

## **Study on reservoir substage design flood**

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**Abstract** A flood period is divided into the first flood period and second flood period based on the characteristics of seasonal variations of storm floods and seasonal movement of rain belts, their influence by climatic cycles, physical conditions for generating successive storm events, and spatial distribution of tropical cyclones in the study region. Design flood processes with different occurrence frequencies in the first and second flood periods are determined on the basis of observed flood discharges and they are used for calculating limiting levels during flood periods. The results demonstrate that the highest flood level in the whole flood period is higher than the reference level in 2000, but the highest flood level in the second flood period is 10–20% lower than that in the first flood period. Current limiting levels during the first and second flood periods can be raised by 2.30 m and 3.90 m, respectively. Therefore, if more flood water is allowed to be stored in the reservoir, it will increase available water resources and reduce release discharges. Reservoir regulation based on the substage limiting levels during the flood season can improve reservoir storage capacity and efficiently utilize flood water.

**Key words** circulation; flood resources; storm flood; substage design flood; tropical cyclone

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