



weatherwalay

DATA INSIGHTS

Annual Temperature Assessment Report for Pakistan – 2025

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1. Introduction

The year 2025 has been recorded as the warmest year on record for Pakistan since the start of the modern observational period. Based on ERA5 reanalysis data and referenced against the 1991–2020 climatological baseline, the national mean annual temperature anomaly reached +1.1 °C, exceeding the previous record of +1.0 °C observed in 2016.

This milestone is not an isolated event but part of a persistent long-term warming trend evident since the late 1970s. Both annual mean anomalies and 12-month running averages demonstrate a statistically significant upward trajectory, underscoring the continued intensification of background warming across the country. This report provides a detailed analysis of the monthly temperature anomalies throughout the year and the implications these anomalies have on Pakistan's climate.

2. Overview of Temperature Anomalies in 2025

Pakistan's annual mean temperature anomaly of +1.1 °C in 2025 represents a substantial deviation from the late-20th-century climate norm. The year was characterized by consistently positive temperature anomalies across most months, contributing to the highest annual departure on record.

Analysis of the 12-month running mean further confirms that warming during 2025 was not driven by short-lived extremes alone, but rather by sustained above-average temperatures throughout the year. This persistence reflects broader regional and global climate signals, including long-term. The warming trend is impacting agriculture, water resources, and public health, exacerbating heat stress and reducing crop yields.



Without immediate mitigation and adaptation strategies, this trend will continue to pose significant challenges to Pakistan's resilience, with growing risks to food security, water availability, and public health.

3. Yearly Average Temperature Anomaly in Pakistan (1991–2025)

This chart illustrates the average temperature anomaly in Pakistan from 1979 to 2025, based on the ERA5 dataset with a reference period of 1991–2020. The data highlights a consistent upward trend, with temperature anomalies becoming more positive over time. The year 2025 marks a new record, with a +1.1°C anomaly, further accentuating the ongoing rise in Pakistan's average temperatures. This warming trend poses significant implications for climate resilience and the country's adaptation strategies.

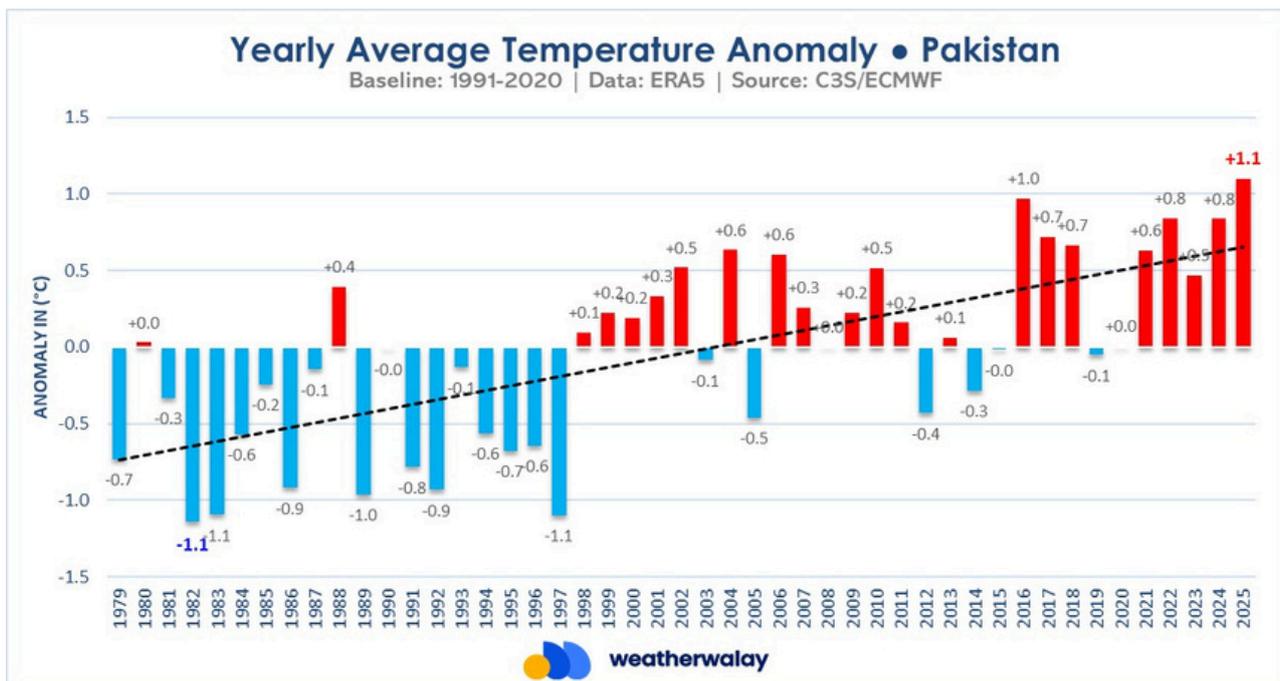


Figure 1: Yearly average temperature anomaly in Pakistan from 1979 to 2025

4. 12-Months Running Temperature Anomaly in Pakistan (1980–2025)

This graph shows the 12-month running temperature anomaly in Pakistan from 1980 to 2025, with data sourced from the ERA5 reanalysis (baseline: 1991–2020). The line reveals a consistent upward trend in temperature anomalies, reflecting the long-term warming pattern in Pakistan's climate. The steep rise in the anomaly from 2020 onwards highlights the accelerating nature of temperature increases.

