

Introduction to ArcGIS for Brushy Creek

Course exercise for CE 374K Hydrology

University of Texas at Austin

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DESCRIPTION

A geographic information system (GIS) is a system designed to capture, manage, analyze, and display all forms of geographically referenced information. It allows us to view, understand, interpret, and visualize data in many ways. This exercise introduces you to a fundamental understanding of GIS and describes how information is derived from the spatial data in a map. In addition, you will try some basic operations and make your own maps.

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GOALS

After completing this exercise, you will be able to

- Understand how data is managed in ArcGIS in thematic layers.
- Visualize and query the attributes of those data layers.
- Create a flood map of Brushy Creek in Williamson County, TX.
- Do some simple calculations using the data stored in an attribute table.

COMPUTER AND DATA REQUIREMENTS

To complete course exercises, you need the following software:

- **ArcGIS Desktop** (Only one product in this category is required.
ArcView 10

ArcEditor10
ArcInfo 10

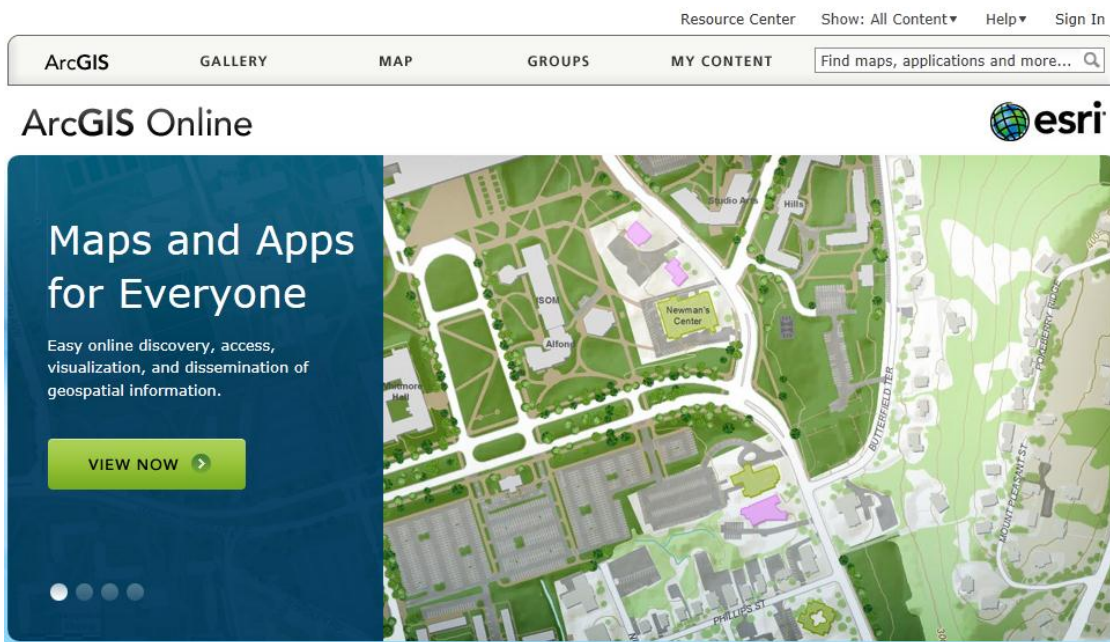
We are going to use ArcInfo 10, the most powerful of these options. You can follow the steps in [Appendix 1](#) to install ArcGIS 10 on your personal computer, or you can use a computer in the Learning Resource Center on the third floor of ECJ, where the software is already installed.

PROCEDURE

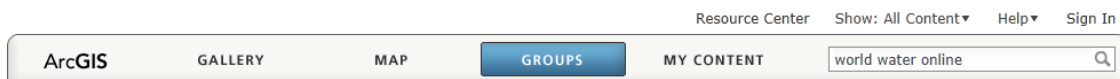
1. Accessing ArcGIS Online

The data of this exercise is from the ArcGIS online at <http://www.arcgisonline.com/home/>

At the upper right of the display, change Show: **Web Content Only** to **Show: All Content**.



Click **Groups** and search for **World Water Online**.



Groups allow you to collaborate with other people.

And you'll see a Map Icon called **BrushyCreek: Geodatabase of Brushy Creek in Williamson County, Texas**

No image available **World Water Online**

Explores ways of sharing the world's water data online

Join This Group

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Group Content

All Results

- Maps
- Applications
- Tools

Title Owner Rating Views Date



Open Details

Papaloapan RH28

Papaloapan Hydrography (RH28) created by INEGI
Map Package by ic.esda (last modified: January 26, 2012)
☆☆☆☆☆ (0 ratings, 0 comments, 0 downloads)



Open Details

k_x_map

add later
Map Package by ahamdtavakoly (last modified: January 25, 2012)
☆☆☆☆☆ (0 ratings, 0 comments, 2 downloads)



Open Details

BrushyCreek

Geodatabase of Brushy Creek in Williamson County, Texas
Map Package by maidment1840 (last modified: January 20, 2012)
☆☆☆☆☆ (0 ratings, 0 comments, 5 downloads)



Open Details

World Water Online

Web Map by fernando.r.salas (last modified: November 7, 2011)
☆☆☆☆☆ (0 ratings, 0 comments, 205 views)

Group Details

Owner: twhiteaker
Status: public
Tags:
water, data, hydrology, climatology, terrain

11 Members

- twhiteaker
- ahamdtavakoly
- asafwat
- daniel.siegel
- fernando.r.salas
- harish2rb
- ic.esda
- maidment1840
- stevekopp
- teklitag
- yeghialt

Click on the BrushyCreek Map and you'll open up the following page, and you want to **Open in ArcGIS 10 for Desktop**

BrushyCreek



Geodatabase of Brushy Creek in Williamson County, Texas
Map Package by maidment1840 (last modified: January 20, 2012)
☆☆☆☆☆ (0 ratings, 7 downloads)

