Geospatial PDF
How To

Description
This lesson is intended to give the GIS Specialist (GISS) guidance in creating a geospatial PDF using either Esri's ArcMap or ArcGIS Pro. The geospatial PDF should be compressed before being loaded into the Avenza Maps app for use on the fireline.

Target Audience - GIS Specialists / GIS Specialist Trainees

Objective
Detail the method of work commonly used to create and compress geospatial PDFs for use in the Avenza Maps app.

GSTOP Reference: Chapter 6, *Map Products*

Method of Work:

1. Operational needs will dictate the type of geospatial PDF to be created. Once that determination is made, decide on the basemap that best suits that type of map. For example, an IAP map will require topography, while a transportation will need a roads layer. Aerial imagery can also be very beneficial for some maps.
2. The appropriate map scale for use on a mobile device also needs to be determined. Typical topo maps should be at 1:24k; aerial imagery may be 1:8 to 12k; and the travel map may be 1:50 to 100k. Focus on the map scale that the end user needs to do their job. Since this is a PDF the user will not be able to "zoom" in and get additional information. They will only be able to see what is displayed in the map, so the scale needs to be appropriate.
3. The next consideration is the "page size". Since the map is designed for Avenza and not being printed, you do not need to adhere to a standard size and are not constrained to ANSI E or 11"x17" pages. Rather than paper size, the "page size" is determined by the area of interest and ArcMap/Pro allows you to set a custom page size to cover the area that you need. There is a tradeoff between page size, scale, and output file size, so be sure to keep that in mind during this process.
4. The map needs to have all of the standard map elements (STANDL SGD), however with a few modifications. The title, legend, etc. need to be legible, but they don't have to be large enough for someone to read at a certain distance. In addition, you should try to minimize the amount of white space around the borders.
5. Once you get your map set up the way you would like, follow the directions for either ArcMap or ArcGIS Pro (depending on what you are using) to export a geospatial PDF.

