Android Applications for GNSS
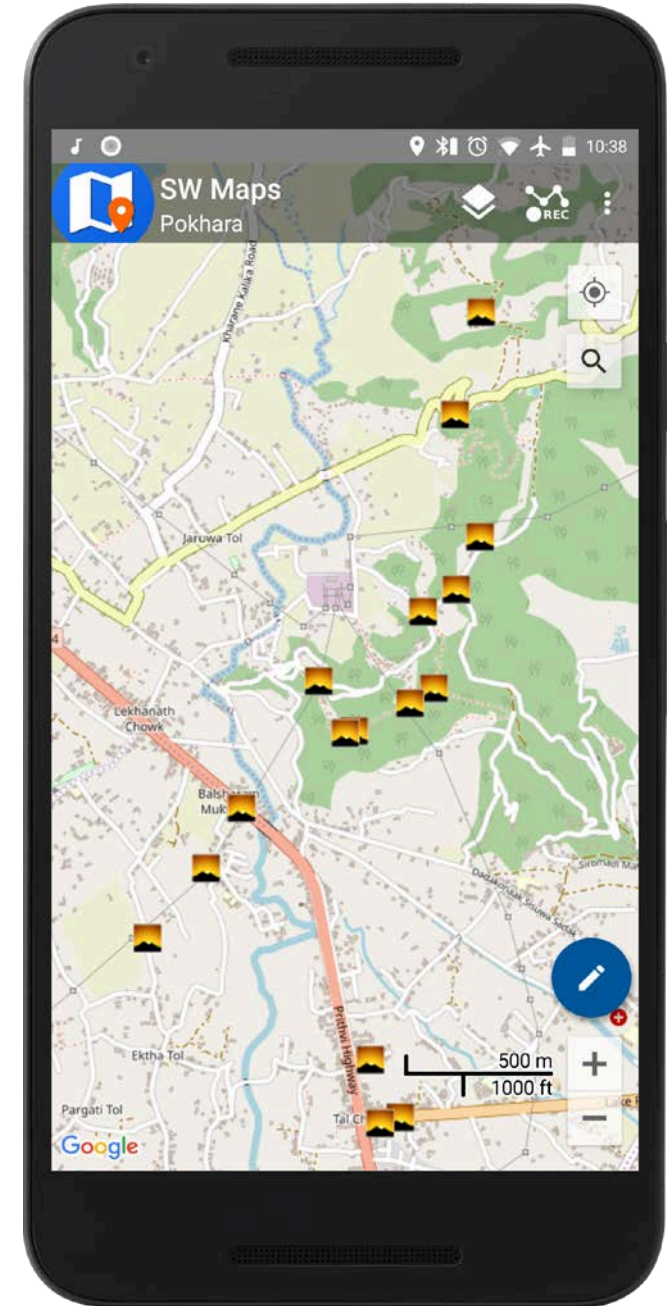
(SW Maps and RtkDroid)

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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 100,000 times by users all over the world
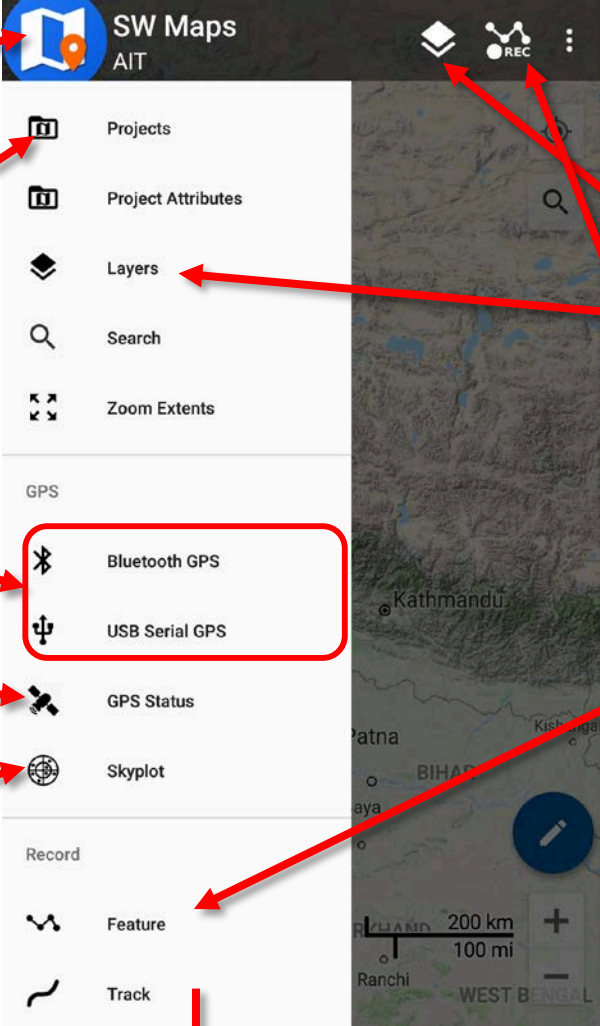
Features

- 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 (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, 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)
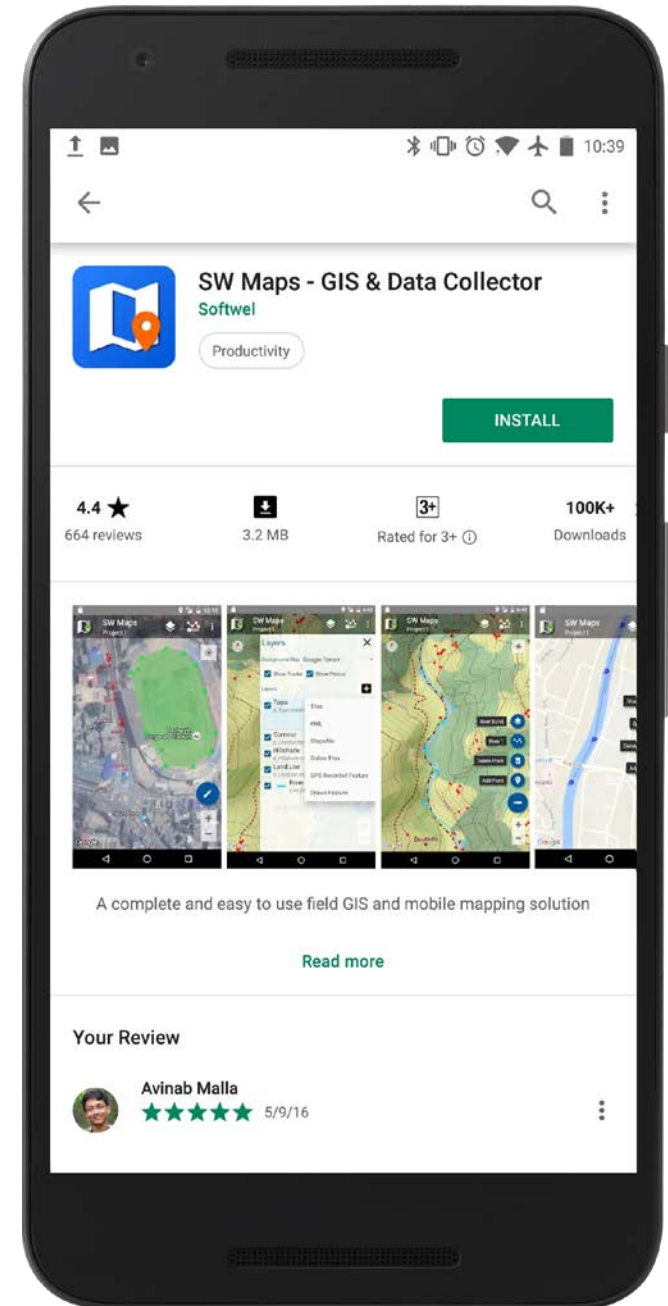
App Navigation

Press to open Drawer
(Or slide from left edge)

