

## Climatological Report for summer 2021 in Tunisia

### Hottest summer on record since 1950

The summer of 2021 was characterized by an exceptional rise in temperature across the country. Several regions had known new records.

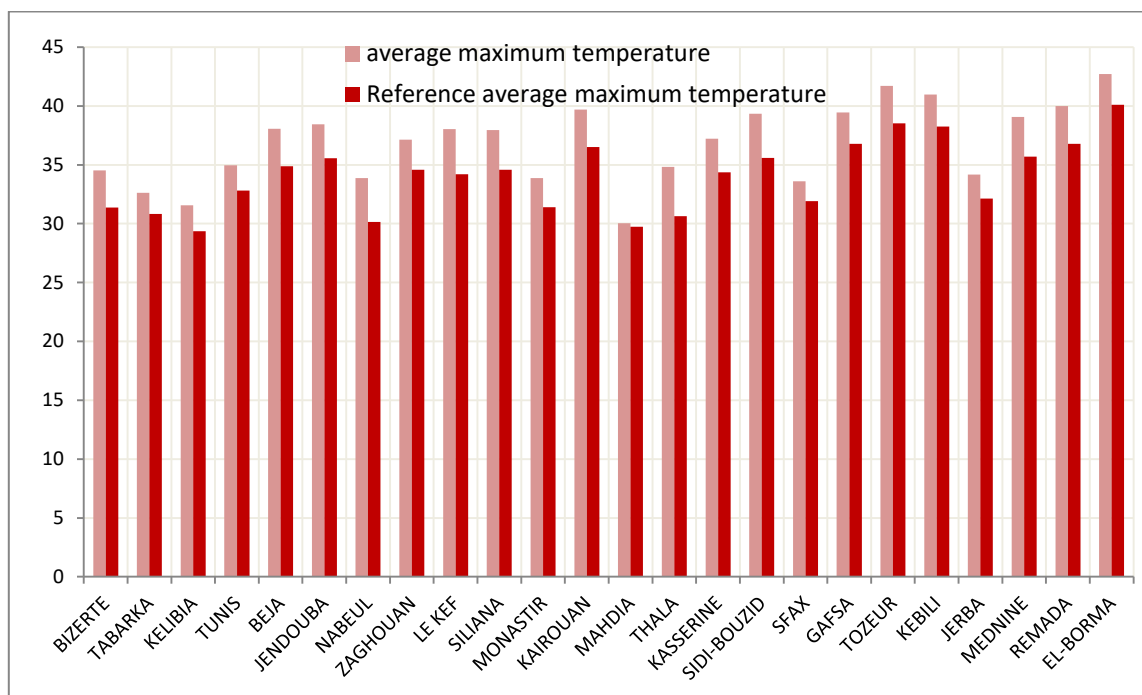
On average and throughout Tunisia (24 main stations), the average temperature reached 29.95 °C and was above the reference normal (1981-2010) with a significant difference of (+2.65 °C) . This gap ranks **summer 2021 as the hottest summer ever**.

Regarding rainfall, rains were rare or even absent during the summer of 2021. The seasonal cumulative of all stations (24 main stations) reached 268 millimeters, it was lower than the reference cumulative of the same stations (546 millimeters) with a **deficit of 51%**.

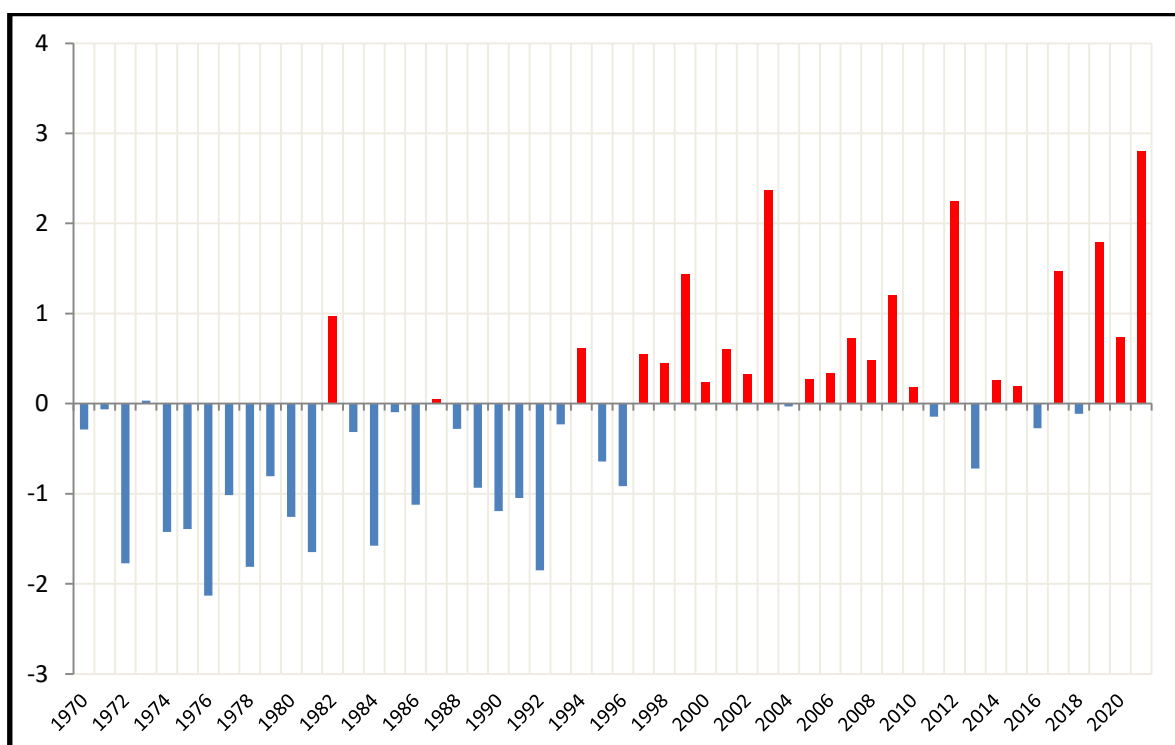
#### - Maximum temperature:

Maximum temperatures during the summer of 2021 were high in all regions and varying from 30° C in Mahdia to 42.7° C in El Borma, they were above the seasonal reference averages with a variation ranging from (+0 , 3° C) in Mahdia to (+ 4.2 C) in Thala.

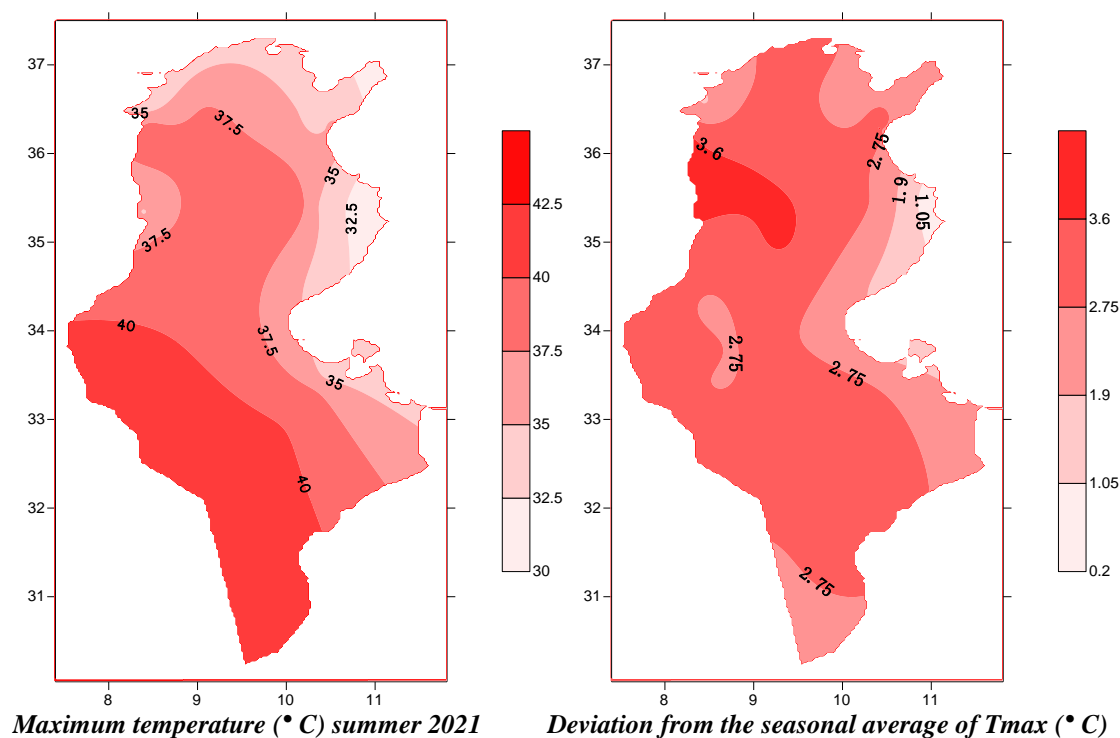
As for the general average of the maximum temperature was reached for the first time 36.8° C and it exceeded the reference average (34.0° C) with a significant difference of (+2.8 ° C).



