



Incorporating GPS into GIS

Estimated time: 20 minutes

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Importing GPS Data into ArcMap

Estimated time: 20 minutes

The purpose of this exercise is to learn how to import raw GPS data into ArcMap.

Students will learn how to utilize GPS data by incorporating it into a GIS Geodatabase for analysis purposes.

Step 1: Add GPS Data to ArcMap

☐ Open ArcMap.

a.) Open the map document titled *Tree_Inventory.mxd*

Note: You should see a map of the ESRI Denver Campus in Broomfield Colorado. The Aerial Imagery is a basemap provided by Bing that was previously added to the map via ArcGIS Online

b.) Next select *Bookmarks* from the context menu and choose "*Denver Campus*"

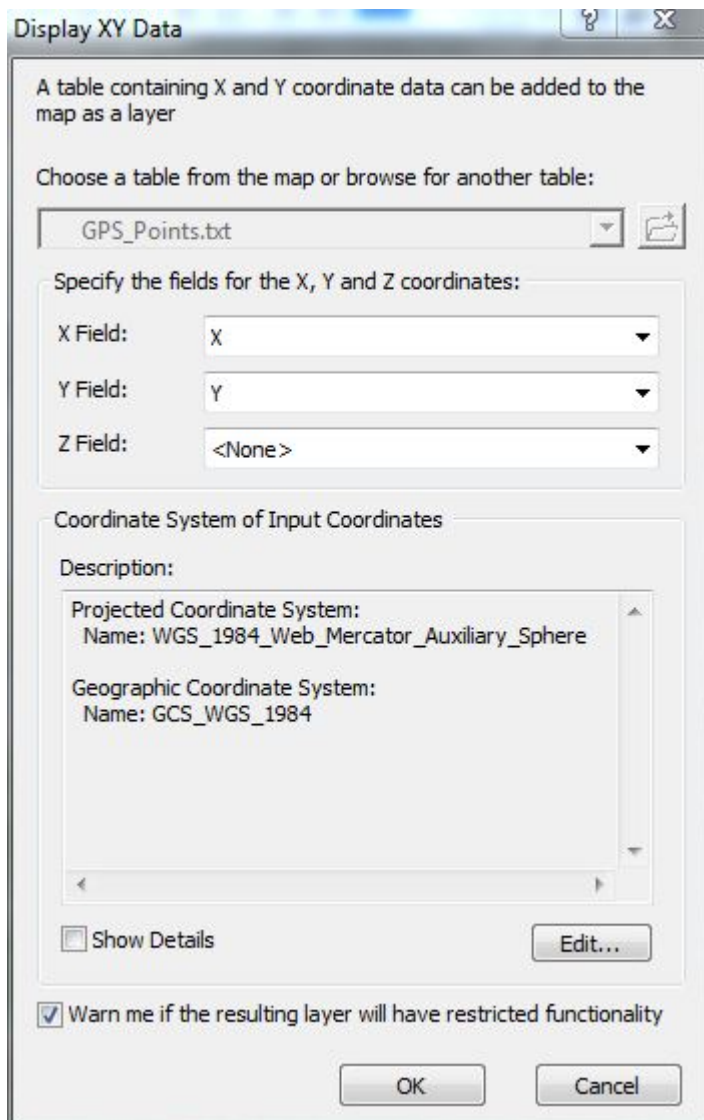
c.) Add GPS Data to ArcMap
Use the "Add Data Button"



