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Using Kriging and the DAC Statistic to Predict Low Birthweight Clusters in Spartanburg County, SC

Alexandru I. Petrisor, MSPH

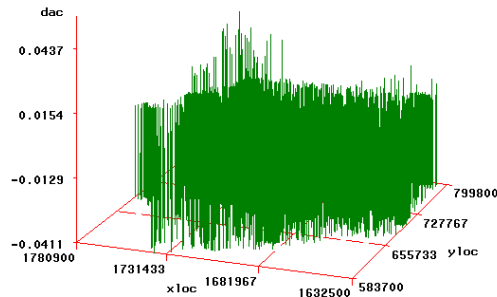
J. Wanzer Drane, PhD

Norman J. Arnold School of Public Health

University of South Carolina

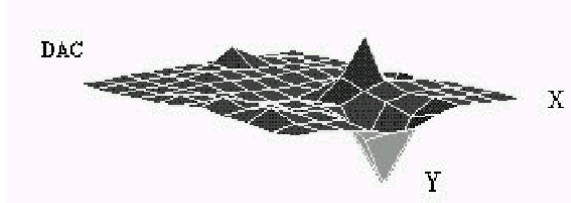
Columbia, SC 29208

Previous Results

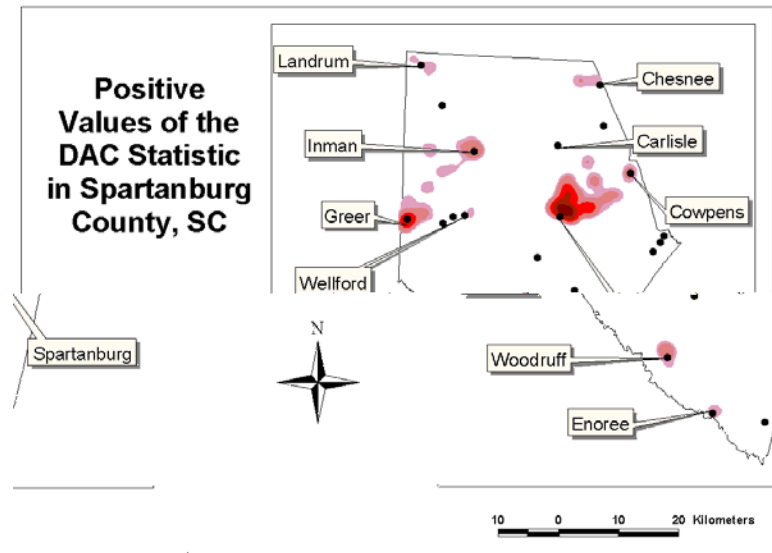


SAS Representation of DAC Values in Spartanburg County, SC

Plot of DAC Statistic for the Original Sample

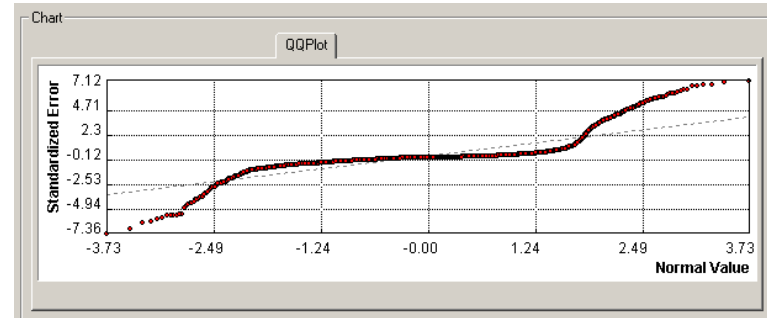
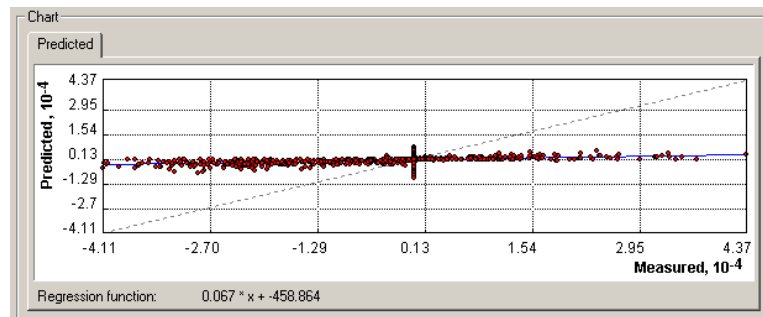
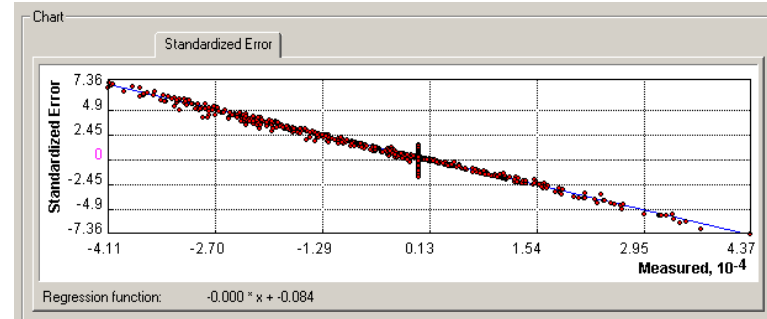
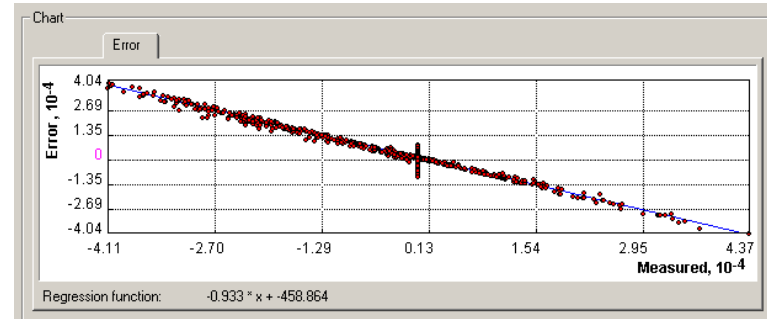
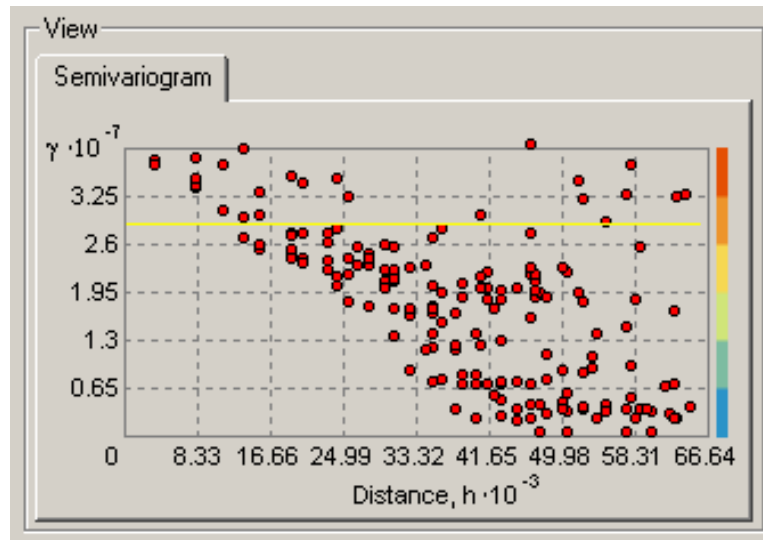