Comparison of maximum temperatures (summer 2021) to summer norms (1981-2010)

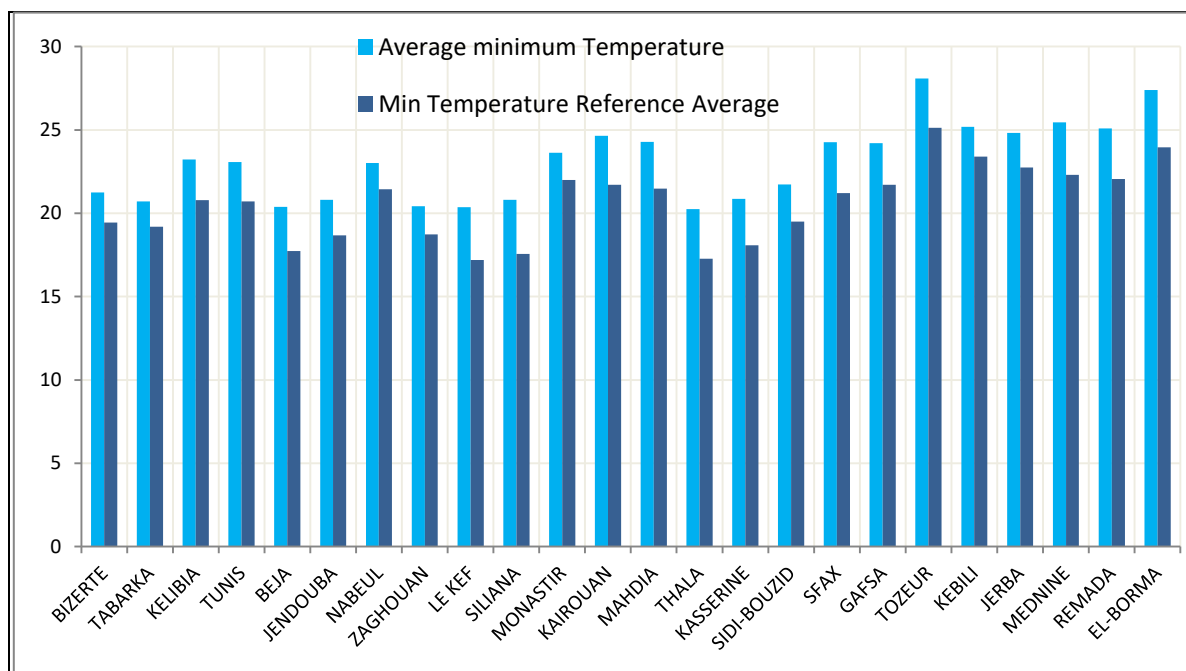


*Deviation from the seasonal reference average (1981-2010)  
maximum temperature (summer 1970 to 2021)*

