

Record-breaking temperatures in Israel July 2019

An extreme Sharav¹ occurred in Israel on July 17th. In Sedom (southern Dead Sea) the daily maximum temperature reached an outstanding high of 49.9°C, which is the highest temperature recorded in Israel since June 1942 (On June 21st 1942, 54°C was measured at Tirat Tzvi, the highest temperature ever recorded in Israel).

A Sharav depression (warm cyclone) reached Israel from North Africa, which is unusual for the main summer months (it mostly occurs in spring). As a result there was a sharp rise in temperatures, which reached 40-42°C in the Coastal Plain, the Northern Valleys and the northern Negev, 42-43°C in the central Negev, 37-39°C in the Coastal Strip and 34-36°C in the mountainous areas. In the Jordan Valley and the Arava 43-46°C were measured with some places even warmer: Paran (central Arava) measuring 47.1°C, Hazeva (northern Arava) 48.5°C and the aforementioned 49.9°C in Sedom. The relative humidity was very low (10%-25%) in all areas, including the Coastal Plain which normally is humid in summer, with relative humidity values of 60%-70% at noon.

The event was intense but short – at noon winds became westerly in the coastal areas, causing a drop in temperatures. In the interior parts of the country the warm temperatures prevailed for a longer time, but by the end of the day temperatures dropped significantly in all areas and returned to normal.

Fires broke out in several areas across Israel. A number of people were hurt, mainly from smoke inhalation, and hundreds were evacuated from their homes.

Exceptional elements in the event

A number of records were set on 17.07.2019 in addition to the Sedom record-breaking temperature. The 48.5°C measured in Hazeva (northern Arava) is the highest temperature for this station since records began there in 1988.

¹ A hot and dry spell

The temperatures that were measured in the Coastal Plain are new records for July, breaking the previous records by 1-1.5°C (table 1).

July records were broken in the northern Negev too (but less dramatically). In many stations the previous record was set last year, on 25.07.2018.

It should also be mentioned that the occurrence of this Sharav in the Coastal Plain is remarkable. Ordinarily, summer along the coast is dominated by a prevailing westerly flow from the Mediterranean Sea, amplified by the sea breeze. Sharav events with warm and dry weather can occur in summer in the interior parts of the country, yet in most cases, due to the westerly flow, the coastal areas experience lower temperatures but an increased relative humidity. In the past Sharav events with very warm and dry weather affected the the Coastal Plain in summer approximately once every 5-10 years, but in the last decade it has happened more frequently (once every 2-3 years), and last year (on July 25th 2018) it occurred too.

The event in relation to global warming

Extreme temperatures were measured in the distant past too (June 1942), yet the fact that maximum temperature records are frequently broken in recent years can indicate that global warming not only affects the average temperatures but also the extreme temperatures. Even though a single meteorological event is not necessarily associated with climate change, the projections are for a continuation of global warming, and therefore we can expect an increased number of extreme heat waves and a rise in the probability of more record-breaking temperatures (figure 1).

Table 1 presents the daily maximum temperatures on July 17th 2019, alongside the average daily maximum temperature for July and the absolute maximum temperature for July (until 2018).

Table 1: Daily maximum temperature on July 17th 2019, July average and July absolute maximum temperature since records began*

Area	Station	Daily maximum temperature (°C) 17/7/19	Average daily max. in July (1995-2009)	Absolute maximum (°C) in July (until 2018)	Date of absolute maximum	Start of measurements
Coastal Plain	Haifa	39.7***	31.6	37.8	31/07/2002	1898
	En HaHoresh	40.4***	31.1	38.6	02/07/1995	1949
	Tel Aviv**	38.7***	29.9	37.4	02/07/1995	1874
	Bet Dagan	41.5***	31.5	39.8	25/07/2018	1962
	Negba	41.7***	31.7	40.5	25/07/2018	1950
Northern Mountains	Zefat Har Kenaan	34.4	30.7	39.0	30/07/2000	1939
	Merom Golan	33.1	29.2	40.8	29/07/2007	1978
Central Mountains	Jerusalem	35.7	30.0	41.1	12-13/7/1888	1866
	Beit Jimal	40.2	32.9	40.5	25/07/2018	1920
Northern Valleys	Afula Nir HaEmek	39.6	34.1	42.0	11/07/1983	1948
	Kefar Blum	40.0	35.6	44.5	31/07/2002	1953
	Zemah	41.7	37.7	45.9	31/07/2002	1945
Negev	Besor Farm	42.3***	32.6	40.6	25/07/2018	1975
	Beer Sheva	42.4***	34.7	42.0	10/07/1945	1938
	Sede Boqer	41.6***	33.4	40.9	25/07/2018	1952
Jordan Valley & Arava	Gilgal	45.3	40.4	48.1	31/07/2002	1973
	Sedom	49.9****	40.7	47.9	25/07/2018	1934
	Hazeva	48.5****	40.2	46.7	25/07/2018	1988
	Elat	40.4	40.4	48.3	31/07/2002	1949

* Data of extreme values are also taken from nearby stations. However in a few cases the data are not consecutive and there are some missing periods.

