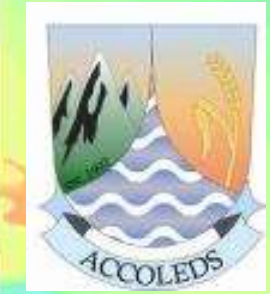


Calgary 2015

Utilizing free open source tools to create interactive web maps in order to visualize (StatsCan) data

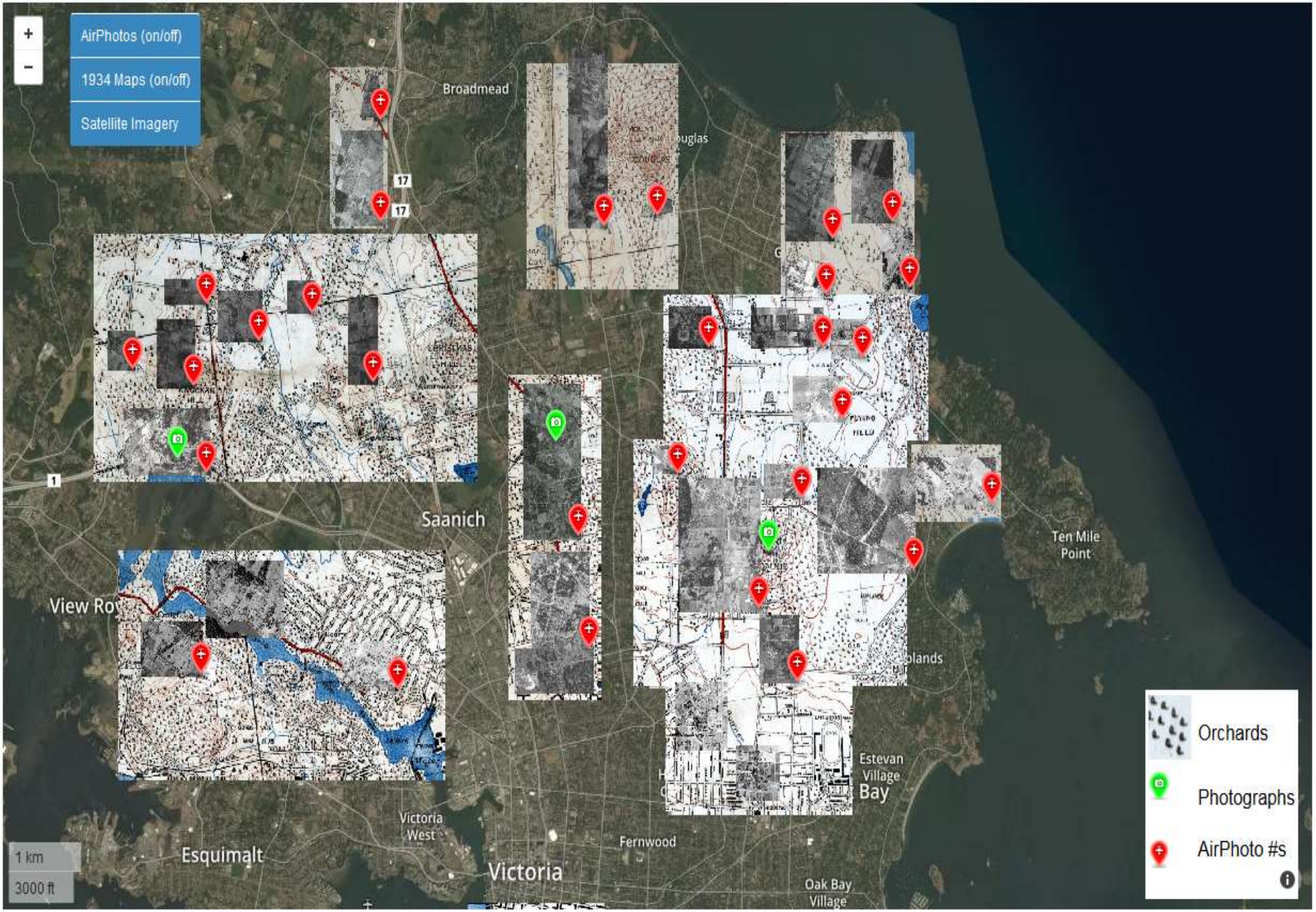
danielbm@uvic.ca

University of Victoria Libraries

outline

- **data libraries have amazing resources…**
- **visualize the data (to promote the collection)**
- **web map(s)**
  - **types of web maps**
    (specific “type” of web map)
- **how?!**
- **considerations**

thousands of aerial photos and maps…
Historical and remnant orchards, (2013)



Land use change over time, (2014)

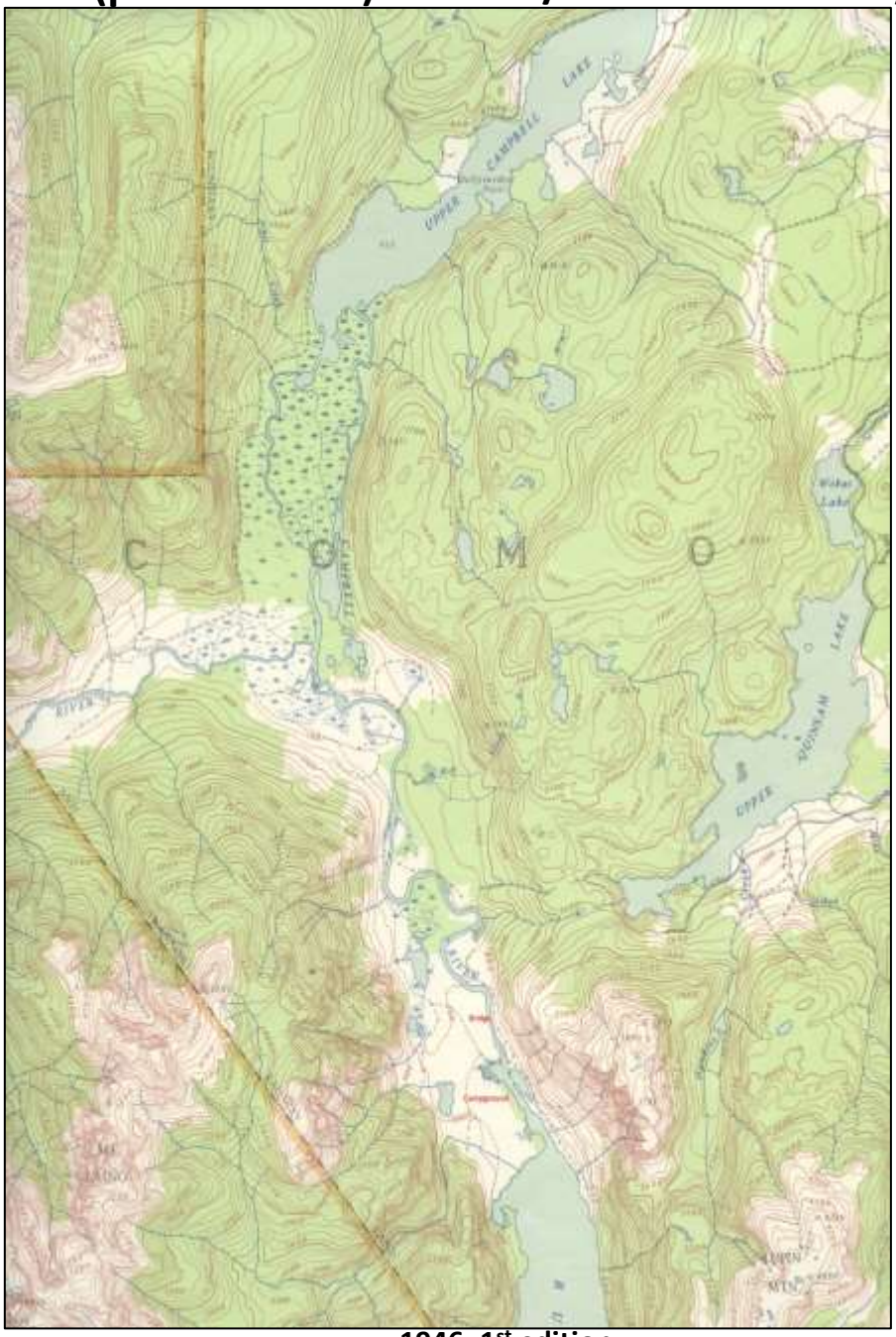
University of Victoria | Libraries

Land use change over time in Saanich, Victoria, BC

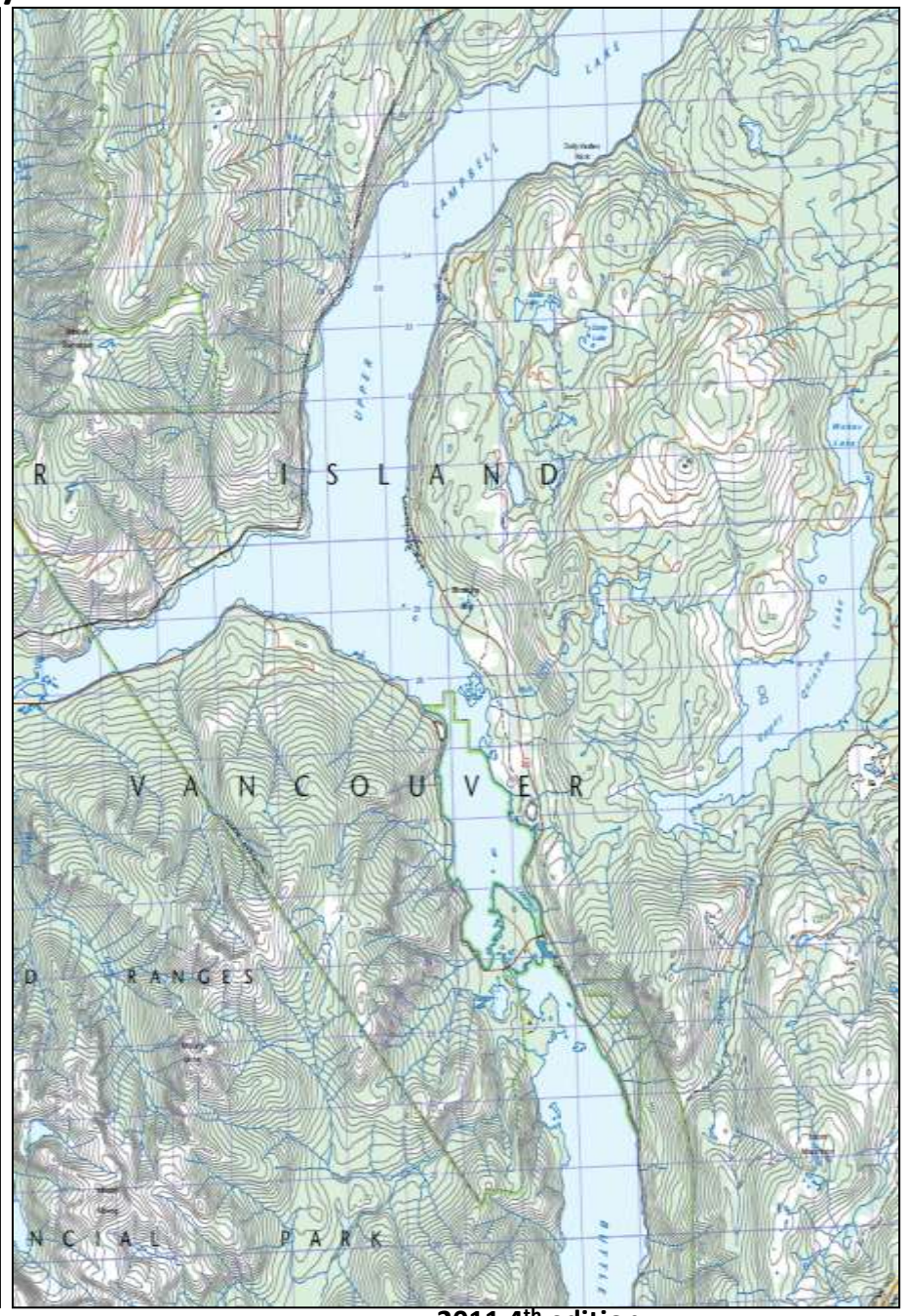
Slide through historic airphotos from 1926, 1954, 1969 and 1992.

(Airphotos also auto-cycle for mouse-less touch screen devices.)

