GEO 309 – Intro to GIS

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Topics

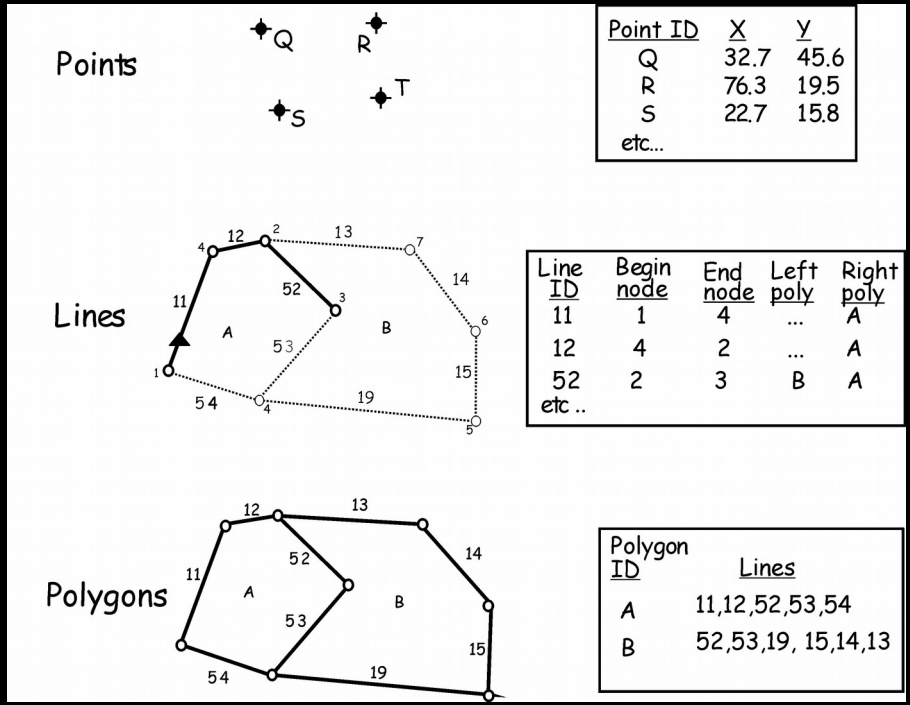
- Discussion – Rundstrom
- Vector geoprocessing
  - Basics of vector topology
  - Vector overlay analysis
  - Spatial joins

Discussion – Rundstrom

- Rundstrom, R. (2009). Countermapping. In, International Encyclopaedia of Human Geography, pp. 314-18. Amsterdam, The Netherlands: Elsevier.

