



Kingdom of Saudi Arabia  
Ministry of education  
General Administration of Education in  
Taif Governorate  
High School hawazin



Effect of wind speed on temperature in taif  
During the period (2012-2016)

**Prepare students**

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## Abstract

The objective of this study was to reveal the statistical relation between the average wind speed and the average temperature of air temperature bikes in Taif city during the period (2012-2016).

The study data consisted of wind speed data from the Meteorological and Environmental Protection Agency and air temperature data for the Environmental Globe Program of the Hawazin High School.

The arithmetic mean was used for both wind speed and atmospheric temperature, Pearson's simple correlation coefficient,

The results showed that there was a weak positive relationship between mean wind speed and mean air temperature per year by Pearson correlation coefficient. The results showed an inverse relationship between mean wind speed and mean air temperature during the period 2012-2016 through Pearson correlation coefficient .

## Introduction

Winds are one of the most important elements of the atmosphere and its factors. Winds of some plants are a breeding factor and a good source of energy, and their speed is also important.

(The wind is moving air that may flow very slowly and is difficult to sense, and may blow at varying speeds that can exceed 300 km / h, as in the case of violent hurricanes). [1]

Winds are also a major cause of fuel combustion in ships and are therefore the cause of their movement.

Allah (SWT) said: "Allah sends the wind and raises a cloud and opens it in the sky. May Allah have mercy on him how he will revive the earth after her death, that is for the living of the dead, and He is over all things mighty. (2.

So low wind speed is a major environmental and economic problem.

We, with the help of God, created this research after several questions came to mind, the most important of which was that we noticed that the winds became almost normal and almost daily in our lives, but did not become a source of concern to people as they were before.

In the past it was a reason for the low temperature and parents' fear for their children from the disease, while now it is no longer affecting the atmosphere, which led us to research previous studies and research in the observations of the meteorological data of wind and heat of the atmosphere.

(The element of heat is one of the most important elements of the climate. Temperatures vary widely around the world. The heat has clear effects on humans, animals and plants. Heat also has a great influence on other climate elements such as atmospheric pressure. Heat is an expression of energy strength.

Which are present in any body, and by increasing that energy, the body's temperature increases.) (3)

## Questions and hypotheses

Hypothesis:

Researchers assume that wind speed, has an effect on the temperature.

The researchers formulated the following questions to validate the hypothesis:

1. What is the relationship between average wind speed and mean air temperature during one year?
2. What is the relationship between average wind speed and average atmospheric temperature during the period 2012-2016?

## Materials and method

- Data used in the study

1. Air temperature data from the secondary Huazin (4)
2. Wind speed from the Meteorological and Environmental Protection Authority, Taif and Jeddah Subdivisions.