(part of sheet) NTS 92F/13: before / after 1952-54 dam construction



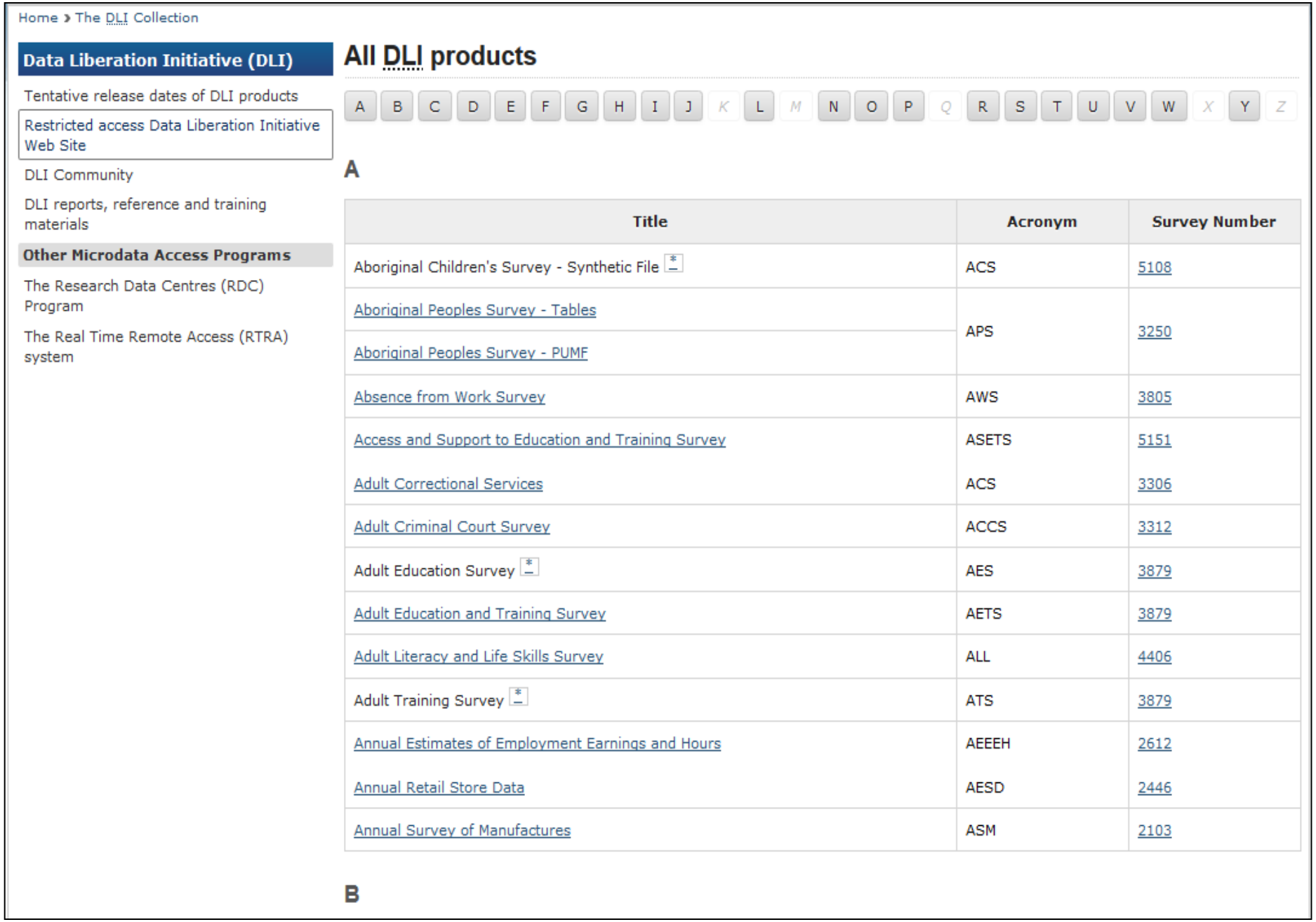
1946: 1st edition



2011 4th edition

Before Mica Dam

hundreds of data sets…



Home › The DLI Collection

Data Liberation Initiative (DLI)

- Tentative release dates of DLI products
- Restricted access Data Liberation Initiative Web Site
- DLI Community
- DLI reports, reference and training materials

Other Microdata Access Programs

- The Research Data Centres (RDC) Program
- The Real Time Remote Access (RTRA) system

All DLI products

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

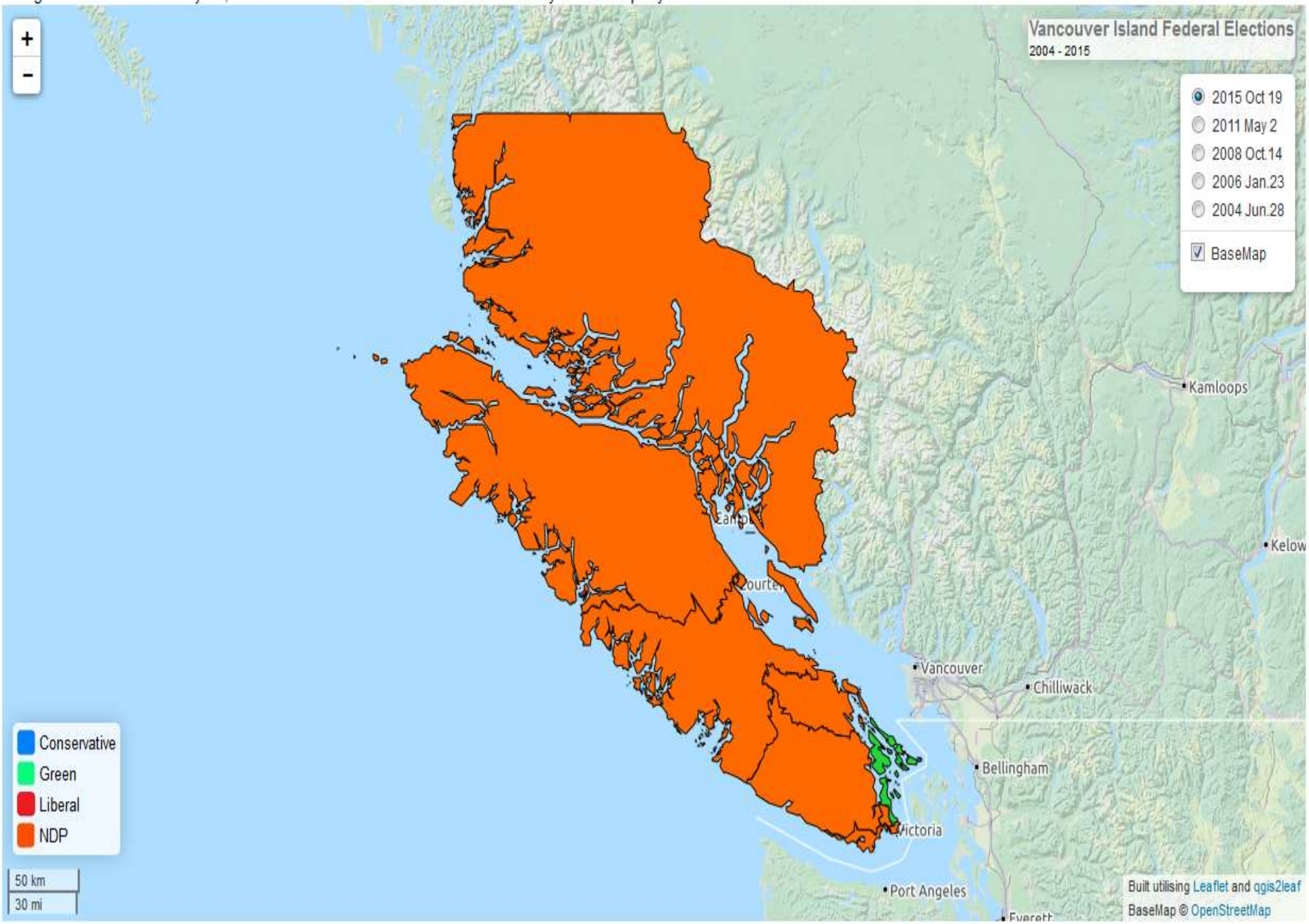
A

Title	Acronym	Survey Number
Aboriginal Children's Survey - Synthetic File	ACS	5108
Aboriginal Peoples Survey - Tables	APS	3250
Aboriginal Peoples Survey - PUMF		
Absence from Work Survey	AWS	3805
Access and Support to Education and Training Survey	ASETS	5151
Adult Correctional Services	ACS	3306
Adult Criminal Court Survey	ACCS	3312
Adult Education Survey	AES	3879
Adult Education and Training Survey	AETS	3879
Adult Literacy and Life Skills Survey	ALL	4406
Adult Training Survey	ATS	3879
Annual Estimates of Employment Earnings and Hours	AEEEH	2612
Annual Retail Store Data	AESD	2446
Annual Survey of Manufactures	ASM	2103

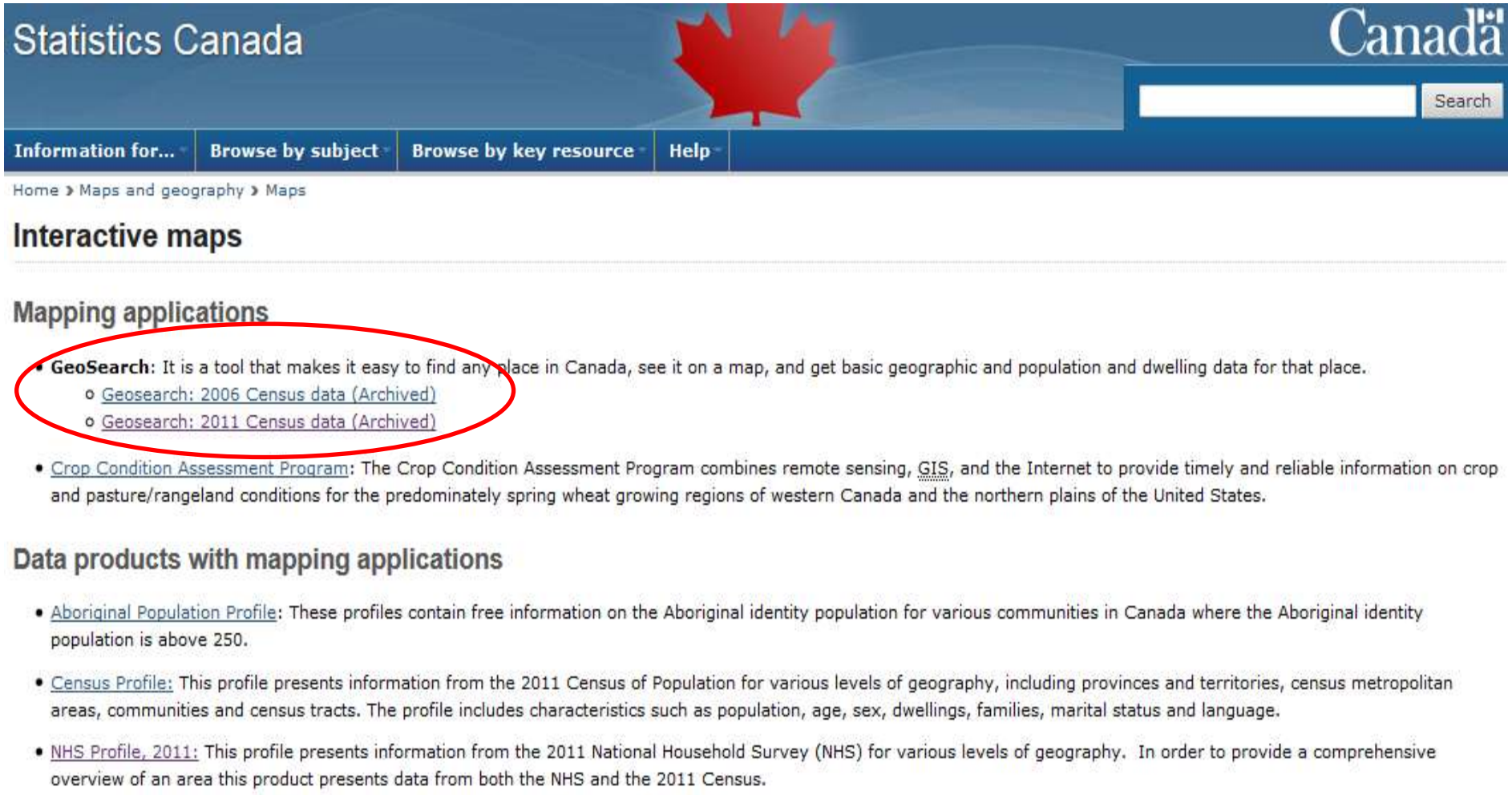
B

Vancouver Island Federal Election results: 2004-2015

Change the Federal Election year; click on a Federal Electoral District for results by candidate/party.



StatsCan interactive maps



StatsCan GeoSearch

GeoSearch

This interactive mapping application makes it easy to find many places in Canada, see them on a map, and get basic geographic and demographic data for those places. To find a specific place of interest, users can click and zoom in on a map of Canada or they can search by place name, street name, street intersection or postal code.

GeoSearch displays the appropriate map showing boundaries and other features. GeoSearch automatically shows, for the selected places, the type of geographic area and its relationship to other geographic areas. A thematic mapping option is also available for selected census topics (for selected levels of geography).

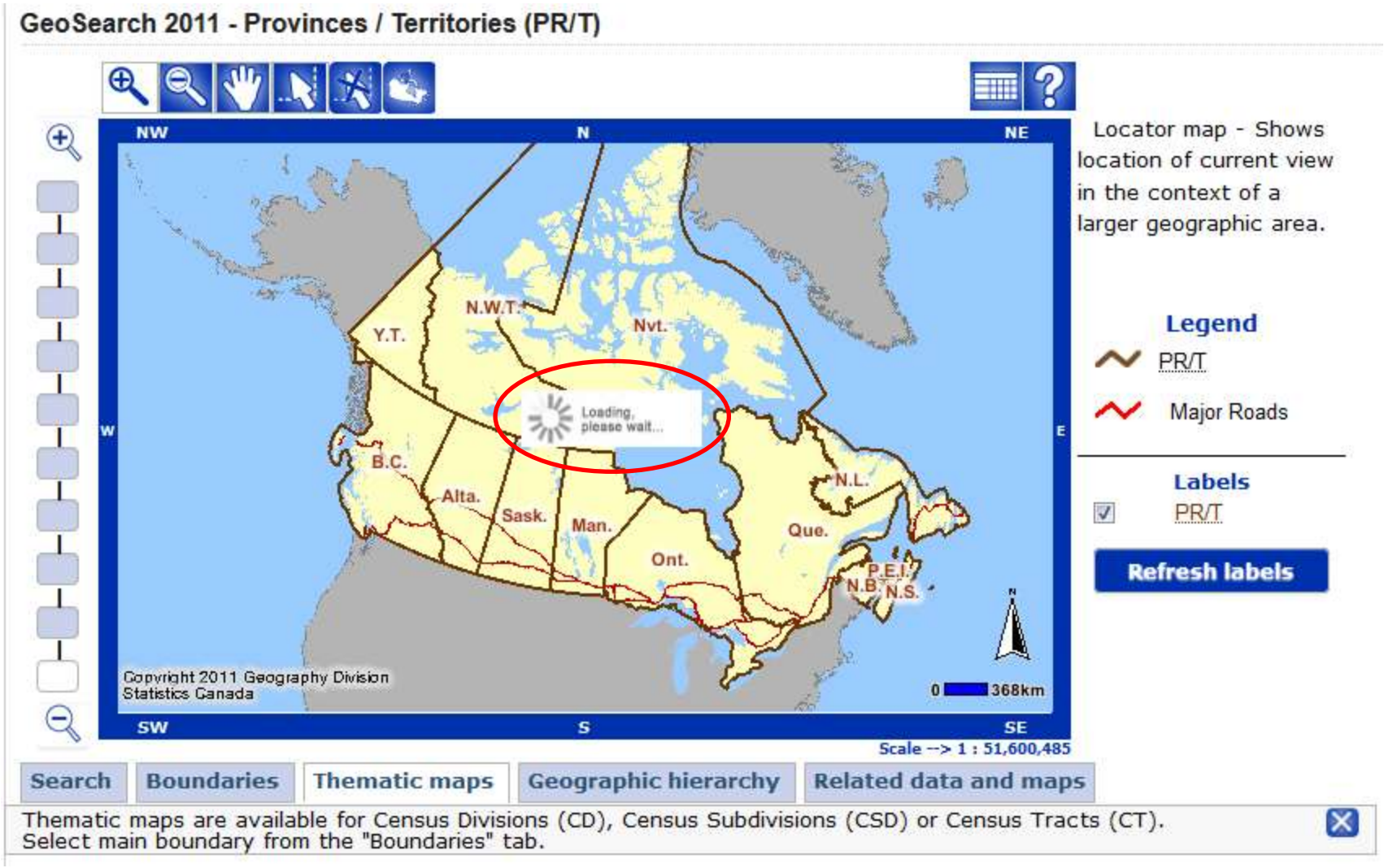
New functionality for 2011 allows users to view data for more than one geographic area at a time and automatically display additional census data for each selected geographic area (including population and dwelling counts). It also includes improved search capabilities and allows users to display two types of geographic boundaries at the same time.

