



Geographic Data Analysis

Geog 4/595: Winter 2017, 2:00-3:50 TTh, 206 Condon Hall

Topic: Visualization and Data Analysis

Instructor: Pat Bartlein, bartlein@uoregon.edu, 154 Condon, 6-4967

Course overview: Phenomena describable by multiple variables arise in many subfields of physical and human geography and related disciplines. The focus of this course is on the analysis and display of multivariate geographical data by traditional multivariate methods and by newer methods of scientific visualization. The **R** data-analysis and computing environment will be used.

(Ideally, students should have access to a personal computer with sufficient rights and availability to install and run **R**, but the software is usually available in various campus computer labs (e.g.SSIL).

Tentative topics:

- the nature of geographical data
 - univariate and bivariate plots
 - descriptive statistics
 - multivariate plots
 - Trellis/lattice plots and conditioning
 - descriptive plots and statistics for spatial data
 - regression analysis
 - nonparametric regression
 - contouring and surface fitting
 - principal components and factor analysis
 - discriminant analysis and MANOVA
 - cluster analysis
 - high-resolution and high-dimension data
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Format and grading: Lectures, two take-home exams, and eight exercises, both exams and all exercises must be completed to receive a passing grade for the course.

Readings

Online Readings: (available on CRAN at <http://cran.us.r-project.org/other-docs.html>)

Kuhnert, P. and W. Venables, 2005, *An Introduction to R: Software for Statistical Modelling & Computing*. CSIRO Australia (.pdf)

Owen, W.J., 2011, *The R Guide*. Dept. of Mathematics and Computer Science, University of Richmond. (.pdf)

Rossiter, D.G., 2012, *Introduction to the R Project for Statistical Computing for use at ITC*. International Institute for Geo-information Science & Earth Observation (ITC)

Robinson, A., *icebreakR* (.pdf)

Reserve Readings:

Cleveland, W.S., 1993, *Visualizing Data*, Hobart Press, 360 p.

Rogerson, P.A., 2001, *Statistical Methods for Geography*, Sage, 236 p.

Fotheringham, A.S., C. Brunson, and M. Charlton (2000) *Quantitative Geography*, Sage, 270 p.)
