Creating PDF Files from ArcView Projects

Why PDF?

For hours you toil with [ArcView](#), working to create perfect map to illustrate your project. Finally, you declare victory, and you want to share the fruit of your efforts with others. Traditionally, you would print or plot a map on paper, and this is still the best solution under many circumstances. These days, however, demand has risen for providing maps in electronic form, either on the Internet or on portable storage media (e.g., a floppy disk or Zip disk). If the intended recipient has both access to the data in your themes and the ArcView program (e.g., your colleagues here at [MIT](#)), then you might provide them with your ArcView project (.apr) file. In the world at large, however, neither of these assumptions hold; many people do not have ArcView available, and most will not have access to your data files. What to do?

One option is to make an image file of your map in one of the common formats, e.g., [GIF](#), [JPEG](#), or [TIFF](#). GIF and JPEG files are particularly well suited to the web. Unfortunately, web browsers have been slow to add native support for TIFF files, although the [Apple QuickTime](#) plugins for web browsers quietly add this capability. While such images have their place--they are usually fairly compact and thus quick to download, plus are natively supported by popular web browsers--they do have their limitations. Because the resolution of the image is fixed at the time it is created, the image may appear too small or too large on the screen depending on the resolution of the user's display. Simple tools to magnify the image may make it easier to see, but will create an unattractive "pixelizing" effect. Printouts on high-resolution laser printers are likely to be disappointing.

These are the problems that the Portable Document Format ([PDF](#)) is meant to solve. Developed by [Adobe](#), PDF is an offshoot of their most popular creation, [PostScript](#), a page description language that drives many popular laser printers, including those on [Athena](#). PDF files contain, in compressed form, the commands needed to display your document, rather than simply an image of the document. Hence, it is possible to adjust the level of detail to the current display or printer. It is also possible to zoom in and out when viewing a PDF document, a feature that adds a bit of GIS-style functionality to your product. While the [Adobe Acrobat Reader](#) is usually needed to view the files, it is free and available for Windows, MacOS, and popular Unix platforms. The same file can be read on any platform; hence, your PDF file will enjoy a high level of cross-platform interoperability. The Acrobat Reader includes a plugin for the [Netscape](#) and [Internet Explorer](#) web browsers that allow PDF files to be viewed directly within the browser. Hence, PDF files are also a good choice for providing high-resolution documents on the Internet. When printed, the documents will appear at the maximum resolution permitted by the printer settings.

Here are a couple of examples of PDF files showing maps created in ArcView:

- Boston and Surrounding Census Tracts*
- Codman Square land use*

* Refer back to the Lab section.

Creating PDF Files in ArcView

Now that you're sold on the virtues of PDF files, how do you make them? As mentioned earlier, PDF is a descendant of PostScript, and tools are available to convert PostScript files (which ArcView generates directly) to PDF. The typical procedure is to create a PostScript file in ArcView, then convert it to PDF using another tool.

First, make sure you've created an ArcView "layout" to format your page. Using a layout will give you the most control over the size of the page and the size of the objects on it. Note that a standard 8.5-inch by 11-inch letter-size page may not be the best choice for web display, since many users' displays will lack the screen real estate to display the entire page, even in landscape mode. You'll also need to allow room for the toolbars and menus in the web browser. The Acrobat plug-in will shrink the size of the image to fit in the browser window, but this may not yield desirable results. On the other hand, since you can zoom into a PDF file, having the image appear at reduced size initially may work well for your application, and a 8.5"x11" page size will allow users to print your image easily on a letter-size page. You may need to experiment to obtain the best results.

Next, generate a PostScript file in ArcView. You can have two options. The first--and recommended--choice is to use the menu item **File | Export**, as shown below:
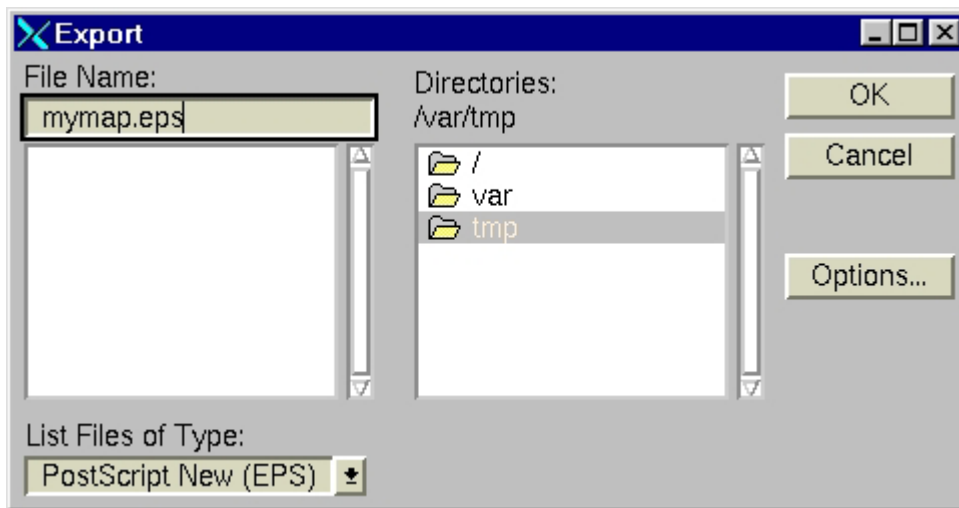

