experienced. Over Panama and into northern Colombia rainfall was suppressed and accumulated totals from June 1997 to January 1998 were much below average. Crops were lost and food supplies were seriously affected. Shortages of water disrupted operation of the Panama Canal and restricted ship traffic. Later, as the intertropical convergence zone shifted northwards and the El Niño influence was rapidly declining during 1998, drought turned to flood and more than 300 000 people required government assistance in Panama.

The accumulated rainfall from September 1997 to May 1998 at several locations on the north coast of Peru, and the comparison with normal rainfall and the 1982–83 El Niño event, are shown in Figure II.25. In many locations the accumulated totals of summer rainfall were more than ten times normal values.

The heavy rainfall running off steep terrain along coastal Ecuador and northern Peru during the Southern Hemisphere summer caused extensive erosion and mudslides, and resulted in loss of houses, roads and agricultural infrastructure, including irrigation systems. In Ecuador, 90 000 families were evacuated and 70 per cent of the population suffered direct and indirect losses. More than 30 000 people were left homeless as 7 500 houses and 440 schools were destroyed or damaged. The death toll exceeded 200 persons as a result of drowning, landslides and related causes. Seventy per cent of the coastal highway, including 15 bridges, was destroyed with the overall loss estimated to exceed US $2 billion.

The very heavy rains over the region of southern Brazil, Paraguay, Uruguay and Argentina during the second half of 1997 and early 1998 produced flooding and posed problems for agriculture and water management. During the Southern Hemisphere winter of 1997 the heaviest rains were in higher latitudes and a number of locations in and near Chubut Province of Argentina received record rainfall during June 1997 (see Comodoro Rivadavia, Figure II.26).

Over late spring and summer the abnormally heavy rain was further north over the headwaters of major rivers. Monthly rainfall records were exceeded at a number of locations during October and December 1997 and January, February, March and April of 1998. For example, Paso de los Libres in

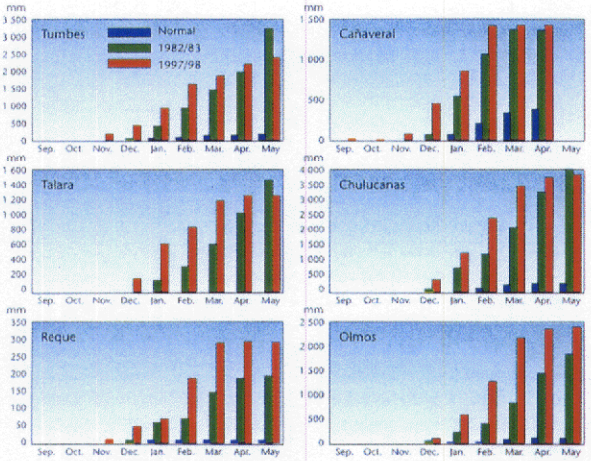

Figure II.25
Accumulated rainfall for selected stations of Peru during 1997–98 and comparison with normal summer rainfall and the 1982–83 El Niño event.
(Cornejo (personal communications) based on data from SENAMHI, Peru)

Corrientes Province of northern Argentina exceeded previous monthly rainfall records in December 1997 as well as in January and April of 1998 (Figure II.27).

The frequent heavy spring and summer rains over northern Argentina, Paraguay, Uruguay and southern Brazil caused rivers to rise and there was extensive flooding, especially after the heavy rains of April 1998. The data at Table II.1, showing the maximum levels reached for locations in Argentina along the Paraná River and Paraguay River, are typical for the region and show that peak levels reached during May 1998 were comparable to levels reached during the 1982–83 and 1991–92 El Niño events.

Below average rainfall was recorded over a region extending from northeastern

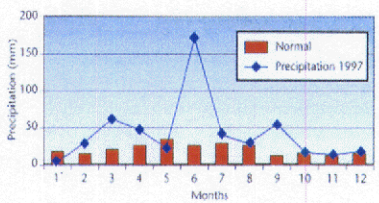

Figure II.26
Monthly rainfall for 1997 and the 1961–90 normal for Comodoro Rivadavia, Argentina.
(National Meteorological Service, Argentina)

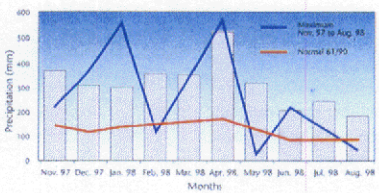

Figure II.27
Monthly, normal and previous maximum monthly rainfalls for Paso de los Libres, Argentina.
(National Meteorological Service, Argentina)