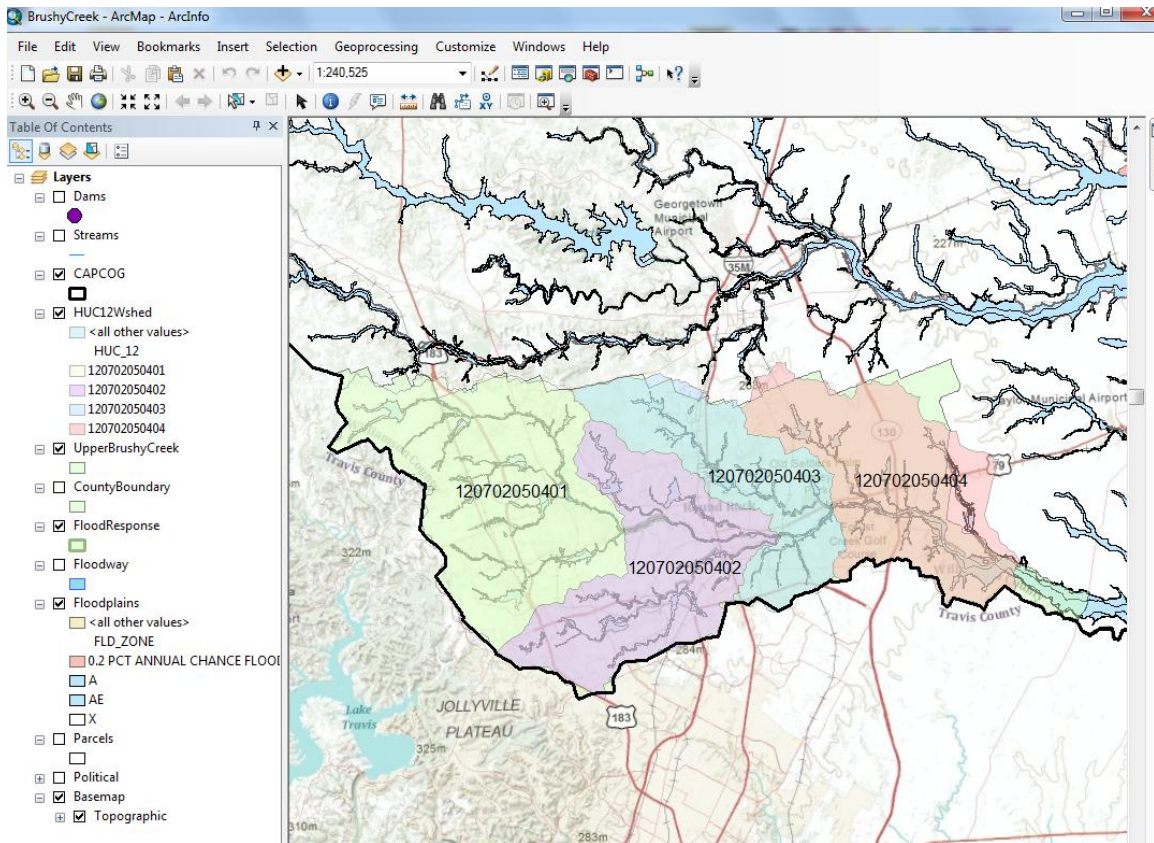
Sign In to rate this item.

Facebook Twitter

Open ▾
 Open in ArcGIS 10 For Desktop
 Download

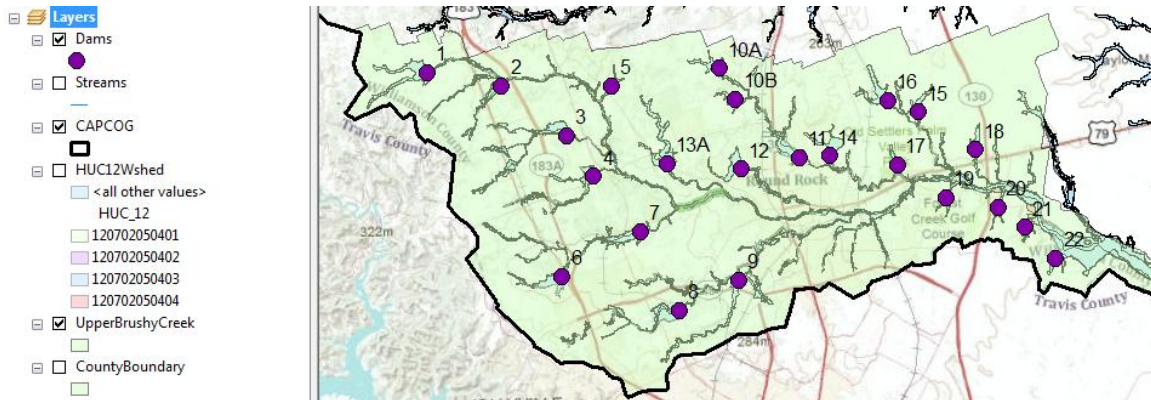
Data being used in CE 374K Hydrology at the University of Texas at Austin, Spring 2012

And this automatically opens up ArcGIS 10 Desktop and displays the data in a map. Pretty cool!



2. Viewing and Querying the Layers

In the list of layers on the left of the map, you can click the display of each layer on or off with the check box to the left of the layer name. For example, if you check on **Dams** and check off **HUC12Wshed**, you'll get a map like this:



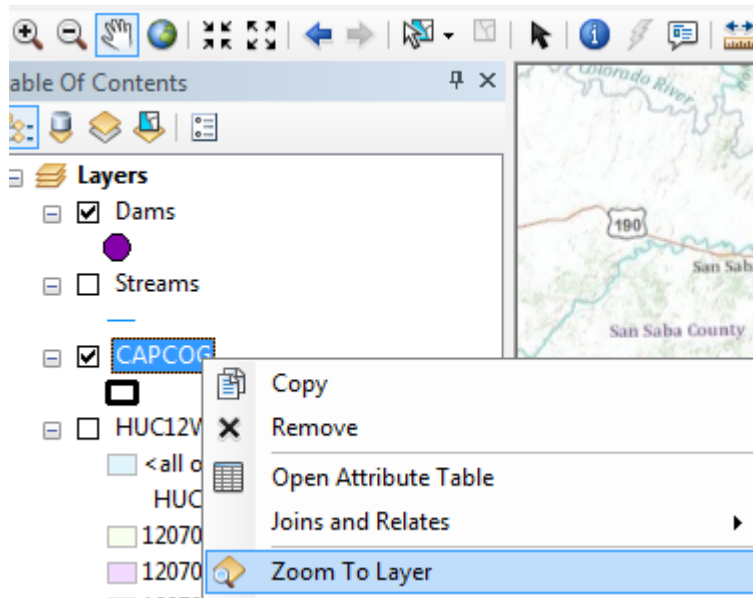
You can zoom to any layer you would like to see by right clicking and selecting




