Android Applications for GNSS

(RtkDroid and SW Maps)

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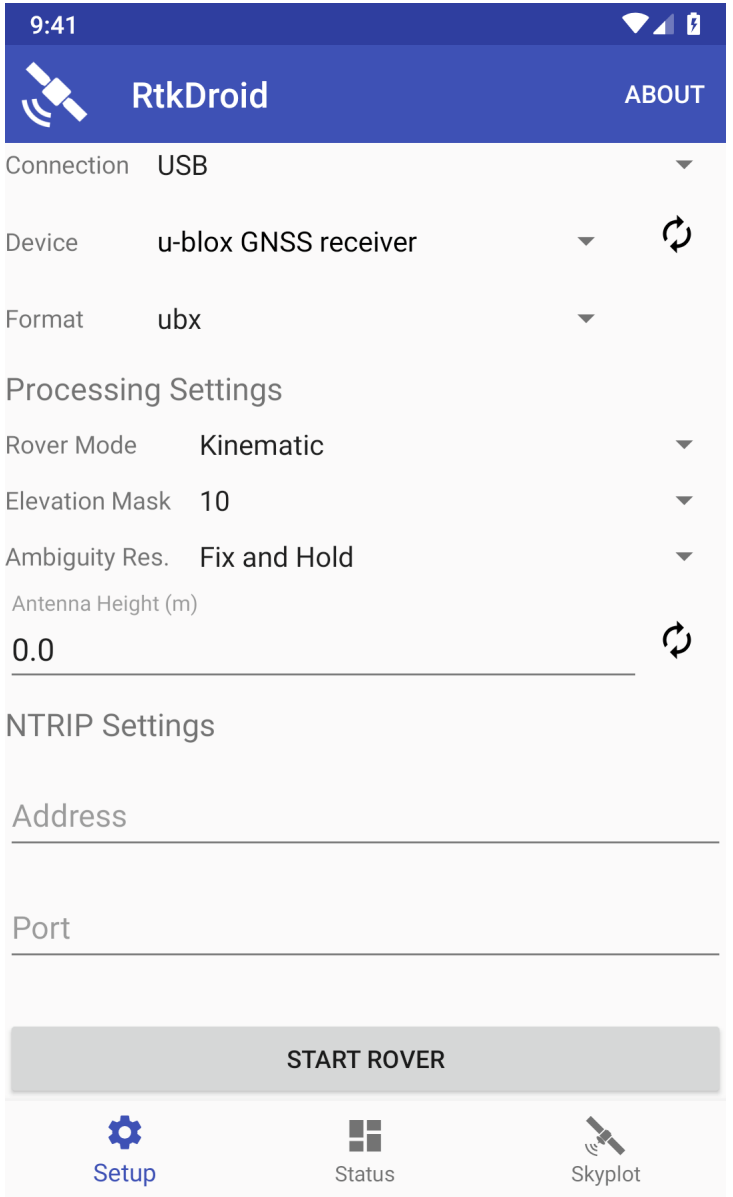
Android Applications for GNSS

1. RtkDroid

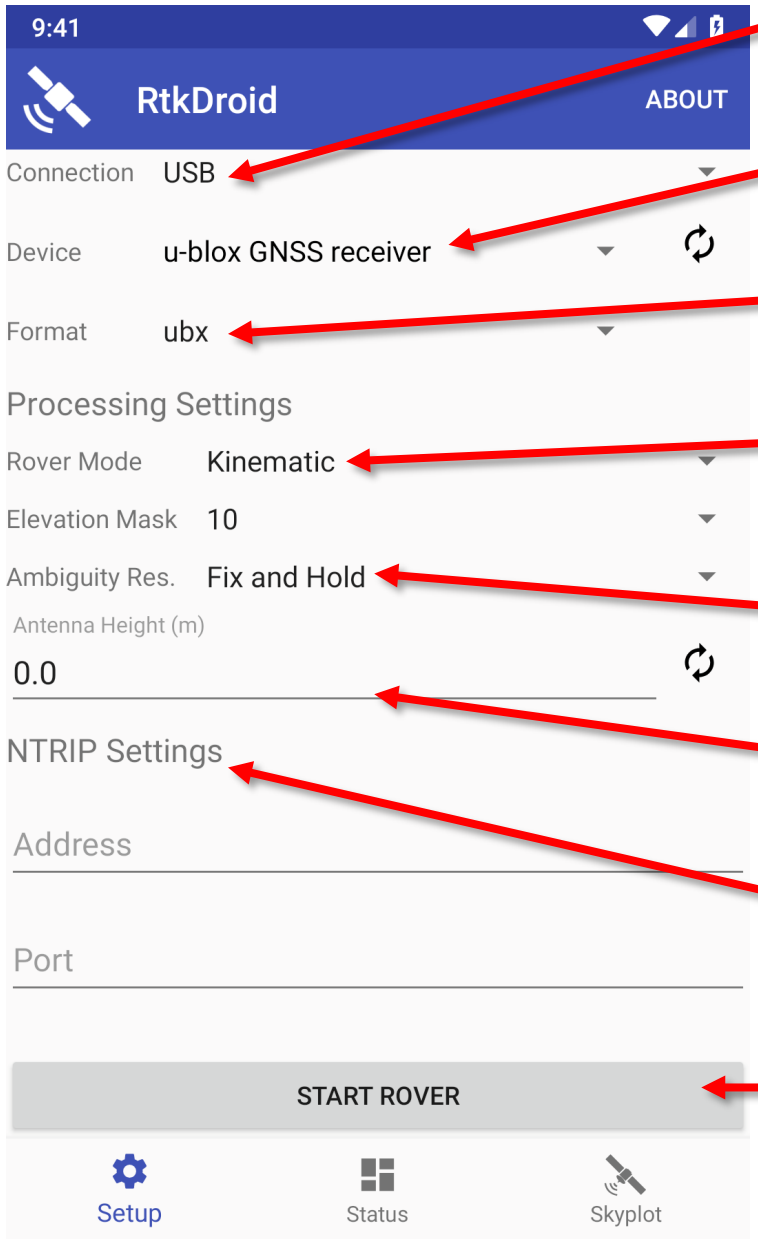
2. SW Maps

RtkDroid

- For RTK positioning using low-cost receivers.
- RtkDroid uses correction data from NTRIP casters (in RTCM3 format)
- Uses RTKLIB 2.4.3b33 for RTK positioning.
- Corrected position output of RtkDroid can be used by SW Maps for data collection
- Sets location of Android device using a mock location provider so all other apps use RTK positioning
- For installation files and more information, contact Dr. Dinesh Manandhar at dinesh@iis.u-tokyo.ac.jp



RtkDroid



1. Select Connection Method
(USB or Bluetooth)

2. Select Receiver

3. Select Format(ubx, sbf or rtcm3)
Use ubx for u-blox

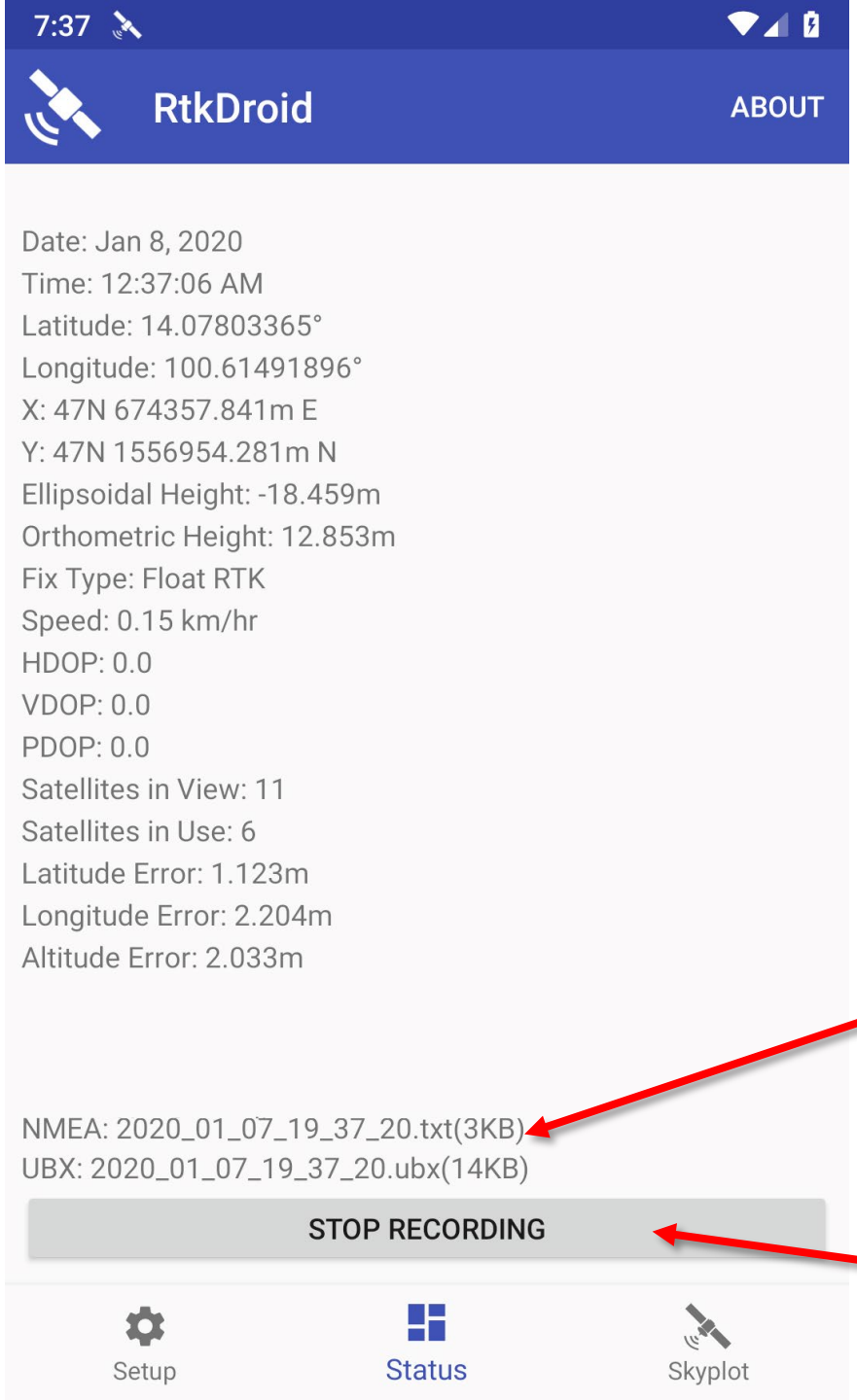
4. Set Rover Mode
(Single, Kinematic or Static)

5. Set Ambiguity Resolution Mode
Continuous, Instantaneous or Fix and Hold

6. Set Antenna Height
(From Ground to Antenna Reference Point)

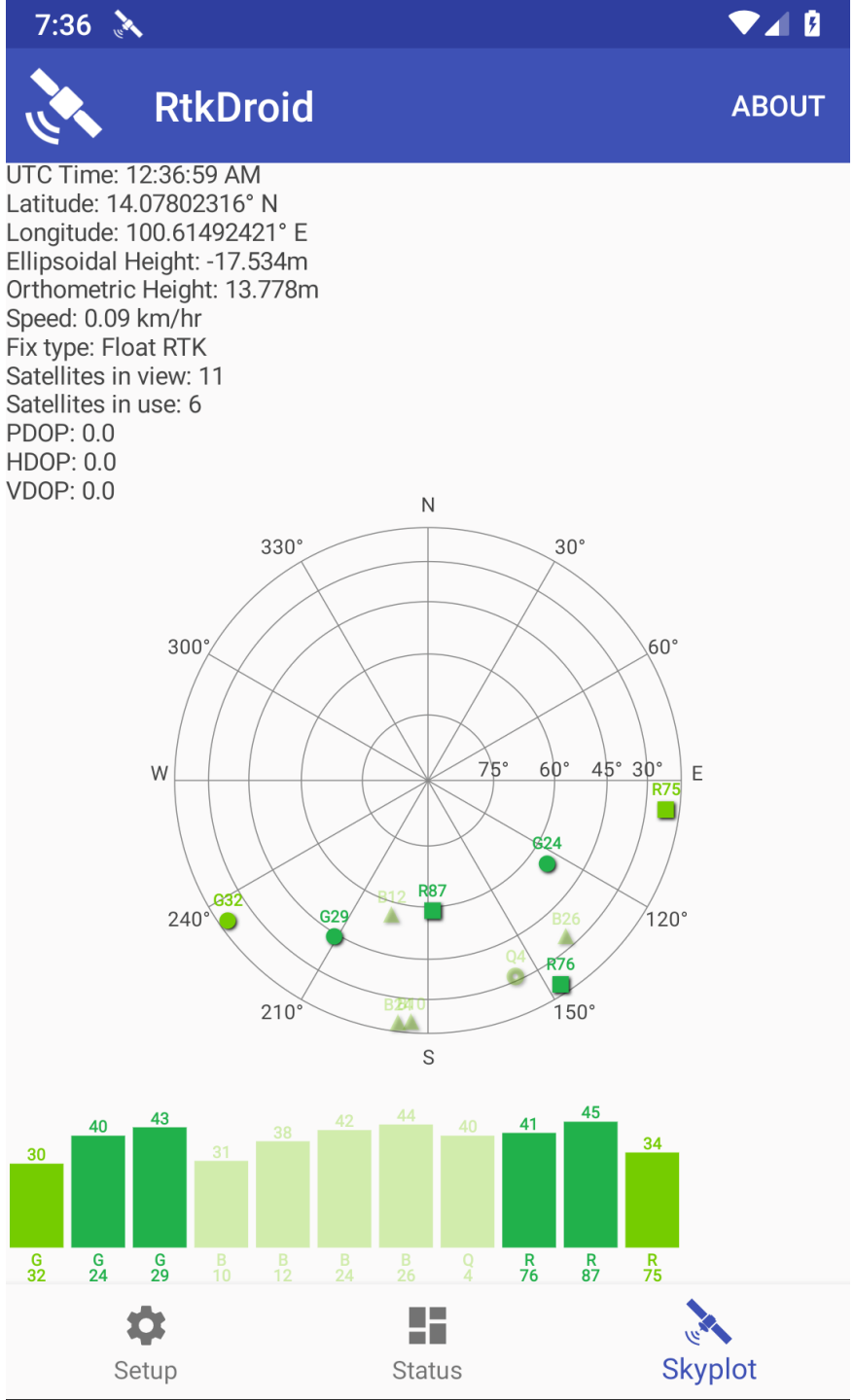
7. Enter NTRIP settings
(For RTK Correction)

