NS481/581 NATURAL SCIENCE SUMMER INSTITUTE
QUICK START GUIDE TO ARCVIEW GIS SOFTWARE

I. ARCVIEW OVERVIEW

ArcView is a desktop GIS software that enables users to manage, create, view, and query spatial databases and digital cartographic images. Each session in ArcView is set up as a "project" in which the user can add data to the desktop.

ArcView Projects

A **project** is the file in which work you do in ArcView is stored. A project typically contains all the **view, tables, charts, layouts** and scripts that you use for a particular ArcView application. These are the components of a project.

For example, if you are using ArcView to find suitable locations for a new office buildings, you would keep all the views, tables, charts, layouts and scripts that you use in this application in one project. In this way, your work is stored in one convenient place. The next time you want to work on this application you simply open this project file in ArcView and all the components you need are available for you to use.

***Project files have an *.apr extension*

Project Components (view, tables, charts, layouts)

The primary software functions are four-fold, and include a pallette of GIS-related software activities as follows:

View -A view is an interactive map that lets you display, explore, query and analyze geographic data in Views are saved in the ArcView project you are currently working with. A view defines the geographic data that will be used and how it will be displayed, but it doesn't contain the geographic data files themselves. Instead, a view references these source data files.

Table - A table lets you work with data from a tabular data source in ArcView. You can bring data from almost any tabular data source in your organization into ArcView as tables. Then you can add data from these tables to maps, and symbolize, query and analyze this data geographically. An ArcView table references the tabular data source it represents, but doesn't contain the tabular data itself. This means that tables are dynamic, because they reflect the current status of the source data they are based on.

Chart - A chart is a visual representation of data in a table, especially attributes of geographic features, that can quickly convey information that would otherwise take a long time to summarize and understand. You can use a chart to display, compare, and query your geographic and tabular data effectively. Charts in ArcView are especially powerful because they are dynamically linked to your maps. For example, you can select map features in a view and they will be highlighted in your view, table, and chart.

Layout - A layout is a map that lets you display views, charts, tables, imported graphics, and graphic primitives. The layout is used to prepare these graphics for output from ArcView. A layout defines what data will be used for output and how they will be displayed. A layout can be dynamic because it allows you to make specific graphics live. When a graphic is live, it reflects the current status of the data. For example, if the data in a view changes, the layout automatically reflects the change. The same data can be

displayed on a number of different layouts. Think of each layout as being a different way of presenting the data. I

Map Themes

A **theme** is a set of geographic features in a view. A theme represents a source of geographic data such as: (1) A spatial data source such as an ArcView shapefile, (2) A CAD drawing such as an AutoCAD drawing (if ArcView's CAD Reader extension is loaded) , (3) An image data source such as a satellite photo, (4) A table containing XY coordinates, street addresses that can be geocoded in ArcView, or events that can be matched to route features. The themes in a view are listed in its **Table of Contents**. For example, a view of a country might have one theme representing cities, one theme representing roads, one representing an satellite image, etc.

Types of Themes

There are three types of themes that may be added to a View in ArcView. They are:

Feature Data Source	Vector themes (for example a shape file)
Image Data Source	Raster image themes (for example JPEG, TIF, SID)
Grid Data Source	ArcView Grid Data - option only available with use of Spatial Analyst Extension (*note: USGS DEM's must first be imported into the ArcView Grid Data format, before they can be used)

Shape Files

ArcView shapefiles are a simple, non-topological format for storing the geometric location and attribute information of geographic features. A shapefile is one of the spatial data formats that you can work with in ArcView. The shapefile format defines the geometry and attributes of geographically-referenced features in as many as five files with specific file extensions that should be stored in the same project workspace. They are:

*.shp - the file that stores the feature geometry.

*.shx - the file that stores the index of the feature geometry.

*.dbf - the dBASE file that stores the attribute information of features. When a shapefile is added as a theme to a view, this file is displayed as a feature table.

*.sbn and *.sbx - the files that store the spatial index of the features. These two files may not exist until you perform theme on theme selection, spatial join, or create an index on a theme's Shape field. If you have write access to the source data directory, the index files will be persistent and remain after your ArcView session is complete. If you do not have write access to the source data directory, they will be removed when you close the project or exit ArcView.

*.ain and *.aih - the files that store the attribute index of the active fields in a table or a theme's attribute table. These two files may not exist until you perform Link on the tables. If you have write access to the source data directory, the index files will be persistent and remain after your ArcView session is complete.

Why use ArcView shapefiles?

Shapefile features display more rapidly on a view. You can work with a theme based on a shapefile format the same as any other feature data sources that ArcView supports, such as setting the theme's properties and performing spatial analysis. You can edit the features of themes based on shapefiles only. You can create a new theme that's based on the shapefile format. You can create shapefiles by converting other geo-referenced data formats such as ARC/INFO coverages and popular desktop mapping data formats.

