Investigation of the Relationship Between Wind Force and Decreasing the Intensity of Usage in Maltepe Coastal Fill Area

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***Abstract*—Coastal fill areas has been thought that using of natural data is not considered in architectural design while fill areas were planning. It has been seen that the wind, should be included in design studies as a determining element in the design criteria. Otherwise, open spaces become uncomfortable. It has been suggested that landfills of Maltepe coastal areas have different climatic data before being filled. It has been thought that the utilization rate of coastal areas decrease comparing usage of unfilled areas. It has been showed with two-year individual observations that the rate changes according to users and climate.**

The aim of the project is to reveal the problem that the usage rate in Maltepe / İstanbul fill area changes depending on the wind intensity. In study, filling area examined in terms of wind speed and determined the intensity of usaged. The speed of the wind above 5 m/s in the open area is taken as the threshold value at where the user is disturbed.

- **Maps, graphics obtained which show the direction and speed of the wind in Maltepe coast.**
- **Gale force was measured by ananometer and users of the areas were examined by questionnaire in three different specified area.**
- **The photos are taken at the area for examine rate of use.**

According to obtained datas, the result is the wind affects the use of the field. According to the wind effect on users at the landfills areas, it was revealed that designers needs to consider measurement of the gale force in open space regulations.

Open urban spaces are used by local in habitants and tourists. Its also important to be able to use the open urban spaces comfortably related to the cultural interaction. To ensure the comfort of usage of the open urban spaces for sustaniable tourism, will help the touristic cities to be preferable.

***Index Terms*—coastal areas, fill areas, wind, life quality, use intensity, user type, comfortable areas, concern about usage intensity**

I. Introduction

Coastal areas has been a point of a shooting in the city. Cities with a population density in coastal areas from time to time whether it us used as fill-in fields, recreation areas reviewed. The effort to create urban open space is extremely important for both inhabitants and tourists. However, there is an open space that was created to continue and is expected to improve the quality of life or more. Filler fields common in the literature realed to the field of the titles has created ecological imbalances, depending on the wind field and the stands. From a user perspective to a study of the area depending on the prevailing winds on the intensity of use has been found. However, the climatic data in the literature on the effects of creating open space criteria as relevant to the design and comfortable spaces to work have been found.

Fill areas when planning the design area it is believed that the use of natural data do not take into account. Wind is the at the top of natural data. Wind is a natural element that directly affect the quality of life. On this subject in a work of literature that should be incorporated into the desing of a climatic wind data was observed. Arises in otherwise uncomfortable places.

II. Purpose

The study is located in İstanbul, Maltepe fill the space specified by examining the intensity of use in terms of design criteria relevant to a determination of the wind study.

The purpose of this study fill an area planned as part of the coastal area in winter and spring months, the wind and the fall of the detection of the increase in the intensity of use intensity. In four seasons at the same rate of the fill area of the coast that has not been used to detect and to extend the usage time of the area revealed the need to undertake work on behalf of. Field studies and analysis of the data followed by the designs of this type of fill area and fill area during wind create comfortable spaces to extend the use of on behalf of to be included in the desing

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revealed need for. Evaluation of research in creating sustainable open spaces in coastal area as wind has revealed the need for design criteria to benefit in economic terms the project a study on how it can be used at the maximum level of investment in these areas.

In addition to, the open urban spaces are the attraction points in cities regarding tourism. To extend the time of usage of the open urban spaces in cities, will provide for the tourists and the local people a meeting environment. In a long term, it will help the world peace.[1],[2]

III. Literature Summary

The literature section is composed of two main sections. Firstly; the data defining the use of open space generated through the literature. Secondly; the literature in determining comfort conditions were defined through the use assessment criteria in the open space.

‘‘Nowak ve Dawyer’ (2007) according to the proper planning and managing urban ecosystems and human health green open area provides many other positive effects on. Herbal materials change the speed of the wind, urban surfaces and changing of heat storange using water creating shaded spaces to a single forest, by creating a local climate and air quality affect thermal comfort on a scale raning. (Yılmaz and Irmak, 2010)’[3]

Süleyman Toy and Sevgi Yılmaz ‘Bioclimatic Comfort in Landscape Design and its Importance for Living Areas’ [4] from the work of called. In this study, Human bioclimatic comfort conditions for a region, including studies on comfort in the years of the distributions is generally trying to find. Ultimately in terms of comfort in appropriate periods, such as tourism and recreation based on the outer space of human activity, is recommended. Outer space landscape architecture planning and design at an area of interest to professionals because it is an area of landscape planning and design at least to be made to the area in which the intensity of use will be high during the season knowing that a comfortable period in terms of space necessarily must be known. Another advantage is the comfortable periods the activity of the external structures that are known is that it can be put in the middle of the options. In this way, land use can be shaped according to the periods and also comfortable.’ the intensity and duration of the use of the spaces of the world in the comfort of the space, they noted.

Ece Şahin and Neslihan Dostoğlu ‘ Use of natural data in the design of urban space ‘[5] called in the work; the design of a successful open space, however, stated that in consideration of the climatic data would be made. When designing urban spaces, the successful interpretation of the climatic data, to reduce the worst effects of the climate, these areas become more used to he brought,

Spring and Depending on the structure of the region in the design of climatic wind, sometimes desired, and sometimes undesirable and preventable factors,

By considering the difference of winter, needs to respond to two different places for efficient use design should be stated.

In addition, they emphasized that reducing the adverse effects of climatic data would make these areas more useful.

