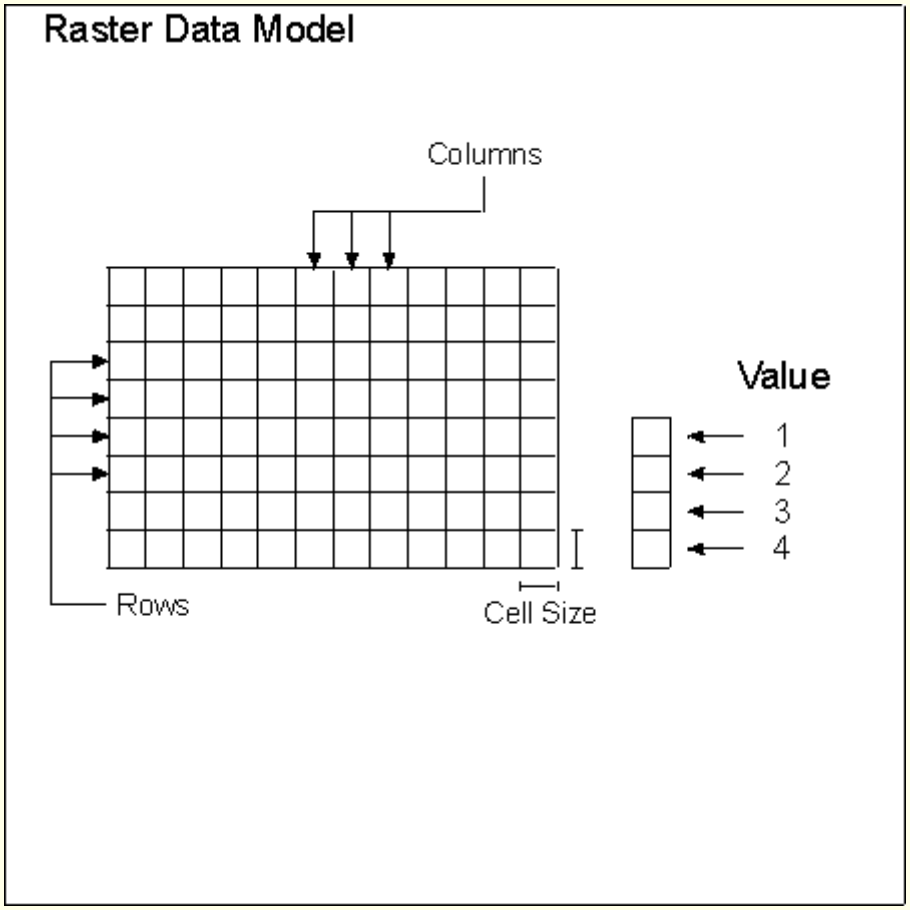
Raster GIS

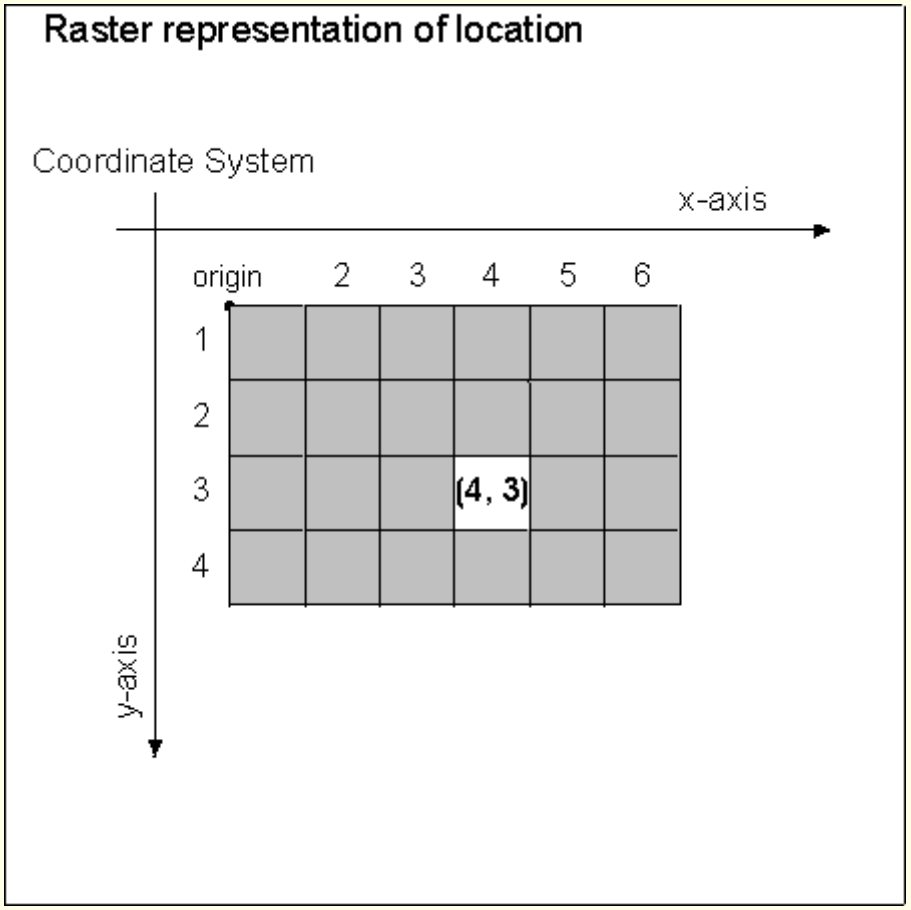
Raster GIS

1. *Raster Data Models*
2. *Raster Data Structure*
3. *Advantages and Disadvantages*
4. **Other data model**
5. *GRID in ARCVIEW*
6. *Exercise*

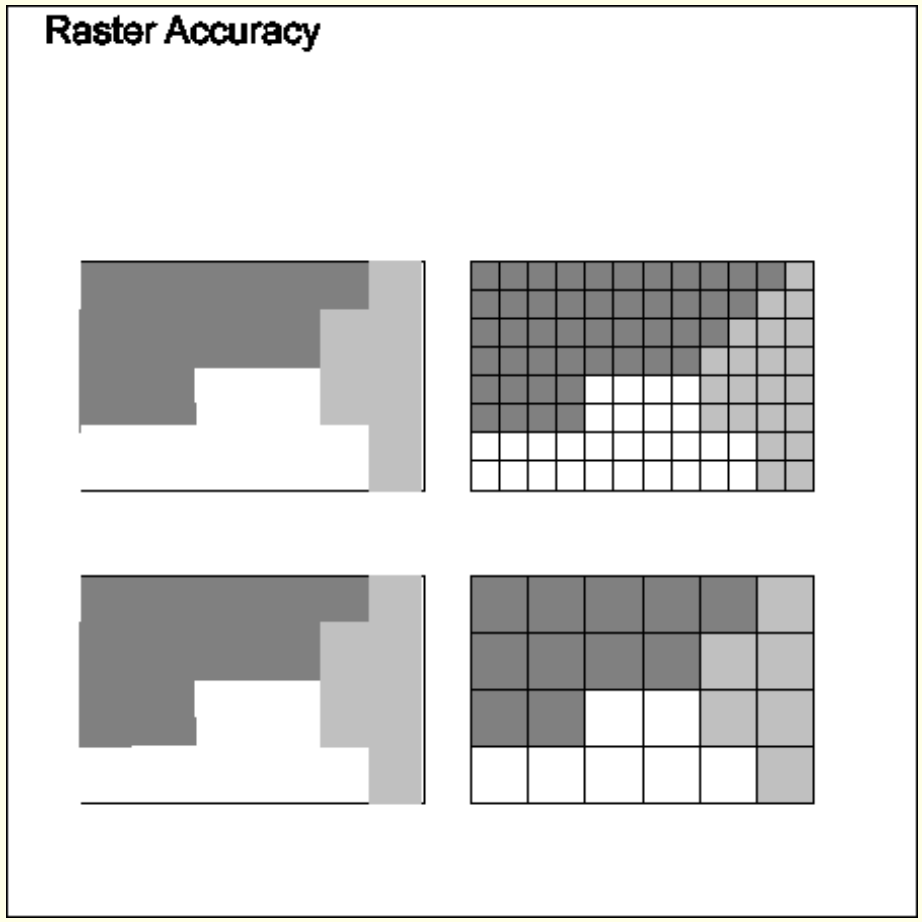
1.Raster Data Models



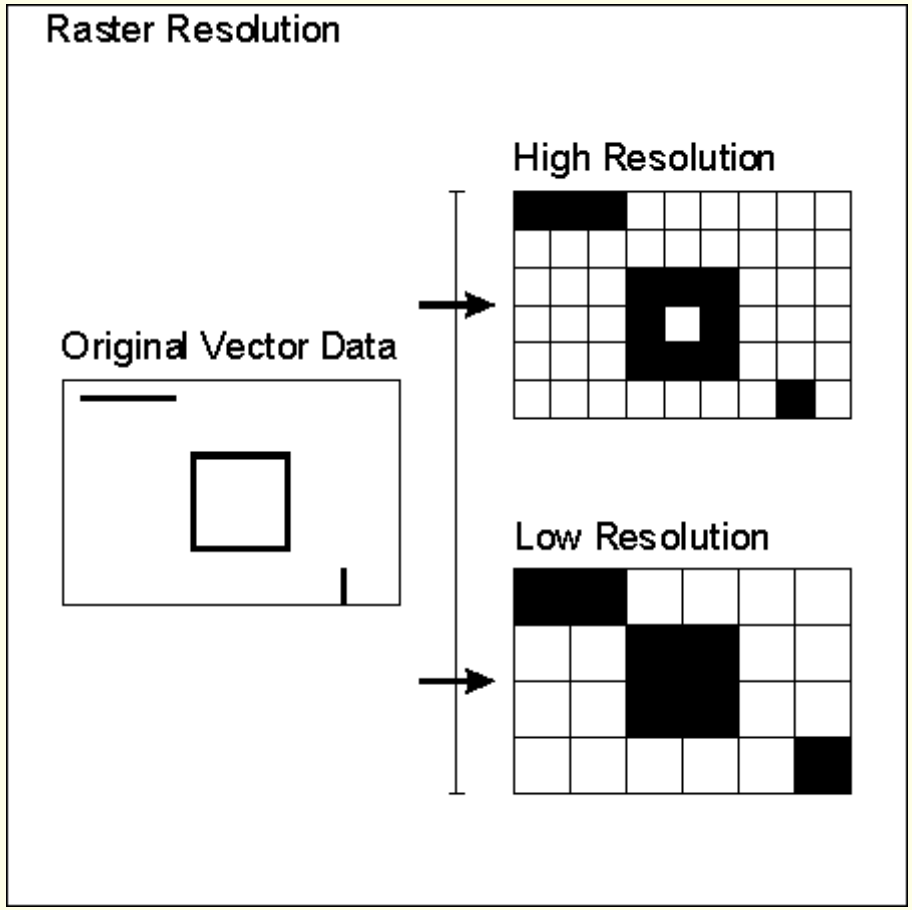
1.1 Raster representation of location



1.2 Raster Accuracy



1.3 Raster Resolution



1.4 Raster Resolution

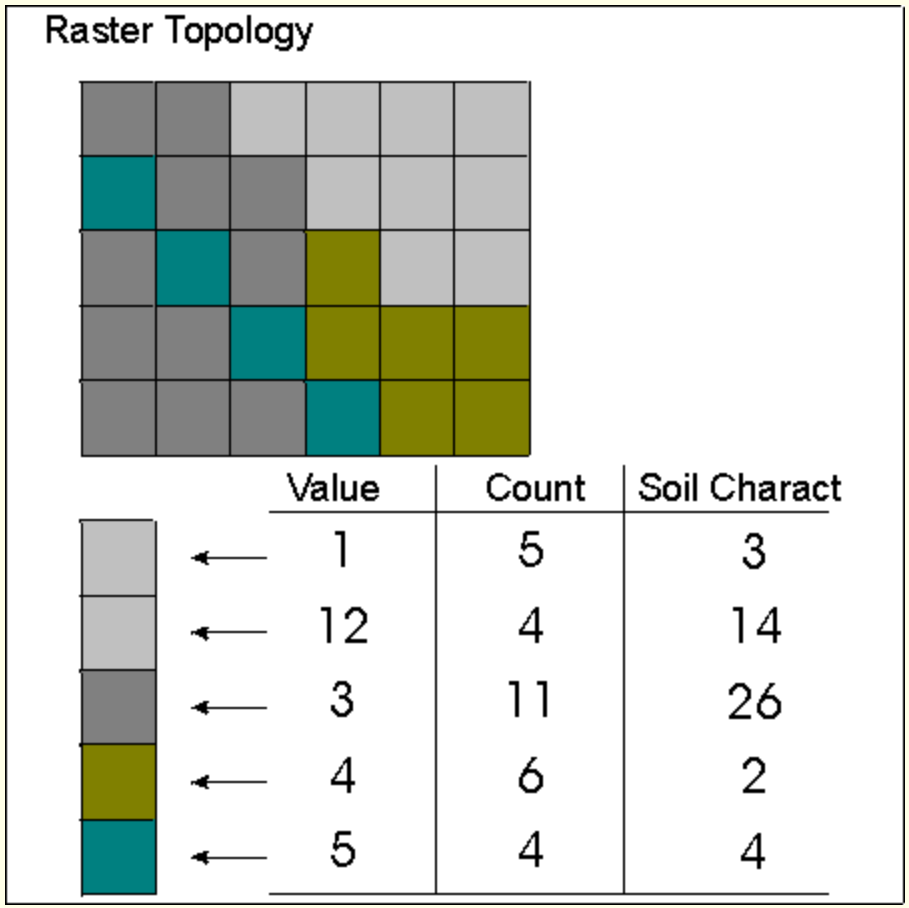
Resolution is defined as content of geometric domain divided by number of observations, normalized by spatial domain.

Mean resolution element = sqroot(area/no of observation)

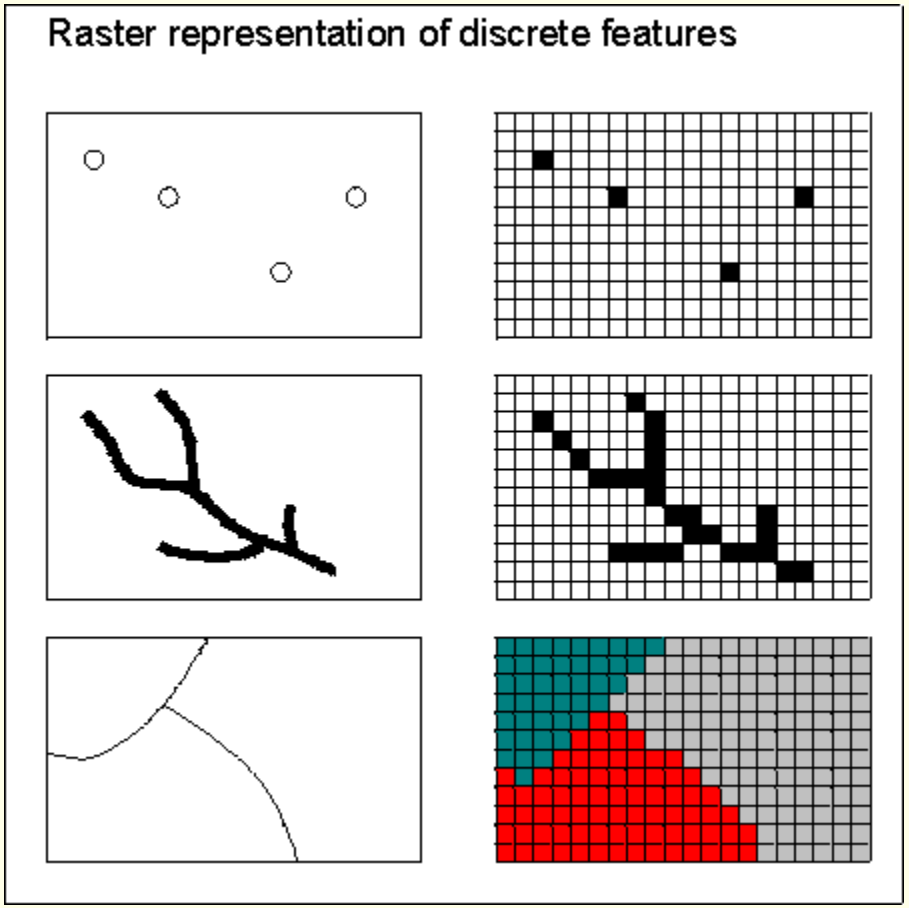
According to Tobler W.R.,(1987)

Example, for provincial level (76)mapping of Thailand (area, 514,000 km2) , representative value for spatial resolution to portray the provinces is approximately 82km.

1.5 Raster Topology



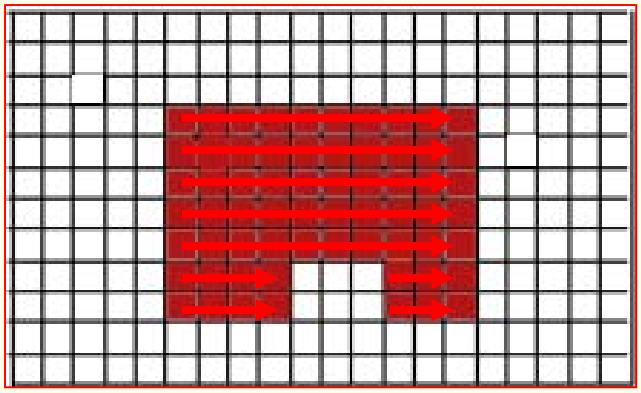
1.6 Raster representation of discrete features



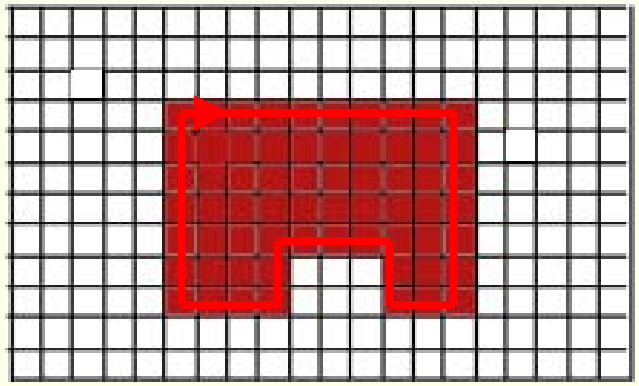
2. Raster Data Structures

- Run-length encoding
- Chain Codes
- Block Codes
- Quad-tree Model

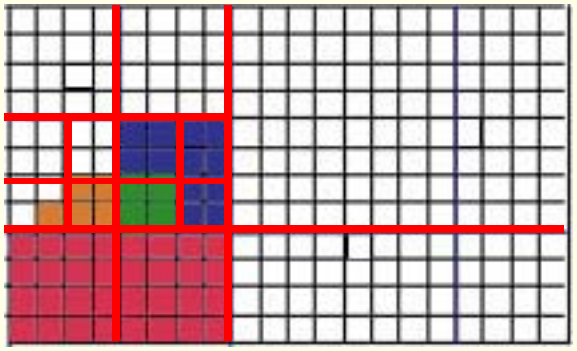
2.1 Raster Data Structure Types



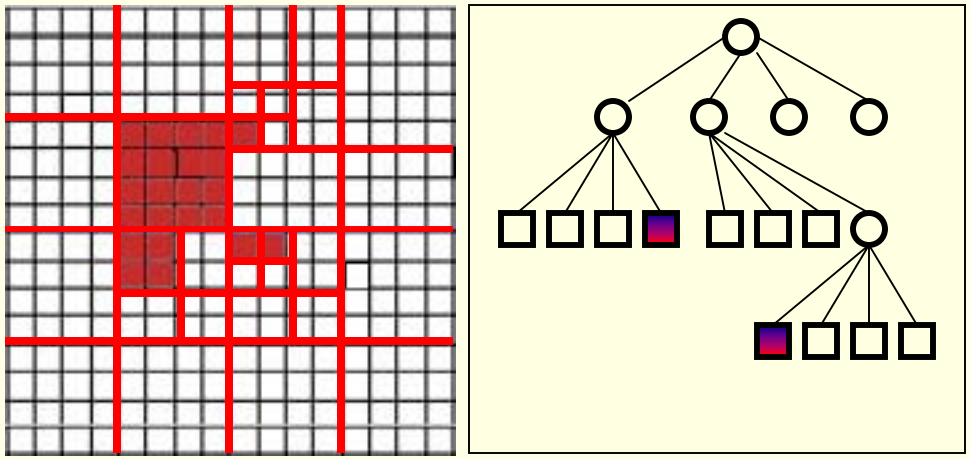
Run Length



Chain Codes



Block Codes



Quad-tree Model

Prepared by Mona Lacoul, July 2004

3. Advantages and Disadvantages

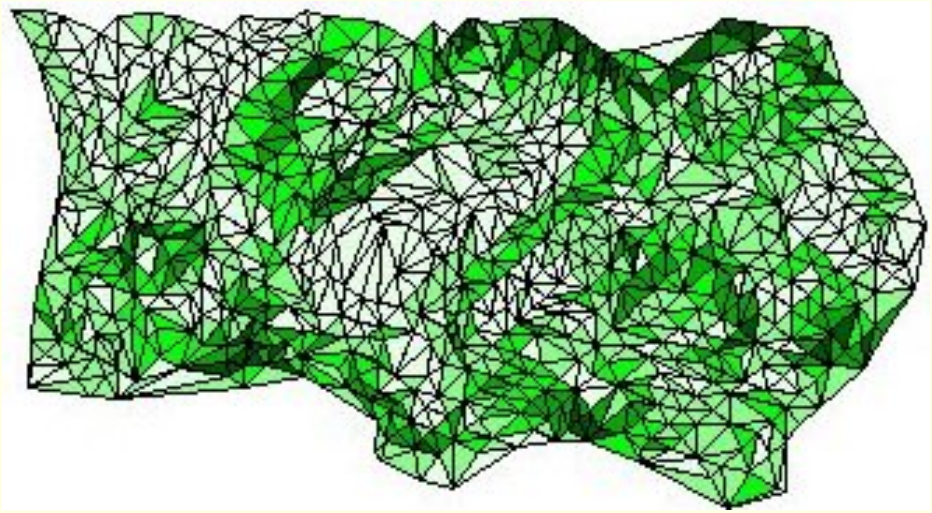
Raster	
Data Collection	Rapid
Data Volume	Large
Data Structure	Simple
Geometric Accuracy	Poor
Area Analysis	Good
Continuous phenomenon	Average
Modeling	Easy
Compatibility with image	good
Spatial resolution	low

4. Other Data Model

- **Triangular Irregular Network Data Model**

-Alternative to represent continuous surface.

