Introduction to ArcGIS
ESRI

• Environmental Systems Research Institute
  Redlands, California
ESRI GIS Development

Arc/Info (coverage model)
Versions 1-7 from 1980 – 1999
Arc Macro Language (AML)

ArcView (shapefile model)
Versions 1-3 from 1994 – 1999
Avenue scripting language

ArcGIS (geodatabase model)
Version 8.0, 8.1 from 2000 –
Visual Basic for Applications

100,000 licenses
1,000,000 users as of 2001
The ArcGIS Desktop is available in three options: ArcView, ArcEditor, and ArcInfo. All three share a common user interface and developer tools and work with the same data.
ArcGIS

- ArcView
- ArcEditor
- Arc/Info
  - Desktop
  - Workstation
The GIS Data set or geo-data set used

- Shape file
  - Consisting of:
    - Shape file (*.shp)
    - Shape Index (*.shx)
    - Database table (*.dbf)
  - Additional files may be present and required as well
- Coverages
- Databases
Three Main Modules

- Three main modules are...
  - ArcCatalog
    • (Go to programs >ArcGIS>ArcCatalog>)
  - ArcMap
    • (Go to programs >ArcGIS>ArcMap>)
  - ArcToolbox
    • (Go to programs >ArcGIS>ArcToolbox>)
ArcGIS has a three part interface:

- **ArcCatalog** – for navigating spatial data
- **ArcMap** – for creating presentation graphics
- **ArcToolbox** – powerful geoprocessing tools
Component of *ArcGIS*

- *ArcCatalog*
- *ArcMap*
- *ArcToolbox*
ArcCatalog

- Catalog
- Data mgmt.
- Similar to Explorer
Arc Catalog

View data
(like Windows Explorer)

Graphical previews

Tables

View and edit metadata.

Metadata
ArcMap

- GeoSpatial data is:
  - displayed
  - viewed
  - queried
  - edited

- Cartographic products are created
Arc Map

View and edit data

Analyze data (Geoprocessing)

Create maps
ArcMap GUI
ArcToolbox

- Data conversion
  - import/export
- Spatial analysis
  - various overlays
ArcToolbox for ArcView and ArcEditor contains over 20 commonly used tools for data conversion and management.
Principles of GIS

• We will use each of these modules
• Focus on ArcMap
Your First Exercise with ArcGIS

- Familiarize yourself with
  - Menubar
  - Toolbars
  - the ArcGIS GUI.
Context menus

- Copy
- Remove
- Open Attribute Table
  - Joins and Relates
- Zoom To Layer
- Visible Scale Range
- Selection
- Label Features
- Convert Labels to Annotation...
Property tabs
• Features of *ArcMap*
• Displaying map data
• Navigating a map
• Looking at feature attributes
Double Click – each line specific context menus
Double Click – each line specific context menus
Double Click – each line specific context menus
Tools – toolbar

- zoom
- full extent
- previous
- select
- “i” tool
- find tool
- measuring
- pan
- customize
Tables – core of GIS
Queries – asking questions
Review
- Main Menu
- Data Frame
- TOC’s
- Display
- Data / Map
- Tables
- Queries
- More later…
Exploring ArcMap
• Features of *ArcMap*
• Displaying map data
• Navigating a map
• Looking at feature attributes
Displaying map data
Adding Layers
Label Features
Using the “i” tool

Order Layers >

Zoom to Full extent
Navigating a map
Tools – toolbar

- zoom
- full extent
- previous
- select
- “i” tool
- find tool
- measure
- pan
Zoom to Layer
Zoom to Selected
Bookmarks
Looking at feature attributes
Opening Attribute Table
Opening Attribute Table

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Clear Selection
Sort Selection

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Record: | | 0 | | Show: All | Selected | Records (0 out of 27 Selected.) | Options |
Get Statistics

![Screenshot of a software interface showing a table and a histogram depicting a frequency distribution of flight path lengths. The table includes columns for FID, Shape, and LENGTH, with values such as FID 8 Polyline 3194.8, FID 16 Polyline 3009.78, and so on. The histogram shows the distribution of lengths with bins ranging from 180.0 to 2443.3.]
Overview of applications

- All ArcGIS products share common applications
- ArcMap, ArcCatalog
  - ArcToolbox and Command Line windows
ArcMap

- Primary display application
- Perform map-based tasks
  - Displaying
  - Editing
  - Querying
  - Analyzing
  - Charting
  - Reporting
ArcCatalog

- A window into your database
- Browse your data
- Manage your data
- Create and view data documentation (metadata)
ArcToolbox Window

- Available in ArcCatalog and ArcMap
- Geographic processing functions
  - Data management, analysis, and conversion
  - Tools vary between ArcGIS products
Getting help

- Tabs
  - Contents
  - Index
  - Search
  - Favorites
- Other help
  - What’s this?
  - Tool tips
  - Online Support
Demonstration

• Observe ArcCatalog
  – Directory structure and navigation
  – Documentation

• Observe ArcMap
  – Add data
  – Display and query data
  – Zoom and Pan tools
  – Save a map document

• Observe ArcToolbox window
  – Toolkits
Exercise 2 overview

- Use the software to:
  - Start ArcMap
  - Examine some feature layers and their organization
  - Identify relationships between geographic features
  - Associate descriptive information with a layer
  - Identify specific features
  - Select geographic features based on certain conditions
  - Challenge: Work with queries