



# Early Climate Assessment of Türkiye in 2024



**Climate and Agricultural Meteorology Department**

**Research Department**

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Ankara**

**Republic of TÜRKİYE**  
**MINISTRY OF ENVIRONMENT, URBANIZATION AND CLIMATE CHANGE**  
**TURKISH STATE METEOROLOGICAL SERVICE**

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**RESEARCH DEPARTMENT**

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# CONTENT

1. Introduction.....	1
2. Temperature .....	2
2.1 Monthly Temperature .....	3
2.2 Seasonal Temperature.....	3
2.3 Extreme Temperatures.....	4
3. Precipitation .....	8
3.1 Monthly Precipitation .....	9
3.2 Standardized Precipitation Index.....	9
3.3 Seasonal Precipitation.....	10
4. Extreme Meteorological Events.....	11
4.1 Forest Fire.....	12
4.2 Heavy Precipitation-Floods .....	13
4.3 Lightning .....	14
References .....	15

## 1. Introduction

The mean temperature was 16.8 °C in the first eight months of 2024 in Türkiye. This value is 2.3 °C above from 1991-2020 normal (14.5°C) which makes 2024 the warmest year since 1971.

The monthly mean temperatures of 2024 are slightly below the normal in May but above the normal temperatures in other months. The mean temperature anomaly for the first 8-month of 2024 was the highest in April (4.3°C).

In 2024 winter mean temperature was 7.2 °C, which is 3.3 °C above their normal (3.9 °C), spring mean temperature was 14.2 °C which is 1.8 °C above their normal (12.4°C) and summer mean temperature was 26.1 °C, which is 2.1 °C above their normal (24.0°C).

For the first 8-month of 2024: Lowest minimum temperature in 2024 was -31.3°C in Ardahan in January, while highest maximum temperature was observed 47.8 °C in Ceylanpınar on 20.06.2024. A total of 136 stations shown in Table 1 broke their monthly extreme maximum temperature records

Türkiye 8 months (Jan. to August) mean areal precipitation in 2024 was 348.8 mm. This value is 4% under the 1991-2020's normal (365.0 mm).

In the first eight months, precipitation levels across several regions in Turkey have shown significant variability when compared to long-term averages. Notably, the Aegean Region, the eastern Marmara, Western Thrace, the Western Black Sea, and the western parts of Central Anatolia, including areas such as Konya, Kastamonu, Çankırı, Samsun, Amasya, and Malatya, experienced a marked decline in precipitation, exceeding a 20% reduction compared to normal levels. Conversely, in the southern areas of Lake Van and around Giresun, an opposite trend was observed, with precipitation levels rising by more than 40%.

Monthly total precipitation in 2024 were below normal in the February, April and June while they remained above the normal in the January, March, May and July).

The number of extreme events reached 900 in first 8 months of 2024 according to TSMS's Database. In the first eight months of 2024, the most hazardous extreme events were heavy rainfall and floods with 36%, hail with 22%, storms with 19%, lightning strikes with 8%, heavy snow with 6%, landslides with 3%, tornadoes with 2% and frost with 2%. Extreme events such as avalanches, wild fires, fog and sandstorms accounted for 1% or less of the total.

The forest fire in Izmir on August 15-18, the heavy rain and flood in Antalya on February 12, and the lightning strike in Amasra on July 5 were the most important extreme events in 2024.

## 2. Temperature

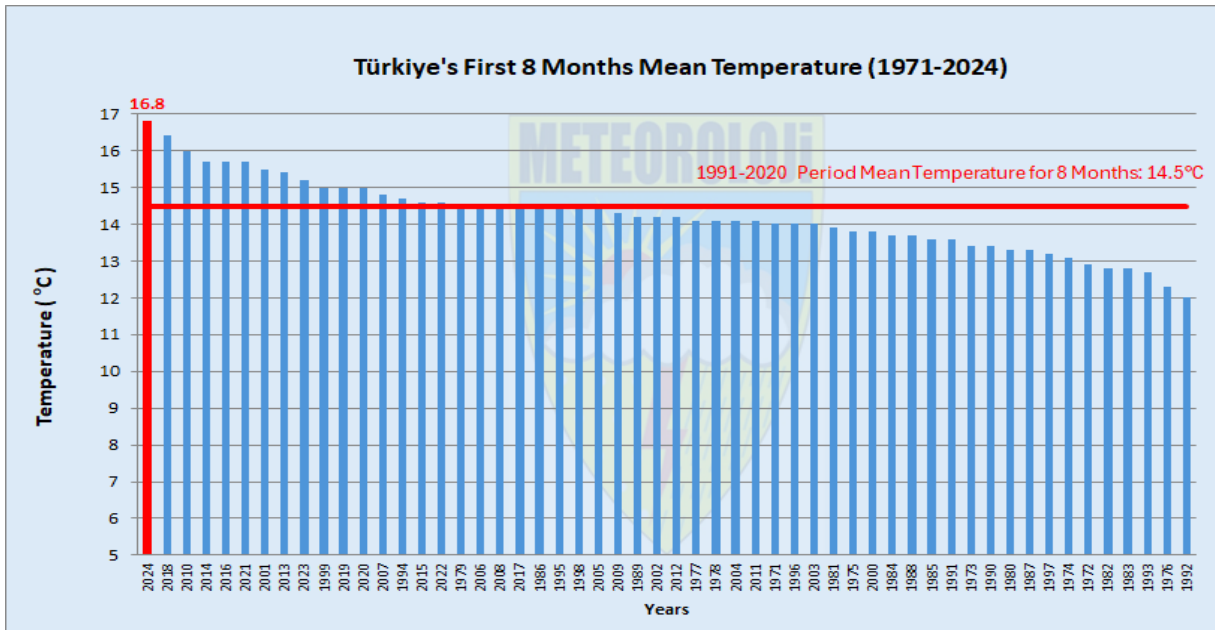


Figure 2. 1 Türkiye’s January-August mean temperature ranking since 1971.

The mean temperature was 16.8 °C in the first eight months of 2024 in Türkiye. This value is 2.3 °C above from 1991-2020 normal (14.5°C) which makes 2024 **the warmest year** since 1971 (Fig.2.1).

