

# An ArcGIS ModelBuilder Application for Comparing Interpolation Methods



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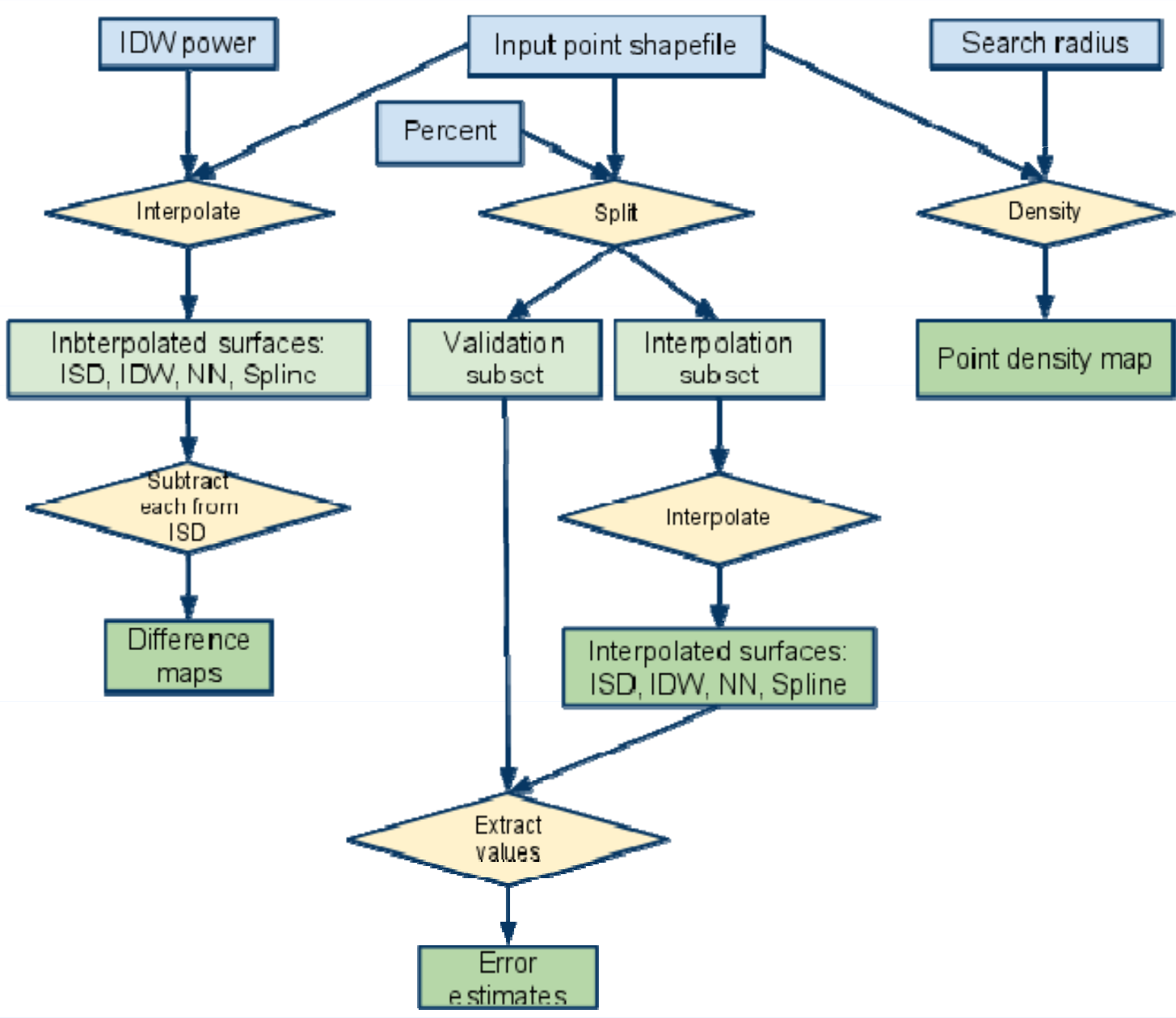
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## Model

The main objective was to develop a structured, user friendly and re-usable framework to facilitate easy comparison of different interpolation methods as well as provide a quick exploratory analysis tool. After running the model, the user is presented with a number of different views of the dataset allowing for quick grasp of the nature of modeled phenomena.

