This guide provides step-by-step instructions on how to:

- Download census boundary files from the Statistics Canada Website
- Add data to ArcMap
- Create a census tract shapefile of the CMA of Winnipeg
- Create a thematic map of lone parent families by gender
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</tbody>
</table>
Data Acquisition

To begin this exercise create a new folder on the C drive of your computer and name it Census_2011. Copy the Excel file you created in the previous class into this folder. Using a browser of your choice, navigate to the Statistics Canada Boundary File page:


Select the 2011 census year link in the table.

<table>
<thead>
<tr>
<th>Year</th>
<th>Intercensal year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>2012</td>
</tr>
<tr>
<td>2006</td>
<td>2010</td>
</tr>
<tr>
<td>2001</td>
<td>2005</td>
</tr>
<tr>
<td></td>
<td>2008</td>
</tr>
</tbody>
</table>

DOWNLOADING BOUNDARY FILES

At this point you will note that Statistics Canada provides two boundary file options available for download: Cartographic and Digital files.

Cartographic boundary files portray geographic areas of land mass and the digital boundary file portrays the full extent of Canada including its coastal waters (Statistics Canada, 2011).

We are interested in mapping Winnipeg so we need not concern ourselves with coastal water areas.

Choose to download the Cartographic Boundary File in English. Select the ArcGIS (.shp) format at the Census Tract level.

Click the Continue button at the bottom of the page.
On the resulting screen right-click the link shown below and choose **Save target as ... Download** the zipped file to your computer. **Extract** the zip file to your **Census_2011** folder.

### Alternative format - ZIP document

The following document is available for downloading or viewing:

**3oct_000billa_e.zip (ZIP Version, 129001.0kb)**

To access the Compressed Archive (ZIP) version, you do not require special software if you are using Windows XP (just download the file and view it using Windows Explorer). There are many packages to zip/unzip files available for free or for purchase on the Internet:

- Winzip
- 7-zip
USING CENSUS DATA WITH ARCMAP

STARTING ARCMAP

To start ArcMap, first double-click the GIS icon on the desktop.

Next, double-click the ArcGIS icon.

Finally, double-click the ArcMap icon.

Upon program start up click the OK button to open a Blank Map.

When ArcMap starts take a few moments to orientate yourself to the interface using the Quick Reference Guide. Throughout this exercise the step-by-step instructions will refer to specific toolbars, menus, windows and the table of contents by name. All of these are clearly labeled in the guide.

By default, the Catalog and Search windows are auto-hidden upon program start up. They appear as tabs on the right side of the ArcMap interface. If you hover over or click on a tab then the corresponding window will open.

Hover over the Catalog window and click the Pin control (located in the upper right of the window). This will dock the window along the right-hand side of the interface. Repeat this procedure to open and dock the Search window.
Note: If you accidentally close the Catalog or Search window you can re-open them by clicking on their corresponding Standard toolbar button.

For example: To re-open the Catalog window, click its corresponding button on the Standard toolbar.

MAKING A FOLDER CONNECTION
An initial task in ArcMap is to create a folder connection. In the Catalog Window click on the Connect to Folder button, navigate to your Census_2011 folder and click the OK button.

Folder Connection
Folder connections are used by ArcMap to access a folder’s contents.

A connection to this folder will now be visible in the Catalog Window.
Data Preparation

Often real world data is “messy” and the more time you spend preparing it, the better off your project will be.

ADDING DATA TO ARCMAP

On the **Standard** toolbar click the **Add Data** button.

In the **Add Data** browser, browse to your **Census_2011** folder and select the cartographic boundary file (gct_000b11a_e.shp).

Click the **Add** button to add this Shapefile to your map.

Once the layer has been added to the map you will see census tracts for all of Canada displayed in the **Data View**. Also the name of your layer will appear in the **Table of Contents**.
USING CENSUS DATA WITH ARCMAP

SUBSETTING DATA BY ATTRIBUTE

SQL is a computer language for database access and management. However, you need not become a computer programmer to make a quick attribute selection in ArcMap.

Instead you can use the program’s Select By Attributes dialog box to help you construct a WHERE clause.

A WHERE clause is an SQL expression used to filter selection results to only those database records that match your criterion.