-Effective display terrain , other types of continuous data.



Triangular Irregular Network (TIN)

5. Grids in ArcView

Floating Point Grids

-no attribute table associated

-can be converted to integer by classify

Integer Grids

Value Attribute Table (VAT)

-contains value and its counts for each record.

No Data Value

-assigned to cells which are doesn't have data value.

6. Exercise

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6.1 Working with grid themes

Activating spatial analysis
Open existing data
Delete grid theme
Converting shape file to raster grid
View Theme Properties
Retrieve information of individual cell
View Histogram

6.2 Available Functions

Calculate density
Reclassify
Map query
Map calculator
Tabulate area
Histogram by zones

Summarize zones
Find distance
Assign proximity
Neighborhood statistics
Create contour
Derive slope
Derive aspect
Interpolate Surface

6.3 Surface Modeling with TIN and DEM

6.1 Working with grid themes

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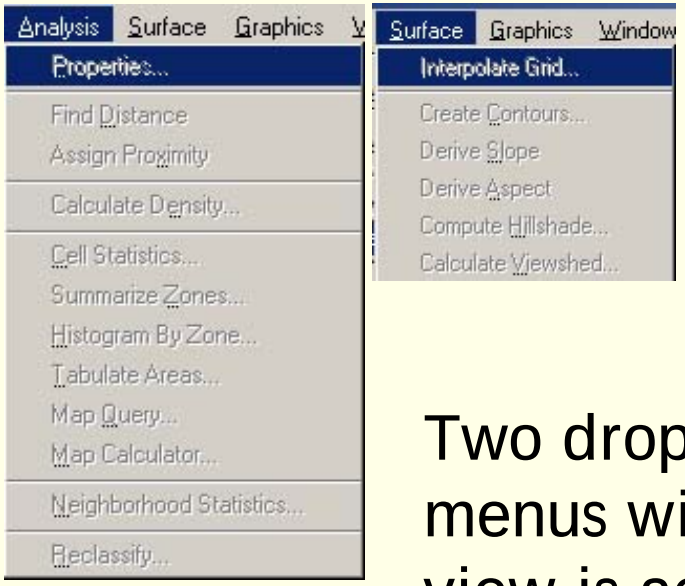
1.Activating spatial analysis

Start ARCVIEW  .

Select *EXTENSION* from *FILE* dropdown menu.

Click *SPATIAL ANALYSTS* on *EXTENSION* window.



Two drop down selection menus will be available when view is active.

6.1 Working with grid themes

2.1 Open existing data

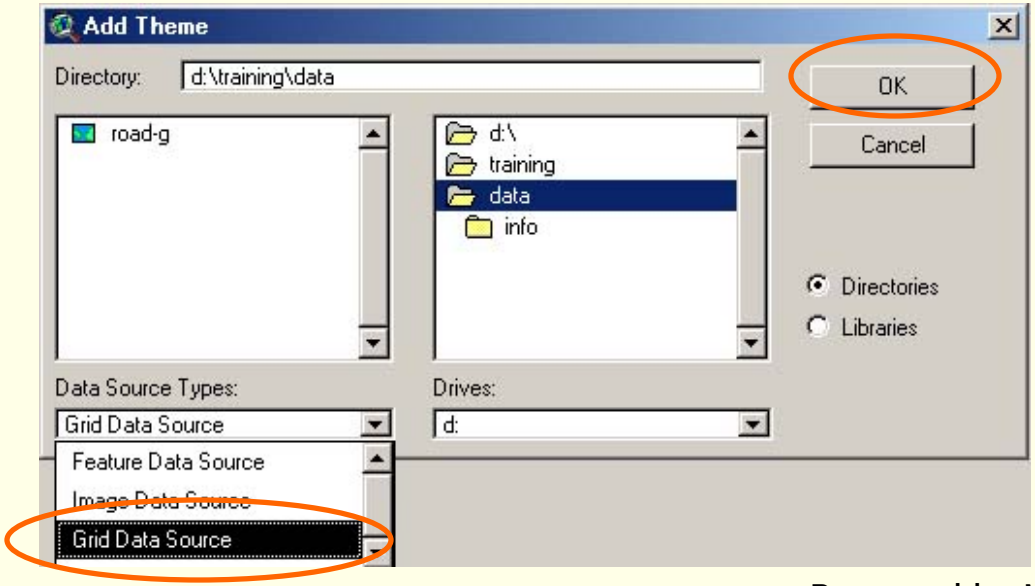
Open a view window by clicking on NEW on project window.

Click add theme button  .

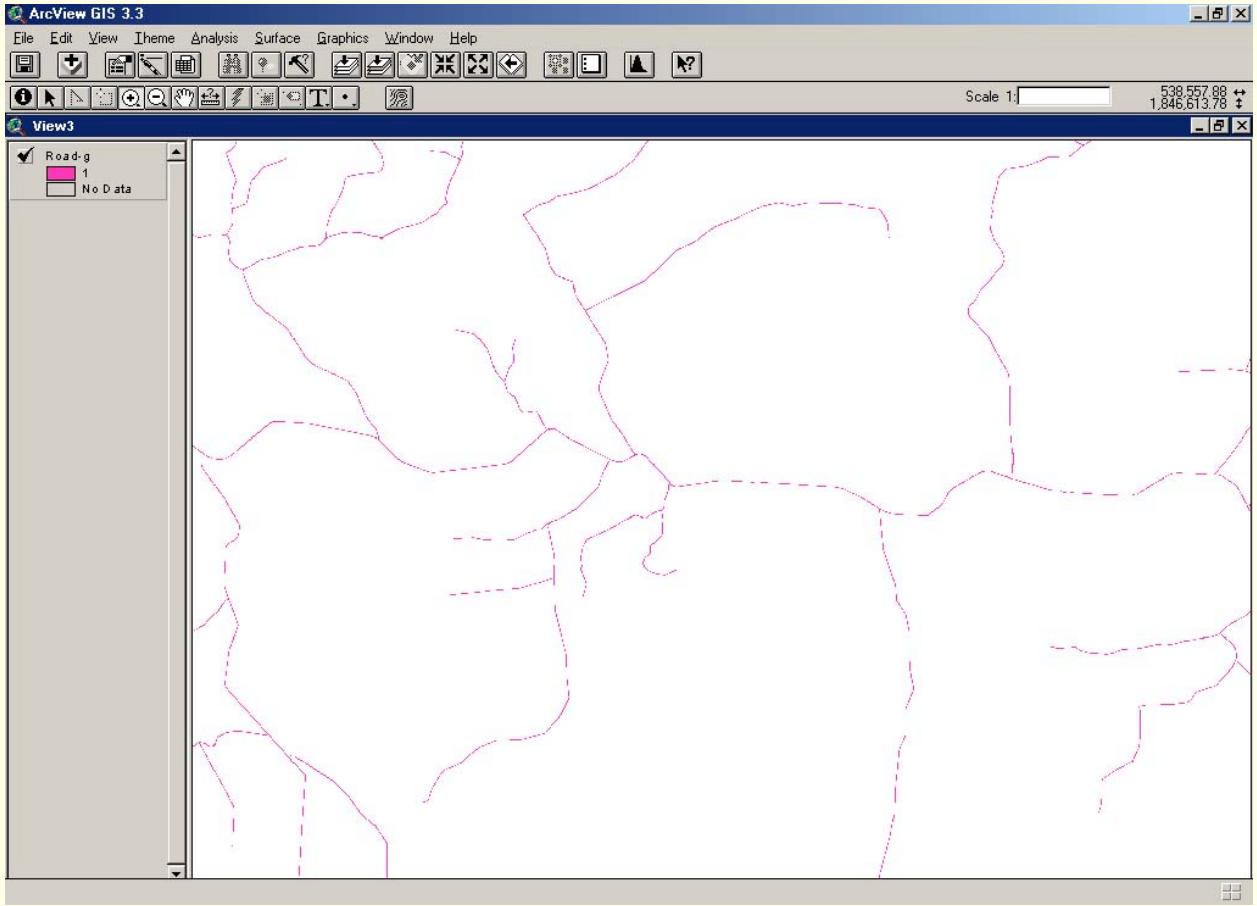
Change the *DATA SOURCE TYPES* to *GRID DATA SOURCE*.

Select the data "road-g" to load.

Click *OK*.



2.2 Open existing data



6.1 Working with grid themes

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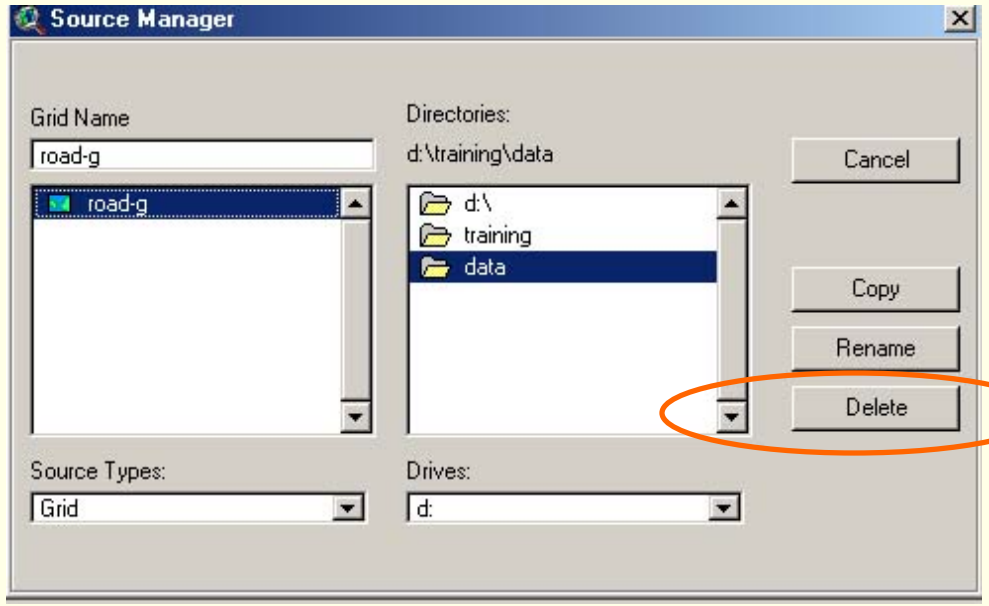
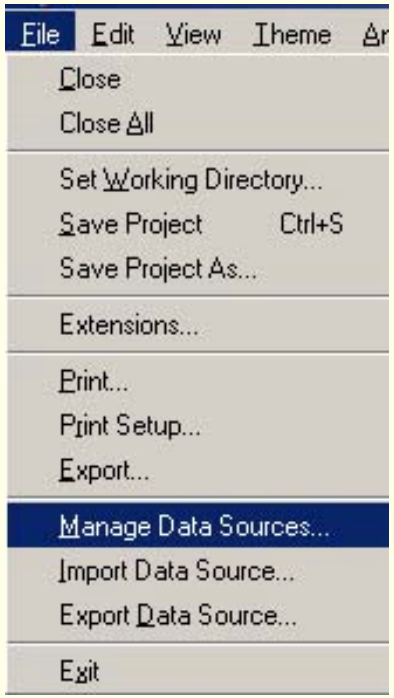
3. Delete grid theme

Select *MANAGE DATA SOURCE* from *FILE* menu.

Select “road_g” .





Press *DELETE* to delete the grid data.

6.1 Working with grid themes

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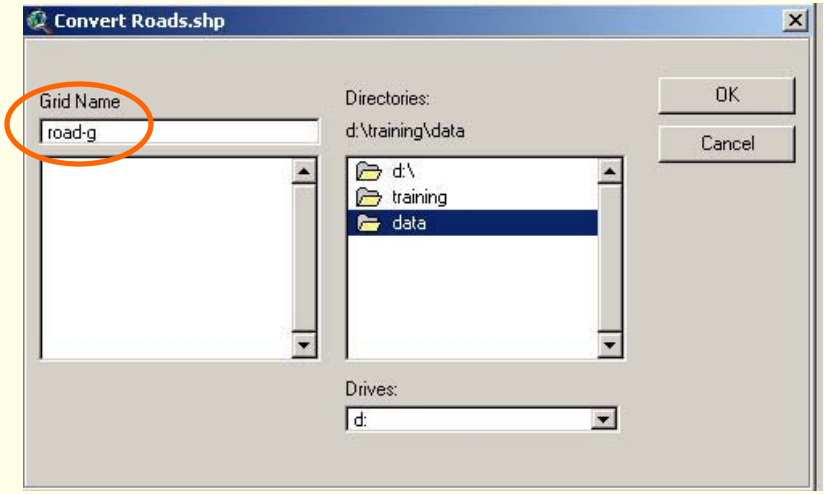
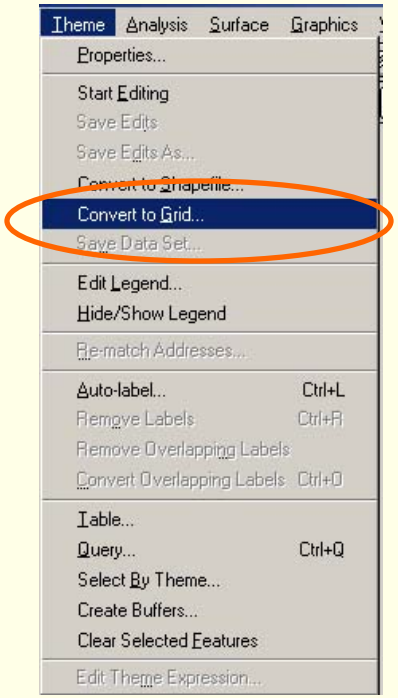
4.1Converting shape file to raster grid

Load shape file " roads.shp" to view window  .

Select *CONVERT TO GRID* from *THEME* menu.

Specify the output grid name "road-g".





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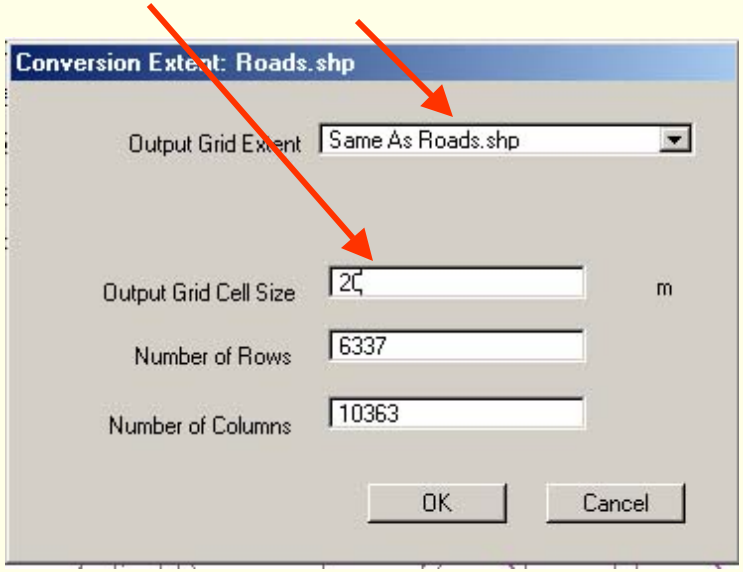
4.2 Converting shape file to raster grid

Specify *CELL SIZE* and *OUTPUT GRID EXTENT.*



Note, The View property should be defined before specifying cell size and extent.

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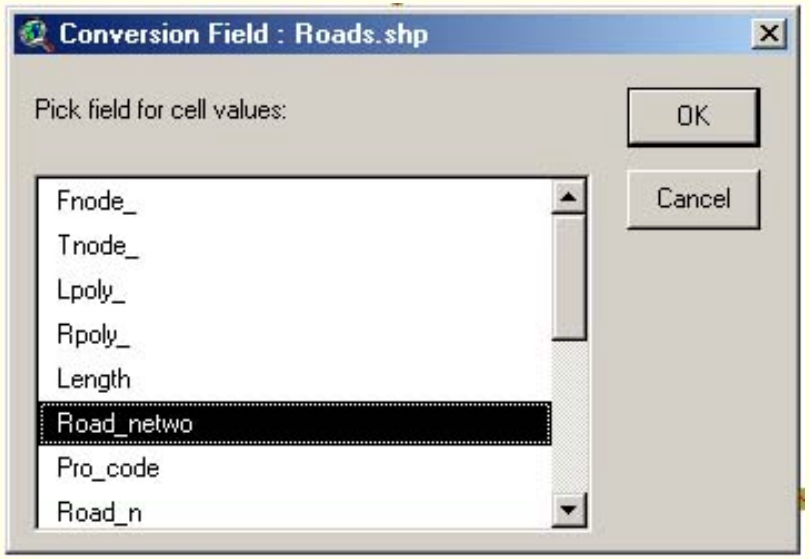
4.3 Converting shape file to raster grid

Specify conversion field “road_network”.



Click *OK* to join remaining database.

Click *OK* to view it on screen.

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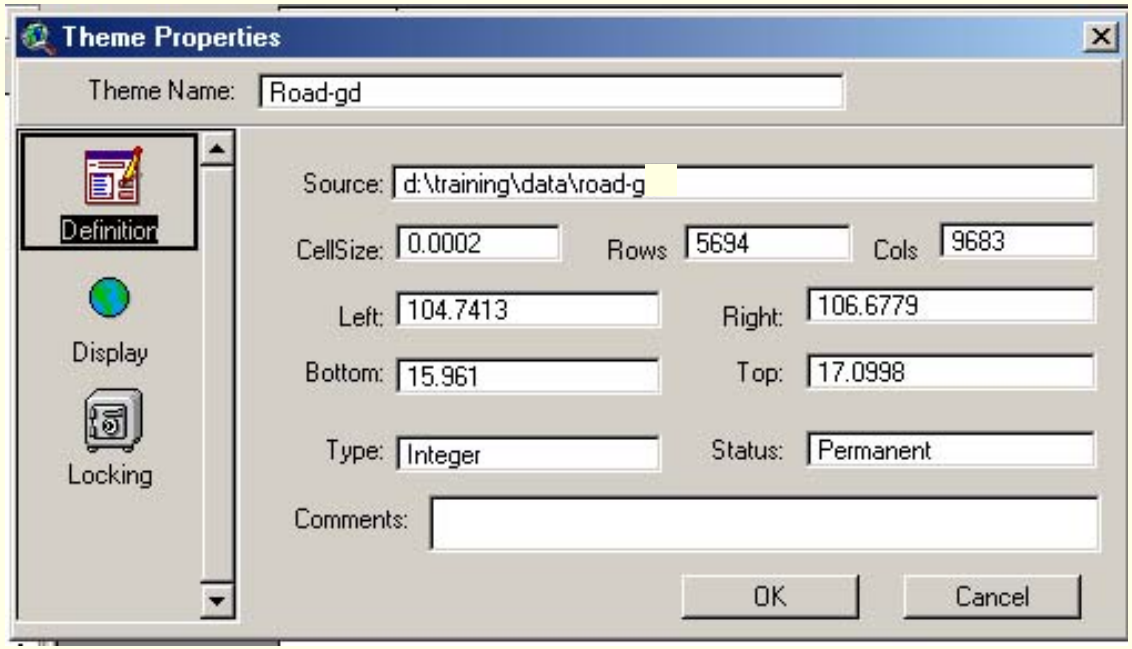
5. View Theme Properties

Make the theme active.

Select *PROPERTIES* from *THEME* menu.



6.1 Working with grid themes

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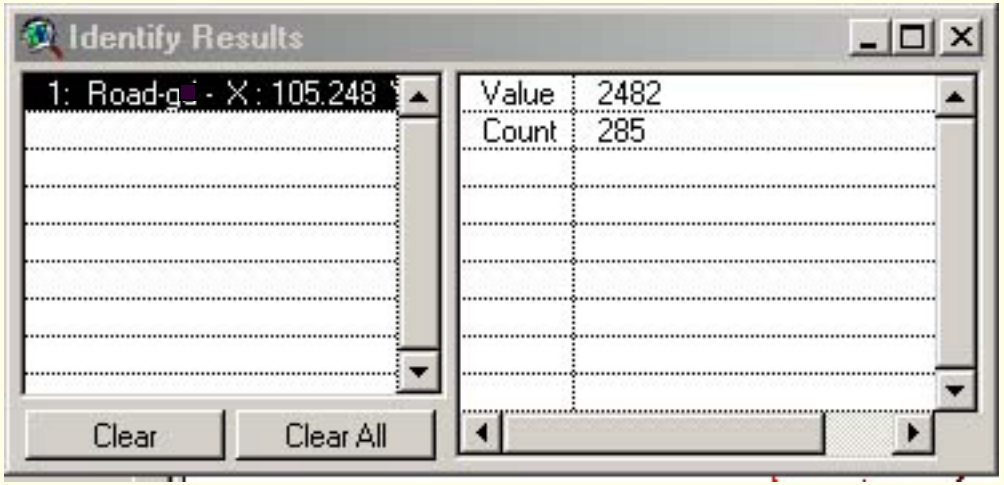
6. Retrieve information of individual cell

Make the theme road-g active.

