Files and File Handling in ArcView

It is the nature of a GIS to be able to incorporate many different forms of files. This section, although hardly technical in content, is very important. I have personally experienced all of the problems discusses here, and they can be very frustrating. It is important to read this section earlin in your efforts to learn ArcView. If file problems arise, you will want to return to this section at that time to troubleshoot the difficulty.

Let us start with a review of the files you will likely encounter when using ArcView. In many cases, these files have a common extention (e.g. project files end in ".apr".

ArcView Project Files

.apr:

An ArcView project file is saved when you select "File: Save Project" or "File: Save Project As..." within ArcView. When you save a project file you are saving all of the settings of the ArcView session. This includes properties of the view, analysis extent, themes, etc. Any grids loaded into the project (see below) that have a "temporary" status will be changed to "permanent" and saved to disk. The project file does **not** save themes within its contents, all it does is save the reference to where all themes are located. For this reason, a project file **cannot** be copied to a different machine with the expectation that it will work there unless the same themes exist in the same paths, or if the project does not refer to any themes. Strategies to move information from one machine to another will be discussed later in this section.

.avx:

ArcView allows for additional functionality to be loaded into the software through the use of "extension" that have the filename "*.avx". You will use at least three extension in this course: Spatial Analyst, Hydro (CE465Hydro), and Projector. The latter two extensions you may need to load into ArcView yourself if you are using the GLUE unix system.

.ave:

The scripting language in ArcView is called "Avenue". Scripts written in this language end in "*.ave" by convention.

ArcView Data Files (Vector/Feature) Data

.shp, *.shx, *.dbf:

An ArcView "shapefile" is actually three files with the same filename but the different file extensions indicated. TO move a shapefile from one machine to another you must move all three files. A shapefile loaded into an ArcView view window will only indicate

the *.shp file (e.g. streams.shp) in the legend. However, all three files are actually loaded and needed.

ArcView Raster Data ("Grids"):

If the spatial analyst extension is loaded, ArcView can then handle "raster" or "grid" data. Grids are not actually stored as a single file, but as an entire directory. Further, knowledge of the presence of that gird is stored in the "info" directory located in the same level directory where the grid directory is. **Very important: Grids should not be copied, deleted, or moved using any software other than ArcView itself. Use "File: Manage Data Sources..." (on the PC) or "File: Manage Grids..." (on GLUE). Failure to heed this warning will definitely result in corruption of the "info" directory rendering all grids in this directory suspect. Further, if the grid has been moved or copied elsewhere, it will likely not load properly.** Proper movement of a grid from one machine to another is accomplished through the ASCII_grid file format.

.asc:

Grids can be moved from one machine to another by creating portable versions of the grid information stored in the ASCII_grid file format. To import an ASCII_grid choose, "File: Import Data Source..." (on the PC) or "File: Import Grids..." (on GLUE). To export a grid choose, "File: Export Data Source..." (on the PC) and "File: Export Grids..." (on GLUE). Using this functionality, a grid can be easily transferred between machines by first exporting an ASCII_grid representation of the grid from the source machine and then importing that same ASCII_grid on the destination machine. Movement of this ASCII_grid can be done through any software (e.g. windows explorer, ftp, etc.).

ArcView Image Data

.tif, *.tff, *.tiff, *.bil, *.bsq, *.bip, *.bmp, *.jpg:

These and other picture formats can be used to bring "Image" data into the ArcView view window. Common examples of such image data include digital raster graphics picturing USGS quadrangle sheets, scanned images of site drawings or aerial photographs. These data do not convey any useful information to the GIS, but can be very useful to the engineer as a background on which to visualize other data.

"worldfiles"

In order to convey to ArcView the extent and origin of an image file, it is necessary to have a second companion file referred to as a "worldfile". Quoting from the ArcView help: *"It's easy to identify the world file which should accompany an image file: world files use the same name as the image, with a "w" appended. For example, the world file for the image file mytown.tiff would be called mytown.tiffw and the world file for redlands.rlc would be redlands.rlcw. For workspaces that must adhere to the 8.3 naming convention, the first and third characters of the image file's suffix and a final "w" are used for the world file suffix. Therefore, if mytown.tif were in a an 8.3 format workspace,*

the world file would be mytown.tfw. If redlands.rlc was in an 8.3 format workspace, its world file would be redlands.rcw.

For images that lack an extension, or have an extension that is shorter than three characters, the "w" is added to the end of the file name without altering it. Therefore the world file for the image file terrain would be terrainw; the world file for the image file floorpln.rs would be floorpln.rsw. ending in this extension are used to convey to ArcView." The worldfile extension we are most likely to encounter in our class is "*.tfw" to accompany a "*.tif" image file.

ArcView Filesystem Components

"info" directory:

As described earlier under "Grids" the info directory keeps track of all grids located at a given directory level. If using ArcInfo, this directory may also contain information about ArcInfo coverages. This directory is created automatically by ArcView/ArcInfo on creation of the first grid or coverage. It is updated automatically by ArcView/ArcInfo as subsequent grids/coverages are created, moved, or deleted. **Do not delete or modify this directory in any way.**

"log" directory:

Treat this directory as you would an info directory. Do not delete or modify in any way.