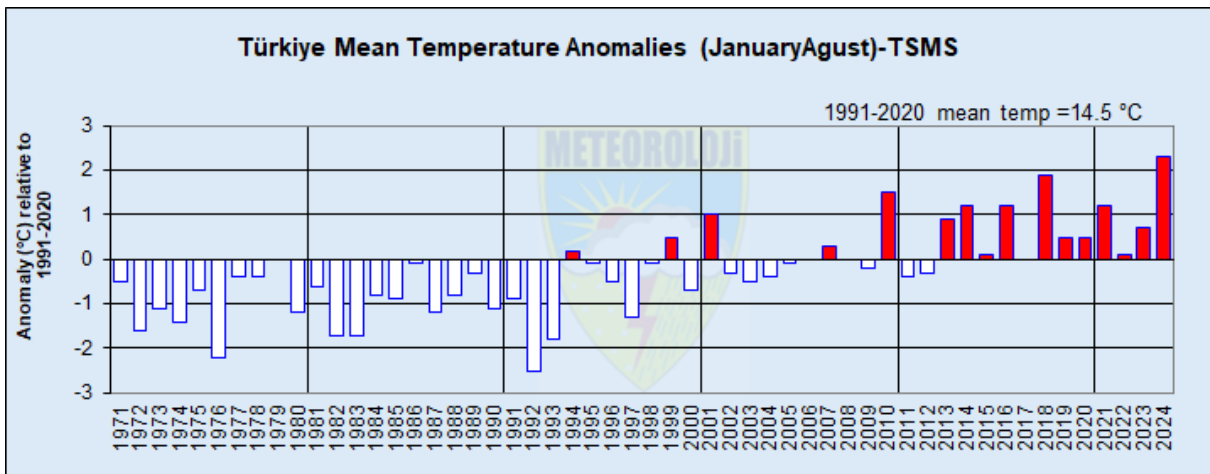


Figure 2. 2 Türkiye’s January-August mean temperature anomalies (URL 1)

Since 2005, there are consistent positive anomalies in Türkiye’s mean temperatures except for the years 2009, 2011 and 2012. The warmest year was 2024 with 2.3 °C temperature anomaly (Fig.2.2).

## 2.1 Monthly Temperature

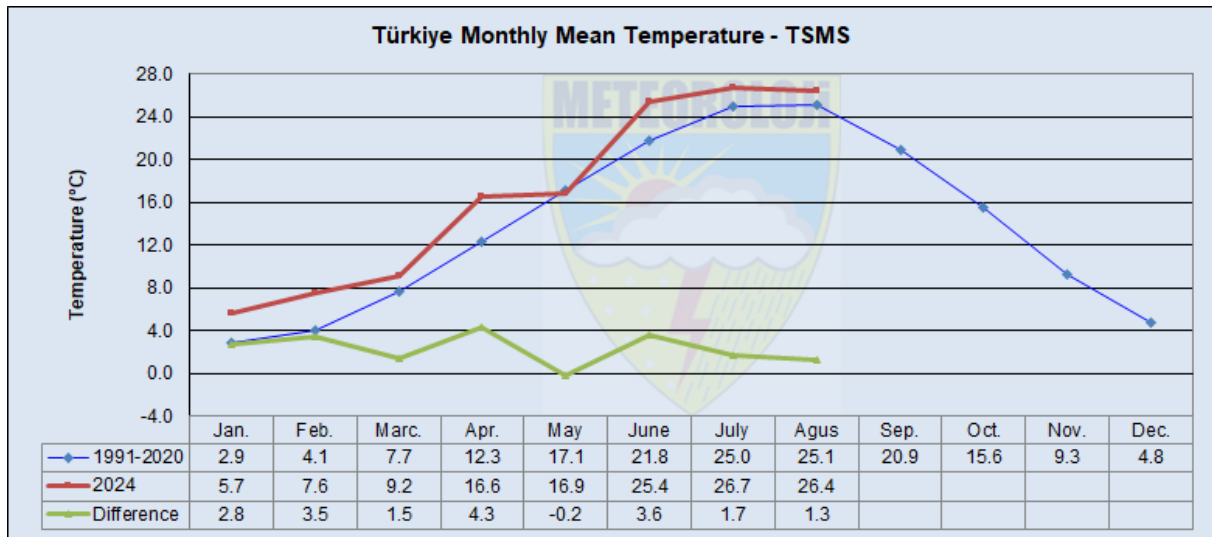


Figure 2. 3 Monthly mean temperature differences in Türkiye in 2022 (URL 1)

The monthly mean temperatures of 2024 are slightly below the normal in May but above the normal temperatures in other months. The mean temperature anomaly for the first 8-month of 2024 was the highest in April (4.3 °C) (Fig.2.3).

## 2.2 Seasonal Temperature

The mean temperatures of the winter, spring, summer seasons of 2024 were above their seasonal normal temperatures (1991-2020) (Fig.2.4 - Fig 2.6).

