

NOTES

SUMMER MONSOON OF 1998 AND ASSOCIATED FLOODS – A BRIEF APPRAISAL

The main features of the 1998 monsoon are:

1. No organised weather systems like depressions or cyclonic storms occurred over the country from 16 June to 14 August
2. Axis of the monsoon trough remained confined to the north of its normal position during major part of the season and by and large was diffused and ill defined on most of the days, thereby causing weak monsoon.
3. The summer monsoon of 1998 was post El Nino year monsoon and it has been estimated that in this season the country received +6% above the long-period average rainfall of the country.

In the year 1998, summer monsoon first advanced over northeast India a couple of days before its traditional onset date of 1st June. It actually set over Kerala a day later than the normal date, i.e. on 2nd of June. The peculiarity of the onset in 1998 over Kerala was that it was not associated with any vortex system. Further advance of monsoon was very quick thereafter and it covered the entire country by about 30 June, i.e. about 15 days earlier than the normal date of 15 July. Monsoon finally retracted from the peninsula by about the middle of October when the northeast monsoon set in over the southern half of the peninsula.

The quick advance of monsoon over the country was hastened by a very severe cyclonic storm in the Arabian Sea. This disturbance started on 2 June near Lakshadweep and advanced towards Saurashtra peninsula. It crossed the coast at Porbandar on 9 June as a severe cyclonic storm. By 11 June it moved northeast and became less marked over Punjab and Himachal Pradesh. This storm caused tremendous loss of life and damage to the Kandla port and its neighbourhood. It is reported that more than 1000 people have lost their lives due to the fury of the storm. On 16 June, a depression in the Bay of Bengal crossed the Orissa coast near Visakhapatnam. As a result of this, the Bay of Bengal branch of monsoon advanced quickly over northern India. In July, three low pressure areas formed, two in Bay of Bengal and one over Saurashtra. Rainfall due to these three low pressure areas was more or less well distributed up to about 15 July. From 16 July onwards till about 25 July (i.e. about 10 days) 'break' monsoon situation set in with the axis of monsoon trough shifting northwards towards the foot-hills of the Himalaya. Due to this 'break' situation, practically dry conditions prevailed over the country. It has been seen that this 'break' monsoon situation was the longest break (in monsoon) after 1989 and its duration was about 10 days.

Monsoon once again became active in the month of August. Two low pressure areas occurred over the country, but the monsoon by and large was sluggish after 12 August. It was, however, observed that in July and August months, a well marked off shore trough persisted along the west coast of India which caused fairly well distributed rainfall along and near west coast of India. In September one low pressure area formed in the Bay of Bengal and another formed near Orissa-West Bengal coast. This disturbance became well marked and moved to Madhya Pradesh on 10 September. It persisted there and concentrated into a depression on 14 September close to Bhopal. It moved slowly and was near Dessai on 18th September. This system gave fairly good rainfall over central India from Orissa to Gujarat, till about 19 September. As a result of this