As we are only interested in Winnipeg census tracts, you will subset this data based on the Census Metropolitan Area code of 602. This is the code that Statistics Canada has assigned to the City of Winnipeg.

Click Selection on the Main menu and then Select By Attributes.

When the Select By Attributes dialog box opens you will note that the Layer is set to the Cartographic Boundary file and the Method is set to Create a new selection.

In the Field List you will see all the attributes of your boundary file. Double-click on the CMAUID attribute to begin building the expression. Click on the equals button to add an operator to the expression.

Click on the Get Unique Values button and type 602 in the Go To text box. This will advance your position in the list to your census tract of interest. Double-click 602 to complete the expression.
Click the **Verify** button to check the syntax of your expression.

Click the **OK** button to make your selection.

![Select By Attributes dialog box]

**Note:** You will see on the map that all the census tracts for Winnipeg have now been selected (indicated onscreen with a cyan colour).

Right-click on your layer in the **Table of Contents** and select **Open Attribute Table**.

With the table open you can see that 173 records have been selected out of the possible 5452. If you check in the **CMANAME** field you can see that only Winnipeg census tracts are currently selected.

Therefore, we know that there are 173 census tracts in the Winnipeg Census Metropolitan Area.

**EXPORTING DATA**

Use this selection to create a new data layer. Right-click on the layer in the **Table of Contents** and choose **Data** then **Export Data** to create the new layer.

![Export Data option in the Table of Contents]

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In the Export Data window, you will notice that Selected Features is set to Export and Use the same coordinate system is set to this layer's source data. Accept these program defaults.

Use the Browse button to bring up the Saving Data dialog box.

Use the Look in menu to navigate to your Census_2011 folder. In the Name field type Winnipeg_CT. From the Save as type menu select Shapefile.

Click the Save button.

Click OK in the Saving Data dialog box.

Click OK in the Export Data dialog box.

Click Yes when prompted to add the exported data to the map as a layer.

REMOVING DATA FROM THE TABLE OF CONTENTS

We can now remove the Cartographic Boundary file (gct_000b11a_e) from the map, as we will use the Winnipeg_CT layer for the remainder of this exercise. Right-click gct_00b11a_e in the Table of Contents and select Remove.

ZOOMING TO A LAYER

Right-click Winnipeg_CT in the Table of Contents and select Zoom To Layer. Those familiar with Winnipeg's census geography will note that the shape of our city appears to be a little bit distorted. This is because the original Cartographic Boundary file used a Geographic projection more appropriate for a large land mass such as Canada but less so for Winnipeg.
PROJECTING DATA

Some of you may remember from Geography class, that when we make a map we are essentially projecting a spheroid onto a flat surface. In doing so there are tradeoffs in terms of the properties of shape, area, direction and distance. As a mapmaker you select the properties that you want to preserve and this decision will guide your selection of an appropriate projection.

In this exercise we want to preserve shape so we will use the Universal Transverse Mercator coordinate system. This system is best thought of as a Local projection system because it divides the Earth into sixty different zones. The most appropriate zone for Winnipeg is UTM Zone 14N.

USING THE SEARCH WINDOW

In the Search window type Project then click the Search button.

![Search window with Project highlighted](image)

A search result named Project (Data Management) is amongst the returned. If you hover your mouse over the tool name in this result a short summary of what the tool does will be displayed. If you click the tool’s name in the search result the tool’s dialog box will be opened.

![Project (Data Management) (Tool)](image)

Projects spatial data from one coordinate system to another. toolbox\system toolboxes\data management tools.tbx\proj...

Click Project (Data Management) (tool) to open the Project dialog box. Set the Input Dataset or Feature Class to Winnipeg_CT.

Use the Browse button to navigate to your Census_2011 folder. In the Name field type Project_Winnipeg_CT. For the Save as type select Feature classes.

Click Save.

Click the Browse button next to Output Coordinate and in the Spatial Reference Properties box type NAD 1983 UTM Zone 14N into the search box. Click Search.

Click the Plus symbol next to the Projected Coordinate Systems, UTM, and NAD 1983 folders in order to view the search result. Select NAD 1983 UTM Zone14N.

