

Downloading GPS Data Using DNR Garmin

Session Objectives - At the conclusion of this session you will be able to:

- Customize DNR Garmin default settings
- Download Garmin GPS point, line and polygon data using DNR Garmin
- Save GPS data as shapefiles (.SHP), Geodatabase Feature Class or Google Earth (.KML) files

Warning if you use DNR GARMIN Version 5.41: The latest version of DNR Garmin supports the newer Garmin models, such as the Colorado, Oregon and Nuvi, but has a problem with saving the field data. You will not always be able to save the data to a shapefile or geodatabase feature class. This is an inconsistent problem, but a serious one. The workaround is save your data in Google Earth format (.KML), then export to shape or feature class using XTools Pro Tools in ArcGIS.

Materials created by: Eric Kelchlin, June 2010

Software: DNR Garmin version 5.32, ArcGIS 9.3.1

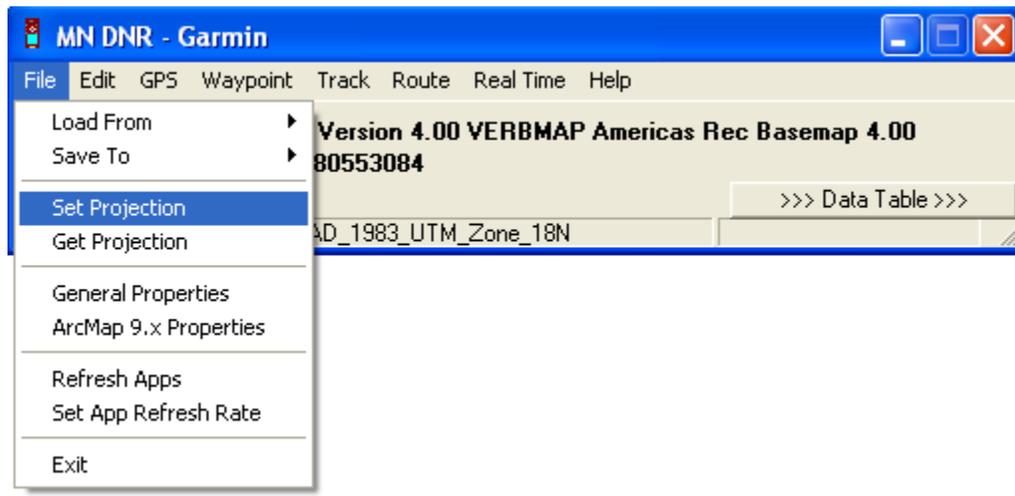
GPS unit: Garmin Map76CSx (but material applies to all Garmin units)

You will need to have the Garmin USB driver installed before you can connect your GPS to your PC. Refer to the FWS_Garmin_Map76CSX_Setup document on this SharePoint site for detailed instructions on how to obtain and install the driver.

This exercise uses DNR Garmin, a free GPS/GIS tool that allows you to import waypoints, lines and polygons from any Garmin device. DNR Garmin allows you to save your GPS data as an ArcView shapefile, geodatabase feature class, Google Earth (.kml) or GPS exchange (.gpx) file. Search on Google for “DNR Garmin” to get the latest download. **You will need administrative privileges to install the program.**

SECTION 1 – DNR Garmin Configuration

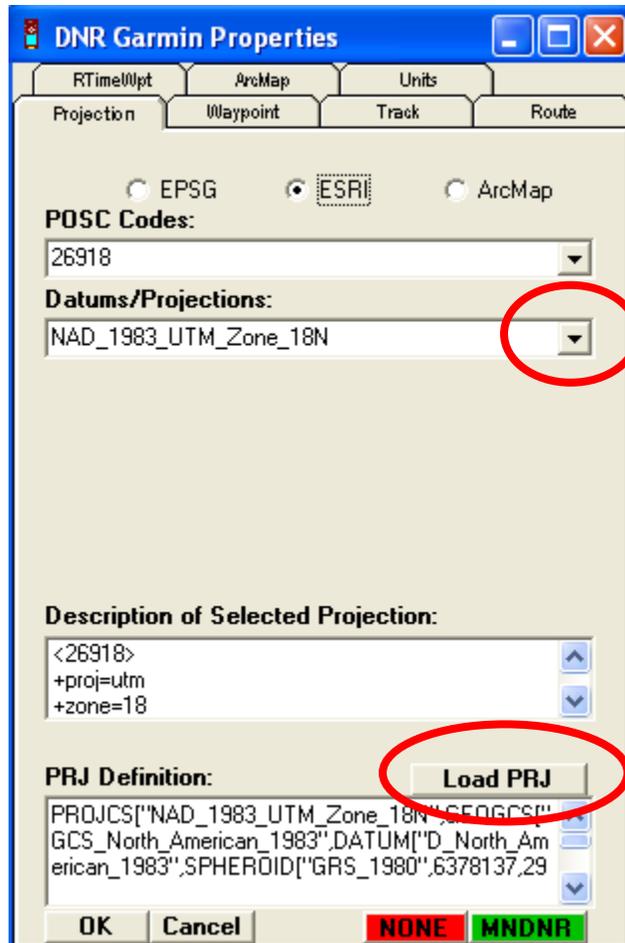
1. Launch the DNR Garmin utility from your desktop (or within ArcMap). A splash screen appears for a few seconds.
2. When using the software for the first time after installation, you will be asked if you want to set the default projection to NAD83 – UTM Zone 15 (Minnesota’s default projection). Click YES if appropriate. Otherwise, click NO and set your desired projection.
3. To set your projection, choose **File** and select **Set Projection**.



