ERE445/645
Hydrologic Modeling
HW# 3
Due Thursday February 25, 2016

For this homework assignment, we will make further additions to the code you developed in HW#1 and HW#2. Perform each of the following:

1) For many rainfall runoff models, we are interested in how well we can produce the average monthly streamflow time series. Determine the average streamflow for every month of the streamflow record (by averaging the flows for a month), and print out a table that has Month in column 1, monthly average daily streamflow for each of the first 4 water years in columns 2 – 5, and the average monthly daily streamflow over the entire 20 year record in column 6.
2) Produce a single scatter plot with water year on the x-axis which contains each of the following series on the y-axis (a single figure with 3 things plotted):
    a. Annual average daily streamflow.
    b. The 7-day annual minimum streamflow.
    c. The maximum daily streamflow.

    Make sure you use a log-scale on the y-axis of this plot. To do this in R, include the statement log="y" in your plot statement.
3) Produce a histogram with 7-day annual minimum streamflows. Identify in your histogram the location and value of the 7-day, 10-year low streamflow (from HW2).
4) Produce a histogram with annual maximum streamflows. Identify in your histogram the location and value of the 100-year flood (from HW2).
5) For HW#2, you were asked to determine the 100-year flood by fitting a log-Pearson III distribution to the annual maximum daily streamflow. In reality, we instead should be fitting this distribution to the annual peak flows. Download the annual peak flows for our study site for the same 20-year record and determine a new estimate of the 100-year flood.