Climate Change in China

On average, the earth became warmer in the 20th century. Climatologists are confident that the global average surface temperature increased by about 0.5°C. This increase was in part due to differential changes in daily maximums and minimums, resulting in a narrowed diurnal temperature range (1). A decrease in the diurnal range was first identified in the US, where large area trends showed that maximum temperatures have remained constant or increased only slightly, whereas minimum temperatures have increased at a faster rate (2). Measurements at the earth’s surface indicate global average warming of between 0.3 and 0.4°C since the year 1979 (3).

Regional changes in the temperature are very complex, as is climatic diversity. Over the past 100 years, there has been a 1–2°C decrease in the eastern half of southern China, except for the coastal areas. The mean temperature in southern China has decreased by 0.8°C from the 1950s to 1980s (4).

CHINA’S REGIONAL TEMPERATURE TRENDS

Confusing global and regional results mean that we have to look more carefully at past changes. Analyses of observed surface temperatures between the 1950s and 1990s from 400 stations around China (5) provide evidence of temperature change in the past, and a sound regional basis for global climate change. The climate system is so complex, however, so that past changes cannot be interpolated to forecast future trends and changes.

Has China become warmer? On average, insignificantly so. The observed data from the latter half of the 20th century show no change when averaged over the whole territory of China. However, if we break down the averages, some conspicuous shifts and changes can be detected from the data.

In the 8 major climatic regions (Fig. 1), a clear pattern of trends was observed, with cooling or lower warming in the subtropical zone or the southern parts of China, and warming in the temperate zone or the northern parts, including the crowded and water-scarce North China Plain. On an axis from NE to SW it is very clear; the former has become remarkably warmer, whereas for SW China and the Tibetan Plateau there is evidence of a cooling trend. The annual means in Tibet