** Current data of Tel Aviv are from Tel Aviv Coast Station. The 1995 record was measured in Tel Aviv Sede Dov

*** Bold temperature values are new records for July that were set in the current event

**** Red bold temperature values are new records for the whole year that were set in the current event

P.O. Box 25, Bet 5025001
Dagan,
Fax: 972-3-

www.ims.gov.il

ims@ims.gov.il
9604065



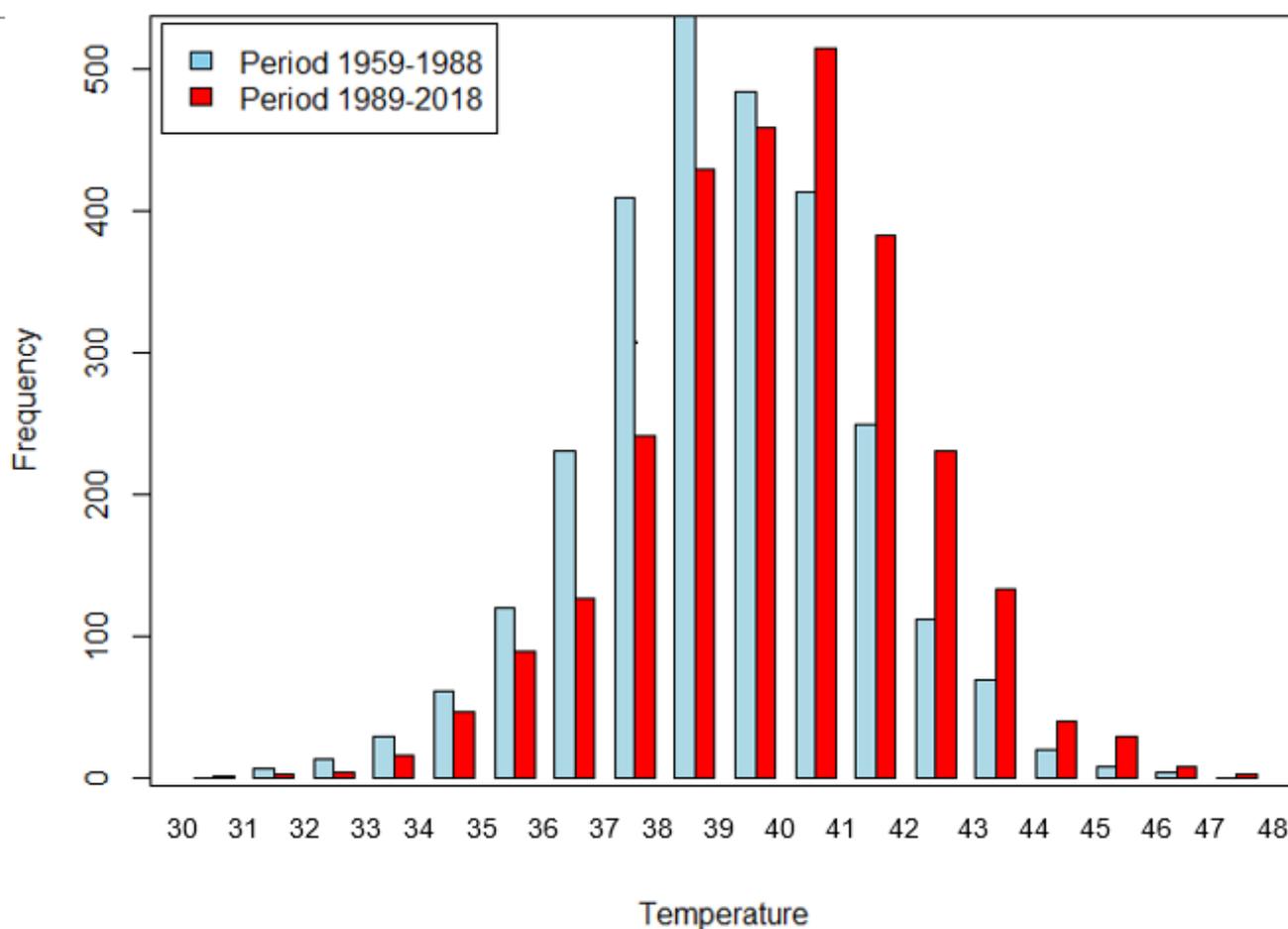


Figure 1: Sedom daily maximum temperature distribution June-July-August 1959-2018

Figure 1 presents the distribution of Sedom Maximum temperatures, comparing between two periods - 1959-1988 and 1989-2018. The extreme value of 49.9 °C on July 17th 2019 (vertical red line) is well outside even the recent period distribution.

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 Fax: 972-3-

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ims@ims.gov.il
 9604065

