State of Israel
Ministry of Transport
Israel Meteorological Service

10 Iyar 5785
08 May 2025

Summary of the Rain and Flood Event in Southern Israel - 04 May 2025

Overview

On 4 May 2025, rainfall was registered in southern Israel from the early afternoon until the evening. In parts of the Negev, the Arava Valley and the Dead Sea area, precipitation reached very high intensities, inducing significant runoff and flash-flooding in local wadis. The most extreme rates occurred near En Gedi, within the drainage basins of Nahal David and Nahal Arugot, where the rainfall return periods for various accumulation intervals were estimated at 100 – 200 years, rendering the event exceptional even when compared with historical analogues.

Elevated rainfall intensities along the eastern sector of the country are characteristic of the transition seasons. They arise when warm air in the lower atmosphere encounters colder air aloft, creating marked instability and fostering the development of deep convective storm clouds. Ongoing global warming is expected to enhance both the frequency and the magnitude of such high-intensity precipitation episodes, not only over the eastern regions but also across the western portions of Israel.

1. Evolution of the event and rainfall amounts

From the early afternoon of 4 May 2025, well-developed convective cells began penetrating southern Israel under the influence of an upper-level low centred over the eastern Mediterranean and northern Sinai, which advected abundant moisture and promoted instability.

Heavy showers accompanied by frequent thunderstorms had already been recorded during the morning in north-western Sinai. As the upper low migrated eastward, a cloud band moved accordingly while additional convective cells materialised over central Sinai and south-west of Eilat. By midday the cloud band had approached the Israeli frontier, and the first showers were reported near the Ḥaluẓa Sands. This is evident in the satellite-borne radar snapshot (part of NASA's GPM mission) that overflew the region on 4 May 2025 at 12:47 LT (Fig. 1). The image depicts a relatively broad cloud shield punctuated by compact cores of very high reflectivity; indeed, light to moderate flooding was simultaneously occurring in parts of Sinai.

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At 13:30 LT the principal rain cells advanced from the Eilat Mountains toward the north-north-east, while further cells entered more northerly sectors of the western Negev. Concurrently, isolated convective clouds burgeoned over the Arava and eastern Negev, and around 14:00 LT a vigorous storm cell expanded above Maʿale Ephraim in the southern Jordan Valley.

The main convective outbreak over Israel unfolded between 14:00 and 17:00 LT. Storm cells erupted adjacent to the Dead Sea, others progressed north-eastwards from the southern Negev into the southern and central Arava, and additional cells tracked from the Yeruham area toward Dimona and the north-eastern Negev. Where these cores matured, cloud tops were extremely high and rainfall rates were intense; radar returns also indicated the presence of hail. The cell approaching Dimona strengthened in the immediate vicinity of the city, releasing heavy hail and torrential rain that inundated several neighbourhoods. Owing to the absence of automatic gauges in that locality, radar-derived estimates suggest that 30 – 40 mm fell in Dimona, the bulk of it within roughly 15 – 20 minutes, as portrayed in the event-total rainfall map derived from the Bet Dagan weather radar (Fig. 2).

During the evening, as the upper-level low progressed eastward, the convective clouds likewise shifted east and decayed. Overnight, a few residual cells formed in the cold sector and deposited only a few millimetres, locally somewhat more—at scattered stations across northern and central Israel.