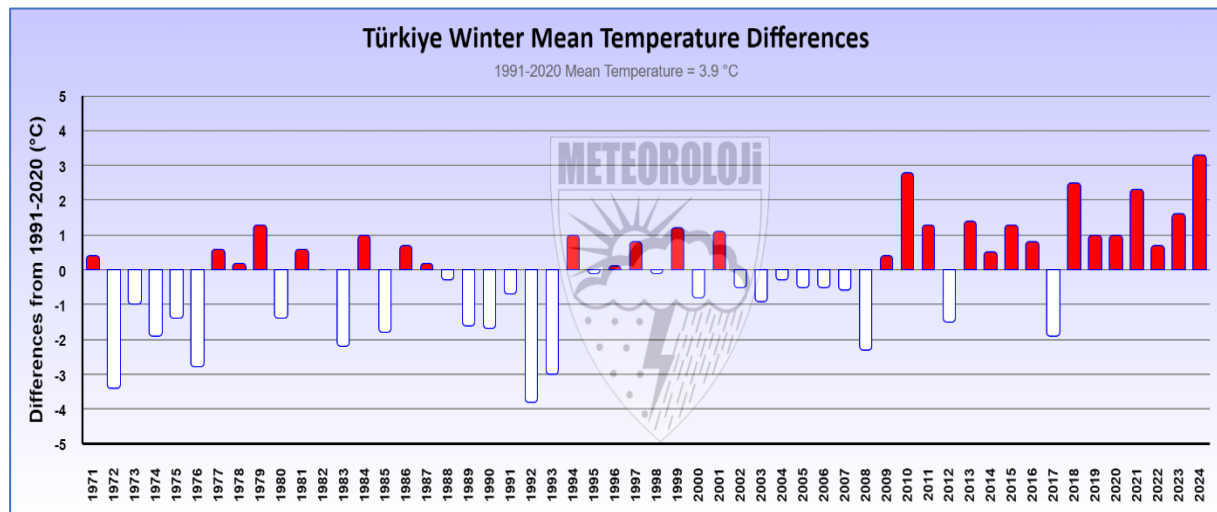
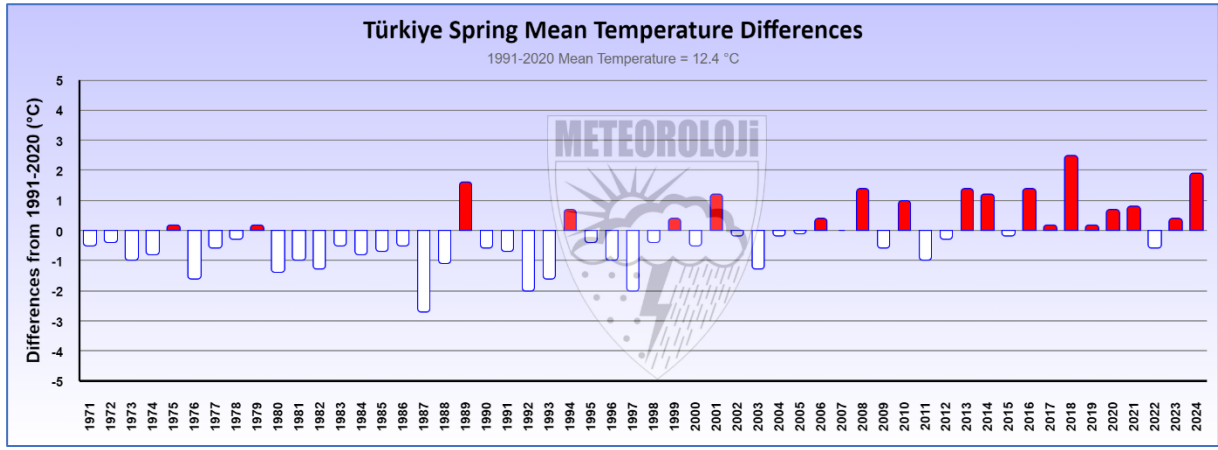
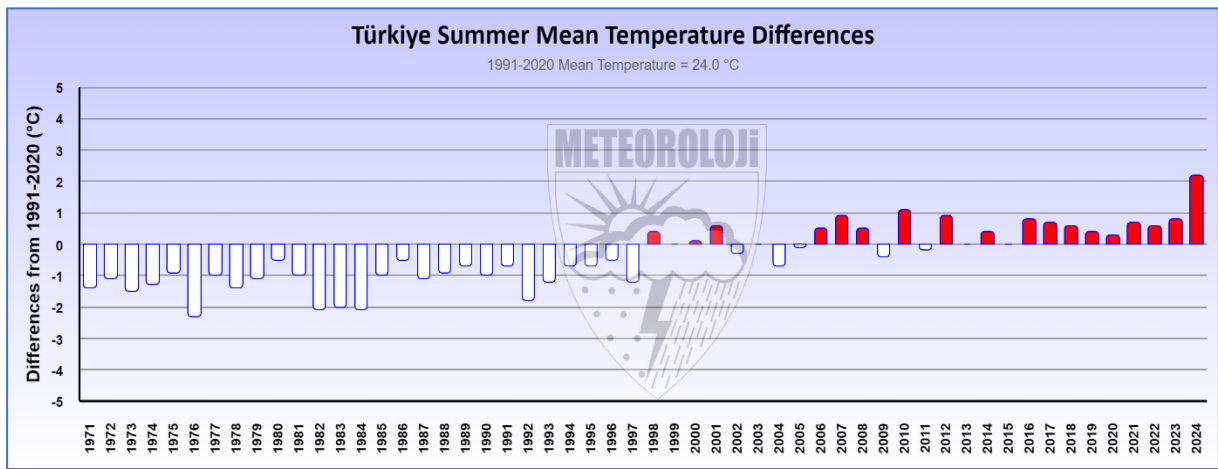


Figure 2. 4 Türkiye's Winter mean temperature differences (URL 1)



**Figure 2.5** Türkiye's Spring mean temperature differences (URL 1)



**Figure 2.6** Türkiye's Summer mean temperature differences (URL 1) (Url 1)

In 2024 winter mean temperature was 7.2 °C, which is 3.3 °C above their normal (3.9 °C), spring mean temperature was 14.2 °C which is 1.8 °C above their normal (12.4°C) and summer mean temperature was 26.1 °C, which is 2.1 °C above their normal (24.0°C) (Fig.2.4 - Fig 2.6).

### 2.3. Extreme Temperature

For the first 8-month of 2024: Lowest minimum temperature in 2024 was -31.3°C in Ardahan in January, while highest maximum temperature was observed 47.8 °C in Ceylanpınar on 20.06.2024.

A total of 136 stations shown in Table 1 broke their monthly extreme maximum temperature records (Table 1).

**Table 1.** New extreme maximum temperature records in 2024.

Day	Month	Station	2024	Long term	Difference
19	January	GÖKÇEADA	20.7	20.1	0.6
19	January	LÜLEBURGAZ	22.8	21.7	1.1
5	January	ÇEŞME	21.1	20.9	0.2

Day	Month	Station	2024	Long term	Difference
19	January	AYDIN	23.8	23.2	0.6
21	January	MARMARİS	22.6	22.5	0.1
5	January	SEFERİHİSAR	21.2	21	0.2
5	January	MUT	20.8	20.6	0.2
5	January	ERDEMLİ	25.6	24.6	1.0
22	January	KALE-DEMRE	23.4	22.4	1.0
7	January	AKÇAKOCA	29.3	26.4	2.9
17	January	KIZILCAHAMAM	19.9	17.0	2.9
6	February	EDİRNE	24.5	23.3	1.2
25	February	FLORYA	22.5	21.0	1.5
14	February	KARAIŞALI	28.7	27.1	1.6
30	March	GÖKÇEADA	24.6	24.2	0.4
30	March	UZUNKÖPRÜ	25.9	25.6	0.3
30	March	LÜLEBURGAZ	27.7	27.0	0.7
31	March	GEYVE	31.0	30.3	0.7
31	March	GÖNEN/BALIKESİR	30.2	30.0	0.2
31	March	ÇEŞME	26.1	25.2	0.9
30	March	TAVŞANLI	28.3	27.4	0.9
31	March	SEFERİHİSAR	27.8	27.3	0.5
31	March	GÖKSUN	24.0	23.0	1.0
30	March	KÖYCEĞİZ	29.0	28.9	0.1
30	March	MANAVGAT	29.7	27.7	2.0
30	March	YUMURTALIK	29.8	29.2	0.6
31	March	KANGAL	22.7	22.5	0.2
31	March	PINARBAŞI/KAYSERİ	23.8	22.9	0.9
31	March	GÜMÜŞHANE	24.2	24.0	0.2
31	March	KIZILCAHAMAM	26.1	24.4	1.7
31	March	NALLIHAN	27.8	27.6	0.2
31	March	BEYPAZARI	27.6	26.2	1.4
31	March	BİNGÖL	22.9	22.3	0.6
31	March	ARAPGİR	24.0	23.1	0.9
31	March	SARIZ	23.3	21.8	1.5
31	March	VİRANŞEHİR	27.3	26.4	0.9
24	April	FETHİYE	35.8	35.7	0.1
27	April	ISLAHIYE	34.5	34.4	0.1
25	April	GAZİPAŞA	32.3	32.2	0.1
26	April	ÇANKIRI	31.9	31.0	0.9
25	April	SİVAS	29.5	29.0	0.5
24	April	KAYSERİ	31.7	31.2	0.5
24	April	KONYA	31.0	30.9	0.1
24	April	EREĞLİ	32.7	32.4	0.3
25	April	ZARA	28.3	27.8	0.5
24	April	ÇİÇEKDAĞI	31.5	31.3	0.2
25	April	KANGAL	26.4	26.0	0.4
24	April	ÇUMRA	32.1	31.5	0.6



