normal accumulations from autumn 1997 to winter 1998 caused waterlogging and flooding of fields and high river levels. Record February levels were reached on the Mingjiang River and critical flood levels were exceeded on a number of rivers, including also the Xinjiang, Ganjiang and Beijiang Rivers. By 16 March 1998 the level of the Yangtze River at Hankou was 21.33 metres, the highest recorded for that time of the year. The high levels of rivers, lakes and reservoir storages by late winter made water conservation and management very difficult during the following spring. Another complicating factor was the commencement of spring runoff from Tibetan snowmelt up to a month earlier than normal in places.

There was major flooding and extensive destruction over a wide area as a consequence of the heavy summer rains over the Yangtze Basin that followed record winter rains. The summer flooding was generally the worst since at least 1954 and in parts set new all-time records. In terms of the total area affected, the river heights reached and the duration of flooding, the 1998 summer flood achieved values rarely experienced in past records.

Overall, the 1998 summer flooding of the Yangtze River affected 212 000 km^2 of which 130 000 km^2 was declared a disaster area. The population affected within the disaster area exceeded 223 million persons with more than 3 000 deaths attributed to the flooding. Approximately 5 000 homes were destroyed and the direct economic loss was estimated at 166 billion yuan.

Equatorial Asia-Pacific

The equatorial Asia-Pacific region considered here extends from Indonesia to Papua New Guinea and includes the islands of the Philippines. The region is also referred to as the "maritime continent" because of the very strong diurnal cycle of the island rainfall distributions. The surrounding waters are warm all through the year and daily solar heating over the islands tends to establish local circulations with warm moist air from the sea converging inland and triggering deep atmospheric convection and rainfall during the afternoons.

The islands of the region generally receive rainfall in all months of the year, although there are peaks of rainfall associated with the seasonal movement of the intertropical convergence zone. South of the equator there is a distinct peak in rainfall from October to March. North of the equator the peak rainfall comes with the southwest monsoon of the Northern Hemisphere summer, and tropical cyclones and storms moving across the Philippines enhance the seasonal rainfall in that region.

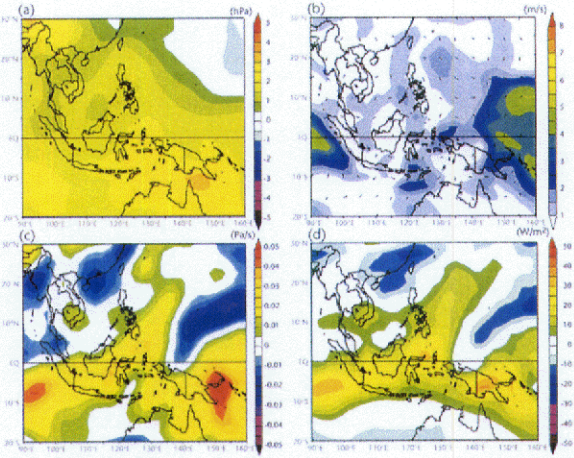

Figure II.44
Montage of selected climate indicators over the equatorial Asia-Pacific region for August to October 1997: anomalies of a) sea level pressure; b) surface vector mean wind; c) vertical motion at 700 hPa (approximately 3 km altitude); and d) outgoing longwave radiation.
(NOAA/CDC, USA)

Significant climate anomalies of the 1997–98 El Niño event over the region were:

- Suppressed rainfall over the region with drought in many parts;
- Abnormally high temperatures and drying of vegetation;
- Increased frost incidence over highland regions; and
- Reduced tropical storm activity over the Western Pacific and South China Sea.

The maritime continent is within the ascending branch of the Walker Circulation during most years. The onset of the El Niño event during mid-1997 established warm sea surface temperatures across the equatorial central Pacific with temperatures exceeding 28°C much further east than normal. Deep atmospheric convection extended eastward with the warm waters and the region of the maritime continent came under the influence of higher than normal surface air pressure. Across equatorial Asia and the western equatorial Pacific Ocean the normal pattern of ascending air associated with the Walker Circulation was disrupted.

June–November 1997

The Northern Hemisphere summer monsoon is the dominant climatic feature of Asia and the intertropical convergence zone