



PROCEDURES FOR DOWNLOADING AND MAPPING CENSUS DATA

Trent University is a member of the [Data Liberation Initiative](#) (DLI), an agreement that provides academic institutions with access to a number of restricted data files from Statistics Canada. This includes spatial boundary files and other data at lower levels of geography such as dissemination area (DA), enumeration area (EA), forward sortation area (FSA), and census tract (CT). Only registered members of those post-secondary institutions who participate in the DLI are permitted access to the collection, and access is granted under the restriction that the data be used for research and teaching purposes only.

A number of data sets can be downloaded directly through Trent Library's subscriptions to several Internet data systems, including the University of Western Ontario's [Equinox Data Delivery System](#), the University of Toronto's [CHASS Census Analyser](#), Statistic Canada's [ESTAT](#), and Scholars Portal's [ODESI](#).

Links to Statistics Canada's census Web sites and to a variety of data providers can be found at <http://www.trentu.ca/admin/library/data>. Please note that if you are attempting to access licensed databases from a computer that is not on the Trent network, you will be prompted to enter your Trent user ID and password.

Offline files can be obtained from the MaDGIC unit by completing a [data request form](#).

This guide outlines the procedures involved with downloading and mapping a subset of DLI data from the *CHASS Census Analyser*. For a demonstration or for any assistance related to finding census data, please contact us at dataimage@trentu.ca.

Step 1 Downloading Census Data Using CHASS Census Analyser

To access the DLI collection available through CHASS, visit the Bata Library home page at <http://www.trentu.ca/admin/library/> and click on the link for *Maps, Data and Government Info* in the left menu. This brings you to the MaDGIC home page. Click on *Statistical Data* and scroll down the page to the link for the *Canadian Census through CHASS*.

◆ [CANADIAN CENSUS THROUGH CHASS \(restricted access\)](#)

Note: If you are on campus, you will be provided immediate access to the database. If you are working on a computer that is not a part of the Trent network, you will be asked to identify yourself using your Novell credentials.

The CHASS Welcome page allows you to choose various starting points to locate your data, such as browsing Census Profile Tables by geography level or census year, as well as searching microdata and postal code conversion files.

1. [Census Profiles Tables](#)

- by Census Geography:
 - [Canada, Provinces and Territories](#)
 - [Federal Electoral District](#)
 - [Census Division - New! -](#)
 - [Census Subdivision - New! -](#)
 - [Census Tract](#)
 - [Enumeration area / Dissemination area](#)
- by Census Year
 - [2006](#)
 - [2001](#)
 - [1996](#)
 - [1991](#)
 - [1986](#)
 - [1981](#)
 - [1971](#)
 - [1961](#)

2. [Microdata Files](#)

3. [Postal Code Conversion Files](#)

This example will outline the procedures used to download a subset from a Census Profile Table and subsequently map the results using ArcGIS 10. To begin, choose your starting point. In this example, we have chosen to browse the profile tables by census tract. The figure below displays all census profile tables available through CHASS at this level of geography. Choose the profile table of interest and click its title to continue to the next step.

[2006 \(cumulative\)](#)

- [Age and Sex](#)
- [Marital status, Common-law status, Families, Dwellings and households](#)
- [Language, immigration, citizenship, mobility and migration](#)
- [Aboriginals people](#)
- [Labour market activity, industry, occupation, education, language of work, place of work and mode of transportation](#)
- [Ethnic origin and visible minorities](#)
- [Income and earnings and housing and shelter costs](#)
- [Additional immigration and place of birth](#)

[2001 \(cumulative\)](#)

- [Age and Sex](#)
- [Marital status, families & household living arrangements, and housing](#)
- [Language, mobility, and migration](#)

The next page will ask you to select both a specific region of interest, and the census categories you wish to include in the downloaded file. In the example below we have selected the Peterborough census agglomeration and have indicated that we wish to include population data for the years 2001 and 2006 as well as the percent change of population that occurred between those years.

Census metropolitan areas(CMA) / tracted census agglomerations(CA):



[Cumulative Profiles](#) --> [Age and sex](#)

Census Category:



Note: It is important to include the unique identifier that relates to your geography level in the downloaded results. In this case, because we are interested in mapping profile information by census tract, we will choose to include the census tract unique identifier, or CTUID. This identifier is a crucial component that will be used in mapping the census profile data using ArcGIS. You may choose to include all of the codes and names provided, or a subset.

