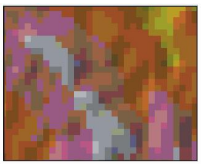
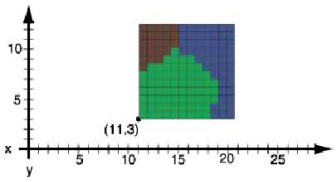
Raster Data Analysis

Raster Data Model

- Cells (Pixels)
- Cell value



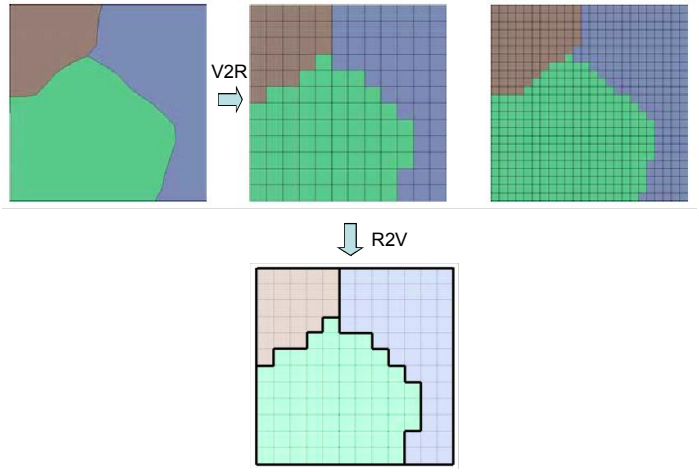
- x, y cell sizes
- Geographic coordinates



Attributes

Value	Count	Name	Suitability	Type
2	30672	Cropland and pastureland	4	Agriculture
3	3339	Urban and industrial	5	Urban
10	212	Clearings and brushfields	5	Cleared
21	1383	Cottonwood	4	Riparian
463	142	Ash-Cottonwood	3	Woodland
476	7205	Oak	3	Woodland
505	1112	Douglas fir	2	Forest
510	6557	Mixed evergreen-broadleaf	3	Forest
512	7943	Douglas fir-Hemlock-Cedar	1	Forest