Zoom To Layer

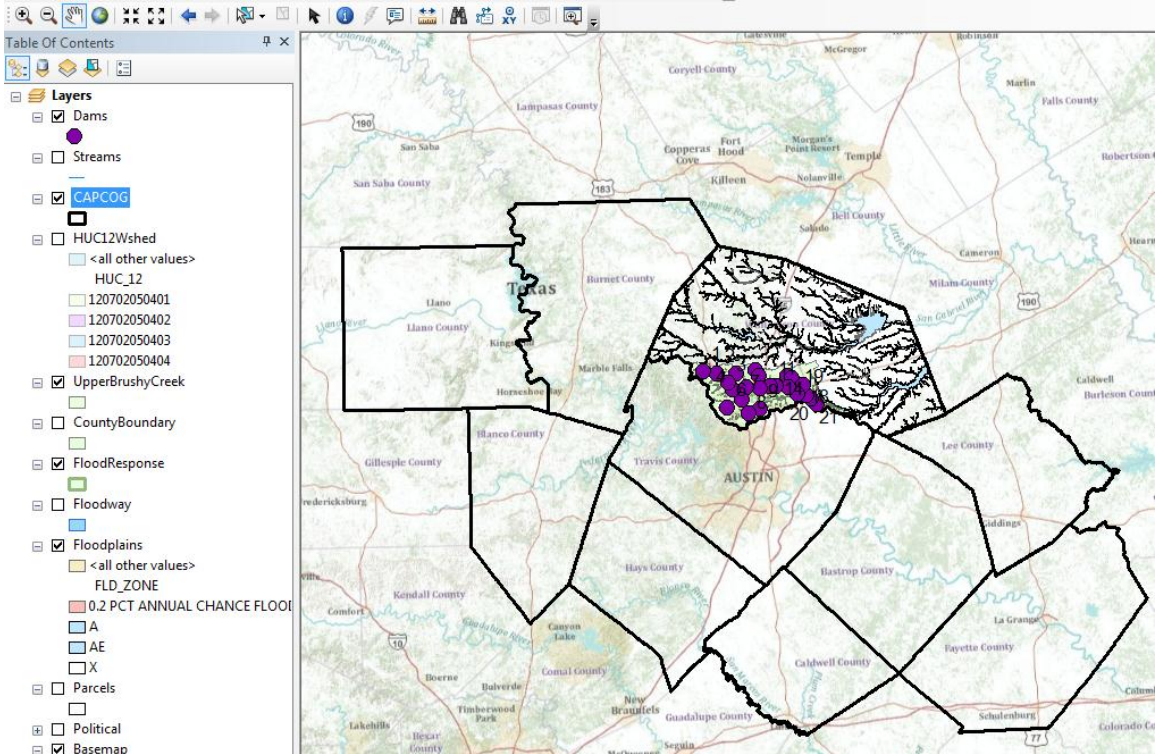
, but remember to open that layer by checking the box in front of it first.

For example, let's zoom to the **CAPCOG** layer, and see what happens.

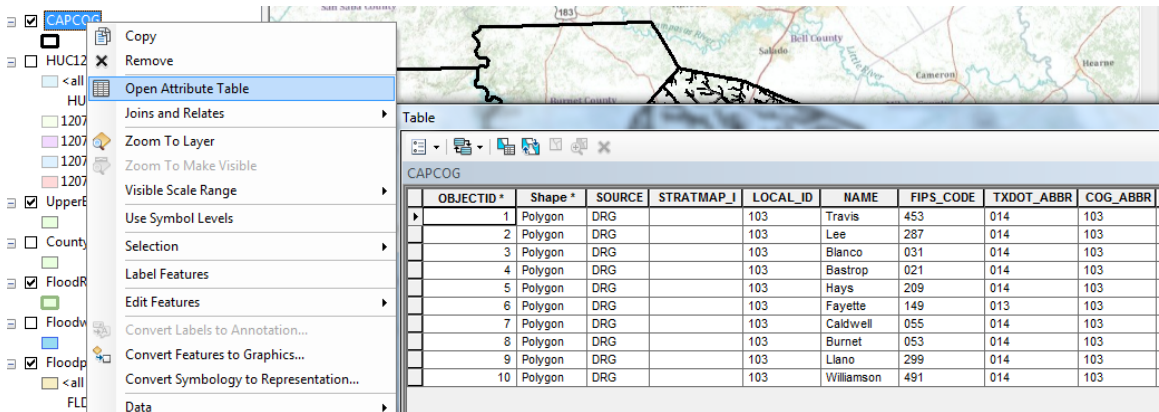


If you mess up the display at some point and want to return to the display you had before, hit the  arrow at the top of the display.

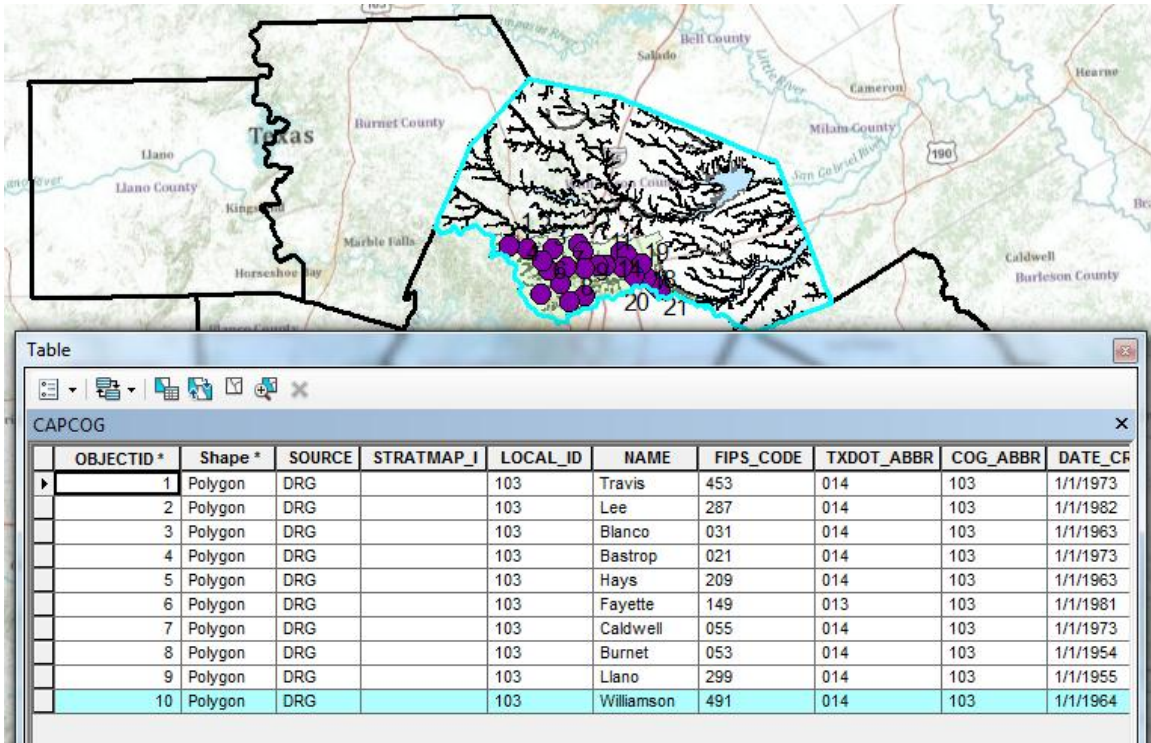
These are the 10 counties in the Capital Area Council of Governments. We are working in Williamson County where the floodplain map shows below, and just south of Williamson County is Travis County where Austin and UT are located.



