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ORIGINAL PAPER

Determining the relationships between climatic elements and thermal comfort and tourism activities using the tourism climate index for urban planning: a case study of Izmir Province

Tourism climate index for urban planning

Fatih Adiguzel[1] · Elif Bozdogan Sert[2] · Yucel Dinc[3] · Mehmet Cetin[4] · Senay Gungor[1] · Pakize Yuka[5] · Ozlem Sertkaya Dogan[6] · Efdal Kaya[7] · Kayhan Karakaya[8] · Ercan Vural[9]

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Abstract
The tourism climate index of local and international tourists, especially in summer, is determined using the thermal comfort relationship in the province of Izmir. The aim is to reveal the most suitable time and the most suitable area for tourism activities in İzmir Province. The temperature (maximum, minimum, and average) of 1960–2019, the relative humidity (minimum and average) from 39 meteorology stations, the precipitation (total and average), the sunshine duration (total), and the wind speed (average) data were studied and evaluated. The data obtained were arranged and transferred to the GIS (geographic information systems) environment. The inverse weighted average method—one of the interpolation methods—was used to estimate unknown points with the help of known points in the study area. The tourism climate index was used to determine the climatic comfort conditions of the province in terms of tourism to assess the effect of the climatic conditions on tourism. The tourism-based climatic comfort map of İzmir Province, which was obtained by using the average temperature, relative humidity, total rainfall, and wind data, was presented in 7 categories: unfavorable, marginal, acceptable, good, very good, excellent, and ideal. The variety of tourism activities that could be done in these months also increased the importance of this period. The results obtained in this study are important in terms of developing the tourism strategy of İzmir Province. Making tourism-based climatic comfort conditions for all provinces that are important in terms of tourism will make a significant contribution to the tourism strategy of our country.

1 Introduction

Tourism constitutes one of the world's largest and fastest growing industries (Smith 1993; De Freitas 2003; Hamilton and Tol 2004; Scott and Lemieux 2009). As the World Travel and Tourism Council (WTTC) noted in 2019, tourism contributed 10.4% of the world GDP and employed 319 million people (Zhong and Chen 2019). Among the countries where tourism activity is an important source of income are the USA, Spain, and France. The total number of visitors in Turkey in 2017 was 38 million people, and tourism income was US $26.3 billion (Ministry of Development 2018). Although the tourism industry is among the major economic sectors of the world, it is sensitive and vulnerable to war, terrorism, theft, and social and political crises (Clements and Georgiou 1998; Fletcher and Morakabati 2008; Fielding and Shortland 2011). In addition to these human factors affecting tourism, geographical location, topography, landscape, flora and fauna, weather, and climate constitute the main factors affecting recreation and tourism activities (De Freitas 2003). Climatic conditions are considered very sensitive in terms of tourism activities (Bode et al. 2003). In addition to coastal tourism, which is still the most popular tourist attraction based on the sea-sand-sun trio worldwide, diversification efforts have begun to spread tourism across the whole year and across different regions to generate more income from tourism, and studies on tourism types such as rural tourism or village tourism, plateau tourism, thermal tourism, faith tourism, and ecotourism have increased (Emekli 2002).

✉ Mehmet Cetin
mcetin@kastamonu.edu.tr

Extended author information available on the last page of the article

Climate is significantly associated with the tourism industry (Matzarakis 2006; Scott and Lemieux 2009; Hernandez and Ryan 2011; Hejazizadeh et al. 2019), and climate conditions directly affect tourism activities (Scott and McBoyle 2001; De Freitas 2003, 2005; Berrittella et al. 2006; Lin and Matzarakis 2008; Scott and Lemieux 2009). Studies revealing climate-tourism relationships show that climate conditions are the first or second factor affecting tourists' destination preferences (Lise and Tol 2002; De Freitas 2003; Lin and Matzarakis 2008; Scott and Lemieux 2009; Zhong and Chen 2019). Tourists who prefer destinations that do not have suitable climates may encounter extreme weather events that can negatively affect their comfort and experience. Such a situation causes thermal stress and impacts tourism quality. Therefore, to provide thermal comfort, climate components must be in the appropriate value range for humans (Cetin et al. 2010; Matzarakis and Endler 2010; Topay 2012; Cetin 2015, 2016).

The thermal comfort index has been studied worldwide to determine the climatic comfort in areas with human effects, such as planning and management. All researchers evaluate climate factors with different studies, such as Grassl (1981; 2006), who explained the climatic factors of atmospheric and ocean heat, and Grassl (1976), who worked with wind stress and heat flux. Grassl (1989) worked on the surface temperature using satellite images and explained the challenge of the climate change albedo effect (Grassl 2011; Grassl 1979). Worldwide, researchers working on this challenge have tried to find different climate indices, including the tourism climate index (TCI). This research tried to take different perspectives on the TCI to find surface temperature as an effect of humans in planning and management in Turkey. Although there are different methods for determining tourism comfort, the tourism climate index (TCI) is preferred. The reason why the TCI is preferred is that it is an effective method in determining the periods when tourist comfort is appropriate. In addition, there are many advantages that enable the TCI to be preferred in the study. The tourism climate index (TCI) allows the coexistence of many climate elements (e.g., temperature, relative humidity, precipitation, sunshine duration, and wind) that affect tourism. Another advantage is that the parameter value finds a relationship for each scale, making the results more accurate. The TCI reveals the determination of the effects of climate on local and international tourist flows.

Considering the disadvantages of the tourism climate index, it can be used for coastal and yacht tourism, which includes the sea-sand-sun trio. In addition, the missing aspect of the index is that sea water temperatures are not included.

The relationships between climate and tourism and recreation are explained through certain indices (Moreno et al. 2008). These indices make it possible to facilitate the interpretation of the degree of integration of various atmospheric elements and to compare locations (De Freitas 2005; Matzarakis 2007). Different studies have been conducted to explain tourism and climate relations with numerical measurements (Auliciems and Kalma 1979; Mieczkowski 1985; Harlfinger 1991; Maddison 2001; Matzarakis 2002; Lin and Matzarakis 2008; Lei et al. 2013; Liu Shaojun et al. 2014; Mendez-Lazaro et al. 2014; Wang et al. 2016). The most popular index frequently used in tourism climate research is the tourism climate index (TCI), which was developed by Mieczkowski (1985) (Lin and Matzarakis 2008; Hejazizadeh et al. 2019). Mieczkowski (1985) designed a broad-based tourism index (TCI) to evaluate tourism-climate relationships, but except for the Harlfinger (1991), the TCIs were initially interpreted without field research. Later, instead of the subjective value judgments of the researcher, which tested the accuracy of TCIs, it was deemed necessary to conduct field studies in practice (De Freitas, 2005). Thus, the number of academic studies using the TCI and testing the accuracy of the data with field studies started to increase (Scott and McBoyle 2001; Scott et al. 2004; Amelung and Viner 2006; Amelung et al. 2007; Farajzadeh and Ahmetabadi 2010; Ataei and Hasheminasab 2012).

