Creating Figure Ground Maps in ArcMap 10.x: *Basic procedures to download, open, manipulate and print spatial data*

These procedures outline:

A. Retrieving Property Data
B. Uncompressing the Downloaded Files
C. Opening Shapefiles or DWG files in ArcMap 10.x
D. Setting the Appropriate Projection
E. Measuring Distances
F. Preparing the Layout
G. Creating Figure Ground maps in ArcMap 10.x
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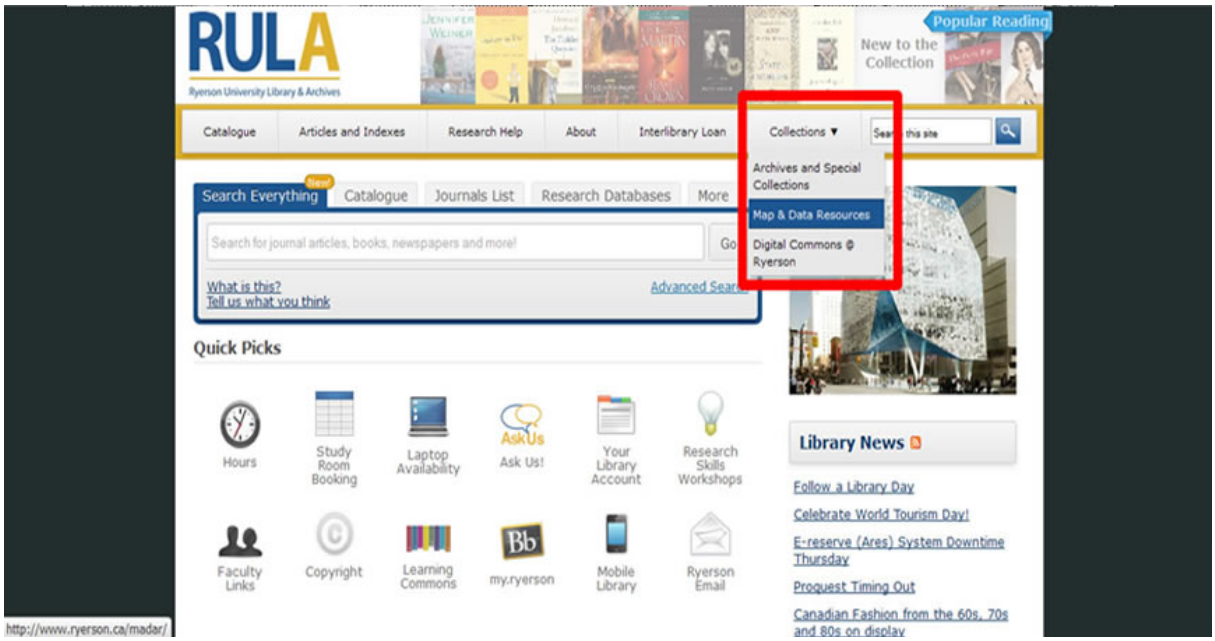
In order to use these instructions, you must have ArcMap 10.x. In this example, we are going to use shape files depicting a combination of topography and assessed parcel boundaries for the City of Toronto that have been downloaded from the Ryerson University Library website.

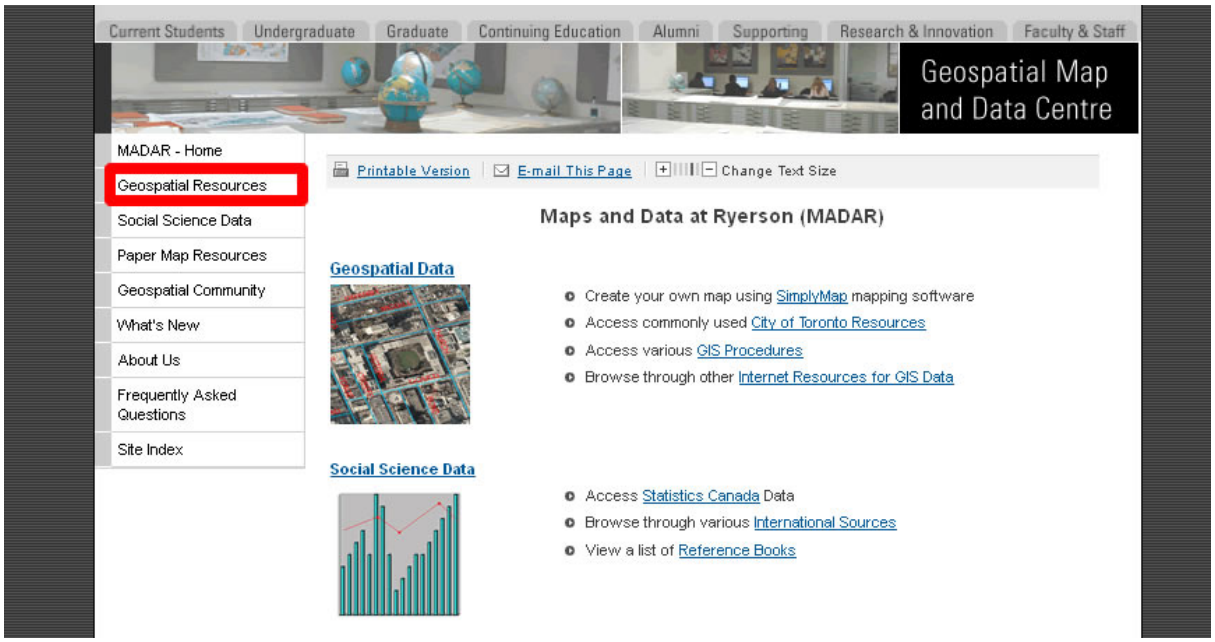
A. Retrieving Property Data from the Ryerson University Website

The files that will be used in this example are all found on Ryerson University's Geospatial Map and Data Centre website. We find a combination of topography and assessed parcel boundaries for the City of Toronto including: Etobicoke, North York, Scarborough, and Toronto (Downtown) for the year 2010. City map layers include: Street and Property Boundary Lines, Building Lines, Garages, Railway Tracks, City Paths and Utilities infrastructure (hydro-poles, hydrants, traffic lights, and general light poles).

1. Browse to the Ryerson University Library website (www.library.ryerson.ca) and go to **Collections**. Browse through the drop down menu and *click* **Map & Data Resources**. This will take you to the Geospatial, Map & Data Centre page.