To view this Internet product, please select from the census years below:

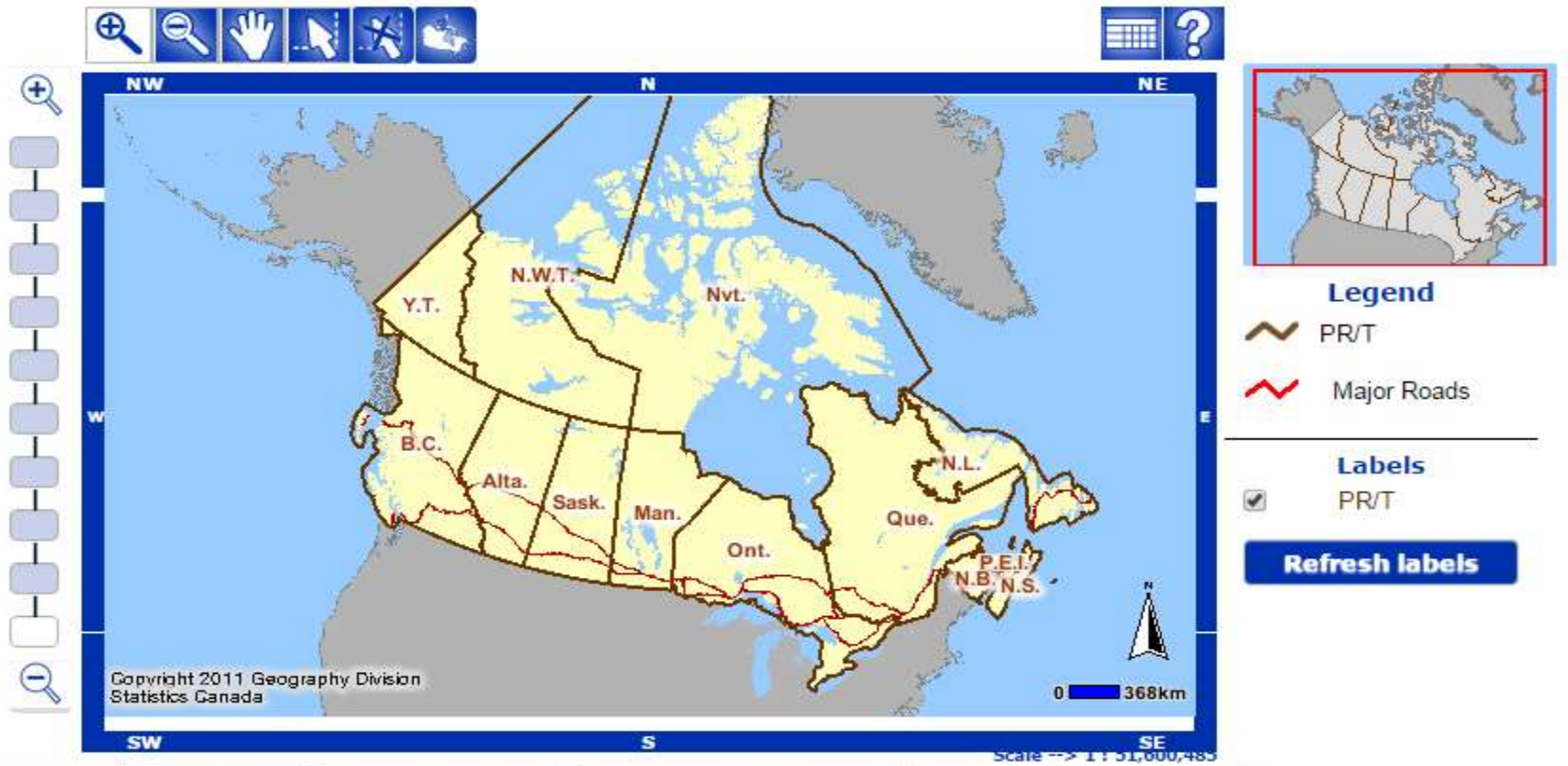
Census year

ARCHIVED - 2011
ARCHIVED - 2006

GeoSearch: slow…clunky…not functioning…?



GeoSearch: Census "regions" are greyed out and do not work…?



StatsCan *NHS* thematic maps…???

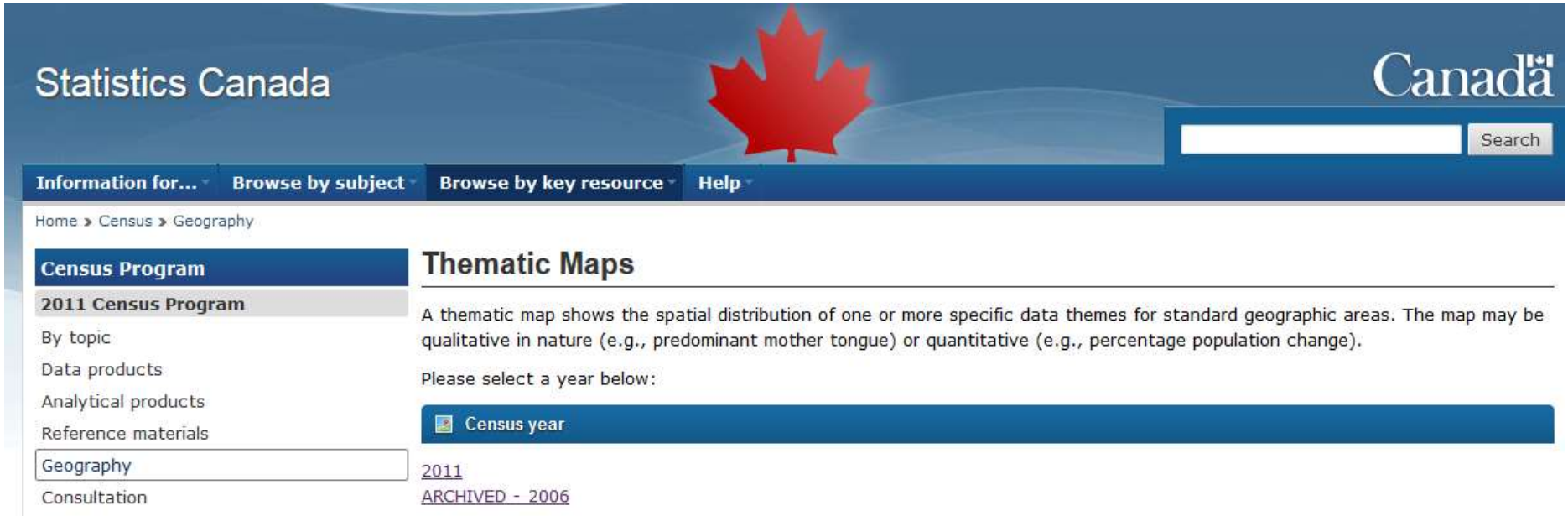
Statistics Canada

Data for the 2011 National Household Survey income variables were released on September 11, 2013, as part of an integrated release with the housing variables.

The products published using 2011 NHS income data include:

- Analytical products
- Data products
  - NHS Profile
  - NHS Data Tables
  - NHS Focus on Geography Series
- Reference products
- Thematic maps

StatsCan *Census* thematic maps



2011 Census – Thematic maps by theme

A thematic map shows the spatial distribution of one or more specific data themes for standard geographic areas. The map may be qualitative in nature (e.g., predominant mother tongue) or quantitative (e.g., percentage population change).

Age and Sex

Released: May 29, 2012

- Percentage of the population aged 0 to 14 years
  - available by 2011 census subdivision for Montréal, Toronto and Vancouver census metropolitan areas
  - available by 2011 census tract for census metropolitan areas
- Percentage of the population aged 15 to 64 years
  - available by 2011 census division for Canada
- Percentage of the population aged 65 years and over
  - available by 2011 census division for Canada
  - available by 2011 census subdivision for Montréal, Toronto and Vancouver census metropolitan areas
  - available by 2011 census tract for census metropolitan areas
- Sex ratio
  - available by 2011 census division for Canada