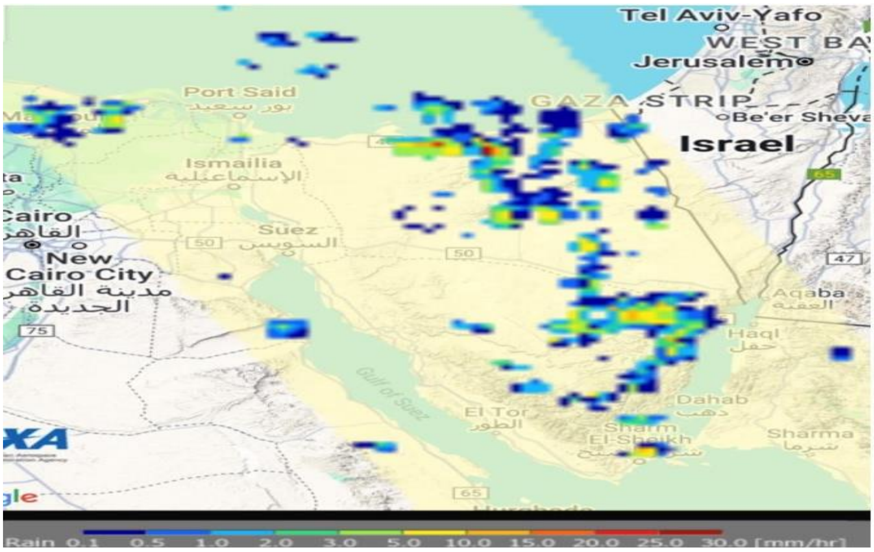

Figure 1: Rainfall intensity as captured by NASA’s satellite-borne radar during its overpass of Sinai at 12:47 IDT. Source: https://gpm.nasa.gov/missions

Figure 2 shows that, beyond the main rainfall hub centred on Dimona, five additional hubs experienced intense and comparatively prolonged precipitation, producing accumulations of roughly 20 mm or more: the Yotvata sector (Samar 24 mm); the Menuha Junction–Paran corridor (33 mm); the Holot Ḥaluza dunefield; the north-eastern flank of Makhtesh Ramon; and the Ein Gedi area. The highest instantaneous radar reflectivity values, together with the lowest cloud-top temperatures, were registered above the precipitous Dead Sea escarpment near Nahal David, whose discharge surged with exceptional vigour relative to its modest catchment (Figure 3).

