

31 August 2023

Monthly Weather Summary – August 2023

General

August was considerably warmer than average and compared to the past it is ranked fifth in the nationwide series of temperature measurements since 1950. In the coastal plain and in the valleys, August is ranked higher, most notably with regard to the minimum temperatures, where it is ranked second. This was largely caused by a prolonged warm period which took place during the month and included an unprecedented sequence of high minimum temperatures in the coastal plain and in the northern valleys. At the end of the month there was an unusual event of widespread rain with relatively large amounts of rain for the summer months.

The warm August follows July which was considerably warmer than average too, so the period of the two primary summer months was the warmest, alongside July-August 2017, in the nationwide series of measurements since 1950.

Temperatures and Weather during the month

During daytime, August was warmer than average (1991 to 2020) by 1 to 2 °C in most parts of the country. At night, there were differences between various parts of the country. In the coastal plain, temperatures were higher than average by more than 2 °C, by 1.5 to 2 °C in the northern valleys and the Negev, by 1 to 1.5 °C in the northern mountains and the Arava and by 0.5 to 1 °C in the central mountains (table 1).

August can be divided by its weather pattern into three parts. The first part, until the 11th of the month, where temperatures were near average, but with a few warmer than normal days, the second part (12th to 24th of the month) when the significant warm period of the month prevailed and the third part, from the 25th until the end of the month, where temperatures were near average and sometimes lower, including some rainfall (figures 1, 2).

August 1-11

In the first part of the month, temperatures were mostly near average in the mountains and inland areas, but higher than average on some days. In the coastal plain, daytime temperatures were above normal for most of the time, but nights were near average. The first two days of the month were warmer than average (following July 31st) with temperatures of 34 to 36 °C in the coastal plain and in the lowlands, 37 to 38 °C in the

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northern Negev and the northern valleys and 42 to 44 °C in the Jordan Valley and the Arava. Similar temperatures prevailed on the 6th and 7th of the month as well, but it should be noted that relative humidity was low not only in the inland areas but also in the coastal plain (relative humidity of 25% to 30% at noon), which allowed for rapid nighttime cooling and lower than usual minimum temperatures (19 to 20 °C).

August 12-24

During this period it was warmer than normal, but it was different from the classic summer heatwaves and it had some unusual characteristics. For most of the period, a static high-level ridge prevailed over our region while in the lower level of the atmosphere the seasonal Persian Gulf trough prevailed with winds from the western sector. As a result, it was very warm and dry at altitudes of 1,000 to 1,500 m and higher, while in the lower layers the weather was cooler and humid. As a result, a thick inversion layer was formed, below the base of which extensive cloud cover prevailed at night and early morning primarily in the coastal plain, with extensive humidity.

On the 12th and 13th of the month, the inversion base height descended, so higher temperatures prevailed at daytime. The daily maximum temperature reached 45 to 46 °C in the Hula Valley, 38 to 42 °C in the central mountains (41.7 °C were measured in Jerusalem), 36 to 37 °C in the northern Golan and Upper Galilee, 42 to 45 °C in the Arava. The weather was dry in these areas. In the lowlands and the northern Negev, 34 to 37 °C were measured and 33 to 34 °C in the coastal plain, but with a higher relative humidity, which increased the heat stress.

The inversion base ascended later in the month, which resulted in lower temperatures, but they continued to be higher than average by 2 to 4 °C in the mountains and the inland areas. The extensive cloud cover and high humidity in the coastal plain and in the northern valleys lead to warm nights with minimum temperatures of 27 to 29 °C (which is 4 to 6 °C above average). These temperatures, combined with a relative humidity of 75% to 80% resulted in medium-level heat stress at night. This situation of heavy heat stress at daytime and medium-level heat stress at night lasted for eight consecutive days (13-20 of August) in the coastal plain and in the valleys, and this is an unprecedented sequence of warm nights in these regions (figure 3).

It should also be noted that with regard to the highest minimum temperature measured during the event, there were several stations where the record was broken by a small margin (such as Bet Dagan with 29.0 °C and Negba with 28.2 °C), while in other stations it was the second or third highest value.