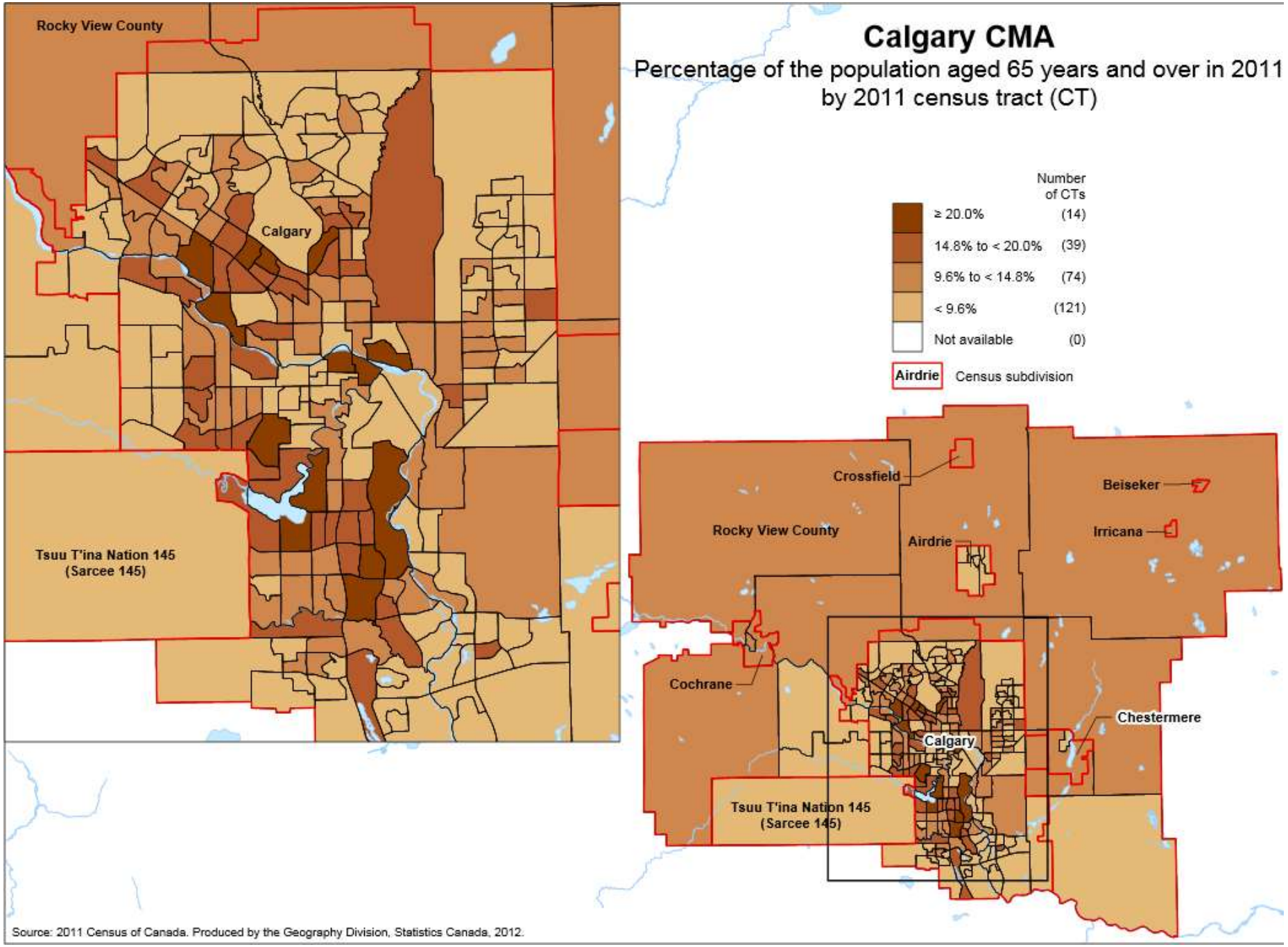
Age and Sex

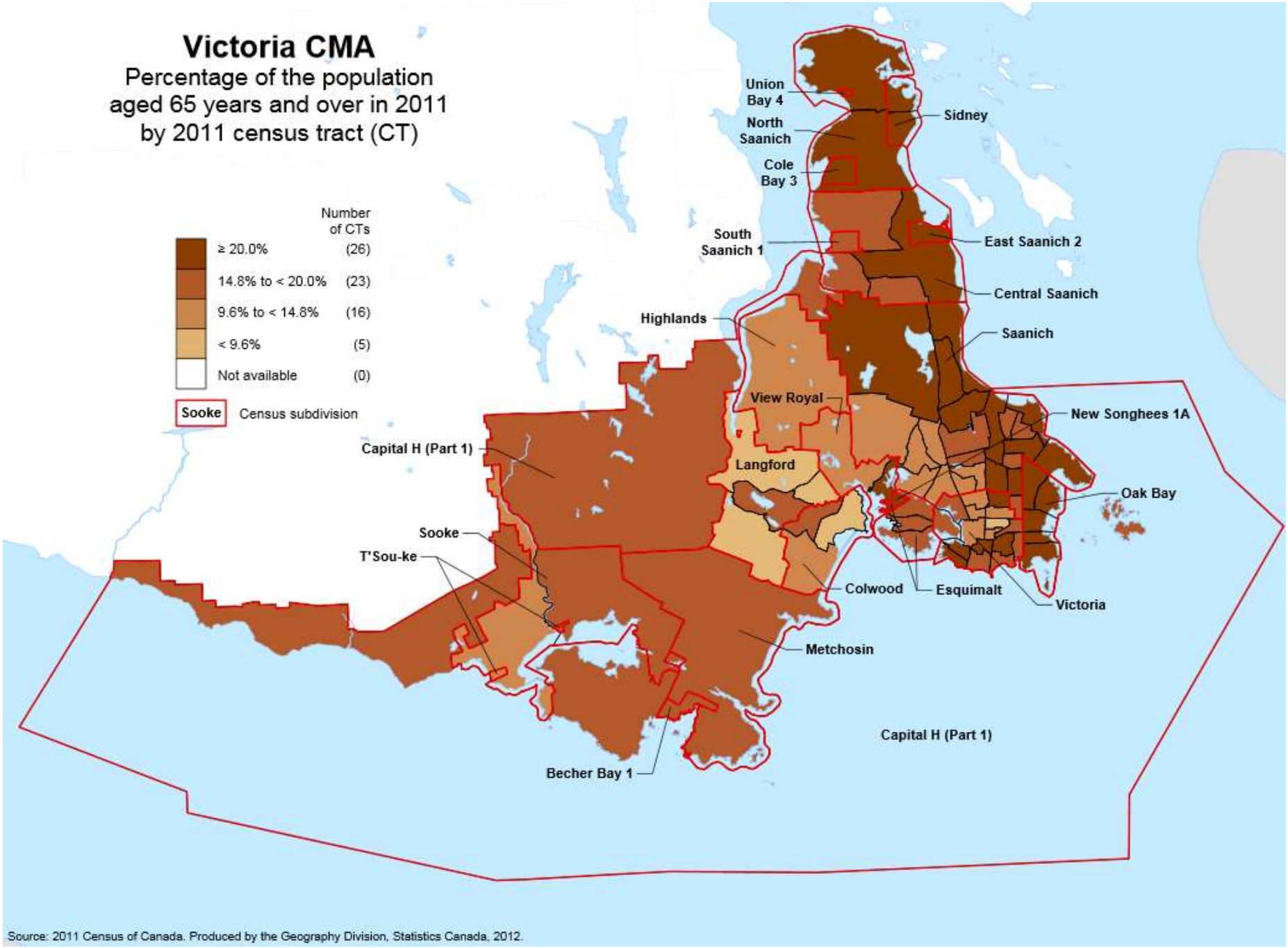
Families and Households

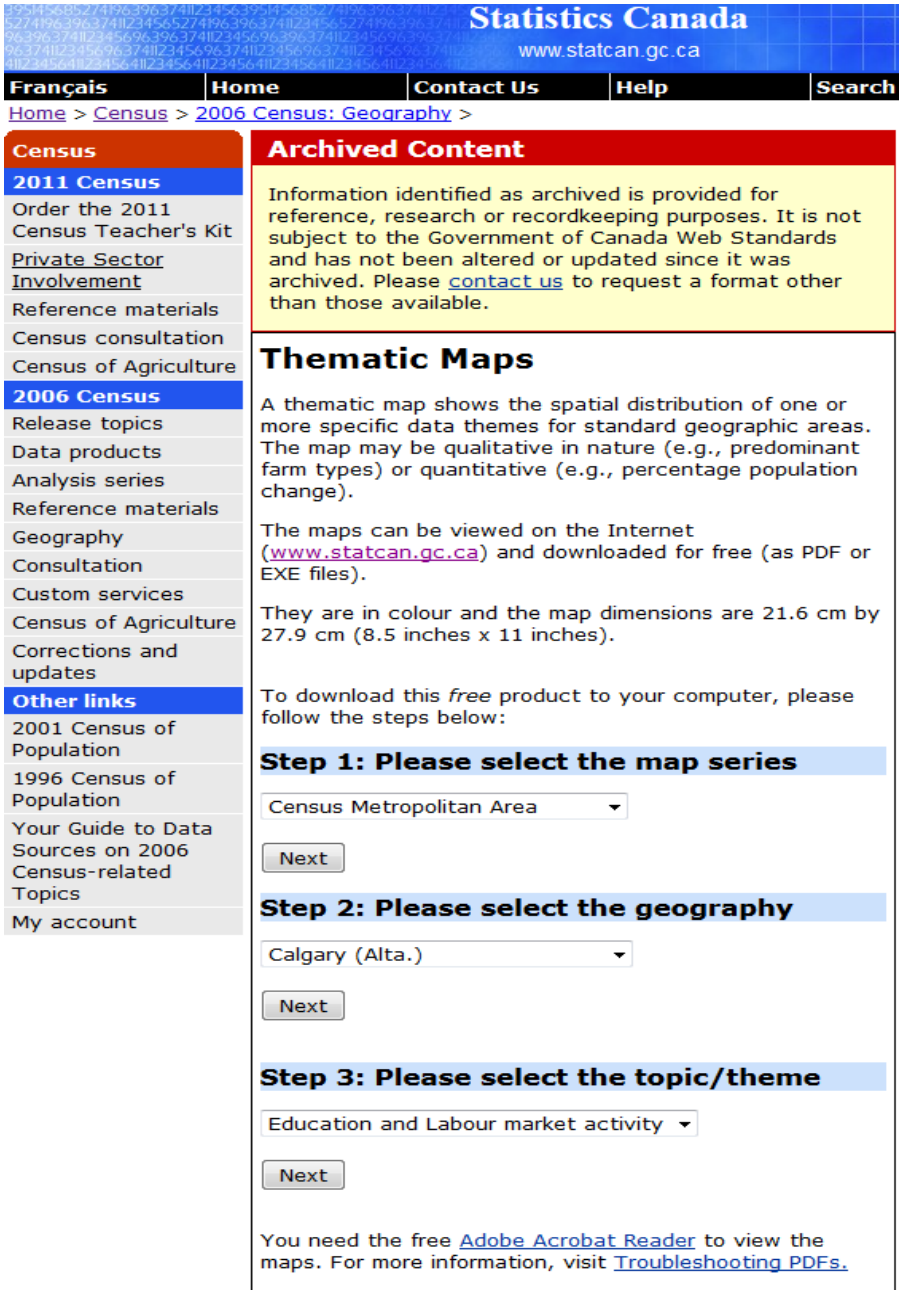
Language - Mother tongue

Language - Official / Home

Population


Calgary CMA
Percentage of the population aged 65 years and over in 2011 by 2011 census tract (CT)
Number of CTs
≥ 20.0% (14)
14.8% to < 20.0% (39)
9.6% to < 14.8% (74)
< 9.6% (121)
Not available (0)
Airdrie Census subdivision
Rocky View County
Calgary
Tsuu T'ina Nation 145 (Sarcee 145)
Crossfield
Beiseker
Irricana
Airdrie
Cochrane
Chestermere
Source: 2011 Census of Canada. Produced by the Geography Division, Statistics Canada, 2012.


Victoria CMA
Percentage of the population aged 65 years and over in 2011 by 2011 census tract (CT)
Number of CTs
≥ 20.0% (26)
14.8% to < 20.0% (23)
9.6% to < 14.8% (16)
< 9.6% (5)
Not available (0)
Sooke Census subdivision
Union Bay 4
Sidney
North Saanich
Cole Bay 3
South Saanich 1
East Saanich 2
Central Saanich
Highlands
Saanich
View Royal
New Songhees 1A
Capital H (Part 1)
Langford
Oak Bay
Sooke
T'Sou-ke
Colwood
Esquimalt
Victoria
Metchosin
Capital H (Part 1)
Becher Bay 1
Source: 2011 Census of Canada. Produced by the Geography Division, Statistics Canada, 2012.


Statistics Canada
www.statcan.gc.ca
Français
Home
Contact Us
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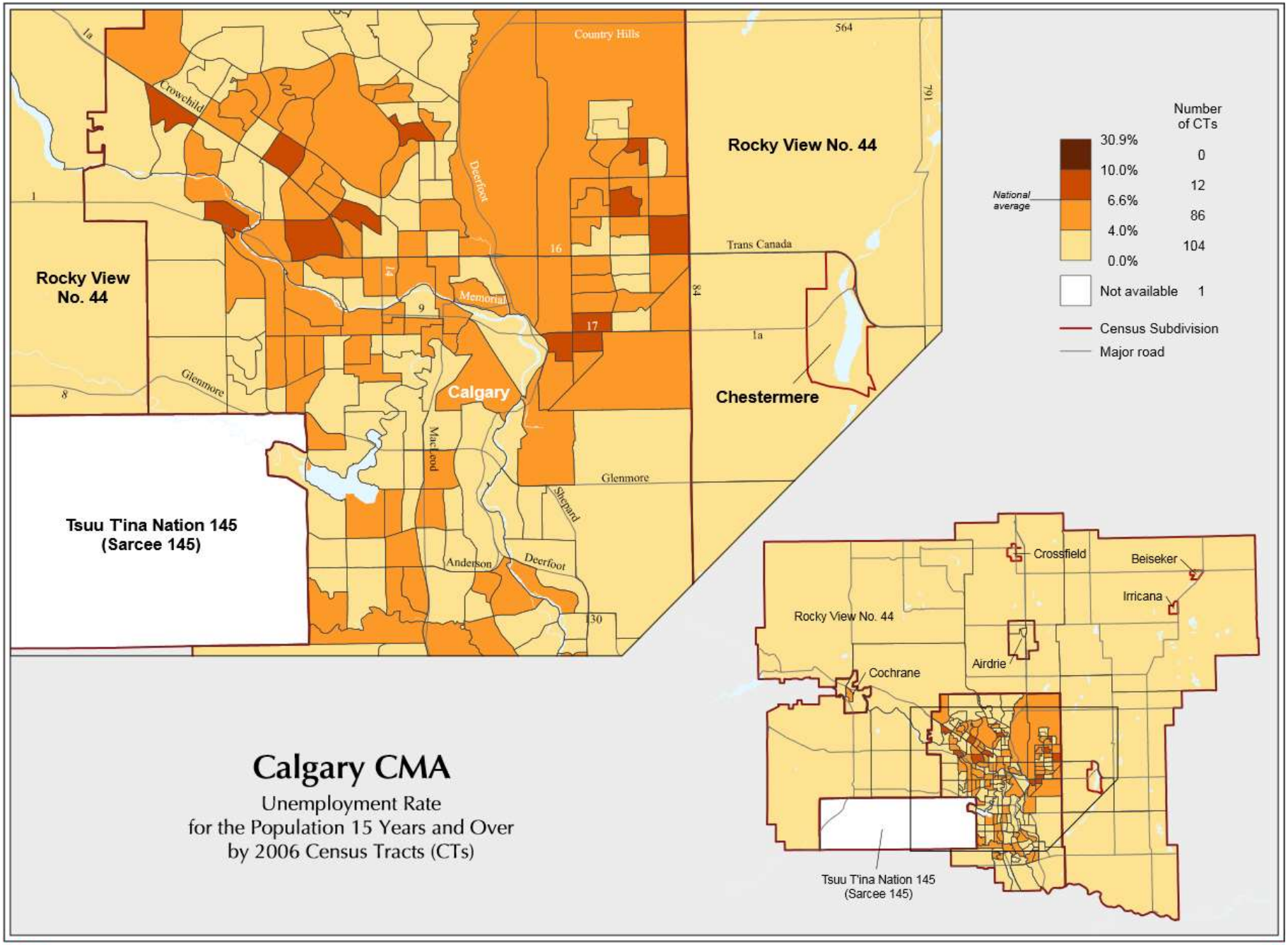
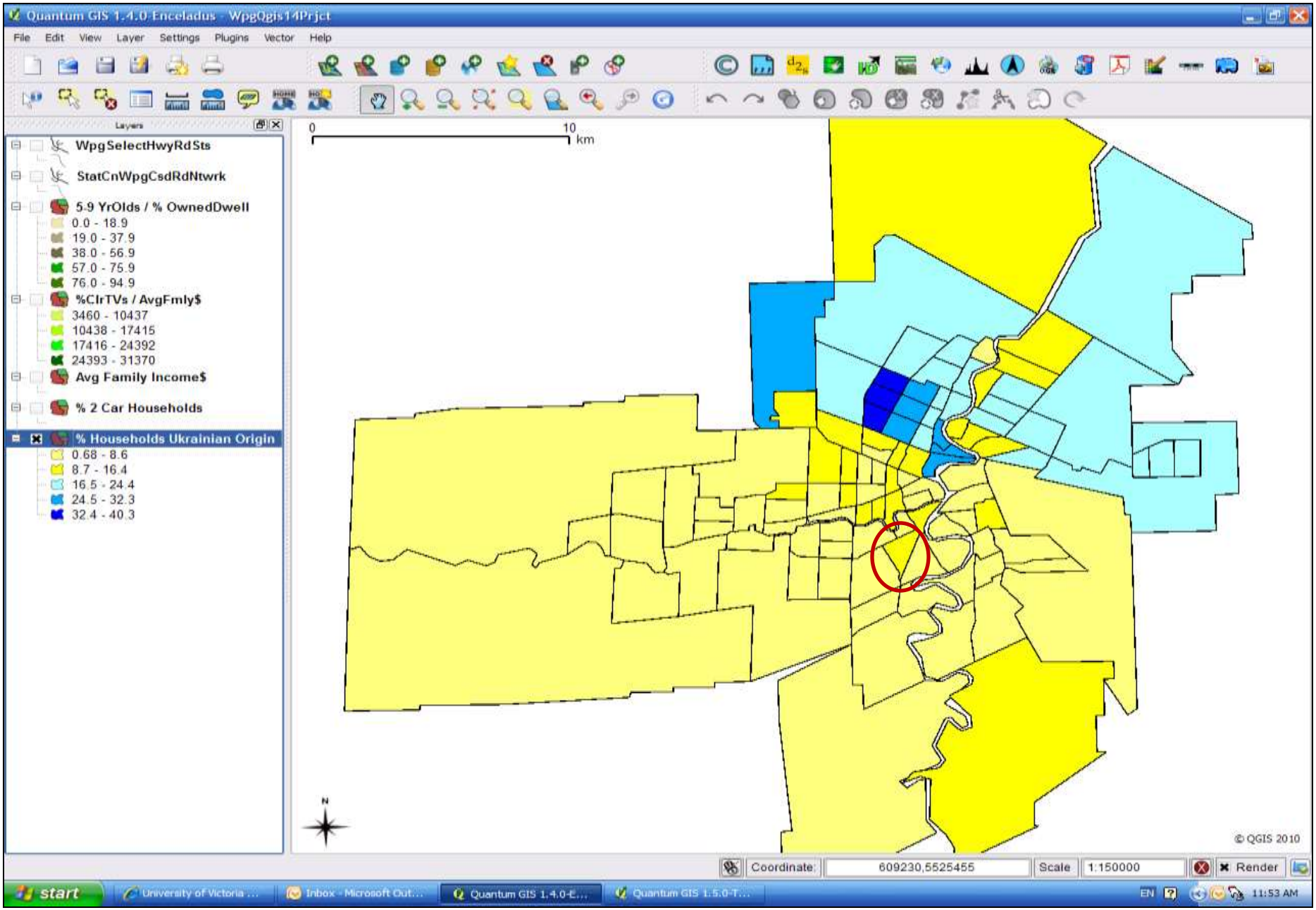
Home > Census > 2006 Census: Geography >
Census
2011 Census
Order the 2011 Census Teacher's Kit
Private Sector Involvement
Reference materials
Census consultation
Census of Agriculture
2006 Census
Release topics
Data products
Analysis series
Reference materials
Geography
Consultation
Custom services
Census of Agriculture
Corrections and updates
Other links
2001 Census of Population
1996 Census of Population
Your Guide to Data Sources on 2006 Census-related Topics
My account
Archived Content
Information identified as archived is provided for reference, research or recordkeeping purposes. It is not subject to the Government of Canada Web Standards and has not been altered or updated since it was archived. Please contact us to request a format other than those available.
Thematic Maps
A thematic map shows the spatial distribution of one or more specific data themes for standard geographic areas. The map may be qualitative in nature (e.g., predominant farm types) or quantitative (e.g., percentage population change).
The maps can be viewed on the Internet (www.statcan.gc.ca) and downloaded for free (as PDF or EXE files).
They are in colour and the map dimensions are 21.6 cm by 27.9 cm (8.5 inches x 11 inches).
To download this free product to your computer, please follow the steps below:
Step 1: Please select the map series
Census Metropolitan Area
Next
Step 2: Please select the geography
Calgary (Alta.)
Next
Step 3: Please select the topic/theme
Education and Labour market activity
Next
You need the free Adobe Acrobat Reader to view the maps. For more information, visit Troubleshooting PDFs.



