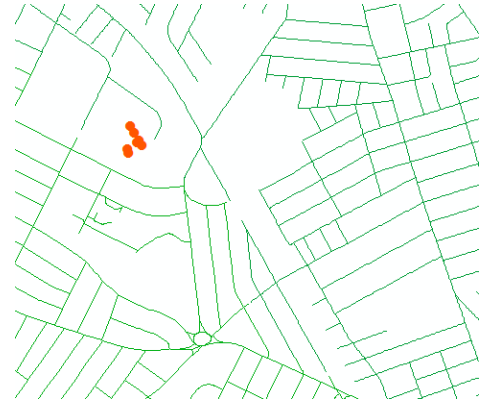


Downloading Data with DNR-GPS & Importing to ArcMap



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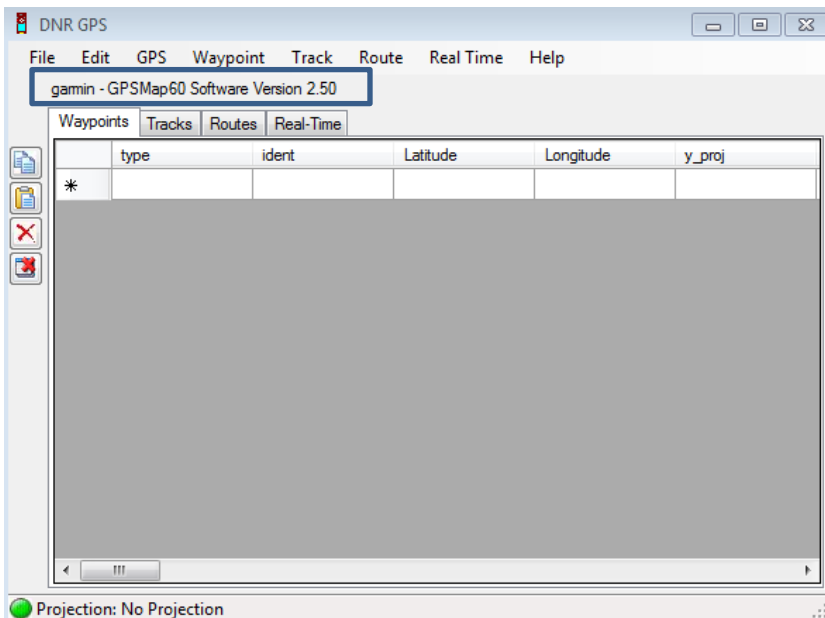
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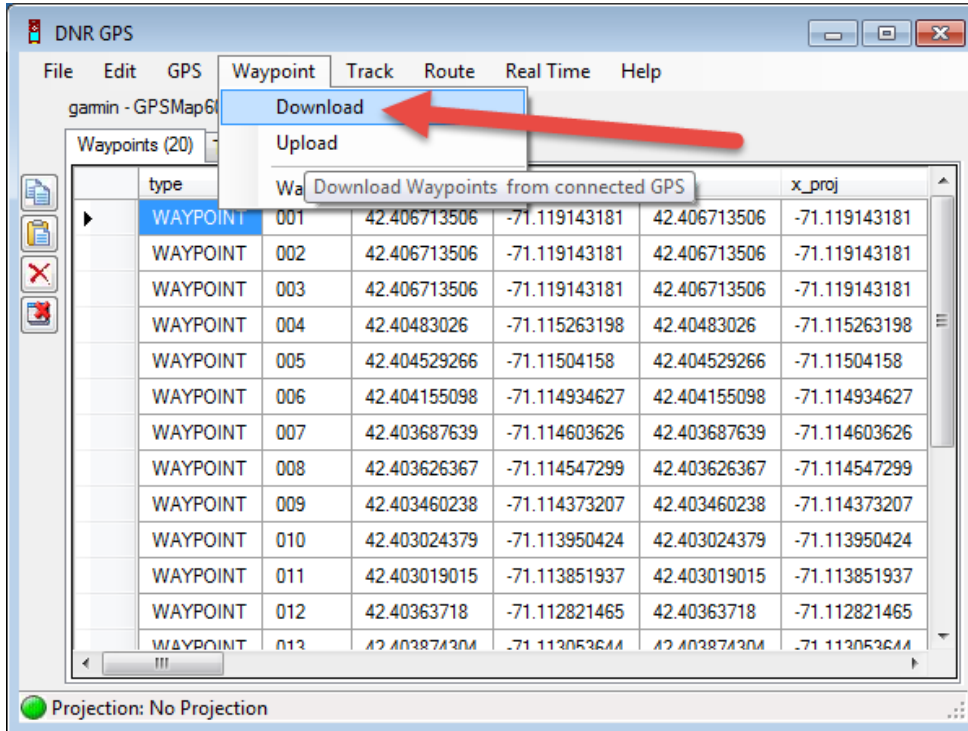
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Downloading GPS Waypoints