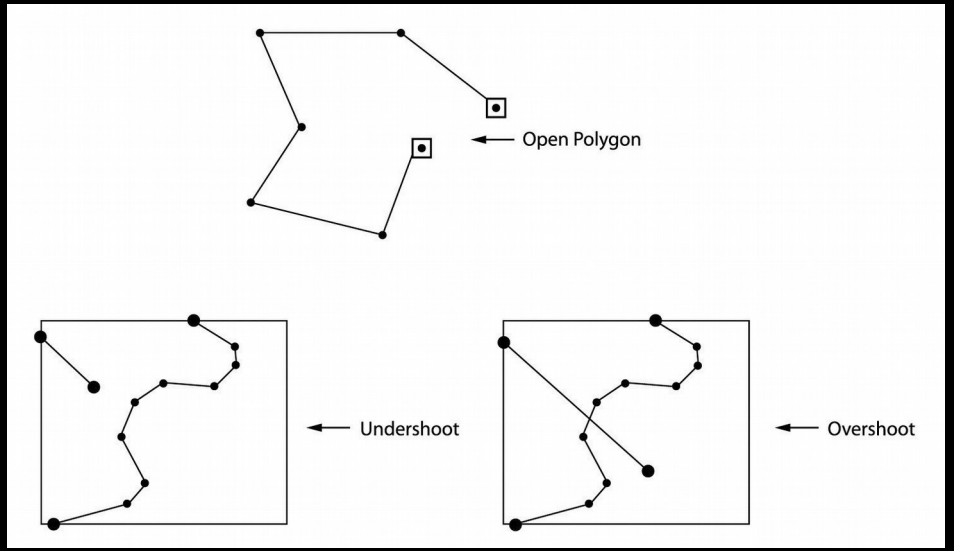
Vector Geoprocessing

- Basic vector topology
  - How points, lines, polygons share geometry
  - Arc-node topology
    - Arc connectivity (& direction)
    - Areal containment
    - Feature adjacency
    - Feature Coincidence
  - Polygon-arc topology



Vector Geoprocessing

- Basic vector topology
  - Common errors
    - Open polygon
    - Slivers
    - Undershoot
    - Overshoot
    - Dangling nodes
  - Tools
    - Snapping

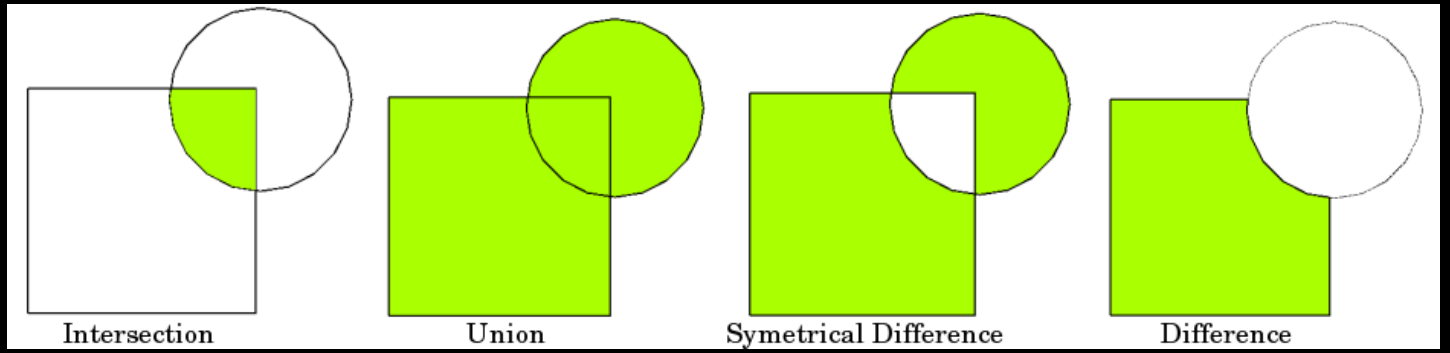


Vector Geoprocessing

- Basic vector topology
  - Point-in-polygon
  - Polygon-on-point
  - Line-on-line
  - Line-in-polygon
  - Polygon-on-line
  - polygon-on-polygon

Vector Geoprocessing

- Overlay Analysis
  - Select by location
  - Buffer
  - Intersect
  - Clip
  - Union
  - Difference
  - Dissolve

