Working with Selections

In this Chapter you will learn

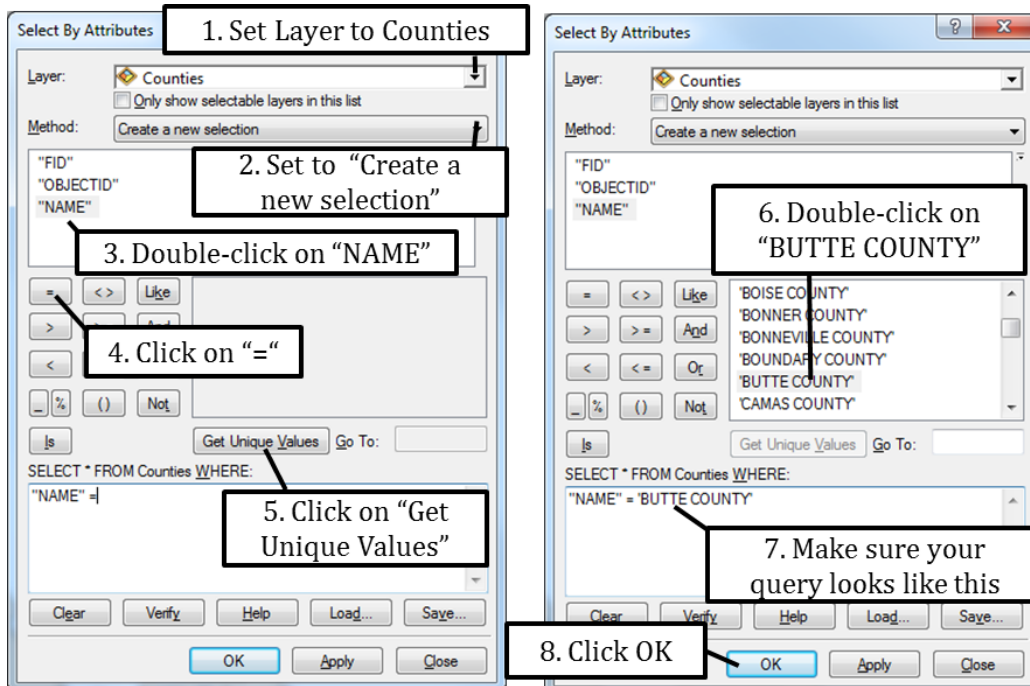- How to select features based on their attributes or location.
- How to export selected features to a new shapefile
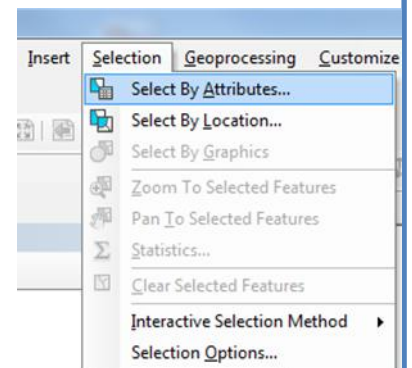
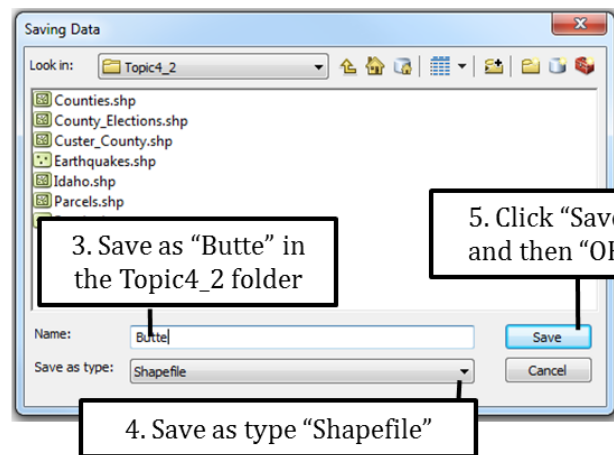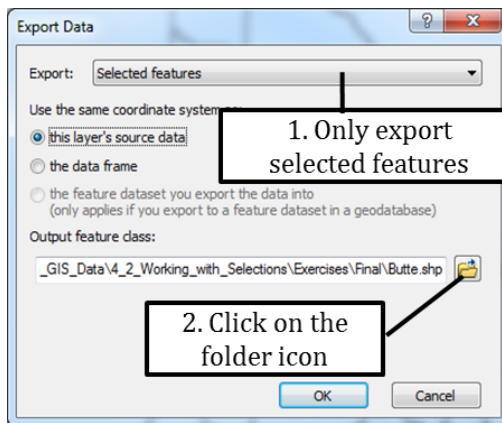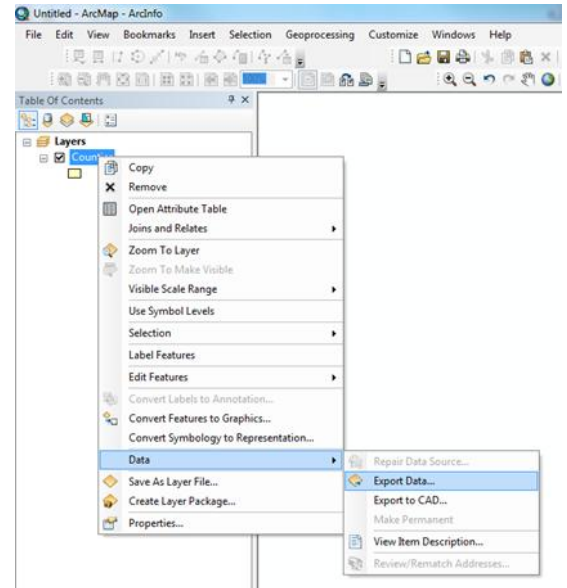**VIDEO**