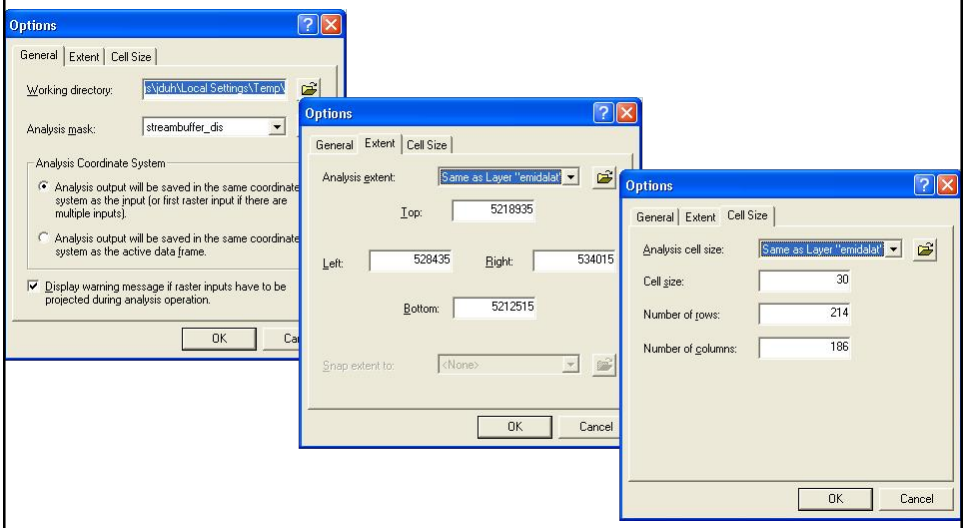
Raster to Vector / Vector to Raster



ArcGIS Spatial Analyst

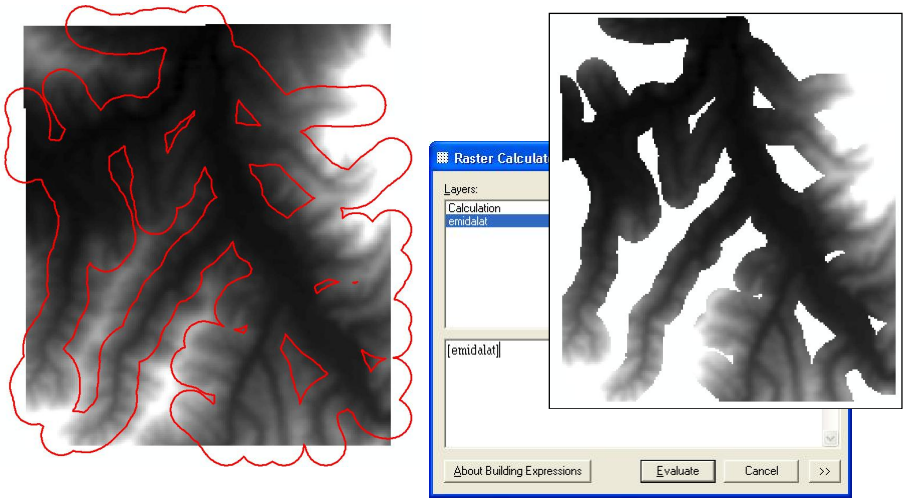
- Mainly for raster data analysis
- Arctoolbox: Spatial Analyst Tools
- Spatial Analyst Toolbar
  - Raster Calculator

Spatial Analyst Option Menu



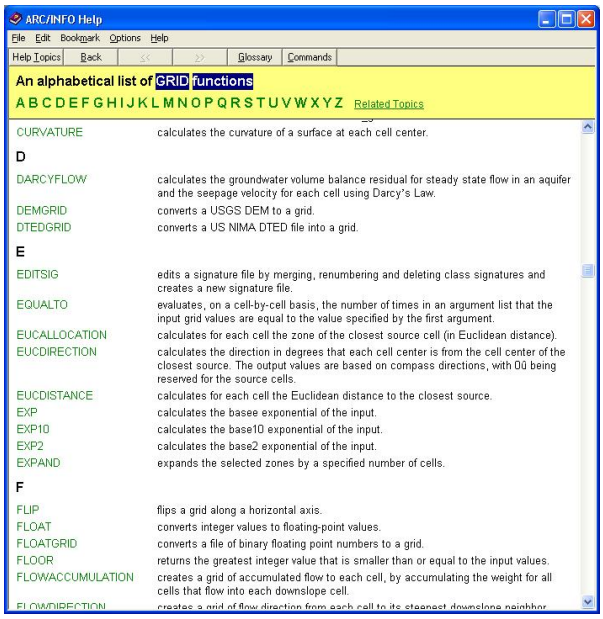
Raster Calculator

- the most powerful tool in spatial analyst



Raster Calculator Functions

- Arcinfo Workstation / Arcdoc
- > 200 functions

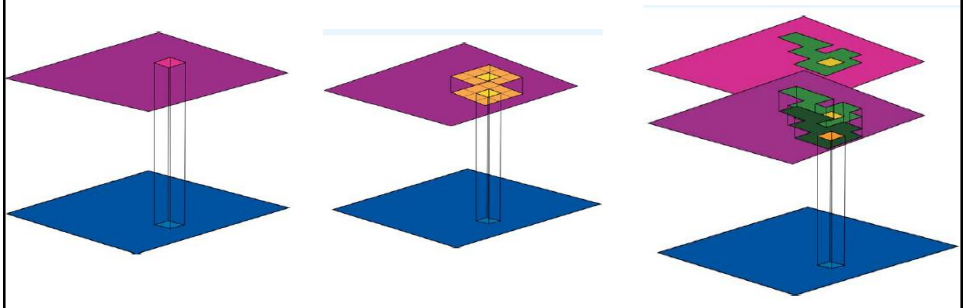


Raster Operations

Local operation (majority)