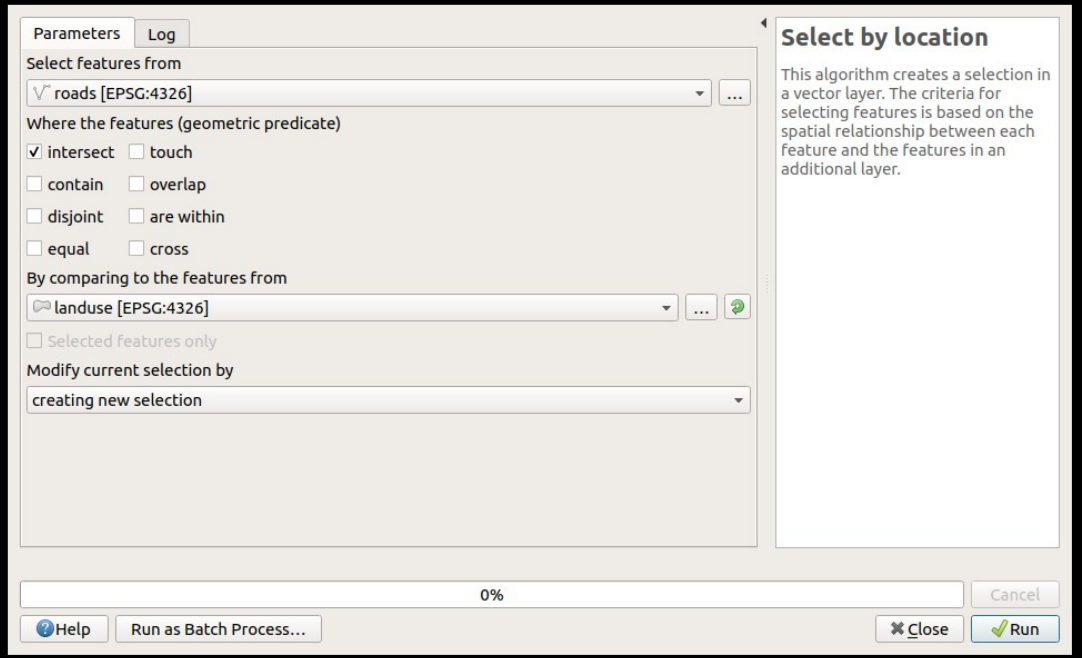


Vector Geoprocessing

- Overlay Analysis
  - First step
  - Don’t forget to **project or re-project** your layers!
    - What kind of analysis are you performing?
    - What projection best suits that model?
    - What units of measure are your features?

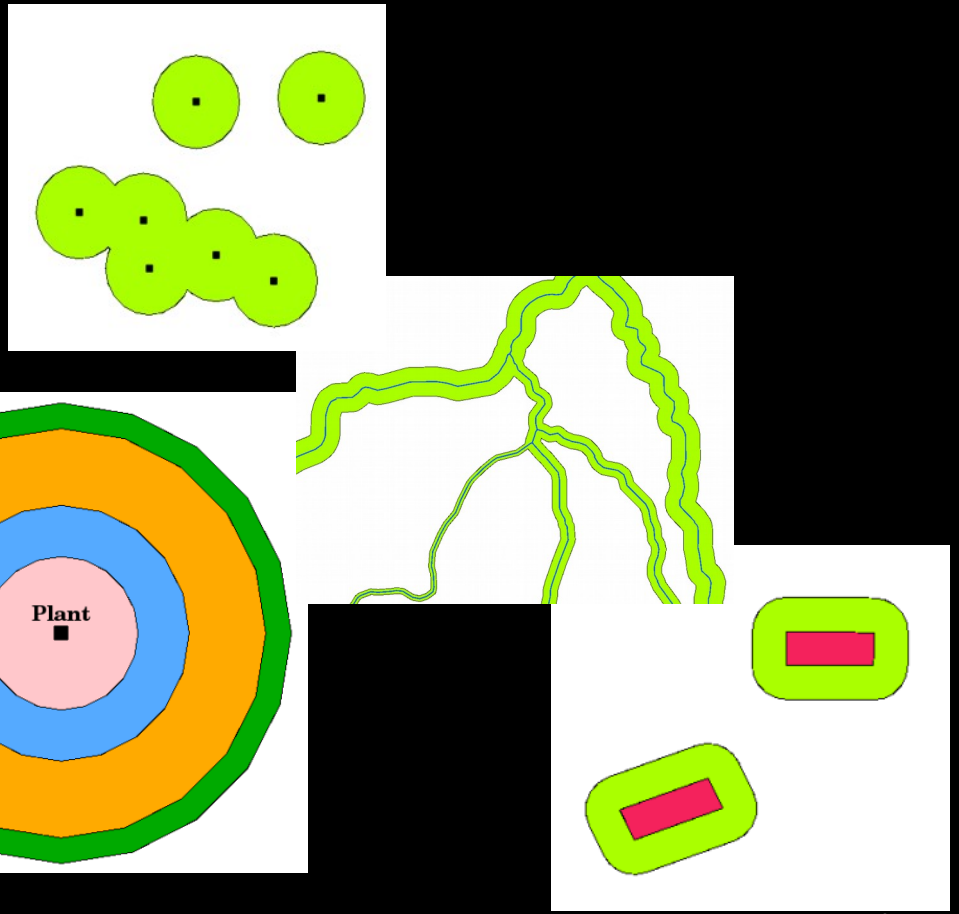
Vector Geoprocessing

- Select by location
  - A selection in a vector layer
  - Based on the spatial relationship
  - Between each layer



