# Introduction To ArcMap

# ArcMap is a Map-centric GUI tool used to perform map-based tasks

- Mapping
  - Create maps by working geographically and interactively
- Display and present
  - Export or print
  - Publish on WWW
- Edit
  - Update data
  - Modify features
- Query
- Chart
- Reporting
  - Embed maps in reports

# ArcMap is a Map-centric GUI tool used to perform map-based tasks

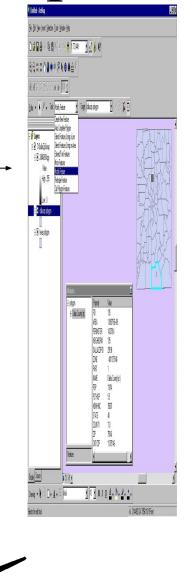
- Analyze
  - -Visualize information
    - •See patterns
    - •Reveal hidden trends
    - •Show relationships between features
  - -Solve problems
    - •Where is
    - How close
    - •How much
    - •What if
- Develop custom mapping applications based on ArcMap components

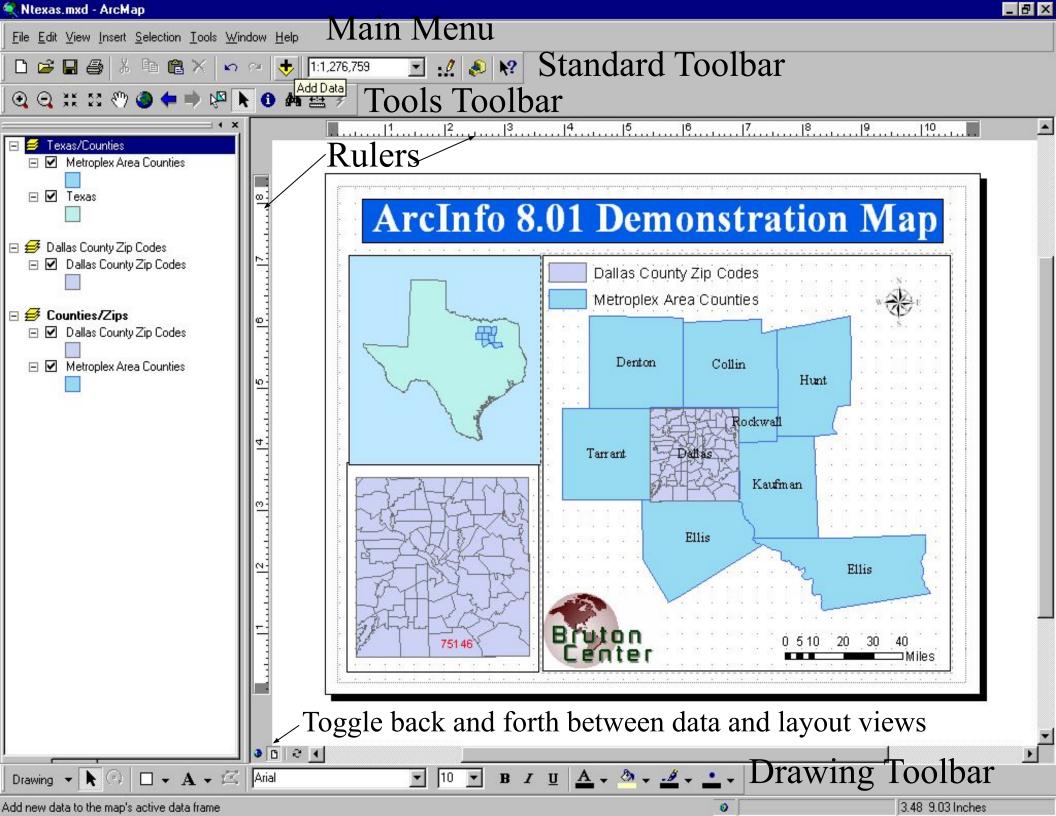
#### ArcMap

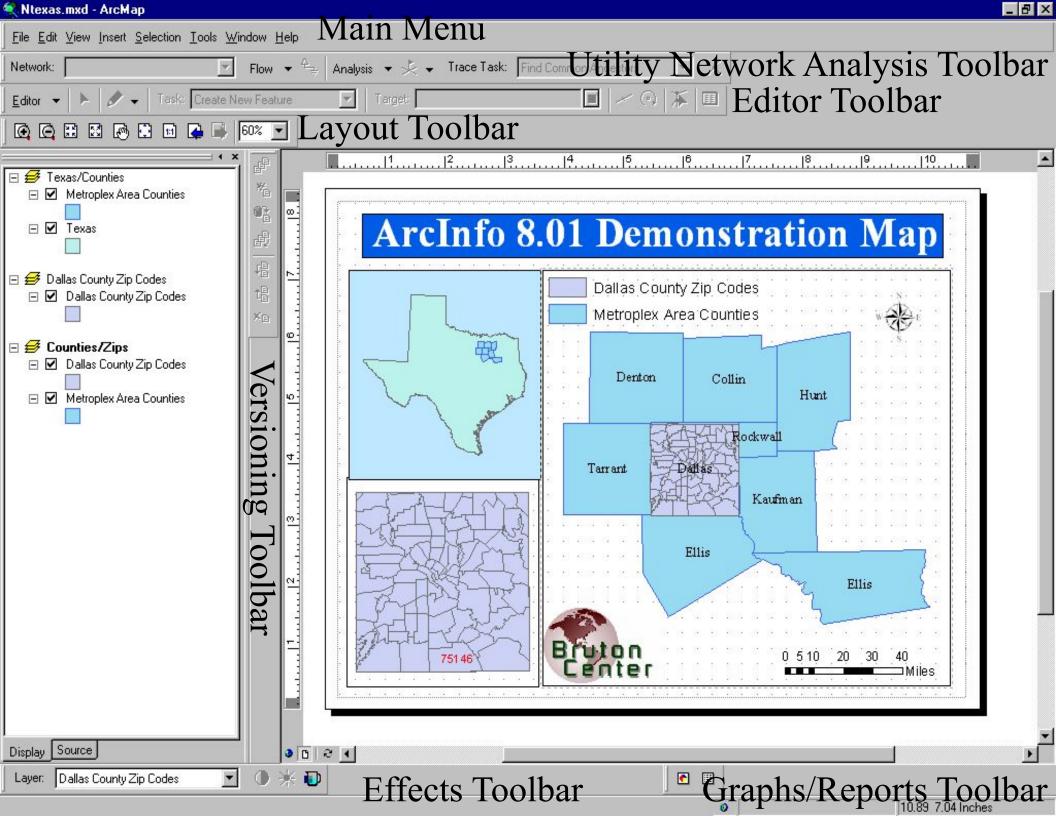
- Is both a data editor as well as map generator
- Provides two different ways to view a map on the fly
  - Data view
  - Layout view

Navigating Around the Map

- Main Menu
- Toolbars
  - Standard
  - Tools \_\_\_
  - Drawing
  - Utility Network Analysis
  - Editor
  - Layout
  - Effects
  - Graphs/Reports
- Create Spatial Bookmarks
- Open magnifier and overview windows
- Find Features