Focal operation (focalmajority)

Zonal operation (zonalmajority)



Global operation (costdistance)

Application functions

Working with Nodata in RC

- ISNULL: convert Nodata to a value
- SETNULL: set cell value to Nodata
- CON: conditional function

- Examples

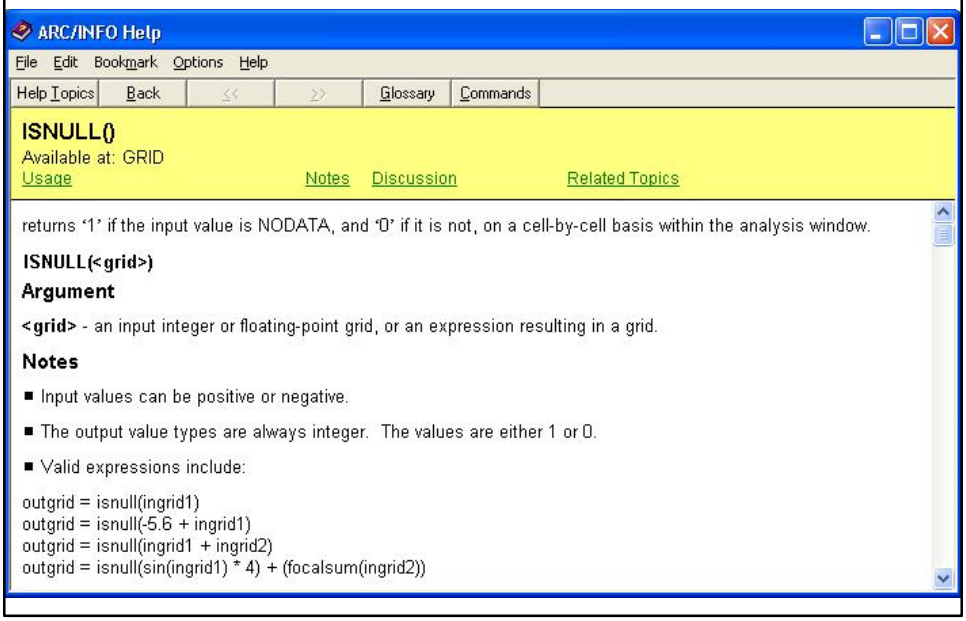
  – Replace Nodata with 0 in a DEM

```
Outgrid = con(isnull([dem]), 0, [dem])
```

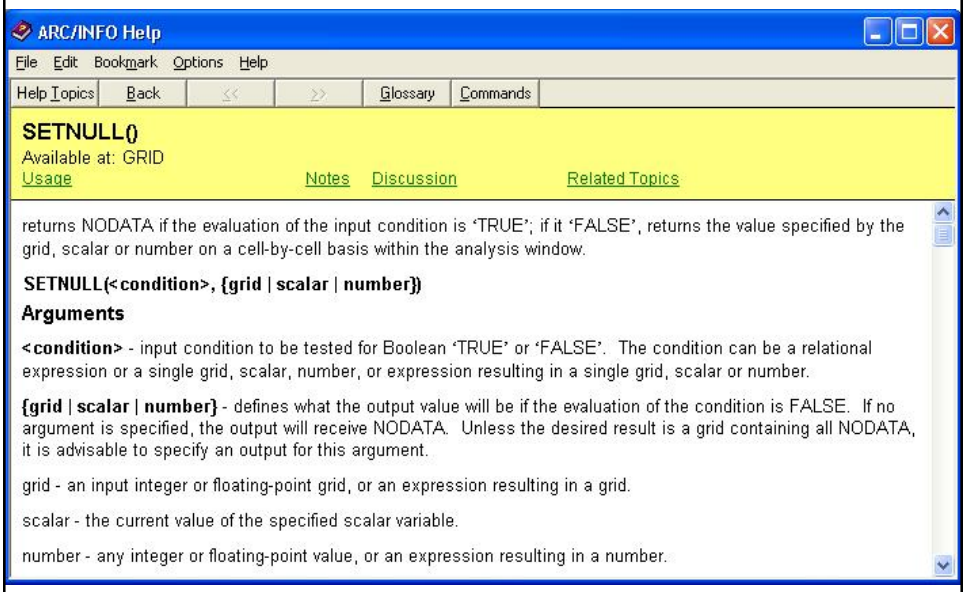
  – Set slope > 15 to Nodata on the DEM

```
Lowrisk = setnull([slope]> 15, [dem])
```