Pick *IDENTIFY* tool  .

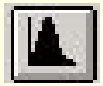
Click on the cell of interest.

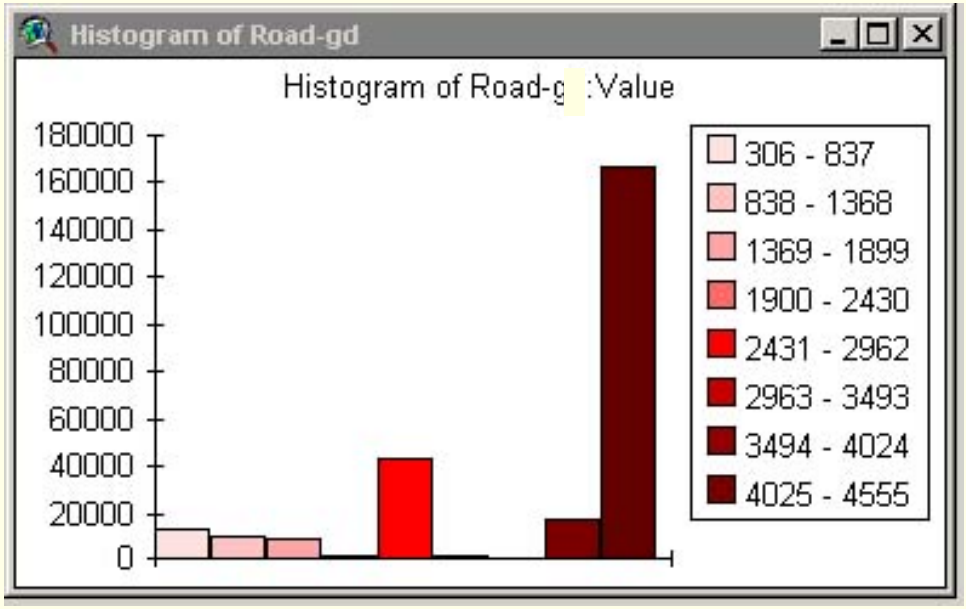


6.1 Working with grid themes

7.View Histogram

Make the theme road-g active.

Click the histogram button  .



6.2 Available Function

1.1 Calculate Density

-calculate Density

-distributes to produce a continuous surface.

-two types of density methods are

Simple (simple average method)

Kernel (quadratic kernel function)

-the occurrences of the measured quantity per specified Area Unit.

-finding density of houses,population, wildlife observations, or crime reports

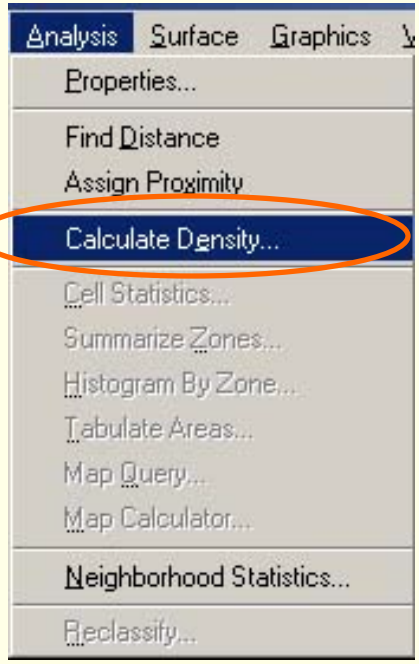
6.2 Available Function

1.2 Calculate Density

Click add theme button  to display “pop95_p”.

Make the theme “pop95_p” active.

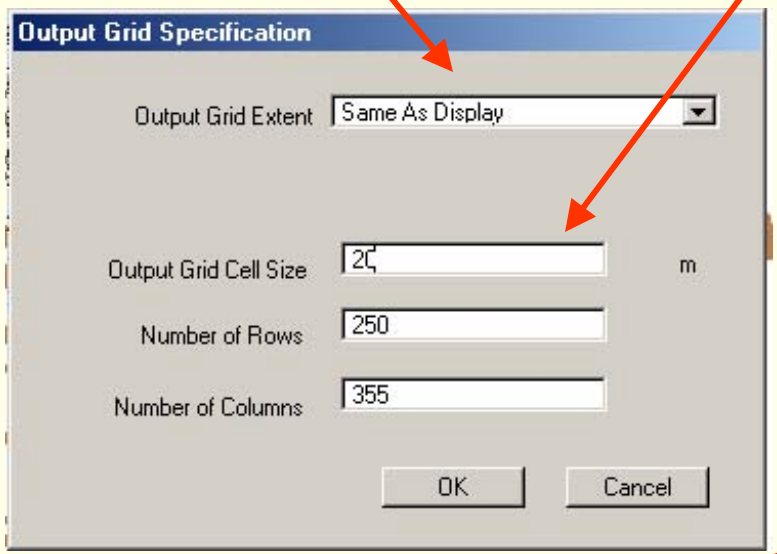
Select *CALCULATE DENSITY* from *ANALYSIS* menu.



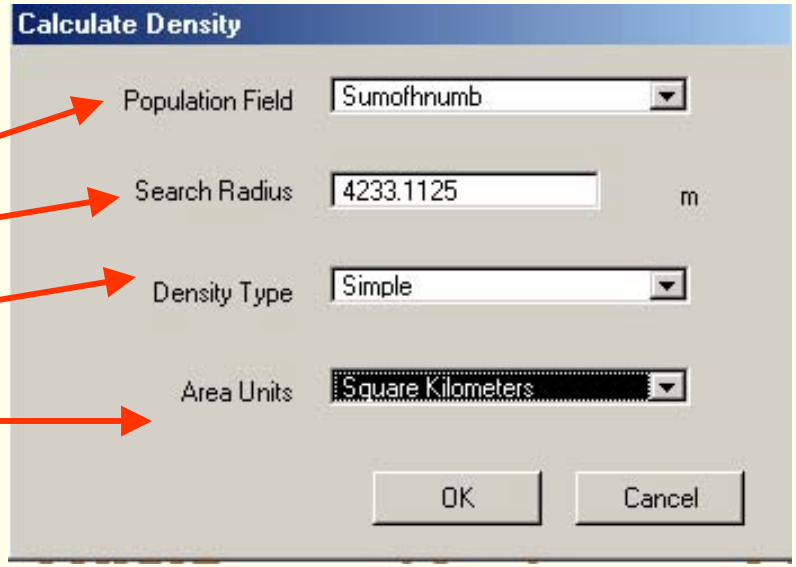
6.2 Available Function

1.3 Calculate Density

Specify output cells size, output extent and press ok.

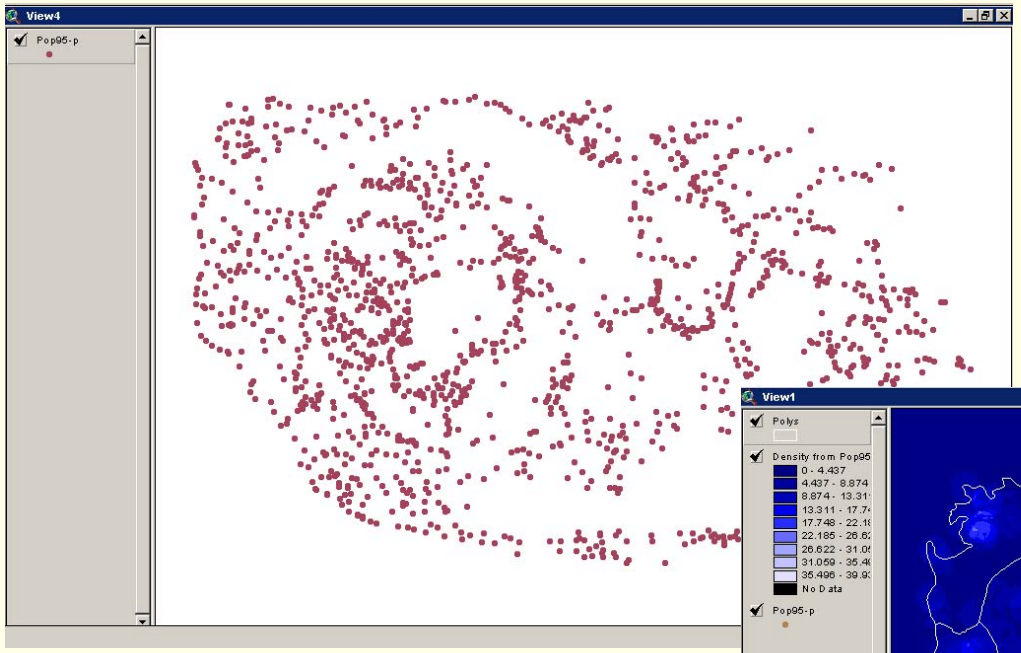


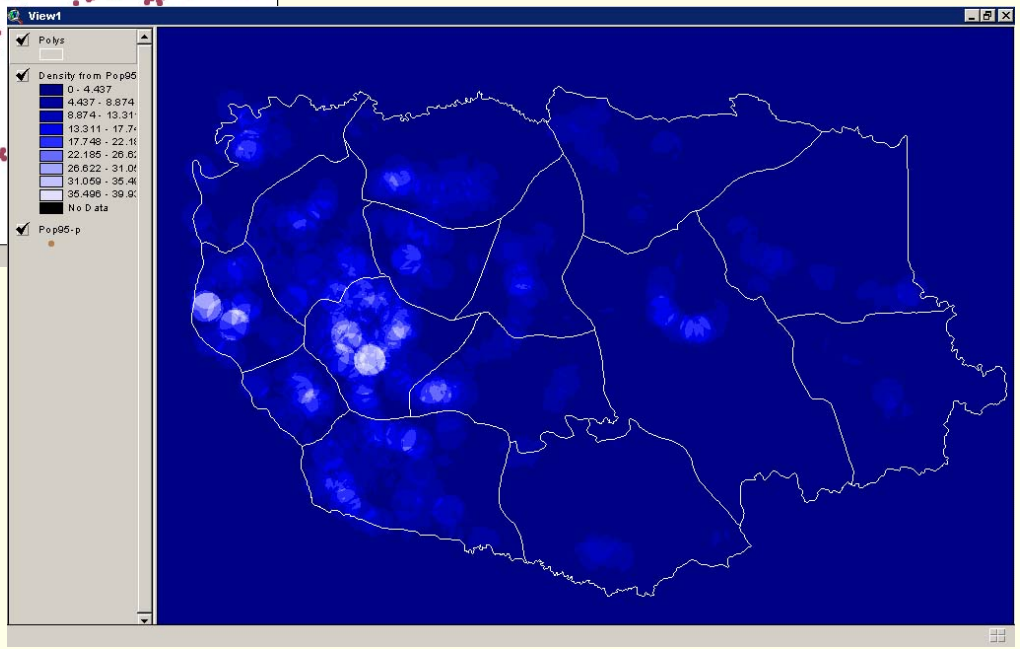
Specify population field, search radius, density type, area unit and press ok.



6.2 Available Function

1.4 Calculate Density





Save “density from poulation95_p” as “density”.

6.2 Available Function

2.1 Reclassify

-Allows set standard classification methods

-Set the parameters for that classification

-Equal Area, Equal Interval, Natural Breaks, Quantile, Standard Deviation

-Classify gird to assign weight

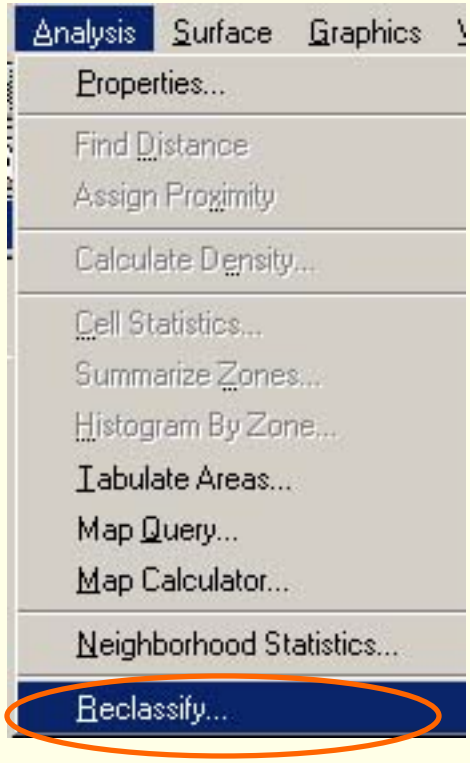
-perform suitability analysis

6.2 Available Function

2.2 Reclassify

Make the theme “density from pop95_p” active.

Select *RECLASSIFY* from *ANALYSIS* menu.



6.2 Available Function

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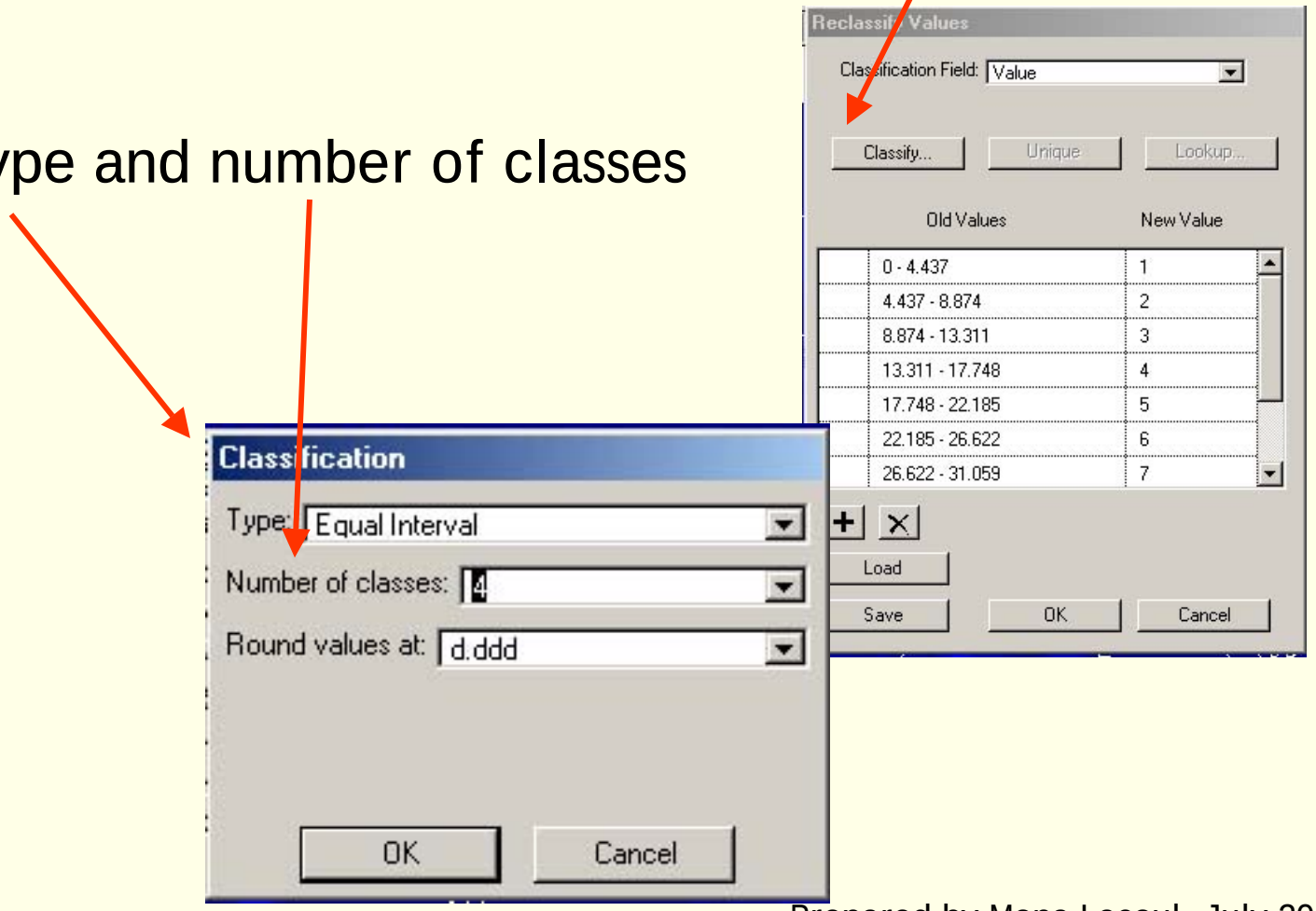
2.3 Reclassify

Reclassify values window will popup. Click *CLASSIFY* button.

Specify type and number of classes

Press OK.



6.2 Available Function

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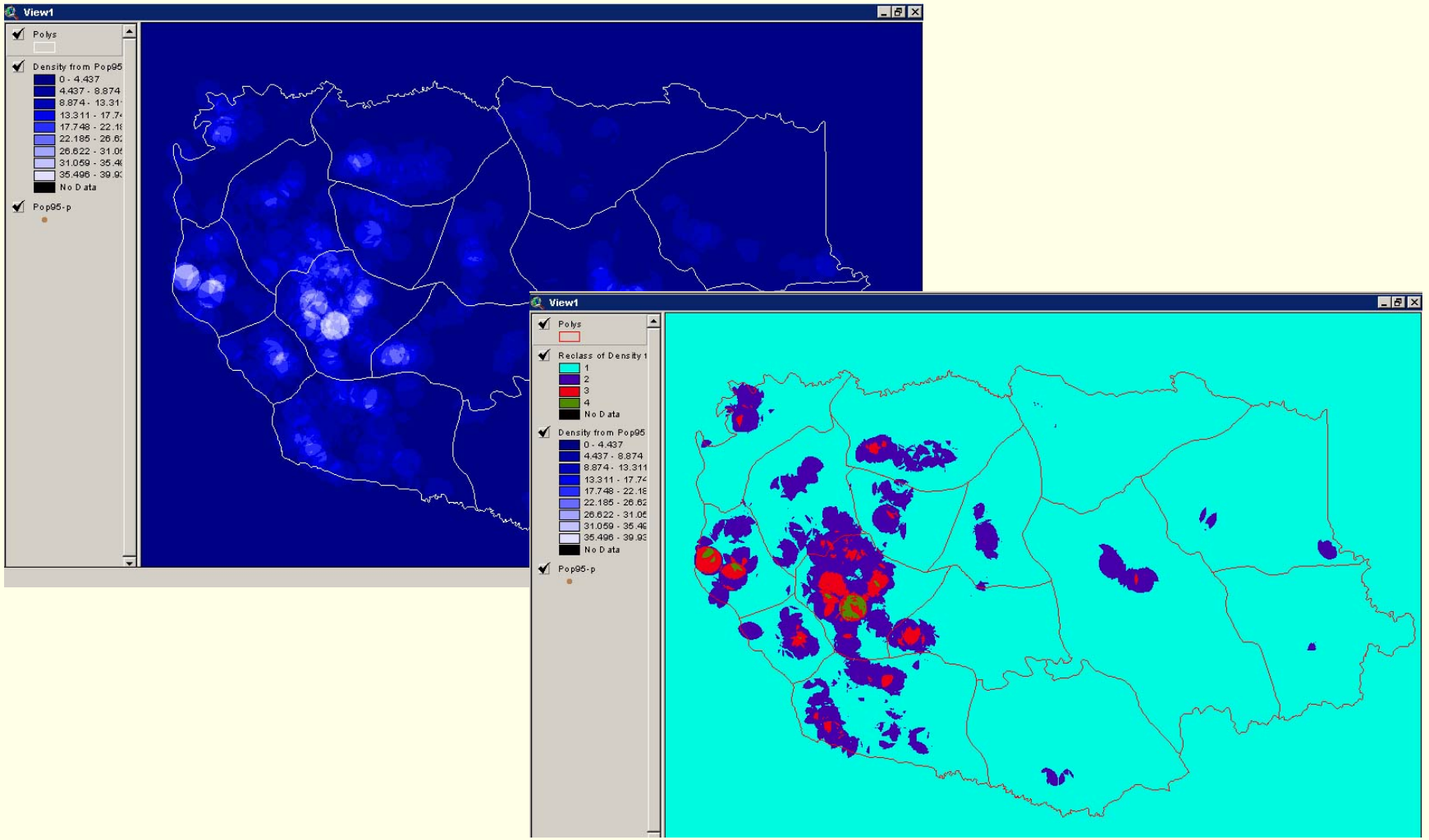
2.4 Reclassify



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6.2 Available Function

3.1 Map Query

allows to select areas spatially by defining a Boolean query based on the values of one or more grid themes.

The output- a grid theme with areas that

1 (TRUE)

0 (FALSE)

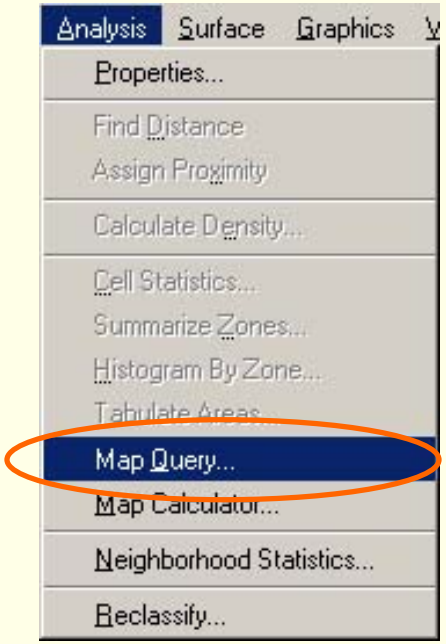
6.2 Available Function

3.2 Map Query

Add grid theme “density”.