Tourism activities in Turkey occur in all climatic zones, with different types of tourism offered in the many regions in Turkey. In this context, İzmir is one of the most important tourism cities of the country. Although the geographical and physical conditions, especially the mild climate and the transportation conditions, are effective in the development of İzmir Province in terms of tourism, its natural and cultural features also allow the development of different tourism areas such as cultural tourism (Ephesus, Bergama), faith tourism (Virgin Mary's House), sea tourism, yacht tourism, cruise tourism, health tourism, thermal tourism, mountain tourism (winter tourism and mountaineering), rural tourism, nature tourism and ecotourism, cycling tourism, congress and fair tourism, and gastronomy tourism. The districts of İzmir Province with the highest tourism potential are Çeşme, Konak, and Selçuk. According to the 2018 data, the number of foreign visitors coming to İzmir was 1,021,576, which showed an increase of 33.75% compared to the previous year. Other features that increase the tourism potential of Izmir are national and international festivals; for example, the cultural assets in cities (2 on the World Heritage List: Bergama Multi-Layered Cultural Landscape Area and Ephesus World Heritage Site and 3 on the World Heritage Temporary List: Birgi Historical City, and Foça and Çandarlı Castles), blue flag beaches, ski center, paragliding, and windsurfing opportunities. Additionally, features created by different topographies between the mountains and the sea contribute to the diversification of tourism (TR Ministry of Culture and Tourism 2018, 2020). Findings from the Neolithic indicate Izmir has been a settlement for thousands of

years. Furthermore, there are Ionian, Hellenic, and Roman period ruins; the ancient cities of Ephesus, Pergamon, Teos, Erythrai, Klazomenai, and Metropolis; Turkish period artifacts and Aegean rural culture; and cultural tourism supply, all of which provide proof of how rich the tourism potential is.

2 Materials and methods

The location map and workspace stations belonging to İzmir Province, which is located in western Anatolia, are given in Fig. 1. The city is located between 37° 75′ and 39° 50′N and 26° 00′ and 28° 50′E. It has a geography surrounded by the Madra Mountains and Balıkesir in the north, Aydın in the south, Çeşme Peninsula and İzmir Bay in the west, and Manisa in the east.

In this study, the temperature (maximum, minimum, and average) from 1960 to 2019 and the relative humidity (minimum and average) from 39 meteorology stations were taken from the Turkish State of Meteorological Service (TSMS) (TSMS 2021) (Table 1), and data from Ödemiş, Torbalı, Aliağa, and Urla, located within İzmir, as well as precipitation (total and average), sunshine duration (total), and wind speed (average) data, were provided. The data were arranged and transferred to the GIS environment. The inverse distance weighted (IDW) average method, one of the interpolation methods, was used to estimate unknown points with the help of known points in the study area (Fig. 2).

