

July 02 2023

Monthly Weather Summary – June 2023

June was an exceptional month with three unusual weather events which included widespread rainfall, thunderstorms, high temperatures, strong wind gusts and dust storms. Each event in itself was unusual for this month and the series of events was very unusual, to which we may add a similar event in the end of May.

Monthly rain amounts were not large and reached several millimeters, but they fell over most of the country, including the southern Negev and the Arava. This is unprecedented for June in terms of spatial distribution. In the first half of June there were several Sharav days and in one of them temperature records for June were broken in some stations. On the other hand, there were cooler than average days mostly in the mountains and inland, so in those areas June temperatures were near average. In the coastal plain they were slightly higher than average.

The first half of 2023 is ranked eighth in the nationwide series of temperature measurements since 1950.

Rain in June 2023 compared to the past

In June, rainfall amounts ranged from a few tenths of a mm to several millimeters in all parts of the country (table 1). The areas where the largest amounts fell were the northern Golan, the southern coastal plain, Judea and Samaria with 3 to 5 mm and over 6 mm locally. In other areas of the country the amounts usually ranged from 1 to 3 mm and there were a few areas where less than 1 mm fell.

Rainfall in June is not unusual, and measurable rain occurs every year in some of the stations. Sometimes the totals exceed 10 mm and in the years 1992 and 2018 several tens of mm were even measured. However, the rains this year fell over the entire country and almost all of the stations reported some rainfall. Usually, the rain in June occurs in limited parts of the country and even in rainy Junes such as 1992 and 2018 the rain did not reach the most southern parts of the country. In 1957, rain fell in the Arava and the southern Negev as well, like in the current year, but then there was no rainfall in the northern and central coastal plain, so the state-wide rainfall spread in June 2023 is unprecedented. Figure 1 presents the percent of stations measuring rainfall of more than 0.1 mm or more in June since 1925. In June 2023, 95% of stations measured rain and this is the highest rate in June for almost 100 years.

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Table 1: Rainfall in June 2023

Station	Rainfall (mm)	Station	Rainfall (mm)	Station	Rainfall (mm)
Rosh HaNiqra	1.7	En Zurim	3.9	Kedumim	4.0
Nahariyya	0.9	Negba	5.0	Har Berakha	6.1
Evron	2.7	Erez	0.9	Kefar Tappuah	6.6
Haifa Technion	0.4	Dorot	1.7	Eli	4.8
Haifa (port)	0.2	Yakhini	3.2	Shilo	3.5
Yagur	0.1	Be'eri	4.6	Neveh Tzuf	4.6
Daliyat el-Karmel	1.5	Besor	3.0	Har Harasha	2.8
En HaShofet	2.5	Nimrod Fortress	0.3	Pesagot	5.1
Zikhron Ya'akov	3.0	Merom Golan Picman	2.8	Latrun	5.8
Amikam	2.7	Gamla	0.2	Zova	4.9
Gal'ed	2.0	Elon	1.0	Jerusalem Center	4.6
En HaHoresh	2.4	Kabri	2.2	Ma'ale Adumim	2.0
Kefar Hess	2.6	Kefar Giladi	1.1	Beit Jamal	3.1
Nir Eliyyahu	2.2	Meron	2.0	Zur Hadassah	4.4
Nahshonim	2.6	Zefat Har Kena'an	2.4	Rosh Zurim	1.7
HaKfar HaYarok	0.9	Harashim	1.8	Arad	1.3
Tal Aviv Coast	4.1	Deir Hanna	1.7	Be'er Sheva	1.3
Mikve Yisrael	0.0	HaSolelim	4.6	Revivim	3.0
Bet Dagan	1.8	Neve Ya'ar	3.1	Sede Boker	1.0
Ben Gurion Airport	1.4	Afula Nir HaEmek	0.0	Mizpe Ramon	2.9
Rishon Le Zion	1.6	Banias	0.5	Neot Smadar	0.7
Nezer Sereni	1.0	Dafna	0.4	Gilgal	0.6
Gan Shlomo	1.2	Kefar Blum	1.1	Sedom	0.2
Nir Galim	0.6	Ayelet HaShahar	2.3	Hazeva	0.7
Qevuzat Yavne	2.9	Ginosar	0.6	Paran	0.0
Be'er Tuvia	4.5	Zemah	3.1	Yotvata	1.2
Nitzanim	3.9	Sede Eliyyahu	0.3	Elat	0.3

