ERE445/645
Hydrologic Modeling
HW# 2
Due Friday February 12, 2016, submitted via Blackboard by 5 pm.

1) Go through the tutorial on plotting in R. You will be responsible for this material.

2) In HW#1, 20 years of daily streamflow values for the West Branch Delaware River at Hale Eddy, NY were downloaded from the Internet, and a computer program (an R script) was written to read this data and calculate the annual average streamflow for 20 water years. For this assignment, you will continue to develop your script to examine this streamflow series. You should continue to use the script you have written for HW#1, adding additional components and functions. You should consider how to make the script you constructed for HW#1 more concise and portable. For instance, if I provided you with another input file with a different length, would your program be able to handle this?

Often we are not only interested in average streamflow conditions, but also extreme conditions such as floods and droughts. Knowledge of extreme streamflow conditions allows us to better prepare for these events, and plan more appropriate uses and allocations of our water resources.

In this assignment you are asked determine the following information:

1) For each of the 20 water years, determine the annual maximum, and 7-day annual minimum streamflow (note that to determine the 7-day annual minimum, you take the average of the flow over the 7 days);

2) Determine the mean (average) and standard deviation of annual average, maximum and 7-day minimum streamflows over the 20 year period; and

3) Calculate the 100 year flood using a Log-Pearson III distribution.

4) Calculate the 7-day 10-year low streamflow using a 3-parameter lognormal distribution (LN3). [Note: if $x(1) + x(n) < 2*x(median)$ you should fit a 2 parameter lognormal distribution.]

Results should be given in units of cfs.

You are asked to provide electronic copies of the following for this assignment:

1) A script to perform the necessary calculations;

2) A script containing the functions you employed in your program;

3) The input file you employed in this assignment; and

4) The output file your program calculates.

While you should consider creating functions for different parts of your program, **you must** create **at least** 2 functions in your script: (1) to calculate percentiles of a Log-Pearson III distribution, and (2) to calculate percentiles of a 3-parameter lognormal distribution.