Typically, you will want to use the file type 'PostScript New (EPS)' as shown above; this choice is the default. Make sure to click on the **Options** button and select an appropriate resolution (e.g., 600). Note that you can type a resolution in as well as select from the drop-down list.

The second, less-preferred option is to use the menu item **File | Print** and print to a file. On a Unix system, the window will look like this:
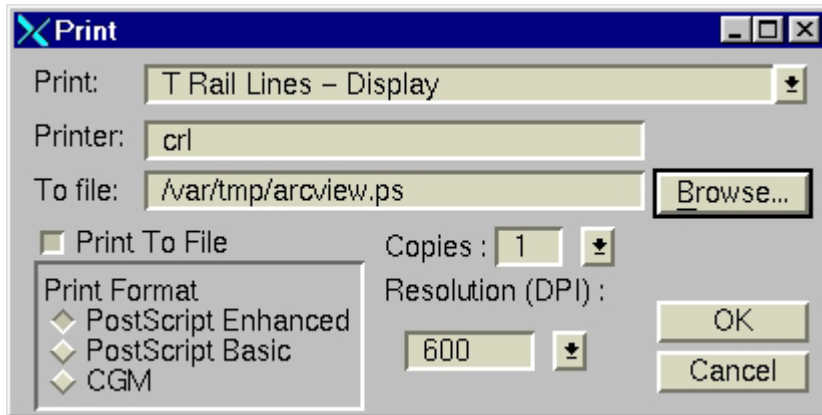
On a Windows system, the window will look like this:
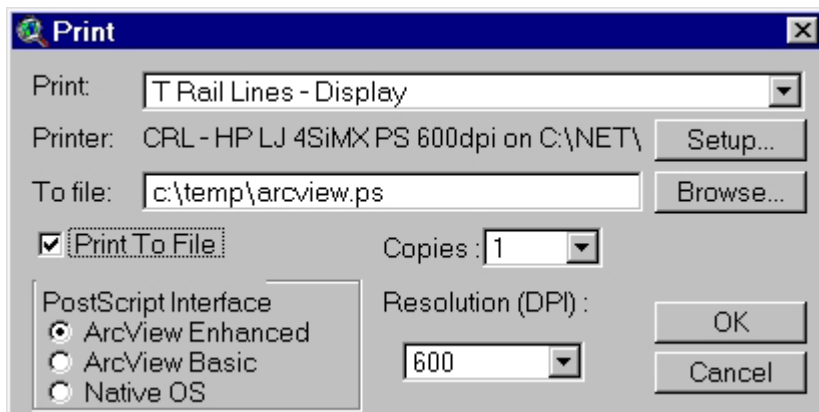
On either platform, you will want to select the "Enhanced" option.

In all the examples above, the PostScript file was saved to a directory on the local disk; /var/tmp for Unix, C:\TEMP for Windows. Since PostScript files for complicated layouts can grow large, saving to the local disk will save time. You may have to go through several iterations of generating these files. You should, however, preserve your final product. *Remember to save your final files (.ps, .eps, .pdf) on the network or on a removeable (floppy or Zip) disk when you are done. Files on the local disks may **disappear** without warning!*

Now we need to convert the file to a PDF. On Athena Sun workstations (but not SGI's), we can use the **distill** program in the **acro** locker. To convert the file /var/tmp/myfile.eps, use the following commands:

```
cd /var/tmp
add acro
distill myfile.eps
```

If you are prompted about compatibility with older versions of Acrobat, select option 1 to enable the Acrobat 3.0 features; relatively few people should be still using Acrobat 2.x by now. You'll then see output similar to that below:

```
Distilling myfile.eps (164,225 bytes)
1.3 seconds (0:01)    164,225 bytes PS  =>  39,215 bytes PDF  (24%)
```
Notice that the PDF file is much smaller than the original PostScript file. This is one of the benefits of PDF. To view the result, use the following command:
```
acroread myfile.pdf &
```
Note that with the proper software installed, it may be possible to use a program's Print command to create a PDF file directly. If this software is available, it will probably be easier to create the PDF file this way than using the instructions above. This capability is *not* available on Athena.