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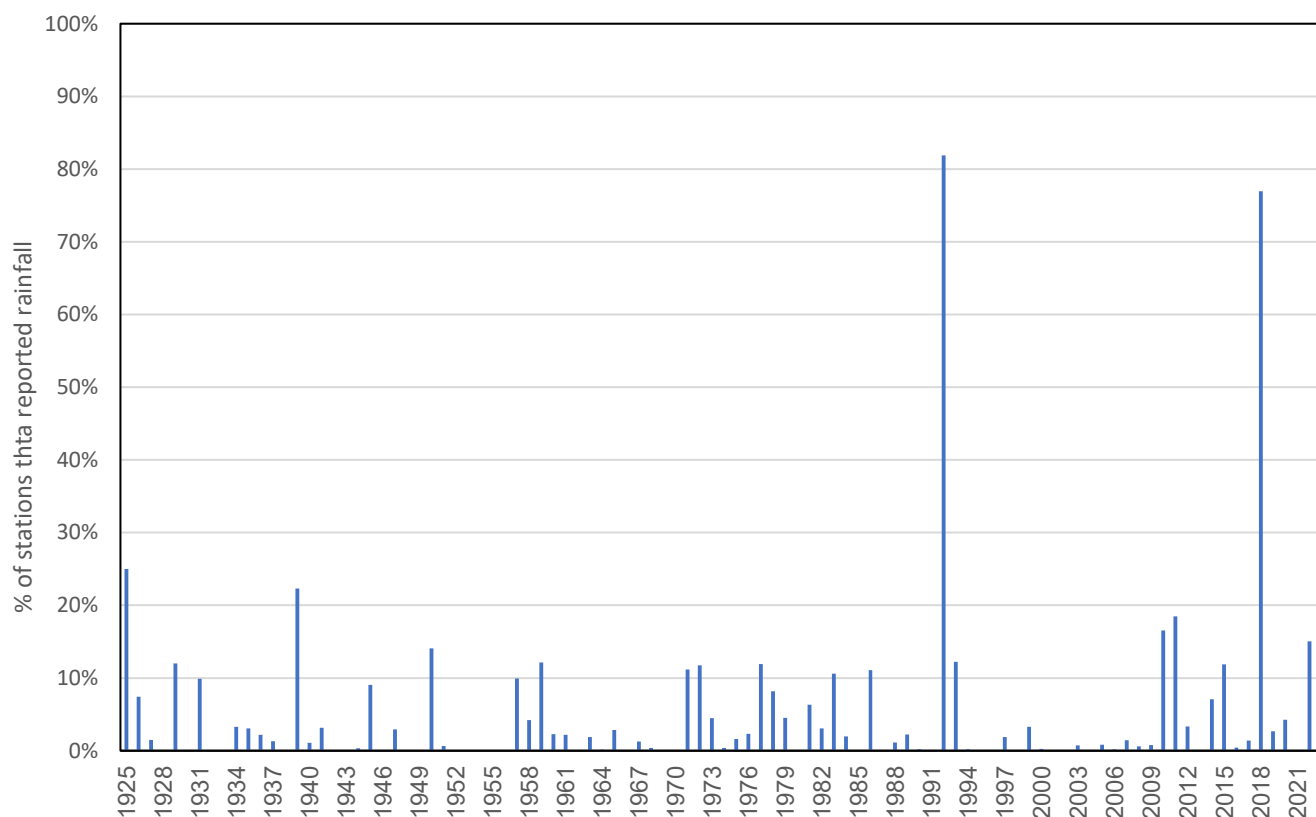


Figure 1: Percent of stations, where monthly rainfall of 0.1 mm or more was reported in June 1925 to 2023

Temperatures

June was generally close to average (1991 to 2020) in the mountains and inland and warmer than average in the coastal plain (table 2). During the day, temperatures inland were around average and slightly lower than average (by approximately 0.5°C) in the northern mountains and the Arava. At night, temperatures were slightly above average (by approximately 0.5°C) in most areas.

During the month, there were 3 Sharav events. The most significant was at the beginning of the month (1st to 2nd of June). In most parts of the country, excluding the mountains, over 40 °C were measured on the 2nd of the month and even values of 43 to 45 °C were measured. In some of the areas the values measured are ranked second or third for June and in some stations records were even broken. Heavy (but less extreme) Sharav events were on the 9th and 17th of the month.

