

Case 7
Statistics 8801
Spring Semester 2008
Handed out February 29, due March 7

We have a river A with superfund sites on it, and another river C that doesn't have any. We want to use C as a "reference" site for A, as is done when using Indices of Biological Integrity or IBIs, to decide how the superfund sites have impacted the river. Each river has multiple measurement sites (say n_A on river A and n_C on river C), and measurements taken over time for at least a few years.

Frequent measurements are available on chemical and hydrological characteristics of the river, as well as approximately 20 characteristics that may reflect superfund effects, like phosphorus level.

There are lots of data, some paired in time and some not. Suggested methods include regression of some sort, or simply t -tests.

Here are a few of the terms.

- A superfund site is a toxic waste site that needs to be cleaned up.
- A reference site is an "undisturbed" site that can be used as a basis for comparison when studying a disturbed site (like one with a superfund waste dump).
- An Index of Biological Integrity is a numerical scale that combines various features of a location or ecosystem into an overall score of how well the ecosystem is functioning. You might have an IBI to measure how diverse the animal life is, and another to measure the productivity of the plants, and so on.

The assignment

If you can, tell if you prefer regression or paired t -tests. If you think something else should be done, describe that instead. If you need some questions answered before you can say anything, ask those questions. The client is a Ph.D. chemist who is familiar with simple statistics, but not statistical theory or advanced methods.

The groups

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