### Time period

2012 to 2016

### Geographic area

City of Taif

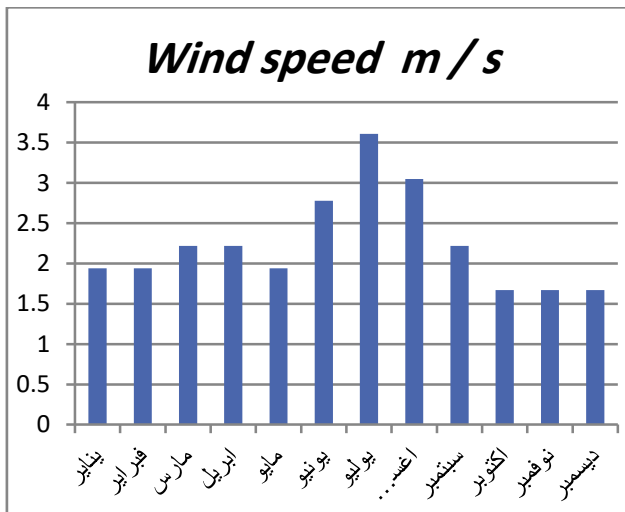
### Measurement units

Air temperature: ° C

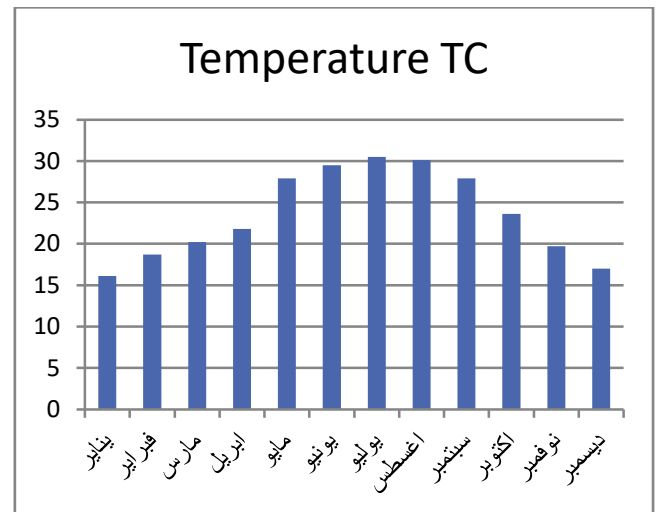
Wind speed: meters / sec

## Summary of data

<b>2012</b>		
Wind speed (m / s)	Temperature (TC)	
1.94	16.1	<i>Januaryc</i>
1.94	18.7	<i>February</i>
2.22	20.2	<i>March</i>
2.22	21.8	<i>April</i>
1.94	27.9	<i>May</i>
2.78	29.5	<i>June</i>
3.61	30.5	<i>July</i>
3.05	30.1	<i>August</i>
2.22	27.9	<i>September</i>
1.67	23.6	<i>October</i>
1.67	19.7	<i>Nov</i>
1.67	17	<i>Dec</i>
<b>0.734</b>	<b><i>Coefficient of correlation (Pearson)</i></b>	
<p><b>Table 1</b>  <b>Temperature and wind speed data for the year 2012 in all months of the year.</b>  <b>July recorded the highest temperature (30.5).</b>  <b>It also recorded the highest wind speed (3.61).</b></p>		



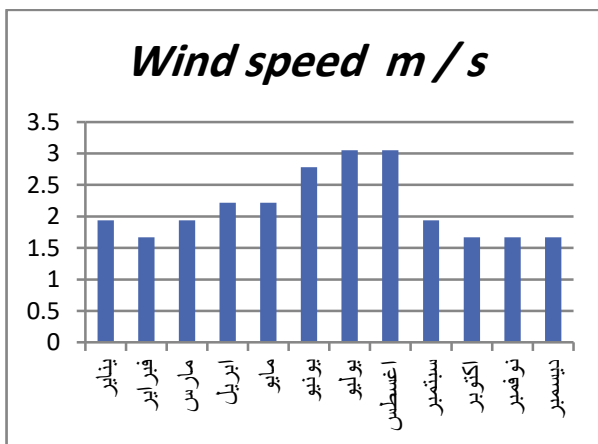
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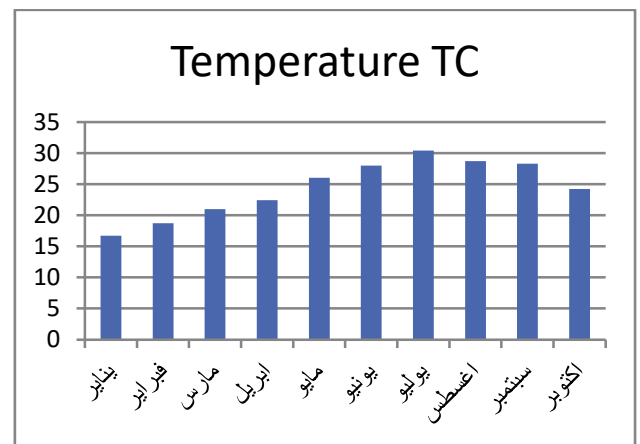
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<b>2013</b>		
Wind speed (m / s)	Temperature (TC)	
1.94	16.7	Januaryc
1.67	18.7	February
1.94	21	March
2.22	22.4	April
2.22	26	May
2.78	28	June
3.05	30.4	July
3.05	28.7	August
1.94	28.3	September
1.67	24.2	October
1.67	20	Nov
1.67	16.2	Dec
0.764	<i>Coefficient of correlation (Pearson)</i>	
<p align="center"><b>Table 2</b>  <b>Temperature and wind speed data for 2013 for all months  of the year.</b>  <b>July recorded the highest temperature (30.4).</b>  <b>Also record the highest wind speed (3.5).</b></p>		