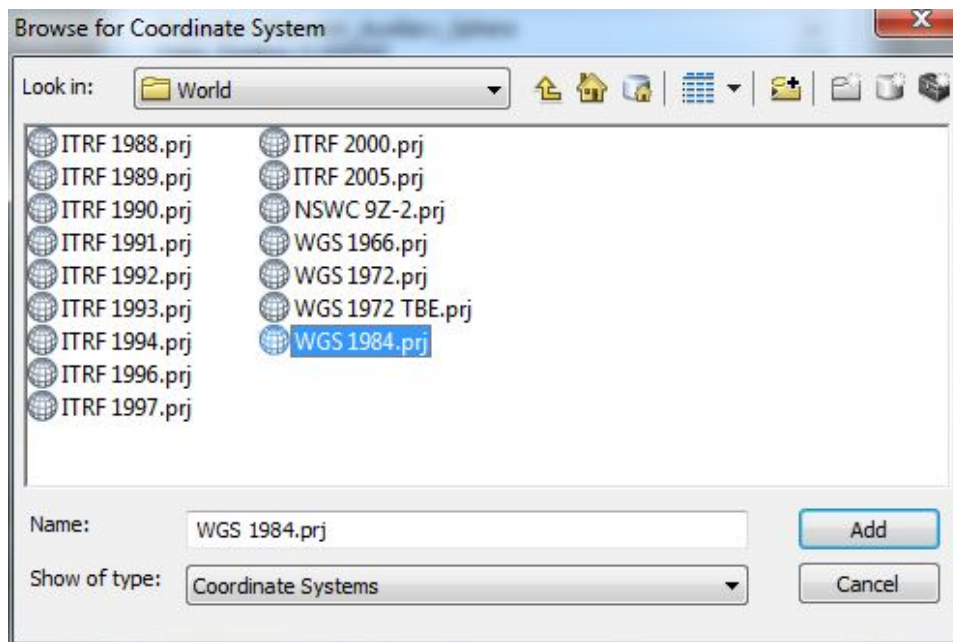
browse to the C:\GPS_GIS Workshop directory and choose "*GPS.txt*"

d.) Right click on the GPS.txt layer in the Table of Contents and choose "*Display XY Data...*"

e.) Select the "Edit..." button below the "Coordinate System of Input Coordinates" box as shown below:



- f.) "Select" a predefined coordinate system. Navigate to Geographic Coordinate Systems|World and choose "WGS1984.prj" Press "Add", "Apply" then "OK." Make sure you have the "X" and "Y" fields mapped correctly. Press "OK" You will see a warning that the table does not have object ids. Select "OK."



- ☐ You should now have an Event layer called GPS.txt Events in your table of contents displaying your GPS Points.

Note: An event layer is only a representation of the points from the text file. Events cannot be queried or selected. In the next steps, you will learn how to import the GPS data into a geodatabase to use for analysis.

Step 2: Import GPS Data into a Geodatabase

- ☐ Open ArcCatalog

a.) Navigate to the C:\GPS_GIS Workshop directory. Expand the folder, and you will see a file geodatabase called " Tree_Inventory.gdb " Inside there is a feature class called "Trees"

b.) Right click on the geodatabase and select *"Properties."* Click on the "Domains" tab.

Note: Notice there are several coded value domains. These domains are lists of acceptable values for certain fields. They represent attributes for the GPS points that were collected in the field.

- ☐ Close ArcCatalog

- ☐ Return to ArcMap

Using the "Add Data" button, add the "Trees" feature class to ArcMap. You will see a warning that the "Coordinate System does not match" click "OK"

- c.) "Right Click" on the "GPS.txt Events" layer in the Table of Contents and choose "Data" then "Export Data." In order to copy the Events into the Trees Feature Class, they first need to be converted to a GIS format. In the "Output feature class" box, navigate to the Tree_Inventory.gdb. Type "*Output_Temp*" in the Name box and select "OK." Add the layer to the map. Click "Yes"

Next, you will need to start an edit session to copy the new features into the Trees feature class.

- d.) From the standard Toolbar, choose the "Editor Toolbar" button



The Editor Toolbar should now be floating within the ArcMap window. From the Editor dropdown choose "Start Editing." Select "Trees" as the layer to edit and then select "OK" and "Continue" on the next dialog. Now you are ready to edit data.

