全球灾害性天气监测月报

—2023年10月—

世界气象中心（北京） 2023年11月13日

Global Occurrence of Extreme High Temperatures and Prolific Activity of Tropical Cyclones Resulting in Severe Impacts on Multiple Countries

Abstract: In October 2023, global temperatures were notably elevated, and precipitation was deficient, particularly in the Southern Hemisphere. Extreme heatwaves were observed in numerous regions worldwide, including the Arctic Circle in North America, Southern Europe, Siberia, Mongolia, Brazil, Paraguay, and South Africa. Prolonged periods of elevated temperatures and scarce rainfall led to severe droughts and extensive forest fires in multiple areas. Tropical cyclones were active, with a higher-than-average number of occurrences, especially in late October. Six typhoons coexisted in the global tropical seas, and the Category 5 hurricane "Otis" caused significant property damage and casualties in southern Mexico. Additionally, the Arabian Sea witnessed an extremely powerful cyclonic storm named "Tej" and the Gulf of Mexico experienced a particularly strong cyclonic storm

named "Hamoon," bringing heavy rainfall to the eastern coasts of Yemen and Bangladesh, respectively.

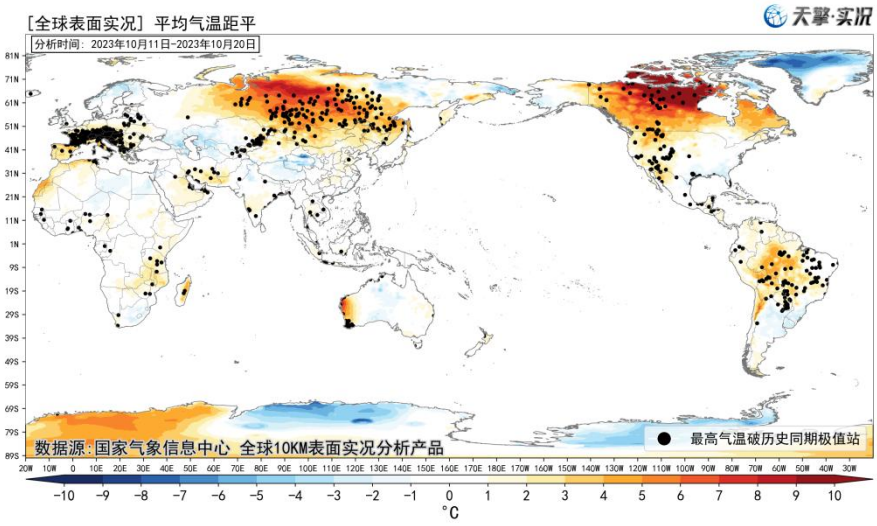
Global Weather Overview

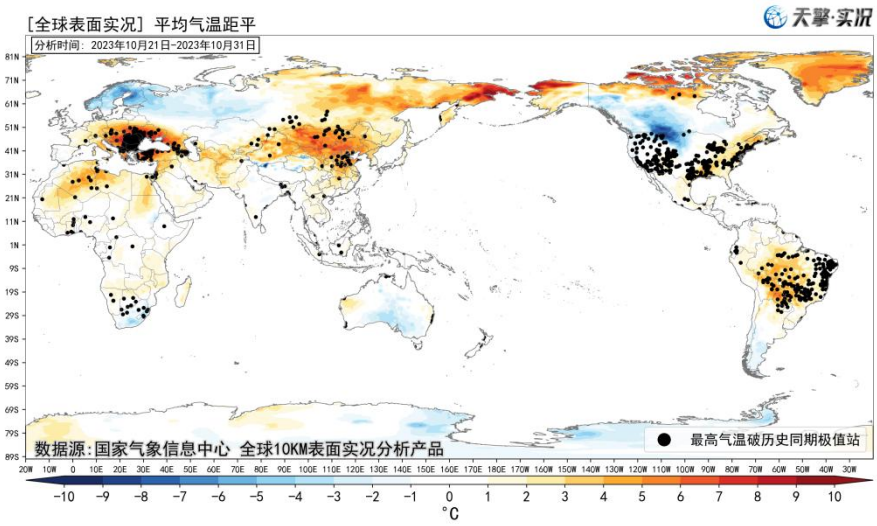
1. Temperature

The temperature anomalies for October 2023 are illustrated in Figure 1. Apart from the northern regions of Europe and Eastern Europe, where temperatures consistently remained below average, most parts of the world experienced temperatures that were either above or close to the long-term averages for the same period. Notably, the Arctic Circle in North America, Southern Europe, Siberia, Mongolia, and the northern regions of China observed prolonged periods of elevated temperatures, characterized by significant deviations, reaching 6 to 8°C above average during the first and second halves of the month. In Central and Southern Canada, temperatures fluctuated significantly, with above-average temperatures in the early and late parts of the month and below-average temperatures by 3 to 6°C in the mid-month period.

