

Lab GPS: GPS Optional Extra Credit Lab

Purpose: Introduce Global Positioning System (GPS) data collection, data transfer, and create a simple map.

To Do: Use Garmin GPS76 to collect data, transfer and use ArcMap to create a map.

To Turn In: A map of the campus area where you collected GPS data, displaying your collected data points. (Remember to add, title, name, north arrow, legend, etc.).

Data Used: Campus_ UTM, Zone 15 NAD83, meters.

Data Source: C:\Data\FR3131-5131\GPS_Lab_(Optional_Extra_Credit)

Note: Despite the folder name, this optional Lab will be with worth 5 extra credit points.

Background (Optional)

On the CFLAB\FR3131 (or 5131)\GPS_Lab_(Optional) directory
There are copies of the actual Owner's Manuals for the GPS Instruments.

The Lab instructor will pass out Garmin GPS76 instruments for you to use during this exercise. Please turn them in when the lab period is over.

BASIC PROCESS (step by step details are shown later)

- Learn simple basics (in classroom) as to how to turn on GPS instrument and collect a data point (also referred to as "Waypoints").
- Outside locate at least 5 of the 10 flagged points (in the old athletic field, south of the Gym)
- Collect Data at least 5 of the 10 points, all 10 if you wish. Name the points if you wish, the GPS instrument will number them as you proceed.
- Back in classroom – Transfer the GPS data to your computer, using DNR Garmin software.

- Save the data file as a Shapefile to your Jump drive (d:\).
- Using ArcMap, map your data on top of the image of campus. (C:\data\FR3131-5131\GPS(Optional_No_Credit)\Campus_UTM.img)
- Print your map to a .pdf file and submit it via the WebVista class site.

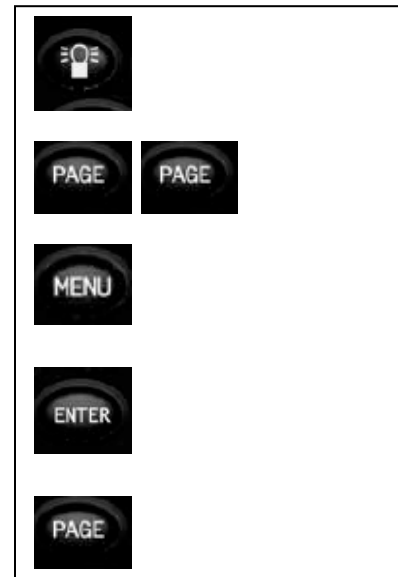
Complete detailed step by step instructions for Garmin 76 can be found at G:\CFLAB\FR3131 (or 5131)\GPS_Lab_Optional\Supplemental for GPS Optional Lab.doc.

Each GPS instrument should also have a white card attached with simple instructions.

Below are the simple “button pushing” instructions:

CLASSROOM - Inside

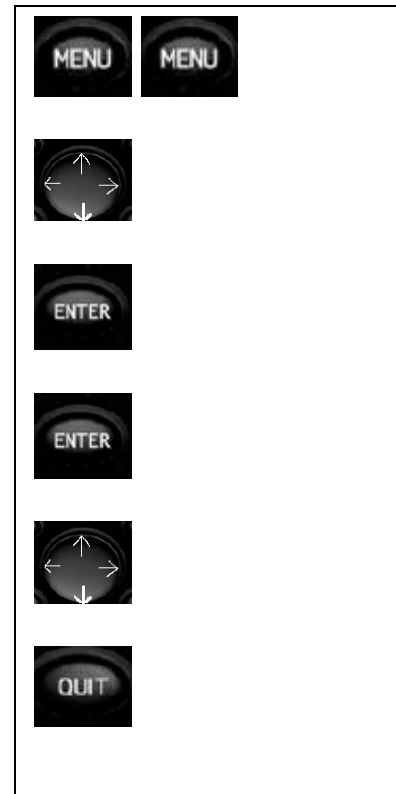
1. Power On (hold for 2 seconds)
2. Push Page twice (*to clear messages*)
3. Push Menu
4. Push Enter (activating Simulation)
5. Push Page a few times and watch the screen flip through the 5 “Windows”



Push Menu twice

6. Arrow down to Points
7. Press Enter
8. Press Enter to select Waypoints
9. Arrow to a Point and press enter to see it
10. Note details for of Points
11. Push Quit returning to Waypoint list.
12. Repeat steps 11 – 13 as necessary

