

# Heavy precipitation in East Asia during Summer 1998

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Heavy rains in East Asia triggered widespread flooding during Summer 1998, which affected regions with very high population density and caused a lot of damage. Beside the region around river Yangtze in China, which was the target of a previous GPCC report, also Bangladesh and South Korea received heavy precipitation.

Using a computer program, developed at the GPCC, all precipitation data out of the global synoptic weather reports (SYNOP) received via the Global Telecommunication System (GTS) at the Deutscher Wetterdienst (DWD) have been analysed since July 1998. Actual data of more than 20 stations in the catchment area of the lower reaches of the rivers Ganges and Brahmaputra and data of more than 50 stations in Korea were used for that analysis.

[Fig. 1](#) and [Fig. 2](#) give an overview over the analysis regions around Bangladesh and Korea.

The GPCC-analysis of the precipitation totals for August 1998 is shown on [Fig. 3](#) for Bangladesh and [Fig. 4](#) for Korea. [Fig. 5](#), [6](#) and [7](#) illustrate the daily precipitation totals during each day of July and August 1998 at 3 stations with very high precipitation totals during the month of August 1998: [Dehra Dun](#) (located Northeast of New Delhi in India in the catchment area of the upper reaches of river Ganges), [Chittagong](#) (location see in [Fig. 1](#)), [Seoul](#) (location see in [Fig. 2](#)). Dehra Dun received 1020 mm, in Chittagong precipitated 999 mm (about 2 times the normal value for 1961-1990) and in Seoul 1251 mm (about 4 times the normal value for 1961-1990) precipitation were measured in August 1998.

The plots of Dehra Dun and Chittagong show, that the monsoon precipitation continued during the whole analysis time, which triggered the river levels in Bangladesh, where three quarter of the country have been flooded.

An extraordinary high precipitation activity can be recognized in Seoul during the first half of August 1998, when some heavy flash floods occurred in South Korea.

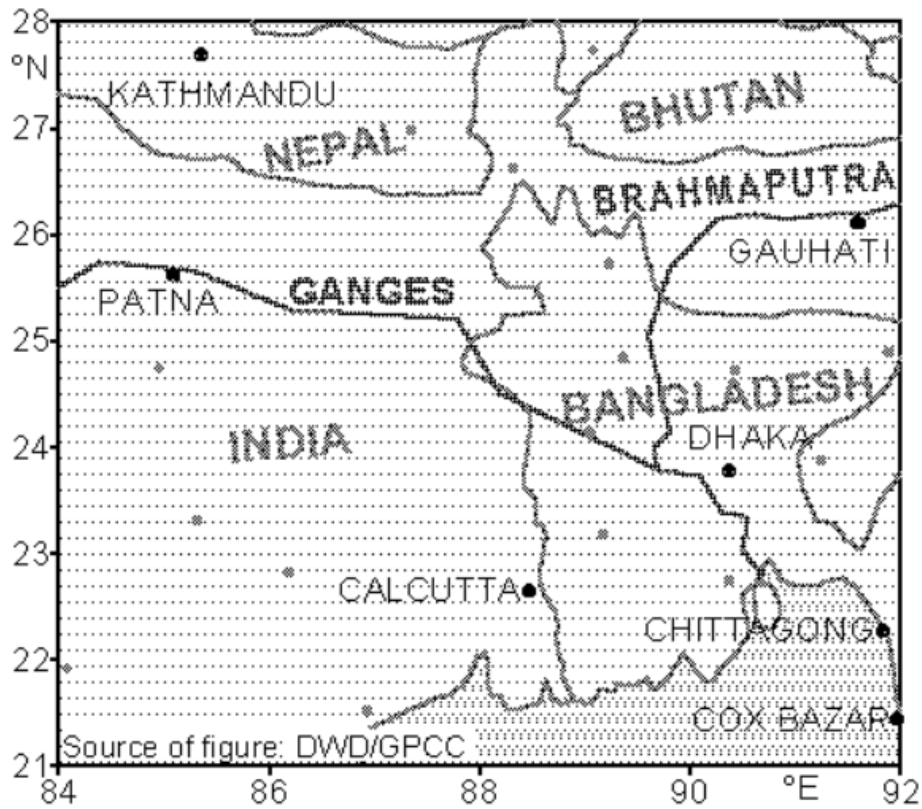


Fig. 1: Location map of the analysis region in the catchment area of the lower reaches of the rivers Ganges and Brahmaputra. The positions of the GTS-SYNOP stations used for the GPCC-analysis are marked with red and black points.