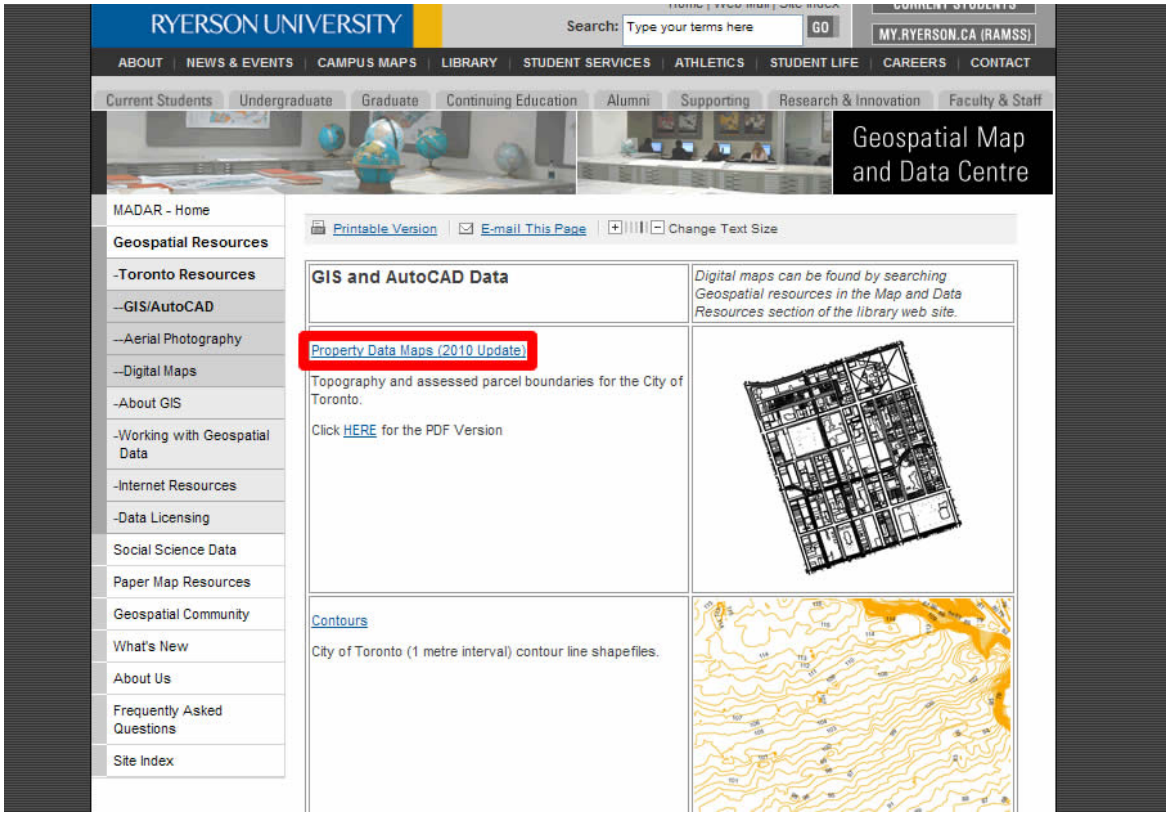
2. *a. Click* on **Geospatial Resources**. This will take you to the Geospatial Resources page where you can read about and link to tutorials such as this one that give step by step procedures of how to use and manipulate various spatial data.



b. Click on **Toronto Resources**. This will take you to the Geospatial Resources that focus on the city of Toronto

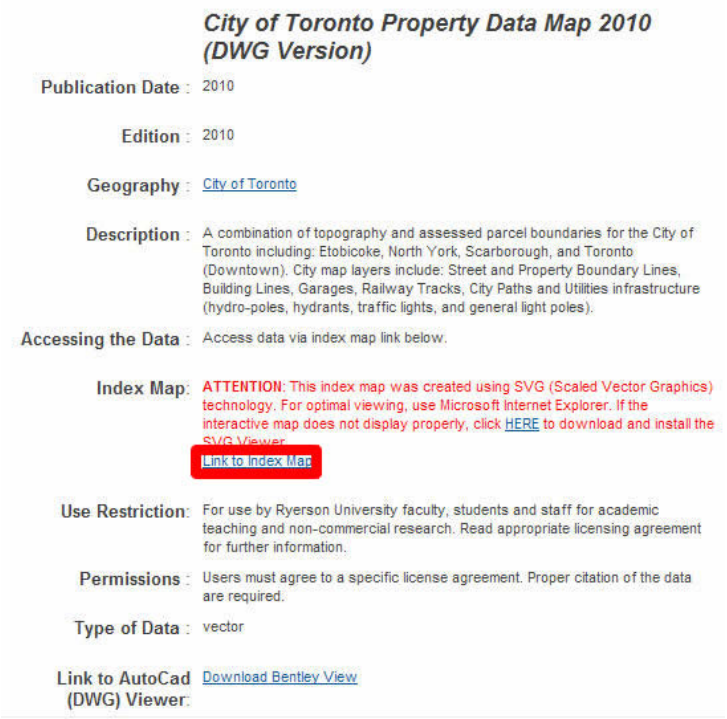
c. Click on ***GIS/AutoCad***

3. *a. Click* on **Property Data Maps (2010 Update)**

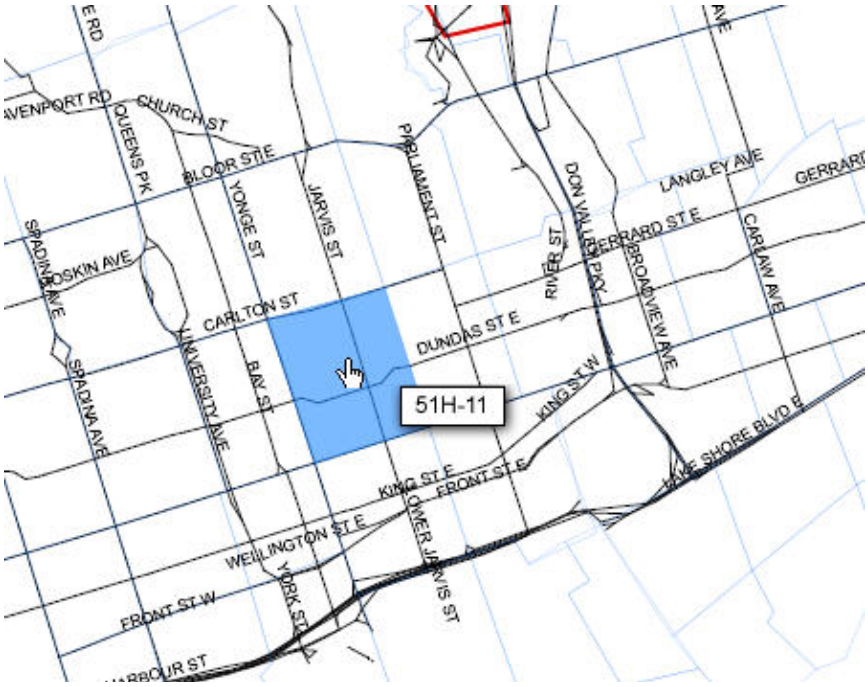


Note: <u>do not</u> *click* on the *HERE* link unless you want a PDF version

b. Next *click*: ***Link to*** **Index Map**



4. a. Use the Zoom tool on the right to zoom in to the desired site.
   b. Use the Information tool do download tile.
   c. In this example we will be downloading site **51H11** (Ryerson Campus).



5. You will then be asked for your Matrix user name and password (the same as your Ryerson e-mail and password), fill this information out then *click* **Login**.

   a. Read the City of Toronto End User License Agreement then *click* **I Agree**.
   b. In the view data page *click* **51H-11.zip**.

