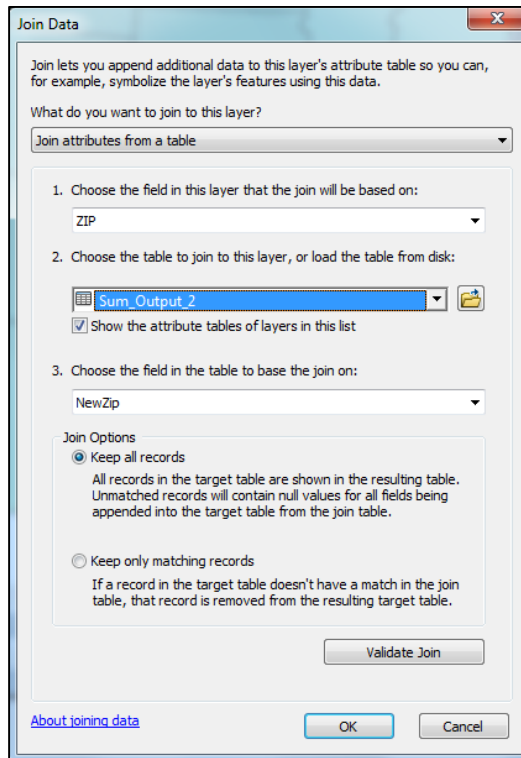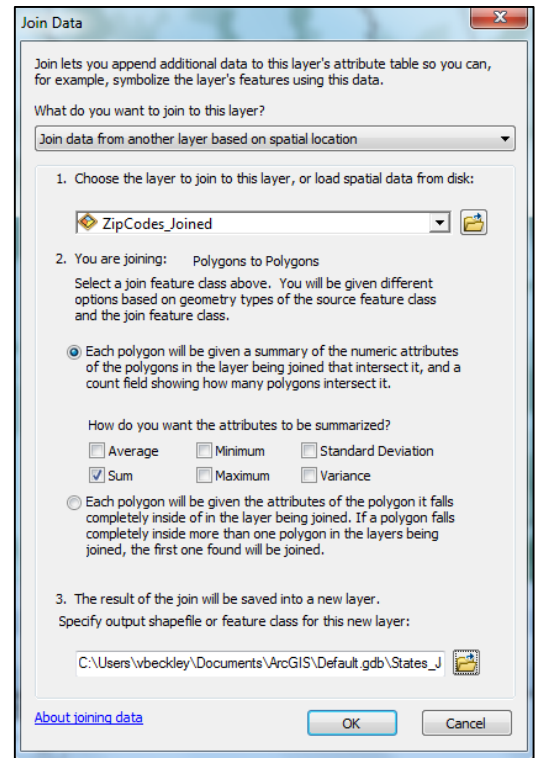# Guide to Spatial and Attribute-based Joins
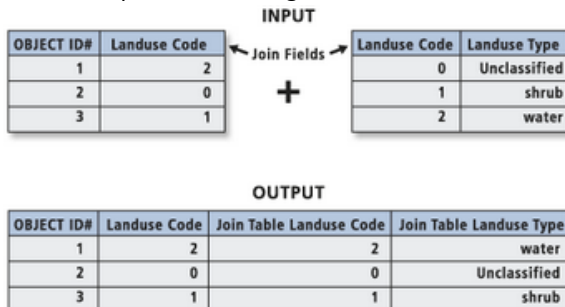
Attribute-based Join

This join links two columns, or "fields", that have overlapping data, one field is in the table and one is in the map layer

To access this tool: right-click on **the map layer to be joined**, choose Joins and Relates → Join

1. Choose field (column) from map layer
2. Identify the table to be joined
3. Choose the field from the table

Join Options: you can choose to keep or discard remaining unmatched records – ex: if your table contained data about 35 of the 50 US States, you could keep the other 15 states in the resulting table with "Null" values, or you could leave them out of the table

Validate Join will predict resulting errors and total values matched

Spatial Join

This join links attributes between two map layers based on spatial relationship

This tool can be used for points, lines, and polygon data

To access this tool: right-click on **the map layer to be joined that contains the area that the join will be based on**, choose Joins and Relates → Join

Ex: joining zip-code data to the state-level, as seen above, right-click on the state layer to initiate the join, then:

1. Select the layer to load the spatial data from (ex: zip-code layer)
2. Choose how the feature attributes will be compiled in the resulting layer
3. Choose an output location – this tool generates a new layer

Best Practices

1. Formatting the spreadsheet (or other input table) -- This is where most join-related troubleshooting occurs:
    a. Most important: remove all **spaces** and **symbols** from the table field names, and do not start field names with numbers!

Pref Class	Zip#	NewZip	2005 location
0	1038	01038	Portland, OR
0	1027	01027	Dallas, TX
0	3833	03833	Redlands, CA

Bad

Pref_Class	Zip	NewZip	Location 2005
0	1038	01038	Portland, OR
0	1027	01027	Dallas, TX
0	3833	03833	Redlands, CA

Good

    b. Exporting the spreadsheet as a .csv (comma-separated values) will remove the formatting, which makes it easy to read by the GIS. Using Sheet1 from an expanded .xls will also work, but may have more formatting/conversion issues
    c. Depending on the format of the table data you may need to summarize data
    d. When using data like the zip codes seen above it is challenging to retain the "0" in codes like "01060". Either save the spreadsheet field as a string/text and save as .xls or transform the field in the map layer to an integer by adding a field and field calculating
    e. Make sure the values in your matching fields align – NORTHAMPTON and Northampton will **not** be recognized as the same, neither will New London and New_London – use a formal in excel to transform the values to match. Remember -- consistency is critical!

2. Post-join Results: Once the join is made look at the attribute table of the map layer for results
    a. Export the map layer to permanently join the table and map layer in a new layer: right-click layer go to **Data → Export Data**
    b. The resulting attribute table may have an overwhelming number of fields. These can be turned off in the properties window under **Fields** tab. Field can be deleted individually by right-clicking field name in attribute table and clicking delete, and collectively by exporting the data AFTER turning the unwanted fields off in the **Fields** tab
    c. Joins can be removed by right-clicking layer, **Joins and Relates → Remove Joins**

Resources:

Esri Joins and Relates by Attribute:
http://resources.arcgis.com/en/help/main/10.2/index.html#//005s0000002n000000
Esri Join Troubleshooting:
http://help.arcgis.com/en/arcgisdesktop/10.0/help/index.html#//005s0000002p000000

Attend SAL lab hours: www.smith.edu/gis   Set up a meeting, email: SAL@smith.edu