Create or Open Projects

Connect External Receivers
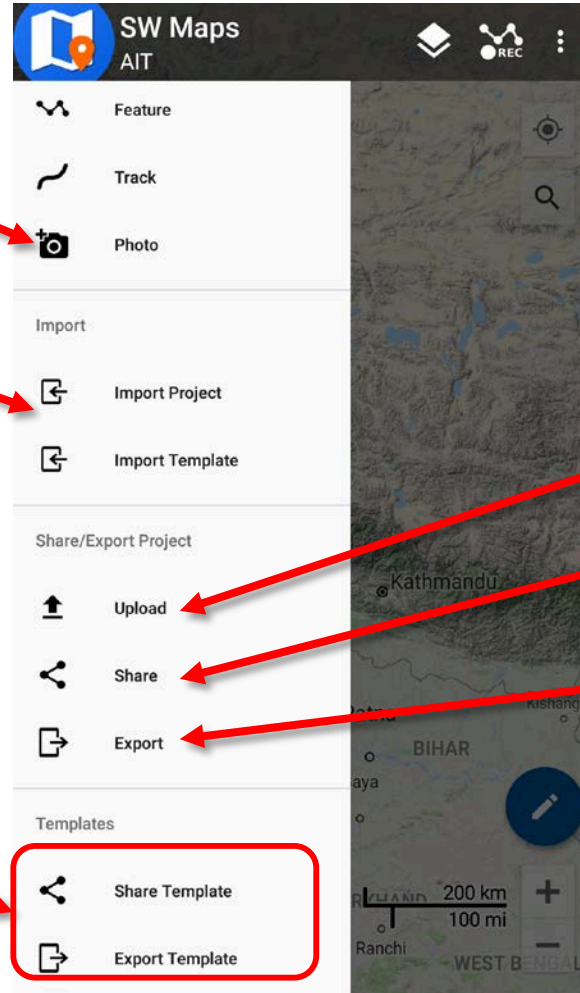(Bluetooth OR USB)

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

Upload Data to FTP Server

Share data to other users

Export to device storage
As KMZ, SHP, Excel...

Save and share layer definitions
as a template for other projects

SW Maps Folder

All exported files saved here

Photos and Videos taken by SW Maps
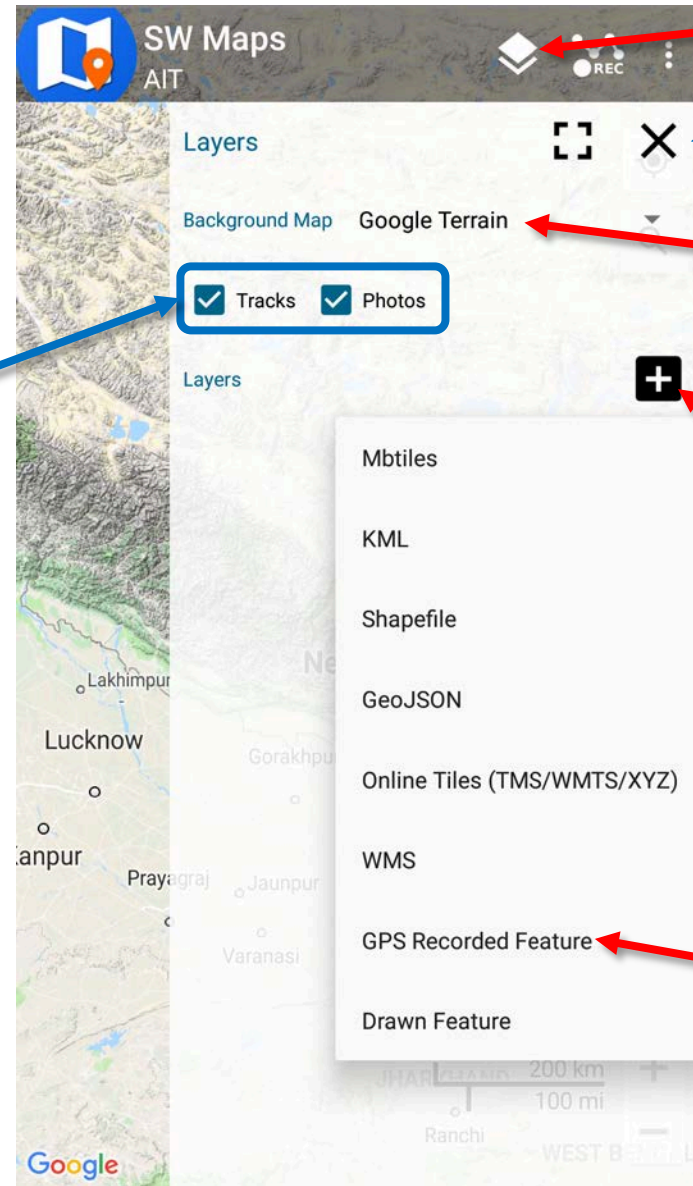
RAW GNSS Data (UBX, SBF..)

