

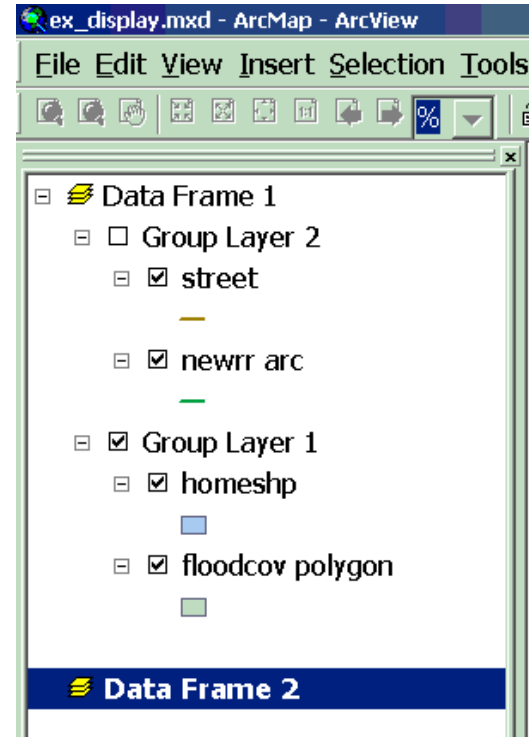
Spatial Analysis Functions GeoProcessing

topics of the week

- ❑ **More on layers**
- ❑ **More on subsets**
- ❑ **Paths, Templates, Map Documents**
- ❑ **Populating the Metadata**
- ❑ **Aggregating Spatial Data**
- ❑ **Proximity Analysis**
- ❑ **Overlay Analysis**

More on layers

- **The hierarchy of layers in the TOC**
 - Data frames
 - Group layers
 - Layers
- **Copying and pasting**
- **The many ways to show the data source**
- **Saving layers, group layers in a *.lyr* file**
- **Mending the path ie broken links to the data or the *.lyr* file**



More on subsets

- **Displaying a subset of the features in a layer**
 - Same data source, No selection – *Properties/Definition Query*
- **Displaying the selected subset features in a layer**
 - Same data source - *Selection/Create layer*
- **Exporting to a separate data source either subset**
 - New data source – *Data/Export Data*

Paths, Templates, Map Documents

- ❑ **Map document (.mxd) = Disk based representation of a map**
 - ❑ *Connection to the data source maintained*
 - ❑ *Set relative path or mend broken links*
- ❑ **Where does ArcGIS stores templates (.mxd)**
- ❑ *C:\users\jim\AppData\Roaming\ESRI\Desktop10.0\ArcMap\Templates*
- ❑ **Saving a map as a template (.mxd)**
 - ❑ *Connection to the data source maintained, overwrites existing template, can be stored anywhere*
- ❑ **Exporting a map (EMF, BMP, PDF, JPEG, etc.)**
 - ❑ *No connection to the data source maintained*

Populating the Metadata

- ❑ **Creates on the fly as you click the Description tab**
 - ❑ *Stored along with the data source files*
 - ❑ *Stored by default in .xml format*
- ❑ **Export in .html or .txt format or else**
 - ❑ *Be aware of different stylesheets*
- ❑ **Edit, enhance metadata**
 - ❑ *From ArcGIS' interface*
 - ❑ *Any other software that can open the file*

Aggregating Spatial Data

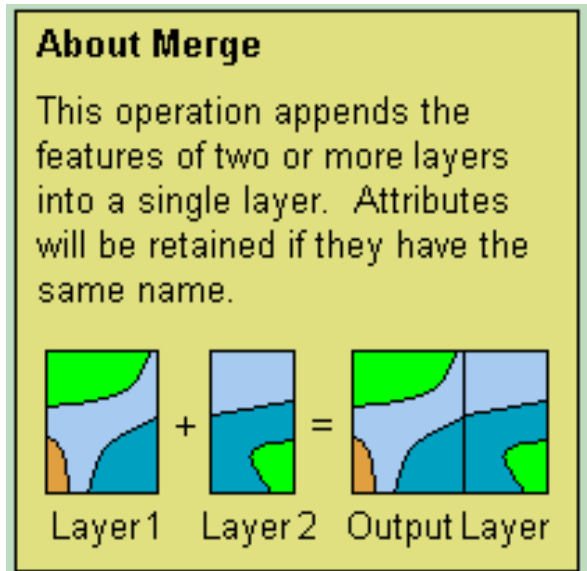
- **Merge**
- **Dissolve**

Merge

- **Merge operation – two or more layers**
 - Append adjacent layers
 - Appends data source(s) or feature class(es) to an existing