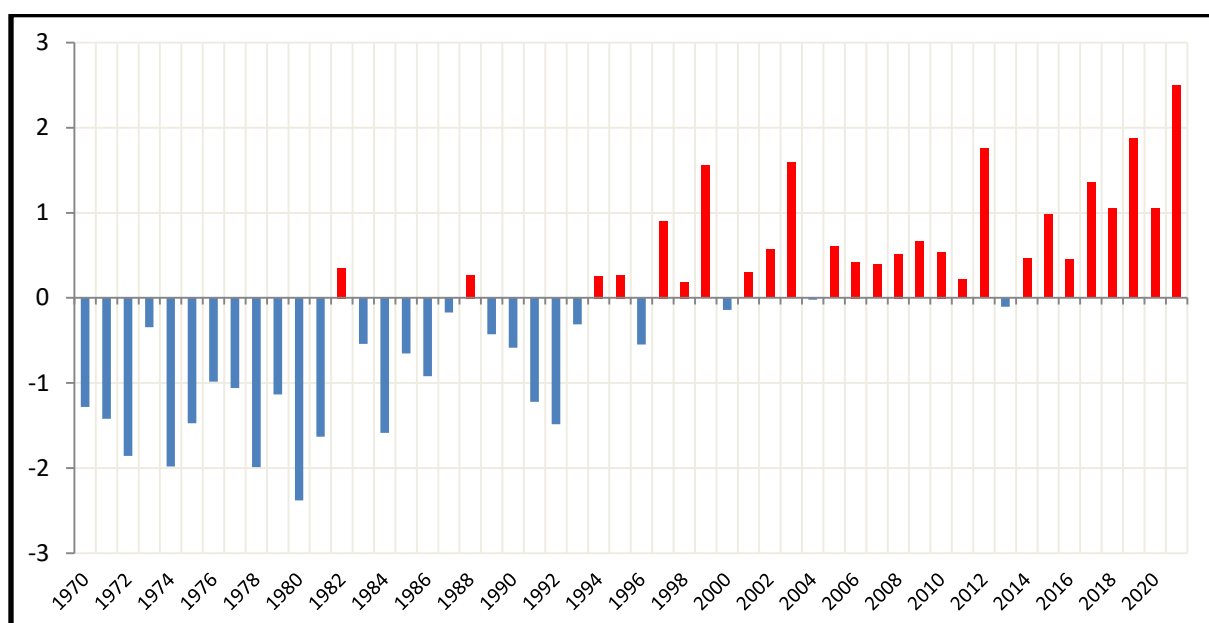


## - Minimum temperature

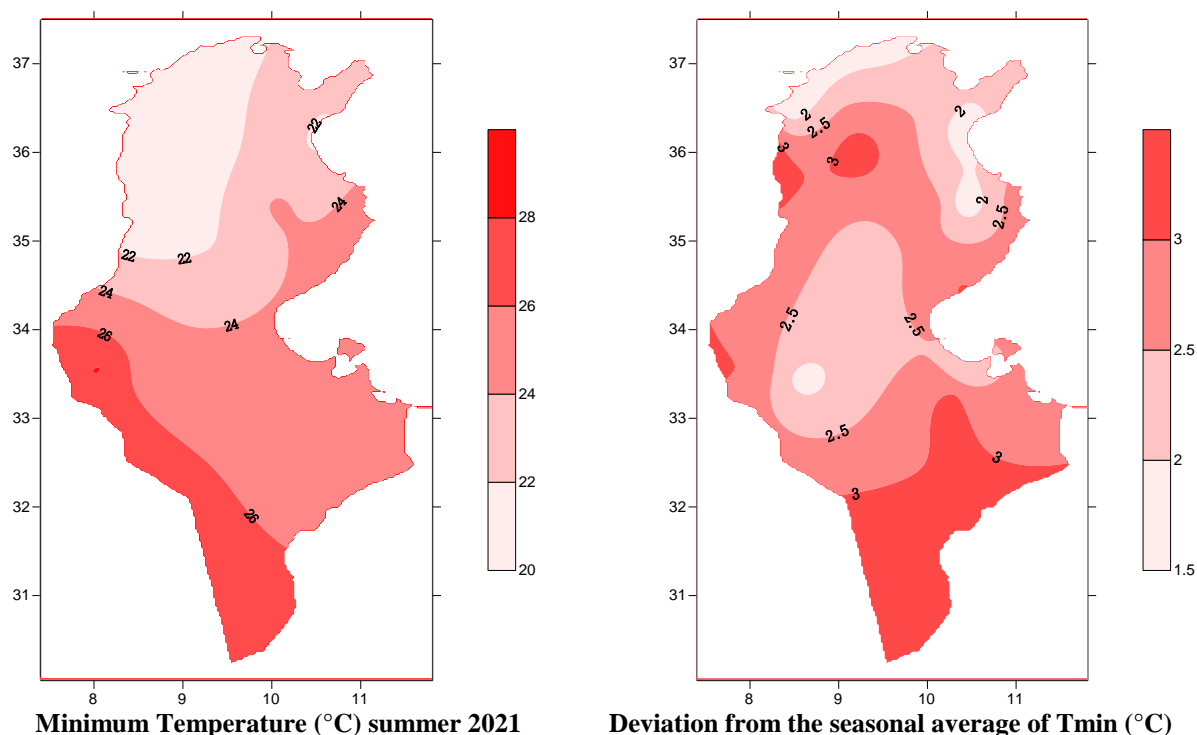
The minimum temperatures for summer 2021 exceeded the seasonal reference averages in all stations. On average throughout Tunisia the minimum temperature was above normal with a difference of (+ 2.50 ° C).



Comparison of minimum temperatures (summer 2021) to summer normal (1981-2010)



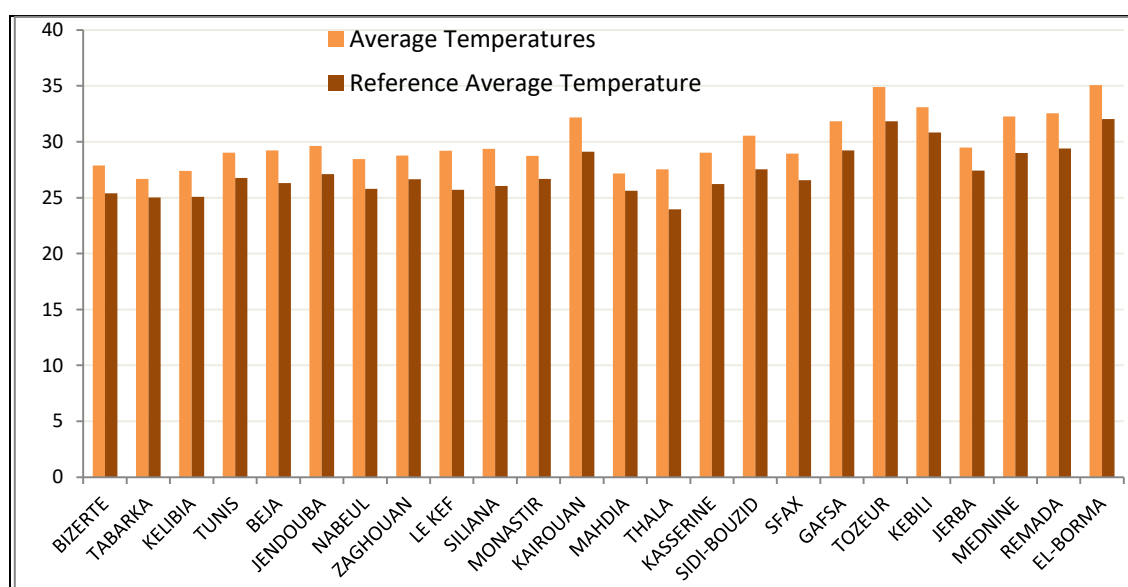
Deviation from the seasonal reference average (81-2010)  
minimum temperature (summer 1970 to 2021)



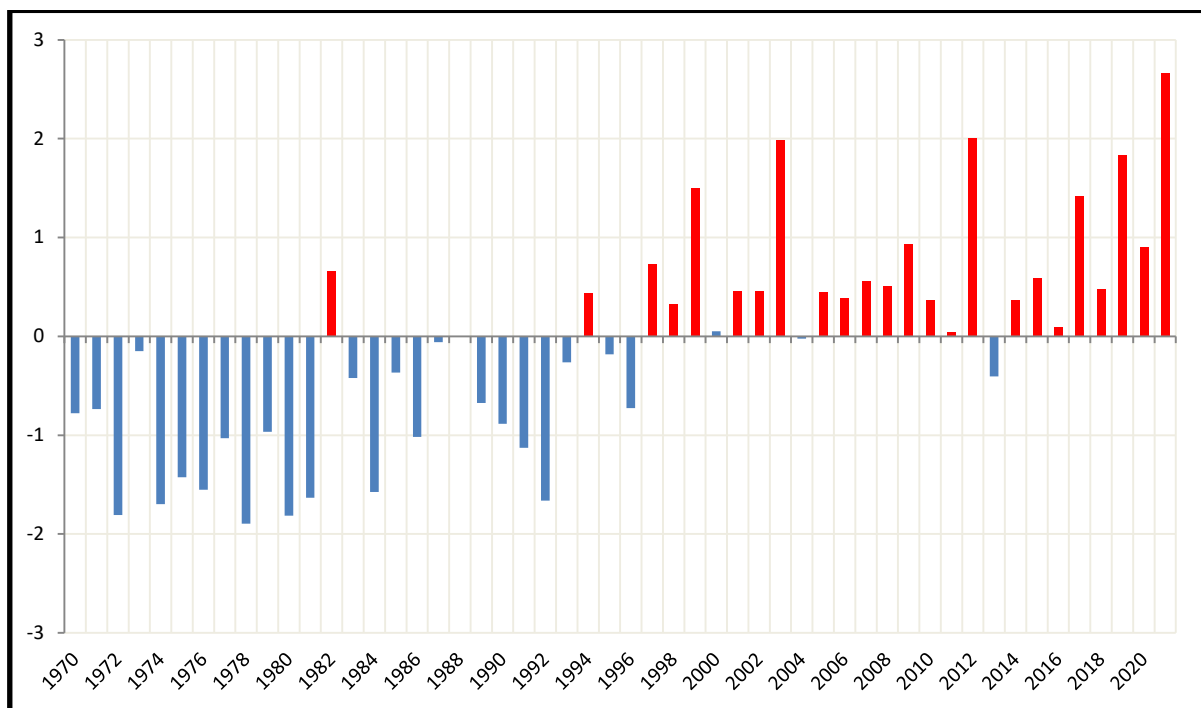
### Mean temperature :

Average temperatures were above normal in all stations. They varied between 26.68° C in Tabarka and 35.06 ° C in Elborma.

