ENVIRONMENTAL FIELD INVENTORY MANUAL

DATA COLLECTION FOR MDT'S BIOLOGISTS

A SYSTEMATIC MANUAL FOR GPS DATA COLLECTION USING COLLECTOR FOR ARCGIS

Corey Richardson

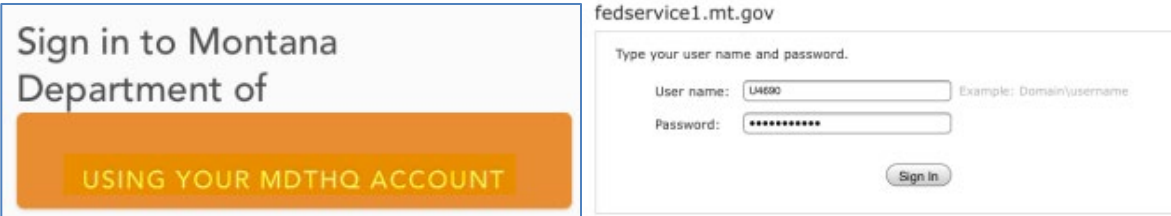MONTANA DEPARTMENT OF TRANSPORTATION 2701 Prospect Avenue, PO Box 201001, Helena, MT 59620-1001

This next portion must be completed with a Wi-Fi Connection

These steps will need to be completed in the office prior to going out in the field. You will use the **state's Wi-Fi MDT GUEST connection**. You will be working with an iPad Air Mini.

1. Turn on the iPad.
2. Clear all existing apps by double tapping the Home button, this will come in handy later.
3. Connect to the Wi-Fi Network.

    a. Go to the **Settings App** ⚙ > Choose **Wi-Fi** from the **Settings Menu**, verify the Wi-Fi is turned on > *Choose a network*: Tap on the desired network under the list of available Wi-Fi Networks.

        i. Use the **_MDTGuest_** Wi-Fi Network when at the Planning building.
            1. The password is ▇▇▇▇▇▇ .
            2. After selecting, wait for the **End User Agreement** to pop-up**.**
            3. **Accept** the End User Agreement.
            4. Open the **Chrome** app to verify you have an internet connection or to accept the End User Agreement.

4. Open the **Collector for ArcGIS** 📋 app on the iPad.
5. Login to your AGOL Account:

    a. Tap the **ArcGIS Online** button **>** Sign in with the ENTERPRISE ACCOUNT option.
    b. Next, type in '**mdt**' to complete the path '**mdt.maps.arcgis.com**'.
    c. Select '**USING YOUR MDTHQ ACCOUNT**'.
   d. Finally, sign in with your Windows user name and password:

    *e. If someone is already logged into the Collector app, make sure the data has been **SYNCED** and then follow the steps below:*

        i. Tap the ⬆️ **Action** button > tap **_Sign Out_** > When the "*Are you sure you want to sign out*" window appears > tap **Sign Out**.
        ii. Sign in using the steps above.

6. Download the data:
    a. The **All Maps** section of the application will open. A selection of maps will appear that are both owned by you and shared with you.
    b. Tap on **All Maps** > Choose **ENVIRONMENTAL** from the list of groups.
    c. You will now see 3 maps to download from: **MDT BIOLOGIST COLLECTOR - A, B, and C.**
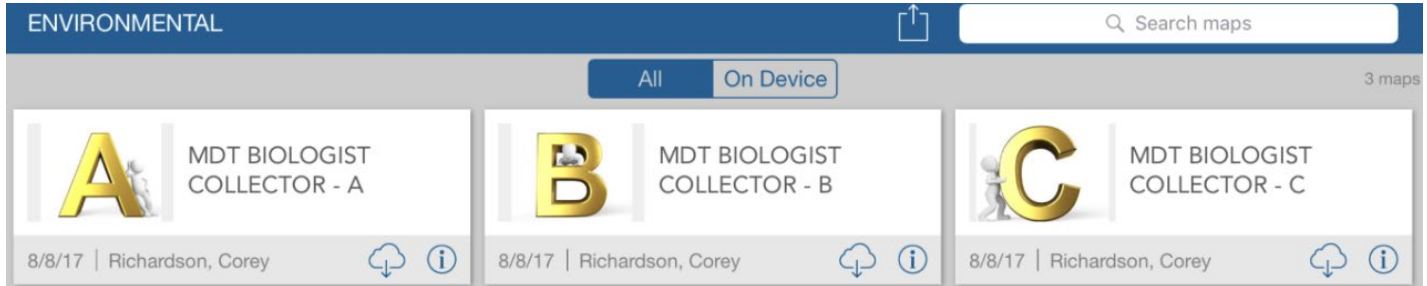
    d. Next, in order to download an area, tap the **Download** ☁ button.
        i. You have the opportunity to download 3 separate areas, before you go out in the field.