Make the theme “density” active.

Select *MAP QUERY* from *ANALYSIS* menu.



6.2 Available Function

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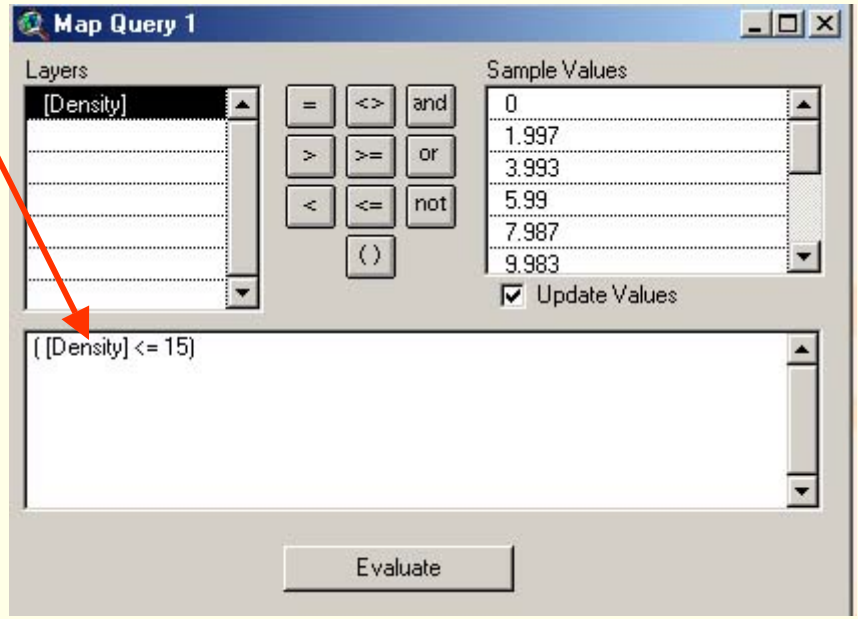
3.3 Map Query (single grid)

Enter query in the map query window.



Selects cells that are having density less than 15 person/sq km and returns value 1in output grid.

6.2 Available Function

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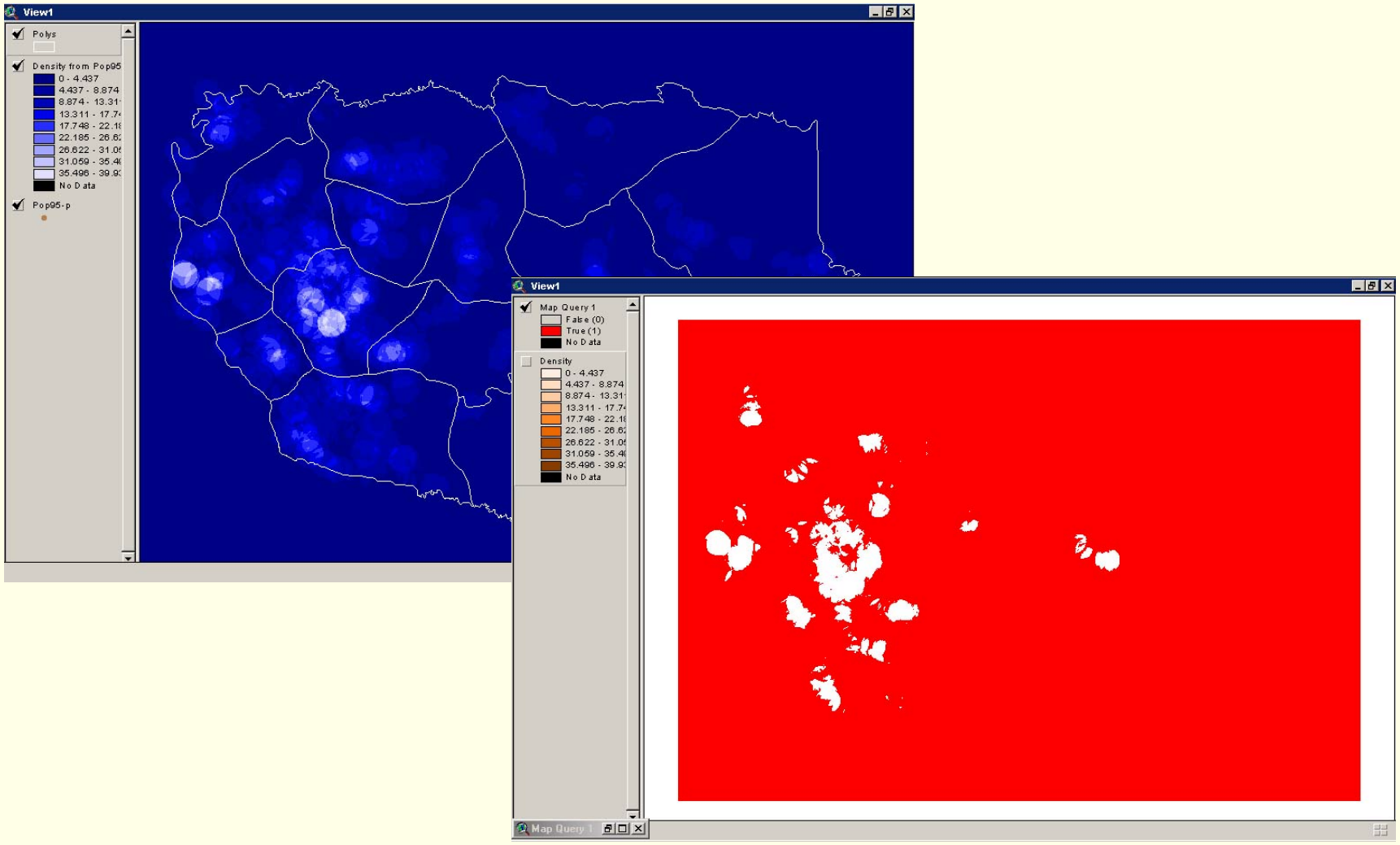
3.4 Map Query (single grid)



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Exercise I :

Find out low population density area in

1. Othuomphun district
2. Nong, Thapngthong and Songkhon districts.

The available dataset are

Population data (pop95_p)

District map (district-p)

Form your own criteria for the analysis.

6.2 Available Function

4.1 Map Calculator

-Performs analysis on grid themes using mathematical expressions.
-Available operations
- Arithmetic
- Trigonometric
- Boolean, and
- relational operations.

-Creates a grid theme as output.
(change the expression and re-evaluate the grid theme without having to create a new grid theme.)

6.2 Available Function

4.2 Map Calculator (arithmetic operators)

The four basic arithmetic operators

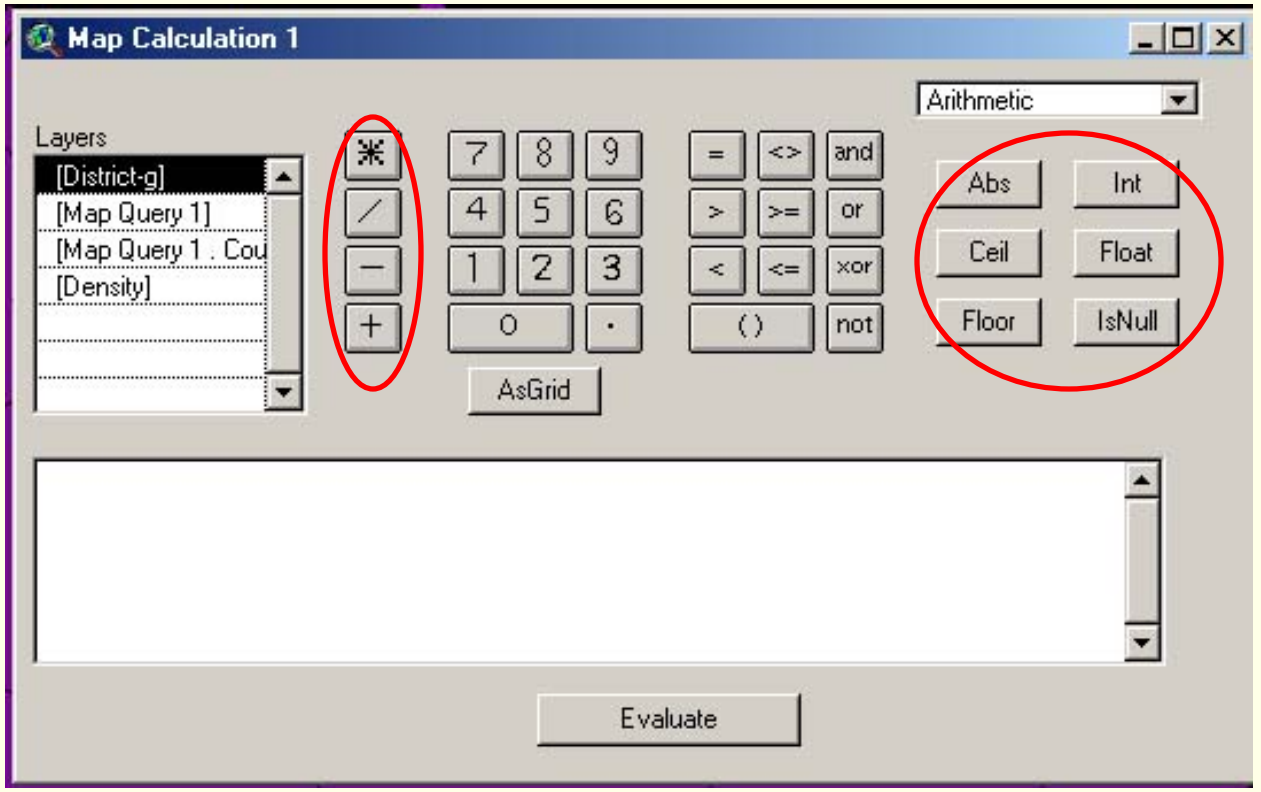
Multiplication

Division

subtraction

addition

Other (float..)



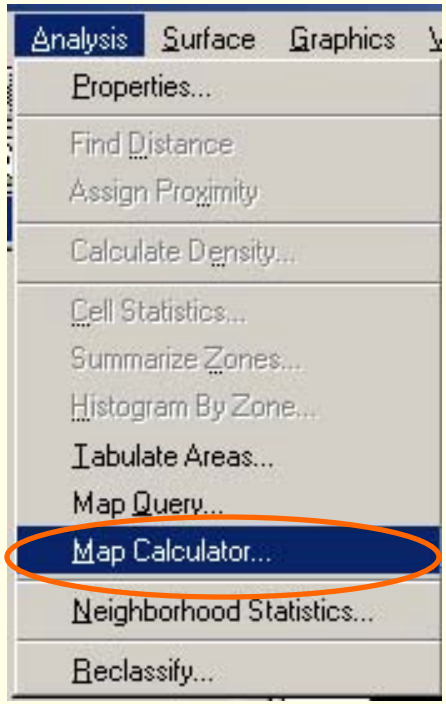
6.2 Available Function

4.3 Map Calculator(arithmetic operators)

Make the theme “density” active.

Click add theme button  to display “district-g”.

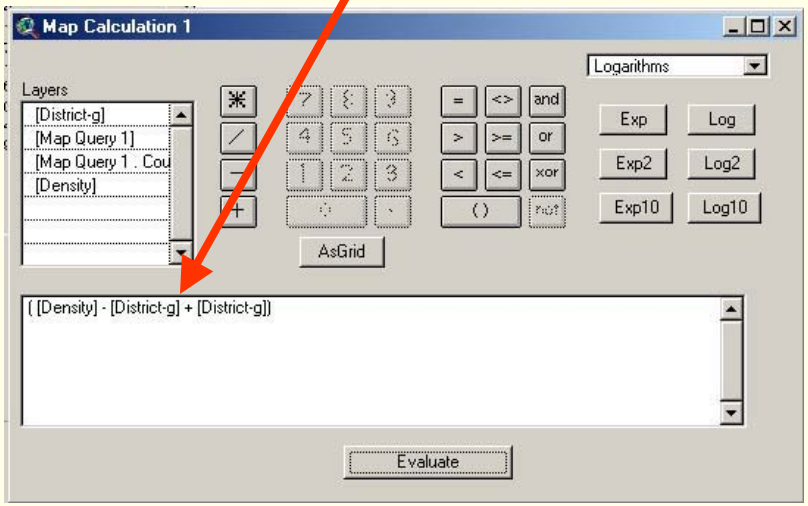
Select *MAP Calculator* from *ANALYSIS* menu.



6.2 Available Function

4.4 Map Calculator(arithmetic operators)

Type following expression.



Note,spatial extent of population density grid is larger than the actual study area. Above expression will create the population density map for the study area.

6.2 Available Function

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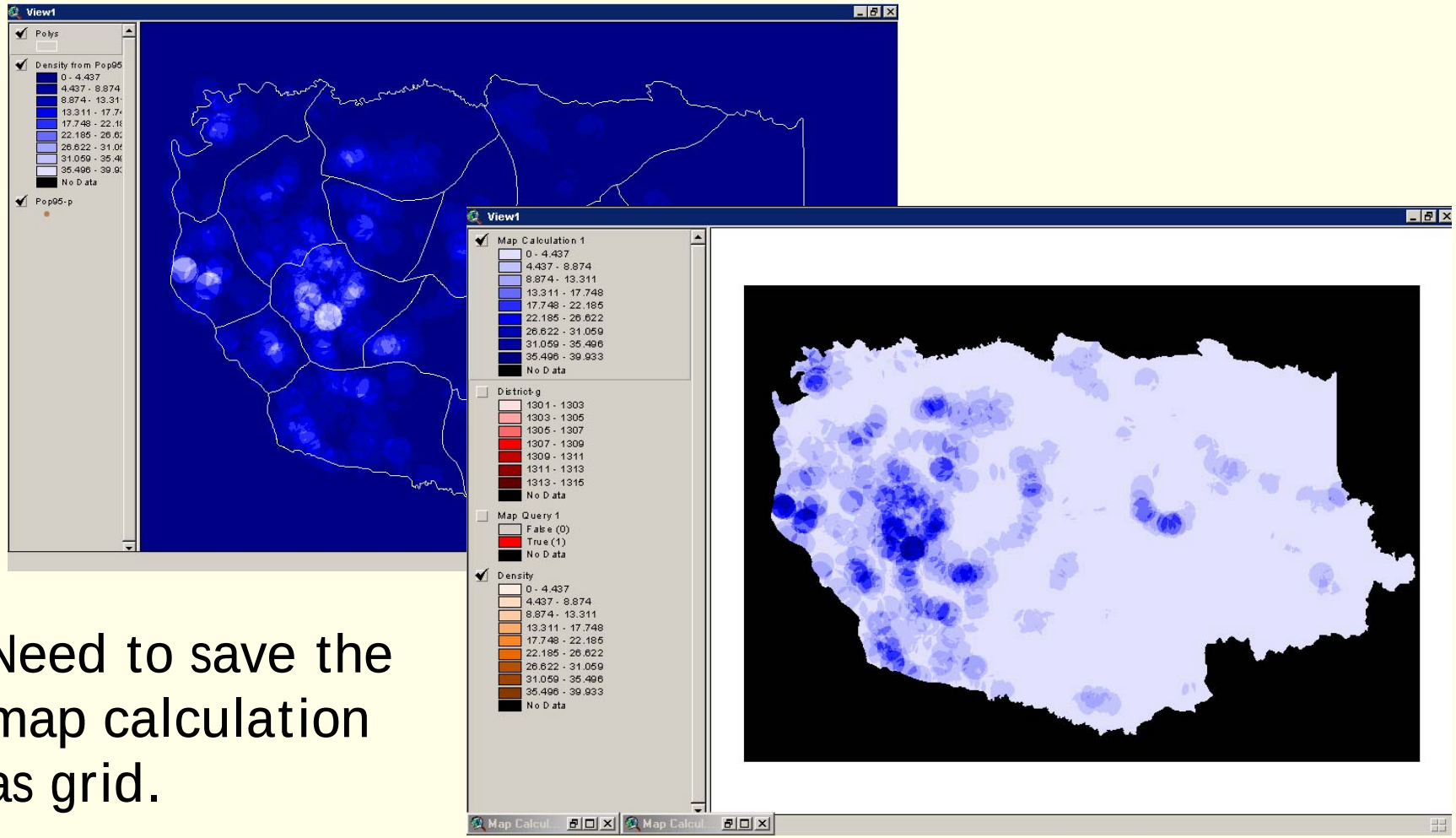
4.5 Map Calculator(arithmetic operators)



Need to save the map calculation as grid.

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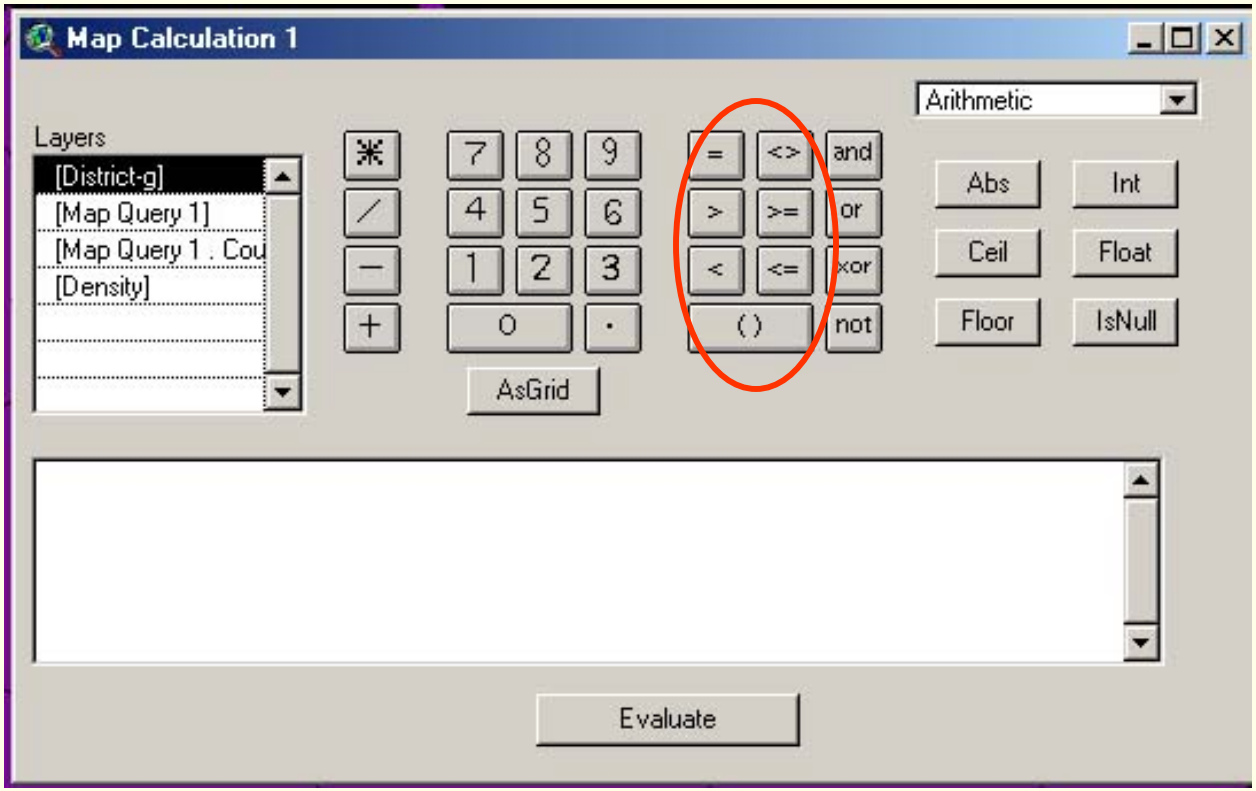
6.2 Available Function

4.6 Map Calculator(relational operators)

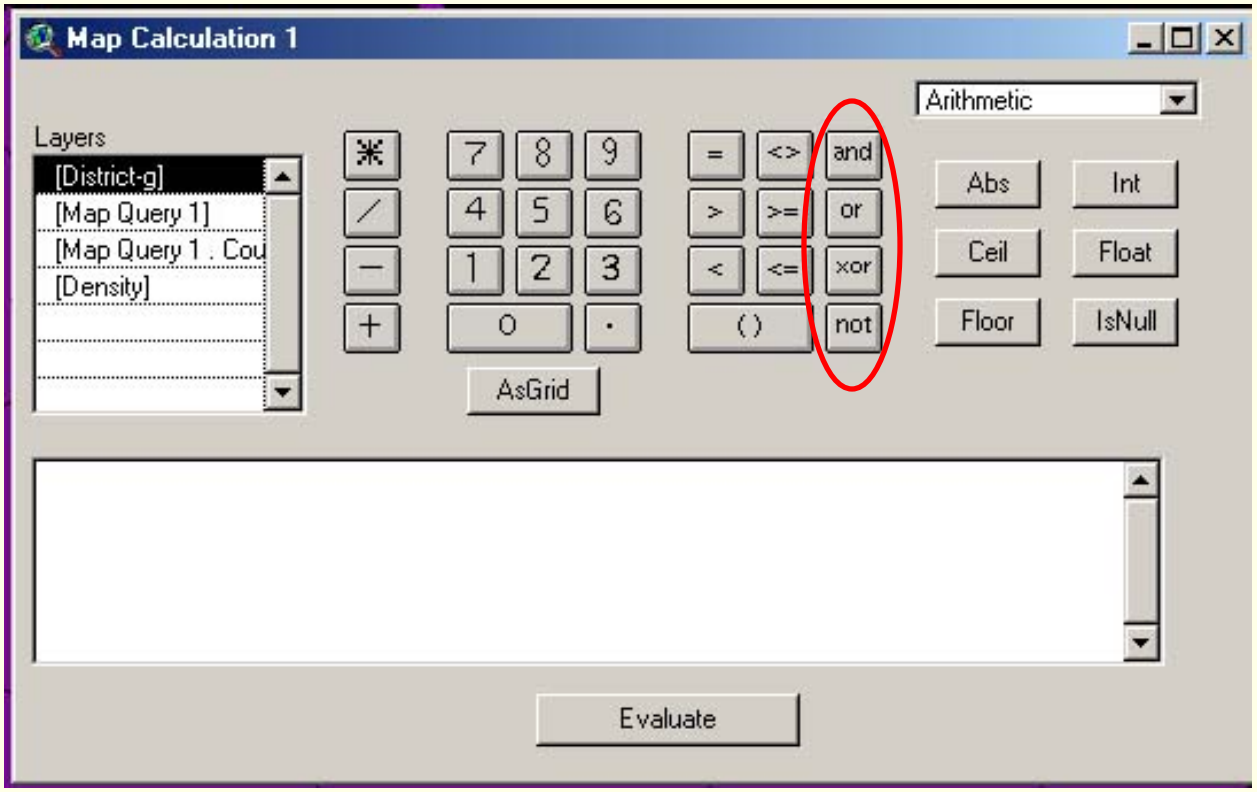
-compare the values of two grid themes or numbers on a cell by cell basis.



