Case Study: MPCA water quality

The Minnesota Pollution Control Agency has a state-wide volunteer program for measuring the clarity of streams around the state. Volunteers measure the clarity throughout the year by collecting water in a tube and noting how far down the tube they can see. Sometimes the tube isn't long enough, so the data is censored. Additionally, they got longer tubes about five years ago, so the censoring used to be at 60cm but is now at 100cm. The number of measurements varies both by the volunteer and by the year. The clarity is known to vary by season (spring/summer/fall) and also by stage (how high the water level is: low/normal/high). Most of the volunteers have been doing this for at least five years, and some as long as forty years! (The program started in 1971).

The agency wants to make individual reports for each volunteer to show them how the clarity in their stream has changed (or not) over the time they have been measuring it. They'd like to do some sort of statistical inference to test if there is a trend, and if so, how large it might be. They'd also like to report how each stream compares with others in the same watershed, and test if there is an overall trend in the watershed. Finally, they'd like to make some nice plots to include in the report to graphically show how the clarity has changed (or not).

First, what methods of inference could you use for investigating trends in individual streams? How would you report the results in a way the public would understand?

Secondly, what methods of inference could you use for investigating overall trends in the various watersheds? Again, how would you report the results in a way the public would understand?

STAT8801, February 22, 2013
Case Study: MPCA water quality

Name: ______________________________

Describe a method (either for inference or for display) discussed today that was interesting to you.

____

____

____

____

____

____