Surface temperatures

The estimated departures from normal (1951 to 1980) for the 1993 surface global mean temperature varied from +0.18°C to +0.24°C. These estimates vary, primarily because of slight differences in resolution, analysis, amount and distribution of data, although all estimates relied heavily on the 1993 land surface temperature data from the monthly CLIMAT messages exchanged over the Global Telecommunication System. Surface tempera-

The 1994 estimated global mean surface temperature anomaly (departure from normal calculated relative to the 1951–1980 base period) for land and marine areas, was +0.31°C +/-0.03°C (Figure 1). The uncertainty in this estimate results mainly from data sparsity, especially in the southern hemisphere oceans and parts of the tropics, and lack of data from Antarctica. As a result, different

The globally-averaged surface temperature for 1995 was 0.40°C above the 1961-1990 average, according to observations made at land stations along with sea-surface temperatures measured from ships and buoys. The previous warmest year since 1861 was 1990, which had an anomaly of 0.36°C for the year as a whole (see front cover).

Based on observations over both land and ocean, the 1996 estimated global mean surface temperature anomaly was 0.22°C above the 1961–1990 base-period average. This made 1996 the eighteenth consecutive year with positive global temperature anomalies and the eighth warmest year since 1860. However, the magnitude of the

The 1997 global mean surface temperature anomaly, 0.43°C above the 1961-90 base-period mean temperature, was the highest since records began in 1860. The previous highest anomaly was +0.38°C in 1995.One major contributing factor was the El Niño/ Southern Oscillation (ENSO) episode with temperatures in the tropical belt being the second highest in the historical record.

The global temperature in 1998 was the warmest since reliable instrument records began 139 years ago. A persistent El Niño in the first half of the year and the unprecedented warmth of the western and central Indian Ocean contributed to this record warm year. Compared to climatological standard normals from the years 1961 to 1990, which was itself a warm era, the average temperature near the surface of the Earth in 1998 was 0.57°C above normal.

The global mean combined land-surface air and sea-surface temperature for 1999 (see Figure 1a) was 0.33 °C above the 1961–1990 normal, making 1999 the 5th warmest year in the global instrumental record (1860–1999). The seven warmest years globally occurred during this past decade, the warmest being 1998 (+0.58°C). The ten warmest years have all occurred since 1983,