#### Map Layers & Data Frames

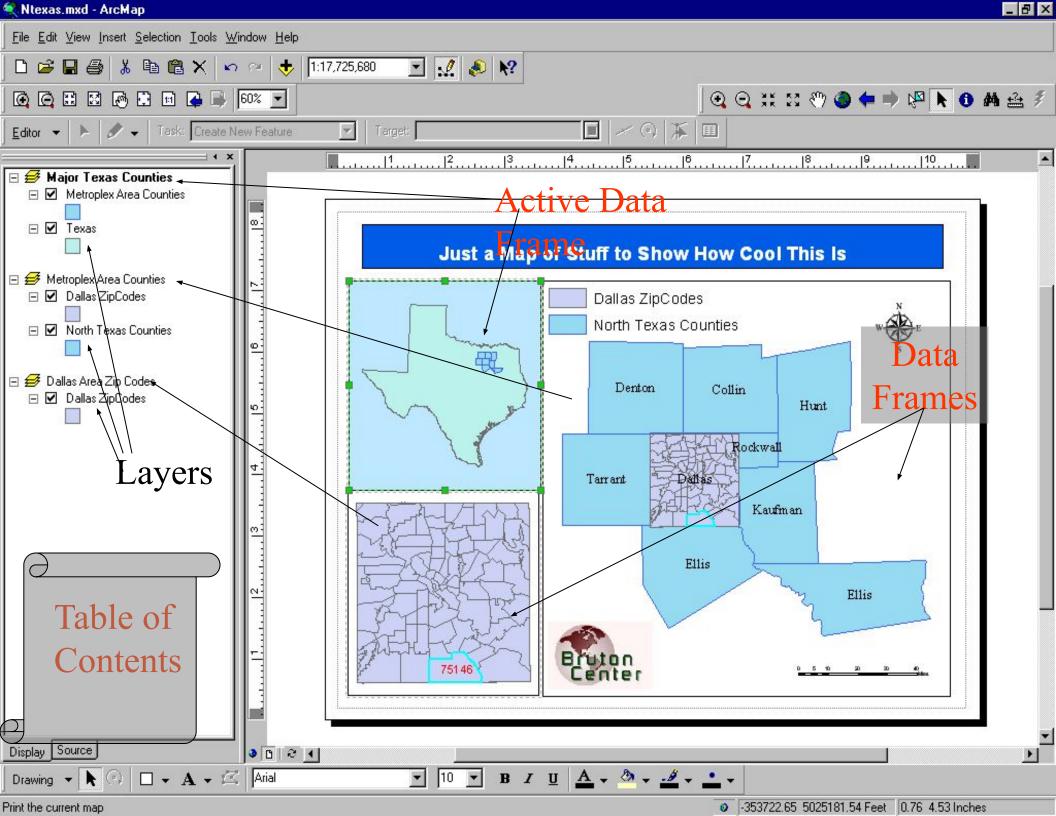
- Arcinfo 8 maps have layers and data frames
- Data frames organize layers similar to ArcView Views
- Data frames have a map extent and a map projection
- Layers are like ArcView themes, but persistent
- Layers represent your geographic data with colors and symbols
- Layers support
  - Thematic mapping
  - Single symbol values
  - Unique value
  - Graduated color ramps
  - Proportional symbols
  - Look up tables
  - Pie and bar chart maps

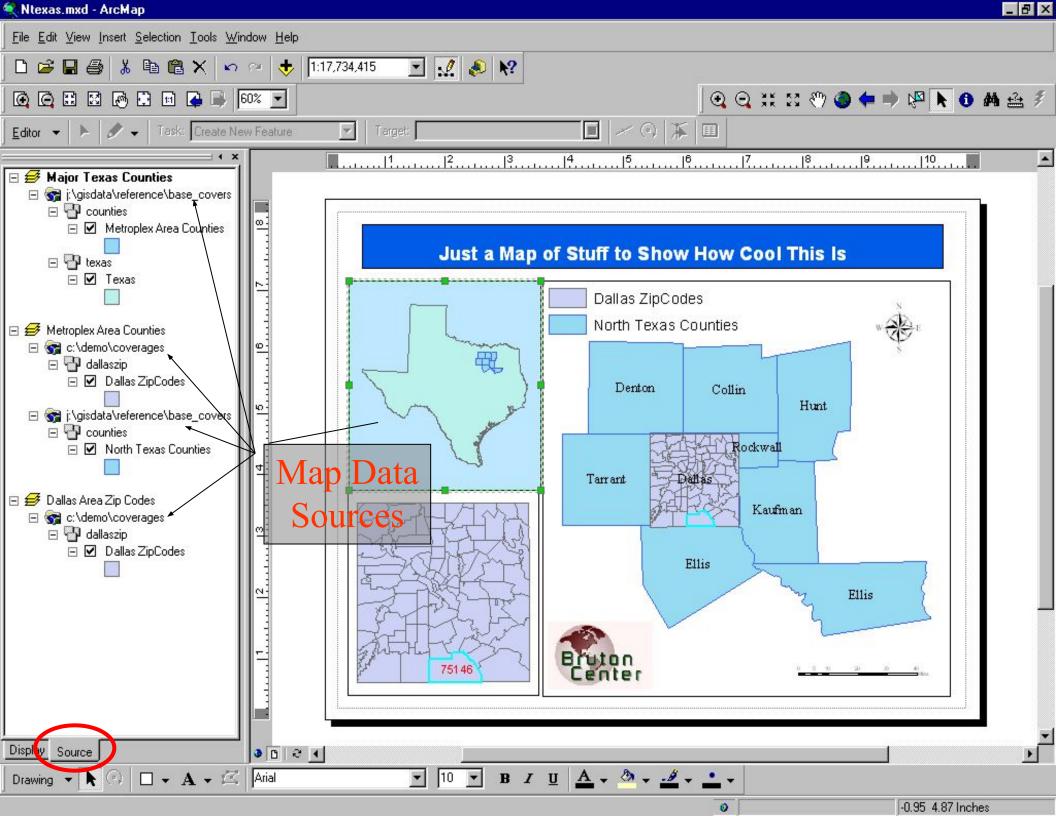
#### Layers

- A layer defines how to display the geographic data it references.
- When you add a layer to a map, ArcMap references the data source the layer is based on.
- When a map is saved data references are stored with it.
- Maps opened in ArcMap locate data based on stored references.
- As in ArcView, if the data location has changed you will be prompted to locate the data source yourself, or ignore the reference in which case the layer will not be drawn.
- ArcMap allows storage of relative pathnames to data sources referenced on a map. This allows you to distribute you data and maps in the same directory. The reference on the map would be correct regardless of where they were placed on the disk.
- It is very easy to add layers to a map.
  - All you do is drag the layer from ArcCatalog to the data frame.

## Managing Layers in ArcMap

- In ArcMap you can...
  - Change a layers's text description
  - Change a layer's drawing order
  - Copy layers
  - Remove layers from a map
  - Group layers together
  - Access layer properties
  - Display layers at different scales
  - Use data frames to organize layers
  - Save a layer to a disk
  - Repair broken data links