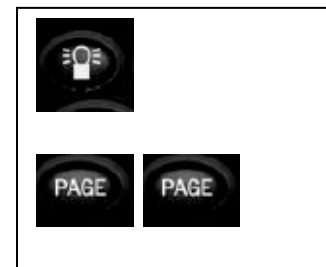
Power Off (hold for 2 seconds)



FIELD – Outside

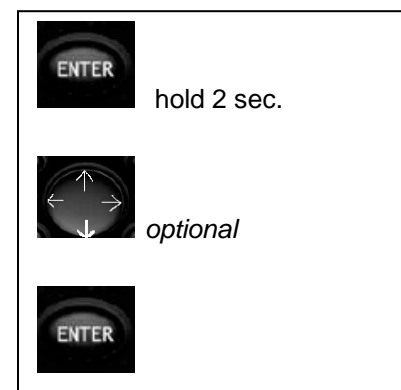
(assume unit is powered off)

1. Power On/Off (hold for 2 seconds)
2. Push Page twice *(to clear messages)*
3. Wait to get a fix



To Mark a Point

4. Walk to a Point
5. Push Enter (hold for 2 seconds)
6. You will see the Mark Waypoint Screen
7. *(optional change default number; use the rocker key to move to the number beside the marker, push Enter to edit the field, then use the rocker to change the name of this point to "M" for mark and the labeled point number)*
8. Push Enter *(on the OK)*



To Average a Point

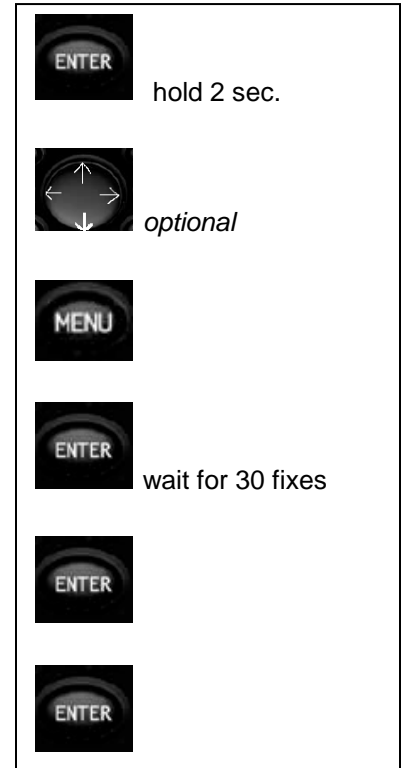
9. Walk to a Point
10. Push Enter (hold for 2 seconds)
11. When you get the Mark Waypoint Screen
12. *(optional change default number; use the rocker key to move to the number beside the marker, push Enter to edit the field, then use the rocker to change the name of this point to "A" for average and labeled point number)*
13. Push Menu
14. Push Enter (to begin averaging)
15. Wait for at least 50 fixes
16. Push Enter *(on the SAVE)*
17. Push Enter *(on the OK)*

Repeat for the next points

When finished



Push Power On/Off (hold for 2 seconds)



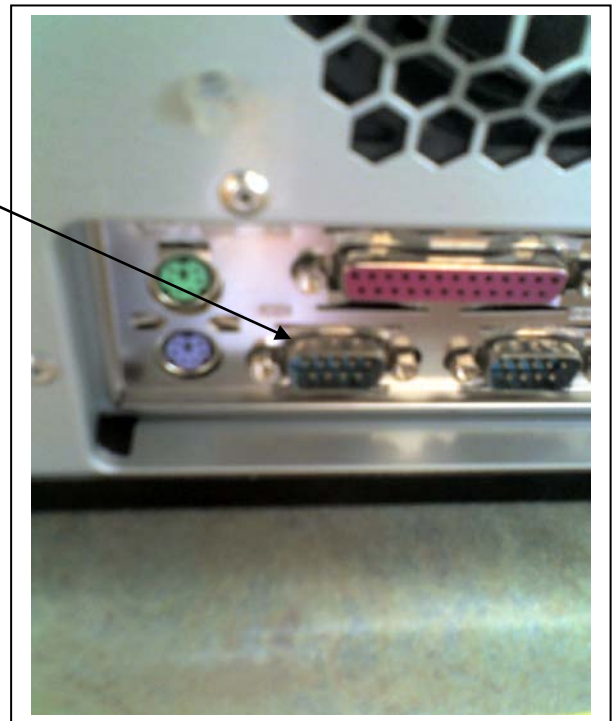
When you have collected data from at least 5 points, turn the instrument off and go back to the Skok 35 lab.

