Spatial Prediction
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Definition: Spatial Prediction is a process of creation a continuous surface from sampled point values. Any form of spatial prediction is based on the premise that observations made in close proximity to each other are more likely to be similar than observations separated by larger distances.

Application:

The process of spatial prediction requires that a model of the spatial variability (spatial dependence) in a data set be constructed or assumed so that estimates at the unsampled locations (prediction points) may be made on the basis of their location in space relative to actual observation points.

There a two major major spatial prediction methods. *Global methods* use all the data to determine a general model for spatial dependence. *Local methods* use only points 'neighboring' the prediction point in the prediction operation. There is a variety of prediction techniques which may be applied to mapping continuous surfaces. The most widely known include: global means and medians; local moving means; inverse-square distance interpolation; Akima's interpolation; natural neighbor interpolation; quadratic trend; Laplacian smoothing splines; and various forms of kriging.

The prediction technique of choice for map production will depend on the expected use of the map.

Software:

Two ArcGIS extensions can be used to create predicted surfaces. *Spatial Analyst* provides three techniques: Inverse Distance Weighted (IDW), Spline and Kriging. *Geostatistical Analyst* also provides more advanced methods such as Global and Local Polynomial Interpolation, Radial Basis Functions and CoKriging.

References/Links:

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