4.2: Selecting and Exporting Data

1. Working with Selections

**Exercise 1: Creating simple selections based on attributes**

1. Open a new map document and add the Counties shapefile from the Topic4_2 folder. In this exercise we will select Butte County and then export this County as its own shapefile.

2. Click on Selection on the main menu along the top of your screen and click "Select by Attributes" as shown on the right.

3. Complete dialog box as shown below.

Insert	Selection	Geoprocessing	Customize
	Select By Attributes...		
	Select By Location...		
	Select By Graphics		
	Zoom To Selected Features		
	Pan To Selected Features		
	Statistics...		
	Clear Selected Features		
	Interactive Selection Method	▶	
	Selection Options...		

Select By Attributes

Layer: ◇ Counties
☐ Only show selectable layers in this list

Method: Create a new selection

"FID"
"OBJECTID"
"NAME"

= <> Like
>
<
_ % () Not

Is   Get Unique Values   Go To:

SELECT * FROM Counties WHERE:

"NAME" =|

Clear   Verify   Help   Load...   Save...

OK   Apply   Close

1. Set Layer to Counties

2. Set to "Create a new selection"

3. Double-click on "NAME"

4. Click on "="

5. Click on "Get Unique Values"

Select By Attributes

Layer: ◇ Counties
☐ Only show selectable layers in this list

Method: Create a new selection

"FID"
"OBJECTID"
"NAME"

= <> Like
> >= And
< <= Or
_ % () Not

Is   Get Unique Values   Go To:

'BOISE COUNTY'
'BONNER COUNTY'
'BONNEVILLE COUNTY'
'BOUNDARY COUNTY'
'BUTTE COUNTY'
'CAMAS COUNTY'

SELECT * FROM Counties WHERE:

"NAME" = 'BUTTE COUNTY'

Clear   Verify   Help   Load...   Save...