Day	Month	Station	2024	Long term	Difference
24	April	ÇORUM	30.6	30.4	0.2
24	April	TOKAT	33.8	33.5	0.3
25	April	GÜMÜŞHANE	30.7	29.0	1.7
28	April	BAYBURT	27.1	25.3	1.8
17	April	ÜNYE	35.3	34.8	0.5
26	April	OSMANCIK	33.0	32.8	0.2
28	April	İSPİR	30.5	28.8	1.7
29	April	OLTU	30.1	30.0	0.1
29	April	ERZİNCAN	30.3	30.0	0.3
29	April	KARS	26.6	25.0	1.6
29	April	AĞRI	27.6	27.2	0.4
29	April	BİNGÖL	30.5	30.3	0.2
28	April	HAKKARİ	25.2	25.0	0.2
29	April	SARIKAMIŞ	23.0	22.0	1.0
30	April	TERCAN	28.5	27.3	1.2
29	April	PALU	31.8	31.4	0.4
29	April	ŞIRNAK	29.8	29.0	0.8
28	April	CEYLANPINAR	38.9	37.5	1.4
24	June	KÜTAHYA	37.5	36.2	1.3
13	June	MANİSA	43.4	42.4	1.0
24	June	UŞAK	40.0	36.6	3.4
24	June	AFYONKARAHİSAR	37.3	35.8	1.5
13	June	İZMİR	41.4	41.3	0.1
12	June	AYDIN	44.6	44.4	0.2
12	June	MUĞLA	41.2	40.8	0.4
12	June	SİMAV	37.4	37.3	0.1
24	June	GEDİZ	41.4	39.5	1.9
14	June	EMİRDAĞ	37.2	37	0.2
12	June	YATAĞAN	43.6	42.8	0.8
24	June	BURDUR	40.9	38.7	2.2
24	June	ISPARTA	40	36.2	3.8
25	June	BEYŞEHİR	35.9	35.1	0.8
20	June	KAHRAMANMARAŞ	42.6	42	0.6
6	June	ALANYA	39.4	38.2	1.2
7	June	ANAMUR	41.5	41	0.5
7	June	SİLİFKE	42.3	41.3	1.0
7	June	ADANA	43	42.8	0.2
5	June	KAŞ	42.5	40.6	1.9
24	June	SENİRKENT	39.6	37.6	2.0
24	June	DİNAR	38.8	38.1	0.7
20	June	GÖKSUN	35.1	34.4	0.7
24	June	EĞİRDİR	38.2	36	2.2
12	June	ACIPAYAM	39.2	38.2	1.0
24	June	TEFENNİ	38.4	36.5	1.9
24	June	ELMALI	38.7	37.4	1.3

Day	Month	Station	2024	Long term	Difference
13	June	MUT	43.6	42.1	1.5
4	June	DÖRTYOL	42.2	41.6	0.6
5	June	KALE-DEMRE	42.6	42.4	0.2
7	June	GAZİPAŞA	40.2	39.2	1.0
4	June	SAMANDAĞ	40.5	39.8	0.7
24	June	ESKİŞEHİR	37.2	36.6	0.6
25	June	AKŞEHİR	37.3	36.2	1.1
25	June	KONYA	37	36.7	0.3
25	June	EREĞLİ	37.4	36.4	1.0
25	June	NİĞDE	35.7	35	0.7
14	June	POLATLI	39.3	37.4	1.9
25	June	KULU	37.8	37	0.8
24	June	KANGAL	33.2	33	0.2
24	June	ILGIN	36.6	35.9	0.7
25	June	ÇUMRA	37.8	37.3	0.5
24	June	SİVRİHİSAR	37.4	35.8	1.6
4	June	BARTIN	38.9	38	0.9
13	June	DÜZCE	39.7	39	0.7
24	June	NALLIHAN	39.5	38.4	1.1
20	June	ELAZIĞ	39.8	38.6	1.2
18	June	HORASAN	37.2	34.8	2.4
25	June	ÇEMİŞGEZEK	38.7	38.4	0.3
23	June	KARAKOÇAN	37.1	36.8	0.3
20	June	PALU	40.1	40	0.1
19	June	SARIZ	33.7	32	1.7
20	June	BASKİL	36.8	36.2	0.6
24	June	ELBİSTAN	37.6	36.6	1.0
20	June	DOĞANŞEHİR	37.8	36.8	1.0
20	June	GAZİANTEP	41.2	40.2	1.0
19	June	KİLİS	42.7	42.5	0.2
25	June	ADİYAMAN	43	41.5	1.5
20	June	DİYARBAKIR	42.2	42	0.2
20	June	KAHTA	43.4	41.8	1.6
20	June	SİVEREK	42.8	41.8	1.0
20	June	VİRANŞEHİR	45.3	44	1.3
20	June	BİRECİK	44.3	44	0.3
20	June	CEYLANPINAR	47.8	46.9	0.9
20	June	AKÇAKALE	45.3	44.2	1.1
18	July	ÇANAKKALE	39.8	39.2	0.6
21	July	UŞAK	40.4	40.2	0.2
14	August	DURSUNBEY	40.3	39.8	0.5
14	August	SALİHLİ	43.9	43.3	0.6
21	August	SİNOP	34.2	33.3	0.9

### 3. Precipitation

Türkiye 8 months (Jan. to August) mean areal precipitation in 2024 was 348.8 mm. This value is 4% under the 1991-2020's normal (365.0 mm) (Figure 3.1).