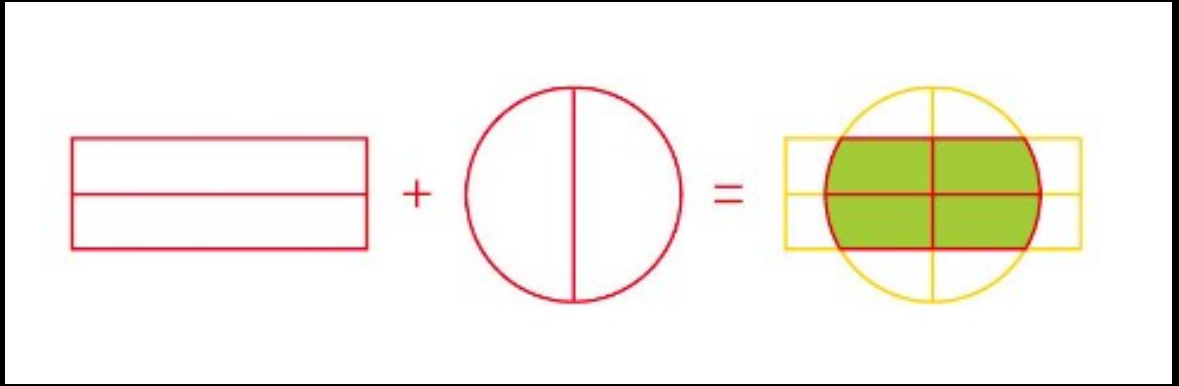
Vector Geoprocessing

- Buffer
  - Distance from feature
    - Points
    - Lines
    - Boundaries
  - Variations
  - Multiple buffers
  - Inward/outward
    - boundaries



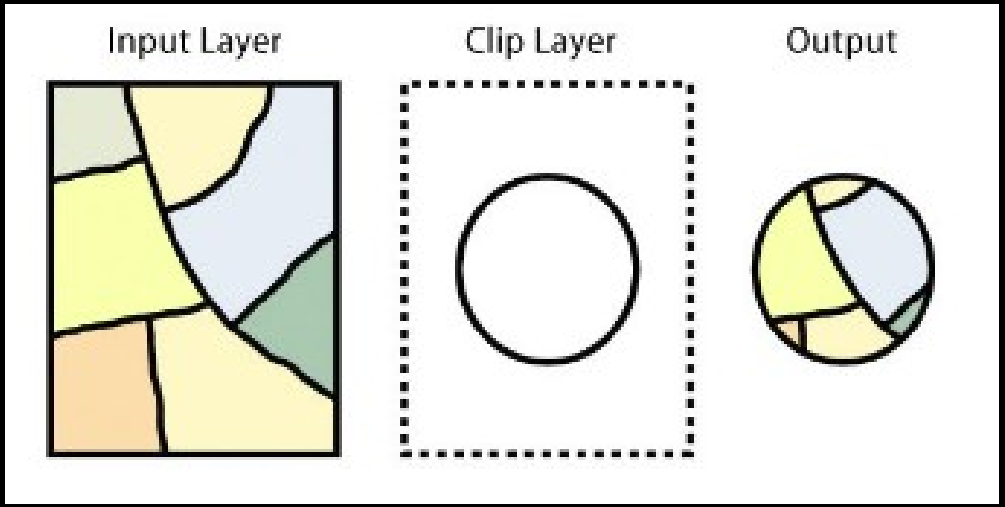
Vector Geoprocessing

- Intersect
  - Input and overlay
  - Combines both into output
    - Where there is an intersect