Example:

- **Merge several counties**
- **Attn*** when layers overlap:**
 - Features are not intersected
 - Features and attributes are only appended
- **ArcTool Box/Data Management Tools/General/Merge**
- **Geoprocessing/Merge**



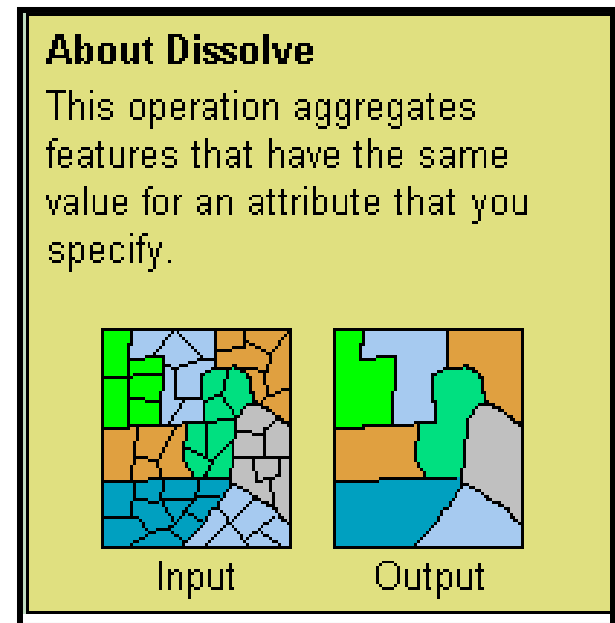
Dissolve

- ❑ **Dissolve operation – one layer process**

- ❑ Aggregate geographic features with same values for one data type
- ❑ Creates new data source or feature class

Example:

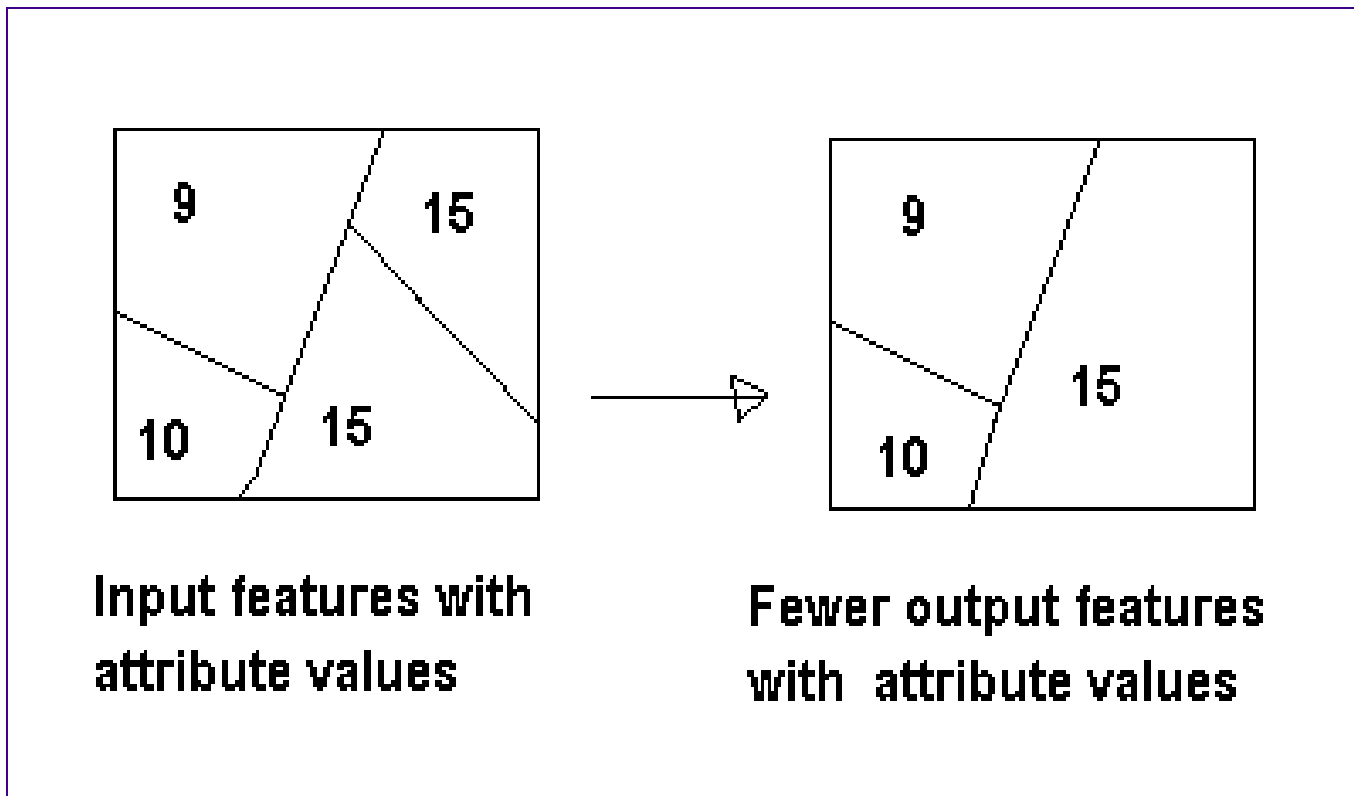
- ❑ Landuse Level 2 to Level 1
- ❑ Parcels based on ownership



