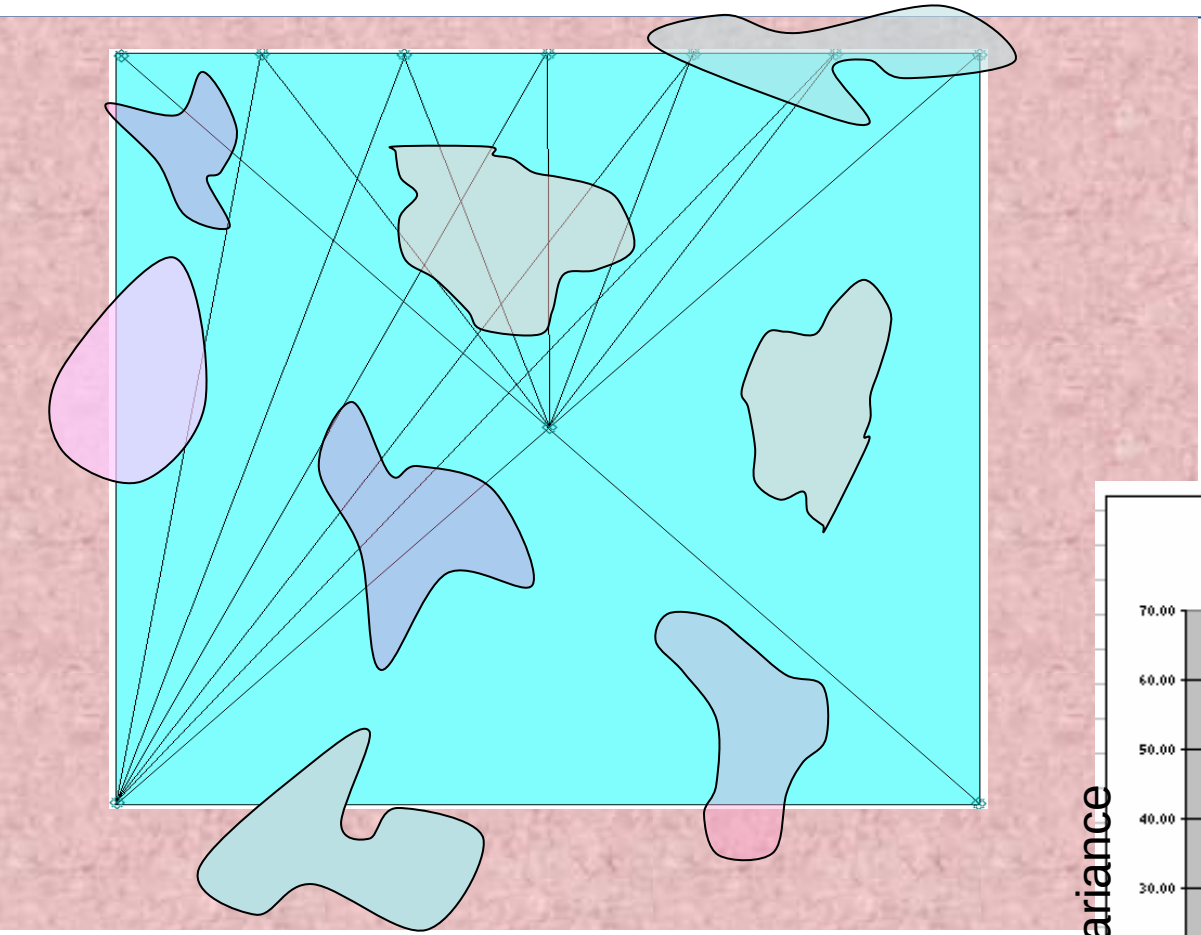
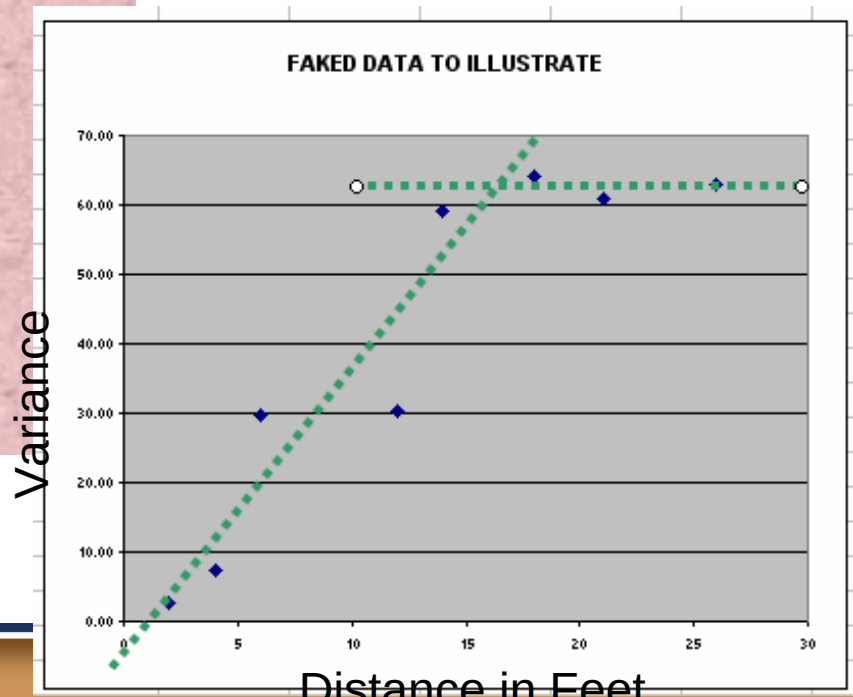
Some auto-correlation exists, but distance to reach spatial randomness is found