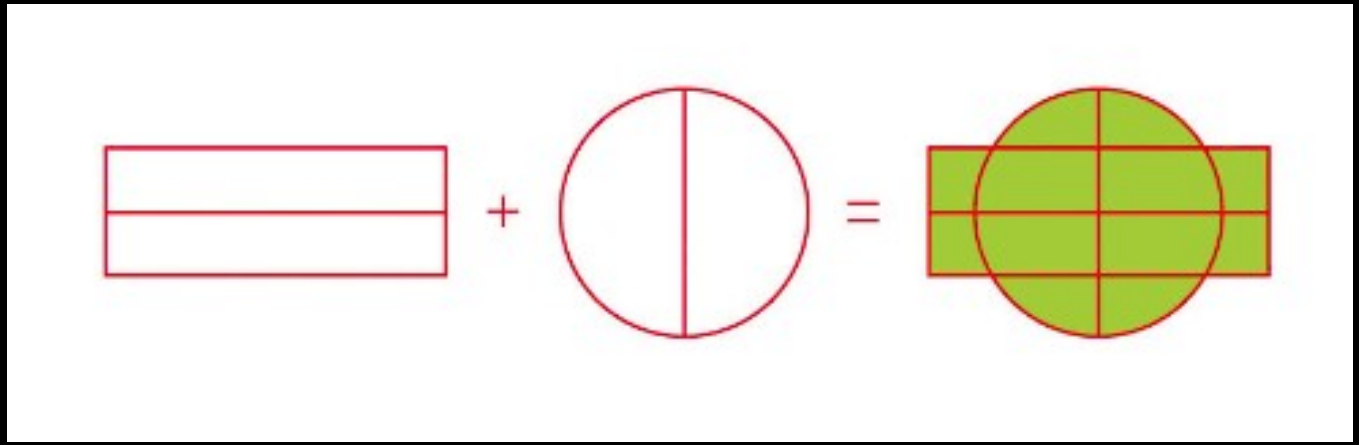
Vector Geoprocessing

- Clip
  - Similar to Intersection
  - Input features in output only



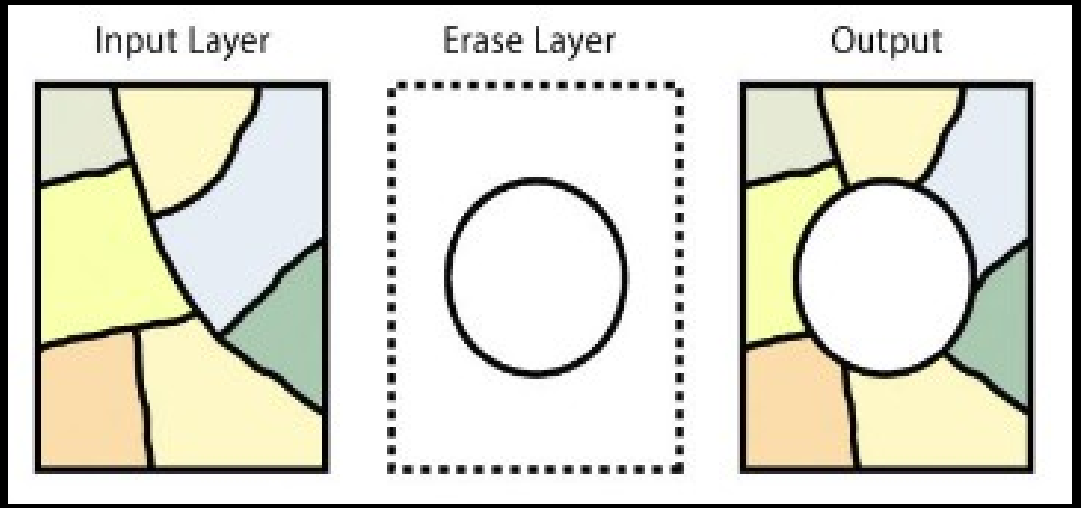
Vector Geoprocessing

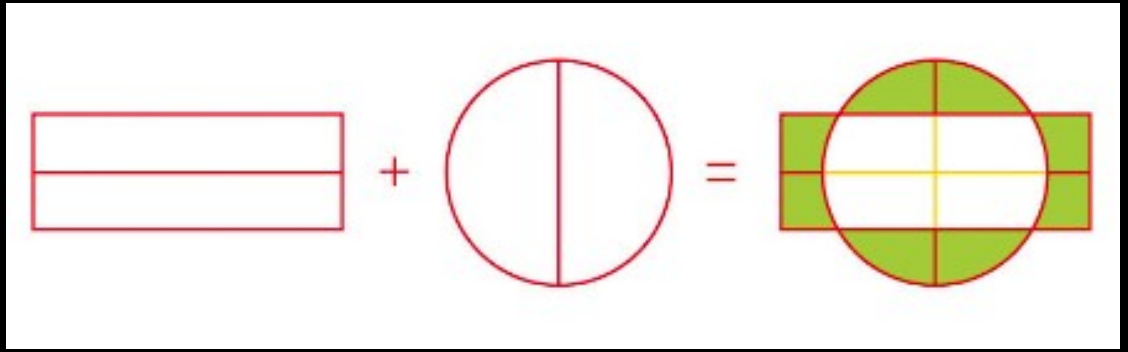
