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

Nonstationarity and local spatial statistics.
- o LISAs, Local Geary's c, Getis-Ord statistics.

Anisotropy analysis.
Contiguous unit analysis.
- o Quadrat variance/covariance analysis; spectral and wavelet analysis.

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

Boundary and cluster analysis.
- o Wombling, agglomerative clustering, K-means clustering.

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