8. Start Rover



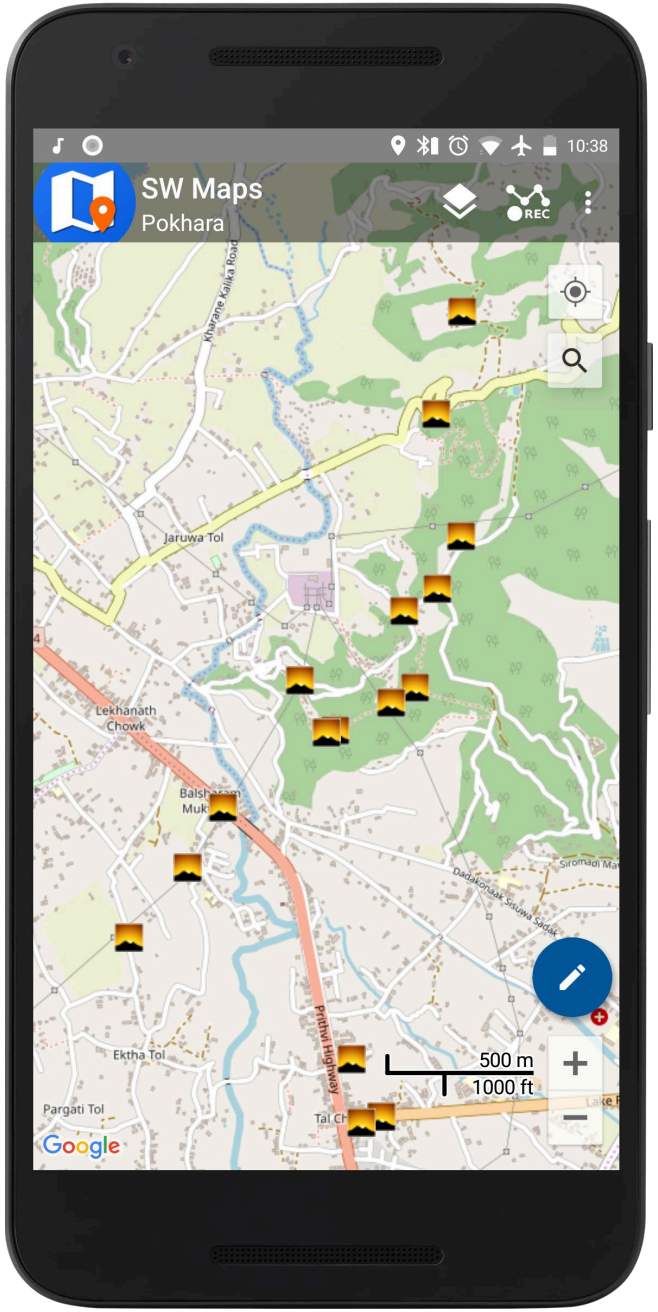
Records solution as NMEA and logs receiver raw data input

Press this button to start/stop recording



SW Maps

- **Free** Android Application for collecting, presenting and sharing geographic information
- Can be used for large scale GNSS surveys to collect detailed attribute information or just to display popular GIS data formats on Android
- Downloaded more than 180,000 times by users all over the world

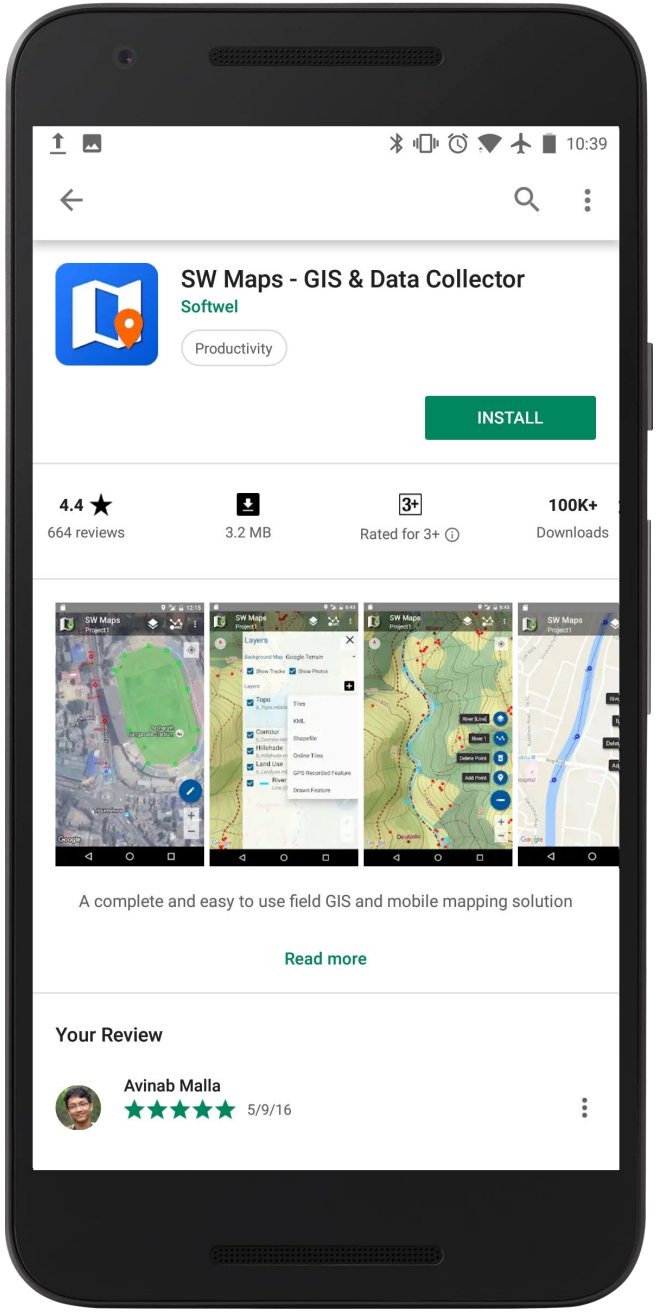


Features

- Collect data using internal and external GNSS receivers (Bluetooth or USB). Connect RTK capable receivers for high accuracy surveying.
- Import and display popular GIS Data formats (GeoPackage, KML, Shapefiles, GeoJSON, MbTiles)
- Google Maps or OpenStreetMap as background; Can also import and cache maps from online sources (WMS, XYZ Tiles)
- Record tracks and photos.
- Export or share collected data directly to KMZ, Shapefiles, GeoPackage, GeoJSON and many other formats.

Installation

- Open Google Play Store
- Search for SW Maps
- Install and open app
- Allow permissions if requested (Android 6.0 and above)



App Navigation

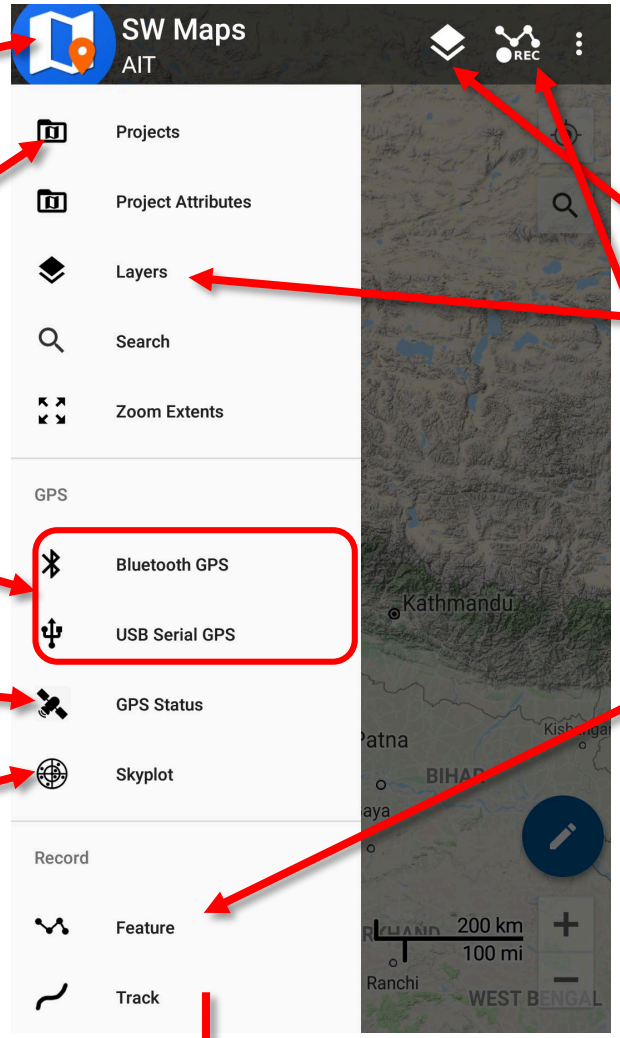
Press to open Drawer
(Or slide from left edge)

Create or Open Projects

Connect External Receivers
(Bluetooth OR USB)

Display GPS/GNSS Data
(Position, Time, DOP…)

Show Satellite Skyplot



Change Background Map
Add Recorded or Drawn Feature Layers
Import External Layers (Mbtiles/KML/SHP..)
Add Layer Attributes

