TABLES, ANATOMY OF A TABLE

topics of the week

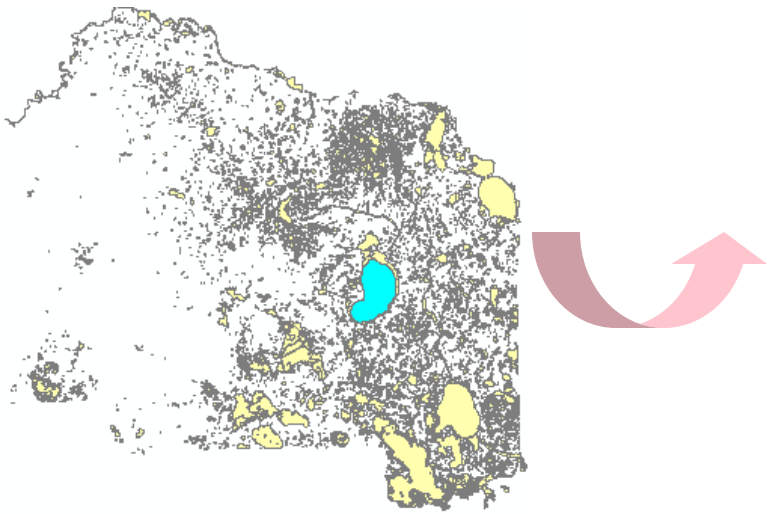
- Table structure
- Working with tables
- Table relationships
- Cardinality, Joins and Relates

Table Jargon

- What is a Database?
- What is a Table?
- What is a Record/Row?
- What is a Field/Column?
- What is a Primary Key?
- What is a Query?
- What is a Query Language?

Tables

- Descriptive information about geographic features
- Each geographic feature class has an associated table
- Each geographic feature has an associated row – data element

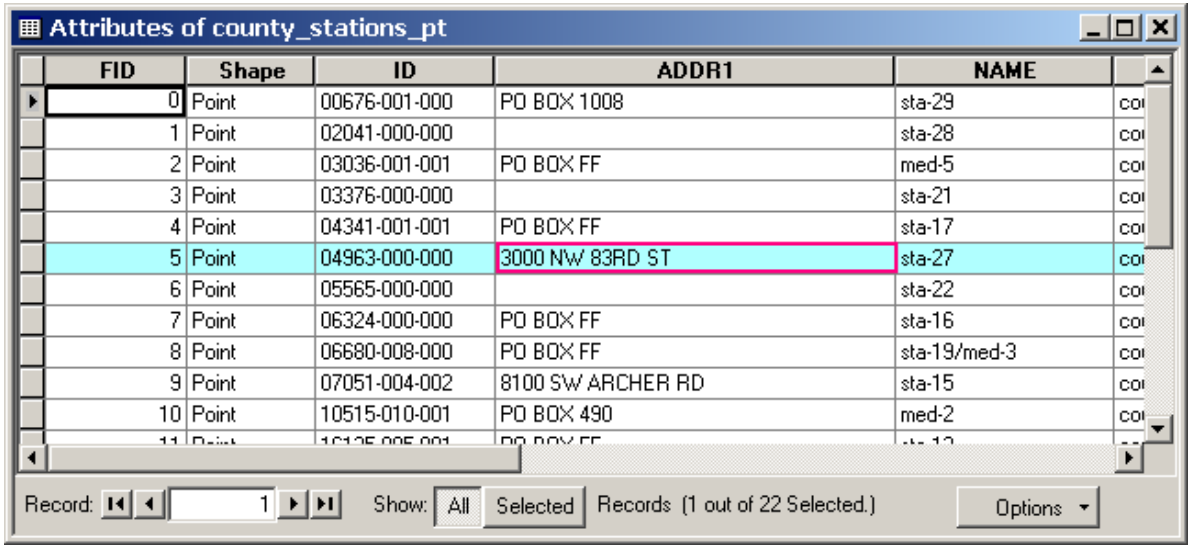


Feature Attribute Table

OBJECTID*	Shape*	AREA
1	Polygon	53233.35302
2	Polygon	2246.91016
3	Polygon	140.42082
4	Polygon	383.77933
5	Polygon	2424.9155
6	Polygon	2744.96696
7	Polygon	2910.46316
8	Polygon	9585.07983
9	Polygon	5258.15586
10	Polygon	3709.66528
11	Polygon	1157554.52887