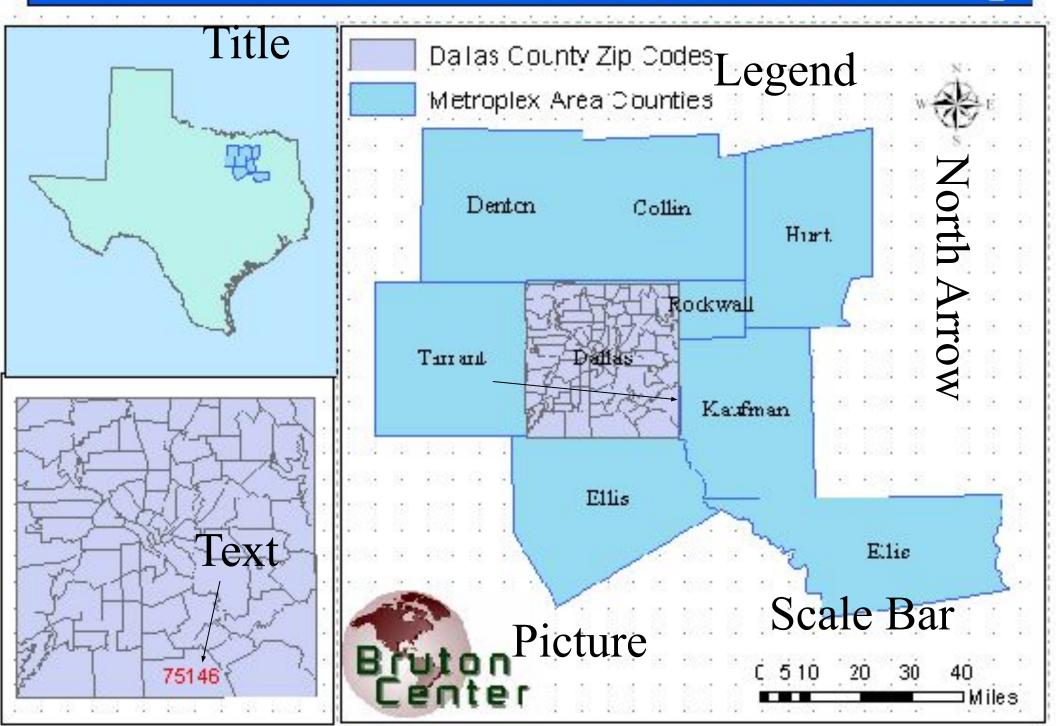




#### Inserting Map Elements

- ArcMap makes it easy to add.....
  - Titles
  - Legends
  - North arrows
  - Scale bars
  - Scale text
  - Label text
  - Pictures

# ArcInfo 8.01 Demonstration Map



### Labeling Map Features

- Labels are text on a map that provides additional information about a feature
  - Can label on the fly with any or several attributes
  - Advanced options for label placement and visibility
  - Labels can be made into annotation layers and stored in geodatabases with relationships to a feature class

<=> = 

#### Managing Annotation

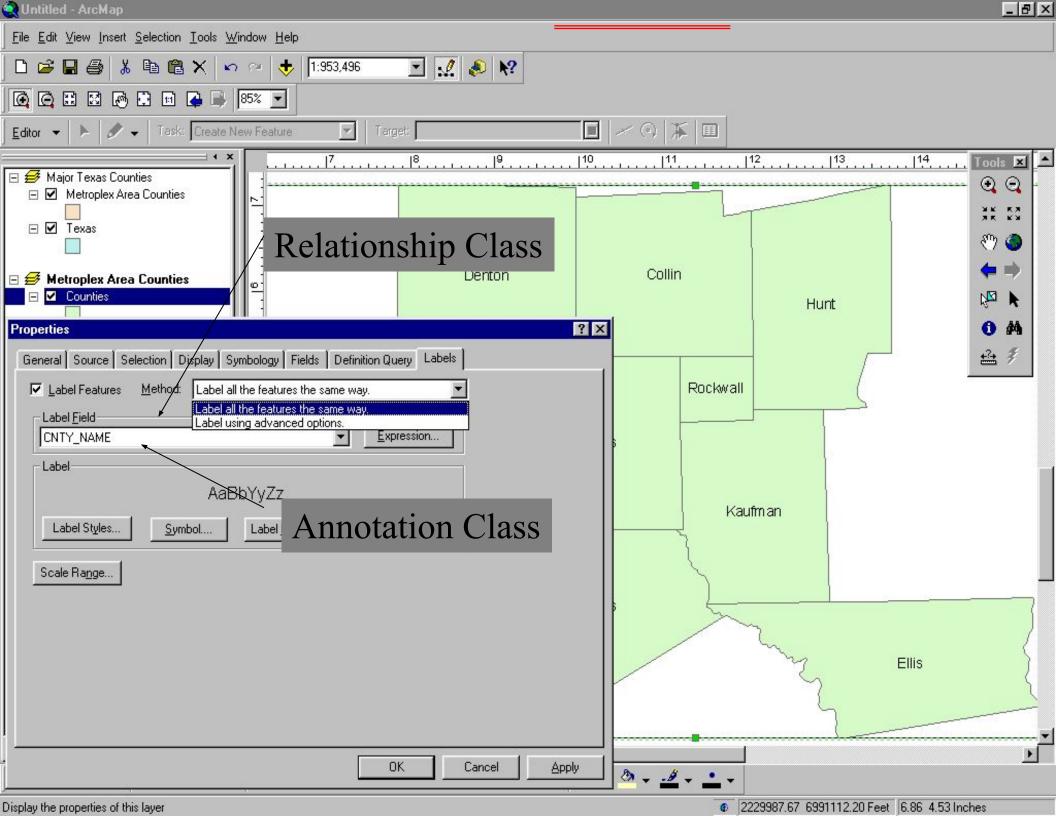
- Annotation refers to the process of automating text placement OR to the text itself
- In addition to geometry and location, geographic features can have descriptive text associated with them, e.g., streets with names
- Annotation may also be a geographically located piece of text independent of other features, e.g., Name of mountain range on map

#### Geodatabase Annotation

- Annotation can be created for feature classes in the geodatabase
  - Stored in annotation classes (special feature classes) as
    ESRI annotation features
  - Annotation classes can be managed in ArcCatalog the same way as feature classes and tables
- Two kinds of annotation in a geodatabase
  - Feature-linked annotation class is linked to another feature class in the geodatabase via relationship class
    - Relationship class is managed as any other relationship class
  - Nonfeature-linked geographically placed text stings not associated with geodatabase feature classes
    - No relationship class linking it to a feature class

## Coverage Annotation

- Annotation in coverages can be converted to geodatabase annotation classes using ArcMap
- Converted coverage annotation cannot be feature-linked
  - Relationship classes can be created to link feature classes to converted coverage annotation but the behavior is different than true feature-linked annotation



