IOWA STATE UNIVERSITY
Extension and Outreach

Geometry Calculations: Coordinates

Welcome to the Essential ArcGIS Task Sheet Series. This series supplements the Iowa State University GIS Geospatial Technology Training Program short course series, "Essential ArcGIS Tutorial Series." The task sheets are designed to provide quick, easy instructions for performing specific tasks in GIS.

This task sheet will take you through the process of adding a point shapefile that is in the NAD 1983 UTM Zone 15 projection and adding fields with the calculated X and Y coordinate of each point in both Latitude/Longitude Decimal Degrees and UTM coordinate values.
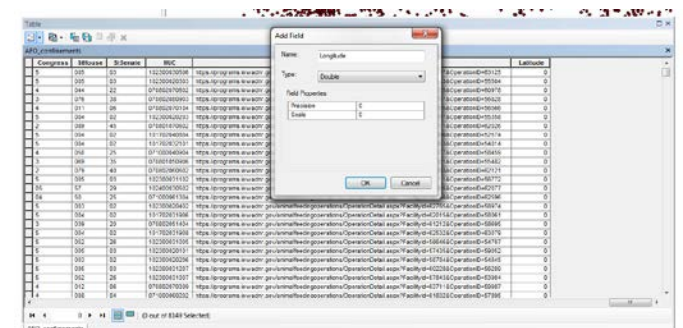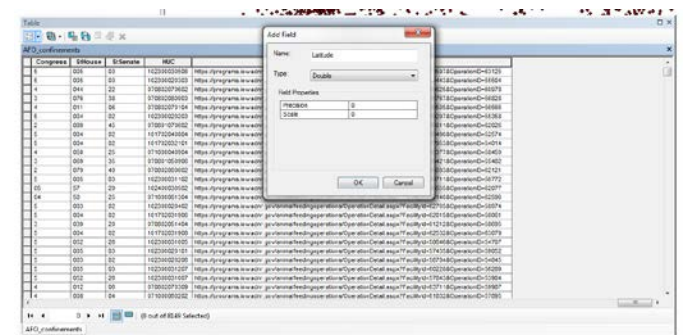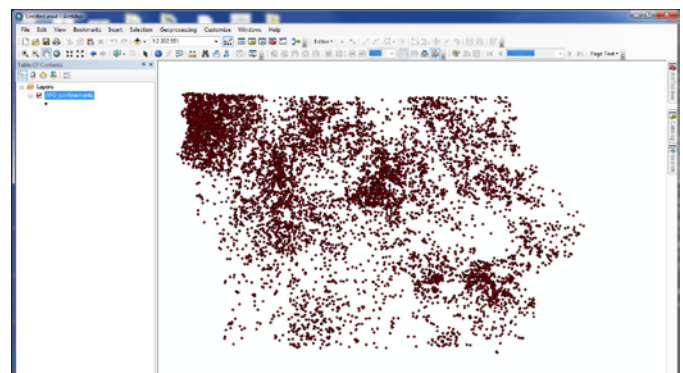
1. Download the Data

a. To download the data used in this task sheet, navigate to www.extension.iastate.edu/communities/gis/quicktasksheets/data in a web browser. Click on the publication number that matches this task sheet. In this case, the publication number is **PM2082-14m**. *Note: the publication number can be found on the bottom right-hand corner of the second page of this task sheet.*

b. When the download is complete, you will need to unzip the folder or copy the files from the zipped folder to a different folder or directory in order to access the files in ArcGIS.
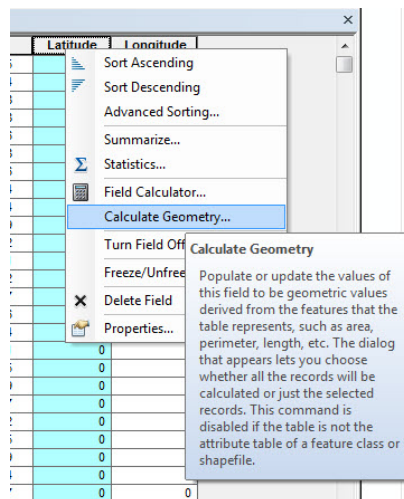