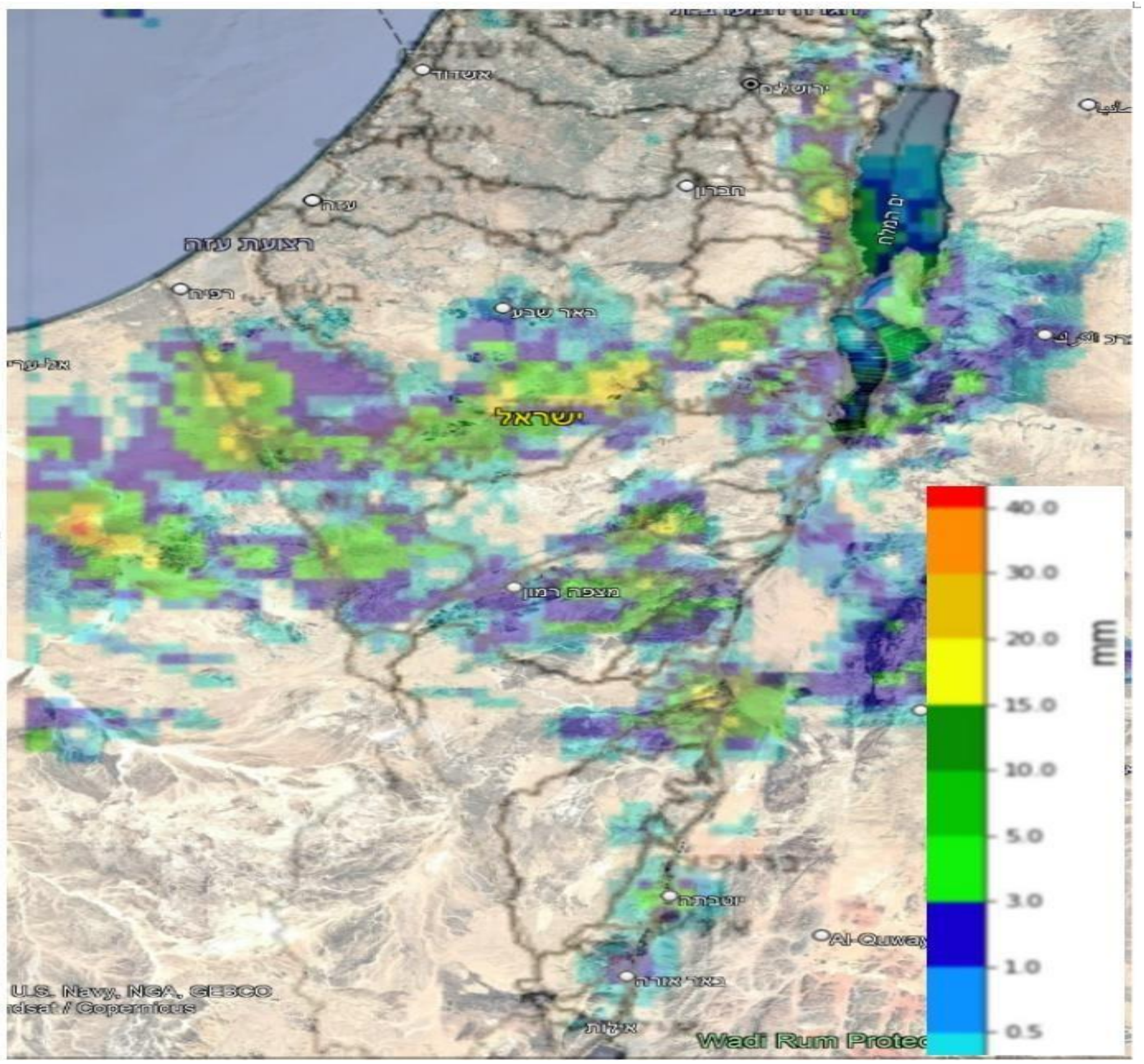

Figure 2: Spatial distribution of rainfall during the event—12-hour accumulation up to 22:00 IDT. In areas situated far from the radar (e.g., the central and southern Negev) and in sectors lying in the radar's orographic shadow (such as the Jordan Valley and the Judean Desert), the displayed totals underestimate the true precipitation amounts.

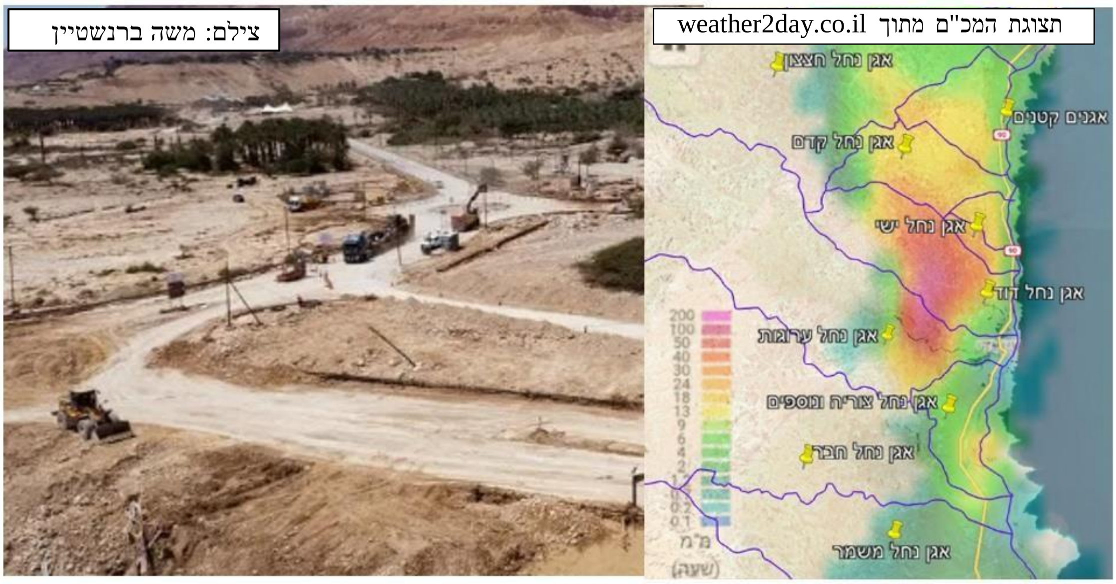

Figure 3: The powerful precipitation cell over the Nahal David and Nahal Arugot catchments at 15:25, along with the measured breadth of the scouring traces in Nahal David.