- e.) Right click on the "Output_Temp" layer in the Table of Contents and choose "Selection" and "Select All"

- f.) On the Standard toolbar, choose the "Copy" then "Paste" buttons.



Be sure to specify the "Trees" layer as the target.

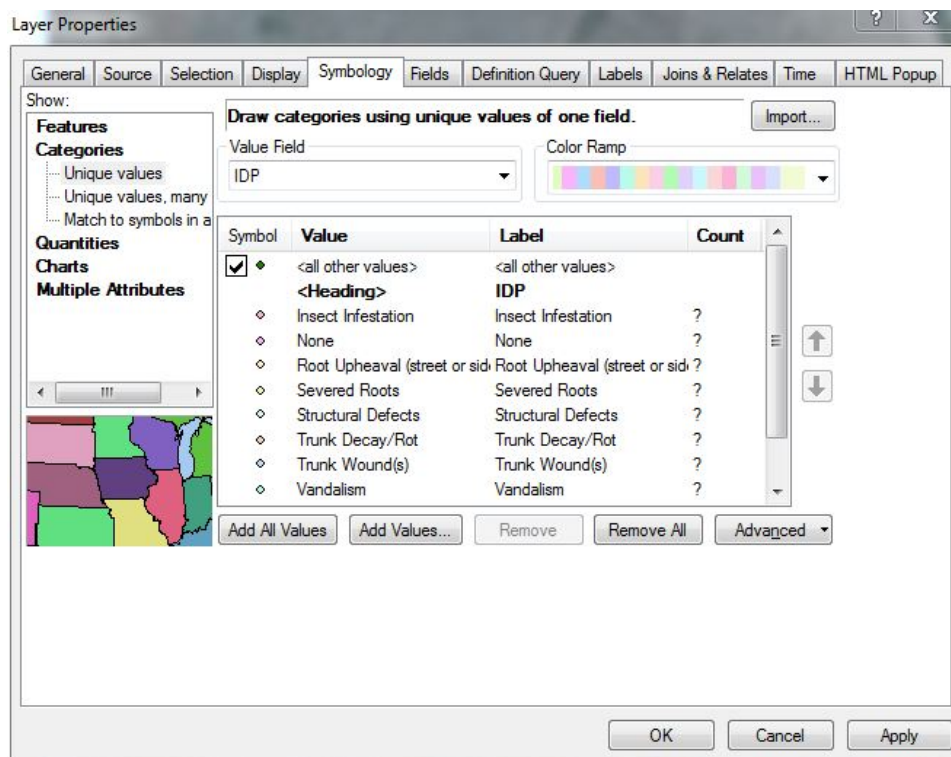
- g.) Next, right click on the "Trees" layer in the table of contents and "Open Attribute Table." Highlight a record in the table or choose a tree feature from the map. The attributes can now be edited.

Note: Several fields have dropdown lists of values for the attributes. These are called domains, and were setup inside the geodatabase. Domains are available for use with any feature class within the geodatabase.

- h.) Edit several of the attributes for the trees feature class including the "IDP" field.
 This field will be used to symbolize the trees on the map later.
 On the Editor Toolbar, choose "Editor" and "save edits"

Step 3: Symbolizing Data

- The final step is to symbolize the trees based on their health or other variables.
- a.) Right click on the "Trees" layer in the Table of Contents and choose "Properties."
 Open the Symbology tab. Choose "Categories" and "Unique Values." Choose "IDP" as the value field. You can add all or some of the values. Each value can be displayed with a different color or symbol.
- b.) Click "OK" and "Apply."