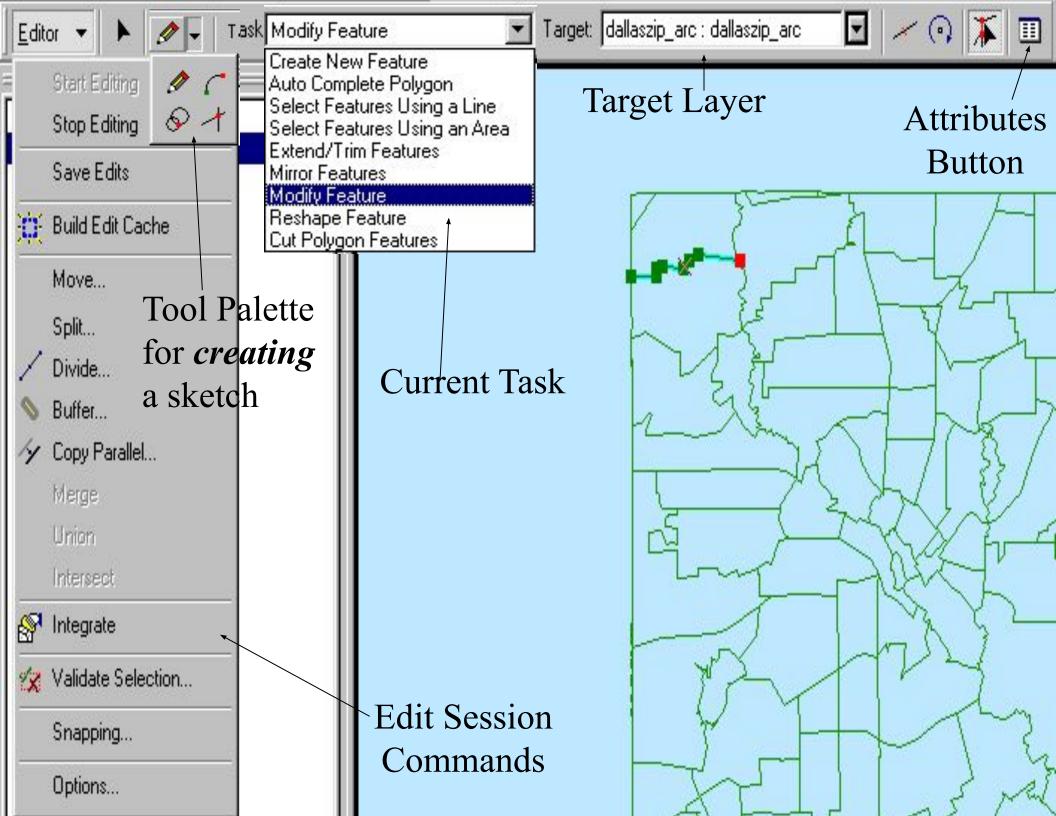
### ArcMap Editing

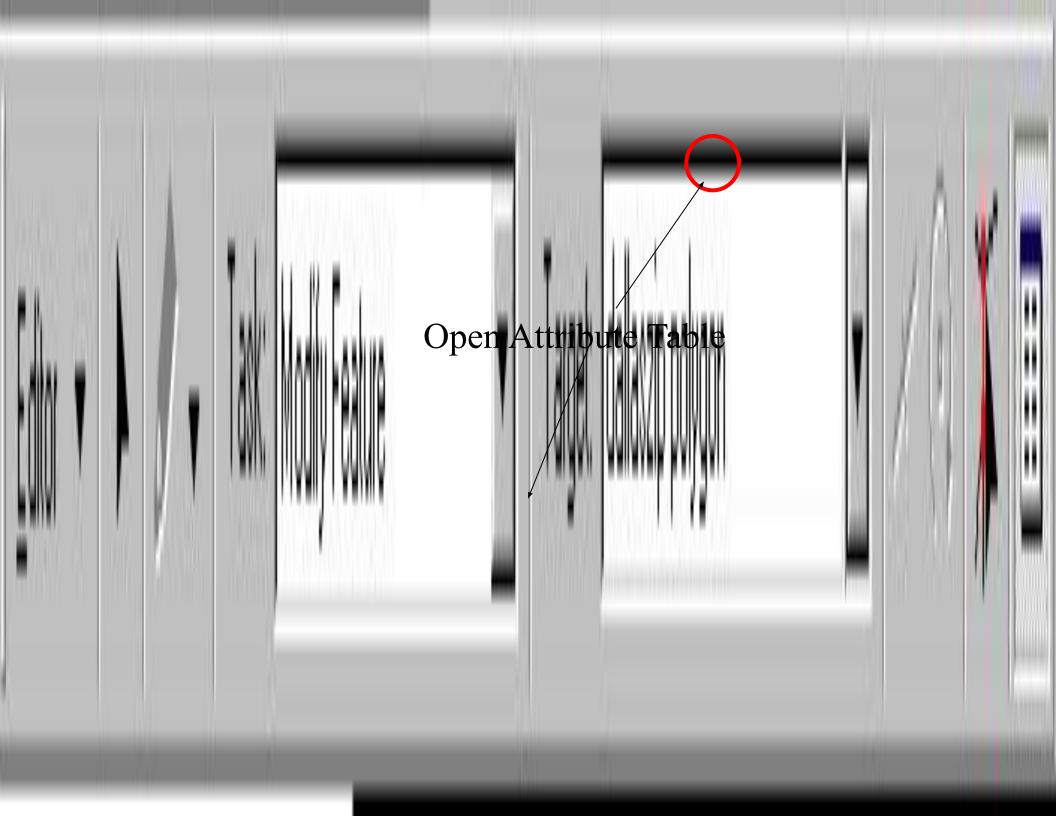
- ArcMap editor has tools to edit ....
  - Tables.
  - Shapefiles.
  - Coverages.
  - Geodatabases (personal & SDE).
- Direct Geodatabase editing (personal & SDE).
- Cad-like.
- Rule based.
- Long transactions.
- Un-do, re-do.
- Edit many layers at the same time.