*If you see a cloud with two arrows ⟳, the app is remembering your downloaded map from the last time you signed in. You need to remove it before downloading a new one. Jump to step 6 and then return to 5c.

    e. **Choose Basemap** window will appear next; select **new Topographic**.
    f. **Choose your work area** window will appear. The *Work Area* is the area in which the fieldwork will be completed.
        i. Zoom in or out until the map is showing the detail you should work with in the field. **Make sure the entire Field Inventory Area exists within the defined work area box: you cannot collect data outside of your defied work area.**
        ii. Once you have the window centered over your work area, tap **DOWNLOAD**.
        iii. Depending upon the size of the area and the connection speed this could take some time to download (10+ minutes).
    g. The application will go back to **All Maps** and the status bar within **MDT BIOLOGIST COLLECTOR** item box will show *Downloaded xx/xx/xxxx*.

7. ***This section only applies if it looks like there is still data that should be synced on your device. If there is no data to be synced (red number near the cloud), proceed to step number 7.*** *If you have already completed a region of field inventory you will first need to delete the data that was previously downloaded. Be sure you have synced data and verified that the data exists in ArcGIS Online before moving on.*

    a. You will know that data needs to be deleted if you see the **Sync** ⟳ button in the bottom right of the item box. You will need to remove this map. You will need to download the map again with a newly defined work area.
    b. Tap the **Action menu** ⬆ in the upper right screen and choose **Manage** from the list.
    c. Tap **Remove** (red text) in the bottom right of the **Item Window** to remove this map.

i. The map item box will be removed.

ii. Tap **Done** in the upper right of the screen.

d. Use the steps above section 5 to download the new region data.

8. When the download is complete, tap on the **Item** to open the map. You will now be able to open this map without an internet connection, because you have taken it 'offline'.

a. Double check that the map has loaded correctly: First turn off your Wi-Fi connection.

b. Things to check:

i. Editable features that are loaded: Point, Line, and Area.

ii. If you see these layers above, then the correct map is loaded.

CONNECTING TO THE GPS RECEIVER

1. **Turn on** the **Trimble R1 GPS Receiver** (hold the button for 3 seconds).

2. Use the image below to pair the GPS with the iPad.

3. After GPS unit is turned on, make sure you hold the button until you have seen **4 flashing blue lights** and then release. The GPS unit is now in pairing mode.

4. Check to see that the Bluetooth is enabled on the iPad mini and paired to the GPS Device.

a. Open the **Settings** app   > Choose **Bluetooth** from the **Settings Menu.**

i. Verify that the Bluetooth is turned on.

b. Under the **My Devices** menu, find the GPS device you want to use and tap on the name of the device. Choose the GPS device you are trying to pair with (i.e. GNSS:53495).

5. Close the **Settings** app.

If the GPS is no longer paired with the iPad (i.e. you don't see a solid green light). Repeat pairing process.

1. Next, you will need to verify your accuracy within the GNSS Status app.
   a. Select the GNSS Status app from the home screen.
   b. On the bottom of the screen, choose '**Select New Receiver**.'
   c. The GPS receiver in which you are now paired to should appear (i.e. 53495).
   d. Within a minute or two (while standing outside) you should watch your accuracy drop from feet to inches on the Home screen within the app. (Note – it generally levels off at **18 inches**).
   e. Ensure **SBAS** is turned on.
2. Hit the Home button to return to the Home screen and select the Collector app to jump back into Collector.
3. Once you open the Collector app, select the GPS compass near the top left.
4. If the external receiver location box in the bottom left doesn't appear, follow these steps below:

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TROUBLESHOOTING THE EXTERNAL RECEIVER

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   a. Hit the Home button to return to the Home screen.
      i. Double tap the Home button and clear all apps.
   b. Return to Collector.
   c. From the map view in Collector, select 'Maps' in the top left.
   d. Click on the box with an arrow
   e. Select 'Settings', select 'Provider'.
   f. If the Trimble receiver is currently selected, switch it back to the Integrated Receiver.
      i. Make sure the blue check is now on the Integrated Receiver.
      ii. Select 'Settings' again to go back, then 'Done'.
   g. Return to the **FIELD INVENTORY – 2017** map.
   h. Select the GPS compass again .
   i. A green box in the lower left should now appear.
      i. When using the integrated GPS, the accuracy should level off at 16.4 ft.
5. Now that we have ensured that the Collector app is working correctly with the Integrated Receiver, we will switch back to the Trimble.
   a. Repeat Step 8 again, but select the Trimble in use and not the Integrated when choosing the Provider.
   b. **NOTE – You might have to give the Trimble a little time to find itself in the world before the accuracy appears in the bottom left. The accuracy should level off at 18 inches or so.**
   c. **Call Corey with any problems 406-444-6404 or 802-535-5878.**

Collecting a Point

1. When you arrive at the desired location to collect data.
2. Open the Collector app and open the **MDT BIOLOGIST COLLECTOR – A (B, OR C) map**.
3. Tap on the **My Location** ⊕ button; this will pan and center the map to your location.
   a. This icon shows a filled circle when turned on; once you turn it on, it will stay on.
4. Tap the ＋ icon on the right hand side of the app to expand the **Collect a New Feature** menu.
   a. Choose the point data layer to collect from the menu.
5. First, set the **Collection Settings:**
   a. Tap **Collection Settings** button ⚙ in the left corner of the app.
   b. Under the *Collect Settings* window use the slider to set the following parameters:
      i. Required Accuracy: **30 ft.**
      ii. Streaming Interval: **2 sec (Not as critical for point collecting, but line collection definitely needs to have this selected).**
      iii. Tap **Save**
      iv. *You should only have to do this once per layer, but for each new downloaded area.*
   c. If you get a *Poor Location Accuracy* error window and are not able to collect a point because the GPS cannot get the require accuracy set.
      i. First, check to see that the external receiver is still flashing **Yellow** to ensure that you are connected via Bluetooth. If not, **reconnect** to the receiver.
      ii. Tap **Retry** and wait a few minutes for a better signal.
         1. If this does not work and you receive the *Poor Location Accuracy* error window again, Change the Settings to: ***Required Accuracy: 40 ft.***
      iii. Remember to reset these settings for the next point.
6. Tap the **Use my location** 📷 to collect a point.
7. Fill in all the attribute information in the **Details Form** (right side of the screen) for the data being collected.
8. Capture pictures for the point by tapping the **Attachments** 📷 button.
   a. The *Attachments* window will open. Tap **Add**
      i. Choose **Take Photo or Video.**
         1. Tap **Use Photo** or Retake the photo.
      ii. Repeat the process to add more attachments (pictures).
      iii. When finished, tap **Done**.
9. Tap Submit.
10. Check your data: is it in the right location, do your pictures look good?

11. **What to do if you have collected a point in the wrong layer:**
    a. Hit the **Cancel** button on the iPad to exit the point capture dialog.
    b. A *Discard collection?* window will appear, tap **Discard**.

Collecting a Line

1. At the location where you want to start the collection tap on the Zoom to Location ⊙ button.

2. Select the '+' symbol to expand the **Collect New** menu > Choose the **Line** layer to collect.

3. Tap the **Settings** button ⚙ 🖱 and choose **Collect Settings** from the menu.
   a. Under the *Collect Settings* window use the slider to set the following parameters:
      i. Required Accuracy: **30 ft**
      ii. Streaming Interval: **2 sec**
   b. Tap **Ok**.
      i. *You should only have to do this once per layer, but for each new downloaded area.*

4. Fill in all the attribute information in the **Details Form** for the Route being collected.
   a. Populate fields as appropriate.