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During the month, there were episodes of relatively cool weather, the most notable of which was on the 19th to 20th of the month, when minimum temperatures of 14 to 15°C and maximum temperatures of 23 to 24°C were measured in the mountains, values lower than the average by 5 to 6°C.

Table 2: Temperatures in June 2023 (°C) compared to average

	Station	June 2023		Difference from Average 1991-2020	
		Maximum	Minimum	Maximum	Minimum
Coastal Plain and Lowlands	Haifa (Technion)	28.3	20.5	+1.1	+0.1
	En HaHoresh	30.1	17.6	+1.0	+0.1
	Bet Dagan	31.3	20.4	+1.6	+0.6
	Negba	30.9	18.9	+0.8	+0.3
Northern Mountains	Elon	29.7	19.2	+0.5	+0.3
	Merom Golan Picman	27.3	13.9	-0.6	+0.1
	Avne Eitan	31.2	16.9	-0.4	+0.1
	Zefat Har Kena'an	27.8	16.7	-0.4	-0.9
	Deir Hanna	30.2	20.7	+0.4	+0.3
Northern Valleys	Afula, Nir HaEmek	32.7	18.4	+0.2	+0.2
	Kefar Blum	34.0	18.3	-0.1	+0.4
	Eden Farm	36.1	20.7	+0.1	+0.3
	Zemah	35.6	21.2	-0.1	+0.4
Central Mountains	Qarne Shomron	30.3	19.3	+0.8	+0.8
	Jerusalem	28.3	17.8	-0.3	-0.5
	Beit Jamal	31.2	19.5	-0.5	+0.4
	Rosh Zurim	26.9	16.2	0.3	-0.1
The Negev	Besor	30.7	18.8	-0.1	+0.5
	Arad	32.5	17.8	+0.5	+0.8
	Be'er Sheva	33.0	19.7	-0.1	+0.7
	Sede Boker	31.9	17.5	+0.1	+0.6
Arava	Sedom	38.0	28.6	-0.7	+0.1
	Hazeva	37.9	24.3	-0.7	+0.2
	Elat	39.1	26.1	-0.3	+0.7

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Table 3: Extreme Temperatures in June 2023 (°C) Compared to the Past

	June 2023				Extreme Values Since Start of Measurements				Station Activity Years
	Extreme Max		Extreme Min		Extreme Max		Extreme Min		
	Temp	Date	Temp	Date	Temp	Date	Temp	Date	
Bet Dagan	43.8*	2/6/23	16.2	1/6/23	43.7	8/6/2002	11.5	1/6/1967	1962-2023
Negba	43.7*	2/6/23	15.5	5/6/23	43.2	16/6/2018	11.5	1/6/1967	2023-1950
Zefat Har Kena'an	33.5	17/6/23	12.8	5/6/23	40.0	22/6/1942	8.7	4/6/1990	2023-1867
Jerusalem*	36.6	2/6/23	14.5	6/6/23	42.0	21/6/1942	9.0	2/6/1943	2023-1935
Be'er Sheva**	41.6	2/6/23	15.7	6/6/23	46.0	13/6/1933	8.0	3/6/1928	2023-1922
Elat	43.3	3/6/23	23.4	27/6/23	47.9	28/6/2014	18.5	11/6/1958	2023-1949

*Record value breaking the previous record

**Jerusalem: Center 1950-2022, Talbiye 1948-1949, Palace Hotel 1935-1947, American Colony 1927-1935, Mount of Olives 1918-1926, German Colony 1895-1915, English Hospital on Ha-Nevi'im Street 1898-1913, English Hospital in the Old City 1867-1915

***Be'er Sheva University 2023, Be'er Sheva Negev Institute 1957-2022, Be'er Sheva 1922-1957

Weather Events in June 2023

Several weather events took place during the month, some of which included a severe Sharav in most parts of the country, rain, widespread thunderstorms, dust storms and strong winds. The events were related to clouds and humidity transported from southern tropical origins (figure 2).

A. June 1-2: an event which included warming on its first day, two episodes of strong wind gusts and dust storms and an extreme Sharav on the second day followed by rain and thunderstorms.