6.2 Available Function

4.7 Map Calculator(Boolean operators)

-compare the values of two grid themes or numbers on a cell by cell basis.



6.2 Available Function

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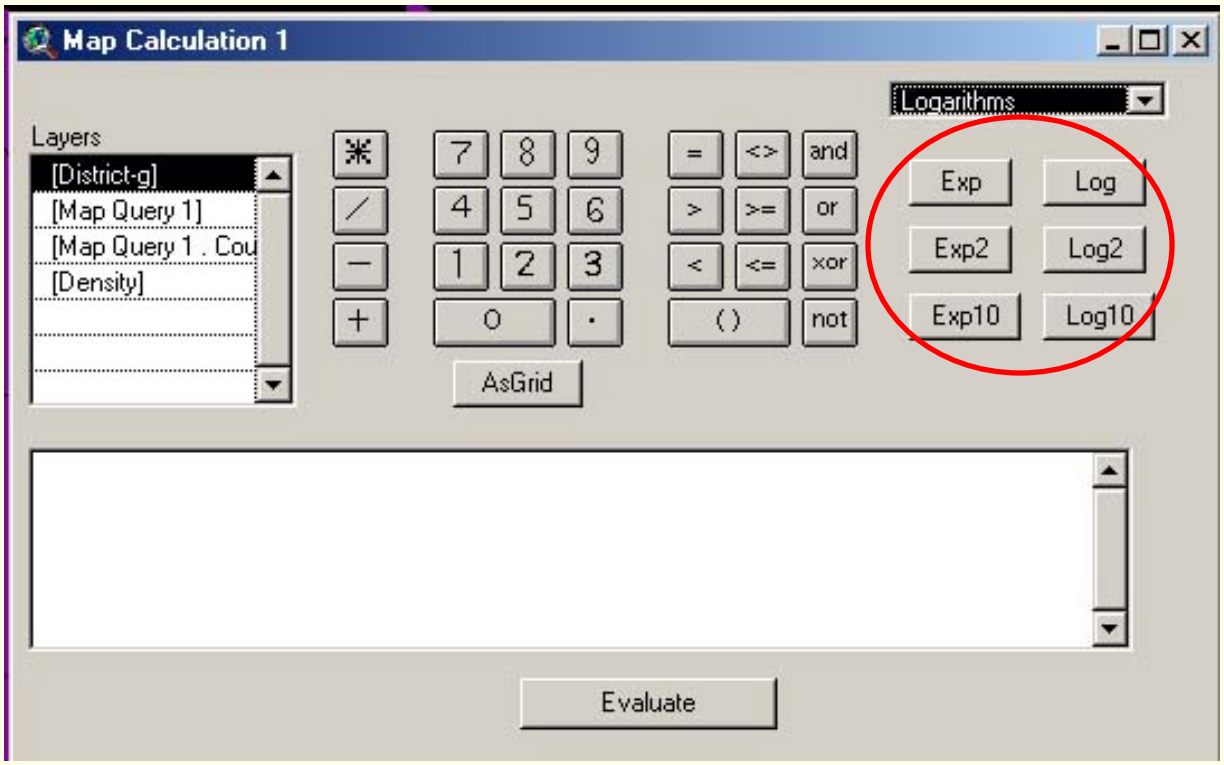
4.8 Map Calculator(Logarithmic operators)

-perform logarithm and exponential analysis on grid themes or numbers.



6.2 Available Function

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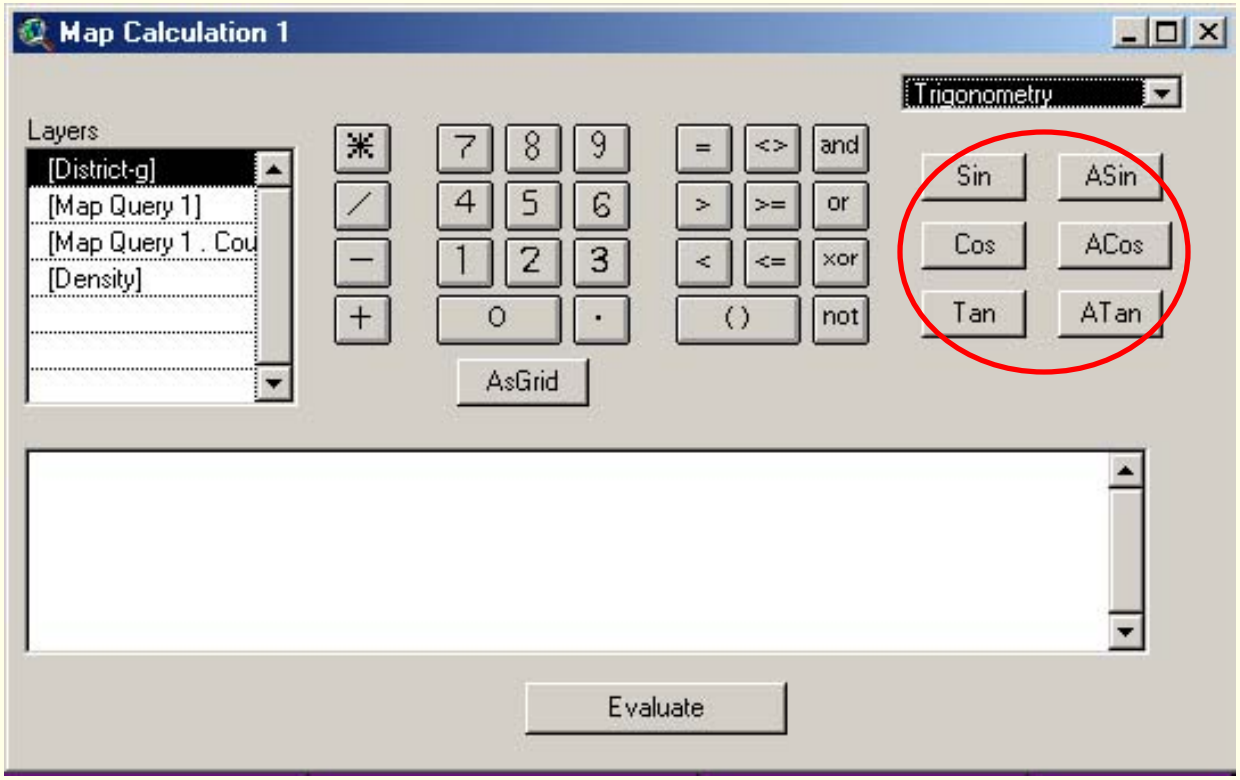
4.9 Map Calculator(Trigonometric operators)

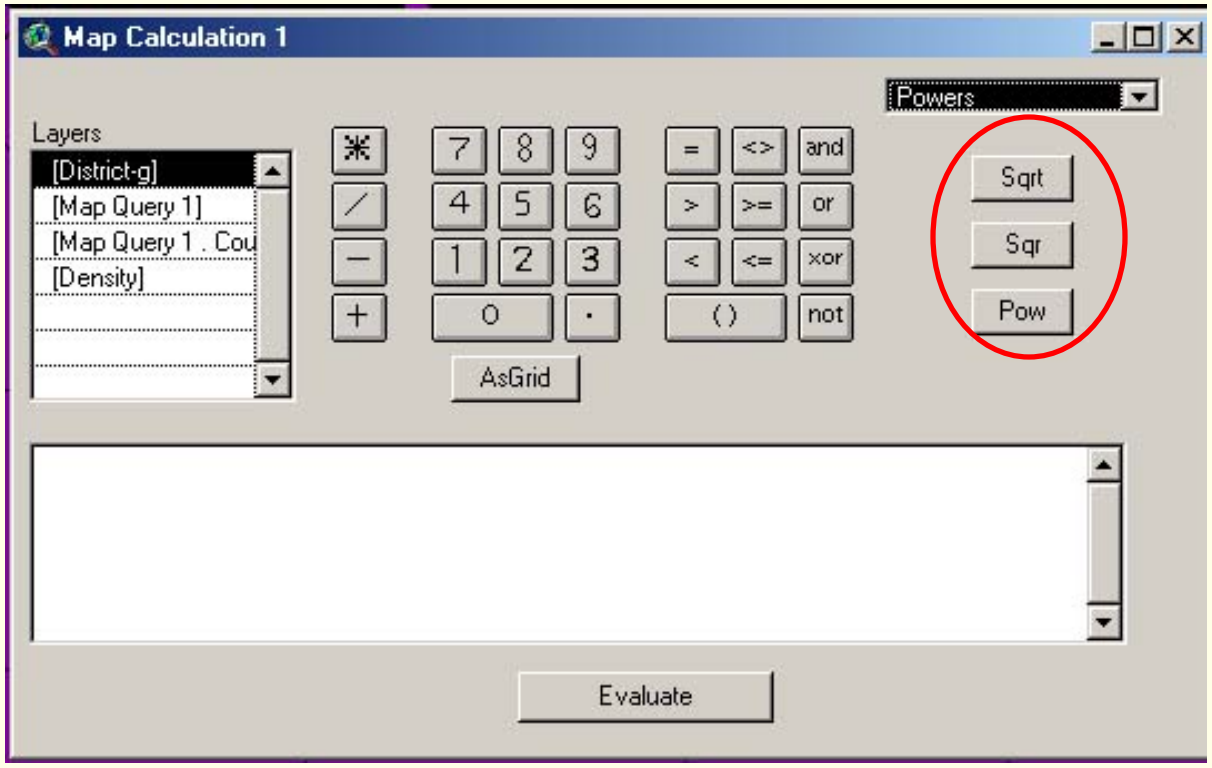
- perform trigonometric analysis on a grid theme or number.
- input values should be in radians (rad=angle * pai/180deg).



6.2 Available Function

4.10 Map Calculator(power operators)

-raise grid themes or numbers to certain powers.



6.2 Available Function

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5.1 Tabulate Area

-Performs a cross tabulation of the zones between two input themes.

-Creates an output table.

- values in the resulting table identify the area of each zone in one theme encompassed within each zone in another theme.

-Available at least two feature or two integer grid themes, or one of each.

-summarizing the area of each land use type within each county.

6.2 Available Function

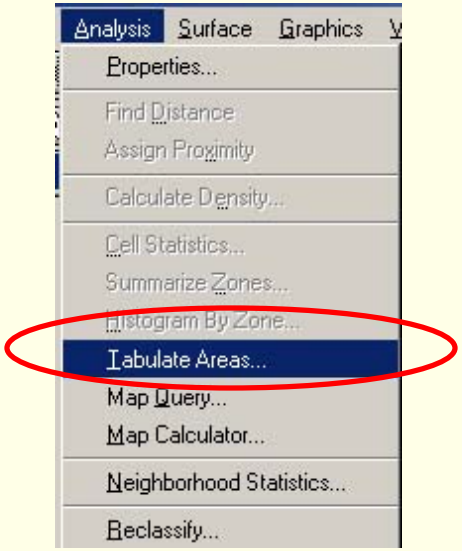
5.2 Tabulate Area

Make themes “density” and “ district-g” active.

Reclassify the density grid into four classes.

Save output as “recla_density” by using “*SAVE AS DATASET*”button on theme menu.

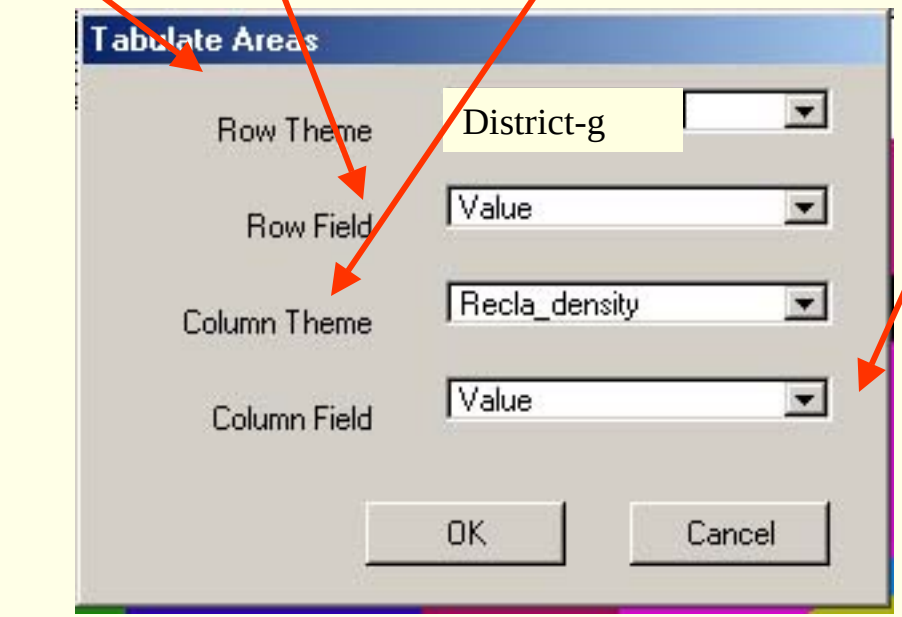
Select *TABULATE AREA* from *ANALYSIS* menu.



6.2 Available Function

5.3 Tabulate Area

Select row theme, row field, column theme and column field.



Press ok.

6.2 Available Function

5.4 Tabulate Area

Areas of Recla_density Tabulated For Each Zone in Map Calcul...

Value	Value-1	Value-2	Value-3	Value-4
1301	400904000.00	193198800.00	73634800.000	13846000.000
1302	782371200.00	294581600.00	4990000.000	0.000
1303	570018000.00	127002400.00	4033600.000	0.000
1304	3242338000.0	127012000.00	2585600.000	0.000
1305	2225020800.0	41643600.000	0.000	0.000
1306	1695648800.0	4884000.000	0.000	0.000
1307	2089960800.0	25833600.000	0.000	0.000
1308	1252700400.0	360196800.00	22835200.000	0.000
1309	385812000.00	472573600.00	154627600.00	36857200.000
1310	1090707600.0	89522000.000	25691200.000	0.000
1311	781847600.00	108759200.00	5401600.000	0.000
1312	1763554800.0	1547600.000	0.000	0.000
1313	1258482400.0	182536000.00	11321200.000	0.000
1314	300836800.00	138085600.00	15411600.000	430800.000
1315	915806800.00	82024000.000	22000.000	0.000

Table can be exported to other file formats (excel, dbase, text..) for further analysis of result.

6.2 Available Function

6.1 Histogram by zones

-points, lines, or polygons in the active theme are used to define what cells are used to create the histogram.

-allows you to examine the number of cell values for each class in a grid theme in a localized area defined with another theme.

-An integer grid theme, polygon theme.

-examine the number of cells of each land use type that intersect roads that have a 45 or 65 mph speed limit

6.2 Available Function

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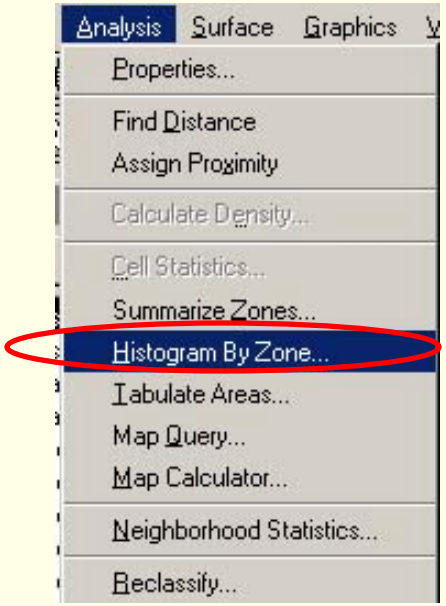
6.2 Histogram by zones

Add themes “recla_density” and “district-g” .

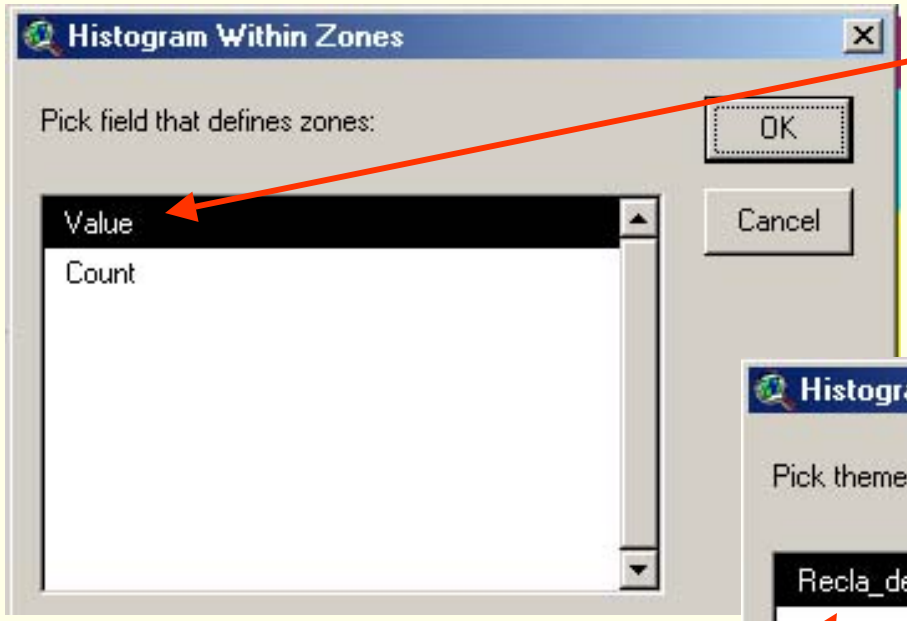
Make the theme “district-g” active.

Select *HISTOGRAM BY ZONES* from *ANALYSIS* menu.



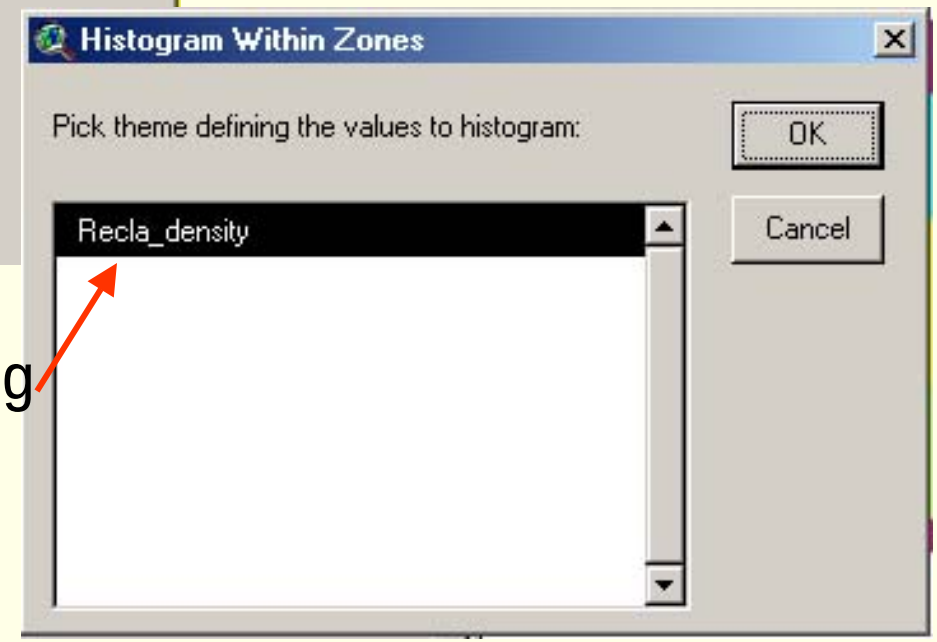
6.2 Available Function

6.3 Histogram by zones



Select the field to define zones for district grid.

Press OK.



Select the theme defining values to histogram.

Press OK.