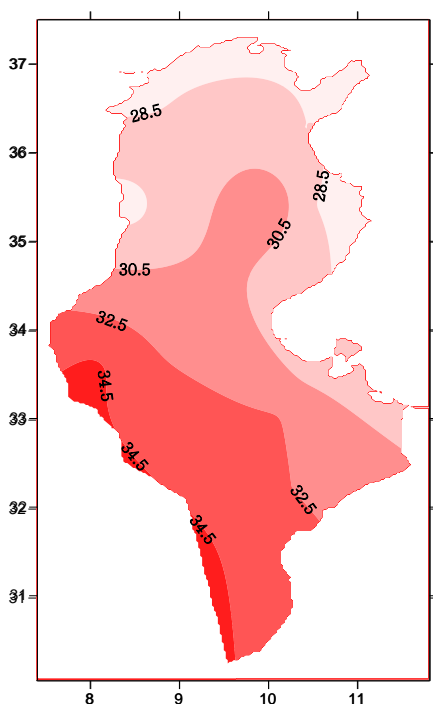
All over Tunisia (24 main stations), the average temperatures during the summer were 29.95° C while the normal for the same stations are 27.30 ° C. As a result the average temperatures were above normal by 2.65 ° C. This gap ranks **summer 2021 as the hottest summer ever.**



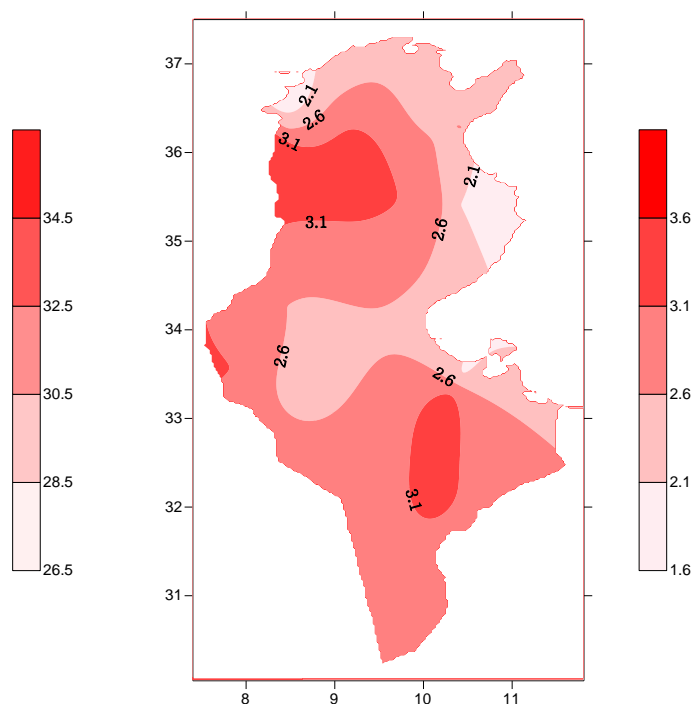
*Comparison of average temperatures (summer 2021) to summer norms (1981-2010)*



*Deviation from the seasonal reference average (81-2010)  
average temperature (summer 1970 to 2021)*



Average temperature (° C) summer 2021



Deviation from the seasonal average of Tmoy (° C)

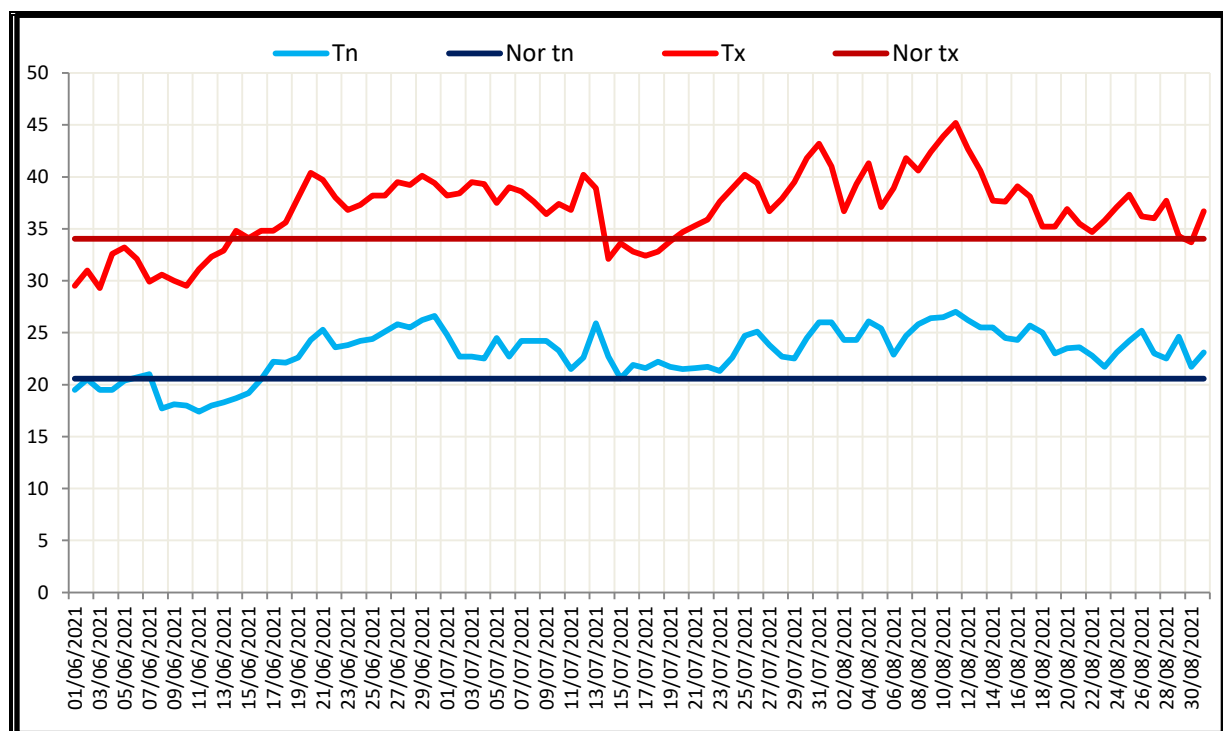
## Daily Evolution of Temperatures:

Temperatures mostly remained above normal throughout the season. A very large part of Tunisian country was affected by the high heat, and most regions experienced exceptionally high temperatures with several records.

At the beginning of June, temperatures were below normal. But from the second half of the month temperatures started to rise. Minimum and maximum temperatures remained above normal until the end of the month with a severe heat wave.

Following June, July began with high temperatures day and night. A decrease has been recorded since the 13th of the month. From July 24, a heat wave was installed with deviations from the normals exceeding 10° C in the southern regions. Several records have been broken.

The heat wave at the end of July persisted in southern regions into early August as the central and northern parts of the country experienced a slight drop in temperature. An episode of high heat was recorded on the 3rd and 4th of the month. On August 5, a temporary drop in temperatures was recorded. However the severe heat wave began on the 7th of the month and persisted until the 12th of the month when a significant number of our stations (14 stations) broke their absolute records.



*Evolution of daily minimum and maximum temperatures during summer 2021*

## New records:

### - Month of June

Tmax (°C)	Station	New record Tmax	Date New record	Latest record Tmax	Date Latest record Tmax
	Tozeur	48.7	06/30/2021	48.0	06/30/1954
	Kébili	48.1	06/30/2021	47.7	06/14/1997

* Tmin (°C) (the highest)	station	Tmin *	Date New record	Latest record Tmin*	Date Latest record Tmin*
	Kébili	31.8	06/29/2021	28.9	06/19/2007

### - Month of July :

Tmax (°C)	Station	New record Tmax	Date New record	Latest record Tmax	Date Latest record Tmax
	Kasserine	43.9	07/04/2021	43.6	07/24/1997
	Remada	48.1	07/04/2021	47.9	07/22/1973

* Tmin (°C) (the highest)	station	Tmin *	Date New record	Latest record Tmin*	Date Latest record
	Nabeul	27.5	07/30/2021	27.4	07/24/2017
	Gafsa	32.8	07/09/2021	32.1	07/03/1981

### - Month of August :

Tmax (°C)	Station	New record Tmax	Date New record	Latest record Tmax	Date Latest record Tmax
	THALA	41.3	08/08/2021	40.6	08/05/2012
	KASSERINE	43.5	08/08/2021	43.0	08/20/2020
	GAFSA	46.1	08/08/2021	45.7	08/02/2005
	KEBILI	48.5	08/08/2021	47.6	08/10/1999
	JENDOUBA	49	08/09/2021	48.2	08/09/1999
	SILIANA	46.2	08/10/2021	46.1	08/09/1999
	ZAGHOUAN	47.5	08/10/2021	46.5	08/07/1970
	BIZERTE	48.9	08/10/2021	45.4	08/09/1999
	TUNIS	48.9	08/10/2021	46.8	08/01/1982
	BEJA	48.9	08/10/2021	47.6	08/09/1999
	KELIBIA	43.5	08/11/2021	40.7	08/12/1987
	NABEUL	46.3	08/11/2021	41.0	08/16/1987
	KAIROUAN	50.3	08/11/2021	48.1	08/10/1999
	SIDI BOUZID	47.4	08/11/2021	47.0	08/11/1963

Continuation of August 2021

* Tmin (°C) (the highest)	station	Tmin *	Date New record	Latest record Tmin*	Date Latest record
	Bizerte	28.6	08/10/2021	28.40	08/10/1997
	Remeda	35	08/05/2021	34.3	08/19/2005

### Rainfall:

During the summer of 2021, rains were rare in most regions and absent in a others, particularly in the south.

