GIS: Data Formats, Design & Quality

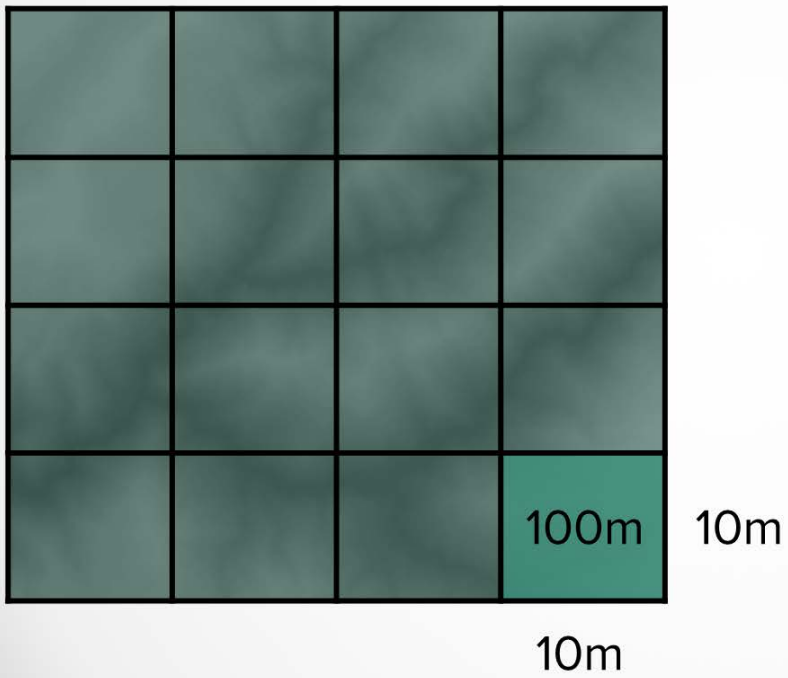
Raster Data Concepts

Learning Objectives

At the end of this lesson, you should be able to:

- Describe the raster model
- Discuss the core building blocks of raster data
- Explain how transformations and overlays work
- Discuss imagery and surfaces

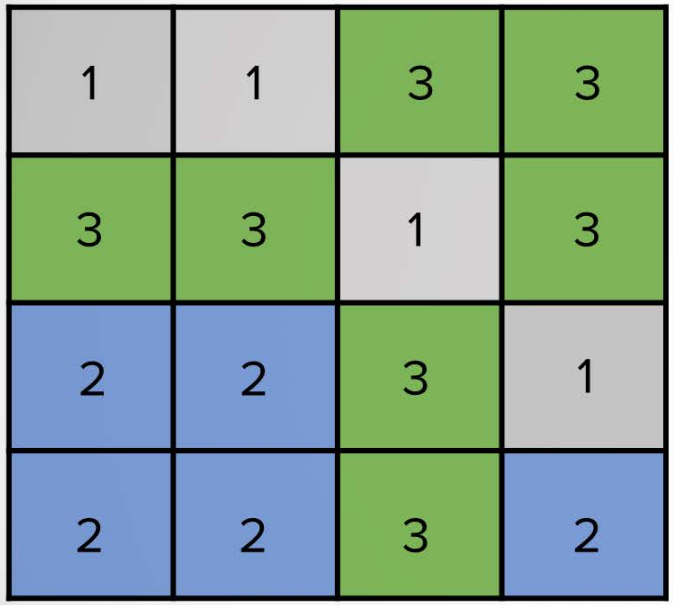
Raster Data Model



Raster Data Model

5 m	5 m	6 m	6 m
5 m	6 m	7 m	7 m
6 m	7 m	7 m	8 m
7 m	8 m	9 m	10 m

Raster Data Model



1	Pavement
2	Water
3	Vegetation

Raster Data Model

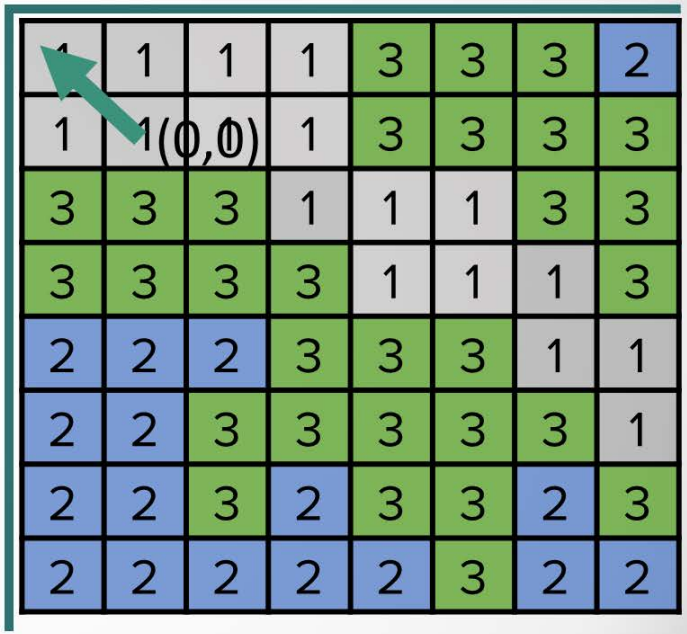
1	1	1	1	3	3	3	2
1	1	1	1	3	3	3	3
3	3	3	1	1	1	3	3
3	3	3	3	1	1	1	3
2	2	2	3	3	3	1	1
2	2	3	3	3	3	3	1
2	2	3	2	3	3	2	3
2	2	2	2	2	3	2	2