On the other hand from Technical University, Istanbul Erkin Musayev ‘Evalation of Yalova 17 Ağustos Shore Park In Terms of Landscape Planning and Design in the Frame of Utilization of Urban Shore Filling Areas’[6] in the thesis;

‘Made on the coast, filling the natural balance of ecological damage despite the work of today's coastal cities of this area for both active and passive recreational purposes of any figure, a rational planning and design is important in terms of the benefits they provide to our cities.’the statement emphasized the importance of the design of filling the space.

The most important design criteria in terms of urban recreation areas and the town square gotta climatic data should be. Intense and stressful work life of the urban population in the city socializing and sports activities in terms of mental health and physical health needs. These bioclimatic comfort in an environment of healthy activities, including only the necessary executable. The user is located at the open fields between types of tourists. The open areas of the city, including by considering a threshold of designing with bioclimatic comfort in terms of tourism sustainability. In coastal areas, fill the elements of tourism planning by considering the climate of the area also contributes on a large scale. Sustainable tourism also means sustainable public space.

‘Weather is the state of the atmosphere at a moment in time, as determined by the simultaneous occurrence of several meteorological variables (temperature, wind, cloud cover, precipitation) at a specific geographical location. Weather is an element of the environment that nobody can escape. That weather is good or bad is subjective, and depends on personal preferences, activities, and personal health. Weather is what tourists actually experience when at a destination, affecting their activities and holiday satisfaction. Weather also affects key aspects of tourism operations, including infrastructure, activity programming, and operating costs.’[7]

It has been known that there is a relationship between tourism and climate in a long time. Climate experts have studied climatic thresholds that define the season length for tourism activities. Biometeorologists have examined systems for evaluating climate variables, the physical comfort of tourists and the climate of tourism destinations. The suitability of a particular climate and weather conditions varies for different types of tourism. Therefore, climate and weather conditions are crucial for sustainable tourism. [7]

‘The natural environmental conditions, have a direct impact on the character of space is a feature.(Hızlan,1996) In this respect, the urban Square in order to fulfill the functions of a real sense of natural environmental features and the climatic conditions of the place where it is located and benefit the most from the protection is essential. In particular, the most intensive use occurred in the times, sun, shade, wind associated with the elements

of the natural environment and so must offer a comfortable environment.'[8]

'The regulation of public spaces to meet basic needs, enhancing the amount of time they spend to make arrangements users in the field and to create opportunities where you can spend enjoyable time is directly related to spatial design. However, the most important spatial attribute field in the design process of the design of the region/city must be specific. Different terrain, different climates, and different cultures need different requirements. For this reason, in a region or city in a very well-functioning public space of urban living in another region have the same success all the time are to be expected. When considered in terms of climatic effects, especially in cold regions with hot climatic conditions required by both overt and closed areas in terms of design details design details differ. Harsh climatic conditions in the winter months and is effective in countries and cities where people in public venues, the rate of use fell, and as it is associated with reduced opportunities for socializing is characterized as a period of becoming more and more alone. To minimize these negative effects and year-round living for the creation of public spaces, many studies are being done in the northern countries the winter period is long developed and is being implemented.'[9]

'Consisting of wind pressure differences, in terms of climatic comfort is an important element of climate control. According to Yılmaz (2005) from a structural point according to the wind pressure, vibration from a dynamic perspective; environmental health; heat transfer in terms of comfort, pollution and noise, there are effects such as rain and air leaks.'[10]

'Including bioclimatic comfort, most of the people that feels most healthy and dynamic climate policies. In other words, while spending the least amount of human energy that can fit into the environment conditions. Bioclimatic comfort, which is important in providing the components of climate, including temperature, Relative humidity, radiation and wind, such as may affect.'[11]

'Including 'comfort with climate Olgyay bioclimatic to be done in order to ensure the values of the elements Olgyay(1973) ;in the open 21-27 ℃ temperature, %Relative humidity 30-65, and 5 m/sec of wind speed is explained as a combination of up to. Many of these values were used for bioclimatic assessment with including.'[11]

The intensity of land use and open space design criteria concern the intensity of the wind in to take the place of the use of outdoor space will increase. Moving in the city will increase the population. The increase in the population moving will be a factor highly influential in the formation of a healthy society. The wind in the intensity of use the intensity of the fill area Maltepe work and has done a study on.

The literature about the subject; Gülay Zorer Gedik and Raşide Çaçan's;

''Farklı İklim Bölgelerinde Açık Alan Rüzgar Konforu Değerlerinin Belirlenmesi ''[12] in the work of called;

'The wind has had on the human body firstly in terms of the mechanical stresses in Melbourne, Australia and significant acceptable pedestrian wind conditions in the Old Town centers of the cities of max. discussing wind speeds, by their own admission, organized in terms of acceptable comfort conditions max. as the speed, pressure value, which is about half of people will cause you to swing around 16 m/s is committed to. Melbourne did additional research on the work of Davenport, has proposed a table based on the Beaufort scale.' Have said. (Table I)

TABLE I. BEAUFORT SCALE OF WINDS AS USED ON LAND, AFTER ASCE (2003).[13]

