C in 2008 and an average temperature of 15,0 ^{0}C. Considering the maximum temperature changes of the total sum of all seasons, the highest was recorded as 29,8 °C in 2010, the lowest temperature as 24,2 ^{0}C in 2011 and the average temperature as 26,5 ^{0}C. Trend analysis results of the average maximum temperatures for many years in Avanos district are given in Table 1.

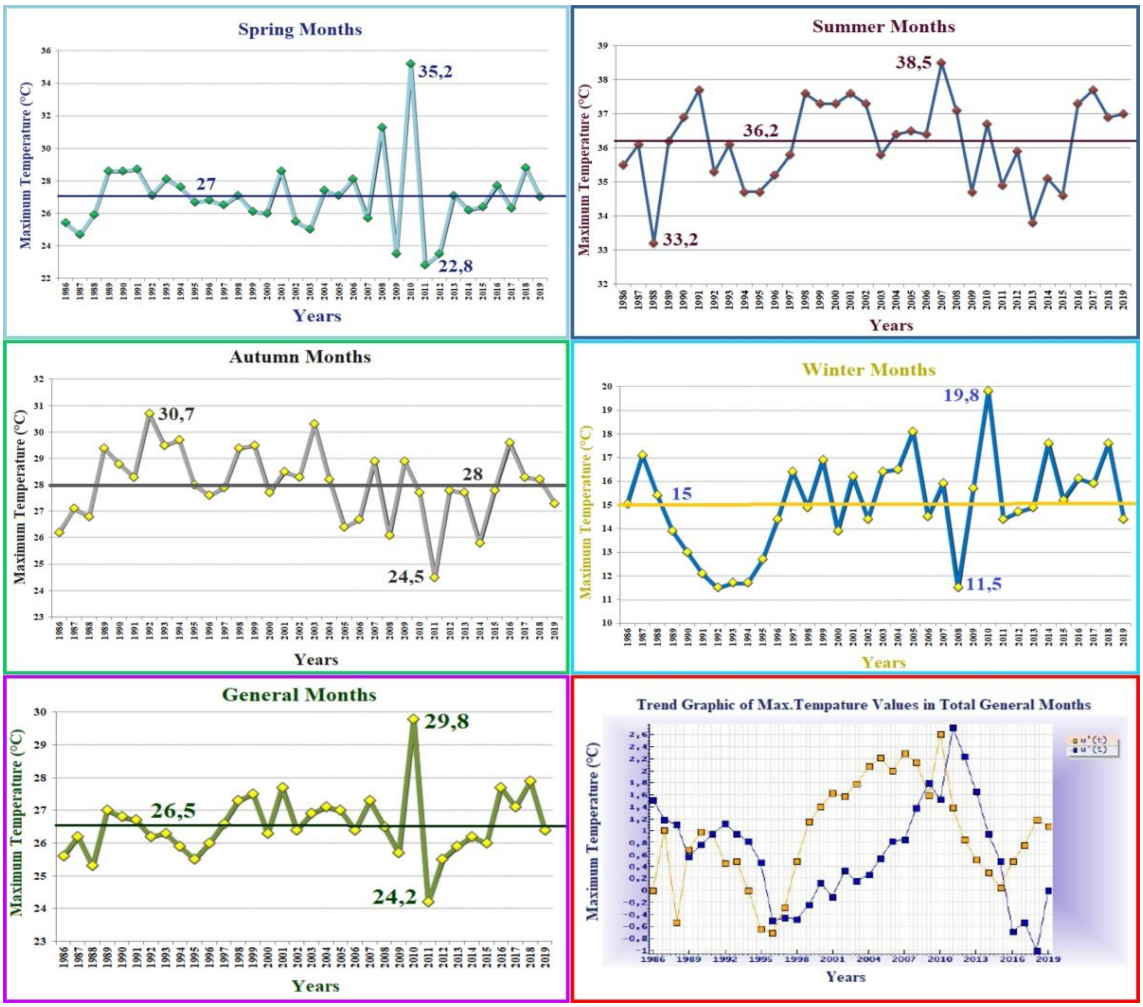

Figure 2. Maximum Temperature Changes for Many Years (1986-2019) in Avanos district

Table 1. Trend analysis results of the average maximum temperatures for many years (1986-2019) in Avanos district

Parameter	Seasons	Mann-Kendall Test Statistical	Spearman's Rho Test Statistical
Maximum Temperature	Spring	No Trend	No Trend
	Winter	Positive Trend	No Trend
	Autumn	No Trend	No Trend
	Summer	No Trend	No Trend
	Totally	No Trend	No Trend

According to the trend analysis results made for the maximum temperatures of Avanos district on the basis of many years, there is a trend in the Mann-Kendall Test in winter, while there is no trend in winter according to Sperman's Rho Test. It is concluded that there is no trend on the basis of spring, summer, autumn and general average.

The maximum temperature values in the district of Ürgüp, which were analyzed for many years (1970-2019), were evaluated seasonally (spring, autumn, summer and winter months) with trend analysis. The course of change of the maximum temperature values for many years is also shown in detail in the graph given in Figure 3.

Considering the average maximum temperature changes in the spring months of Ürgüp for many years, the highest maximum temperature was recorded as 31,90 ^{0}C in 2010, the lowest temperature in 2012 and 22,5 ^{0}C in spring, the maximum temperature average was 25,47 ^{0}C. The highest maximum temperature for the summer months was 37,27 ^{0}C in 2007, the lowest temperature was 31,13 ^{0}C in 1984 and the maximum temperature average in the summer was 34,63 ^{0}C. The highest maximum temperature for autumn months was 30,47 ^{0}C in 2003, the lowest temperature was 24,53 ^{0}C in 1986 and the average temperature is 26,8 ^{0}C. The highest temperatures in the winter months were recorded as 19,93 ^{0}C in 2010, the lowest in 1992 as 7,77 ^{0}C and the average temperature as 13,82 ^{0}C. Considering the maximum temperature changes of the total sum of all seasons, the highest was recorded as 22 ^{0}C in 2010, the lowest temperature was recorded as 15,88 ^{0}C in 1992 and the average temperature was 18,48 ^{0}C. Trend analysis results of Ürgüp district average maximum temperatures for many years are given in Table 2.