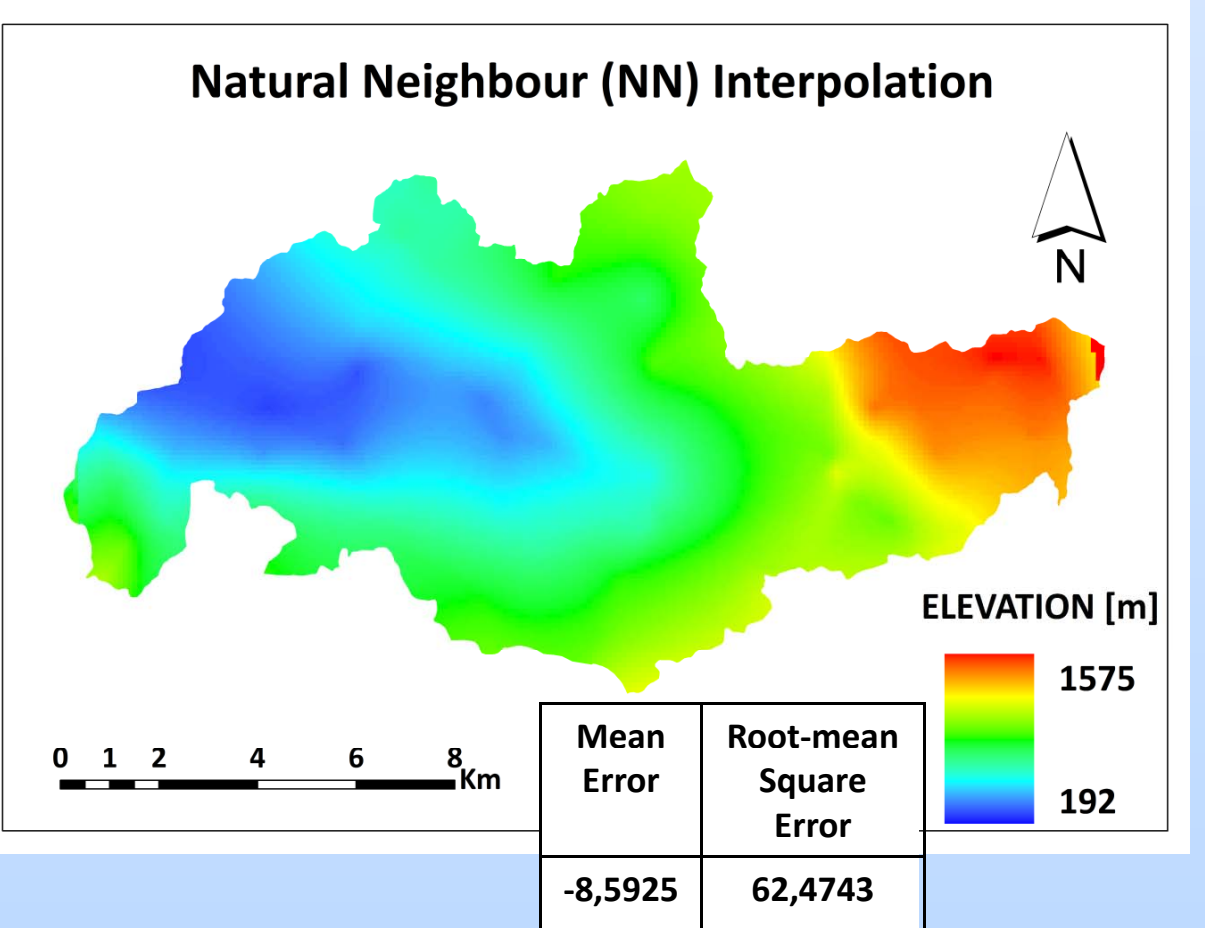
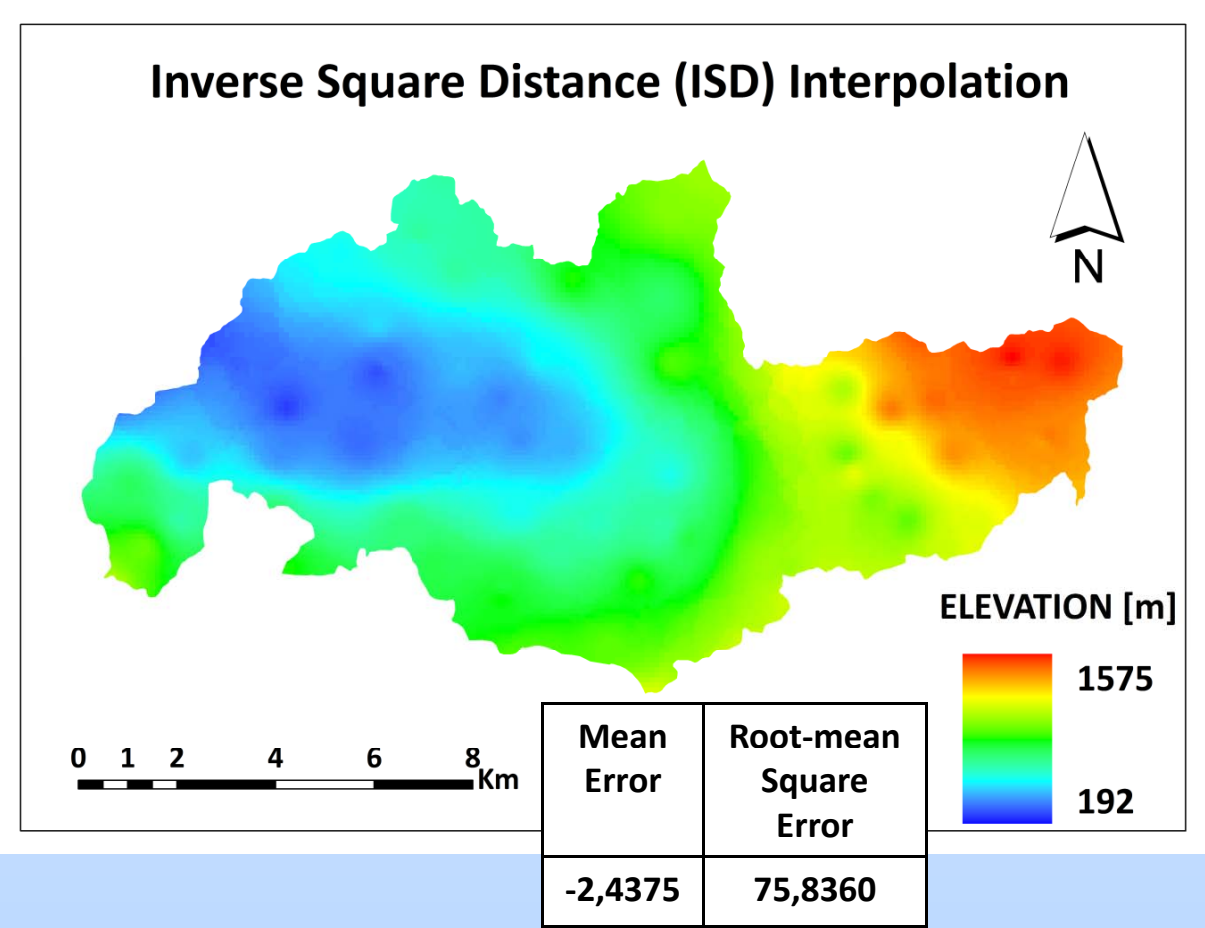
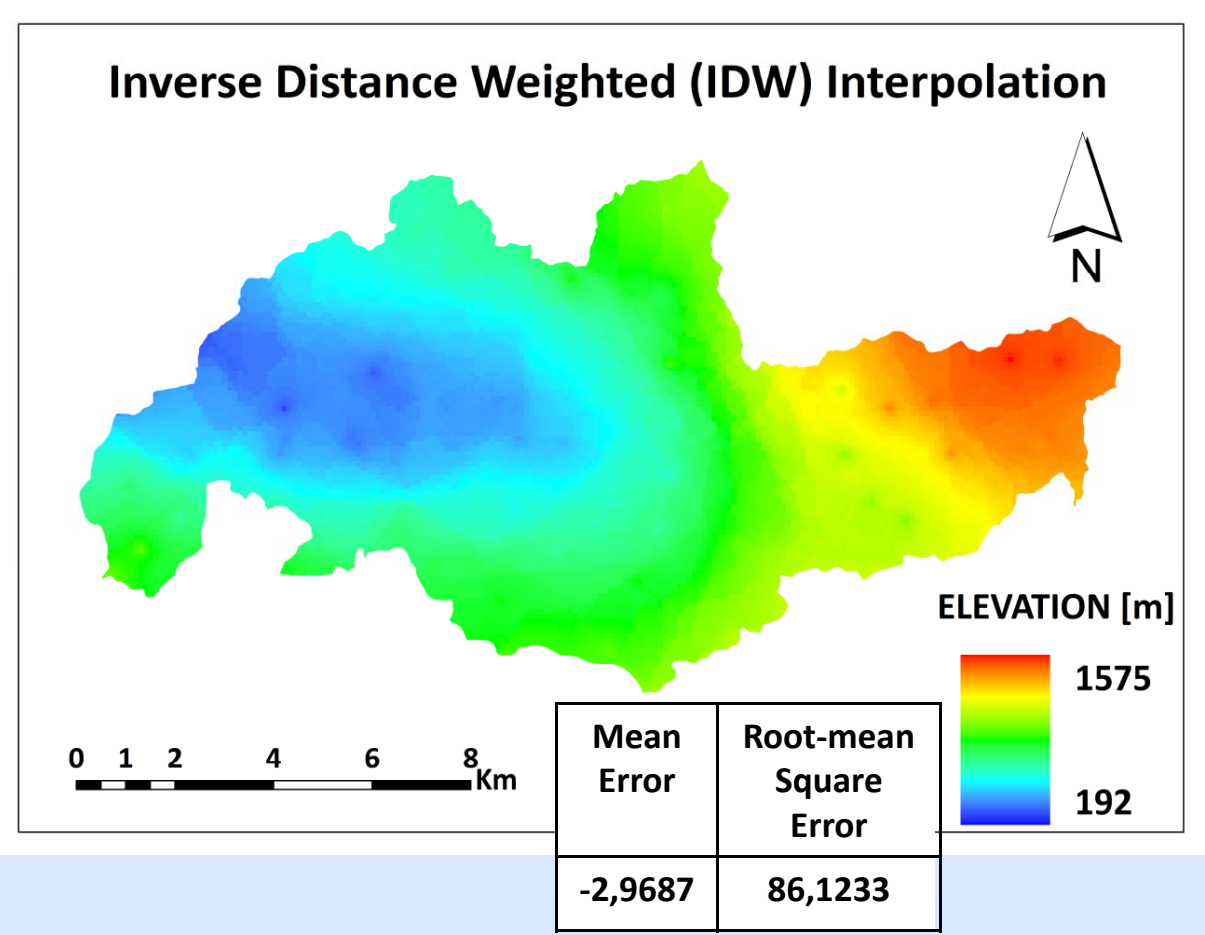