Turbo-Pascal Representation of DAC Values in Spartanburg County, SC



ArcView GIS Density Map of Positive DAC Values in Spartanburg County, SC

Ordinary Kriging

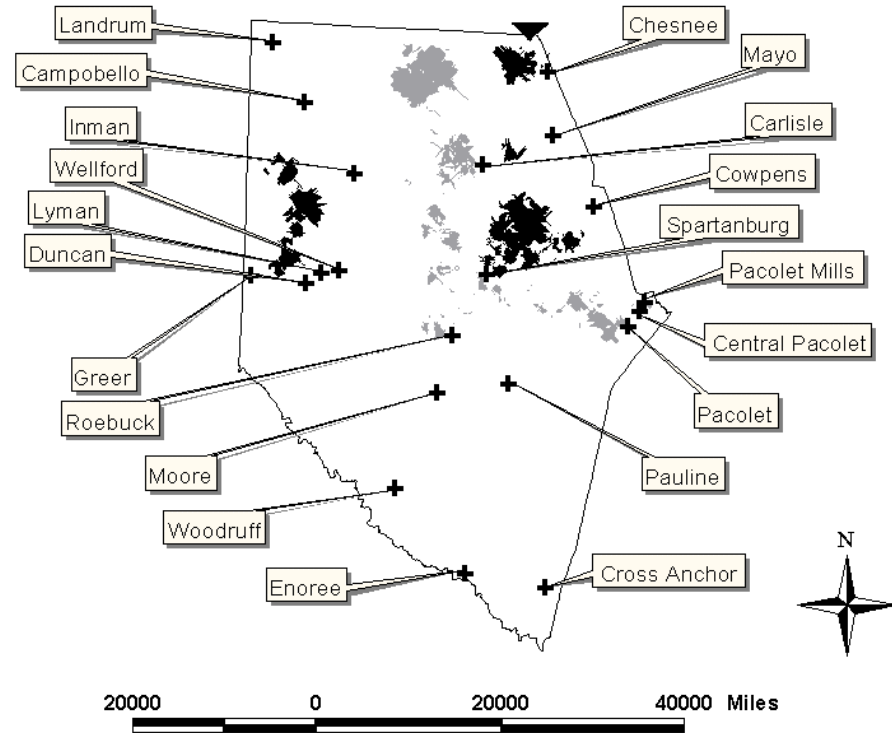


Ordinary Kriging: Model

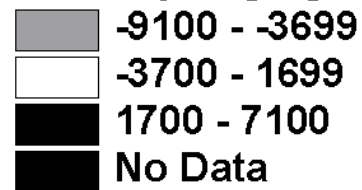
- Selected Method: Ordinary Kriging
- Number of Points: 5270
- Model:
0*Spherical(62297)+2.8667e7*Nugget
- Neighbors to Include: 5 or at least 2 for each angular sector