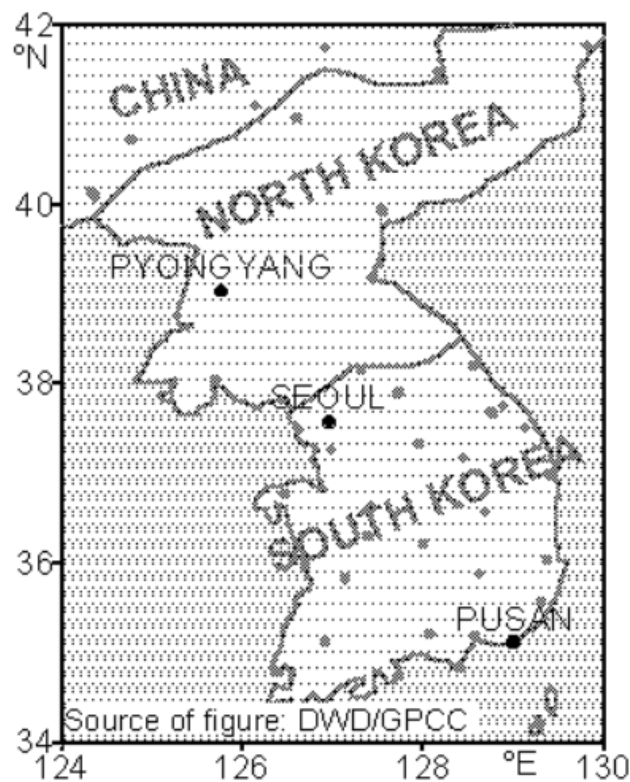


Fig. 2: Location map of the analysis region in North and South Korea. The positions of the GTS-SYNOP stations used for the GPCC-analysis are marked with red and black points.