- ❑ **ArcTool Box/Data Management Tools/Generalizations/Dissolve**
- ❑ **Geoprocessing/Dissolve**

Dissolve

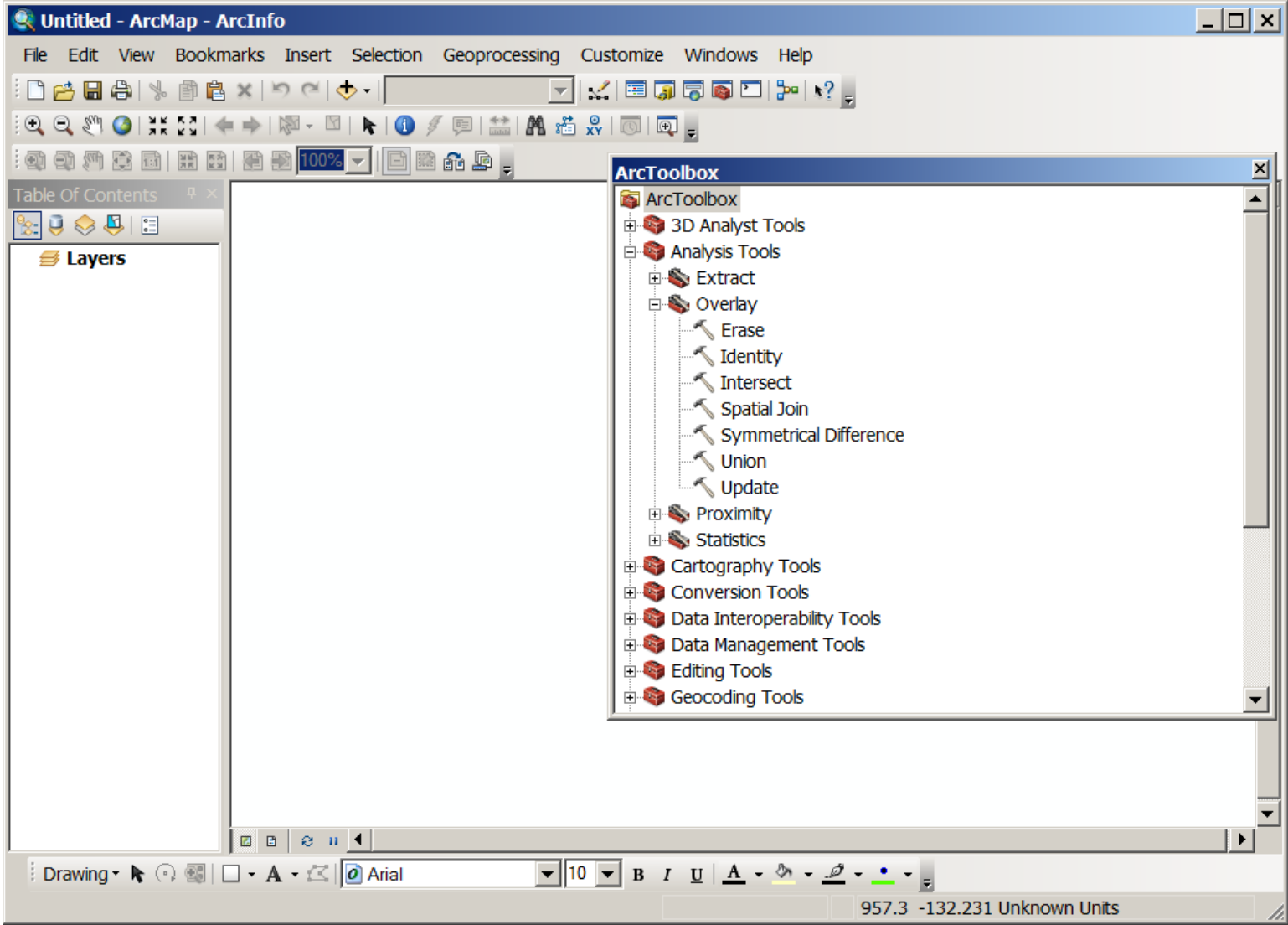
- Dissolving features - simplify the data based on common attribute values