Copy project templates here

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

Project files saved here

Layers

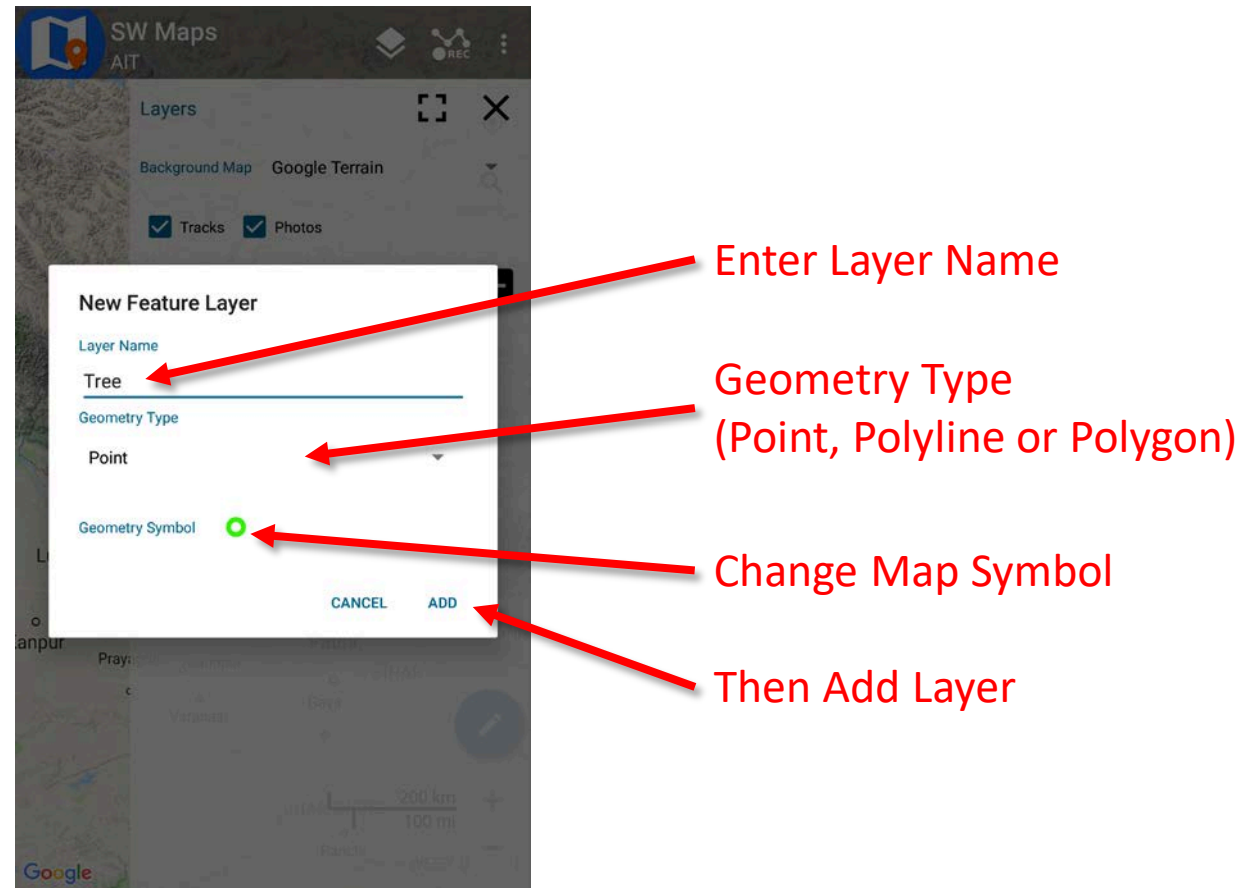1. Press to open Layer sidebar

Maximize/Close Sidebar

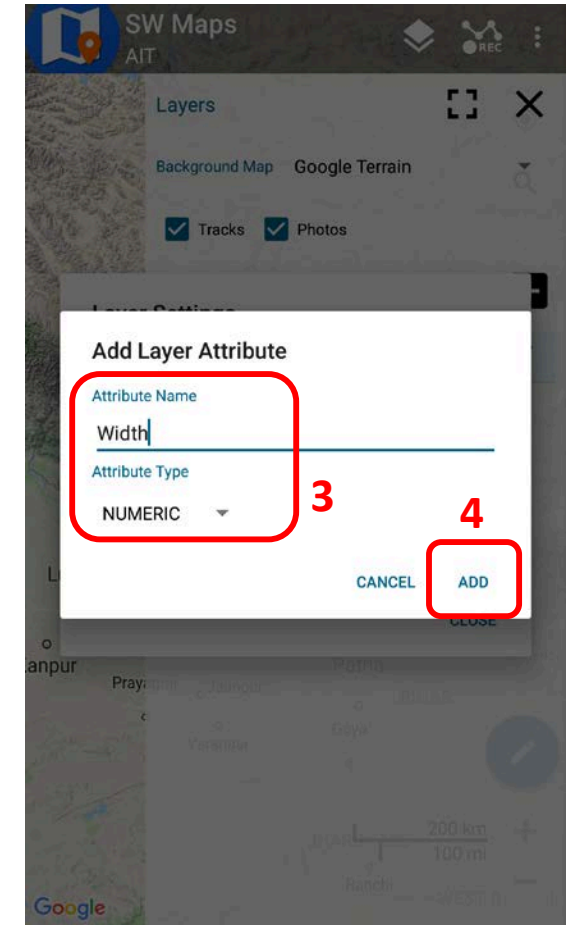2. Change Background Layer

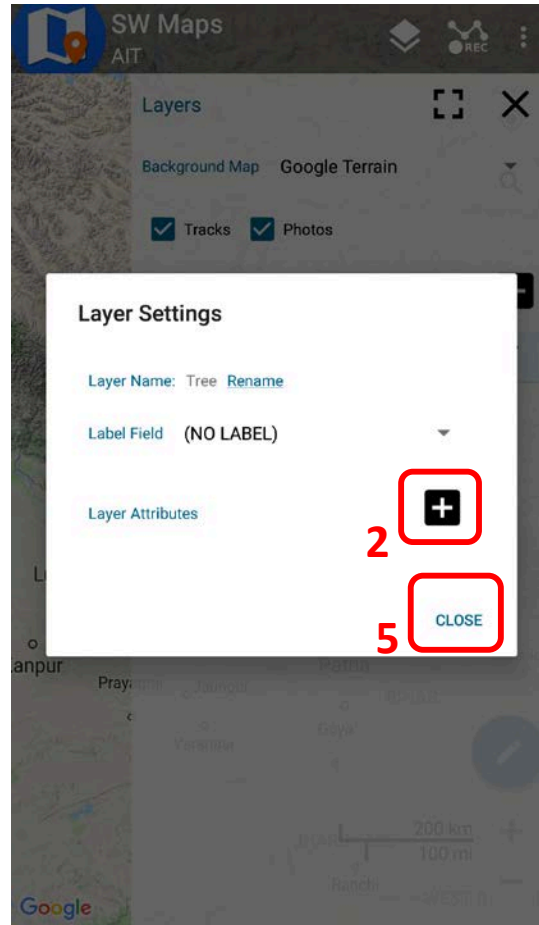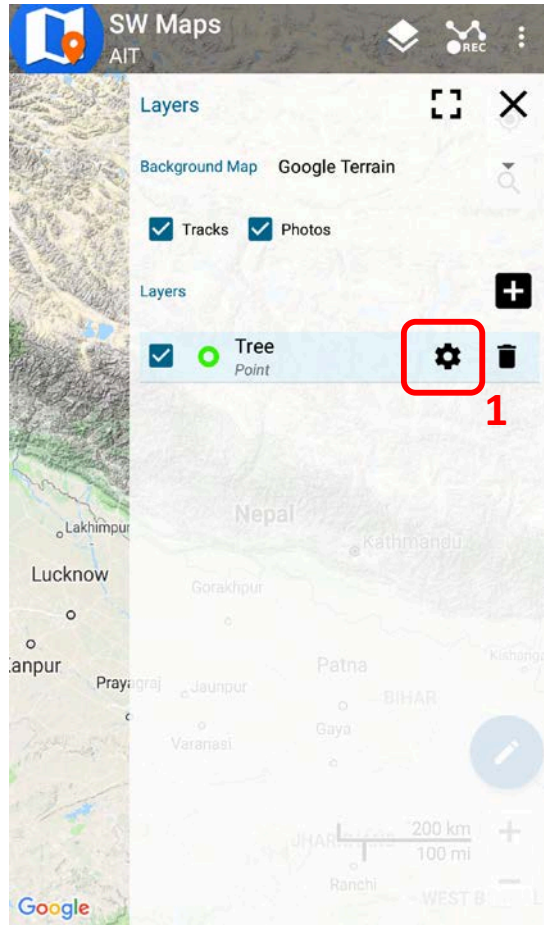Toggle Track and Photo Point Layers

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

Connecting u-blox External Receiver

- 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**
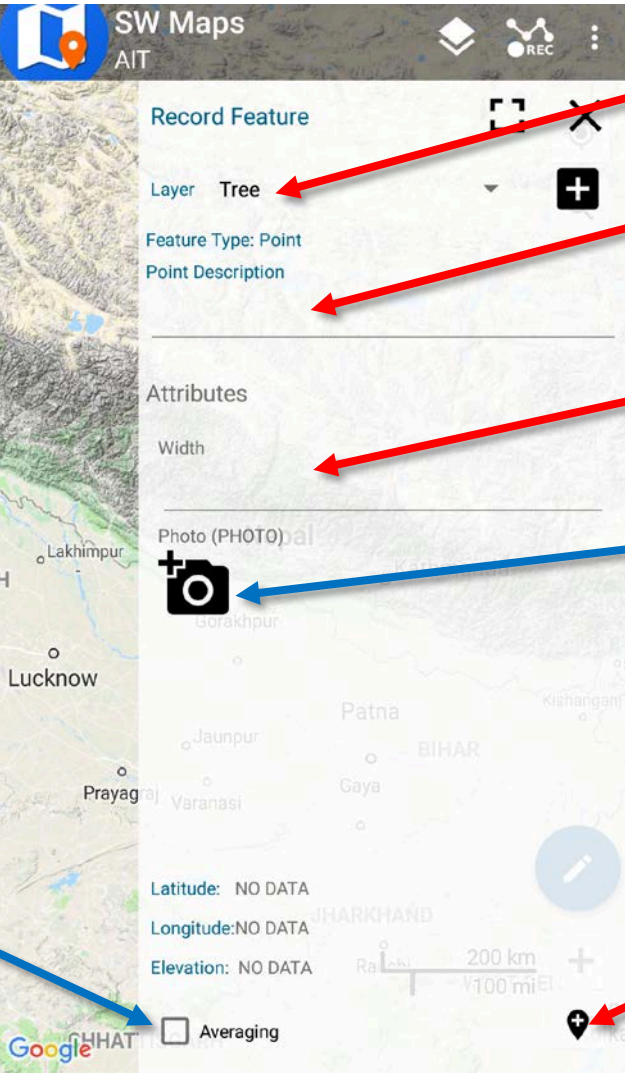
- Set Instrument Height