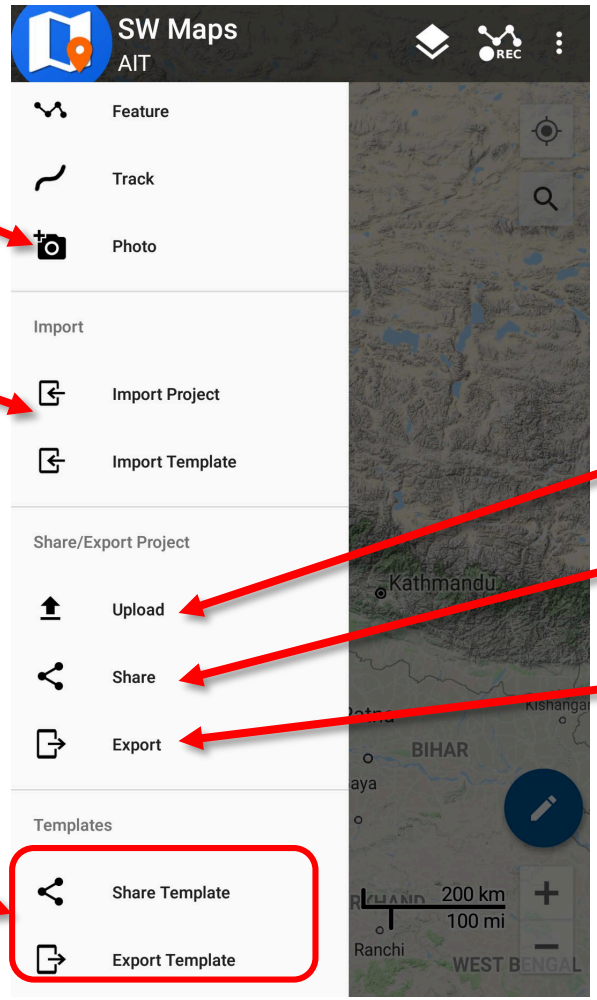
Record Features and Tracks

Scroll Down for More

Take Geotagged Photos

Import Projects and
Templates from Device Storage

Save and share layer definitions
as a template for other projects

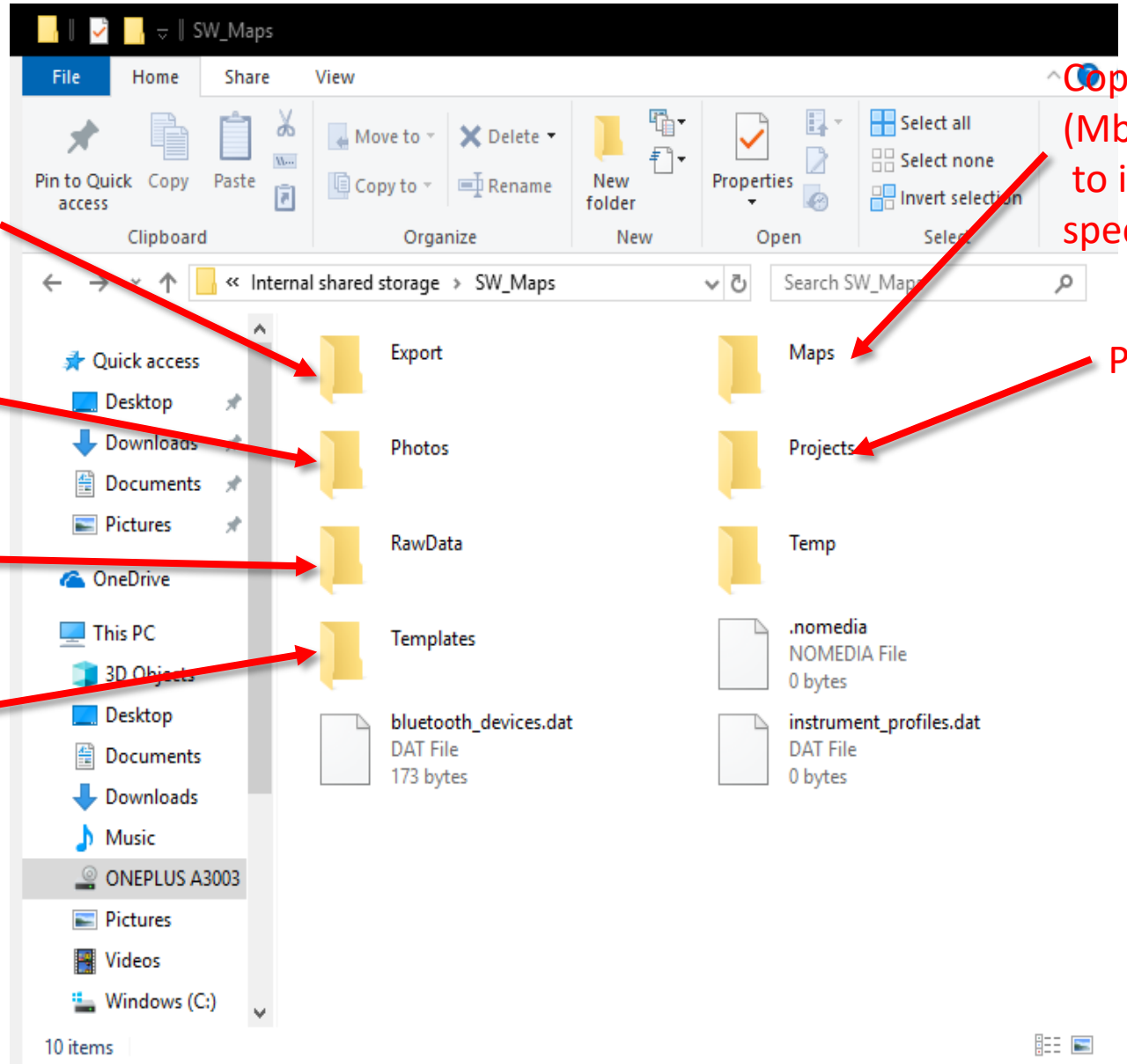


Upload Data to FTP Server

Share data to other users

Export to device storage
As KMZ, SHP, Excel…

SW Maps Folder



All exported files saved here

Photos and Videos taken by SW Maps

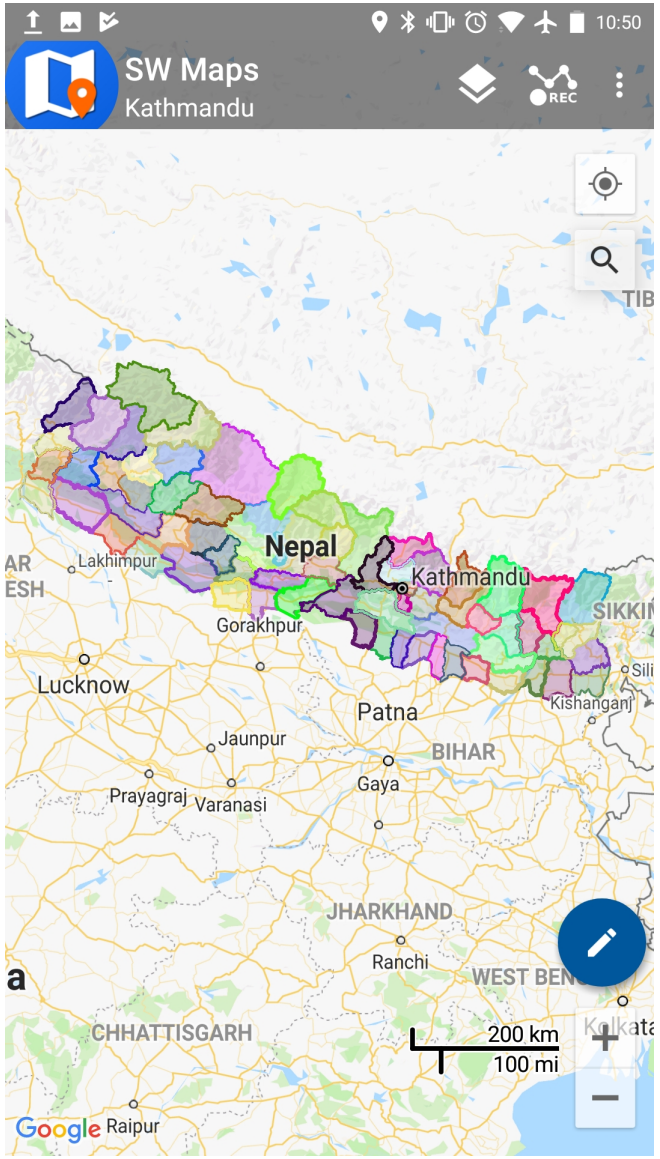
RAW GNSS Data (UBX, SBF..)

Copy project templates here

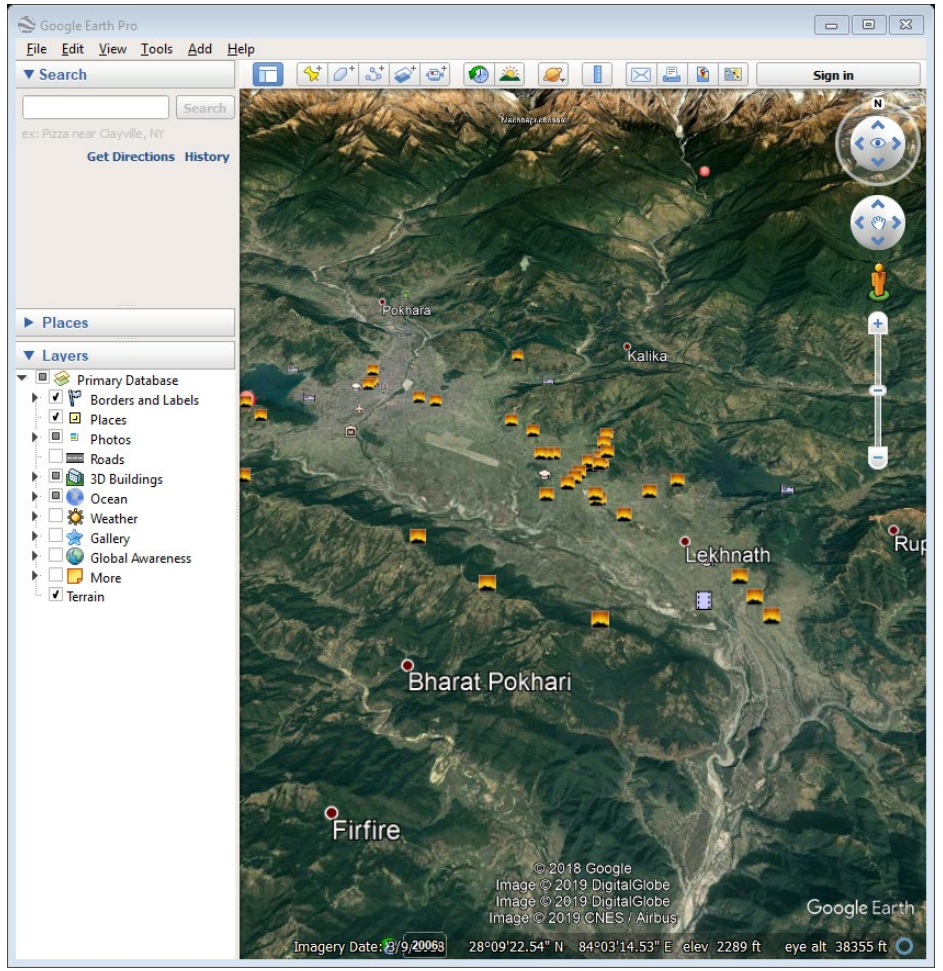
Copy GIS Data files (Mbtiles, KML, SHP, GeoJSON…) to import here, inside format specific sub-folders