A data cable will be provided for you to transfer your data to the computer.

The data cable plugs in to the serial port on the back of the computer and the other end plugs into the back of the Garmin 76. See below.

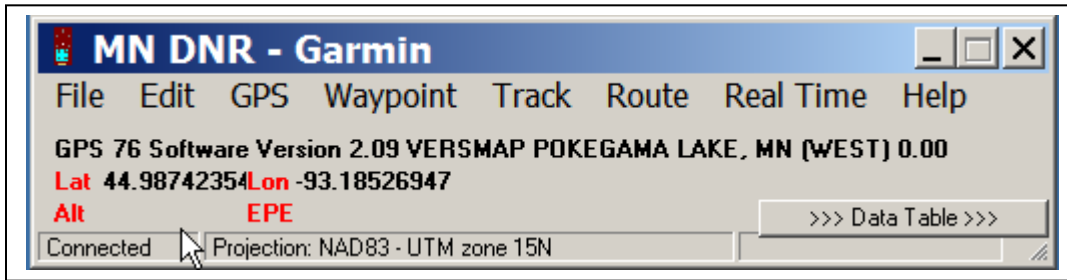


The serial port on the back of the computer is the **only plug that will fit the cable**. If it doesn't fit, you are using the wrong one.

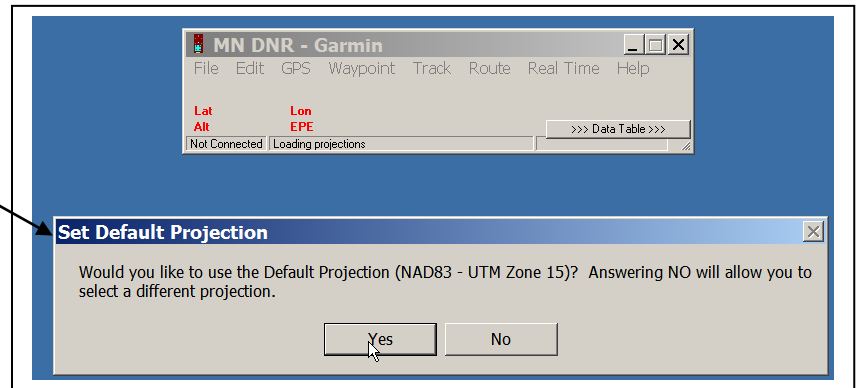


Once "cabled up", power the GPS instrument on. Select Programs → GIS & GPS and select DNR Garmin.

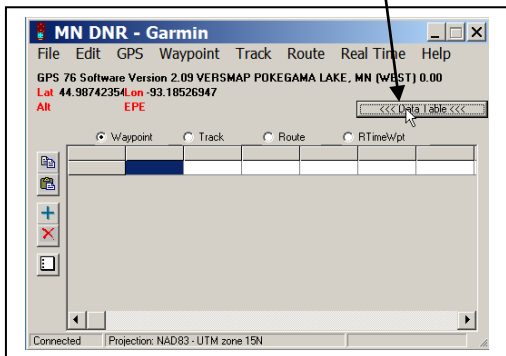
You should see this screen:



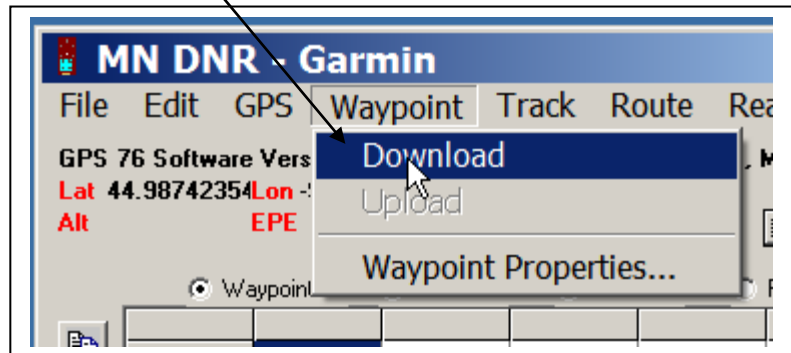
You may get this question
Answer Yes, to select the Default Projection.