4. Change the code type to **ESRI**.



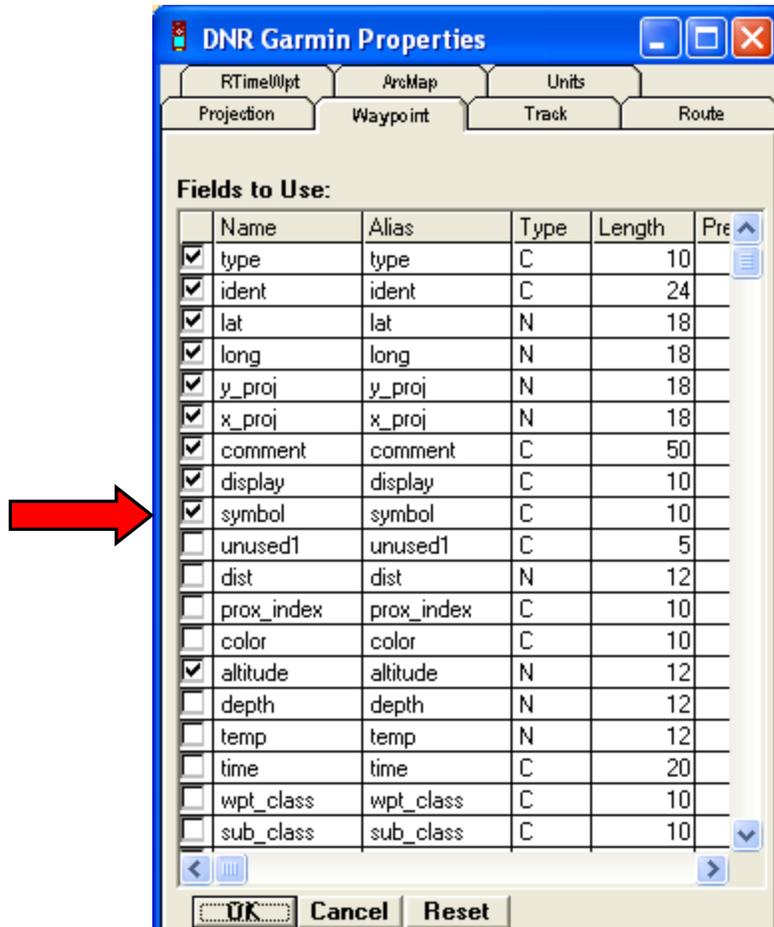
5. Click on the drop-down arrow in the **Datums/Projections** field and select your desired projection (i.e., NAD83, UTM Zone18N).
6. Next, load the projection file (PRJ) by clicking the **Load PRJ** button and browse to your ESRI datum and projection file. It will be located in the **C:\Program Files\ArcGIS\Coordinate Systems** sub-folder.
7. Select the correct .prj file and click **Open**.



8. DNR Garmin was designed for a specific audience. Not all of the data fields are needed for our purposes so the next step is to determine what fields we want to use in our database before we download the GPS data. Click on the **Waypoint** Tab.



9. Uncheck all the fields after **symbol**, except for **altitude** and **model**. Click **OK** when finished. Once you set these properties, they will be used as the default settings for all future downloads. However, you can modify what fields you want before or during any download session and the changes will be immediate.