Project files saved here

Drone Imagery Mbtiles



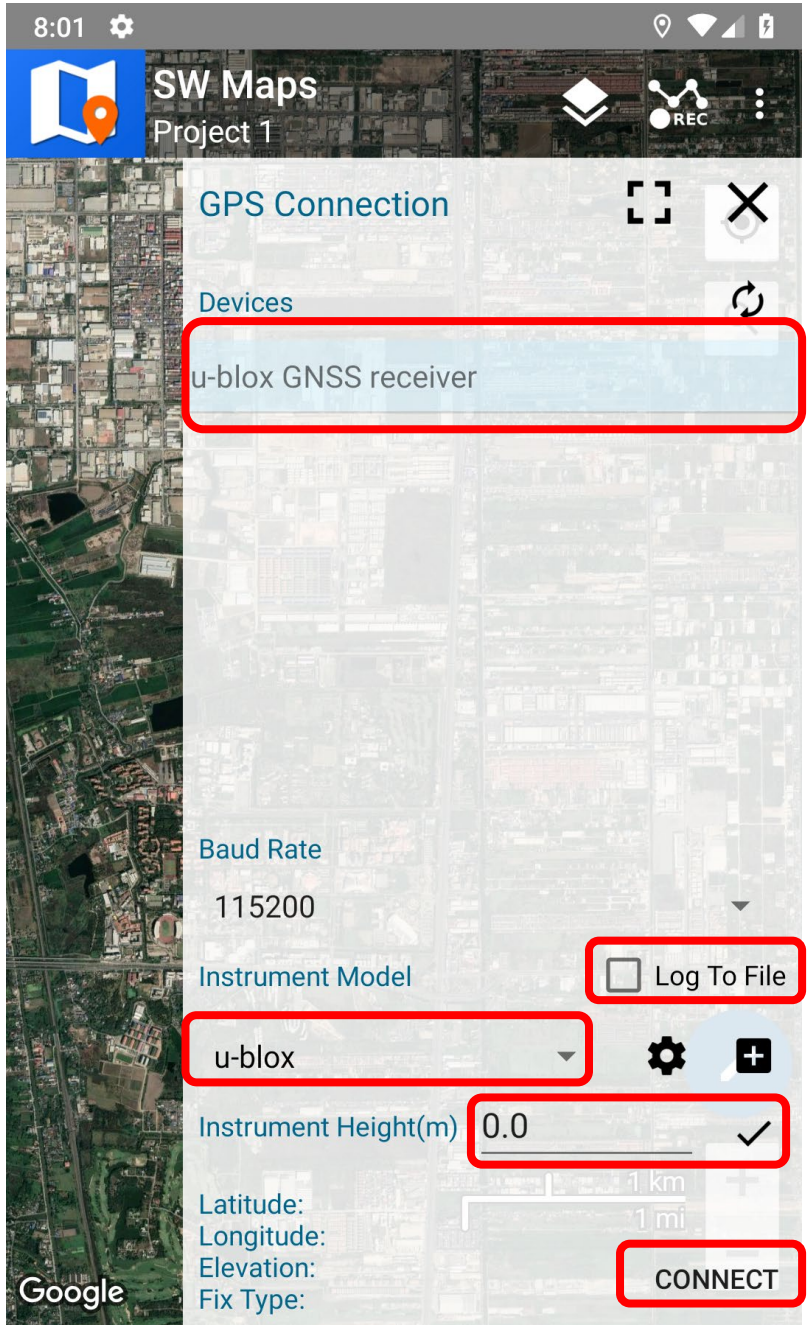
Shapefile Categorized Styling



Exported KMZ in Google Earth

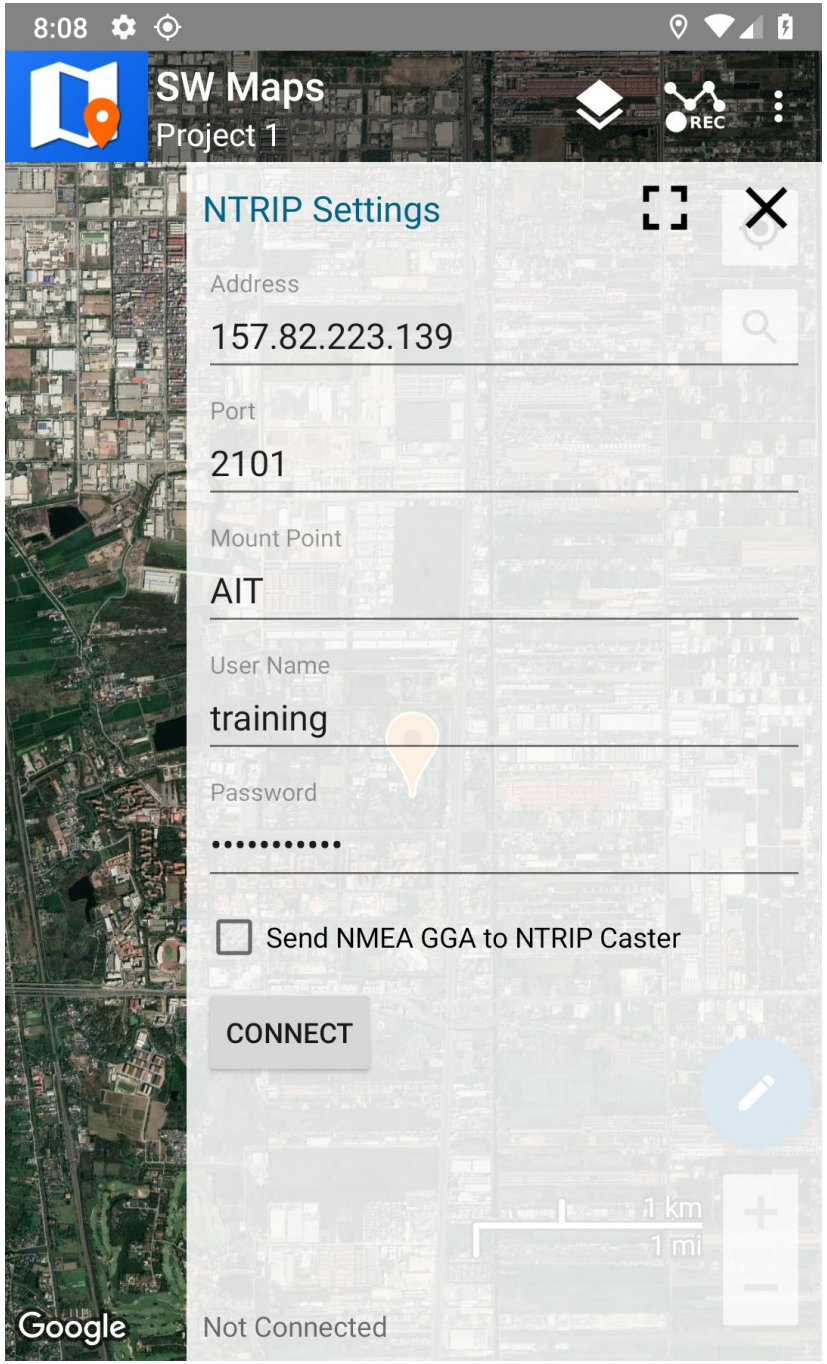
Connecting u-blox External Receiver (SPP)

- Connect u-blox receiver to phone USB port using OTG cable (You may also need to enable OTG Storage in some devices)
- From Navigation drawer, select USB Serial GPS. List of connected devices will appear.
- Select u-blox GNSS receiver
- Set Instrument Model to u-blox
- Check Log to File
- Set Instrument Height
- Press Connect



Connecting u-blox External Receiver (RTK)

- RTK is supported with the u-blox M8P and F9P
- Set Instrument Model to **u-blox RTK** and **Connect**
- Open **NTRIP Connection** from the navigation drawer
- Enter NTRIP caster information and press **Connect.**



Connecting Other GNSS Receivers

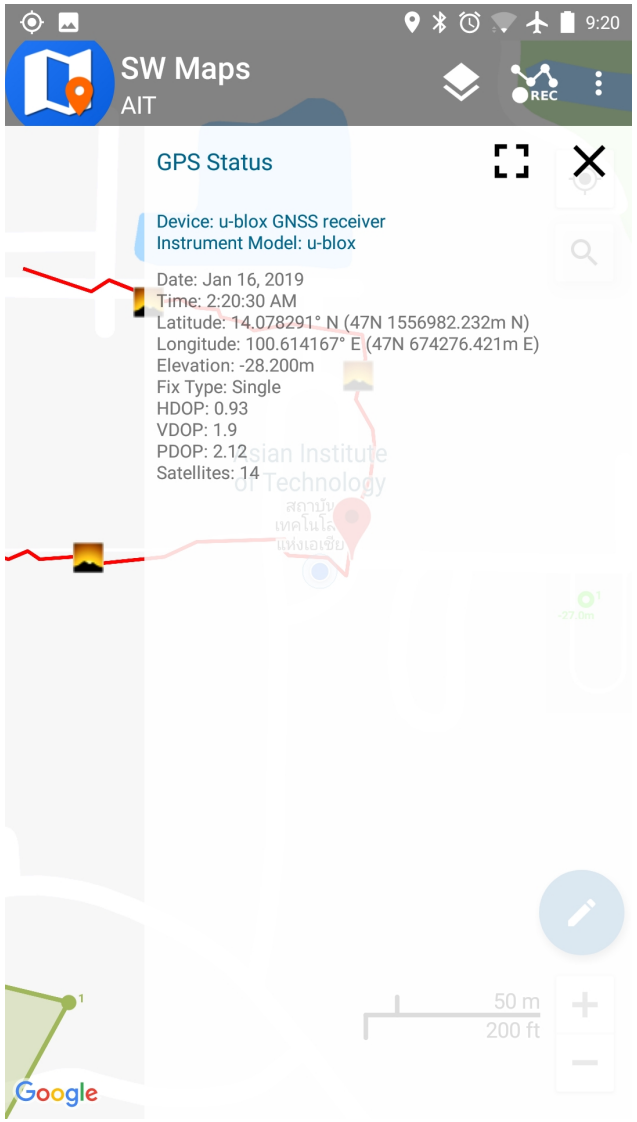
- Instrument profiles are provided for many receivers
- Profiles can be created for your receiver if you know the setup commands.
- Alternatively, setup your receiver to output NMEA to serial port or Bluetooth, and use **Generic NMEA** profile when connecting.

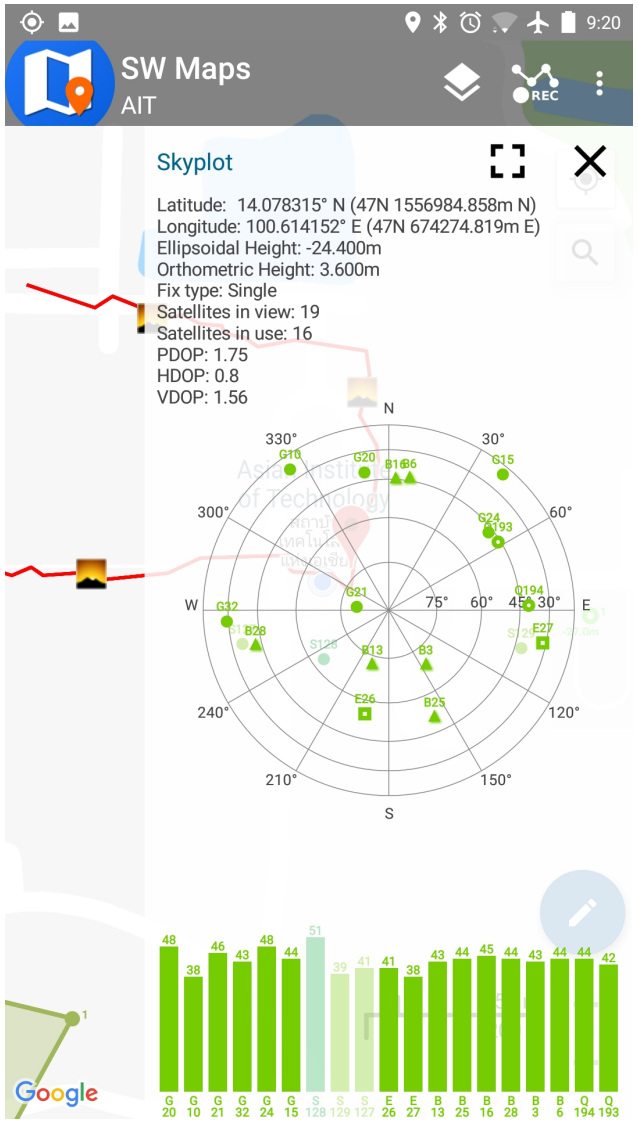
Using RtkDroid with SW Maps

- SW Maps (v2.4.1 and later) automatically uses RtkDroid position output when RtkDroid is running.

- No configuration necessary

GNSS Data and Skyplot





- Raw GNSS data files are saved in SW_Maps/RawFiles Folder

RTK in Android: Summary

For Data Collection with SW Maps:

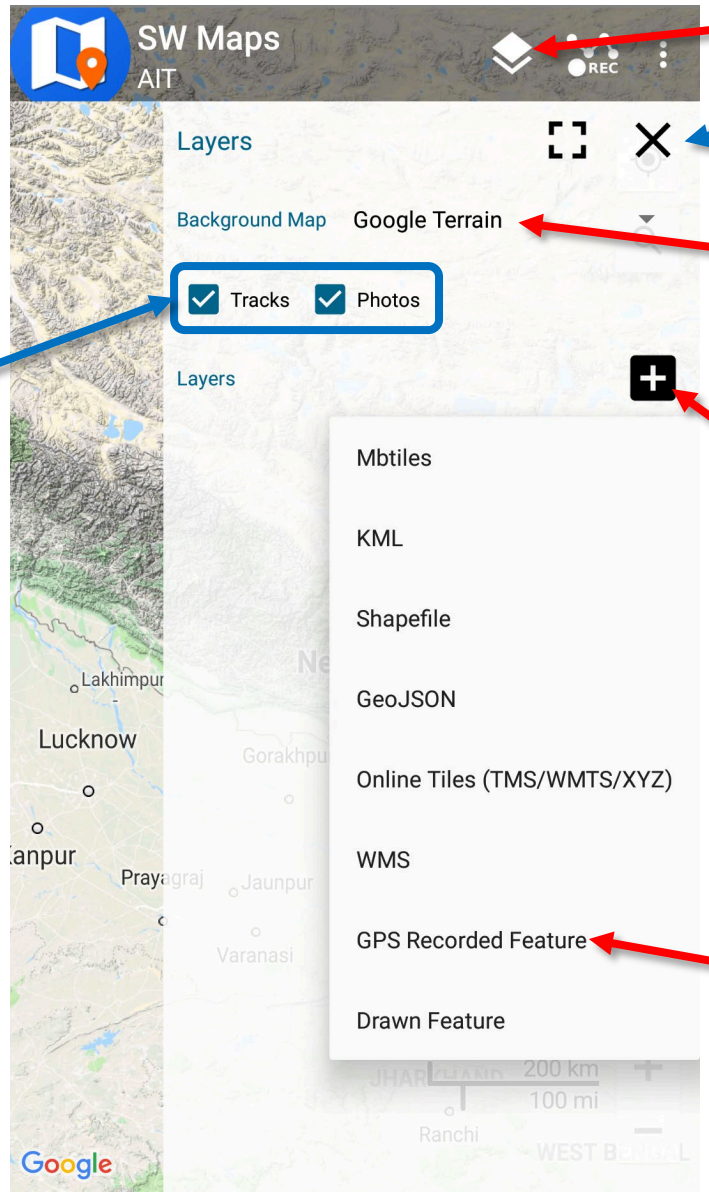
- u-blox M8T: Use RtkDroid for RTK, connects automatically with SW Maps

- u-blox M8P, F9P: Connect from SW Maps with **u-blox RTK** profile, then set NTRIP Settings in SW Maps

- Other receivers: Use one of the built-in instrument profiles, or setup receiver to output NMEA and use the **Generic NMEA** profile.

For Data Collection with Other Apps, set up RtkDroid as a Mock Location Provider in Android Developer Options