Beaufort Number	Descriptive Term	Speed (km/h)	Specification for Estimating Speed
0	Calm	Less than 2	Smoke rises vertically.
1	Light Air	2 – 5	Direction of wind shown by smoke drift but not by wind vanes.
2	Light Breeze	6 – 11	Wind felt on face; leaves rustle; ordinary vane moved by wind.
3	Gentle Breeze	12 – 19	Leaves and small twigs in constant motion; wind extends light flag.
4	Moderate Breeze	20 – 29	Raises dust and loose paper; small branches are moved.
5	Fresh Breeze	30 – 39	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6	Strong Breeze	40 – 50	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.
7	Near Gale	51 – 61	Whole trees in motion; inconvenience felt in walking against the wind.
8	Gale	60 – 74	Breaks twigs off trees; generally impedes progress.
9	Strong Gale	75 – 87	Slight structural damage occurs e.g. to roofing shingles, TV antennae, etc.
10	Storm	88 – 102	Seldom experienced inland; trees uprooted; considerable structural damage occurs.
11	Violent Storm	103 – 116	Very rarely experienced; accompanied by widespread damage.
12	Hurricane	Above 116	

'Studies focusing on the mechanical effects of the wind are also mostly about the wind. The wind effects on the human body, given open space to ensure the comfort of the threshold value for the determination of the wind speed is mandatory. Cold wind, the refreshing effects and beside it, it also mechanical strain, the activity levels of the user given region and climate has been designed for open spaces, walks through the process of determining the threshold value in terms of comfort.'[12]

'Studies on wind speeds that provides human comfort in the open field; the wind studies that focus on the mechanical effects on the human body (H. Holger Koss, 2006; Eddy Willemsen, Jacob A. Wisse, 2007; Pendwarden, A.D., Wise, A.F.E. 1975; Isyumov, N., Davenport A.G. 1975), studies that focus on thermal effects (Arens, Edward A, 1989; Koch-Nielsen, H., 2002), studies that address the situation or both (Ted Stathopoulos,2003, 2009; Hoppe P. , 2002; Agota Szucs, 2004, 2006), it is observed that can be classified as.'[14]

'A simple rule of thumb has been provided by Wise (1970) and Pendwarden (1973). This is based on mean speeds (V) assuming the following effects: − V = 5 m/s or 18 km/h onset of discomfort − V = 10 m/s or 36 km/h definitely unpleasant − V = 20 m/s or 72 km/h dangerous Conditions for pedestrians are considered acceptable if V > 5 m/s less than 20% of the time (Pendwarden and Wise 1975).'[13]

On the other hand, Ted Stathopoulos 'Wind and comfort' (2009) in titled study of wind uncomfortable have addressed the topic created for pedestrians. Figure 1. 10-15 km/h of wind speed has shown the effects in the human body.[13]

Figure 1. Wind tunnel exposure of people at 10-15 km/h winds[13]

'Theodore Stathopoulos and others "Outdoor Human Comfort In An Urban Climate" (2003), head at study, the typical relationships between human activities and the levels of comfort that creates a comparative statistical analysis on weather related parameters are important because transform and define a research program.'[14]

In addition to all these, IR Dr. Johnny T. S. Yu, ' Wind effects on pedestrians'[15] in the study of which is called the wind in the pedestrian zone criteria with the criteria of different researchers decided universally unacceptable uncomfortable stated that it was unique. Hong Kong city pedestrian wind comfort studies has done a review of the case by.

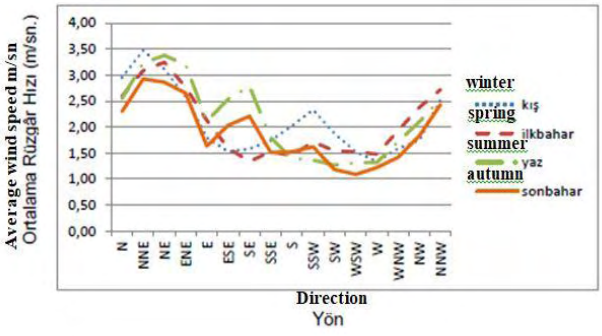

Figure 2. The hours of operation for seasonal wind speed values in Istanbul[14]

Figure 2. Gülay Zorer Gedik, Raşide Çaçan, Fatih Kiraz,Neşe Yüğrük Akdağ and Bekir Şener(2014) project in; On 6:00, 9:00, 12:00, 15:00, 18:00,21:00 and 24:00 hours seasonal shows values for wind speed and direction. When analyzing the data, the highest wind speed from the Northeast to North during the winter months 3,50 m/sec is reached, it is seen that.

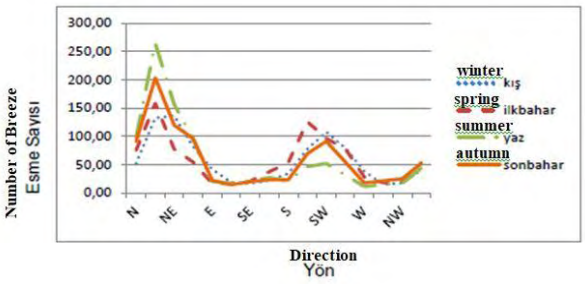

Figure 3. The hours of operation for seasonal number of wind breeze in İstanbul[14]

Figure 3 Gülay Zorer Gedik, Raşide Çaçan, Fatih Kiraz,Neşe Yüğrük Akdağ and Bekir Şener(2014) project in; On 6:00, 9:00, 12:00, 15:00, 18:00,21:00 and 24:00 hours the number of seasonal wind shows values for breeze. Looking at the chart, the numbers in the fall and spring, per breeze 150.00-200.00 and is blowing from the northeast between. In winter, the number breeze 100.00-150.00 between the northeast direction. One winter the air temperature in open space is important for the design of the numbers obtained is low and breeze. In open areas the wind speed and the intensity of use in terms of numbers breeze should be considered values for breeze in Istanbul.