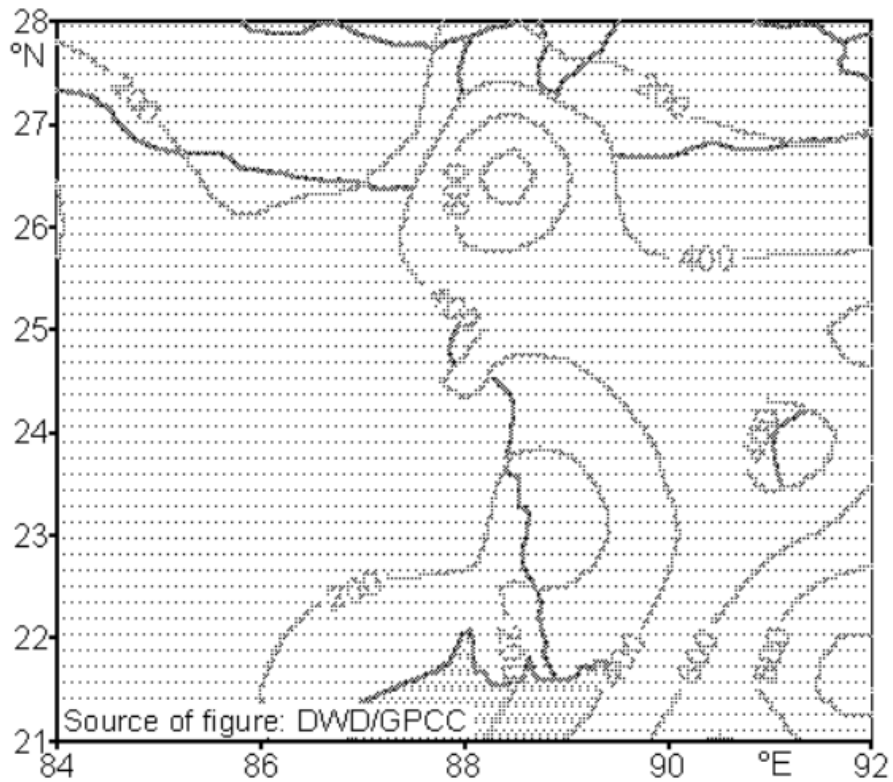


Fig. 3: Precipitation totals in mm in Bangladesh and its surroundings during August 1998. Regions of more than 400 mm precipitation are marked with dots. (Database: GTS-SYNOP data of DWD).

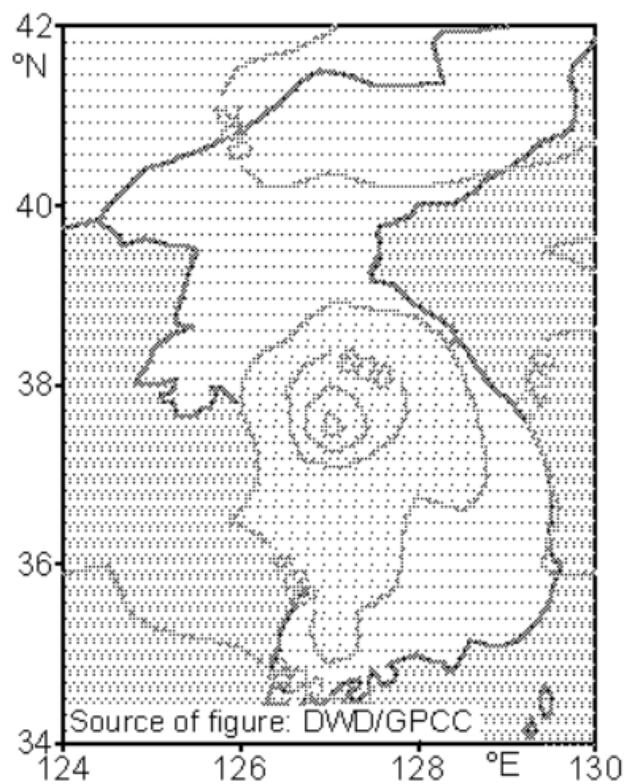


Fig. 4: Precipitation totals in mm in North and South Korea during August 1998. Regions of more than 400 mm precipitation are marked with dots. (Database: GTS-SYNOP data of DWD).

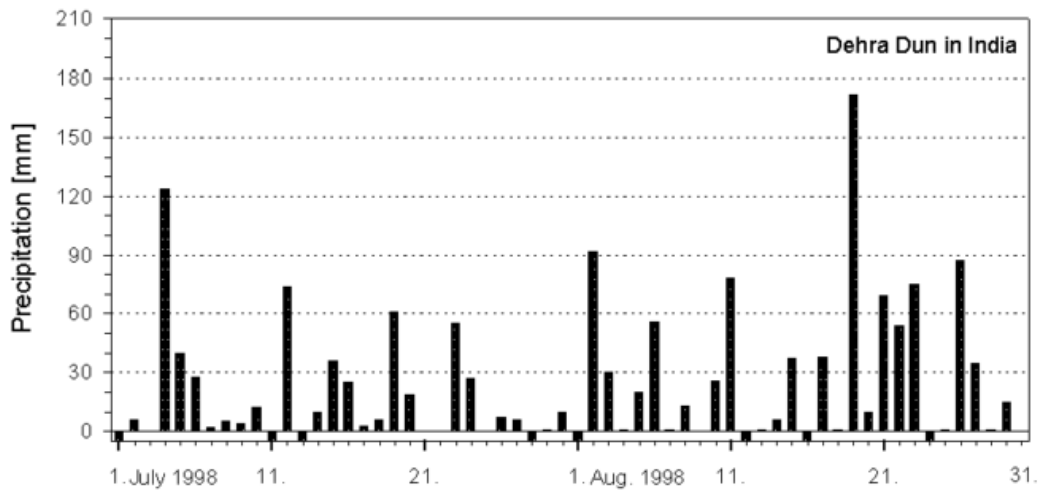


Fig. 5: Precipitation totals in mm during each day of July and August 1998 at the station Dehra Dun in India. Database: GTS-SYNOP data, analysed at DWD/GPCC. Negative values indicate missing data.