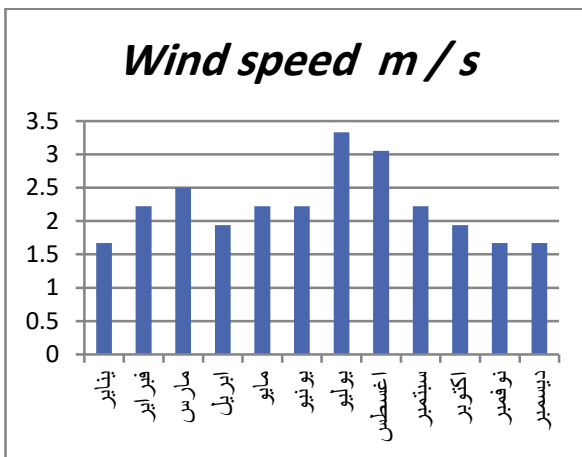


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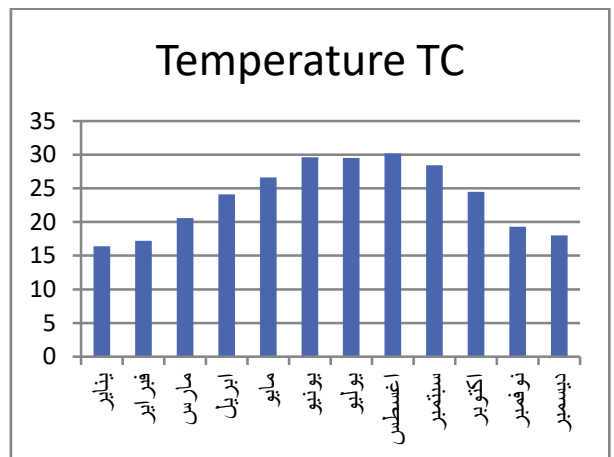


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2014		
Wind speed (m / s)	Temperature (TC)	
1.67	16.4	January
2.22	17.2	February
2.5	20.6	March
1.94	24.1	April
2.22	26.6	May
2.22	29.6	June
3.33	29.5	July
3.05	30.2	August
2.22	28.4	September
1.94	24.5	October
1.67	19.3	Nov
1.67	18	Dec
0.667	Coefficient of correlation (Pearson)	
<p align="center"><b>Table 3</b>  <b>Temperature and wind speed data for the year 2014 for all months of the year (exceptional year). August recorded the highest temperature (30.2). July also recorded the highest wind speed (3.33).</b></p>		

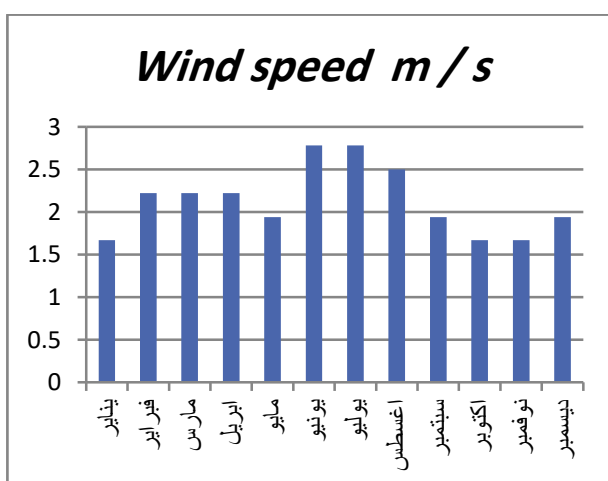


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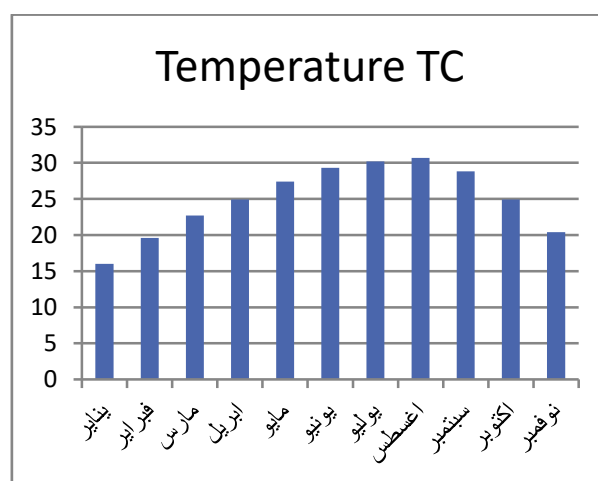