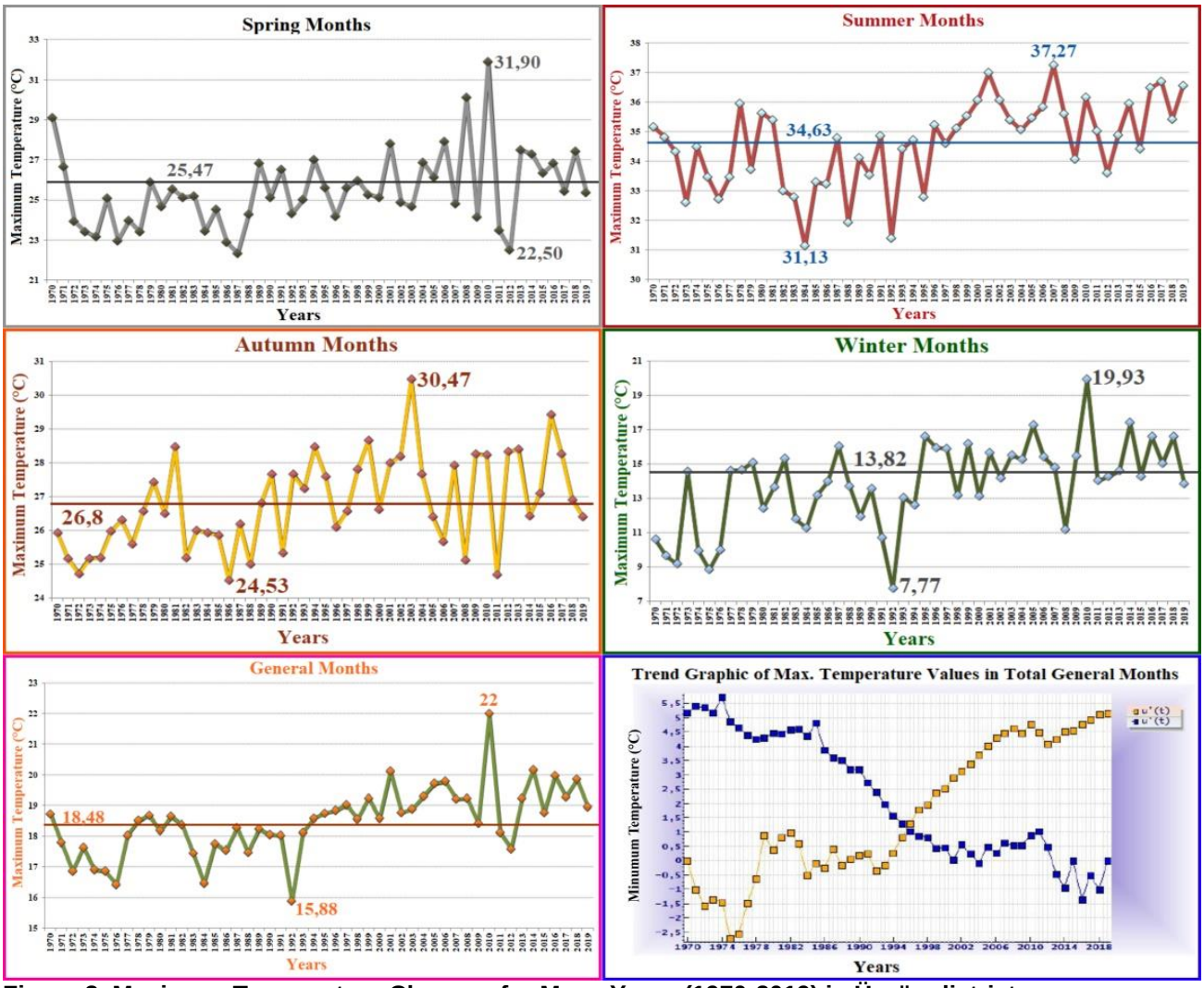

Figure 3. Maximum Temperature Changes for Many Years (1970-2019) in Ürgüp district

Table 2. Trend analysis results of average maximum temperatures for many years (1970-2019)in Ürgüp district

Parameter	Seasons	Mann-Kendall Test Statistical	Spearman's Rho Test Statistical
Maximum Temperature	Spring	No Trend	No Trend
	Winter	No Trend	No Trend
	Autumn	No Trend	No Trend
	Summer	No Trend	No Trend
	Totally	No Trend	No Trend

According to the results of the trend analysis made for the maximum temperatures of the Ürgüp district for many years, according to the Rho Tests of Mann-Kendall and Sperman, it was concluded that there was no trend in all seasons and the general average. The maximum temperature values in the Nevsehir province which were analyzed for many years (1970-2019) were evaluated seasonally (spring, autumn, summer and winter months) with trend analysis. The course of change of maximum temperature values for many years is also shown in detail in the graph given in Figure 4.

According to the results of the average maximum temperature changes in the spring months of Nevşehir province for many years, the highest maximum temperature was recorded as 29,6 ^{0}C in 2008, the lowest temperature was 21,6 ^{0}C in 2011, while the maximum temperature in summer was 24,1 ^{0}C, In 2007, 36,2 ^{0}C, the lowest temperature was 30,8 ^{0}C in 1988 and the maximum temperature average in summer was 33,5 ^{0}C. The highest maximum temperature for autumn months was 29,1 ^{0}C in 2003, the lowest temperature was 22,9 ^{0}C in 2011 and the average temperature was 25,5 ° C. In winter, the highest temperature values were recorded as 19,3 ^{0}C in 2010, the lowest temperature as 7,8 ^{0}C in 1992 and the average temperature as 13 ^{0}C. Considering the maximum temperature changes of the total sum of all seasons, the highest was recorded as 26,6 ^{0}C in 2010, the lowest temperature was 21,6 ^{0}C in 1976 and the average temperature was 24 ^{0}C. Trend analysis results of average maximum temperatures for many years in Nevsehir povince are given in Table 3.