6.2 Available Function

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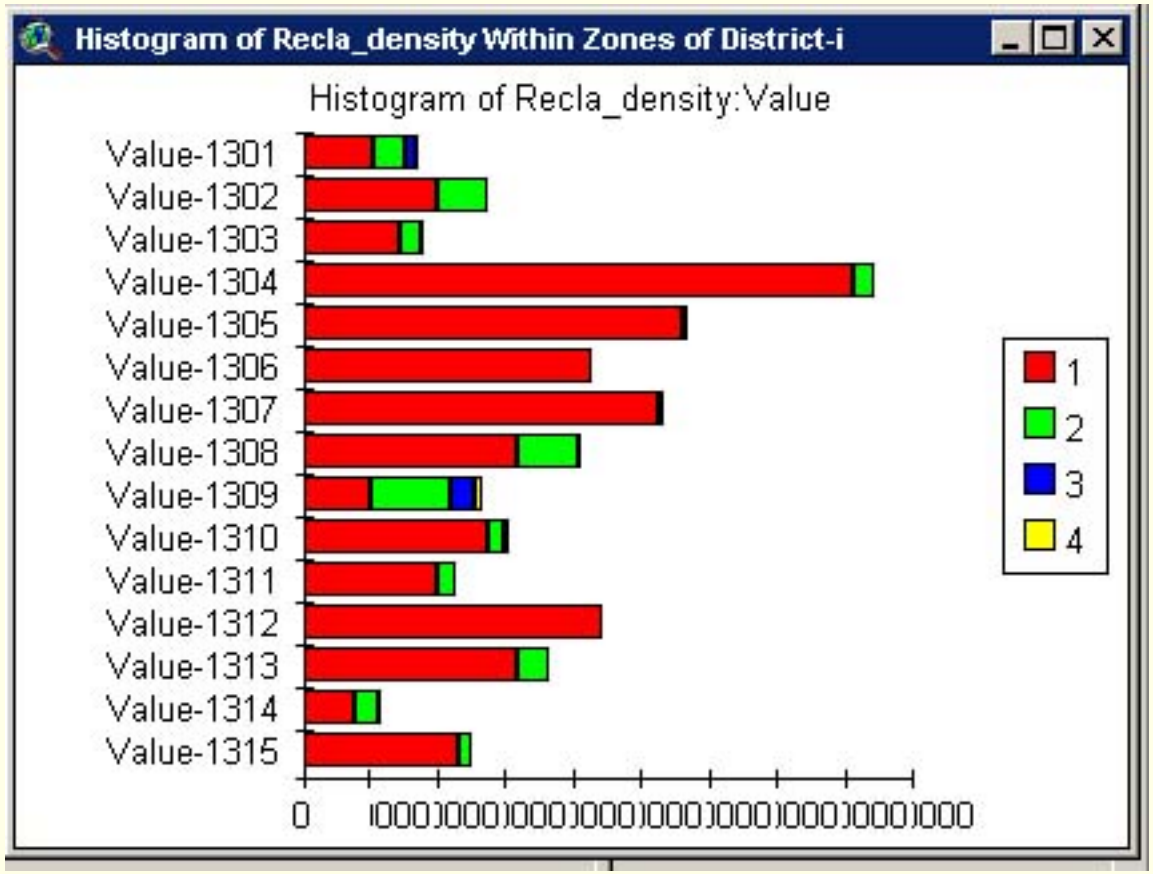
6.4 Histogram by zones



The chart displays proportion of population density in each district and can easily compared among the districts.

Different chart options are available.

Prepared by Mona Lacoul, July 2004

6.2 Available Function

7.1 Summarize Zones

-computes a chart and a table.

- output values are a function of the value of the cells in an input value grid theme found within each zone in the zone theme.

-zone theme:

- an integer grid theme or a feature theme.
- parcels in a city, land use categories, forest types, or buffer zones.

- value theme:

-a grid theme

-value theme(input grid): endangered species, vaccinations, housing prices, and sales.

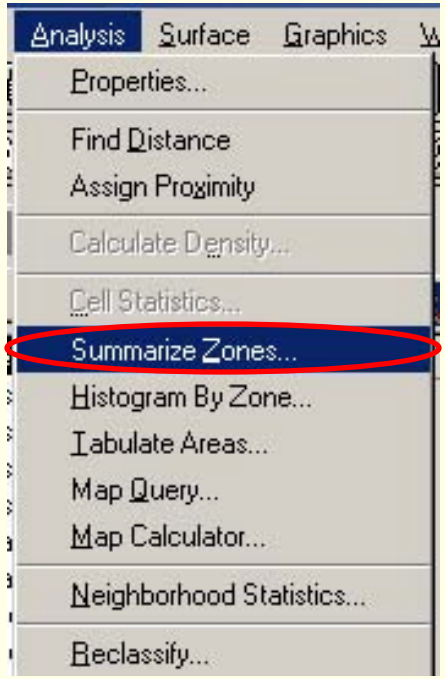
6.2 Available Function

7.2 Summarize Zones

Add themes “density” and “district-g” .

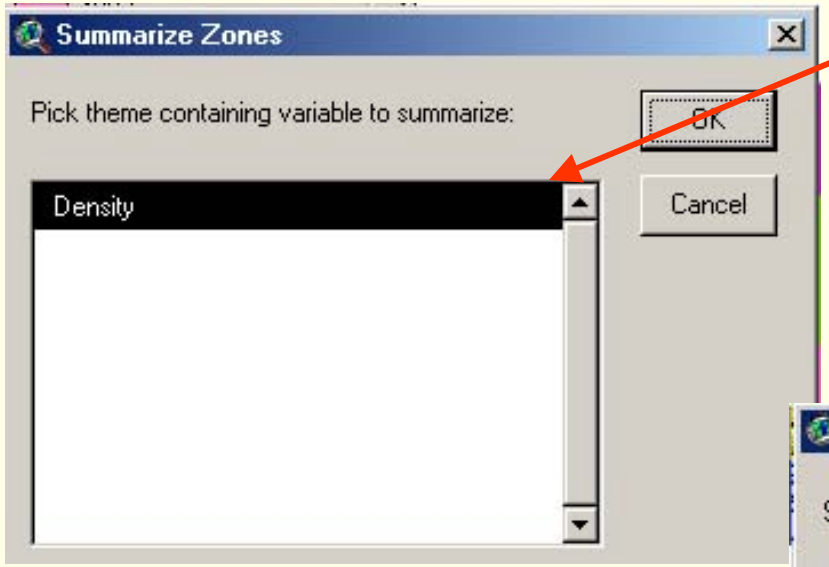
Make the theme “district-g” active.

Select *SUMMARIZE ZONES* from *ANALYSIS* menu.



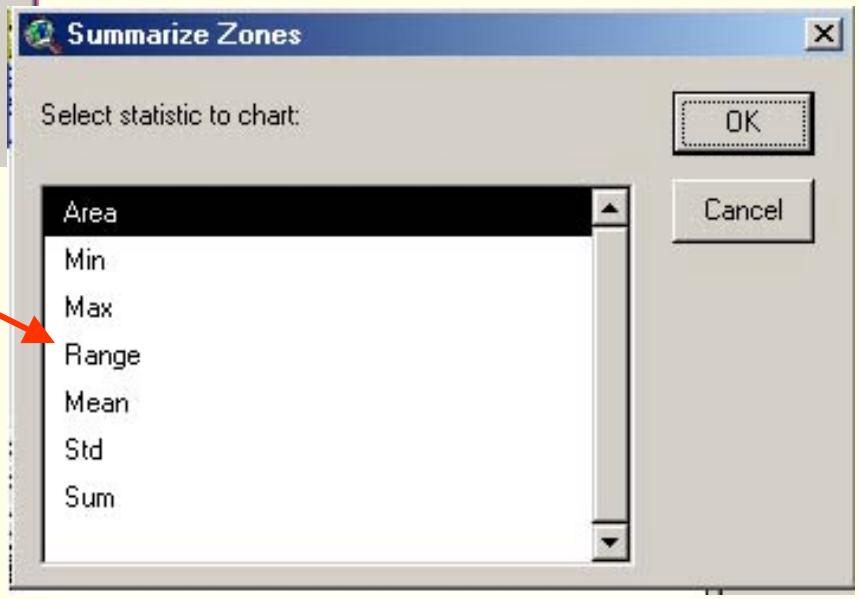
6.2 Available Function

7.3 Summarize Zones



Select theme containing variable to summarize.

Press OK.



Select statistic to display on chart.

Press OK.

6.2 Available Function

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7.4 Summarize Zones

Stats of Density Within Zones of District-i

Value	Count	Area	Min	Max	Range	Mean	Std	Sum	Label
1301	1703959	681583616.00	0.0000	38.6180	38.6180	10.4049	7.4554	17729552.000	1301
1302	2704857	1081942784.0	0.0000	25.6684	25.6684	7.0954	4.9897	19192132.000	1302
1303	1752635	701054016.00	0.0000	22.0624	22.0624	5.8558	5.0072	10263127.000	1303
1304	8429839	3371935488.0	0.0000	21.4939	21.4939	1.6539	3.1541	13941857.000	1304
1305	5666661	2266664448.0	0.0000	13.9799	13.9799	2.1072	2.3701	11940742.000	1305
1306	4251332	1700532736.0	0.0000	11.1555	11.1555	1.5269	1.7901	6491492.0000	1306
1307	5289486	2115794432.0	0.0000	13.7312	13.7312	1.5389	2.0708	8139871.0000	1307
1308	4089331	1635732352.0	0.0000	25.6684	25.6684	6.8451	4.7797	27991896.000	1308
1309	2624676	1049870400.0	0.0000	39.9325	39.9325	12.8432	8.2873	33709116.000	1309
1310	3014802	1205920768.0	0.0000						
1311	2240021	896008384.00	0.0000						
1312	4412756	1765102336.0	0.0000						
1313	3630849	1452339584.0	0.0000						
1314	1136912	454764800.00	0.0000						
1315	2494632	997852800.00	0.0000						

Table lists statistics of population density for each district.

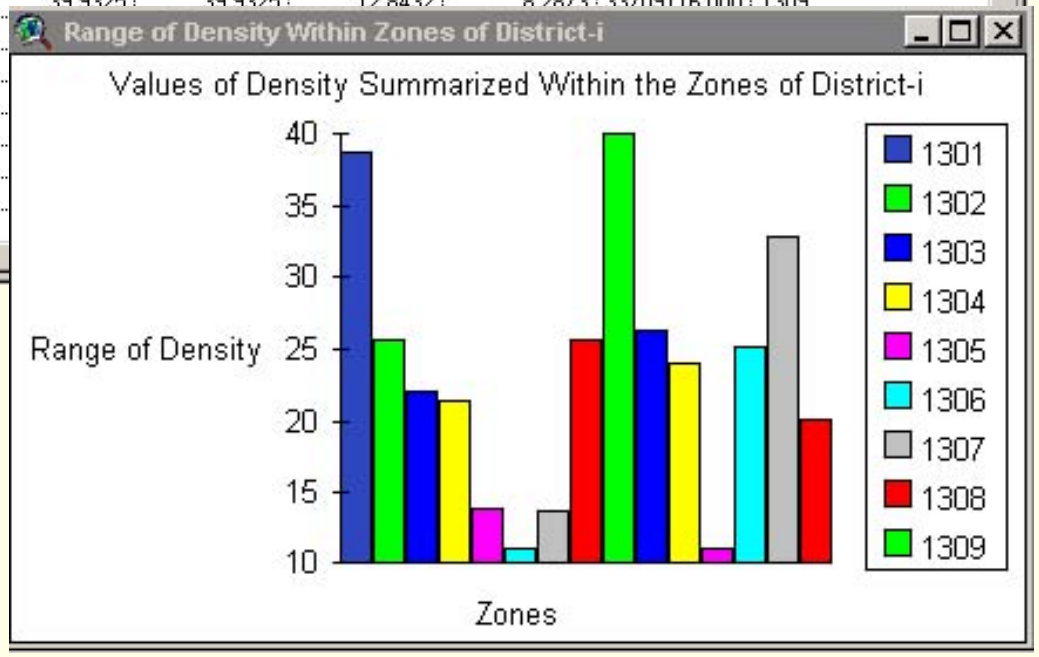

Chart displays range of density for each districts.

Prepared by Mona Lacoul, July 2004

6.2 Available Function

8.1 Find Distance

-Finds the distance to the closest feature in the active theme.

-Creates a grid theme as output.

-Each cell in the output grid theme contains the distance from that location to the nearest feature.

- similar to generating buffer.

- find nearest hospital, define buffer zone, study hazard vulnerability to settlements…

6.2 Available Function

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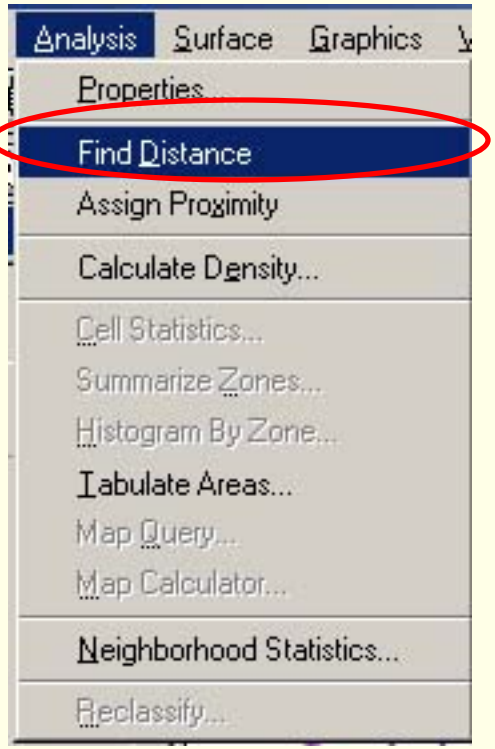
8.2 Find Distance

Add theme line feature “road-p”.

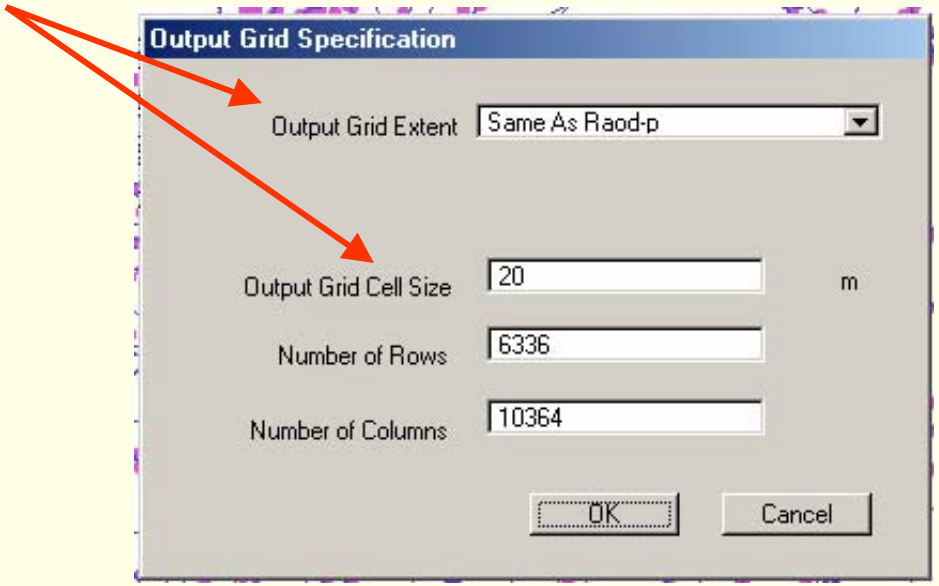
Click on the theme to activate.

Select *FIND DISTANCE* from *ANALYSIS* menu.



8.3 Find Distance

Enter output grid specifications.



Press OK.

6.2 Available Function

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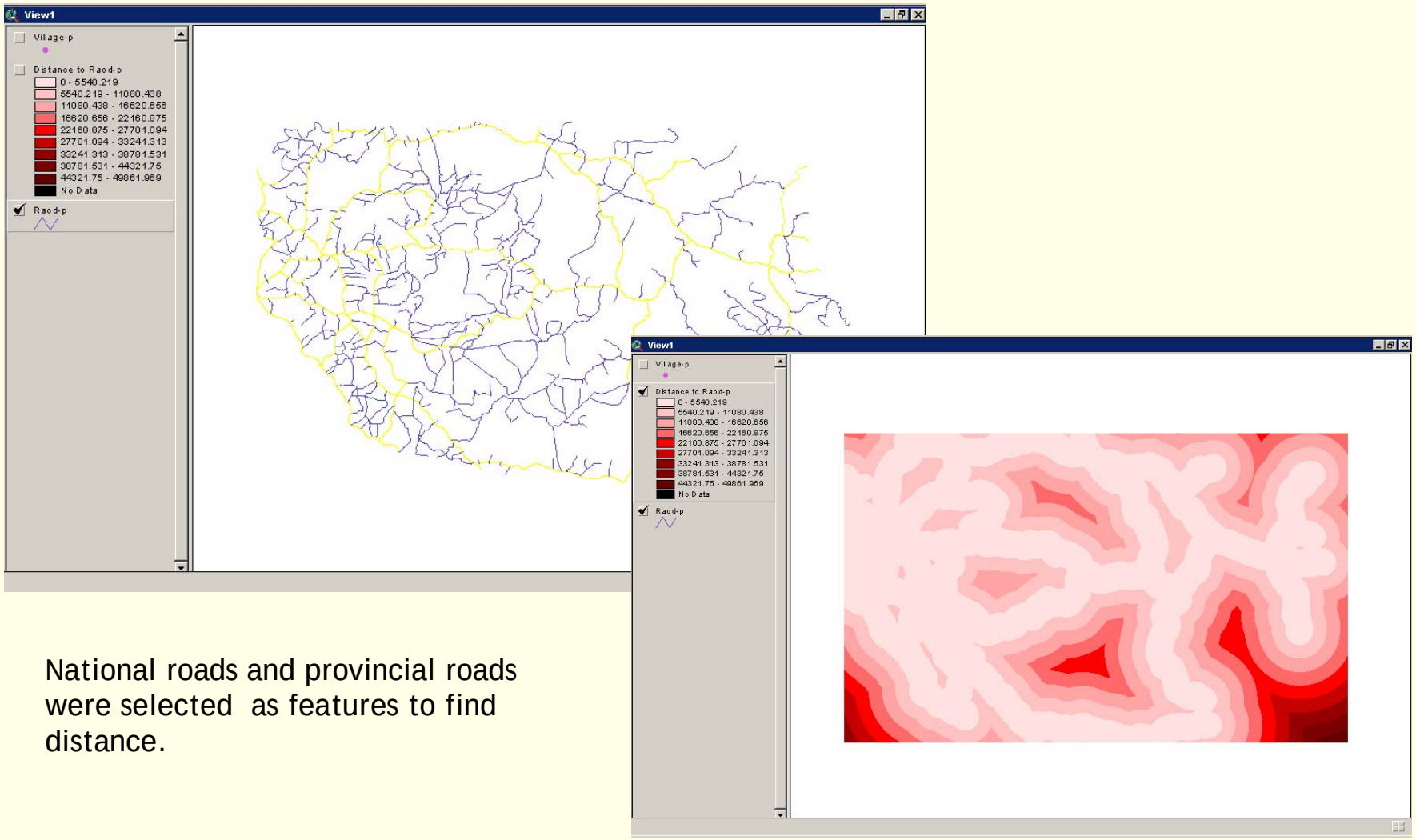
8.4 Find Distance



National roads and provincial roads were selected as features to find distance.

Prepared by Mona Lacoul, July 2004

6.2 Available Function

9.1 Assign Proximity

-Assigns areas of proximity to features found in the active theme.

-Creates a grid theme as output. Each cell location in the grid theme is allocated to the closest feature, determined by Euclidean distance.

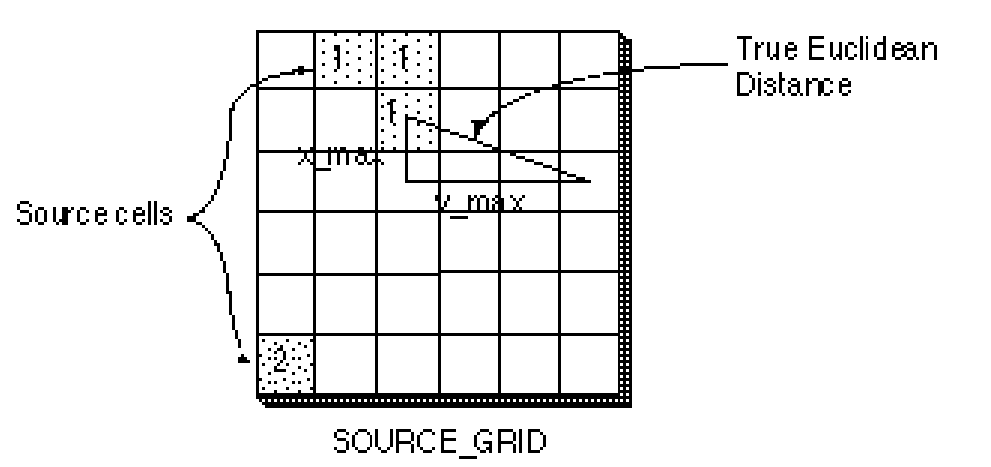
-To find the closest feature in another theme

-To define the area of space allocated to each feature

6.2 Available Function

9.2 Assign Proximity

for each cell, the distance to each source cell is determined by calculating the hypotenuse with the x_max and y_max as the other two legs of the triangle.



