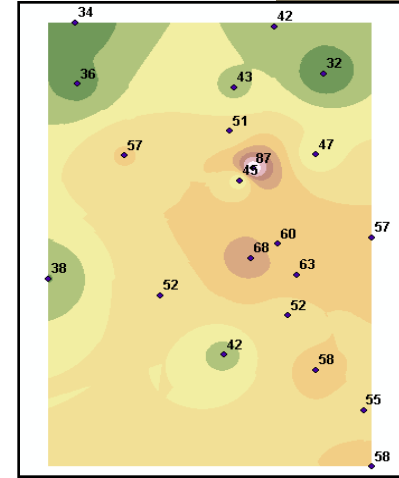


# What is interpolation?

- Interpolation is the prediction of values in between measured points
- Sampling of points may be uniform, random, or based on sampling scheme
- Many methods are used which have different mathematical models and make different assumptions about the data



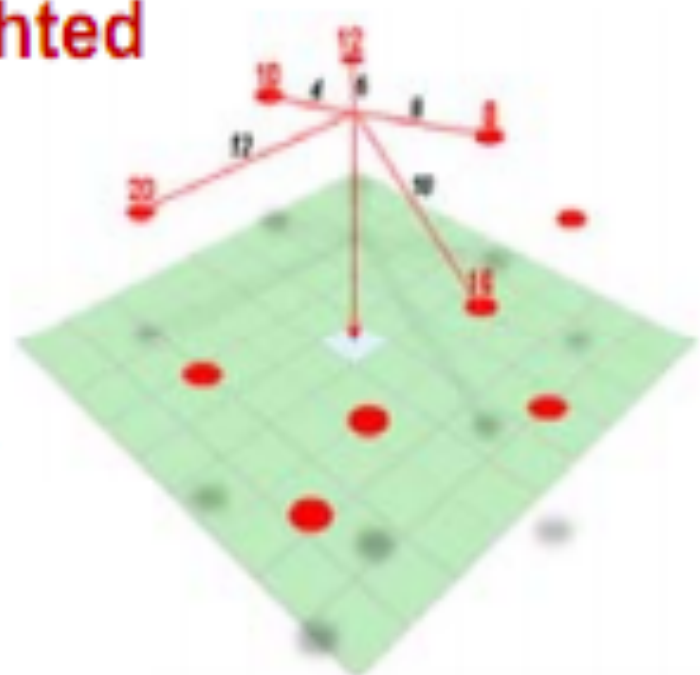
# Methods in Spatial Analysis

- There must be many interpolation methods developed by geographers, geologists, etc.
- ArcGIS **Spatial Analyst** used the following well-established methods only...
  - IDW (Inverse Distance Weighted)
  - Spline
  - Kriging

# IDW

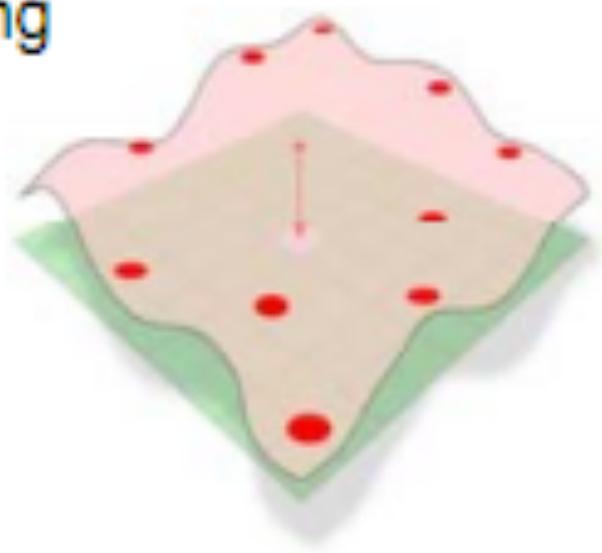
- **Inverse Distance Weighted**

- Weight will decrease as distance increases, thus "inverse" .....
- Use averaged out weight



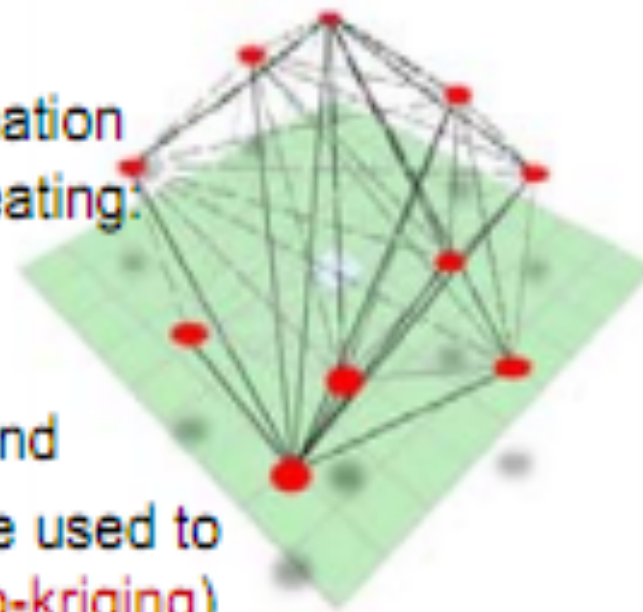
# Spline

- Has a stretching effect
- Creates a more smooth looking surface
- Sometimes estimated values exceed the values of sample data
- Two types
  - Regularized
  - Tension



# Kriging

- Most powerful, complex and flexible of all 3 methods
- Kriging can calculate statistical trends (deviation, fluctuation) in surface
- Kriging can assess prediction/estimation errors, and thus is also good for creating:
  - Probability surface
  - Standard error/quantile surface
- But, the method is hard to understand
- More than one layer/variable can be used to calculate more accurate surface (co-kriging)



# Interpolation Results

Sample point features:  
climate stations with  
annual precipitation values

Interpolated continuous  
raster of precipitation  
values

