

GIS and Maps WAC Bennett Library Procedure Guide Lesson 3: Working with CHASS Census Data in an ArcGIS Environment

Created by: Sarah E. Pearce, Peer Graduate GIS Resource Facilitator, Bennett Map Library, SFU 2012

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 First, Total population 25-64 years by highest certificate, diploma or degree- 20% sample
 → University certificate or degree

Secondly, Population 25 years and over- Labour force activity → Unemployment Rate

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 Degree level of education and second, a map showing the Vancouver Unemployment Rate in the 2006 Census.

Introduction

The following guide demonstrates to SFU GIS and Maps library users how to create a thematic maps working with CHASS generated Census data tables imported into ArcGIS software.

Before you begin, ensure that you have the following software programs installed on your computer:

- 1. ArcGIS 10
- 2. SFU Computing ID and internet connection

Step 1: Go to the SFU library website and connect to CHASS.

http://cufts2.lib.sfu.ca/CRDB/BVAS/resource/5684



Sign in with your SFU computing ID connect to \rightarrow CHASS

Step 2- Choosing data query parameters for your project

Create a new folder for Lesson 3 data downloads and outputs on your local disk drive (C-drive for example)

```
Right click→ new→ Folder→ Lesson 3
```

We will now choose the data parameters for our query in CHASS. Next we go to the 2006 Profile of Dissemination Areas / Labour market activity, industry, occupation, education, language of work, place of work and mode of transportation data for the Greater Vancouver Census Division.

Starting Points:

1. Census Profile Tables → by Census Geography→ Enumeration area/Dissemination area



2. Profile of Dissemination Areas (2006 cumulative)

→ Labour market activity, industry, occupation, education, language of work, place of work and mode of transportation

mect: Search results × M Profile of Dissemination Areas / Profil × + datacentre.chass.utoronto.ca/census/ea.html						
CHASS	Canadian Census Analyser / Profile of Dissemination Areas / Pro					
Advancing Knowledge throug	h Technology					
2006 (cumulative)						
Age and Sex Marital status, Comm Language, immigratio Aboriginals people	on-law status, Families, Dwellings and households on, citizenship, mobility and migration					
 Labour market activiting place of work and more than the second se	y, industry, occupation, education, language of work, ode of transportation					
Ethnic origin and visit	ble minorities					
Additional immigratio	n and place of birth					

Highlight the Census Categories we are interested in (make sure you are *certain* you are highlighting *the data you want to work with*)

Firstly, narrow the Census Divisions

Choose the following parameters \rightarrow

By Province: British Columbia

Census Division → Greater Vancouver [5915] (BC)



Profile of Dissemination Areas

2006 Census / Labour market activity, industry, occupation, education, language of work, place of work and n

Narrow Census Divisions	All provinces> All British Colum	bia	
by Province:	Census Divisions:		
Alberta	Bulkley-Nechako [5951] (B.C.)		A
British Columbia	Capital [5917] (B.C.)		
lanitoba	Cariboo [5941] (B.C.)		
lew Brunewick	Central Coast [5945] (B.C.)		
VEW DIUISWICK	Central Kootenay [5903] (B.C.)	-	
Newfoundland and Labrador	Central Okanagan [5935] (B.C.)	-	
Northwest Territories	Columbia-Shuswap [5939] (B.C.)		
lova Scotia	Comox-Strathcona [5925] (B.C.)		
Junavut	Cowichan Valley [5919] (B.C.)		
Dotario	East Kootenay [5901] (B.C.)		
Dringer Edward Jaland	Fraser Valley [5909] (B.C.)		
rince Edward Island	Fraser-Fort George [5953] (B.C.)	_	
Quebec	Greater Vancouver [5915] (B.C.)		
Saskatchewan	Kitimat-Stikine [5949] (B.C.)		
/ukon Territory	Kootenay Boundary [5905] (B.C.)	-	-

For this lesson be sure to select/highlight the following two census data fields:

Population 25 years and over- Labour force activity → Unemployment Rate

AND

(you can select/highlight multiple fields in the Census Category box by holding down the **ctrl** key and navigating the list category options by scrolling down)

Total population 25-64 years by highest certificate, diploma or degree- 20% sample → University certificate or degree