**.avl:*

Themes are displayed in ArcView using default (and somewhat randomly determined) color ramps and labelling techniques. If a certain type of data is to be displayed consistently across many views, you may wish to create a legend file which will have the indicated extension. Once you have created a color ramp / labelling scheme you like you can save it using the "Save..." button on the legend editor (double click on the legend to obtain editor). Subsequently, you can relaod this scheme using the "Load..." button from this same editor.

Frequently Asked Questions:

1. **What happens when you save a project (*.apr) file?** When you save a project you save all the settings that were active at the time the save function is enacted. This includes the exact setting of the display (how zoomed in/out you are), analysis extent, view units, working directory, etc. It saves any scripts you have written internally to the project (i.e. copies of the scripts are saved directly in the project file). It save references to what themes and tables were loaded into the project at the time of saving. Since only the reference is saved grids, featured themes, and tables might be deleted or moved before the next time the project is loaded. If this is the case, ArcView will prompt with a "Where is: xxxxx?" file dialogue asking where the

missing data is now located. You can cancel past this inquiry, but then that theme or table will not be loaded. Because project files keep track of themes/tables by reference, moving a project to another another machine will probably result in a lot of lost data unless that machine has an identical directory structure. See answer to #3 below for suggestions on how to move information from one machine to another.

2. **Why is setting a "working directory" a good idea?** The working directory in ArcView is the location where all grids or shapefiles are written unless the user instructs the software to do otherwise. The default working directory for ArcView is generally "c:\windows\temp" (on the PC) and "\users\username" (on GLUE). Especially on the PC this leads to trouble as perhaps several students work on one machine at different times, all storing their grids in the same place. Perhaps one fails to understand my warning as indicated above under "Grids". All students using this machine will then suffer as the default working directory has become corrupted. My suggestion is to be sure that you always set your own working directory rather than accepting the default directory. Choose: "File: Set Working Directory..." and then indicate a path that only you will be using. Before setting the working directory for the first time, you should create a personal directory on the PC using your last name (or other unique identifier) and then always set the working directory to that path before doing any work. It may seem like a needless effort at first, but from experience it will save a lot of pain for you (and perhaps others) in the long run.
3. **How do I move data from one place to another?** For reasons explained in #1 above, the project file is not the best way to move data from one place to another. I like to think in terms of individual items that make up a project: the themes (grid and feature data), tables, and scripts. A project file can be used to effectively move scripts from one location to another. The remaining data types must be moved as individual items. Grids should be exported to ASCII_grids, transferred in this format, and then imported on the receiving end. Feature data can be simply transferred if it is in a shapefile format. If feature data is in an ArcInfo format you should first convert it to a shapefile (use "Theme: Convert to Shapefile...") and then transferred. Tables (*.txt, *, dbf, etc) should be transferred as separate files. All files can then be reloaded into the view or table documents to recreate the project on the new machine.

4. **My disk quota is small. How can I do the work I wish to do and use a minimum of disk space?** Grid themes especially can take up a lot of space. I like to think in terms of grid themes that can be determined from other themes (e.g. the flow direction, flow accumulation, watershed, etc. themes are all dependent on the DEM theme). These themes I never save, but instead recreate each time I sit at the computer. Keep in mind that if you create a temporary grid (such as flow direction) and then save the project with that grid loaded in the view – the grid becomes permanent (often with an incomprehensible default name like "fdir5"). To determine if a grid is temporary or permanent make that grid theme the active theme and choose: "Theme: Properties". You will see an entry that indicates "Status" as either permanent or temporary. Saving a project with themes that only have permanent status will not result in saving any new grids and therefore will not add to the clutter in your account or on your hard drive. So before I save a project I inspect the

contents of all grids in the view and delete all grid themes that I can re-create quickly next time I enter that project.

5. **How can I tell if the "info" directory is corrupted?** There are several possible errors but I can only recall one at this writing (my apologies). If you try to load a grid and get an error message that refers to the "STA Table" this probably indicates a corrupted info directory.

6. **My grids won't load, what can I do to recover them?** *(First, shame on you for either not setting the working directory to your own special place or for trying to manipulate your grids outside of ArcView!)* Fortunately, you can "cheat" a little. Create a brand new directory. Now go into the ArcView "File: Manage Data Sources..." menu option and use the copy feature to copy grids in the corrupted directory to the new place. Under many (but not all) circumstances, the copied grid in the new location will be useable. Once everyone has recovered all the grids they want out of the corrupted directory, delete that directory as it is worthless.

7. **I'm using GLUE and I can see my grids in the browser dialogue box, but then then don't load – what is going on?** I have encountered problems with both case sensitivity AND grids that have names starting with a number (e.g. 465grid). Be careful when naming grids to start the grid name with letters and to use the same case (I suggest all lower case) in the grid name.