

# GPS Utilization Manual



**Ministry of Forestry and Research**

Created by: Reforestation Division

# Table of Contents

1. Field Note	2
2. Garmin 62s	3-18
3. Garmin 62s	19-28
4. Data Sharing	29-31

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# Field Note

For maintaining the field data as reminder, it is important to note each data description when you get in the field like a form below:

PLACE: \_\_\_\_\_ DATE: \_\_\_\_\_ SURVEYER: \_\_\_\_\_  
GPSmodel: \_\_\_\_\_.

No	Description	Note	Photo
KOM1	Start	Boundary survey start point (house)	No.1
	Road	Road crossing point	No.2
	Tree	Shade tree for community people	No.3
KOM10	End	Same to Start point	No.20

# GPS etrex10

Garmin Etrex10 is used in the tutorial

## Objective

To know how to use Garmin GPS

## Preparation of GPS for field survey

### 1. Check current status and change settings

1. **Battery, GPS condition and Date and Time**  
Push **the light button**. Then you can see the current status.  
When you use your mobile phone to take photos with coordinates.  
Please check the date and time are the same.



Garmin GPS Time on a mobile phone.

**What do you need to check before field survey?**

2. **Satellite position correction**  
Push **Back**(change the screen to see **Setup**)  
> Select **Setup** > **System** > Satellite system > Select **GPS+GLONASS**(Just in case)  
> Select **Setup** > **System** > Select **WAAS/EGNOS** (Just in case) > ON



3. **Check the status of the received satellite**  
 Push light button to see the GPS condition indicator  
 More detail > Push **Back(change the screen to see Setup)** > Select **Satellite**  
 Check GPS accuracy: The picture shows 2m

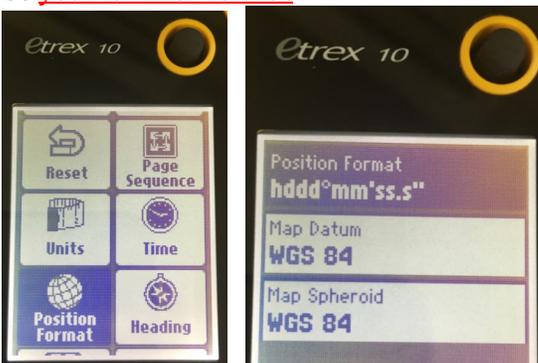


indicator Detail >

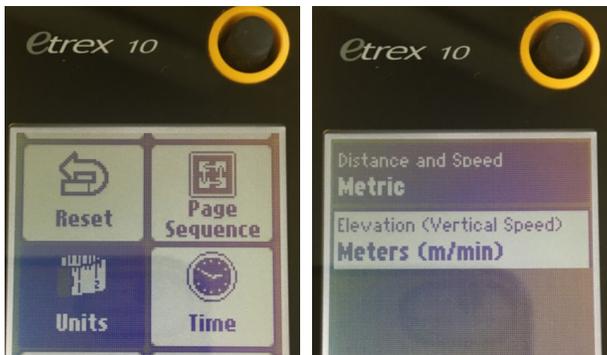
4. **Change the formats**  
**Time and Time zone**: 24hours > Push **Back(change the screen to see Setup)** > Select **Setup** > **Time** > **Enter** > **Select 24-Hours** > Quit  
 If your clock is not correct, please change Time Zone.



- Positional Format** > Push **Back(change the screen to see Setup)** > Select **Setup** > **Position Format** > **Enter** > **Map Datum and Map Spheroid should be WGS84** > Position Format should be **your familiar format**



5. **Change the unit**  
**Unit** > Push **Back(change the screen to see Setup)** > Select **Setup** > **Unit** > **Change the unit which you want to use** .



## 2. Clean up the GPS data on your GPS

**Please backup before you delete the GPS data.**

### 1. Delete tracks

Push **Back**(change the screen to see **Setup**) > Select **Track Manager** > Current Track > Save Track(It will be stored in Archive) or **Clear Current Track** > Yes



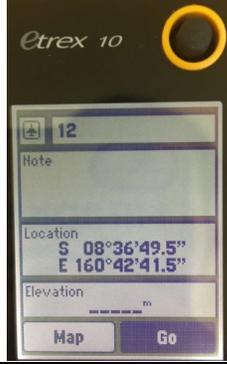
### 2. Delete waypoints

Push **Back**(change the screen to see **Setup**) > Select **Waypoint Manager** > Menu > **Delete All**  
 Or Push **Back**(change the screen to see **Setup**) > Select **Waypoint Manager** > select a waypoint > Menu > **Delete**

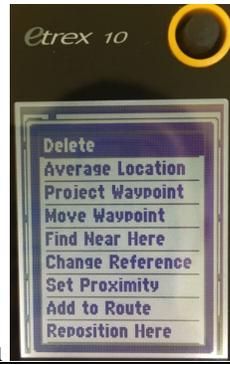




> Select one



> push menu



> delete one

# Data collection

## 1. Track

### 1. Track Settings

Push Back(change the screen to see Setup) > Select Setup > Track > **Change the Record method (Auto is OK)**



Auto(time and distance)    Time(e.g. 10sec)    Distance(e.g. 0.1km)

### 2. Record On OFF

please select **Record, Show on Map**. Then Tracklog will be recorded automatically when you turn on. But if don't need to record, select Do Not Record.



### 3. Go to Field survey

## 2. Waypoint

### 1. Normal waypoint

**You must check the accuracy of GPS from Satellite menu(See 1.3) before you get waypoints.**

Push Back(change the screen to see Setup) > Select Map > > **Long push the button(below)** >

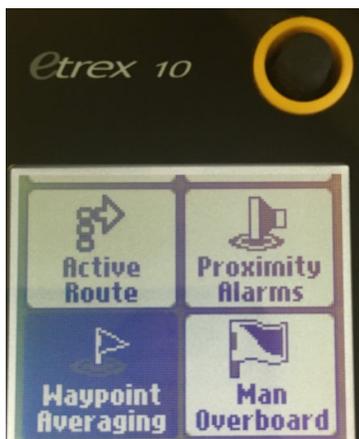
Select Done > push the button(Below)



Or Use Mark waypoint

2. Averaging waypoint (for reliable point

Push Back(change the screen to see Setup) > **Waypoint Averaging** > Create Waypoint > then averaged location will be calculated > Save



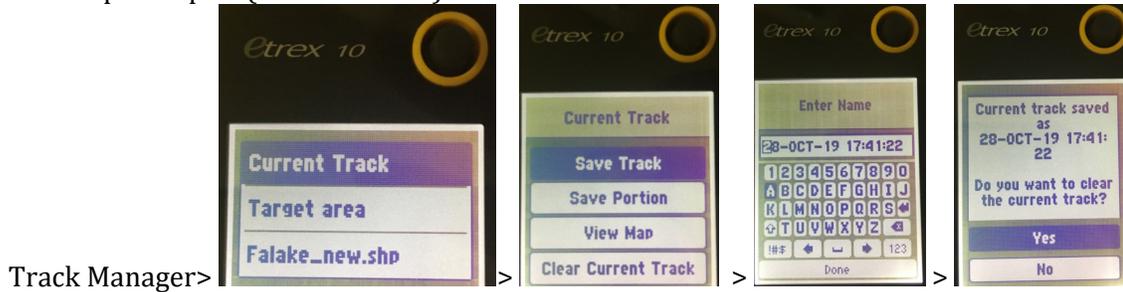
**Please make a memo according to point IDs.  
Please take photos by your mobile around a waypoint.**



Point ID	Attribute A	Attribute B	Attribute C
019			
020			

### 3. At the end of field Survey

1. When you finished the survey, please save your track to archive  
Push MENU(change to the screen to see Setup) > Select Track Manager > Enter > Select Current Track > Enter > **Save Track** > Name it > Done > You can choose YES or NO to clear the track on the temporal space(Current Track)



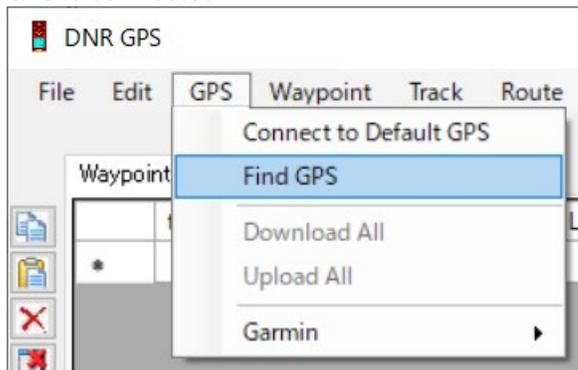
2. Not necessary to save waypoints.

