Learning Objectives in this chapter:

* Be able to work with attribute tables
* Editing tables
* Exporting tables for Excel

# Working with Tables

**8.1 Overview**

This section will discuss tables, which contain your attribute information about spatial features in your map project.

**8.2 Working with Tables**

A table contains formatted descriptive information. In ArcGIS, the information in a table is generally associated with spatial data, such as a feature attribute table, but can also be independent of any spatial data. The feature attribute table contains descriptive information about the features in a feature class. To open a feature attribute table in ArcMap, right click on the layer in the Table of Contents and choose Open Attribute Table. This may also be done in ArcCatalog by selecting data and clicking on the Preview tab.

*Opening an Attribute Table*

 

An attribute table is made up of fields (columns) and records (rows). Each field represents one type of descriptive information. Each record contains the attributes of one feature in the dataset.

In the following example, a field would be Name and a record would be Scotland.

**Field**

**Record**

*Fields and Records* 

You can select features directly from the attribute table by selecting a record. Go to the left hand side of the screen and click on the gray box next to the record you want to select. The record will be highlighted in the attribute table and its corresponding feature will be selected within the map as well.

There are three ways to view the attribute information for a feature within ArcMap:

1.Its attribute table, which can be docked anywhere on the interface

2.The Identify button, which we have discussed in an earlier chapter

3. The HTML popup tool. This is illustrated in the following image.

*Viewing Attribute Information* 

**HTML Popup with information on the selected feature**

**Selected record within the attribute table**

**HTML popup tool**

**Selected feature associated with the selected record within the attribute table.**

Across the top of the attribute table there are some other informational areas and options. The first button is the Table Options button.



Clicking on the Table Options button gives you a menu full of ways to search, select, and add fields.



Toggle between these two buttons to change the view from showing all attributes to just showing the selected attributes.

The main tools that we will discuss on this menu include: Find & Replace, Selection tools, and Add Fields. We will also touch on Joins and Relates, and how to create graphs later in the chapter.



**Switch selection: alternates between selected features and unselected features.**

**Select by attributes: Brings up a wizard that allows you to select by querying attributes**

**Related Tables: Shows if there are any table relationships associated with this table.**

Click on the Select by Attributes button at the top of the table. A dialog box opens. You may Create a New Selection, Add to Current Selection, Remove from Current Selection, or Select from Current Selection. When you decide what method you want to do, then you will click on the field name that you want to select by. (Example: County Name)

If you would like to query by County Name, you would then click on the ‘equal to’ symbol, and then click on ‘ Get Unique Values’ which will populate the central box with the counties that are listed in that field. Select the county name that you desire.

*Creating a Query*



Click Apply and the polygon with the name that you chose will be selected in your map, as well as in the attribute table.

You can dock your table where you want within your map if you like. The image below shows the blue arrows that indicate the areas that you can dock your table.

Simple hold down the right mouse button and drag your table to one of the blue arrows to automatically dock the table.

*Docking a Table*



*Docked Table*



You can also click on the pin button that is in the top right hand corner of your table to pin the table just above the Drawing toolbar as shown below. It simply contracts the table so that you still have it open, however it’s out of the way while you work. You can do this to more than one table at a time. When you add more than one table, the names of the corresponding layers will show up instead of the just title ‘Table’.

*Just one table open and pinned in the map:*



*More than one table open and pinned in the map:* 

**Table Display**

If you want to see all features within a table or just a selected set, two icons at the bottom of the table are used by toggling between the two.

Click on either icon. The  button will display all features within the table. The  button will only show the selected features attributes in the table.

The total amount of selected features will be displayed in parentheses next to the icons.

A second way to toggle between selected and all features is by using the switch selection button at the top of the table. 

*Viewing Selected Features*



**8.3 Table Editing**

**Adding a Column to the Table**

You may want to add a new field to the table of your shapefile. In order to add a new column, you must not be within an Edit Session. Simply click the Table Options button on the table toolbar and select Add Field.

The Add Field dialog box will open. Name your new field…make sure that there isn’t any spaces in the name. Ten is the maximum amount of characters. If your contents in the rows will be text, select Text. Precision would be the amount of characters you will be entering. Otherwise, choosing Float or Double is useful because the number can be in decimal format of a whole number. Leave the Precision at zero for the maximum digits.

*Adding a Field*



Click OK and your field will be added to your table. You can move your column by dragging it to where you want it in the table.