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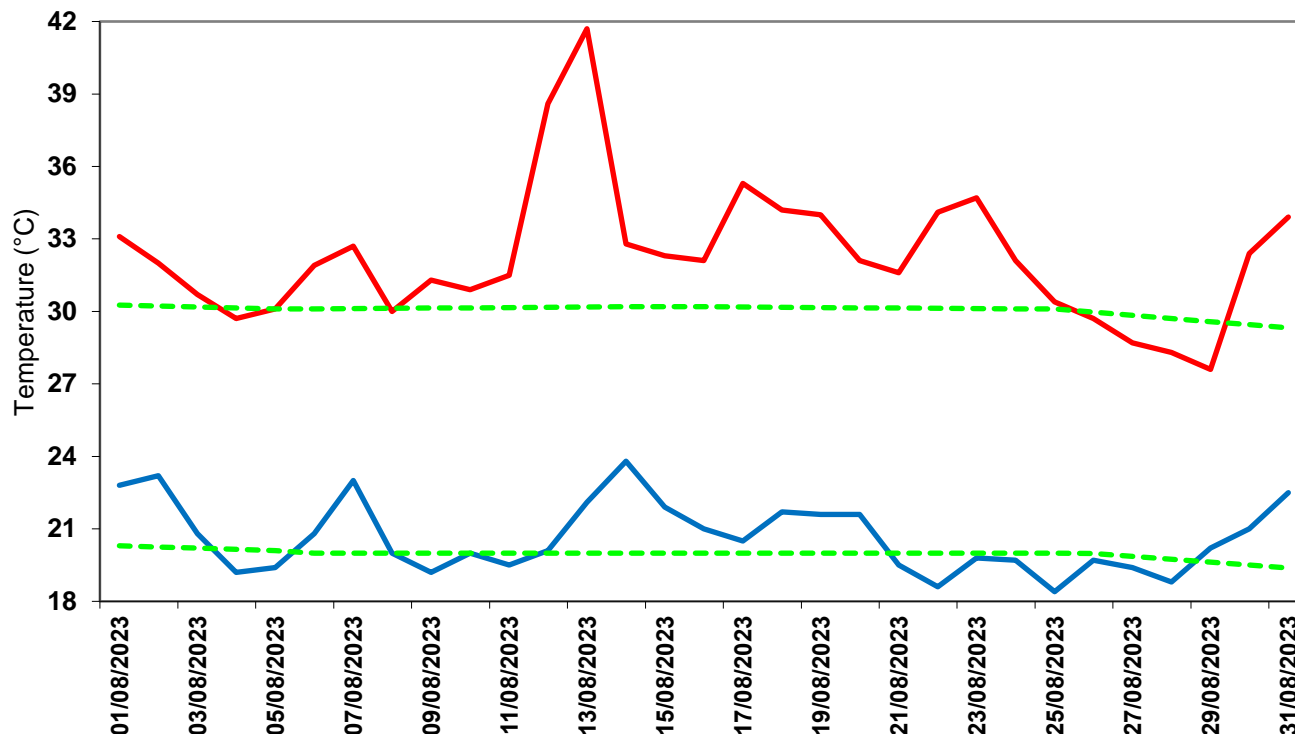
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August 25-31

The final part of the month was less warm. Temperatures in the mountains and inland areas at daytime were close to average and even lower on some days while nighttime temperatures were near average. In the coastal plain minimum temperatures were higher than average, but to a lesser degree than during the previous period and the maximum temperatures were slightly higher than average. On the 28th and 29th, rain fell mainly in the north but also in the southern coastal plain, in unusual amounts and spatial distribution for the summer months. In Jezreel Valley, over 10 mm were measured (Timrat 20 mm, Ram-On and Mishmar HaEmek 11 mm), up to 9 mm were measured in stations around Haifa, 8 mm were measured in the Galilee Panhandle (in Metula and Kfar Giladi) and several millimeters fell in other stations in the north. Most of the rainfall fell in the north, but also in the southern coastal plain (Kefar Warburg 3 mm, Yad Mordechai 2.4 mm). While light, localized summer rains occur occasionally, this rain event is unusual for the months of July and August both in distribution and in amount. However, it is interesting to note that in the past two decades the frequency of significant rain events in the primary summer months is higher than in the past.

