

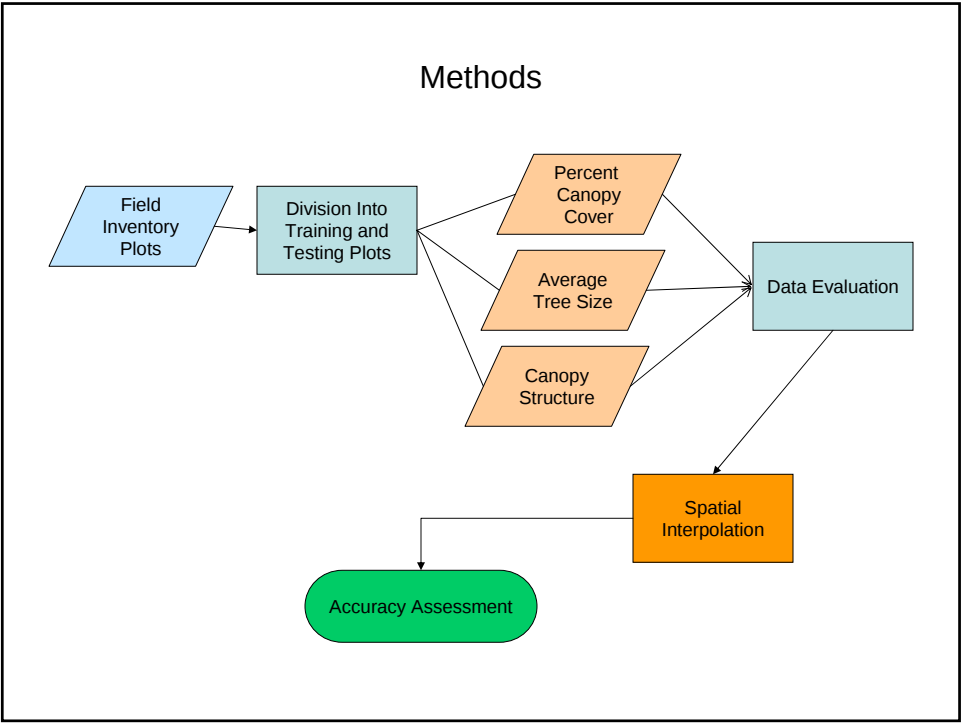
Creation and Assessment of an Alternative Forest Structure Map

Craig Ducey
GIS II – Applications

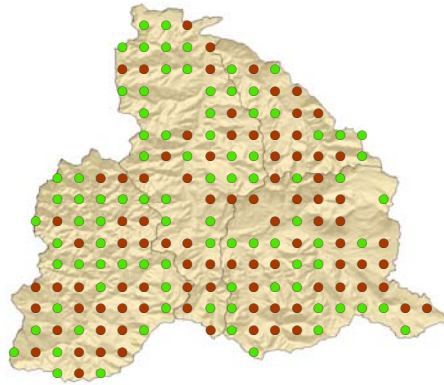
08 June 2004

Objectives

- Develop a map of forest structure using spatial interpolation based on:
 - Percent Canopy Cover
 - Average Tree Diameter (Quadratic Mean Diameter)
 - Canopy Structure
- Compare predicted map to a reference map created using alternative methods