**Editing Existing Data in a Table**

You can’t edit existing data in a table unless you are in an edit session. Click on the Editor Toolbar button to open the Editor Toolbar. Click on Editor, and start editing.

(If multiple shapefiles are open, the Editor tool needs to know which files to edit. In this case, another dialog box would display asking you to start editing, and you will need to pick the layer or geodatabase to edit.)

When you are in an editing session, the top row of the attribute table will turn white. Go to any of the values within the table and type over the text to change it. When you are finished editing your table, make sure that you stop the edit session and save your edits when prompted.

Another way to edit attributes once you start an edit session would be to click on the Attributes button on the Editor Toolbar. You can then click on the feature directly within the data view.

A new window will open displaying the attributes of the selected feature. You can click directly in the appropriate field and start typing. When you are finished, stop editing and save your edits when prompted.

*Attributes Window*



**Hiding/Deleting Columns and Performing Calculations**

If you have added a shapefile or feature class to your map project and you notice that there are some fields in the attribute table that you do not need, you can either hide the column, or delete it completely.

To turn a field off, right click on the field name and choose Turn Field Off.

*Turning a Field off*



If you would like to turn the field back on later, then you can choose the Table Options button and choose Turn all Fields on.

*Turning a Field on*



To delete a field, you must not be in an edit session. Make sure that you are not editing, and then right click on the field you want to delete. Select ‘Delete Field’.

*Deleting a Field*



You can also choose to sort your field by ascending or descending order, and freeze or unfreeze your column in this way. Freezing your column would enable you to scroll through your fields while keeping specific ones always viewable. Using the field calculator enables you to apply a calculating to your values.

A dialog box will appear and you can either manually create a formula to apply to your field, or if you click on the Load button and navigate out to the Y drive, there are calculations available for you to apply.

Navigate to Y:/TMS/arcview/Data/Calculations choose from any of the files and then click open.

*Selecting a Calculation*



The script will be loaded into the Pre-Logic Script Code area of the box. Click OK to apply the calculation to your field.

*Selecting a Calculation*



A general rule of thumb when calculating fields with existing data is to *calculate within an edit session*. (To be able to undo the results…)

When calculating new empty fields  *calculate outside an edit session.*

**8.4 Excel Support**

Excel files are supported directly in ArcMap as read-only tables. Excel files are shown in ArcCatalog. Click on the Expand (+) button and you can view the Excel file’s worksheets.

*Selecting a Calculation*



When you add the Excel table to your table of contents, the view automatically changes to show the List by Source view. Why? Because an Excel table does not have geometry and will not show up in the table of contents when Listing by Drawing Order… it doesn’t have anything to draw on the screen.

They will always have a $ sign attached to the end. Excel data can be used like other tables in ArcGIS with the exception they can’t be edited from inside ArcGIS and fields can’t be added, deleted or calculated.

***This concludes Chapter 8. The next exercise will guide you through working with tables.***

Overview:

In this exercise you will learn how to add data and edit your tables. Editing tables may only be done on data that you have write access to. This data generally consists of clipped areas, buffer areas, tables and shapefiles or feature classes that you have created. The tables you have added from the TMS Toolbar are not editable.

**Step 1**

Open **ArcMap**, using your bookmarks zoom to project **j5p0347g**.

The layers that should be *turned on* right now are; **Cave**, **Area\_Footprints**, **Hazwaste\_clip**, **Wells\_selection**, **Accident Severity**, **j5p0347a**, **Missouri LRS** and the **Polylines** in the Group Layer **j5p0347g.**

**Step 2**

Next we will be adding data to the Cave table.

*Select* **Editor > Start Editing** and *select* the **Cave** shapefile.



*You can also start editing by right clicking on the feature you would like to edit in the table of contents and select Edit Features > Start Editing.*

*Select* **OK**.

**Step 3**

*Right click* on **Cave** in the Table of Contents and *select* **Open Attributes Table**.



Enter the following information into the table:

**ID:** 1

**Artifacts:** 15

**Survey:** March 2009



**Step 4**

Next we need to calculate the **Area** of the Cave polygon. This will be done by the calculate geometry option.

*Right click* on the **Area field** and *select* **Calculate Geometry…**.



In the calculate geometry dialog box keep the default of **Area** and **Use coordinate system of the data source**. *Change* the units to **Acres US [ac]**.



