

## Water Resources Engineering BSE 2031 (2017)

### Rainfall Frequency Analysis

1. Annual maximum rainfalls (in mm) of various durations of the 竹子湖雨量站 are listed in the file BambooLake\_AMS.csv.
  - (1) Conduct goodness-of-fit test (the Kolmogorov-Smirnov test and chi-square test) to determine whether the annual maximum rainfalls at the 竹子湖 can be characterized by Pearson type III distribution.
  - (2) Estimate distribution parameters by the method of maximum likelihood. [Note: Assume annual maximum rainfalls can be characterized by the Pearson type III distribution and use  $(x_{\min} - 5)$  as the location parameter ( $x_{\min}$  is the lowest observed value).]
  - (3) Plot the depth-duration-frequency (DDF) curve and the intensity-duration-frequency (IDF) curve.
  - (4) Fit the IDF curve by using the following model:

$$i(tr, T) = \frac{aT^m}{(tr + b)^c} \text{ with } b = 0.$$