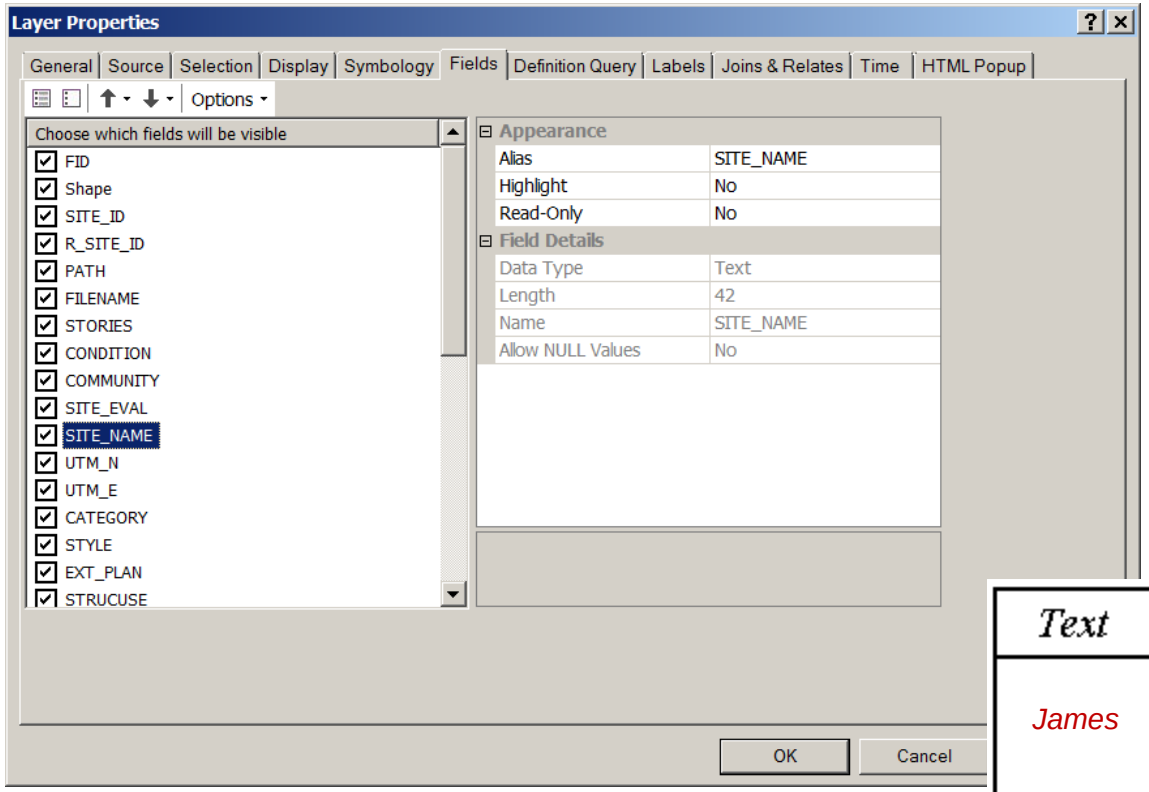
Table structure

- Records/rows - fields/columns
- Value – cross of a field & a row
- Fields/columns definition – field types
- Fields/columns types can store numbers, text, dates
- Each field/column name must be unique



Tabular data - field data types

- Different field data types store different kinds of values
- Choose the right field type for the right value
- Field types vary according to the file format of the table