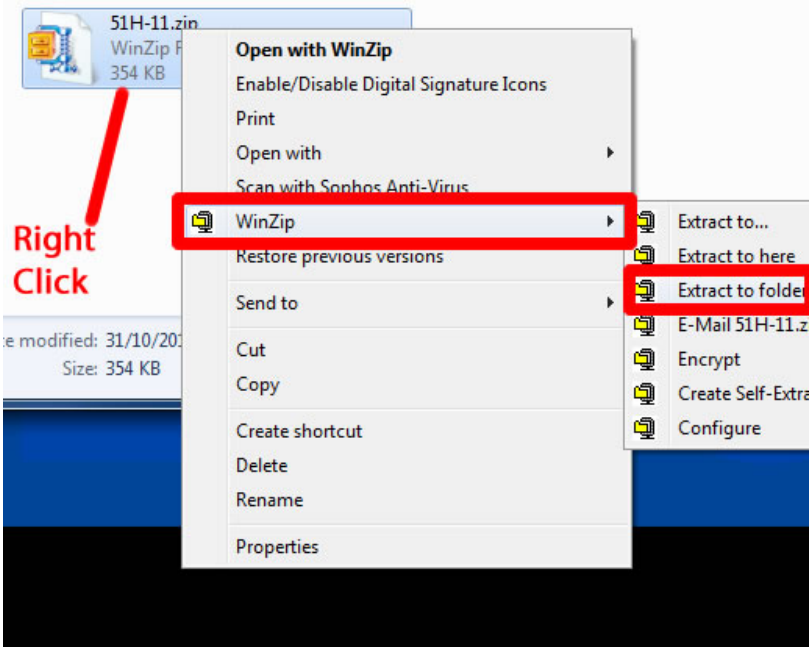
6. Once the file is *clicked*, you will be prompted to Open or Save each file.

B. Uncompressing the Downloaded Files

As you may have noticed while downloading the figure ground map, the extension for the file was .**zip**. This is a Zip file or compressed file. Files are stored in this format on the server to save space. The following section outlines the procedure for uncompressing these files. The extraction process varies depending on whether or not WinZip is loaded on your computer. Select one of the following options:

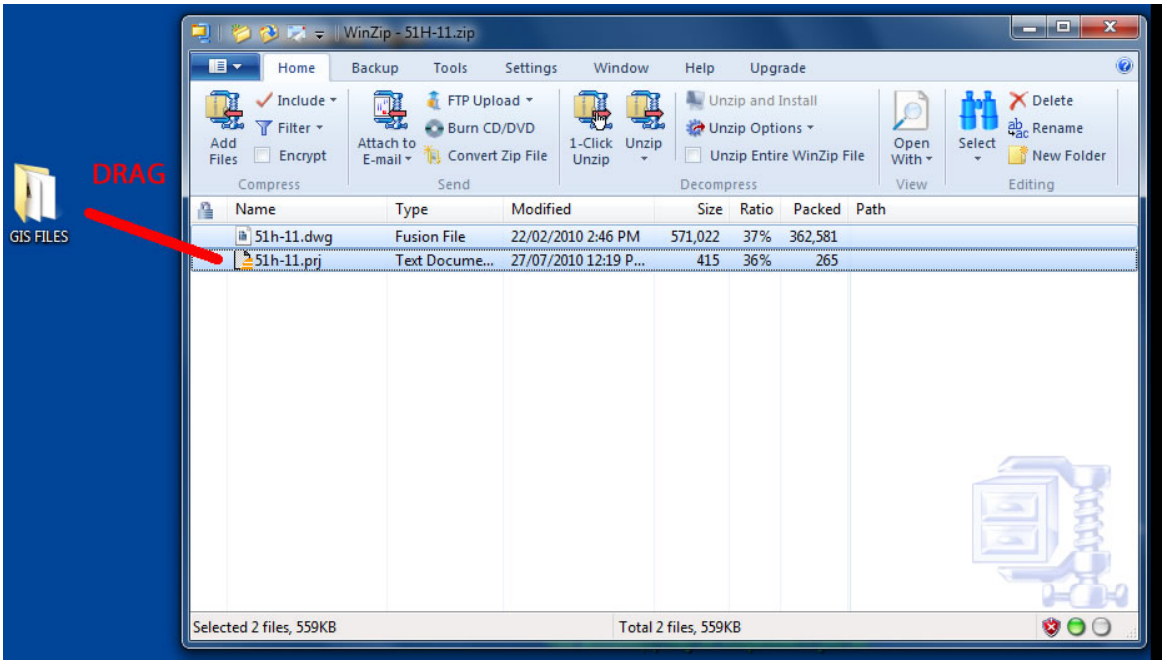
With WinZip

1. **Save** the file to an appropriate location on your hard drive.
2. Browse to the location of the downloaded file.
3. *Right click* the desired file.
4. Scroll down to **WinZip** then *click* **Extract to folder…**



Without WinZip

1. **Open** the file
2. **Drag** the desired files into an appropriate location on your hard drive



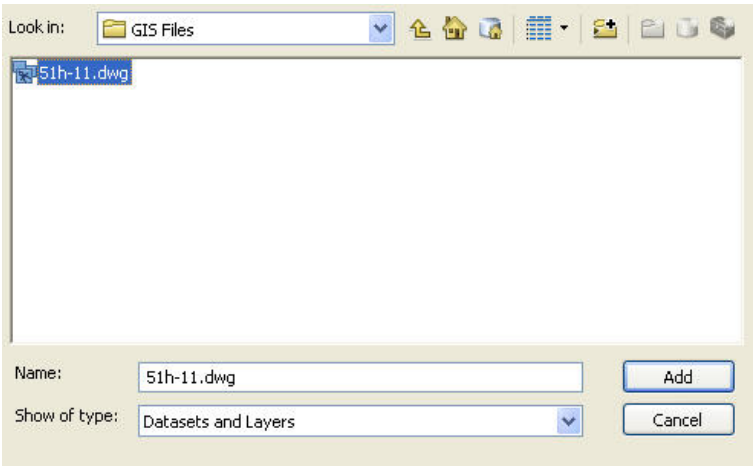
C. Opening Shapefiles or DWG files in ArcMap 10.x

ArcMap 10.x is software that allows the user to view, manipulate or create spatial data. ArcMap is part of the ArcGIS software package created by ESRI. This section will demonstrate how to open files in ArcMap 10.x.

1. The first step is to open ArcMap. *Double-Click* on the **ArcMap 10.x** icon or *Select* **Start > Programs > ArcGIS > ArcMap**. ArcMap should automatically prompt the option to **Add Data**. Otherwise, *Click* the **Add Data** button  .

2. In the **Add data** window, browse to the shape file that you wish to add (in this example it is GTA_county.shp).

   Note: If there were more than one file in this folder, you can hold down the **CTRL** or **Shift** key to *select* multiple files and open them at the same time.



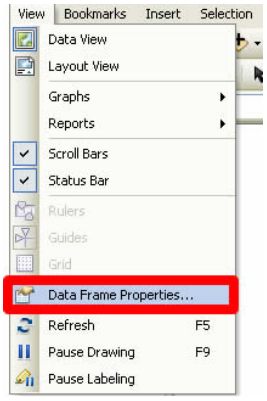
3. *Click* **Add**.

Note: do Not *double click* the DWG file.
Your data view (main viewing window) should show a file similar to the one below.

D. Setting the Appropriate Projection

A map projection is any method used in cartography (mapmaking) to portray the surface of the earth or a portion of the earth on a flat surface. Essentially, flat maps could not exist without map projections. Distortions of conformality, distance, direction, scale, or area always result from this process. The City of Toronto is generally viewed using the UTM NAD (Universal Transverse Mercator North American Datum) 1983 zone 17 N projection. The files used in the procedure above were automatically opened in ArcMap 10.x in the unprojected MTM_3Degree. The following steps will outline how to correctly project the data.