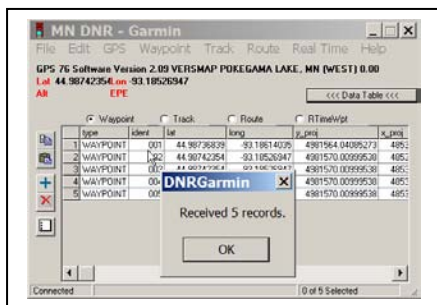
Expand the data table by clicking on the '>>>Data Table >>>>' button



Next select Waypoint and select Download

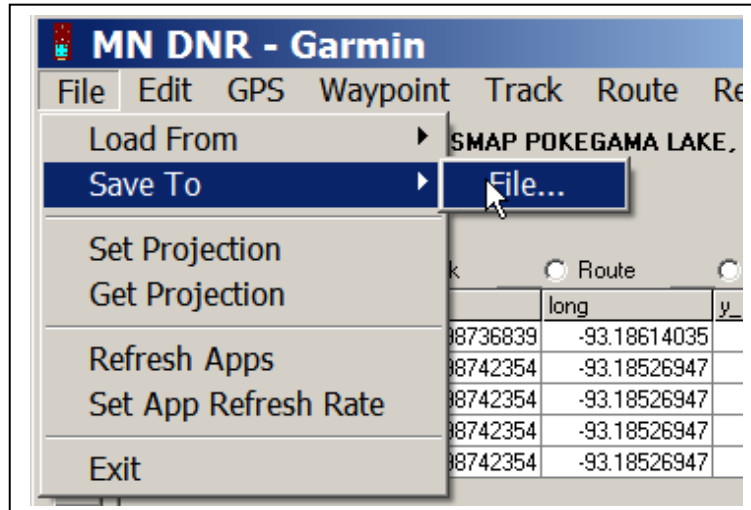


This transfers you points to the computer. You will get a message about the number of points. Select, OK.

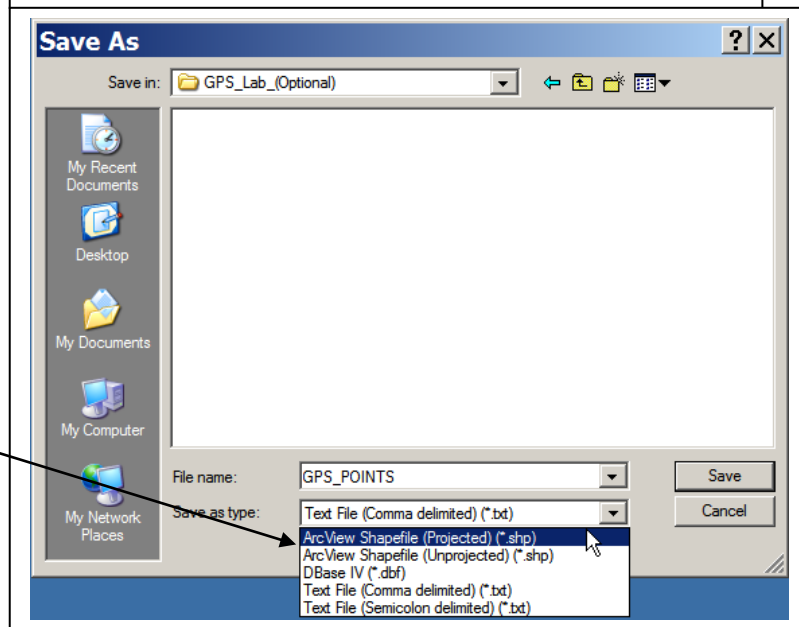


Note: If you don't go outside, use the file on C:\data\Fr3131-5131\GPS_Lab(Optional_No_credit)\extra_for_home_use\GPS_Points_if_you_don't_go_outside.txt. Use File → Load From to bring this data into the DNR Garmin. Then continue with the File Save on the next page