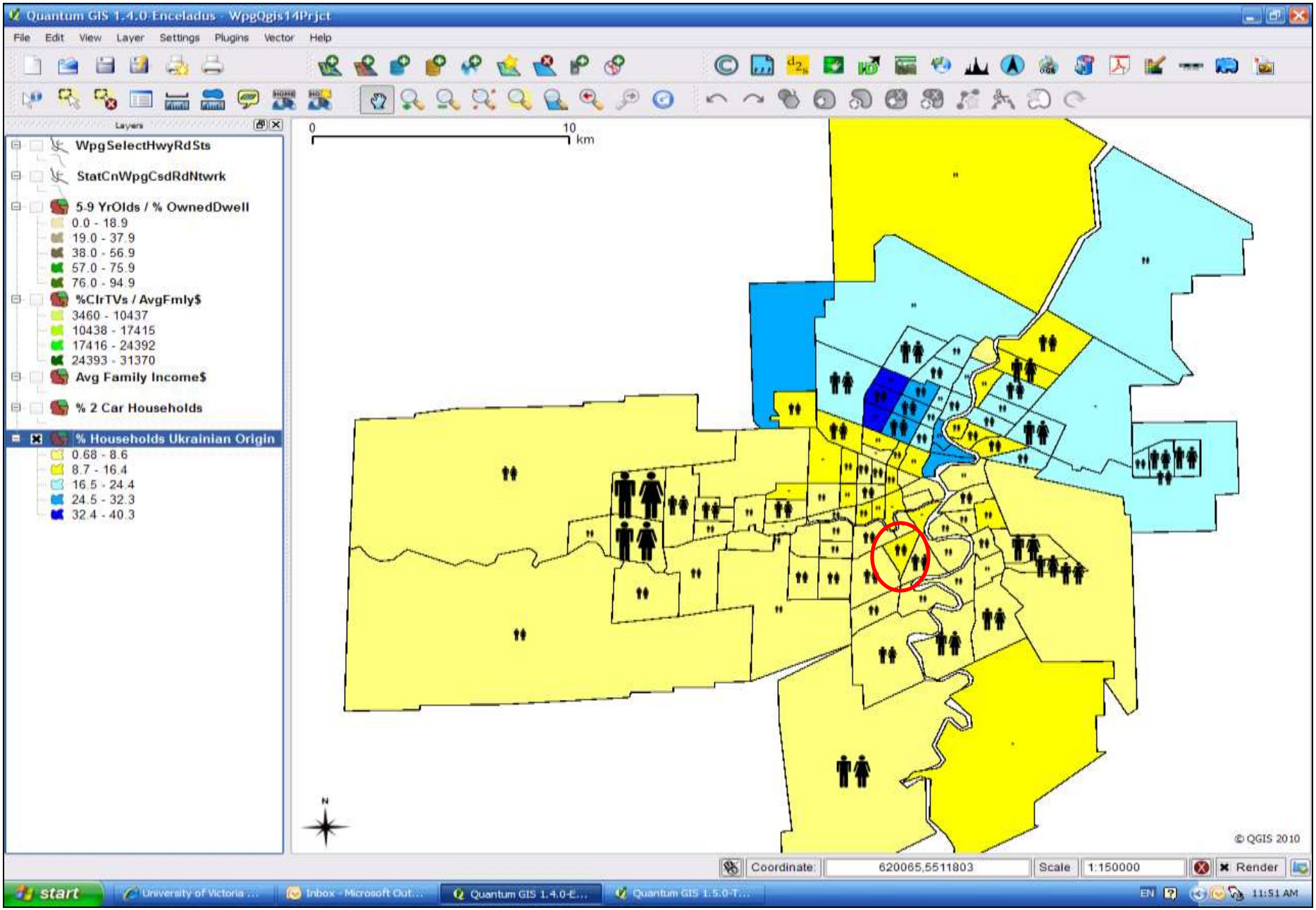
Calgary CMA

Unemployment Rate
for the Population 15 Years and Over
by 2006 Census Tracts (CTs)

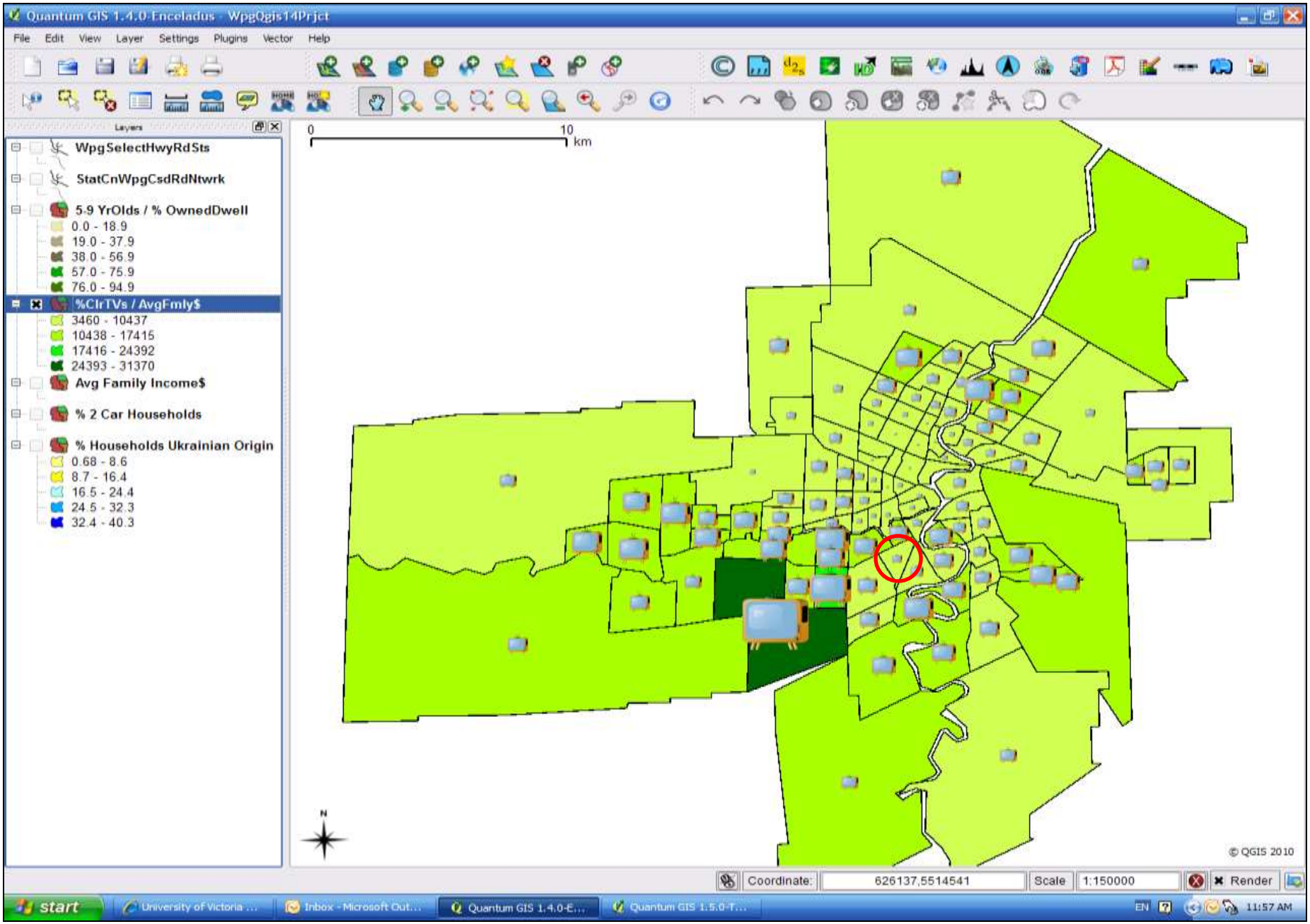
Winnipeg 1971 Census Tracts: % Households Ukrainian Origin



Wpg 1971 CTs: 5-9 yr olds & % households Ukrainian origin



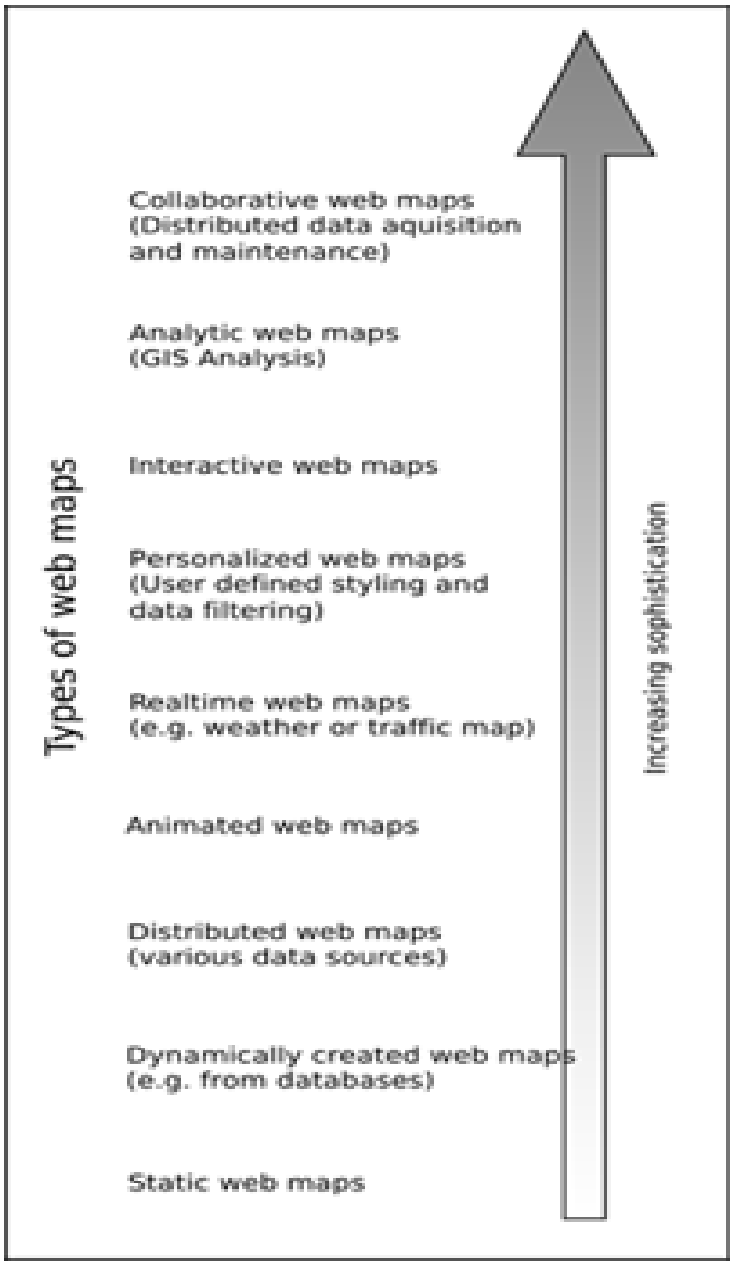
Wpg 1971 CensusTracts: % Households w/ Colour TV over Avg.Family Income