On June, the monthly cumulative rainfall in all regions (24 main stations) was 58.6 millimeters, while the baseline cumulative for the same stations was 237.65 millimeters, where the deficit is amounted to 76%. Note that rain did not fall in most parts of the south during the month of June 2021.

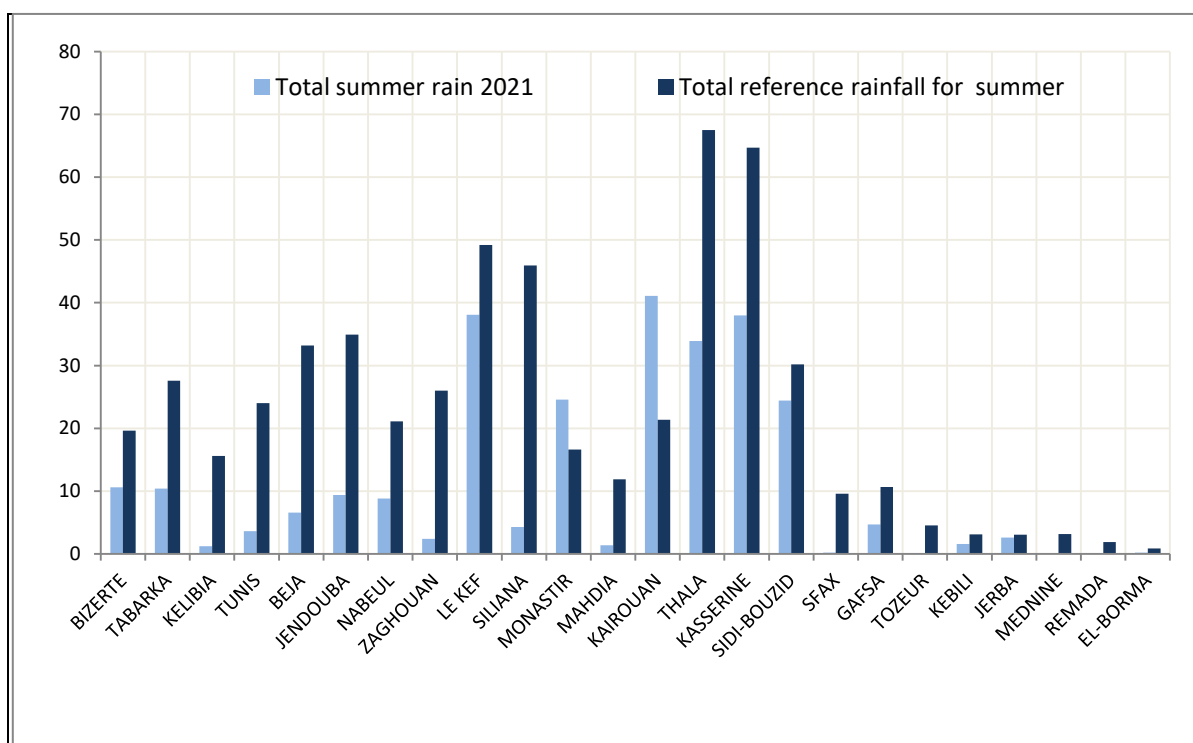
Rains were also weak and sparse during the month of July in most parts of the country, and the monthly total was only 24 millimeters, while the baseline total for the same stations was 85.66 millimeters. , and the decrease was 72%, knowing that the rains did not fall in most of the central and southern regions during July 2021.

As for the month of August, rains were absent in the first half of the month, and the second half of the month was rainy by the formation of local and thunderstorm clouds over the north and the center, but the total remained lower than the total. monthly rainfall in all regions (24 main stations) except Kairouan (41 mm) and Gafsa 5 millimeters), where their accumulations exceeded normal. The August cumulative total reached 97 millimeters, while the benchmark cumulative for the same stations was 223 millimeters, which is 43% of the benchmark rate for the month. It should be noted that the rains did not fall during the month of August 2021 in the regions of Nabeul, Zaghouan, Siliana and most of the southern regions. The seasonal rainfall accumulations recorded in all the main stations during the summer of this year were lower than the reference accumulations, with the exception of Monastir and Kairouan where they exceeded the reference rates.

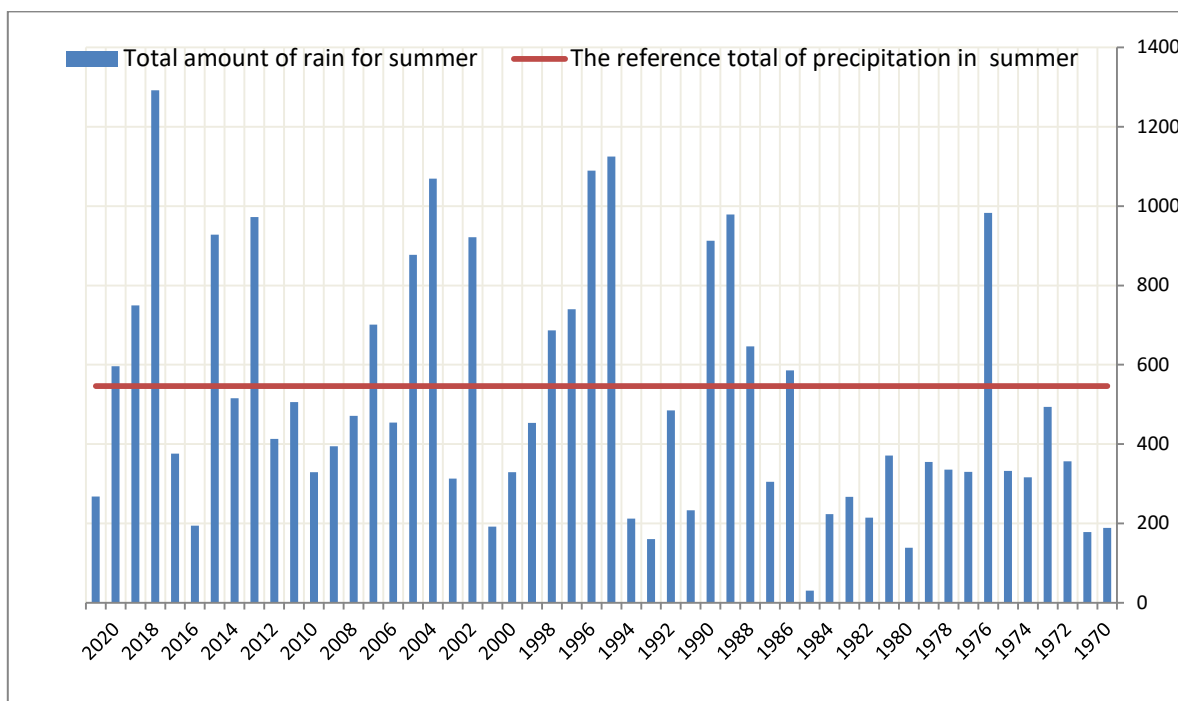
As for the general seasonal total in all regions (24 main stations), it reached 268 millimeters and it was lower than the baseline seasonal total for the same stations (546 millimeters) and the deficit this year is 51%.