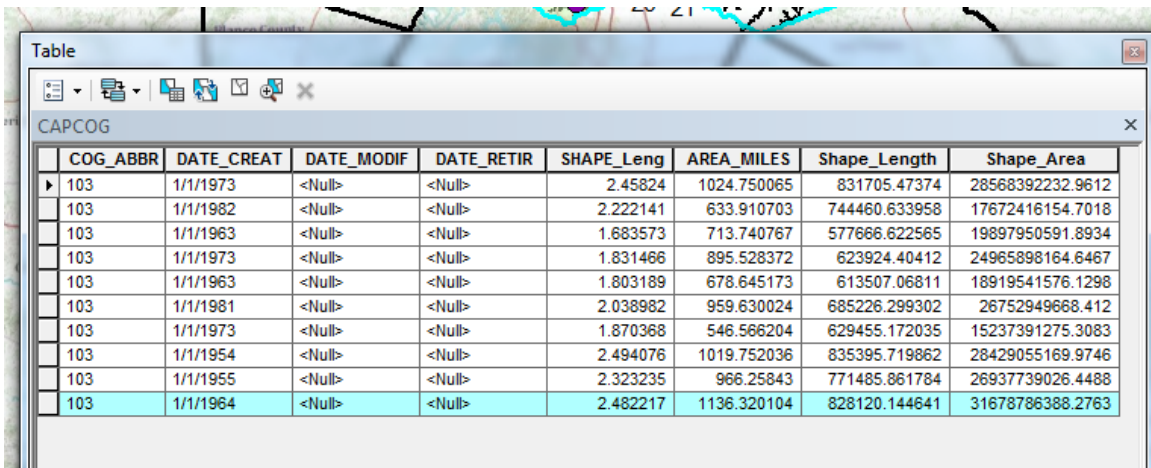
You can access the attributes of a particular feature in a layer by opening the attribute table. For example, right click on **CAPCOG** and select **Open Attribute Table**



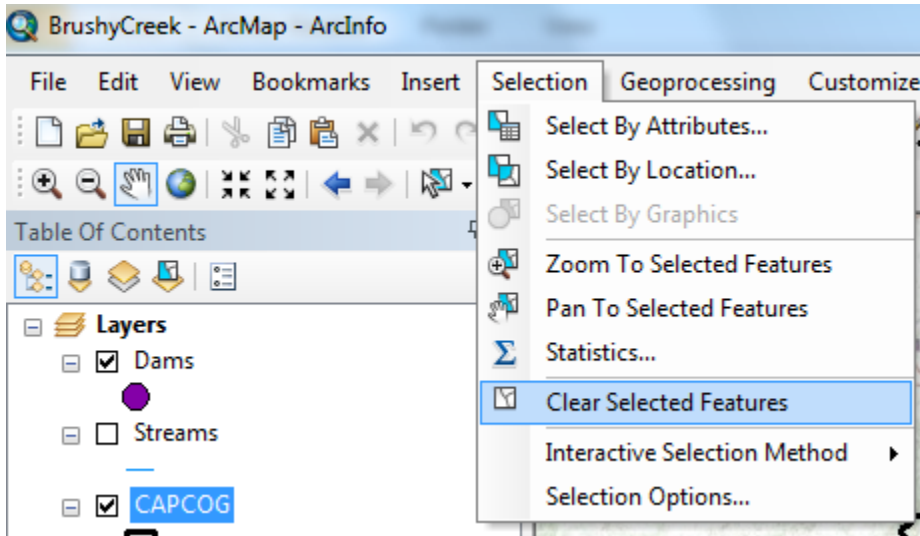
If you click on the row for Williamson county in the table, notice how it is selected also in the map. This is a key idea of GIS – the association of the geometry of a feature with descriptive attributes in a table.



If you scroll along to the end of this table, you'll see various length and area measures. The length refers to the length of the boundary of the polygon describing Williamson County and area the area of this polygon.



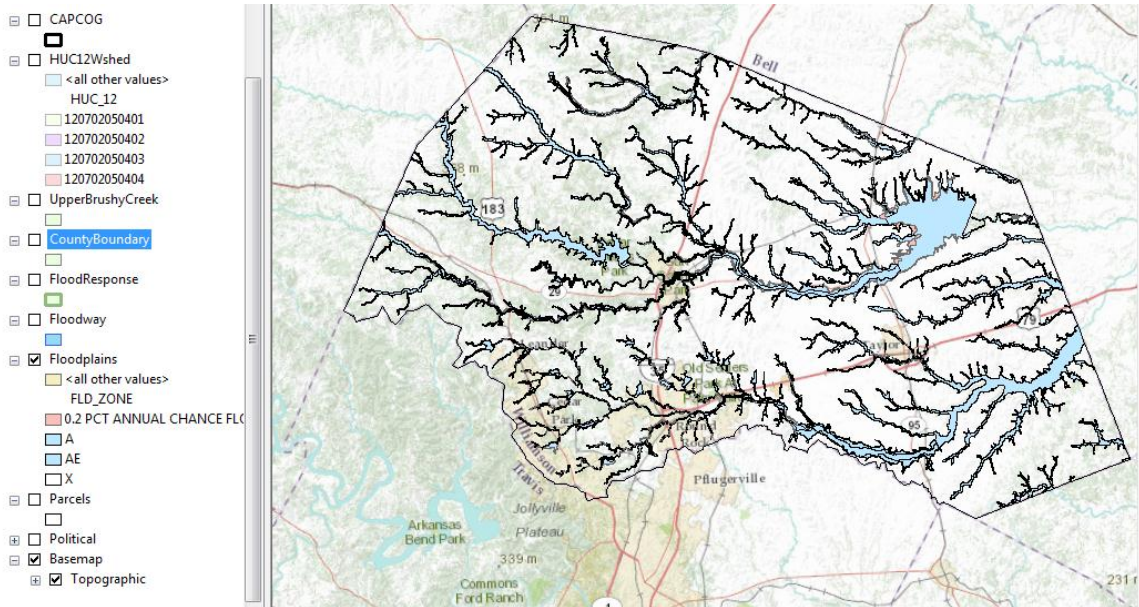
Use **Selection/Clear Selected Features** to unselect Williamson County in the display.



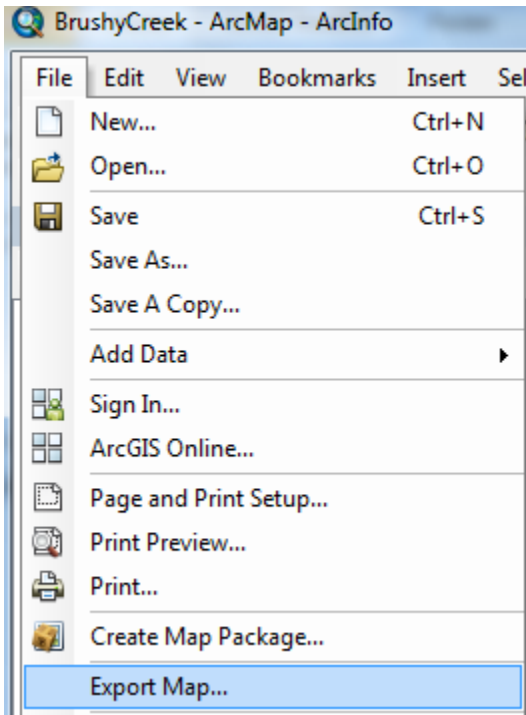
To be turned in: What is the area of Williamson County in Square Miles?