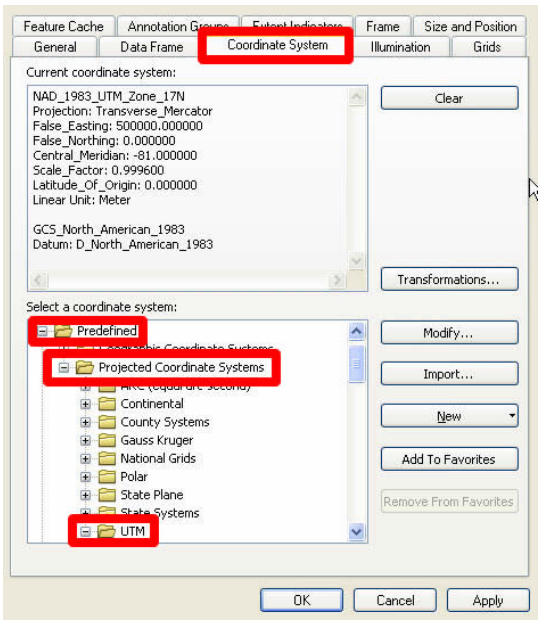
1. From the main menu select **View** > **Data Frame Properties**.

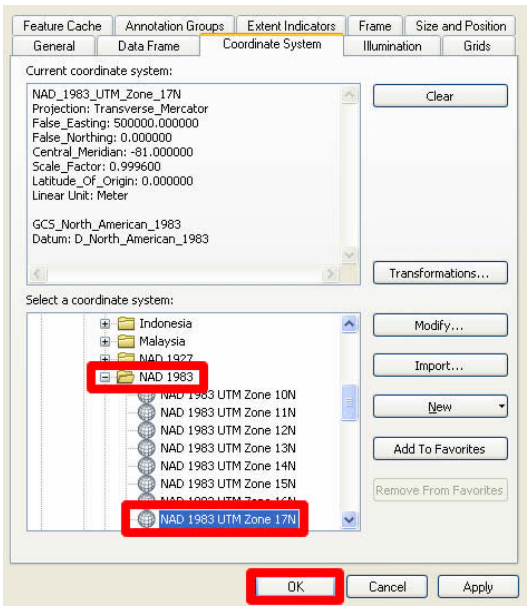


2. Select the **Coordinate System** tab.

3. In the **Select a coordinate system** window click **Predefined** > **Projected Coordinate Systems** > **UTM** > **NAD 1983** > **NAD 1983 UTM Zone 17N**

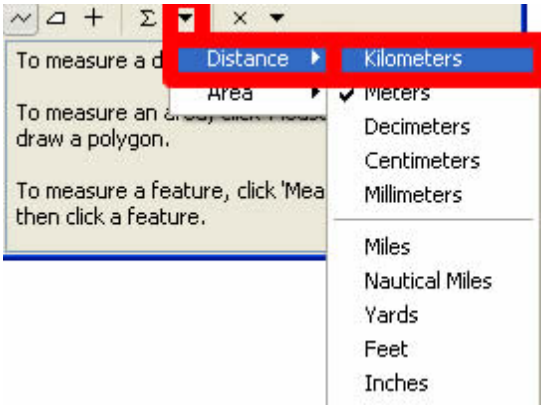
4. Click **OK**





E. Measuring Distances

1. Once the projection has been set you can proceed to measure distances using the **Measure** tool  .



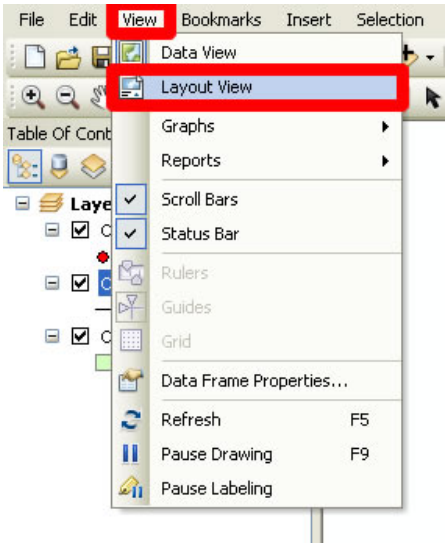
2. The default may be set to kilometers so if you want to change the units, use the drop down arrow at the top of the **Measure** window then *click* **Distance**.

F. Preparing the Layout

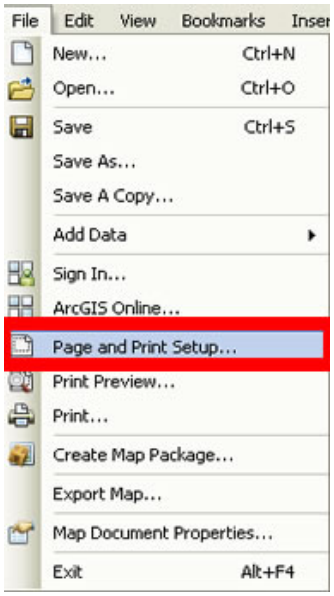
Use the zoom tool  to zoom into the desired location. Let us zoom into the Ryerson campus area:

Compared to other GIS software, creating a layout in ArcMap is a simple task. The following section describes how to create a basic layout including the fundamental map elements**.**

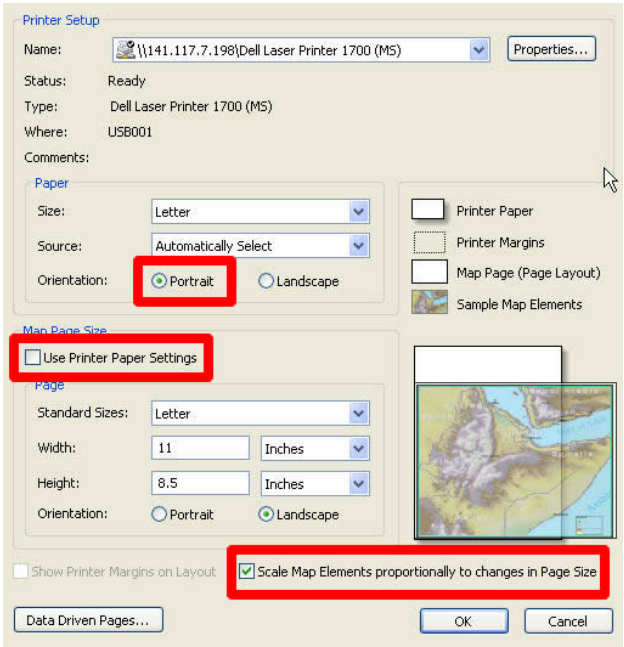
1. To change the View from **Data View** to **Layout View**. *Click* **View** from the main menu and *Select* **Layout View** from the drop down menu.



2. **Note:** If your layout view is already in **portrait** view then skip to **step 4**. The figure ground map for Ryerson Campus is more appropriate if displayed on a portrait image. From the main menu, *click* **File** then *click* **Page and Print Setup**.

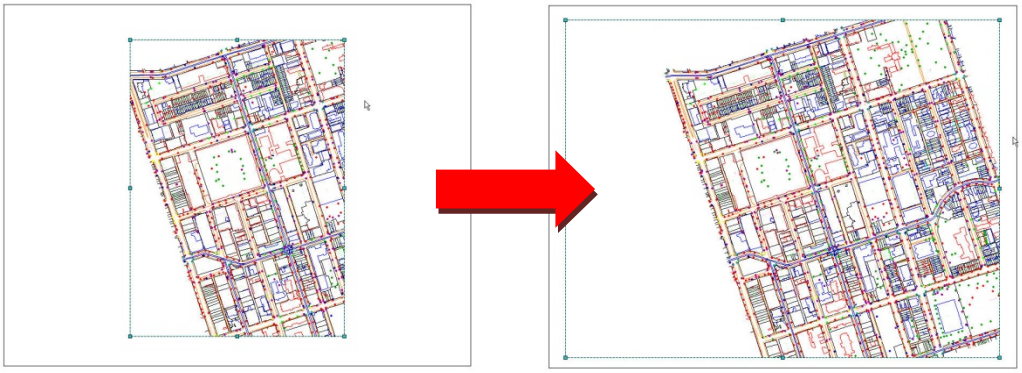


In the **Page and Print Setup** window *click on* the **Portrait** radio button and *check on* the **Scale Map Elements** … button. *Uncheck* the **Use Printer Paper Settings** box. Then *click* **OK**.