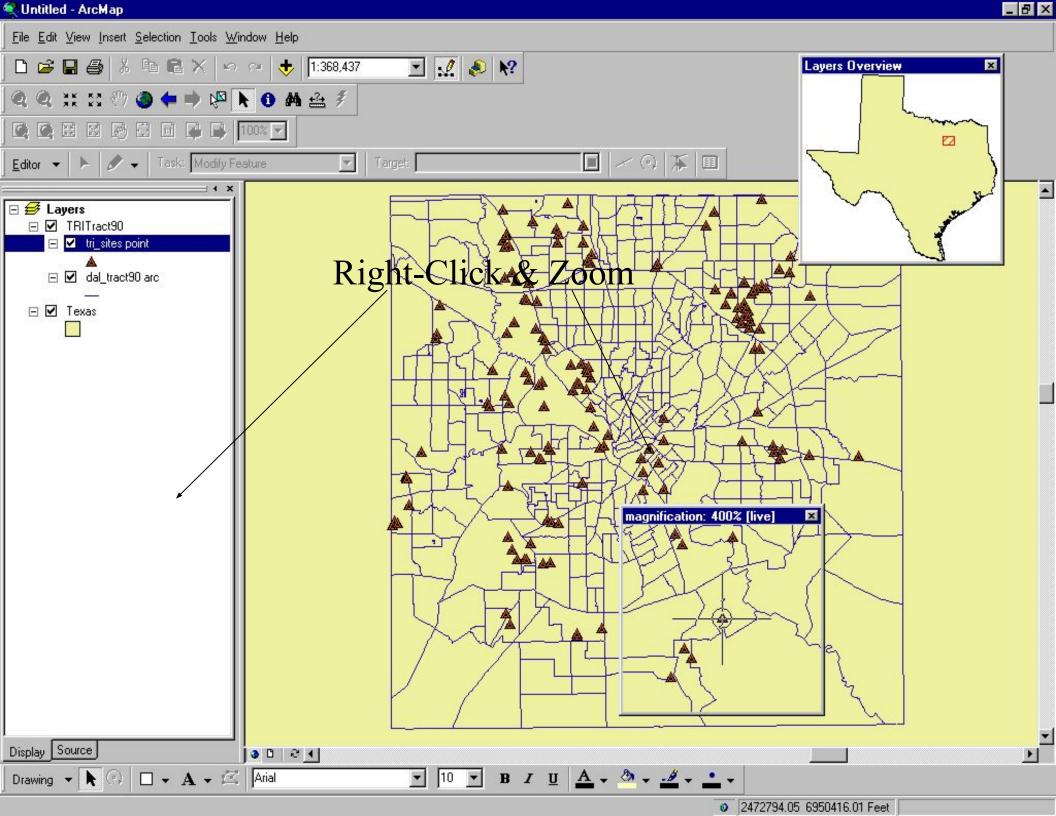
#### ArcMap Editing

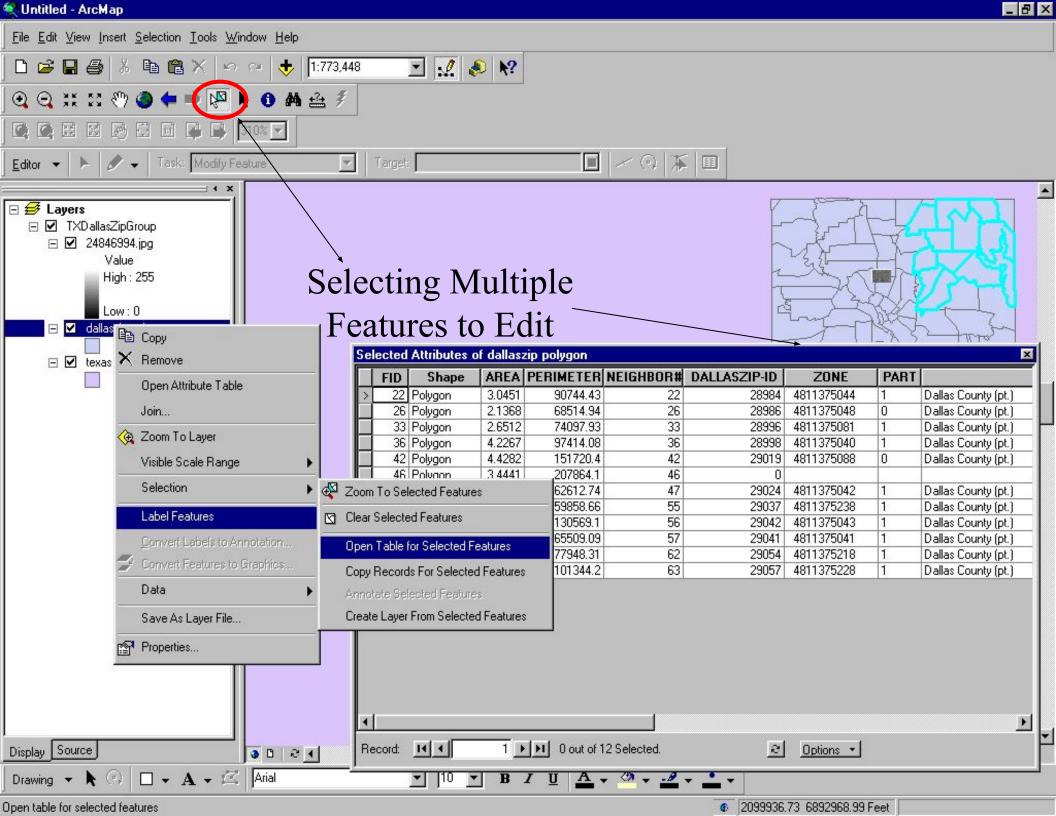


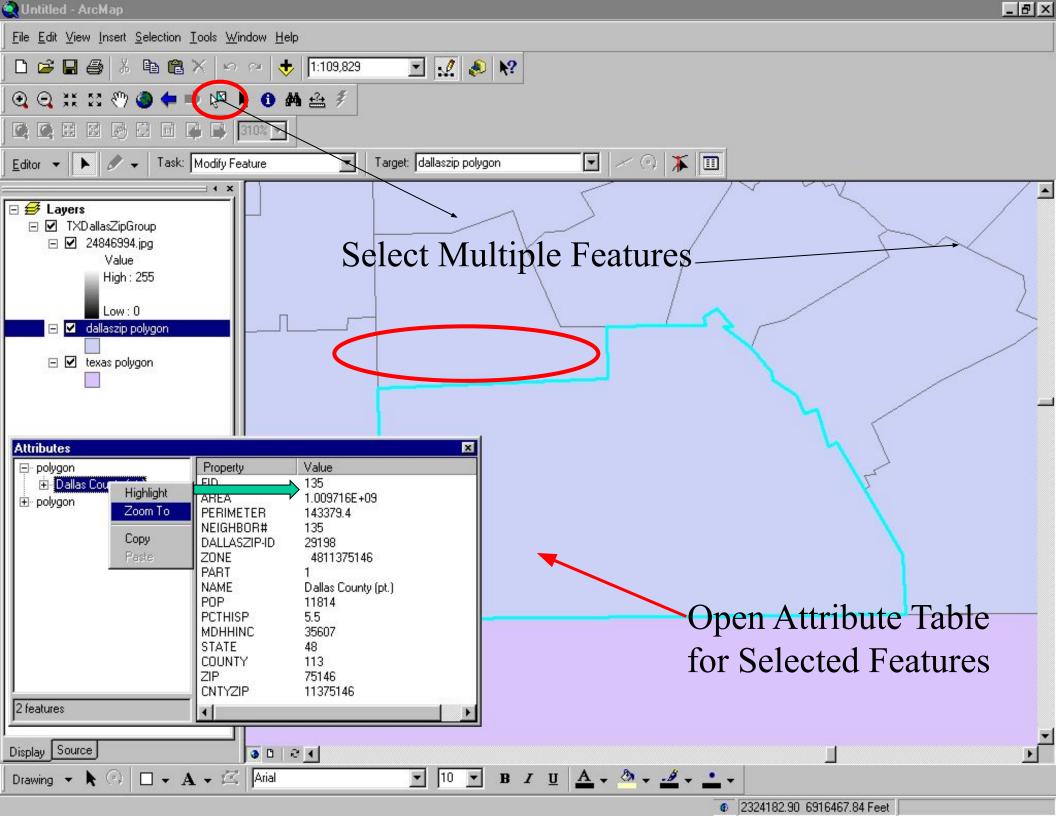
- All editing takes place within an edit session
- Editing sessions are started and ended from editor menu on editor toolbar
- Can edit attributes interactively from ArcMap
- Can edit multiple features in one session
- Can copy and paste individual or multiple attribute values from feature to feature