3. Creating a flood map for Williamson County

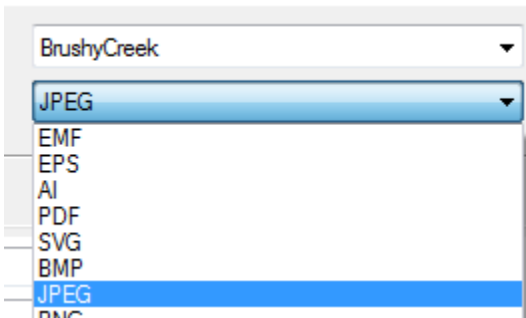
Now, let's suppose we want to create a flood map for Williamson County and put that in a report being written in Microsoft Word. Turn off the display of all the layers except for **Floodplains** and **BaseMap**, and zoom into the layer **CountyBoundary**



In ArcMap, select **File/Export Map**



and in the formats suggested, select **JPEG**

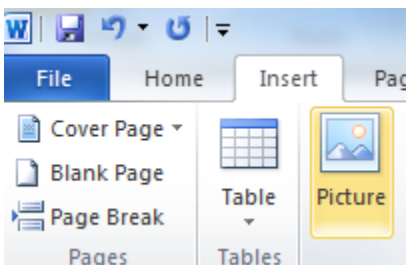


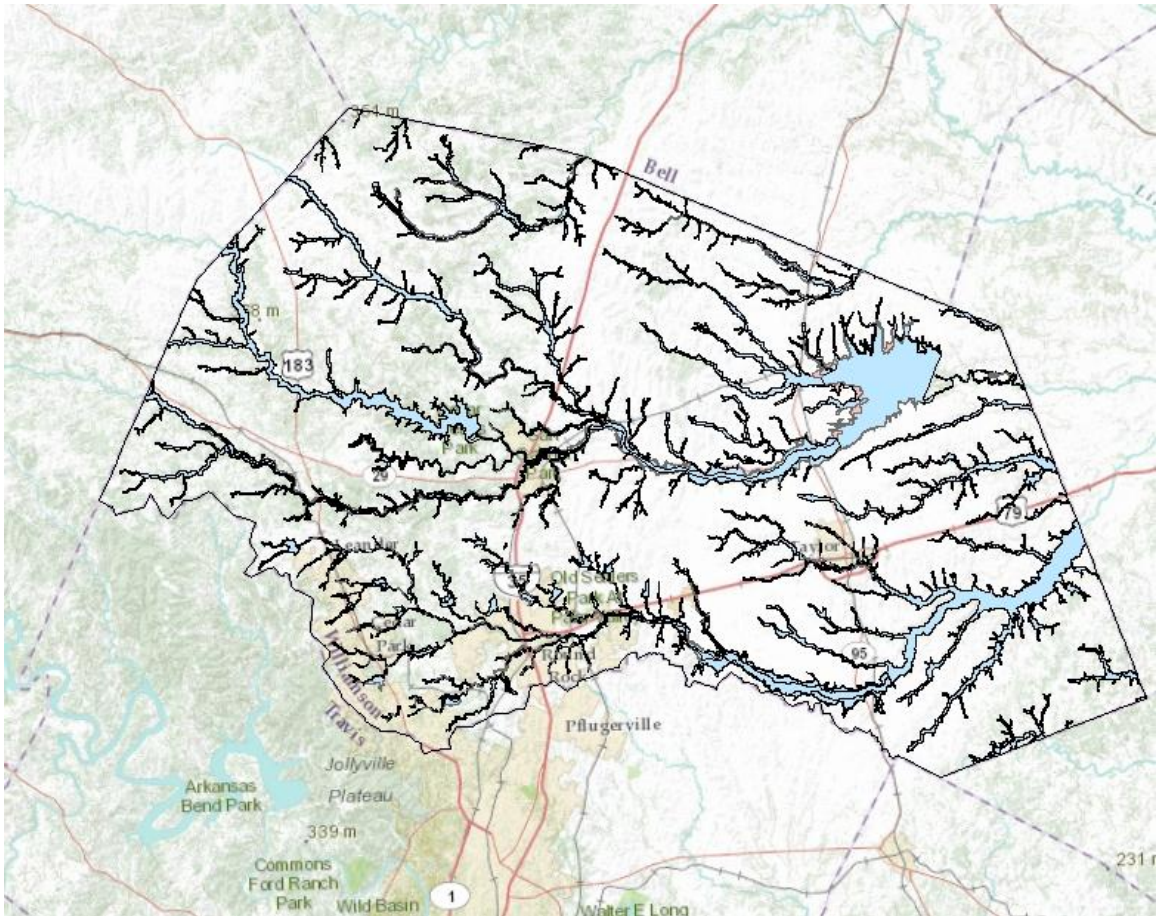
Put the resulting file into a workspace that you can access for your homework report

And you'll find you've got a file there that looks like this:



In Microsoft Word, use **Insert/Picture** to select this file and add it to your homework report.

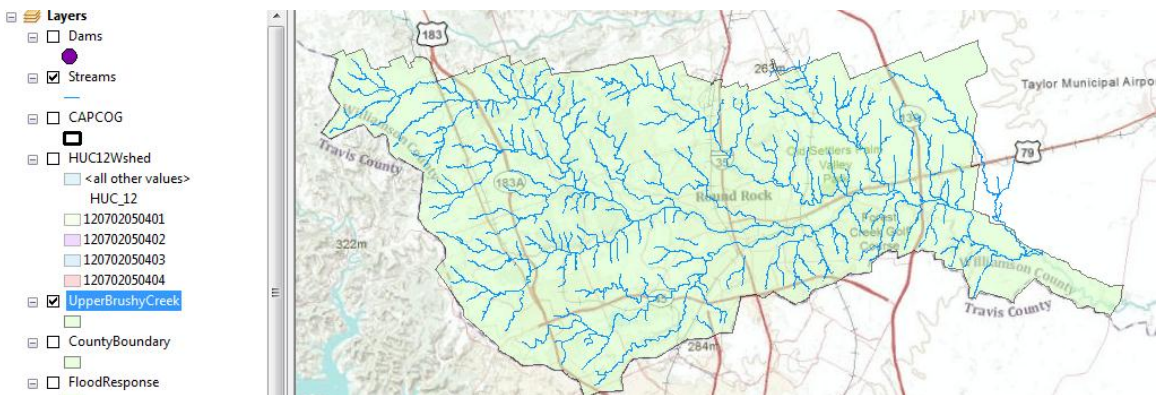




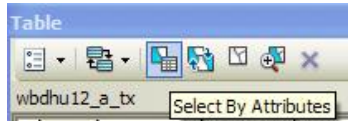
To be turned in: A flood map of Williamson County.