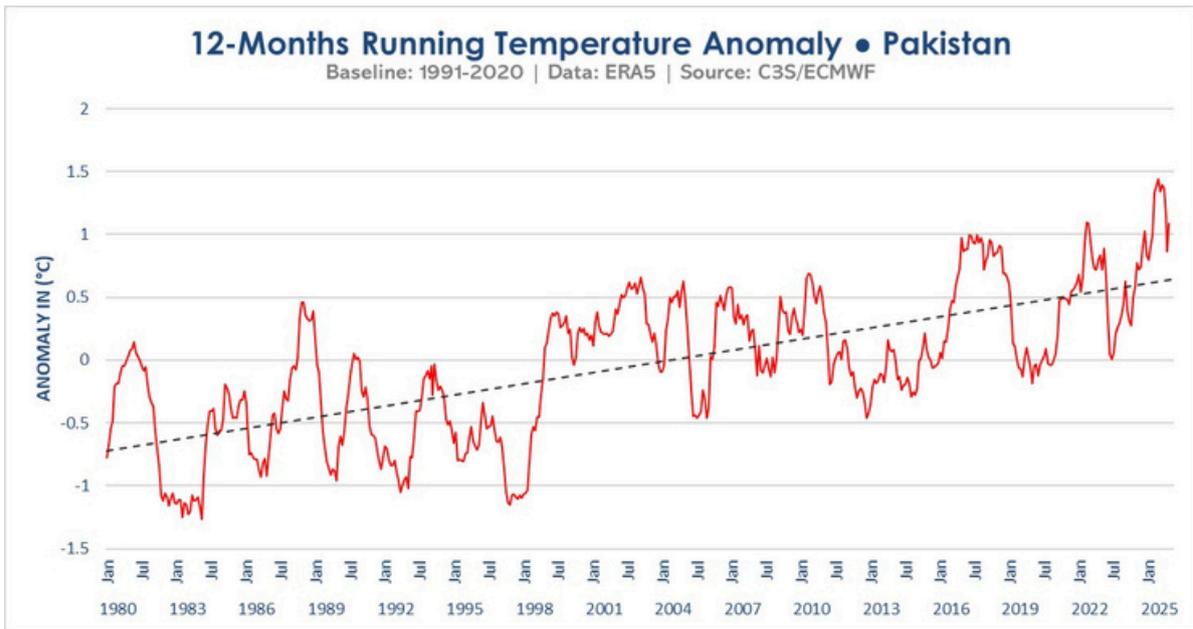


Figure 2: 12-month running temperature anomaly in Pakistan from 1980 to 2025.

5. Monthly Temperature Anomalies

Temperature Anomaly Map for January 2025 – Pakistan

This map shows the temperature anomaly for January 2025 across Pakistan, based on ERA5 data with a reference period of 1991–2020. The map highlights regions with significant positive anomalies, indicating warmer-than-average temperatures, particularly in the northern and eastern parts of the country. Some areas in the north show anomalies exceeding +6°C, underscoring the intensity of the recent warming trend.

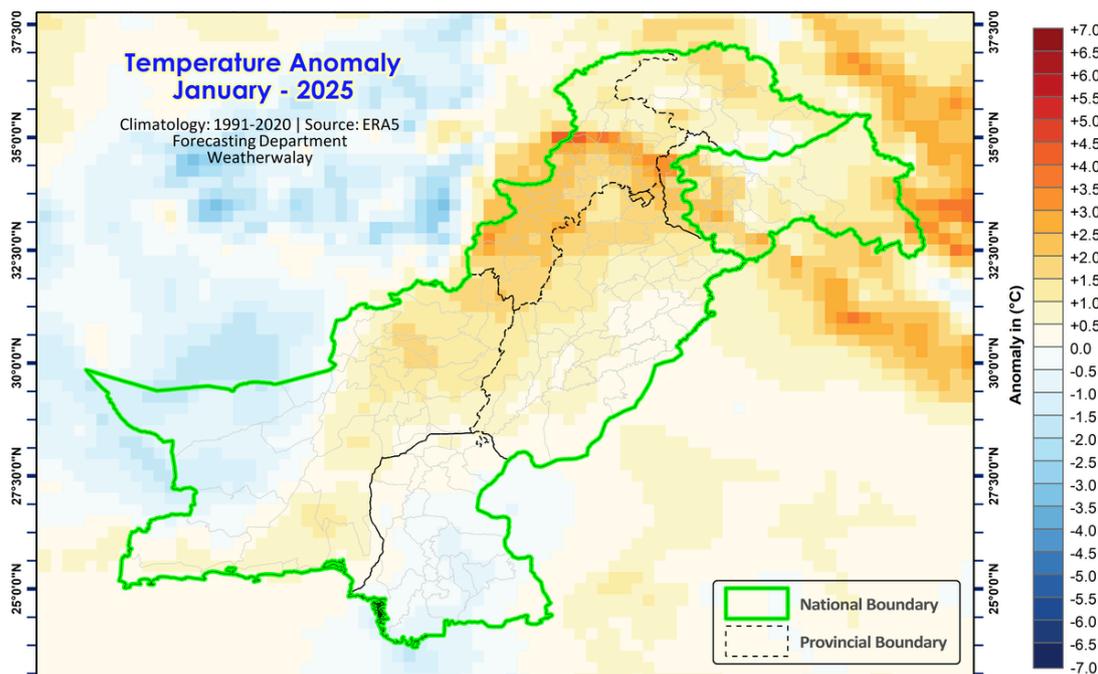


Figure 3: Temperature anomaly map for January 2025 in Pakistan

Temperature Anomaly Map for February 2025 – Pakistan

This map shows the temperature anomaly for February 2025 across Pakistan, based on ERA5 data with a reference period of 1991–2020. The map highlights widespread warmer-than-normal temperatures across the country, with certain regions, particularly in the northwest and northeast, experiencing anomalies of over +6°C. These temperature shifts reflect the continued warming trend that has been observed in recent years. The map also delineates national and provincial boundaries, providing a visual overview of the temperature deviations.