ArcMap

1. Go to **File → Export Map…**
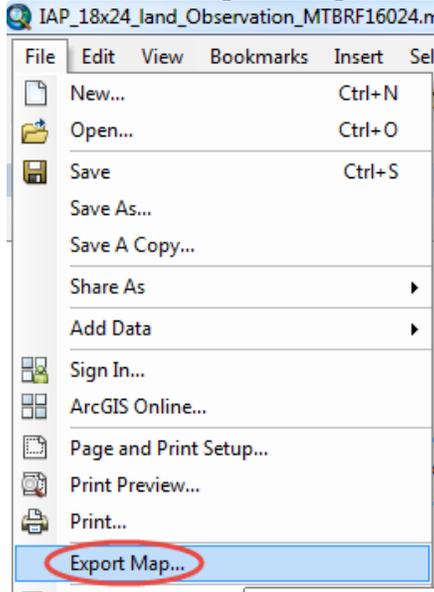
2. In the Export Map window, save your map in the appropriate folder and name it using the GSTOP naming conventions. Next to **Save as type**, select **PDF**. In the **General Tab**, for **Resolution**, choose **300 dpi**, which is the default resolution for vector export formats. Also, confirm that the **Output Image Quality (Resample Ratio)** is set to **"Best"** and the Ratio is **1:1**; this controls the amount of raster resampling and anything less than 1:1 and the topo lines may appear grainy and unreadable.
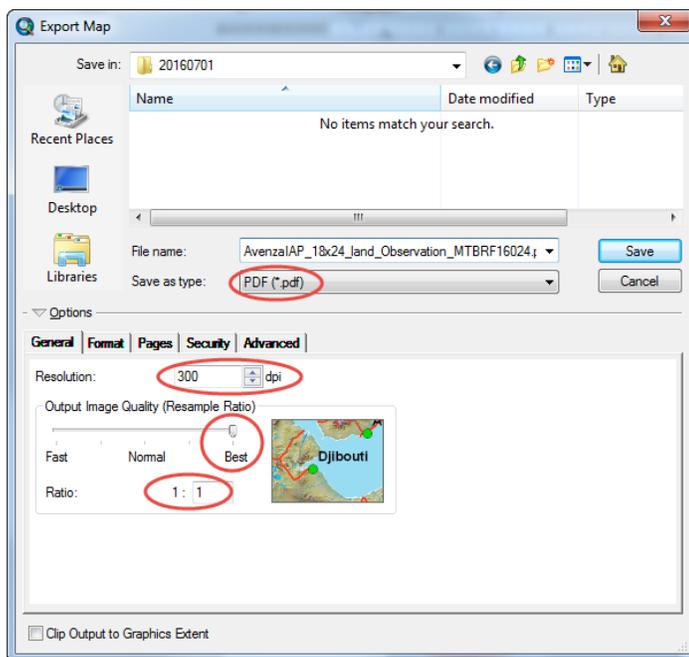
3. On the **Format Tab**, confirm that the **Destination Colorspace** is set to **RGB**. This is the default and is suitable for on-screen viewing. Check **Compress Vector Graphics** to compress the vector portions of the PDF in order to create a smaller output file. The **Image Compression** option is used for compressing raster portions of the PDF. The **Adaptive** mode produces the smallest file size, but there may produce some "compression artifacts" on the export image. Therefore, it is advised to always look over your output PDF carefully before using it. Finally check the box for **Embed All Document Fonts**. This includes the fonts used within the document itself so that the PDF looks the same no matter if the device viewing the output PDF has those specific fonts installed or not.
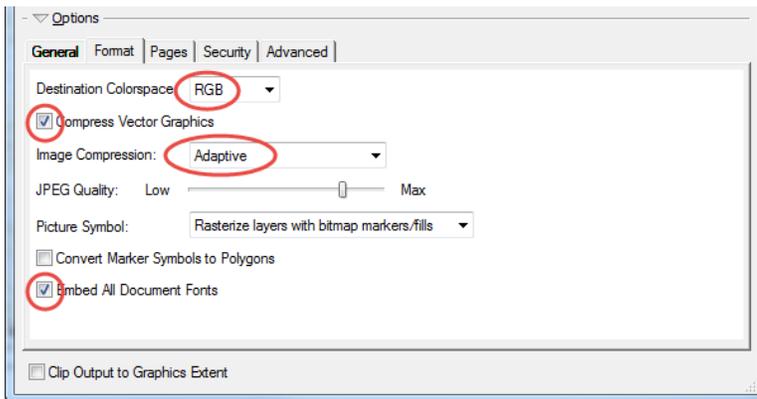

4. On the **Advanced tab**, you have the option of enabling the **Layers and Feature Attributes** in the PDF export. The Layers may be beneficial in some PDF viewing applications, but it is not advised to export the attributes as it can lead to performance issues in compatible PDF viewers. Select either **None** or **Export PDF Layers Only**. Last, and most critical, be sure to check **Export Map Georeference Information** which records the data frame's georeference information inside the PDF. Click **Save** to create the geospatial PDF.
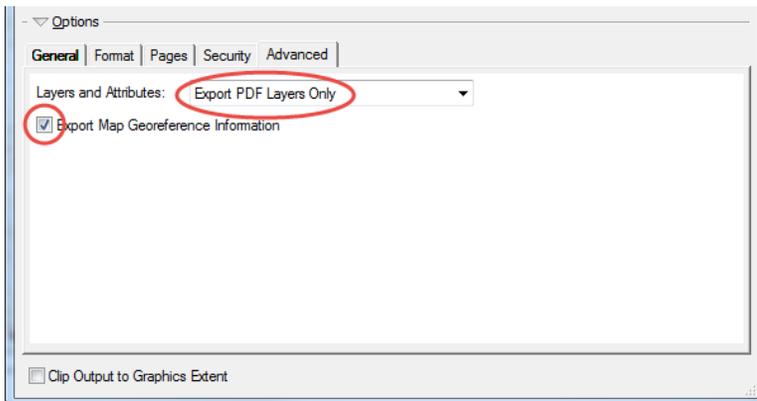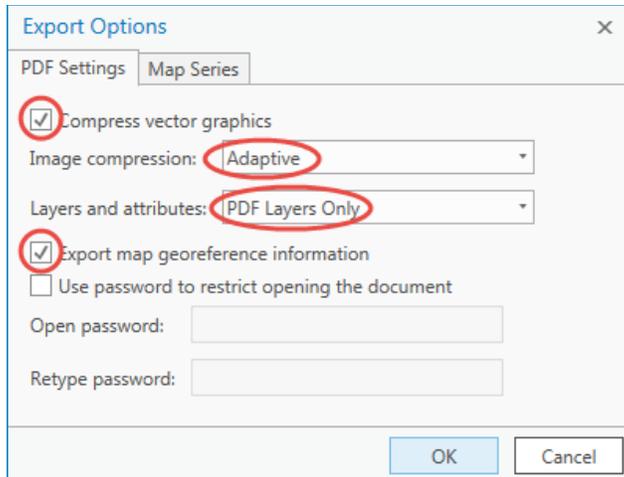
ArcGIS Pro