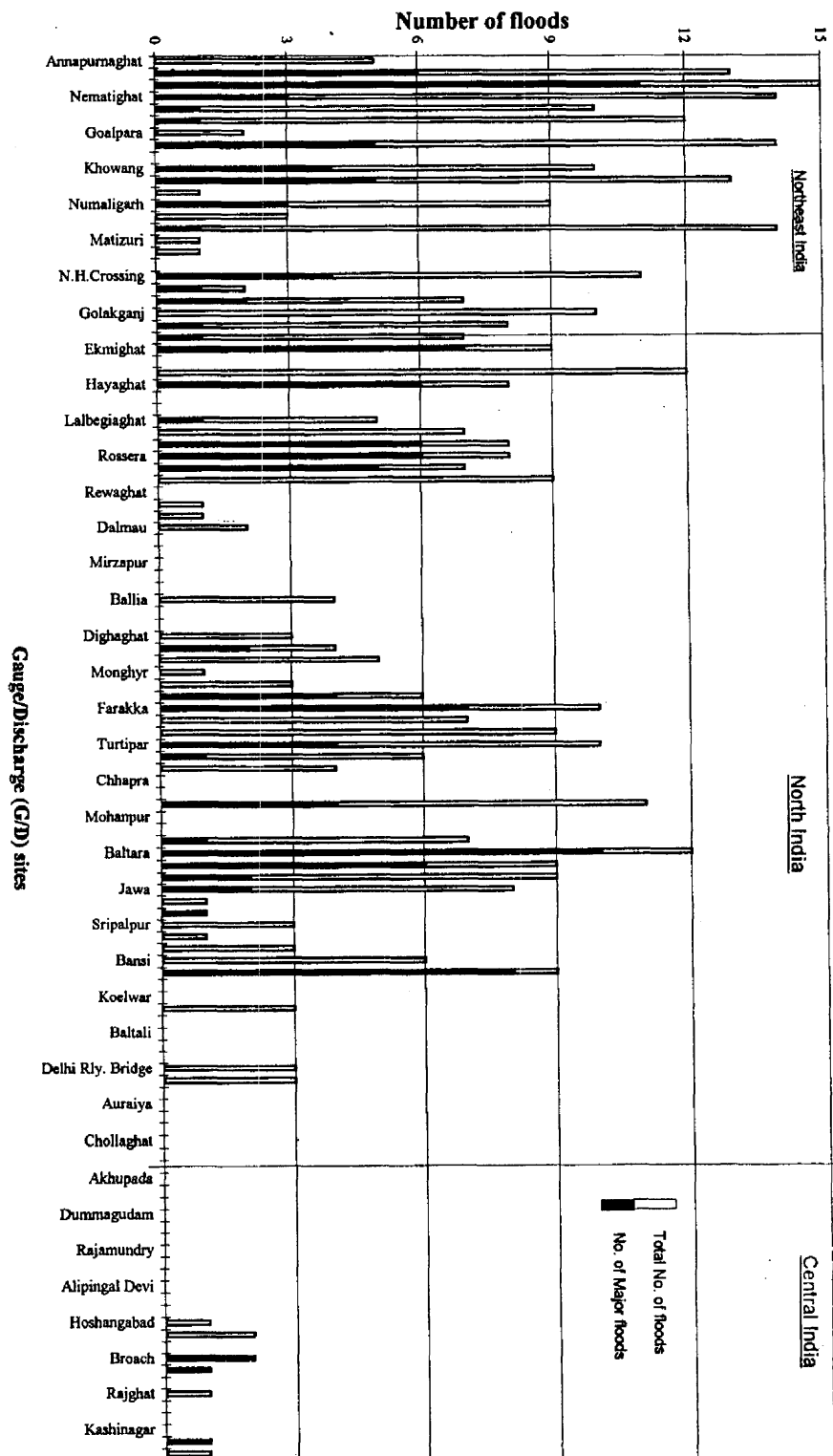


Fig.1. Number of severe floods recorded at different G/D sites on the major rivers of India during 1998 monsoon season.

system, monsoon was vigorous to active over northwest India. The heavy rains resulted in high floods in the central Indian rivers of Tapti and Narmada submerging the Surat town and its neighbourhood in the 3rd week of September.

During the monsoon of 1998 floods occurred in August, September months over north India in the States of Assam, Orissa, Bengal, Uttar Pradesh, Andhra Pradesh and Gujarat, and heavy rains also occurred in the Central Himalayan regions. Considering the past 11 year flood data (1987-1998), large number of floods (i.e. 429) were recorded at 70 gauge/discharge sites during this season, out of which 136 were major floods (i.e. 1 m and above the danger level). Using the flood statistics of 1998 monsoon, which were recorded at different gauge/discharge (G/D) sites of major rivers of the country, Fig. 1 was drawn showing floods experienced at different G/D sites on major rivers of the country.

Due to continuous heavy rains extending over a week or so, land slides occurred in Garhwal-Kumaon regions of central Himalaya. Nearly 200 pilgrims, trekking along the Kali river to Kailash and Mansarovar pilgrimage centres in southern Tibet, were completely washed away into the Kali river along with their mules, horses and other camping equipment on 18th August at Malpa camping site in the Pithoragarh district of Kumaon region.

References

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SUMMER AND WINTER SCHOOLS IN MODERN PETROLOGY

The summer/winter schools on "Databases, Numerical Methods and Computer Modelling in Modern Approaches to Petrology" (NMCMP-I to V) have recently completed the first five year cycle successfully. The NMCMP-I course commenced in 1993 and concluded in 1999 at the Department of Geology, Delhi University (Course Director: Prof. P.K. Verma). The courses were earlier conducted at Jadavpur University (S.C. Sarkar, 1994), Allahabad University (A.K. Gupta, 1995) and Wadia Institute of Himalayan Geology (K.K. Sharma, 1996). These schools were the first of their kind aiming at familiarising the budding earth scientists with current global trends in petrological research. The schools gave a major thrust on utilizing computer programmes for a critical synthesis of large volume of data, leading to reconstruction and quantification of viable petrological processes. This programme was sponsored by Science and Engineering Research Council (SERC) of the Department of Science and Technology (DST). Meticulous planning by Prof. R.S. Sharma, Chairman of NMCMP; Dr. K.R. Gupta, DST and Prof. P.K. Verma of Delhi University made it a grand success, generating great enthusiasm among the young scientists from all over India to provide major reorientation to their research activity. The faculty for the courses consisted of eminent scientists like A.B. Thompson, R.S. Sharma, R.N. Singh, K. Gopalan, C. Leelanandam, S.C. Sarkar and A. De.

The thrust in NMCMP-I was on fundamentals of thermodynamics in understanding natural processes like metamorphism, magmatism and ore genetic processes through statistical approaches,