Figure 1: minimum and maximum daily temperatures in Jerusalem in August 2023 compared to the multi-year average



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Figure 2: minimum and maximum daily temperatures in Bet Dagan in August 2023 compared to the multi-year average

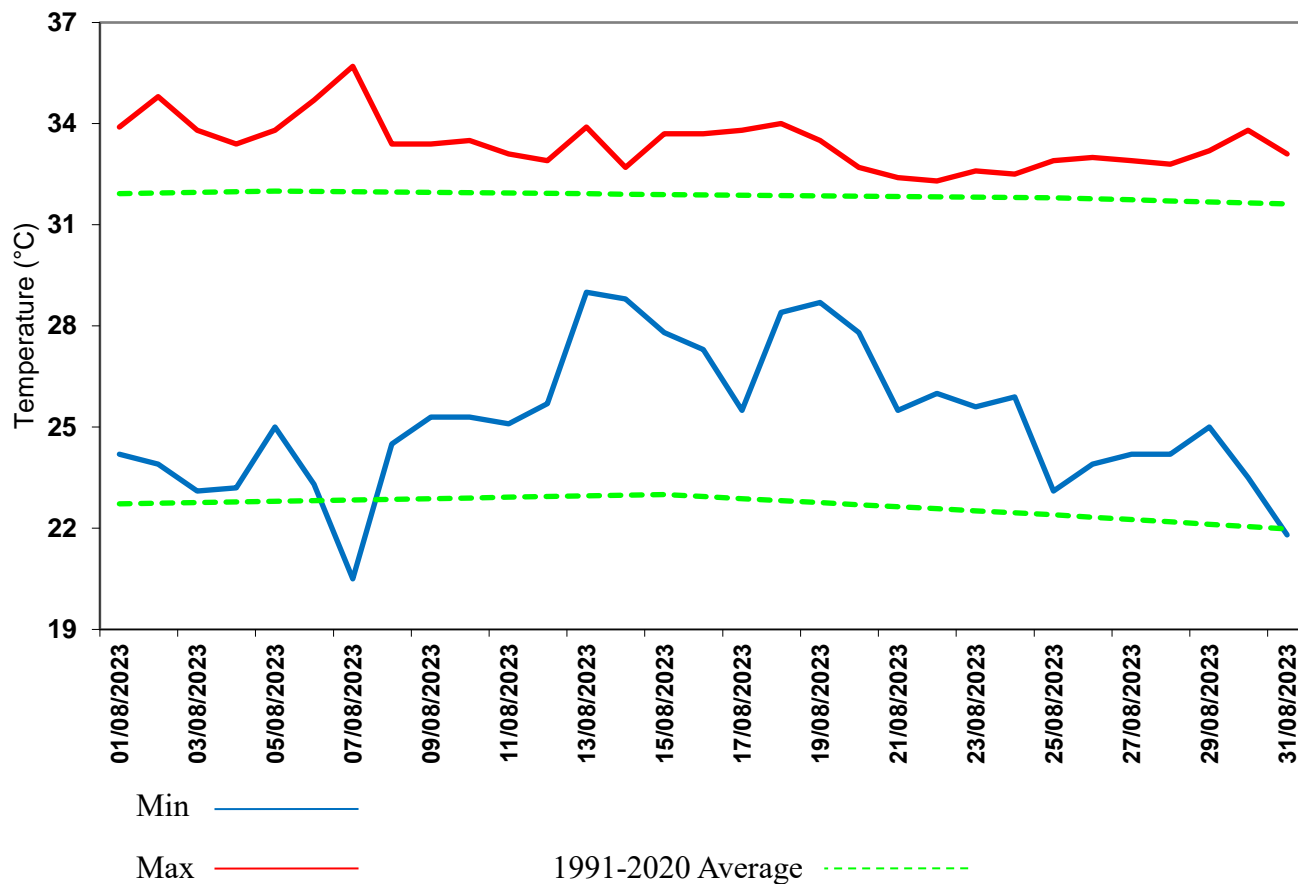


Figure 3: Number of Hours in the Day with medium or higher heat stress in Bet Dagan in August 2023