2. Rainfall Intensities and Their Anomalies

Rainfall intensities were exceptionally high and anomalous in the catchment basins of Nahal Arugot (the lower basin), Nahal David, and Nahal Kedem (Figure 4 in the appendix). The automatic rain gauge at Nahal Arugot, operated by Ben-Gurion University and the Desert Research Institute for Flash Floods (DRI), located near the mouth of Nahal Arugot, recorded extraordinarily high rainfall rates.

The appendix presents the full minute-by-minute measurements from this station, showing that precipitation there began only after 15:31 and immediately reached moderate to high intensities of around 0.5 mm per minute (30 mm/hour). Five minutes later (at 15:36), the rainfall intensified significantly, with 30.9 mm falling within 10 minutes, including 17.6 mm in just 5 minutes. After 15:46, the rain gradually subsided: until 15:49, it still maintained a high rate of approximately 1 mm per minute or more, marking 14 consecutive minutes of intense rainfall, after which the rate sharply dropped to 0.3 mm per minute or less.

Table 1 presents the peak rainfall amounts and intensities at the Nahal Arugot station for intervals ranging from 5 to 60 minutes. Table 2 compares these values with the threshold values calculated for rare probabilities of 1% and 0.5% (corresponding to mean recurrence intervals of 100 and 200 years, respectively) at the Sedom station, a long-standing site with climatic characteristics similar to those of the Ein Gedi area.

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Table 1: Peak rainfall totals measured on 4 May 2025 at the Nahal Arugot automatic station over various intervals.

Duration (minutes)	Time	Amount (mm)	Intensity (mm/h)
5	15:42-15:46	17.6	211.2
10	15:37-15:46	30.9	185.4
15	15:35-15:49	36.2	144.8
20	15:32-15:51	38.0	114.0
30	15:32-16:01	40.6	81.2
45	15:32-16:16	41.0	54.6
60	15:32-16:31	41.3	41.3

Table 2: Rainfall intensities (mm/h) recorded in the current event compared with the threshold intensities calculated for 1 % and 0.5 % exceedance probabilities at the Sedom station.

	Rainfall intensities (mm/h)		
Duration (minutes)	04.05.2025	probability 1%	probability 0.5%
10	185.4	150.8	200.2
15	144.8	116.0	154.6
20	114.0	95.3	127.5
30	81.2	69.1	92.4
45	54.6	51.3	69.4
60	41.3	40.9	55.6

Table 2 shows that the likelihood of rainfall intensities matching those recorded at Nahal Arugot during the present storm lies below 1 %—equivalent to a 100-year return period—yet exceeds 0.5 % (a 200-year recurrence) for all durations from ten minutes to one hour. Over the shorter spans, the observed rates converge toward the thresholds calculated for the 0.5 % exceedance probability, whereas the 30- and 60-minute totals drift nearer to the values associated with the 1 % level.

3. Comparison with earlier events

To place the current episode in historical perspective, Table 3 contrasts its peak short-duration rainfall totals with those registered during the most significant storms in southern and eastern Israel. Although the present accumulations do not eclipse existing records, they approach them closely, especially for intervals of up to ten minutes. The ten-minute total from this event is roughly 2.5 mm below the all-time benchmark for that duration, measured at Jericho on 17 October 1987, and only 0.6 mm shy of the next-highest value, documented on 22 October 1979.

There is a strong likelihood that the storm observed at Ashdot Ya'aqov on 7 November 1957 likewise reached ten-minute totals of 30 mm or more. Apart from a single report of the twenty-minute accumulation—which mirrors the amounts logged at Jericho and Mitzpe Ramon—we lack time-series data of finer resolution for that episode.

Five-minute rainfall intensities are difficult to benchmark against earlier records, because accurately determining the slope of rain trace over such a short segment is inherently challenging. Still, by estimating the typical proportion of the peak five-minute total within the peak ten-minute amount in desert environments, generally exceeding 55–60 % one may infer that the Jericho and Mitzpe Ramon storms marginally eclipsed the present event.