## Additional data for field survey

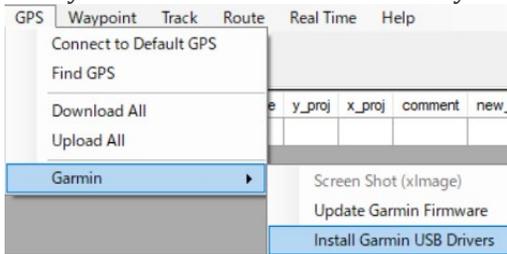
### 4. Upload points, lines(polygon) using google earth

1. Software  
[DNRGPS\(https://www.dnr.state.mn.us/mis/gis/DNRGPS/DNRGPS.html\)](https://www.dnr.state.mn.us/mis/gis/DNRGPS/DNRGPS.html)  
Open DNRGPS  
 dnrgps.exe
2. Connect Garmin GPS to your PC  
Wait until your GPS is recognized(**you may need to install Garmin driver.**)

3. Find GPS on DNR GPS  
GPS > Find GPS > When you connect to your GPS  
> You can see **garmin - eTrex 10 Software Version 340** (your Garmin) and **Projection:** then Garmin GPS is connected.

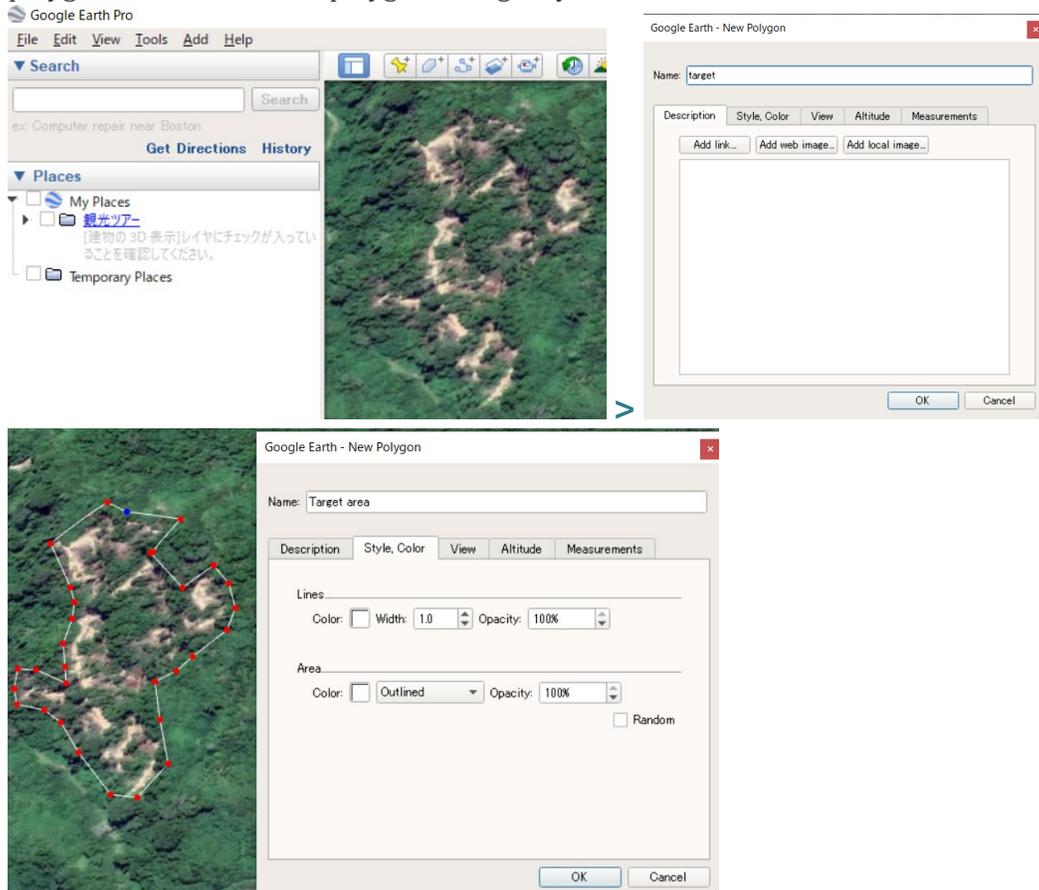


\*\*\*If you can not connect Garmin to your PC, please install the **Garmin USB Drivers**.

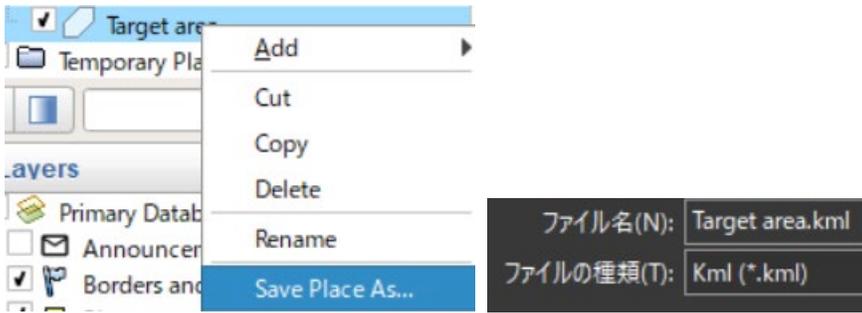


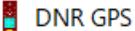
4. Upload polygon, polyline, point using Google earth.

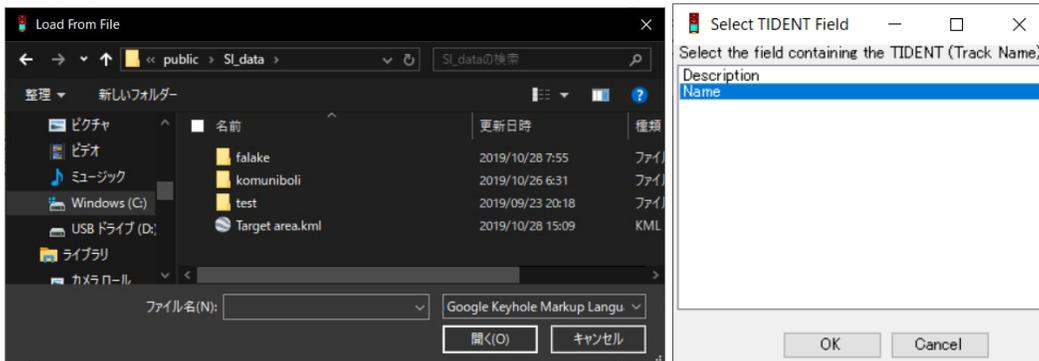
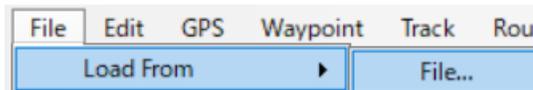
Open Google earth > click one >  point/polygon/polyline > Type Name of the polygon etc. > Then draw polygon:change Style,Color > > OK



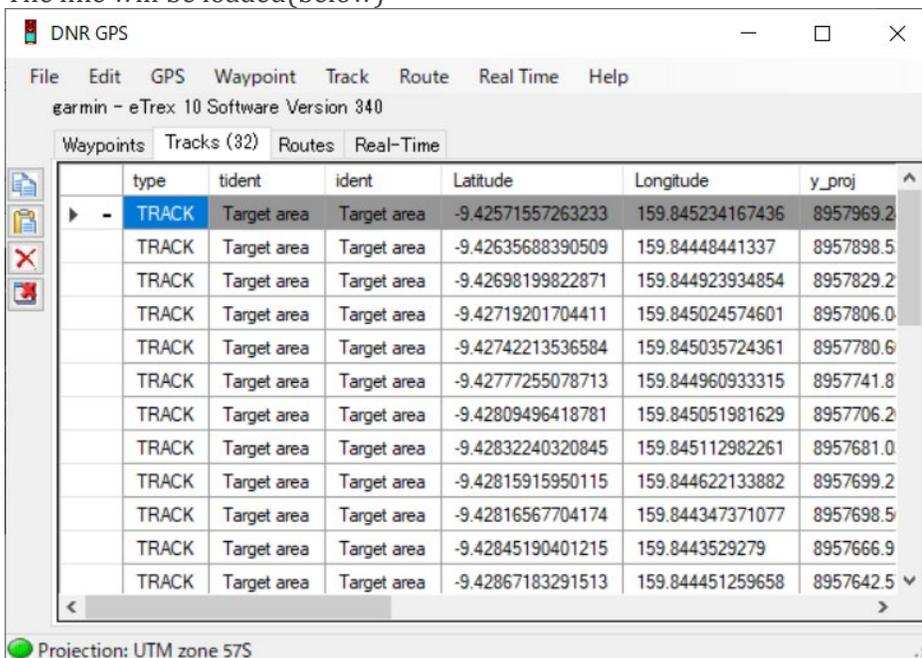
Export the data as KML format. Right click on the Name > Save Place As... > Change the file type to .kml not KMZ.