* Ethnic origin and visible minorities * Income and earnings and housing	Census Category:
and shelter costs * Additional immigration and place of birth	Employed Unemployed Not in the labour force Participation rate
Preferrences	Unemployment rate
See Provinces as: <u>Select list</u> <u>Checkbox list</u> See Census category as: Select list	Population 25 years and over - Labour force activity In the labour force Employed Unemployed Not in the labour force Participation rate Employment rate
Checkbox list	Males 15 years and over - Labour force activity In the labour force Employed Unemployed
	Not in the labour force Participation rate

You will have to scroll way down the list to find the Census education field to highlight.

ensus Category:	
Master's degree	
Earned doctorate	
Total population 25 to 64	years by highest certificate, diploma or degree - 20% sample data
No certificate, diploma	or degree
Certificate, diploma or	degree
High school certificat	e or equivalent
Apprenticeship or tra	des certificate or diploma
College, CEGEP or c	ther non-university certificate or diploma
University certificate,	diploma or degree
University certificat	e or diploma below bachelor level
University certificat	e or degree
Bachelor's degre	8
University certifica	ite or diploma above bachelor level
Degree in medicil	ne, dentistry, veterinary medicine or optometry
Master's degree	
Earned doctorate	
Total population 65 yea	is and over by highest certificate, diploma or degree - 20% sample data
No certificate, diploma	or degree
Certificate, diploma or	degree
High school certificat	e or equivalent

Next step: Make sure the following parameters/check boxes are checked

1. Include in the result (check all of the following boxes)

- A) \rightarrow DAuid,
- B) \rightarrow Division code
- C) \rightarrow Division name
- D) \rightarrow Province code
- E) \rightarrow Province abbrev.
- F) \rightarrow Province name
 - 2. Data category to be listed as \rightarrow colums
 - 3. Optionally enable zip file compression (yes)
 - 4. Select the output format as→ (Download to a file) → dBase (DBF) file → Submit Query
 - 5. Wait for CHASS to process, it will give you two files to download.

Include in the re-	sult:				
DAuid	Division code	Division name			
Province code	Province abbrev.	Province name			
Dissemination ar (e.g: 0 1-4 7-9 005	ea names (the form 9 302)	at of DA name is xxx	x):		
Data category to columns: rows	be listed as: (apply	only to Screen outpu	it format)		
Optionally provid	le an email address	for larger downloa	ads notificatio	ns (apply only to	Download to a file output form
sepearce@sfu.ca					
none: O zip: O Select the output	t format:	on (apply only to bo	in load to a life	oupur formatj.	
Screen output Text HTML Comma-Separa MS Excel ready SAS SPSS Download to a fill Comma-Separa dBase (DBF) file	ted Values (CSV) for s e ted Values (CSV) file fo	or spreadsheet			
Submit your requ	lest:				

Right click on the two seperate files (.dbf.zip and header.txt) save in your Lesson 3 folder, right click on the zipped file \rightarrow extract all



Step 3- Download the Census boundary file from the Statistics Canada website following the link below

http://geodepot.statcan.gc.ca/2006/040120011618150421032019/02152114040118250609120519/02152114040118250609120519/021521140401182519011205_05-eng.jsp?lang=eng&catno=92-169-XWE2006011&Submit=Download

Choose→ Cartographic boundary file (ArcInfo)

Save this boundary file in your lesson 3 folder, right click \rightarrow extract all

Step 4- The next step in ArcMap

Open Census boundary file and "your_CHASS_database_table.dbf" file in ArcMap

Open ArcMap \rightarrow add data \rightarrow (connect to folder button then navigate to your Folder 3) \rightarrow select $gda_059b06a_e.shp$

Open ArcMap→ add data→ (navigate to your Folder 3) → select v06JN5GVGDJN_data.*dbf*

(your file name will vary slightly to this example)





Step 5- Open the CHASS data header file with \rightarrow *Notepad* software and reformat it for easy viewing of column numbers and associated labels

Re-format (by moving your cursor and hitting return, look for COL 0- Dissemination Area) so that the Colum numbers and associated labels are justified left down the side of the notepad document and save your edits.

Keep the header file open, you will need to refer back to it later on in this lesson.