TABLE II. THRESHOLD VALUES FOR WIND SPEED[12]

ACTIVITY LEVEL	ERZURUM		DİYARBAKIR		ANKARA		ANTALYA		İSTANBUL	
	SUMMER	WINTER	SUMMER	WINTER	SUMMER	WINTER	SUMMER	WINTER	SUMMER	WINTER
SITTING							1<,<3.6	<3.6	<3.6	<3.6
WALKING							1<,<5	<3.6	<5	<3.6
ALL	<3.6	<2.5	<3.6	<2.5	<3.6	<2.5				

Table II. The result of the studies Gülay Zorer Gedik and Raşide Çaçan (2014) On a threshold value is obtained. Activity levels in the spring all across the Turkey 3.6 m/sec wind speed as a threshold that could be considered stated.

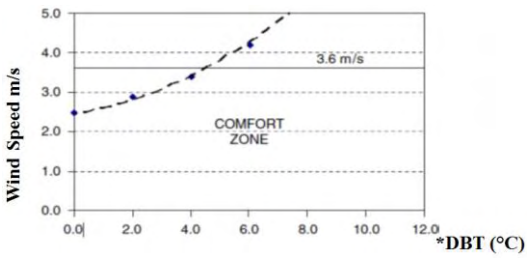

Figure 4. For the open spaces acceptable wind speed the effect of the wind created using the WCI* graph and the mechanical threshold value (Szucs et al. 2007)[14]

*WCI is the wind created by the low temperatures "cold" effect. (Çaçan ve Zorer Gedik, 2013)

*DBT is the dry thermometer temperatures. (Zorer Gedik,Kiraz ve Ça çan,2014)

Figure 4; 'Acceptable temperature drops as wind speed, wind cold decreases due to the effect of 2.5 m/s, after a situation in which this effect can be ignored. In the graph, for example, dry bulb temperature (DBT) is approximately 3.5℃ when the wind hits max. 3 m/sec blowing at a speed that should be observed. Otherwise the wind cause a cold effects.' [14]

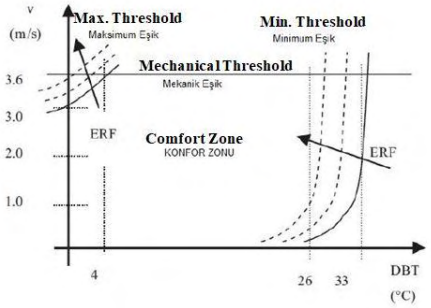

Figure 5. Comfort zone with flexible limits (Szucs vd., 2007)[14]

Kiraz and Çağan; Figure 5; Navigating higher speed than has stated to sit that can be considered values. On the Beaufort scale "sweet wind" with the definition of 3.4 to 5.4 m/s. just walking between values the wind speeds and high humidity purpose that was discussed in the areas needed and 3.6 m/sec. with higher speed than bioclimatic values, including he stated that in terms of comfortable might be more appropriate.

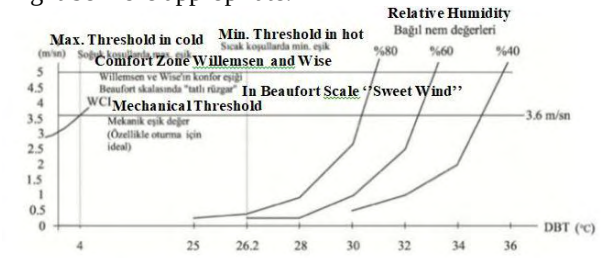

Figure 6. Comfort zone chart for different humidity values and activity levels.[14]

In the graph, the average wind speed in an area with high humidity and temperature in summer max.to living the values of 3.6 m/s for hiking while it is 5 m/sec, the wind effect is taken into account chill during the winter months, since in all activities, max. 3.6 m/sec is taken to be when the average of temperature values this value is quite low in areas with 2.5 m/s should be selected as was emphasized.

TABLE III. CRITERIA FOR WIND COMFORT AND DANGER IN NEN 8100 AFTER WILLEMSEN AND WISSE (2007)[13]

Wind comfort				
$P(V_{IS}>5m/s)$ in % hours per year	Grade	Activity area		
		Traversing	Strolling	Sitting
< 2.5	A	good	good	good
2.5–5.0	B	good	good	moderate
5.0–10	C	good	moderate	poor
10–20	D	moderate	poor	poor
> 20	E	poor	poor	poor

Wind danger		
$P(V_{IS}>15$ m/s)	Limited risk	0.05-0.3 % hours per year
	Dangerous	> 0.3 % hours per year

Table III Stathopoulos(2009)[13] 'Wind and Comfort' in his work; in the Netherlands a few experts, architects and engineers for a few years as a result of intensive study stated that a new regulation has been approved. Average hourly rates are summarized at the pedestrian level.The threshold value for the comfort of the average wind speed 5 m/s for danger 15 m/s unless otherwise indicated.

Looking at the literature, the decisive element in the design of open space and coastal areas as a place of comfort and quality of life, including bioclimatic design should be incorporated into the living space was observed.The particular climate element, which is wind, moving and social life of the population when planning to create a comfortable space in terms of the sustainability of coastal areas should be concluded that the most important criterion. Arises in otherwise uncomfortable places.

This study in ways which have not been studied previously, fill the coastal areas of the city and the user has emphasized the importance of consideration when designing wind of the relationship. The maximum level of investment possible for the need for wind data to be used at architectural design solutions has been identified. The results of the project, are expected to contribute to architecture and Urban Planning.

