

## Open an ArcGIS Online Map in Collector

In this guide, we will use the **Collector for ArcGIS** app to collect points on the SFSU Quad. *As with other tutorials, much of this is translatable to other field sites; we will collect point, line and polygon data, using a basemap for visual reference.* This guide assumes that you already have published feature services to employ, and an ArcGIS Online Map that has been shared with these feature services. As with the previous step, we will use the SFSU Quad as a field site, and include some features that are found there – lamp posts, maintenance hole covers, trees and paths – which can hopefully be translated for use in other field study areas.

### Open the shared map

First you will need to have a device with the (free) Collector for ArcGIS app installed. This could either be on an iOS, Android, or Windows device, but the instructions here will focus on an Android device since we have Nexus tablets with built-in GPS. If necessary, install the Collector for ArcGIS app.

- Open Collector and sign in to SFSU's ArcGIS Online organization (sfsu.maps.arcgis.com) with your ArcGIS Online credentials. Search for and open the ArcGIS Online map you created in the previous tutorial by tapping on its thumbnail.
- **For working offline:** If you are going to be working away from WiFi, you will need to download the map with the basemap tiles you will need. Click 'Download' to save the map on your device. In order to complete the download you need to first select a **Study Area** and then establish both your **Work Area** and the **Map Detail** level:
  - For **Work Area**, make sure to zoom out enough to specify the entire area you will be collecting data from – Collector does not allow data collection outside this area.
  - For **Map Detail**, you select the scale which you wish to work at and you feel is appropriate for your given task. Be aware that more detail results in larger file sizes (and storage needs).
  - When you have established both your Work Area and the Map Detail, click 'Download' and the map data and background tiles will be saved to your device. You can now access and work with this map in Collector for ArcGIS even if you are not connected to WiFi.

Collect Features

- We will be collecting attribute information as well as positions for the feature classes created in the previous tutorials (lamp posts, maintenance covers, paths, trees and any other features of worth noting, i.e. the generic feature classes). We will also be including photos, using the attachments button , for the **trees** feature class.

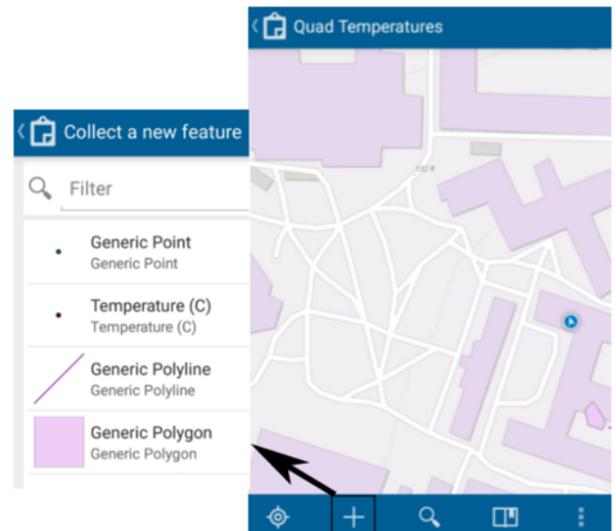
- How to collect features in Collector for ArcGIS:
  - First, you will need access to GNSS (e.g. GPS) coordinates. You can either use the internal receiver on your phone/tablet or, for more accurate positions, a Bluetooth-connected receiver such as the Trimble R1, paired using the GNSS Status app.
  - In Collector, select and open a map (such as **QuadDataFeatures** or **Quad Temperatures** we'll use as an example). The basemap should be centered on the SFSU Quad, just as you set it up to be. Assuming you're physically on the quad, the blue circle that you see on the display represents your geographic position according to the GNSS satellite signals being received by the device's internal GNSS receiver. The fluctuating blue ring that surrounds the blue dot represents the horizontal accuracy of your position. The larger the ring the greater the horizontal error, the smaller the ring the lower the horizontal error.
  - On the side of the basemap should be a column with each respective feature class (actual layout varies by device/OS); ensure that each of our desired feature classes are present in this column. *Note: on a phone, this will not be visible, and the list only appears when adding a feature.*
  - To map a point, polyline or polygon, simply select the corresponding feature class for the feature you wish to map, fill in the attribute information in the menu screen that appears and when finished select 'Done.' *On a phone, you'll need to press the + symbol to bring up the list to add a feature.* The features positional data along with the attribute information you provided will be stored to the device.

- Please note, if collecting a Polyline or Polygon feature in Collector you need to select the 'Start streaming' option. Doing so initiates Collector to start gathering positions as you walk a linear or the perimeter of an areal feature. Collector does not trace linear features like in TerraSync, rather it establishes vertices and develops linear features based on the positions of each respective vertex. To change how often a point is taken,

**Basics of Connecting to the R1  
(See Appendix for details.)**

1. To turn on, push the button down until both LEDs are green – takes a second or two.
2. Wait a few seconds until the left LED is blinking blue and yellow.
3. Hold the button down for about 5 seconds, until the left LED is blinking blue only.
4. In the Bluetooth settings on your device, pair the GNSS receiver.
5. Use GNSS Status app to select and connect to the R1.

