Streams and Flooding Exercise

# USGS 08049500 W Fk Trinity Rv at Grand Prairie, TX

This exercise uses data from the USGS. Partial instructions for downloading data can be found at

<http://nwis.waterdata.usgs.gov/tutorial/realtime_streamflow.html>

Following these instructions will give you plots of discharge and stage. You can download the data by

1. Select a tab separated under output format and press “go”.
2. Copy all the data into “notepad” and save as a .txt file
3. Open Excel and open the .txt file. You will have to select “All Files” under “Files of Type”.
4. Select “delimited” and click next, then “tab”, and “finish”
5. You now have the data in Excel. Save as an Excel file.

To make some simple plots (learn to plot data in Excel)

1. Copy column C (column labeled datetime) to a new sheet in column A and copy column G (column labeled 01\_00060) to column B. You can delete the top rows with no data. **Make a plot of discharge (column labeled 01\_00060) vs time (column labeled datetime) for the last 7 days.**
2. Copy column C to another column on the new page and column E (column labeled 02\_00065). Again, delete the top rows with no data. **Make a plot of Stage vs time for the last 7 days.**
3. Copy the stage and discharge values to new columns. **Plot a rating curve (Q as a function of stage) for the last 7 days on a**
	1. Linear scale
	2. Log scale

To determine the size of the 100-year flood

1. Return to the USGS site where you downloaded the data and click on “[**Summary of all available data for this site**](http://waterdata.usgs.gov/nwis/nwisman/?site_no=08049500&agency_cd=USGS)**”**
2. **Click on “**[**Peak streamflow**](http://waterdata.usgs.gov/nwis/peak/?site_no=08049500)**”**
3. Select “Tab separated file”
4. Copy the data into notepad, input into Excel, and save as an Excel file.
5. Plot the peak discharge as a function of time the same way you did in the previous exercise.
6. Make a rating curve (log scale) the same way you did in the previous exercise. The discharge is in the column labeled “peak\_va” and the stage is in the column labeled “gage\_ht”
7. Copy the discharge values into another column and sort them, with the largest value at the top
8. In the next column, rank the floods. An easy way to do this is to type “1” into the cell adjacent to the largest flood. If this value is in column H, row 3, you can type “=H3+1” into the cell below. Then copy this cell to the remaining rows in column H.
9. Calculate the recurrence interval (R=(N+1)/M). In this example, N=85 (the rank of the smallest flood). You can type “=(85+1)/H3” into column into cell I3, and then copy I3 to the rest of the rows in that column.
10. Copy the discharge data into the column to the right of the recurrence interval.
11. Plot the flood-frequency curve (peak discharge vs recurrence interval). Make the scale on the x-axis logarithmatic.