IV. METHOD

Material that is used in research;

- Istanbul Maltepe Map Satellite Images(Figure 7)
- Satellite images of Maltepe
- Coastal areas and open areas which were made before the dissertation relating to research and projects
- Recreation areas, coastal areas and open space related to the studies previously published
- Wind map in Maltepe coastline obtained from *T.C. Ministry of Energy Natural Resources-General Directorate of Renewable Energy
- Monthly data graphs of air temperature, wind speed and direction of Maltepe obtained from www.meteoblue.com website
- Testo Electronics and Test Measurement Instruments purchased 3 units 410-1 Anemometer model coded from the firm (purchased under the supervision of Yildiz Technical University Research Project Coordinator)

*T.C is republic of Turkey.

Figure 7. Maltepe fill area, and three areas of the research field selected for (Google Earth 15.06.2017)[16]

In every season in the coastal area of research that has not been used to detect the intensity of the same use of open spaces and times of the particular use of the filling area, to extend the determination of the need for all the months of the year is carried out . Were detected with four methods in the field of research. Measurements were taken at three selected points, photographs were taken to observe the intensity of use of the area, and surveys and observations were made with the users. Measurements from the winter months when wind speeds are high, during the summer months starts in the month of November and until the month of June were made. Measurements were made every week from 12.00 to 18.00, when rate of use is high. The aim of the measurement is to reveal that the wind speed in the coastal zone of the fill area is affecting the use.

The user types identified in the study and were surveyed. Users surveyed demographic information has not been asked. Only the condition of space and the utilization rate of wind exposure was evaluated. The universe of the survey, Maltepe fill the area on the weekends 12.00-18.00 hours of use between young people, families with children and the elderly. The sample of the survey, weekends 12.00-18.00 a walk in the coastal band between randomly selected which makes the Young, the elderly and families with children, consisting of 122 persons. Other user types to families with children and the elderly are thought to be more sensitive to adverse climatic conditions. Requests to change activity in adverse conditions and fast decisions by considering young people were included in the sample. Conducted interviews with research users who use the area frequently. Objective to analyze the padding of the field interviews with regular users who is able to provide positive and negative climatic elements. The scope of the research 53 young, aged 35 and 34 with a family of children were discussed. (Figure 8), (Table IV)

V. Results

In this section, Maltepe Fill Areas within the scope of the climate parameters of wind speed and the intensity of use in terms of the relationship will be evaluated.

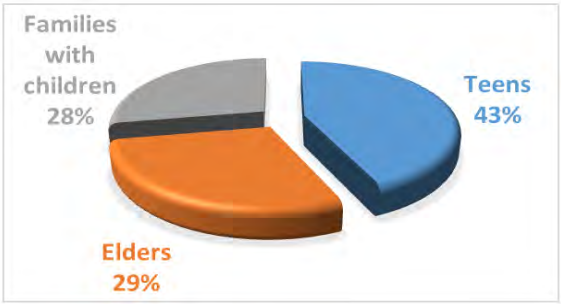

Figure 8. Distribution according to the user type

TABLE IV. DISTRIBUTION ACCORDING TO THE USER TYPE

	Teens	Elders	Families with children
Number	53	35	34
Percent	43	29	28

Of the users surveyed age of 15 and 60+ ranged and the largest user rate of 43% in the age group 15-30 with a user belonging to the type. (Table V), (Figure 9)

TABLE V. DISTRIBUTION ACCORDING TO THE AGE OF THE USERS

	15-30	30 – 45	45 - 60	60 +
Number	53	25	9	35
Percent	43	21	7	29

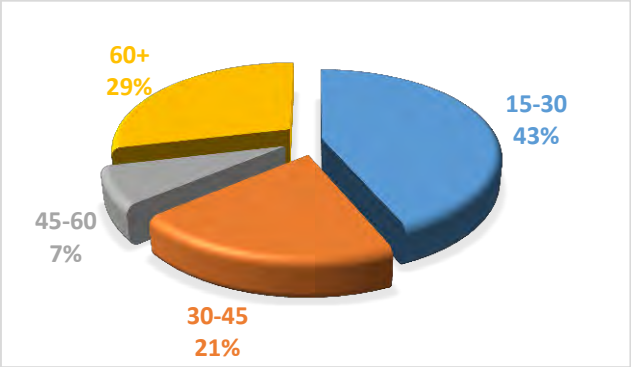

Figure 9. Distribution according to the age of the user

Fill the poll with the users of the area, 94% have reported that they are using often. Fill the area with the highest rate of the utilization rate of 81%, it is observed that with the summer season. The lowest rate of 93% has been with the winter season. (Table VI.)

The user group is 90%, it was determined that they are disturbed by the wind. When the wind speed is high, the 80% do not continue to use the user group, 20% of the user group for the work they continue to use the equipment creating a comfortable environment and take the necessary precautions that are indicated. Shoreline is located in the walking path of the user group that is disturbed by the wind 84% type. (Table VI.)

