Creating a Georeferenced PDF with QGIS for Use in the Avenza Maps App

AVENZA MAPS QGIS

UConn CLEAR's Geospatial Training Program's
Introduction to GPS Mapping with Avenza Map
Link to Digital Tutorials: https://s.uconn.edu/geoPDFavenza
Resources and Links https://clear.uconn.edu/geospatial/avenzamaps/

Download QGIS on a desktop computer

Download the Avenza Maps App for iOS or Android

Creating a Georeferenced PDF Using QGIS

Getting Started

Open QGIS
Start a new project from the **Project** dropdown menu. Select **new.**

Optional: Add a Basemap
Add the QuickMapServices Plugin from the Plugin Manager
1. Click **Plugins** from the main header menu **> Manage and Install Plugins**…
2. Search for **QuickMapServices** in the Plugin Manager
3. Click **Install Plugin** and close the Plugin Manager

Access the QuickMapServices Plugin
4. Click on **Web** from the main header menu, Hover over QuickMapServices and click on **Search QSM**
5. In the Search QMS window, type in the name of a basemap (Google Maps, Bing Maps, Open Street Map, Topo…). Results will appear in the window below.
6. Click **Add** next to the map service name to add it to the Layers window.

Add Statewide Data Layers from CT ECO

Open CT ECO in a browser tab
Go to https://cteco.uconn.edu in a web browser on your computer.

Find a Map Service
From the CT ECO home page, click on Map Services, or go to https://cteco.uconn.edu/map-services

Map and Image services are available for many statewide geographic datasets through CT ECO. These allow you to connect to the data layers in QGIS and other mapping software through an internet connection.

1. Scroll down to the heading titled **Aerial Imagery**
2. Expand the subheading, **Imagery – Spring Statewide**
3. Expand the subheading, **2019 Spring 4 band, 6 inch** (or choose the date you are most interested in)
4. **Find and copy the server URL** for the cached image service (https://cteco.uconn.edu/ctraster/rest/services/images/Ortho_2019_tiled/ImageServer)
5. Return to QGIS

Add an ArcGIS REST Service to QGIS

In QGIS
1. In the **Browser** window in QGIS, right click on **ArcGIS REST Server** and select **New Connection**
2. In the **New Connection** window, paste the CT ECO service URL in the box under **Connection Details**.
3. Give the service an appropriate name. Click OK.
4. In the **Browser** window in QGIS, find **ArcGIS REST Servers** again and click on the **small arrow** to expand the contents. You should now see your new service listed.
5. Expand the service by again clicking on the **small arrow** next to the service name. You should see the contents of the service listed.
6. In the Browser window by clicking the **right facing arrow** (see image below).
7. Click on the image name, in this example, "images/Ortho_2019_tiled" and **drag and drop it** into the **Layers** window directly below to add the image to your QGIS map.
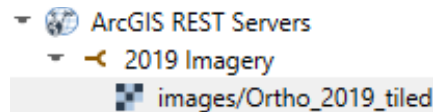
Add Another
8. Return to the CT ECO map and image services webpage and locate the **Parcels** map services
9. Expand the **CT Parcels (2023 data collect)** subheading
10. **Copy the server URL** for the feature service – **everything EXCEPT the "/0" at the end of the service!**

    https://services3.arcgis.com/3FL1kr7L4LvwA2Kb/ArcGIS/rest/services/Connecticut_State_Parcel_Layer_2023/FeatureServer


11. Return to QGIS. Right click on **ArcGIS REST Server** and select **New Connection**.

UCONN | COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES
EXTENSION

CLEAR
Center for Land Use Education & Research

12. In the **New Connection** window, paste the CT ECO service URL in the box under **Connection Details**. Give the service an appropriate name. Click OK to add the new server.
13. Expand the service name under **ArcGIS REST Servers** until you see **CT_Parcels**. Click on it and drag and drop it into the Layers window ABOVE any basemap or imagery dataset you currently have in your map. See note about layer order below.
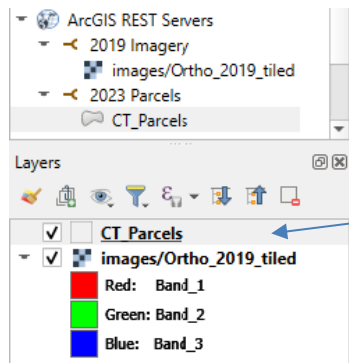
Layer order matters! Layers listed on the bottom of the list will draw below layers listed above them. Click, hold, and drag to reorder layers. In this example, be sure CT_Parcels is listed above the Ortho image or you will not see the layer on your map!

Change the Symbology

Open Layer Properties
1. From the Layer List, identify the layer you wish to change the symbology for. In this case, CT_Parcels.
2. Right-click on the CT_Parcel layer name and select **Properties** from the menu.
3. In the **Layer Properties** window you will see many layer options. Be sure **Symbology** is selected on the left. You will see options for changing the symbol style on the right. Select a style that you will be able to see better, like the red outline. You can select or modify the outline color by using the color selector. Click ok.