Include in the result:

- CTUID (CMA/CA code + CT name) CMA / tracted CA code CMA / tracted CA name
- Province code Province abbrev. Province name

The final step prior to submitting your request involves selecting the output format. There are a number of options to choose from, however not all of these are conducive to mapping data. Spreadsheet (comma delimited), MS Excel ready (for ArcGIS versions 9.3 or higher), and dBASE are all acceptable formats. The dBASE format facilitates mapping the results in ArcGIS with the least amount of processing – however, pay attention to the size restriction. If you expect that your results will exceed the maximum amount then another format will be more appropriate.

Select the output format:

dBASE (maximum 255 columns allowed) ▼
 HTML
 Text
 Spreadsheet (comma delimited)
 MS Excel ready
 SAS
 SPSS
 dBASE (maximum 255 columns allowed)

Submit the request. You will be provided with a link to download the results as soon as your request is processed. An example dBASE file downloaded from CHASS and viewed in MS Excel is shown below.

	A	B	C	D	E
1	COL0	COL1	COL2	COL3	COL4
2	0000.00	5290000.00	110876.00	116570.00	5.10
3	0001.00	5290001.00	7394.00	7617.00	3.00
4	0002.00	5290002.00	3845.00	3802.00	-1.10
5	0003.00	5290003.00	5011.00	5744.00	14.60
6	0004.00	5290004.00	3962.00	4237.00	6.90

In many cases, you will also see a link to the column definitions for your file. Clicking this link will provide a screen output similar to the one shown below. This information is provided because the census profile table is formatted with column headings of 'COL0', 'COL1', 'COL2', and so on (as seen above). It is usually a good idea to rename the columns in your dBASE file to reflect the data in a more descriptive way – keeping in mind that column headings must not exceed ten characters.

```

2006 Profile of Census Tracts / Additional immigration and place of birth
COL0 - Census Tract name
COL1 - CTUID (CMA/CA code + CT name)
COL2 - Population, 2001 - 100% data
COL3 - Population, 2006 - 100% data
COL4 - Population percentage change, 2001 to 2006
  
```

Step 2 Downloading Census Boundary Files

Mapping census profile information requires two data components; the statistical data (obtained in Step 1), and a spatial file (called a *census boundary file*) that is used to link the statistical results to a specific geographic region.

Census boundary files are available for download from the [Equinox data delivery system](#). It is important to note that a few of the census boundary files are subject to DLI restrictions. These include census tract, forward sortation area, dissemination area, and enumeration area.

Note: You can also request census cartographic boundary files directly from MaDGIC by filling out a [data request form](#) and e-mailing the completed form to MaDGIC at datamage@trentu.ca.

Access the Equinox data delivery system from the *MaDGIC/Statistical data* Web page. Use the Advanced Search function to locate the spatial files that correspond to the census data downloaded previously. The search example below will retrieve all cartographic boundary files associated with the 2006 census year:

Advanced Search ?

File Variable

Cartographic in Title

and boundary in Title

and 2006 in Title

and in All Fields

[Basic Search](#)

Results:

Census of Canada - Geographic Products

Census of population, 2006 [Canada]: Cartographic Boundary, Digital Boundary, Ecumene, Road Network, Road Network and Geographic Attribute Files

[Documentation](#) [Access files](#)

Explore the documentation and use the *Access files* link to begin the download process. Note that you also have the option of downloading base features such as water and road network files.

Now that you have successfully downloaded both a statistical profile table and a spatial boundary file, it is possible to map the census data in a GIS. The following example illustrates mapping census data using ArcGIS 10.

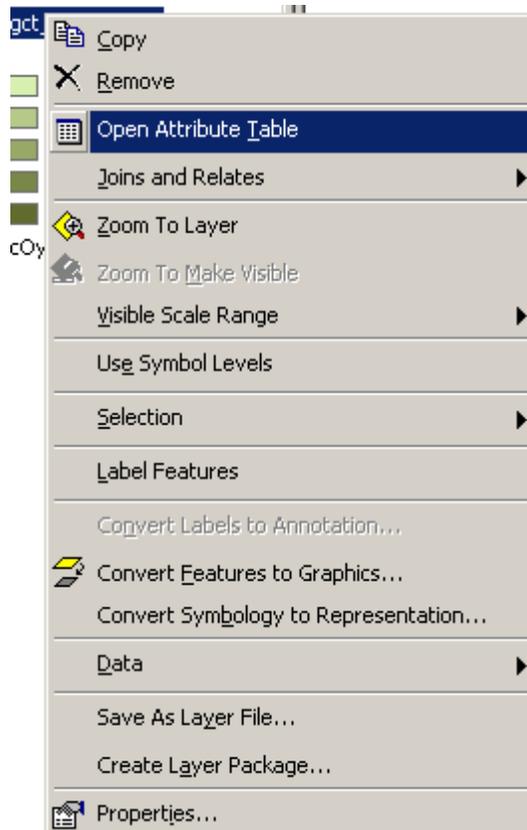
Step 3 Mapping Census Data Using ArcGIS

Extract the spatial data files downloaded in Step 2 and open a new blank map document in ArcMap (*Program Menu > ArcGIS > ArcMap*).

