BIO 200 ECOLOGY Water Quality in the Hudson/ Scientific Method

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1. Go to: <http://www.riverkeeper.org>

2. Click on the Water Quality Tab

3. Click on “Hudson River Water Quality” and follow the link “View our Sampling

 Data”.

4. Make some observations about the layout of towns/cities, urban/ rural

 locations, differences in land-use, etc. Think about how rainfall may affect the

 movement of sewage to the river.

5. Come up with a question that related to the abundance and/ or distribution of the

 water quality indicator, *Enterococcus* spp., a group of bacteria that are found in

 the feces of mammals. The presence of Enterococci in waterways raise a “red

 flag” in that it indicates that the water has sewage contamination and

 thus poses health risks to swimmers and other persons using the waterway for

 recreational purposes. Examples of the types of questions you can ask:

* Will the abundance of Enterococci be significantly different at site “A” than at site “B”?
* Will the average historical Enterococci counts at site “A” be greater than those at present at site “A”?
* Will Enterococci counts at site “A” during dry weather vary significantly from counts at site “A” during rain events?

6. Use your question to come up with a hypothesis.

7. “Collect” your data and enter it into an excel spreadsheet. Be sure column headings are clearly labeled. In order to collect your data, you will need to click on the “table” tab. At the bottom of the table, you can select years of interest or you can click on the “all” tab and see all the data from 2006 until present. The table will provide the following data:

* Enterococci density (Entero count = # of Enterococci cells per 100 ml),
* the 4-day total rain amount in inches, historical data).

 NOTE: You should be collecting multiple data points, if you are comparing summer 2006 to summer 2008, for instance, you will need to collect ALL the data from the summer for your selected site. We will be going over statistical analyses together in lab.

8. Answer the following questions:

a. Are the Enterococci numbers at your site/ sites within the accepted range for healthy waterways? Were there temporal trends in your data?

b. Are any of your sites polluted? What other data would help you determine the degree of anthropogenic impact on your sites?

c. Does your data support your hypothesis?

d. If you results differ from the expected outcome, what was the cause? [This may require some investigation]

e. If you were in charge of communicating with the public through press releases, what would you tell them about your study? Should swimming be allowed at your study sites? If not, what suggestions do you have for the town/towns in that area? Is there something they could do to prevent sewage contamination?

f. Do you feel you had sufficient data to make informed decisions about the state of the water? Was sampling frequency adequate to make such decisions?