

# GEO 447 PRINCIPLES OF GIS

## Analysis Part 1

- Operators
  - Boolean
- Specialized Raster Operations

Created by JDG 2000

Class slides are based on readings, the current NCGIA Core Curriculum for GIS(ystems) and GIS(cience), Kemp & Goodchild (1991), the NCGIA Core Curriculum Project at UBC, and Foote & Heubner's *The Geographer's Craft*

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## Operators

- Create new objects
- Calculate areas, distances, and perimeters
- Find ‘something’

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## Raster Operations

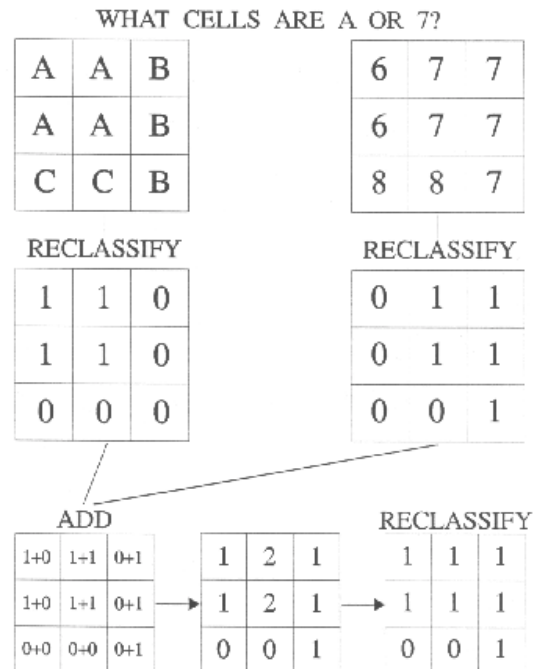
- Different from vector because they are filled spaces with single values
- Operations change values

# GEO 447 PRINCIPLES OF GIS

## Raster: Local Operators

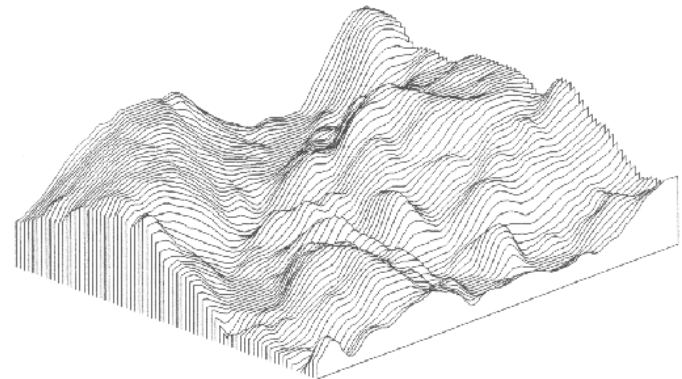
- Recode: assign new values, create classes, rank order
- Overlay: boolean, additive,  $\langle \rangle$ , reclass OVL1/OVL2 combination

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## Raster: Neighborhood Operators

- Filter
  - standard ‘window’ (3x3 matrix)
  - ‘low pass’ filters smooth
  - ‘high pass’ filters edge enhances
- Slope/Aspect
  - calculated based on difference between adjacent cells (ex: DEM)



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## Raster: Extended Neighborhood Operators

- Distance
  - least cost-distance
- Buffer
  - a.k.a. ‘spread’
  - creates new polygon beyond a feature
- View Shed
  - based on rotating a DEM, a 1 or 0 can be assigned to an area if visible from a given location

## Raster: Zone Operators

- Zone Operators are performed on collections of contiguous pixels with same value (essentially a polygon-like object in a raster)
- These operators include:
  - identity
    - a re-class of extended neighborhood result
  - shape
    - is based on comparison of perimeter length & sq-root of area
  - area
    - calculate area of contiguous cells with zone property “X”
  - distance from boundary of zone
    - calculated for each cell

# GEO 447 PRINCIPLES OF GIS

## Raster: Describe

- Provide summary statistics
- Might include a histogram

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## Raster: Other

- Create new color maps
- Create an accompanying documentation file

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