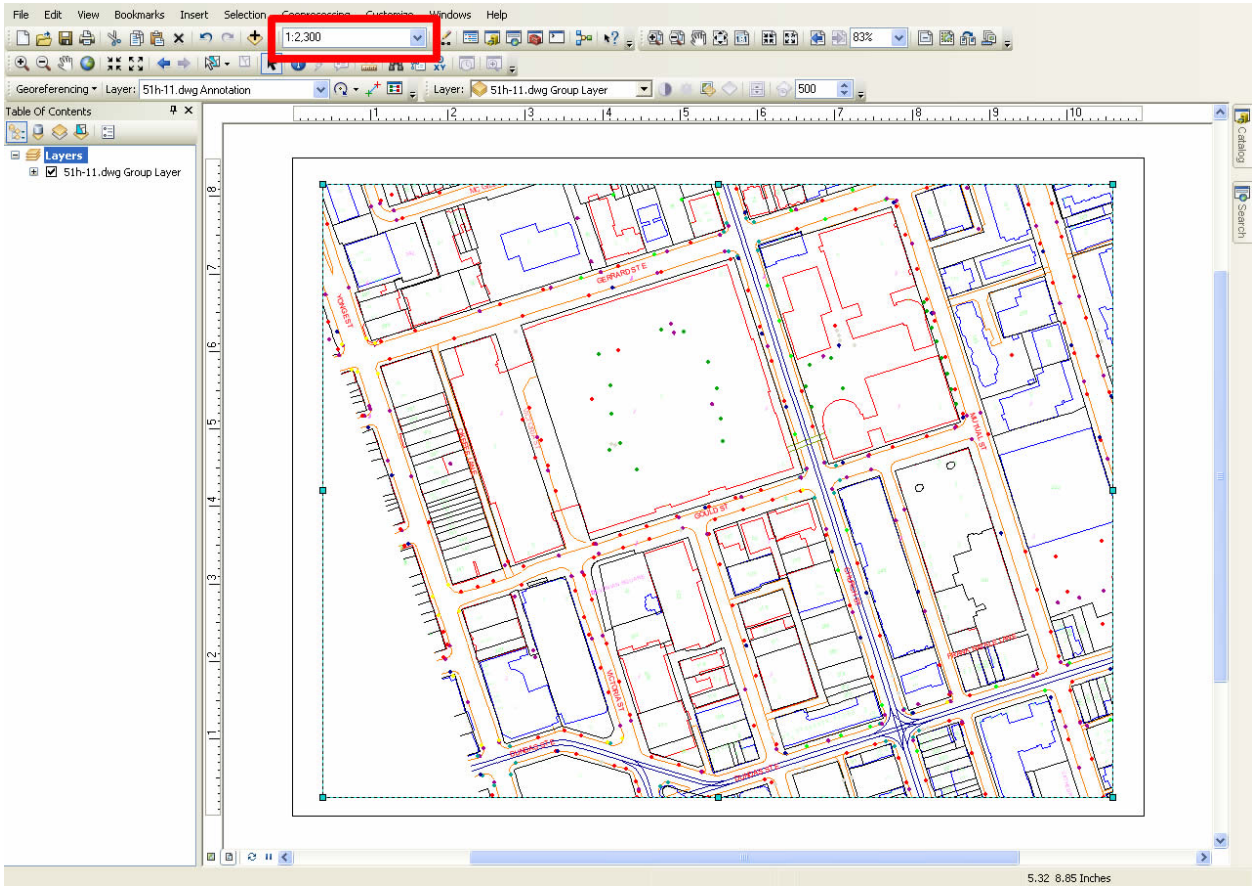
You should notice that your layout view has changed to portrait.

3. a. Arrange appropriately by dragging the map. Stretch the image using the small blue squares so that it covers your layout (leave a little space for margins).



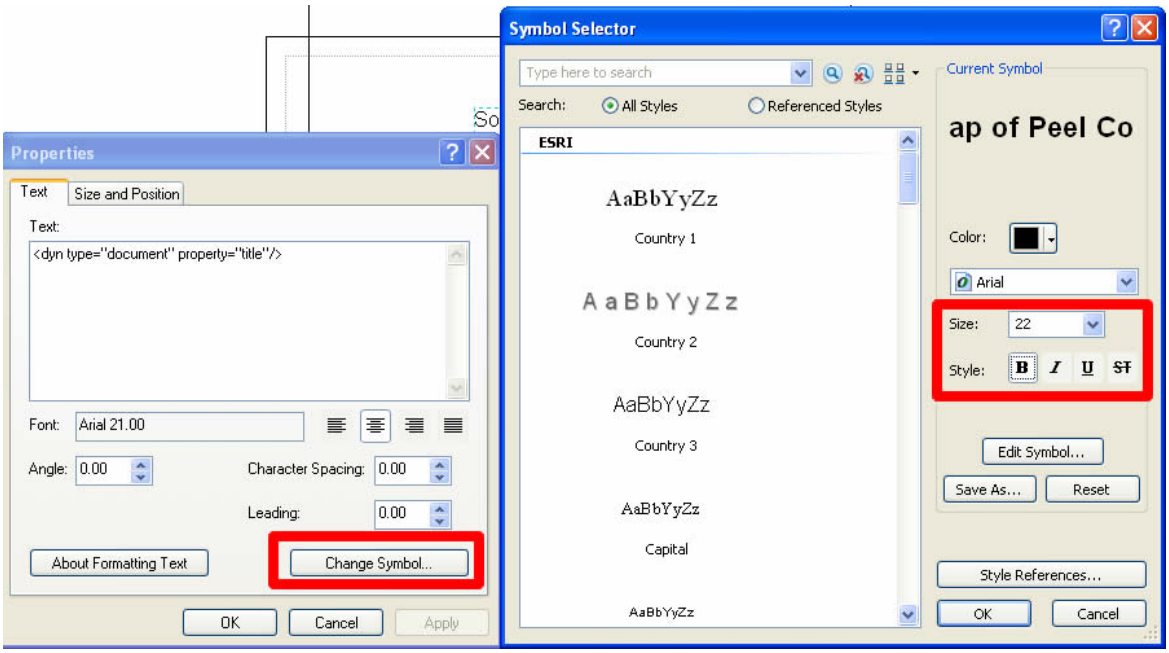
b. Set Scale by entering an appropriate scale in the scale input box. Using trial and error, the scale used in this example came to 1:2300

c. Finally use the **Pan**  tool to centre image.