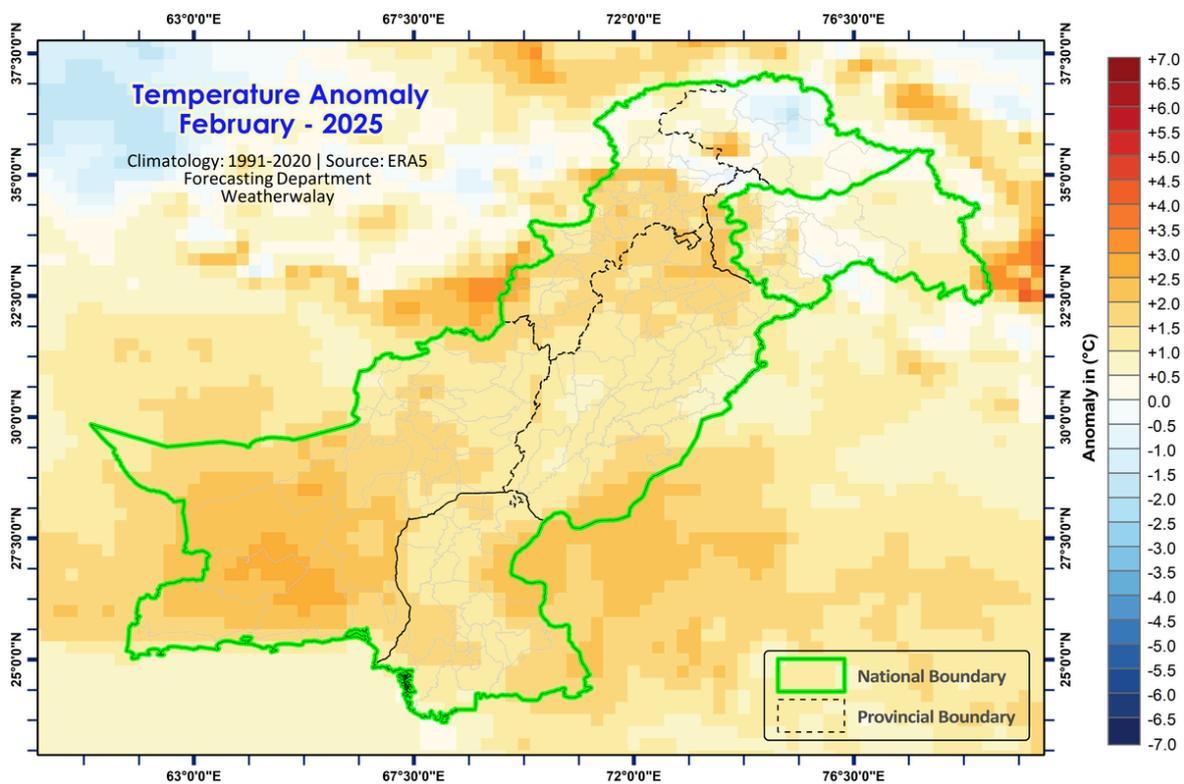


Figure 4: Temperature anomaly map for February 2025 in Pakistan

Temperature Anomaly Map for March 2025 – Pakistan

This map displays the temperature anomaly for March 2025 across Pakistan, based on ERA5 data (climatology: 1991–2020). It shows widespread warmer-than-average temperatures, with some regions experiencing anomalies exceeding +6°C. This reinforces the ongoing warming trend in the country, with significant temperature deviations, particularly in the northern and western regions.

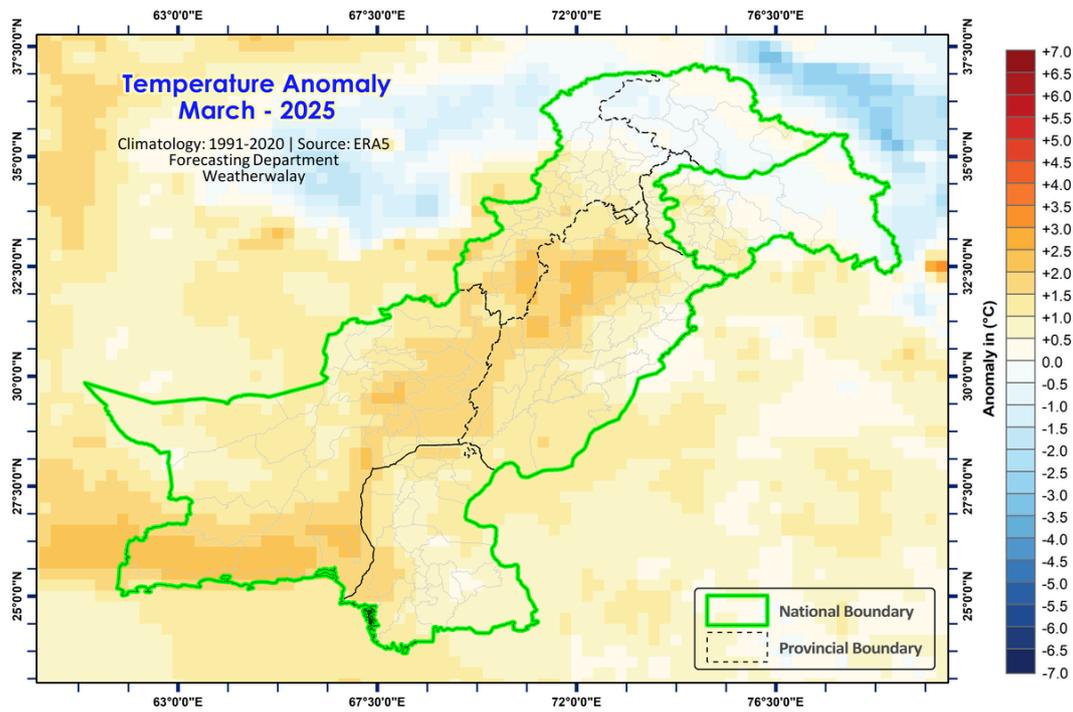


Figure 5: Temperature anomaly map for March 2025 in Pakistan

Temperature Anomaly Map for April 2025 – Pakistan

This map shows the temperature anomaly for April 2025 across Pakistan, based on ERA5 data with a reference period of 1991–2020. The map reveals widespread higher-than-average temperatures, particularly in the southern and central regions, with anomalies exceeding +6°C in many areas.

