Exercise 1 – Downloading GPS Data Using DNRGPS

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

- ❑ Customize DNRGPS settings
- ❑ Download waypoints (e.g., points) and tracks (e.g., lines or polygons) using DNRGPS
- ❑ Save GPS field data in ArcGIS shapefile (.shp) file formats

Materials created by*:* Eric Kelchlin (July 2007)

Revision*:* October 2012

Directory Path: CSP7101\GPS_Data

Software: ArcGIS 10, SP5

Garmin USB Driver → http://www8.garmin.com/support/download_details.jsp?id=591

DNRGPS v6.15 → http://www.dnr.state.mn.us/mis/gis/DNRGPS/DNRGPS.html

Garmin Web Updater → http://www8.garmin.com/products/webupdater/howtoinstall.jsp

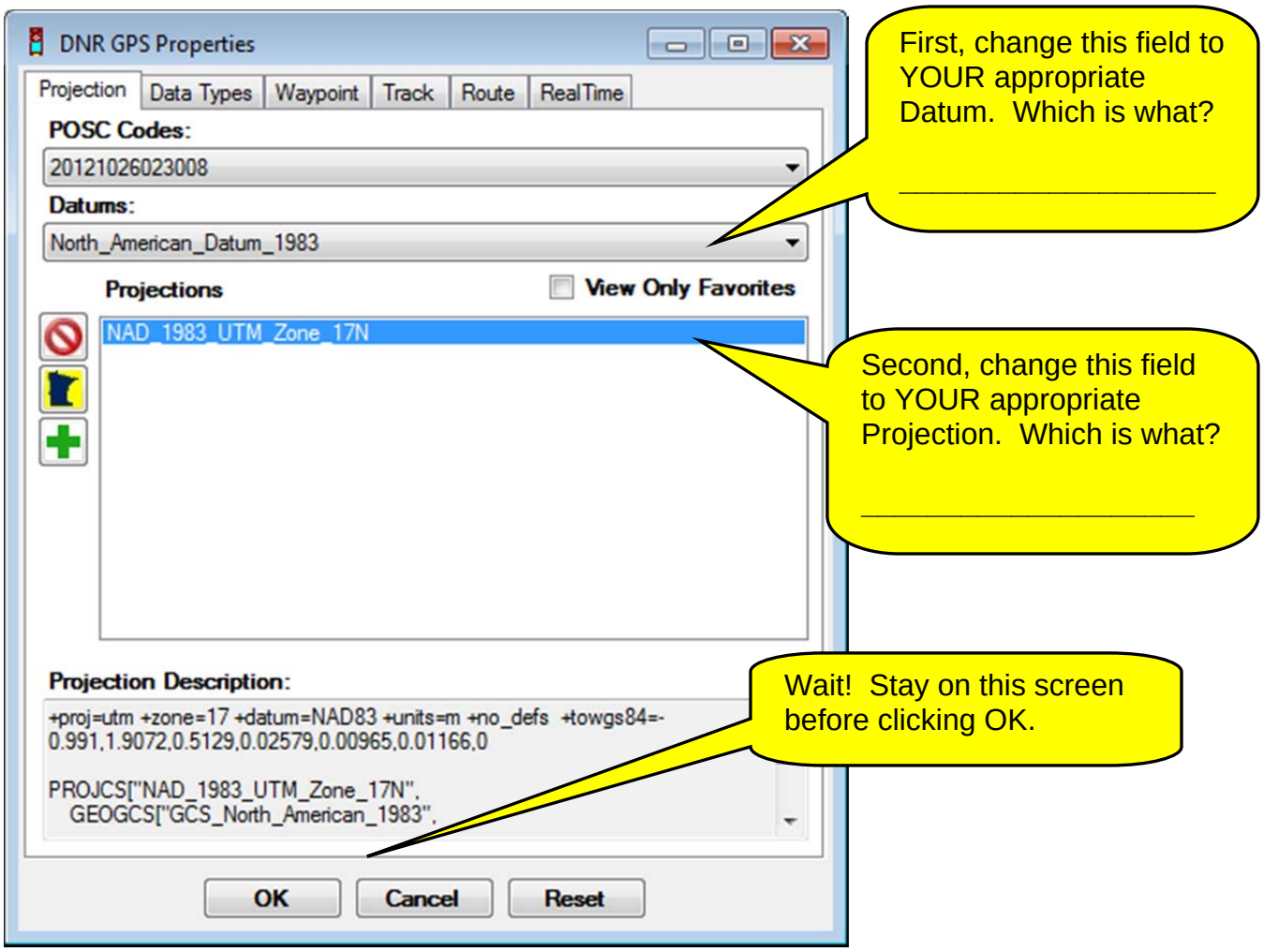
(This software updates the OS and firmware on your GPS unit. It's not needed for this exercise, but very necessary to keep current with updates.)