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2015		
Wind speed (m / s)	Temperature (TC)	
1.67	16	Januaryc
2.22	19.6	February
2.22	22.7	March
2.22	24.9	April
1.94	27.4	May
2.78	29.3	June
2.78	30.2	July
2.5	30.7	August
1.94	28.8	September
1.67	24.9	October
1.67	20.4	Nov
1.94	16	Dec
0.619	Coefficient of correlation (Pearson)	
<p><b>Table 4</b>  <b>Temperature and wind speed data for the year 2015.</b>  <b>July recorded the highest temperature (30.7).</b>  <b>It also recorded the highest wind speed (2.78).</b></p>		

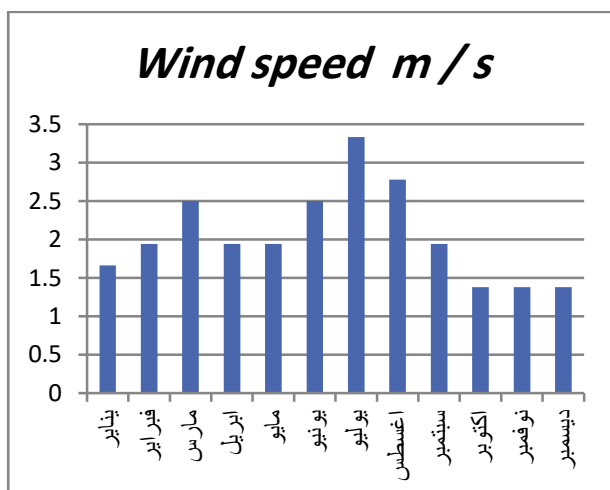


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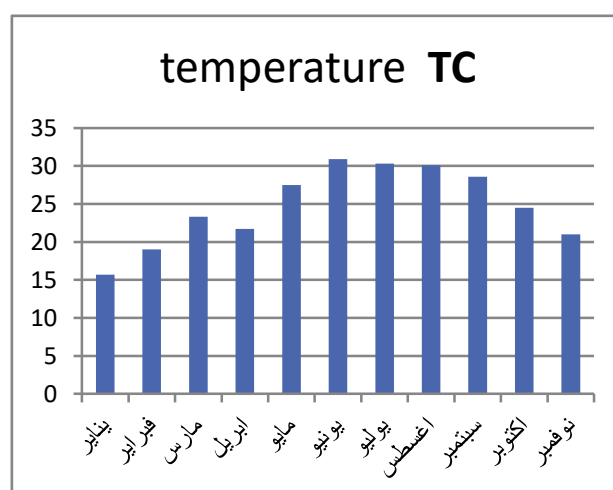


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2016		
Wind speed (m / s)	Temperature (TC)	
1.66	15.7	January
1.94	19	February
2.5	23.3	March
1.94	21.7	April
1.94	27.5	May
2.5	30.9	June
3.33	30.3	July
2.78	30.1	August
1.94	28.6	September
1.38	24.5	October
1.38	21	Nov
1.38	19.6	Dec
0.672	Coefficient of correlation (Pearson)	
<p align="center"><b>Table 5</b>  <b>Temperature and wind speed data for 2016 in all months of the year.</b>  <b>June recorded the highest temperature (30.9).</b>  <b>July also recorded the highest wind speed (3.33).</b></p>		

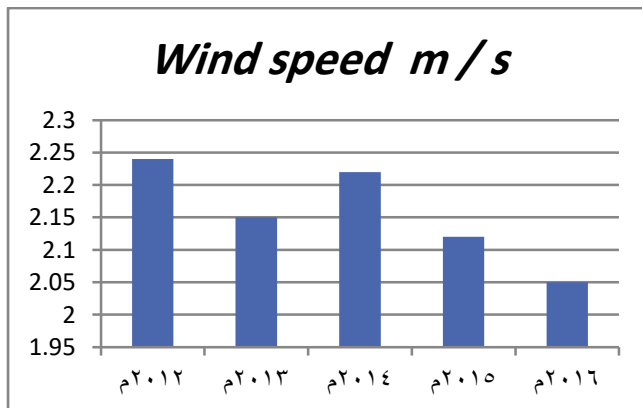


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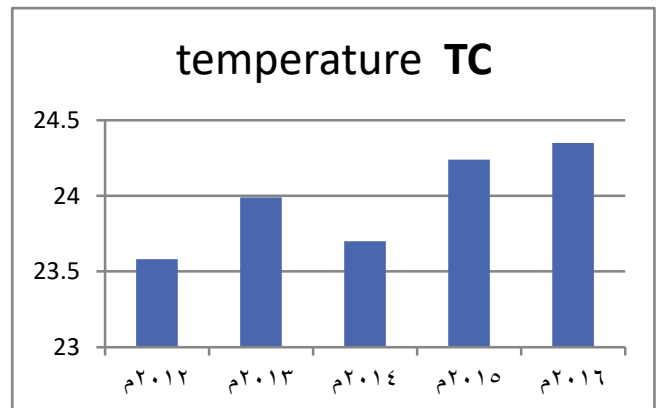