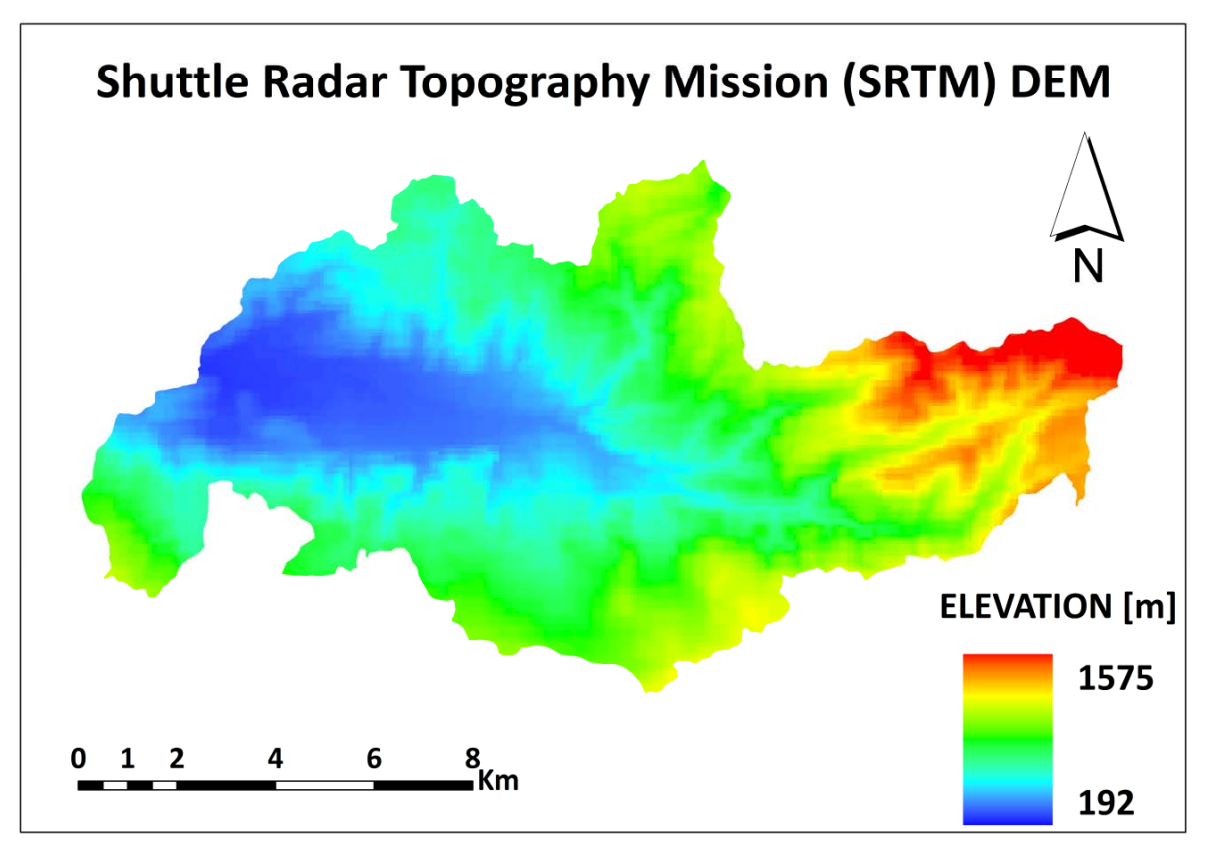
The model uses a point shapefile with point attributes (e.g. elevation, temperature, etc.) as an input. The user can further divide the input data into a training dataset for interpolating surfaces and a validation dataset for error estimation. Once the parameters are set, the model generates series of interpolated surfaces, difference maps and a point density map.