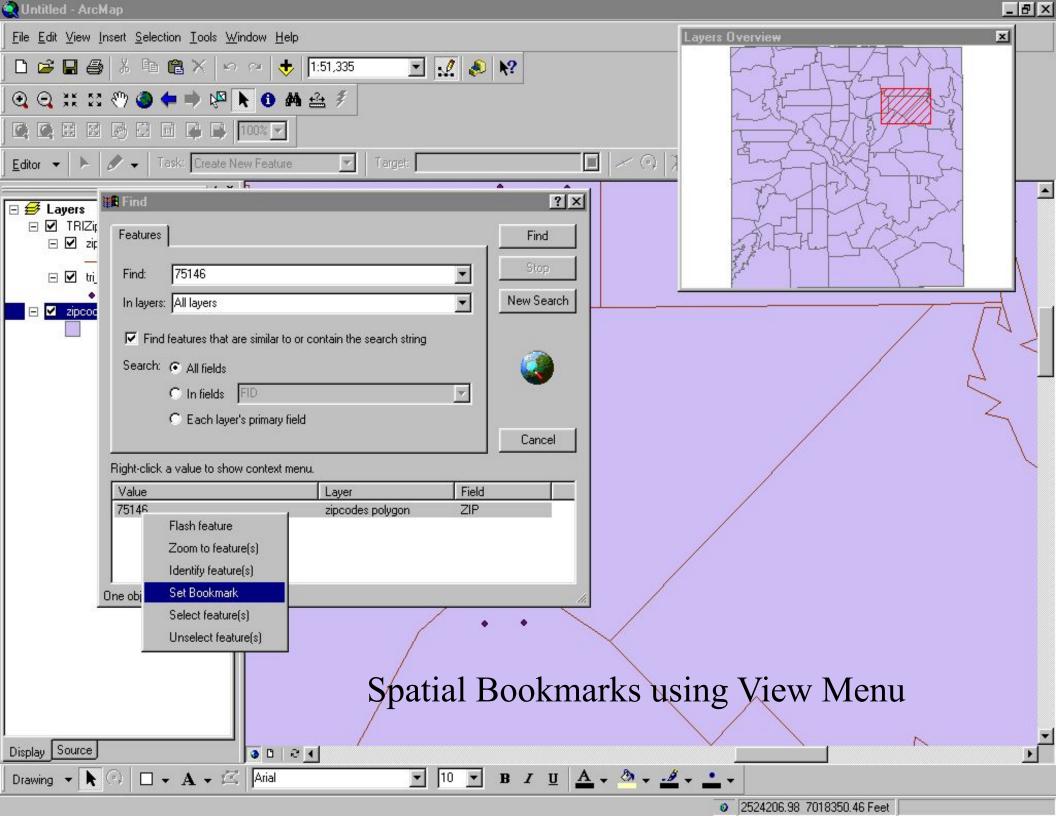






#### Spatial Bookmarks

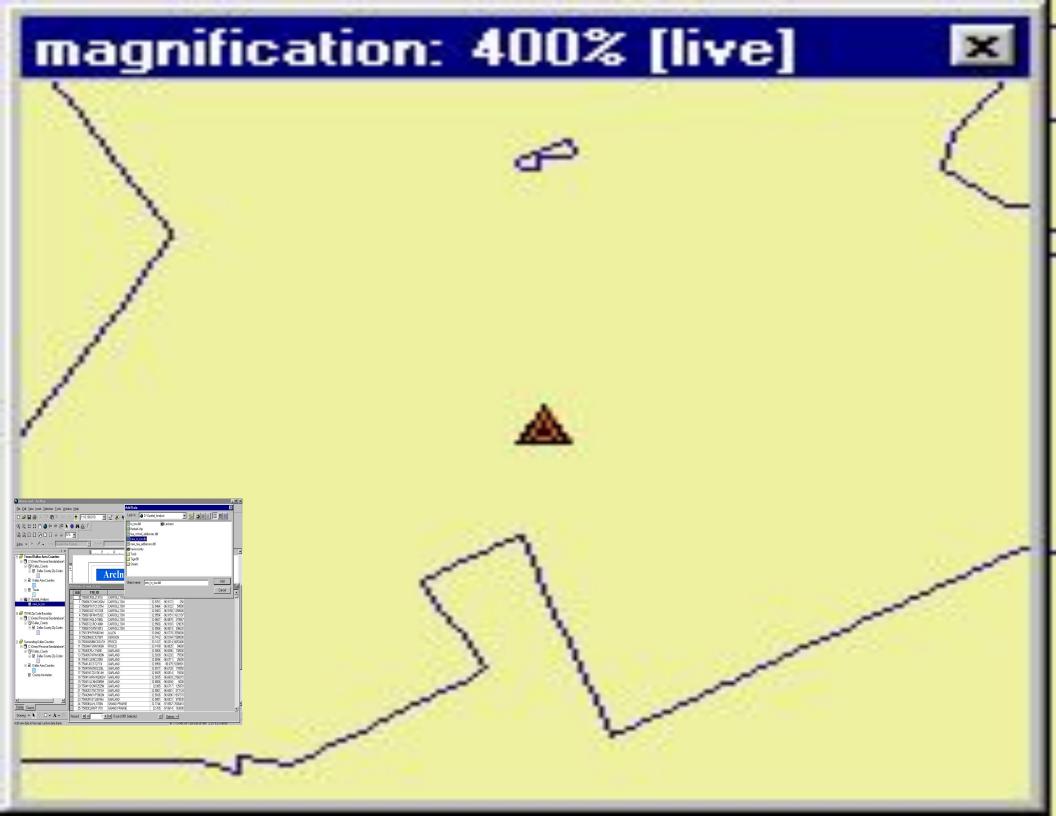
- Pan or Zoom to area within Data Frame
- From View Menu
  - Goto Bookmarks
  - Type in a Name
- Can also create from Identify Results dialog box
- Can also create from find dialog box



FID	Shape	AREA	PERIMETER	NEIGHBOR#	ZIPCODES-ID	ZONE	PART	NAME
	Polygon	478065	27553,86	2	28954	4812175007	0	Denton County (pt.)
	2 Polygon	150418	6004.097	3	28954	4812175007	0	Denton County (pt.)
	3 Polygon	2.8461	41408.91	4	28975	4811375007	0	Dallas County (pt.)
	4 Polygon	378160	22620.79	5	28978	4811375287	0	Dallas County (pt.)
	5 Polygon	4.8529	131403.7	6	28974	4811375006	1	Dallas County (pt.)
	6 Polygon	125277	29114.39	7	28965	4808575082	0	Collin County (pt.)
	7 Polygon	567776	22965.38	8	28958	4808575252	0	Collin County (pt.)
	8 Polygon	66968.	13188.33	9	28957	4808575287	0	Collin County (pt.)
	9 Polygon	516026	19641.88	10	28967	4808575080	0	Collin County (pt.)
1	O Polygon	10260.	2700	11	28957	4808575287	0	Collin County (pt.)
1	1 Polygon	831.83	904.3572	12	28940	4812175028	1	Denton County (pt.)
1	2 Polygon	153242	6828.111	13	28967	4808575080	0	Collin County (pt.)
- 1	3 Polygon	1530.3	1548.177	14	28957	4808575287	0	Collin County (pt.)
1	4 Polygon	275529	7110.801	15	28965	4808575082	0	Collin County (pt.)
- 1	5 Polygon	2.5171	70610.66	16	28980	4811375248	1	Dallas County (pt.)
1	6 Polygon	607640	41923.6	17	28940	4812175028	<b>#</b> Find & F	Replace
- 1	7 Polygon	3.7880	89446.84	18	28973	4811375019	pog i ma a i	replace
	8 Polygon	2787.8	1248.972	19	28958	4808575252	Select F	By Attribute
	9 Polygon	126162	19015.06	20	28964	4808575048		
	0 Polygon	3.8938	27756.3	21	28983	4811375082	Clear S	election
2	1 Polygon	3.0451	90744.43	Snaff	al Bookh	4811375044	si 19Highligh	Edud" Tool
2	2 Poluzon	2 1774	C100E 0E	эрац	ar Dookli	1801 1375 nort	otti Riii.	1991

# Overview & Magnification Windows

- In data view only, instead of repositioning you can open.....
  - Magnifier window.
    - Acts like magnifying glass.
  - Overview window.
    - Show full extent of the data.
- Handy for editing and finding your way about multiple layers.



