State of Israel
Ministry of Transportation
Meteorological Service

30 July 2023

Heatwave in July 2023

A heatwave that lasted approximately two and a half weeks, featuring high temperatures and extreme heat stress levels occurred from 12 to 29 July 2023. While no extraordinary temperature values were recorded, the duration of this heatwave is considered exceptional.

Heatwave Progression

The heatwave began on the 12th of the month, with alternating periods of warming and cooling. However, temperatures consistently remained above average, sometimes significantly so - 4 to 7°C above average in mountainous and inland areas and 2 to 5°C above average along the coast, in the lowlands, and the valleys. On certain days, temperatures reached 43 to 46°C in the Jordan Valley and Arava, 35 to 37°C on the coastal plain and lowlands, 38 to 40°C in the northern Negev, and 34 to 36°C in the mountainous areas. Along the coastline, temperatures ranged from 32 to 33°C with high relative humidity, reaching 70% to 75% during midday.

In the coastal plain, lowlands, Negev, and valleys, severe to extreme heat stress prevailed for several hours daily. In the mountains, heat stress was typically moderate.

Minimum temperatures in the first part of the heatwave were mild (20 to 22°C in the coastal plain and lowlands, 18 to 19°C in the mountains). Later, they increased to 23 to 26°C in the mountains. Along the coast, minimum temperatures also rose but only exceeded 25 to 26°C on a few nights, typically remaining between 22 to 24°C. Consequently, nighttime heat stress was generally mild or absent.

Exceptional Nature of the Heatwave

To assess the rarity of this heatwave in terms of duration, we examined prolonged hot periods in the past at several long-standing weather stations. A lower threshold of approximately 0.5°C below the lowest maximum temperature during the current heatwave was used, requiring a sequence of at least 14 consecutive days. (so some of the sequences in the table are slightly shorter than the current 16–17-day long sequence).

Table 1 (presented on the next page) shows past events. Except for Jerusalem, most stations recorded several prolonged sequences in the past two decades (e.g., late August and September 2020, late July and August 2015, August 2010). Prior to this (from the 1940s to the 1990s), prolonged sequences were rare, though a few cases occurred in earlier decades (July 1978 in some stations).

www.ims.gov.il ת.ד. 25 בית דגן, 50250
פקס. 03-9604065 דוא"ל: ims@ims.gov.il

It is noteworthy that recent summer heatwaves (2020, 2015, and 2010) featured high minimum temperatures and significant heat stress even at night, making them equally severe despite being slightly shorter.

From a long-term perspective (70 years or more), the current heatwave is exceptional in duration but not in daily peaks, and it is generally not unprecedented.

The Heatwave in Europe and its Link to Global Warming

Simultaneously with this heatwave in our region, a prolonged and extreme heatwave occurred in southern Europe and northern Africa, with temperatures reaching 40°C and even exceeding 45°C in Spain, Italy, and Greece. This heatwave is linked to an unusually strong subtropical high-pressure system over the past two to three weeks, extending to 40° latitude and occasionally beyond, particularly in the central and western Mediterranean region. As a result, shallow troughs typically affecting the region in summer failed to penetrate, leading to continuous air subsidence and escalating heat in these areas. The heat and dryness fueled wildfires, notably in Greece (especially on the island of Rhodes).

Our region was on the periphery of this ridge, experiencing a prolonged heatwave but without extreme temperature values.

The current heatwave, both in our region and in southern Europe, aligns with the global warming trend, evident in more frequent and prolonged heatwaves observed in recent decades in our region and globally.

www.ims.gov.il ת.ד. 25 בית דגן, 50250
פקס. 03-9604065 דוא"ל: ims@ims.gov.il

Table 1: Prolonged Heatwaves in the Past

	Current and Expected Sequence	Similar or Close Sequences in the Past	Beginning of Measurements in the Station or Area
Jerusalem	17 days with 33 °C or more	29/08/2020 – 14 days 19/07/1928 – 15 days 17/07/1893 – 15 days 21/07/1922 – 23 days 08/07/1888 – 15 days	1861
Ben Gurion Airport (Lod)	16 days with 33 °C or more	29/08/2020 – 15 days 11/08/2010 – 19 days 24/07/2002 – 16 days 29/07/1998 – 24 days 03/07/1978 – 20 days	1950
Bet Dagan	16 days with 33 °C or more	01/08/2021- 16 days 29/08/2020 – 15 days 30/07/2015 – 14 days	1962
Negba	16 days with 33 °C or more	30/07/2021 – 17 days 06/08/2015 – 15 days	1950
Beit Jamal	16 days with 34 °C or more	29/08/2020 – 15 days 29/07/2015 – 14 days 12/08/1932 – 18 days	1920
Zefat Har Kena'an	17 days with 32 °C or more	04/07/1978 – 18 days	1939
Be'er Sheva	17 days with 36 °C or more	29/07/2015 – 14 days 11/08/2021 – 14 days 29/07/1998 – 16 days 13/09/1931 – 15 days	1921
Kefar Blum	17 days with 37 °C or more	29/08/2020 – 15 days	1948
Zemah (Degania)	17 days with 39 °C or more	25/07/2021 – 14 days	1945
Afula Nir Haemek	17 days with 36 °C or more	29/07/2015 – 14 days 29/07/2010 – 14 days	1950
Tavor Kadoorie	17 days with 37 °C or more	Did not occur	1939
Sedom	17 days with 41 °C or more	26/07/2020 – 14 days 17/07/2009 – 15 days	1959
Eilat	17 days with 41 °C or more	31/07/2017 – 15 days 28/07/2015 – 15 days 11/07/2012 – 19 days 11/08/2010 – 14 days	1949

www.ims.gov.il
ת.ד. 25 בית דגן, 50250
פקס. 03-9604065
דוא"ל: ims@ims.gov.il