Create a Layout

New Print Layout
1. From the **Project** dropdown menu, select **New Print Layout.**
2. Give the print layout a name, click OK. The print layout will open in a new window.
3. Items are added to the print layout from the **Add Item** menu at the top of the print layout.

Add a Map
4. Click **Add Item** and select **Add Map**.
5. When you hover over the print layout page, your cursor will change to a cross hair. Hover over the top left corner, click and drag to define the extent of your map on the layout. When you are satisfied, release the mouse button. The map will be rendered on the layout page.
6. The map can be moved or resized by click on the position anchors in the corners of the map. Be sure the map takes up most of your map layout page.

Add Additional Map Elements
7. Click **Add Item** and add a **legend, scale bar, north arrow**, etc. to your map.
8. Each element can be modified by right clicking on it and selecting **Item Properties**.

Export to Georeferenced PDF

Export the Print Layout

1. From the **Project** dropdown menu, select **Export as PDF.**
2. Navigate to the folder location where you would like to save the PDF and give it a name.
3. Click Save. A **PDF Export Options** window will appear.
4. <u>**Check the box**</u> next to **Create Geospatial PDF (GeoPDF).** This will enable other options below.
5. Under **Layer Structure** check only the necessary layers (imagery and CT_parcels). **Uncheck the box** next to **Include Attributes**.
6. Click Save.
7. Your georeferenced PDF map is now ready to be viewed or used in another program.

Importing a Georeferenced PDF into Avenza Maps

Before You Start

Create a Georeferenced PDF map

Before starting this tutorial, be sure to complete the first step, creating a georeferenced PDF using QGIS. Alternatively, you may have a GeoPDF that you have downloaded from another source.

Save the Georeferenced PDF to Your Device

Before starting this tutorial, be sure to save the GeoPDF to your mobile device. The file can be emailed to you, airdropped/shared, or saved on an online drive (onedrive, google drive, dropbox, etc.) that is accessible from your device.

Import to Avenza Maps

My Maps

1. In the Avenza Maps app, go to the **My Maps tab**
2. Click on the **+ button** at the top (iOS) or **big red +** (Android) and select **Import Maps**.
3. In the **Import Map** window, navigate to the location where you have saved your georeferenced PDF map.
4. Select the georeferenced PDF file and click open.
5. The file will be downloaded to your device and add it to your Aveza My Maps library.

Avenza Maps My Maps

My Maps

1. Your newly imported georeferenced PDF will be available in the Aveza My Maps library.
2. From the My Maps tab, click on the file name. It will open in the Map Viewer. If you are currently located at the same geographic location that the map covers, you will see your current position on the map as a blue dot.

Collect GPS Data

Start Tracking

Now you are ready to use Avenza Maps to collect GPS data using the georeferenced PDF as a reference layer. The following instructions provide basic guidance about collecting data using the app.

1. While in the map view, **swipe up from the bottom** to see the options of Location, Tracking, Navigation
2. Select **Tracking**
3. Click the **Start Tracking** button. Start walking.

Collect Points

Either

A. Take a photo of a point of interest. Repeat.
   NOTE: geolocated photos must be enabled on your phone.

OR

B. Use the Placemark icon to capture a point. Repeat.
   Optional. Give the point a name, description, and/or add a photo.

Stop Tracking

1. Swipe up from the bottom and **Stop.**

Export GPS Data

Navigate to the Map Layers menu or the Layers tab:

Android

1. Tap 🟠 and select **Export Map Features**

iOS

1. Tap 📤 and choose **Export to Others**.
2. Rename the file to be something meaningful. Keep it as a KML so that photos are included.
   NOTE: There is an option to change file format (KML, CSV, GPX). Keep KML.
   CAUTION: Notice the Image size settings and the choices of small, medium, large. Image sizes can add up quickly. Choose small if possible.
3. Choose how to export the file. If it is small enough for email, that is often preferable. Note that photos are what makes files large (use sparingly and/or choose small image size). For larger files, cloud drives like Google Drive and One Drive work well. Click Export.

Important! When you export data from Avenza Maps you are ONLY exporting the GPS data – Not an updated version of the Georeferenced PDF map. If you wanted to show your GPS data along with the georeferenced PDF, you will need to add the GPS data layer to QGIS and export an updated version of the map!

For more information and the Avenza Maps App, resources, links, UConn CLEAR Training, and more, visit the workshop web page https://clear.uconn.edu/geospatial/avenzamaps/.

Cary Chadwick, cary.chadwick@uconn.edu
Emily Wilson, emily.wilson@uconn.edu

UCONN | COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES
EXTENSION

CLEAR
Center for Land Use Education & Research