Rains did not fall during the summer of 2021 in Sfax, Tozeur, Medenine, Remada and El Borma.

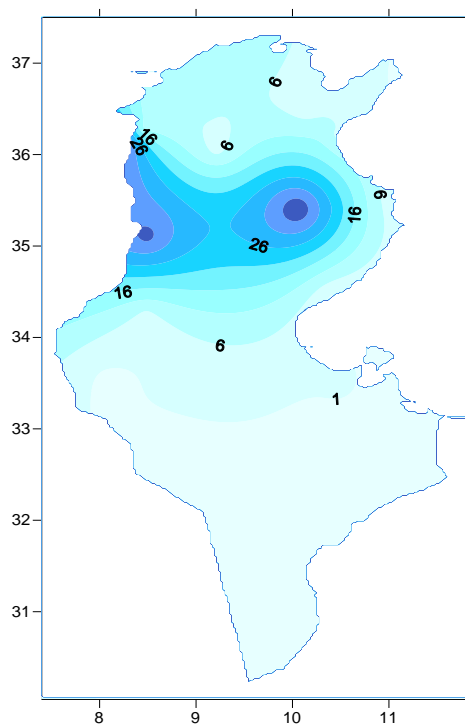




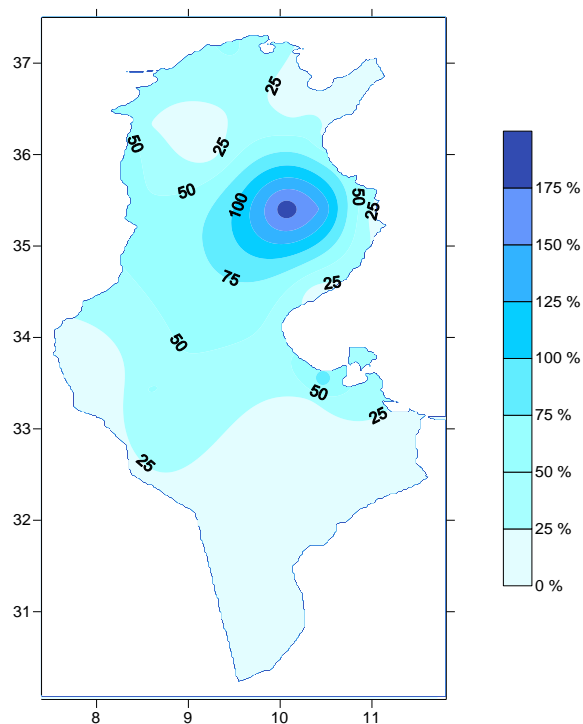
*Comparison of seasonal rainfall amounts  
with cumulative reference averages: summer 2021*



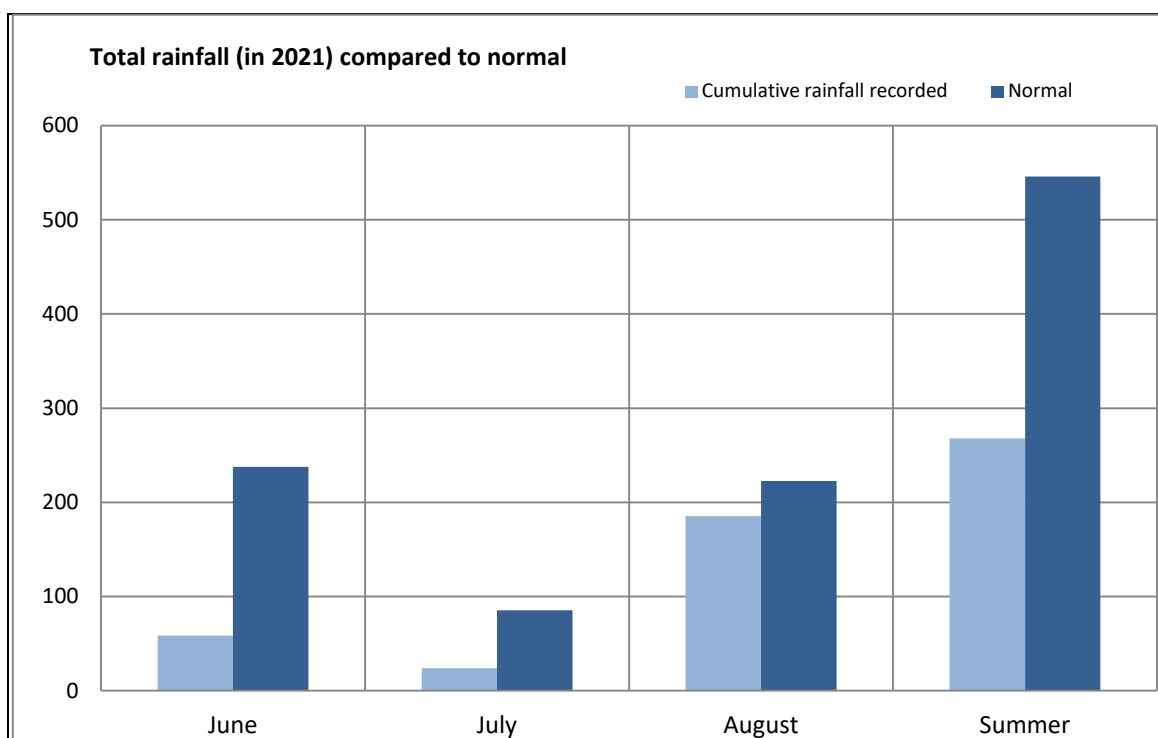
*Seasonal rainfall accumulation (mm): summer ( 1970 to 2021)*