$$\hat{Z}(X_0) = \frac{\sum_{i}^{N=2} W(X_i) Z(X_i)}{\sum_{i}^{N=1} W(X_i)}$$

$$W(X_i) = \|X_i - X_0\|^{-p}$$

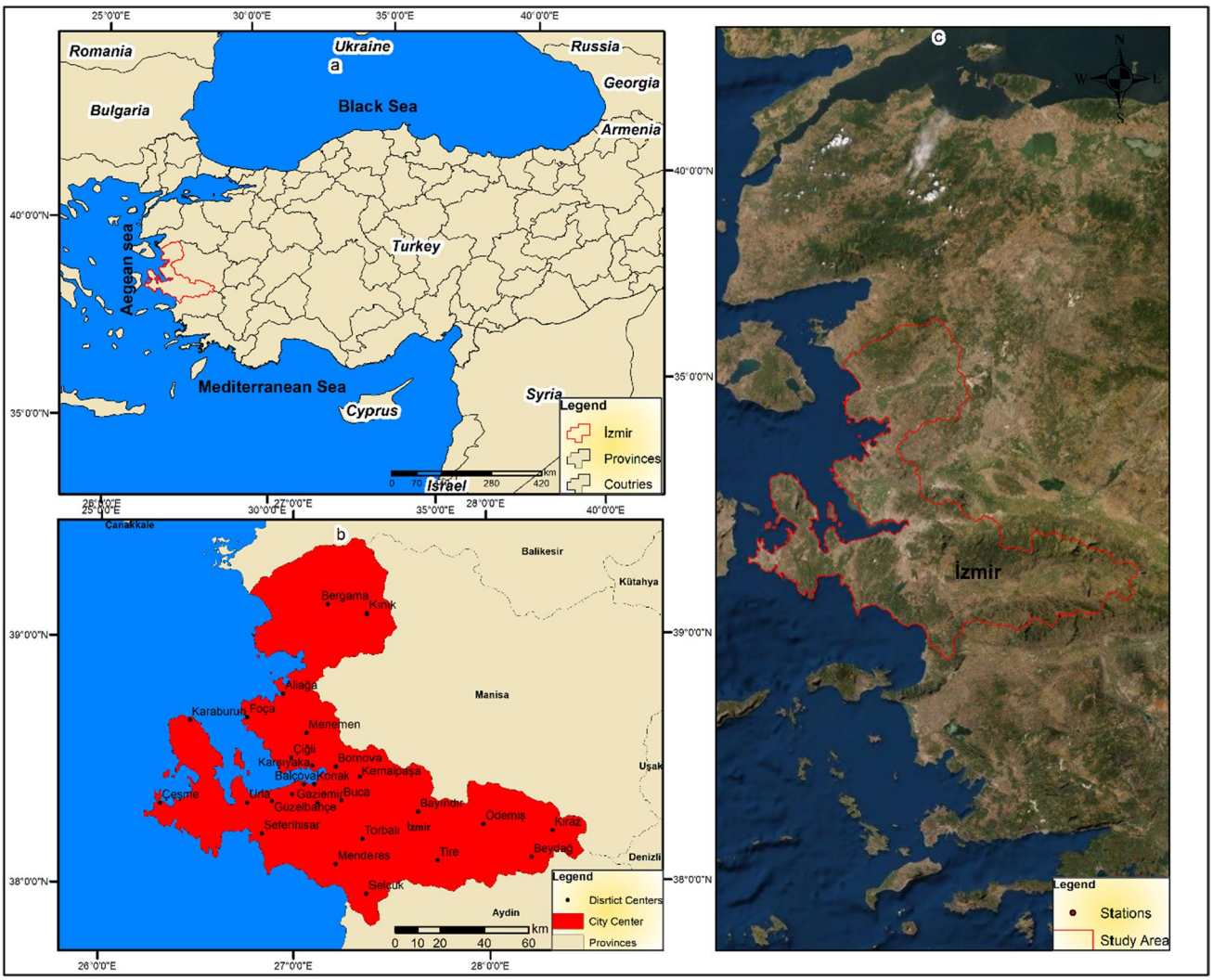

Fig. 1 Location map of İzmir Province and study area stations

Table 1 Information on workspace stations

Province	Station name	Station code	Latitude	Longitude	Elevation (m)
İzmir	Aliağa	17,787	38.7922	26.9682	27
İzmir	Bayındır	18,049	38.1975	27.6719	70
İzmir	Buca	18,443	38.3750	27.1953	150
İzmir	Bayraklı	18,440	38.4778	27.1489	85
İzmir	Dikili	17,180	39.0737	26.8880	3
İzmir	Çeşme	17,221	38.3036	26.3724	5
İzmir	Ödemiş	17,822	38.2157	27.9642	111
İzmir	Foça Toprak Su	17,782	38.6856	26.7392	37
İzmir	Güzelbahçe	18,444	38.3717	26.8908	20
İzmir	Kemalpaşa	17,749	38.4639	27.3705	208
İzmir	Konak	18,448	38.4049	27.1895	283
İzmir	İzmir Bölge	17,220	38.3949	27.0819	29
İzmir	Menemen	17,789	38.6237	27.0433	10
İzmir	Narlıdere	18,450	38.3842	27.0044	240
İzmir	A Noktası Işıklı Şamandıra	17,383	38.4256	26.9133	2
İzmir	Seferihisar	17,820	38.199	26.8350	22
İzmir	Selçuk	17,854	37.9423	27.3669	18
İzmir	Torbalı	18,030	38.1743	27.3623	60
İzmir	Urla	18,028	38.3628	26.8322	60
İzmir	Uzunkuyu Orman Sahası	18,035	38.2836	26.5770	149
İzmir	Bergama	17,742	39.1098	27,1710	53
İzmir	Bornova Orman Sahası	18,442	38.4517	27.1979	14
İzmir	Çiğli Havalimanı	17,218	38.5127	27.0144	5
İzmir	Adnan Menderes Havalimanı	17,219	38.2950	27.1481	120
İzmir	Menderes Orman Sahası	18,034	38.2447	27.0849	145
İzmir	Zeytincilik Arş. (TAGEM)	18,031	38.4517	27.1979	10
İzmir	Döküntütaş Feneri	17,443	38.3303	26.2683	0
İzmir	Çukuralan Köyü	18,901	39.1956	26.9606	640
İzmir	Güzelbahçe Feneri	17,441	38.3794	26.8861	0
İzmir	Çatalkaya Radar Sahası	18,445	38.3106	27.0006	960
İzmir	Ovacık Köyü	18,439	38.3478	27.6836	800
İzmir	Pasaport Mendirek Feneri	17,442	38.4303	27.1322	0
İzmir	Çileme Köyü	18,449	38.1408	27.1858	70
İzmir	Gümüldür Köyü	18,050	38.0720	27.0026	60
İzmir	Balıkçı Barınağı Mendirek Feneri	17,440	38.3658	26.7733	0
İzmir	Kubilay Sığlığı Işıklı Şamandıra	17,384	38.4467	26.7175	0
İzmir	İncecikler Orman Sahası	18,823	39.2414	27.1475	700
İzmir	Tire	18,029	38.1330	27.8165	70
İzmir	Mordoğan Ana Mendirek Feneri	17,444	38.5189	26.6283	0

IDW is expressed by the formula. Here;
N = total number of known measuring points.
$W(X_i)$ = weight at ith known position.
$Z(X_i)$ = shows the amount of precipitation in the ith position. The second formula is used to obtain the weights. It shows the sample point in the second formula and the distance between the prediction points (Aydin and Cicek 2013).

The tourism climate index (TCI) prepared by Mieczkowski was used to determine the climatic comfort conditions of the province in terms of tourism to determine the effect of the climatic conditions in the province of İzmir

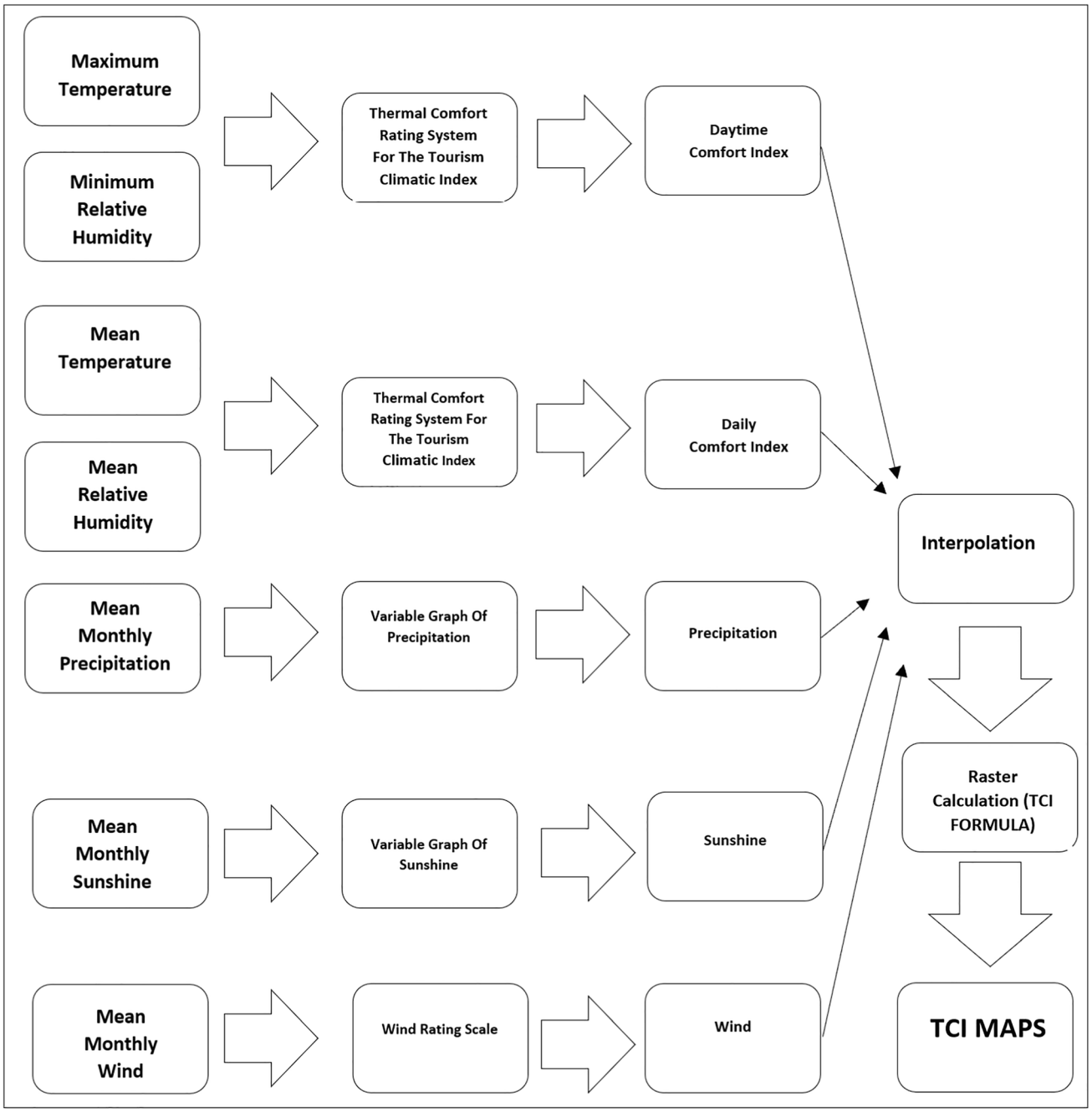

Fig. 2 Flow chart of the study methods

on tourism. This index is as follows (Kovács and Unger 2014a,b):

$$TCI = 2[4 * CID + CIA + (2 * P) + (2 * S) + W]$$

CID and CIA CID is the daytime comfort index and is calculated according to the maximum temperature and minimum relative humidity values. CIA represents the daily comfort index and uses the average air temperature and average humidity values. To reveal these values, a thermal comfort averaging system prepared by ASHREA was used. If the temperature is 20 °C and the relative humidity is 30%, the scale equivalent is 5.0. If the relative humidity is 70% at 27 °C, the scale equivalent is 3.5 (Fig. 3).