TABLE VI. DISTRIBUTION OF USERS ACCORDING TO THE FREQUENCY USAGE OF SPACE

	Ranges	Number	%
How often do you use Maltepe Fill Area?	Often	115	94
	Sometimes	7	6
Which season do you use more often?	Spring	15	12
	Summer	98	81
	Autumn	5	4
	Winter	4	3
Is there a season you never used?	Spring	4	3
	Summer	0	0
	Autumn	5	4
	Winter	113	93
Prior to the fill area did you use ?	Yes	116	95
	No	6	5
Does the wind affect your use of the fill area?	Yes	110	90
	No	12	10
If in windy weather affects what are you doing? Do you continue to use?	By taking the necessary precautions (Yes, hat – scarf, etc.)	25	20
	No, I do not use the coast, I walk near the road in the inner part.	97	80
Do you feel the wind walking on the path ?	Yes	103	84
	No	19	16
Do you aware of the north-south wind?	Yes	12	10
	No	110	90

Maltepe coastal area of the filler in the band to determine the measurement results in changing the wind speed the highest wind speed for each month on behalf of the selected coordinates and the results are given in Table VII. The measurement endpoint in coastal compared to the results of the measurements after the band fill space, which is considered discomfort threshold 5 m/s that was on it was determined. At the same time, there was not detected wind speed to create a state of discomfort in coastal roadside and unfilled area. (Table VII)

TABLE VII. MONTH'S HIGHEST WIND MEASUREMENT DATA ACCORDING TO THE SELECTED POINT

UTM Coordinate (6 Degress)		Grid Zone Sign	A coordinate of the fill area on the coast
East(Right Value)	For TheNorthern(Upper value)	Number	Letter
677962.44 d	4533010.71m	35	T

Days	Hours	Temperature	Wind Speed	Status of Comfort
20 November 2016	17.00	7,8 °C	12,6 km/h	+
25 December 2016	18.00	7,1 °C	18,2 km/h	-
15 January 2017	15.00	18,2 °C	19,9 km/h	-
4 February 2017	16.00	10,1 °C	18,6 km/h	-
11 March 2017	16.30	10,6 °C	10,7km/h	+
23 April 2017	17.30	13,1 °C	18,3km/h	-
6 May 2017	13.30	16,5°C	11,3 km/h	+

UTM Coordinate (6 Degress)		Grid Zone Sign	A Coordinate From The Unfilled Coast
East(Right Value)	For TheNorthern(Upper value)	Number	Letter
677403.61 d	4534519.85m	35	T

Days	Hours	Temperature	Wind Speed	Status of Comfort
20 November 2016	17.00	7,5 °C	9,9 km/h	+
25 December 2016	18.00	7,8°C	7,8 km/h	+
15 January 2017	15.00	8,3°C	8,3km/h	+
4 February 2017	16.00	13,0 °C	13,0 km/h	+
11 March 2017	16.30	11,0 °C	15,7 km/h	+
23 April 2017	17.30	19,1 °C	9,9 km/h	+
6 May 2017	13.30	19,1°C	13,6 km/h	+

UTM Coordinate (6 Degress)		Grid Zone Sign	A Coordinate The Side of The Road
East(Right Value)	For TheNorthern(Upper value)	Number	Letter
678296.87 d	4533302.04m	35	T

Days	Hours	Temperature	Wind Speed	Status of Comfort
20 November 2016	17.00	9,0 °C	4,0 km/h	+
25December 2016	18.00	14,5°C	4,0 km/h	+
15 January 2017	15.00	12,2 °C	12,2km/h	+
4 February 2017	16.00	11,8 °C	2,8 km/h	+
11 March 2017	16.30	11,2 °C	6,4 km/h	+
23 April 2017	17.30	21,6 °C	13,3 km/h	+
6 May 2017	13.30	18,7°C	11,5 km/h	+

When analyzed in Table VII, The measurement area on the coast of fill Olgyay (1973), according to discomfort in the open field, the lower limit is determined as 5 m/s(3,4-5.4 m/s value of 12-19 km/h corresponds to)(beaufort scale) for the value of has been determined to have a day uncomfortable. At the same time, Çaçan and Zorer Gedik(2013)[9] obtained in the work of all activity in Turkey in the spring in the level of 3,6 m/s wind speed threshold value that can be considered as the result of considering the assessment reviewed. Unfilled on the side of the road on the shore and the measurements above this limit values were obtained.

TABLE VIII. WIND SPEED DATA WIND RESEOURCE INFORMATION FROM THE AREA CALLED REPA SPOT FILLER MALTEPE

UTM Coordinate (6 Degress)		Grid Zone Sign		Repa Annual Average Wind Speed (m/s)
East(Right Value)	For the Northern(Upper Value)	Number	Letter	
678301,61 e	4532899,36 n	35	T	

m	Hours	Temperature	Wind Speed	Status of Comfort
30m	not specified	not specified	6,16 m/s	-

In the chart VIII fill space coordinates of the wind data is located in Maltepe. 6,16 the measurements at 30 m of the average annual wind speed m/s speed and is designated as the designated Olgyay (1973) accepted as threshold according to discomfort 21-27 ℃ temperature, %relative humidity 30-65, and 5 m/sec wind speed, it is seen that up to a combination of does not provide.