5. Close Google Earth
6. Load the polyline shape file(Form1\_sample\_Psm\_line.shp) to DNR GPS  
File > Load From > File > Select saved kml > Open > Select Name > OK  


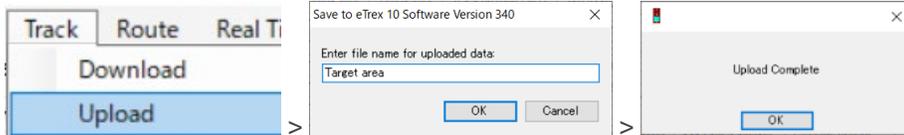


The line will be loaded(below)



7. Upload the line as a track

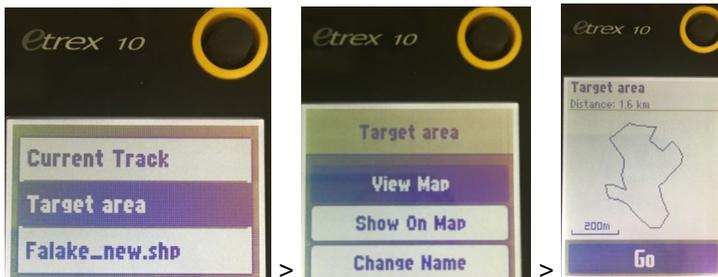
Track > Select all rows > Upload > Name the data > OK



8. Check the track on Garmin GPS  
Unplug Garmin GPS from your PC.

Turn ON Garmin GPS

Push **Back**(change the screen to see **Setup**) > Select **Track Manager** > You can see Saved Track > **Select uploaded track** > **View on Map** in order to check your data



New track is shown > View Map > Check it

**When you upload points, please use waypoint on DNR GPS.**

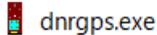
# Data management after field survey

## 1. Download GPS data

1. Software

DNRGPS(<https://www.dnr.state.mn.us/mis/gis/DNRGPS/DNRGPS.html>).

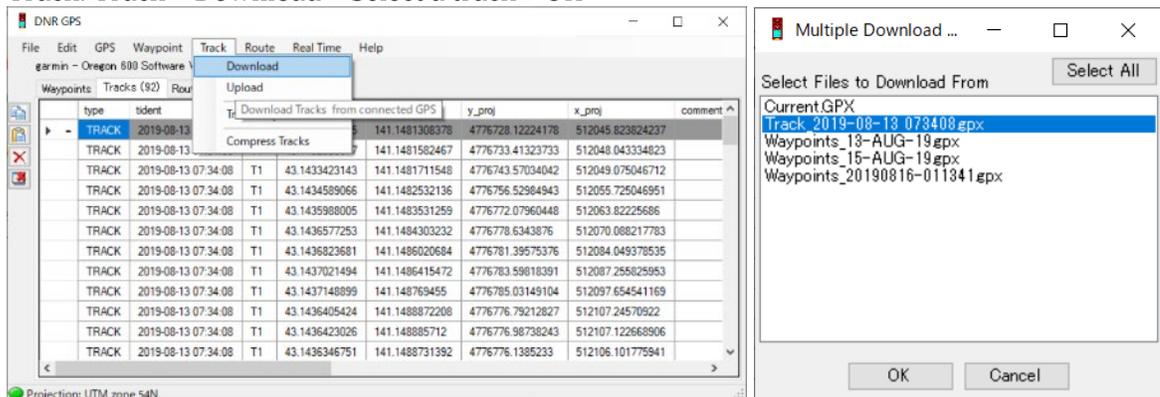
Open DNRGPS from



2. Connect Garmin GPS to your PC

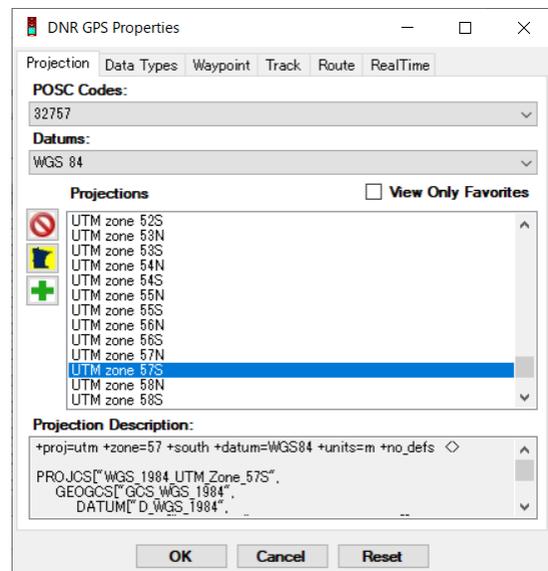
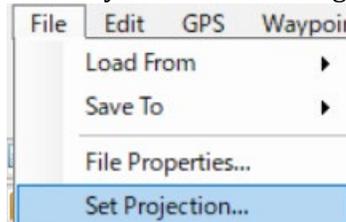
3. Open DNR GPS

Track: Track > Download > Select a track > OK

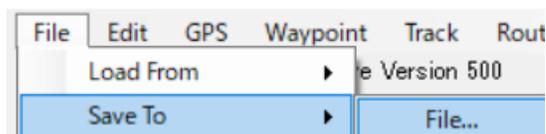
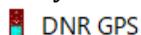


4. Change CRS

Choose your UTM zone! E.g. UTM zone 57S



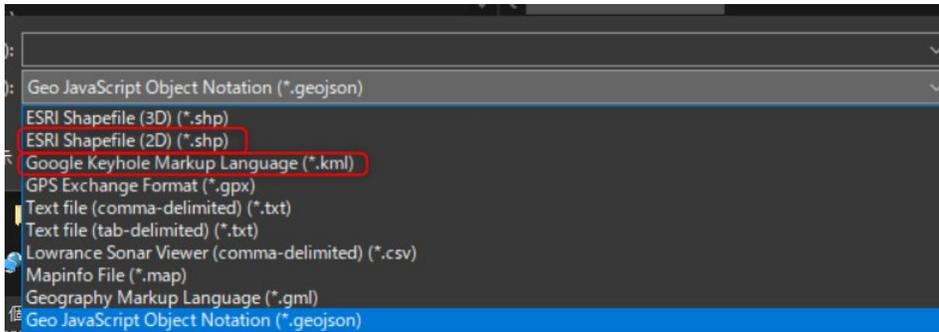
5. Save your GPS data



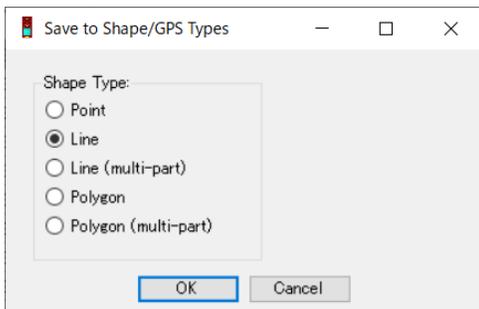
> Name it then select file type.

To visualize by google earth, use kml.