Name: James

Age: 46

Height: 5.6

Date of birth: 2.12.00

Picture: jpg

Text	*Short*	*Float*	*Date*	*Blob*
James	*46*	*5.6*	*2.12.00*	*picture*

Working with tables in ArcGIS

- **In** ArcCatalog **– preview, edit existing, create new**
  - **Sort ascending or descending**
  - **Freeze/Unfreeze columns**
  - **Run statistics**
- **In** ArcMap
  - **Select records**
  - **Edit existing values**
  - **Set up relationships**
  - **Make field calculations**
  - **etc.**

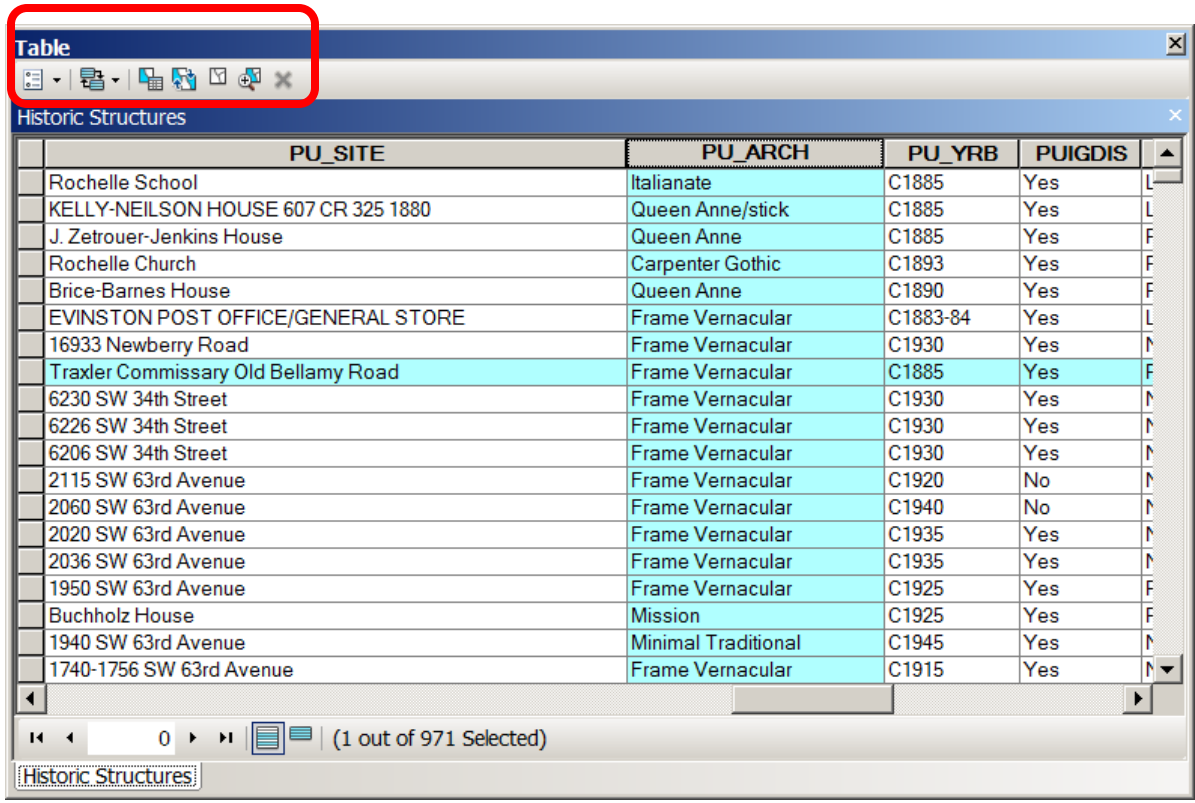
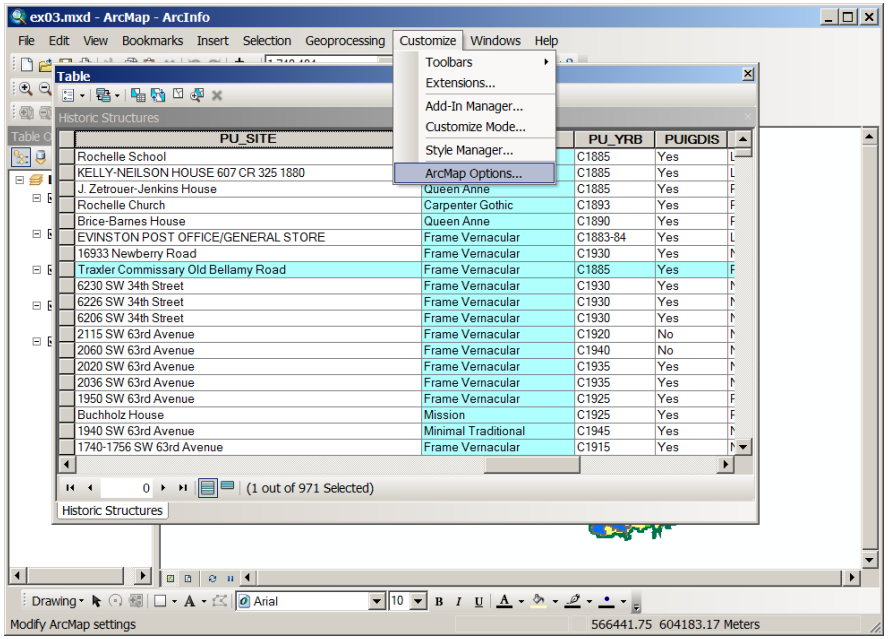
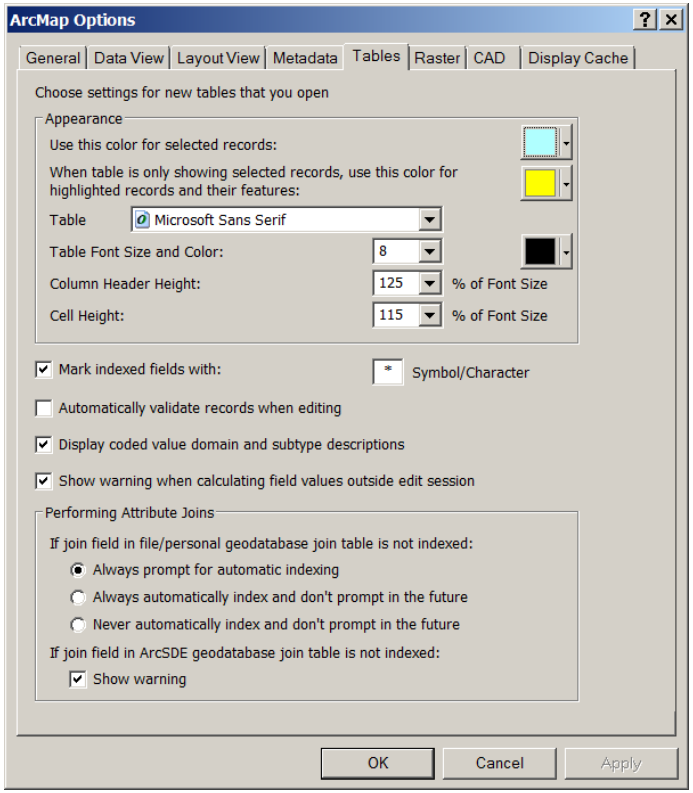