Click OK.
Review the following graphic to ensure your settings match those shown. Click **OK**.
The geoprocessing tool will run in background processing mode and you will receive notification of its completion in the bottom right hand corner of the screen. In the Catalog window you will see that the Project_Winnipeg_CT.shp file has now been added to your Census_2011 folder connection.

Data Frame Tips

By default ArcMap's Data Frame takes on the spatial reference of the first layer added to a map document. To verify this you can right-click on Layers in the Table of Contents and select Properties. On the Coordinate System tab you can see that the current coordinate system for the Data Frame is GCS_North_America_1983 or the Geographic Coordinate System based on the North American datum of 1983.

On the Standard toolbar click the New button to create a new blank map. Click No when prompted to save your map. A new Blank document opens. Drag your Project_Winnipeg_CT.shp file from the Catalog window into Data View. Visually you can see that the map looks different. Additionally, you can verify this by right-clicking on Layers in the Table of Contents and selecting Properties. Now the Current coordinate system is set to NAD_1983_UTM_Zone_14N. Click OK to close the Data Frame Properties dialog box.

Join

A join allows you to append the fields of one table to those of another using a field common to both tables.

JOINING DATA

In the Catalog window click on the Plus button to expand the LoneParent spreadsheet. This will reveal the LoneParent$ worksheet.
USING CENSUS DATA WITH ARCMAP

Add the worksheet to ArcMap by dragging it from the Catalog window into Data View.

Note: Ensure that you drag the worksheet, not the spreadsheet into the map.

We need to identify a common field in both tables in order to make the join. Right-click on the census tract layer in the Table of Contents and select Open Attribute Table. Next, right-click on the LoneParents$ worksheet in the Table of Contents and choose Open. If necessary resize the Table window to enlarge it.

To view both tables at once, click on the Census Tract’s tab and drag it to the table (shown above the tab) until the docking target appears.

Use the docking target to position the table on the right-hand side. You will notice that the contents of the CT_ID field in the worksheet are a match to the values in the CTUID field of the layer.

Note: The column headings need not exactly match but the data types must be the same e.g. you must be joining numbers to numbers or text to text.

CHECKING A DATA TYPE

As we are working with third party data we can double check that the data types match by reviewing the Properties of each Field.

Right-click the Census Tract layer in the Table of Contents and choose Properties.

On the Fields tab click the CTUID field and note that the Data Type is listed as Text under Fields Details. Click OK to close the Layer Properties dialog box.

Repeat these steps with the worksheet to confirm that the data types match.
Now that we know our data types match we are ready to make the join. Right-click the **Census Tract** layer in the **Table of Contents**.

Select **Joins and Relates** then **Join**.

In the **Join Data** dialog box click the **What do you want to join to this layer?** arrow and select **Join attributes from a table**.

Under the **1. Choose the field in this layer that the join will be based on:** caption click the **CTUID** field.

Under the **2. Choose the table to join to this layer, or load the table from disk:** caption click the **LoneParent2$** worksheet to select it.

Under the **3. Choose the field in the table to base the join on:** caption the **CT_ID** field should now be visible if not then click it.
USING CENSUS DATA WITH ARCMAP

Ensure that the Join Option is set to Keep all records (we are selecting this option so that the two NULL value tracts in the worksheet will be retained).

Right-click the Census Tract layer in the Table of Contents and choose Properties. In the Layer Properties dialog box with the Fields tab selected scroll down the fields list to confirm that the fields from the worksheet have now been joined to the Census Tract layer. Click OK.

SAVING A MAP DOCUMENT

You have accomplished much during the Data Preparation phase of this project and it is now time to save your map document.

Map Document Tips

ArcMap saves “maps” in a map document with an .mxd extension. A map document does not reference its contents in the same way, as say for an example: a Microsoft Word document does. A map document references the session in which the document was created and includes properties such as:

- The Data View zoom level.
- Map layouts that have been created in the Layout View.
- The symbology assigned to layers in the Table of Contents.
- The features and states of layers in the Data View.
- Filesystem pointers to the data within the Table of Contents.

