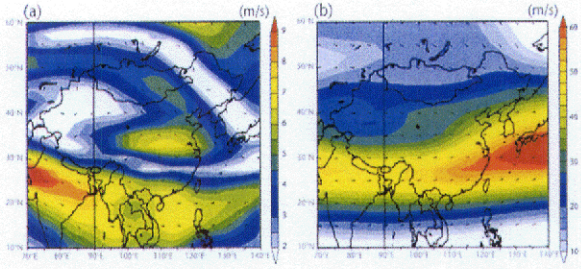

Figure II.40
a) Wind anomaly; and b) wind flow in the high atmosphere (250 hPa — approximately 10.5 km) over Asia from January to March 1998.
(NOAA/CDC, USA)

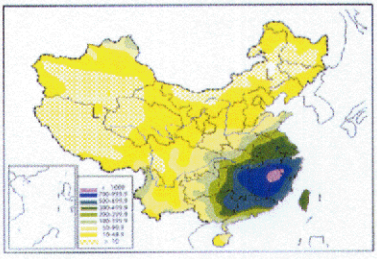

Figure II.39
Accumulated rainfall for winter and spring of 1997–98 (1 November 1997 to 10 March 1998) over China.
(CMA/NCC, China)

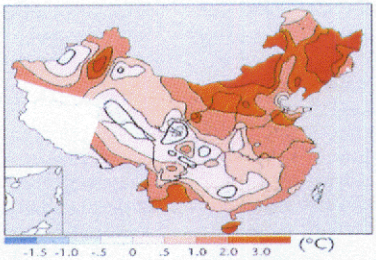

Figure II.41
Mean temperature anomalies (°C) over China for the period December 1997 to February 1998.
(CMA/NCC, China)

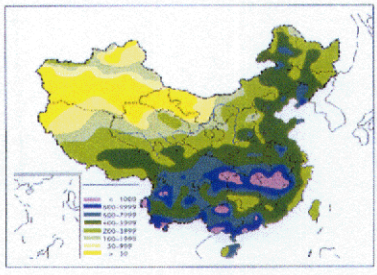

Figure II.42
Total rainfall for the period June 1998 to August 1998 over China.
(CMA/NCC, China)

There were also critical changes to the westerly wind flow of the high atmosphere. The subtropical jetstream shifted equatorward and there were stronger westerly winds over the Indian subcontinent and through Myanmar and southern China; over northwestern China the westerly winds were reduced (Figure II.38a). However, the jetstream emanating from the region of the Asian summer monsoon remained strong (Figure II.38b).

The southward shift in the jetstream produced changes in the vertical motion fields of the middle atmosphere, particularly the increased tendency towards subsiding air north of the jetstream over central to northern China (Figure II.38c — subsiding air is shaded orange/green). The increased outgoing longwave radiation over central to northern China (Figure II.38d — positive anomalies are shaded orange/green) is consistent with the suppression of convection and summer rainfall over China north of the Yangtze River.

As with other regions of southern and eastern Asia, tropical storms, cyclones and typhoons normally contribute a significant proportion of total rainfall over southern China. Only four typhoons made landfall over China during 1997 and this was the lowest frequency in the past 46 years. The first landfall was not until early August 1997, later than all previous first seasonal landfalls in the past 46 years.

November 1997–March 1998

Rainfall across southern China from November 1997 through March 1998 was persistent and total accumulations were above normal (see Figure II.39). In addition, heavy snowfalls led to an above normal accumulation over the Tibetan Plateau. Some locations over the southeast received in excess of 1 000 mm during the period. Totals also generally exceeded previous record values and many across the region were more than twice the seasonal average.

From January 1997 through March 1998, the axis of the high atmosphere jetstream continued to be further south than normal with anomalous westerly winds extending from northwestern India to south of China (Figure II.40a). The axis of maximum wind speed was across southern China and peak speeds were west of China (Figure II.40b). The equatorward shift of the high atmosphere jetstream is linked to the reduced equatorial convection and weaker meridional circulation in the longitudes of East Asia associated with the El Niño. It is a contributing factor to the enhanced winter rainfall across southern China. Over northern China, poleward of the jetstream, below average rainfall persisted into winter and early spring. Winter temperatures were more than 3°C above normal over some parts of the region (Figure II.41).