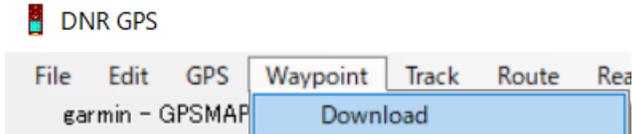
To visualize by QGIS or share by Geonode use shape file



6. Select shape type



**Waypoint is the same way to download. Change Track to Waypoint. Then select Point as shape type.**

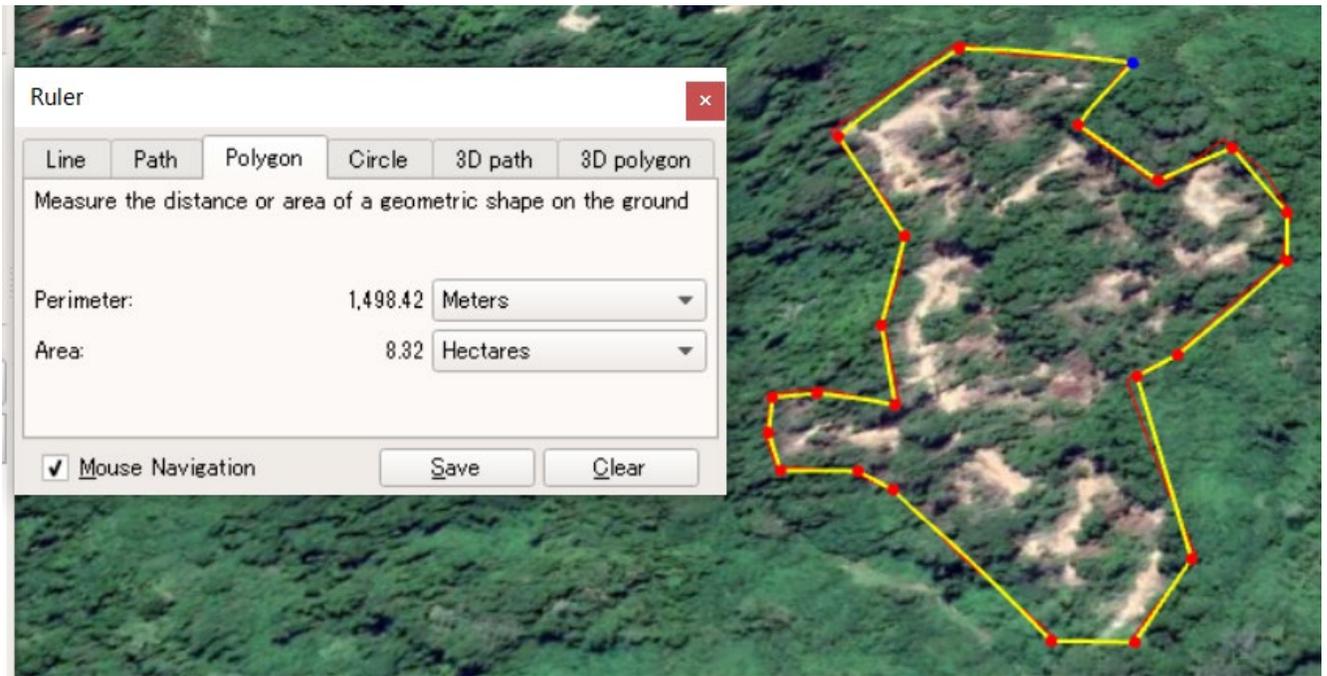


Waypoint > Download

## 2. Open by Google earth

**Open by Google earth : double click on the saved file(.kml)  
You can roughly calculate area.**





## Calculate area from waypoints

### 1. Convert waypoints to polygon

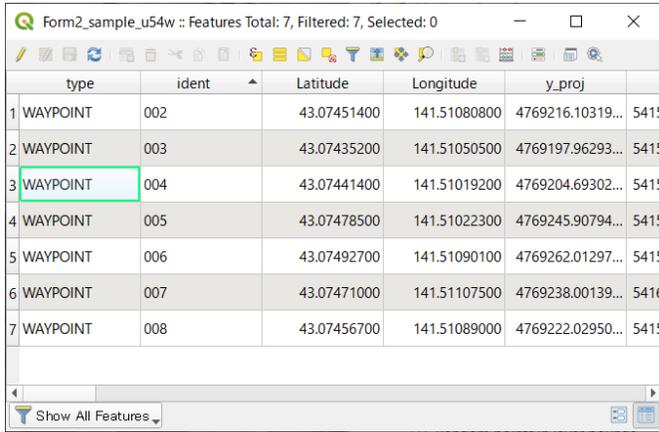
1. Modify the points >  then select unnecessary points using  then delete(key board)



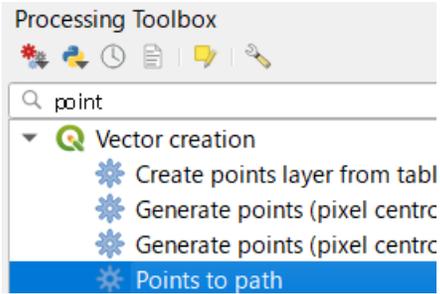
2. Stop editing using .

### 3. Convert to path(line)

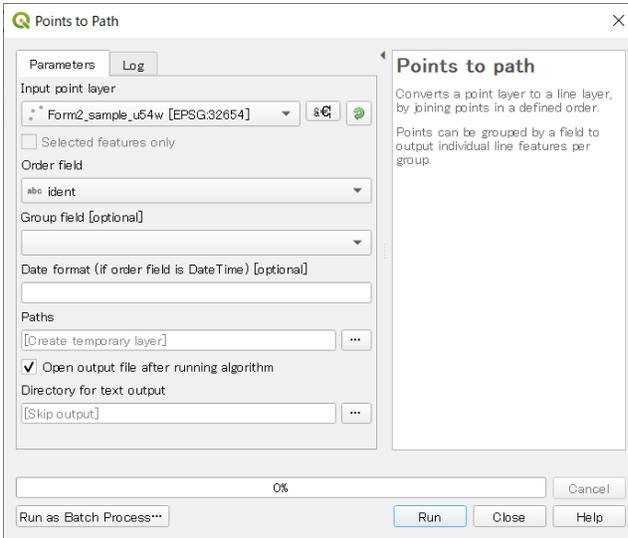
Check the orde field of the points and group field.



	type	ident	Latitude	Longitude	y_proj
1	WAYPOINT	002	43.07451400	141.51080800	4769216.10319...
2	WAYPOINT	003	43.07435200	141.51050500	4769197.96293...
3	WAYPOINT	004	43.07441400	141.51019200	4769204.69302...
4	WAYPOINT	005	43.07478500	141.51022300	4769245.90794...
5	WAYPOINT	006	43.07492700	141.51090100	4769262.01297...
6	WAYPOINT	007	43.07471000	141.51107500	4769238.00139...
7	WAYPOINT	008	43.07456700	141.51089000	4769222.02950...



Processing Toolbox > Vector creation > Points to path



Input point layer: points which you remove unnecessary points

Order field: ident

Not necessary to save it.



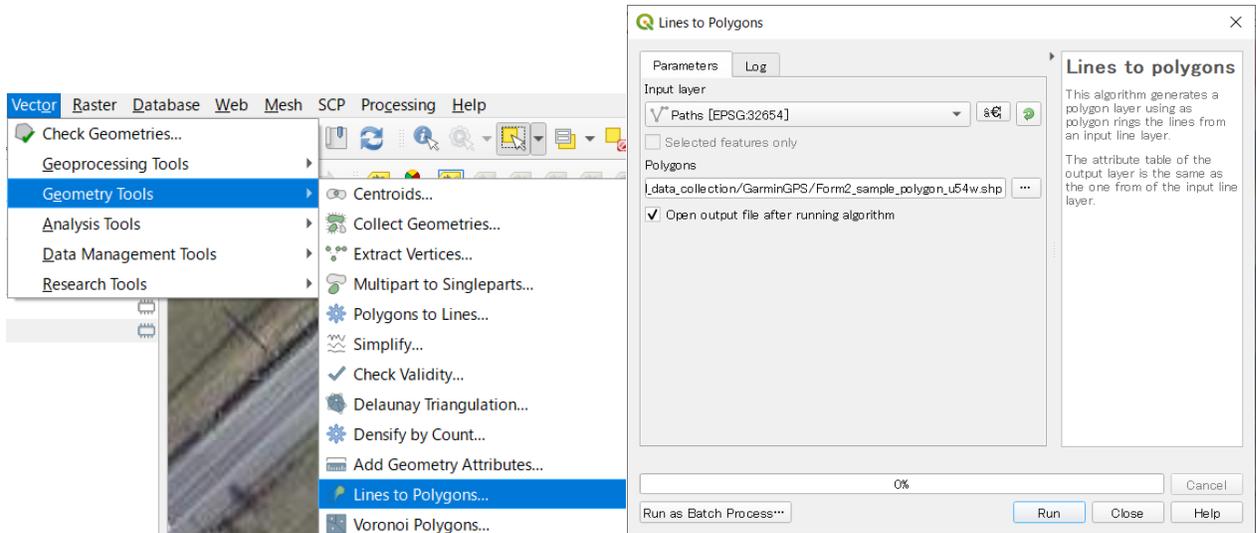
Path converted from point.

### 4. Convert path to polygon

Vector > Geometry Tools > Line to Polygons

Input layer: Paths

Polygons: output > please name it  
Run.