1. Make sure that the map or layout is the active view and then click on the **Share tab** → then in the **Export Group** → click **"Map"** or **"Layout"** (Depending on the active view)
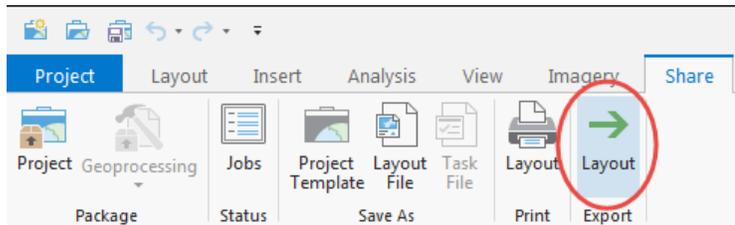
2. In the Export Layout window, navigate to the appropriate folder and name it using the GSTOP naming conventions. Click **Save as type** and choose PDF. The option descriptions are similar to those found in ArcMap. Type **300** for the **Resolution (DPI),** check to box next to **Embed** Fonts, and select **Best** for **Image Quality**.
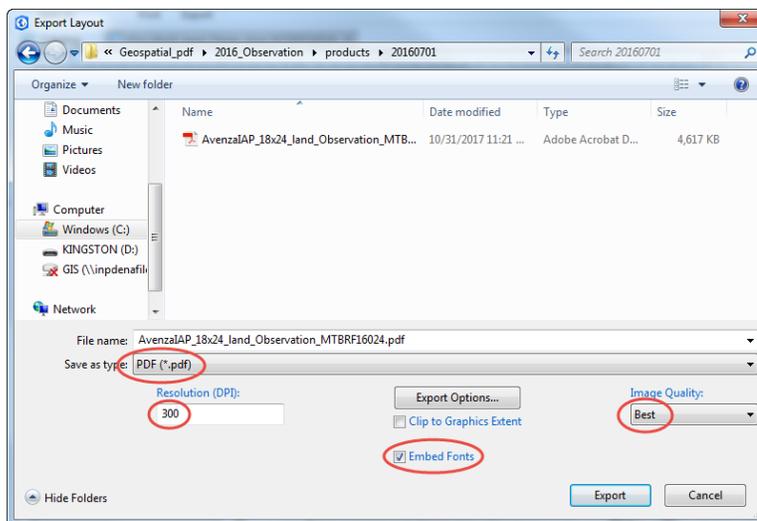
3. Next, click the **Export Options** button. In the Export Options window, confirm the box next to **Compress vector graphics** is checked. Choose **Adaptive** for **Image Compression**. For **Layers and attributes**, choose either **None** or **PDF Layers Only**. Finally, check the box next to **Export map georeferenced information**. Click **OK** and then click **Export** to create the geospatial PDF.

6. Once the geospatial PDF is created (by using either ArcMap or ArcGIS Pro), you will need to compress the file. This is important to do when sharing the file and makes installing the PDF onto mobile devices much faster. To do this, you can use either Adobe Acrobat Pro (if it is installed on your computer), or a free online compression tool such as https://smallpdf.com/ . Simply upload the geospatial PDF to the site, and then download the newly created compressed PDF. Compressing the PDF can reduce the file size by nearly 50%. Use the GSTOP naming convention and move the geospatial PDF to the appropriate file.
7. Finally, upload the geospatial PDF to a mobile device and open using the Avenza Maps App to test the appearance and functionality. It may take several attempts to get the correct balance of page size, scale, and output settings.