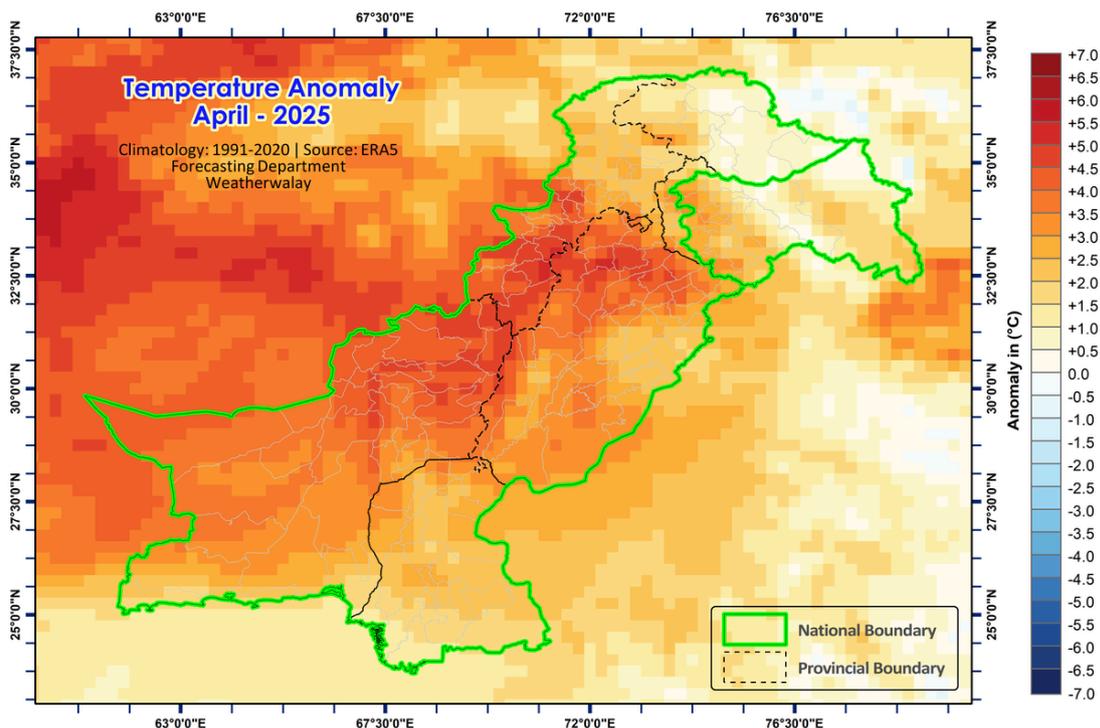


Figure 6: Temperature anomaly map for April 2025 in Pakistan

Temperature Anomaly Map for May 2025 - Pakistan

This map shows the temperature anomaly for May 2025 across Pakistan, based on ERA5 data (climatology: 1991–2020). The map indicates widespread above-average temperatures, with northern regions experiencing anomalies over +6°C, particularly in Gilgit-Baltistan and parts of Khyber Pakhtunkhwa. This pattern signals an early and intense start to the summer heat across the country, aligning with the broader trend of rising temperatures observed in recent years.

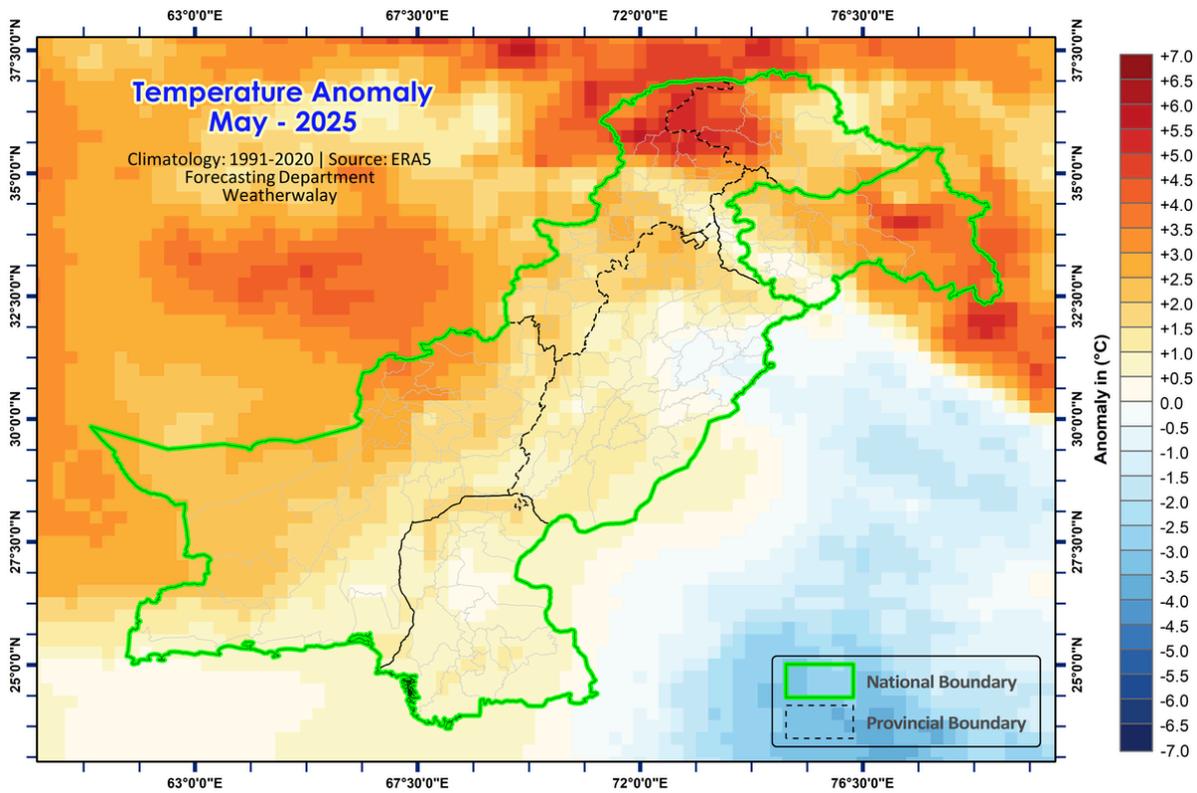


Figure 7: Temperature anomaly map for May 2025 in Pakistan

Temperature Anomaly Map for June 2025 - Pakistan

This map illustrates the temperature anomaly for June 2025 across Pakistan, based on ERA5 data with a reference period of 1991–2020. The map reveals a significant warming trend, especially in the northern and northwestern regions, where anomalies exceed +6°C, signaling a particularly intense heatwave in these areas. This reflects the ongoing climate warming, particularly during the early summer months.