OK   Apply   Close

6. Double-click on "BUTTE COUNTY"

7. Make sure your query looks like this

8. Click OK

4. Right-click on the Counties layer in the table of contents and click on Data > Export Data as shown on the right.

5. Fill in the Export Data dialog box as shown below

1. Only export selected features

2. Click on the folder icon

3. Save as "Butte" in the Topic4_2 folder

4. Save as type "Shapefile"

5. Click "Save" and then "OK"

6. When prompted add the Butte shapefile to your map.

7. Add the Earthquakes shapefile to your map. Start another "Select by Attributes…" query and complete the dialog box as shown on the right to select only those earthquakes with a magnitude ("MAG") greater than 6 on the Richter scale.

8. Export only the selected earthquakes to a new shapefile called "Large_Earthquakes" in the Topic4_2 folder. Add the new layer to your map.

9. Click Selection along the top of your screen and then Clear Selected Features as shown on the right.

10. Leave your map open if you plan to move on to the next exercise.
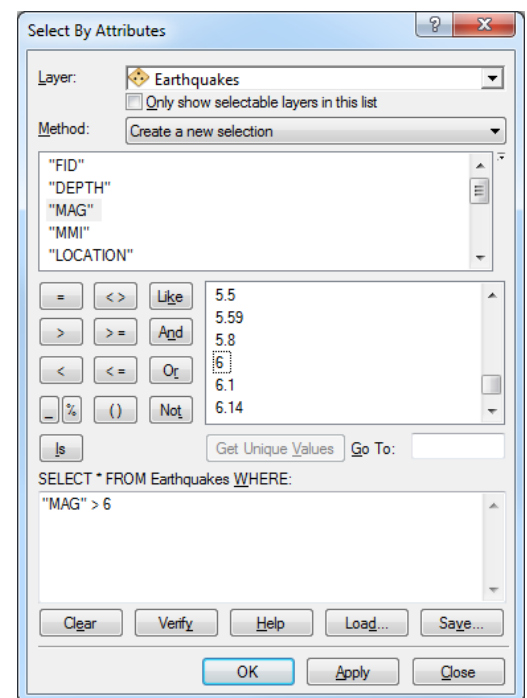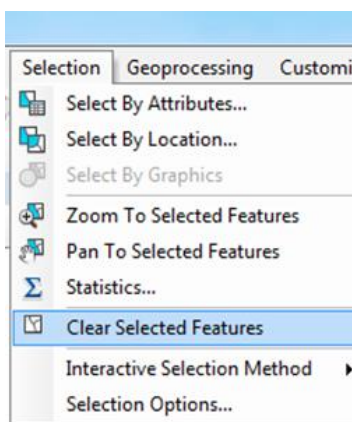
Exercise 2: Creating selections with "And" statements

1. If you are not continuing from exercise 1 then open a new map document and add the Earthquakes shapefile from the Topic4_2 folder.

2. Open the attribute table for the Earthquakes shapefile and note the MAG field which shows the magnitude for each of the earthquakes. For the first part of this exercise you will select earthquakes that have a magnitude between 3 and 5 on the Richter scale. To fit in this range an earthquake must be more than 3 AND less than 5. Close the attribute table.

3. Open the "Select by Attributes" dialog box and use the AND statement as shown in the figure on the right to build a query that reads "MAG" > 3 AND "MAG" < 5

4. After you finish the selection, export the selected data as a shapefile called "Earthquakes_between_3_and_5" in your Topic4_2 folder.