In this manner map documents serve as pointers to the physical datasets that are stored on your computer. It also stores references to the settings applied during your session. As a result, map documents do not contain any actual data. Choose File then Save As from the Main Menu. Then name your file CensusMap and save it in your Census_2011 folder.
Data Analysis

In our analysis we will use ArcMap’s onscreen display and visual interpretation to note any discernible gender differences in the location of lone-parent families in Winnipeg. Additionally, we will make note of the top 5 lone-parent census tracts count and gender.

INSERTING A DATA FRAME
To help us compare the location of female and male headed lone-parent families we will insert a new data frame. Select Insert from the Main Menu and then Data Frame.

RENAMING A DATA FRAME
You should now see two Data Frames in your Table of Contents: one named Layers and another named New Data Frame.

ArcMap documents contain a Data Frame named Layers upon start-up. Right-click Layers in the Table of Contents and choose Properties. In the Data Frame Properties dialog box click on the General tab to make it active. On the General tab type Female into the Name field. Click OK. Use this same method to change the name of the New Data Frame to Male.
USING CENSUS DATA WITH ARCMAP

SETTING LAYER SYMBOLS

Visually, we want to highlight census tracts that have a greater number of lone-parent families and then further differentiate these tracts by gender. However, when making comparisons you want to ensure that you are comparing apples to apples and oranges to oranges. In a GIS the map is data driven, meaning that it is the data in the table that is used to create the map. A quick review of our data reveals that the range of values in FemPar and MalePar are quite different. If we were to accept the symbolization defaults we would be comparing apples to oranges and effectively lying with maps. In the map legend example below it is easy to see how the reader might be deceived into interpreting dark orange census tracts as being equivalent even though the data ranges are not.

<table>
<thead>
<tr>
<th>FemPar</th>
<th>MalePar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min = 5</td>
<td>Min = 5</td>
</tr>
<tr>
<td>Max = 460</td>
<td>Max = 105</td>
</tr>
</tbody>
</table>

To overcome this problem we will create a symbology layer based on the full range of values in the FemPar attribute and then apply it to both layers so that an equitable comparison can be made.

Right-click the Female data frame in the Table of Contents and choose Activate.

Right-click the census tract layer in the Table of Contents then Properties. In the Layer Properties dialog box click on the Symbology tab. In the Show box click on Quantities, then Graduated colors.

In the Fields box click the arrow next to Value and chose FemPar as the attribute of interest.

Right-click on the arrow next to the Color Ramp and uncheck Graphic View. Choose the Orange Bright color ramp.

Accept the default Classification method Natural Breaks (Jenks) with 5 classes.
USING CENSUS DATA WITH ARCMAP

FORMATTING LEGEND LABELS

Left-click the Label header and choose Format Labels . . . and type 0 into the Rounding text box.

Click OK to close the Number Format dialog box.

Review the following graphic to ensure that all of your settings match. Click OK to close the Layer Properties dialog box.
SAVING A LAYER FILE
Right-click the Census Tract layer and choose Save As Layer File...

In the Save Layer dialog box type FemPar into the Name text box and click Save.

COPYING A LAYER TO A DATA FRAME
Right-click the Census Tract layer in the Table of Contents and choose Copy.

ADDING A LAYER FILE TO ARCMAP
Right-click the Male data frame and choose Activate.

Note: Although ArcMap documents can contain multiple data frames, they can only display one data frame at a time. However, at any time during the session you can use Activate to switch between data frames.

Right-click the Male data frame and choose Paste Layer(s).

Right-click the pasted layer and then Properties.

IMPORTING A LAYER FILE TO ARCMAP
In the Layer Properties dialog box click the Import button.
In the Import Symbology dialog box click the Browse button and navigate to your FemPar.lyr. Click the layer to select it.

In the Import Symbology from Layer dialog box, click Add.

In the Import Symbology dialog box click OK.

In the Import Symbology Matching Dialog box change the Value Field to MalePar. Click OK.
In the **Layer Properties** dialog box, click **OK**.

Click the **Save** button on the **Standard** toolbar to save the changes that you have made to your map document.

**REVIEWING THE DATA**

In the **Female** data frame right-click the **Census Tracts** layer and choose **Open Attribute Table**. Repeat this step to open the **Male** table.

View the tables side by side. Drag the Male Census Tract tab and dock it on the right-hand side.

In the Female table drag the horizontal scroll bar to the right until you see the **FemPar** column.