- Error modeling:
Microstructure: 2.8667e7 (100%)
Measurement error: 0 (0%)
- Searching Ellipse:
Angle: 0
Major Semiaxis: 62297
Minor Semiaxis: 62297
Angular Sectors: 4

Ordinary Kriging of Spartanburg Data

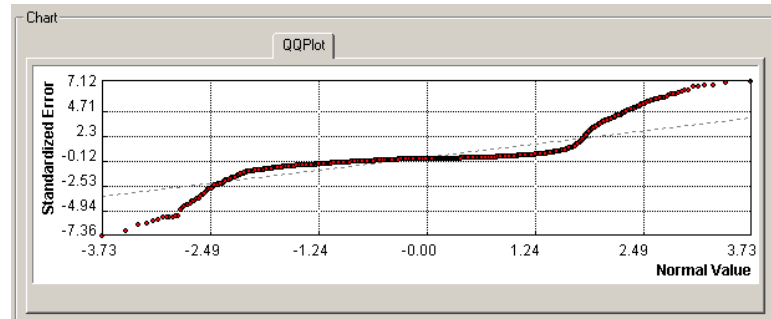
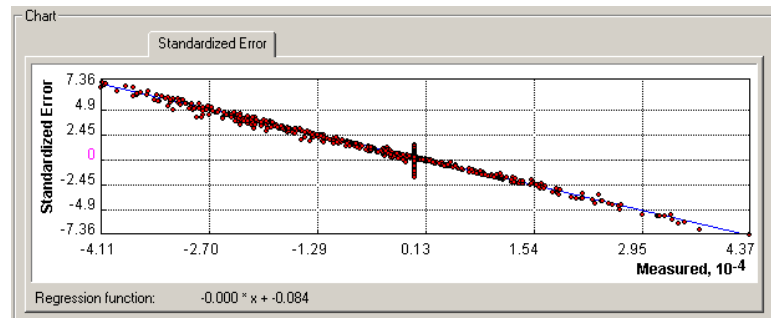
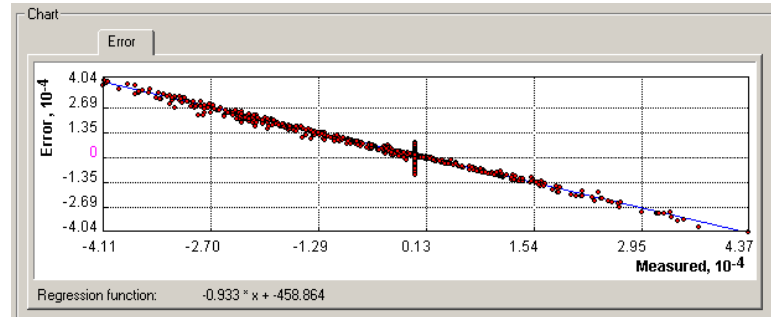
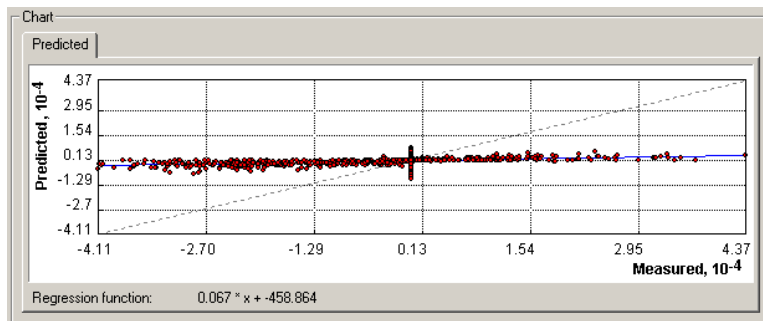
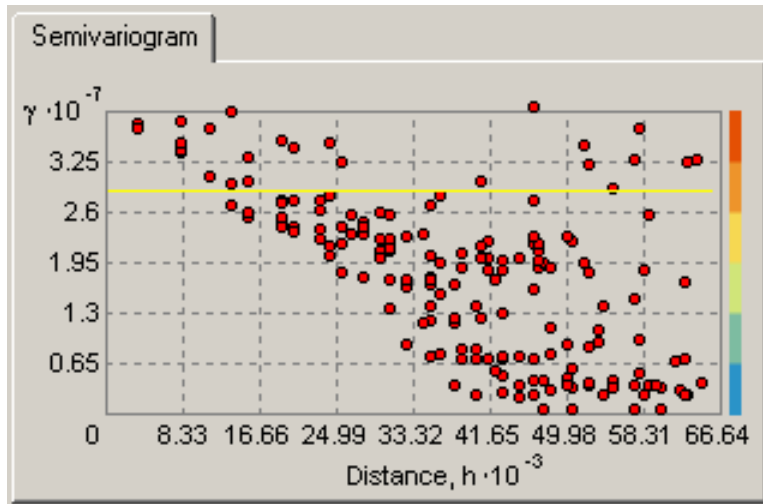
Ordinary Kriging: Results