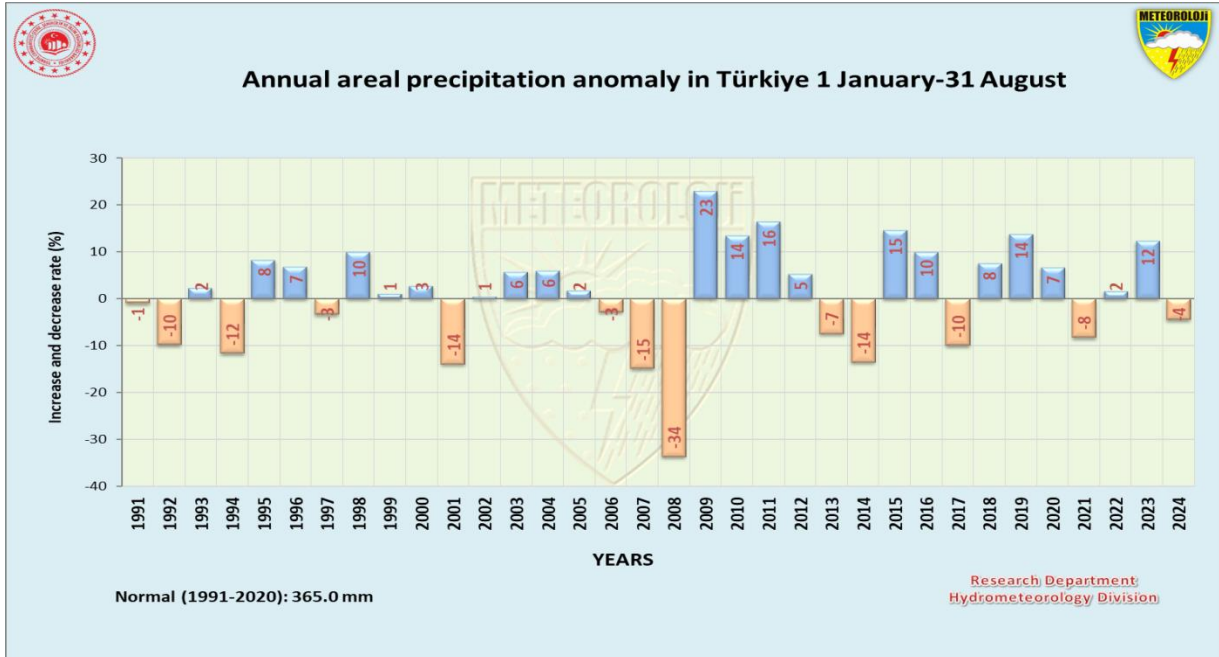


Figure 3. 1 Annual areal precipitation anomaly in Türkiye (URL 2)

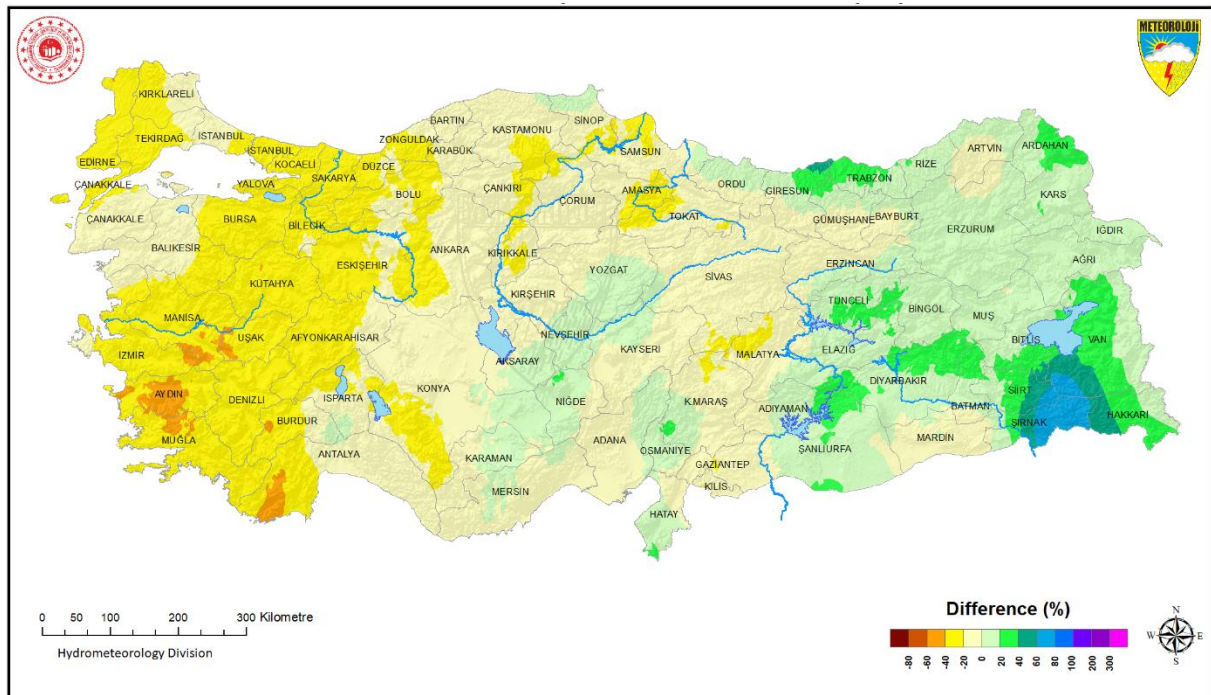


Figure 3. 2 Spatial distribution of mean precipitation anomalies in Türkiye in 2024 (URL 2).

In the first eight months, precipitation levels across several regions in Turkey have shown significant variability when compared to long-term averages. Notably, the Aegean Region, the eastern Marmara, Western Thrace, the Western Black Sea, and the western parts of Central Anatolia, including areas such as Konya, Kastamonu, Çankırı, Samsun, Amasya, and Malatya, experienced a marked decline in precipitation, exceeding a 20% reduction compared to normal levels. Conversely, in the southern areas of Lake Van and around Giresun, an opposite trend was observed, with precipitation levels rising by more than 40%.

### 3.1 Monthly Precipitation

Monthly total precipitation in 2024 were below normal in the February, April and June while they remained above the normal in the January, March, May and July (Figure 3.3).