Layers



1. Press to open Layer sidebar

Maximize/Close Sidebar

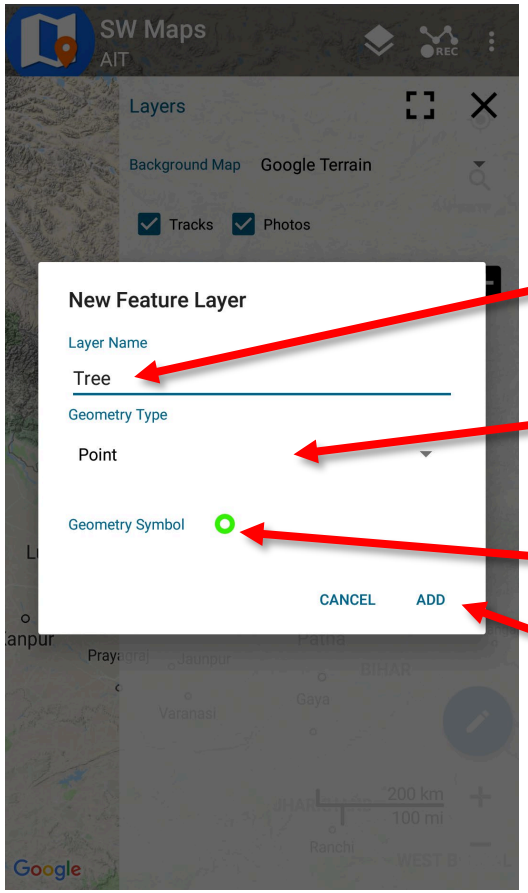
2. Change Background Layer

Toggle Track and Photo Point Layers

3. Press + to add layer

4. Select Layer Type
(We will add a GPS Recorded Feature layer for recording features using GNSS)

Add GPS/GNSS Recorded Feature Layer



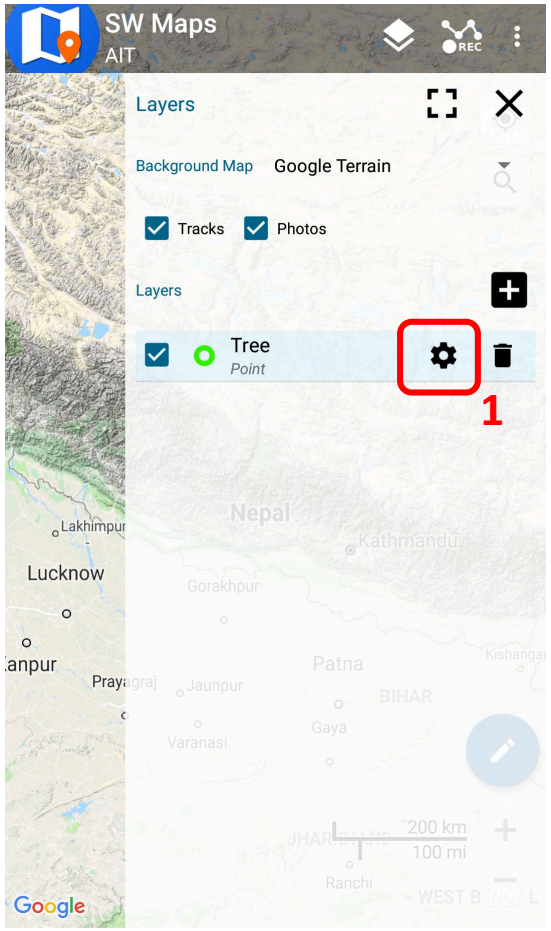
Enter Layer Name

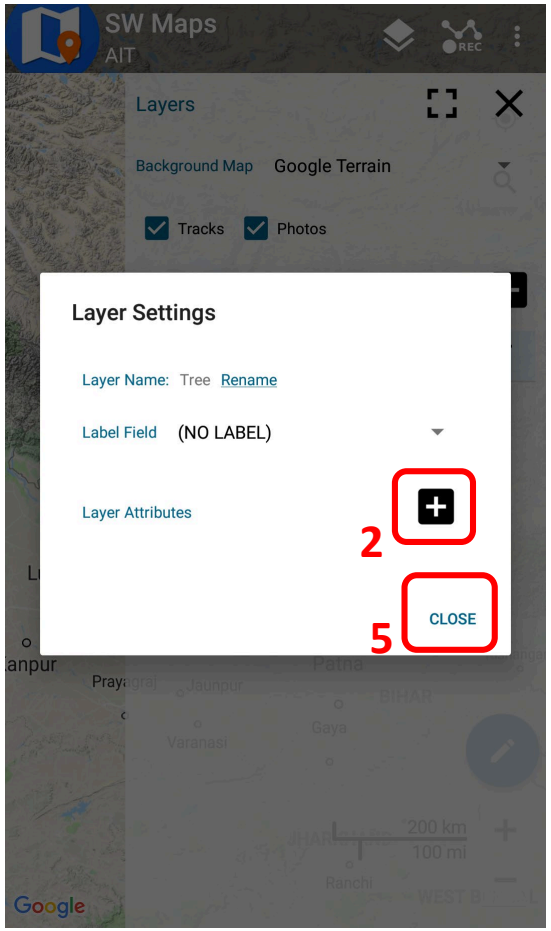
Geometry Type
(Point, Polyline or Polygon)

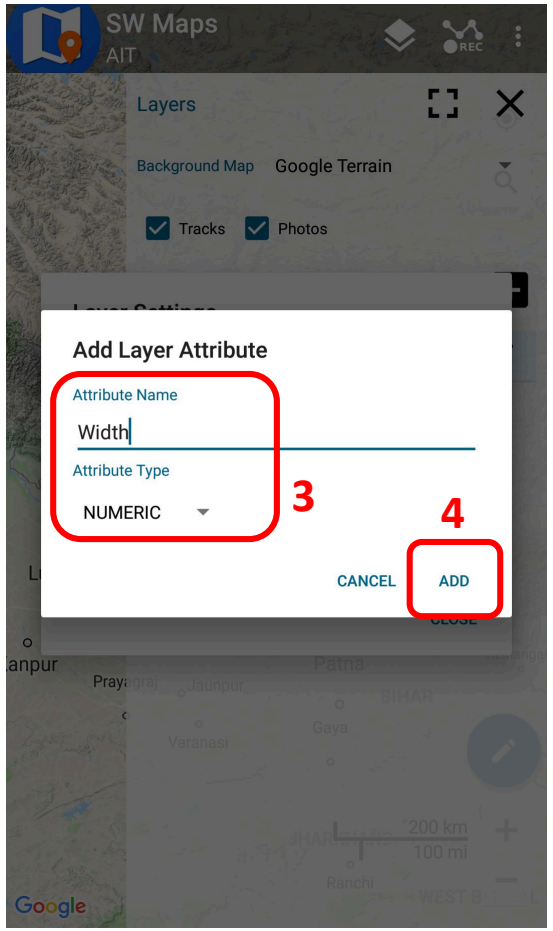
Change Map Symbol

Then Add Layer

Feature Attributes

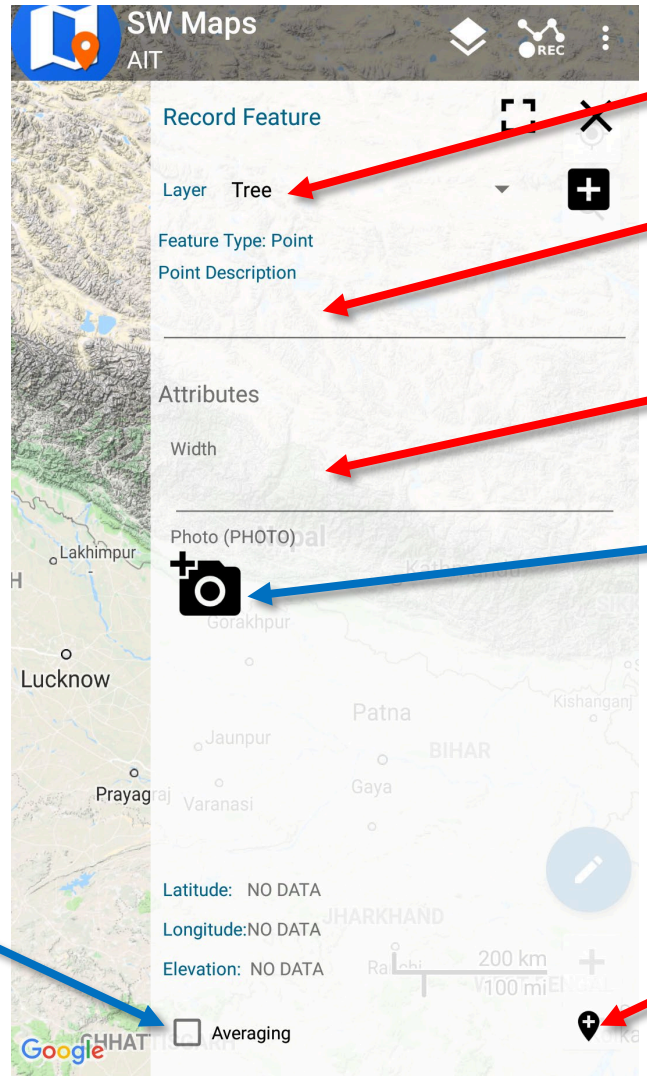






Also try adding a Photo Attribute

Record Feature



Select Layer

Type in feature remarks (if required)

Enter Attribute Data

(Photos can only be taken after recording the feature)

