Write 2

GY 402 Sedimentary Petrology (W)

GSSA Writing Assignment Two

Developing Hypotheses in Scientific Publications
Research Methodology

Your Task: By now, you have all had a chance to get down to Dauphin Island and to have collected samples for your grain size project. Hopefully you now understand that there are plenty of interesting sedimentological issues in our backyard. Today's writing assignment will comprise your group's research statement as well as the research methods that you employed to do the study. First the "hypothesis" part. What is your question, and how will grain size help you to answer it? The catch for today (there is always) a catch, is that you must present your question and the means by which to solve it in classical hypothesis fashion. We in geology generally do not do this. We talk more about objectives than we do hypotheses, but I would still like you to understand the methodology just in case you ever have to talk to a biologist, or a chemist or (God forbid!), a physicist.

Hypotheses are *reasoned explanations for observations.* They are never stated as questions, but always as statement with an explanation following it. It is not to be a question because it states what he/she thinks or believes will occur (see example below). Most importantly, they are testable; the test(s) either *confirm* or *refute* your explanation. No fence sitting here. If your hypothesis cannot be tested in this fashion, it is not an[1] hypothesis. Here's an example of what I mean.

The question "is global warming caused by human activities" is not a/an[2] hypothesis, but, this is; global warming is caused by human activities. The problem with this hypothesis is that while seemingly testable, it is not easily tested. The question is too broad which is one of the reasons for the major contention between pro- and anti-global warming activists. It would be better to consider a lot more smaller scale hypotheses.

For the purposes of this assignment, your hypothesis and tests should follow standard format. Use this as an example of how to do it:

> Hypothesis: Bulk grain size will decrease down slope from the Municipal Park amphitheatre to the lake as a result of a gradually shallowing gradient.
>
> Test(s): Collect 10 grain size samples (5 per group member) along a transect from the amphitheatre (high gradient) to thelake (low gradient). Analyze these samples for grain size distribution using the pipette and sieve method. Measure the gradient at each site and produce a topographic profile related to grain size.

The other important section of a term paper that you will be addressing in this assignment is a summary of the methodology employed in the study. This section (usually titled Methods), gives a brief summary of the approach used to gather data needed to address the hypotheses as well as any limitations to the analyses employed. As a general rule, the methods section is the driest part of a paper and should be one of the easiest parts to do. The problem is that it's hard to summarize sampling and lab procedures. How comprehensive should you be? How much basic stuff (e.g.,

[1] Okay. Is it a or an when you need an indefinite article preceding a word starting off with a hard "h"? It's an when you precede a word beginning with a silent h (e.g., hour), but hypothesis is one of those words that I can't ever sort out. Had this not been a W class, I wouldn't care, but….

[2] Arggggh!

weigh a filter paper) do you ignore? All of you must 1) succinctly summarize how you selected your samples and how you collected them, and 2) the lab procedures used to analyze the sediment samples that you collected. Each of your groups will have a unique sampling procedure, but lab analysis should more or less be identical. In the real world, you would have to write up your lab procedure, but at this point in the semester, I **encourage** you to borrow verbatim the methods bleb that I provided to you in the Grain Size writing assignment handout (it is reproduced below again for you). Yes, I am actually encouraging you to plagiarize in a W class[3]. Why am I giving this to you freely? Because a study's methodology needs to be as succinct as possible and most students at this stage of their education are not certain which parts of an procedure like grain size analysis need to be outlined in the paper (e.g., extraction of silt and clay aliquots) and which parts can be excluded (e.g., weighing samples and filter papers).

> Samples were processed in the Sedimentology Laboratory at the University of South Alabama. Approximately 50 to 100 gram splits were extracted from each of the samples and allowed to air dry under a fan for 1 to 2 days. Once fully dry, 5 to 15 gm splits were obtained from each sample, weighed to 4 decimal places, and placed in individual shaker bottles. A 10 ml solution of sodium hexametaphosphate and approximately 100 ml of RO water was placed in each bottle and they were allowed to sit over night. The next day, the bottles were placed in a bottle shaker and agitated for a minimum of 8 hours before being transferred to settling columns. Grain size analysis was done using the pipette and sieve method according to procedure outlined in Haywick (2006). Data was processed using an Excel spreadsheet (Haywick 2006).

Your written response for both parts (hypothesis + methods) should not exceed one to two pages (typed, double spaced, 12 pitch Times Roman font). This is a group project so I expect one submission from each group. You will all receive the same grade, so make sure two or more pairs of eyes go over it to ensure that there are <u>no</u> typos, grammatical, or structure errors at all. Indeed, make sure that you proof read ALL of your assignment.

The assignment requires a GSSA cover letter and is redo-able (see assignment one for the guidelines concerning resubmissions). Each team member <u>must</u> sign the cover letter.

<u>Due date/Revision date:</u> refer to the due dates page on the website/calendar.

[3] I will go to hell for this.