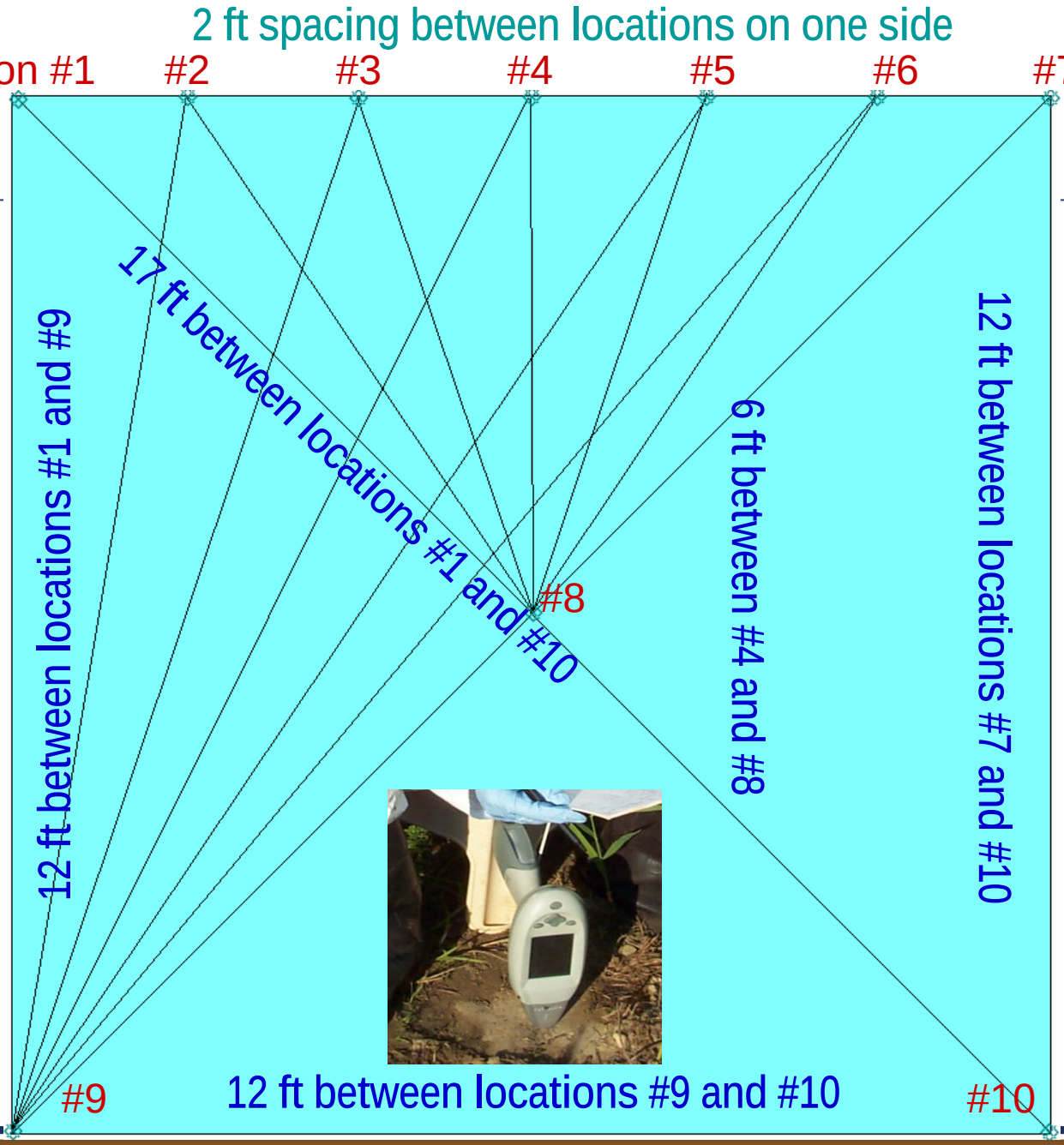
Stabilized Variability as variance = 62

SD = sqrt(62) = ~8

Use VSP to compute "n" to use in increments per DU.



Vario-plot layout



Determines short-scale heterogeneity (SS) (on order of feet). SS heterogeneity causes SS data variability.

Initially start with a 12 X 12 ft area.

Using *in situ* XRF, analyze each location in the designated pattern

(see QC for in situ XRF)

Spreadsheets Developed to Calculate Variance at Multiple Distances

- Calculate variance at distance (2, 4, 6-8.5, 12-14, 14-17 feet)
- Calculate standard deviation of points across each distance

