Deriving bedform phase diagrams: in-class and homework assignment
Due Thursday, October 16, beginning of class.
Relevant reading in Boggs: pp. 74-93

Recall the first experiment we did in lab yesterday, with the unidirectional flume at SAFL. *Without looking at the remainder of this handout,* what three variables do you think play the *most* important role in shaping the bedforms we made (ripples, plane bed, etc.)?

Main variables that control the state of the bed:

1.
2.
3.

Part I: Initial relationships

You will find three Excel files on the course website (under "Assignments" and "Homer Project"):

0.10-0.14 mm.xls
0.5-0.64 mm.xls
1.3-1.8 mm.xls

Each of you will be randomly assigned one of these files. Note the name of the file you received here:

*Describe, in a well-written, **brief** paragraph, what your file contains.*

What is the relationship between flow velocity, flow depth, and the bedforms present under these conditions?

To answer this question, use Excel and its wonderful charting functions to make a plot that has mean flow velocity on the horizontal axis and flow depth on the vertical axis. For each bedform type, you need to plot a different symbol on this chart. Hint: you may have to use the "sort" function, move some columns around a bit, and you will have to use the "Add data" function when making the chart.

On your chart, you should try to divide the data into logical bedform "fields", or areas that define the conditions under which certain bedforms tend to occur.

Describe what your results tell you about this relationship for your set of data:

Print your chart and have it ready for part 2!!

Part II: How does grain size change things?

I will assign you to new groups of three or four. In your new groups, write a collective response (using Word) to the following:

Based on your data, what is the effect of changing grain size on the state of the bed (i.e. on the conditions under which certain bedform occur)? Be careful and in your response pay attention to the actual values under which certain bedforms occur and how they change with changing grain size.