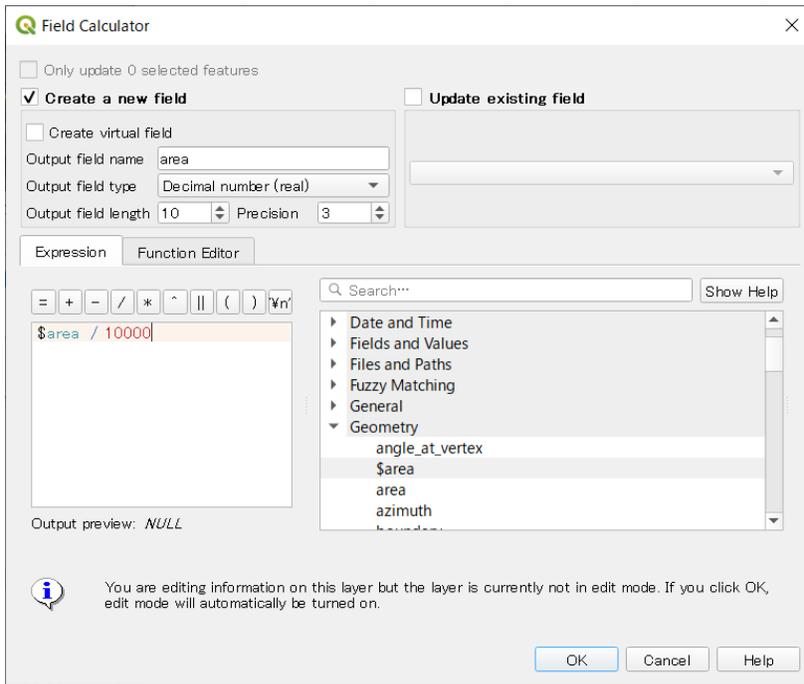


Converted polygon form Paht.

## 2. Calculate area

Open attribute table of **Polygon** above > click on  then type like below > OK

- Check: Create a new field
- Output field name: area
- Output field type: real
- Expression:  $\$area / 10000$  it calculates in ha



Polygons :: Features Total: 1, Filtered: 1, Selected: 0

time	model	filename	ltime	desc	link	area
19/08/12 22:...	garmin Oregon ...		2019/08/13 07:...			2.202

Stop editing 

# GPS Garmin62s

Garmin62s is used in the tutorial

## Objective

To know how to use Garmin GPS

## 5. GPS current status and change settings

### 1. Battery, GPS condition and Date and Time

Push the power button. Then you can see the current status.

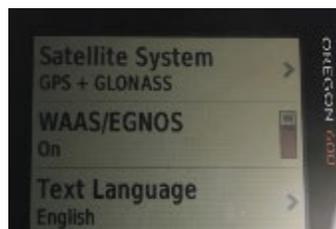
When you use your mobile phone to take photos with coordinates. Please check the date and time are the same.



Garmin GPS Time on a mobile phone.

### 2. Satellite position correction

Push **MENU(change to the screen to see Setup)** > Select **Setup** > **Enter** > **System** > **Enter** > Select **WAAS/EGNOS** (Just in case) > Quit button >



If your GPS has Satellite System, please use **GPS+GLONASS** etc. This settings is to select the satellites to receive.

### 3. Check the status of the received satellite

Push **MENU(change to the screen to see Setup)** > Select **Satellite** > **Quit**

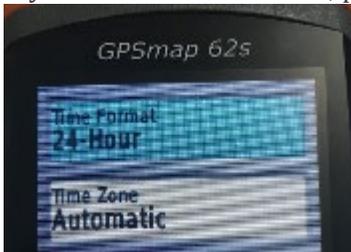
Check GPS accuracy: The picture shows 15m.

Check number of satellites: The picture shows 7.

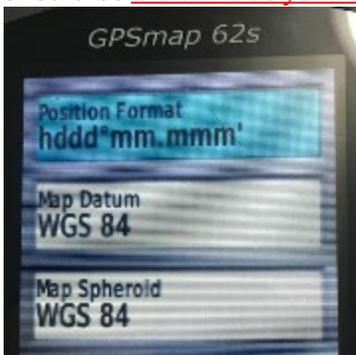


4. **Change the formats**

**Time and Time zone:** 24hours > Push **MENU**(change to the screen to see Setup) > Select **Setup** > Enter > **Time** > Enter > Select 24-Hours > Quit  
If your clock is not correct, please change Time Zone.



**Positional Format** > Push **MENU**(change to the screen to see Setup) > Select **Setup** > Enter > **Position Format** > Enter > Map Datum, Map Spheroid should be WGS84 > Position Format should be the same as your basemap(hands-out) > Quit



5. **Change the unit**

**Unit** > Push **MENU**(change to the screen to see Setup) > Select **Setup** > Enter > **Unit** > Change the unit which you want to use > Quit



## 6. Clean up the GPS data on your GPS

Please backup before you delete the GPS data.

### 3. Delete tracks

Push MENU(change to the screen to see Setup) > Select **Track Manager** > Enter > Current Track > Save Track(It will be stored in Archive) and **Clear Current Track** > Enter > Yes > Enter > Quit



### 4. Delete waypoints

Push MENU(change to the screen to see Setup) > Select **Waypoint Manager** > Enter > Menu > **Delete All** > Enter > Quit. Or Push MENU(change to the screen to see Setup) > Select **Waypoint Manager** > Enter > select a waypoint > Enter > Menu > **Delete** > Yes > Enter > Quit



## 7. Data Collection

### Track

#### 1. Track Settings

Push MENU(change to the screen to see Setup) > Select **Setup** > Enter > Track > Enter > **Change the Record method (Auto is OK)** > Quit button



Auto(time and distance)



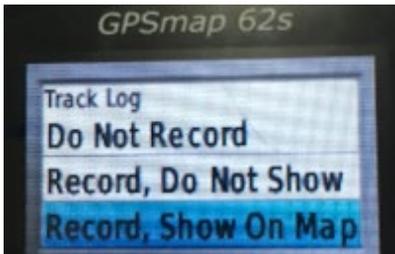
Time(e.g. 10sec)



Distance(e.g. 0.1km)

2. **Record On OFF**

please select Record, Show on Map. Then Tracklog will be recorded automatically when you turn on.



3. Go to Field.

**Waypoint**

3. **Normal waypoint**

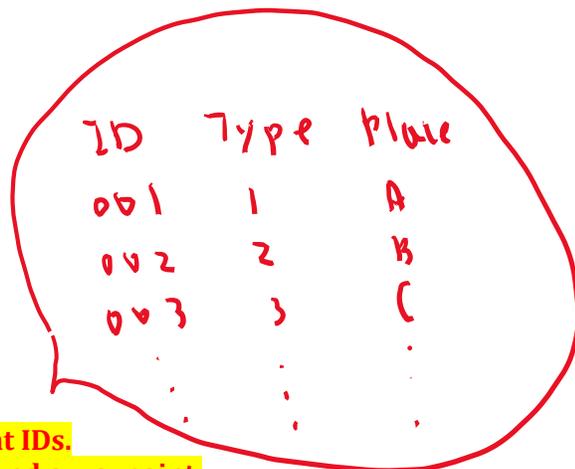
**Please check the accuracy of GPS from Satellite menu(See 2.3).**

Push MARK > **Done** (Then Recorded) , **Map** then the waypoint becomes the goal of navigation.



4. **Averaging waypoint (for reliable poin**

Push MENU(change to the screen to see Setup) > **Waypoint Averaging** > Enter > Create Waypoint > then averaged location will be calculated > Save > Done



**Please make a memo according to point IDs.**  
**Please take photos of your mobile around a waypoint.**

## 8. Upload points, lines(polygon)

1. Software

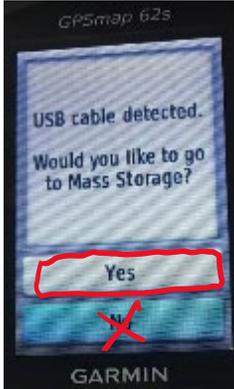
DNRGPS(<https://www.dnr.state.mn.us/mis/gis/DNRGPS/DNRGPS.html>).

Open DNRGPS from SI\_training\TR4\_Field\_data\_collection\GarminGPS\dnrgps\dnrgps.exe

 dnrgps.exe

2. Connect Garmin GPS to your PC

When you plug Garmin GPS to your PC, the message is shown. Please select **Yes**.