Enable/Disable Location Averaging

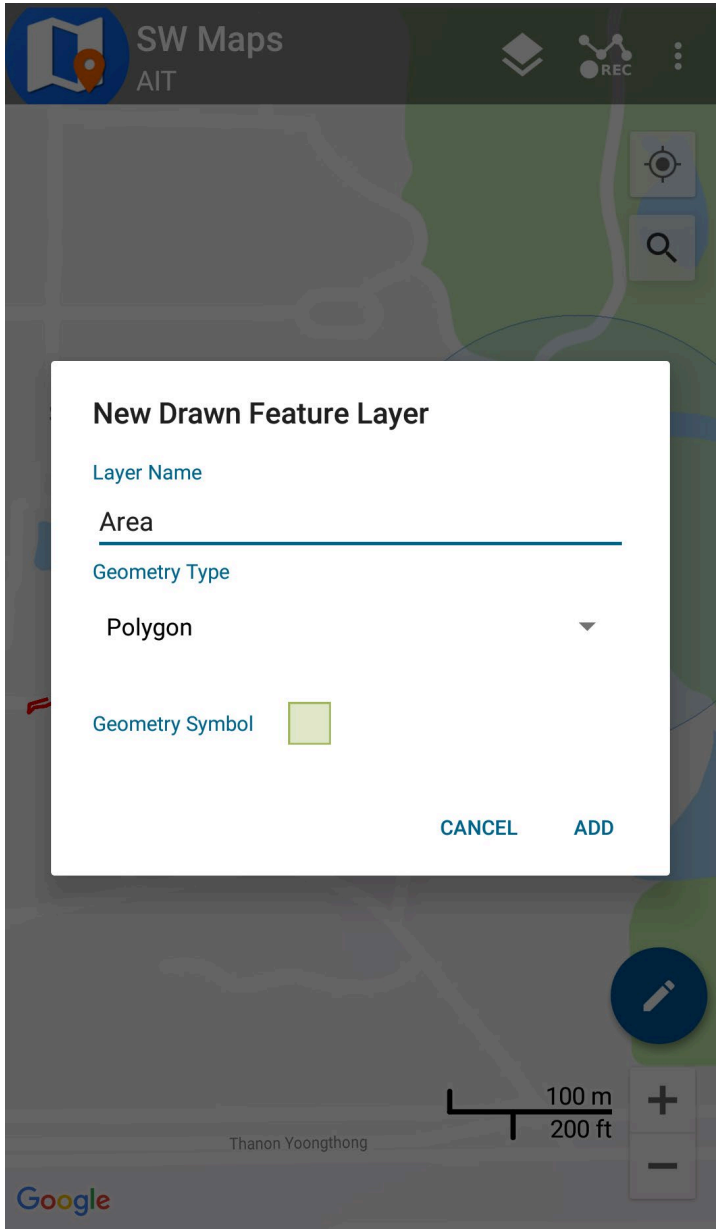
Record Point

Drawing Features

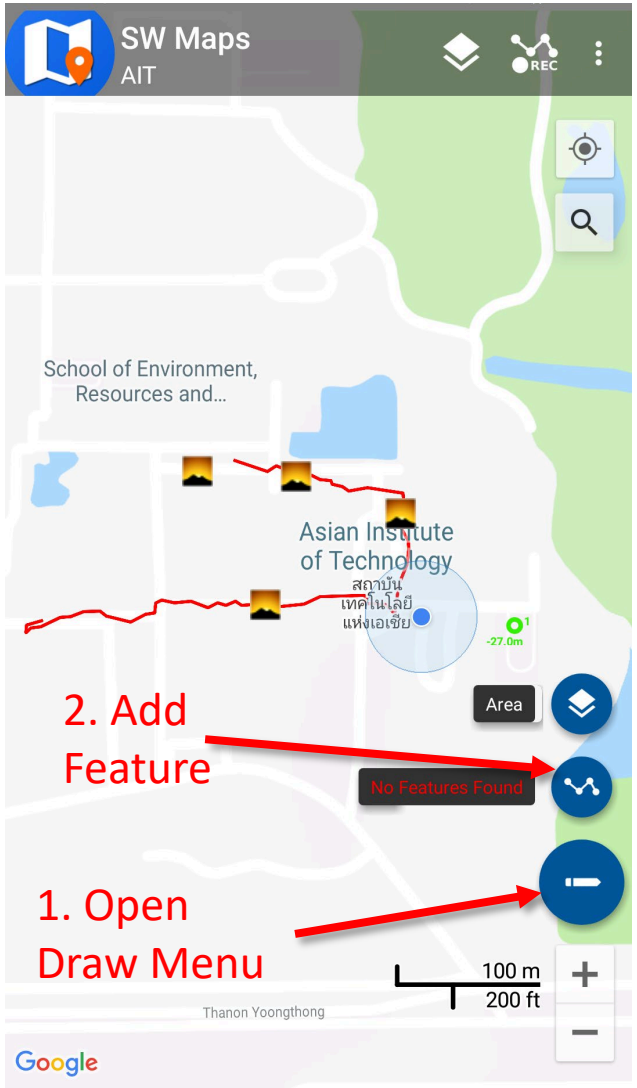
1. Add a Drawn Feature Layer

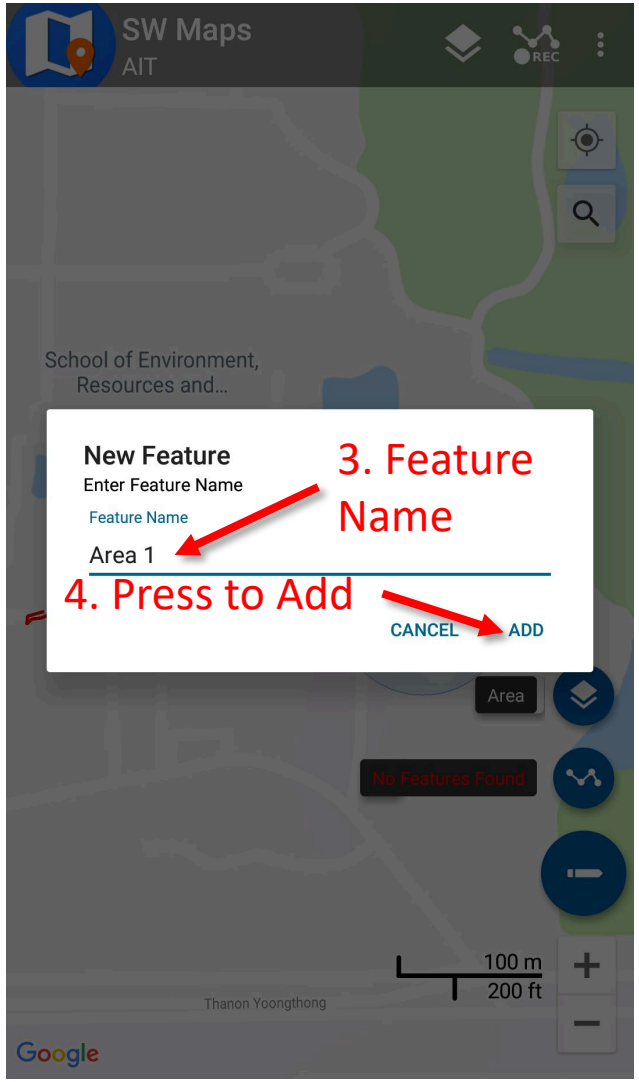
Name: Area

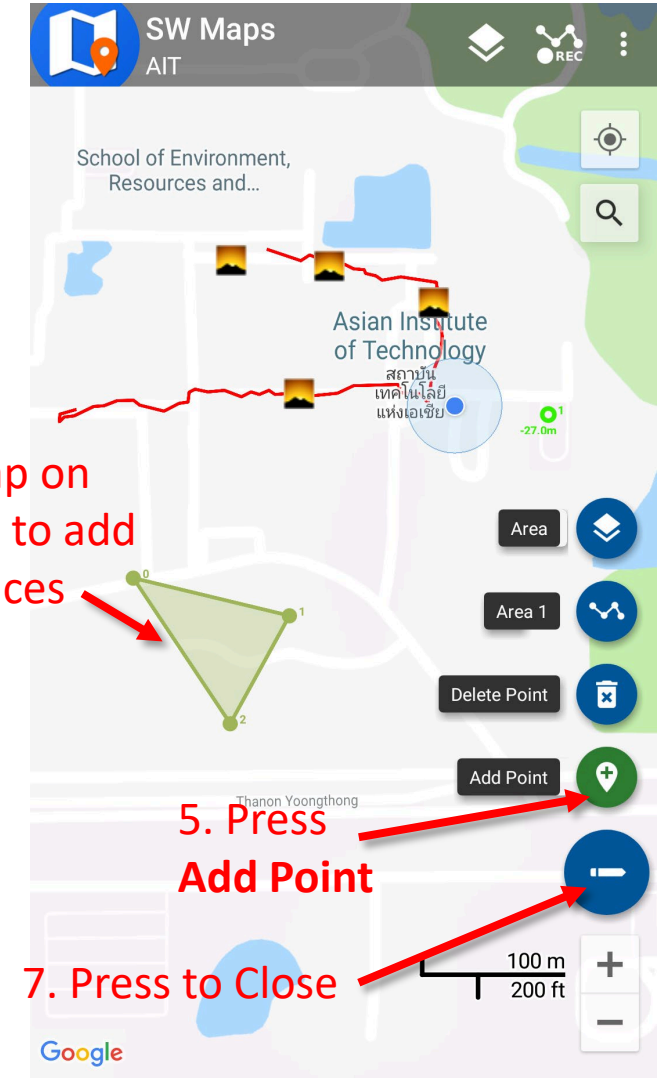
Type: Polygon



Drawing Features

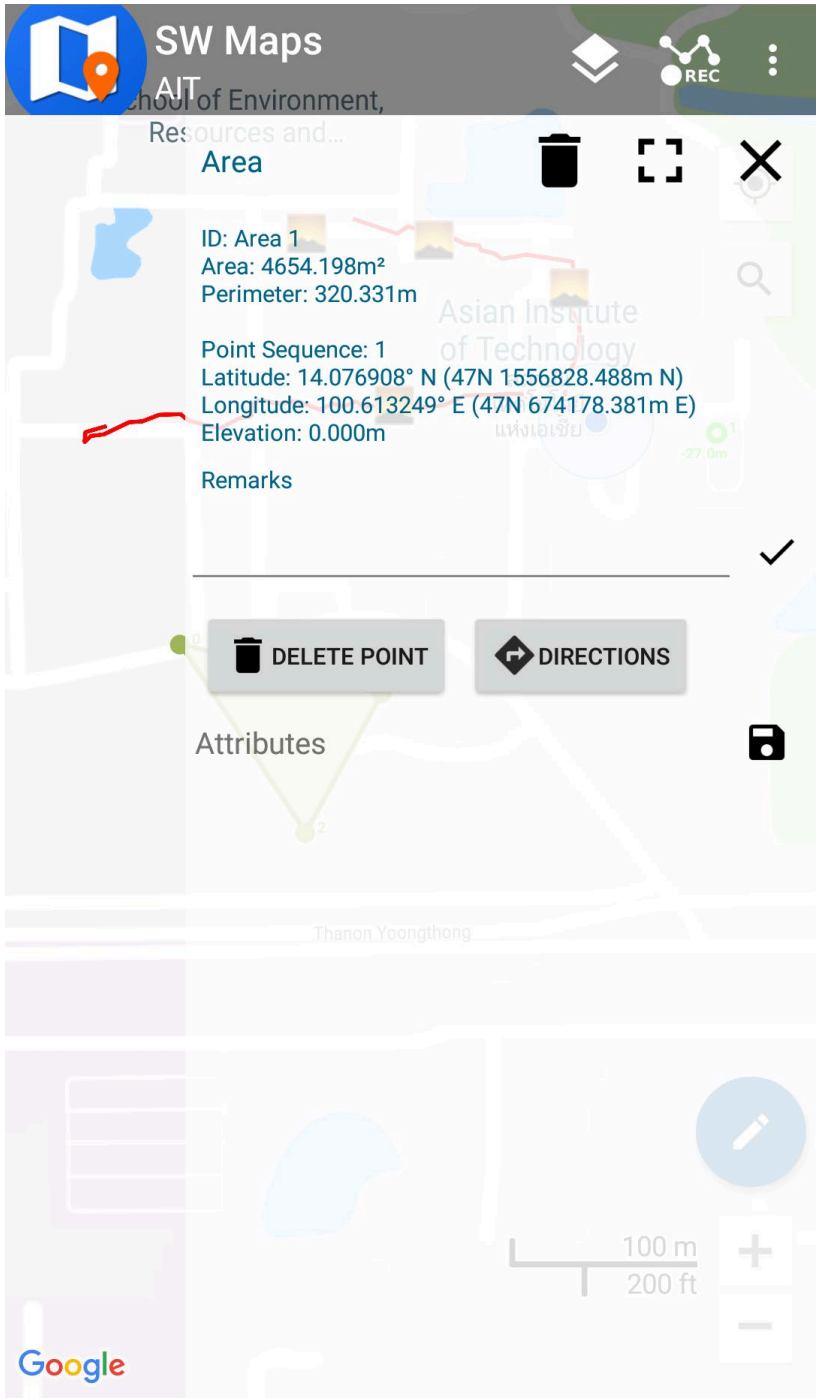




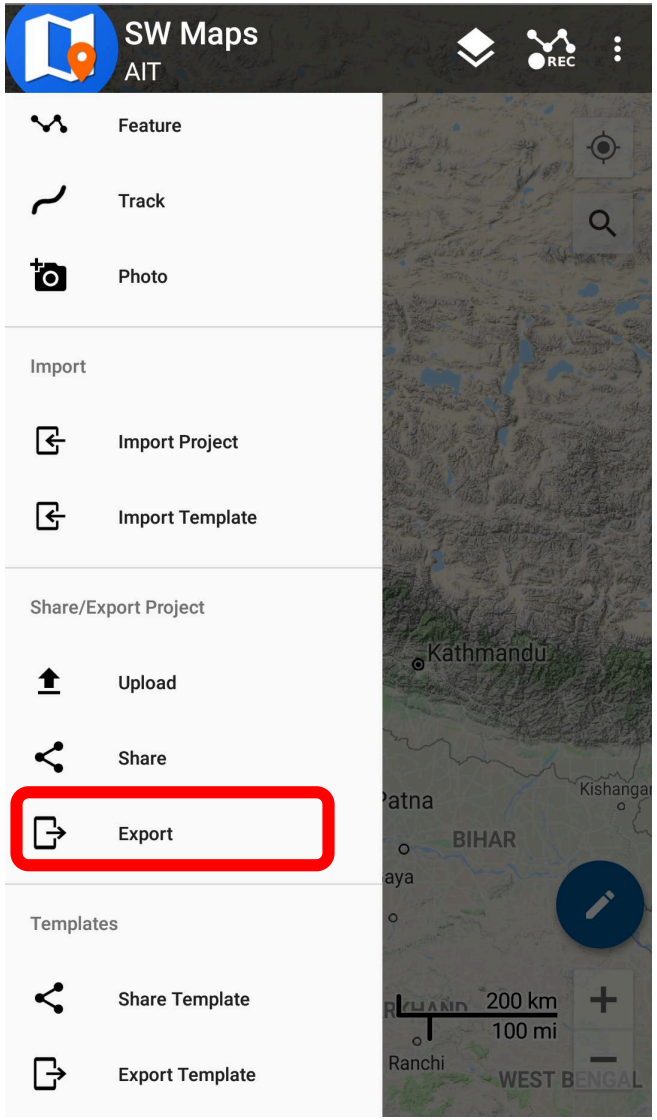


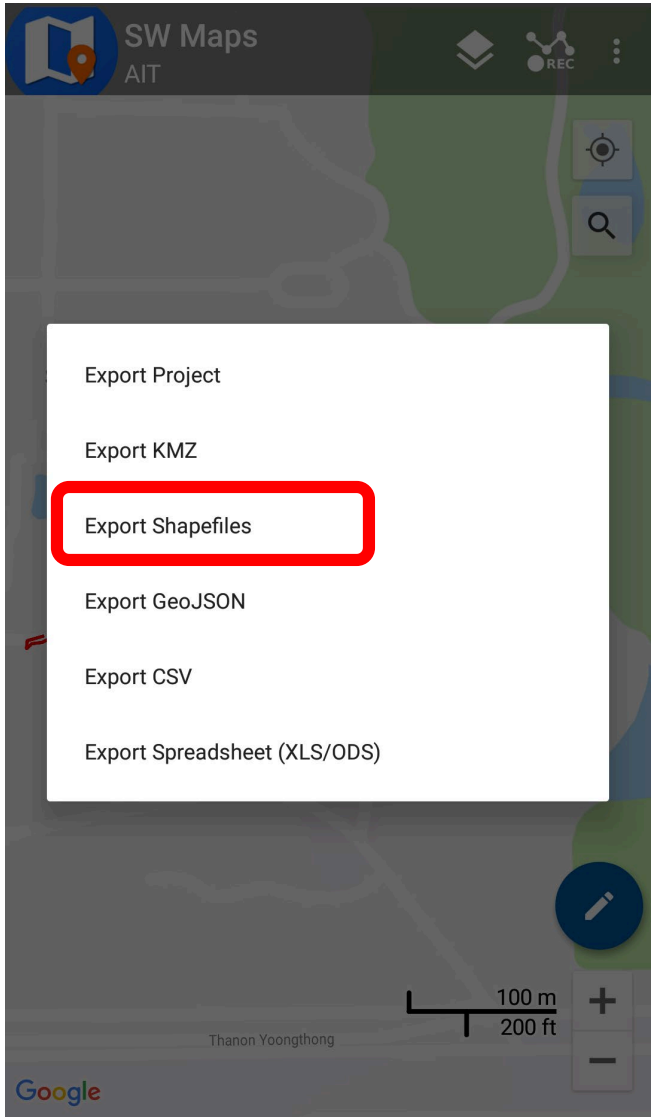
Tap a feature point to open its properties.

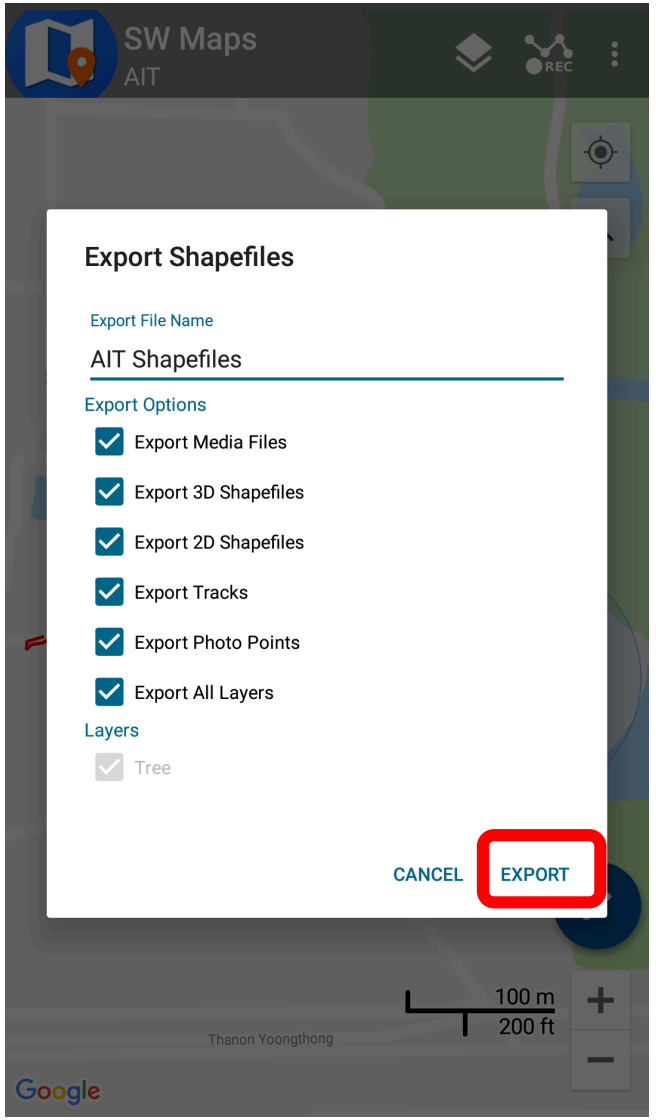
You can edit attributes, delete vertices or get directions to a point using Google Maps.