Ordinary kriging map



Simple Kriging

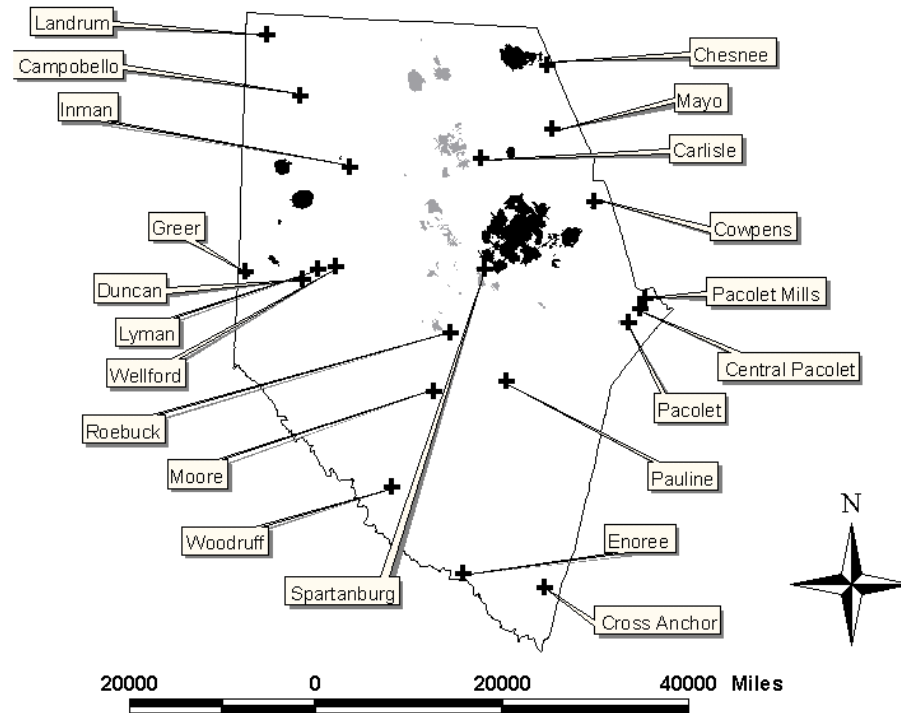


Simple Kriging: Model

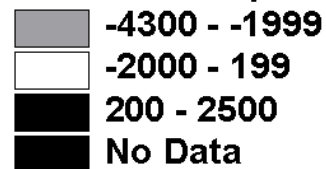
- Selected Method: Simple Kriging
- Number of Points: 5270
- Mean Value: -570.22
- Model:
3120100*Spherical(6036.3)+2.5541e7*Nugget
- Neighbors to Include: 5 or at least 2 for each angular sector
- Error modeling:
Microstructure: 2.5541e7 (100%)