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<b><i>Average air temperature and wind speed</i></b>		
Wind speed (m / s)	Temperature (TC)	
2.24	23.58	2012
2.15	23.99	2013
2.22	23.7	2014
2.12	24.24	2015
2.05	24.35	2016
<b>-0.977</b>	<b><i>Coefficient of correlation (Pearson)</i></b>	
<p align="center"><b>Table 6</b></p> <p align="center"><b>The arithmetic average of temperature and wind speed data for all years without detailing the months.</b></p> <p align="center"><b>The year 2016 recorded the highest temperature (24.35).</b></p> <p align="center"><b>The year 2012 recorded the highest wind speed (2.24).</b></p>		



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## Analyze and discuss data

Table 1 and Fig. 1 and 2: which represent average mean air temperature and average wind speed for all months for 2012, found that the relationship between mean wind speed and average atmospheric temperature is a direct correlation by correlation coefficient (Pearson).

⦿ Table 2 and Figure 3 and 4: which represent the mean air temperature and average wind speed for all months of 2013. The relationship between mean wind speed and average atmospheric temperature was positively correlated with Pearson correlation coefficient.

Table 3 and Figure 5 and 6: Mean air temperature and average wind speed for all months of 2014, is an exceptional year. There was a decrease in the average air temperature for the year and an increase in the average wind speed for the year, contrary to previous years. Mean wind speed and mean air temperature are correlated by correlation coefficient (Pearson).

Table 4 and Fig. 7 and 8: Mean mean air temperature and average wind speed for all months for 2015, found that the relationship between mean wind speed and average atmospheric temperature was a positive correlation by Pearson.

Table 5 and Fig. 9 and 10: Mean mean air temperature and average wind speed for all months of 2016. The relationship between mean wind speed and average atmospheric temperature was found to be a direct correlation by correlation coefficient (Pearson).

Table 6 and Figure 11 and 12: The average temperature of the air and wind speed for all years (2012-2016). We find a decrease in wind speed and an increase in the temperature of the atmosphere, except in 2014. Wind, and it was found that the relationship between average wind speed and mean air temperature for all the years from 2012 to 2016 is a weak inverse relationship according to correlation coefficient (Pearson).

## Conclusions

After analyzing the data and extracting the average air temperature, also the mean wind speed, calculate the simple Pearson correlation coefficient

We concluded that:

1. There is a weak correlation between Pearson and average air temperature per year.

There is a low inverse correlation between Pearson and average wind speed and average wind speed during the period (2012-2016), where a decrease in average wind speed and an increase in average air temperature were observed.

3. It was observed that the year (2014) achieved an increase in the average wind speed and decrease in the average temperature of the atmosphere.

4. It was noted that the percentage of increase in air temperature between 2012 and 2016 (0.77) degrees Celsius.

5. The decrease in wind speed between 2012 and 2016 was observed (0.19) m / s

6. We found that with each one meter drop in wind speed, the air temperature rises 4 degrees Celsius



## Recommendations

1- We recommend investigating the impact of low wind speed on wind power production.

2 - We recommend searching for solutions in the issue of high temperature of the atmosphere and investigate all the reasons.

3 - Apply the study to other cities and countries.

And we hope to be in our research, thank God the Lord of the Worlds.

## References

- 1- Journal of Science and Technology, 1999, Wind, part one, King Abdulaziz City for Science and Technology.
- 2 - The Holy Quran - Surah Al-Rum - verses 48,49,50
- 3 - Youssef Fayed, 2005, Geography of Climate and Plants, Part I, Dar al-Nahda al-Arabiya
4. Global data for the secondary school
5. Meteorological and Environmental Protection Agency (Meteorological Branch of Taif)
6. Meteorological and Environmental Protection Authority (standards and standards management in Jeddah)

## Thanks and appreciation

Thank you both of our parents.

We do not respond to you as part of your help in us, and thank you for the reward and reward and ask God to provide you with health and wellness.

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