Precipitation (*P*) In the formula, *P* is the value of the monthly average amount of precipitation in millimeters.

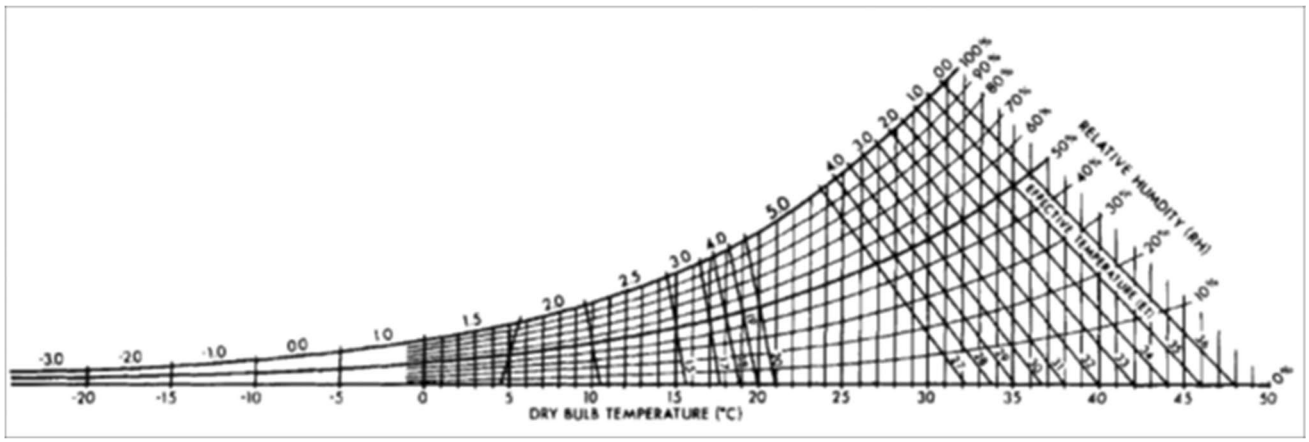

Fig. 3 Thermal comfort proportioning system (Mieczkowski 1985)

Table 2 The precipitation variable (Mieczkowski 1985)

Rates	Mean monthly precipitation
5.0	0.0–14.9 mm
4.5	15.0–29.9 mm
4.0	30.0–44.9 mm
3.5	45.0–59.9 mm
3.0	60.0–74.9 mm
2.5	75.0–89.9 mm
2.0	90.0–104.9 mm
1.5	105.0–119.9 mm
1.0	120.0–134.9 mm
0.5	135.0–149.9 mm
0.0	150.0 mm or more

Table 3 Insolation variable (Mieczkowski 1985)

Rates	10 h or more	Rates	10 h or more
5.0	9 h–9 h 59 min	2.5	4 h–4 h 59 min
4.5	8 h–8 h 59 min	2.0	3 h–3 h 59 min
4.0	7 h–7 h 59 min	1.5	2 h–2 h 59 min
3.5	6 h–6 h 59 min	1.0	1 h–1 h 59 min
3.0	5 h–5 h 59 min	0.0	less than 1 h

The weight of the precipitation amount in the TCI formula is 20%. Rainfall in coastal areas has a negative impact on tourism activities. In the summer, it is desirable to have little or no rain to carry out tourism activities. If the amount of rainfall exceeds 150 mm, it has a negative effect in terms of comfort, and its ratio in the scale becomes 0.0 (Table 2).

Sunbathing time (*S*) One of the most important climatic elements that plays a role in the realization of tourism activities is the total sunbathing time. More than 10 h of sunbathing is a situation that increases tourism attractiveness. The weight of the sunshine duration in the TCI formula is 20% (Table 3).

Table 4 Wind ratio scale (Mieczkowski 1985)

Wind speed (m/s)	Beaufort scale	Normal system	Trade wind system	Hot climate system
< 0.79	1	5.0	2.0	2.0
0.80–1.59	2	4.5	2.5	1.5
1.60–2.50	2	4.0	3.0	1.0
2.51–3.39	2	3.5	4.0	0.5
3.40–5.49	3	3.0	5.0	0
5.50–6.74	4	2.5	4.0	0
6.75–7.99	4	2.0	3.0	0
8.00–10.70	5	1.0	2.0	0
> 10.71	6	0	0	0

Wind (*W*) The wind blowing in the summer period makes people feel comfortable by providing a refreshing effect However, because the temperatures are low in winter, wind has a negative effect. In the TCI formula, the weight of the wind is 10%. According to the wind ratio scale, the "normal system" is used in locations where temperatures are between 15 and 24 °C, and the "Alized system" scale is used in locations where temperatures are between 24 and 33 °C. If the wind speed in m/s is less than 0.79, its equivalent in the normal system is 1.38, while its equivalent in the Alized system is 0.55. A hot climate system is used in places where temperatures are higher than 33 °C, and the scale is used according to wind speed at temperatures lower than 15 °C. If the temperatures are less than 15 °C and the wind speed is 2.22 m/s, it is scaled according to the normal system (Table 4).

Table 5 Tourism comfort category values (Mieczkowski 1985)

TCI numerical value	Tourism comfort category
90–100	Ideal
80–89	excellent
70–79	Very good
60–69	Good
50–59	Acceptable
40–49	Borderline
30–39	Unsuitable
20–29	Highly unsuitable
10–19	Extremely unsuitable
9–(− 30)	Impossible

The numerical values obtained as a result of the TCI formula calculated to determine the effects of climate on tourism activities are classified according to the climate category for tourism. In classification, a value of − 30 is undesirable, 50–59 is acceptable for tourism comfort, and values of 90–100 are considered perfect (Table 5).

3 Results

The tourism-based climatic comfort conditions of İzmir Province were determined according to the TCI criteria. The average temperature, relative humidity, total rainfall, and wind parameters were used for this index. In line with the data obtained, tourism-based climatic comfort maps of İzmir Province are shown in Figs. 4, 5, 6and 7. The average monthly temperature values of İzmir Province ranged between 2.2 and 28 °C. The temperature values, which reached the highest level in summer, reached their lowest level in winter. Due to the topographic structure of the city, the places where the temperature is high in the summer are the areas close to sea level, and the places where the temperature is the lowest in the winter season are in the mountainous areas. The hottest months of the city are August > July > June. During this period, the temperature is higher in areas influenced by the sea; additionally, the higher the altitude is, the lower the temperature in mountain-affected areas is. Accordingly, July and August, which are the hottest months, can be considered the months when the climatic comfort level is the lowest. In contrast, the decrease in temperature starts in November, and the coldest period is ranked as January > February > December. March is a transition period. The relative humidity in the study area varies between 43.1 and 88.0%. The relative humidity in the winter season is lowest in December–January; in summer, it reaches its highest level in July–August. Areas with a high relative humidity are in mountainous areas, especially around the province. The period when the city has the highest relative humidity starts in October and continues until the end of March. Looking at the total amount of precipitation data, the precipitation ranges from 0.08 to 310 mm. The lowest rainfall amount is observed in the summer season, and the highest rainfall amount is observed in the winter season. In general, precipitation, which has a decreasing trend in summer, increases in mountainous areas in winter. There is almost no rainfall in July and August. In contrast, January is the rainiest month, and rainfall continues in the other winter months.