5. Open your attribute table for this new shapefile and note the strength of the earthquakes.

6. Clear the selected features.
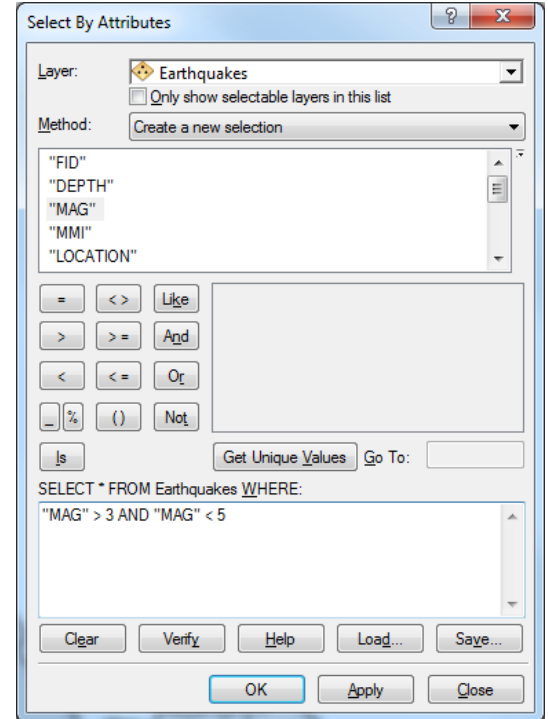
Exercise 3: Creating selections with "Or" statements

1. In this exercise you will create a new shapefile showing only Ada and Canyon County. Open a new map document and add the Counties shapefile.

2. Open the Select by Attributes dialog box and set up the "OR" query on the right-hand side. The query reads: "NAME" = 'ADA COUNTY' OR "NAME" = 'CANYON COUNTY'

3. Export to selection to a shapefile called "Ada_Canyon.shp" in your Topic4_2 folder.

4. Try the same query again, except replace the "OR" with an "AND" so the query reads "NAME" = 'ADA COUNTY' AND "NAME" = 'CANYON COUNTY'. Why are there no features selected? This is because there are no counties that are simultaneously called Ada *and* Canyon County.
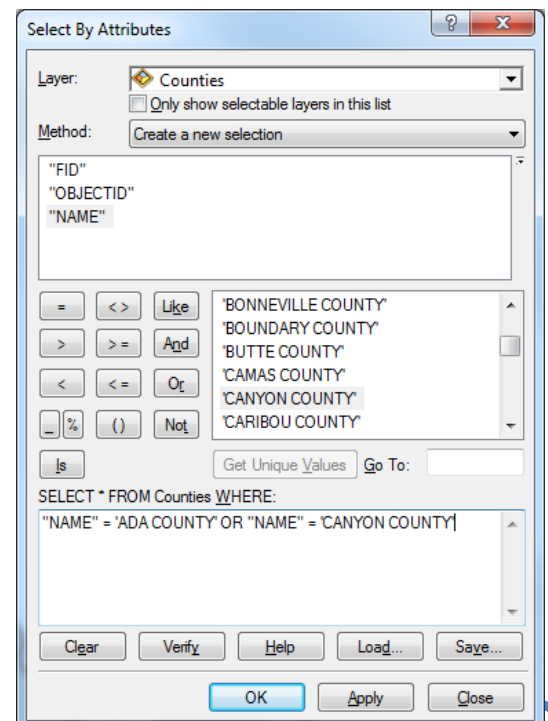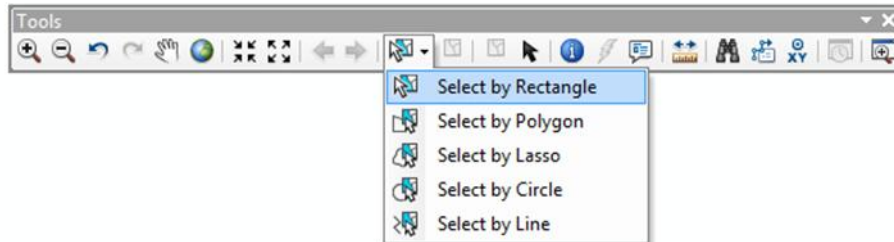
**Exercise 4: Removing from and adding to a selection**

1. Up to this point we have used the "Select by Attributes…" tools to select features. You can also directly select features on the map using the Select Features tools on the Tools toolbar as shown below.