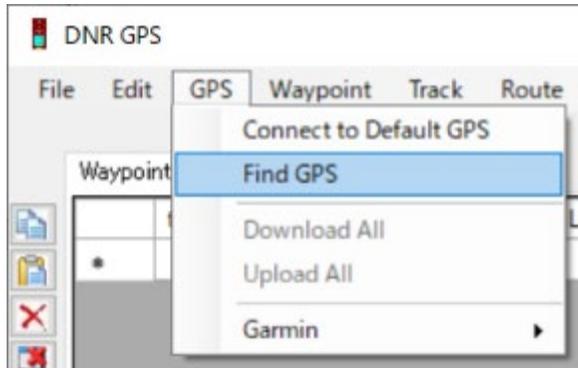


3. Find GPS on DNR GPS

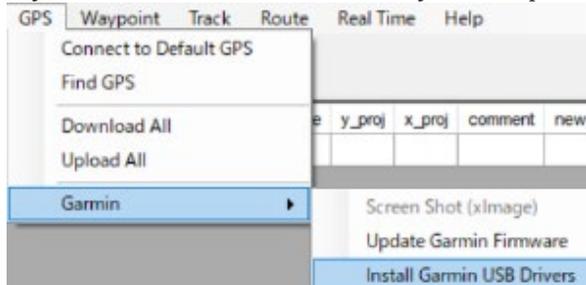
GPS > Find GPS > When you connect to your GPS

> You can see **garmin - GPSMAP 62s Software Version 5.70** (your Garmin) and

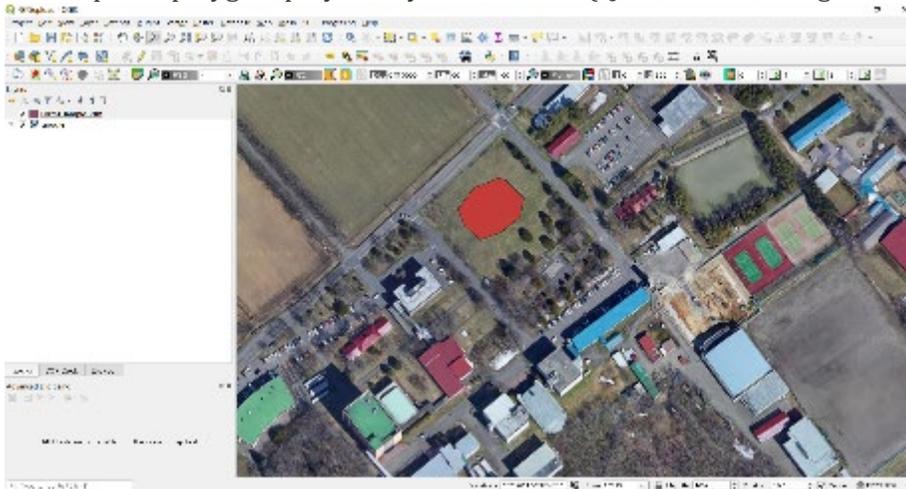
 **Projection: No Projection** then Garmin GPS is connected.



If you can not connect Garmin to your PC, please install the Garmin USB Drivers.

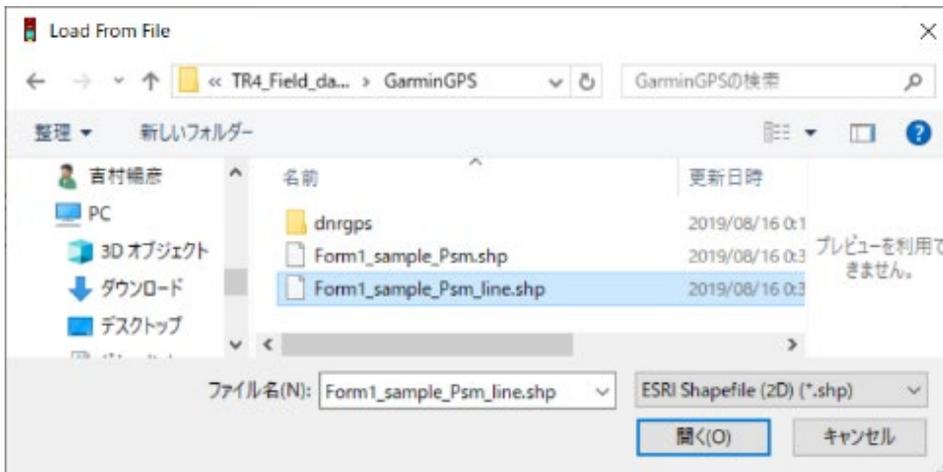
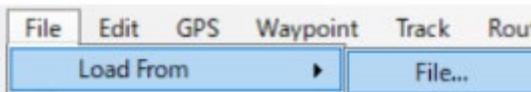


4. Upload point, polygon, polyline  
Create point, polygon, polyline by GIS software(QGIS, ArcGIS, Google earth)

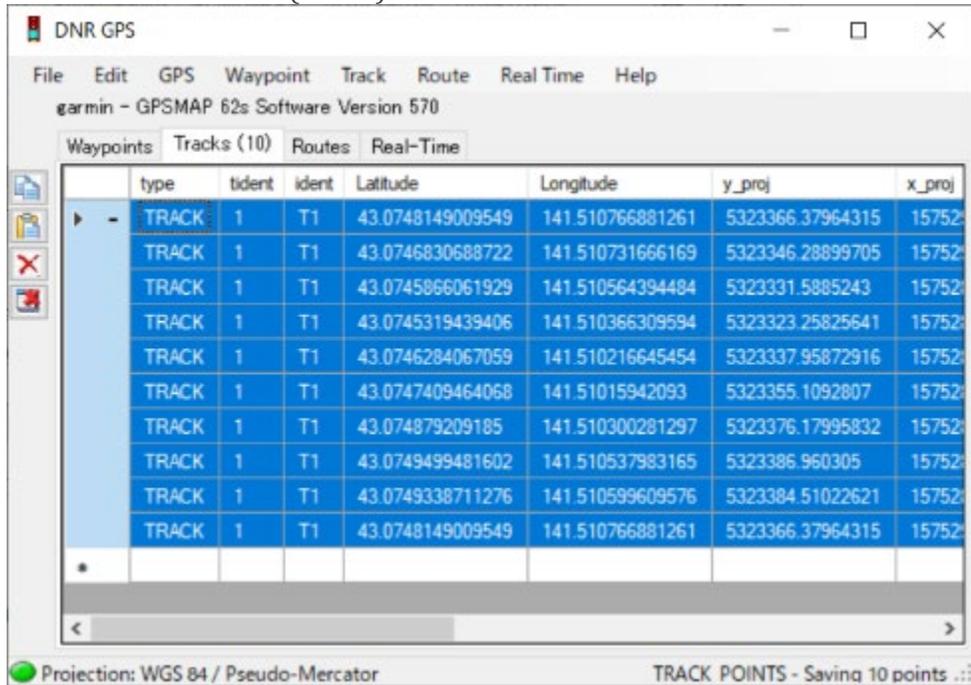


5. Close GIS software
6. Load the polyline shape file to DNR GPS  
File > Load From > File > Select a shape file> Click OK

 DNR GPS



The line will be loaded(below)



- Upload the line as a track  
Track > Select all rows > Upload > Name Your tracks e.g. Form1 > OK



- Check the track on Garmin GPS  
Unplug Garmin GPS from your PC.

ON Garmin GPS

Push **MENU**(change to the screen to see Setup) > Select **Track Manager** > Enter > You can see Saved Track (In the tutorial, 1) > **Select uploaded track** > **View on Map**.

**If the uploaded track is OK > Quit > Show on Map > You can see it on Map.**



New track is shown(e.g.1) can see the track on Map.