Location pairings for 2-ft spacing

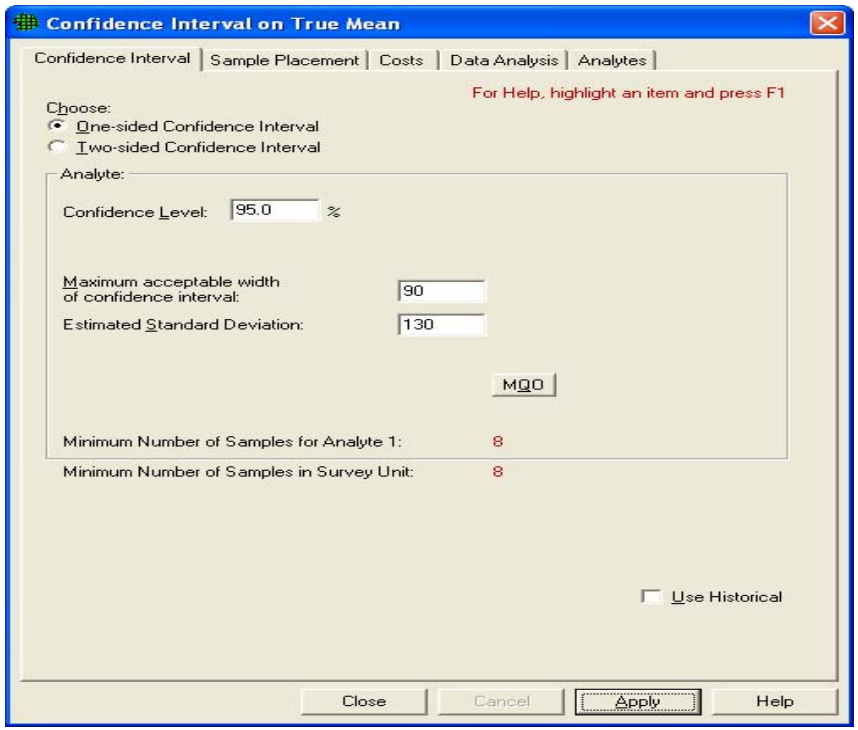
				RPD	ABS value	RPD to RSD		1/2 CI width	ave	upper limit
							if want mean +10%	**46.51**	465.14	558.17
1	Pair #1-2 = 2ft	485	569	-4.0	4.0	0.028				
2	Pair #2-3	569	485	4.0	4.0	0.028				
3	Pair #3-4	485	495	-0.5	0.5	0.004				
4	Pair #4-5	495	406	4.9	4.9	0.035				
5	Pair #5-6	406	436	-1.8	1.8	0.013	ave of tot Pb for	Ave SD from ave RSD		
6	Pair #6-7	436	380	3.4	3.4	0.024	samples #1 to #7	(SD of differences between data points spaced at 2 ft)		
		Ave RPD for 2-ft spacing =			**3.11**	**0.0220**	**465.14**		**10.213**	