2. Start a new map document and add the Counties layer from the Topic4_2 folder. Experiment with the different Select Features tools, such as "Select by Rectangle" and "Select by Line" to select Counties. Note that every time you use the tool you are discarding the old selection and starting a new one.

3. Go to "Selection" near the top of your screen and select the Interactive Selection Method as shown on the right. Notice the different options available to you. Click on "Add to Current Selection".
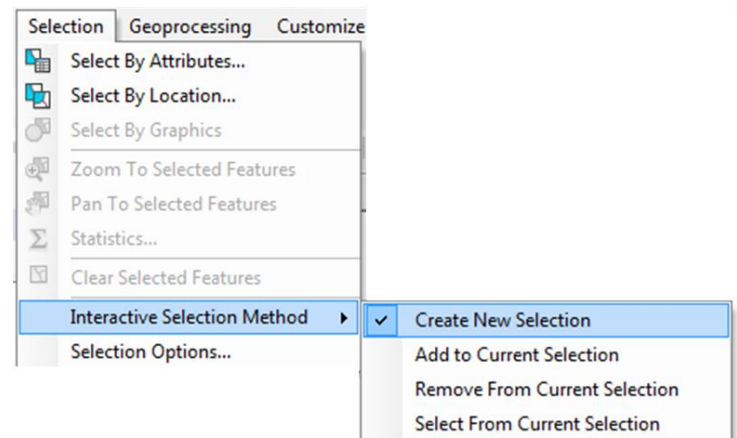
4. Go back to your map and select a number of Counties. Notice that new selections are added to the counties that were already selected.


5. With a number of Counties selected go back to the Interactive Selection Method and choose "Select From Current Selection". Use the "Select by Rectangle" tool to select simultaneously a number of counties that are already selected and some that are not already selected. What does the "Select From Current Selection" do?

6. Right-click on the Counties layer in the table of contents and click Selection > Select All. Then go back to the Interactive Selection Method and choose "Remove From Current Selection". Use one of the Select Features tools and select a number of Counties. Notice that you are now removing counties from your selection.

7. When you are working with the "Select by Attribute…" dialog box as we did in the previous exercises you have access to the same Interactive Selection Methods as you just used in this exercise.

8. Right-click on the Counties layer and choose Selection > Select All.

9. Open the "Select by Attribute…" dialog box and set the Method to "Remove from current selection". Complete the dialog box as shown on the right to remove Lincoln County from the selection. Open the attribute table to verify that the other 43 counties are still selected.
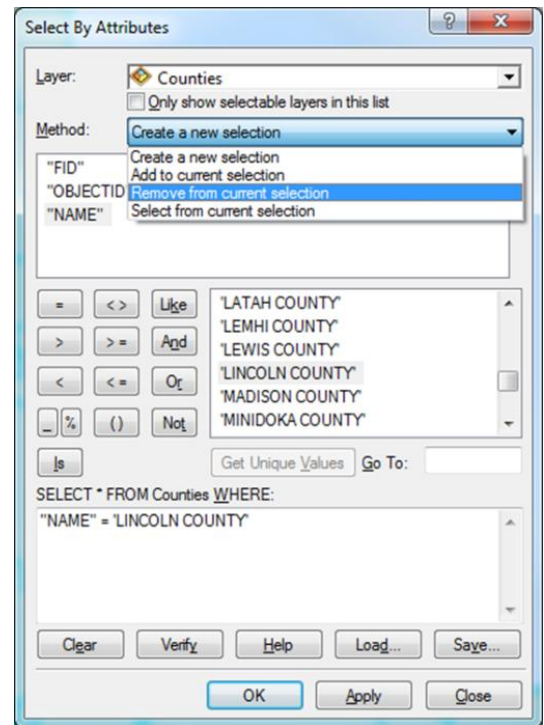
Exercise 5: Setting Selectable layers

1. Map documents can have a large number of layers and sometimes it can sometimes be difficult to only select features from the layers you want. For example, open Exercise5.mxd in the Topic4_2 folder and look at the various layers.