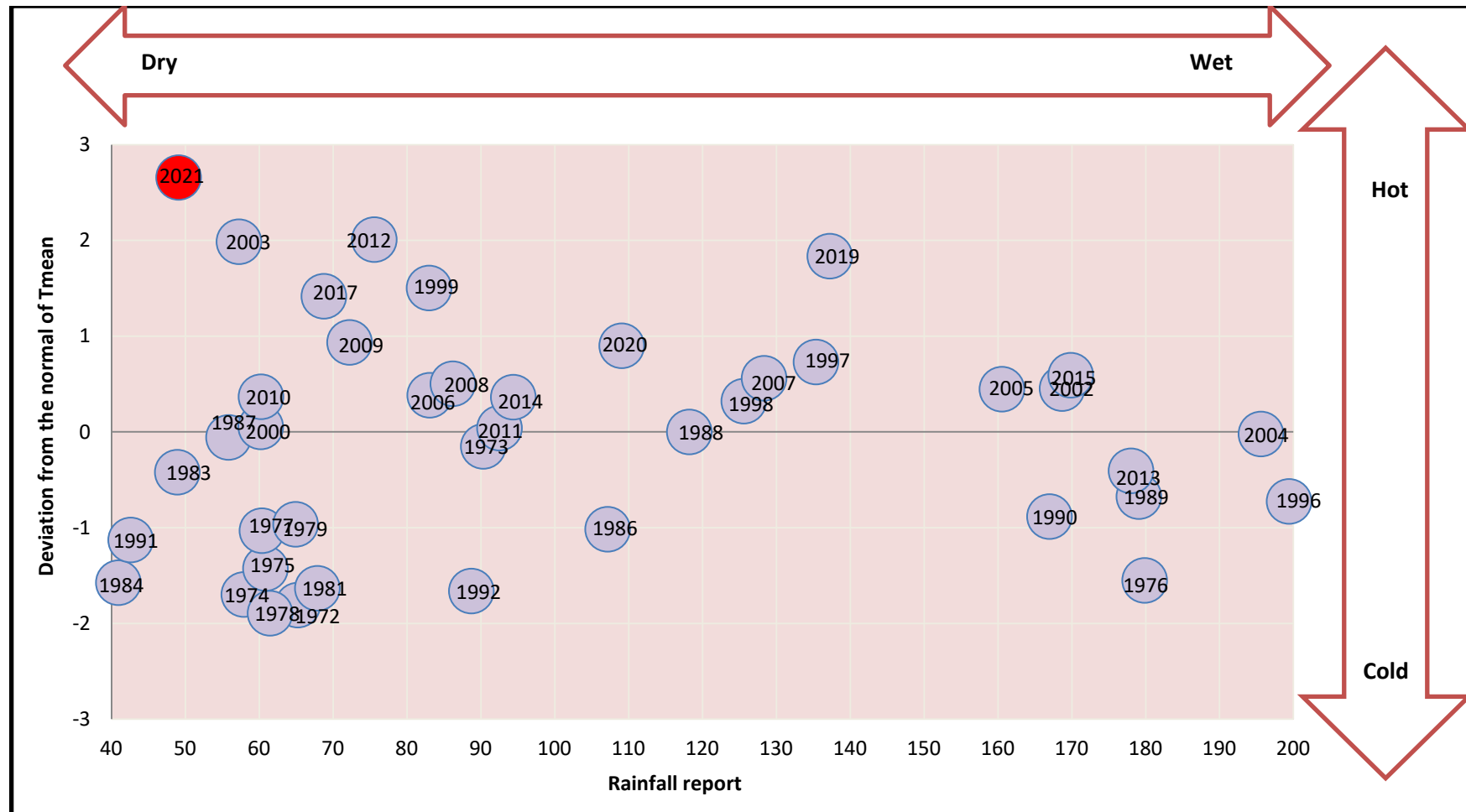
*Total rainfall (mm) summer 2021*



*Normal ratio*



*Comparison of rainfall amounts (in millimeters) with reference amounts)*



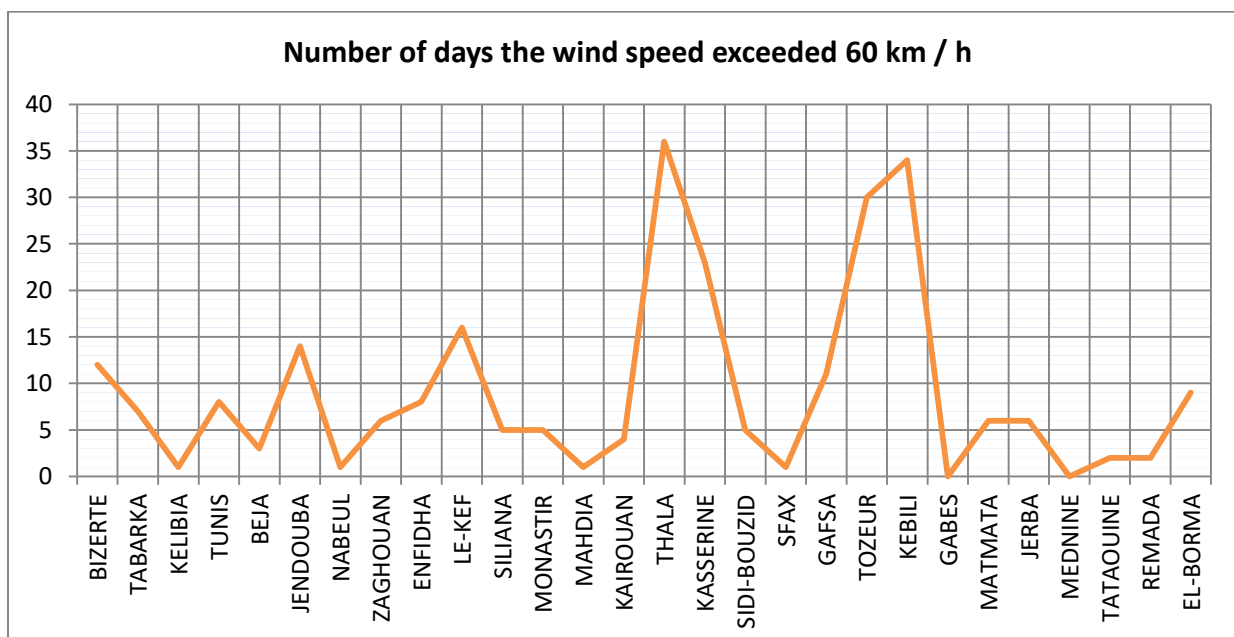
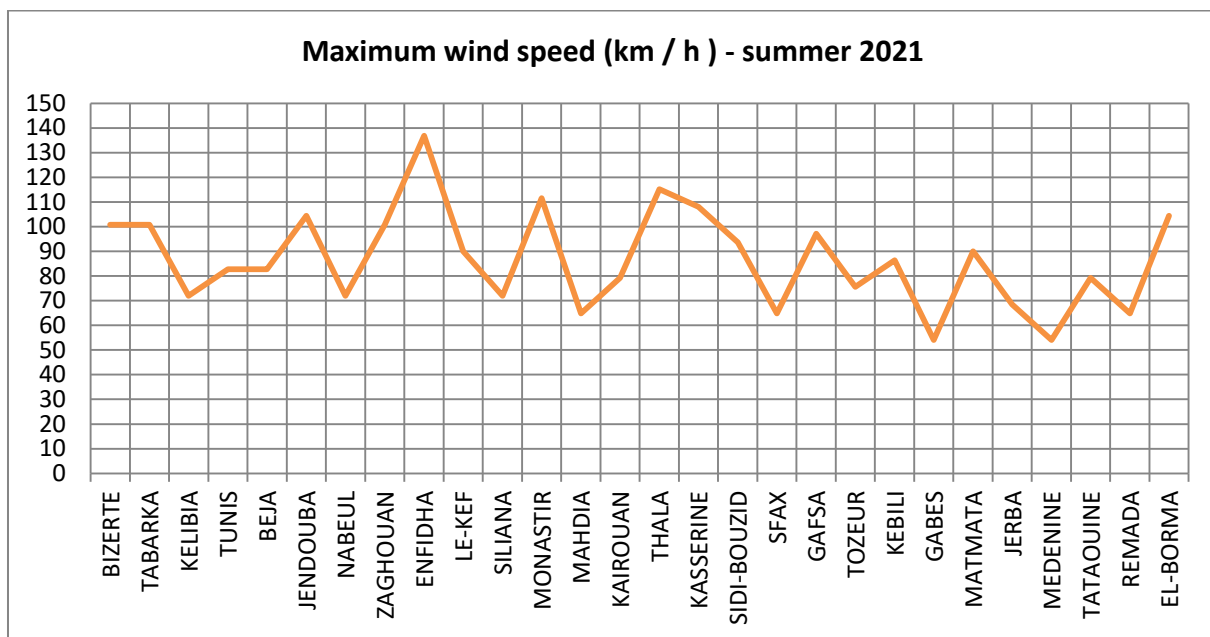
Temperature and rainfall - summer 2021

### - The winds :

The winds were generally light to moderate, but their speed increased during certain days of the three summer months, with a maximum speed between 60 and 97 km / h, and sometimes exceeding 100 km / h.

On June, the maximum wind speed reached 115 km / h in Thala on June 20, 2021, while in July it reached a maximum speed of 108 km / h in Kasserine on the 4th of the month.

During the month of August, the maximum wind speed reached 137 km / h in Enfidha on August 26, and 112 km / h in Monastir on August 29, 2021.