- Press **Connect**
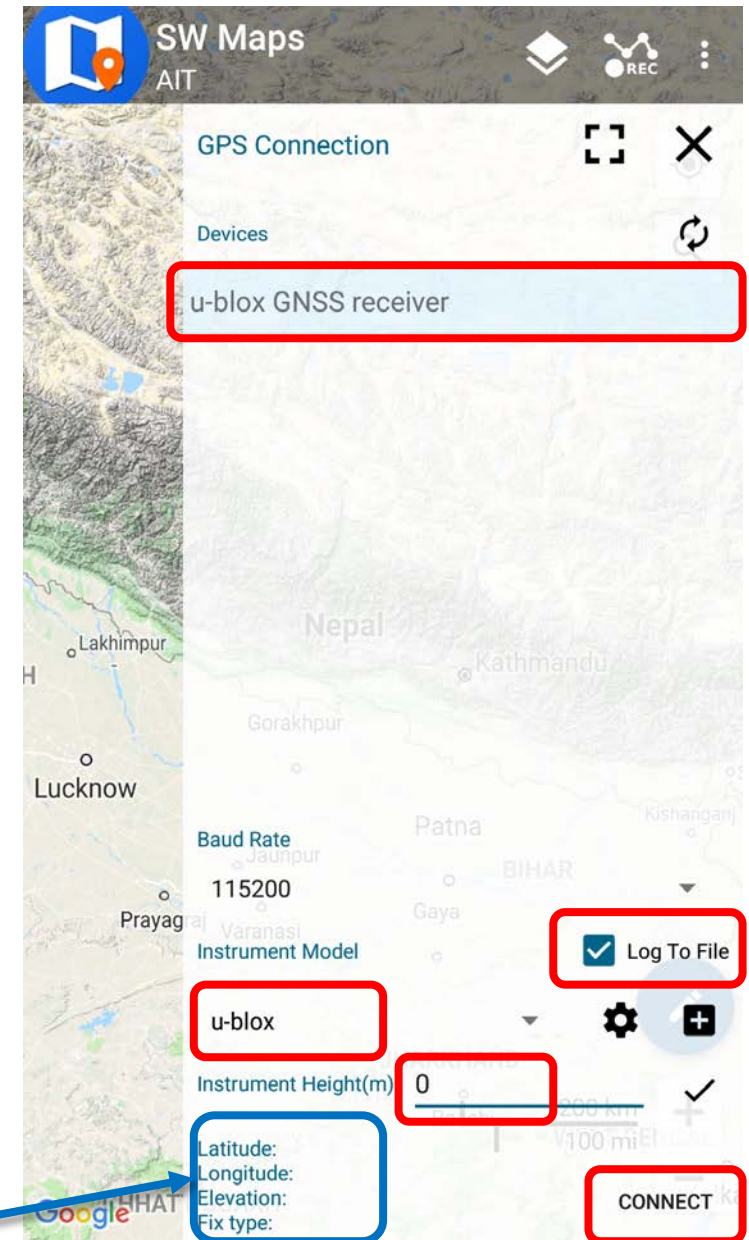
Coordinates Here

GNSS Data and Skyplot
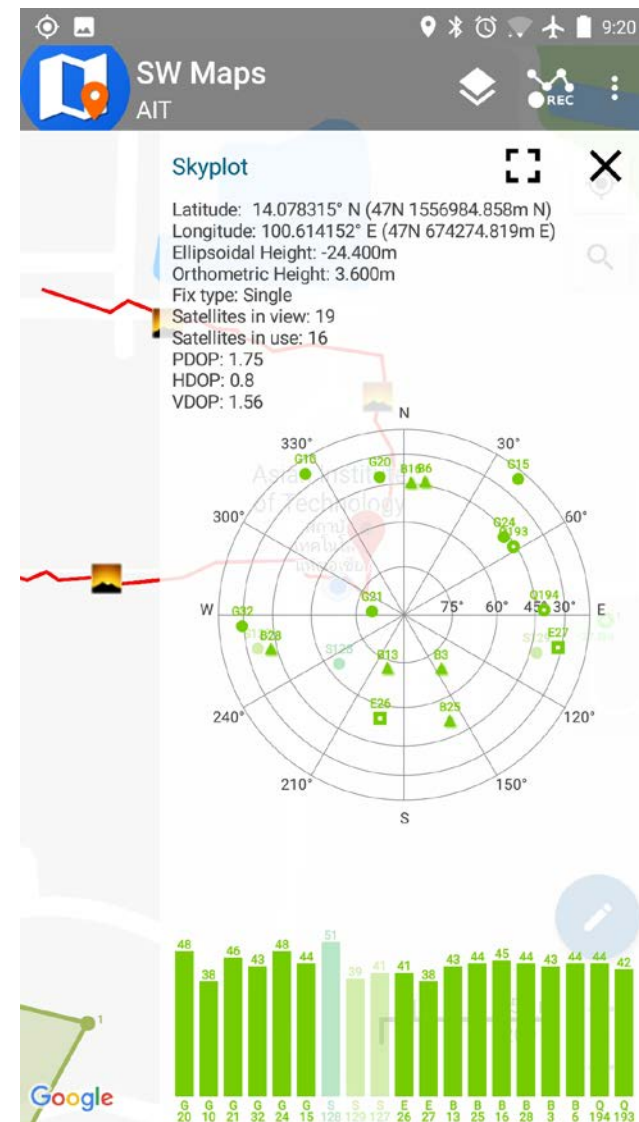
- ubx and sbf files are saved in SW_Maps/RawFiles Folder