Noticeable warming was felt in the first part of June 1st, while at noon the northwesterly winds strengthened significantly, primarily in the coastal plain, accompanied by wind gusts reaching 50 to 70 kph (100 kph at Ben Gurion Airport). In the afternoon and evening the winds intensified again while shifting to northerly-northwesterly, first in the coastal plain, but gradually advancing from north to south, reaching the Negev and Arava. The strong winds caused dust storms mainly in the south and a severe sandstorm reached the southern Arava, causing a delay in activity at Ramon Airport (Timna). With regard to the strong wind gusts, it should be noted that in a large number of stations in the coastal plain and lowlands and in some of the stations in the northwest Negev and the central

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mountains, records were broken for late May and June since measurements began (approximately 20-25 years ago).

On June 2nd 2023 a severe Sharav prevailed, with temperatures in excess of 40°C in most areas, excluding the mountains, for many hours. Maximum temperatures of 43 to 44°C were measured in the central and southern coastal plain and similar values were measured in large parts of the Jordan Valley, Arava and the Dead Sea. In the northern Negev and northern valleys temperatures of 40 to 42°C were measured and similar temperatures were measured even in the coastal strip. At Bet Dagan, Negba and Qevuzat Yavne the record value for June since measurements began over 60 years ago was broken. In other stations in the area, from En HaHoresh in Hefer Valley to Besor Farm in the northwestern Negev, the measured values are ranked second or third for June. At night and the following morning (June 3rd) rain fell in several locations, mostly in the north, accompanied by thunderstorms.

- B. June 8-9: another Sharav event accompanied by heavy clouds and precipitation, caused by the passage of a warm depression accompanied by clouds of tropical origin. During the event, several waves of rain and thunderstorms took place. The effect of the warm depression began on the 8th of the month with temperatures of 34 to 36°C in the lowlands, northern Negev and the northern valleys, 36 to 38°C in the Jordan Valley and 38 to 41°C in the southern Arava. In the early morning hours of June 9th intensive clouds entered the Negev and the central and southern coastal plain, accompanied by frequent, powerful thunderstorms and small amounts of rain. Later in the morning intensive clouds with rain and thunderstorms reached the central mountains and the north as well. Later, the clouds subsided and temperatures reached 38 to 39°C in the coastal plain, the lowlands and the northern Negev and 40 to 41°C in the southern Arava. At night on June 9th there was another wave of rain and thunderstorms from the central coastal plain to the Sharon area, Jezreel Valley, the Sea of Galilee and the southern Golan Heights. In this event, several millimeters of rain fell in most parts of the country.
- C. June 13: Rain and thunderstorms due to the passage of a southern Sharav depression accompanied by a jet stream. Since the system's trajectory was to the south, warming was not felt state-wide and in some of the areas temperatures were even lower than usual. Clouds that developed in Sinai reached the south of the country (mostly the Negev) in the late morning hours and later reached the center. Rain amounts of several tenths of a millimeter to several millimeters fell, accompanied by thunderstorms. There were also reports of hail, and in the southern Arava and Eilat dust storms occurred.

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- D. June 18: A Sharav with no significant clouds or precipitation. Temperatures of 38 to 39°C were measured in the coastal plain, the lowlands, the northern Negev and in Jezreel Valley, 41 to 42°C around the Sea of Galilee and Bet She'an and 43 to 45°C in the Jordan Valley and Arava.
- E. June 19-20: Some rainfall and a noticeable cooling: on the night of the 19th until the 20th and especially in the morning rain fell in various locations along the northern and central coastal plain and in the western galilee in amounts of several tenths of a mm. The formation of the rains and their timing had the characteristics of a summer rain. Temperatures inland and in the mountains were lower than usual.
- The chronology of temperatures and the sharp changes due to these events can be seen in figures 3 and 4.