Proximity analysis

- ❑ **Locating features based on their distance from other features**
- ❑ **Buffering features**
- ❑ **Finding closest feature using a spatial join**

ArcToolBox



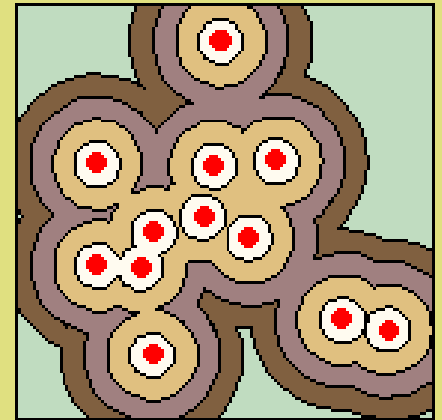
Buffer

- **Buffers are rings drawn around features at a distance**

- By distance or attribute value
- All features or only selected features
- Outside, within, multiple rings
- New layer or graphic

About buffers

Buffers are rings drawn around features at a specified distance from the features.



- **ArcTool Box/Analysis Tools/Proximity/Buffer**
- **Geoprocessing/Buffer**

Clip

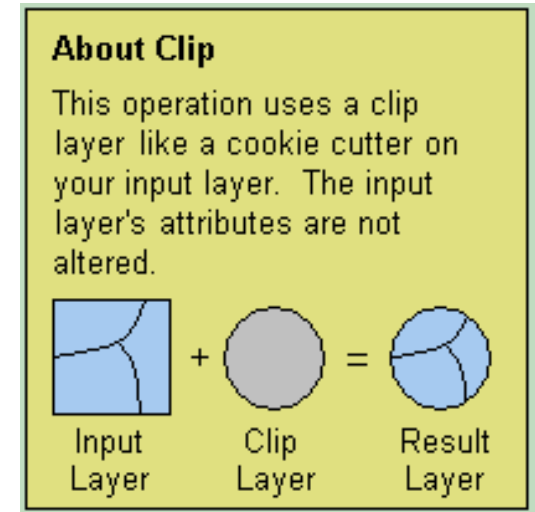
- **Clip operation – two layer process**
 - Reduce spatial extent of one layer based on spatial extent of other
 - Analogous to a cookie cutter
 - Creates new data source or feature class
 - Same attribute table as input layer but a subset
 - Clip layer must be a polygon, input layer can be any feature class
 - Feature class of output layer same as the input layer 's

Example:

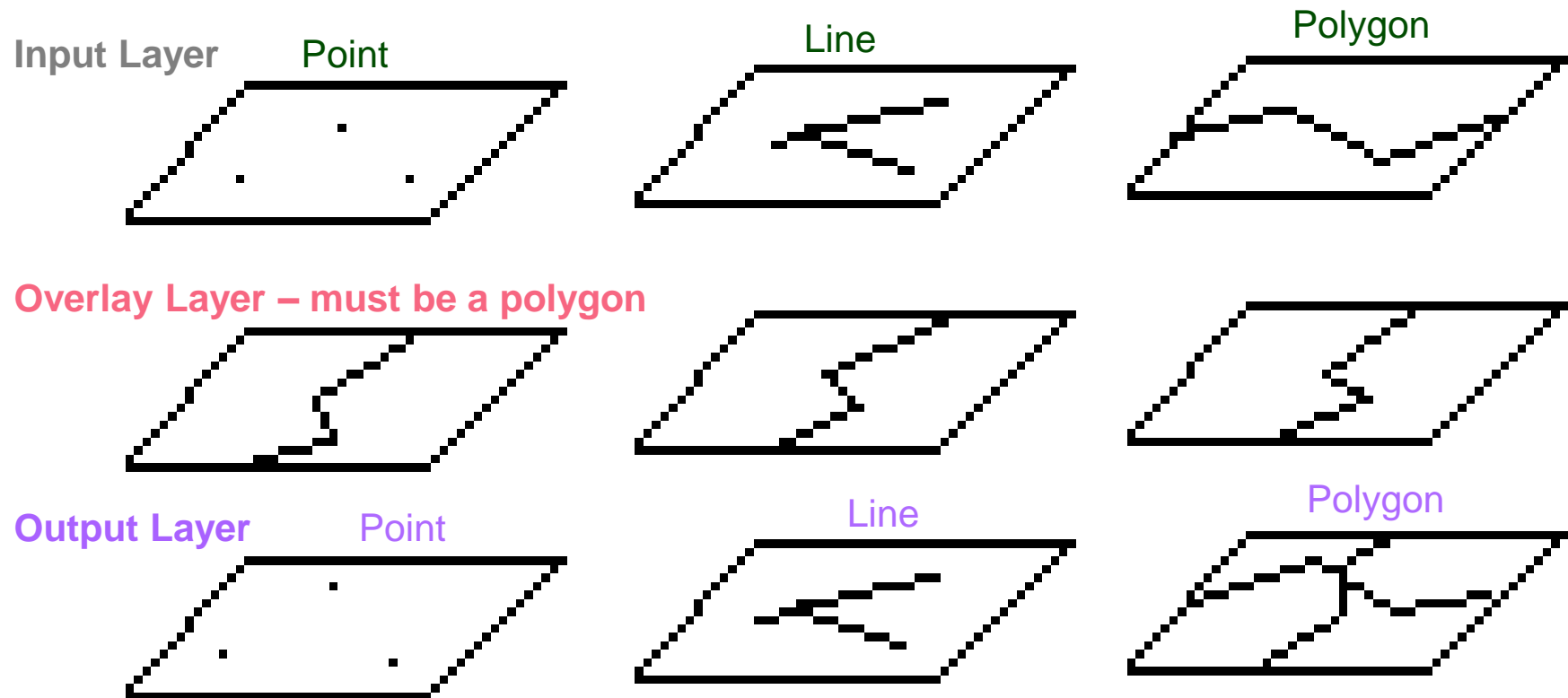
- Limit area of geographic interest
- Parcels for Gainesville