A tourism-based climatic comfort (tourism climatic index: TCI) map of İzmir Province is given in Fig. 8. When İzmir Province tourism-based climatic comfort is evaluated in terms of average temperature, the spring (March–April–May) period is the most suitable period in terms of climatic comfort. The most suitable period is also in autumn (October–November). In the winter season, the comfort in December was generally acceptable and at good levels; additionally, it was determined to be generally at a good level in February. However, there was a noticeable decrease in the good level and an increase in the acceptable level in January. The fact that temperature values are low and relative humidity values are high causes different conditions to be effective in different regions in winter. There are areas at "acceptable" levels in terms of tourism comfort conditions in the northern, central, and eastern parts of the province in winter (except February). In addition, the tourism comfort conditions were "good" and "very good" in all months (except June and July) along the coastline of the province. There was no ideal area in terms of tourism-based climatic comfort conditions. It seemed that there were excellent fields ranked as the highest class. Excellent areas were detected in very small areas during the spring season. While "good" and "very good" classifications are highlighted throughout the province in the spring season, "acceptable" classifications stand out in the summer season. In the autumn season, tourism comfort conditions began to improve.

4 Discussion

The most frequently used index to reveal the effects of climate on tourism comfort worldwide is the TCI, which was developed by Mieczkowski (1985) (Lin and Matzarakis 2008; Scott et al. 2016; Hejazizadeh et al. 2019). Mieczkowski obtained monthly TCI values using the data from 453 meteorology stations around the world and generalized the values he found on 12-month world maps. He also divided comfort levels into 10 categories, defining the most comfortable category as "ideal" (TCI > 90) and the category without any comfort as "impossible" (TCI < 9) for tourism activities (Mieczkowski 1985). Although the comfort levels categorized by Mieczkowski

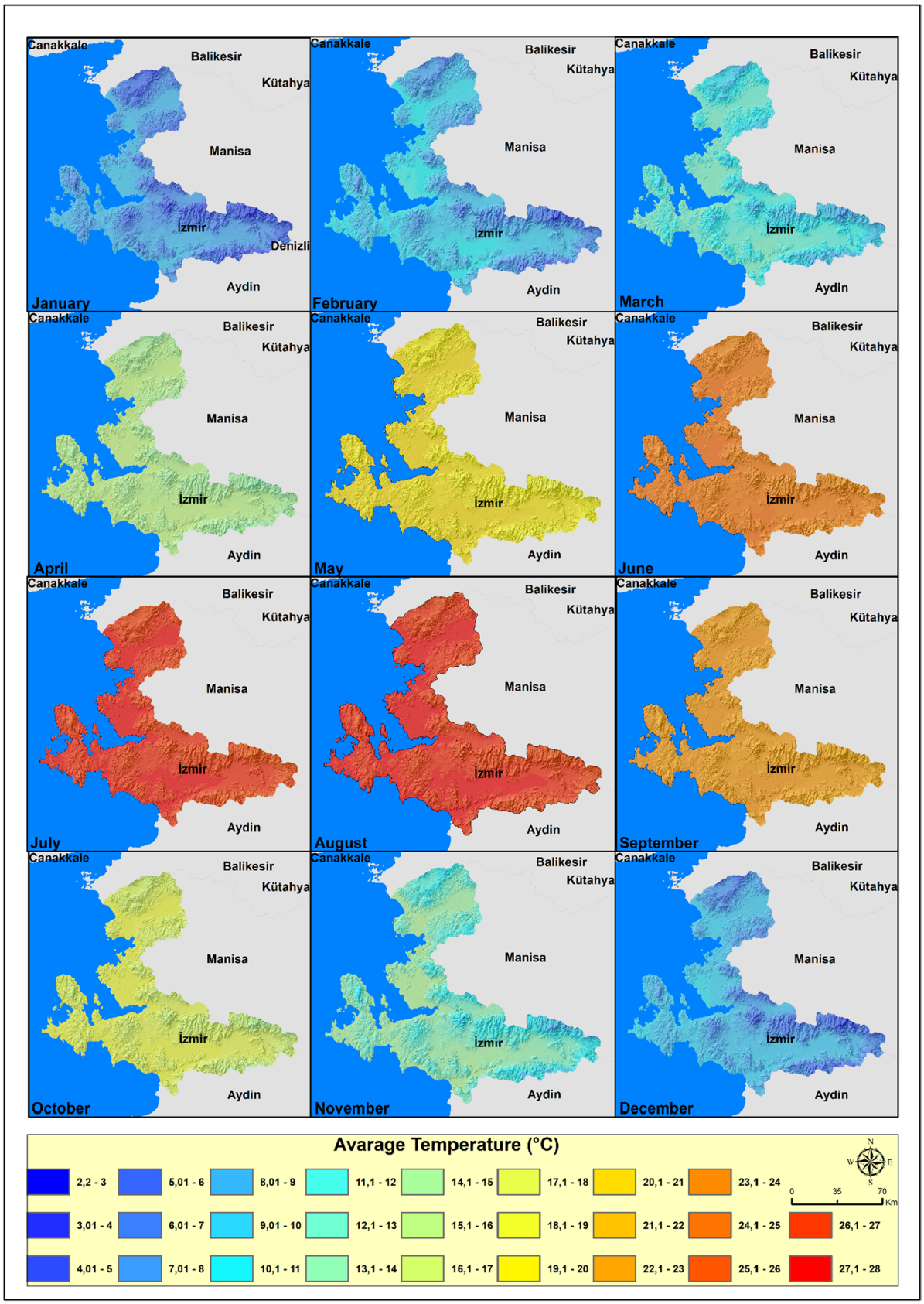

Fig. 4 Assessing tourism-based climatic comfort in İzmir Province in terms of average temperature