- Union
  - Keeps input and overlay features
  - New features result from this



Vector Geoprocessing

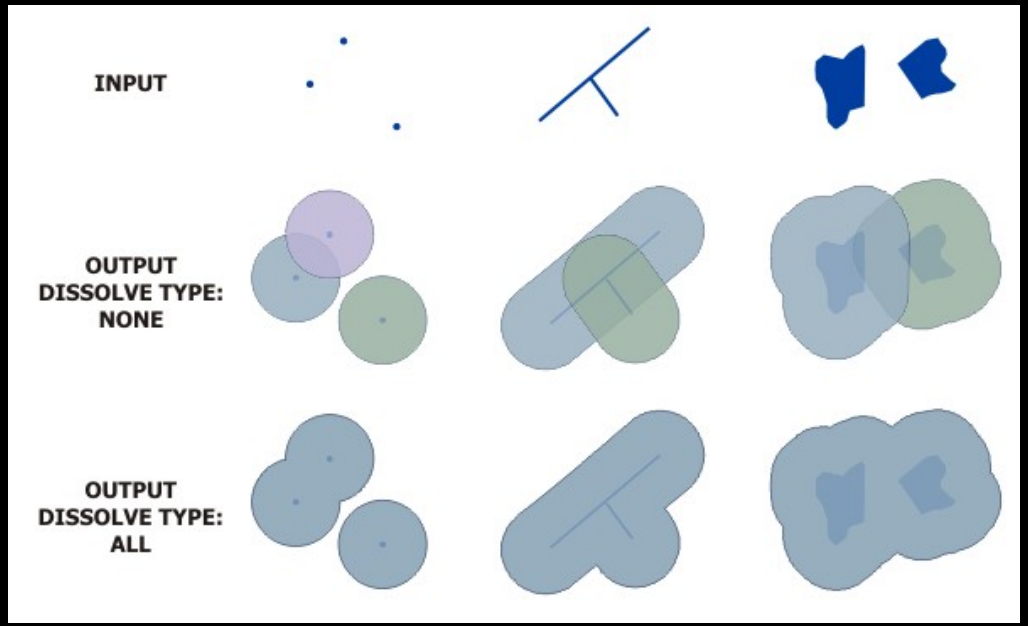
- Difference
  - Opposite of Clip
  - Erase (in ArcGIS)
  - Symmetrical Difference





