Overview

* All calculations must be done using R

Resources

The data set sic97 in the R package gstat contains measurements of the total amount of rain that fell on a particular day at 467 locations in Switzerland. After loading the data set, you should see two point pattern shapefiles: sic\_obs has coordinates and rainfall for 100 stations, and sic\_full has coordinates and rainfall for all 467 stations. The data set also includes an elevation grid that can be attached as follows:

**elevation.ov <- over(sic\_obs, demstd)  
sic\_obs$elevation <- elevation.ov$band1**

Your goal is to create a spatial interpolation of rainfall across the demstd grid based on the 100 stations in sic\_obs. You should validate your interpolation results on the remaining 367 stations.

Question

1. Fit an inverse distance weighting interpolation using inverse distance weighting powers of k = 1, 2, 5, and 10. Which value of k results in an interpolation that most closely matches the validation data set? Provide numerical justification for your answer.  (10 points)

**Hints:**

You create a validation data set by starting with sic\_full and removing any control points that are including in sic\_obs:

**sic\_valid <- sic\_full[is.element(sic\_full$ID, sic\_obs$ID) == F,]**

Assignment 15