1. Make sure the GPS unit is turned on
2. Plug the unit into the computer using either serial port cable or USB cable.
3. Open DNR-GPS.
4. The name of your GPS unit should appear in the title bar of the DNR Garmin Window. If it does not, select **GPS** → **Auto Connect to GPS**. If this still does not work, you can connect manually in the GPS menu by choosing USB if using a USB cable, and Port 1 if using a serial port cable.



5. Click **Waypoint** then **Download**. The points you took will appear as a list.

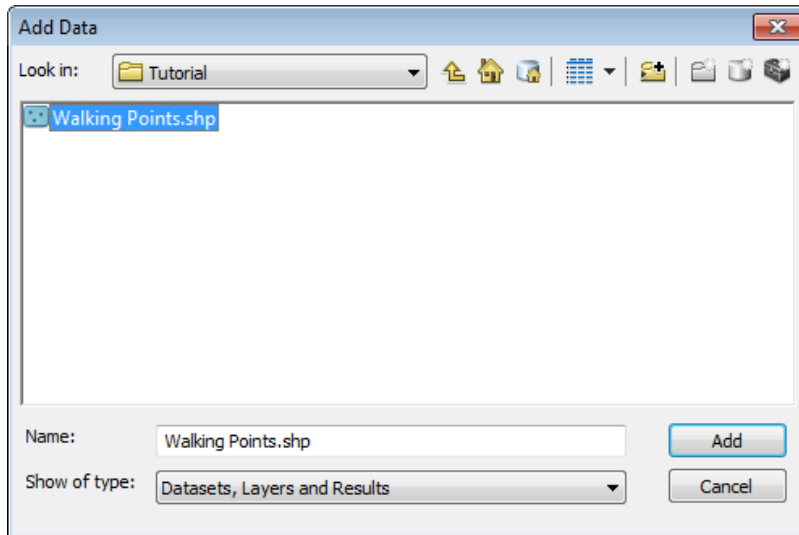


There are several ways to import your data into ArcMap. You can save your points directly as an ESRI shapefile or you can save your data as a .dbf and upload it using “Add XY Data” methods. The following sections will go over the various methods to import your data into ArcMap.

Saving your Points as an ESRI Shapefile

One way to import your data into ArcMap is to save it directly as an ESRI shapefile. This will import all the data that was collected by the GPS unit. It will include numerous fields that will most likely be empty as well. In order to save your points directly as a shapefile:

1. In DNR-GPS, click **File** → **Save to** → **File**.
2. Navigate to your H-drive or thumb/flash drive, name the file and change the “Save As type” to **Esri Shapefile (2D)**.
3. Click **Save**.
4. Open a blank ArcMap session.
5. Add the shapefile using arcCatalog or the “Add Data” button.