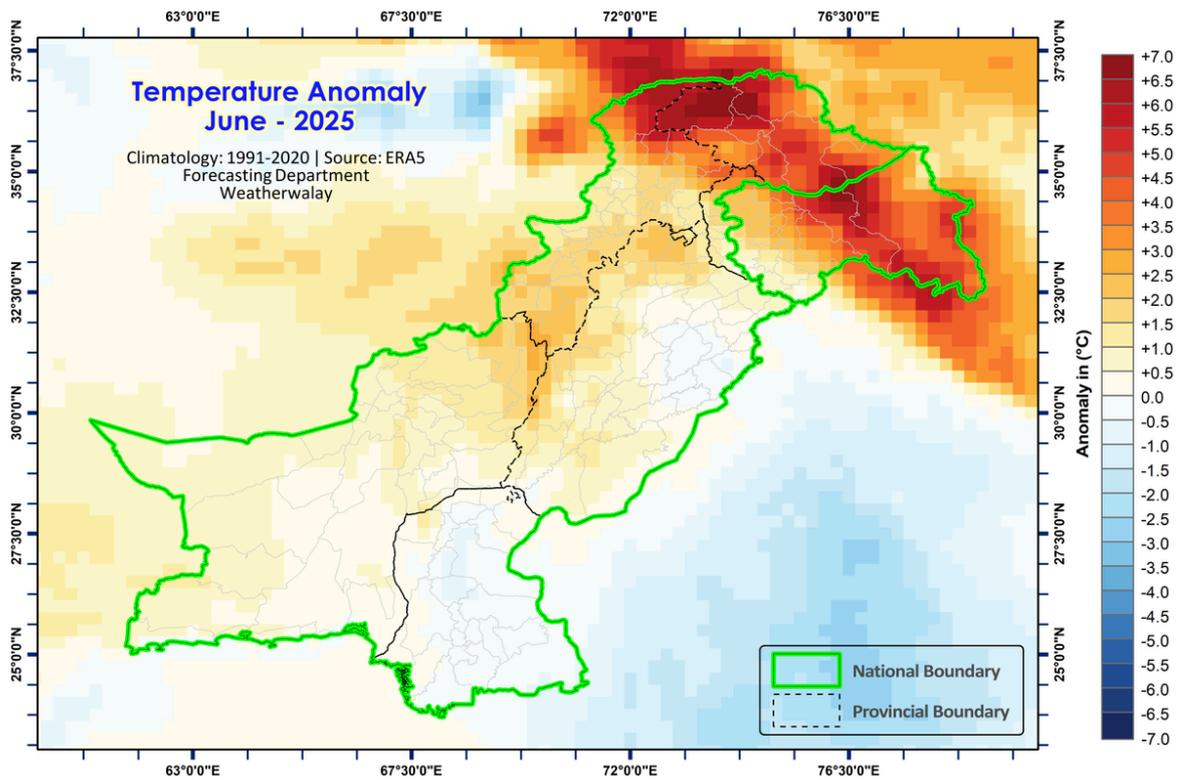


Figure 8: Temperature anomaly map for June 2025 in Pakistan

Temperature Anomaly Map for July 2025 – Pakistan

This map illustrates the temperature anomaly for July 2025 across Pakistan, based on ERA5 data (climatology: 1991–2020). It shows a significant rise in temperatures, especially in the northwestern and northern regions, where anomalies exceed +6°C. This indicates an extremely hot summer, with above-average temperatures across most of the country.

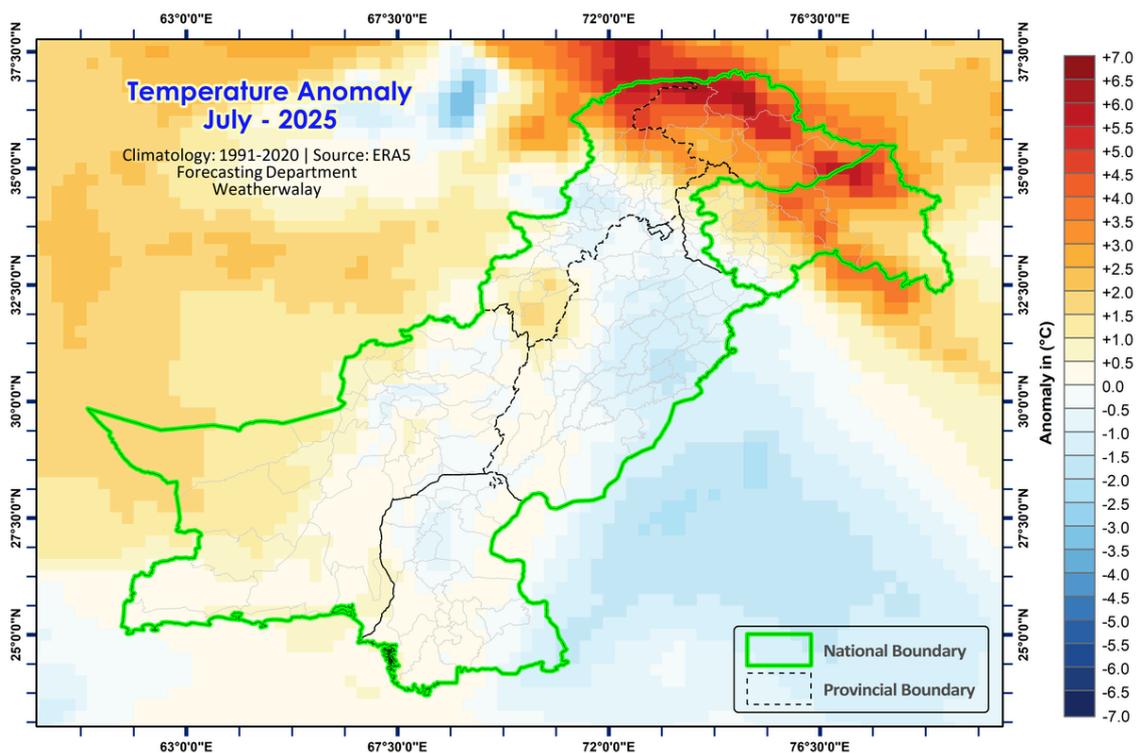


Figure 9: Temperature anomaly map for July 2025 in Pakistan

Temperature Anomaly Map for August 2025 – Pakistan

This map presents the temperature anomaly for August 2025 across Pakistan, derived from ERA5 data (climatology: 1991–2020). It shows widespread warming with particularly intense temperature anomalies exceeding +6°C in the northern and northwestern regions, including Gilgit-Baltistan. The southern regions also experience above-average temperatures, marking a continuation of the strong warming trend throughout the summer.

