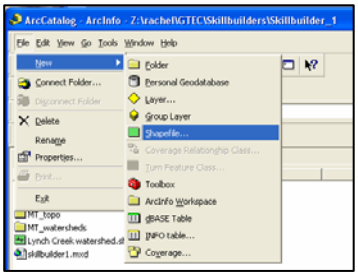
SpatialSci GIS Skillbuilder:
CREATING FEATURE SHAPEFILES

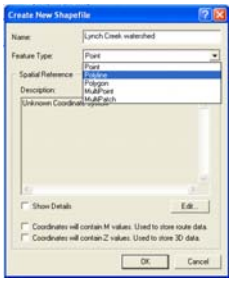
Step 1: Create a new (empty) feature shapefile



1. Open ArcCatalog and navigate to your GIS project directory.

2. Create a new shapefile - select the **File** dropdown menu from the toolbar, then **New**, then **Shapefile.**

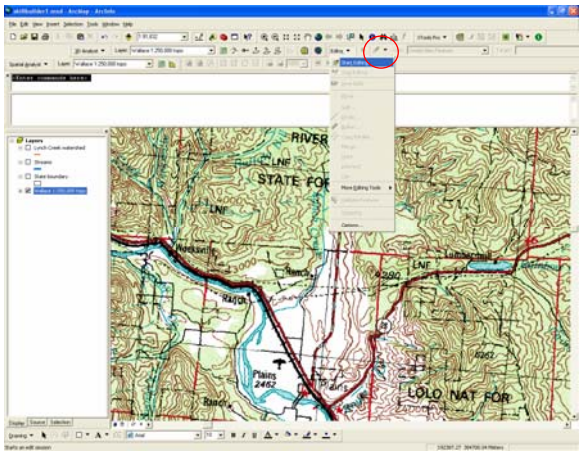
3. Use the **Create New Shapefile** dialog box to define a name, feature type (point, polyline, polygon, etc.), and spatial reference for the new shapefile.



HINT: Match the spatial reference of the new shapefile to the other data layers in your GIS project.

4. Click OK to close the dialog box. Check your GIS project directory in ArcCatalog to make sure your new shapefile is present. You can use the **Contents**, **Preview**, and **Metadata** tabs in ArcCatalog to explore your data layers.

Step 2: Add features to the empty shapefile

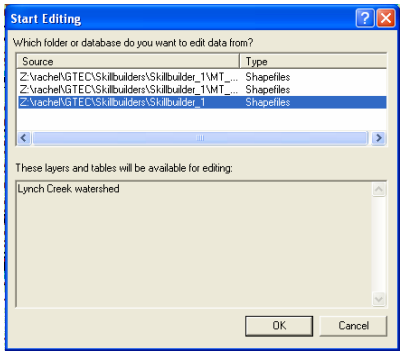


1. Open ArcMap - create a new project or open an exiting project, if relevant.

2. Activate the editor toolbar - select the **View** dropdown menu from the toolbar, then **Toolbars**, then check the **Editor** toolbar box.

3. Start an editing session – use the **Editor** dropdown menu to select **Start Editing**.

4. Use the **Start Editing** dialog box to select the directory containing the shapefile you created in Step 1, then click **OK**.



5. Select **Create New Feature** from the **Task** dropdown menu to the right of the editor dropdown menu.

6. Use the drawing tools to the right of the Editor dropdown menu to create features in your new

shapefile. These features will be either points, polygons, or polylines, as specified when the empty shapefile was created.

7. When you are finished adding features to the shapefile select **Save Edits** and **Stop Editing** from the **Editor** dropdown menu.

HINT: To edit features select the appropriate task from the **Task** dropdown menu to the right of the editor dropdown menu.

Step 3: Perform advanced calculations on feature shapefiles (calculate polygon area and perimeter, segment length, and add X,Y coordinates)

Calculate polygon area:

1. Select **Start Editing** from the **Editor** toolbar.

HINT: You can make calculations without being in an editing session; however, in that case there is no way to undo the results.

2. Right-click the shapefile you want to edit and click **Open Attribute Table**.

3. Right-click the field heading for area and click **Calculate Values**. If there is no field for area values, you can add a new field for area by clicking the **Options** button and selecting **Add Field**. However, to add a new field, you need to exit the editing session.

4. Check **Advanced**.

5. Type the following VBA statement in the first text box:

```
Dim dblArea as double
Dim pArea as IArea
Set pArea = [shape]
dblArea = pArea.area
```

6. Type the variable **dblArea** in the text box directly under the area field name.

7. Click **OK**.

HINT: The property area returns a field type of double. For best results, your area field should also be a double field type.

Update feature perimeters:

1. Select **Start Editing** from the **Editor** toolbar.

HINT: You can make calculations without being in an editing session; however, in that case there is no way to undo the results.

2. Right-click the shapefile you want to edit and click **Open Attribute Table**.

3. Right-click the field heading for perimeter and click **Calculate Values**. If there is no field for perimeter values, you can add a new field for perimeter by clicking the **Options** button and selecting **Add Field**. However, to add a new field, you need to exit the editing session.

4. Check **Advanced**.

5. Type the following VBA statement in the first text box:

```
Dim dblPerimeter as double
Dim pCurve as ICurve
Set pCurve = [shape]
dblPerimeter = pCurve.Length
```

6. Type the variable **dblPerimeter** in the text box directly under the perimeter field name.

7. Click **OK**.

Update feature length:

1. Select **Start Editing** from the **Editor** toolbar.

HINT: You can make calculations without being in an editing session; however, in that case there is no way to undo the results.

2. Right-click the shapefile you want to edit and click **Open Attribute Table**.

3. Right-click the field heading for length and click **Calculate Values**. If there is no field for perimeter values, you can add a new field for length by clicking the **Options** button and selecting **Add Field**. However, to add a new field, you need to exit the editing session.

4. Check **Advanced**.

5. Type the following VBA statement in the first text box:

```
Dim dblLength as double
Dim pCurve as ICurve
Set pCurve = [shape]
```

```
dblLength = pCurve.Length
```

6. Type the variable **dblLength** in the text box directly under the perimeter field name.

7. Click **OK**.

Add x,y coordinates to a point layer:

1. Select **Start Editing** from the **Editor** toolbar.

HINT: You can make calculations without being in an editing session; however, in that case there is no way to undo the results.

2. Right-click the shapefile you want to edit and click **Open Attribute Table**.

3. Right-click the field heading for the X field and click **Calculate Values**. If there is no field for X values, you can add a new field for area by clicking the **Options** button and selecting **Add Field**. However, to add a new field, you need to exit the editing session.

4. Check **Advanced**.

5. Type the following VBA statement in the first text box:

```
Dim dblX As Double
Dim pPoint As IPoint
Set pPoint = [Shape]
dblX = pPoint.X
```

6. Type the variable **dblX** in the text box directly under the perimeter field name.

7. Click **OK**.

8. Right-click the field heading for the Y field and click **Calculate Values**. If there is no field for Y values, you can add a new field for Y by clicking the **Options** button and selecting **Add Field**. However, to add a new field you need to exit the editing session.

9. Check **Advanced**.

10. Type the following VBA statement in the first text box:

```
Dim dblY As Double
Dim pPoint As IPoint
Set pPoint = [Shape]
dblY = pPoint.Y
```

11. Type the variable **dblY** in the text box directly under the Y field name.

12. Click OK.