Your re-formatted notepad text document will now look like the one below, with the COL 0-COL 8 numers and labels matched up in an easy to read format.



Step 6-Return to the ArcMap program and → Preform a spatial join, joining the CHASS database table file to the Census Boundary file <u>using the common DAuid field</u>

Q chass8 - ArcMap - ArcInfo File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help Geostatistical Analyst * 🗋 🚰 🖶 🛸 🗊 🖺 🗙 🔊 (*) 🚸 • (1.215.532 • 🔜 🔤 📓 📋 Editor • ト 🖕 ノ ア 偽 - 米 🔍 🔍 🐑 🚱 | 💥 🖓 | 🖛 🔶 | 🕅 + 🖾 | 📐 🚳 🖉 🗊 | 🔛 | 🖍 👘 🖓 | 💿 | 🗊 | 💭 🚽 3D Analyst - | Layer: 🗌 - = | 💊 🐁 | 🔁 | 🛞 💂 Layer: | 46% 31 Table Of Contents 🏡 🔒 😓 🛄 E Inters C:\Files\GIS_Data\Census_data\Lesson 3_ CHASS\gda_059b06 😑 🗹 gda_059b06<u>a_e</u> Copy 卽 C:\Files\May6_ X Remove VO6JN5GVG Open Attribute Table K Joins and Relates . Join.. Remove Join(s) Zoom To Layer Zoom To Make Visible Relate.... Visible Scale Range ٠ Remove Relate(s) **Use Symbol Levels** Selection ٠ Label Features **Edit Features** ۲ Convert Labels to Annotation Convert Features to Graphics... Convert Symbology to Representation ... Data ۲ Save As Layer File... Create Layer Package ... Properties... Table Of Contents -%: 🔋 😞 🚇 🗄

Right Click on your boundary file \rightarrow Joins and Relates \rightarrow Join

C:\Files\GIS_Data\Census_data\Lesson 3_ CHASS\gda_059b06

C:\Files\May6_Walter_Final\Final_GIS_Module_SFU

E I Layers

⊒ gda_059b06a_e

vO6JN5GVGDJN_data

rex	ample, symbolize the layer's teatures using this data.
loin a	tributes from a table
1.	Choose the field in this layer that the join will be based on:
	DAUID
2.	Choose the table to join to this layer, or load the table from disk:
	🖾 vO6JN5GVGDJN_data 💽 🖻
	Show the attribute tables of layers in this list
3.	Choose the field in the table to base the join on:
	COL1 -
J	oin Options
	Keep all records
	All records in the target table are shown in the resulting table. Unmatched records will contain null values for all fields being appended into the target table from the join table.
	Keep only matching records
	If a record in the target table doesn't have a match in the join table, that record is removed from the resulting target table.
	Validate Join

The Join is based on DAuid and check your header file for the correct colum number

(in this case it is COL - 1) to choose in the Join data dialogue box.

Join Options \rightarrow Keep only matching records \rightarrow Validate Join \rightarrow OK



To confirm that the join has been successful, right click on the shapefile in the table of contents and select \rightarrow open attribute table

Notice that your .dbf table columns have now been appended into your boundary shapefile.