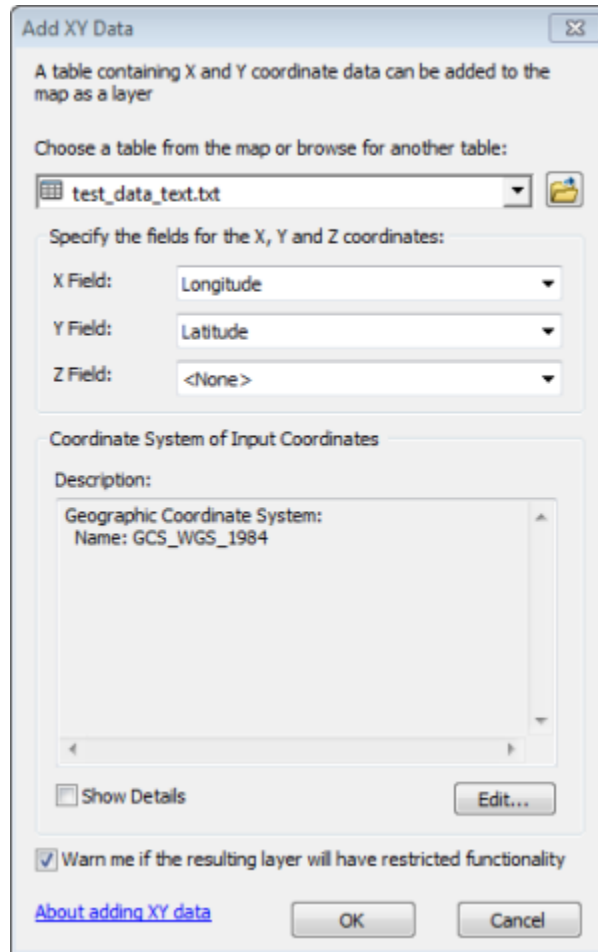
6. Your points should now display in your ArcMap.

Note: Examine the attribute table. You will see that it has several fields. You can delete the fields that are unnecessary.

Creating a Tabular File (.dbf) and Importing into ArcMap using Add XY Data

Another option for importing your data into ArcMap is to save it as a tabular file and then import it using Add XY Data.

1. Again in the DNR-GPS program, click **File** → **Save to** → **File**.
2. Navigate to your H-drive or thumb/flash drive, give the file a name, this time choosing text file (tab-delimited)(*.txt) as the **Save as Type**, and click **Save**.
3. Open ArcMap.
4. Add the .txt file you just created, by clicking the **Add Data** button () and navigating to your saved file.
5. To display the waypoints, click on **File**→ **Add Data**→ **Add XY Data**, and fill out the dialog box as follows:
 - a) In **Add XY Data** select the table with your points from the drop down menu at the top.
 - b) For “X Field” select “Longitude” and for “Y Field” select “Latitude”.
 - c) Click the **Edit** button.
 - d) Scroll up to “Geographic Coordinate Systems”, then “World”, then select “WGS 1984”. • Note: if your GPS unit was set to a different coordinate system such as NAD83, then you need to enter the correct coordinate system.
 - e) The fields in the Spatial Reference Properties window should now look like the image below. When they do, click **Ok**.



Your data points should now display in ArcMap.

Note: This process does not save the data points as a shapefile; it only temporarily displays them in ArcMap (that’s what the warning was about). In order to permanently save these points, you must right click on the points and select **Data** → **Export Data**. Now you will be able to save them as a permanent shapefile in ArcMap. If you will be joining additional data, wait to do this step till after the join.

Checking your points

Using the **Add Data** button, add a layer of data (ie a shapefile of something like streets or parcels) that will give you a good sense of whether the points are where they should be.

If your points are in the right general spots on your map, then you did everything correctly. If not, you may not have set “Map Datum” to “WGS 84” on the GPS unit. Go back to the menu and check.

Joining data from Excel to points in ArcMap

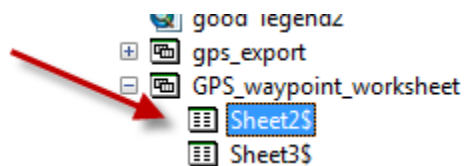
If you’ve followed the suggestions given in [Planning for Field Data Collection & Using Handheld GPS Units in the Field](#), you’ll also have a Microsoft Excel spreadsheet of data that includes additional details on each waypoint. By joining this table to the attribute table of your GPS waypoints, you’ll be able to see the additional details for each point beside the XY data in ArcMap.

If you are unfamiliar with Excel files and ArcMap, you might want to check out the tip sheet [Working with Excel Files in ArcGIS 10](#)