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
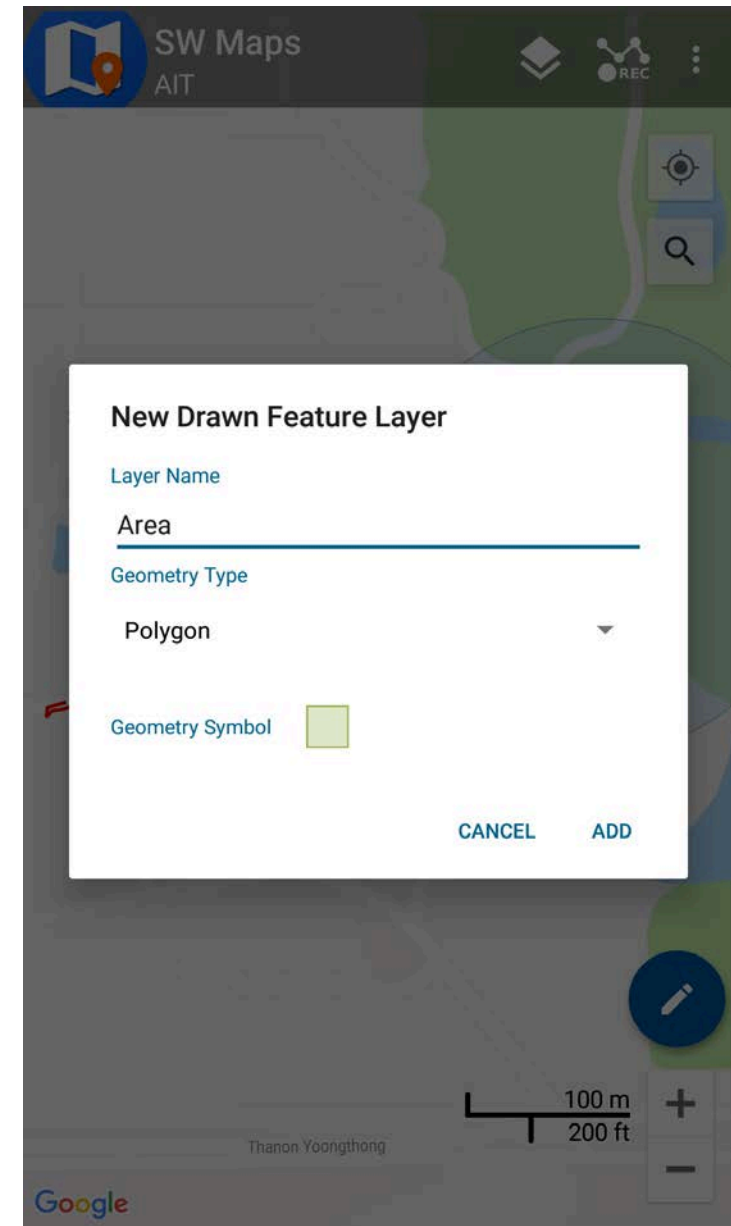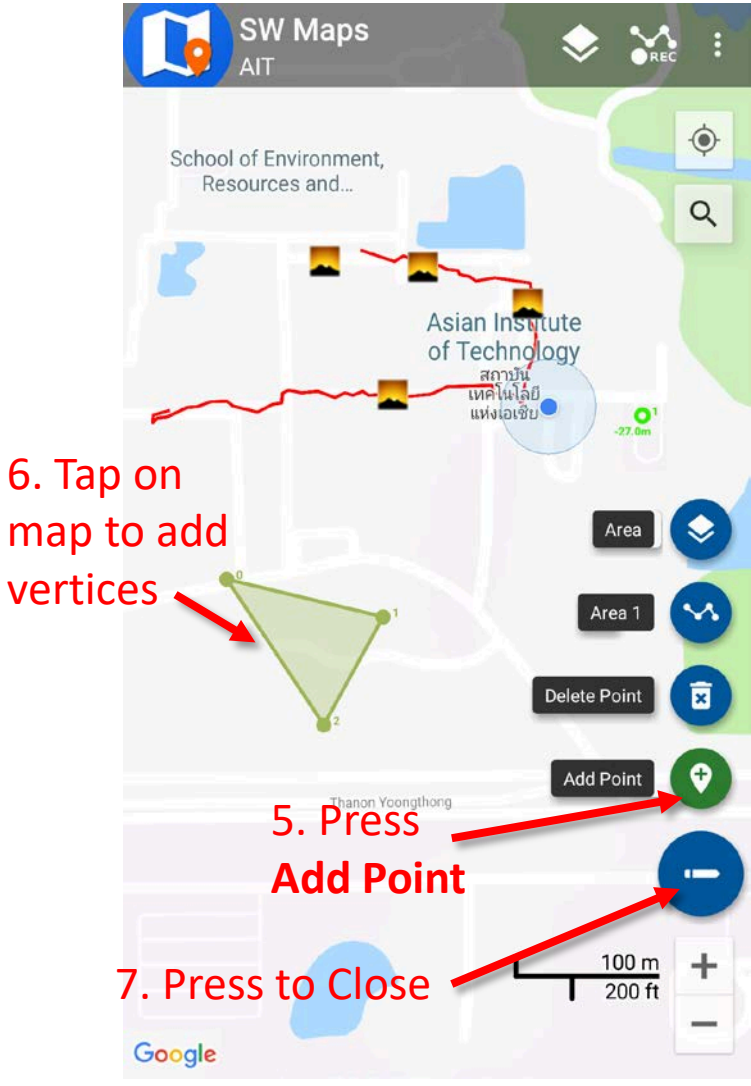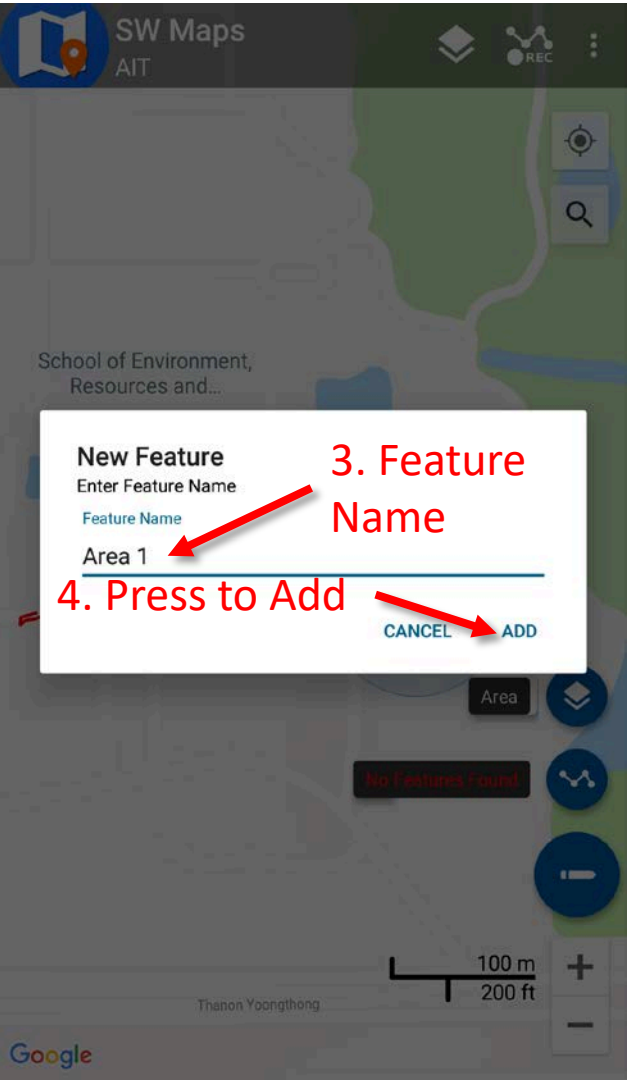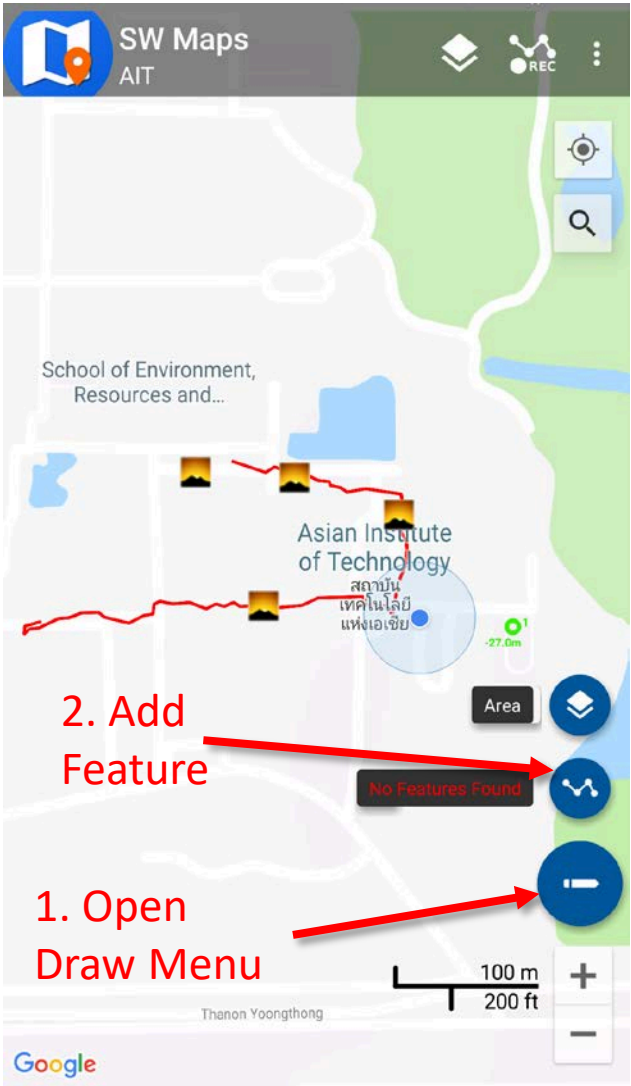
Drawing Features