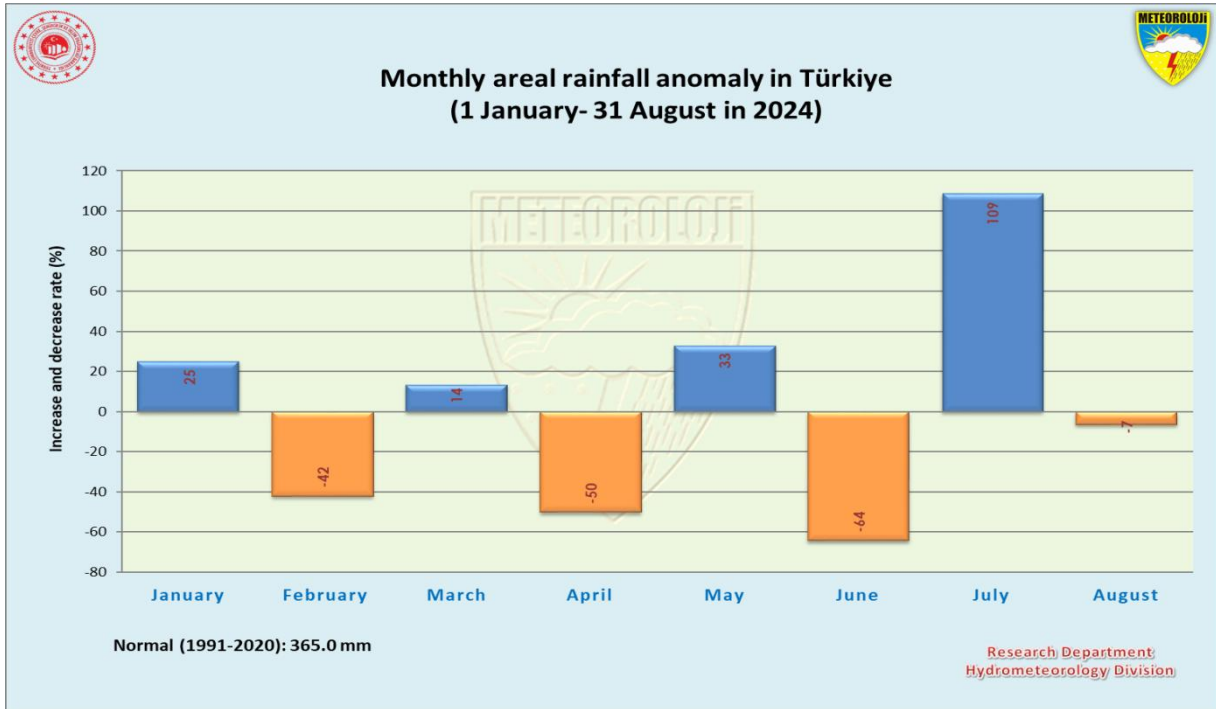


Figure 3. 3 Monthly areal rainfall anomaly in Türkiye in 2020 (URL 2)

### 3.2. Standardized Precipitation Index

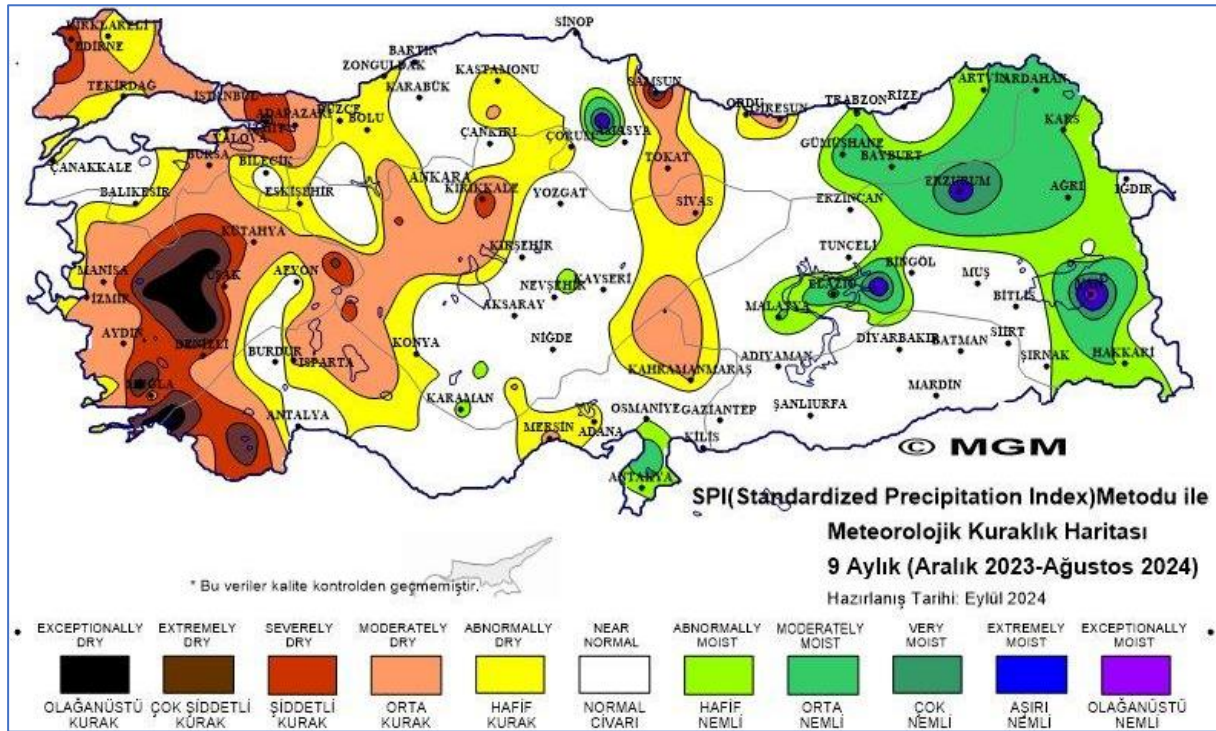


Figure 3. 4 Standardized Precipitation Index of Türkiye (URL 3)

According to the 9-month meteorological drought map prepared according to the Standard Precipitation Index Method, the central and western parts of Türkiye were exceptionally and slightly dry, the east was extremely and slightly humid, while other parts were around normal.

### 3.3. Seasonal Precipitation

Precipitation in 2024 was 7% lower than normal in the winter and was roughly equal to normal in the spring. Besides, summer precipitation decreased by 9% below its normal (Figure 3.5).