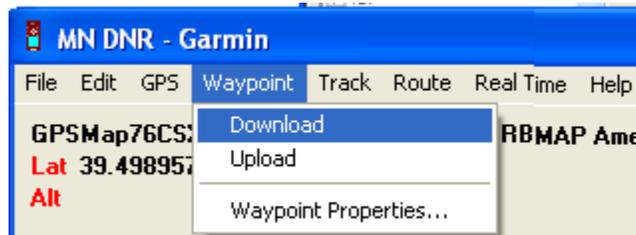
10. Click on the **Tracks** Tab. Uncheck all fields after **new_seg** except for **altitude** and **model**.
11. Click **OK** at the bottom of the DNR Garmin Properties screen when finished.
12. Connect your Garmin GPS Unit to your computer USB port. Turn on your GPS device on.
13. From the DNR Garmin Main menu click on the **GPS** tab. Select **Set Port** and check **USB**.

Continue to the next section.

SECTION 2 – Downloading Saving your GPS Data for use with a GIS

GPS POINT DATA (i.e., Waypoints)

1. To download waypoints select **Waypoint** and **Download**.



2. You are notified when the download is complete. Click **OK** when done.

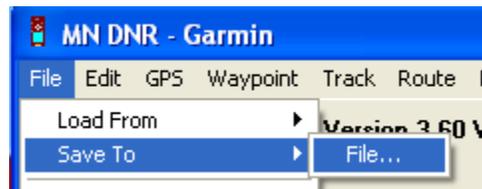
The screenshot shows the 'MN DNR - Garmin' software window with a table of waypoints. The table has columns for type, ident, lat, long, y_proj, x_proj, comment, symbol, altitude, and model. The table is titled 'Waypoint' and shows 12 records. The status bar at the bottom indicates 'Connected' and '0 of 36 Selected'.

	type	ident	lat	long	y_proj	x_proj	comment	symbol	altitude	model
1	WAYPOINT	1	39.48686069	-77.80663004	4374566.45727852	258624.807064296	4	📍	13	0 GPSMap76CSX
2	WAYPOINT	10	39.48560919	-77.80441370	4374421.59248016	258811.118328081	12	📍	13	0 GPSMap76CSX
3	WAYPOINT	11	39.48504441	-77.80414891	4374358.18907499	258831.941997445	7	📍	13	0 GPSMap76CSX
4	WAYPOINT	12	39.48874142	-77.80825839	4374779.5975012	258491.256674379	1	📍	13	0 GPSMap76CSX
5	WAYPOINT	13	39.48400137	-77.80641982	4374248.49177385	258632.995291295	2	📍	13	0 GPSMap76CSX
6	WAYPOINT	14	39.48478122	-77.80456164	4374330.07922492	258795.529987012	8	📍	13	0 GPSMap76CSX
7	WAYPOINT	15	39.48404085	-77.80540695	4374250.15903159	258720.257541512	5	📍	13	0 GPSMap76CSX
8	WAYPOINT	16	39.48761397	-77.80591046	4374648.1466259	258689.307953875	2	📍	13	0 GPSMap76CSX
9	WAYPOINT	17	39.48643682	-77.80566352	4374516.81386909	258706.476059207	6	📍	13	0 GPSMap76CSX
10	WAYPOINT	18	39.48570994	-77.80748483	4374441.00949494	258547.298769417	7	📍	13	0 GPSMap76CSX
11	WAYPOINT	19	39.48541808	-77.80518743	4374402.45149933	258743.903686821	11	📍	13	0 GPSMap76CSX
12	WAYPOINT	2	39.48704140	-77.80790644	4374589.94063311	258515.643012033	10	📍	13	0 GPSMap76CSX

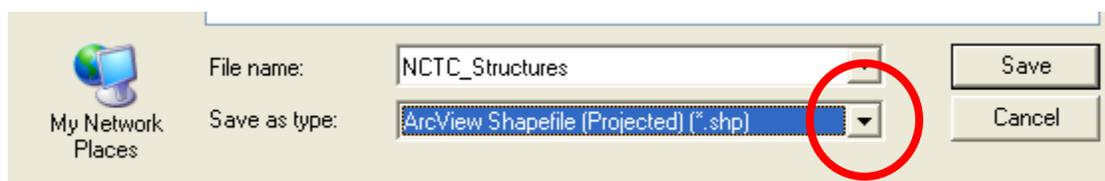
DNR Garmin Table Editing Tips:

- To delete a record, click on the record number along the left side to select it. Once selected, simply click the **Delete selection**  button. You can use the *Shift* Key to select multiple records.
- To add a record, click on the **Add Record to Table**  button.
- To attribute records or edit existing values, double click on the record and column you wish to edit. A text entry prompt is displayed. Enter a new value and click **OK**.

3. To save your GPS data, select **File** on the main menu, select **Save To** and choose **File**. The **Save As** dialog will appear.