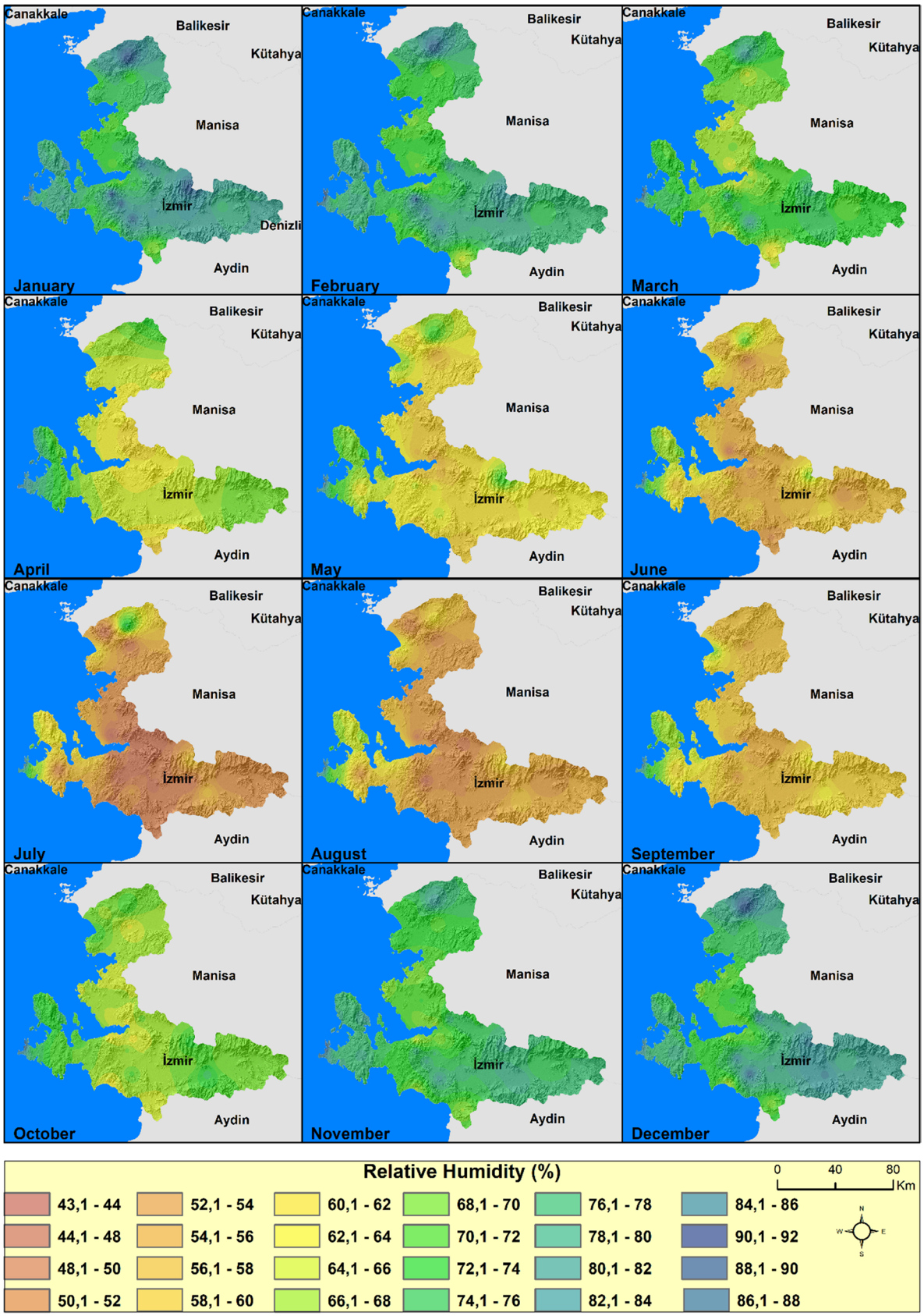

Fig. 5 Evaluation of tourism-based climatic comfort in İzmir Province in terms of relative humidity

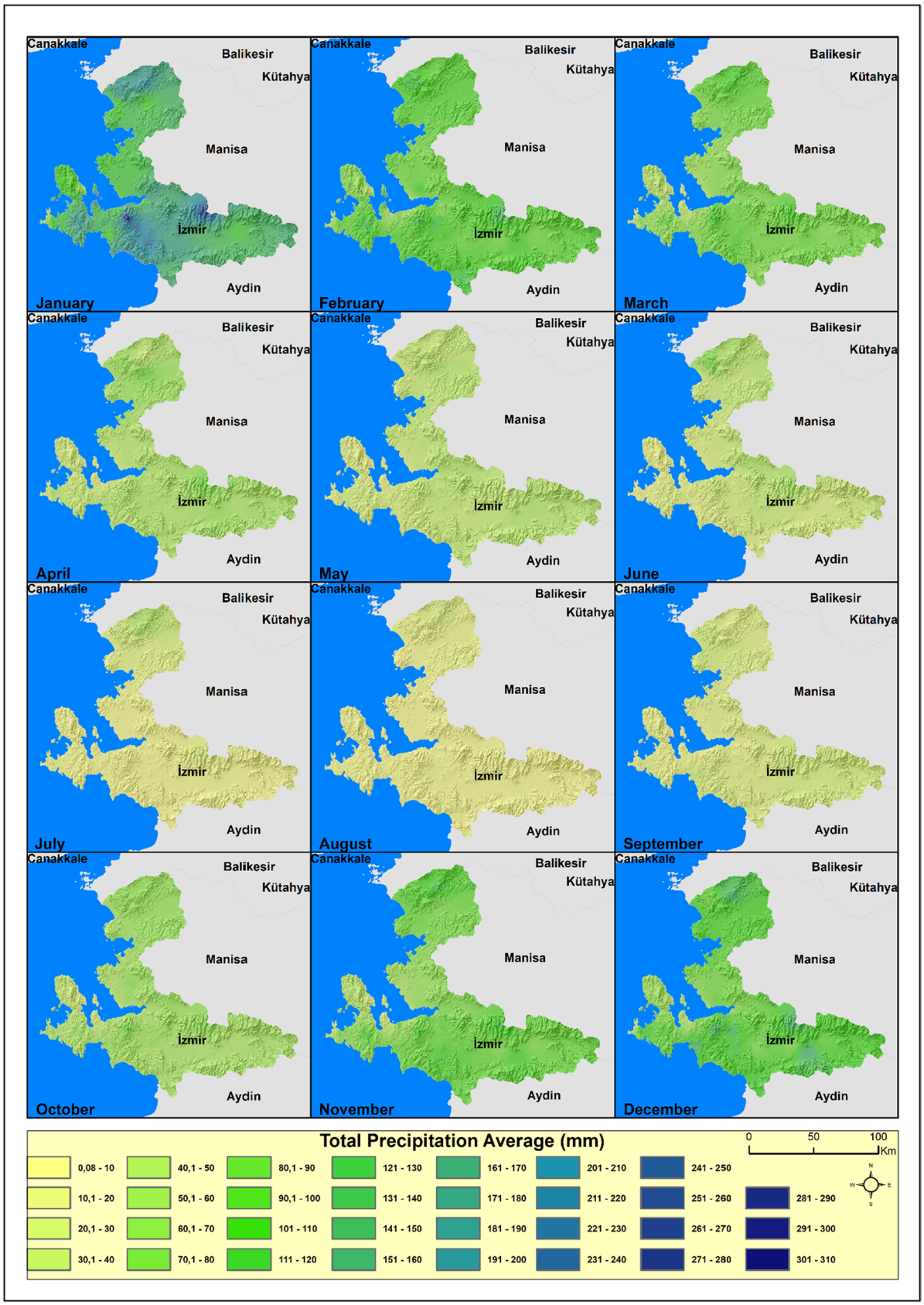

Fig. 6 Assessment of tourism-based climatic comfort in terms of total precipitation in İzmir Province