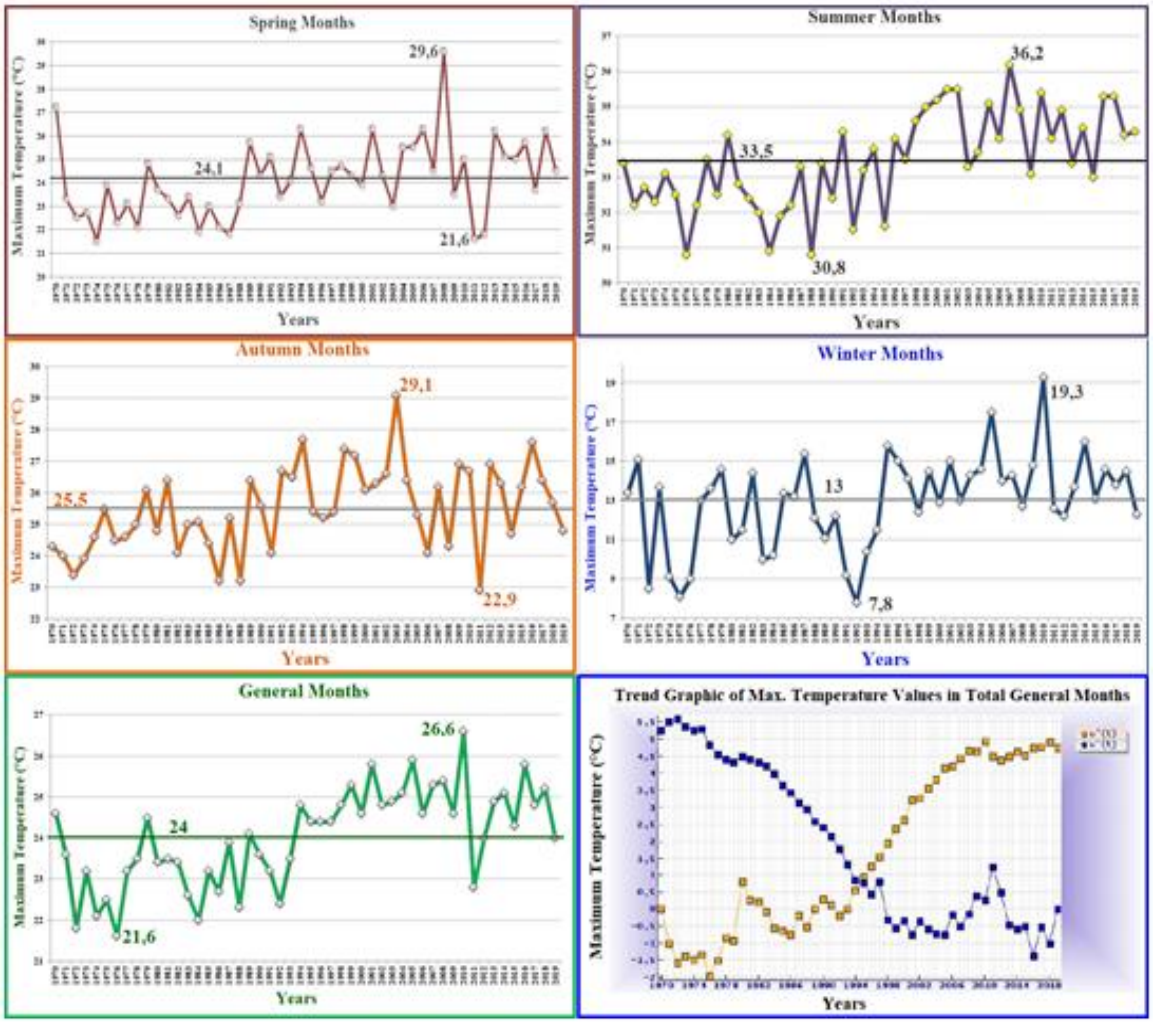

Figure 4. Maximum Temperature Changes for many years (1970-2019) in Nevsehir Province

Table 3. Trend analysis results of average maximum temperatures for many years (1970-2019) in the Nevsehir province

Parameter	Seasons	Mann-Kendall Test Statistical	Spearman's Rho Test Statistical
Maximum Temperature	Spring	No Trend	No Trend
	Winter	No Trend	No Trend
	Autumn	No Trend	No Trend
	Summer	No Trend	No Trend
	Totally	No Trend	No Trend

According to the results of the trend analysis on the maximum temperatures on a long-term basis in Nevşehir province, it was concluded that there is no trend in average temperature changes according to the Rho Tests of Mann-Kendall and Sperman.

Minimum Temperature Changes in Long Periods

The minimum temperature values in Avanos district, which were analyzed for many years (1986-2019), were evaluated seasonally (spring, autumn, summer and winter months) with trend analysis. The course of changing the minimum temperature values for many years is also shown in detail in the graph given in Figure 5.

The highest minimum temperature in Avanos district in the mean minimum temperature variations in spring for long years is 1,07 ^{0}C in 2001, the lowest temperature in 1992 was -5.23 ^{0}C, while the minimum temperature in the spring was -1,76 ^{0}C. The highest minimum temperature for summer was 11,60 ^{0}C in 2010,, the lowest temperature was 7 ^{0}C in 1994, the minimum temperature average in summer months was 9,46 ^{0}C. The highest minimum temperature for autumn months was 3,33 ^{0}C in 2010, the lowest temperature was 24,5 ^{0}C in 2011 and the average temperature was 28 ^{0}C. The highest temperatures in the winter months were recorded as 19,8 ^{0}C in 2010, the lowest in 2009 as -3,83 ^{0}C and the average temperature as -0,55 ^{0}C. Considering the minimum temperature changes of the total sum of all seasons, the highest was recorded as 1,58 ^{0}C in 2014, the lowest temperature was -3,78 ^{0}C in 1992 and the average temperature was -1,20 ^{0}C. Trend analysis results of the average minimum temperatures for many years in Avanos district are given in Table 4.

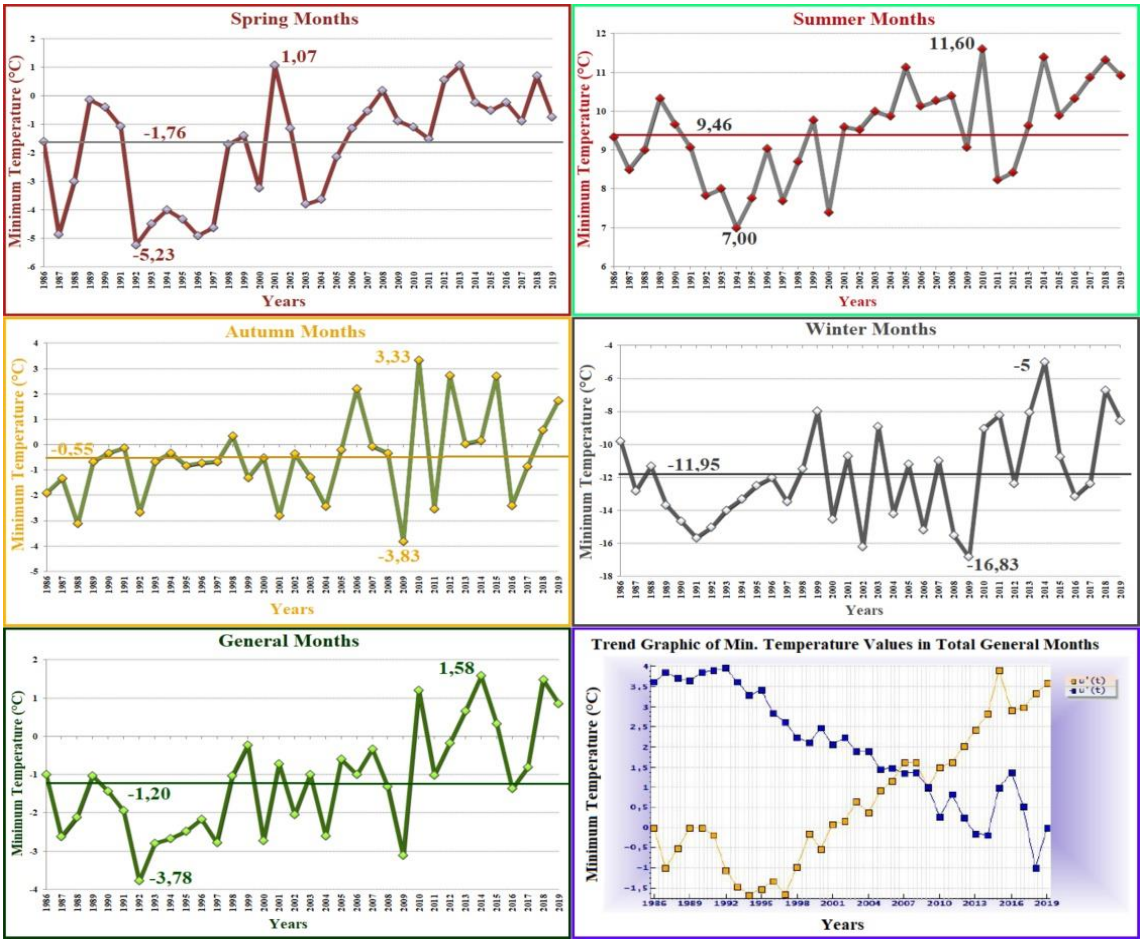

Figure 5. Minimum Temperature Changes for many yeras (1986-2019) in Avanos district