SECTION 1 – Changing the Default Settings in DNRGPS

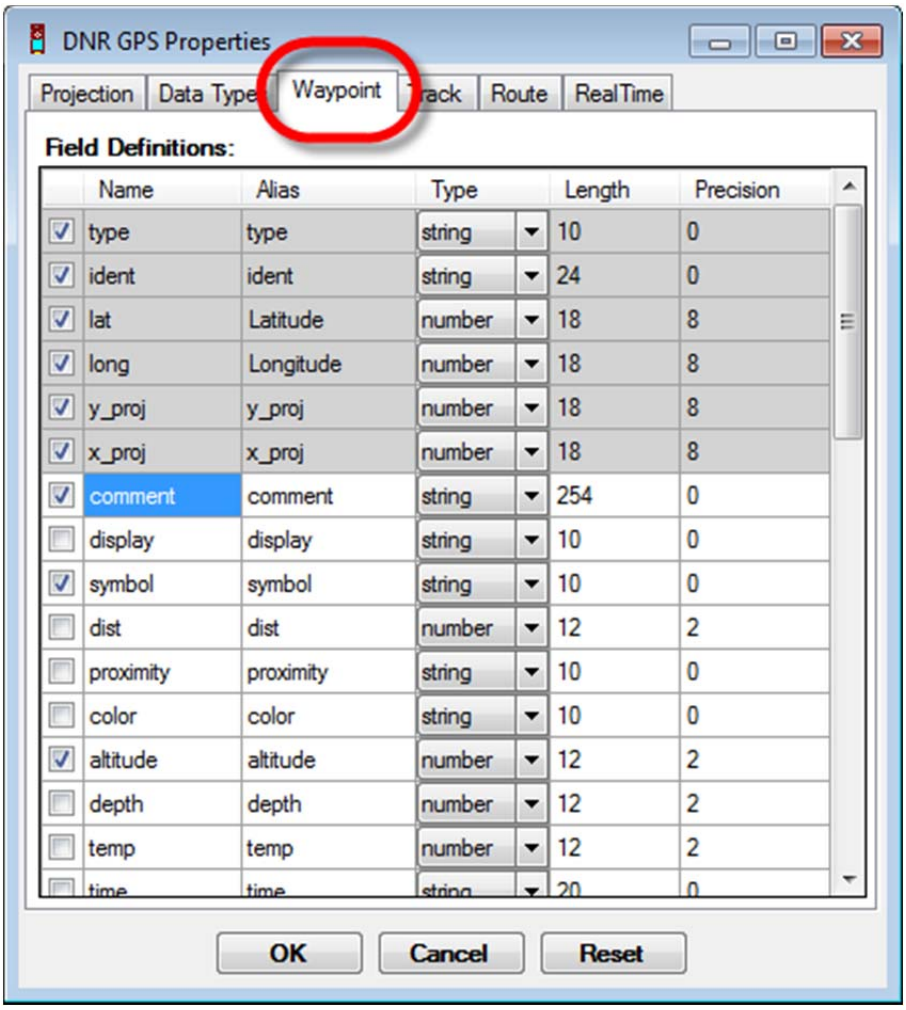
This exercise uses DNRGPS, a free tool that allows you to import waypoints and tracks from any Garmin device. DNRGPS allows you to save your data in many different spatial file types. However, as of October 2012, shapefiles (.shp) is the only file type that works. It's a new tool with lots of supporting code writers, so expect enhances in the future. Google DNRGPS for the latest download or look in the Utilities folder on the class DVD.

1. Launch the DNRGPS utility from your desktop.

2. Select **File > Set Projections > Projection** tab. Change the projection settings as illustrated below.



3. Click on the **Waypoint** Tab. Uncheck all the fields after **comment**, <u>except for</u> **symbol, altitude** and **model**.