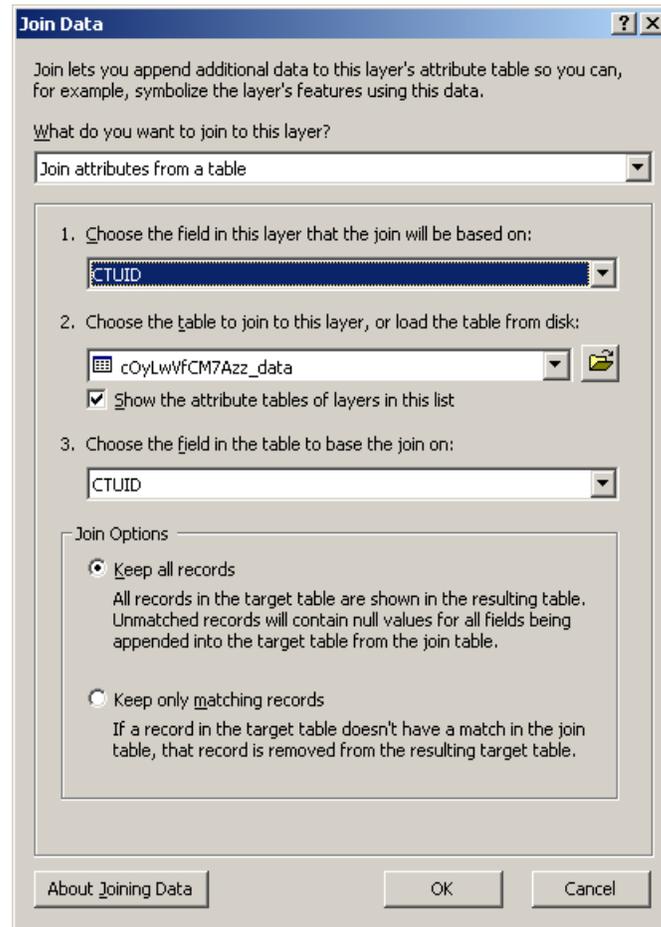
Click the *Add Data* () button and browse to the location of your files. Add the boundary files and the dBASE file containing your census profile data to the map document.

The first crucial step in mapping and symbolizing your census data is to associate the spatial boundary file with the statistical information in the dBASE file. This is where the unique identifier comes into play. The CTUID is a unique ID defined for each census tract in Canada. There is also a unique ID for all census metropolitan areas, dissemination areas, etc. Regardless of the geography level you are working with, it is absolutely necessary that this unique identifier is present in both the spatial attribute table and the statistical file. This ID field is the common field that will be used to link the two data sets together.

In this example, the Peterborough census tract agglomeration has a unique ID of 529, and the census tracts that fall within the CT agglomeration are subsequently numbered. Thus, the CTUIDs for two of the census tracts within the Peterborough CT agglomeration would be displayed in the attribute table as 5290001.00 and 5290002.00. You can view these values by opening the spatial file attribute table (right-click the file name in the table of contents and select '*Open Attribute Table*').



You are now ready to join the two files based on the common CTUID field. To initiate the join, right-click on the spatial file and select *Joins and Relates > Join*. In the *Join Data* dialog, choose to join the CTUID field in the spatial file with the CTUID field in the census profile table, as shown below.



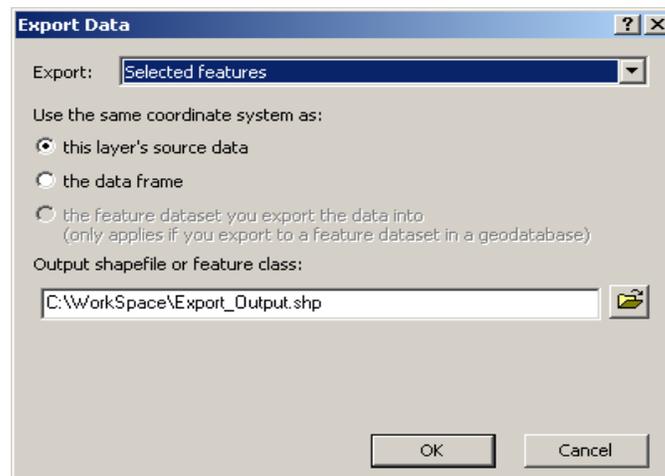
Click *OK* and select *Yes* if you are prompted to create an index for the join. The spatial file should now be joined with the census table based on the field CTUID.