To turn off, hold the button down until both LED's are red, then wait until the left one turns off, then release.



click on the settings icon that looks like a gear and change the 'Streaming Interval' to more or less seconds.

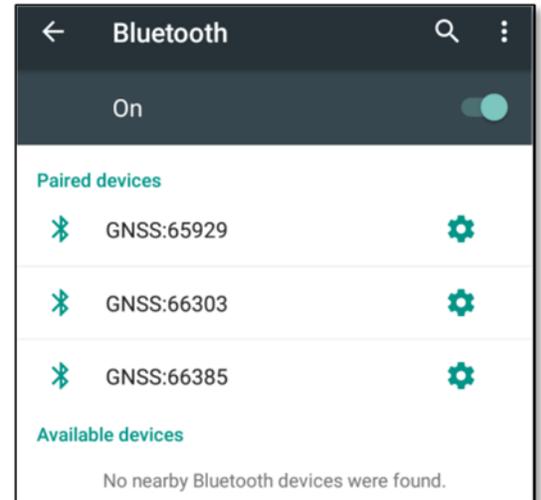
- If the satellite signal is not strong enough in order to log a position using the GNSS receiver, a position can still be manually logged by tapping the location of the feature on the basemap. This is obviously not as desirable a data collection method but is useful if efficiency takes precedence over accuracy. *Note that image basemaps in hilly terrain can often be locally inaccurate.* You can alter the accuracy requirement settings by clicking on the settings icon that looks like gear.
- The data you collected in the quad can be uploaded to AGOL by selecting the Sync option once you have finished with your data collection once you are back in WiFi range. *Note that a WiFi connection is required in order to Sync data collected in the quad to your AGOL profile and map service.*
- Survey the quad and collect as much data as you see fit. Once you have finished, close the map, sync your collected data with AGOL and then return to the lab or your workstation. Open up the **QuadDataFeatures** map in AGOL on your desktop. All of the data you collected should be present.

**Appendix: Reading GNSS Data from a Trimble R1**

The Trimble R1 receiver has a much better accuracy than your phone, to about a half meter under optimal conditions, and many tablets don't have built-in receivers and using the internal GPS can be a battery drain, so this is a good option. To use the R1, it will need to be charged, turned on, paired and connected for Bluetooth data; and you'll need the GNSS Status app (free app from Trimble) to access it.

**Start the R1 and pair it with the tablet using GNSS Status**

1. To turn on, push the button down until both LEDs are green – takes a second or two.
2. Wait a few seconds until the left LED is blinking blue and yellow; then you can initiate pairing from the R1 side by holding the button down for about 5 seconds, until the left LED is blinking blue only.  
*Note: it will blink red before getting to blue; keep holding until it blinks blue.*
3. From the settings on your phone or tablet, click on Bluetooth to see the list of paired devices. If the receiver you are using hasn't been paired before, pair it from the list of available devices.
4. Start GNSS Status. You'll see a screen that says **No receiver connected.**
5. **Select new receiver.**
6. You should see a code like "GNSS:nnnnn" with nnnnn being the R1 device number, like 66385. When you've identified the right receiver, click the plug icon  to connect. Make sure you're connecting to the right receiver if there's more than one around. We've labeled the units with their numbers. If your tablet has connected with receivers before, it will show some that are in memory, and these may not be the one you're using. *To disconnect with a receiver, click the connect icon again, turn off and then re-establish pairing on the R1, and then connect with that receiver.*
7. You should see a whirling circle while it's connecting. Once connected a display with the **Estimated Accuracy** will display. Initially you'll see a ? question mark, but this does mean that you have paired.
8. If you have an android device and are prompted to turn on the developer settings to allow mock locations, do so. This allows the external device's coordinate readings to take precedence over the internal GPS receiver's coordinates.



Using GNSS Status for more status information

GNSS Status is essential for connecting to the Trimble R1 units, and without it you can't connect to the receiver. It does not work with your internal GNSS of your phone, and other apps you might download don't access all of its data; they might pick up the GNSS coordinates, but they don't show satellite status or other information. Other things you can see with the app via its menu (either displays on the left on a horizontal tablet or can be accessed with the menu bars in the upper left) are:

- **Home:** What you've already seen – displays the accuracy of the receiver you're connected with, along with its id, battery level, and real-time setting (e.g. SBAS).
- **App Settings:** You can change the unit system to Metric or US.
- **Receiver Options:** Correction services you can install, for a fee.
- **Real-time Config:** Click EDIT to change to **SBAS** (recommended) to receive real-time differential correction.
- **NMEA Settings:** For connecting to various sensors. Research to learn more.
- **About:** for the software version.
- **Detailed Status:** Displays latitude, longitude and altitude (HAE) currently being received, more accuracy readings, which satellites are tracked or in use, and several other useful things.