Web Maps

Types of web maps

- some spatial analysis
- download data / upload data
- zoom, pan, turn off/on, click for more info
- zoom, pan, turn off/on elements/layers
- zoom, pan
- .pdf with elements to turn off/on
- (static) image (.jpg, .png, .pdf)

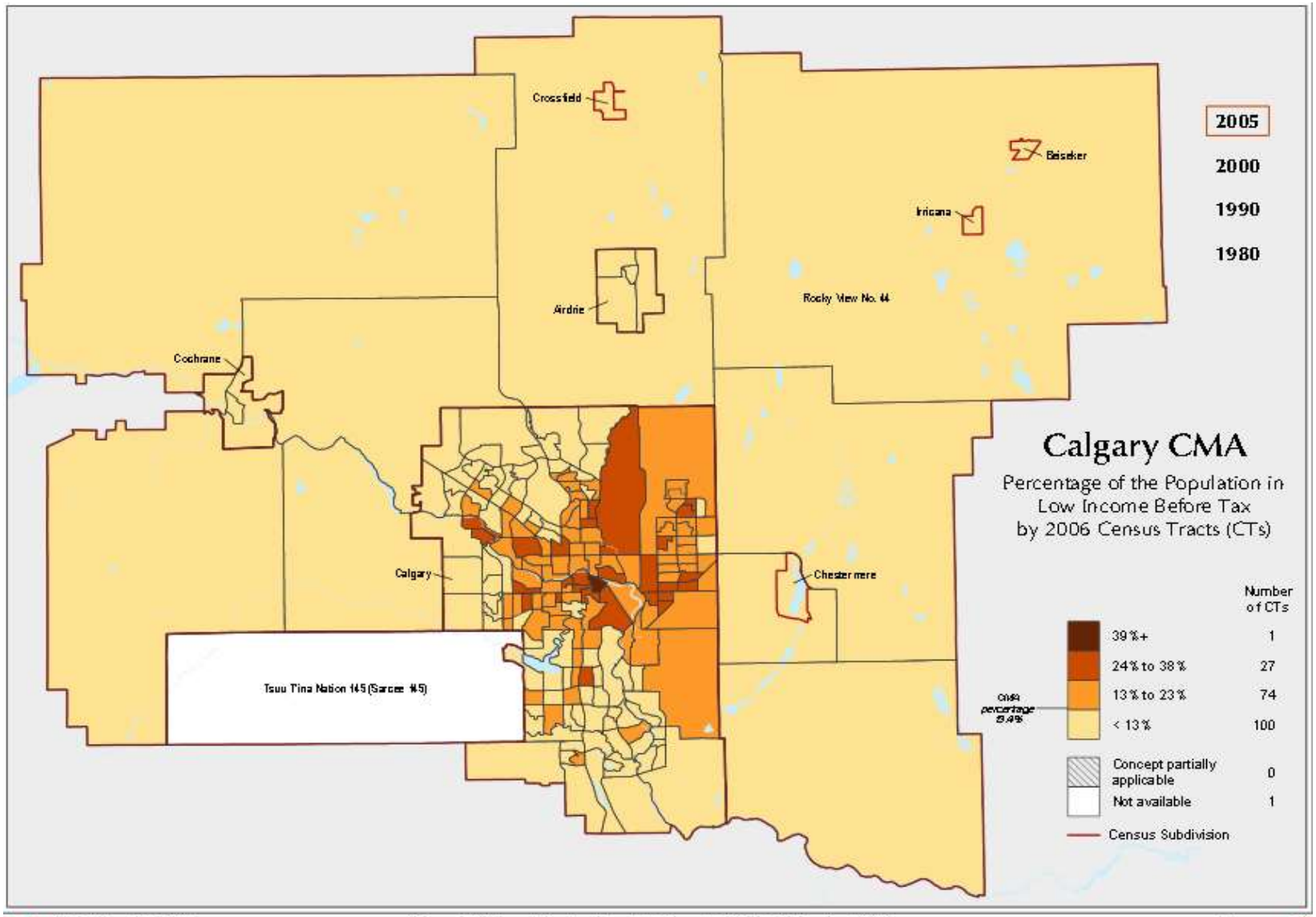


Jan-Menno Kraak, *Web Map Classification*, 2001

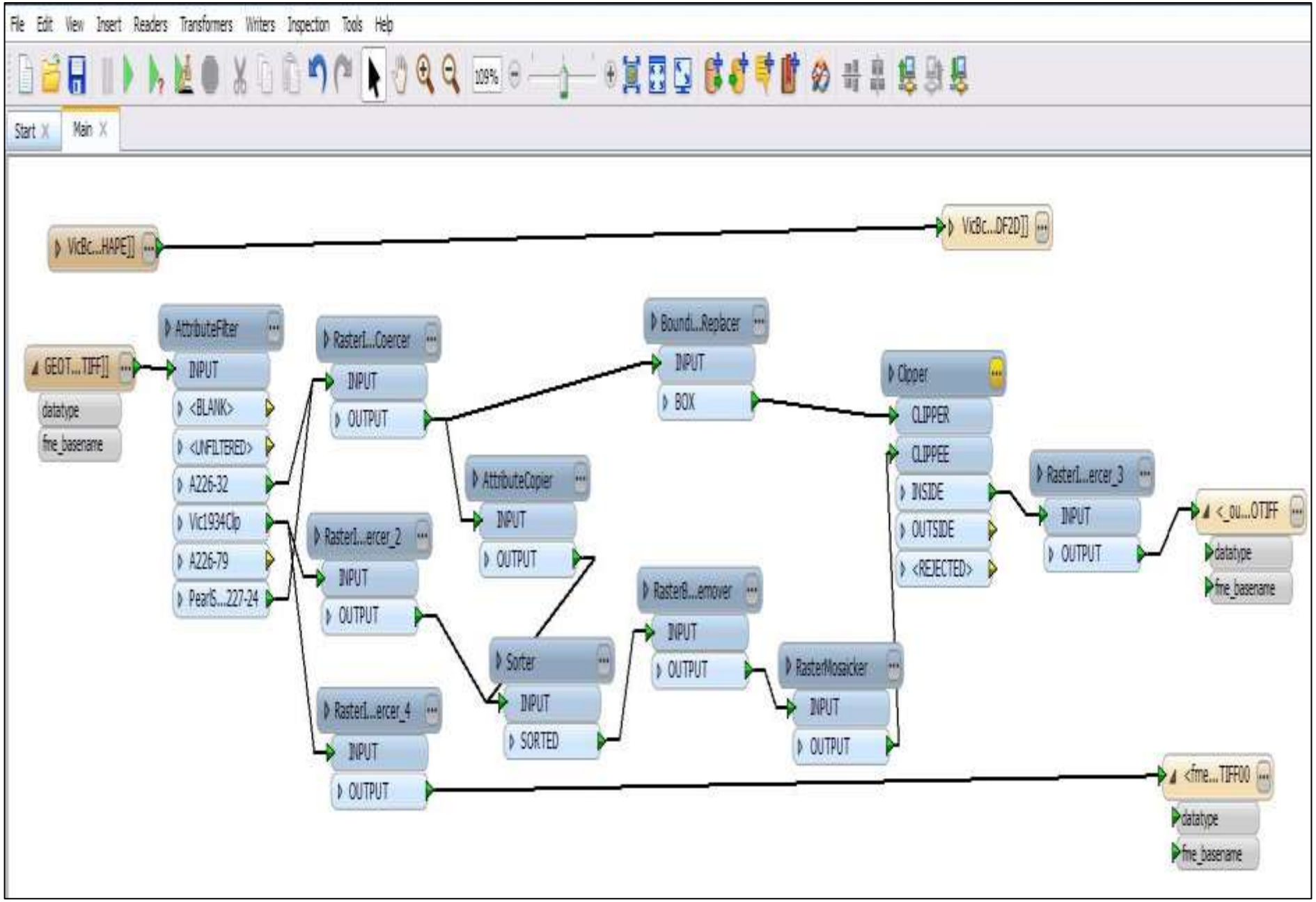
static .pdf:

can generate .pdf from ArcGIS or QGIS but both…

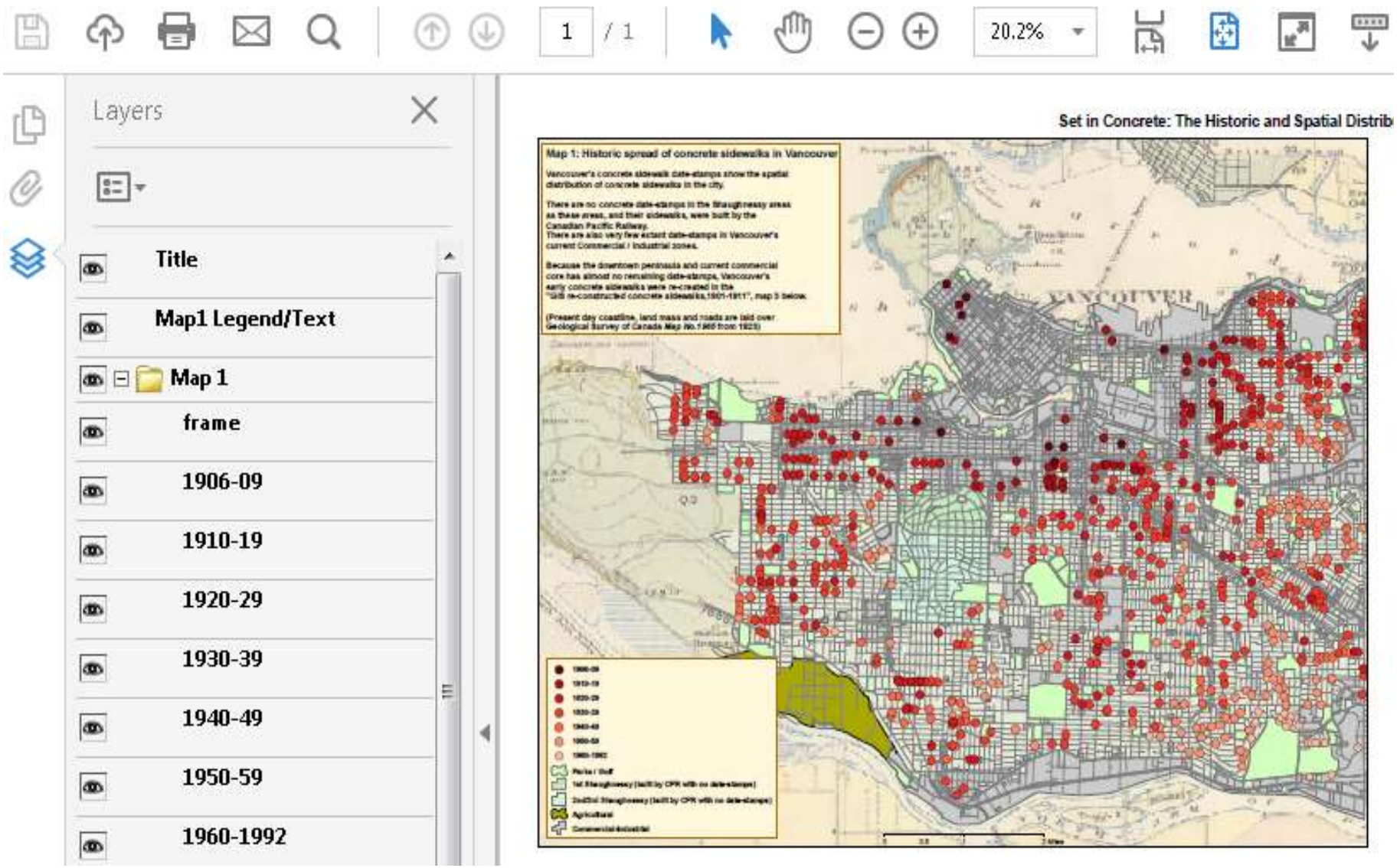
"flatten" 2 or more layers into one inseparable layer



Safe FME translator(s) (Feature Manipulation Engine)…



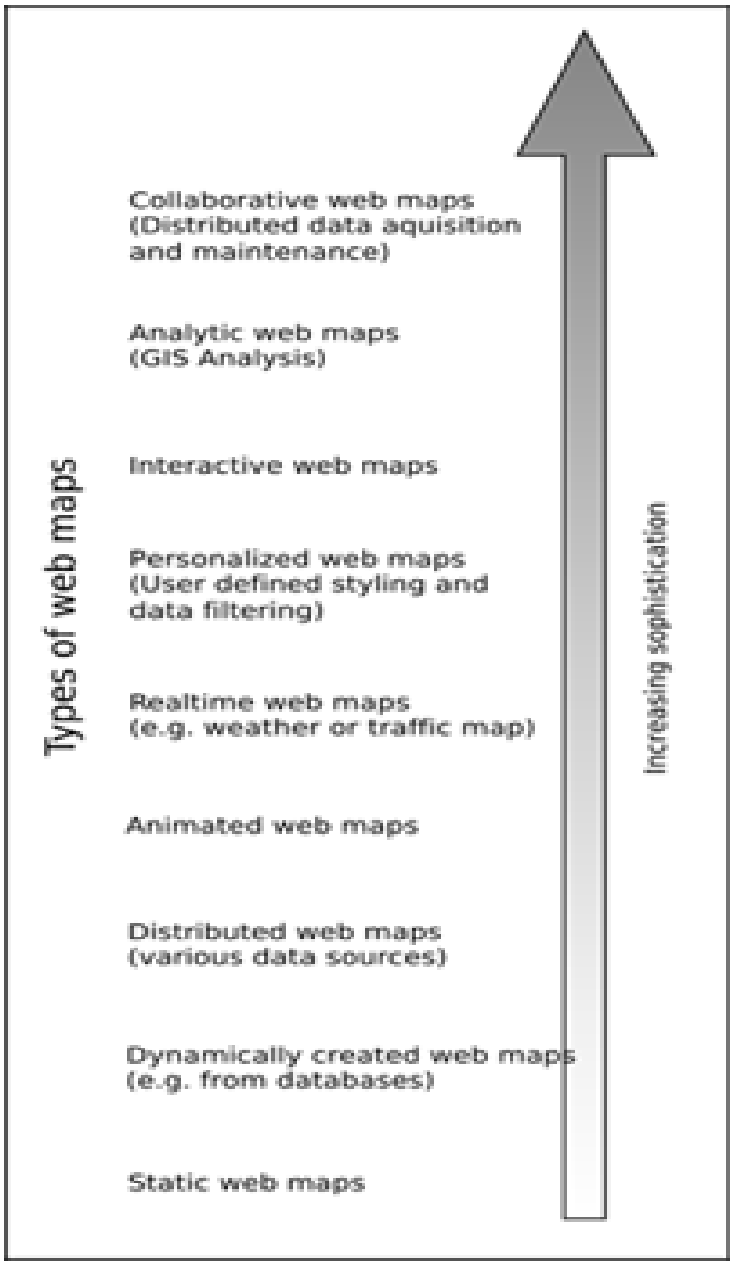
Safe FME* (Feature Manipulation Engine) translators OR *Adobe Illustrator
can produce a .pdf with clickable layers…but…
slow to load; pan/zoom limited; limited "click" for further info, etc