Table 4. Trend analysis results of the average minimum temperatures for many years (1986-2019) in Avanos district

Parameter	Seasons	Mann-Kendall Test Statistical	Spearman's Rho Test Statistical
Min. Temperature	**Spring**	Possitive Trend	Possitive Trend
	Winter	No Trend	No Trend
	Autumn	No Trend	No Trend
	Summer	Possitive Trend	Possitive Trend
	Totally	Possitive Trend	Possitive Trend

According to the results of the trend analysis regarding the minimum temperatures of Avanos district for many years, it is concluded that Mann-Kendall and Sperman are trending in spring, summer and general average basis and there is no trend in winter and autumn seasons.

The minimum temperature values in the Ürgüp district, which were analyzed for many years (1970-2019), were evaluated seasonally (spring, autumn, summer and winter months) with trend analysis. The course of changing the minimum temperature values for many years is also shown in detail in the graph given in Figure 6.

The average minimum temperature changes in the spring months for the longest years in Ürgüp was the highest minimum temperature in 2012; -0,83 ^{0}C, the lowest temperature in 1985; -8,6 ^{0}C, the minimum temperature in spring was -4,12 ^{0}C, the highest for summer months the temperature was 9,5 ^{0}C in 2010, the lowest temperature was 2,93 ^{0}C in 1983, and the minimum temperature average in summer months was 5,66 ^{0}C. The highest minimum temperature for autumn months was 0,37 ^{0}C in 1976, the lowest temperature was -7,67 ^{0}C in 1995 and the average temperature is -3,43 ^{0}C. In winter months, the highest temperature values were recorded as -7,80 ^{0}C in 1981, the lowest temperature as -20,03 ^{0}C in 1992 and the average temperature as -14,92 ^{0}C. Considering the minimum temperature changes of the total sum of all seasons, the highest was recorded as 1,60 ^{0}C in 1979, the lowest temperature as -7,58 ^{0}C in 1992 and the average temperature as -4,20 ^{0}C. Trend analysis results of the average minimum temperatures for long years in Ürgüp district are given in Table 5.

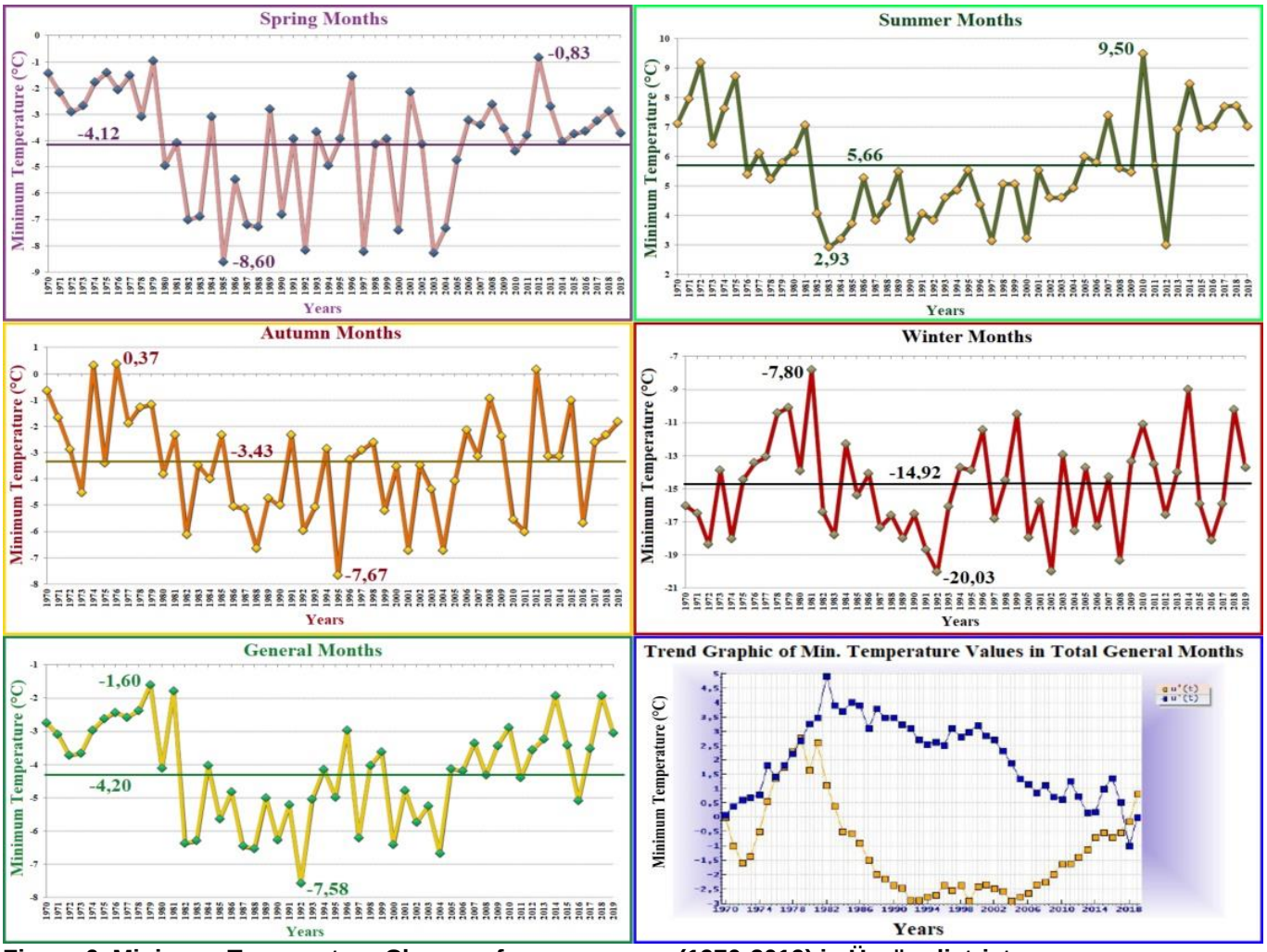

Figure 6. Minimum Temperature Changes for many years (1970-2019) in Ürgüp district

Table 5. Trend analysis results of average minimum temperatures for many years (1970-2019) in Ürgüp district

Parameter	Seasons	Mann-Kendall Test Statistical	Spearman's Rho Test Statistical
Min. Temperature	Spring	No Trend	No Trend
	Winter	No Trend	No Trend
	Autumn	No Trend	No Trend
	Summer	No Trend	No Trend
	Totally	No Trend	No Trend

According to the trend analysis results regarding the minimum temperatures of Ürgüp district for many years, it is concluded that there is no trend on the basis of all seasons and general average according to Rho Tests of Mann-Kendall and Sperman. There is no change in temperatures.