Open the attribute table and view the fields to confirm that the join has been processed successfully. If your spatial file includes boundaries for the entire country, then all of the joined fields will be null except those related to the Peterborough census tract agglomeration. This occurs because the census profile table only included data for the Peterborough census tracts.

At this point it is usually a good idea to export the relevant records to a new shapefile so that you are working with a file that includes only your area of interest. To do this, open the attribute table and sort the *joined* CTUID field in descending order (right-click field name > *Sort Descending*). This will bring all of the non-null values to the beginning of the column. Select all of the records associated with the Peterborough census tract. This can be done manually by clicking the grey box beside the records containing data and holding down the *Ctrl* key to select multiple records. Your selection will be highlighted in the attribute table and on the map document.

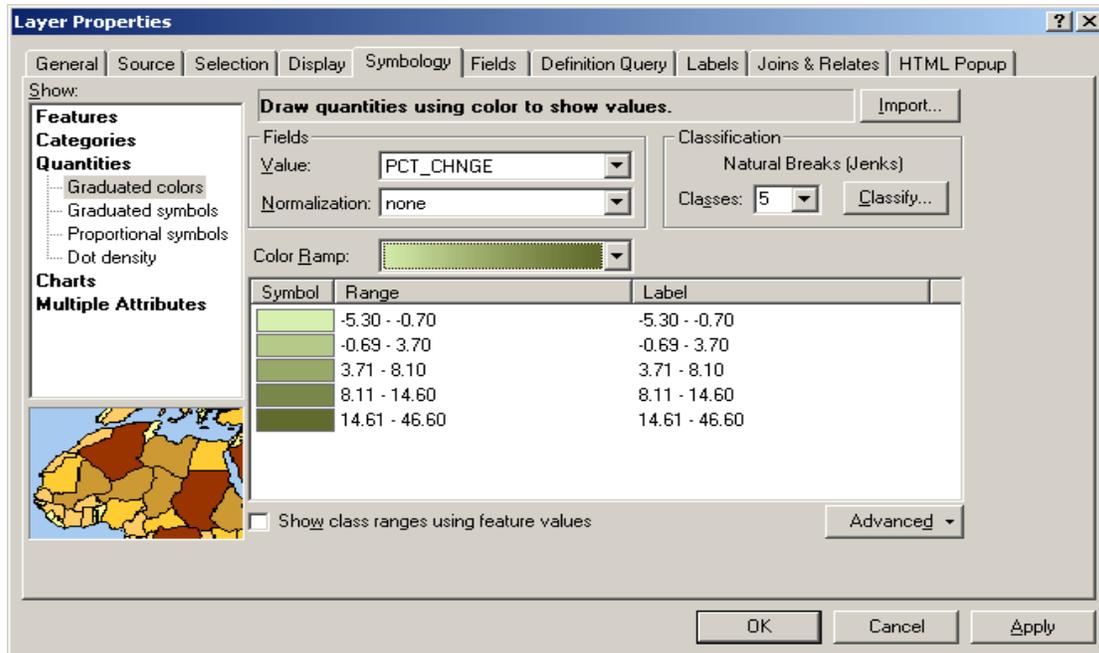
FID	Shape	CTUID	CMAUID	PRUID	OID	CT_NAME	CTUID *	POP_2001	POP_2006	PCT_CHNGE
1812	Polygon	5290201.00	529	35	27	0201.00	5290201.00	4535	4832	6.5
1811	Polygon	5290200.00	529	35	26	0200.00	5290200.00	3918	3996	2
1810	Polygon	5290106.00	529	35	25	0106.00	5290106.00	1369	1447	5.7
1809	Polygon	5290105.00	529	35	24	0105.00	5290105.00	5597	5970	6.7
1808	Polygon	5290104.00	529	35	23	0104.00	5290104.00	2988	3012	0.8
1807	Polygon	5290103.00	529	35	22	0103.00	5290103.00	4584	4954	8.1
1806	Polygon	5290102.02	529	35	21	0102.02	5290102.02	3348	3832	14.5
1805	Polygon	5290102.01	529	35	20	0102.01	5290102.01	6439	6675	3.7
1804	Polygon	5290101.00	529	35	19	0101.00	5290101.00	3145	3346	6.4
1803	Polygon	5290100.00	529	35	18	0100.00	5290100.00	3507	3608	2.9
1802	Polygon	5290014.00	529	35	17	0014.00	5290014.00	2144	2030	-5.3
1801	Polygon	5290013.00	529	35	16	0013.00	5290013.00	4627	4879	5.4
1800	Polygon	5290012.00	529	35	15	0012.00	5290012.00	5728	5849	2.1
1799	Polygon	5290011.00	529	35	14	0011.00	5290011.00	2496	2515	0.8
1798	Polygon	5290010.00	529	35	13	0010.00	5290010.00	2468	2406	-2.5
1797	Polygon	5290009.04	529	35	12	0009.04	5290009.04	5796	5732	-1.1
1796	Polygon	5290009.03	529	35	11	0009.03	5290009.03	3396	4977	46.6
1795	Polygon	5290009.02	529	35	10	0009.02	5290009.02	5625	5571	-1
1794	Polygon	5290009.01	529	35	9	0009.01	5290009.01	2922	2938	0.5
1793	Polygon	5290008.00	529	35	8	0008.00	5290008.00	3873	3969	2.5
1792	Polygon	5290007.00	529	35	7	0007.00	5290007.00	4143	4715	13.8
1791	Polygon	5290006.00	529	35	6	0006.00	5290006.00	5649	5610	-0.7
1790	Polygon	5290005.00	529	35	5	0005.00	5290005.00	2367	2307	-2.5
1789	Polygon	5290004.00	529	35	4	0004.00	5290004.00	3962	4237	6.9
1788	Polygon	5290003.00	529	35	3	0003.00	5290003.00	5011	5744	14.6
1787	Polygon	5290002.00	529	35	2	0002.00	5290002.00	3845	3802	-1.1
1786	Polygon	5290001.00	529	35	1	0001.00	5290001.00	7394	7617	3
0	Polygon	0010001.00	001	10	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
1	Polygon	0010002.00	001	10	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
2	Polygon	0010003.01	001	10	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
3	Polygon	0010003.02	001	10	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>