2. Use the "Draw by Rectangle" Select tool and select a number of features. Open the various attribute tables and note the number of selected features in each of the layers.

3. A different way to quickly see the number of selected features in each of the layers is by going to the "List by Selection Tab" in the table of contents as shown on the right. You can see that you have selected features from all four layers.

4. Go back to the List by Drawing Order tab on the Table of Contents.

5. Frequently you may want to select a feature from one specific layer. You do this by making that layer the only selectable layer. Right-click on Parcels and click Selection > Make This The Only Selectable Layer.

6. Use the "Draw by Rectangle" Select tool again. Go back to the List by Selection tab and notice that only Parcels have been selected.

4.2: Setting Selectable Layers
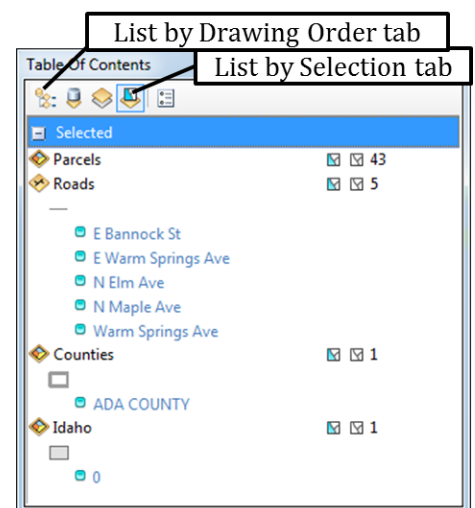
7. Clear your selection

8. On the "List by Selection" tab click on the Toggle button for the Idaho and Counties layers as shown on the right to make them selectable. Click the Toggle Button for the Parcels layer to make parcels Not Selectable. Make a selection to test those settings.
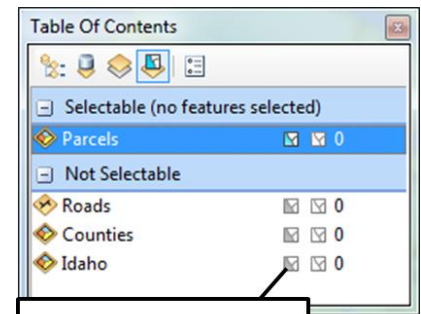
This button toggles between "Selectable" and "Not Selectable"

Exercise 6: Using selections to clean up a shapefile (Case Study)

1. Open a new map document and add the County_Elections shapefile from the Topic4_2 folder. At first glance this shapefile may appear to contain only 3 polygons.

2. Add the Gem.lyr to your map which contains the same County_Elections shapefile, but has been symbolized so that only the outlines of the polygons are visible. You should now be able to see that this shapefiles contains more than 3 polygons and also that those polygons overlap each other.

3. Remove the Gem.lyr that you added in the previous step by right-clicking on it, and choosing "Remove".

4. Right-click on the "County_Elections" layers and then click on "Open Attribute Table".

5. This attribute table, which is also displayed on the right-hand side, contains information about precincts and commissioners districts in Gem County. It would be better if this shapefile was split into two shapefiles, one *only* showing the precincts, and the other shapefile *only* showing the commissioner districts.

It is not uncommon to have multiple "subjects" in one GIS Layer like the one used in this case study, especially if this GIS layer is created by converting a CAD drawing into GIS format

6. Click and drag your mouse to select all the precincts in the attribute table as shown on the right.

7. Right-click on the County_Elections layer in the Table of Contents and choose Data > Export Data. Save the selected features in a new shapefile called "Precincts" in your Topic4_2 folder.