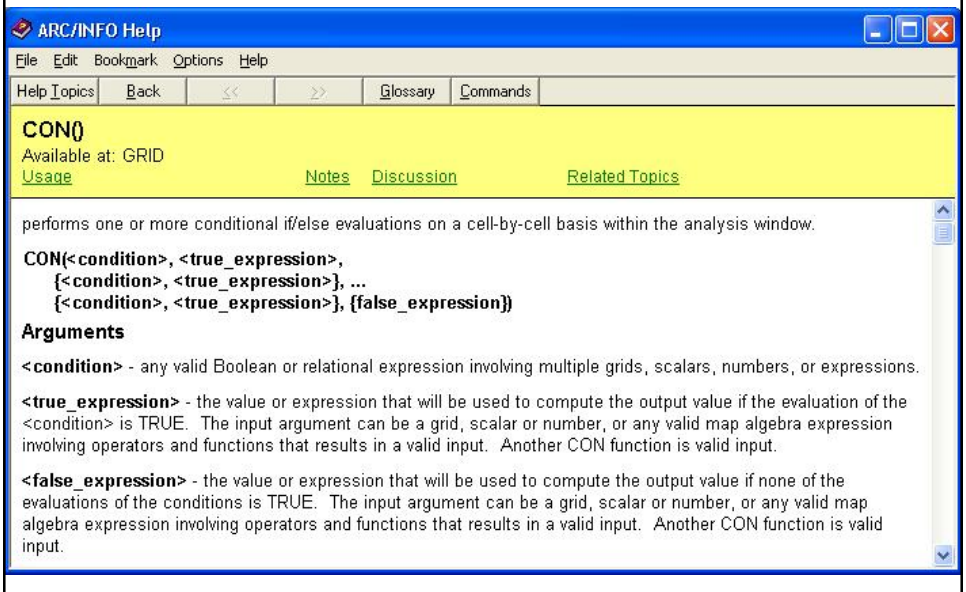
ISNULL() Function



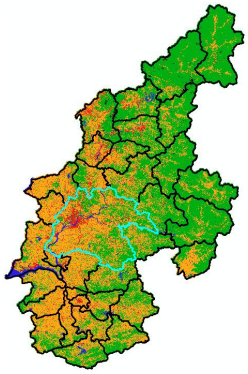
SETNULL() Function

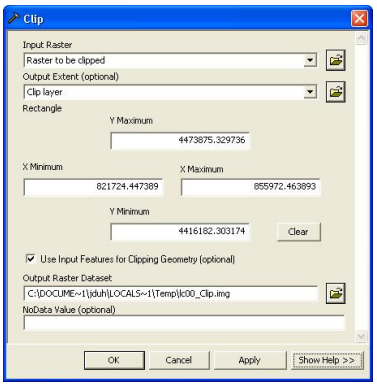


CON() Function

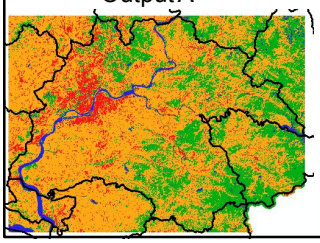


Raster Clip Example

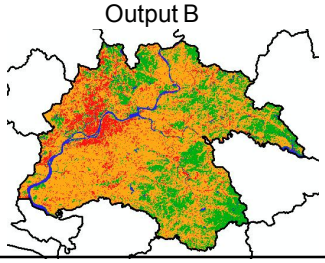




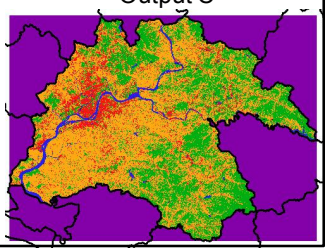
Output A



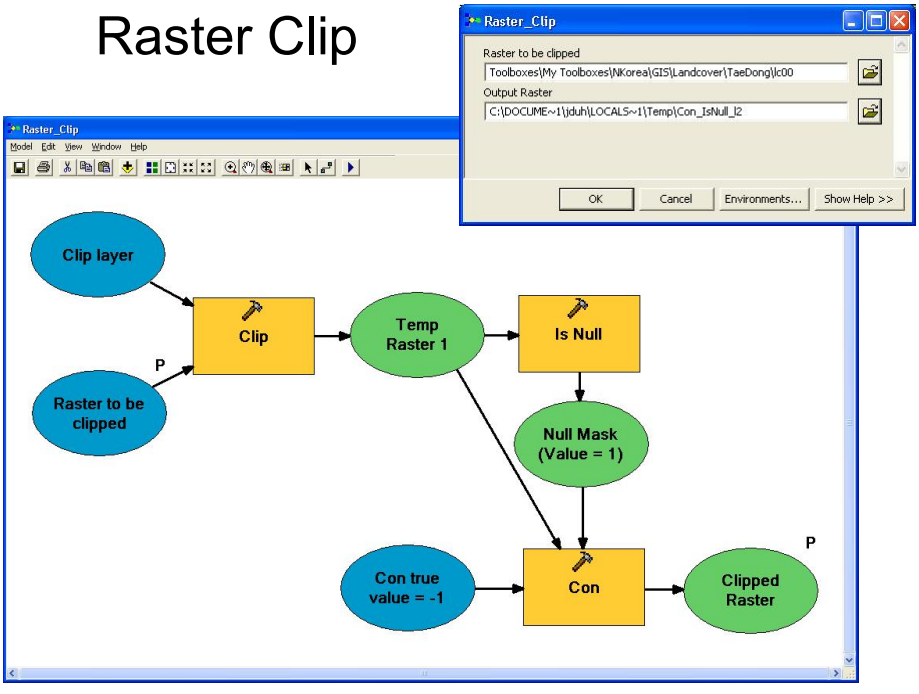
Output B

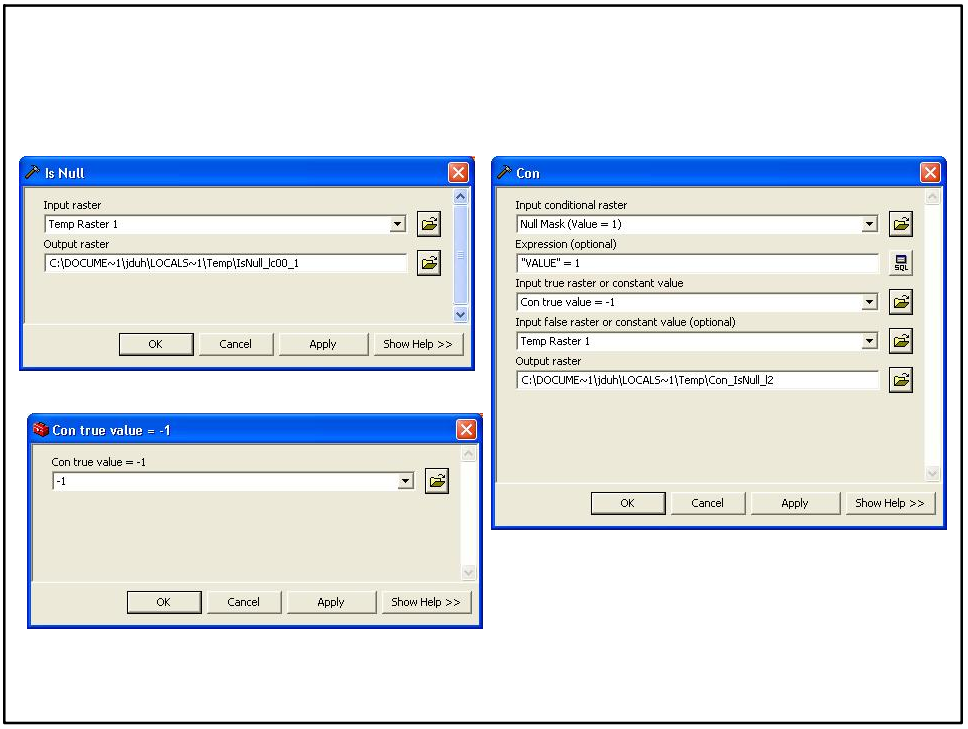


Output C

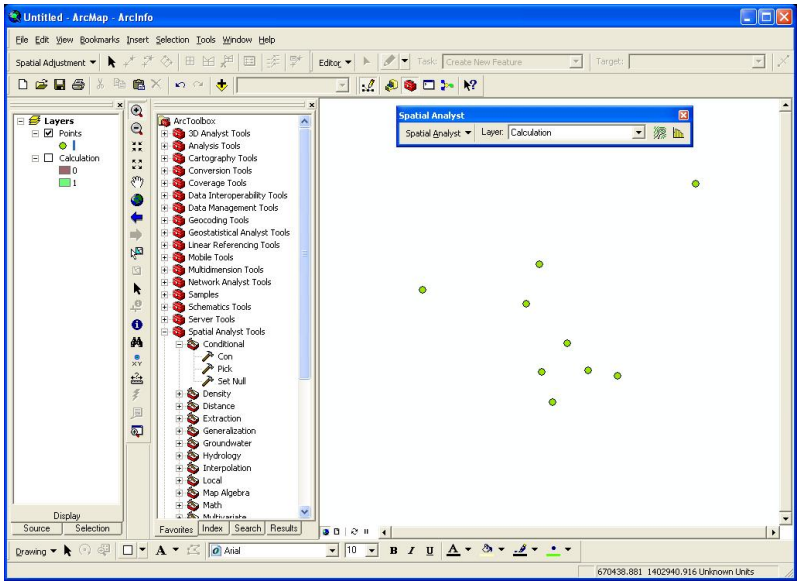