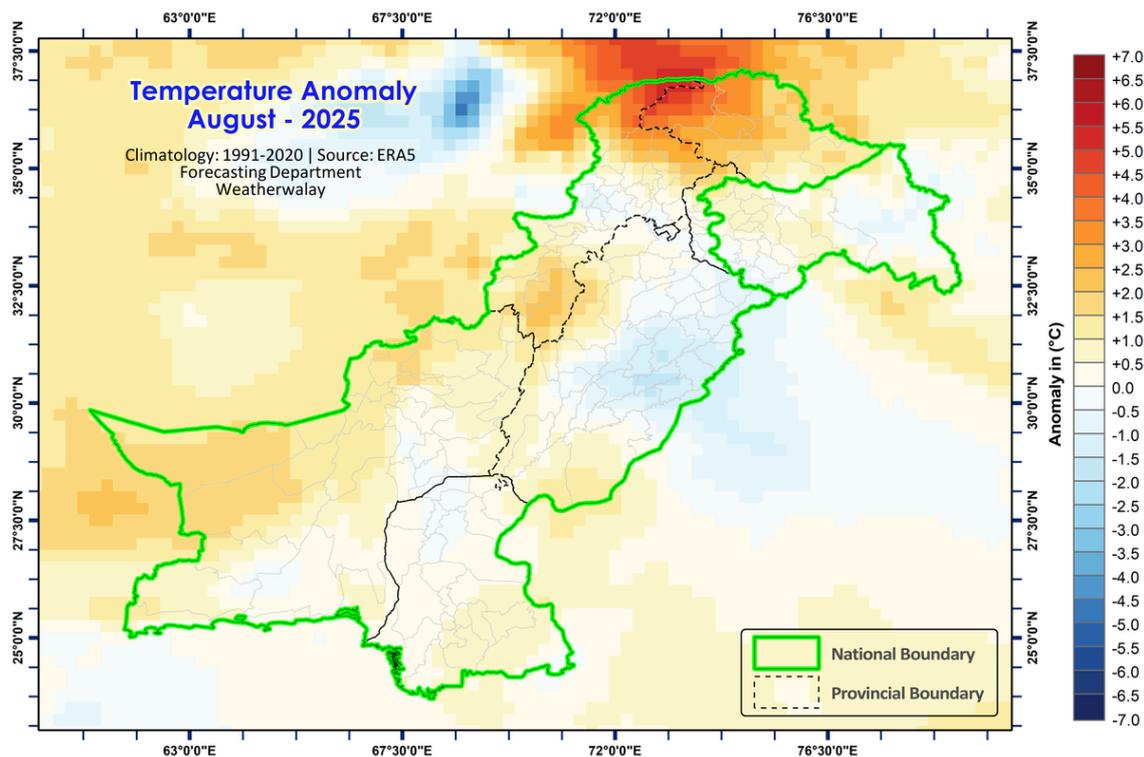


Figure 10: Temperature anomaly map for August 2025 in Pakistan

Temperature Anomaly Map for September 2025 – Pakistan

This map displays the temperature anomaly for September 2025 across Pakistan, based on ERA5 data (climatology: 1991–2020). The map highlights widespread warmer-than-normal temperatures, with certain northern regions experiencing anomalies of over +6°C. This reflects the continuation of intensified heat during the post-monsoon season, contributing to the ongoing climate warming trend.

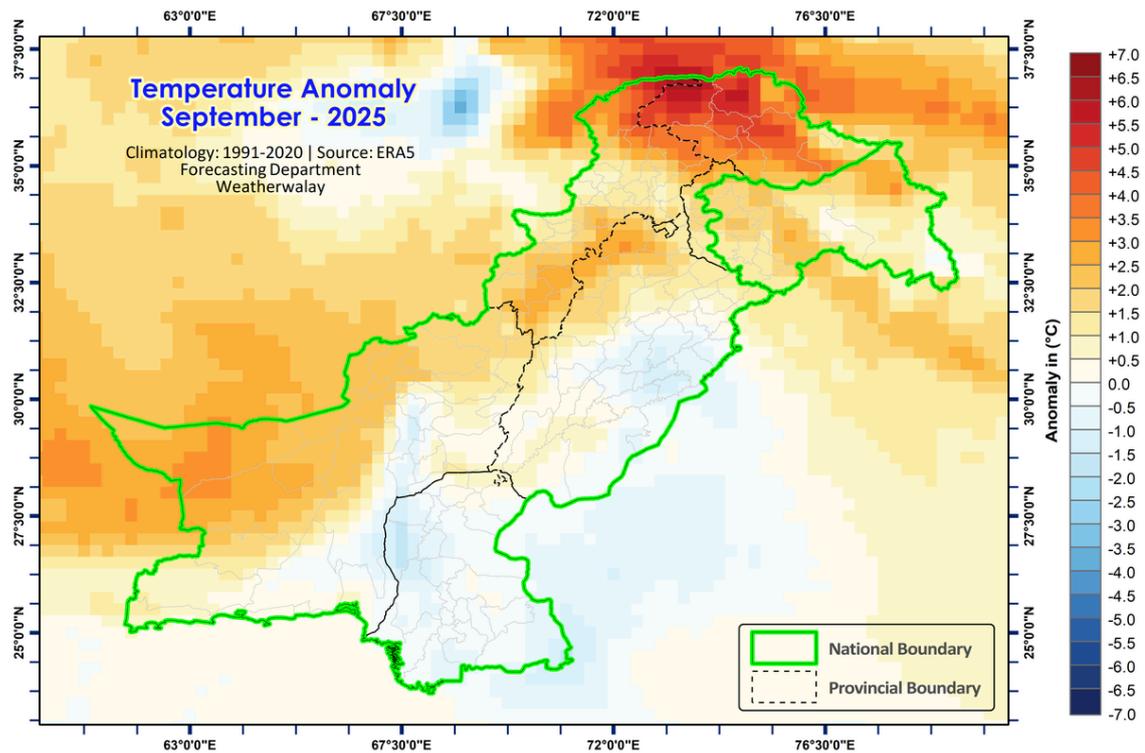


Figure 11: Temperature anomaly map for September 2025 in Pakistan

Temperature Anomaly Map for October 2025 - Pakistan

This map displays the temperature anomaly for October 2025 across Pakistan, based on ERA5 data (climatology: 1991–2020). The map shows widespread warmer-than-average temperatures, with northern regions experiencing anomalies exceeding +6°C. This warming is particularly intense in Khyber Pakhtunkhwa and Gilgit-Baltistan.