4. Calculating the length of Brushy Creek

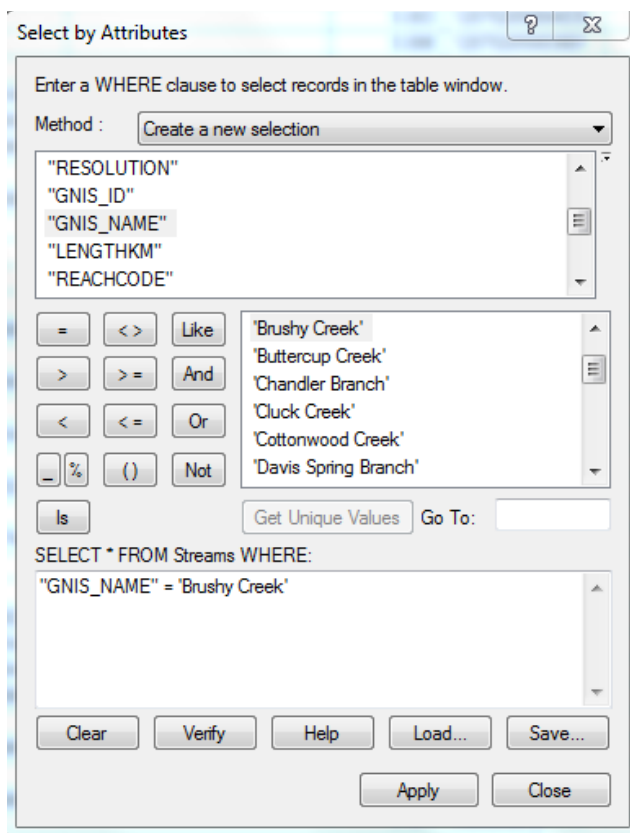
Turn off the display of all the layers except for **Streams**, **UpperBrushyCreek** and **Basemap**, and zoom in to the Brushy Creek watershed.




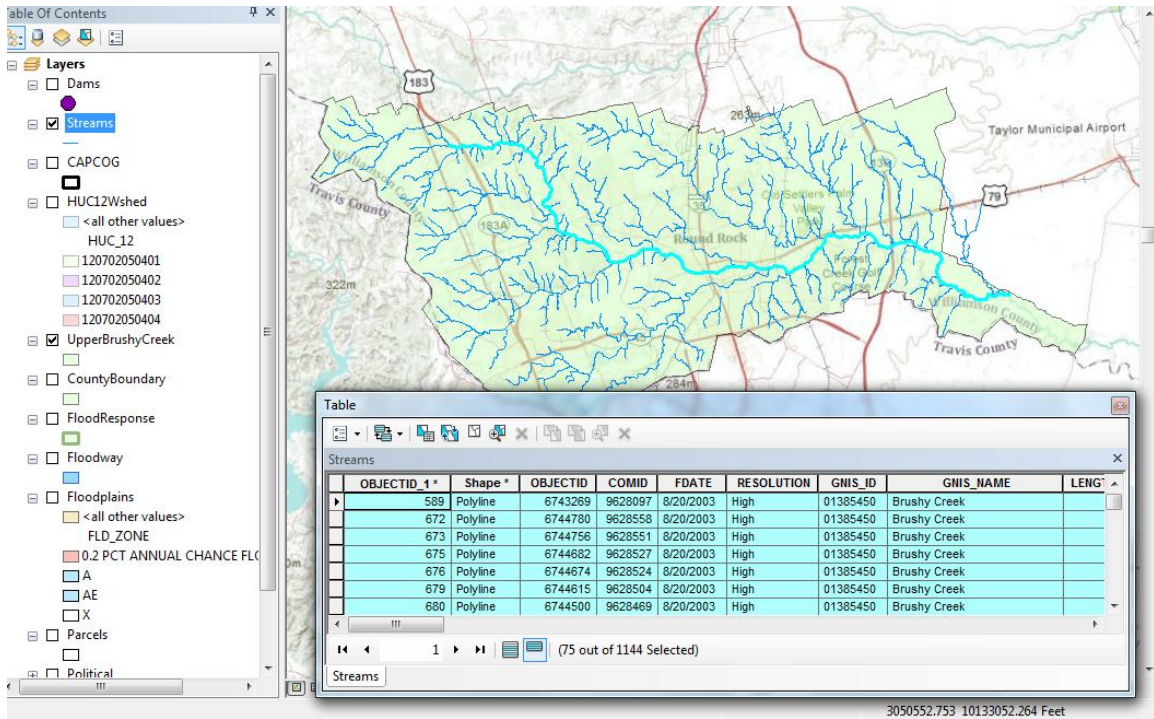
Turn on the streams layer in the display, and open the attribute table by right clicking on the name of the layer. Use the **Select by Attributes Tool** at the top left of the table to select the target river.



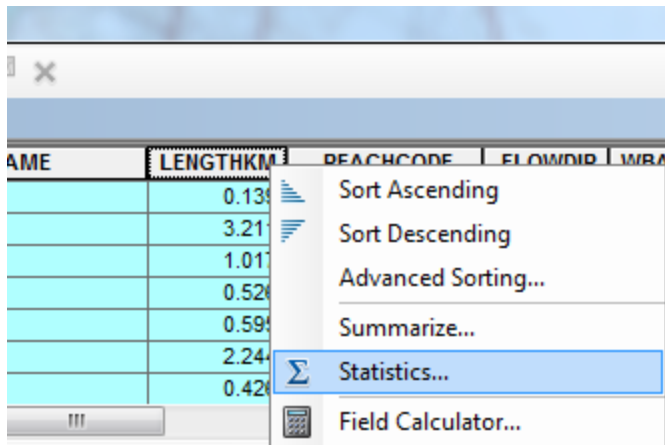
In the Select by Attributes window, click on **GNIS_NAME**, =, **Get Unique Values** and then double click on **Brushy Creek** to form the expression. Click on **Apply** and close the **Select by Attributes** window.