	Name	Alias	Type	Length	Precision
☑	type	type	string	10	0
☑	ident	ident	string	24	0
☑	lat	Latitude	number	18	8
☑	long	Longitude	number	18	8
☑	y_proj	y_proj	number	18	8
☑	x_proj	x_proj	number	18	8
☑	comment	comment	string	254	0
☐	display	display	string	10	0
☑	symbol	symbol	string	10	0
☐	dist	dist	number	12	2
☐	proximity	proximity	string	10	0
☐	color	color	string	10	0
☑	altitude	altitude	number	12	2
☐	depth	depth	number	12	2
☐	temp	temp	number	12	2
☐	time	time	string	20	0

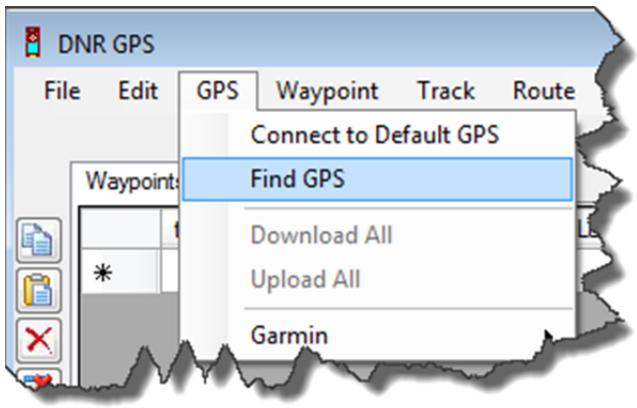
4. Click on the **Tracks** Tab. Uncheck all fields after **new_seg** except for **altitude** and **model**. Click **OK** when finished. Once you set these properties, they will be used as the default settings for all future downloads. However, you can modify what fields you want before or during any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

SECTION 2 – Downloading Waypoints and Tracks (lines or polygons)

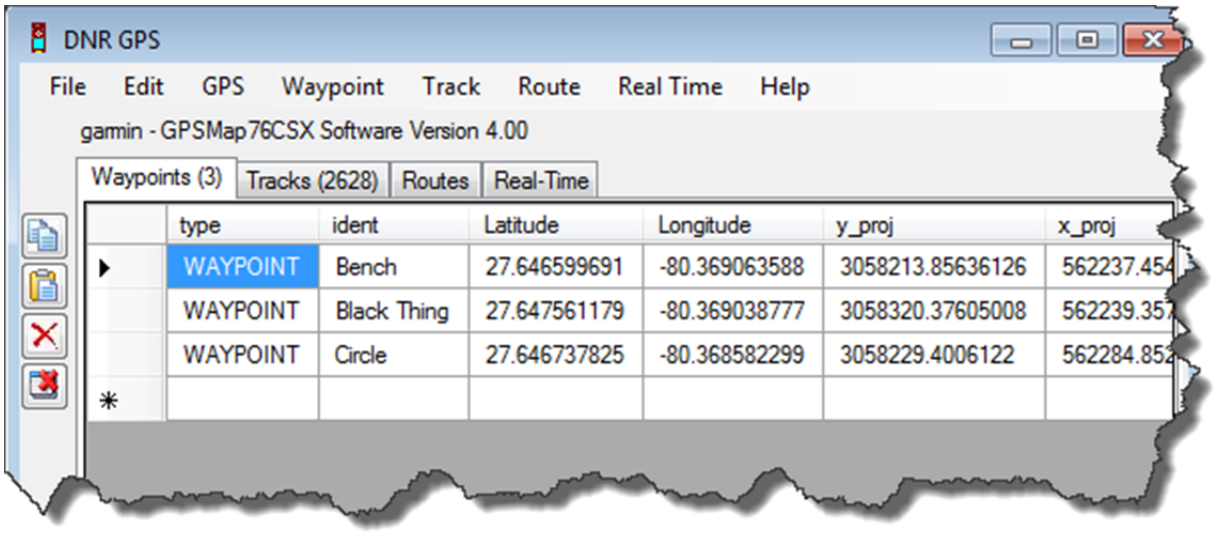
1. Attach your GPS unit to the computer using the USB cable. Be careful with the earflap on the back of the GPS unit….it will come off!

2. Turn on the GPS unit and select **GPS > Find GPS**. The model of the GPS unit will be shown just below the main menu after a few seconds indicating the connection has been made.

   If the GPS unit has not been found, then install the Garmin Driver by selecting **GPS > Garmin > Install Garmin USB Drivers.** You will need administrative rights to install this software.