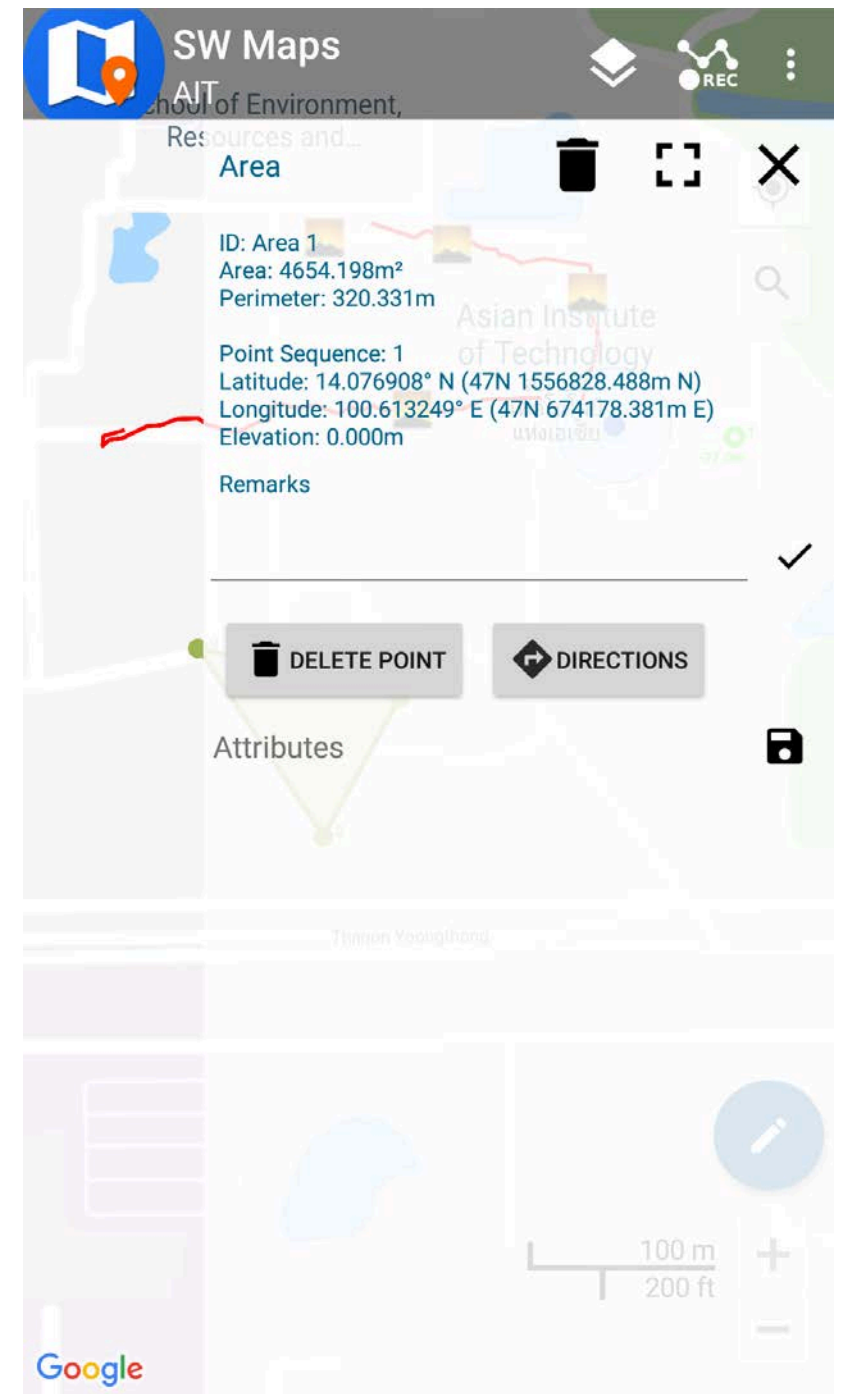1. Add a Drawn Feature Layer

Name: Area
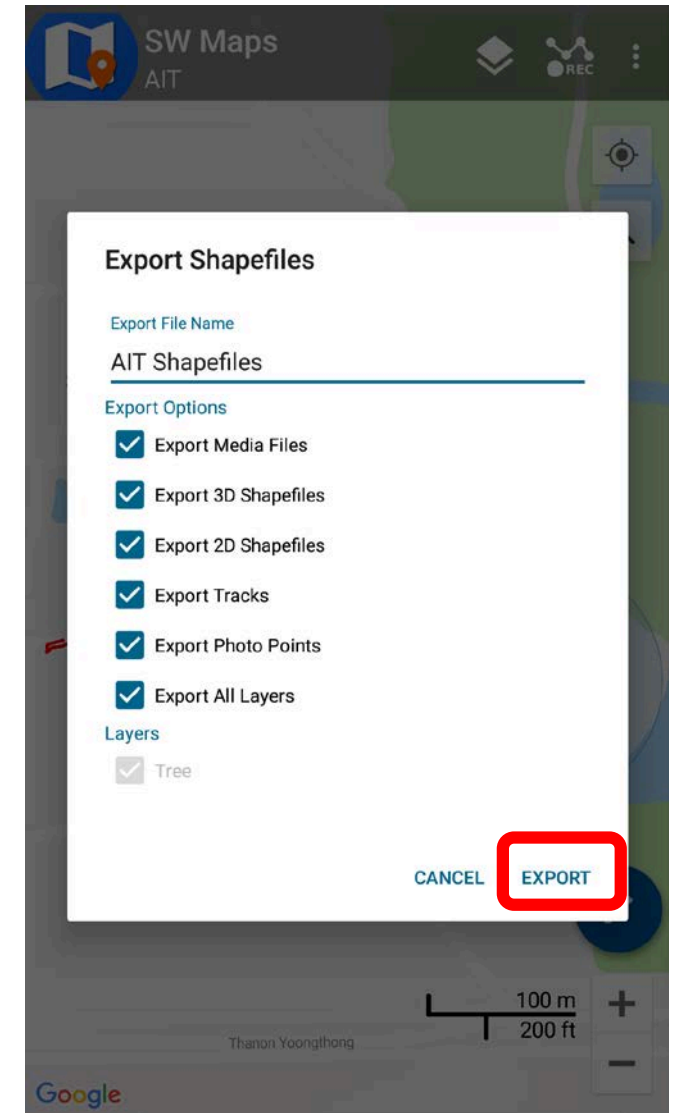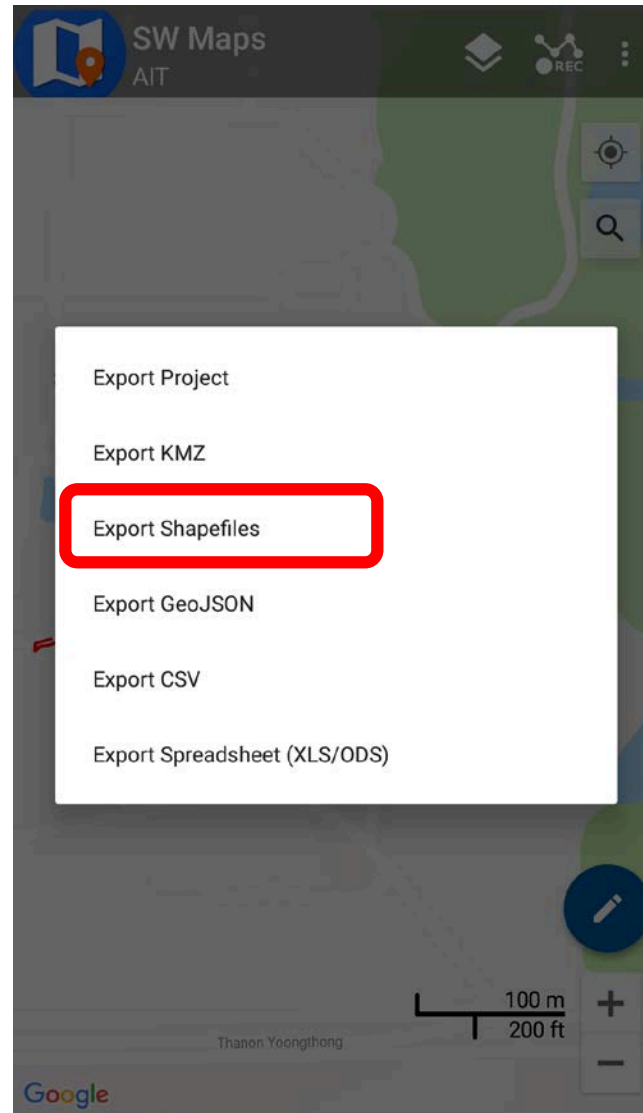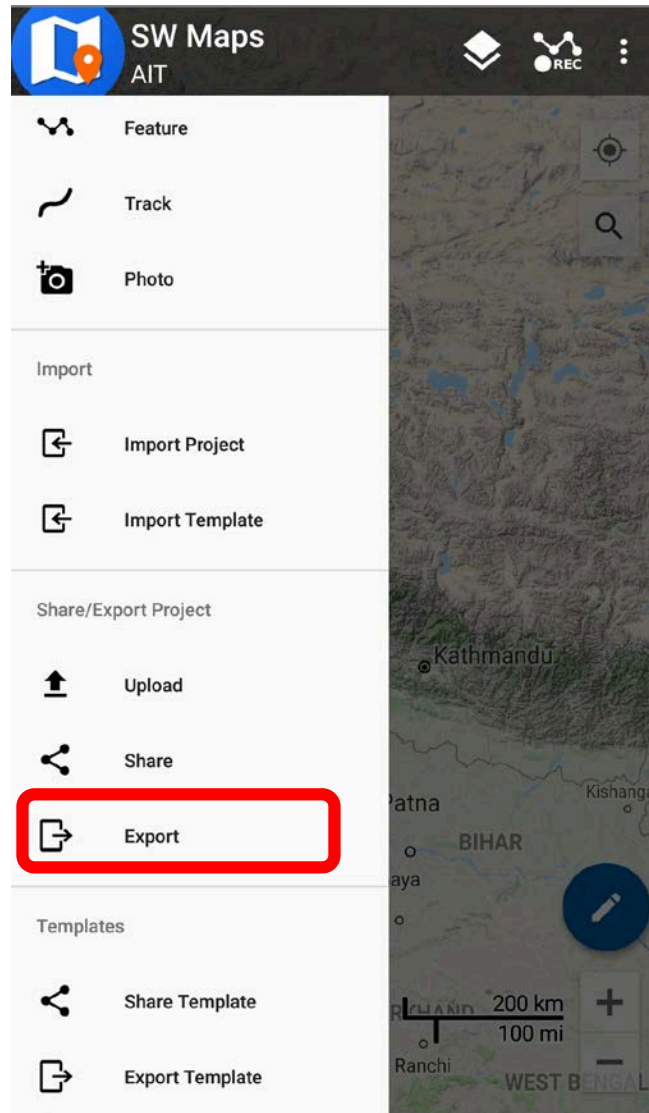
Type: Polygon

