GEOL 3220 Homework 3
Due Tuesday, February 7th

Turn in a typed hard copy in class and submit the Excel file through Canvas.

1) Go to the USGS website and find site 04196800 Tymochtee Creek at Crawford OH
   a) Obtain and print out graphs for discharge and stage for the last 120 days
   b) The action stage (the stage when actions should be taken to prepare for flooding—no manmade structures are threatened, but the river is flowing outside of the channel banks) is 8.0 feet. Did the measured stage exceed the action stage in the last 120 days? When?
2) Based on the following 48-year record of annual peak discharge for Tymochtee Creek near Crawford OH, obtained from the USGS website (shown on the next page and in an Excel file on the course website):
   a) Using Excel, plot a hydrograph of the peak discharge for each year
   b) Based on the hydrograph
      i) What year had the lowest peak discharge?
      ii) What year had the highest peak discharge?
      iii) Describe the relationship in the peak discharge values shown in the hydrograph.
   c) Rank the discharges and calculate the recurrence interval for each year's flood.
   d) Using Excel, plot the discharge as a function of the recurrence interval
      i) Describe the relationship between the discharge and the recurrence interval shown in the graph.
      ii) Based on your plot, estimate the discharge of the 50-year and 100-year floods. Show the points on your diagram. You can print a hard copy of the graph if you want.
      iii) Based on your plot, estimate the recurrence interval for a flood with a discharge of 3000 cfs and a flood with a discharge of 6000 cfs. Show the points on your diagram.
   e) Construct a rating curve for Tymochtee Creek. Based on the rating curve,
      i) Describe the relationship between the discharge and stage shown in the graph.
      ii) What is the flood stage associated with the 50-year and 100-year flood? Show the points on the rating curve. You can print a hard copy of the graph if you want.
      iii) What is the flood stage associated with 3000 cfs and 6000 cfs discharge? Show the points on the rating curve.
      iv) On the topographic map handed out in class, shade in the area that would be inundated by the 100-year flood. Would you feel comfortable living in Crawford? Why or why not?
   f) The action stage is 8 feet. On average, how often does Tymochtee Creek exceed the action stage? Show the point on the graphs you created in parts d) and e).

Date	Discharge (cfs)	Gage Height (ft)		Date	Discharge (cfs)	Gage Height (ft)
4/26/1961	2600	7.2		2/25/1985	4390	8.26
1962	3120	7.62		2/6/1986	2550	6.72
3/6/1963	5400	11.21		7/4/1987	4020	7.98
4/22/1964	6040	9.82		3/10/1988	1490	5.54
3/7/1965	1090	5.41		5/28/1989	4050	8.05
7/13/1966	3680	8.2		2/17/1990	4470	8.36
5/8/1967	4000	8.47		12/31/1990	6700	9.77
1/31/1968	3050	7.5		7/18/1992	2800	6.96
5/19/1969	5050	9.23		11/14/1992	3980	7.95
4/3/1970	3450	8.01		1/29/1994	4460	8.31
2/24/1971	2300	6.98		4/23/1995	3190	7.31
4/21/1972	4580	8.82		1/20/1996	4830	8.58
11/16/1972	2820	7.32		6/3/1997	5070	8.74
1/20/1974	4390	8.66		1/9/1998	5190	8.82
2/24/1975	5140	9.28		1/24/1999	3450	7.59
2/17/1976	2000	6.5		4/10/2000	2040	6.32
4/4/1977	1740	6.17		4/13/2001	1760	6.02
3/17/1978	6390	9.94		3/30/2002	2710	6.97
3/5/1979	4330	8.58		5/11/2003	3790	7.85
6/3/1980	4840	8.74		5/23/2004	4590	8.41
6/15/1981	5710	9.16		1/14/2005	4850	8.65
3/13/1982	3900	7.89		7/15/2006	6700	9.77
5/3/1983	2320	6.49		8/21/2007	6050	9.38
3/22/1984	3220	7.33		2/7/2008	8220	10.61
				2/13/2009	3120	7.25
				6/6/2010	2930	7.08
				3/1/2011	7550	10.25