Raster Clip



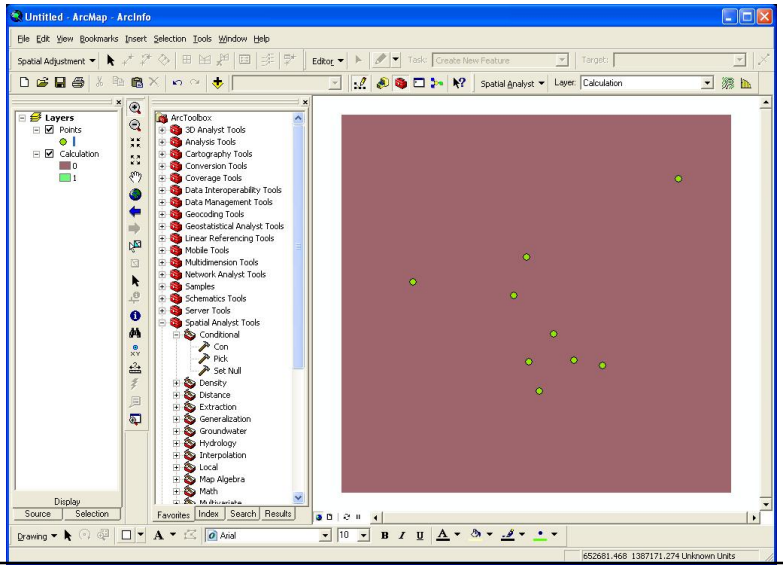


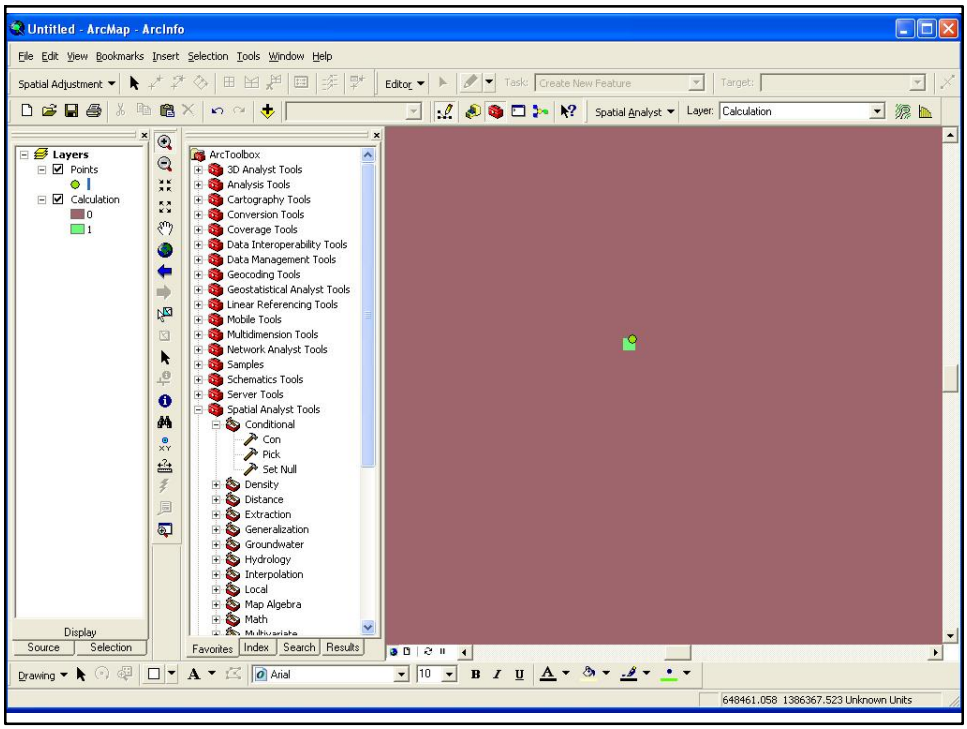
Raster Buffering

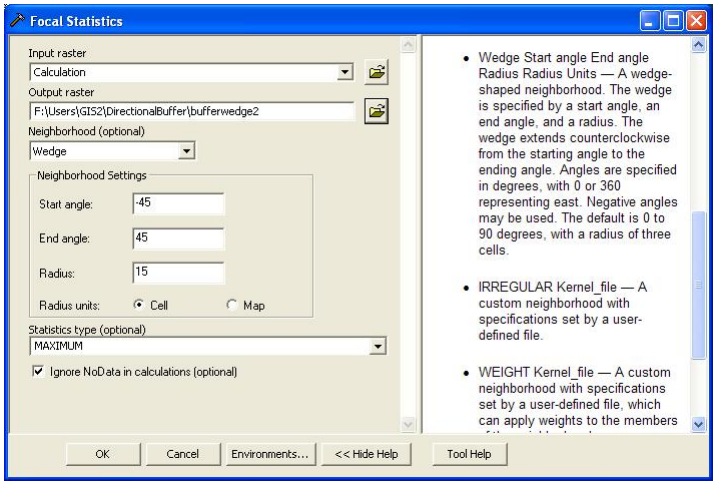


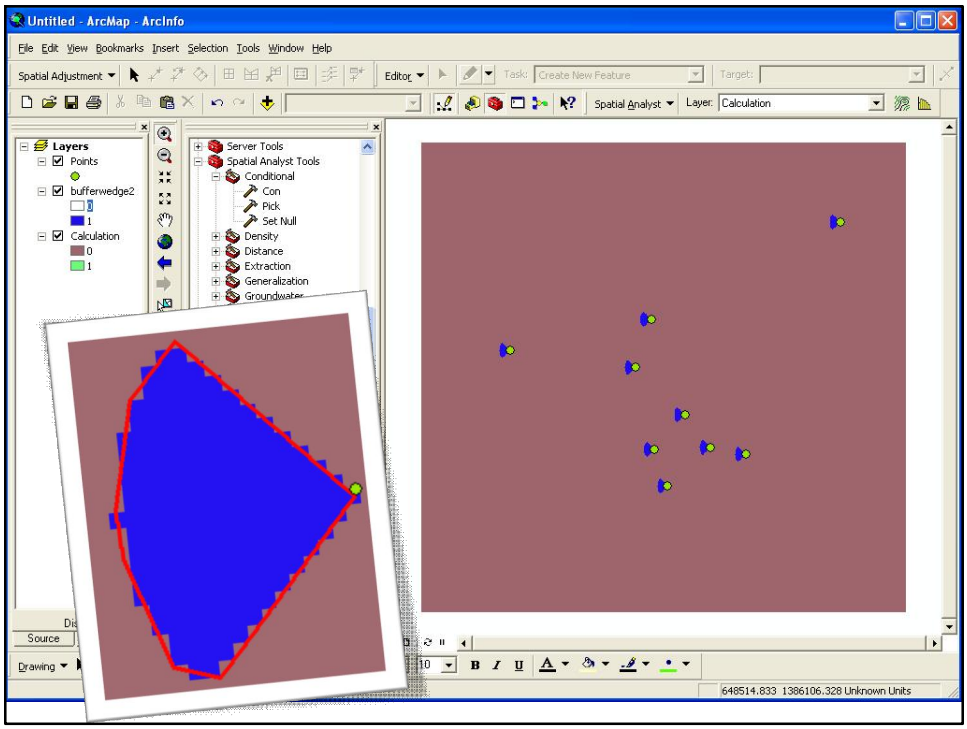
Point Features to Raster

- Con(isnull(pointg), 0, 1)






Focal Statistics
Input raster
Calculation
Output raster
F:\Users\GIS2\DirectionalBuffer\bufferwedge2
Neighborhood (optional)
Wedge
Neighborhood Settings
Start angle: -45
End angle: 45
Radius: 15