A. Field Photo

1) Filler Coast

Figure 10. Filler coast in February(Photographer: Miray Atmaca)

Figure 11. Filler coast in March (Photographer: Miray Atmaca)

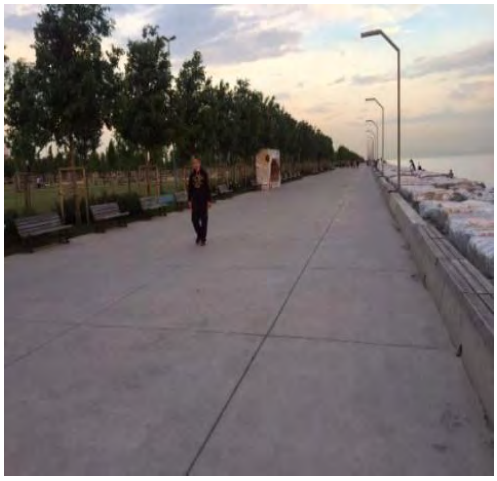

Figure 12. Filler coast in April (Photographer: Miray Atmaca)

2) Unfilled Coast

Figure 13. Unfilled coast in March (while measuring) (Photographer: Miray Atmaca)

Figure 14. Unfilled coast in April (while measuring) (Photographer: Miray Atmaca)

3) *Roadside*

Figure 15. Roadside in February (while measuring) (Photographer: Miray Atmaca)

Figure 16. Roadside in March (Photographer: Miray Atmaca)

Figure 17. Roadside in April (Photographer: Miray Atmaca)

Photos taken in the field were evaluated; in the 4 February at 16.00 in the picture in the fill area of the coast is very low, it is observed that the rate of use of. Shows the captured image to fill the area in 11 March 16.30 coast limited user again. At 16.30 in 11 March again in the inner part and the side of the road in the picture it is observed that more user. 23 April at 17.30 also is in the picture again, if the fill area on the coast of a limited user, unexpired coastal side of the road, and more users are observed in the inner part.

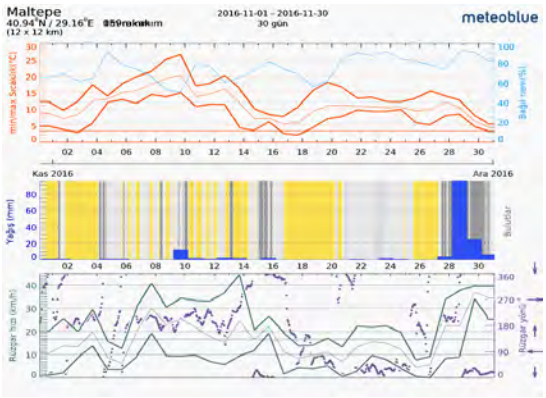

Figure 18. Temperature-wind speed-relative humidity values of Maltepe in november at Meteoblue [17]

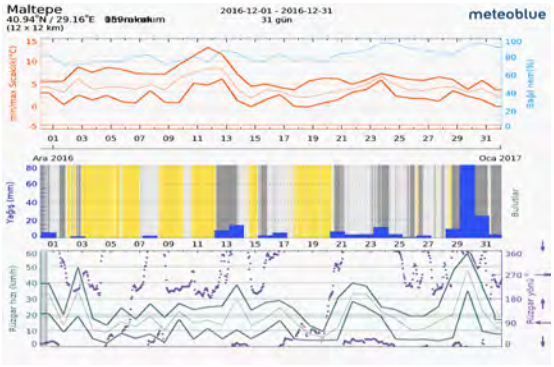

Figure 19. Temperature-wind speed-relative humidity values of Maltepe in december at Meteoblue [17]

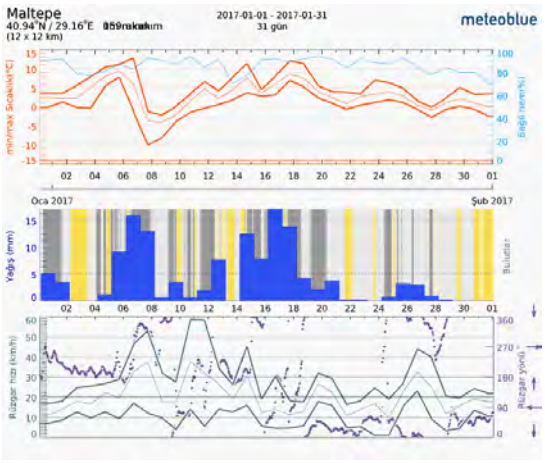

Figure 20. Temperature-wind speed-relative humidity values of Maltepe in january at Meteoblue [17]

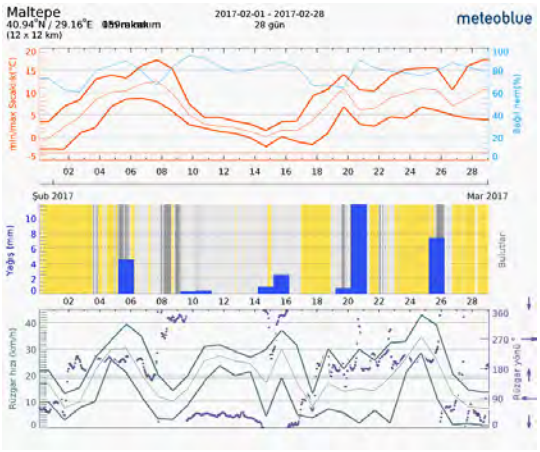

Figure 21. Temperature-wind speed-relative humidity values of Maltepe in february at Meteoblue [17]

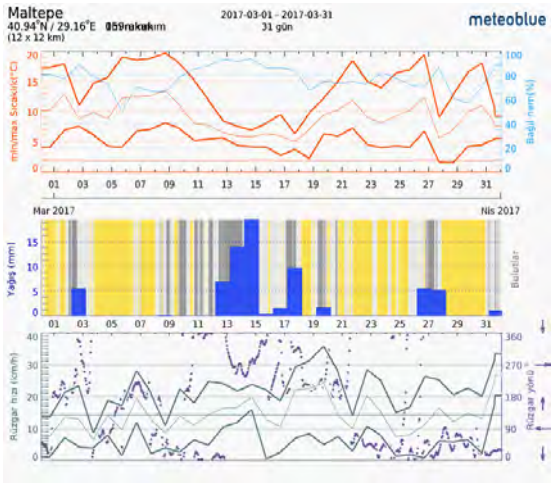

Figure 22. Temperature-wind speed-relative humidity values of Maltepe in march at Meteoblue [17]