#### Working with Tables in ArcMap

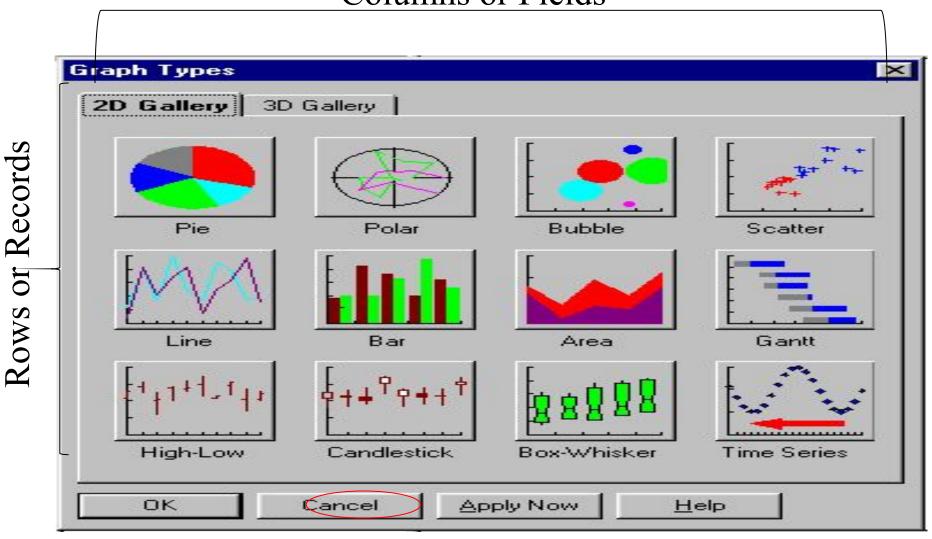
- **Tables** used in ArcMap to inspect attributes of geographic features
  - Rows are records
    - Records represent geographic features
      - Example
        - » Parcel
        - » Highway
        - » Lake
  - Columns are fields
    - Fields represent attributes of a feature
      - Example
        - » Length
        - » Depth
        - » Cost

#### Working with Tables in ArcMap

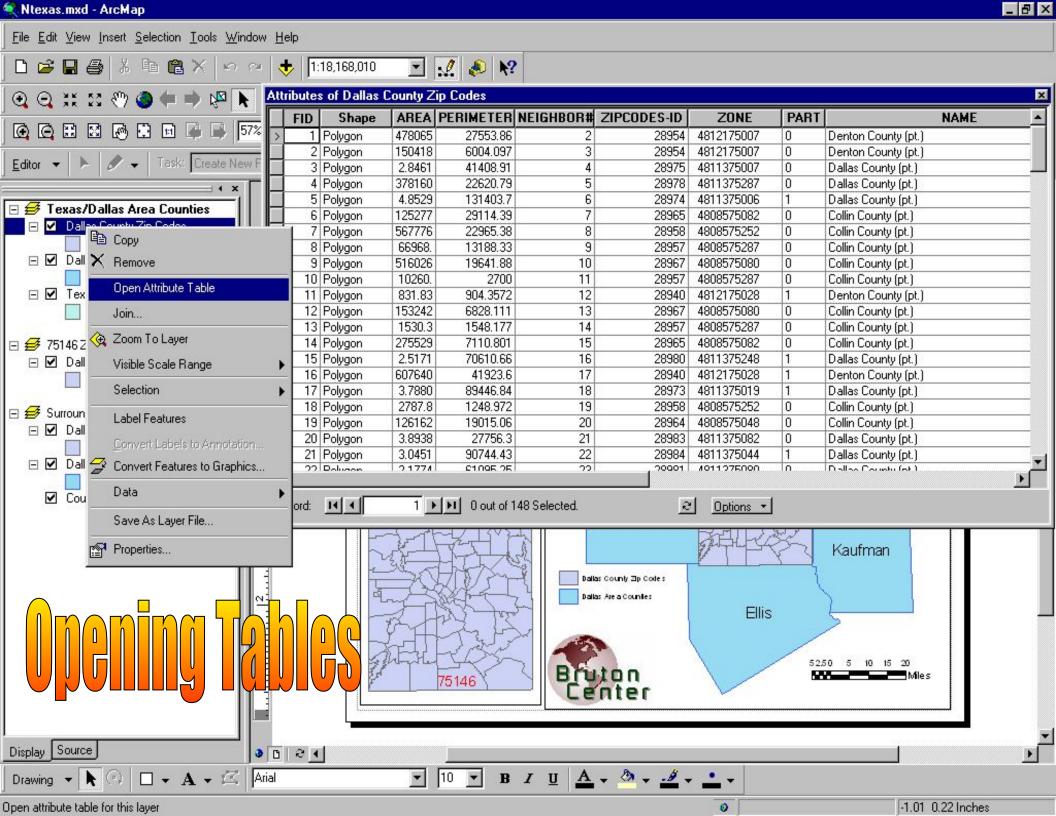
- Add tables to maps
- Organize
  - Freeze/unfreeze columns
  - Rearrange & resize columns
- Sort records
  - Ascending & descending
  - By more than one column
- Edit
  - Add or change records & values
  - Copy and paste records & values
- Query
  - Find values using "find" tool
  - Select records interactively or by attribute with query "wizard"
- Make simple or advanced field calculations using "field calculator" &VB scripts
- Join
  - By name or attribute (common values)
  - By location (spatial join)
- Use relationships to query information in a related table

