Calculating Distance Between Samples

A question commonly asked when creating a cell table is, what size cell should be used? One rule of thumb is to use a cell size of on half to one quarter of the sample spacing. For instance, if you had samples spaced at 100 foot intervals a cell size of 50 or 25 might work well for estimating. The following example describes how to use the *INVERSE* program to calculate average sample spacing. The results may be used to help determine the "best" cell size.

Procedure:
The database requires a flat table with coordinate data and a field to store the average distance. The distance field is a REAL, ACTUAL field. The BOLAND database that is included with the tutorial data was used for this example. You can use your copy to try this example. Remember to add another field to the collars table that will store the average distance.

Table	collars	is a	FLAT table	with	105	records
	collars_rec		collars_nul	hole_id		easting
	northing		td	distance		

The next step is to run the *INVERSE* Program.

Estimation Fields

Data points			Results	
	Value:	collars_rec	Value:	collars_nul
	X:	easting	X:	easting
	Y:	northing	Y:	northing
	Z:		Z:	

It doesn't matter which *Data Value* you choose because what you are calculating is the average distance between samples not an actual value. The result coordinates need to be filled in with the same X and Y fields as the data coordinates so **TECHBASE** knows to store the result back to the same record. The estimated value does not need to be stored in the database, so the collars_nul can be used to "throw the result away". Now setup the *Search* menu choices as follows:

Estimation Search

Max samples:	1	Min samples:	1
Search	U-axis	V-axis	W-axis
Length:	1000		
Dip:			
Azimuth:			

Setting both *Max samples* and *Min samples* to 1 limits the calculation just to the closest sample. You need a search *Length* long enough to always reach the closest sample.

The next step is defining the *Parameter* choices.

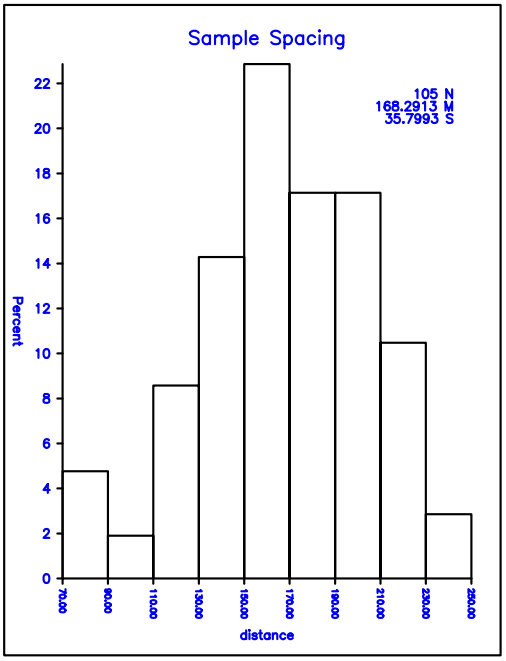
Inverse-distance Parameters	
Inverse-distance power:	2
Elliptical distance?	NO
Jack-knife?	YES
Optional Output Fields	
Sample count:	
Distance:	distance

The default for inverse distance power is 2 and is adequate for this exercise because we only care about the closest sample. Elliptical distance is NO because we want to calculate an actual distance not an elliptical distance. If we said yes to elliptical distance we would always get a value between 0 and 1. Say YES to Jack-knife. A no answer would result in 0 for every distance because each point is its own closest neighbor. Jack-knife allows you to check your estimate by deleting each known point and estimating a value at that point from the other values around it. For the *Distance* choice fill in the distance field. Now estimate.

When the estimation is complete use the *SUMMARY* program to report the average distance of all the samples. You can also use the *HISTO* program to graphically plot the average distance.

The following results are from the BOLAND database:

Summary Statistics	distance
Number	105
Mean	168.2913
Std Dev	35.7993
Variance	1281.59
Maximum	240.22
Minimum	71.84
Range	168.38
Coef Var	21.2722
Std Err	3.4937



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For additional information see **"Inverse - Inverse distance estimation" on page 1mo-17**, **"summary – calculates univariate statistics of one or more NUMERIC fields." on page 1st-65**, and **"histo – histogram plot" on page 1st-35**.

