

## Japan hit by the hottest summer in more than 100 years

Seasonal mean temperature in Japan for 2010 summer (i.e. three-month period from June to August) was the highest in the historical record held by Japan Meteorological Agency that goes back to 1898, with a deviation<sup>1</sup> of +1.64°C from the 1971-2000 average, kicking the 1994 summer out of the top of the record (see Figure 1).

Temperature anomalies for the individual months were 5th in the record with +1.24°C for June, 11th with +1.42°C for July, and highest with +2.25°C for August.

Followings are the most likely principal factors that are thought to have caused summer temperatures in 2010 to soar to the record high.

- Zonally-averaged tropospheric air temperature in the mid-latitudes of the Northern Hemisphere was the highest for June – August since 1979 in the aftermath of an El Niño episode that occurred from summer 2009 to spring (March – May) 2010 and partly due to the effect of a La Niña episode that occurred this summer. Given that the tropospheric air temperature shows a warming trend in the long run and across the mid-latitudes of the Northern Hemisphere, there is a possibility that the warming trend is associated with global warming due to the buildup of anthropogenic greenhouse gases.
- In the period from June to the former half of July, Japan experienced less-than-usual influence of the Okhotsk High, which occasionally conveys cool air to the Pacific side of Northern and Eastern Japan in normal years;
- In the period from the latter half of July to August, a remarkably strong anticyclone persisted over Japan, which is associated with the northward-meandering of the subtropical jet stream around Japan and, especially after the latter half of August, active convections in the northern South China Sea.

For the products that deal with global average temperatures, visit our website at:

<http://ds.data.jma.go.jp/tcc/tcc/products/gwp/gwp.html>

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<sup>1</sup> The observatory stations that represent the average temperature of Japan are selected from those deemed to be least influenced by urban heat island (see Figure 2).

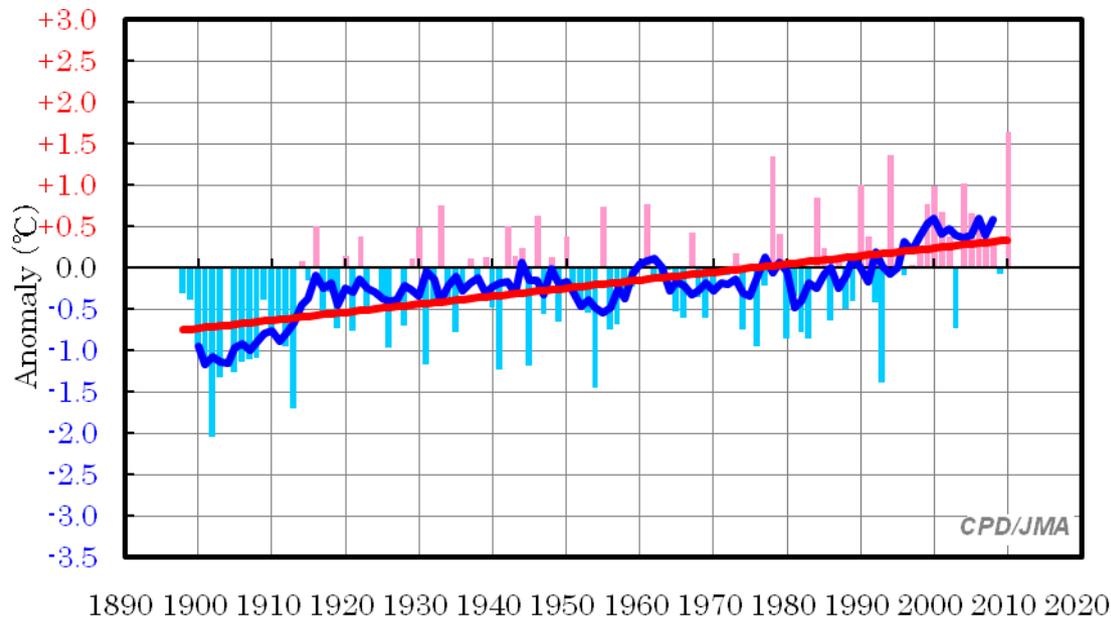


Figure 1. Long-term change in seasonal temperature anomalies for summer (June to August) in Japan. Anomalies are calculated as the average of temperature deviations from the 1971-2000 normal at the 17 observation stations (see below). The bars indicate anomalies of temperature for each summer. The blue line indicates 5-year running mean, and the red line a long-term linear trend.

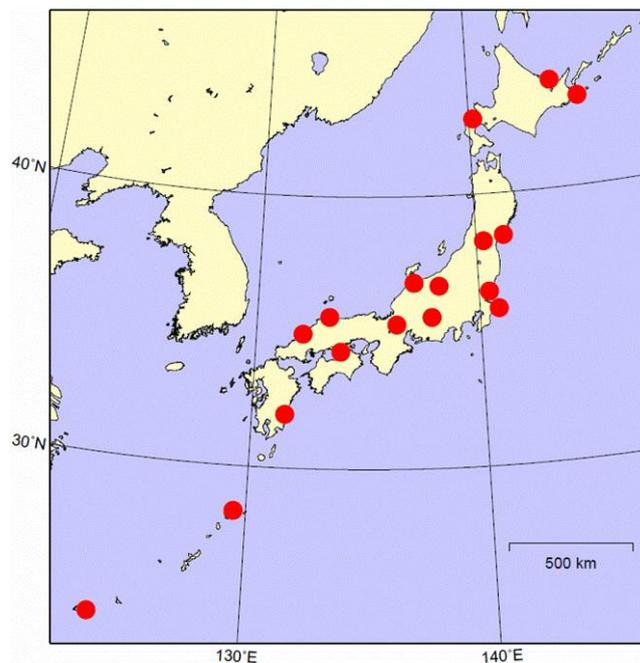


Figure 2. The 17 observation stations that represent the average temperature anomalies of Japan (designated by red-filled circles).