

GPS Data Collection

Introduction

The following instructions provide best practices for capturing location data in the field using GPS and translating that data to a map using ArcGIS mapping and analysis software.

Preparing a Garmin etrex 20 or 30 GPS for Field Data Collection

Setting Units

1. From the HOME screen, click **Setup** and access the **Units** settings.
2. Confirm that **Metric** is selected and click **Back**.
3. Select **Position Format** and make the following selections:

	<u>Small Scale Mapping</u>	OR	<u>Large Scale Mapping</u>
➤ Position Format:	Hddd.dddd (decimal degrees)		UTM UPS (metres)
➤ Map Datum:	WGS 84		NAD 83



4. Click Back twice to return to the HOME screen.

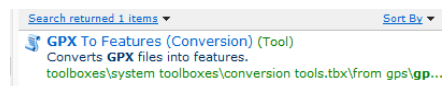
Your GPS is now ready to capture locational information in the field using waypoints.

Marking a Waypoint

5. In MAP view, press and hold the “Rocker/Select” button until the **Mark Waypoint Page** appears.
6. Assign a unique name (i.e. “Tree001”).
7. Click **Done**.
8. Click **Done** again to return to the map view.
9. Repeat steps 5 to 8 to add another waypoint.



Getting Field Data FROM the GPS TO the GIS

1. Connect the GPS to a computer with access to **ArcGIS 10.4** or greater.
2. Run ArcGIS software and click **Cancel** to the Getting Started window.
3. Open the search tool .
4. Enter GPX as a search term (this is the native format for GPS data).
5. Click the **GPX to Features (Conversion)** tool.
6. Beside Input GPX File, browse to the Garmin unit that you connected in step 1. **HINT: After clicking the Browse button, click This PC. You should see Garmin eTrex 30 listed as a drive. Navigate to Garmin > GPX >**
7. Select the file dated the day you captured waypoints in the field.
8. Beside **Output Feature Class**, click browse.
9. Click the **Connect to Folder** button  and navigate to your student storage space. **THIS IS ONLY CONNECTING TO A FOLDER!** Click OK.
10. Enter a name for the file (start with a letter and do not include spaces or special characters).
11. Click Save.
12. Click OK to run the conversion. This process may take several minutes. You will see a popup prompt indicating success.
13. The waypoints appear on the map.



Displaying a Table of X,Y Coordinates

If a table (.csv, .txt, .xls) exists with X,Y coordinates, follow these steps to display the data in ArcGIS. This example uses an Excel file (.xls) of Latitudes and Longitudes in decimal degrees. [Download sample XY coordinates here.](#)

1. Run **ArcMap** and create a new document.
2. Click the **Add Data** button . In order to see directories, a 'folder connection' needs to be established.
3. Click the Connect to Folder button . Navigate to the folder holding the table of coordinates. Click **OK**.
4. Click *Add Data*.
5. From the look-in dropdown, select the folder connection established above.
6. Select the table file, in this case, double-click the XY_coordinates.xls, select **Sheet1\$** and click **Add**.
7. The table will be added to the *Table of Contents* on the left of the ArcMap window. Right-click on the table and select "**Open**" to view the data. Notice the **X** and **Y** columns representing Latitude and Longitude values. Close the table by clicking the **X** in the upper-right corner.
8. To create points, right-click the table listed in the *Table of Contents* and select **Display XY data...**
9. In the dialogue box, ensure the *X Field* indicates **X** and the *Y Field* indicates **Y**. If the indicated fields are incorrect, use the drop-down menu to select the correct values.

****TIP for future use: See the following table for a summary of X, Y formats.****


Latitude	43 degrees	UTM-Y	4,763,000 metres N
Longitude	-79 degrees	UTM-X	623,000 metres E

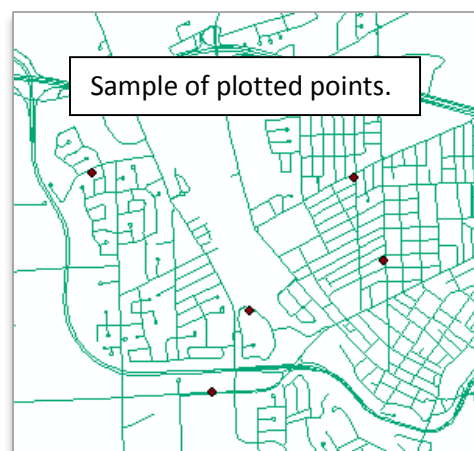
10. Under *Coordinate System of Input Coordinates*, click the **Edit...** button to define the Geographic coordinate system used in this example.
11. From the *Spatial Reference Properties* dialogue box, click each *folder* in the following path, until you get to the projection file "**GCS_North_American_1983**".

Geographic Coordinate Systems > North America > NAD 1983

12. Click **OK**.
13. The *Display XY Data* dialogue box is now complete. Click **OK**.
14. A message box will appear stating that the table does not have an Object-ID field. Click **OK**.

The XY data is displayed in the map window as a temporary 'event' file.

15. To make a permanent shape file, right-click on the point data layer and choose **Data > Export Data**. Click the **Browse** button  and navigate to the folder in which you wish to save the file. Ensure the *Save as type:* is **Shapefile** and click **Save**. Accept the rest of the defaults and click **OK**.
16. When prompted to add the exported data to the map as a layer, click **Yes**. The point file is now a permanent shape file.



Continue with [From the Field to the Map: Part Two](#) for instructions regarding prepping a table in Excel that can be used in ArcGIS and joined with GPS data to facilitate thematic mapping.

Here is a [troubleshooting guide](#) for cleaning up GPS data.