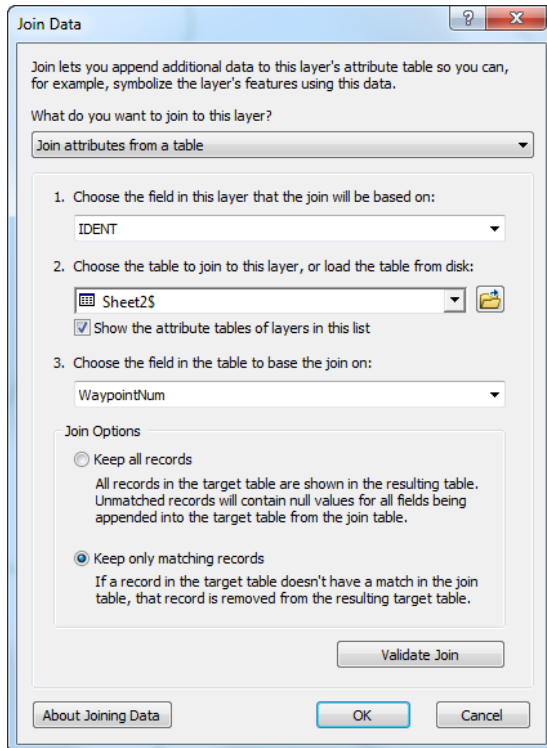
1. It's important to ensure that the **IDENT** field number of each waypoint assigned by the DNR-GPS software matches exactly with the **WaypointNum** in your Excel spreadsheet.
 - a) Right click your shapefile of GPS points in ArcMap, and select **Open Attribute Table**. Note the way **IDENT** is displayed: the example below shows 001, 002, 003.. etc

FID	Shape *	TYPE	IDENT	LAT	LONG	Y_PROJ	X_PROJ	COMM
0	Point	WAYPOIN	001	42.406595	-71.119611	4933269.249814	2303610.155048	29-APR-11
1	Point	WAYPOIN	002	42.406899	-71.11927	4933310.825697	2303629.139871	29-APR-11
2	Point	WAYPOIN	003	42.407186	-71.11937	4933340.588502	2303612.185261	29-APR-11
3	Point	WAYPOIN	004	42.407397	-71.119543	4933360.240117	2303591.525028	29-APR-11
4	Point	WAYPOIN	005	42.406983	-71.119179	4933322.236892	2303634.083592	29-APR-11
5	Point	WAYPOIN	006	42.406826	-71.119068	4933307.15062	2303648.00658	29-APR-11
6	Point	WAYPOIN	007	42.406706	-71.119659	4933280.594814	2303602.8217	12-MAR-12

- b) Ensure that the **WaypointNum** field in your Excel table is labeled in exactly the same fashion.
- c) Save your Excel spreadsheet in .xlsx format.
- d) Close Excel.
- e) Use the **Add Data** button () in ArcMap to select and add your spreadsheet, making sure to select the correct *sheet* within the .xlsx file.



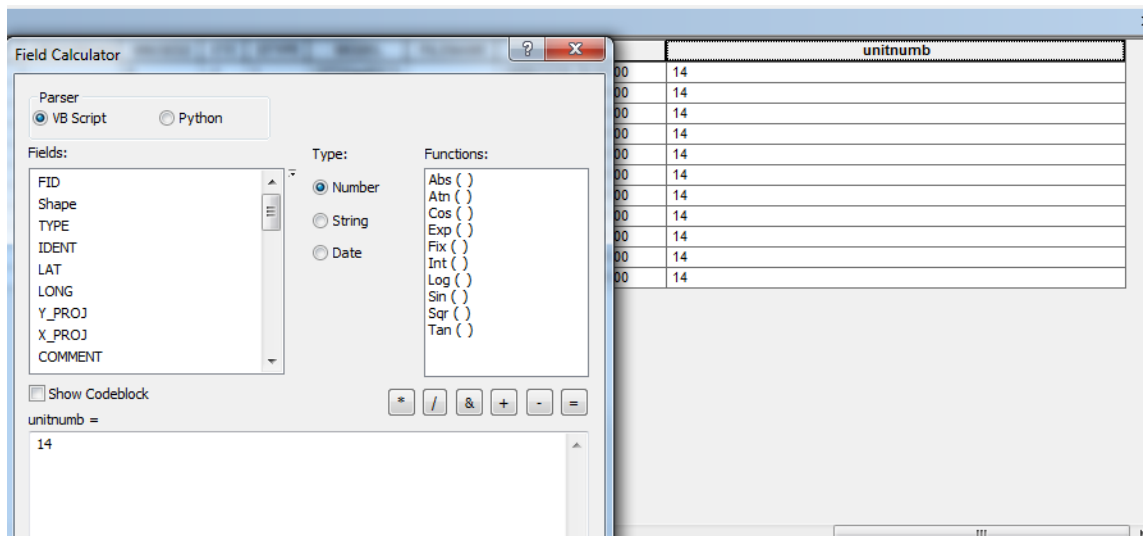
- f) Once the Excel sheet appears in your left hand table of contents, right click on the shapefile of your GPS point, go to **Joins and Relates**, and select **Join...**
- g) Fill out the dialog box as follows, making sure to match the fields for **IDENT** (GPS shapefile) and **WaypointNum** (Excel spreadsheet)