Right-click the **FemPar** column's heading then select **Sort Descending**.
Fill in the following table with the CT_ID and FemPar values shown in the Female table.

**Table 1 - Top 5 Female**

<table>
<thead>
<tr>
<th>Ranking</th>
<th>CT_ID</th>
<th>FemPar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the Male table drag the horizontal scroll bar to the right until you see the MalePar column.

Right-click the MalePar column’s heading then select Sort Descending.

Fill in the following table with the CT_ID and MalePar values shown in the Male table.

**Note:** To reduce the amount of back and forth scrolling necessary to complete the table you can move the CT_ID column. Left-click the CT_ID column heading and drag to the right. The new position of the column is indicated by a red line. Position the column next to the MalePar column.

**Table 2 - Top 5 Male**

<table>
<thead>
<tr>
<th>Ranking</th>
<th>CT_ID</th>
<th>MalePar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What does your analysis suggest?
CREATING A NULL VALUE LAYER

Two of the census tracts we originally downloaded did not have recorded data values. When data is missing from a table we consider it to have a NULL data value. In database terminology, a NULL value is associated with a field if it is missing data or if the field is not applicable to a particular database record. Recall from the previous class that there were two census tracts in the original data that contained NULL values: census tract 6020024.00 and census tract 6020052.00.

We will now build an expression that will select these two tracts and create a new NULL Value layer.

From the Main menu click Selection then Select by Attributes.

Set the Layer to Census Tract.

Set the Method to Create a new selection.

Double-click the CTUID field to add it to the expression.

Click the equals operator to add it to the expression.

Click the Get Unique Values button and type in 6020024.00 into the text box. Double-click on the value to add it to the expression.

Click the Or operator to add it to the expression.

Double-click the CTUID field to add it to the expression.

Click the equals operator to add it to the expression.

Click the Get Unique Values button and type 6020052.00. Double-click on the value to add it to the expression.

Review your expression to ensure it matches the following graphic:

```
SELECT * FROM Project_Winnipeg_CT_LoneParent$ WHERE:
  "Project_Winnipeg_CT.CTUID" = '6020024.00' OR
  "Project_Winnipeg_CT.CTUID" = '6020052.00'
```

Click the Verify button.

Click the OK button.
With the tracts selected right-click on the Census Tract layer and choose Data then Export Data.

Click the Browse button in the Export Data dialog box. Navigate to your Census_2011 folder and name the file Null Values. Click the Save button.

In the Export Data dialog box click OK.

When prompted to add the layer to the map, click Yes.

CLEARING SELECTED FEATURES

On the Tools toolbar click the Clear Selected Values button.

ALTERING LAYER APPEARANCE

Right-click the NULL Values layer in the Table of Contents and choose Properties.

On the Symbology tab click the color swatch.

In the Symbol Selector dialog box click the Fill Color swatch and choose Black (first column, last row).

Click OK.

In the Layer Properties dialog box click the Display tab.

Set the Transparency to 40%.

Click OK.
COPYING AND PASTING LAYERS BETWEEN DATA FRAMES

Right-click the NULL Value layer and choose Copy.

Right-click the Male data frame in the Table of Contents and choose Paste Layer(s).

Click Save to save all the changes that you have made to your map document.
Using Census Data with ArcMap

Data Presentation

Choropleth
A thematic map that is coloured or shaded to represent classed values of attributes

In this next phase of the GIS workflow we are going to create a choropleth map.

ArcMap provides two ways to view a map: data view and layout view. Each of these views lets you interact with your data in a different way.

The Data view is used for preparing, querying, and displaying your data.

The layout view is used to create and design maps that are based on your data.

Up until this point you have conducted this exercise entirely in the Data View of ArcMap. Now you will switch over to the Layout View.

Layout View

From the Main menu click View and then Layout View.

Notice that the current page orientation is set to Portrait and that both of your data frames are visible on the page. A review of the interface indicates that the first data frame is the Female headed lone-parent families and second data frame is the Male headed lone-parent families.
USING CENSUS DATA WITH ARCMAP

As we would like to make a choropleth map that depicts both of the data frames side-by-side for comparison, we will change the orientation of the map and the placement of the data frames. Additionally, we will add map surround elements such as a title, legend, north arrow and scale bar to create the final map.