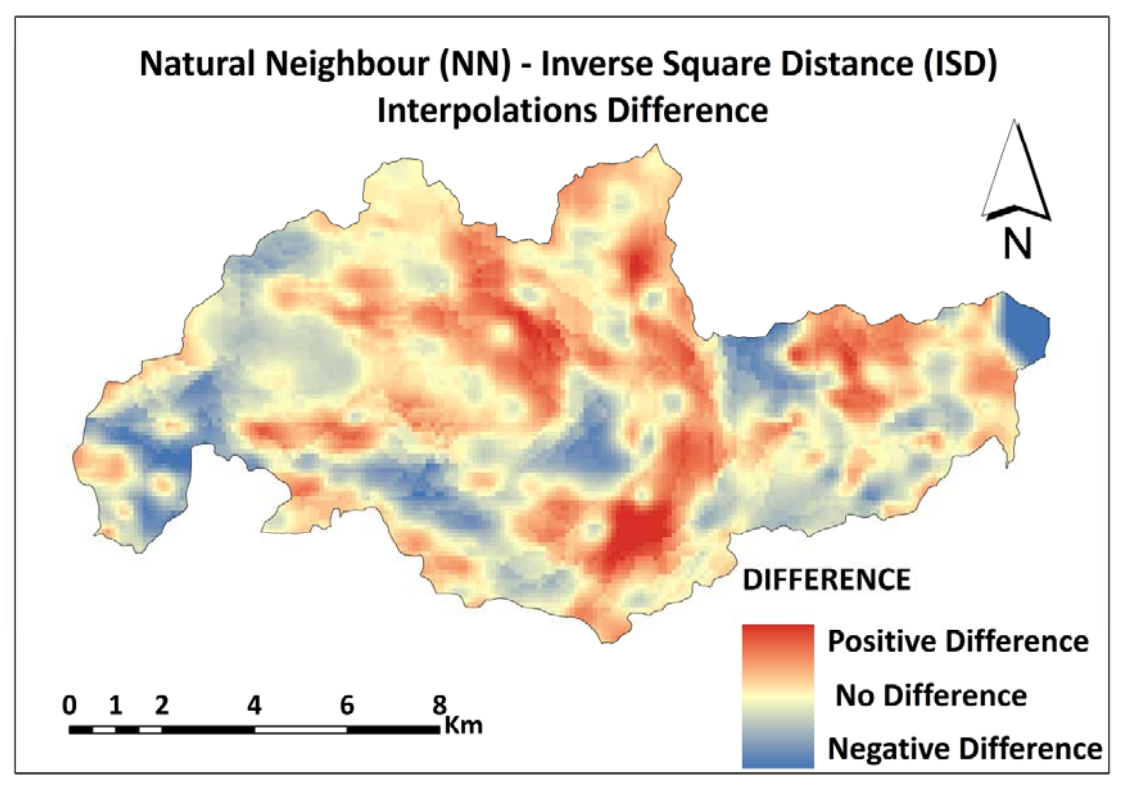
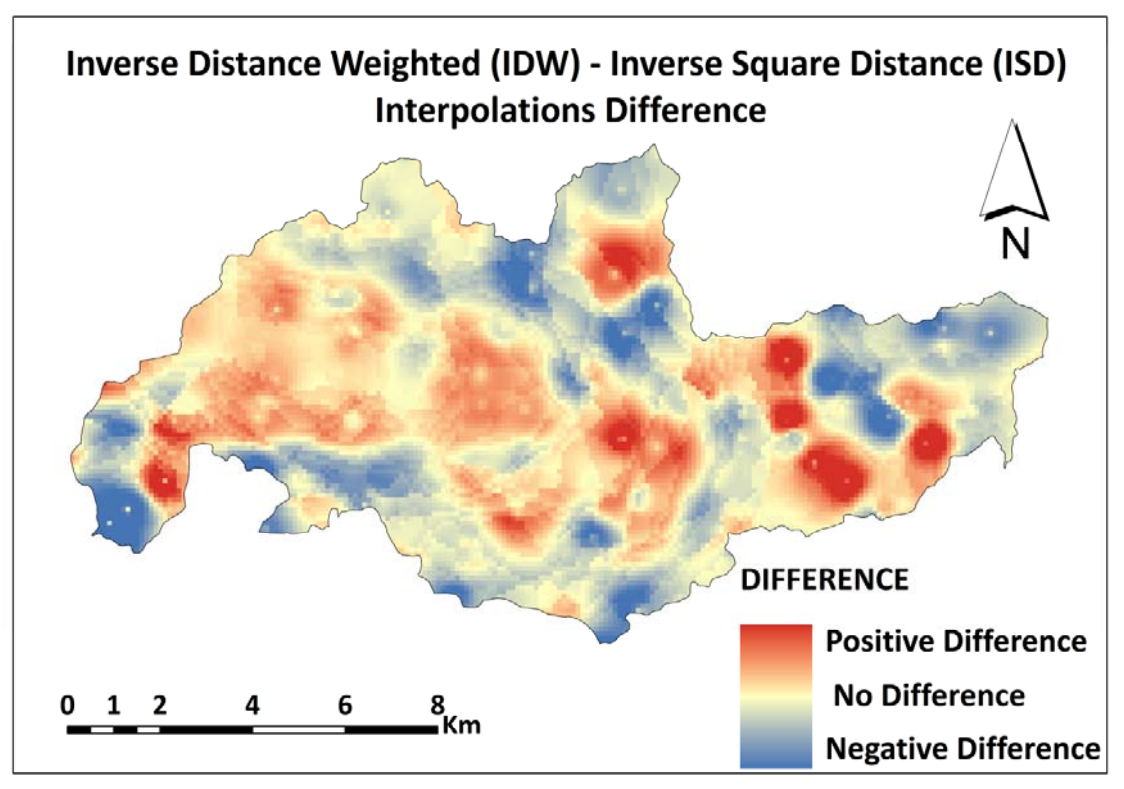
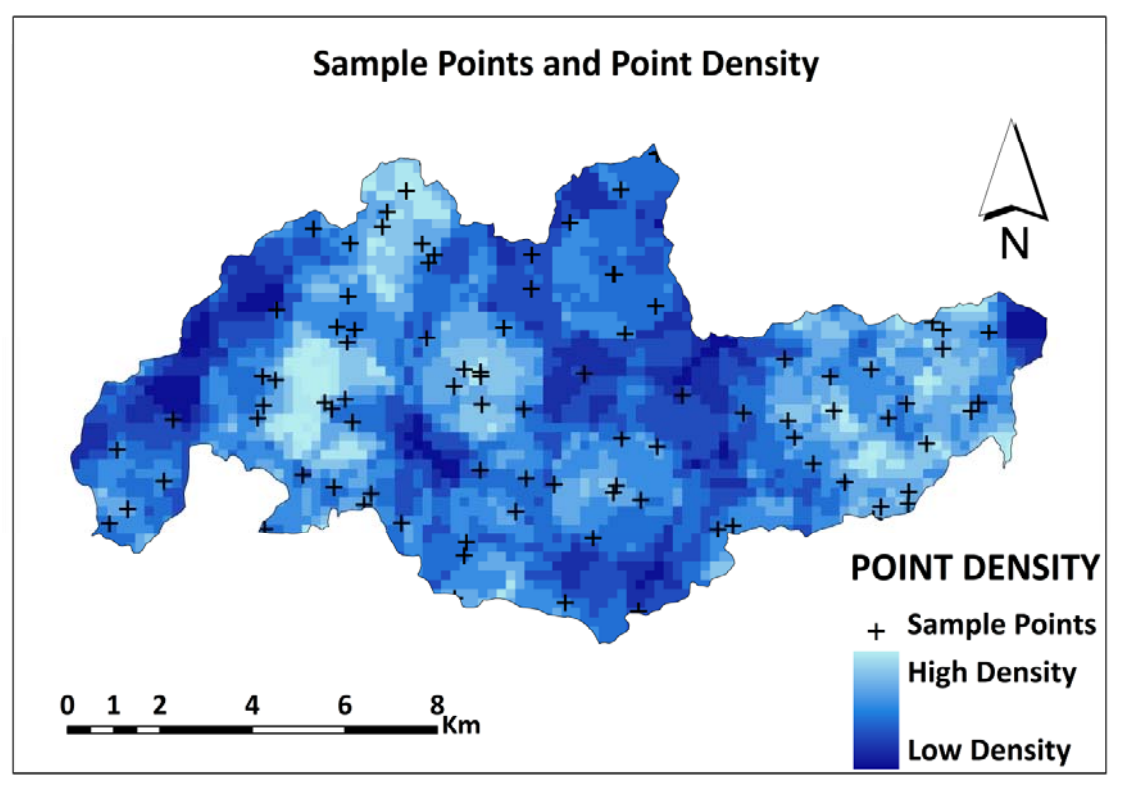
- Primary outputs of the model are:
- interpolated surfaces produced with deterministic methods such as Inverse Distance Weighted, Spline and Natural Neighbourhood
  - three difference maps created with raster algebra by subtracting the interpolated surfaces from one another: ISQ minus IDW, ISQ minus NN and ISQ minus Spline
  - a point density map for comparing interpolators' performance across regions with different point concentrations
  - Root Mean Square Error and Mean Error are calculated using separated validation dataset

Randomly distributed points were used to sample values from SRTM DEM to perform example analysis.

## Outputs



Original SRTM dataset used to extract values to sample points and three example interpolated surfaces with error tables



Point density map and two example interpolation difference maps

## Final remarks

- Limitations**
- Some issues to bear in mind (arising from implementation difficulties as well as software's limitations) when using the model are:
- symbology has to be applied manually to all generated datasets.
  - point density tool used doesn't allow the user to specify custom search radius

The model was developed as a part of GIS Application end semester project at the Universidade Nova de Lisboa, Erasmus Mundus Master of Geospatial Technologies. Presented example dataset analysis was carried out using the model as the final project assignment for Geostatistics course.

The authors would like to thank their colleagues at the university for helping in testing the model. The authors are also indebted to 'AI geostats' website for hosting the model.

The model features context help that guides the user through the process of entering input parameters

The model is free to download and use. Available at [ai-geostats website](#). [The link will be added]