Radius units: Cell Map
Statistics type (optional)
MAXIMUM
Ignore NoData in calculations (optional)
OK
Cancel
Environments...
<< Hide Help
Tool Help
• Wedge Start angle End angle Radius Radius Units — A wedge-shaped neighborhood. The wedge is specified by a start angle, an end angle, and a radius. The wedge extends counterclockwise from the starting angle to the ending angle. Angles are specified in degrees, with 0 or 360 representing east. Negative angles may be used. The default is 0 to 90 degrees, with a radius of three cells.
• IRREGULAR Kernel_file — A custom neighborhood with specifications set by a user-defined file.
• WEIGHT Kernel_file — A custom neighborhood with specifications set by a user-defined file, which can apply weights to the members


Untitled - ArcMap - ArcInfo
File Edit View Bookmarks Insert Selection Tools Window Help
Spatial Adjustment
Editor
Task: Create New Feature
Target:
Spatial Analyst
Layer: Calculation
Layers
Points
bufferwedge2
Calculation
Server Tools
Spatial Analyst Tools
Conditional
Con
Pick
Set Null
Density
Distance
Extraction
Generalization
Groundwater
Source
Drawing
648514.833 1386106.328 Unknown Units

Implementing Ordered Weighted Average in ArcGIS

- Raster Calculator

  r1 = rank(1, [factor1], [factor2], [factor3])

  r2 = rank(2, [factor1], [factor2], [factor3])

  r3 = rank(3, [factor1], [factor2], [factor3])

  owavg = [r1] * 0.5 + [r2] * 0.3 + [r3] * 0.2