Exporting Data







Things to Try

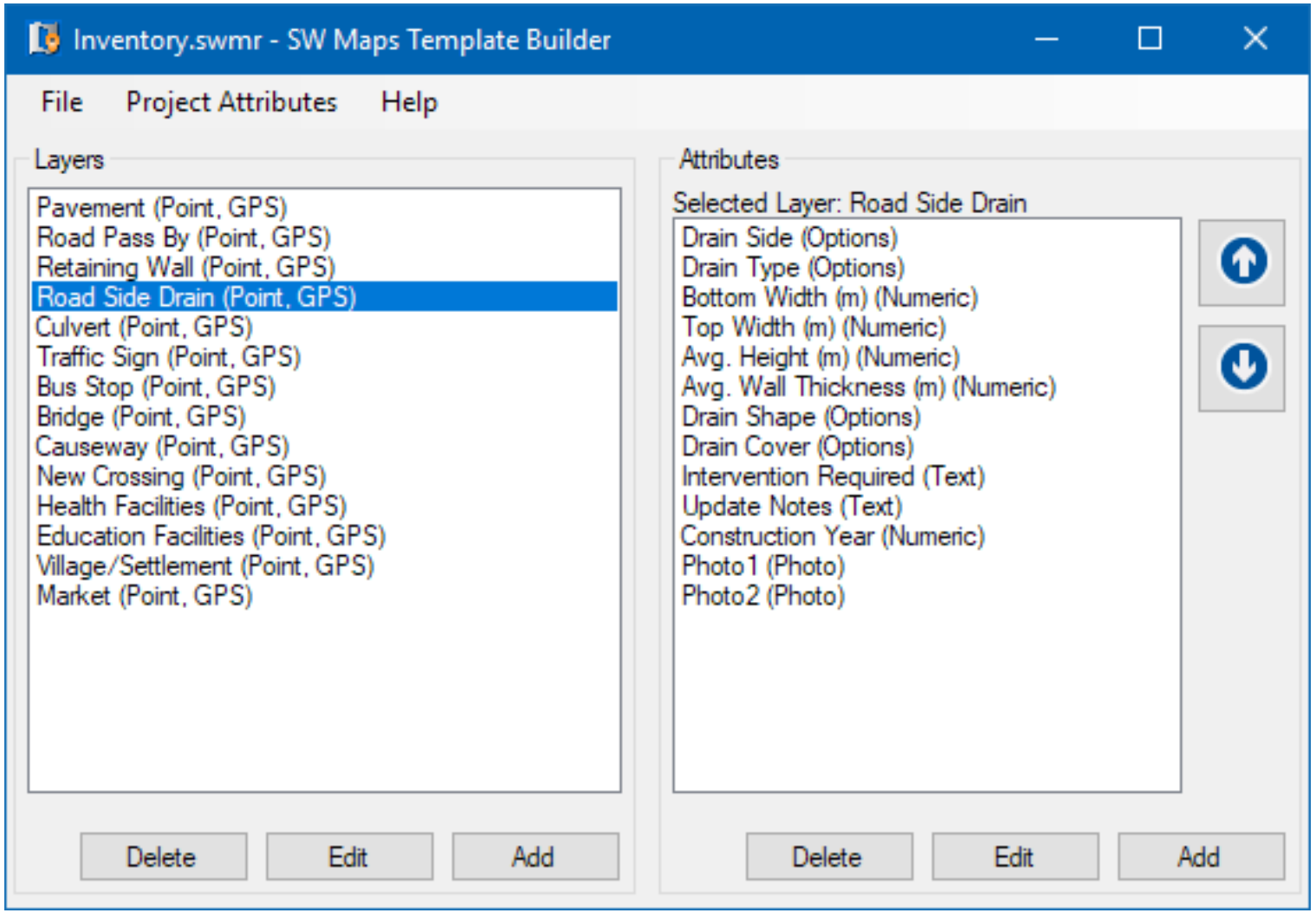
- Record a Line Feature
- Record a Polygon
- Add an Options Attribute Field (Dropdown choices)
- Edit attributes after saving feature (Hint: Tap the feature on map)
- Take a Photo Point (Select **Photo** from drawer)
- Record a track
- Export data to KMZ, copy to computer and open in Google Earth
- Measure length and area by drawing lines and polygons

Templates

- Projects once created can be exported as a template for other projects.
- Useful when many surveyors and instruments are deployed to collect the same type of data
- Templates can be made on a Windows PC using the **SW Maps Template Builder** tool, or exported from any existing project using SW Maps

http://swmaps.softwel.com.np/template_builder

Template Builder



SW Maps Applications

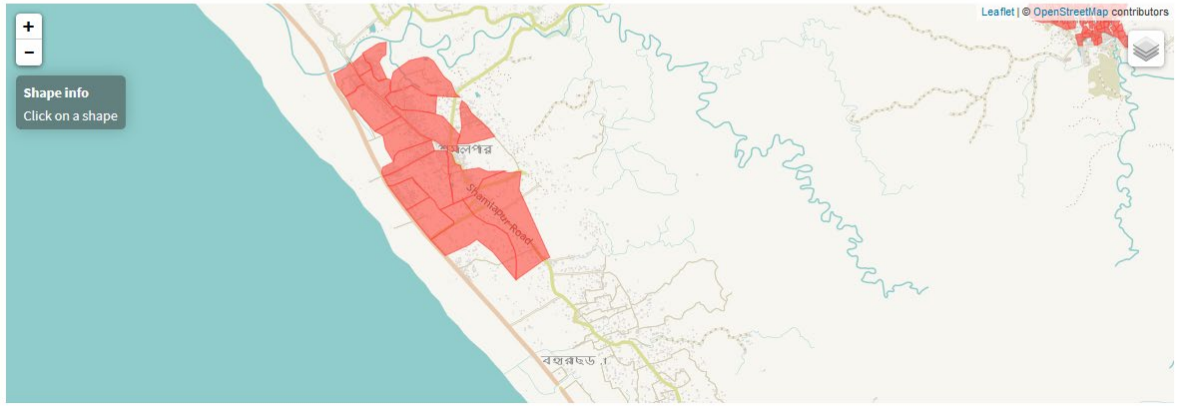
SW Maps used by IOM Bangladesh - Needs and Population Monitoring

IOM Bangladesh - Needs and Population Monitoring (NPM) Cox's Bazar Rohingya Refugees Settlements UAV Imagery

NPM Bangladesh has produced a number of tools based on its regular data collection activities and drone flights.

SW Map package: for mobile use, this enables users to visualize the site maps and boundaries on their own mobile. Together with the relevant files, users can also find a manual showing step by step how to copy files from their own computer to SW Map ... More

5200+ Downloads | This dataset updates: Every three months



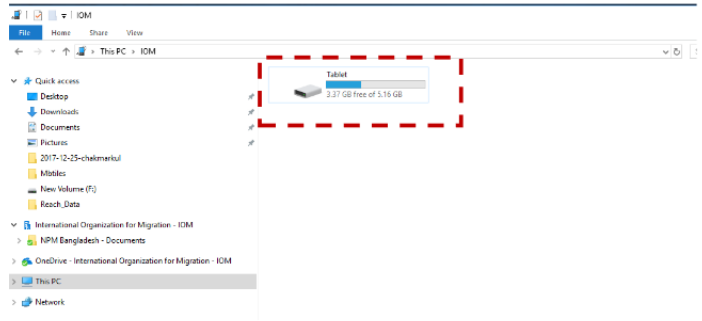
IOM – Needs and Population Monitoring
npmbangladesh@iom.int

IOM • OIM
NPM
Needs and Population Monitoring
THE UN MIGRATION AGENCY

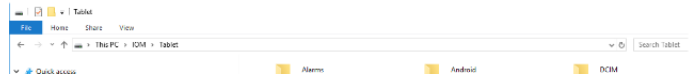
How to copy files from a computer to SWMAPs running on a tablet or other device

After you copy the file your from computer you need to paste it in in SWmaps using the following path:

1. Open tablet.



2. Go to the folder **SW_Maps**.



SW Maps Use for 2020 Census in Indonesia

Bps Kabupaten Deli Serdang
17 October 2018 ·

Selamat pagi #SahabatData

Selamat beraktivitas,
Terus berkarya,
Dan tetap semangat 💪

Tak terasa Sensus Penduduk 2020 sudah di depan mata...
Berbagai persiapan sudah dilakukan,
diantaranya adalah pelaksanaan *ground check* oleh teman-teman Koordinator Statistik Kecamatan di wilayah Kabupaten Deli Serdang.

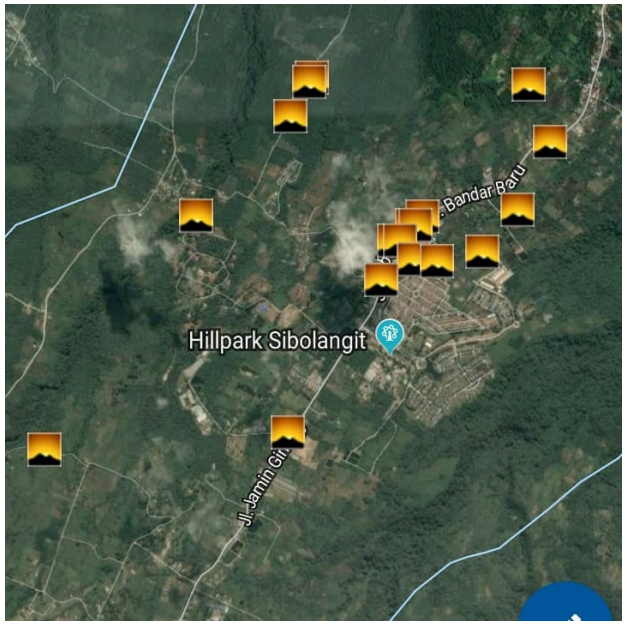
Kegiatan ini dilakukan Dalam rangka Persiapan Pemetaan Dan Pemutakhiran Muatan Wilayah Kerja Statistik SP2020.

Prosedur kegiatan lapangan dilaksanakan berkoordinasi dengan aparat desa untuk memperoleh informasi mengenai batas wilayah yang ingin dilakukan ground check Peta dasar.
Kemudian dengan menggunakan aplikasi SW Maps,
KSK mencari titik batas dan mengambil gambar untuk memperoleh informasi detail mengenai batas wilayah tersebut.

Dengan suksesnya kegiatan ini, diharapkan akan mempermudah pelaksanaan SP2020 mendatang.