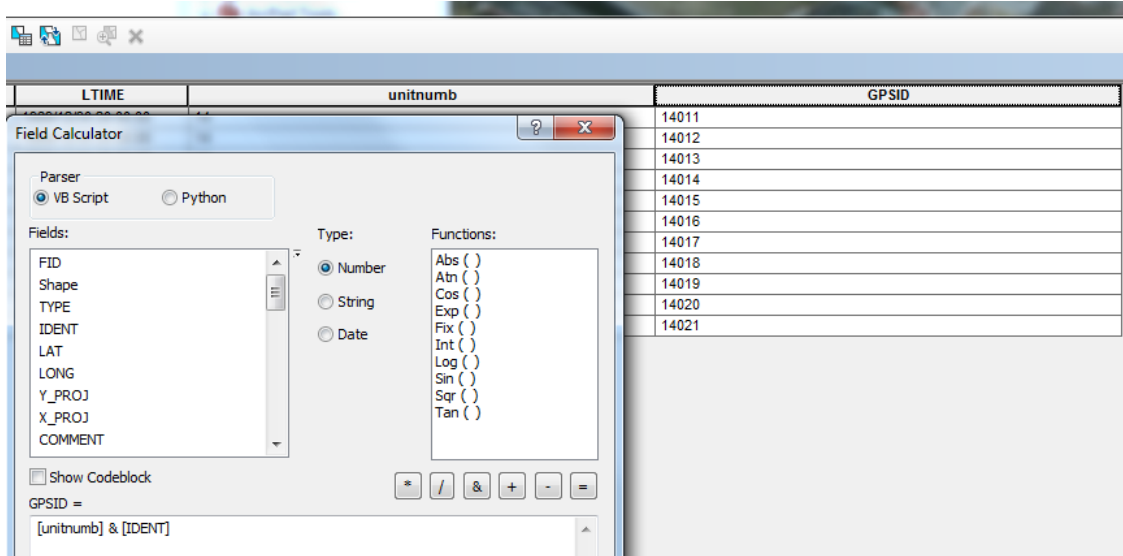
- h) To create a permanent ArcGIS shape file that includes your joined table, right-click on your points layer in the ArcMap *Table of Contents* and choose **Data – Export Data** – navigate to an appropriate folder and give the new file an appropriate name. This will make it easier to work with the attribute table.
- i) Click **Ok**.
- j) Now when you right click on the GPS points shapefile and select **Open Attribute Table**, the additional data from the Excel spreadsheet will appear at the far right of the attribute table.

If More Than One GPS Unit is Being Used

1. In ArcGIS add a **new field** to the shapefile called **UnitNumb**. Choose **text** for type.
2. Right click on the label of the column and open up the **field calculator**. Populate the column with the correct GPS unit number.



- Next create a new text field called **GPSID** . Use the field calculator on this field and concatenate (**[Field Name] & [Field Name]**) the UnitNumber with the Waypoint number. This is the unique identifier and the field they will use to join the Excel data to.



- In Excel, concatenate **GPSUnitNum** and **WaypoinNum** into a new field called **GPSID**. This function is performed in Excel by typing **=concatenate (cell1, cell2)** in a new cell. As in the example below, you would type a1 for cell1 and b2 for cell2.

H2		=CONCATENATE(A2, B2)						
	A	B	C	D	E	F	G	H
1	GPSUnitNum	WaypointNum	DegNorth	DegWest	FeatureType	Height	Name	GPSID
2	14	011	42.406573	-71.119672	Tree			14011
3	14	012	42.406608	-71.119675	Tree			14012
4	14	013	42.406449	-71.119428	Statue			14013

- Join the Excel and Shapefile by the GPSID field. This way you can keep track of waypoints from different units.