Table options in ArcGIS

There are many options for table manipulations which can be accessed from the virtual table interface.





ArcGIS tabular data formats

- **Each spatial format has a native tabular format**
  - Coverages: INFO - closed
  - Shapefiles: dbf – open, interoperable
  - Geodatabases: mdb – somewhat operable
- **Can convert among the three or text format**
- **Some can create links between them, independent on the format**
- **Can all be created in** ArcGIS**, but for the** INFO **which can only be created in** ArcInfo **and** ArcEditor

Associating tables

- **Spatial data store attributes in their *feature table***
- **Sometimes one or more *separate tables* exist that have more information about our spatial data**
- **An association can be made between the *feature table* and the *separate tables*, to tie this additional information to the spatial data**
- **This association of tables is based on common column key values**
- **For this association to occur, the nature of the relationships *(cardinality)* of these tables** MUST BE KNOWN

Table Relationships - Cardinality

Four types of cardinality:

One-to-one

a unique value in one table associates to a unique record with same value in the other

One-to-many

a unique value in one table associates to many records with same value in the other

Examples:

One parcel – one owner i.e. one record

One parcel – multiple owners i.e. many records

Table Relationships – Cardinality

Four types of cardinality

Many-to-one

many unique values in one table associate to same value in the other

Many-to-many

many unique values in one table associate to many same values in the other

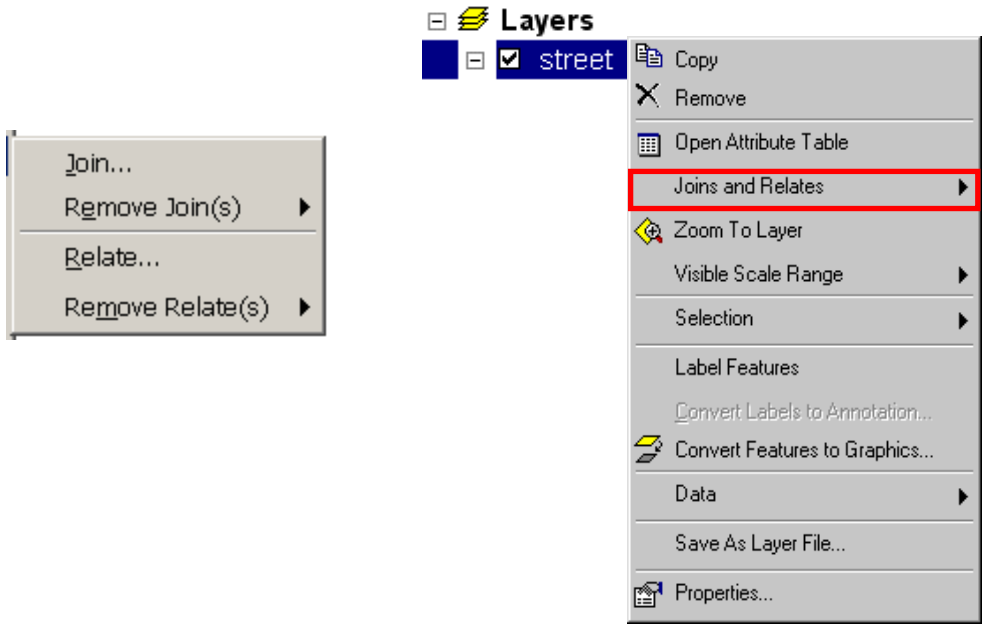
Examples:

Multiple parcels – one owner

Multiple parcels – multiple owners

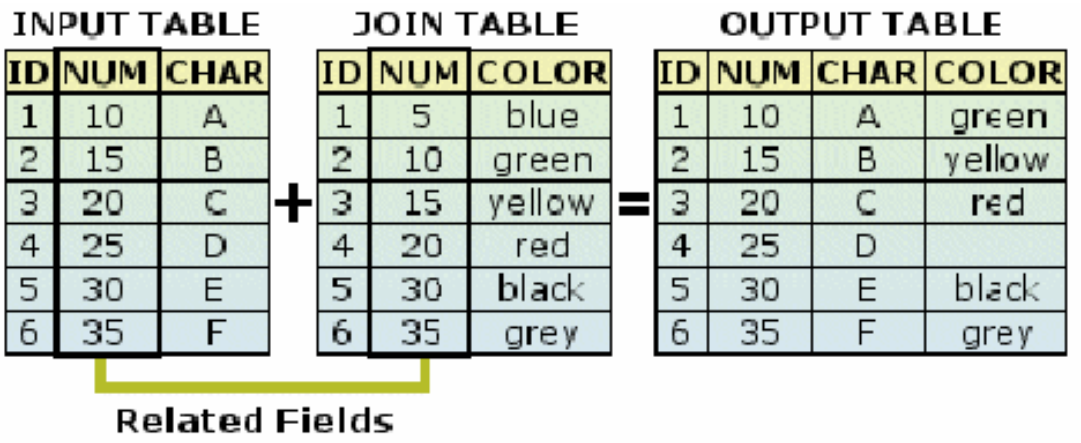
Joins and Relates

- Two ways are available in ArcMap for associating tables
- *Join* - appends the attributes from one table onto the other based on a common field, physically merges the two tables
- *Relate* - defines a relationship between two tables
- Use one or the other based on cardinality type