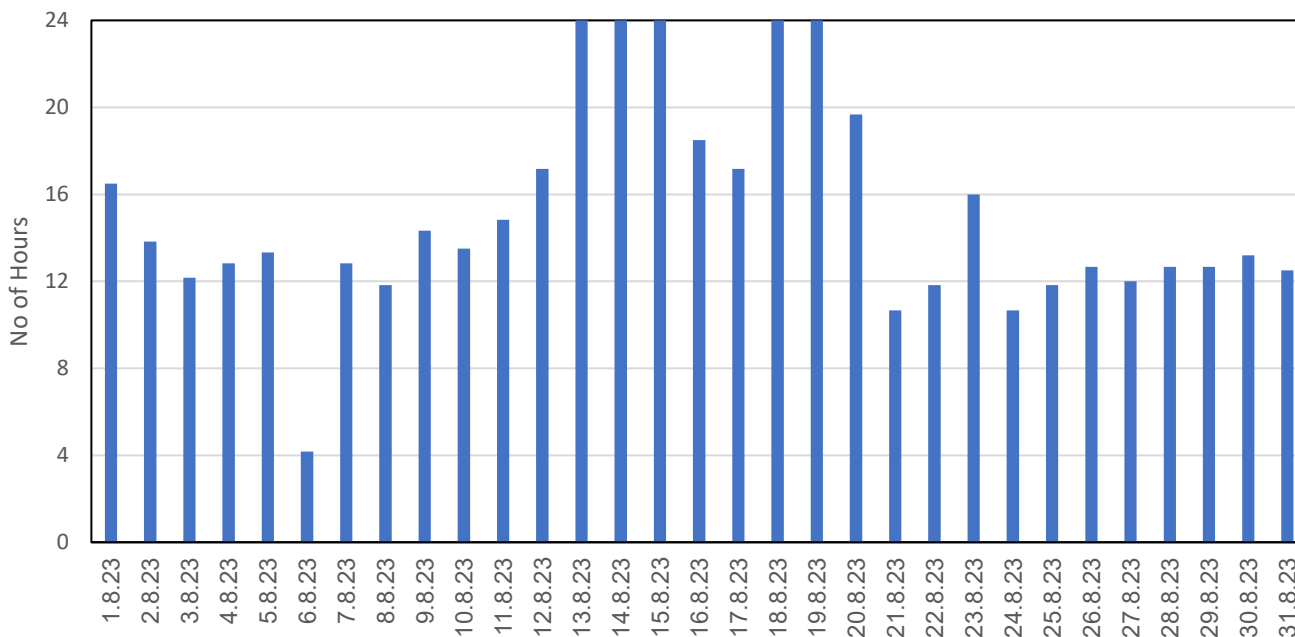


Table 1: August 2023 temperature* (°C) compared to the average

	Station	August 2023		Difference from 1991-2020 Average	
		Maximum	Minimum	Maximum	Minimum
Coastal Plain and Lowlands	Haifa (Technion)	30.4	24.6	+1.2	+1.2
	En HaHoresh	32.2	23.3	+0.7	+2.2
	Bet Dagan	33.4	25.2	+1.4	+2.2
	Negba	32.8	24.0	+0.9	+1.9
Northern Mountains	Elon	32.4	23.4	+1.1	+1.7
	Merom Golan Picman	32.0	18.5	+2.0	+1.5
	Avne Eitan	34.2	21.6	+0.8	+1.3
	Zefat Har Kena'an	31.4	20.5	+1.6	+0.9
	Deir Hanna	32.7	24.6	+0.7	+1.4
	Tavor	35.9	24.2	+1.5	+1.7
Northern Valleys	Afula, Nir HaEmek	35.5	24.1	+0.9	+2.2
	Kefar Blum	37.7	23.2	+1.5	+2.1
	Eden Farm	38.8	25.7	+0.7	+1.6
	Zemah	38.9	26.3	+1.0	+1.8
Samaria and Judea	Qarne Shomron	32.4	23.1	+1.2	+1.8
	Jerusalem	32.2	20.6	+1.9	+0.4
	Beit Jamal	33.8	23.3	+0.4	+1.6
	Rosh Zurim	30.2	19.1	+1.8	+0.8
The Negev	Besor	32.6	23.1	+0.4	+1.5
	Arad	35.6	20.9	+2.1	+1.6
	Be'er Sheva	35.7	23.3	+1.1	+1.8
	Sede Boker	34.1	21.1	+0.9	+1.6
The Araba	Sedom	40.7	31.8	+0.3	+0.9
	Hazeva	40.5	27.9	+0.7	+1.2
	Yotvata	40.7	26.1	+1.8	+1.6
	Elat	41.0	28.6	+0.5	+1.0

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Table 2: Extreme August 2023 temperatures (°C) compared to the past

	August 2023				Extreme Values Since Measurements Began				Years Station is Active
	Extreme Maximum		Extreme Minimum		Extreme Maximum		Extreme Minimum		
	Temp	Date	Temp	Date	Temp	Date	Temp	Date	
Bet Dagan	35.7	7/8/23	20.5	7/8/23	38.6	1/8/2012	14.6	18/8/1969	2023-1962
Negba	36.6	6/8/23	20.7	7/8/23	39.5	5/8/2021	14.0	18/8/1969	2023-1950
Zefat Har Kena'an	39.4	13/8/23	18.0	21/8/23	40.6	20/8/2010	13.0	22/8/1949	2023-1867
Jerusalem*	41.7	13/8/23	18.4	25/8/23	44.4	28/8/1881 30/8/1881	14.0	3/8/1926	2023-1935
Be'er Sheva**	38.8	7/8/23	21.0	4/8/23	43.8	6/8/2010	12.0	31/8/1934	2023-1922
Elat	44.7	8/8/23	25.0	7/8/23	48.0	1/8/2002	19.4	22/8/1976	2023-1949