## Summer climate 2021 per month:

### -1° ) June:

#### - Temperatures:

Maximum temperatures increased exceptionally over most regions during the period from June 17 to 21, as well as on June 29 and 30, new records were **recorded** in several stations and the absolute maximum temperature reached 48.1 degrees at Tozeur and 48.7 ° C in Kebili on June 30, 2021. The average maximum temperatures varied from 27.5°C in Mahdia to 42.2°C in El Borma, they were above reference rates, with a difference ranging from (+0.13) ° C in Mahdia to (+4.69)°C in Thala. On average and throughout Tunisia, the maximum temperature reached 34.8° C and exceeded the reference average (31.9°C) with a significant difference of (+2.9) ° C.

Regarding the minimum temperature, most of the averages were above the reference rates, and they varied between 19° C in Beja and 27.2° C in El Borma, they were above the reference rates with a difference ranging from (+1.6)° C in Zaghouan to (+4.5)° C in El Borma. The absolute minimum temperature reached 11.8 ° C in siliana on June 08, 2021. On average (24 main stations), the average minimum temperature was 21.62 ° C and it was above the reference average (18.58° C). ) with a difference of (+3.04) ° C.

As for the average temperature for the month of June 2021, it fluctuated between 24.90 ° C in Tabarka and Mahdia and 34.70 ° C in El Borma. June 2021 is the hottest June since 1950.

#### - Rainfall:

Regarding rainfall, the monthly total of rainfall amounts in all regions (24 main stations) was 58.6 millimeters, while the baseline total for the same stations was 237.7 millimeters, which represents about 24%. It should be noted that rain did not fall in most parts of the south during the month of June 2021.

#### - The winds :

During the month of June, the winds were generally light to moderate, and their speed increased on 06 June 2021 in the south, where the maximum varied from 60 to 70 km / h and reached a maximum of 83 km / h in Kebili. Wind speed also increased during the period June 20-26 in most areas and the maximums ranged from 65 to 90 km / h and reached a maximum of 115 km / h in Thala on June 20 and 101 km / h in Zaghouan on June 25. 2021. The strong winds continued during the days of June 29 and 30 in the central regions, where its maximum speed varied between 60 and 79 km / h, and its maximum was 86 km / h in Kasserine. The strong winds were accompanied by sand phenomena in the south.

## **- 2° ) July**

### **- Temperature :**

During the month of July 2021, most parts of Tunisia were affected by a noticeable rise in temperatures, and all regions (24 main stations) experienced exceptionally high temperatures. The maximum temperature has increased exceptionally in most regions, especially during the period from 04 to 07 July and the period from 29 to 31 July, where we set new records in many stations, and the absolute maximum temperature reached 48.9°C in El Borma, 48.8 in Tozeur 48.7 in Kebili and 48.5 ° C in Tataouine on July 04, 2021.

As for the maximum temperatures, they varied from 32.2°C in Kelibia to 42.6°C in El Borma and they were above the reference rates, with a difference of (+1.31) °C in Djerba to (3.45) °C in Bizerte, except in Mahdia. , where the average was 30.4°C and it was slightly lower than the average by a slight difference (-0.18)°C. As for the general average of the maximum temperature, it reached 37.37 °C, and it exceeded the reference rate (35.04 °C) with a significant difference of (+2.33°C. As for the minimum temperature, it was also high, and the averages ranged from 20.1 °C in Siliana to 27.9°C in Tozeur, and the reference rates exceeded by a deviation ranging from (+1.2) degrees to Tabarka at (2.86) degrees overall, and the absolute minimum temperature reached (14.0°C) in Thala on July 17, 2021. The overall average minimum temperature reached (23.16°C) and it was above the reference average of (21.21°C) with a deviation of (+1.95°C) .

The average temperatures was varied between 27.25°C in Tabarka and 34.95°C in El Borma. The overall average temperature reached (30.26°C), it was above the reference rate for the month (28.13°C) with a difference of (+2.14 °C), which ranks July of this year as the third hottest July since 1950 after July 2018 (+2.34 °C) and 2003 (+2.62 °C).

### **- Rainfall:**

Rain was generally light and infrequent in July in most parts of the country. This year, the monthly total of rainfall amounts recorded in all regions (24 main stations) was only 24 millimeters, while the baseline total for the same stations was 85.66 millimeters, and the deficit was 72%. rains did not fall in most central and southern areas in July 2021.

### **- Winds:**

As for the winds, they were often weak to moderate, but their speed increased at the beginning of the month (from 01 to 4 July 2021) over the central and southern regions, and its maximum speed varied between 58 and 83 km / h and it reached 104 km / h at Thala on July 3 and 108 km / h at Kasserine on July 4, 2021.

Winds were also strong on July 6 and 7 over the northwestern regions, with a maximum speed ranging from 72 to 90 km / h, and a maximum of 101 km / h at Tabarka on July 7, 2021.

The wind speed also increased during the days of July 13 and 14 in Mahdia and the southern regions, with a maximum speed between 58 and 68 km / h and a maximum speed of 86 km / h in Kebili on July 14. The winds were locally strong on July 17, reaching 97 km / h in Bizerte, 72 in Kélibia, and 58 km / h in Monastir.

At the end of the month on July 31, 2021, the winds were also strong with a maximum speed of 83 km / h in Tunis and 72 km / h in Zaghouan and Kairouan.

### **- 3° ) August :**

#### **- Temperature :**

During the month of August 2021, maximum temperatures increased significantly in all regions (24 main stations) and they exceeded reference rates with a range of 9 to 15 ° C in most regions, notably in the first half of the month and many stations (14 stations) recorded new records above the maximum temperature level (Table of Records). The maximum temperatures varied between 32.5 degrees in Mahdia and 43.4 ° C in El Borma and they were higher than the reference rates and the difference varied between (+1.2) ° C in Mahdia and (+4.7) ° C in Siliana.

As for the general average of the maximum temperature, it reached 38.5 ° C by exceeding the reference rate (35.1 ° C) with a significant difference of (+ 3.4 ° C), which made d August 2021 the first of the hottest August since 1950.

As for the minimum temperature, it was also high in all regions in August of this year, and the rates ranged from 21.4 ° C in Kasserine to 29.4 ° C in Tozeur, and they exceeded the rates of the month, where the difference varied between (+ 1.1 ° C) in Tabarka and (+ 4.4 ° C) in Siliana. The mean minimum temperature was 24.6 ° C and it was above the reference mean (22 ° C) and the difference was (+2.6) ° C.

The average temperatures, they varied from 28.1 ° C in Tabarka to 36.3 degrees in Tozeur. On average and throughout Tunisia, the average temperature reached 31.5 ° C and it was above the reference average (28.6 ° C) with a significant difference of (+ 2.99 ° C). That made August 2021 the first hottest August since 1950.

#### **- Rainfall:**

Regarding rainfall, the monthly cumulative rainfall in all regions (24 main stations) was lower than the monthly reference total in most regions, with the exception of Kairouan (41 mm) and Gafsa (5 mm) , where rates were above normal. The cumulative for the month of

August 2021 reached 97 millimeters, while the reference rate for the same stations was 223 millimeters, which represents 43%, knowing that the rains did not fall during the month of August 2021 in the regions of Nabeul, Zaghouan, Siliana and most of the southern regions.

**- Wind:**

In August, the wind speed increased during the period from 01 to 04 August 2021, the winds were locally strong in the south, and the maximum speed ranged from 58 km / h in Ramada to 76 km / h in Kebili . The winds were also strong on August 09 in the northern regions, the maximum speed was between 61 km / h in Tabarka and 101 km / h in Bizerte. The period from August 17 to 20 was characterized by strong winds over the central and southern regions, with a maximum speed ranging from 58 km / h in Kelibia to 101 km / h in Kasserine and reaching 104 km / h in El-Borma. The winds were also strong during the days of August 25 and 26 over the north and the center, with a maximum speed ranging from 72 km / h in Zaghouan to 104 in Jendouba and reaching 137 km / h in Enfidha. The period from August 28 to 31 was marked by strong winds over most central and southern regions, with a maximum speed between 65 km / h in Djerba and 97 in Gafsa and a maximum of 112 km / h in Monastir.

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