

Large Part of Asia Could Expect Hotter Summers

The global surface temperature has showed a significant warming trend since the mid 1990s. According to statistics of the World Meteorological Organization, the global mean surface temperature during 2011-2015 is higher by 0.57°C than that during 1961-1990. This trend has led to the occurrence of hot summers and extreme events, and the casualties caused by these events during 2001-2010 have increased by 23 times compared to those during 1991-2000.

This warming trend is particularly prominent in the boreal mid- and high- latitudes. Europe's heat wave in 2003, for instance, has brought about more than 30, 000 deaths. In 2010, the maximum temperature of several cities in Russia exceeded 40°C, about twice of the climatological value (23°C). This heat attack resulted in over 15, 000 deaths and more than \$15 billion worth of economic loss. In the same year, people in Mohe County in the north China also experienced historically high temperature, with maximum temperature of 39.3°C during the day.

A recent study by scientists from the CAS Institute of Atmospheric Physics identified a non-uniform warming pattern in summer after the mid-1990s over the Eurasian continent. They found there has been a predominant amplified warming over Europe-West Asia and Northeast Asia, but much weaker warming over Central Asia. They suggested that the Atlantic Multidecadal Oscillation (AMO) may have induced this asymmetry in temperature changes through the decadal change of the Silk Road Pattern, which is a wave-like pattern along the upper-tropospheric westerly jet in mid latitudes. Their results showed that the Silk Road Pattern has a strong decadal variability, which can explain about 30% of its total variance.

Since the AMO has a cycle of 65–80 years and has entered a positive phase since the mid-1990s, they predicted that there could still be a strong warming over Europe-West Asia and Northeast Asia in the coming decade, which is going to exert great influences on the ecological condition, the agriculture, and people's lives in the region.