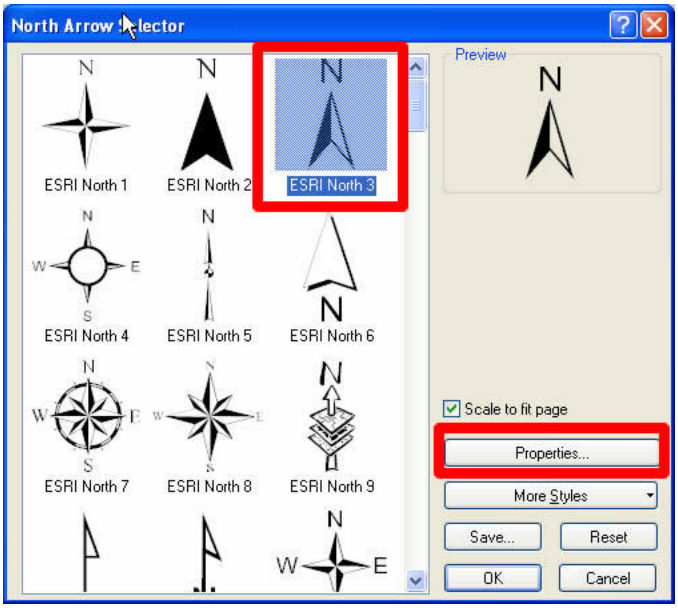
4. *Click* **Insert** from the main menu. In the ensuing drop down menu, you can add a Title, Legend, North Arrow, and Scale Bar. Once inserted into the layout view, each item can be manipulated by *Double-Clicking* on it. Examples are listed below:

5. <u>Title</u> – *Click* **Insert** from the main menu. Select **Title**. In the **Text** textbox type in the title *Ryerson Campus Ground Map* then push **Enter** on your keyboard. *Double-Click* the Title to open the **Properties** window.

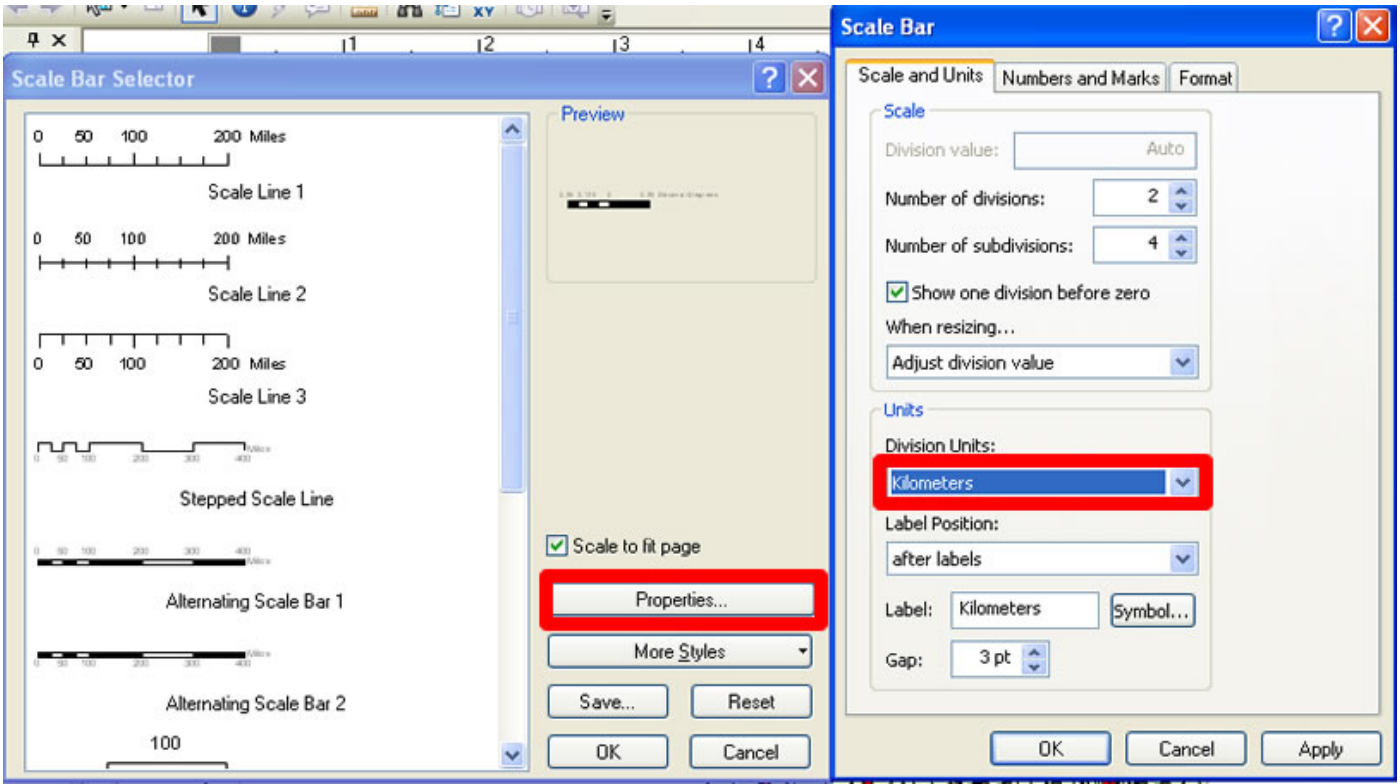


Click **Change Symbol**. In the **Symbol Selector** window, you can change the properties of the text. *Click* the bolded **B** in order to make the text bold. Change the font size to **22**. *Click* **OK**, then *click* **OK** again.

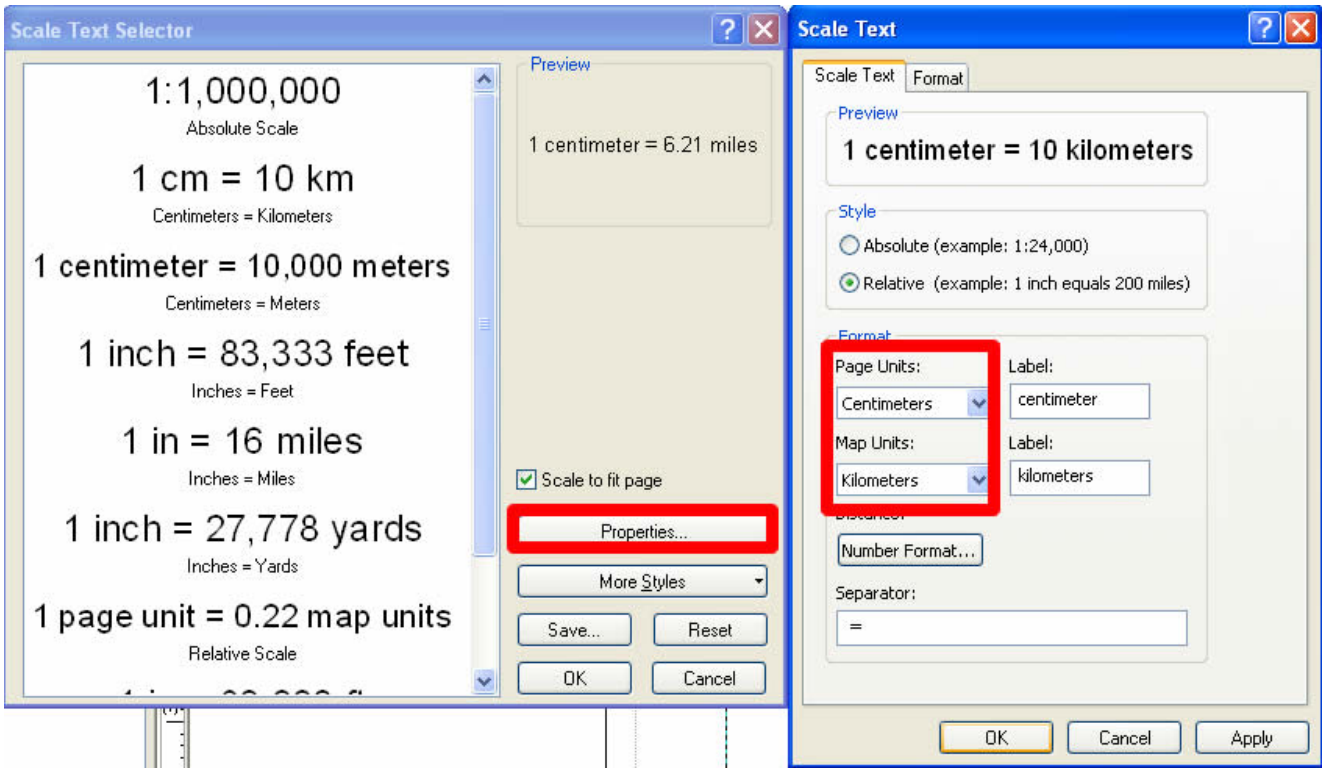
6. North Arrow - *Click* **Insert** from the main menu. Select **North Arrow.** In the **North Arrow Selector** window, chose an appropriate north arrow then *click* **OK**. *Click* and *drag* the north arrow from the centre of the layout and move it to the bottom left corner.



