

ESRM 430 Lecture Notes

Semivariance statistic for measuring spatial autocorrelation

$$\gamma(h) = \frac{\sum_{i=1}^N [Z(x_i) - Z(x_i + h)]^2}{2N}$$

Where $\gamma(h)$ is the semivariance for the lag interval h
 z_i is measures sample value at a point i
 z_{i+h} is measured sample value at point $i+h$
 $N(h)$ is the total number of sample pairs at the lag interval h

Simply put semivariance is the difference between the values at a specified lag distance squared and divided by two times the number of pairs at the lag distance.

Steps for calculating the semivariance:

- The first step is to define a lag increment (h), which is the spacing between any two points in the data
- For each pair separated by 1 lag, calculate the difference, and then square the difference
- Sum up all the differences and divide by twice the number of pairs
- The same is done for other lag distances
- This gives you the semivariance $\gamma(h)$ that can be used to draw a variogram

Example data:

1	0	0
1	3	0
1	1	1