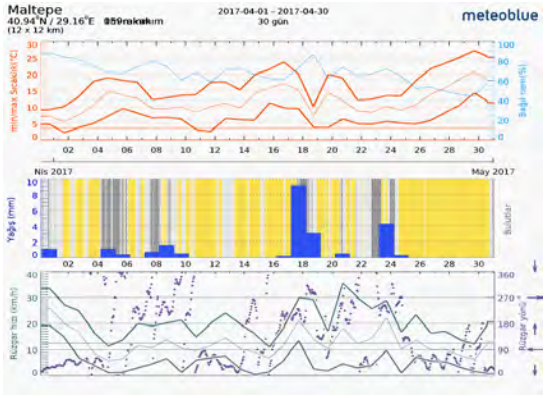

Figure 23. Temperature-wind speed-relative humidity values of Maltepe in april at Meteoblue [17]

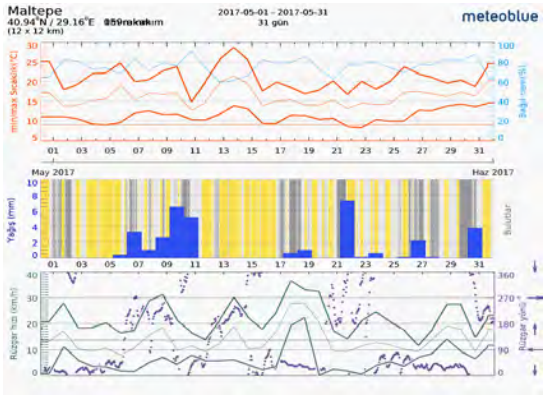

Figure 24. Temperature-wind speed-relative humidity values of Maltepe in may at Meteoblue [17]

TABLE IX. MALTEPE METEOBLUE HIGHEST MONTLY WIND SPEEDS AND RELATIVE HUMIDITY-AIR TEMPERATURE DATA

Coordinate 40.94°N / 29.16 °E 159 m meters above sea level		**Maltepe**		
Months	**Relative Humidity %**	**Temperature °C**	**Wind Speed Km/h**	**Comfort Situation**
14 November 2016	%65-70	15°C	40 – 50 km/h	-
30 December 2016	%95	4°C	50 – 60 km/h	-
11 January 2017	%90-95	5 °C	50 – 60 km/h	-
25 February 2017	%75-80	15°C	40 – 50 km/h	-
20 March 2017	%80	12°C	30 – 40 km/h	-
21 April 2017	%70-80	17°C	30 – 40 km/h	-
18 May 2017	%80	18°C	30 – 40 km/h	-

The resulting chart generated from the table (Table IX.) to assess the state of comfort on behalf of a seven-month high relative humidity wind speed and air temperature data. As shown in the data tables Olgyay (1973); in the open 21-27 ℃ temperature, %Relative humidity 30-65, and 5 m/sec wind speed of up to when they are evaluated in terms of the combination, this combination does not fit, therefore, it is seen that the criteria do not provide comfortable accommodation in the open space area. www.meteoblue.com the monthly wind data obtained from the website of Maltepe were again highest from the data that is tabulated.Table IX analysis of top seven in the table made. Values in the analysis area are not seen as a result of comfortable outdoor space.

VI. CONCLUSION

Sustainable open space planning in architectural design, considering there is a need to create comfortable spaces. The coastal areas are the city's attractions. Open urban spaces also make the city attractive for tourism.[18] Fill in the fields on the coastal area, unless open space is planned in accordance with the value of a comfortable rate and duration of use decreases. Therefore, in adverse weather conditions in the winter and in the spring fill the fields with unused or limited space are transformed into an user base.

Extend the usage time of the fill area to ensure the sustainability of venues. Sustainable open spaces, sustainable tourism is required. Comfortable in the open field values should be assessed at each stage of the design. In otherwise uncomfortable open spaces is created. The problem was studied on the example of the fill area of Maltepe. As a result of the analysis, surveys and examinations, it was determined that utilization rate of the area decreased cause of wind in winter and spring. As a result of the analysis;

- Highest user rate, with 43% of young people between the ages of 15-30 is
- Highest user density 81% on summer season
- Lowest utilization rate with 93% winter
- 90 percent of wind from the user group they are disturbing
- The user group 80% when the wind speed is high, do not continue to use the space
- The user group 84% of the wind speed is high when the coastal band is disturbed

The datas has been reached.

In considering these data, the fill area in winter and spring months, the coastal band may be observed for a period of not clearly big. The inner parts near the road and in the fields are used. Depending on the wind seasonal decline in utilization of living is an obstacle to the creation of sustainable open spaces. In terms of economic investment into the area not to use the maximum level of causes. While the design decisions are taken as a result of research and design criteria to be used as a cosy outdoor space of the data in consideration of the wind, depending on the severity of the discomfort it is understood as a criterion that should be included in the design. To extend the usage of open urban spaces in cities, certainly will provide the cultural relationship between inhabitants and tourists. It will serve the peace.[19]

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