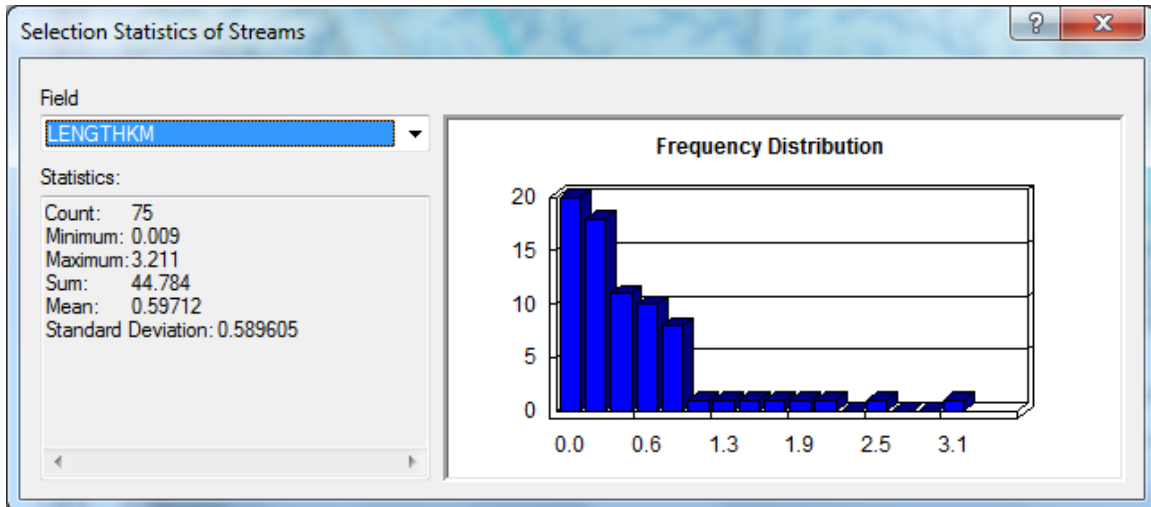
After making the selection, you will see that the Brushy Creek is highlighted in the map. Reopen the attribute table and at the bottom click on  (show selected records), and you should see a display like that below



Scroll across to the **LengthKm** field, right click on it and select Statistics



and the resulting display will appear as:



The **Sum** statistic gives the total value of the **LengthKm** attribute of the selected features. This is in kilometers and you'll need to convert the result to miles.

To be turned in: The length of Brushy Creek in miles.

Summary of items to be turned in:

1. *The area of Williamson County in Square Miles?*
2. *A flood map of Williamson County.*
3. *The length of Brushy Creek in miles.*

APPENDIX 1

Instructions for Installation of ArcGIS Desktop on your Computer

These instructions assume that you have a CD containing ArcGIS for Desktop for student use.

Installation Steps

1. Check supported operating system before the installation at <http://resources.arcgis.com/content/arcgisdesktop/10.0/arcgis-desktop-system-requirements>.
2. Insert ArcGIS Desktop DVD and in the menu folder, select quickstart so that you can refer to the installation guidance.

Files Currently on the Disc (17)

ArcSDE_Personal	7/9/2010 3:49 PM	File folder	
CaseTools	7/9/2010 3:49 PM	File folder	
DataInterop	7/9/2010 3:49 PM	File folder	
Desktop	7/9/2010 3:49 PM	File folder	
DotNet35	7/9/2010 3:49 PM	File folder	
htm	7/9/2010 3:49 PM	File folder	
LicenseManager	7/9/2010 3:49 PM	File folder	
SDK_dotnet	7/9/2010 3:49 PM	File folder	
SDK_java	7/9/2010 3:49 PM	File folder	
SDK_VBA	7/9/2010 3:49 PM	File folder	
10UninstallUtility	6/8/2010 11:08 AM	Application	1,948 KB
10UninstallUtilityGuide	6/9/2010 3:14 PM	QQBrowser HTML...	5 KB
Autorun	12/4/2009 11:52 AM	Setup Information	1 KB
ESRI	7/8/2010 3:57 PM	Application	5,273 KB
esri	3/9/2000 6:32 PM	Icon	4 KB
quickstart	6/11/2010 2:11 PM	QQBrowser HTML...	15 KB
Readme	6/8/2010 8:27 PM	QQBrowser HTML...	2 KB

3. Visit esri.com/EducationEdition to activate your authorization number first (the 12-digit number is inside your CD cover). Select "I have an ArcGIS Education Edition DVD", create your own account, and enter your authorization number to activate your GIS.



ArcGIS for Desktop 10 Education Edition

Welcome! Please choose an option below:



Click here if you received a DVD from your instructor.



Click here if you received an authorization code (e.g., EVA123456789) from your instructor without a DVD.

ArcGIS for Desktop 10 Educatio

Esri Global Account

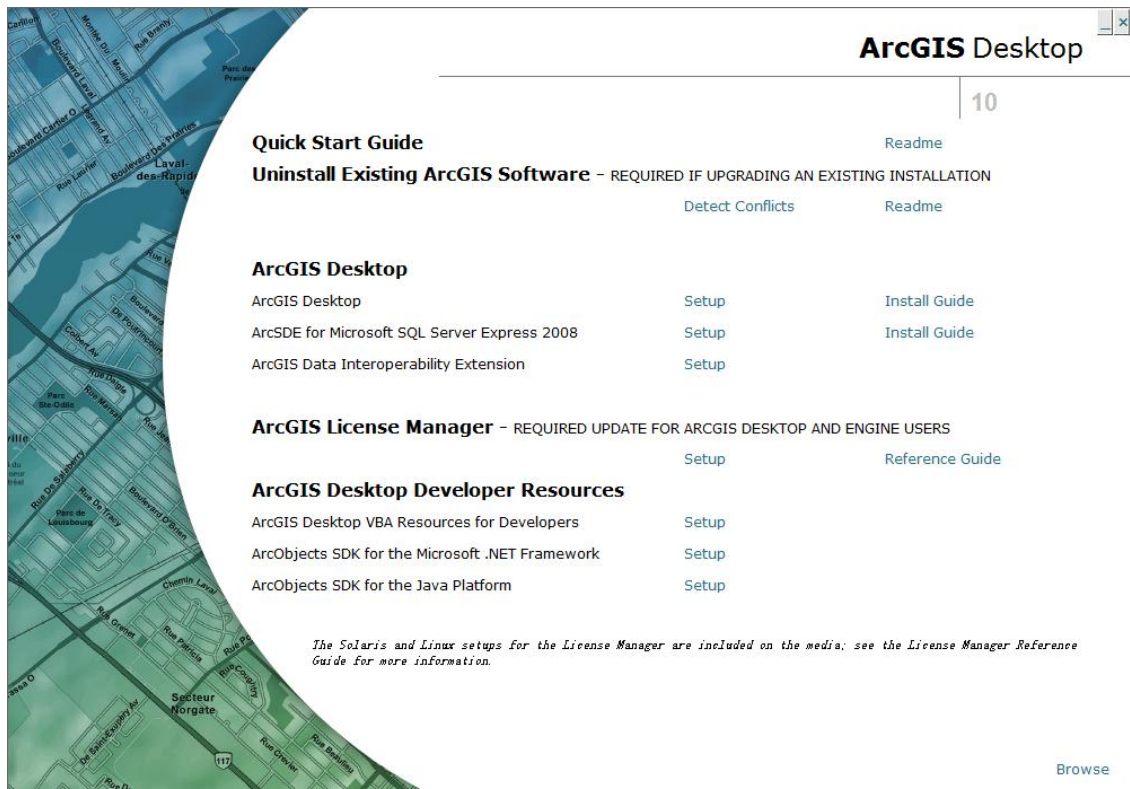
Log in to your Esri Global Account
 Not registered with us yet? [Create an Account](#)