Step 4: Adding Hyperlinks

□ In many cases, it is helpful to take pictures of the features or observations while in the field. With GIS, we can incorporate and store the photos in many ways. In this exercise, you will learn how to add photos as hyperlinks within a map document

a.) Using the "Identify" tool on the Tools Toolbar, identify a tree feature

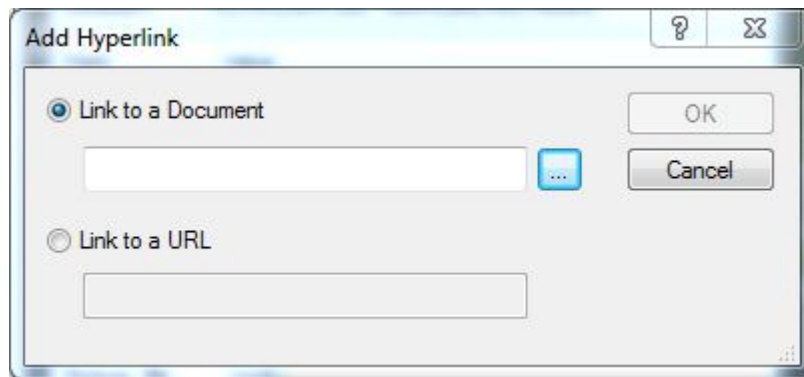


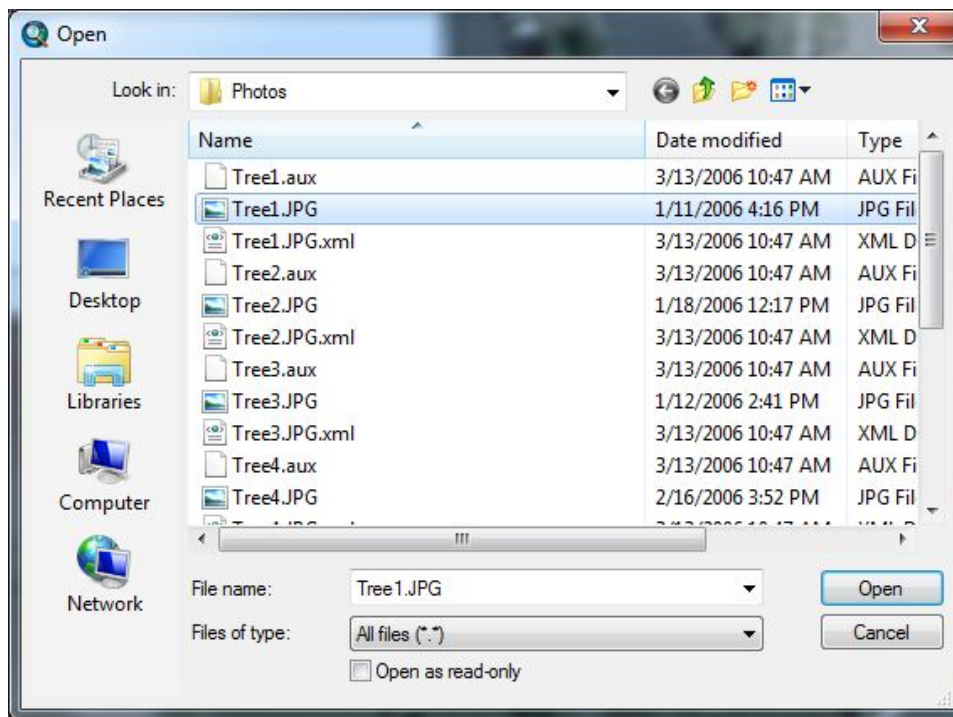
Right click in the white space under "Tree" and choose "Add Hyperlink." Select the button next to the box under "Link to a Document." Navigate to the C:\GPS_GIS Workshop\Photos directory and choose a photo.

b.) Click the "Hyperlink" button



on the "Tools" toolbar. Click on a feature on the map to see the hyperlinked photo.





Conclusion

In this exercise, we learned how to take GPS data from a raw format such as a text file and bring it into the GIS. We first displayed the X,Y coordinates for fetures as Events in ArcMap. Next created a feature class to store temporary data. We then copied the temporary data into a feature class with a defined schema. Additionally, we were able to add a hyperlink to store photos of features within the map document