The minimum temperature values in the central district, which were analyzed for many years (1970-2019), were evaluated seasonally (spring, autumn, summer and winter months) with trend analysis. The course of the change of minimum temperature values for many years is also shown in detail in the graph given in Figure 7.

Considering the average minimum temperature changes for spring months in Nevsehir Province for many years, the highest minimum temperature was 1,2 ^{0}C in 2001, the lowest temperature was -7.07 ^{0}C in 1997, while the minimum temperature was -2,55 ^{0}C, while the highest for summer months temperature was observed as 11,63 ^{0}C in 2010, the lowest temperature was 3,47 ^{0}C in 1984, and minimum temperature average in summer was 7,85 ^{0}C. The highest minimum temperature for autumn months was 4,33 ^{0}C in 2012, the lowest temperature was -5,40 ^{0}C in 1973 and the average temperature was -0,91 ^{0}C. The highest temperatures in winter were recorded as -6,17 ^{0}C in 2018, the lowest in 1992 and -17,60 ^{0}C and the average temperature was recorded as -12,36 ^{0}C. Considering the minimum temperature changes of the total sum of all seasons, the highest was recorded as 1,61 ^{0}C in 2018, the lowest temperature as -5,2 ^{0}C in 1992 and the average temperature as -1,99 ^{0}C. Trend analysis results of the average minimum temperatures for many years are given in Table 6.

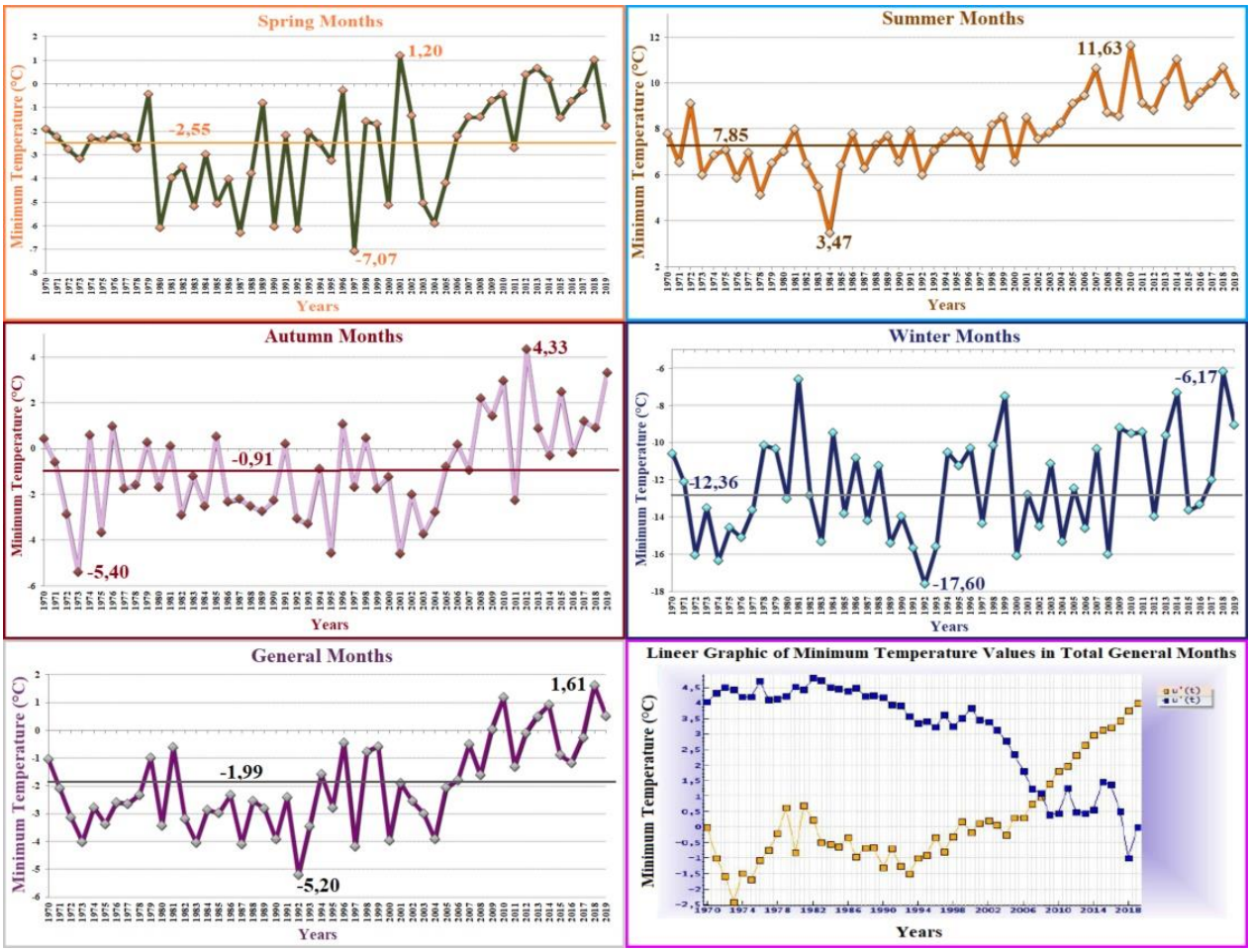

Figure 7. Minimum Temperature Changes for many years (1970-2019) in Nevsehir province

Table 6. Trend analysis results of average minimum temperatures for many years (1970-2019) in Nevsehir province

Parameter	Seasons	Mann-Kendall Test Statistical	Spearman's Rho Test Statistical
Min. Temperature	Spring	Possitive Trend	Possitive Trend
	Winter	No Trend	No Trend
	Autumn	Possitive Trend	Possitive Trend
	Summer	Possitive Trend	Possitive Trend
	Totally	Possitive Trend	Possitive Trend

According to the results of the trend analysis conducted on the minimum temperatures for many years in the central district, it has been concluded that Mann-Kendall and Sperman are trending in spring, autumn, summer and general average and there is no trend in winter months.

Average Temperature Changes in Long Years

Average temperature values in Avanos district, which were analyzed for many years (1986-2019), were evaluated seasonally (spring, autumn, summer and winter months) with trend analysis. The trend of the average temperature values of Avanos district for many years is also shown in detail in the graphic given in Figure 8.

Considering the average temperature changes in the spring months of Avanos for many years, the highest average temperature was recorded as 14,13 ^{0}C in 2018, the lowest temperature in 1987 was 8,93 ^{0}C and the average temperature in spring was 11,42 ^{0}C. The highest average temperature in summer was 24,23 ^{0}C in 2001. The lowest temperature was observed as 20,83 ^{0}C in 2011 and the average temperature in summer was 22,53 ^{0}C.