Web Maps

Types of web maps

- some spatial analysis
- download data / upload data
- zoom, pan, turn off/on, click for more info
- zoom, pan, turn off/on elements/layers
- zoom, pan
- .pdf with elements to turn off/on
- (static) image (.jpg, .png, .pdf)



Jan-Menno Kraak, *Web Map Classification*, 2001

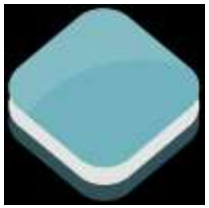
Web Map services

- ArcGIS on-line confusing “credits” system
- Cartodb free for 4 layers: otherwise $149 month
- Click2Map $40.-month
- GeoCommons gone?
- GIS Cloud Was told: “need to upgrade/change subscription”
- MapBox free up to 100mb; otherwise $50 month
- MangoMap free for 3 maps: otherwise $49 month
- QGIS cloud 65 euros/month!
- ScribbleMaps ?
- ZeeMaps free for 5 maps; otherwise $20 month

BUT….with all of the above….

their branding / logo; data on their servers, etc

JavaScript libraries



OpenLayers **javascript library**

- **began 2006**
- **approx. 230,000 lines of code**

Leaflet **javascript library**

- **began 2011**
- **approx. 7000 lines of code**

Either work with QGIS

or rather…

QGIS has plug-ins for either of the above

How?

- **html5**

- **css**

  Link to .css from the web:

  <link rel="stylesheet" href = "http://cdn.leafletjs.com/leaflet-0.7.3/leaflet.css"/>

  OR

  Download to some computer directory and link:

  <link rel="stylesheet" href = "SomeLocalComputer/C_drive/leaflet-0.7.3/leaflet.css"/>

- **javascript**

  Link to .js from the web:

  <script src = "http://leafletjs.com/dist/leaflet.js"></script>

  OR

  Download to some computer directory and link:

  <script src = "SomeLocalComputer/C_drive/Folder/leaflet.js"></script>

css, html5, JavaScript libraries !! Yikes!!

Do you have to learn code?

Not really,

knowing code helps but not entirely necessary…

Really!

Use (a little) code…

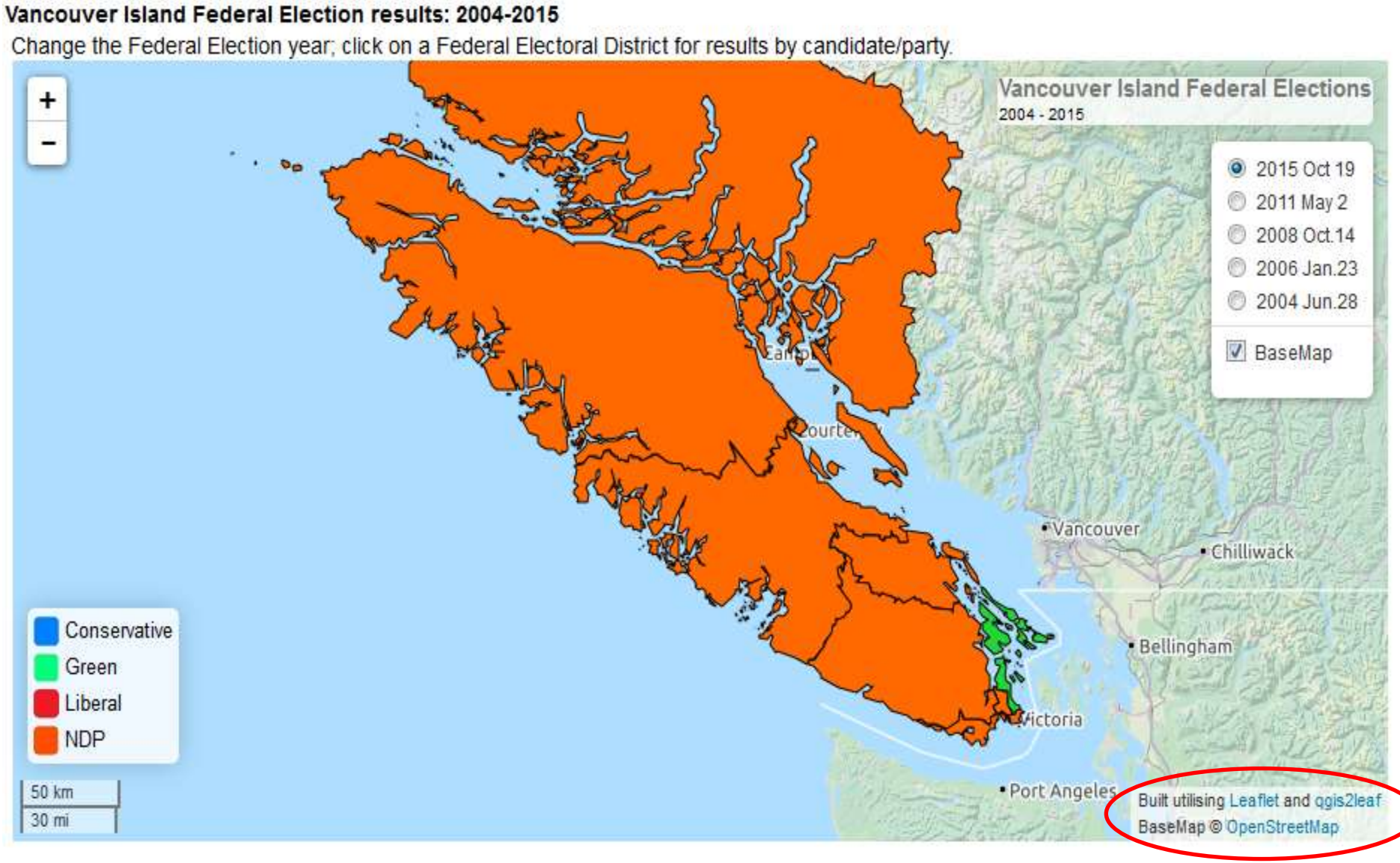
but store data on your (local) computer / server

b/c QGIS has plug-ins,

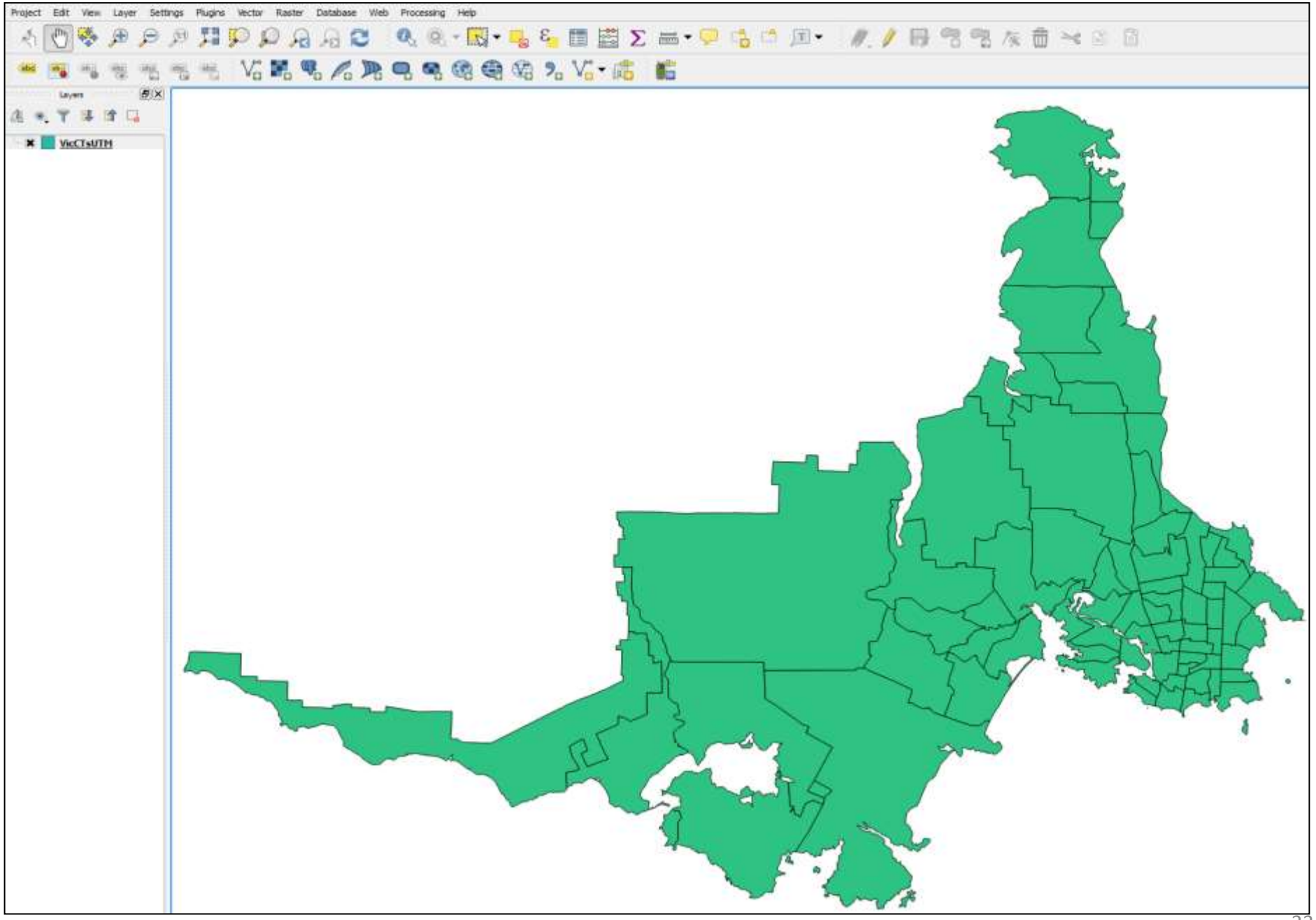
you don't need to know (much) code

- **qgis2leaf**  **April 2014**
- **qgis2web**  **June 2015**

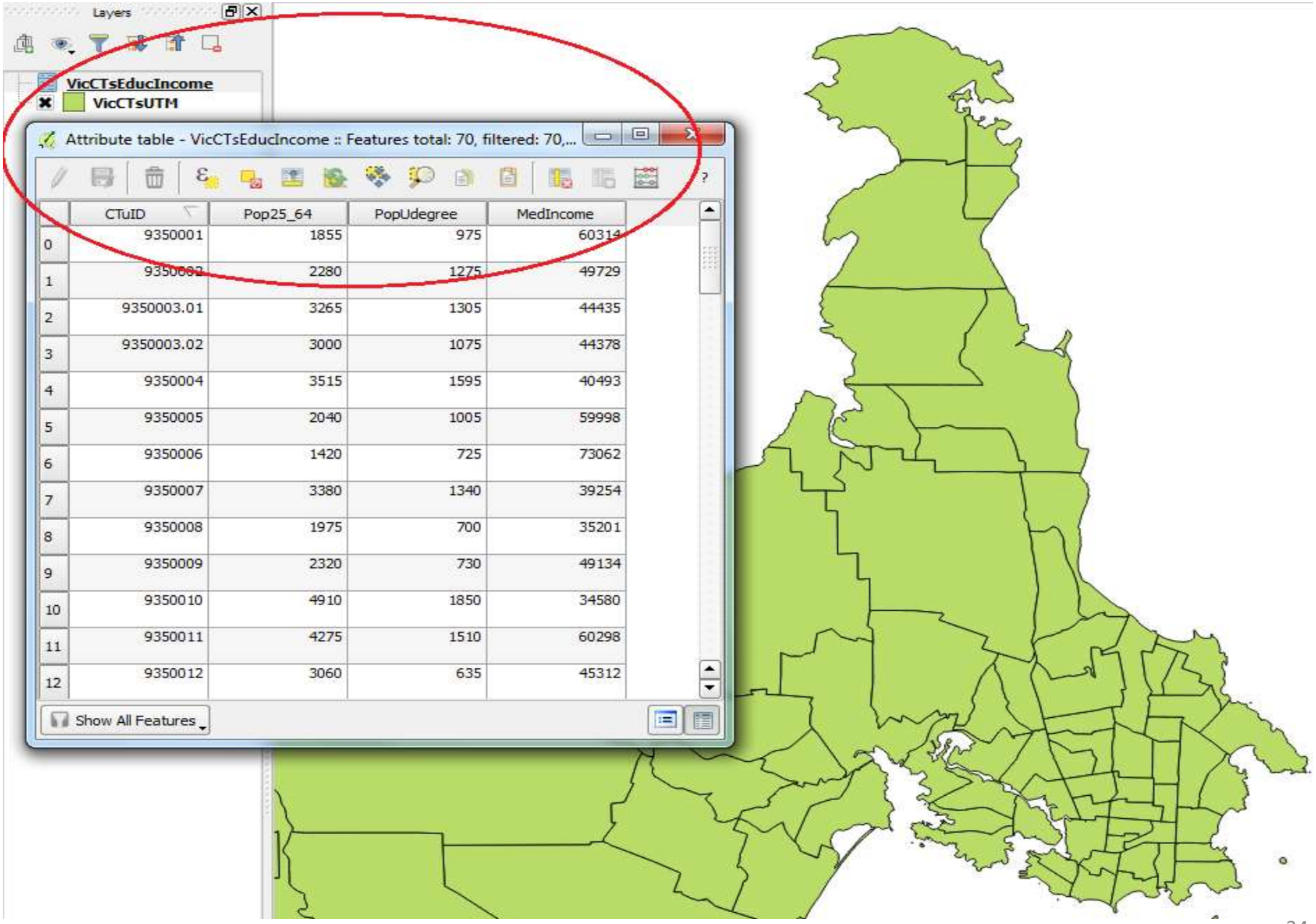
Vancouver Island Federal Election results: 2004-2015