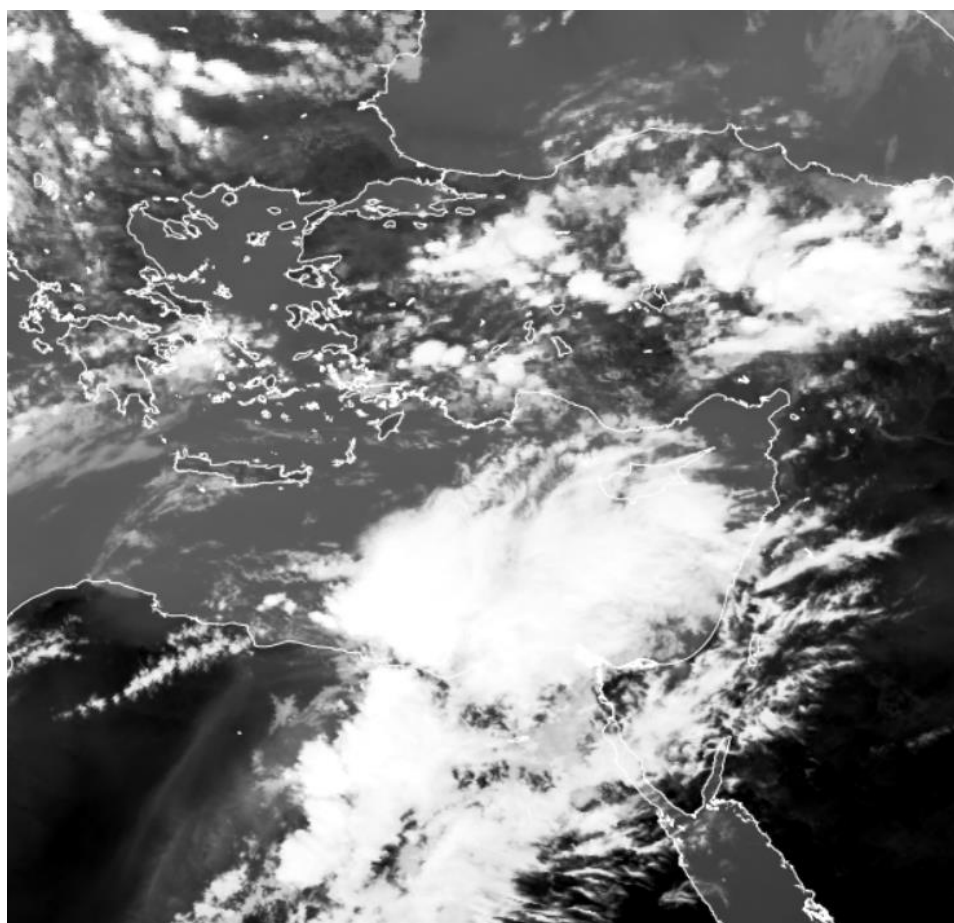


Figure 2: satellite image (infra-red) 01.06.2023 12Z

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Anomaly of June's weather events

Beyond the anomalies with regard to the wind gusts and the event of June 1st and 2nd, the sequence of rain events from the end of May to mid-June was very unusual. In the past 70 years, only in 1957 there were four rain events from the end of May to mid-June.

In addition, it is exceptional that the rainfall was not local but widespread and reached deep into the Negev three times during the month as well as the thunderstorms which took place (with each individual event being irregular for June). Further irregular characteristics of the event: the rain did not have a daily pattern (summer rains usually fall in the morning) and the clouds were accompanied by rapid strengthening of the winds and local haze.

Comparison of June 2023 and the first Half of 2023 to the past

Temperatures in June 2023 were near average (1991 to 2020) and it is ranked 26th in the nationwide series of temperature measurements since 1950 (figure 5).

As for the first half of 2023 – the other spring months (April and May) were characterized by near average temperatures as well, but the winter months that preceded them were warmer than average, so the first half of 2023 is ranked high compared to the past and is in the eighth place compared in the series of measurements since 1950 (figure 6).