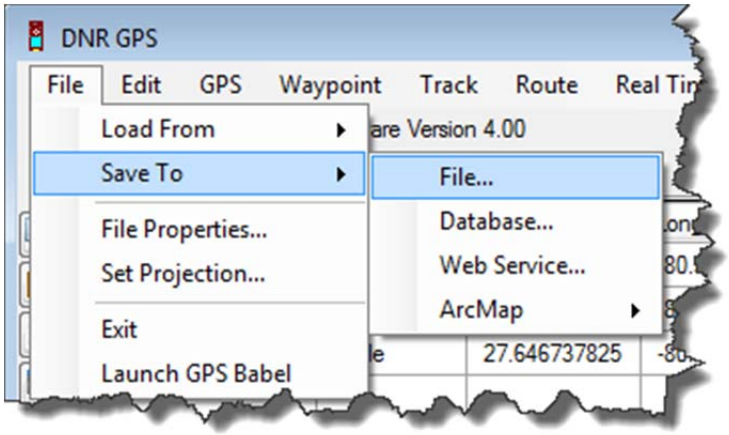


3. Download the waypoints and tracks (e.g., lines and polygons) at one fell swoop by selecting **GPS > Download All**. You can do waypoints and tracks individually under each respective button, but this method is quicker.



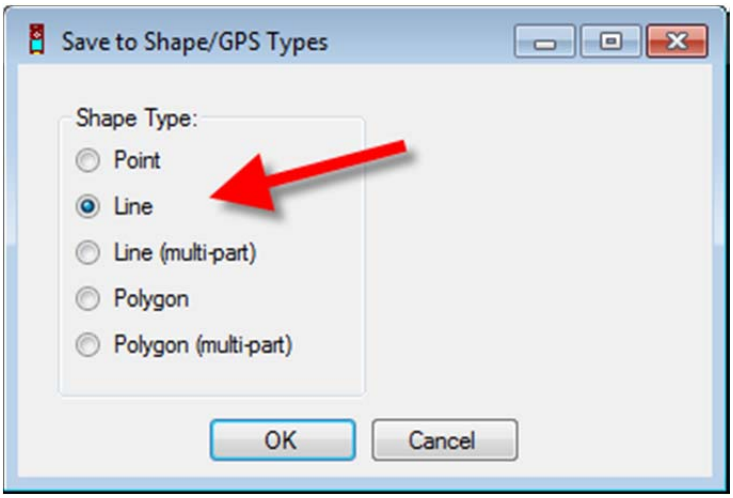
4. Select the Waypoints tab just above the table to view all your waypoints. To save the waypoints as a shapefile, simply select **File > Save To > File.**

   - Browse to the **CSP7101\GPS_Data** folder and save the waypoints as **Day1_Points**. Make sure the file type is an ESRI Shapefile (.shp) and click the SAVE button.



5. To save the lines or polygons, simply click on the Tracks tab just above the table to view your tracks and select **File > Save To > File.**

   - Browse to the **CSP7101\GPS_Data** folder and name the tracks **Day1_Lines** or **Day1_Polygons**. Choose what data type you want, and click **OK**, twice.