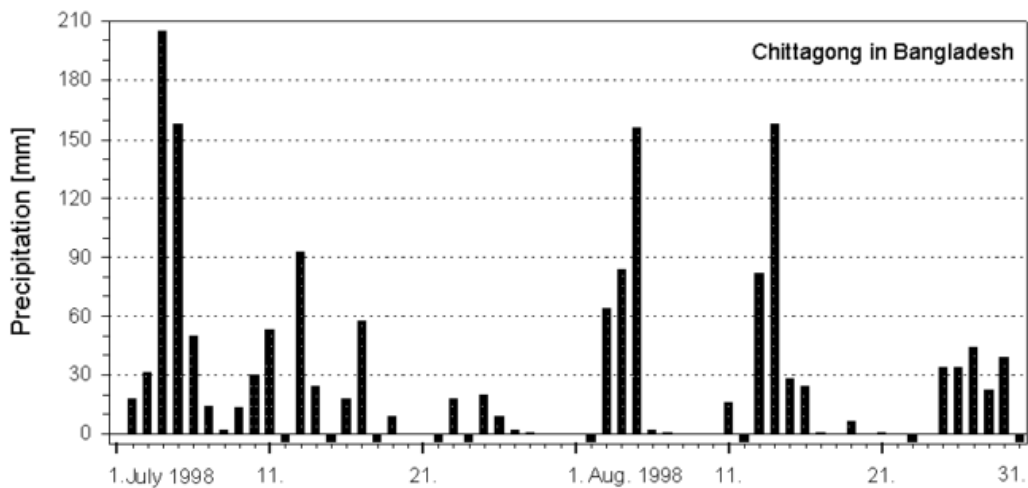


Fig. 6: Precipitation totals in mm during each day of July and August 1998 at the station Chittagong in Bangladesh. Database: GTS-SYNOP data, analysed at DWD/GPCC. Negative values indicate missing data.

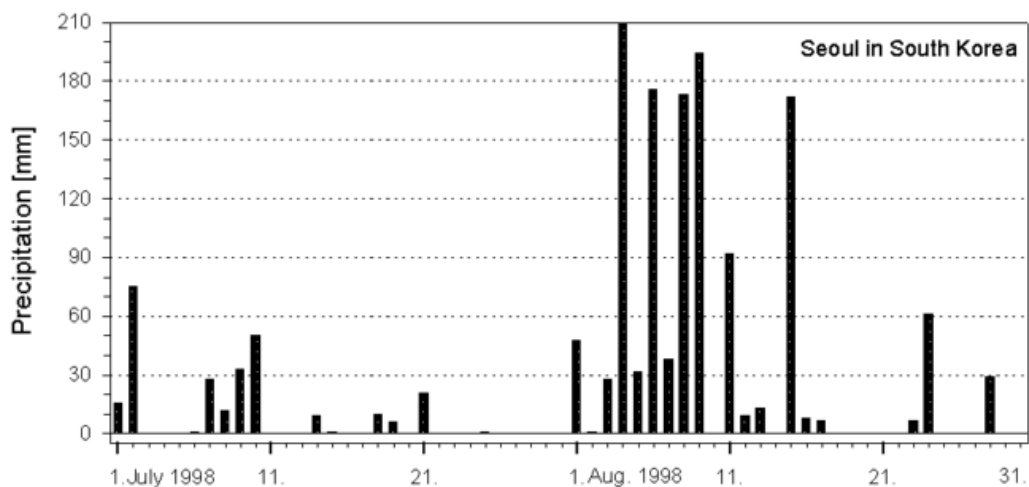


Fig. 7: Precipitation totals in mm during each day of July and August 1998 at the station Seoul in South Korea. Database: GTS-SYNOP data, analysed at DWD/GPCC. Negative values indicate missing data.