

**CE 540 Unsteady Flows in Rivers and Pipe Networks,
Homework 1/ Mini Project 1, Fall 2013
Instructor: Arturo Leon**

Name of student: _____ **Due date:** October 22

1. Considering the following flow data for the Baxter River,
flow upstream of upper reach (Baxter River) = 126,000 cfs
flow upstream of lower reach (Baxter River) = 130,000 cfs
flow upstream of tributary (Tule Creek) = 4,000 cfs

and assuming that there is a waterfall at the downstream end of lower reach (Baxter River), provide recommendations to mitigate flood control in the urban area shown in the Geo-RAS file adjacent to Baxter River (e.g., provide locations and heights of levees to avoid flooding). Provide also recommendations for the most suitable areas for urban development (areas with lower risk of flooding).

- The data for the Baxter River can be downloaded from http://web.engr.oregonstate.edu/~leon/Teaching_transients.html or from Blackboard (data for Tutorial 1)
 - State your assumptions.
2. Compute the discharge in a rock rectangular channel ($n = 0.035$) having a bottom slope of 0.001, a bottom width of 5 ft, and flow depth of 3 ft. What is the critical depth at this flow? Is the flow critical, subcritical, or supercritical? **Use a program of your own in Excel or Matlab.**
 3. A trapezoidal channel with bottom width of 10 m and side slopes of 1V:1.5H is carrying a flow of 80 m³/s. The channel bottom slope is 0.002 and $n = 0.015$. A dam is planned that will raise the flow depth to 10 m. Compute the flow depth in the channel 250, 500 and 750 m upstream of the dam. **Use a program of your own in Excel or Matlab.**