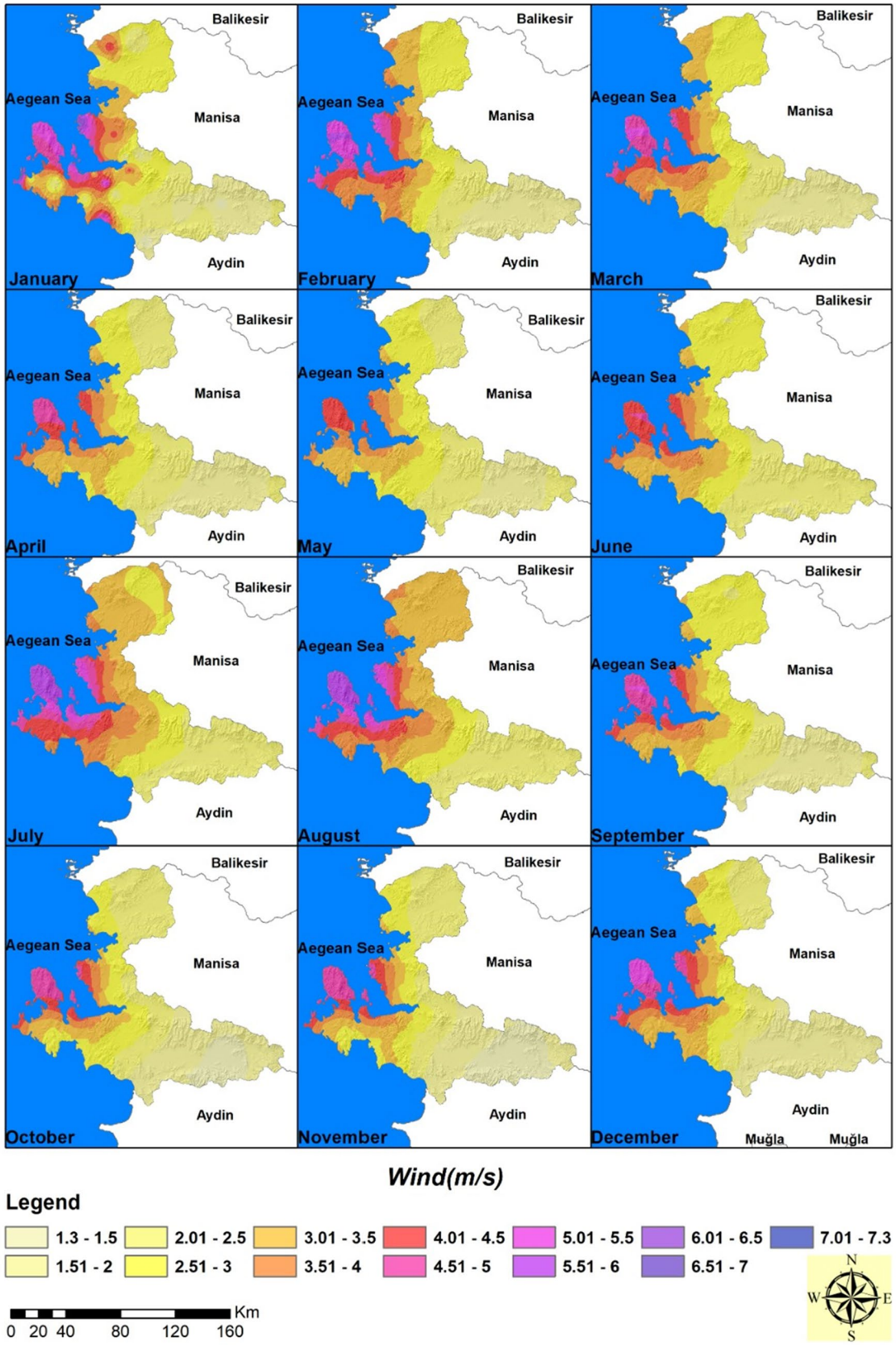

Fig. 7 Evaluation of tourism-based climatic comfort in İzmir Province in terms of wind

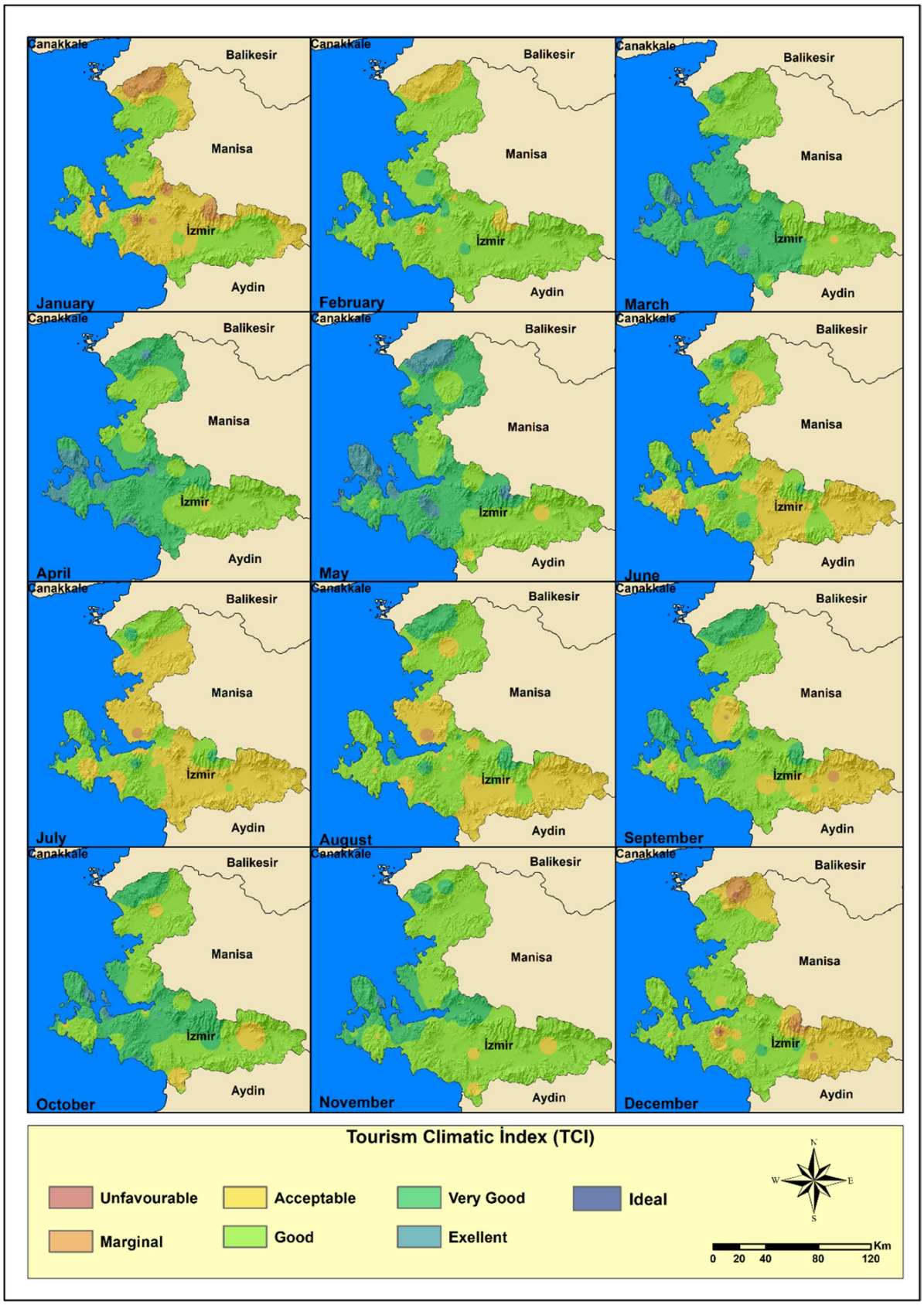

Fig. 8 Tourism-based climatic comfort in İzmir Province (tourism climatic index: TCI)