The highest average temperature for autumn months is 15,17 ^{0}C in 2015, the lowest temperature was 10,33 ^{0}C in 2011 and the average temperature is 13,04 ^{0}C. The highest winter temperature was 5,90 ^{0}C in 2010, the lowest temperature was -2,63 ^{0}C in 2008 and the average temperature was 1,71 ^{0}C. Considering the average temperature changes of the total sum of all seasons, the highest was recorded as 14,24 ^{0}C in 2018, the lowest temperature was 10,69 ^{0}C in 1994 and the average temperature was 12,18 ^{0}C. Trend analysis results of Avanos district average temperatures for many years are given in Table 7.

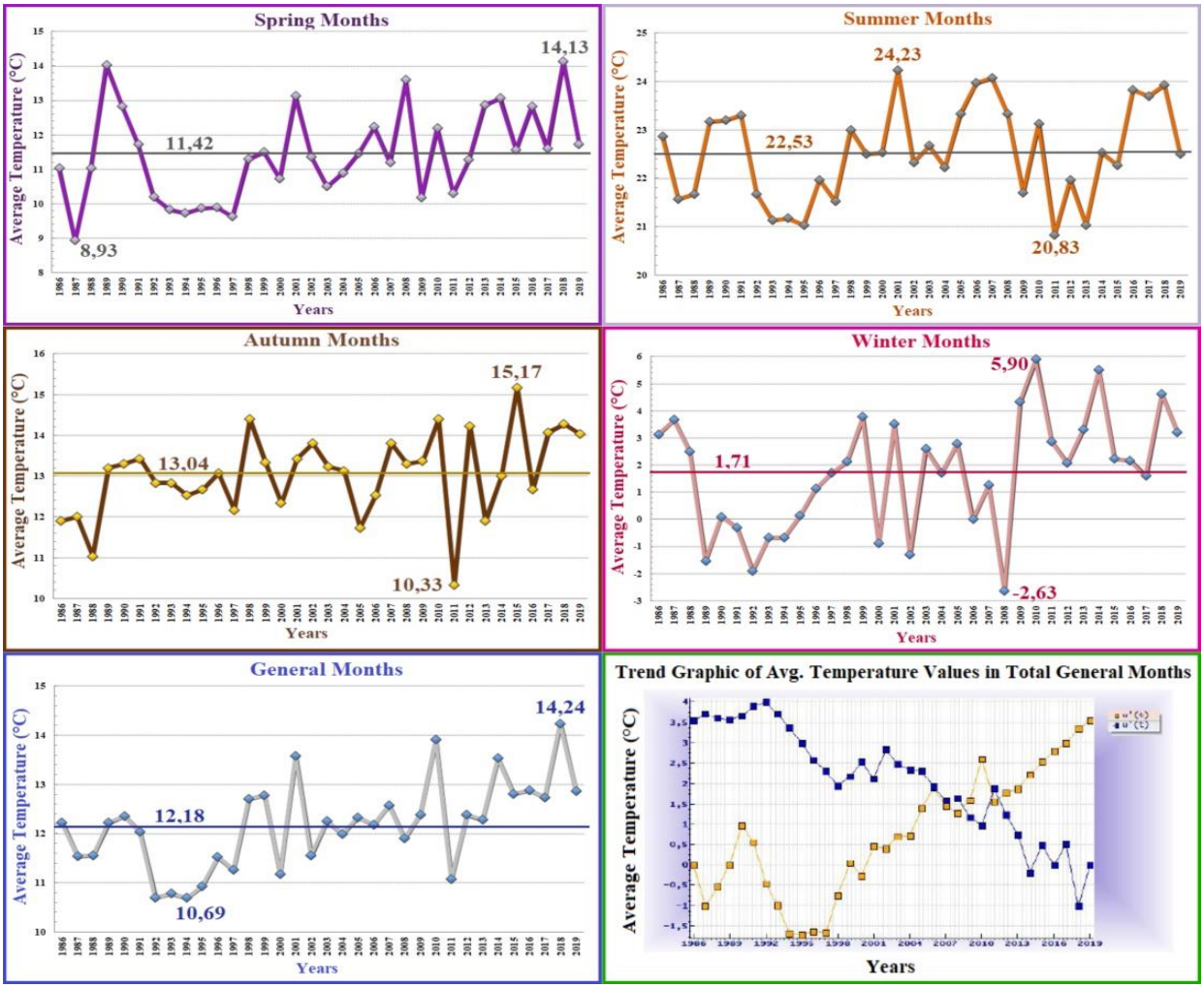

Figure 8. Average Temperature Changes for many years (1986-2019) in Avanos District

Table 7. Trend analysis results of average temperatures for many years (1986-2019) in Avanos district

Parameter	Seasons	Mann-Kendall Test Statistical	Spearman's Rho Test Statistical
Average Temperature	Spring	Possitive Trend	Possitive Trend
	Winter	No Trend	No Trend
	Autumn	No Trend	No Trend
	Summer	No Trend	No Trend
	Totally	Possitive Trend	Possitive Trend

According to the results of the trend analysis on the average temperatures of Avanos district for many years, it was concluded that Mann-Kendall and Sperman have trends in the sum of the spring and general months, and there is no trend in the fall, summer and winter seasons.

Average temperature values in Ürgüp district, which were analyzed for many years (1970-2019), were evaluated seasonally (spring, autumn, summer and winter months) with trend analysis. The course of the change of average temperature values for many years is also shown in detail in the graph given in Figure 9.

In Ürgüp district, the highest average temperature in the mean temperature changes in the spring months is 12,73 ^{0}C in 2018, the lowest temperature in 1987 was 7,03 ^{0}C, the average temperature in the spring was 9,88 ^{0}C, while the highest average temperature for the summer was 22,60 ^{0}C in 2010. the lowest temperature was 17,57 ^{0}C in 1984, average temperature average in summer was 20,10 ^{0}C. The highest average temperature for autumn months was 13,33 ^{0}C in 2010, the lowest temperature was 8,53 ^{0}C in 1988 and the average temperature was 11,04 ^{0}C. In winter, the highest temperatures were recorded as 4,87 ^{0}C in 2010, the lowest in 1992, -5.47 ^{0}C and the average temperature as 0,27 ^{0}C. Considering the average temperature changes of the total sum of all seasons, the highest was recorded as 12,98 ^{0}C in 2010, the lowest temperature was recorded as 7,61 ^{0}C in 1992 and the average temperature was recorded as 10,32 ^{0}C. Trend analysis results of the average temperatures for many years are given in Table 8.