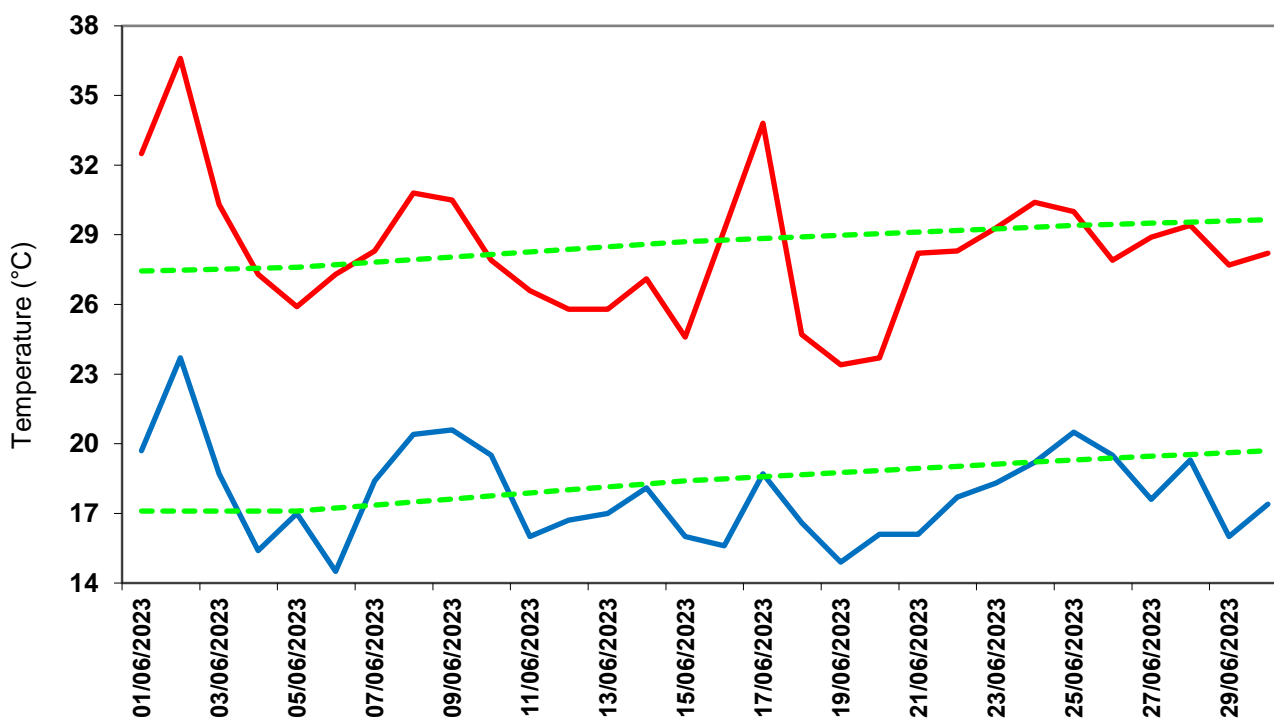


Figure 3: Daily minimum and maximum temperatures in Jerusalem in June 2023 compared to the multi-year average.

