Case Study 6: MPCA

for March 7, 2012

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).

Questions for consideration: 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? Finally, what kinds of graphical displays might you suggest for their reports?

Groups: Here are the groups that will work together on this case. The first student on each list will present the group's findings and should also organize group meetings. The groups should get together in the coming week and consider the case.

Group 1, Presentation:		Group 2, Presentation:		Group 3, Report:		Group 4, Report:	
Name	Email	Name	Email	Name	Email	Name	Email
Emily	pech0081	Zhou	fang0157	Garrett	lepa0050	Bryan	mcca0828
Alain	vando026	Joel	bear0201	Jenny	dokke040	Felipe	acosta
Xiaoyi	zhuxx212	Sarah	jaco0654	Chris D	desja004	Rachel	vonb0035
Jie	renxx034	Matt	stear067	Qi	yanxx195	Yu-Feng	chang648
Greg	schae029	Lindsey	diet0146	Wen	fanxx102	Xin	zhan0648
		Chris H	hulme005				

Presentation groups: The presenter will have 12 minutes of class time to say what the team thought about the problem. To ease switching between groups, we will use my computer for all presenters, so if you choose to make a digital presentation, please email the slides to me by 2pm, or bring them on a thumb drive and arrive five minutes early. PDF format is preferred.

Report groups: Please email your report to me (PDF format preferred) by 2pm so I can make copies for the class. Your report should be at least one page long, but no more than two pages.