Joins

- **A *Join* insures a physical connection between the two tables into one**
- **A *Join* appends the attributes of the two tables**
- **A *Join* assumes cardinality *one-to-one* or *many-to-one***
- **A *Join* is only virtual, does not change the data source**
- **A *Join* can be removed at any time**

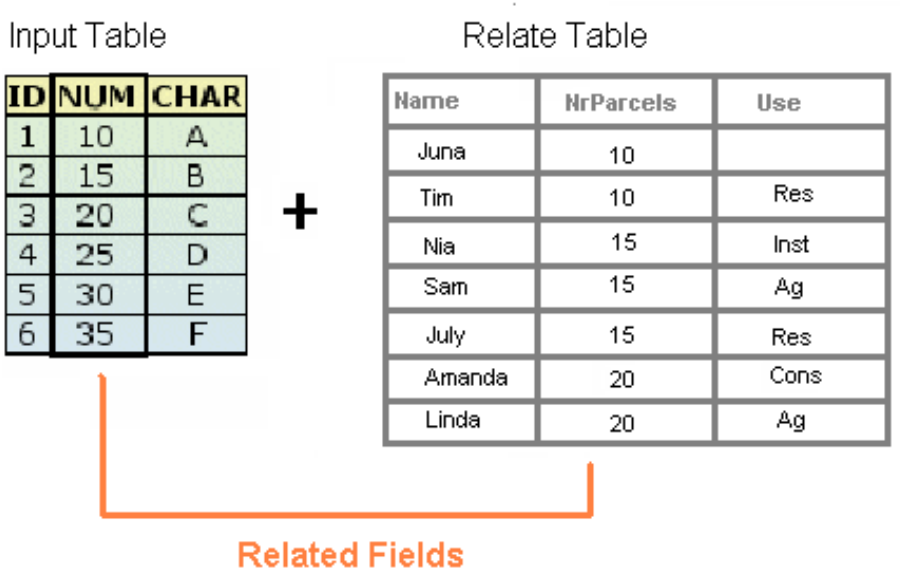


One to one matching records

Relates

- *Relates* **define a relationship between the two tables**
- **Both tables remain independent, no physical merge**
- *Relates* **assume cardinality** *one-to-many* **or** *many-to-many*
- **A** *Relate* **is only virtual, does not change the datasource**
- **A** *Relate* **can be removed at any time**
- **The related table can be updated separately**