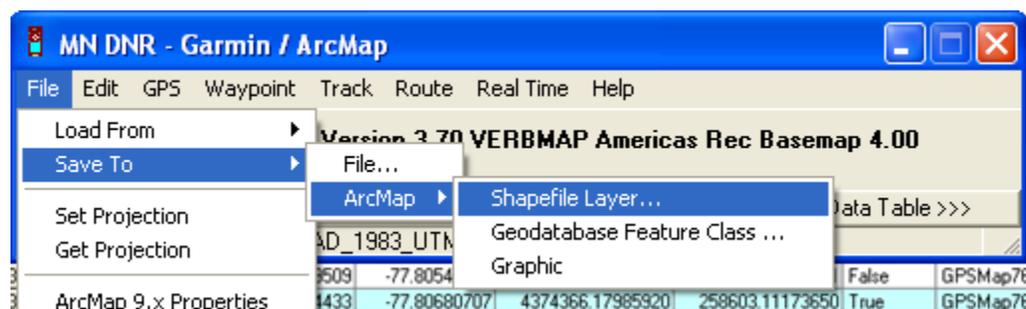


4. Click on the dropdown arrow on the right side of the **Save in** field and navigate to the desired folder on your computer.
5. Name the file, such as "NCTC_Structures" as shown below. Never use spaces in your file name because it's bad karma for GIS data. Change the file type to as needed. This can be an **ArcView Shapefile (Projected) (*.shp)**, (as shown below), a geodatabase feature class, or even a .KML file for use in Google Earth. NOTE: you will need an existing geodatabase if you want to save the file as a feature class.



6. Click the **Save** button. You are notified when the process is complete. Click **OK**. The data will be saved in the datum/projection you specified in Section 1.

ArcMap Users: If you are working directly in ArcMap via the DNR Garmin Toolbar, then you will have a second option to save your data. The ArcMap option will save your data as a shapefile or feature class AND will automatically add the layer to your table of contents. Nice!



GPS LINE & POLYGON DATA

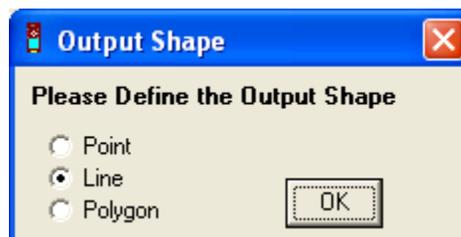
- To download a line or polygon select the **Track** menu and choose **Download**. You are notified when the download is complete. Click **OK**.



- Notice that some of the records are highlighted in blue. These blue records mark the start of new line segments. This allows you to select specific line segments you need to edit or save. **TIP:** To select multiple records, click on the record number on the very left side of the table and simply drag your mouse down to highlight the set of records you want.

128	TRACK	ACTIVE LOG	39.48582217	-77.80578104	4374443.77368316	258634.09301842	False	GPSMap76CSX
129	TRACK	ACTIVE LOG	39.48608754	-77.80571834	4374479.06348771	258700.37026462	True	GPSMap76CSX
130	TRACK	ACTIVE LOG	39.48604228	-77.80564609	4374473.84568157	258706.42835751	False	GPSMap76CSX
131	TRACK	ACTIVE LOG	39.48601630	-77.80559840	4374470.83391014	258710.44059537	False	GPSMap76CSX
132	TRACK	ACTIVE LOG	39.48600825	-77.80555925	4374469.83537075	258713.78028141	False	GPSMap76CSX
133	TRACK	ACTIVE LOG	39.48599509	-77.80548097	4374468.16470785	258720.46810521	False	GPSMap76CSX
134	TRACK	ACTIVE LOG	39.48504433	-77.80680707	4374366.17985920	258603.11173650	True	GPSMap76CSX
135	TRACK	ACTIVE LOG	39.48497610	-77.80663172	4374358.13570550	258617.95877684	False	GPSMap76CSX

- Select **File** and save the data as with the waypoints. However, after you assign an appropriate file name and click **Save**, you will be asked what data type to save it in. Change the desired output to Line or Polygon, depending on your needs. Click **OK**.



- You are notified when the process is complete. Click **OK** and close  DNR Garmin.

Why Do I Have Duplicate Layers On My Map?

Garmin stores all line and polygon data as tracks in the Active Track Log. When you save polygons using the Area Calculation Page or save lines using the Tracks Page then you will have duplicate layers when you download the data.

1. To avoid duplicate layers, only select the manually saved records OR the automatically saved records from the data table in DNRGarmin, then save the selected records to file.
2. After you download the data to your PC, always **Clear** the Active Track Log and delete all saved tracks before you collect any new line or polygon data in the field.