*Select* **OK**.

Your completed area should now have the following information.



**Step 5**

Save your edits. Click on Editor and *select* **Save Edits**. Click on Editor again and *select* **Stop Editing**.

**Step 6**

If someone else opened your map and looked at the Table they would have no idea what sort of units **Area** was in so let’s set an Alias for the field Area.

In the Table of Contents *right click* on **Cave** and *select* **Properties**. *Select* the **Fields** tab.

*Select* **Area**, under Appearance *change* the Alias to **Area\_in\_Acres**.

While you’re in the Fields tab *uncheck* **FID** and **Shape** under Choose which fields are visible. This is another way to hide the fields in the table.

*Select* **OK**.

*Open* the **Cave Attribute Table**. Your table should now look similar to this.



*Close* the **Table**.

**Step 7**

Now we will add some information to Area Footprints feature class we created.

*Select* **Editor > Start Editing** and *select* the **Area\_Footprints** feature class.

*Right click* on **Area\_Footprints** in the Table of Contents and *select* **Open Attributes Table**. To figure out which polygon is the Hospital Area, click on the gray box to the left of the first record. This will select that polygon.



**Selected Polygon**

**Selects the polygon**

**Step 8**

Enter the information below for the hospital polygon.

**Name:** Lake Regional

**Address:** 54 Hospital Dr., Osage Beach, MO 65065

**Phone\_Number:** 573-348-8000

Enter the information below for the airport.

**Name:** Osage Beach Grand Glaize Airport

**Address:** 957 Airport Rd., Osage Beach, MO 65065

**Phone\_Number:** 573-348-4469

**Step 9**

*Close* the **Area\_Footprints** attribute table.

*Save* your **edits**, and *Stop* **Editing**.

**Step 10**



Use the HTML popup tool to view the attributes for the Area\_Footprints features.

*Select* the **HTML popup tool** from the Tools Toolbar, then go to the map and *select* the **hospital polygon**. Here you can see the information from the hospital attribute table.

Using the HTML popup tool *select* the **airfield polygon**.



*Notice you can have multiple popups open at once.*

**Close** the popup boxes.

**Step 11**

Using the HTML popup tool *select* the **Cave** polygon.

*Notice it does not show the data from the table that you have hidden in step six.*

**Close** the popup box.

**Step 12**

Once a feature class or shapefile is created you can also add fields to that feature. Let’s add a MoDOT District field to the Hazwaste\_clip.

*Right click* on the **Hazwaste\_clip** in the Table of Contents and *select* **Open Attribute Table**.

**Step 13**

*Click* on the **Table Options** button and *select* **Add Field**. The field will be added after the last field in the table.



**Step 14**

For the name of the field use **MoDOT\_District**.

For the Type *select* **Text**. In the Field Properties section, for the length *use* **15**.

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*Select* **OK**.

**Step 15**

Scroll to the last column in the table. *Right click* on the **MoDOT\_District field name** and *select* **Field Calculator**. The field calculator can be used to calculate simple text or advanced Visual Basic or Python script.



Since this is a string field make sure you use quotation marks or the calculation will fail. For this calculation *enter* **“CENTRAL”** in the lower box.



*Click* **OK** to start the calculation.

You will see that each field in the MoDOT\_District column now contains the District.



**Step 16**

Tables can be exported to a DBF file that can be brought in to Microsoft Excel. If you add X, Y fields to the table before exporting you can always bring it back into ArcMap.

*Select* the **Table Options** Button and *click* **Export**. Browse to your project folder **j:\gis\_proj\j5p0347** and *save* the file as **Hazwaste\_clip**.

In the Save as Type: dropdown option *pick* **dBASE Table**.



*Select* **Save**. *Click* **OK**.

**Do Not add this table to the map**.

**Step 17**

Opening a DBF in Microsoft Excel.



*Click* the **Windows Start Button** *Select* All **Programs > Microsoft Office > Microsoft Excel.**

From the Office Button *select* **File > Open**. *Change* the file type to **dBase Files (\*.dbf)**.

Browse to your project folder and *open* the **Hazwaste\_clip.dbf**.

*Save* the file as an **Excel Workbook in the project folder**.

*This table could now be edited outside of Arcmap and brought back in later if needed.*

**Step 18**

Close **Excel**.

*Save* your **map** and *close* **ArcMap**.

***End of Chapter 8 Exercise.***

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