For durations of fifteen minutes and longer, the disparities between this episode and historical occurrences become progressively larger. Thus, beyond the three storms compared with the present event in Table 3, additional episodes in Israel's eastern and southern regions yielded accumulations greater than those recorded here.

Table 3: Maximum rainfall amounts in the present event versus the largest historical storms in southern and south-eastern Israel

Duration (minutes)	Jericho 17 Oct 1987	Mitzpe Ramon 22 Oct 1979	Ashdot Yaaqov 7 Nov 1957	Nahal Arugot 4 May 2025
5	At least 18 mm	At least 17 mm	Unknown	17.6 mm
10	33.4 mm	31.5 mm	Unknown	30.9 mm
15	42.9 mm	40	At least 39 mm	36.2 mm
20	52.9 mm	52	52	38 mm

4. Summary

The rainfall episode of 4 May 2025 over southern and south-eastern Israel was characterised locally by very high intensities accompanied by hail. At six distinct hubs, each covering several tens of square kilometres, double-digit precipitation totals were deposited, whereas in the surrounding districts the accumulations remained single-digit or no rain fell at all.

Because the area receiving substantial rainfall was comparatively limited, the principal wadis of the south registered little, if any, significant runoff. Even so, the intense downpours within the mentioned hubs generated vigorous flows in the small catchments that lay directly beneath the convective cores.

The compact Nahal David basin was entirely exposed to an especially powerful rainfall intensity and therefore attained an exceptionally rare peak discharge that has yet to be quantified due to access constraints within the valley.

At the nearby rain-gauge situated at the mouth of Nahal Arugot, rainfall intensities with probabilities below 1 % (≈100-year return period) were recorded for durations of up to one hour, while over shorter windows, down to 15 minutes, the probabilities approached 0.5 % (≈200-year return period).

As a consequence of these exceptional rates, Nahal Arugot likewise achieved an uncommon peak flow of roughly 170 $m^3 s^{-1}$, even though only its lower reach was rained upon and approximately 90 % of its catchment remained not rained down upon.

In the context of previous storms across southern and south-eastern Israel, the short-duration rainfall intensities (≤ 10 minutes) observed at Nahal Arugot occupy third place in the historical series, surpassed only by the peak events at Jericho on 17 October 1987 and at Mitzpe Ramon on 22 October 1979.