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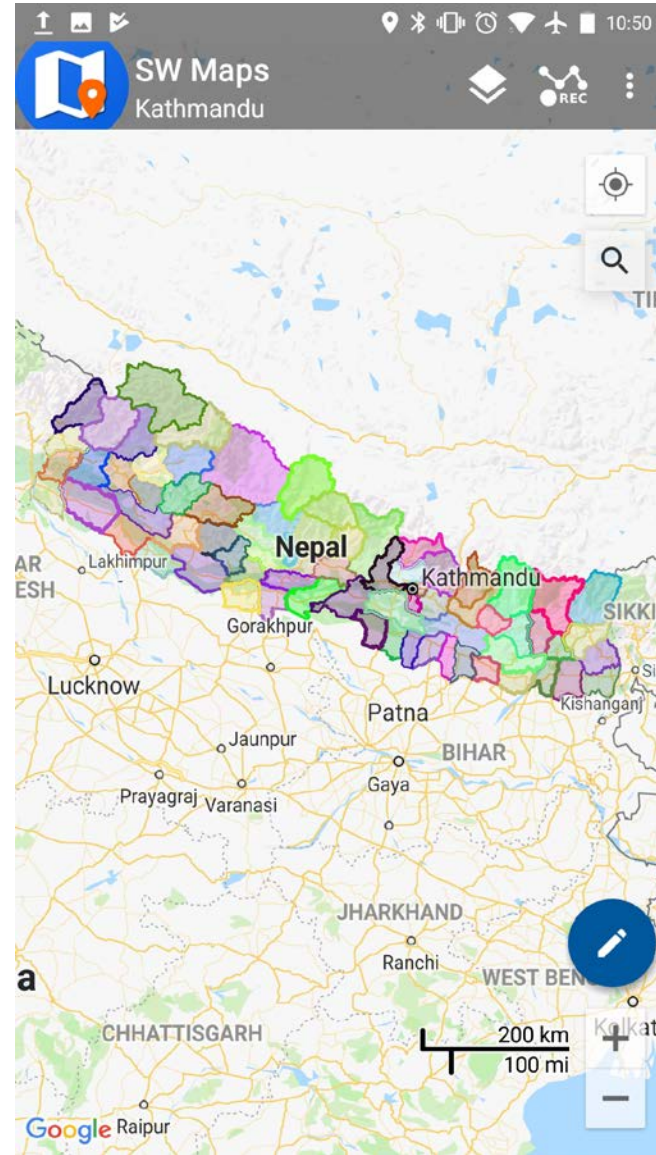
    http://swmaps.softwel.com.np/template_builder