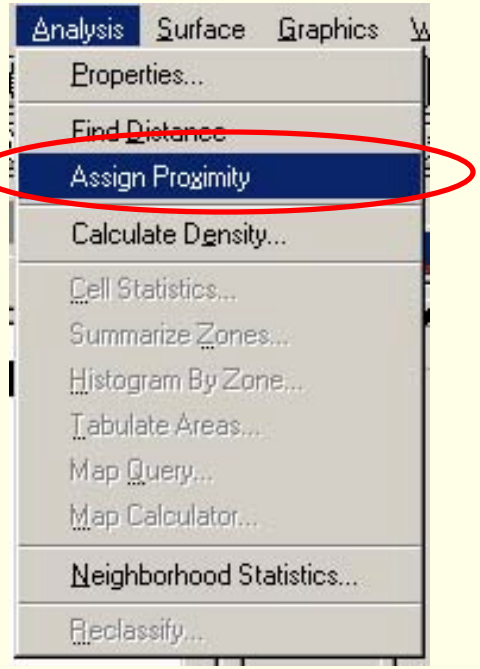
6.2 Available Function

9.3 Assign Proximity

Add theme line feature “village-p”.

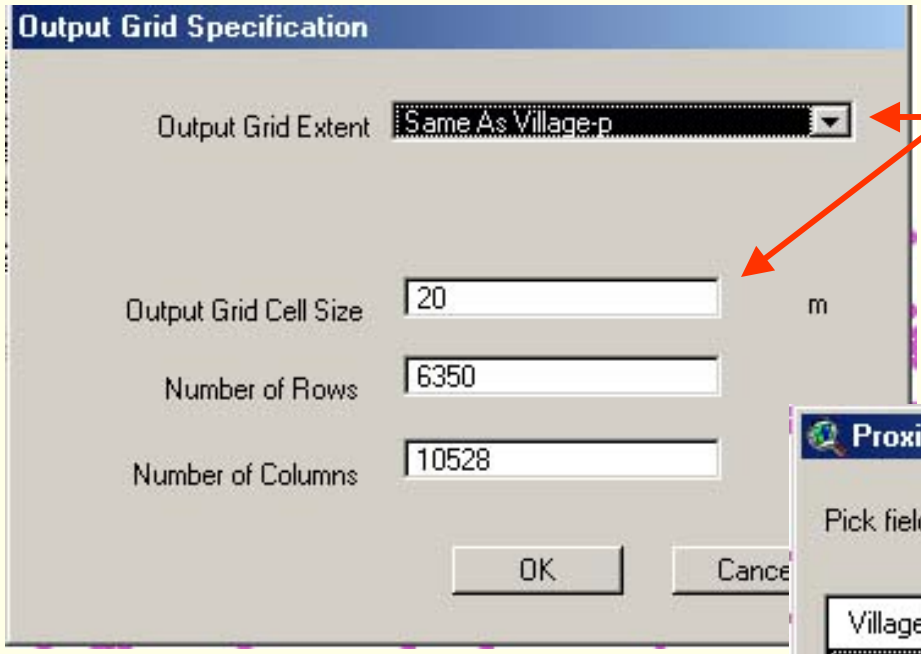
Click on the theme to activate.

Select *ASSIGN PROXIMITY* from *ANALYSIS* menu.



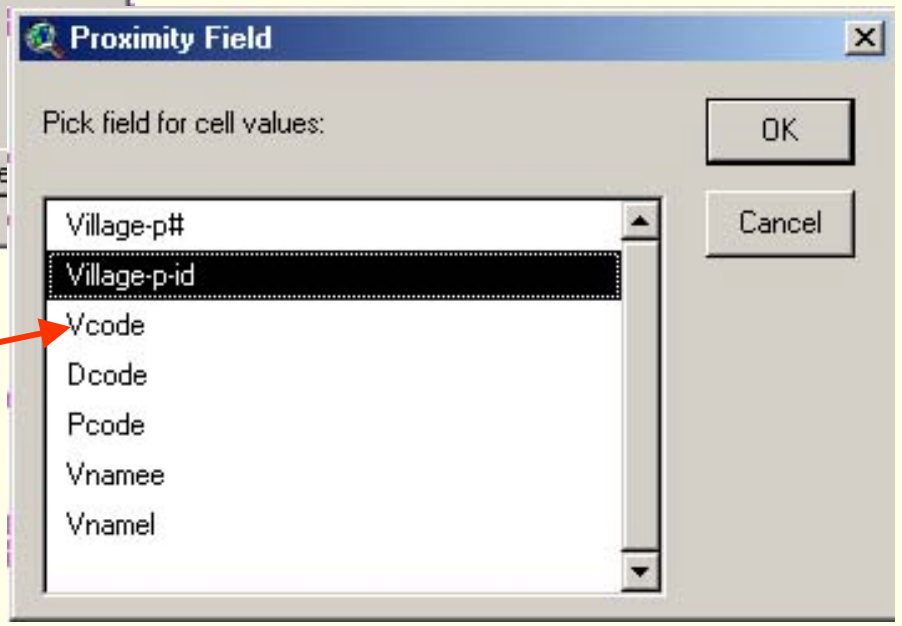
6.2 Available Function

9.4 Assign Proximity



Enter the specification for output grid.

Press ok.



Select the field to assign values to proximity area.

Press ok.

6.2 Available Function

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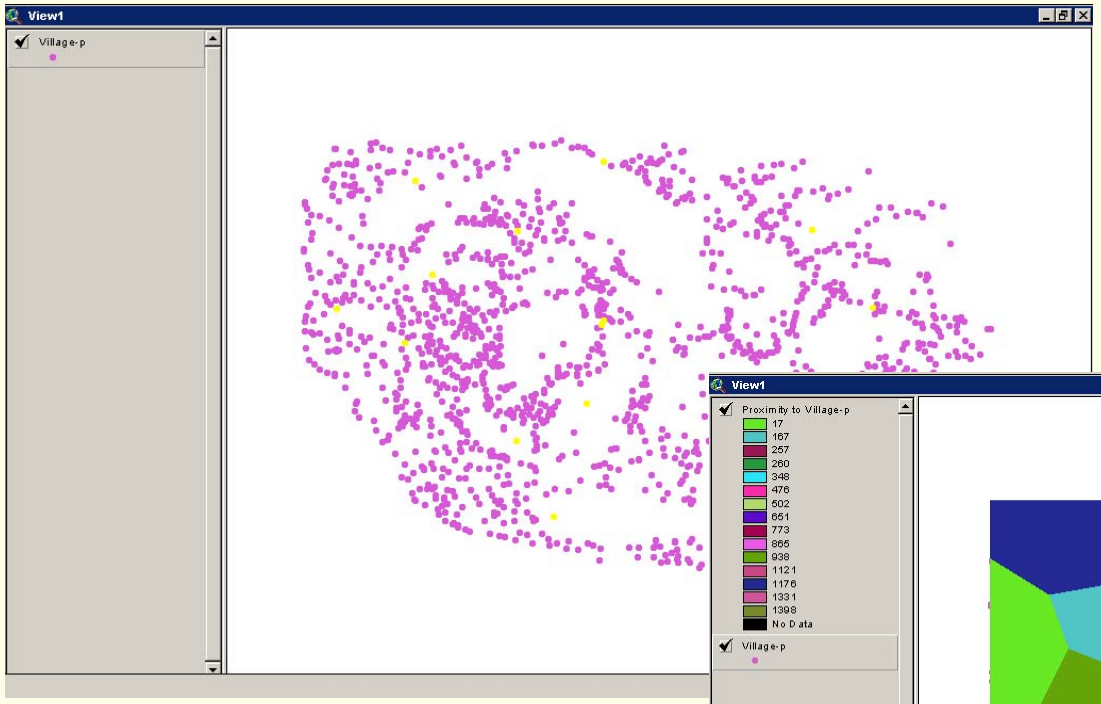
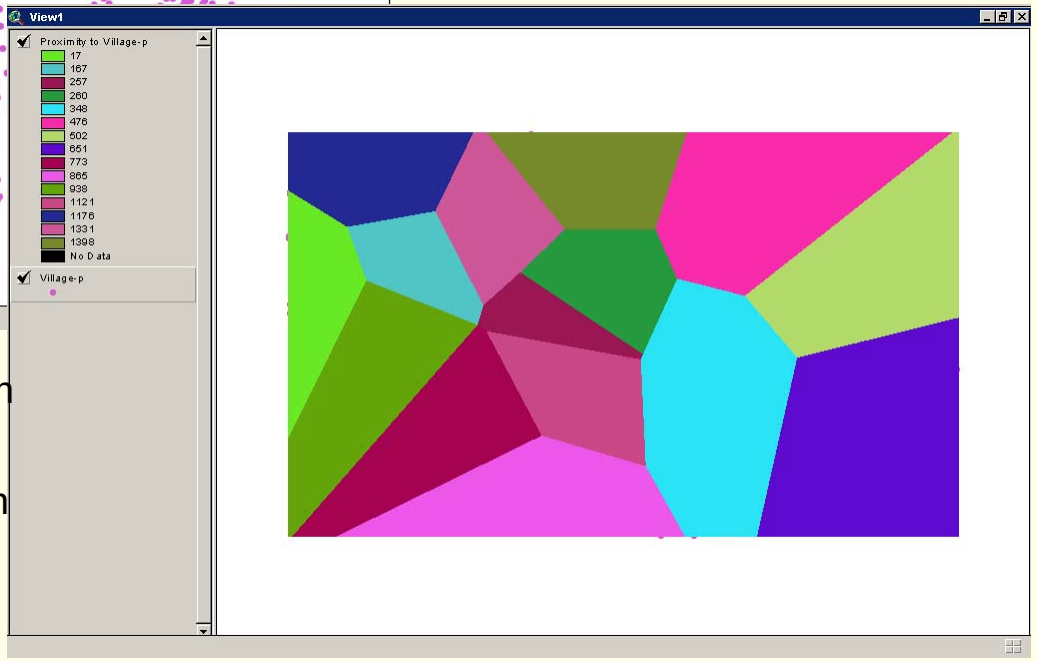
9.5 Assign Proximity



Villages are selected randomly to retrieve the proximity area.



Features can be selected based on certain criteria to calculate proximity area.

Instead of feature theme, Grid theme can be used for proximity analysis.

Prepared by Mona Lacoul, July 2004

6.2 Available Function

10 Neighborhood Statistics

-Calculates a statistic for the values found in a specified neighborhood.

-assigns the desired statistic value for the neighborhood defined around each cell.

-Input theme: a point or grid theme

-Output: a grid theme

-Statistics include majority, maximum, mean, median, minimum, minority, range, standard deviation, sum, and variety.

Exercise II:

List the statistics for population density in for all the districts. Prepare a charts comparing statistics of the districts.

The available dataset are

Population data (pop95_p)

District map (district-p)

6.2 Available Function

11.1 Create Contour

-Creates a line of constant value, a contour line, from a point selected on a grid or TIN theme.

-Input: a single grid or TIN theme is active.

-Use only on themes representing a continuous attribute, such as elevation or density.

- To create Iso-lines , precipitation, temperature, humidity, contour, population density

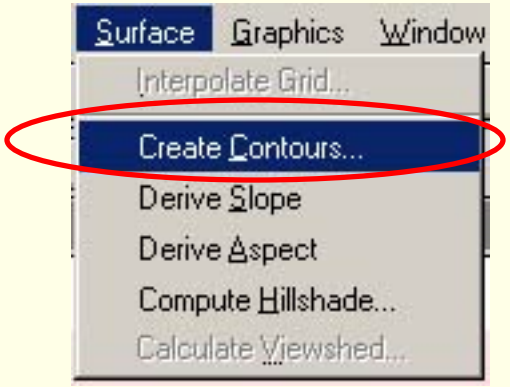
6.2 Available Function

11.2 Create Contour

Add grid theme “density of pop95”.

Click on the theme to activate.

Select *CREATE CONTOUR* from *SURFACE* menu.



6.2 Available Function

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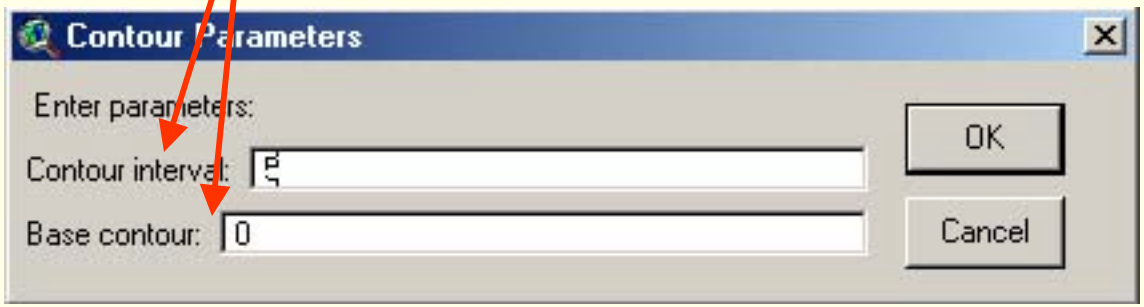
11.3 Create Contour

Enter parameters to create contour (isolines).



Press OK.

6.2 Available Function

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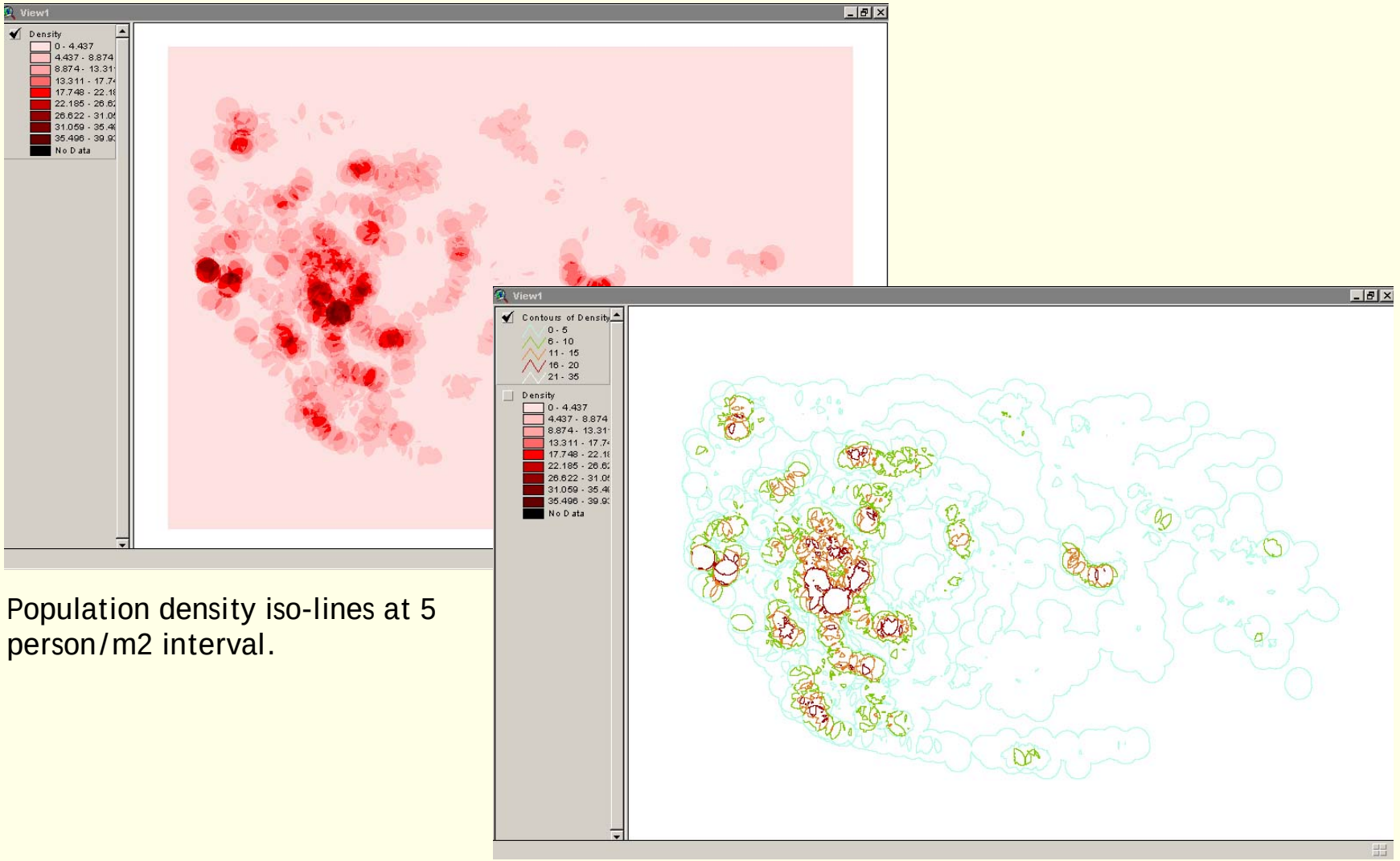
11.4 Create Contour



Population density iso-lines at 5 person/m2 interval.

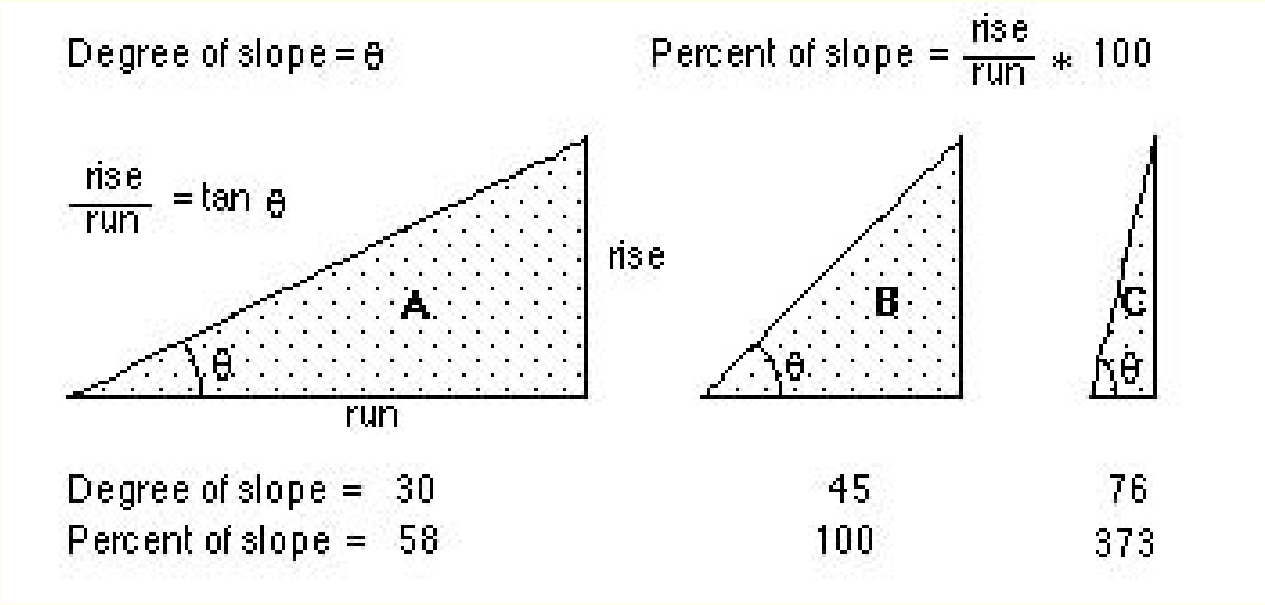
Prepared by Mona Lacoul, July 2004

6.2 Available Function

12.1 Derive Slope

-maximum rate of change in value (each cell to its neighbors)

-Output: Grid in percent slope or degree of slope



6.2 Available Function

12.2 Derive Slope

The actual algorithm to calculate slope is:

rise_run = SQRT(SQR(dz/dx)+SQR(dz/dy))

degree_slope = ATAN(rise_run) * 57.29578

where the deltas are calculated using a 3x3 roving window, where a through i represent the values in the window:

a b c

d e f

g h I

(dz/dx) = ((a + 2d + g) - (c + 2f + i)) / (8 * x_mesh_spacing)

(dz/dy) = ((a + 2b + c) - (g + 2h + i)) / (8 * y_mesh_spacing)

6.2 Available Function

12.3 Derive Slope

-Calculates the rate of maximum change for locations

-Input : grid or TIN themes

-GRID :using a 3 by 3 window.

-TIN: using the triangle the cell center falls in.

-Output: a grid theme (value represented in degrees)

-Use only on themes representing a continuous attribute, such as elevation or density.

6.2 Available Function

12.4 Derive Slope

Add grid theme “DEM_cut”.

Click on the theme to activate.

Select *DERIVE SLOPE* from *SURFACE* menu.