aurie				1000															
•	B • 6	N 12 4	×																
gda_059	b06a_e																		
FID	Shape	DAUID *	CSDUID	CCSUID	CDUID	ERUID	PRUID	CTUID	CMAUID	OID	COLO	COL1	COL2	COL3	COL4	COL5	COL6	COL7	COL8
 939 	Polygon	59150004	5915055	5915020	5915	5920	59	9330133.01	933	1	0004	59150004	59	B.C.	British Columbia	5915	Greater Vancouver	0	95
940	Polygon	59150005	5915055	5915020	5915	5920	59	9330133.01	933	2	0005	59150005	59	B.C.	British Columbia	5915	Greater Vancouver	4.8	145
941	Polygon	59150006	5915055	5915020	5915	5920	59	9330133.01	933	3	0006	59150006	59	B.C.	British Columbia	5915	Greater Vancouver	4.5	140
942	Polygon	59150007	5915055	5915020	5915	5920	59	9330133.01	933	4	0007	59150007	59	B.C.	British Columbia	5915	Greater Vancouver	0	180
943	Polygon	59150008	5915055	5915020	5915	5920	59	9330133.01	933	5	0008	59150008	59	B.C.	British Columbia	5915	Greater Vancouver	5.3	235
944	Polygon	59150009	5915055	5915020	5915	5920	59	9330133.01	933	6	0009	59150009	59	B.C.	British Columbia	5915	Greater Vancouver	0	80
945	Polygon	59150010	5915055	5915020	5915	5920	59	9330133.01	933	7	0010	59150010	59	B.C.	British Columbia	5915	Greater Vancouver	0	265
946	Polygon	59150012	5915055	5915020	5915	5920	59	9330133.02	933	8	0012	59150012	59	B.C.	British Columbia	5915	Greater Vancouver	4.5	120
947	Polygon	59150013	5915055	5915020	5915	5920	59	9330133.02	933	9	0013	59150013	59	B.C.	British Columbia	5915	Greater Vancouver	0	180
948	Polygon	59150014	5915055	5915020	5915	5920	59	9330133.02	933	10	0014	59150014	59	B.C.	British Columbia	5915	Greater Vancouver	0	290
949	Polyoon	59150015	5915055	5915020	5915	5920	5.9	9330132.00	933	11	0015	59150015	50	B.C.	British Columbia	5915	Greater Vancouver	5.8	200

Step 7- Save the spatial join by saving the Census Boundary shapefile with appended 2006 Census data as a new file

We can make a permanent copy of a layer with joined data by exporting the layer. To export the layer:

Right-click your boundary shapefile in the table of contents→scroll to Data→ click Export Data



Rename the Output feature class to something meaningful such as Census2006_Van.shp

Save the new shapefile in your lesson 3 folder



Yes (to add the layer to the map)



• Optional step: you can re-name your field headings from COL 0, COL 1, COL 2, etc to something more meaningful by right clicking on the field label → properties → Alias

Field Prope	rties	2 ×
Name:	3ScHoIScF_data.COL1	
Alias:	DUaid	
Type:	String	

(check your header file as a legend)

Step 8- We will produce two maps (steps 8-9 will have to be followed twice, one time for each map we want to create)

1:

Total population 25-64 years by highest certificate, diploma or degree -20% sample- University certificate or degree, by Dissemination Area, 2006 Census

2:

Population 25 years and over- Labour force activity- Unemployment rate, by Dissemination Area, 2006 Census

Choose a Census data column to display spatially, first Total population 25-64 years by highest certificate, diploma or degree -20% sample- University certificate or degree then Population 25 years and over- Labour force activity- Unemployment rate

In the table of contents, right click on the Census2006_Van.shp \rightarrow properties



Click \rightarrow the Symbology tab \rightarrow click on Show: Quantities

(COL7 - Unemployment rate;

COL8 - Certificate, diploma or degree / University certificate, diploma or degree)

Under the Fields Value \rightarrow choose COL 8 (consult your notepad header file to confirm you are choosing the correct column to display)

Change the Colour Ramp to a single colour gradient scale, similar to the one shown in the screen grab below→ OK

Features	Draw quanti	Draw quantities using color to show values. Import							
Categories	Fields			Classificati	on				
Quantities	Value:	COL8	-	Natu	ral Breaks	(Jenks)			
- Graduated colors	Normalization:	none	-	Classes:	5 🔻	Classify			
- Proportional symbols									
- Dot density	Color Ramp:		•				_		
Unarts Multiple Attributes	Symbol Ran	ige	La	sbel					
Manple Attributes	0.00	- 105.00	0.0	00 - 105.00					
	105	01 - 210.00	10	5.01 - 210.00)				
	210.	01 - 400.00	21	0.01 - 400.00)				
11 1 2. 2. 2. 2.	400.	01 - 800.00	40	0.01 - 800.00)				
- And	800.	01 - 1670.00	80	0.01 - 1670.0	00				
SAL /	Channel and	in fact of			0	Advanced			
	Show class r	ances using reature	vaues			Advanced *	1		



Step 9- Create and export two separate thematic maps from the ArcMap environment as a .JPEG files at 300 DPI. (you can also save and export your maps as 500 DPI .tiff files if you desire a higher resolution output, but the resulting file will be much larger). One map showing the population in Vancouver with a University Degree level of education and second, a map showing the Vancouver Unemployment Rate in the 2006 Census.