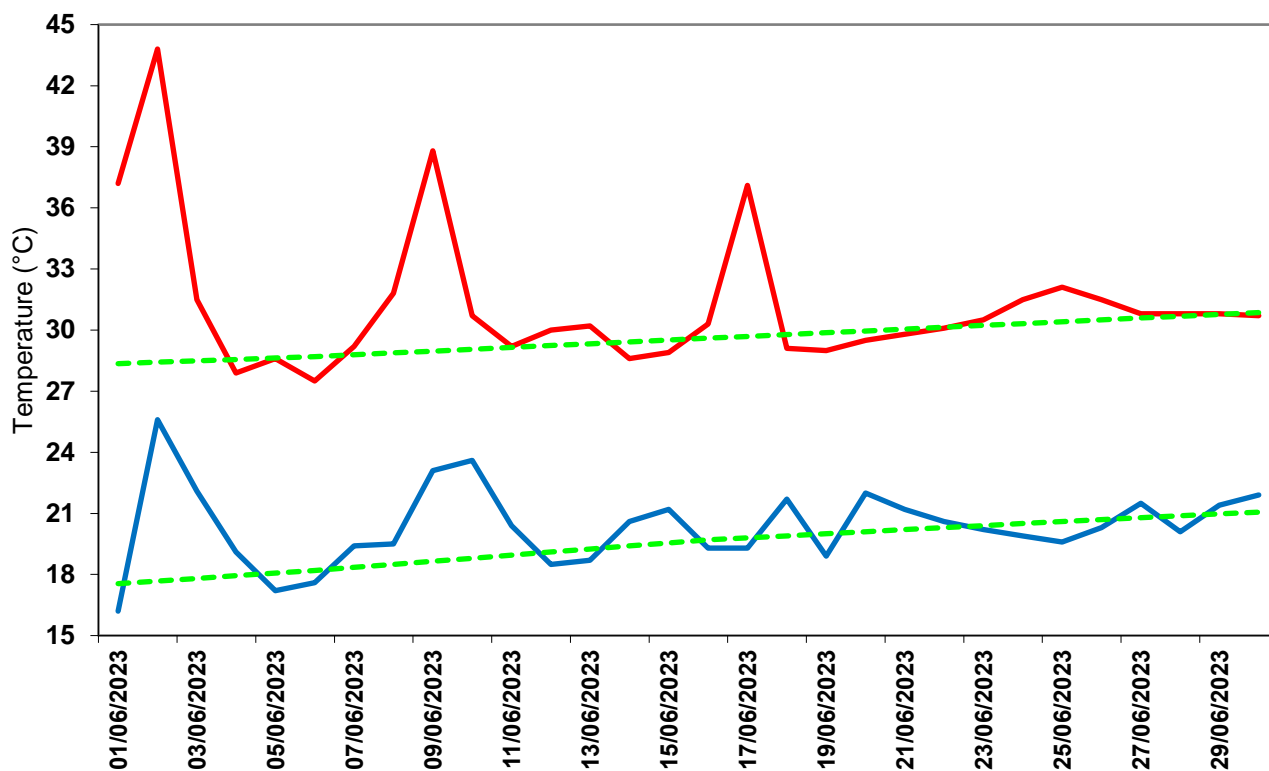


Figure 4: Daily minimum and maximum temperatures in Bet Dagan in June 2023 compared to the multi-year average

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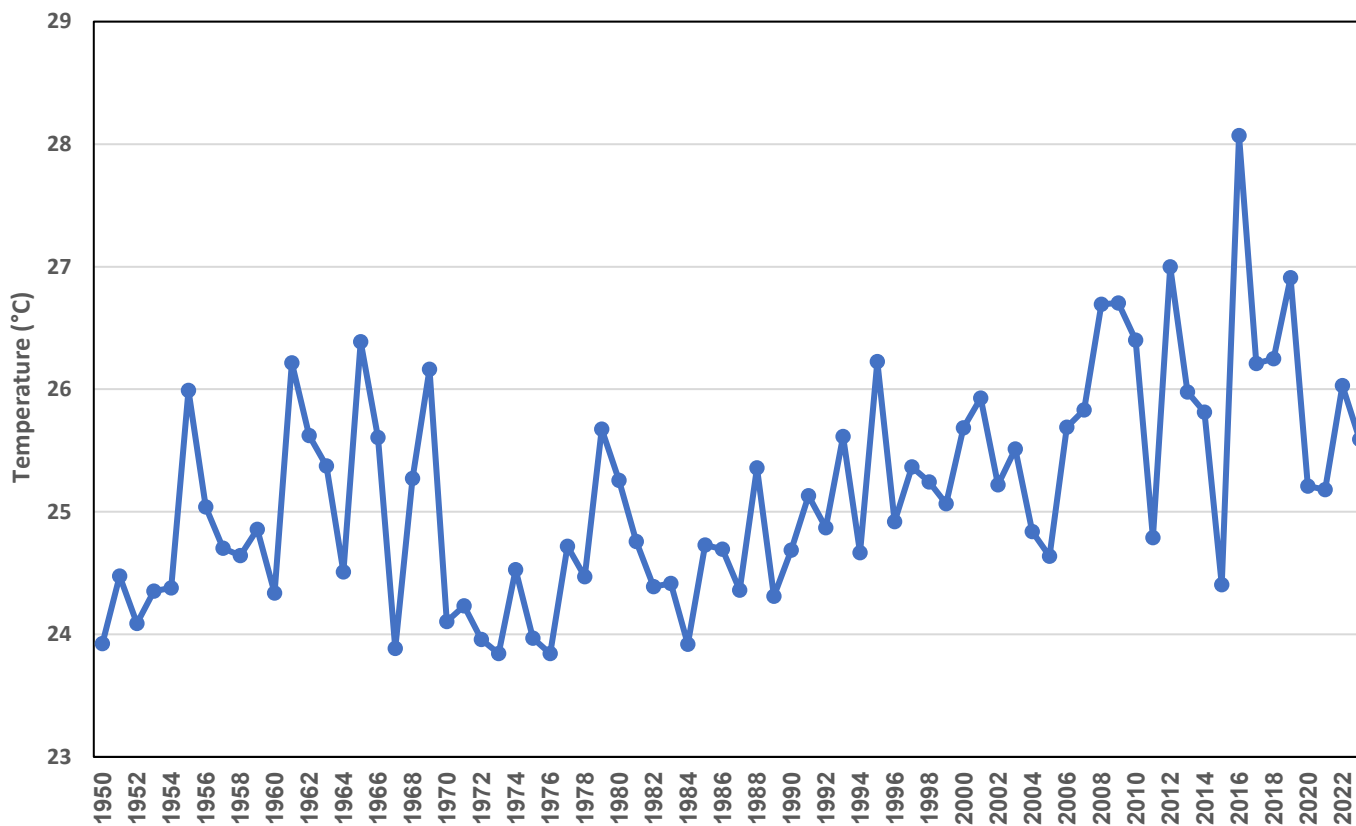