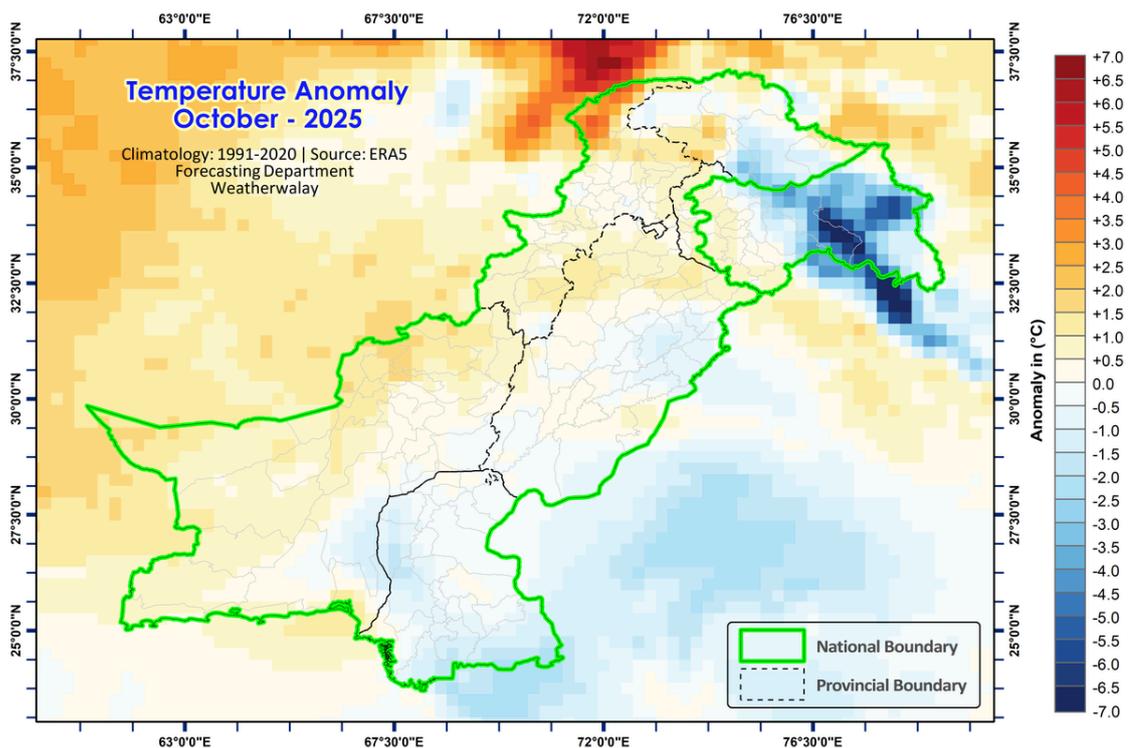


Figure 12: Temperature anomaly map for October 2025 in Pakistan

Temperature Anomaly Map for November 2025 – Pakistan

This map illustrates the temperature anomaly for November 2025 across Pakistan, based on ERA5 data (climatology: 1991–2020). It shows significant warming, particularly in the northern and northwestern regions, with temperature anomalies exceeding +6°C in several areas. This indicates that November 2025 continues the trend of above-average temperatures, with particularly hot conditions persisting in the northernmost parts of the country.

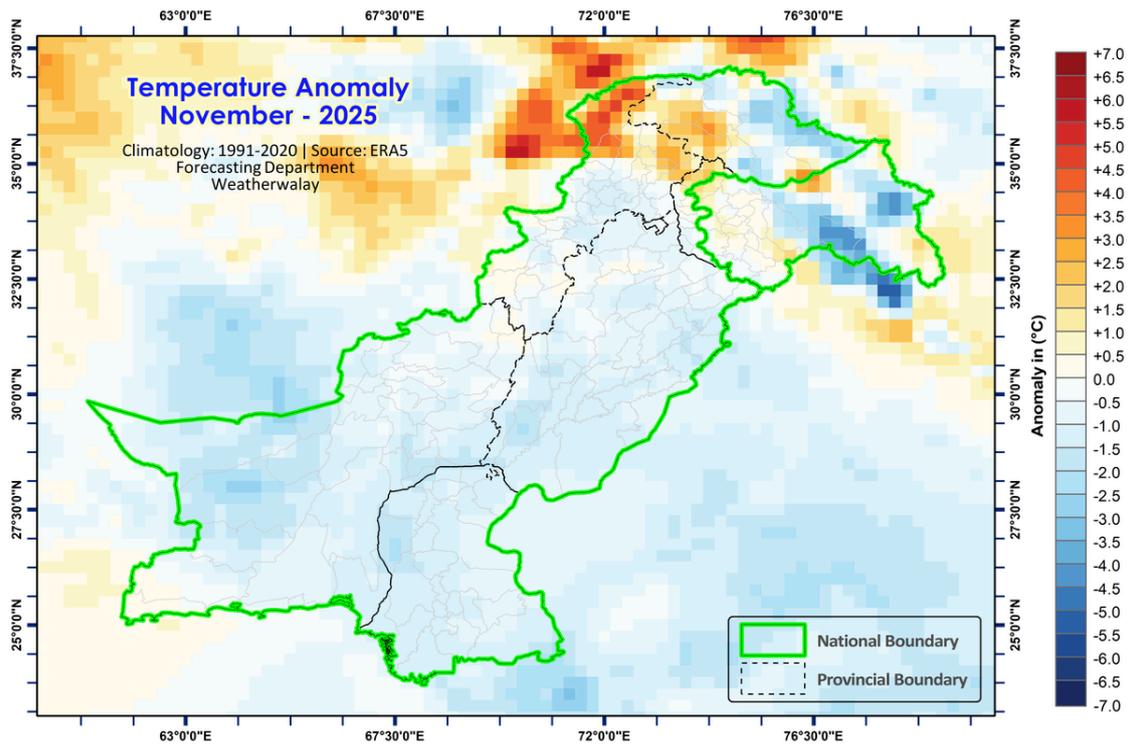


Figure 13: Temperature anomaly map for November 2025 in Pakistan

Temperature Anomaly Map for December 2025 – Pakistan

This map shows the temperature anomaly for December 2025 across Pakistan, based on ERA5 data (climatology: 1991–2020). It highlights widespread above-average temperatures, with certain northern regions, particularly in Gilgit-Baltistan and Khyber Pakhtunkhwa, experiencing anomalies exceeding +6°C. This indicates the continuation of an intense warming trend that has affected the country throughout the year, with particularly warm conditions persisting in the north.