2. Add Fields to Attribute Table (Latitude/Longitude)

a. Right-click on the **AFO_confinements** shapefile in the **Table of Contents** and select **Open Attribute Table**.

b. Click on the **Table Options** icon in the top left corner of the attribute table and select **Add Field**.

c. Type **Latitude** in the **Name** box of the **Add Field** window and select the **Type** as **Double**. Click **OK**.

d. An empty field named **Latitude** should be added to the end of the attribute table.

e. Repeat steps **2b** and **2c** and replace **Latitude** with **Longitude**.

f. You should now have two empty fields called **Latitude** and **Longitude**. The next step is to calculate the coordinate values for each field.
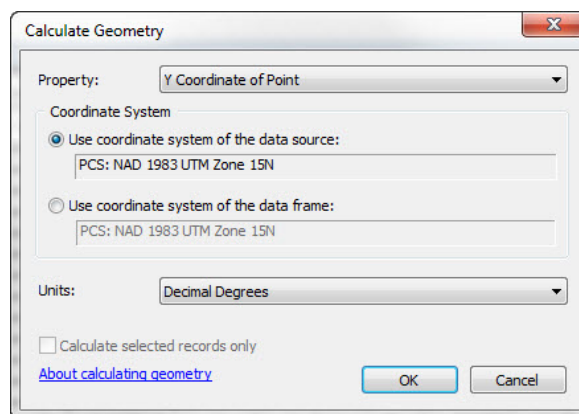
3. Calculate Geometry (Latitude/Longitude)

a. Right-click on the **Latitude** field and select **Calculate Geometry**. Under **Property** in the **Calculate Geometry** window select **Y Coordinate of Point**.

b. Select **Decimal Degrees** from the **Units** drop-down menu and click **OK**.

a. Right-click on the **Longitude** field and repeat steps **3a** and **3b**. Replace **Y Coordinate of Point** with **X Coordinate of Point** for **Property** in step **3a**.
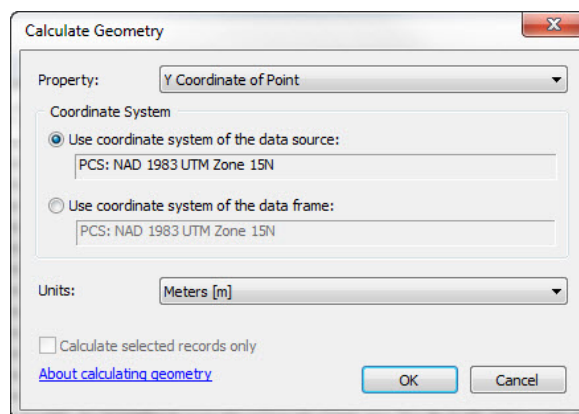
4. Add Fields to Attribute Table (UTM)

a. Right-click on the **AFO_confinements** shapefile in the **Table of Contents** and select **Open Attribute Table**.

b. Click on the **Table Options** icon in the top left corner of the attribute table and select **Add Field**.

c. Type **X_Coord** in the **Name** box of the **Add Field** window and select the **Type** as **Long Integer**. Click **OK**.

d. An empty field named **X_Coord** should be added to the end of the attribute table.

e. Repeat steps **2b** and **2c** and replace **X_Coord** with **Y_Coord**.

f. You should now have two empty fields called **X_Coord** and **Y_Coord**. The next step is to calculate the coordinate values for each field.

5. Calculate Geometry (UTM)

a. Right-click on the **X_Coord** field and select **Calculate Geometry**. Under **Property** in the **Calculate Geometry** window select **X Coordinate of Point**.

b. Select **Meters** from the **Units** drop-down menu and click **OK**.

a. Right-click on the **Y_Coord** field and repeat steps **3a** and **3b**. Replace **X Coordinate of Point** with **Y Coordinate of Point** for **Property** in step **3a**.

Contact:

Bailey Hanson bahanson@iastate.edu, 515-520-1436 or Professor Christopher J. Seeger, ASLA, GISP cjseeger@iastate.edu, 515-509-0651 for more information about the Geospatial Technology Program. This task sheet and more are available at www.extension.iastate.edu/communities/gis