II. QUICK-BULLET SUMMARY OF BASIC ARCVIEW COMMANDS

Top Pull-Down Menu Bar

File

New Project	Creates new project (blank views, layouts, etc.)
Open Project	Opens existing (saved) projects
Extensions	The Extensions dialog allows you to load and unload extensions. Extensions extend ArcView "on the fly" allowing you to enhance your working environment with additional objects, scripts and customization independent of the current project.

Example Extensions with ArcView

- JPEG Reader - imports JPG images
- TIFF Reader - imports Tif images
- Mr.SID Reader - imports Sid images
- Spatial Analyst Extension - activates advanced spatial analysis for grid raster maps
- 3-D Analyst Extension - activates 3-D model builder for grid raster maps
- Geoprocessing Wizard - allows advanced polygon manipulation
- ArcView Projection Utility- converting from one map projection to another

View Menu

File

Save Project	saves project settings / windows
Print	prints view

Edit

Cut Themes	cuts and pastes themes from one view to another
Copy Themes	copies themes
Delete Themes	removes theme from table of contents

View

Properties	set properties of view such as map units (meters, etc.), and map distance units (to use for measuring on maps)
Add Theme	add a new theme to view
New Theme	create a new theme from scratch
Full Extent	zoom to full extent of all themes
Zoom to Selected	zoom to a selected theme feature
Zoom In	zoom in on a select area of the view

Zoom Out	zoom out of the view
Zoom to Themes	zoom to the extent of individual themes
Zoom to Previous	zoom to the previous window

Theme

Properties	Sets formatting for theme (label tag formats, etc.)
Start Editing	starts edit mode to add or alter theme vector elements (lines, etc.)
Stop Editing	exit out of theme edit mode
Convert to Shapefile	convert the theme to an ArcView Shapefile format
Edit Legend	edit the map symbol style, properties, colors etc.
autolabel	results in an automatic labelling of map features
remove labels	removes labels from theme if they have been added by autolabel
table	swithes to the table function to view the database table values
query	enters into to "query builder mode" for creating logical map queries
select	selects map features of a theme, they then may be copied or exported

Graphics	in general, allows user to create graphic elements and manage them (like adding text, lines, boxes, free hand drawings, etc.)
Window	manages the window environment
Help	provides some help (sometimes)

Middle-Top Icons

floppy disk icon	save project
"+" mark icon	add a theme to the view
hand with index finger	sets theme properties (see above)
table icon	enters table mode, to view tabulated data associated with theme
binoculars	find function - enter a text string or number, will find features on map
hammer icon	query builder, permits logical querying of spatial data base
stacked white sheets icon	zoom to full extent of all themes in view
stacked white / gray sheet	zoom to the extent of the active theme

Lower-Top Icons

circle with "i"	inquiry tool, click it and click on map features to view related spatial data
black arrow	a non-active cursor, for general pointing and locating without resulting action
open box icon	select feature tool - selects map features in active theme (point and click)
+ magnifier	zoom in tool (click and drag a box to zoom in on a rectangular area)
- magnifier	zoom out tool
hand icon	pan tool, click and drag the view to move around the them
ruler tool	measure distances on map (note: must set distance units in Theme-Properties), click and drag tool to measure distances, double-click tool to exit measure mode
tag with string icon	label tool, point and click on feature to add a label to theme
"T" tool	text tool, point and click to add a text box to the view
point or line icon	drawing tool, draws lines, points, etc. on view. Click and hold down to select

graphics element types

Other Useful Tips

To Make Themes Visible-After adding a theme, you must check the box to the left of the theme name to make it visible in the view (the check box is a toggle to toggle the theme on/off in the view).

Coordinate Location of Pointer on Theme-Numbers in upper right hand corner of view = coordinate position of cursor on theme

Measuring Distances on Themes - When using the measuring tool (ruler in lower-top icon bar), the mesured distances appear in the lower left corner of the view on the status bar

To Make Themes Active in View - In the Table of Contents, click just to the right of the listed theme to make the theme active. The theme will be highlighted and somewhat discolor in the Table of Contents when it is active.

Using the Inquiry Tool - Only active themes will be queried with the "circle i" inquiry tool

Moving Themes to Front and Back of View - polygon theme layers will cover one another when they are filled with a solid color. In the table of contents, click and drag the theme name to the top of the list to put on top, click and drag the theme to the bottom of the list to move it to the back.

Changing the Map Patterns, Colors, and Line Styles - To change the map patterns, colors, or line styles of themes in the view, simply double-click on the legend symbol in the table of contents. This will allow you to edit the legend properties, colors, line styles, etc.

Solid Color Patterns for Polygon Themes After Adding - By default, ArcView will assign a random solid color pattern to a polygon theme after it is added. The change the color pattern, double click on the legend box in the text and change style accordingly.