7. a. Scale Bar - *Click* **Insert** from the main menu. Select **Scale Bar.** *Click* **Properties** to open the **Scale Bar** window**.** In the **Division Units** textbox, select **kilometers**. *Click* **OK**. *Click* **OK.** *Click* and *drag* the scale bar from the centre of the layout and move it to an appropriate position below the map.



b. Scale Text – *Click* **Insert** from the main menu. Select **Scale Text.** *Click* **Properties** to open the **Scale Text** window**.** In the **Page Units** textbox, select **centimeters**. And in the **Map Units** textbox, select **kilometers**. *Click* **OK**. *Click* **OK.** *Click* and *drag* the scale text from the centre of the layout and move it to an appropriate position below the map.

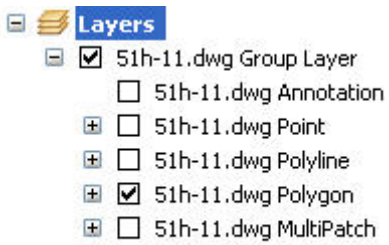


Note the scale bar and scale text will change automatically as you zoom in and out

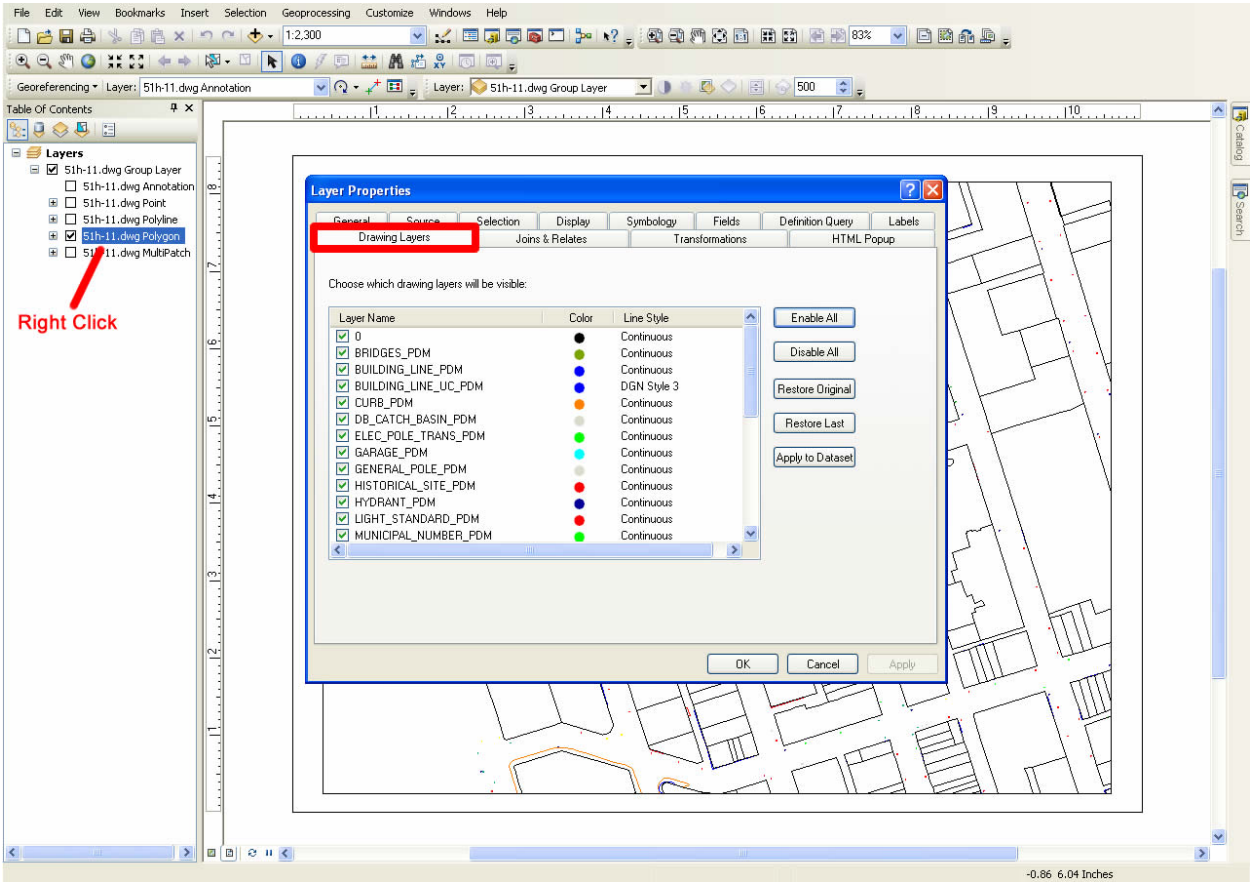
G. Creating Figure Ground maps in ArcMap 10.x

1. In the Legend (left hand side of the screen under **Layers**) :

- Uncheck *Annotation*,
- Uncheck *Point*,
- Uncheck *Polyline*
- Leave *Polygon* checked
- Uncheck *MultiPatch*



2. a. Right *click* **Polygon > Properties > Drawing Layers**



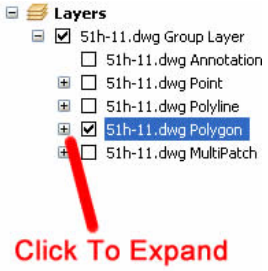
b. Uncheck everything except for:

- *BUILDING_LINE_PDM*
- *BUILDING_LINE_UC_PDM*
- *GARAGE_PDM*
- *HISTORICAL_SITE_PDM*

c. *Click* **OK**

Note: *BUILDING_LINE_UC_PDM* are buildings that were under construction when this data was collected. These buildings may not be complete.

3. a. In order to create a Figure Ground map, the buildings must be shaded black and open space left white). *Click* the '+' button and *double click* the appropriate square to the LEFT of the **Continuous** feature.