Training and Test Plot Data

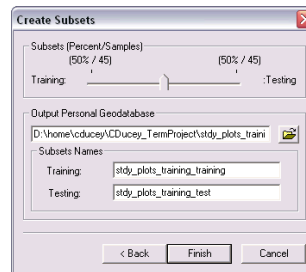


Attributes

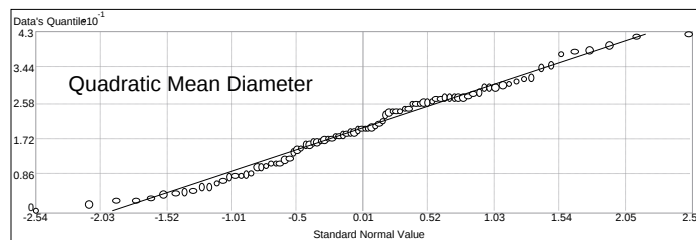
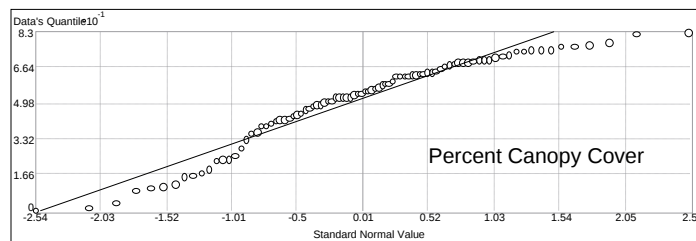
- Canopy Cover
- Average Tree Size (QMD)
- Canopy Structure

Selection

- *Geostatistical Analyst* → *Create Subsets...*

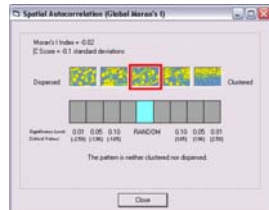


Normality Test (Normal QQPlots)

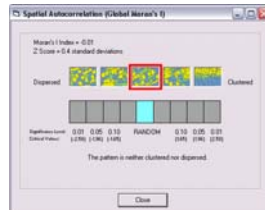


Spatial Autocorrelation

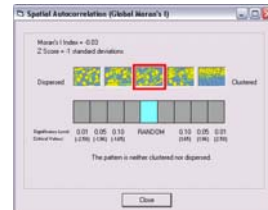
Global Moran's I



Percent Canopy Cover

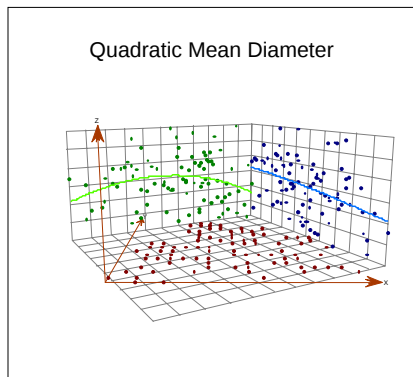
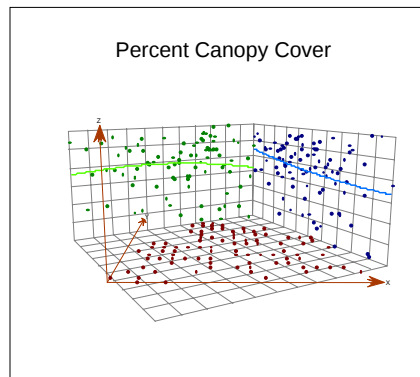


Quadratic Mean Diameter

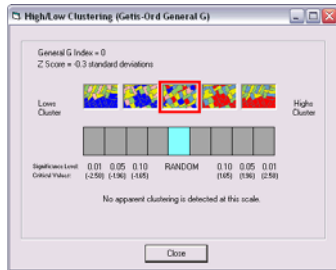


Canopy Structure

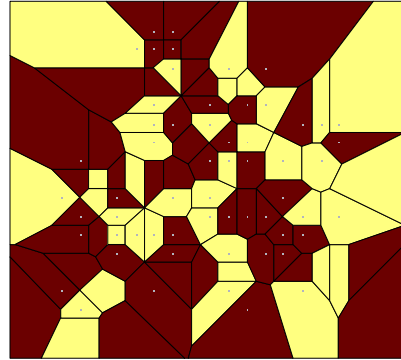
Trend Analysis



Canopy Structure

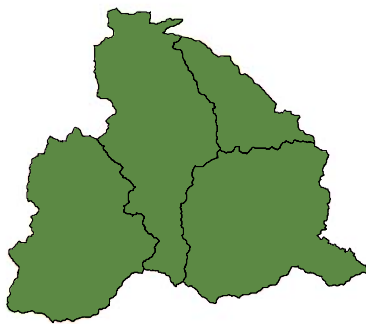


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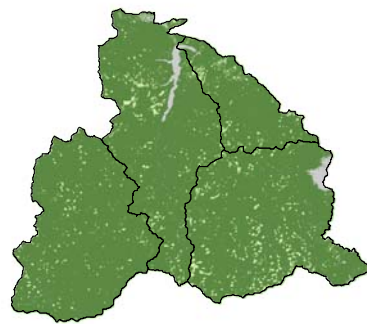