dear KSK,
G.a.n.b.a.t.t.e K.u.d.a.s.a.i 💪

#GerakanCintaData
#DataMencerdaskanBangsa
#BPSDeliSerdang



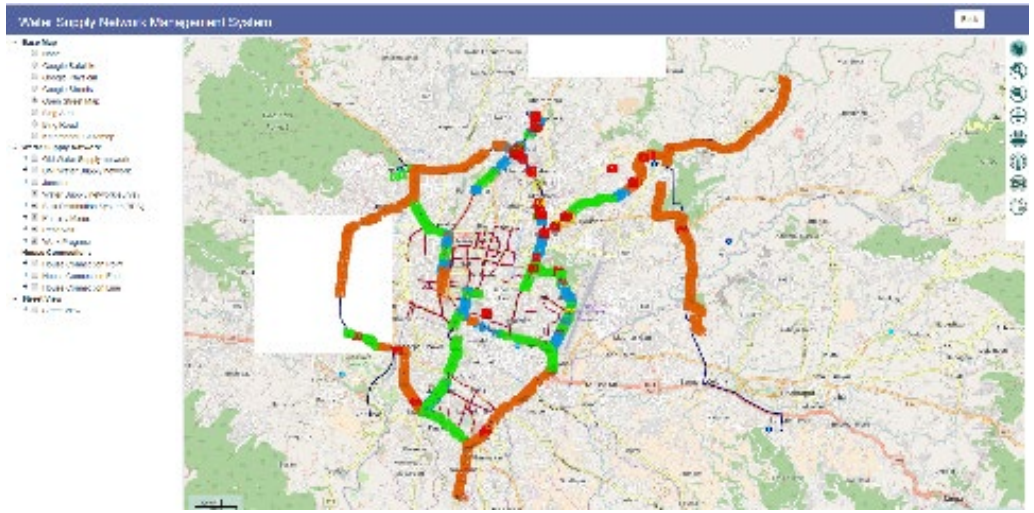
SW Maps Training by Bhutan GIS Society

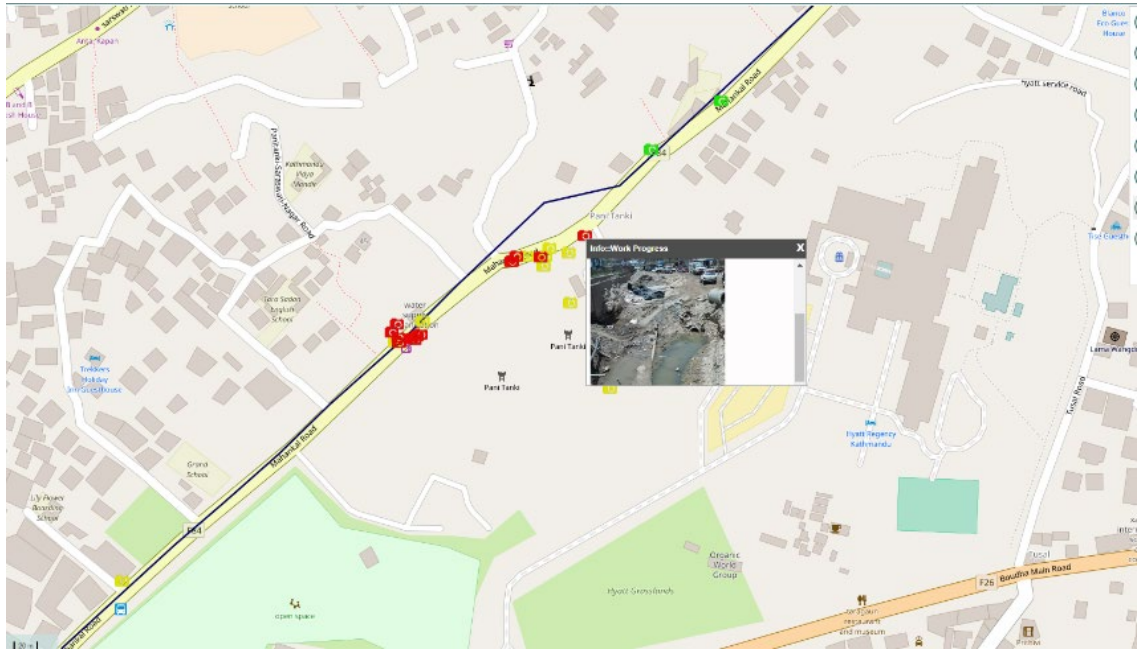
Bhutan GIS Society
14 February ·

Dear All,
Bhutan GIS Society at UWICER would like to propose the first workshop on GPS& Basic GIS for year 2019. The workshop is intended to impart skills on how to use smart phone as GPS and process the data using QGIS. If you are one to avail the opportunity, please express your interest by filling up the Google form on or before 20th February 2019.
Date: 22-24 February, 2019
Venue: Will confirm later
Time: 9:00Am-5:00Pm
If you have any queries, please contact us at 17642189 or 77991755.

Construction Monitoring of Water Supply Works in Kathmandu Valley

http://wnms.softavi.com





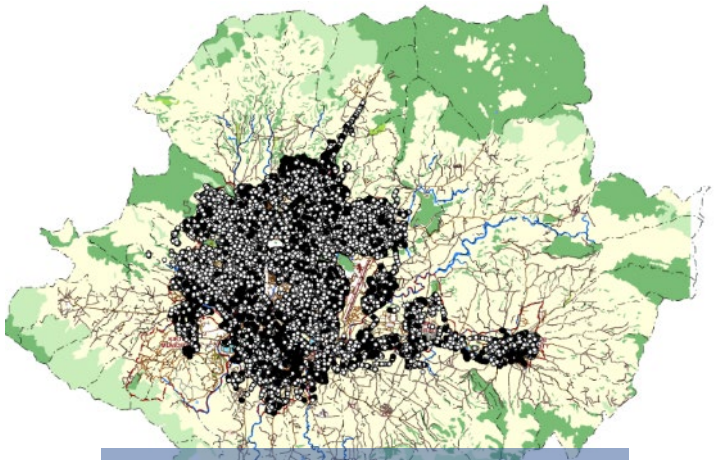
SW MAPS used for Data Capture

- SW MAPS was used for Survey of completed and ongoing works
- Uploading to server with photographs

- Web Based System with open source software
- Centralized PostgreSQL Database
- Web Interface for Data Query and Geometry Editing
- Details of Construction Progress
- Map Overlay

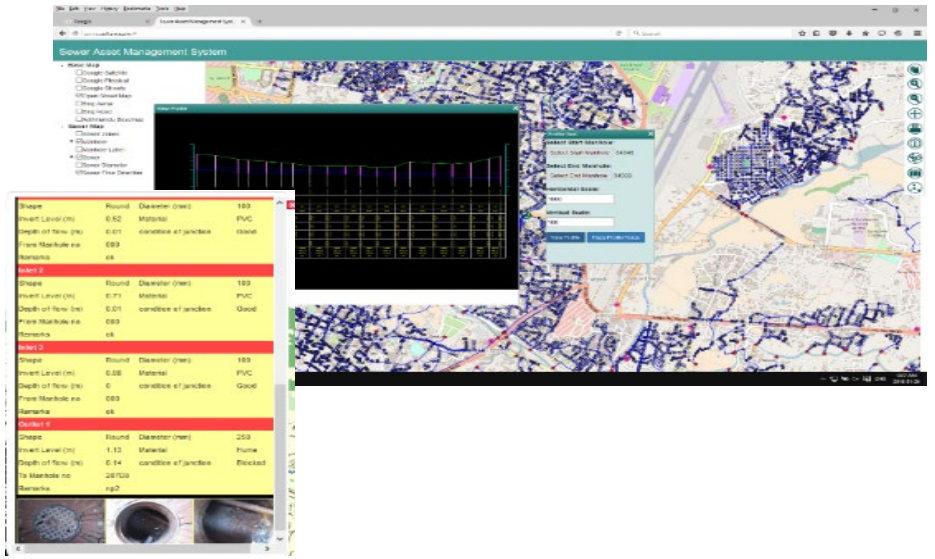
Sewerage Network Asset Condition Assessment and GIS Survey

http://sams.softavi.com



Total Covered=117 SqKm
Total Manhole Surveyed: 52,566
Sewer Line: 1,201 Km

Sewer Asset Management System



- Web Based System with open source software
- Centralized Database
- Web Interface for Data Query and Editing
- Sewer Profile and Manhole Details
- Map Overlay

SW MAPS used for Data Capture

- Customized SW MAPS system for tablet for onsite data entry and photographs
- Automated uploading to server with photographs
- Automated Server Data Update

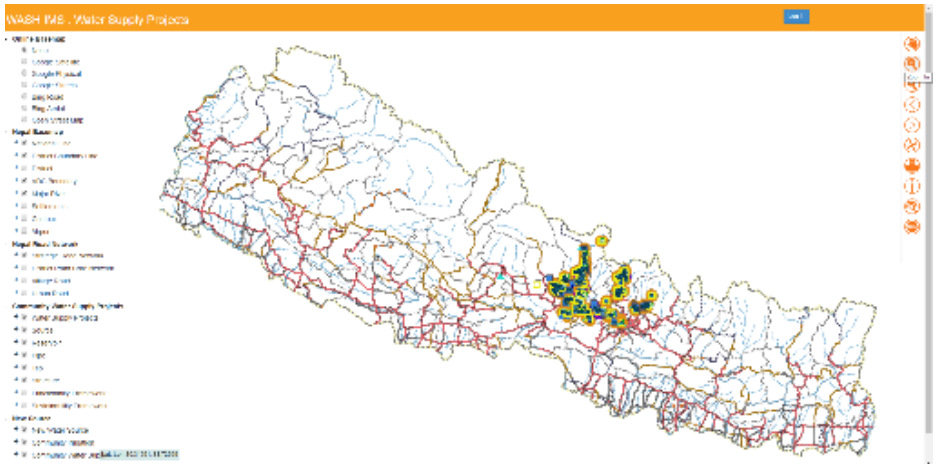
Survey using RTK GPS

Application

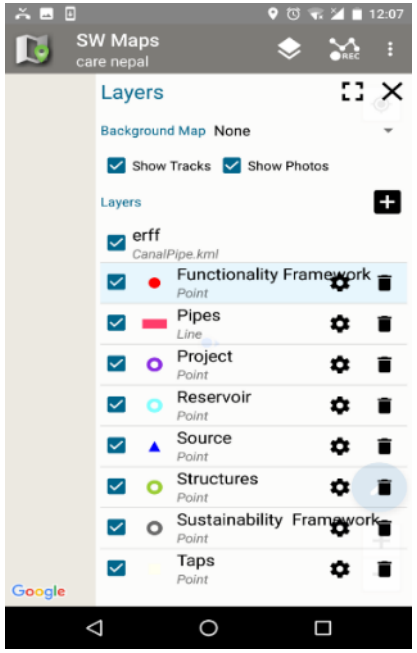
- Sewer Maintenance Management
- Public portal for sewer maintenance request
- Asset Management
- Sewer network expansion

Community Water Supply Information

http://careims.softwel.com.np



Total Covered 5 Districts of Nepal



SW MAPS used for Data Capture

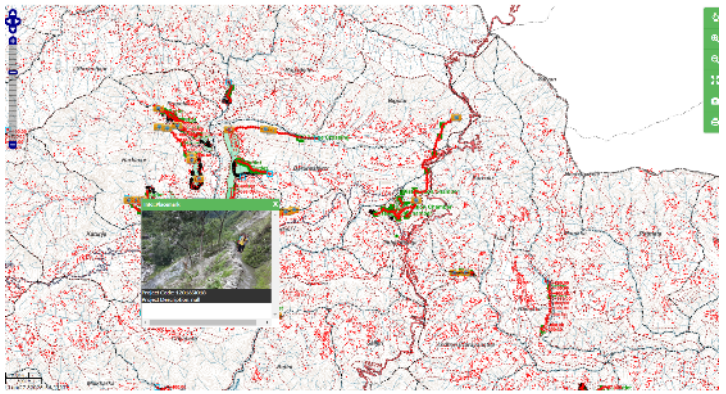
- SW MAPS was used for Survey of completed water supply works
- Survey of unserved Community and potential water sources
- Uploading to server with photographs

- Web Based System with open source software
- Centralized PostgreSQL Database
- Web Interface for Data Query and Geometry Editing
- Details of Water Supply Projects

Small Irrigation Project

Total Covered = 9 Districts Total
Project Surveyed: 1200 (till now)

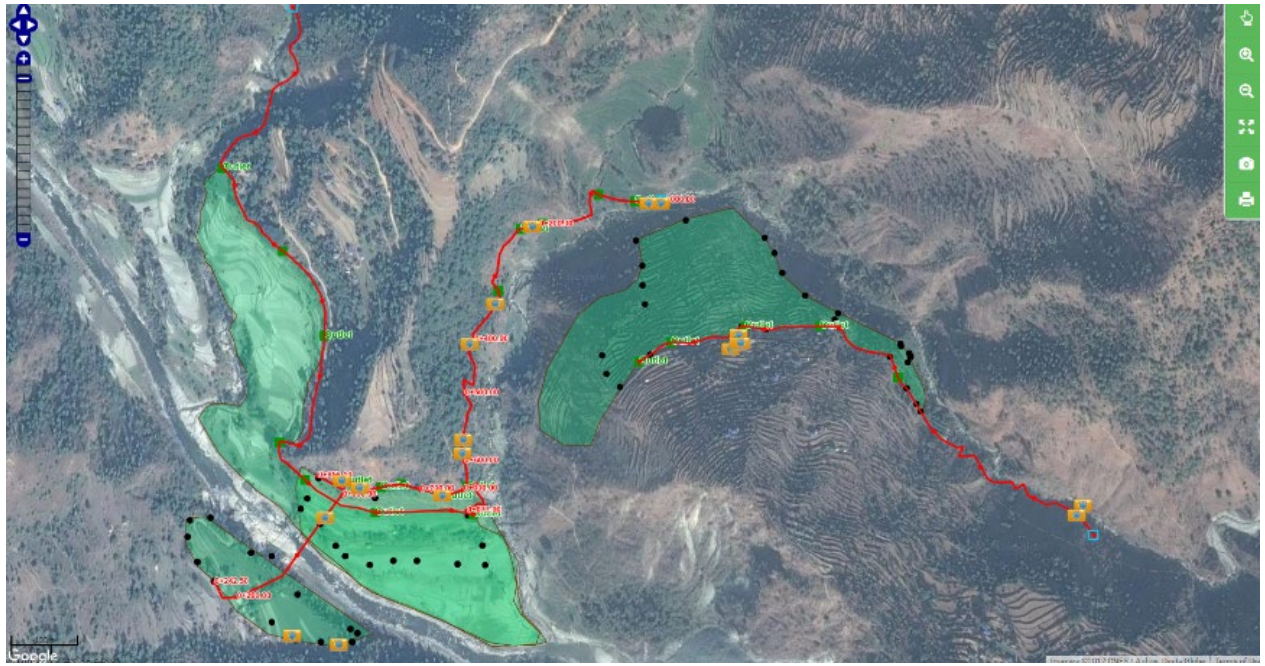
http://sipnepal.org



- Web Based System with open source software
- Centralized PostgreSQL Database
- Web Interface for Data Query and Geometry Editing
- Irrigation Details
- Map Overlay

SW MAPS used for Data Capture

- SW MAPS was used for Survey works.
- Uploading to server with photographs
- Editing of Geometries in Server



More Information

SW Maps on the Google Play Store
https://play.google.com/store/apps/details?id=np.com.softwel.swmaps

SW Maps Template Builder
http://swmaps.softwel.com.np/template_builder

SW Maps User Manual
http://swmaps.softwel.com.np/assets/resources/manual.pdf

RtkDroid Demo

https://www.youtube.com/watch?v=Z_C33io_8S4