Next, select File → Save To

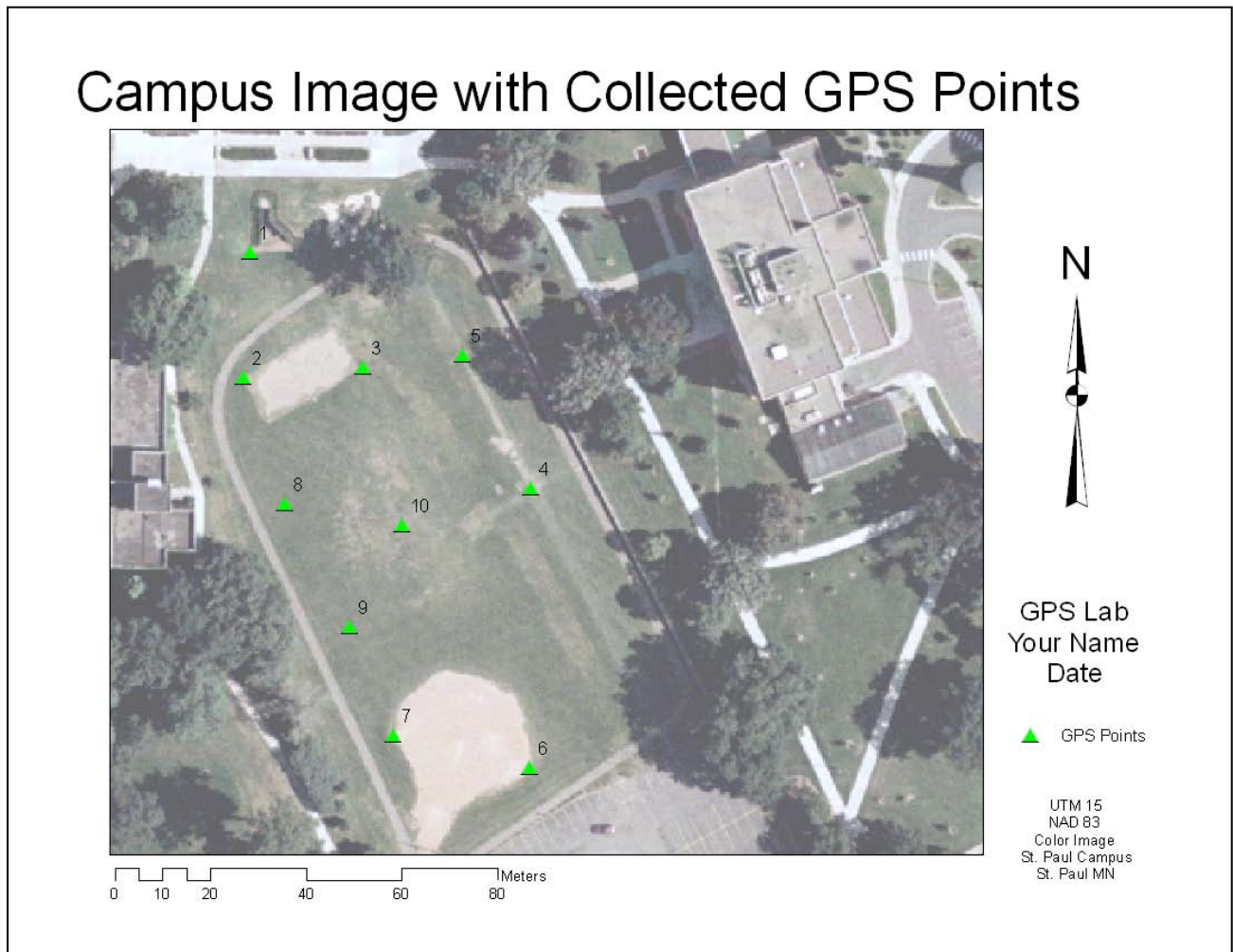


Select your Jump (d:) drive and change the output type to “ArcView Shapefile Projected (*.shp)”



- Close DRN Garmin and open ArcMap.
- Use new empty map and add the C:\Data\FR3131-5131\GPS_(Optional_No Credit)\Campus_UTM.img.
- Then add your GPS data file.
- To add labels to your map use Properties of your GPS layer. Use the Labels tab and select “Label features in the layer” and use IDENT as the Label Field.
- Switch to Print Layout, add your Title, North Arrow, Scale bar, and Legend.
- Export map as a .pdf and submit via WebVista class site.

Example below:



Print a map as a .pdf. Remember to have an overall title, your name, and legend, and one scale bar.

FR3131-5131 Lab GPS

Name: _____

Suggestions for Improvement: Lab GPS

Please help me improve this lab. As incentive, any improvements incorporated (or major errors removed) will gain you a point on your final grade total.

What didn't work in this lab, and how would you fix it?

What was the best part of this lab exercise?