Voronoi Map

Percent Canopy Cover Ordinary Co-Kriging (NDVI)



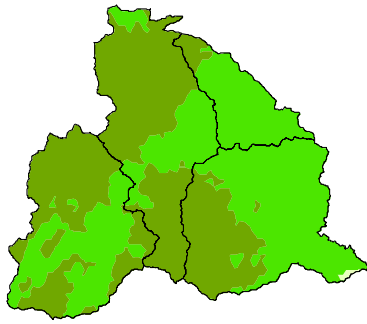
Interpolated Map



Reference Map

Overall Accuracy = 90.1%

Quadratic Mean Diameter
Ordinary Co-Kriging (NDVI)



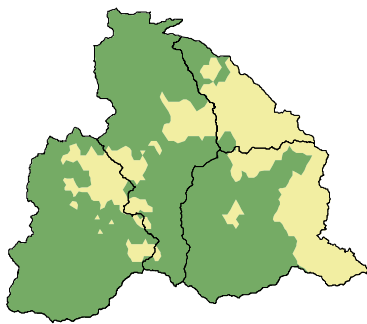
Interpolated Map



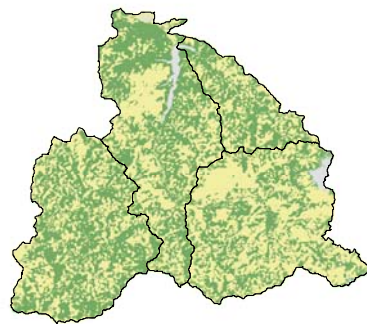
Reference Map

Overall Accuracy = 37.4%

Canopy Structure
Indicator Kriging – Probability Map



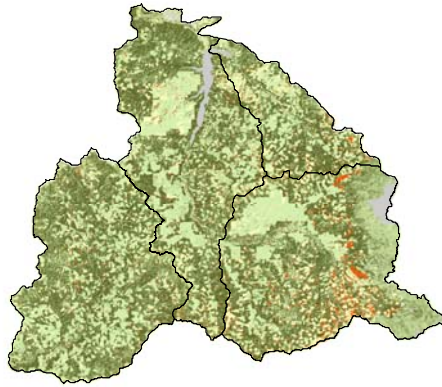
Probability Map



Reference Map

Overall Accuracy = 69.2%

Reference Forest Structure Map



Attributes

- Canopy Cover
- Average Tree Size (QMD)
- Canopy Structure

Classification

1. Potential Forest
2. Seedling/Sapling
3. Small Single-Story
4. Small Multi-Story
5. Medium Single-Story
6. Medium Multi-Story
7. Large Single-Story
8. Large Multi-Story
9. Unclassified
10. Non-Forest Mask

Final Accuracy Assessment

Overall Accuracy = 10.9%

Reference Map

Predicted Map		PF	SS	SSS	SMS	MSS	MMS	LSS	LMS	Unkn	Mask	Total
	PF	0	0	0	0	0	0	0	0	0	0	0
	SS	0	0	0	0	0	0	0	0	0	0	0
	SSS	1	2	3	0	0	0	0	0	0	0	6
	SMS	2	9	3	5	0	12	3	11	1	0	46
	MSS	0	2	0	1	0	0	0	1	0	2	6
	MMS	0	12	4	4	2	2	1	7	1	0	33
	LSS	0	0	0	0	0	0	0	0	0	0	0
	LMS	0	0	0	0	0	0	0	0	0	0	0
	Unkn	0	0	0	0	0	0	0	0	0	0	0
	Mask	0	0	0	0	0	0	0	0	0	0	0
	Total	3	25	10	10	2	14	4	19	2	2	91

Why?