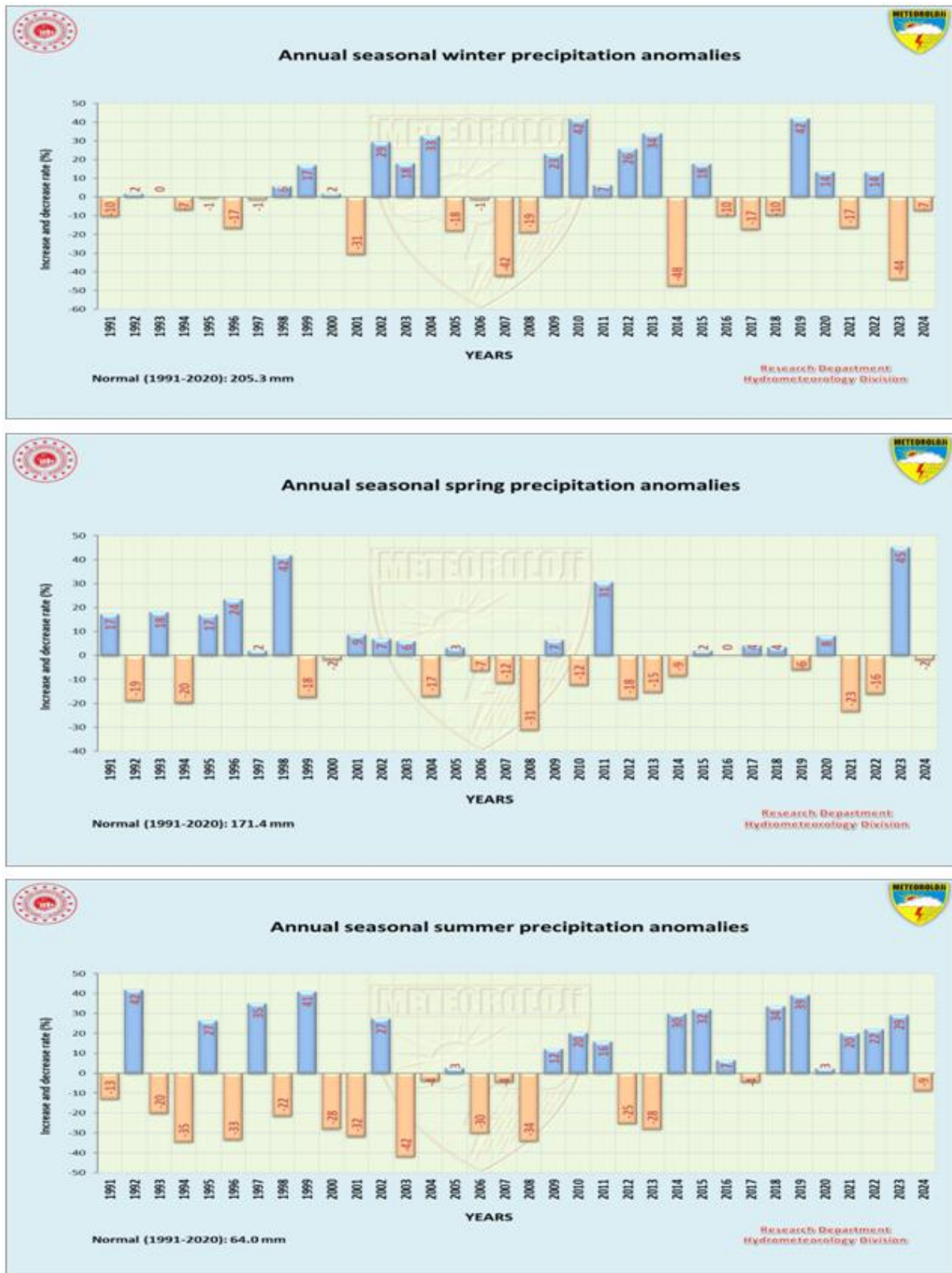


Figure 3.5. Seasonal precipitation anomalies (winter:top, spring:middle, and summer:bottom)

#### 4. Extreme Meteorological Events

The number of extreme events reached 900 in the first 8 months of 2024 according to TSMS's Database (Fig. 4.1).