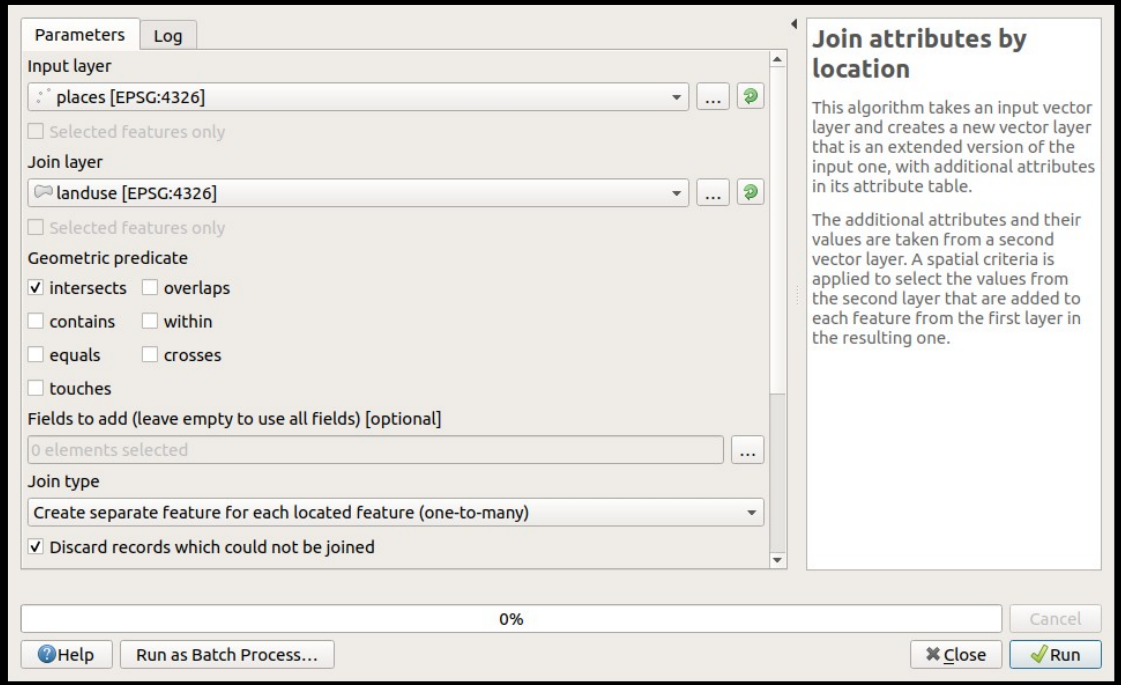
Vector Geoprocessing

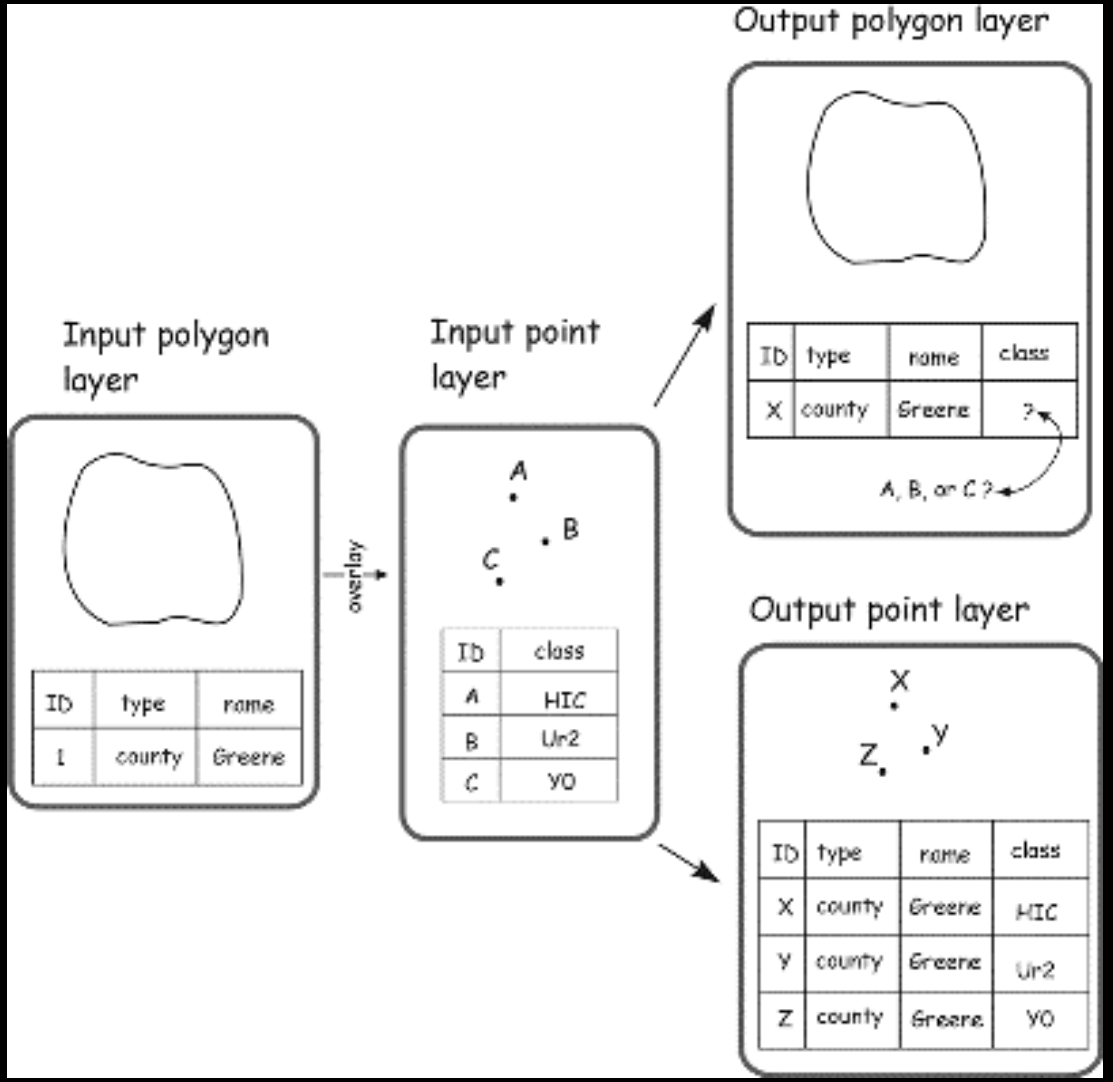
- Dissolve
  - Combines overlapping features



Vector Geoprocessing

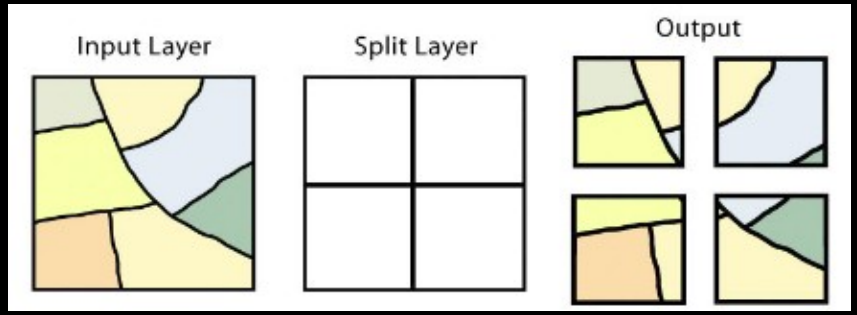
- Spatial Joins
  - Extends attributes of input layer with values from an overlay layer




Output polygon layer
Input polygon layer
Input point layer
overlay
ID type name class
X county Greene ?
A, B, or C ?
A
B
C
Id class
A HIC
B Ur2
C YO
ID type name
1 county Greene
Output point layer
X
Y
Z
ID type name class
X county Greene HIC
Y county Greene Ur2
Z county Greene YO

Vector Geoprocessing

- Additional Operations
  - Merge
    - Append
  - Split



Vector Geoprocessing

Demo