1	Pavement
2	Water
3	Vegetation

Digital Imagery

Computer Screens

Storing Raster Data



Raster Alignment

Location, grid of values

Rasters become difficult when comparing locations

Example:

- 10m cell size vs. 15m cell size

Decisions need to be made about which cells should overlap

Raster Alignment

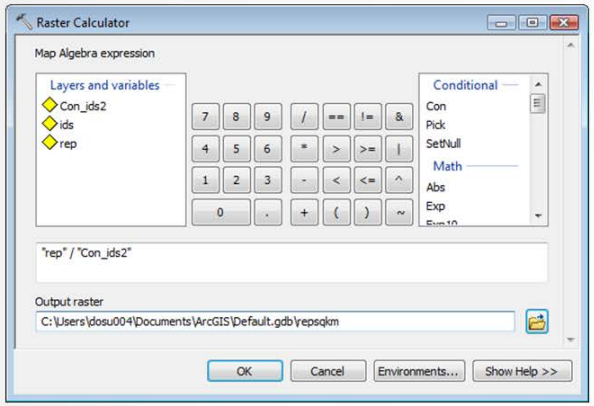
Re-Projection

Re-projection also introduces error

Re-projecting rasters results in "lossy" data

Raster data is often less precise than vector data

Map Algebra



Basic functions without complex programming

"Select by attributes" can be done by writing expressions

Multi-Band Rasters

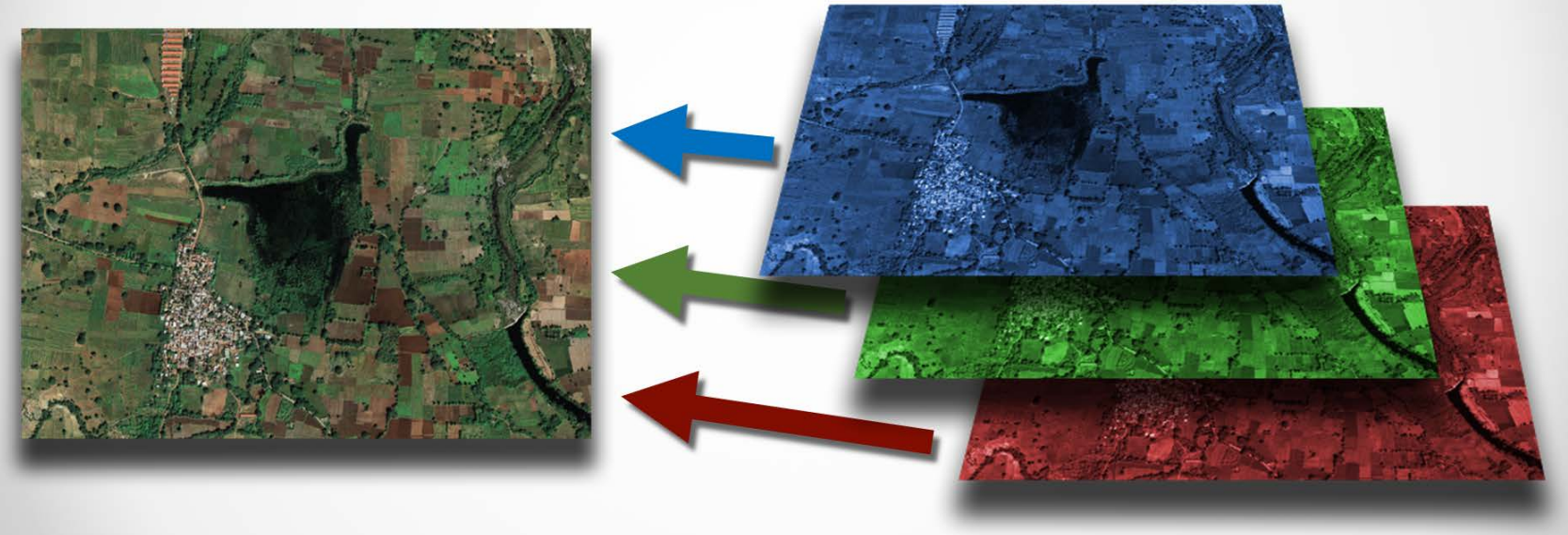
Rasters can be stacked to work with multiple rasters as if they're one

Each "band" is a single raster

Often used to represent data from different sensors captured at the same time

Multi-Band Rasters

Aerial Imagery



Summary

Rasters store information

Limits when transforming raster data

Tools for working with rasters

Multi-band rasters and imagery