

Record-tying High Global Surface Temperature in September 2009

The monthly anomaly of the global average surface temperature in September 2009 (i.e., the average of the near-surface air temperature over land and the SST) was $+0.37^{\circ}\text{C}$ (preliminary value*) (based on the 1971 – 2000 average), which tied with 2005 as the highest record since 1891 (Figure 1).

Monthly mean temperatures were above normal in most land areas of the world except some areas of $30 - 50^{\circ}\text{N}$, southern South America and western Australia. The greatest warming was found from Canada to the northern United States and from western Russia to northern Europe. Sea surface temperatures were also above normal almost in the tropics (Figure 2).

On a longer time scale, global average surface temperatures of September have been rising at a rate of about 0.58°C per century.

Such high temperature can be attributed to an El Niño phenomenon which is developing now and fluctuations over different time scales ranging from several years to several decades, as well as global warming caused by an increase in greenhouse gases such as CO_2 .

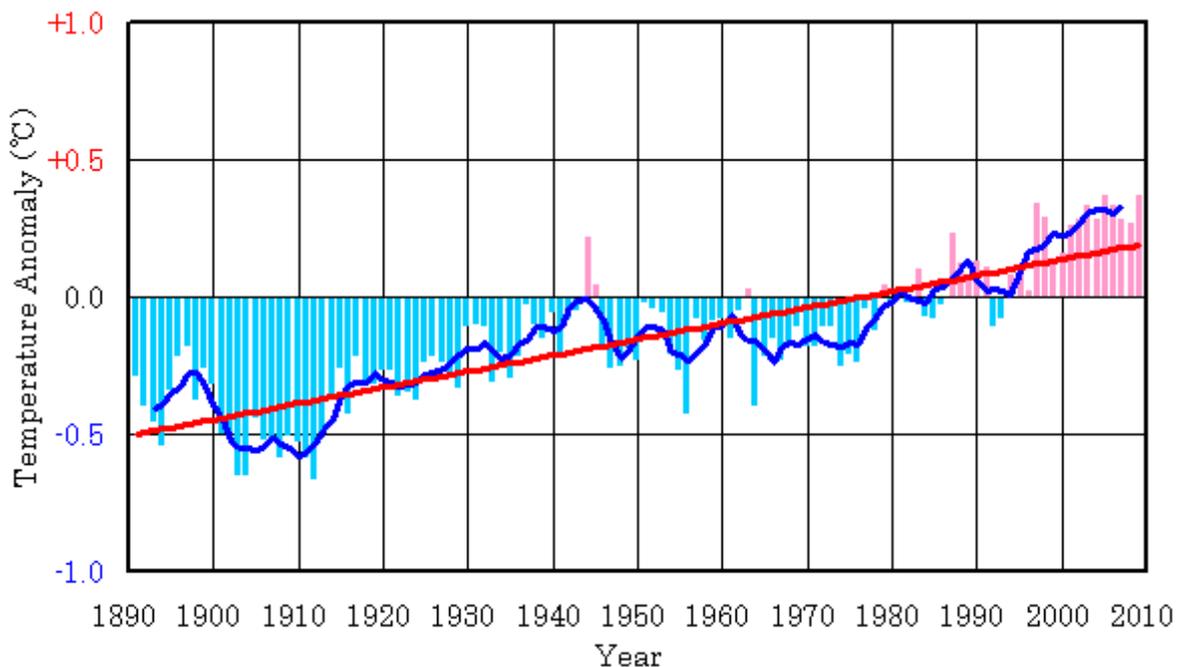


Figure 1 Long-term change in monthly mean surface temperature anomalies in September over the globe

Anomalies are deviations from the normal (1971-2000 average). The bars indicate anomalies of surface temperature in each year. The blue line indicates 5-year running mean, and the red line indicates the long-term linear trend.

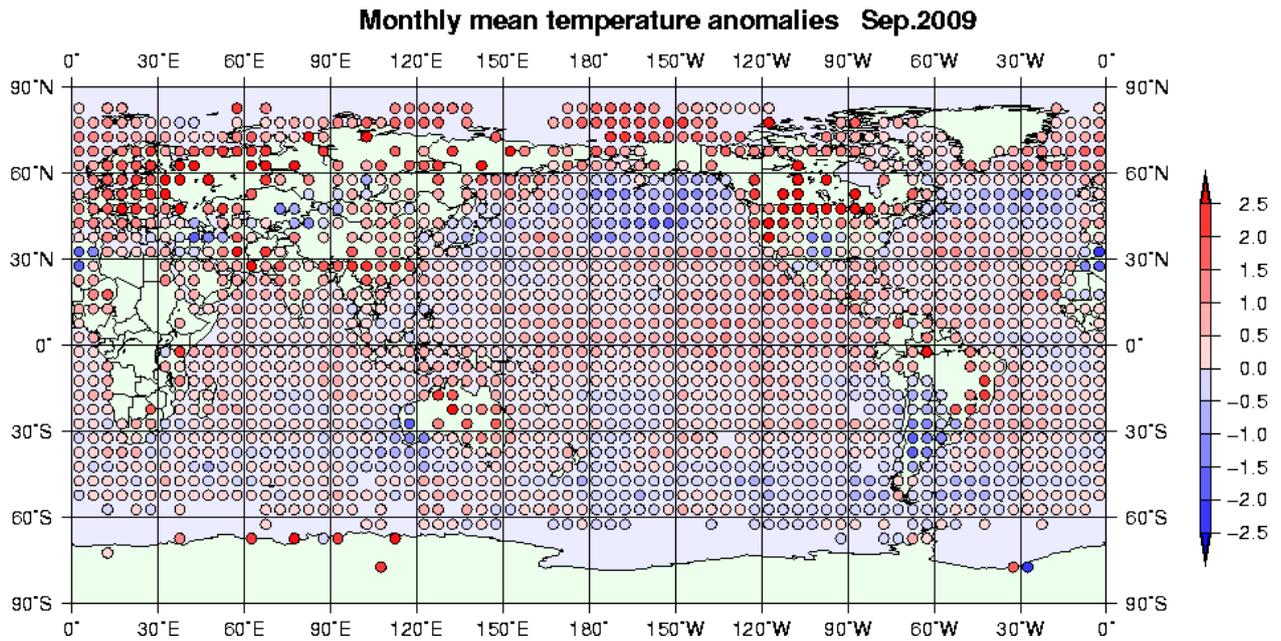


Figure 2 Monthly mean temperature anomalies in September 2009

The circles indicate temperature anomalies from the climatological normal (i.e. the 1971-2000 average) averaged in 5° x 5° grid boxes.

Standings of global monthly mean temperature in September

Rank	Year	Temperature Anomaly
1	2009	+0.37 (Preliminary value)
	2005	+0.37
3	1997	+0.34
4	2006	+0.33
	2003	+0.33
6	1998	+0.29
7	2007	+0.28
	2004	+0.28
	2002	+0.28
10	2008	+0.27

* This value has been obtained on the basis of monthly climate data received at JMA as of 8 October 2009. This value will be fixed in early November as the preliminary value is subject to change due to new incoming data.