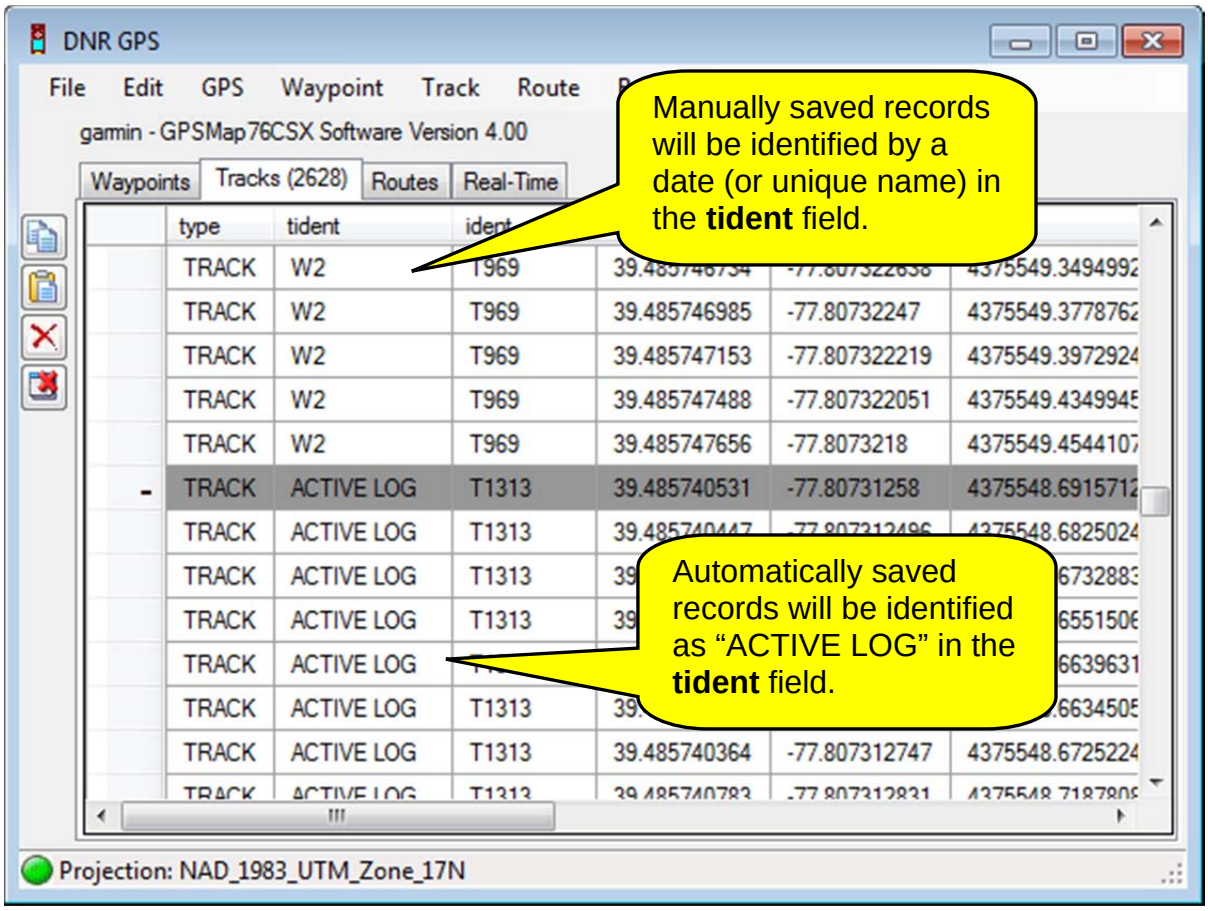


Why Do I Have Duplicate Layers On My Map?

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.

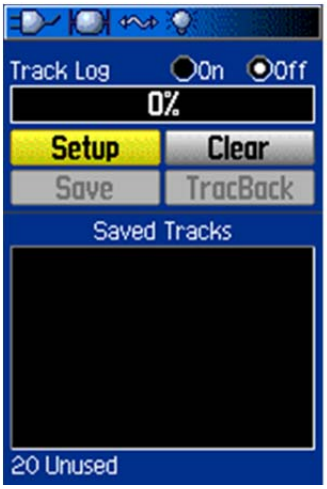
1. To avoid duplicate layers, only select the manually saved records OR the automatically saved records from the data table in DNRGPS, then save the selected records to file. Track segments are identified by the gray record

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.



type	tident	ident			
TRACK	W2	T969	39.485746734	-77.807322638	4375549.3494992
TRACK	W2	T969	39.485746985	-77.80732247	4375549.3778762
TRACK	W2	T969	39.485747153	-77.807322219	4375549.3972924
TRACK	W2	T969	39.485747488	-77.807322051	4375549.4349945
TRACK	W2	T969	39.485747656	-77.8073218	4375549.4544107
TRACK	ACTIVE LOG	T1313	39.485740531	-77.80731258	4375548.6915712
TRACK	ACTIVE LOG	T1313	39.485740447	-77.807312496	4375548.6825024
TRACK	ACTIVE LOG	T1313	39		6732883
TRACK	ACTIVE LOG	T1313	39		6551506
TRACK	ACTIVE LOG				6639631
TRACK	ACTIVE LOG	T1313	39		6634505
TRACK	ACTIVE LOG	T1313	39.485740364	-77.807312747	4375548.6725224
TRACK	ACTIVE LOG	T1313	39.485740783	-77.807312831	4375548.7187809

Why Are My Tracks Generalized?

1. When you have more than 2% of your Active Track Log memory used up, your Garmin unit will automatically begin generalizing the data (i.e., removing vertices) of your manually saved tracks to maximize storage space on the internal flash drive. This is carryover tactic from older GPS models that had very limited memory (≤24 MB).

2. To stop Garmin from generalizing your data make sure your track settings are set as shown below. A logging rate of 2-3 seconds is recommended to avoid data simplification issues.