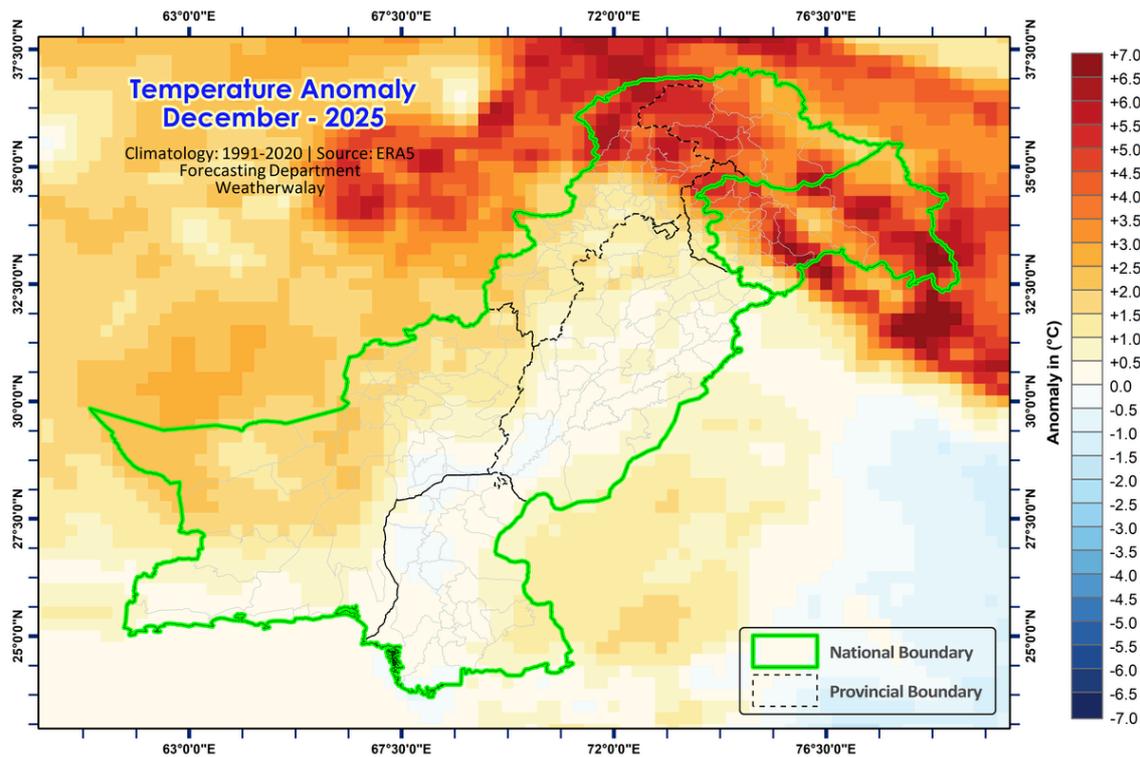


Figure 14: Temperature anomaly map for December 2025 in Pakistan

6. Monthly Temperature Anomalies for Pakistan and its Regions – 2025

This table presents the monthly temperature anomalies for various regions in Pakistan, including Azad Kashmir, Balochistan, Gilgit-Baltistan, Jammu Kashmir, Islamabad, Khyber Pakhtunkhwa (K.P.K), Punjab, Sindh, and Pakistan as a whole for the year 2025. The values are expressed in °C, showing the deviation from the 1991–2020 climatological baseline. The color-coding highlights positive (warmer) and negative (cooler) anomalies, with regions like Gilgit-Baltistan and Azad Kashmir experiencing some of the most significant temperature shifts, especially during the summer months of June and December.

Month	Azad Kashmir	Balochistan	Gilgit Baltistan	Jammu Kashmir	Islamabad	K.P.K	Punjab	Sindh	Pakistan
January-2025	1.98	0.23	0.97	1.22	1.95	1.79	0.85	-0.16	0.67
February-2025	1.38	1.86	0.25	0.83	2.08	1.35	1.40	1.50	1.42
March-2025	0.57	1.42	-0.13	0.23	1.18	0.87	1.33	1.04	1.03
April-2025	2.44	3.61	1.11	1.64	3.79	3.34	3.49	2.22	2.95
May-2025	1.37	1.88	2.99	2.64	2.09	2.56	0.95	0.84	1.78
June-2025	1.94	0.72	4.87	3.60	1.88	2.41	0.79	-0.11	1.45
July-2025	0.92	0.64	4.09	2.32	-0.63	1.18	-0.47	-0.06	0.82
August-2025	0.68	0.96	2.43	0.26	-0.10	1.41	0.03	0.35	0.76
September-2025	1.83	1.45	3.89	1.53	1.79	2.19	0.54	-0.42	1.28
October-2025	0.56	0.66	-0.14	-1.91	0.46	0.98	0.12	-0.61	0.06
November-2025	0.42	-1.02	-0.11	-0.75	-0.72	0.56	-0.94	-1.20	-0.74
December-2025	2.96	1.25	3.97	3.89	1.23	2.74	0.57	0.30	1.66
Annual-2025	1.42	1.14	2.02	1.29	1.25	1.78	0.72	0.31	1.09

Figure 15: Monthly temperature anomalies across different regions of Pakistan

7. Annual Temperature Anomaly Map for Pakistan (2025)

This map visualizes the temperature anomalies across Pakistan for the year 2025, showing the difference from the 1991–2020 climatological averages. The color scale indicates variations in temperature (°C) from +7°C to -7°C, highlighting areas experiencing significantly warmer or cooler conditions than normal. The most noticeable anomalies occur in the northern and northeastern regions, with temperatures exceeding +5°C in some areas. This data is sourced from ERA5 and prepared by WeatherWalay's Forecasting Department.

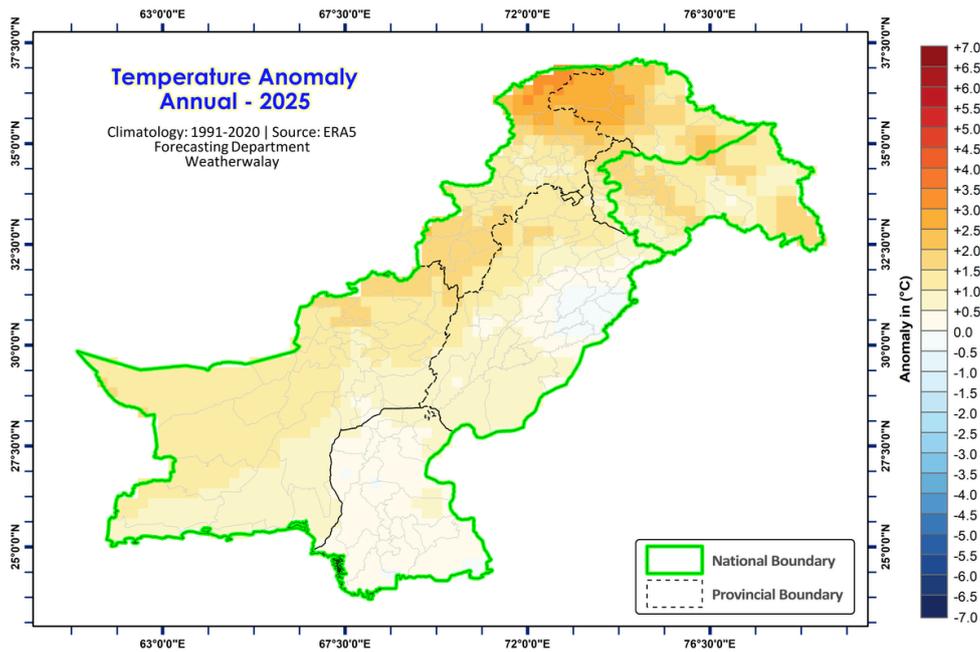


Figure 16: Temperature anomaly map for December 2025 in Pakistan

8. Conclusion

The year 2025 has cemented itself as the warmest year on record for Pakistan, with a significant mean temperature anomaly of +1.1°C above the 1991–2020 reference period. The April anomaly of +2.95°C stands out as the most extreme deviation from historical norms, indicating severe warming trends, especially in spring and summer months. Despite a minor cooling in November, the overall trend is clear: Pakistan is experiencing a gradual increase in average temperatures, with far-reaching consequences for its climate and people. Immediate and continued efforts to mitigate the effects of this warming are necessary to safeguard future agricultural productivity, manage water resources, and protect public health in the country.



Pakistan's First Private Weather Company