Figure 5: Average* temperature in June in Israel 1950 to 2023

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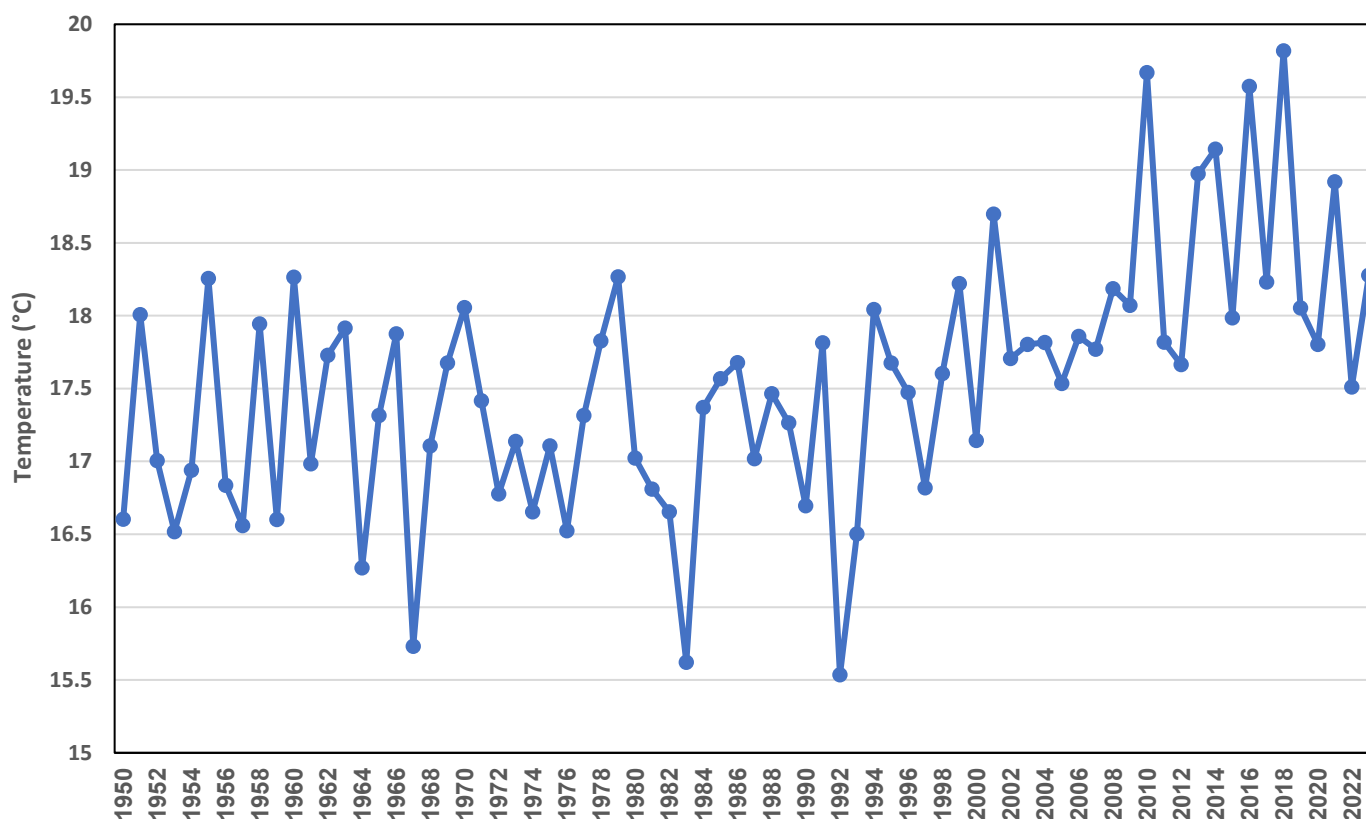


Figure 6: Average* temperature in Israel for the period of January to June 1950 to 2023

*In order to represent all of Israel, five characteristic stations were chosen, which recorded data since 1950. The trend of averages in these stations is similar to the trend of averages in a larger, more varied sample of stations.

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