are generally accepted throughout the world, regional differences in natural conditions cause the comfort categories to differ. When the findings of the studies revealing the relationship between the climate and tourism comfort using the TCI index in Iran were evaluated together, it was noteworthy that there were areas with different categories, with the comfort level ranging from "unfavorable" to "ideal" (Farajzadeh and Ahmadabadi 2010; Bakhtiari and Bakhtiari 2013; Hejazizadeh et al. 2019). In a study on the capital Tbilisi in Georgia, it was stated that TCI values were between "acceptable" and "excellent" and that the Tbilisi climate was suitable for tourism activities throughout the year (Amiranashvili et al. 2008). However, studies on the cities of Kutaisi and Batumi revealed that the lowest comfort level was "unfavorable," the highest comfort level for Kutaisi was "excellent," and the highest comfort level for Batumi was "very good" (Amiranashvili et al. 2010, 2018). No area in the "ideal" category has been identified in these three cities of Georgia.

No month in the score value of the year in terms of climatic comfort in the province was in the "ideal" conditions of 90–100. It was determined that the comfort level was in the "good" and "very good" categories in March, April, May, October, and November and that the months of January, June, and July had the lowest comfort levels and were included in the "acceptable" category. In the spring, it was revealed that a narrow site was in the "excellent" category, and the rest of the city had "very good" and "good" comfort levels. It was determined that the coastal parts of the province were included in the "very good" and "good" categories in all months except June and July.

The findings related to Izmir, Istanbul, and Turkey's southern/southwestern coast showed some settlements that were substantially consistent with the findings. Spring was the season with the highest comfort level in all these settlements. Amelung and Viner (2006) reached the same conclusion in a study where they explained Mediterranean tourism using the TCI (Amelung & Viner, 2006). It was noteworthy that the comfort level in the "ideal" category was not seen in any month of the year at the stations of the province of Izmir, as in the stations of Çanakkale, Bodrum, Marmaris, Fethiye, Finike, Antalya, and Alanya. However, unlike the stations of other settlements, it was determined that "excellent" comfort levels were observed in very narrow areas in the province of İzmir in the spring season. Finally, the fact that the categories where comfort levels prevailed at all stations, including the Izmir stations, were between "acceptable" and "very good"/ "excellent," showed that all of these settlements were suitable for tourism and recreational activities throughout the year.

5 Conclusions

Climatic conditions affect the thermal comfort of tourists participating in tourism activities. In providing thermal comfort, it is essential that the climate components are in a value range suitable for humans. Turkey is in the fortunate position of offering diverse tourism throughout the year. In this context, the effect of climate is very high in the development of İzmir, which is one of the most important tourism cities of the country. Its natural and cultural features allow the development of different tourism areas.

According to the results obtained by evaluating all parameters in the study, the climatic comfort classes in İzmir were determined to be "unfavorable," "marginal," "acceptable," "good," "very good," and "excellent." Within the province of İzmir, there was no area in the "ideal" class in terms of tourism-based climatic comfort conditions. The highest rates of "acceptable" and "good" were seen in the assessments made for each month of the year. Considering both coastal areas and mountainous areas at the provincial scale, the months when thermal comfort was most suitable coincided with the spring period. The variety of tourism activities that can be done in these months also increased the importance of this period. Similarly, the autumn (October–November) months were the months when thermal comfort was most suitable. When the tourism-based climatic comfort conditions of İzmir Province were evaluated, the lowest comfort level was seen in January–June–July. These levels were determined to be "acceptable" and then "good."

The data obtained as a result of the study showed that İzmir Province could provide opportunities for tourism activities that could be carried out throughout the year. In addition, the fact that tourism activities in the summer period can be carried out during 5 months (March, April, May, October, November) due to the comfort level being "good" and "very good" enabled the tourism potential of the city to increase. For this purpose, activities that are carried out in areas with a "good" comfort level during the summer period should be supported and diversified. The results obtained in this study are important in terms of developing the tourism strategy of İzmir Province. For this reason, making tourism-based climatic comfort conditions for all provinces that are important in terms of tourism will make a significant contribution to the direction of the tourism strategy of our country.

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Authors and Affiliations

Fatih Adiguzel[1] · Elif Bozdogan Sert[2] · Yucel Dinc[3] · Mehmet Cetin[4] · Senay Gungor[1] · Pakize Yuka[5] · Ozlem Sertkaya Dogan[6] · Efdal Kaya[7] · Kayhan Karakaya[8] · Ercan Vural[9]

Fatih Adiguzel
fadiguzel@nevsehir.edu.tr

Elif Bozdogan Sert
elif.bozdogansert@iste.edu.tr

Yucel Dinc
ydinc@mku.edu.tr

Senay Gungor
senaygungor@nevsehir.edu.tr

Pakize Yuka
pakize.yuka@gmail.com

Ozlem Sertkaya Dogan
srtkydgn@istanbul.edu.tr

Efdal Kaya
efdal.kaya@iste.edu.tr

Kayhan Karakaya
kayhankarakaya@nevsehir.edu.tr

Ercan Vural
ercanvural_71@hotmail.com

[1] Department of Geography, Faculty of Arts and Sciences, Nevsehir Haci Bektas Veli University, Nevsehir, Turkey

[2] Department of Landscape Architecture, Faculty of Architecture, Iskenderun Technical University, Iskenderun, Turkey

[3] Department of Geography, Faculty of Arts and Sciences, Hatay Mustafa Kemal University, Hatay, Turkey

[4] Department of Landscape Architecture, Faculty of Engineering and Architecture, Kastamonu University, Kastamonu, Turkey

[5] Department of Geography, Institute of Social Sciences, Kahramanmaras Sutcu Imam University, Kahramanmaras, Turkey

[6] Department of Geography, Faculty of Letters, Istanbul University, Istanbul, Turkey

[7] Program of Map and Cadastre, Department of Architecture and Urban Planning, Iskenderun Vocational School, Iskenderun Technical University, Iskenderun, Hatay, Turkey

[8] Program of Cultural Heritage and Tourism, Department of Travel Tourism and Entertainment Services, Vocational School of Urgup Sebahat and Erol Toksoz, Nevsehir Haci Bektas Veli University, Nevsehir, Turkey

[9] Department of Geography, Faculty of Arts and Sciences, Harran University, Sanliurfa, Turkey