6.2 Available Function

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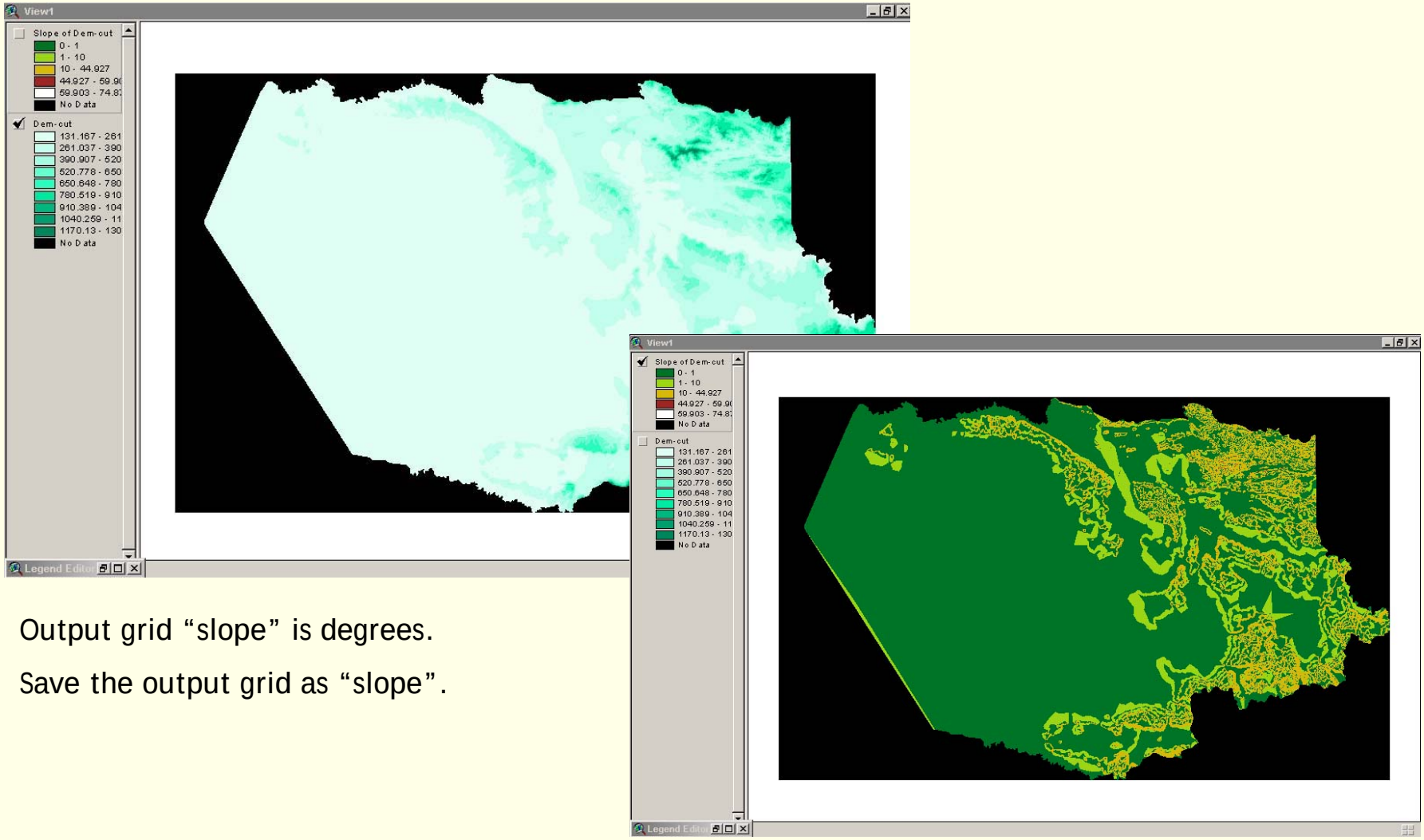
12.5 Derive Slope



Output grid “slope” is degrees.

Save the output grid as “slope”.

Prepared by Mona Lacoul, July 2004

6.2 Available Function

13.1 Derive Aspect

-the down-slope direction of the maximum rate of change in value from each cell to its neighbors.

-the slope direction.

-Output: Grid (compass directions)

6.2 Available Function

13.2 Derive Aspect

-Calculates aspect for each cell

-represents the direction of maximum slope of the input grid or TIN theme.

-starting at 0 degrees (north) and increasing clockwise until 360 degrees

Input: a grid theme a TIN theme

Grid: calculates for each cell using a 3x3 window.

TIN: aspect of the triangle its center falls

Output : a grid theme

- themes representing a continuous attribute, such as elevation or density.

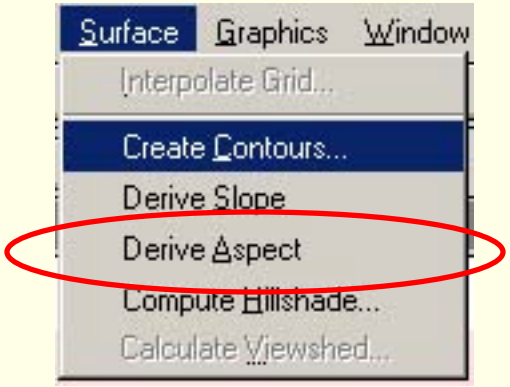
6.2 Available Function

13.3 Derive Aspect

Add grid theme “Slope”.

Click on the theme to activate.

Select *DERIVE SLOPE* from *SURFACE* menu.



6.2 Available Function

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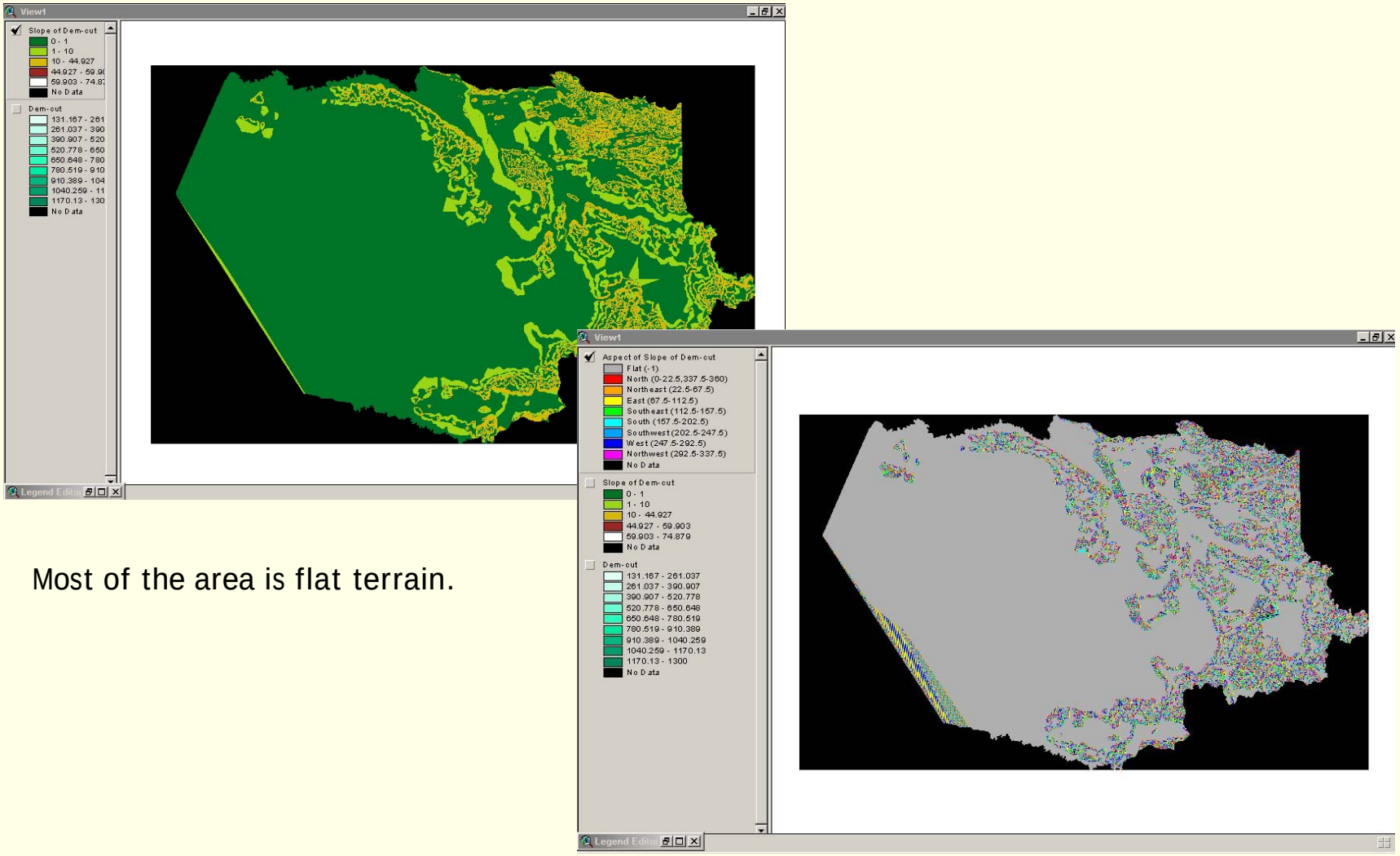
13.4 Derive Aspect



Most of the area is flat terrain.

Prepared by Mona Lacoul, July 2004

6.2 Available Function

14.1 Interpolate Surface

-Fills in the gaps by analyzing the points around each location

-create a continuous surface.

-Input: a point theme

-output:a grid theme

-Method of Interpolation

  -IWD

  -Spline

6.2 Available Function

14.2 Interpolate Surface(Spline)

- Fits a curve through the points surrounding the cell being analyzed and gives the cell the value of the curve at that location.

-best for gently varying surfaces such as elevation, water table heights, or pollution concentrations.

6.2 Available Function

14.3 Interpolate Surface(Spline)

Regularized method:

- yields a smooth surface.

- weight parameter: weight of the third derivatives of the surface in the curvature minimization expression

Tension method:

- tunes the stiffness of the surface

- weight parameter: defines the weight of tension.

number of points parameter:

-identifies the number of points per region used for local approximation.

6.2 Available Function

14.4 Interpolate Surface(IWD)

- weighting the value of each point by the distance that point is from the cell being analyzed and then averaging the values.

- Power parameter :
  - controls the significance of the surrounding points upon the interpolated value.
  - a higher power » less influence from distant points
  - to interpolate a surface of consumer purchasing
  - more distant locations have less influence

Barrier :

input line theme

a break that limits the search for input sample points

Exercise III:

Given the following datasets:
(i)road, (ii)Village,(iii) hospital location,(iv) population

Formulate your criteria for analyzing health facility in the province based on

accessibility (hint: use road)

population served (hint: population).

Propose locations of new hospitals if needed.

Prepare summary tables and and chart whenever possible.

6.3 Surface Modeling with TIN and DEM

1.Surface

-to represent continuous spatial phenomena.
-a z-coordinate value for each planimetric location
- surface object represented by a single-valued function

$$z = f(x, y),$$

Where, z can be an elevation value or any other kind of measurement

6.3 Surface Modeling with TIN and DEM

2. Surface Sampling Method

-infinite number of point to measure

-a sampling method to represent the surface model

-a surface model should

- -Accurately represent the surface
- -Be suitable for efficient data collection
- -Minimize data volume
- -Maximize data handling
- -Suitable for surface analysis

6.3 Surface Modeling with TIN and DEM

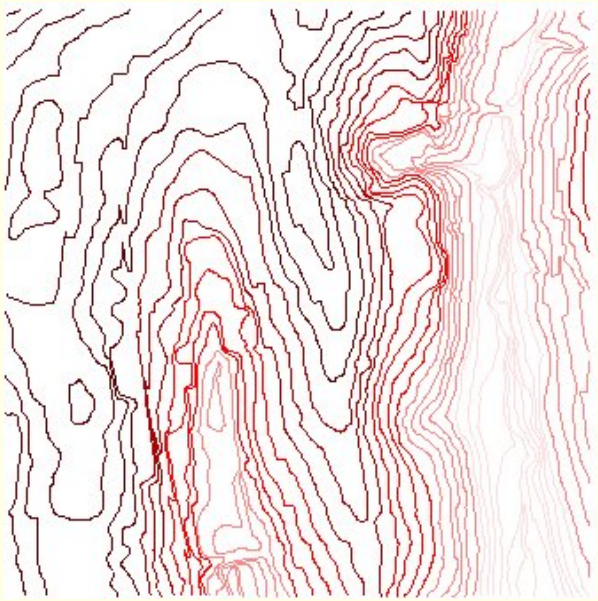
3. Surface Sampling Method (Contour)

-Isolines of constant elevation

-most commonly used

-poorly represented the variance between isolines

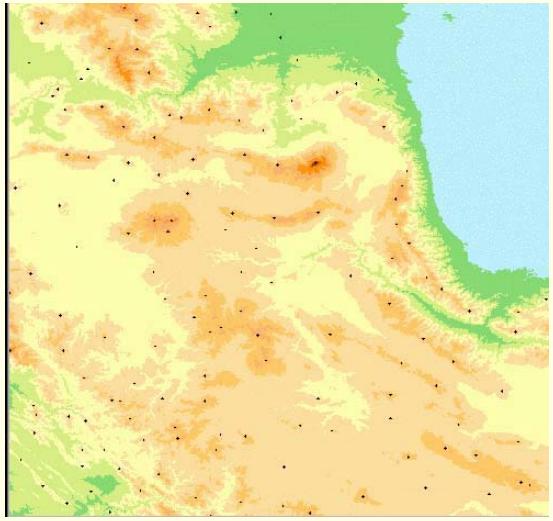
- Accuracy depends on data source

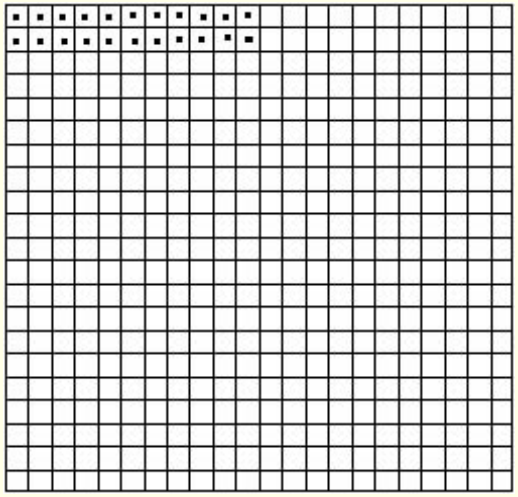


6.3 Surface Modeling with TIN and DEM

4. Digital Elevation Model

- represented by equally spaced sample points
- two ways to determine surface values between points
  - Interpolate between adjacent points : lattice
  - Considers each point as a square cell with a constant value: surface grid





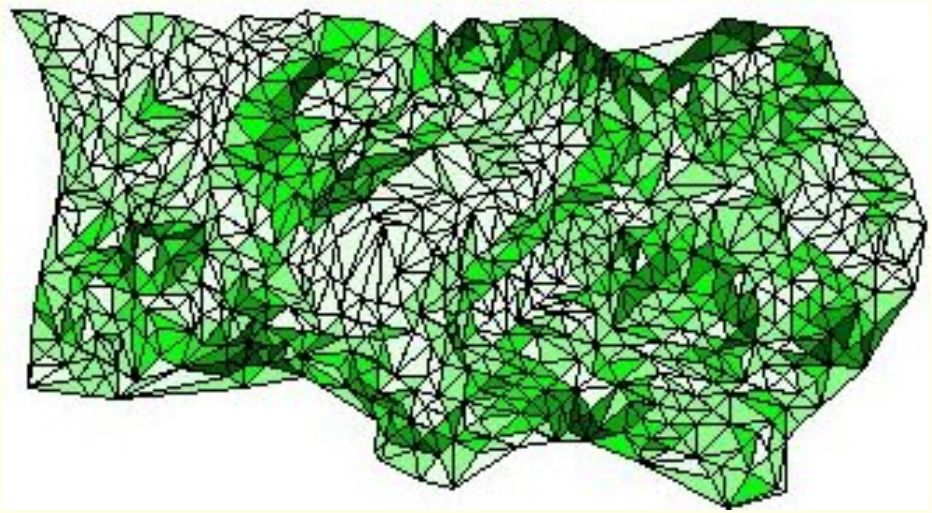
Surface Grid

6.3 Surface Modeling with TIN and DEM

5. Triangular Irregular Network Data Model

-Alternative to represent continuous surface.

-Effective display terrain , other types of continuous data.



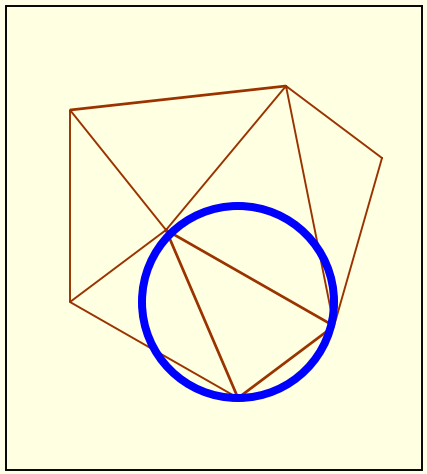
Triangular Irregular Network (TIN)

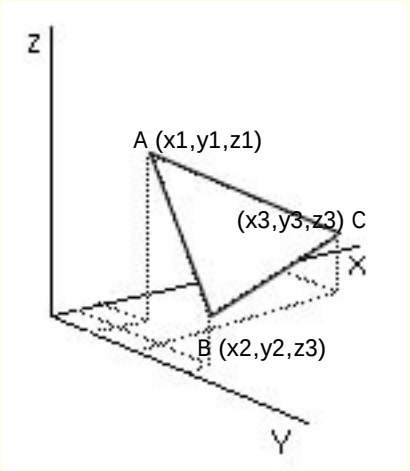
6.3 Surface Modeling with TIN and DEM

Geoinformatics Center
Asian Institute of Technology

6.Triangular Irregular Network Data Model

-triangulation method satisfies the Delaunay criterion.

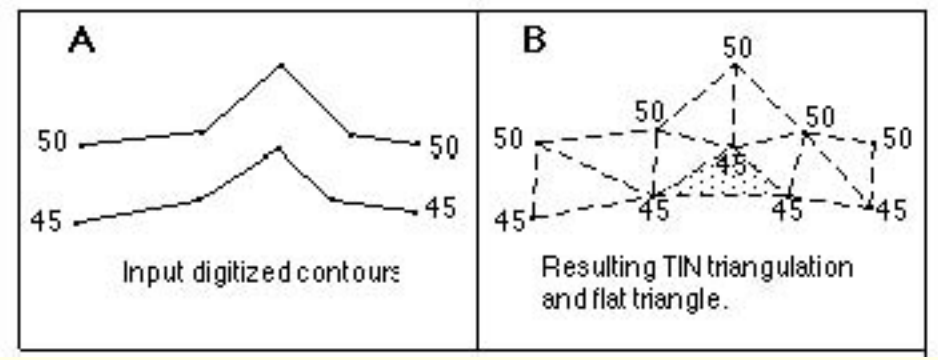




Linear Interpolation

z=ax+by+c

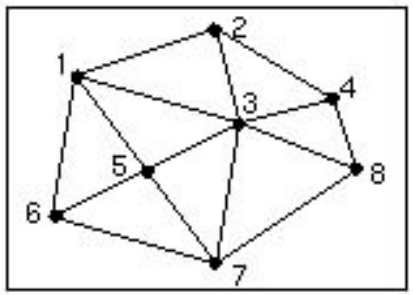
a,b,c is determined by using co-ordinate values A,B,C.

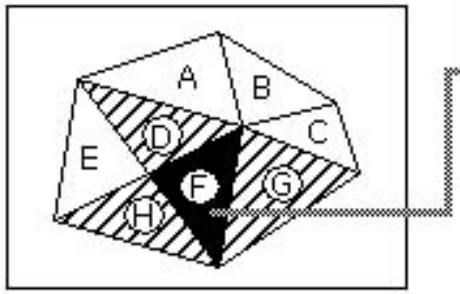


Prepared by Mona Lacoul, July 2004

6.3 Surface Modeling with TIN and DEM

7. Triangular Irregular Network Data Model





TIN Triangle List

Triangle	Node List	Neighbors
A	1, 2, 3	- B, D
B	2, 4, 3	-, C, A
C	4, 8, 3	-, G, B
D	1, 3, 5	A, F, E
E	1, 5, 6	D, H, -
F	3, 7, 5	G, H, D
G	3, 8, 7	C, -, F
H	5, 7, 6	F, -, E

6.3 Surface Modeling with TIN and DEM

8. Triangular Irregular Network Data Model

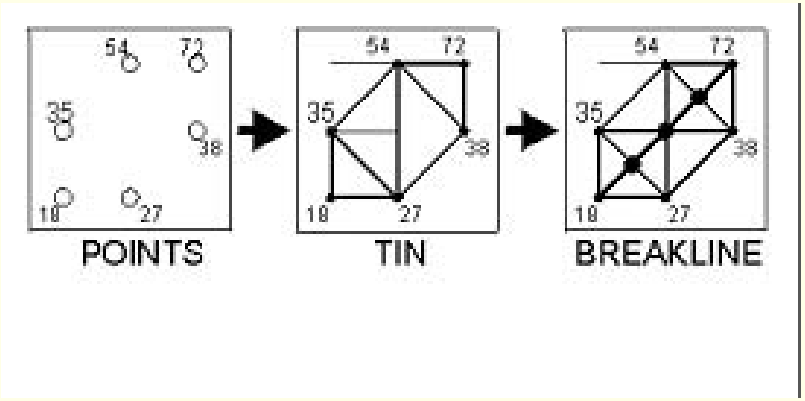
A surface-feature type

influences the triangulation

definition of the resulting surface.

Supported surface-feature types :

- Mass point
- Breakline
- Replace polygon
- Erase polygon
- Clip polygon
- Fill polygon



6.3 Surface Modeling with TIN and DEM

9. Triangular Irregular Network Data Model

Mass point
– entered as nodes to the triangulation
-Input: point data, lines and polygon boundaries

Breakline
– linear features maintained as a sequence of one or more triangle edges.
- Input: line data , polygon boundaries.

Replace polygon
- polygonal features maintained as a sequence of one or more triangle edges.
-boundary and all enclosed area assigned single value.

6.3 Surface Modeling with TIN and DEM

10. Triangular Irregular Network Data Model

Erase polygon

- polygonal features maintained as a sequence of edges.
- areas inside the polygon - outside the zone of interpolation

Clip polygon

- polygonal features maintained as a sequence of edges.

-areas outside polygon - outside the zone of interpolation.

Fill polygon

- triangles falling inside the polygon are assigned an integer.

-No height replacement, erasing, or clipping takes place.

6.3 Surface Modeling with TIN and DEM

Exercise IV:

Given the following dataset:

contour.shp

Boundary.shp

Create Tin and Digital Elevation Model for the area.

Hints

Use spatial analyst and 3D analyst.

Choose mass point and clip polygon options while creating TIN.