

# Biology 3050: "Spatial Analysis"

(Preferred salutation: "Dr. Anderson")

Day

Topics covered:

Introduction to spatial processes and patterns.

Data structures, coordinate systems, and map projections.

Spatial variance, covariance, and autocorrelation.

Scattered Data analysis.

Spatial autocorrelation functions and correlograms: Moran's I, Geary's c, Join-count analysis, Mantel test.

Variography and interpolation.

Modeling and removing autocorrelation.

Nonstationarity and local spatial statistics.

LISAs, Local Geary's c, Getis-Ord statistics.

Anisotropy analysis.

Contiguous unit analysis.

Quadrat variance/covariance analysis; spectral and wavelet analysis.

Point pattern analysis.

Dispersion indices; nearest-neighbor analysis; second-order analysis (Ripley's K function).

Boundary and cluster analysis.

Wombling, agglomerative clustering, K-means clustering.

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Because the point distribution for most classes is not normally distributed, I use a nonparametric grading system, based on ranks, where the median grade in the class determines the "low B" / "high C". In other words, students will be evaluated based on how well they perform *relative* to other students in the class.

I use the upper and lower fence of the distribution to determine and remove outliers. After removing the outliers, the median score in the c