In the Southern Hemisphere, countries such as Brazil and Paraguay consistently witnessed above-average temperatures, exhibiting an increasing trend in both intensity and spatial coverage. Towards the end of the month, Southern Africa experienced a noticeable enhancement in

high temperatures. Analyzing the distribution of sites with record-breaking daily maximum temperatures for the historical period, it is evident that these sites are numerous and widely dispersed. Particularly noteworthy are the regions of high latitude in Asia, large parts of the Americas, Southern Europe, Western Europe, as well as countries and regions such as Brazil and Uruguay, which have the highest concentration of such sites.





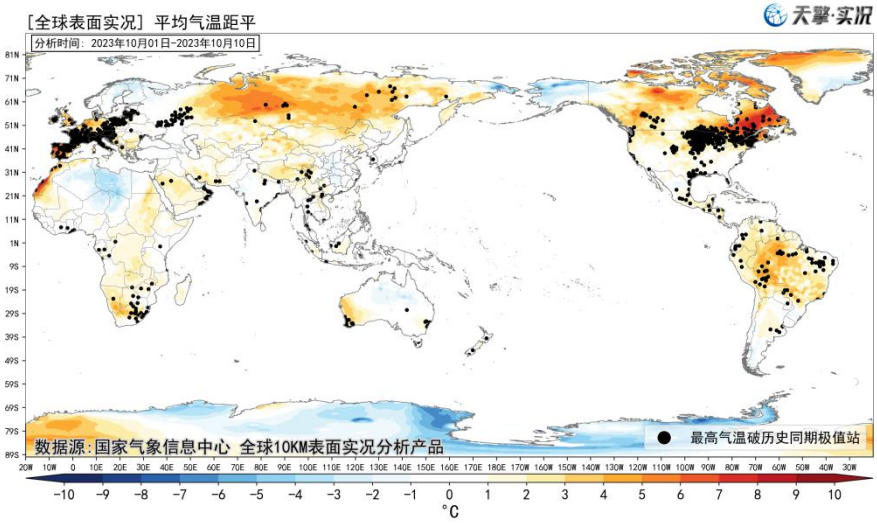


Figure 1: Global Temperature Anomalies and Sites with Record-Breaking Daily Maximum Temperatures in October 2023 (Unit: °C)

2. Precipitation

In October 2023 (Figure 3), global precipitation was generally below average, especially in the Southern Hemisphere. However, certain regions experienced significant accumulations of rainfall, with notable extremes in daily precipitation. The cumulative precipitation in many global regions was less than 100 millimeters. Countries and regions such as Southeast Asia, the southern coastal areas of Alaska, Central America, central Africa, and South America recorded cumulative precipitation between 100 and 300 millimeters, with some areas exceeding 700 millimeters. Certain localized areas in Vietnam even surpassed 1000 millimeters. Numerous locations in Europe, Asia, and North America witnessed daily precipitation surpassing historical records.