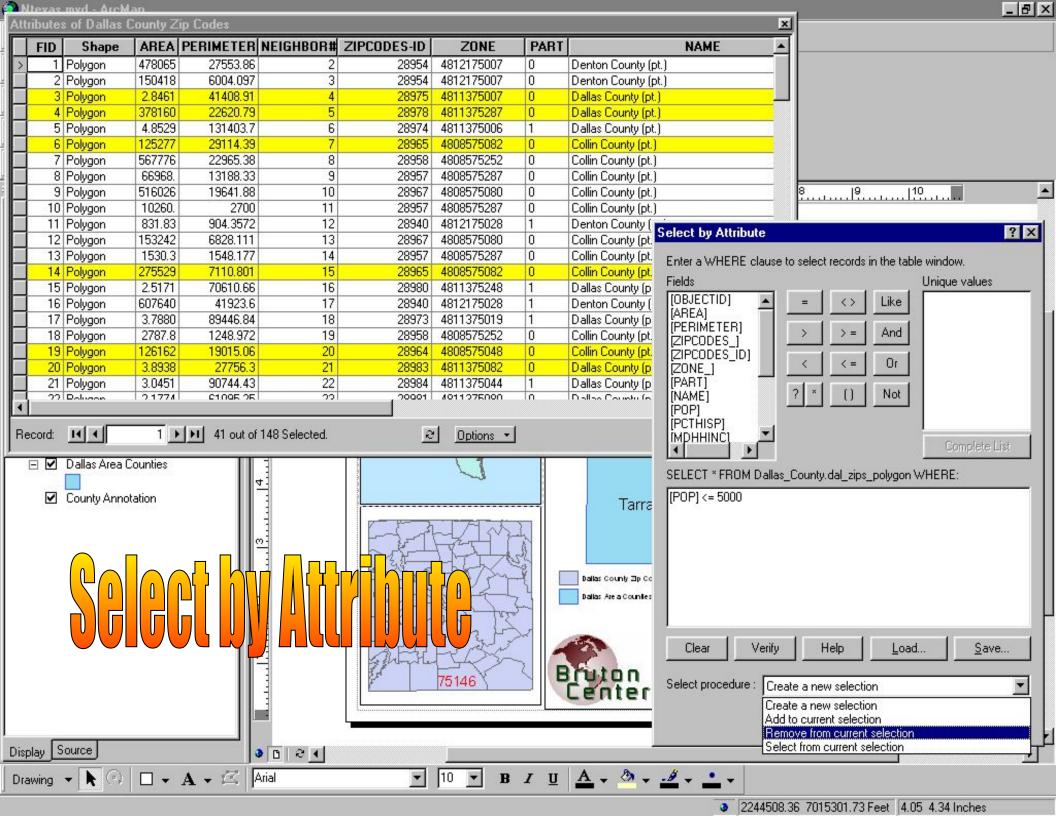
## Elements of an ArcMap Table

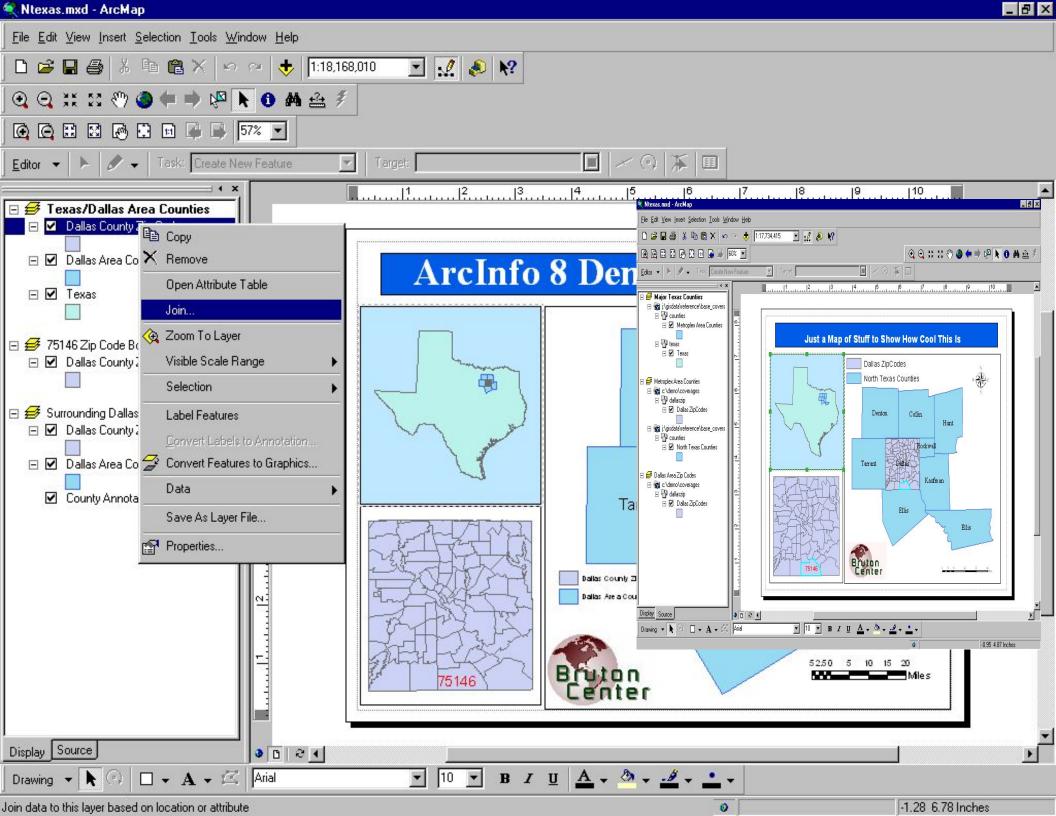
Columns or Fields

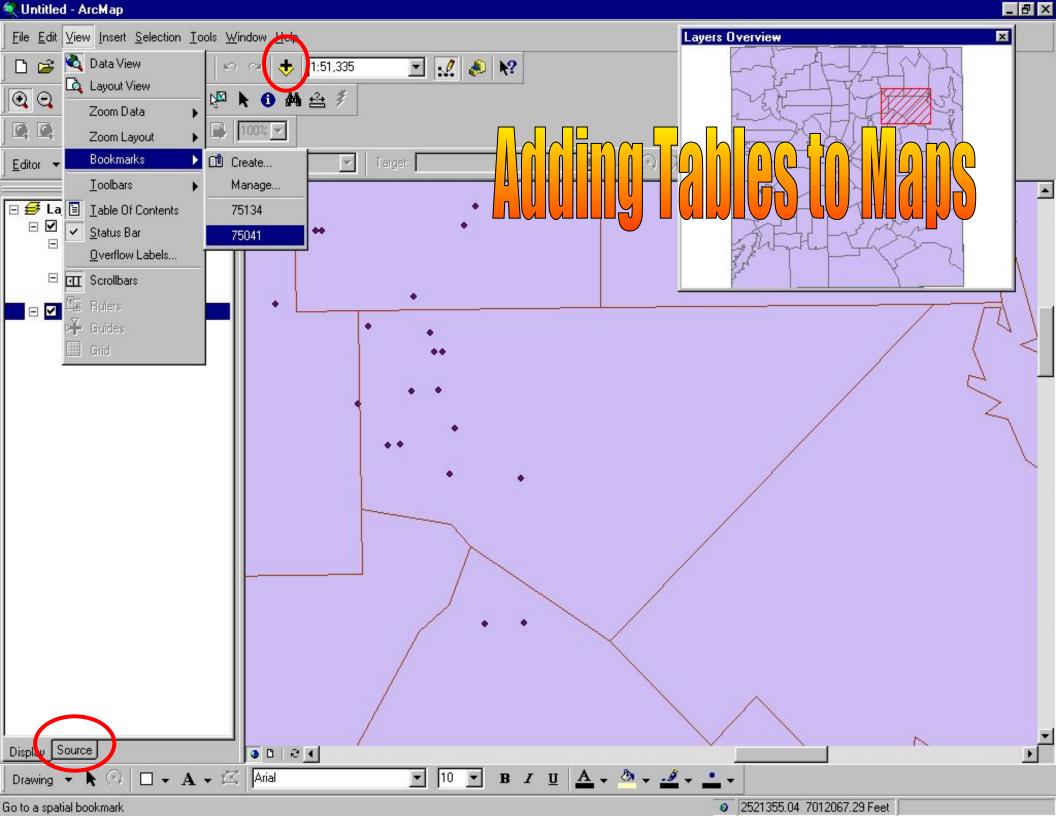


Move To Record





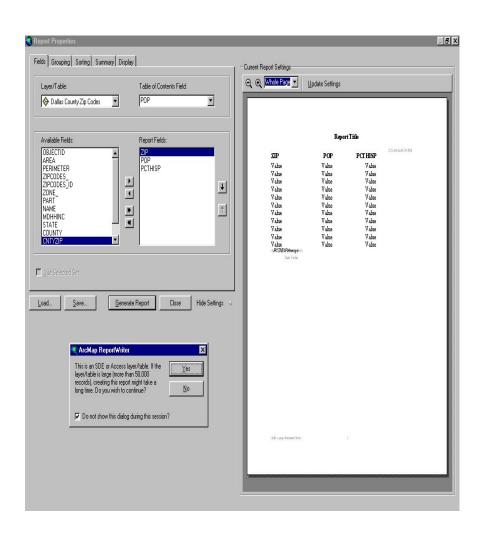




#### Graphs & Reports

- Graphs & Reports
  - Present information about map features and their relationships
- Graphs
  - Present tabular data about map features in graph
  - Derived from attribute tables
  - Can include in map layouts
  - Can save, load or export as graphic file
- Reports
  - Present tabular data about map features in an attractive manner
  - Derived from attribute tables
  - Can include in map layouts
  - Can save, load, or export as PDF, RTF, or TXT

### Graphs



- Area
- Bar
- Box-whisker
- Bubble
- Candlestick
- Gantt
- High-Low-Close
- Line
- Pie
- Polar
- Scatter
- Surface
- Time Series

#### Reports

- A report presents tabular information about features on the map formatted in an attractive manner.
- Reports are derived from an attribute table on your map.
- Report can be placed on your map layout next to your geographic data or Reports can be saved as a file, e.g. \*.pdf, for distribution.
- You can include a title, page numbers, the current date, summary statistics, and images.
- There are different kinds of reports you can create:
  - Record report where each record is represented by a row in the display.
  - Columnar report with data organized in a single column, displaying field names and columns vertically.