Right-click the layer name in the table of contents and select *Data > Export Data*. In the export data dialog, choose to export selected features using the same coordinate system as the layer's source data, and set the output shapefile to your workspace with a name of your choice. In the example below, the file is being saved to the *C:\Workspace* folder and has been renamed *Peterborough_POP.shp*:

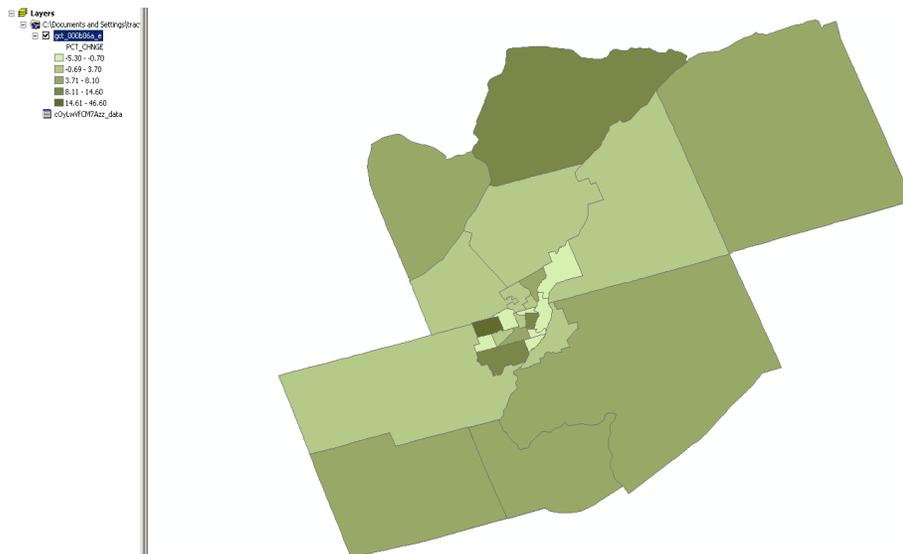


Click OK to export the new shapefile, and select Yes to add the shapefile to the map. Your map document now holds a shapefile of the Peterborough census tract agglomeration that contains all of the statistical data from your census profile table within its attribute table.

Open the new layer's properties window (*right-click > Properties*). Click the *Symbology* tab. Use the tools within this dialog to symbolize the data according to the variables you are trying to display. In the example below, we have chosen to symbolize the percent change of population between 2001 and 2006 using graduated colours for each census tract within the Peterborough census agglomeration.



Results:



Note: For further information related to mapping quantitative data in ArcMap, access *ArcGIS Desktop Help* in the Help menu and enter your topic into the Search box.