CHANGING MAP ORIENTATION
From the Main menu click File and then Page and Print Setup . . . 

Change the Orientation to Landscape.

Click OK.

RESIZING A DATA FRAME
Click on the Female data frame and resize it to take up to be approximately half of the page width allowing for some surrounding whitespace.

Click the Male data frame to select it.

With the Male data frame selected hold down the Shift key and click the Female data frame.

Note: The order that you click your data frames is important. Essentially, you are telling ArcMap take the first thing that I select and make it the same size as the second thing that I select. 

Right click anywhere within the selected data frames and choose Distribute then Make Same Size.

Select both data frames again, right-click within them and choose Align then Align Top.
USING CENSUS DATA WITH ARCMAP

Use the arrow keys on your keyboard to nudge and position the data frames until they are centered on the Layout View page.

SETTING MAP SCALE
To have both maps displaying at the same scale we will quickly switch back to Data View at this point.

On the Main menu select View then Data View.

Currently, the Female data frame is active. Right-click the Census Tract layer in the Table of Contents and choose Zoom To Layer.

Activate the Male data frame and repeat the previous step to set the map scale. Now both maps will display at the same scale in our final map.

Switch back to Layout View.

Click anywhere outside of the selected data frames to deselect them.

Now we are going to add the finishing touches to the map so let’s zoom in a little on the Layout View.

You may have noticed that once you switched to the Layout View the Layout toolbar was added to your display.
USING CENSUS DATA WITH ARCMAP

On the Layout toolbar click the Zoom Whole Page button.

ADDING MAP TITLE
On the Main menu select Insert then choose Title.
In the Insert Title dialog box type "Census 2011: Lone_Parent Families in Winnipeg".
Click OK.
The title has now been added to your map layout, if necessary center the title on the page.

ADDING MAP TEXT
On the Main menu select Insert then Text.

By default the text box is positioned into the middle of the layout but it might be difficult to see so we will now zoom the layout to 100%.

On the Layout toolbar click the Zoom to 100% button to bring your text box into view.

Double click the text box to open the Properties dialog box.

In the Text area replace the default “Text” by typing "Female Headed Lone-Parent Families" into the Text field. Then hit the Enter key and type “per Census Tract”.

Click OK.

On the Layout toolbar click the Zoom Whole Page button to bring the entire map into view once again.

Position the text box near the top of the Female data frame. Select the text box and then the Female data frame. Right-click in the data frame and choose Align then Align Center.

Note: Once again the order that you click your map elements is important. Essentially, you are telling ArcMap take the first thing that I select and align it to the second thing that I select.
Right-click on the **text box** and select **Copy**. Then use the keyboard shortcut **Ctrl v** to paste a copy of the text box into the map layout.

Double-click the **text box** and alter the text so that it now reads "**Male Headed Lone-Parent Families**".

Click **OK** to close the **Properties** dialog box.

Position this **text box** at the **top center** of the **Male** data frame.
INSERTING A MAP LEGEND

First, we are going to tidy up the Table of Contents to create a more informative legend.

Left click twice in the Table of Contents to select the $MalePar$ text. This text will become our legend’s subtitle so we want to change it to something more meaningful to our map readers. Type “Male Lone-Parents”. Hit the Enter key.

Repeat this process to change the subtitle in the Table of Contents from $FemPar$ to “Female Lone-Parents”. Hit the Enter key.

On the Main menu select Insert then Legend . . .

In the first panel of the Legend Wizard check that both the NULL Values and the Census Tracts layers are listed under Legend Items.
REORDERING A MAP LEGEND

Click the down arrow button to re-order the layers so that the NULL Values layer appears below the Census Tracts layer in the Legend. Click Next.

Select the default Legend Title "Legend" and delete it. Click Next.

Click the Next button to accept Legend Frame border, background and drop shadow defaults.

Click the Next button to accept the Legend Items default patches.

Click the Finish button to accept the default spacing between legend parts.

You will notice that the Legend Wizard generated a legend for the Male data frame. This is because it was the currently active data frame.

Activate the Female data frame and repeat this process to create a Legend for Female Lone Parents.

INSERTING A NORTH ARROW

On the Main menu select Insert then North Arrow . . .