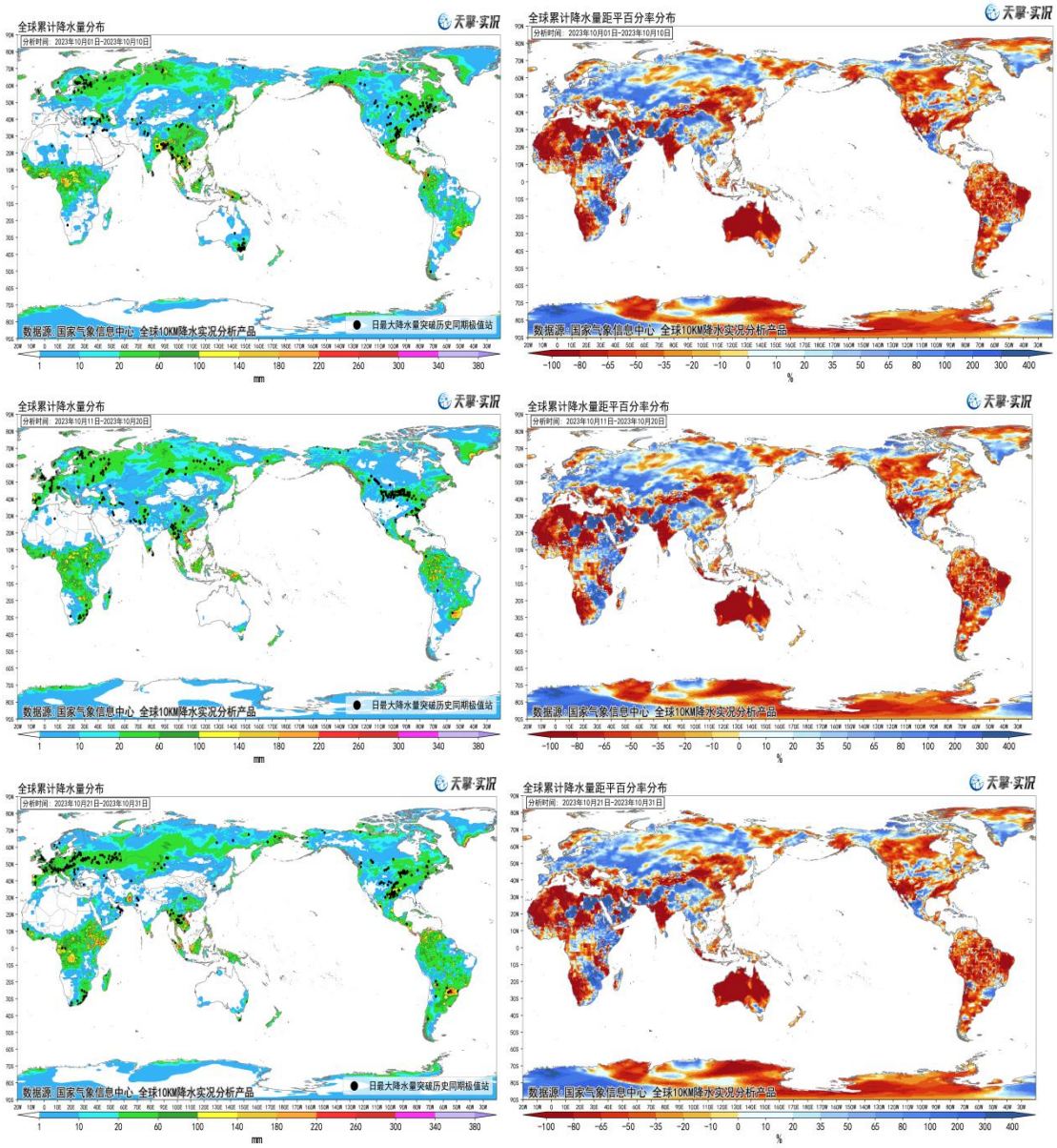


Figure 3: Global Cumulative Precipitation (Left, Unit: mm) and Anomalies (Right, Unit: %) in October 2023

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