

Spatial Analysis

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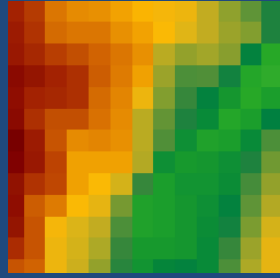
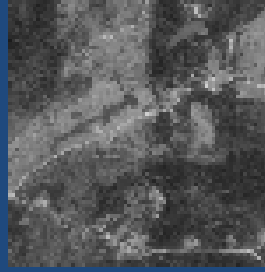
2012

Workshop Outline

1. Presentation
2. Exercises
 1. Creating shapefiles
 2. Five Common ArcToolbox Tools
 3. Spatial Analysis with raster data
3. Questions and concerns?

Raster Data Review

cells



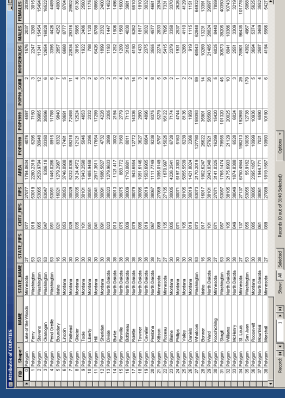
attribute table
(or not)

raster properties

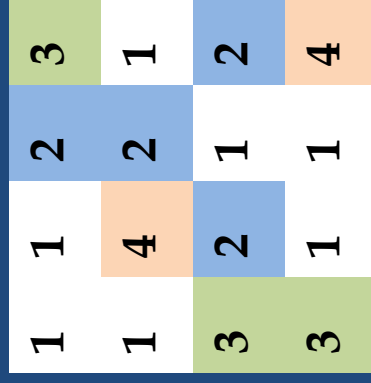


Analysis in GIS

- With vector data, the GIS uses values from fields in the attribute table
- With raster data, the GIS uses values from individual cells, or performs calculations based on zones and/or regions.



A screenshot of a GIS attribute table showing a grid of numerical values. The table has 10 columns and 10 rows. The values are arranged in a pattern that corresponds to the raster data shown in the adjacent image. The values are: Row 1: 1, 1, 2, 3, 1, 1, 1, 1, 1, 1; Row 2: 1, 4, 2, 2, 1, 1, 1, 1, 1, 1; Row 3: 3, 2, 1, 1, 2, 1, 1, 1, 1, 1; Row 4: 3, 1, 1, 1, 1, 1, 1, 1, 1, 1.



A 4x4 grid of colored cells with numerical values, representing raster data. The values are: Row 1: 1, 1, 2, 3; Row 2: 1, 4, 2, 1; Row 3: 3, 2, 1, 2; Row 4: 3, 1, 1, 4.

More on Raster Data

- Two types of raster data:
 - Thematic
 - A measured quantity or a classification
 - Ex: 5=elevation in feet
 - Ex: 5=water; 3=forest

5	5	3
5	5	3
5	3	3

- Image
 - Reflected or emitted light
 - Ex: Pixel scale from 0 to 255
where 0 is black and 255 is white

0	50	229
50	125	73
123	86	140

Raster Datasets

- Usually represent a **single theme** (elevation, land use, etc.) - so you need several to show an area
- Are made up of **individual cells** - cells either have a value or have no data

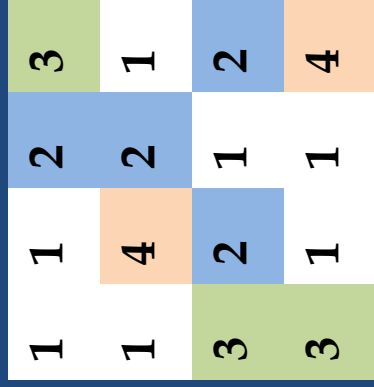
Raster Datasets - Cells

- Cells can be any size, but every cell in the dataset is the same size.
- The smaller the cell size, the greater the resolution.
- Cells are arranged in rows and columns, so each one has a specific address.

More on Cells

Zones

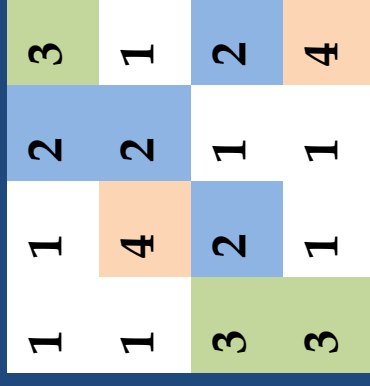
- formed by two or more cells with the same value (connected or disconnected)



Zone 1 consists of 7 cells

Regions

- group of connected cells in a zone



Zone 1 has 2 regions

GIS Analysis - A Process

Define the problem/issue/question

Get Data

What data do you need?
Where will you get it?

Evaluate Data

Is this data in a usable format?
Projection?
Appropriate fields?
Quality of the data?
Metadata?

Perform analysis

What is your methodology?
What tools should you use?

Evaluate Result

Is the methodology sound?
Is the question answered?
Are there any new questions?

Final Formatting

Who is the audience/what is the purpose?
How should results be displayed?

Present Final Result



GIS is just a tool

- Quality of your data
- Quality of your modeling process
- Quality of your analysis
- Aesthetics

Learning more GIS and background

- **GEOG 373** – Geographic Information Systems
- **GEOG 473** – Geographic Information Systems and Spatial Analysis
- **GEOG 306** – Introduction to Quantitative Methods for the Geographic Environmental Sciences
- **Virtual Campus Courses**
 - Learning ArcGIS Desktop
 - Understanding Map Projections and Coordinate Systems
 - Working with Rasters in ArcGIS Desktop

Class Assessment

Please complete this! It's quick and helps us improve the workshops.

Complete the "Spatial Analysis Survey/Assessment" at:
<http://www.lib.umd.edu/GOV/geospatial.html>

Or use the direct link:

<http://www.zoomerang.com/Survey/WEB22E8JSR6XR6>