Measurement error: 0 (0%)
- Searching Ellipse:
Angle: 0
Major Semiaxis: 6036.3
Minor Semiaxis: 6036.3
Angular Sectors: 4

Simple Kriging: Results

Simple Kriging of DAC Data



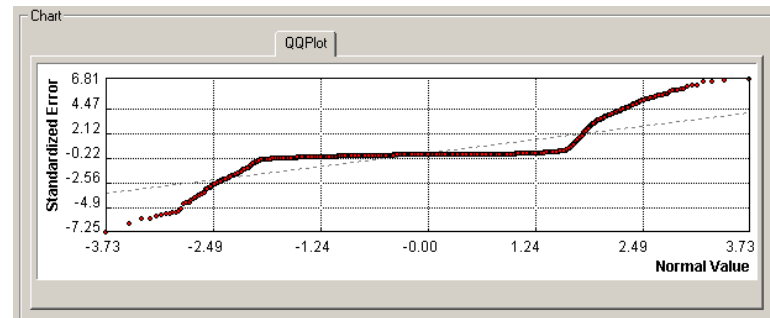
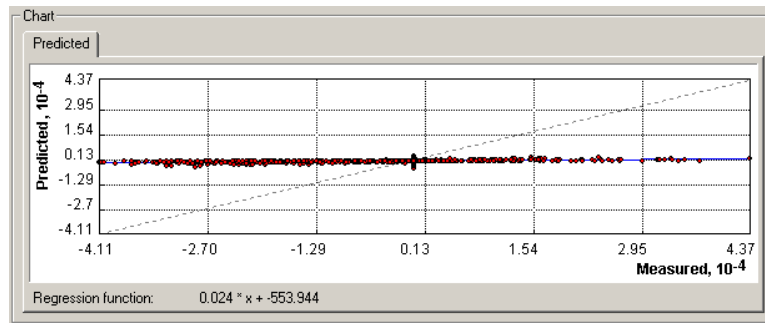
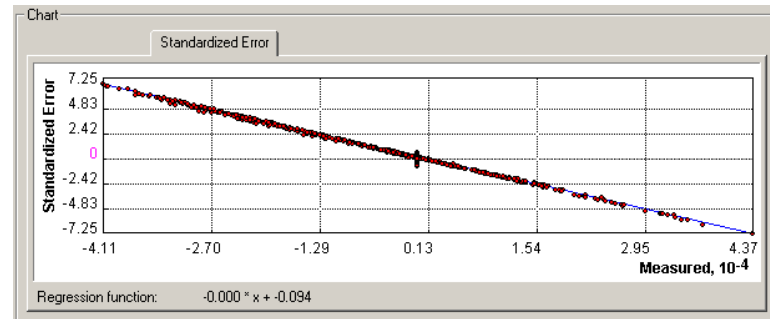
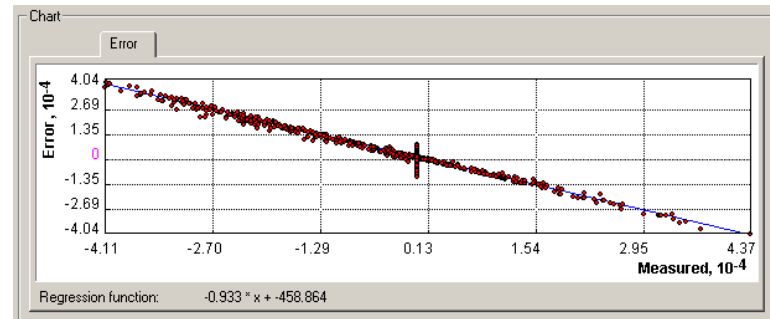
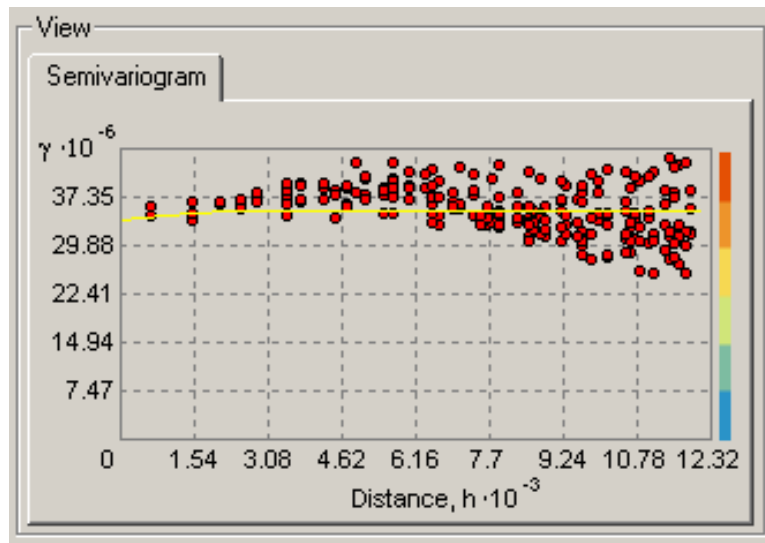
Prediction Map