In the bottom left of the ArcMap screen there is a small square symbol for switching to the layout view. Click → layout view

After we switch to layout view in ArcMap, we will insert a map legend, a north arrow, a map scale statement and a map scale bar to include all the necessary cartographic elements.



Now we will Insert our north arrow, legend, scale bar and scale text symbols to our map



Insert→ Legend (choose which layers you wish to display in your map legend)
Insert→ Scale Bar (if needed change the display units: properties → Kilometers)
Insert → Scale Text → Absolute scale

n your legend	
Legend Items	
	n your legend Legend items



From the main toolbar at the top of the ArcMap page, click on

File→ Export Map

Export Map		Including States - 5	-	- X	Q Export Map		Included to Anna 1	4	×
Save in:	🎉 May6_Walte	r_Final 🗸	G 🗊 📂 🗔 -	<u>ه</u>	Save in:	🕌 Final_GIS_M	Nodule_SFU +	G 🗊 📁 🛄	· 🔂
Recent Places Desktop Libraries	Name	fodule_SFU	Date modified 04/06/2012 2:42 PM	Type File folder	Recent Places Desktop Libraries Computer		No items match your	r search.	
Network	File name: Save as type:	" Census2006_Van_uni_educ TIFF	•	Save Cancel	Network	File name: Save as type:	Census2006_Van_uni_educ_com	pressed.jpg 💌	Save Cancel
Resolution:	500	🗢 dpi		1	Resolution:	300	a dpi		
Width:	4250	pixels			Width:	2550	pixels		
Height:	5500	pixels			Height:	3300 File	ptxels		
Clip Output to C	Graphics Extent				Clip Output to	Graphics Extent			

Save in: Lesson 3 folder, choose an appropriate file name for your map, save as .JPEG and set the output resolution to 300 dpi (or the 500 DPI .TIFF option) \rightarrow Save



Final Step:

We will now produce the second map. Toggle back from the Layout view screen to <u>the Data View</u> <u>screen</u> using the small symbol in the bottom left of the ArcMap screen.

Return to STEPS 8-10

Change to Step 8 to produce the second map:

Change the field value of the Layer Properties \rightarrow Symbology \rightarrow Fields \rightarrow COL 7

(Representing Population 25 years and over –Labour force activity- Unemployment rate)

Change the Colour ramp for the second output map under the Symbology tab→Apply

Return to step 9 to complete and export your second map.

The labels from your first map will show up in the layout view, <u>the title and map legend title will</u> <u>need to changed to reflect the data displayed on the second map. To accomplish this you will need</u> to double click on the map title and then the legend

Text Size and Position	Text Size and Position
Test:	Text: Percelation 25 years and user
by highest certificate, diploma or degree- 20% sample, University certificate or degree	Labour force activity- Unemployment rate
Font: Arial 21.00	Font: Arial 21.00
Angle: 0.00 + Character Spacing: 0.00 +	Angle: 0.00 - Character Spacing: 0.00 -
Leading: 0.00	Leading: 0.00
	About Formatting Text Change Symbol
About Formatting Text Change Symbol	

➔ Apply

2006 Census- 2 Unemployment	5+ Rate				
Show	_				
	Position: a	bove 👻	Symbol		
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Width: 26.65	title and	d items	7.58165		
10.07	tems		4.74185		
Height: 13.2/	column	8	4.76185	E	
Line: -	 layer na 	ame and group	4.73932		
	groups		4.73932		
Area:	 heading 	g and classes	4.74185	*	

→ Apply

Q Export Map		Q Export Map		
Save in:	🕌 Final_GIS_Module_SFU 🔹 🎯 🎓 📴 🖬	Save in:	🕌 Rnal_GIS_Module_SFU 🔹 🚱 🌮 🖽 🖬	
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Resolution:	300 @dpi	Resolution:	500 @dpi	
Width:	2550 pixels	Width:	4250 pixels	
Height:	3300 pixels	Height:	5500 pixels	
Clip Output to 0	Graphics Extent	Cip Output to 0	Singphics Extent	