5. Collect the line data:

   a. Automatically start collecting the Route by tapping the **Start Streaming** START STREAMING button to use the GPS to collect your new route.
   b. Walk the line feature.
   c. After stopping at the desired end location tap the **Pause Streaming** button and the line will be paused.
   d. Verify that the line has been collected with the appropriate fields entered and then hit **Submit.**

6. Click Submit.

7. **What to do if you have collected a line in error**:
   a. To Delete the line captured and start over, hit the **Cancel** button.
   b. If you started to collect a line and you do not want to, tap the iPad **Cancel** button to exit the line edit session.
      i. A *Discard collection?* window will appear, tap **Discard**.

Collecting an Area

1. Use the Process above for Starting and Ending Streaming.

   a. However for Collecting an Area, when you select 'End Streaming', the area boundary will snap to your starting point to complete the perimeter.

Editing the Data

1. Tap on a feature in the map. A list of selected features will appear in the menu.
2. Within the *Features List*, tap on feature to be edited; a grey triangle will appear in the upper right corner of the selected feature.

3. Click the **Action** button 🖱 and a menu will appear with options for editing, viewing, copying, or identifying.
4. Choose **Edit** to edit a feature: location, add an attachment, or edit the attributes.
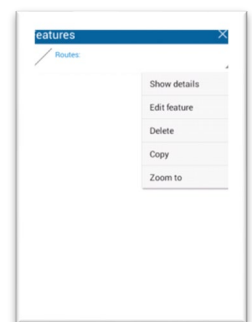
  a. **CAUTION: If editing the attributes of a line, be sure not to change the line work.**
    i. **If you do change the geometry of a line by accident, select Cancel in the top left corner and start over.**
  b. Tap **Update** when done making an edit.

AT THE END OF THE DAY - SYNCING DATA

1. You will need to Sync the data with the cloud when you are finished with data collection for the day, have a least **45% battery or a charge**, and you have a Wi-Fi Connection.
2. Open the Collector App.
3. Tap the clip board icon in the upper left corner of the screen.
4. Choose All Maps
5. Find the map with the correct area you collected in (i.e. A, B, or C).
6. You will see the number of feature you have collected in Red.
7. Tap Sync within the item box.
  a. You will see a status bar appear and the data will start syncing. The time to fully sync will depend upon the internet connection and amount of edits (and attachments) being pushed to AGOL.
8. **IMPORTANT**:
  a. Try to sync on a nightly basis.
  b. Charge all devices on a nightly basis.

TROUBLESHOOTING:

The Collector App seems to be stuck on 'Loading'.

- If you are attempting to complete a task that requires internet access, verify that you have a Wi-Fi Connection.
- **Close** the App by quickly double tapping the home button. **Swipe the app up** to close the app.
- **Open** the Collector app again.

"Unfortunately Collector App has stopped" message appears and the Collector app stops.

8. Tap **Ok** and then **close** the Collector App.
9. **Open** the Collector App. If you were in the middle of data collection, verify that the data was collected was collected, you might have to recollect.

The Collector App closes during collection

- Tap on the Collector app to open it again.
- Verify the data you were collecting is there, if not, recollect.

If you get a "*Poor Location Accuracy*" error window and are not able to collect a point because the GPS cannot get the require accuracy set.

10. Verify the GPS is turned on and paired to the iPad.
11. Tap **Retry** and wait a few minutes for a better signal.
  a. If this does not work and you receive the *Poor Location Accuracy* error window again, Change the Settings to: ***Required Accuracy: 30 ft.***

Check the battery life on the GPS Unit – this must be completed when the iPad is paired to the GPS Unit.

- Open the **GNSS Status App**
- Tap **Home** on the Menu
  - The battery life will show up in the bottom left circle in the window.

Cannot get a GPS Signal

- Verify that the GPS is turned on.
- Verify the GPS is paired to the iPad

How do I save the data collected or edited?

- As soon as you hit the **Done** button the data has been saved, essentially Done is the equivalent to Save. However, the data is only saved on the mobile iPad and in order to save it to ArcGIS Online, you will need to Sync the map.

Call Corey with any other questions 406-444-6404 or 802-535-5878.