View Map

Check it

Show on Map then you

**When you upload points, please use waypoint on DNR GPS.**

## 9. At the end of field Survey

1. Collect waypoints and track.
2. When you finished the survey, please save your track to archive  
Push MENU(change to the screen to see Setup) > Select Track Manager > Enter > Select Current Track > Enter > Save Track > Name it > Done > You can choose YES or NO to clear the track on the temporal space(Current Track)

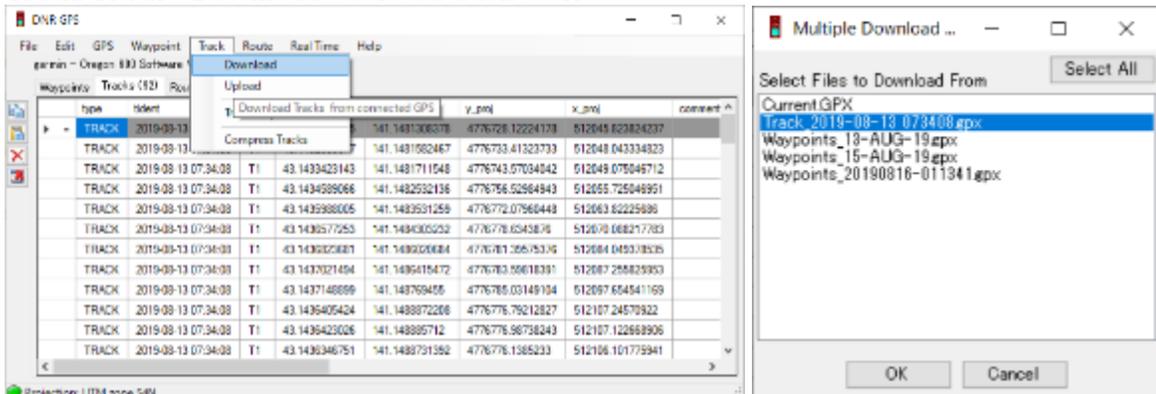
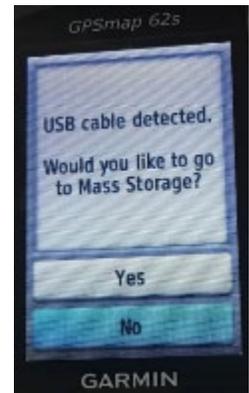


GPS data in Garmin > Track Manager > Save into Archive

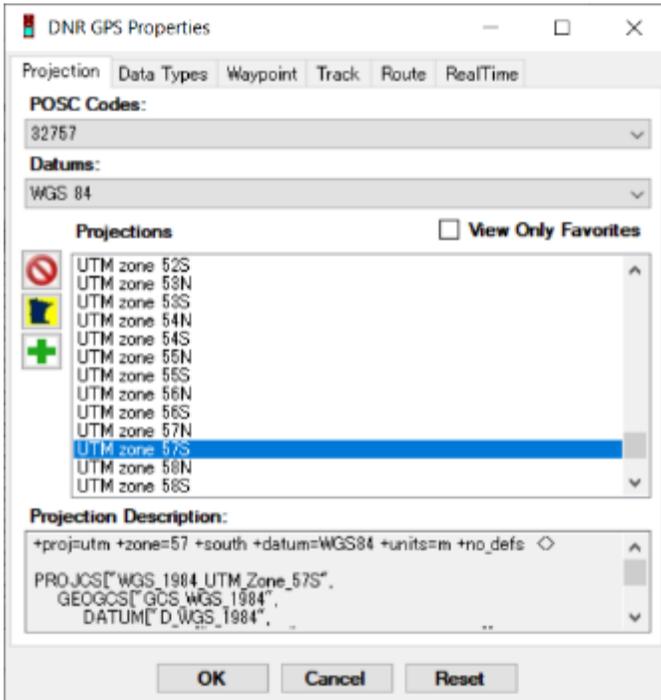
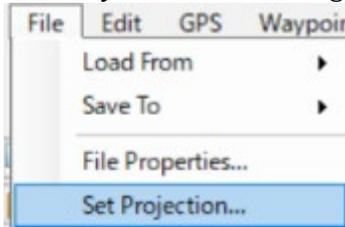
3. Not necessary to save waypoints.

## 10. Download recorded GPS data

1. Software  
[DNRGPS\(https://www.dnr.state.mn.us/mis/gis/DNRGPS/DNRGPS.html\)](https://www.dnr.state.mn.us/mis/gis/DNRGPS/DNRGPS.html)  
Open DNRGPS  
 dnrgps.exe
2. Connect Garmin GPS to your PC  
When you plug Garmin GPS to your PC, the message is shown. Please select **Yes**.
3. Open DNR GPS  
Track: Track > Download > Select a track > OK

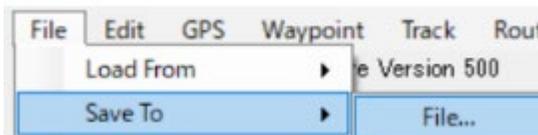


- Change CRS  
Choose your UTM zone! E.g. UTM zone 57S



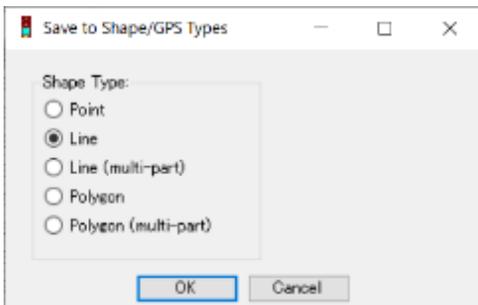
- Save your GPS data

DNR GPS

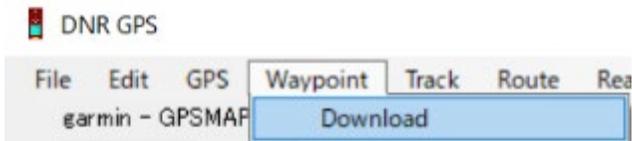


> Name it then select file type. E.g. Form2\_sample\_line\_u54w.shp

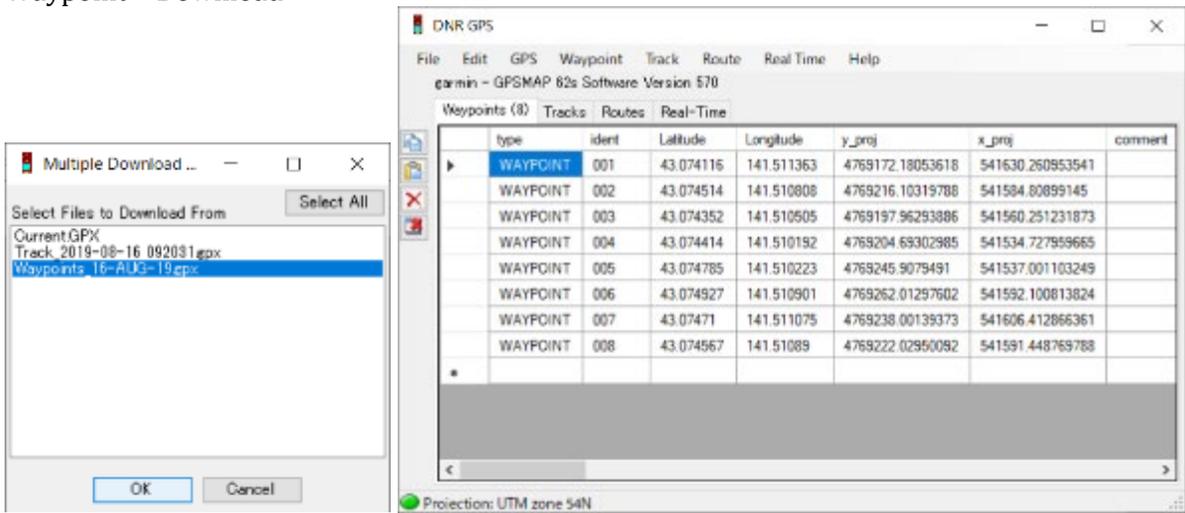
Select shape type.



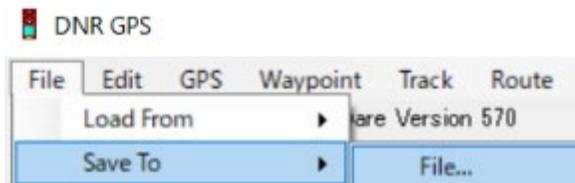
**Waypoint is the same way to download. Change Track to Waypoint**



Waypoint > Download

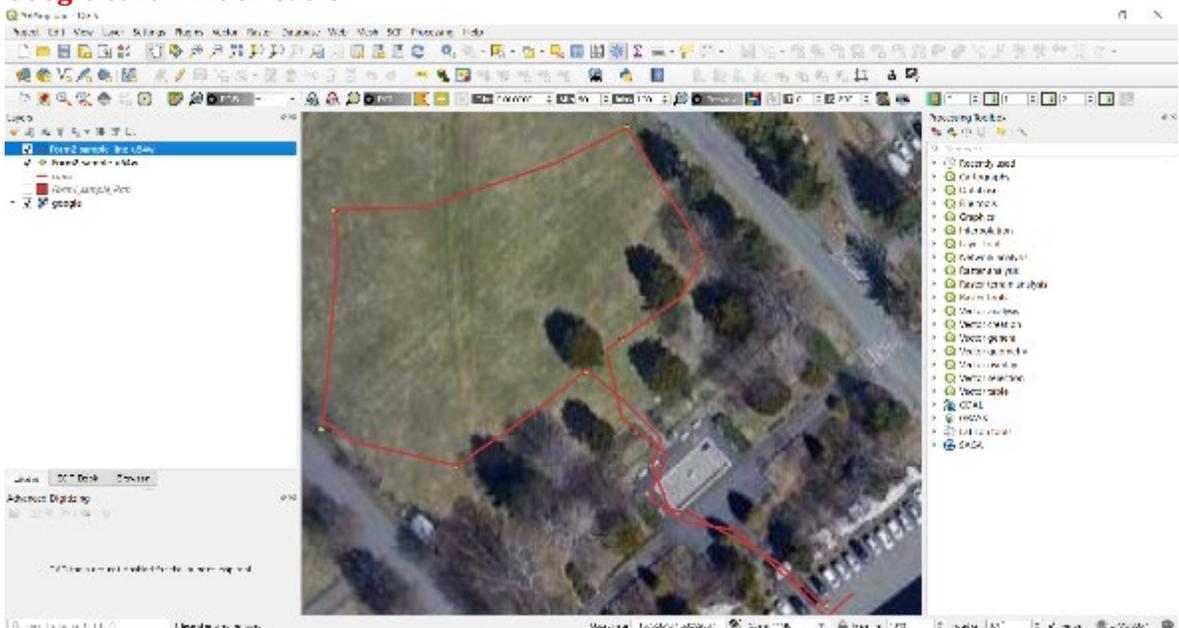


Select Waypoint of the survey date > OK > you will see the list



File > Save to > File... > Name it > Click OK.