Template Builder
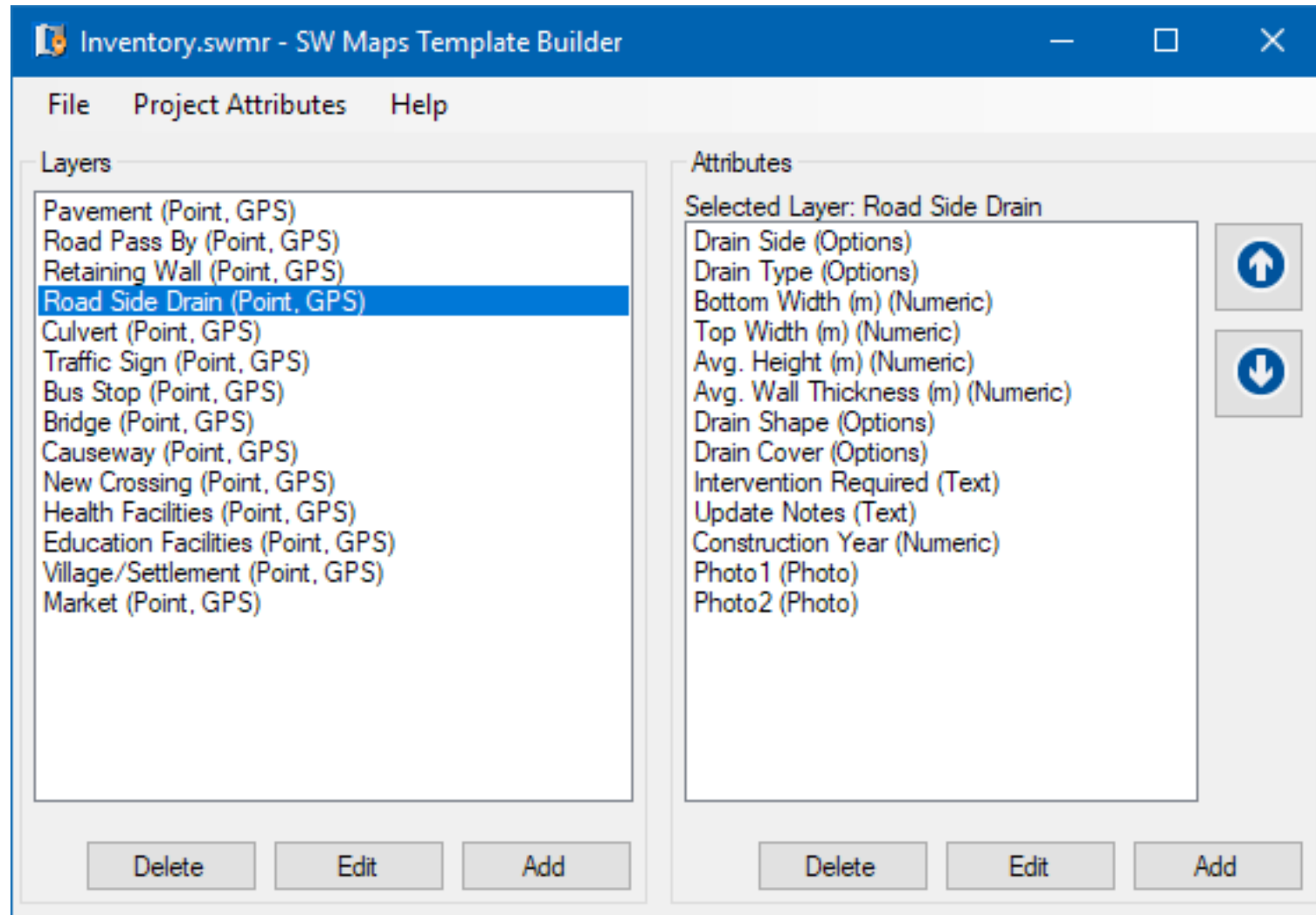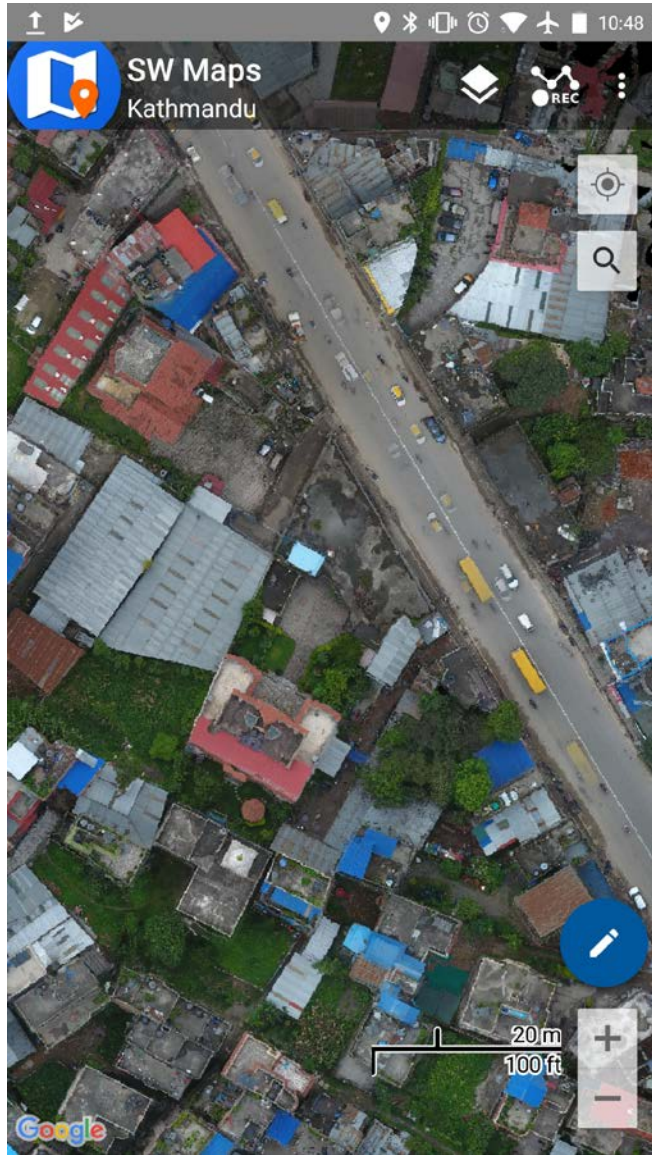
Drone Imagery Mbtiles
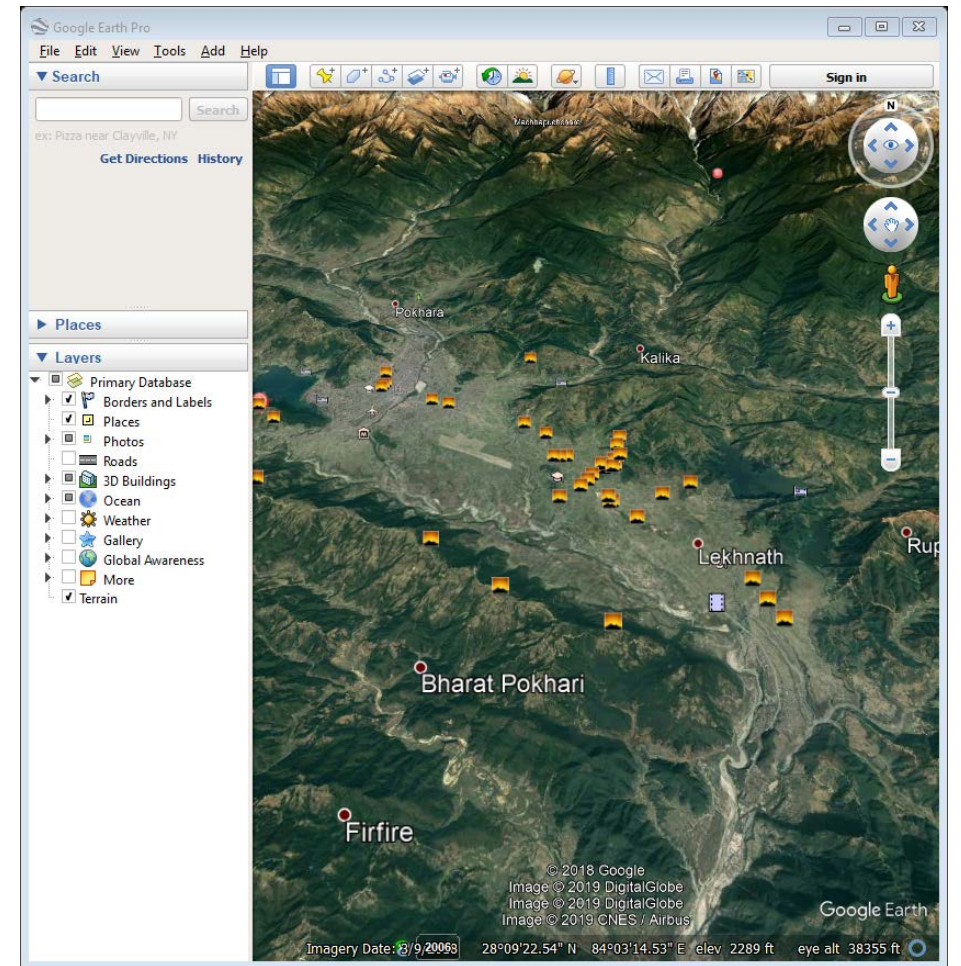
Shapefile Categorized Styling

Exported KMZ in Google Earth

User Manual

- SW Maps

http://swmaps.softwel.com.np/assets/resources/manual.pdf

- Template Builder

http://swmaps.softwel.com.np/assets/resources/TemplateBuilderManual.pdf

Rtkdroid: RTK in Android

- Android app for low cost RTK
- Currently under testing, not distributed to public
- Uses u-blox receiver connected via USB for rover data, RTCM 3 from NTRIP for correction
- Uses RTKLIB 2.4.3b31 for RTK processing
- Sets location of Android device using a mock location provider so all other apps use RTK positioning

RtkDroid

ABOUT

SETUP   SKYPLOT

Rover Mode   Kinematic (RTK)

Set Rover Mode
(Single/Kinematic/Static)

Elevation Mask   20

Ambiguity Resolution   Continuous

Ambiguity Resolution Mode
(Continuous/ Instantaneous/ Fix and Hold)

Satellites

○ GPS + QZSS + GAL

◉ GPS + GLONASS + QZSS + GAL

○ GPS + BEIDOU + QZSS + GAL

Select GNSS Satellites to use

Rate: 5Hz

NTRIP Settings

Address

Port
2101

Mount Point
A01

Username
user

Data Output rate
(Position fixes per second)

Enter NTRIP Caster Settings

START ROVER

Press to Start Rover
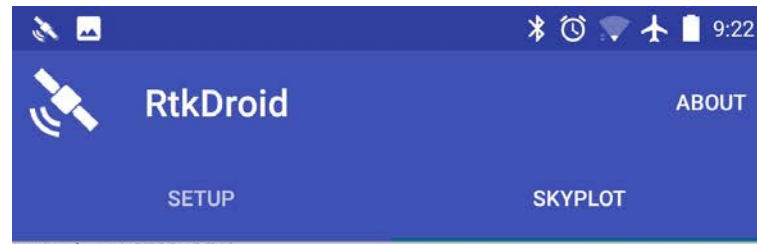
Position Output
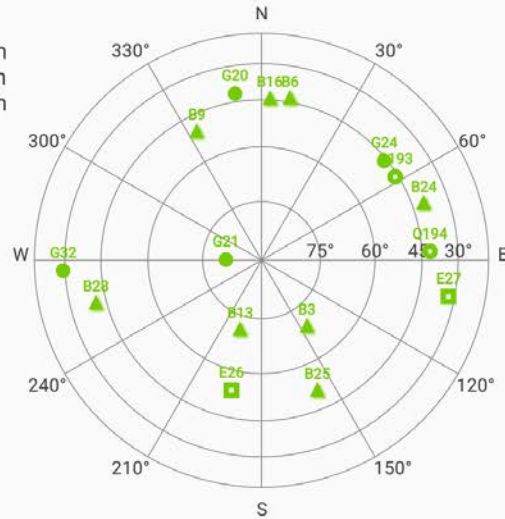
Files being recorded
(File Size)
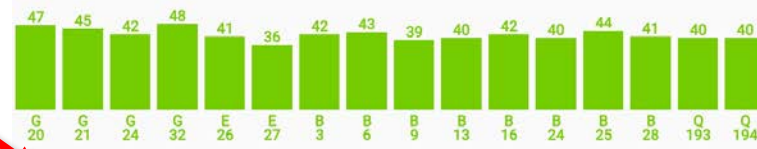
Start/Stop Recording

RtkDroid

- For installation files and more information, contact Dr. Dinesh Manandhar at dinesh@iis.u-tokyo.ac.jp

- YouTube Video Demo

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

Thank You