* Jerusalem: Center 1950-2023, Talbiya 1948-1949, Palace Hotel 1935-1947, American Colony 1927-1935, Mount of Olives 1918-1926, German Colony 1895-1915, the English Hospital in Ha-Nevi'im Street 1898-1913, the English Hospital in the Old City 1867-1915

** Be'er Sheva University 2023, Be'ers Sheva Negev Institute 1957-2023, Be'er Sheva 1922-1957.

Table 3: August 2023 compared to the past

	August 2023 Ranking since Measurements Began at Station			Measurements at Station Began at
	Daily Temperature	Maximum Temperature	Minimum Temperature	
En HaHoresh	2-3	7	1	1949
Beit Dagan	1-2	4	1-2	1962
Ben Gurion Airport (Lod)	4	10	1-2	1950
Negba	4	6	3	1950
Beit Jamal	4	16	4	1920
Jerusalem	11	11	15	1861
Zefar Har Kena'an	6	10	8	1939
Newe Ya'ar	2-3	9	2	1951
Kefar Blum	2	3	2	1948
Zemah (Deganya)	5	4	3	1945
Tavor	2-3	9	2	1939
Be'er Sheva	3	11	2	1921
Sede Boker	5	7	4	1952
Sedom	9	14	6	1959
Elat	6	9	6	1949

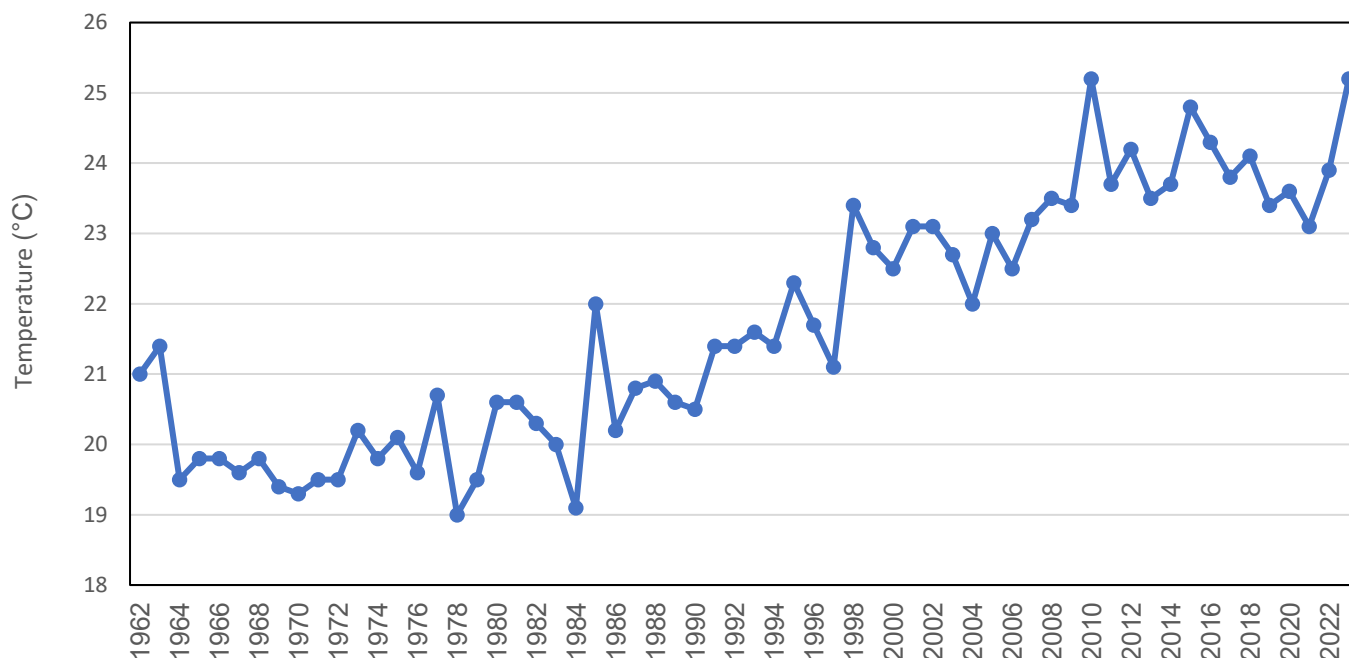
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Figure 5: Mean daily minimum temperature in Bet Dagan in August 1962 to 2023



July-August 2023 compared to the past

Both July and August were considerably warmer than average and a comparison with the past shows that the July-August 2023 period is ranked first, alongside the July-August 2017, in the nationwide series of temperature measurements since 1950.

