ESM 493 (CRN 44659)
Advanced Environmental Science Lab and Field Methods

Course Description
This is an introductory class analyzing statistical data with a spatial component. It is intended to teach students how to manage a statistical analysis project from beginning to end. This includes data and workspace management, data processing, regression analysis and assumptions, spatial autocorrelation, hot spot analysis, and spatial regression. As a hands-on class, the emphasis will be on application rather than theory.

We will work with data from the California Pesticide Information Portal (CalPIP; http://calpip.cdpr.ca.gov/main.cfm). This is an extensive dataset on pesticide use that has a much finer spatial resolution than many other datasets. We will use these data for the entire course, each week building on our work.

Class Time
Mon 11:30 – 1: 20 SRTC 207

Instructor
Samantha Hamlin
Office: SRTC BI-18
Email: shamlin@pdx.edu
Office hours: By appointment

Textbooks
There are no required textbooks for this class. For reference, any introductory statistics textbook is adequate. For students wanting a reference book on spatial analysis, I recommend:
O'Sullivan, D. and Unwin, D. 2010. Geographic Information Analysis. Wiley.

Grading
- Weekly assignments: 80%
- Lab book: 20%

Assignments: The assignments are designed to learn the various techniques of introductory statistics and spatial analysis. You are welcome to discuss the assignments with other students or me, but the final product you hand in must be your own work. Please be sure to submit assignments on the due date. *Late assignments will be penalized 10% of the credit per day* —so if you are 3 days late you'll be marked out of 7 instead of 10. Assignments over 3 days late will NOT be accepted except for documented emergencies.

Students will have one week to complete each assignment (unless otherwise noted). Assignments are due before the next week's class and should be submitted online via the D2L site.

Tentative schedule

Week	Date	Topic	Assignment (due the following week)
1	Jan 9	Data and workspace management	Set up data and workspace
2	Jan 16	Data processing	Begin data processing
3	Jan 23	Regression analysis	Complete data processing
4	Jan 30	Regression analysis	Begin regression analysis
5	Feb 6	Spatial autocorrelation	Finalize variables in regression analysis
6	Feb 13	Spatial autocorrelation	Spatial autocorrelation diagnostics
7	Feb 20	Hotspot analysis	Hot spot analysis
8	Feb 27	Hotspot analysis	Complete hot spot analysis and visualization
9	March 6	Spatial regression	Select type of spatial regression and begin analysis
10	March 13	Spatial regression	Complete spatial regression write up and interpretation
Final spatial regression write up, including data interpretation, and lab book due: **Sunday, March 19, 5:00 p.m.**			