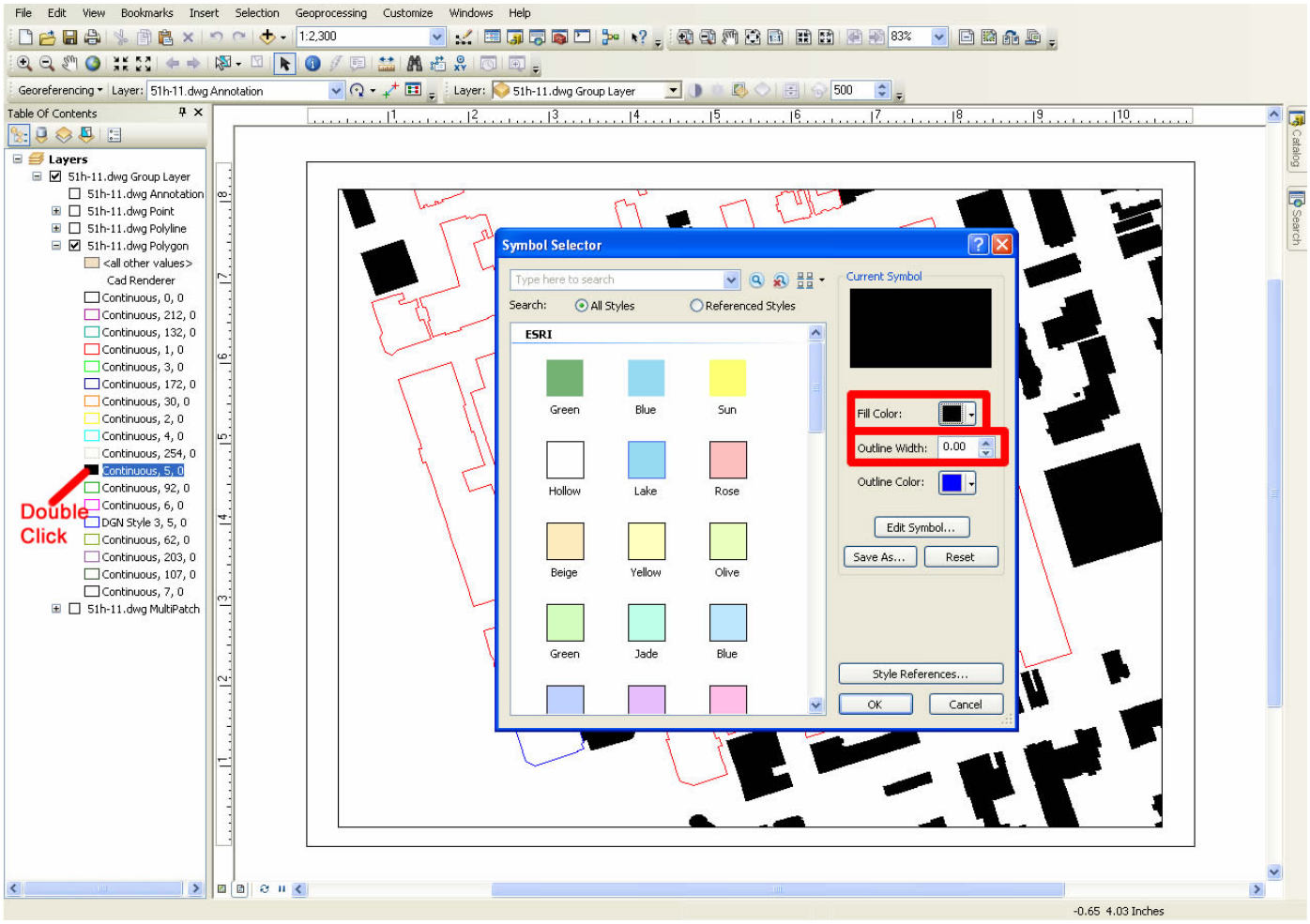


b. In the Symbol Selector window, *remove* outline colour by *changing* the outline width to 0.00 and make the fill colour Black. The following features should be filled in black and with no outlines:

- *Continuous 5,0*
- *Continuous 1,0*
- *Continuous 4,0*
- *DGN Style 3,5,0*

c. *Click* **OK**.

Note: these numbers may vary from map to map.

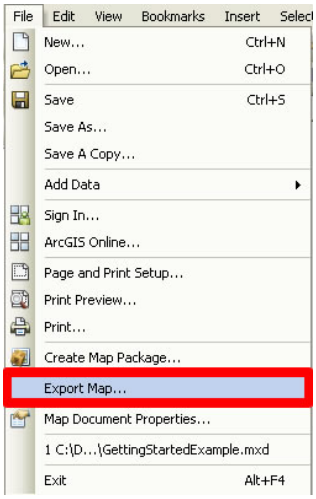


Your final map should look something like this:

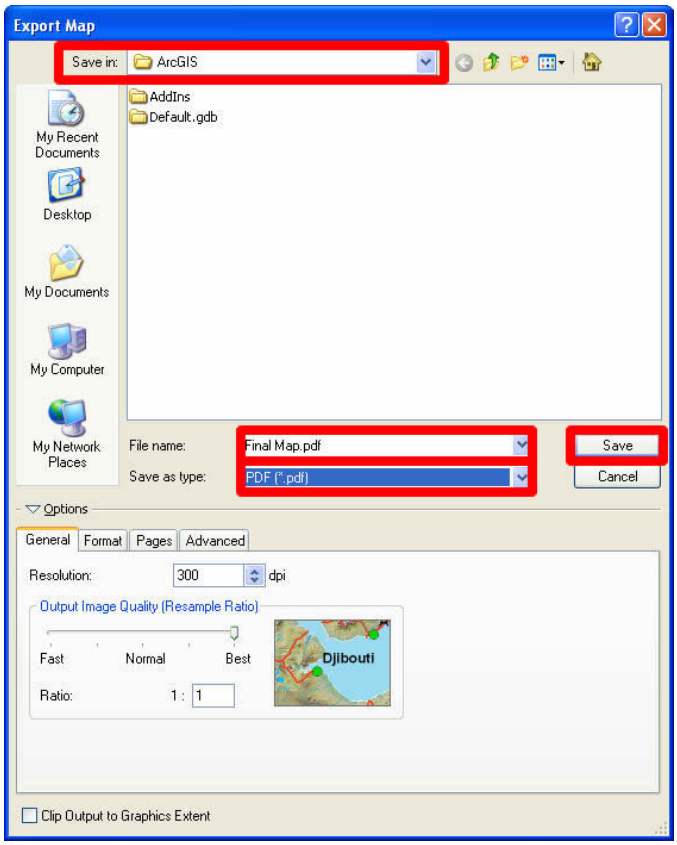
H. Convert to PDF

Alternatively, you may opt to export your map and save it for later use rather than printing your map. ArcMap offers a variety of file types that you can save your map as. The following procedure will show you how to export your map, using one of the various file types.

1. Once you have completed *Steps 1* through 8 above or you are satisfied with your map, you may begin the export procedure. *Click* **File** from the main menu and *Select* **Export Map**.



2. The **Export Map** window will open. In the **Save In** window, *browse* to the location that you wish to save your map. In the **File Name** text box, chose an appropriate name for your map. In the **Save as Type** textbox *select* the format that you would like to save your map in.



3. *Click* **Save**.

Note: to convert to an AI (Illustrator) file *click* **File > Export Map**
Give the file an appropriate name.
In the **Save as type** select *.AI* this time.

Additional Data: Retrieving Zoning By-laws

Click: *http://www.toronto.ca/legdocs/bylaws/2010/law1156-Schedule-A.htm*

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