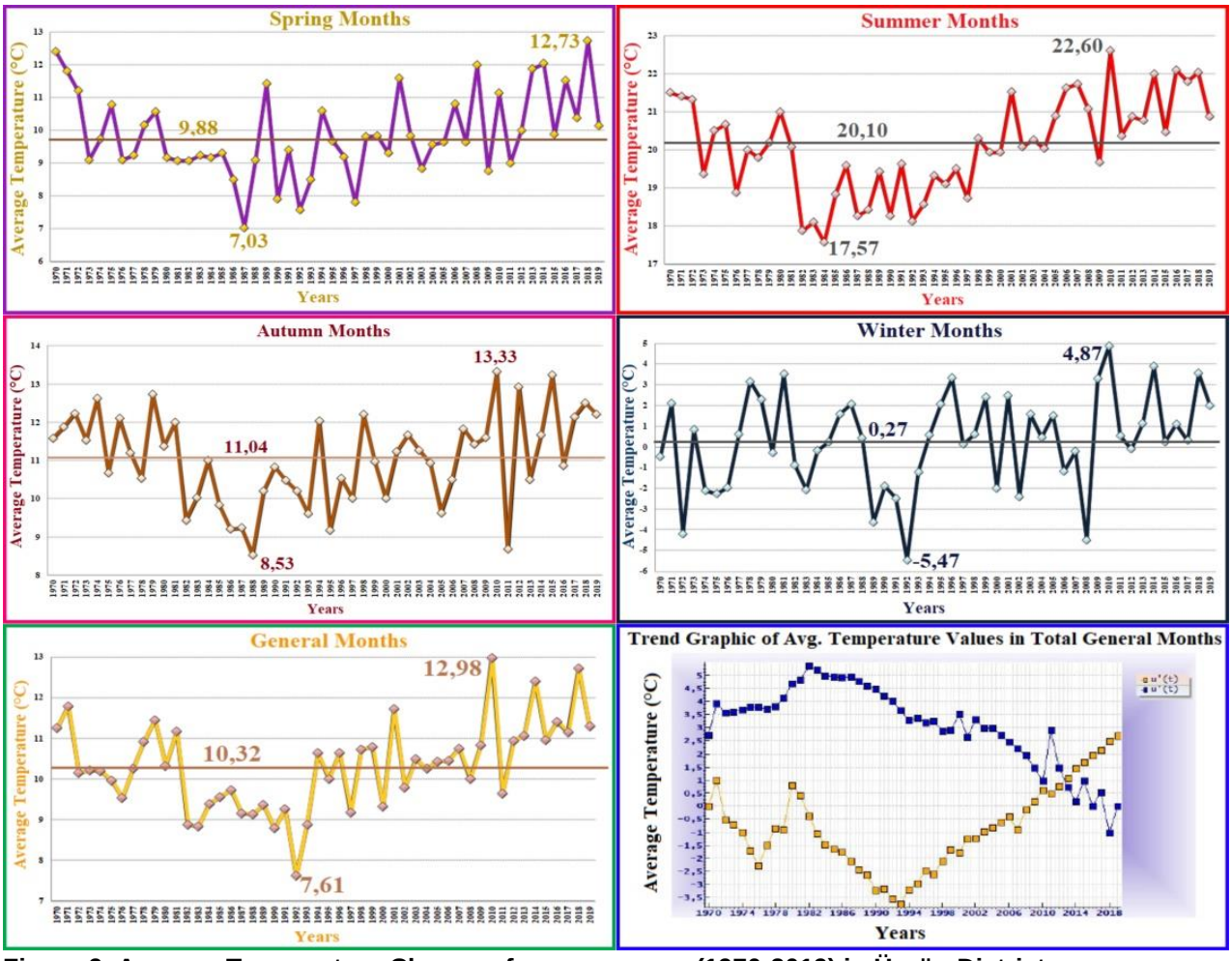

Figure 9. Average Temperature Changes for many yeras (1970-2019) in Ürgüp District

Table 8. Trend analysis results of average temperatures for many years in Ürgüp district

Parameter	Seasons	Mann-Kendall Test Statistical	Spearman's Rho Test Statistical
Average Temperature	Spring	No Trend	No Trend
	Winter	No Trend	No Trend
	Autumn	No Trend	No Trend
	Summer	Possitive Trend	Possitive Trend
	Totally	Possitive Trend	Possitive Trend

According to the results of the trend analysis of the average temperatures for many years in Ürgüp district, according to the Rho Tests of Mann-Kendall and Sperman, it was concluded that there is no trend in the spring, winter and autumn months and there is a trend in the sum of the summer and general months. The average temperature values in the Central district, which were analyzed for many years (1970-2019), were evaluated seasonally (spring, autumn, summer and winter months) with trend analysis. The course of change of average temperature values for many years is also shown in detail in the graph given in Figure 10.

Considering the average temperature changes in spring for many years in theNevsehir Province, the highest average temperature was recorded as 13,17 ^{0}C in 2018, the lowest temperature in 1987 and 6,97 ^{0}C in spring, while the average average temperature was 9.94 0C in summer, the highest average temperature in summer 23,03 ^{0}C, the lowest temperature was observed as 17,77 ^{0}C in 1984 and the average average temperature in summer months as 20,38 ^{0}C. The highest average temperature for autumn months is 14,63 ^{0}C in 2010, the lowest temperature was 9,37 ^{0}C in 2011 and the average temperature was 11,89 ^{0}C. The highest temperatures in the winter months were recorded as 5,40 ^{0}C in 2010, the lowest in 1992; -4,80 ^{0}C and the average temperature as 0,73 ^{0}C. Considering the average temperature changes of the total sum of all seasons, the highest was recorded as 13,64 ^{0}C in 2010, the lowest temperature was 8,37 ^{0}C in 1992 and the average temperature was recorded as 10,73 ^{0}C. The trend analysis results of average temperatures for many years are given in Table 9.