8. Select the three commissioner districts at the bottom of the County_Elections attribute table and export those selected features to a shapefile called "Commissioner_Districts" in the Final folder.
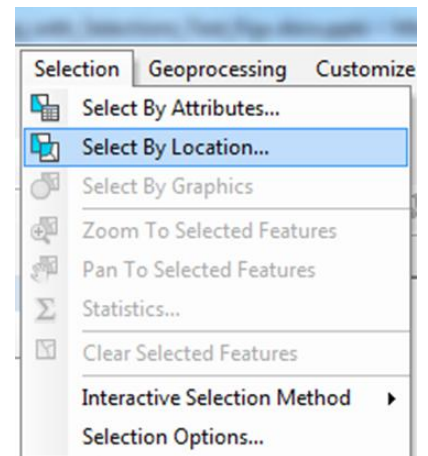
Table

FID	Shape	PRECINCTS	COM_DIS
0	Polygon ZM	LETHA	
1	Polygon ZM	BRICK	
2	Polygon ZM	CENTRAL EMMETT	
3	Polygon ZM		
4	Polygon ZM		
5	Polygon ZM		
6	Polygon ZM		
7	Polygon ZM		
8	Polygon ZM		
9	Polygon ZM	BENCH	
10	Polygon ZM	NORTH EMMETT	
11	Polygon ZM	SOUTH EMMETT	
12	Polygon ZM	WEST EMMETT	
13	Polygon ZM		DISTRICT I
14	Polygon ZM		DISTRICT II
15	Polygon ZM		DISTRICT III

Click here. Then slowly drag you mouse down to select all the features that have a precinct name

1   ◄ ►   ►I   (13 out of 16 Selected)

County_Elections

VIDEO

4.2: Select by Location

Exercise 7: Select by Location

1. Open a new map document and add the Counties, Custer_County and Earthquakes shapefiles from the Topic4_2 folder.

2. In the first part of this exercise we will select all the earthquakes that occurred in Custer County.

3. Click Selection > Select By Location as shown on the right and then populate the Select by Location dialog box as shown below.

Selection   Geoprocessing   Customize

- Select By Attributes...
- Select By Location...
- Select By Graphics
- Zoom To Selected Features
- Pan To Selected Features
- Σ Statistics...
- Clear Selected Features
- Interactive Selection Method ▶
- Selection Options...

Select By Location

Select features from one or more target layers based on their location in relation to the features in the source layer.

Selection method:

select features from

Target layer(s):
- ☑ Earthquakes
- ☐ Custer_County
- ☐ Counties

1. Click the check box in front of Earthquakes to select features from this layer

2. Set Source Layer to Custer_County since we want to select earthquakes that occurred in this County

3. Click drop-down box and note the various options. Select "Target features intersect the Source layer feature"

Source layer:
◆ Custer_County

☐ Use selected features   (0 features selected)

Spatial selection method:

Target layer(s) features intersect the Source layer feature

☐ Apply a search distan...
0.800000

4. Click OK

Help   OK   Apply   Close

7

4. Export selected features to a shapefile called "Custer_Earthquakes" and store it in your Topic4_2 folder. Clear all selected features.

5. Use your Select Features tool to select Oneida County which is located near the south eastern corner of Idaho as shown on the right.

6. Open the Select by Location" dialog box and select all the Earthquakes in Oneida as shown below and then export the selected features to a shapefile called "Oneida_Earthquakes" in your Topic4_2 folder.

Oneida County

Select By Location

Select features from one or more target layers based on their location in relation to the features in the source layer.

Selection method:

| select features from ▾ |

Target layer(s):

☑ Earthquakes
☐ Custer_County
☐ Counties

☐ Only show selectable layers in this list

Source layer:

◆ Counties

☑ Use selected features

Make sure the "Use selected features" box is checked.

Spatial selection method:

| Target layer(s) features intersect the Source layer feature ▾ |

☐ Apply a search distance

| 0.800000 | Decimal Degrees ▾ |

Help   OK   Apply   Close