□ **ArcTool Box/Analysis Tools/Extract/Clip**

□ **Geoprocessing/Clip**



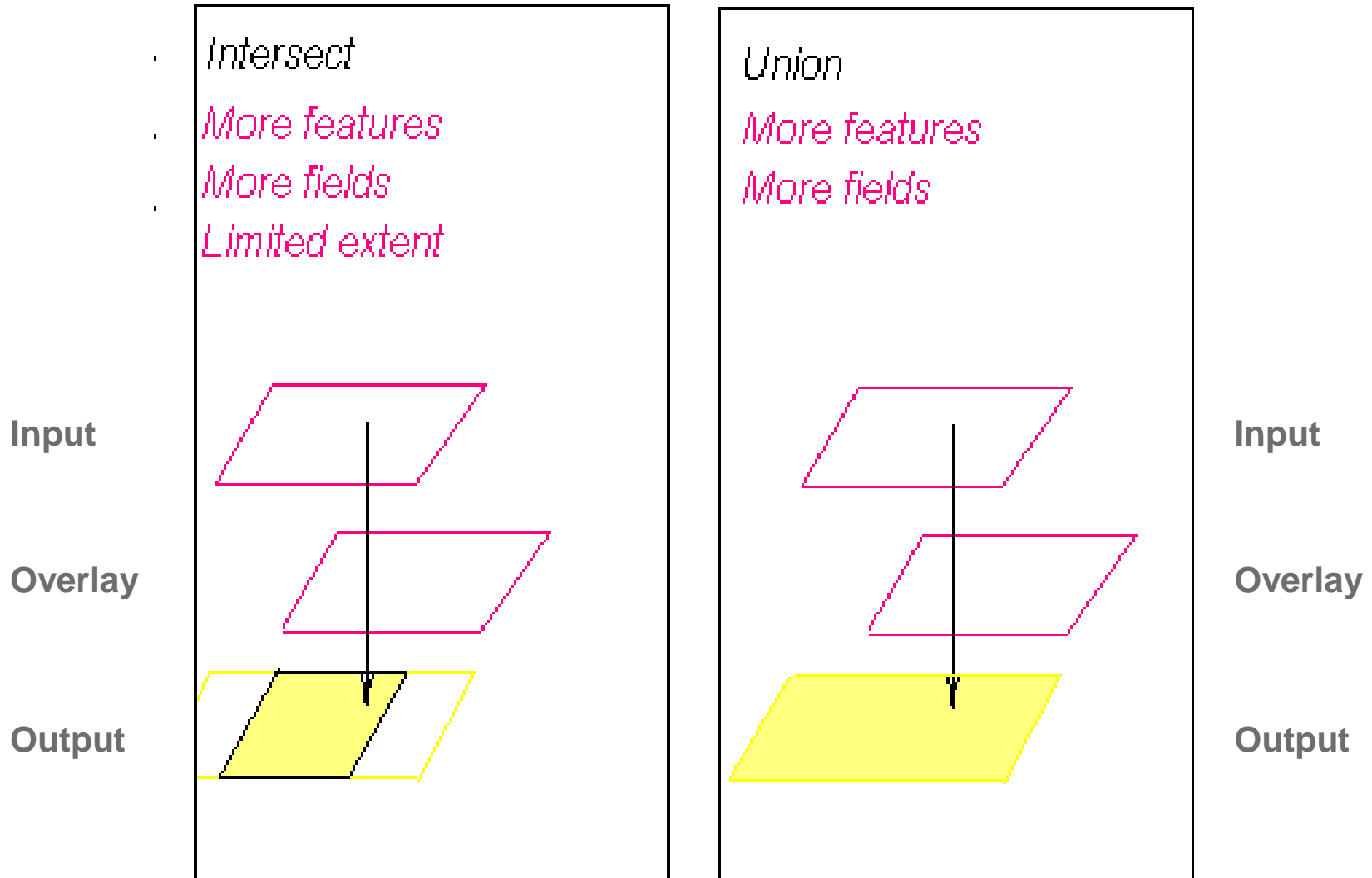
Overlay Analysis / GeoProcessing



Output Layer – inherits attributes from both layers

Output Layer – inherits geographic feature class from the Input Layer

Overlay analysis functions



Intersect

□ Intersect overlay – two layers necessary

- New output layer with spatial extent where the two layers overlap
- Attribute table inherits from both layers
- Creates new data source or feature class
- Input layer determines feature class for output layer
- Overlay layer must be a polygon

Example:

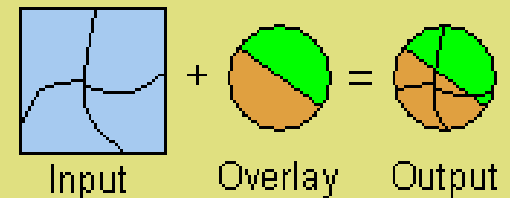
- Intersection of Roads with many counties
- Intersection of Pollution point with counties

□ ArcTool Box/Analysis Tools/Overlay/Intersect

□ Geoprocessing/Intersect

About Intersect

This operation cuts an input layer with the features from an overlay layer to produce an output layer with features that have attribute data from both layers.



Union

- **Union overlay – two layers necessary**
 - New output layer inherits spatial extent of both layers
 - Combine two polygon feature classes and only polygon feature classes
 - Attribute table inherits from both layers
 - Creates new data source or polygon feature class

Example:

Soil layer with crop productivity

- **ArcTool Box/Analysis Tools/Overlay/Union**
- **Geoprocessing/Union**

About Union

This operation combines features of an input layer with the polygons from an overlay layer to produce an output layer that contains the attributes and full extent of both layers.



Union, example

- **Find out influence of soil type over crop productivity:**
 - Get a soils layer
 - Get a crop productivity layer
 - Use Union overlay to combine both layers in one
 - Query, Display, Analyze the new layer, based on the new joint attributes & the new polygons to examine relationship between soil type and crop productivity

Important

The output from the GeoProcessing operation will be in the same Coordinate System as the Data Frame, irrespective of the Coordinate System in each of the data sources of the input layers.

Computer Demo – Suitable Location Exercise

Process Analysis Chart