One to many matching records

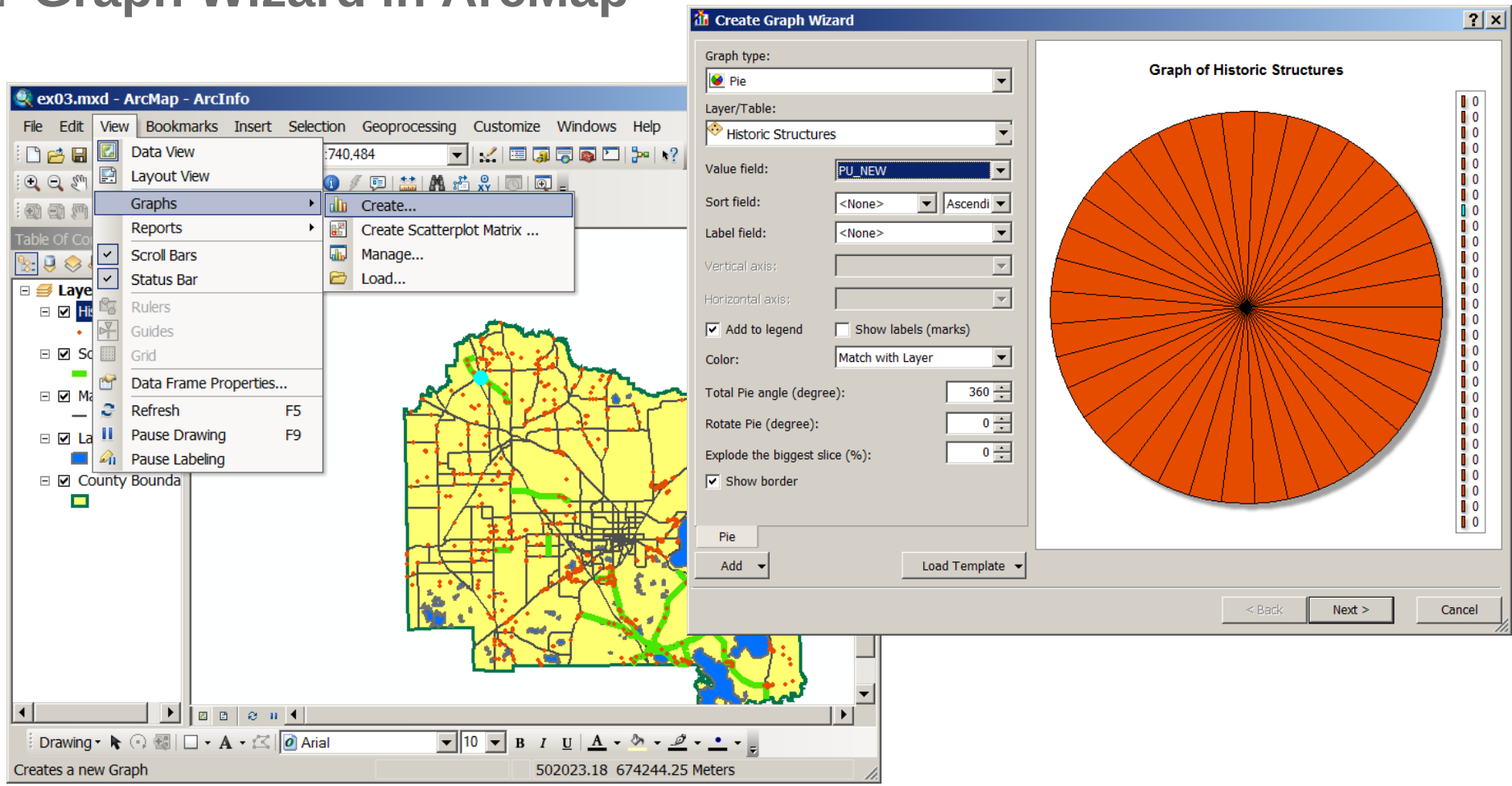


ID	NUM	CHAR
1	10	A
2	15	B
3	20	C
4	25	D
5	30	E
6	35	F

Name	NrParcels	Use
Juna	10	
Tim	10	Res
Nia	15	Inst
Sam	15	Ag
July	15	Res
Amanda	20	Cons
Linda	20	Ag

Creating charts and graphs

- From data to information
- Graph Wizard in ArcMap



More on charts and graphs

- **Dynamically summarize tabular information in a graph**
- **ArcGIS supports a variety of graph types**
- **ArcGIS allows for a variety of graphic properties to be set**
- **ArcGIS graphs can tie to all or subsets of fields/records**
- **ArcGIS graphs can be added to a map** - Data View & Layout View
- **Graphs created outside of ArcGIS can be added to a map**

Graphs update automatically as attributes or selections change in the layer source, but they can also be made static i.e. disconnect from the layer source.

What are reports?

- A way to synthesize your results automatically and store them in a commonly known format such as *html*, *pdf*, etc.
- A report may contain
  - tabular data
  - graphs and charts
  - maps
  - plain text
- Reporting in ArcGIS
  - ArcMap > View > Reports > Create, Load, Run

The ArcMap Report Writer

Only tabular info, export in: .rdf format

Can add back to your map layout