Appendix

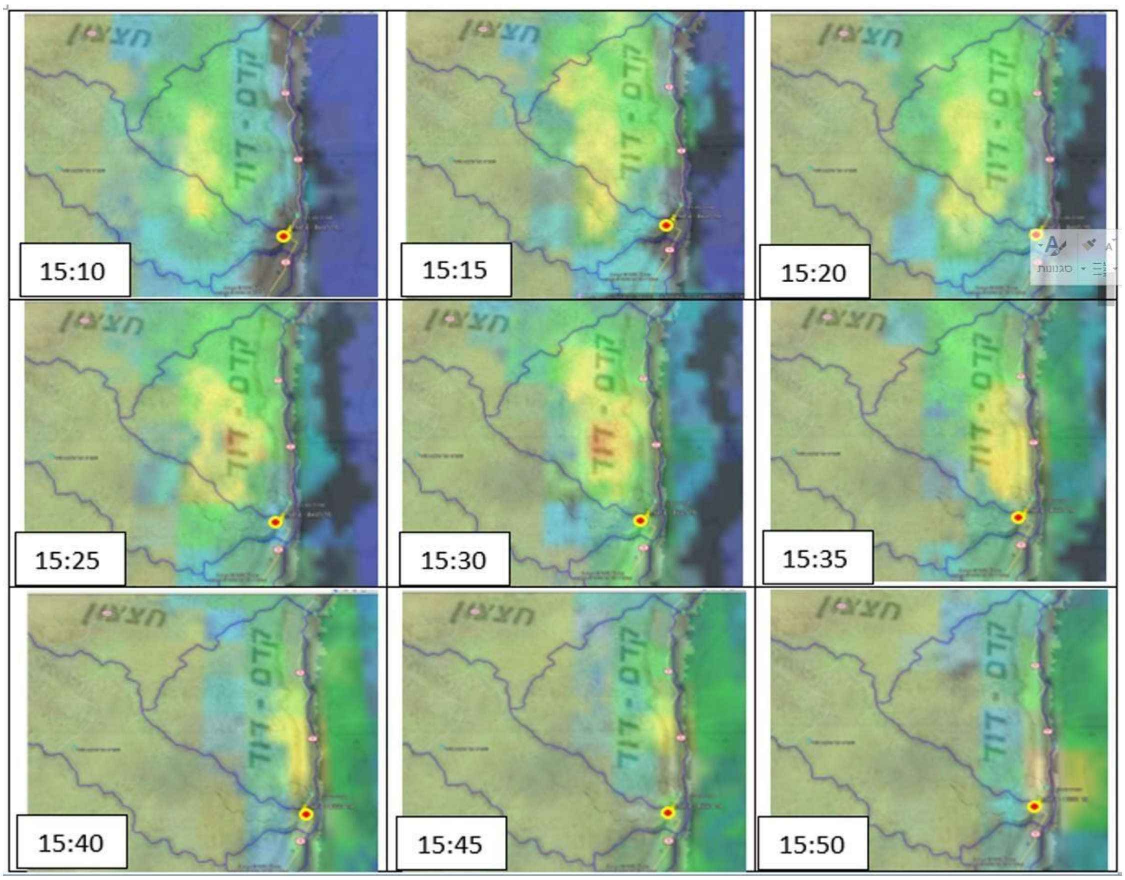

Figure 4: Progression of the precipitating cell across the Kedem, David, and Arugot catchments and its subsequent drift toward the south-east. The red marker denotes the automatic rain gauge at the mouth of Nahal Arugot, where an anomalously high rainfall intensity was recorded.

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Minute-by-minute rainfall record at the Nahal Arugot automatic rain gauge on 4 May 2025*

Time	Amount (mm)	Accumulated Amount		Time	Amount (mm)	Accumulated Amount
15:32	0.4	0.4		16:09	0	
15:33	0.4	0.8		16:10	0	
15:34	0.5	1.3		16:11	0	
15:35	0.5	1.8		16:12	0.1	41.0
15:36	0.9	2.7		16:13	0	
15:37	1.8	4.5		16:14	0	
15:38	2.4	6.9		16:15	0	
15:39	3.3	10.2		16:16	0	
15:40	3.4	13.6		16:17	0	
15:41	2.4	16.0		16:18	0.1	41.1
15:42	3	19.0		16:19	0	
15:43	3.9	22.9		16:20	0	
15:44	4	26.9		16:21	0	
15:45	3.8	30.7		16:22	0.1	41.2
15:46	2.9	33.6		16:23	0	
15:47	1.3	34.9		16:24	0	
15:48	1.7	36.6		16:25	0	
15:49	0.9	37.5		16:26	0	
15:50	0.3	37.8		16:27	0	
15:51	0.2	38.0		16:28	0	
15:52	0.3	38.3		16:29	0	
15:53	0.1	38.4		16:30	0.1	41.3
15:54	0.2	38.6		16:31	0	
15:55	0.1	38.7		16:32	0	
15:56	0.3	39.0		16:33	0	
15:57	0.6	39.6		16:34	0	
15:58	0.6	40.2		16:35	0	
15:59	0.3	40.5		16:36	0	
16:00	0.1	40.6		16:37	0	
16:01	0	40.6		16:38	0	
16:02	0	40.6		16:39	0	
16:03	0.1	40.7		16:40	0	
16:04	0.1	40.8		16:41	0	
16:05	0.1	40.9		16:42	0	
16:06	0			16:43	0	
16:07	0			16:44	0	
16:08	0			16:45	0.1	41.4

*The colors in the table highlight the highest rainfall amounts.