You may find software to distill PostScript files to PDF files on Windows PCs, but don't count on it. You can save files in the **crlbucket** locker, mounted as drive X:, to save files from a PC in a place where Athena can find it. On Athena, you can "attach crlbucket" to make /mit/crlbucket available. The directory /mit/crlbucket is equivalent to drive X:.

Common Problems

We have encountered two consistent problems with generating PDF files from ArcView, both in Windows and Unix:

1. The colors in the resulting PDF file may be very different from those in the original file;
2. Layouts in landscape format end up oriented sideways in the PDF file.

Fortunately, each of these problems has a fix:

- Using GhostView instead of Acrobat Distiller to create PDF files fixes the color problems.
- Using Acrobat Exchange on an existing PDF file allows you to rotate it.

The instructions below give the details. I've geared this primarily towards Unix, with some Windows information where available.

1. **Generate good PostScript.** In ArcView, use the File/Export menu item (rather than printing to a file) and use the **PostScript New (EPS)** option. The standard 'PostScript' option does not produce as accurate a rendition of what you see on the screen (what-you-see is NOT what-you-get), plus the file it produces is an order of magnitude bigger. For a PDF viewed through a web page, letter size is a good choice for page size. These instructions have only been tested with letter-size layouts.

   If this doesn't work, try the other PostScript formats first. If this still fails, then try printing to a file in various PostScript formats, starting with 'PostScript New'. Unfortunately, this is a trial-and-error process. Keep experimenting until something works.

2. **Create a PDF file using Ghostscript.** The **gsdistill** command uses [Ghostscript](), a freeware PostScript interpreter, rather than Adobe Acrobat Distiller to create a PDF. PDF files created with Ghostscript will preserve the colors, but the orientation will be wrong for landscape layouts; we'll fix that in the next step if necessary. To invoke 'gsdistill', use the Athena commands:

```
add crlbin
gsdistill file.eps
```

The 'gsdistill' script will produce a file called 'file.pdf'. You can specify multiple files on the command line. You can also add optional Ghostscript arguments before the file if you really know what you're doing; I don't recommend this, but I mention it for completeness. This command should work both on the Sun and SGI.

In Windows, you can use GSView (in the "GS Tools" folder in the Start menu) to invoke Ghostscript. (If the GS Tools are not installed, you can [download](#) and install them.) If GSView asks you to configure it when it opens the first time, just accept all the defaults. You can then open your PostScript file from the File/Open menu. After a pause, your PostScript file should be displayed in the window. Once the file is displayed, you can "Print" it to a PDF file; GSView performs file conversions as "printing." After you select File/Print, you will see a "Printer Setup" window. Choose the following:

For "Device" pick "pdfwrite"
For "Resolution" pick "300"
Check "Print to File"
Uncheck "PostScript Printer"

With these options set, you can press the "Ok" button. You'll be prompted for the name of an output file, which you should give a PDF extension.

Rotate the PDF file in Acrobat Exchange if necessary. If you find that your image appears sideways in your PDF file, you can fire up Adobe Acrobat Exchange on Sun workstations (sorry SGI users). To do so, use the following Athena commands:

```
add acro
acroexch &
```

Open your PDF file. When it displays, you can use the "Document/Rotate Pages" menu item to rotate your file. Save your rotated file.

Acrobat Exchange may be installed on some Windows machines at the [CRL](#), but you will have to check computers individually to find it.

Note on File Transfers

Many of you are using Windows. Note that the Athena "crlspace1" locker is mounted as drive S: on the PCs. Your CRL home directory (S:\your_username) is also mounted as drive H:. Any files you have saved in this area on Athena should be visible on the PC and vice versa. For large files, you can use the "crlbucket" locker to move files between the PC and Athena. On PCs, crlbucket is mounted as drive X:. On Unix, use 'attach crlbucket' and this locker will be available in /mit/crlbucket. Files in crlbucket will be deleted automatically after a short period. Files greater than 10 MB will be deleted within about 48 hours; smaller files may last a week. This locker is intended for short term storage and file transfers. Make sure to transfer anything longer lasting to your Athena home directory or your CRLspace.