 County limits

+ Cities

Universal Kriging

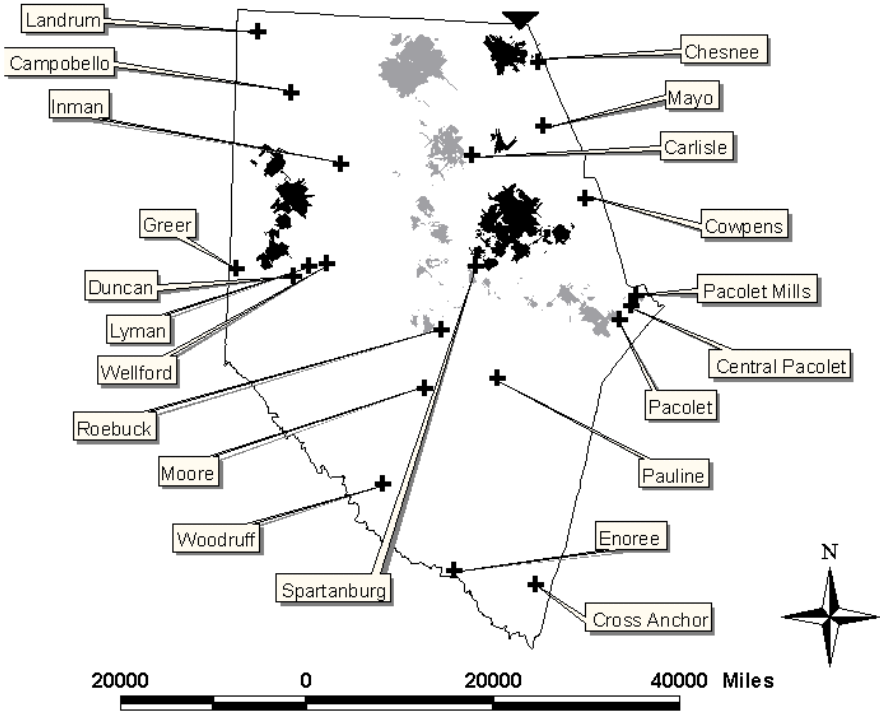


Universal Kriging: Model

- Selected Method: Universal Kriging
- Number of Points: 5270
- Order of Trend: Const (Estimated by Global Polynomial Interpolation)
- Model:
 $0 * \text{Spherical}(62297) + 2.8667e7 * \text{Nugget}$
- Error modeling:
Microstructure: $2.8667e7$ (100%)
Measurement error: 0 (0%)
- Neighbors to Include: 5 or at least 2 for each angular sector
- Searching Ellipse:
Angle: 0
Major Semiaxis: 62297
Minor Semiaxis: 62297
Angular Sectors: 4

Universal Kriging: Results

Universal Kriging of DAC Data



Prediction Map

- 10000 - -3699
- 3700 - 1699
- 1700 - 7100
- No Data
- County limits
- Cities