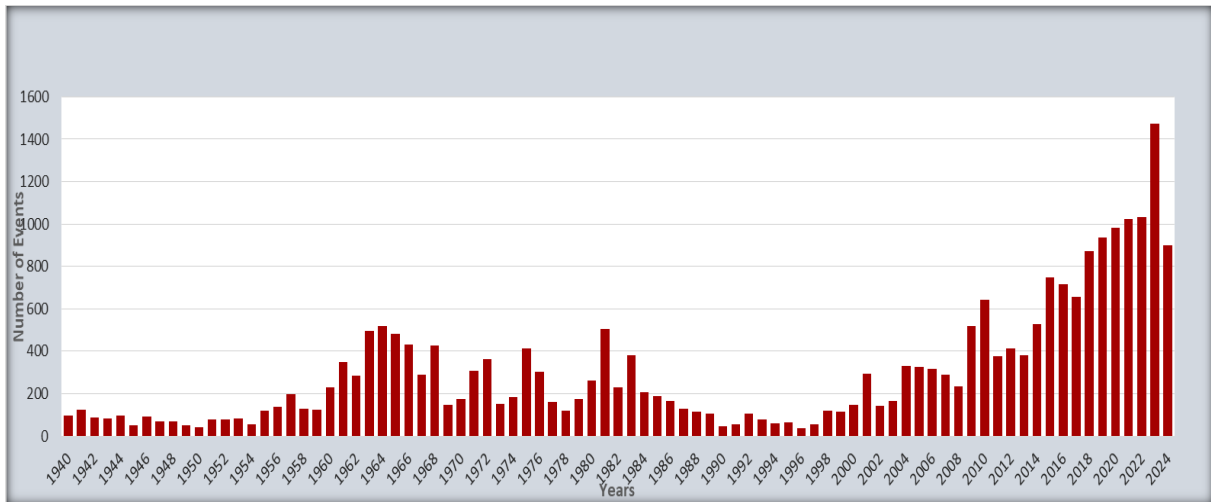


Figure 4. 1 Annual number of extreme events in Türkiye

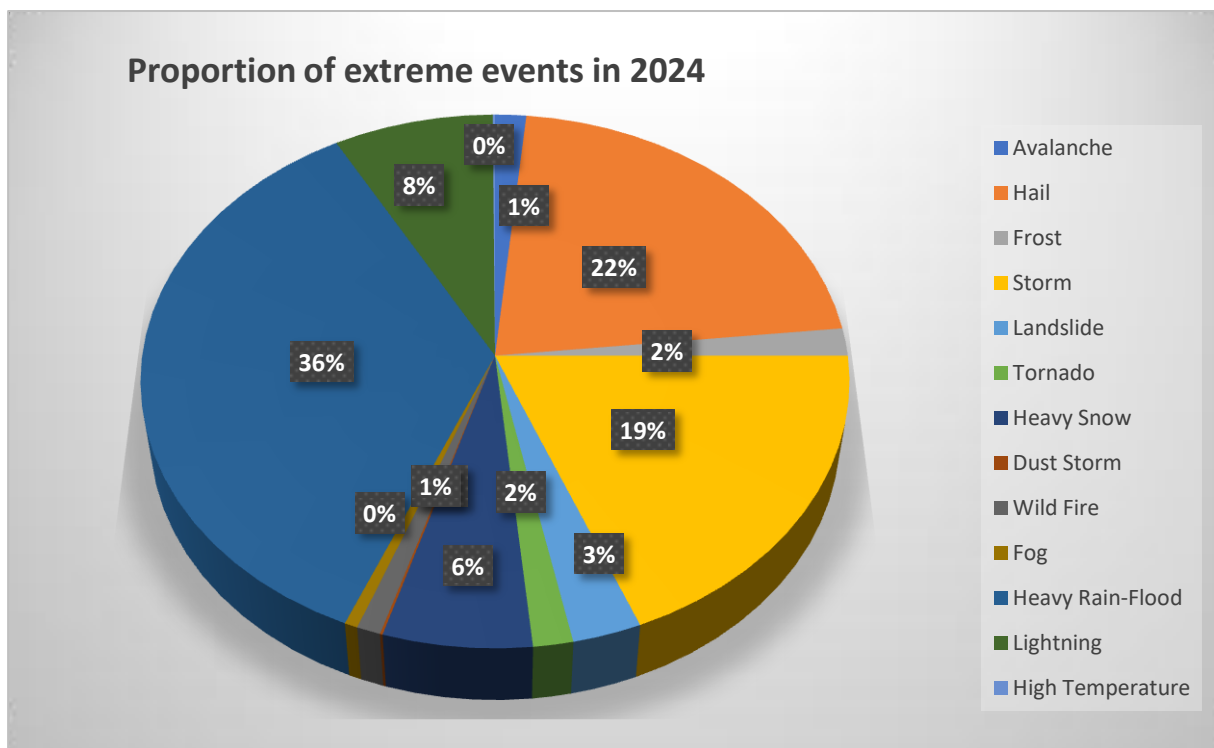


Figure 4. 2 Proportional distribution of extreme events in 2024

In the first eight months of 2024, the most hazardous extreme events were heavy rainfall and floods with 36%, hail with 22%, storms with 19%, lightning strikes with 8%, heavy snow with 6%, landslides with 3%, tornadoes with 2% and frost with 2%. Extreme events such as avalanches, wild fires, fog and sandstorms accounted for 1% or less of the total (Figure 4.2).

## 4.1 Forest fire

On the night of August 15, 2024, a forest fire started on Mount Yamanlar, which is located in the Çiğli-Karşıyaka-Bayraklı and Bornova areas of İzmir. The fire was brought under control on August 18, 2024, and subsequently extinguished. A large portion of the southern slopes of Mount Yamanlar was either burned or damaged in the fire (Figure 4.3).



*Source: Anadolu Agency*

**Figure 4.3.** 15-18 August 2024, Forest fire in İzmir

During the fire, the maximum air temperatures were as follows: in Çiğli, between 34-40°C; in Bayraklı, between 36-41°C; and in Karşıyaka, between 35-41°C. Relative humidity values dropped to 19% in Çiğli, 10% in Bayraklı, and 15% in Karşıyaka. Maximum wind speeds, coming from northern directions, were recorded at meteorological stations near these locations, ranging between 46 and 57 km/h.

The fire that started in Karatepe area of Yamanlar neighborhood in Karşıyaka district reached residential areas. Many houses and workplaces were damaged in the fire. 16 houses were burned, 87 houses and 45 workplaces were evacuated (URL 4).

The forest fire, which started in the forest area on Yamanlar Mountain, spread across the borders of 3 districts and affected an area of 2,159 hectares (URL 5).

## 4.2. Heavy Rain-Flood

On February 12, 2024, in Antalya and its surroundings, intense rain showers and thunderstorms that began in the night and increased in severity over time. The thunderstorms and hail led to flooding. Due to the heavy rain, water accumulated on roads and underpasses, causing disruptions in transportation. Many vehicles were stranded (see Figure 4.4).

Flooding also caused loss of life. The lifeless body of one person was found in a car at the Gıyaseddin Keyhüsrev Underpass on Gazi Boulevard in Kepez district (URL6).

Because of the flood, education was suspended for one day in 5 districts of the city (Aksu, Döşemealtı, Kepez, Konyaaltı, and Muratpaşa) (URL 7).



**Figure 4.5.** 12-14.02.2024, Antalya heavy rain and flood

*Source: Anadolu Agency*

A large number of homes and businesses were flooded. Due to the rainfall, a total of 3,862 buildings were affected by flooding, including 3,297 residences, 519 businesses, and 46 public buildings (URL 8).

Agricultural areas were also damaged. 211 farmers experienced greenhouse damage across 1,200 decares of land (URL 9).

According to data from the Meteorology Regional Directorate 4, in a 24-hour period, the rainfall recorded was 304.9 kg/m<sup>2</sup> in Kepez, 233.9 kg/m<sup>2</sup> in Muratpaşa, 129.2 kg/m<sup>2</sup> in Konyaaltı, 106.9 kg/m<sup>2</sup> in Serik, and 80.2 kg/m<sup>2</sup> in Kemer (URL 6).



### 4.3. Lightning

On the afternoon of Friday, July 5, 2024, a severe thunderstorm with heavy rain, storms and hail struck Amasya province. As a result, there was damage to homes, businesses, roadways, power lines, vehicles, and agricultural lands. In the Kışlacık Village highlands of Amasya, 76 sheep in a flock gathered by three shepherds under a tree were killed by a lightning strike. One of the shepherds affected by the lightning was taken to the hospital (URL 10).



Kaynak: [www.haberler.com](http://www.haberler.com)

Şekil 4.5. 5 Temmuz 2024 Amasra Kışlacık Köyü Yaylası yıldırım düşmesi

Drivers and vehicles experiencing difficulties in traffic took shelter at gas stations. Some trees were broken and toppled due to the storm.

## References

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Turkish State Meteorological Service

Kütükçü Alibey Cad. No:4 06120 Kalaba/ANKARA

Tel : (+90 312) 359 75 45

Faks : (+90 312) 360 25 51

<https://mgm.gov.tr>