**Open in QGIS and check result. If you exported the result as kml, it can be opened by Google earth! Much easier !!**



# Upload field data to Geonode

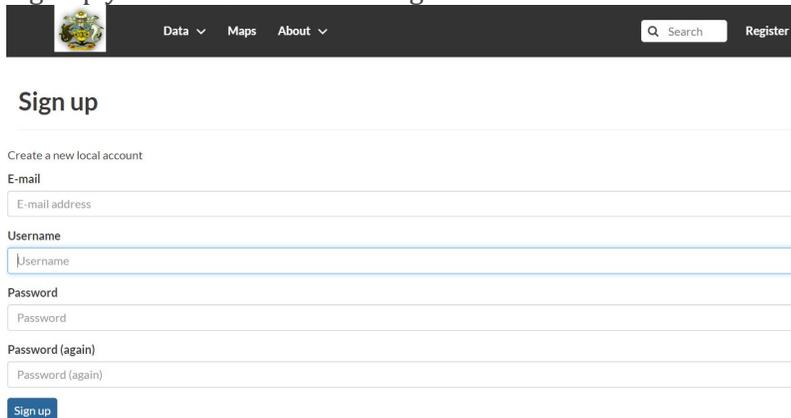
## Objective

To know how to upload field data to GeoNode

## 11. Preparation

### REGISTRATION

Sign up your user account and sign in



The screenshot shows the top navigation bar of the Geonode website with a search bar and a 'Register' button. Below it is the 'Sign up' form. The form includes fields for 'E-mail address', 'Username', 'Password', and 'Password (again)', each with a small icon indicating the required format. A 'Sign up' button is located at the bottom left of the form.

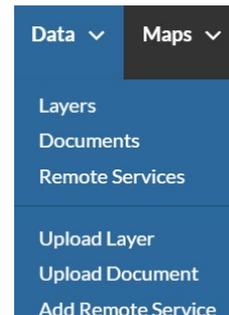
## 12. Brief introduction of Geonode

### • Upload files

You can upload Layers(Shape file, Geo tif etc.) and Documents(Word, Excel, Power points, PDF, GPX, Zip, kml, kmz etc.)

### • Make linkages between

Document and maps can be linked in Geonode.



### Resources using this document

[Forest\\_Code\\_of\\_logging\\_practice.pdf](#)

## 13. Upload Layer

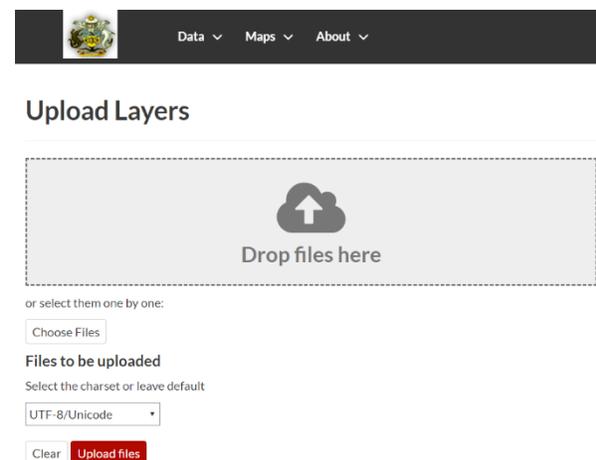
Data > Upload layer > Choose files > Upload files  
>When you upload shape file > please upload  
.dbf, .prj, .shp, .shx.

- [loggingsite\\_polygon.dbf Remove](#)
- [loggingsite\\_polygon.prj Remove](#)
- [loggingsite\\_polygon.shp Remove](#)
- [loggingsite\\_polygon.shx Remove](#)

Select the charset or leave default

UTF-8/Unicode

Clear Upload files



The screenshot shows the 'Upload Layers' interface. It features a 'Drop files here' area with a cloud icon and an arrow. Below this area, there is a 'Choose Files' button and a 'Files to be uploaded' section. The 'Files to be uploaded' section includes a 'Select the charset or leave default' dropdown menu set to 'UTF-8/Unicode' and 'Clear' and 'Upload files' buttons.

Wait a minute then you can see below. Click Edit Metadata.

Your layer was successfully updated

Layer Info

Edit Metadata

Upload Metadata

Upload SLD

Manage Styles

Input Metadata and finish uploading

## Metadata for loggingsite\_polygon

Completeness

✖ Check Schema mandatory fields

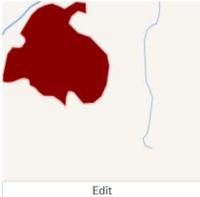
67%

Edit Preview Settings

Mandatory Optional

- 1 Basic Metadata
- 2 Location and Licenses
- 3 Optional Metadata
- 4 Dataset Attributes

Thumbnail



Edit

Title

loggingsite\_polygon

Abstract

No abstract provided

features x loggingsite\_polygon x

Date type

Publication

Date

2020-02-17 11:

Category

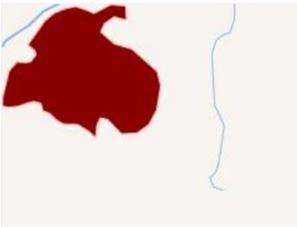
---

Group

---

Data > Layers > you can see the uploaded file.

Data Layers



loggingsite\_polygon

No abstract provided

admin 17 Feb 2020 0 0 0 0 Create a Map

## 4. Upload document

Data > Upload Document > Select Files > Select Link layers or documents > Upload

### Upload Documents

Allowed document types:

.doc .docx .gif .jpg .jpeg .ods .odt .odp .pdf .png .ppt .pptx .rar .sld .tif .tiff .txt .xls .xlsx .xml .zip .gz .qml .kml .kmz .gpx

Title:

Geonode.docx

name by which the cited resource is known

File:

ファイルを選択 Geonode.docx

URL:

The URL of the document if it is external.

Link to:

x loggingsite\_polygon (layer)

Upload

### Permissions

Who can view it?

Anyone

The following users:

Choose users...

The following groups:

Choose groups...

Who can download it?

Who can change metadata?

Who can manage it? (update change permissions publish)

## Input Metadata and finish uploading

### Metadata for Geonode.docx

**Completeness**  
✖ Check Schema mandatory fields  
57%

[Edit](#) [Settings](#)

**Mandatory**

**Mandatory**

**Optional**

**1**  
Basic Metadata

**2**  
Location and Licenses

**3**  
Optional Metadata

**Title**  
Geonode.docx

**Link to**  
loggingsite\_polygon (layer)

**Abstract**  
No abstract provided

**Date type**  
Publication

**Date**  
2020-02-17 11:00

**Category**  
---

**Group**  
---

[Update](#) [Next >>](#)

Soon, the file will be uploaded to Geonode.  
See the related resource(Link)

### Geonode.docx

Download the Geonode.docx document

[Info](#) [Share](#) [Ratings](#) [Comments](#) [Favorite](#)

**Title** Geonode.docx  
**License** Not Specified ⓘ  
**Abstract** No abstract provided  
**Publication Date** Feb. 17, 2020, 11:27 a.m.  
**Regions** Global  
**Owner** admin

[More info](#) -

Metadata Detail

Download Document

Edit Document

Download Metadata

#### Resources using this document

loggingsite\_polygon

## 5. Discussion

What kinds of data do you need to upload?  
What kinds of metadata do you need to input?  
Don't forget linkages.