Figure 6 shows that most of the warmest summers occurred during the past two decades and besides 2023 and 2017, the years 2021, 2012 and 2010 also stood out.

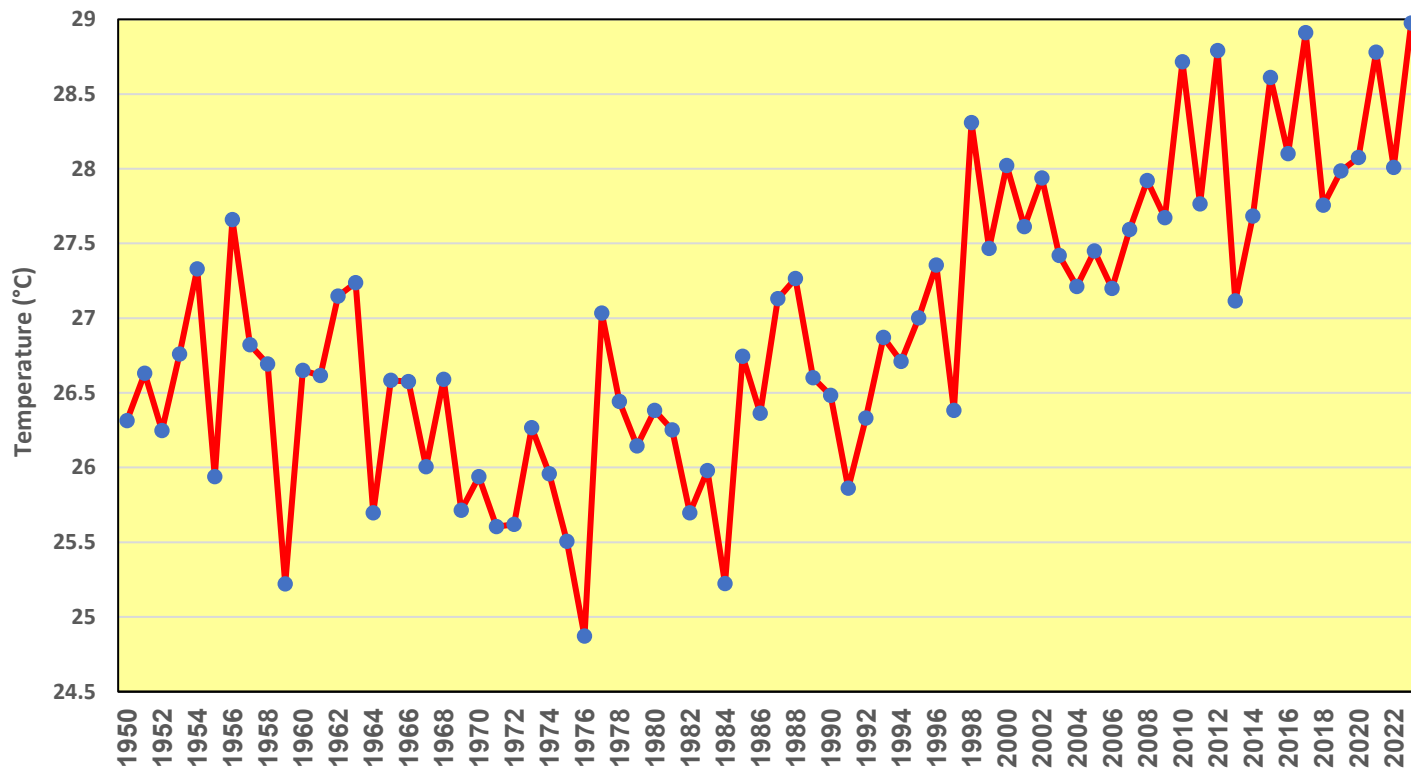
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Figure 6: Mean daily temperature in Israel* in July-August 1950-2023



1991-2020 Average - - - - -

* In order to represent all of Israel, five characteristic stations were selected for which there is data since 1950. The trend of means in these stations is similar to the trend of means in a larger and more versatile sample of stations.

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