In the North Arrow Selector dialog box click on ESRI North 8 north arrow to select it. Click OK.
Position the North Arrow in the lower left hand side of the Female data frame.

**INSERTING A SCALE BAR**

On the Main menu select Insert then Scale Bar ... 

In the Scale Bar Selector dialog box choose Scale Line 1.

Click on the Properties button. In the Scale Bar dialog box select Kilometers from the Division Units drop down menu. The software automatically defaults to the American spelling of the word. However, since we live and map in Canada we will change the label by typing Kilometres into the text box.
Click **OK** to close the **Scale Bar** dialog box.

Click **OK** to close the **Scale Bar Selector** dialog box.

**FINALIZING YOUR MAP**

At this time you can choose to size and reposition any of the map surround elements to create a visually pleasing map layout.

Additionally, if time permits you could add other text elements such as today’s date, your name as the cartographer and a citation link to the Statistics Canada website the data was downloaded from.

**SAVING YOUR WORK**

You have done a fabulous job of making your first map! Now it’s time to **Save** all your good work.

**PRINTING THE MAP**

Optionally, you may print a copy of your final map.
Additional Resources

CONTACT INFORMATION FOR VIRTUAL CAMPUS CODES
The University of Manitoba's ArcGIS license agreement includes an Esri Virtual Campus Standard Subscription. This subscription provides all faculty, staff and students of the University of Manitoba with free access to online courses in GIS. To request an access code for a course please contact David Mosscrop at David.Mosscrop@umanitoba.ca. In your request please include the name of the course(s) for which you wish to register along with your University ID and email address.

The 15-Minute Map: Creating a Basic Map in ArcMap
Creating presentation-quality maps does not have to be time-consuming. The map templates included with ArcMap provide attractive default layouts for fundamental map elements such as geographic data, titles, scale bars, and company logos. Using a template is an efficient way to reduce the time spent creating a map. This focused course teaches how to use ArcMap templates to streamline map creation. Students learn how to identify map element properties and defaults, how to modify elements while maintaining proper cartographic design principles, and how to add elements to layouts to create custom ArcMap templates.

Understanding Geographic Data
Acquiring geographic data can be expensive, so it makes sense for GIS users and their customers to know what to look for and where to find useful data. This course provides a comprehensive survey of the nature of geographic data and the technologies and professions involved in producing the data. You will gain a thorough understanding of the geographic data needed to perform common GIS tasks. In course exercises, you will find geographic data on the Internet from institutions such as the U.S. Geological Survey and the U.S. Census Bureau, and work with ArcGIS software and public domain data viewing applications.

ADDITIONAL READINGS

Getting Started With GIS: A LITA Guide
Written as a primer for librarians without previous GIS experience, it includes several hands-on activities that show you how to bring GIS to your library, along with examples of how to apply it in the real world. You will become proficient in mapping technology and learn to work with several GIS tools used by communities, academics and business leaders today.

Unlocking the Census with GIS
Seeking to demystify the census and explaining the potential of GIS for understanding people, places, and local economies, this guide explains how geographic information systems (GIS) can significantly ease data management, allowing for new ways to analyze and present relationships among variables.
Contact Information

If you have any further questions regarding Census or Geospatial Data please contact:

<table>
<thead>
<tr>
<th>GARY STRIKE</th>
<th>CYNTHIA DIETZ</th>
<th>GENERAL INQUIRIES</th>
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<tbody>
<tr>
<td>DATA LIBRARIAN</td>
<td>GIS LIBRARIAN</td>
<td></td>
</tr>
<tr>
<td>Tel (204) 474-7086</td>
<td>Tel (204) 474-7134</td>
<td>Reference Desk</td>
</tr>
<tr>
<td><a href="mailto:Gary.Strike@ad.umanitoba.ca">Gary.Strike@ad.umanitoba.ca</a></td>
<td><a href="mailto:Cynthia.Dietz@umanitoba.ca">Cynthia.Dietz@umanitoba.ca</a></td>
<td>204-474-9844</td>
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Elizabeth Dafoe Library
25 Chancellor’s Circle
University of Manitoba, Winnipeg, Manitoba R3T 2N2
http://www.umanitoba.ca/libraries/

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References