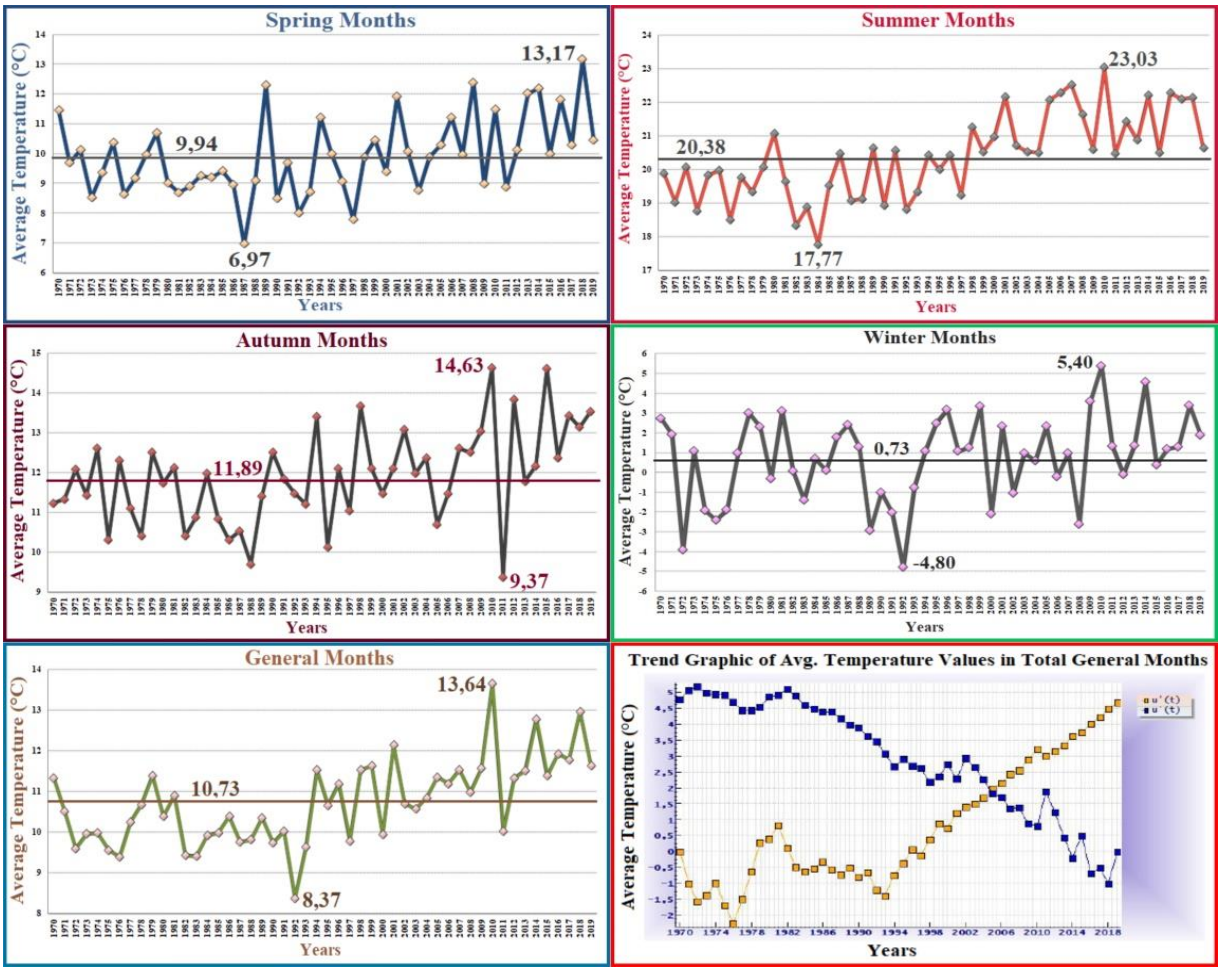

Figure 10. Average Temperature Changes for many yeras (1970-2019) in Nevsehir Province

Table 9. Trend analysis results of average temperatures for many years (1970-2019) in Nevsehir province

Parameter	Seasons	Mann-Kendall Test Statistical	Spearman's Rho Test Statistical
Average Temperature	Spring	Possitive Trend	Possitive Trend
	Winter	No Trend	No Trend
	Autumn	Possitive Trend	Possitive Trend
	Summer	Possitive Trend	Possitive Trend
	Totally	Possitive Trend	Possitive Trend

According to the results of the trend analysis conducted on the average temperatures of the central district for many years, it is concluded that Mann-Kendall and Sperman are not trending in the winter months according to the Rho Tests, and there is a trend in the sum of spring, summer, autumn and general months. Distribution of Long Years Maximum, Minimum and Average Summer Temperatures is given in Figure 11.

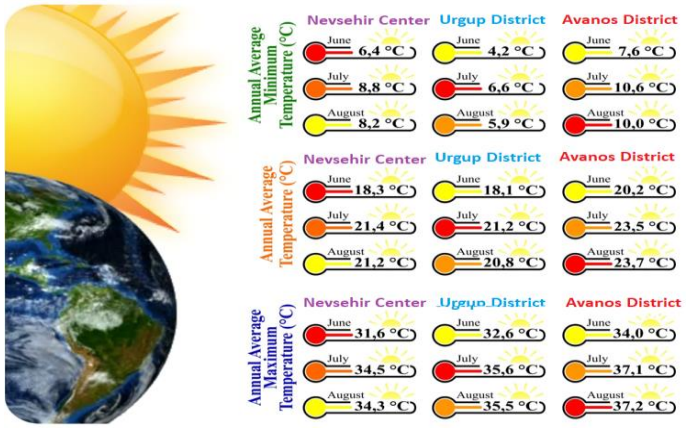

Figure 11. Distributions of Maximum, Minimum and Average Temperatures for Long Years in Summer Months

It was recorded that the highest average temperature in July, while the minimum average temperatures in the center of Nevşehir, Avanos and Ürgüp districts were in July. While the maximum temperature in Nevşehir and Ürgüp is the highest in July, it has the highest temperature in Avanos in August. The average temperatures for Nevşehir and Ürgüp were highest in July, while the highest temperature in Avanos district was seen in August.

SUGGESTIONS

In this study, where the minimum, maximum and average temperature values for many years in Nevşehir povince, Ürgüp district (1970-2019) and Avanos district (1986-2019) were evaluated on a monthly basis. Increasing trend was observed in temperature values due to global warming. When the temperature values are considered, the average of the long-term minimum temperature values is -2,98 ^{0}C for spring, the average of winter is -13,85 ^{0}C, the average of autumn is -1,75 ^{0}C, the average of summer is 8,01 ^{0}C and the general average is -2.64 ^{0}C.

The long-term averages of the maximum temperature values are determined as 27,1 ^{0}C for the spring months, the average of the winter months is 15,17 ^{0}C, the average of the autumn months is 28,36 ^{0}C, the average of the summer months is 36,76 ^{0}C and the general average is 24,54 ^{0}C. For many years, the average temperatures were observed as 10,33 ^{0}C in the spring months, 0,79 ^{0}C in the winter months, 11,93 ^{0}C in the autumn months, 20,95 ^{0}C in the summer months, and 11 ^{0}C in the general average. In maximum, minimum and average temperature changes, trends in all seasons were observed.

In this study conducted in Nevşehir and Avanos, Ürgüp districts within the scope of evaluating temperature changes based on global climate change for many years, it is concluded that there is a tendency to increase in temperatures from place to place. Increasing the necessary studies and measures to minimize the emissions of carbon emissions should be taken all over the world and measures that will minimize the greenhouse gas effect will play an important role in reducing the effects of global warming.

REFERENCES

Ahrens, D.C., 1994. Meteorology Toda, An Introduction to Weather, Climate an The Environment, Fift Edition, West Publishing Company, USA.

Anonymous, 2001. The Scientific Basic Contribution of Working Group I to The Third Assesment Report of The Intergovernmental Panel on Climate Change (IPCC), Cambridge University Press, Cambidge.

Anonyomus 2013. İklim Değişikliği ve Karbon Salınımı. http://apelasyon.com/Yazi/892-iklim-degisikligi-ve-karbon-salinimi (Erişim Tarihi : 14.12.2019) (in turkish).

Anonymous, 2019. Nevşehir Meteorology Station temperature values, General Directorate of Meteorology, Ankara, Turkey

Gümüş, V., Yenigün, K., 2006. Fırat Havzası Akımlarının Trend Analizi İle Değerlendirilmesi, Harran Üniversitesi Fen Bilimleri Enstitüsü İnşaat Mühendisliği Anabilim Dalı Yüksek Lisans Tezi, Şanlıurfa (in Turkish).

Kendall, M. G., 1975. Rank Correlation Methods. Charles Griffin, London, 135p

Mann, H. B., 1945. Non-parametric Tests Against Trend. Econometrica, 13: 245-259

Türkeş, M., 1999. Vulnerability of Turkey to Desertification with Respect to Precipitation Andridity Conditıon, Ankara, Turkey.

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