User Name:

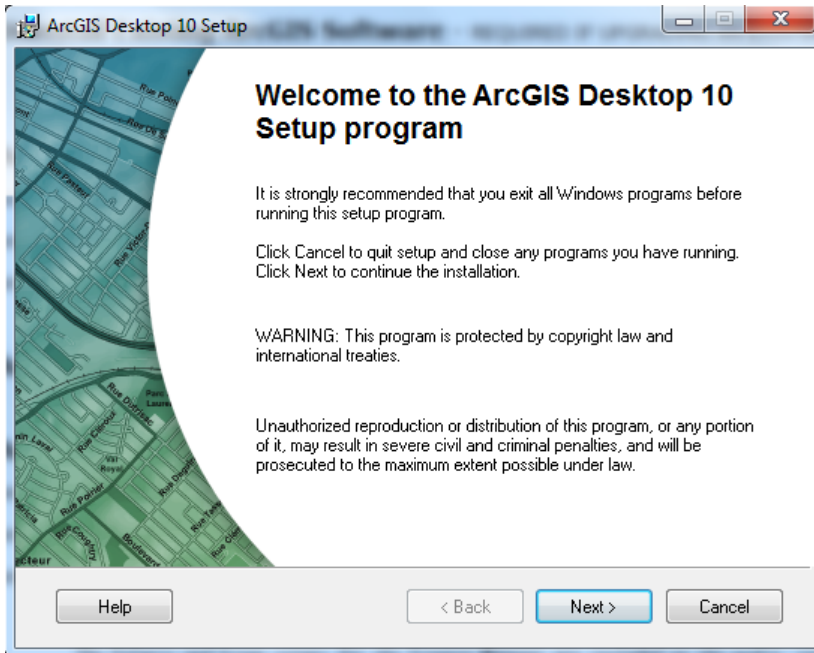
Password:

[Forgot User Name/Password?](#)

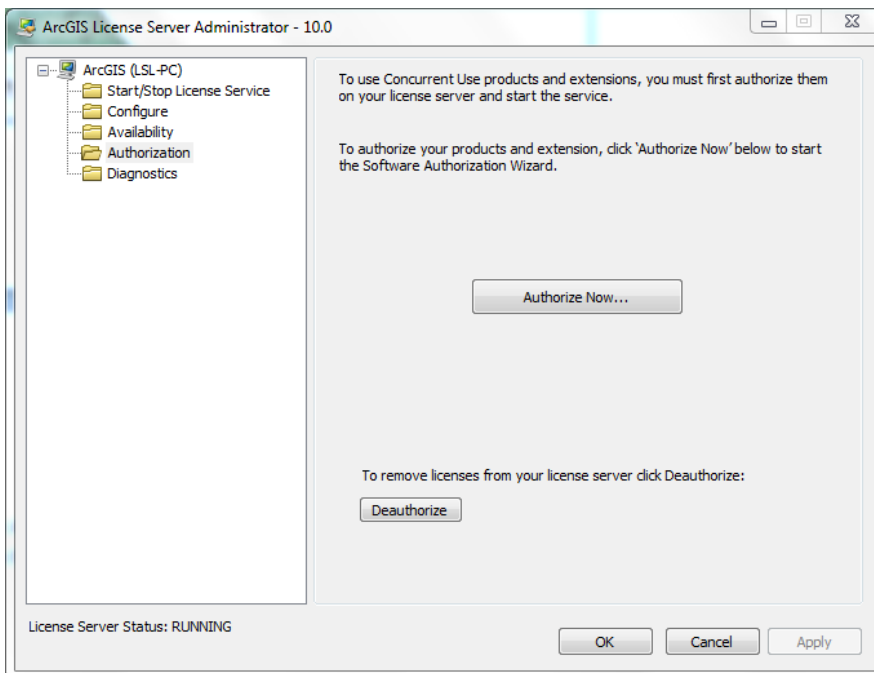
4. Run ESRI.exe you will see a window like this.



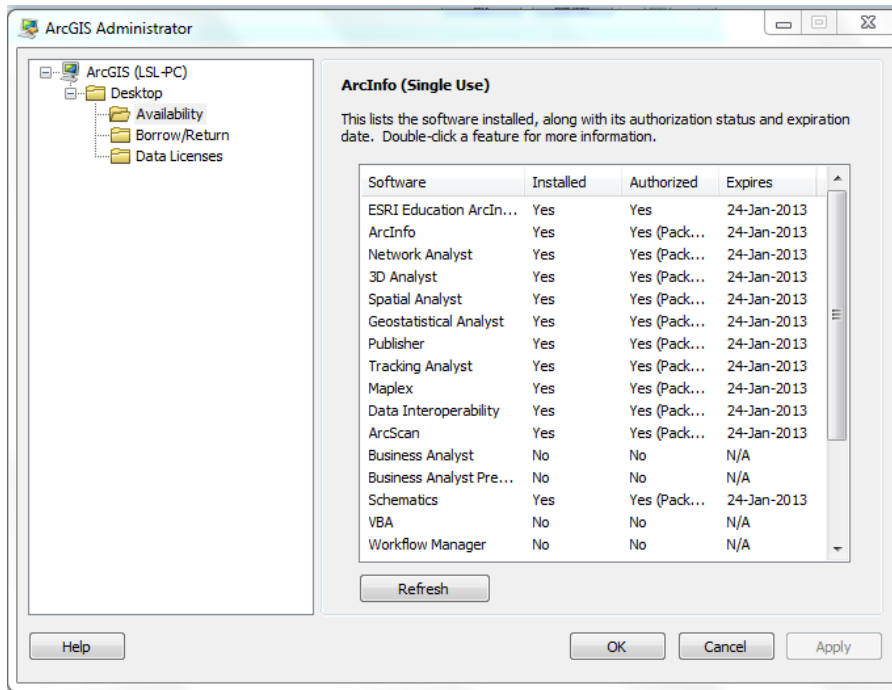
5. Select ArcGIS Desktop and follow the instruction to complete the installation process. Always select "next" until the installation has been finished. It will take you some time to complete the installation, so you can have a cup of coffee and relax during this time.



6. Authorize ArcGIS Desktop 10 single use. After the installation, select the desired Single Use product in the ArcGIS Administrator wizard, and click **Authorize Now**. Select the default option, **I have installed my software and need to authorize it**. Select **Authorize with ESRI now using the Internet**, and enter your personal information and your core product authorization number.



After Authorization, you will see information like this.



Now you have successfully install ArcGIS Desktop 10 on your computer. You can begin your trip with this magic software.