Pairings for 14 to 17-ft spacing

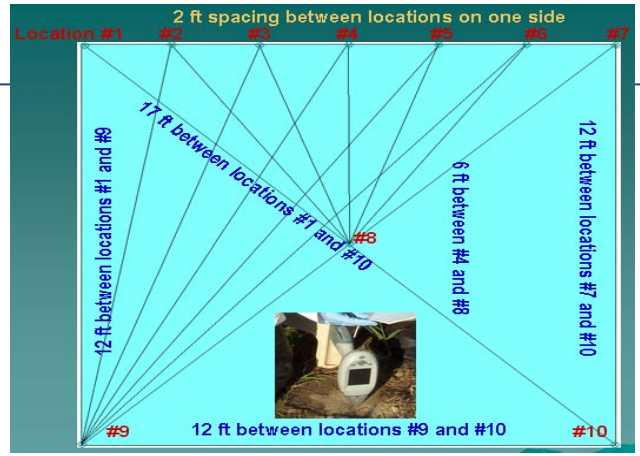
				RPD	ABS value	RPD to RSD				
1	Pair #10-1 17 ft	387	485	-5.6	5.6	0.040				
2	Pair #10-2 14-ft	387	569	-9.5	9.5	0.067	if want mean +10%	**42.66**	426.6	512.0
3	Pair #10-3 14-ft	387	485	-5.6	5.6	0.040				
4	Pair #9-7 17 ft	265	380	-8.9	8.9	0.063				
5	Pair #9-5 14-ft	265	406	-10.5	10.5	0.074	ave of tot Pb for	Ave SD from ave RSD		
6	Pair #9-6 14-ft	265	436	-12.2	12.2	0.086	samples #1 to #7	(SD of differences between data points spaced at 14 to 17 ft)		
			Ave RPD for 14 to 17-ft spacings =		**8.73**	**0.0617**	**426.63**		**26.334**	

Visual Sampling Plan

- Conservative approach
  - Use largest standard deviation to plug into VSP
  - VSP Calculates appropriate number of increments for each ¼ acre decision unit



VarioPlot Example – RR Lot 3



Confidence Interval on True Mean

Confidence Interval | Sample Placement | Costs | Data Analysis | Analytes

For Help, highlight an item and press F1

Choose:
- (•) One-sided Confidence Interval
- ( ) Two-sided Confidence Interval

Analyte:

Confidence Level: 95.0 %

Maximum acceptable width of confidence interval: 90

Estimated Standard Deviation: 130

MQO

Minimum Number of Samples for Analyte 1: 8

Minimum Number of Samples in Survey Unit: 8

[ ] Use Historical

Close | Cancel | Apply | Help

)%	**94.49**	944.9	1133.9		
		Ave SD from ave RSD			
		(SD of differences between data points spaced at 12 to 14 ft)			
		129.963			
)%	**99.95**	999.5	1199.4		
		Ave SD from ave RSD			
		(SD of differences between data points spaced at 14 to 17 ft)			
		91.947			