QGIS: add boundary file

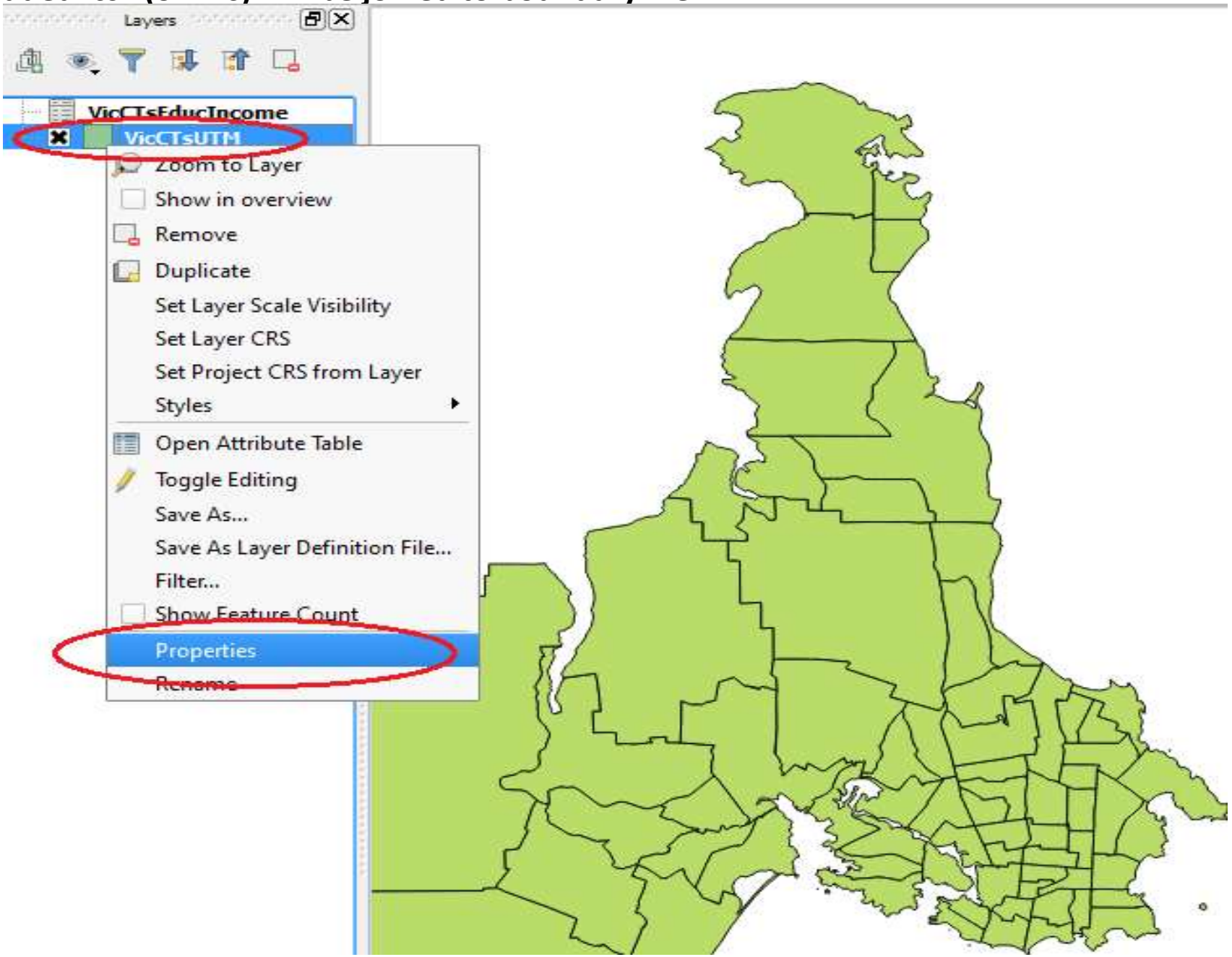


add .csv or .xls file

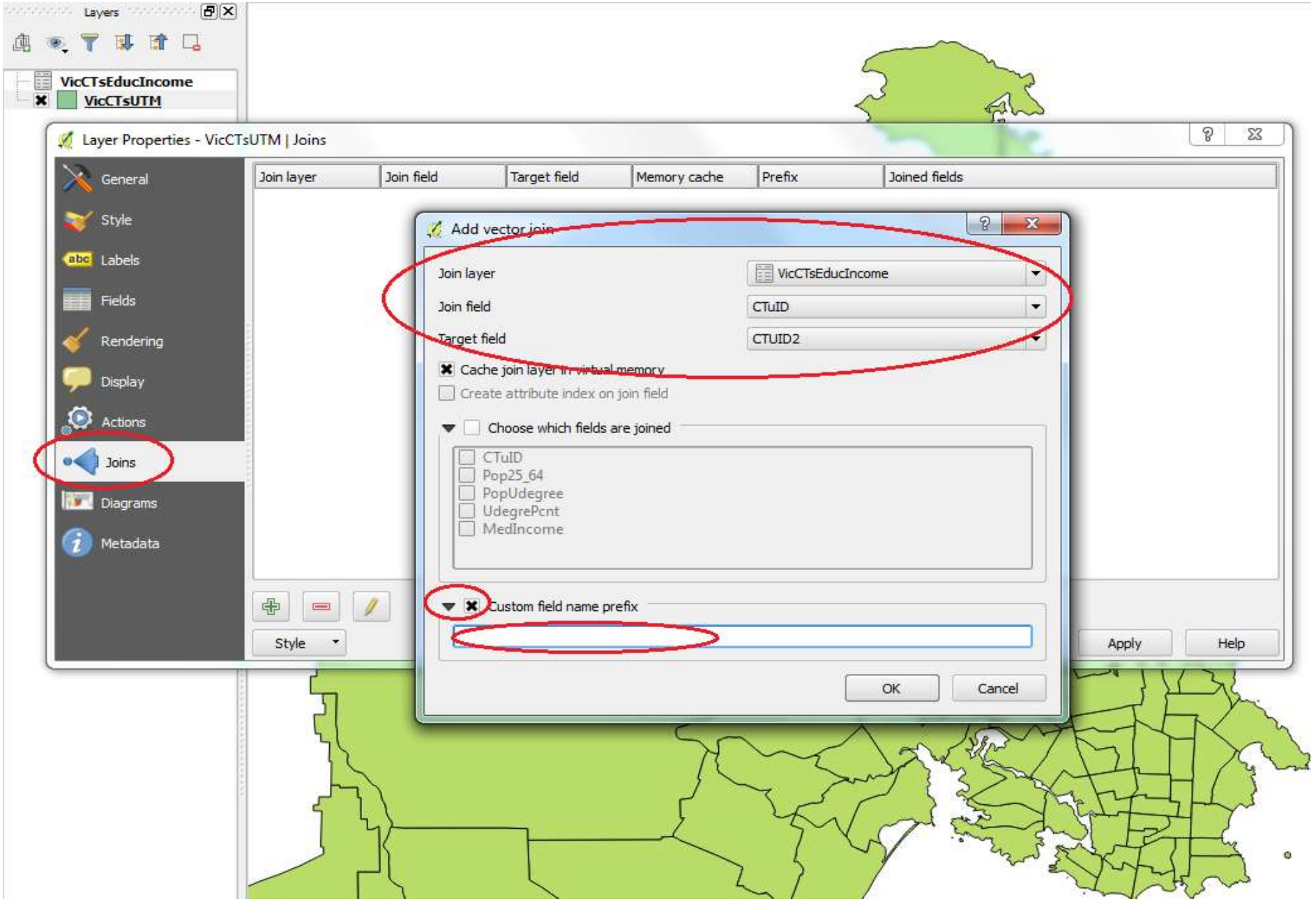


	CTuID	Pop25_64	PopUdegree	MedIncome
0	9350001	1855	975	60314
1	9350002	2280	1275	49729
2	9350003.01	3265	1305	44435
3	9350003.02	3000	1075	44378
4	9350004	3515	1595	40493
5	9350005	2040	1005	59998
6	9350006	1420	725	73062
7	9350007	3380	1340	39254
8	9350008	1975	700	35201
9	9350009	2320	730	49134
10	9350010	4910	1850	34580
11	9350011	4275	1510	60298
12	9350012	3060	635	45312

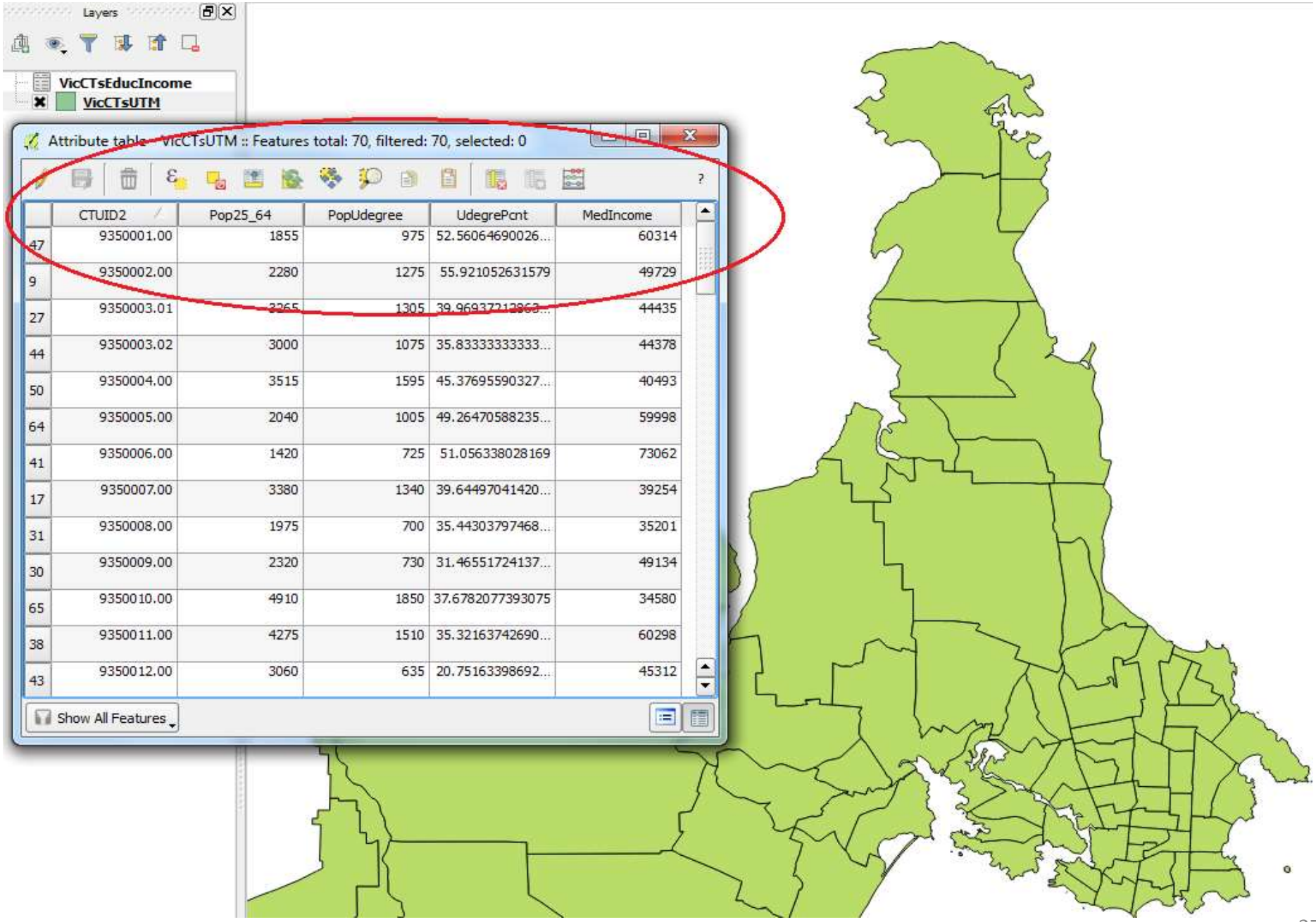
added .csv (or .xls) will be joined to boundary file



join .csv/.xls to boundary file



.csv/.xls joined to boundary file



	CTUID2	Pop25_64	PopUdegree	UdegrePcnt	MedIncome
47	9350001.00	1855	975	52.56064690026...	60314
9	9350002.00	2280	1275	55.921052631579	49729
27	9350003.01	3265	1305	39.96937712863...	44435
44	9350003.02	3000	1075	35.83333333333...	44378
50	9350004.00	3515	1595	45.37695590327...	40493
64	9350005.00	2040	1005	49.26470588235...	59998
41	9350006.00	1420	725	51.056338028169	73062
17	9350007.00	3380	1340	39.64497041420...	39254
31	9350008.00	1975	700	35.44303797468...	35201
30	9350009.00	2320	730	31.46551724137...	49134
65	9350010.00	4910	1850	37.6782077393075	34580
38	9350011.00	4275	1510	35.32163742690...	60298
43	9350012.00	3060	635	20.75163398692...	45312

.csv/.xls joined to boundary file

NOTE: “shapefiles” have 3 necessary components

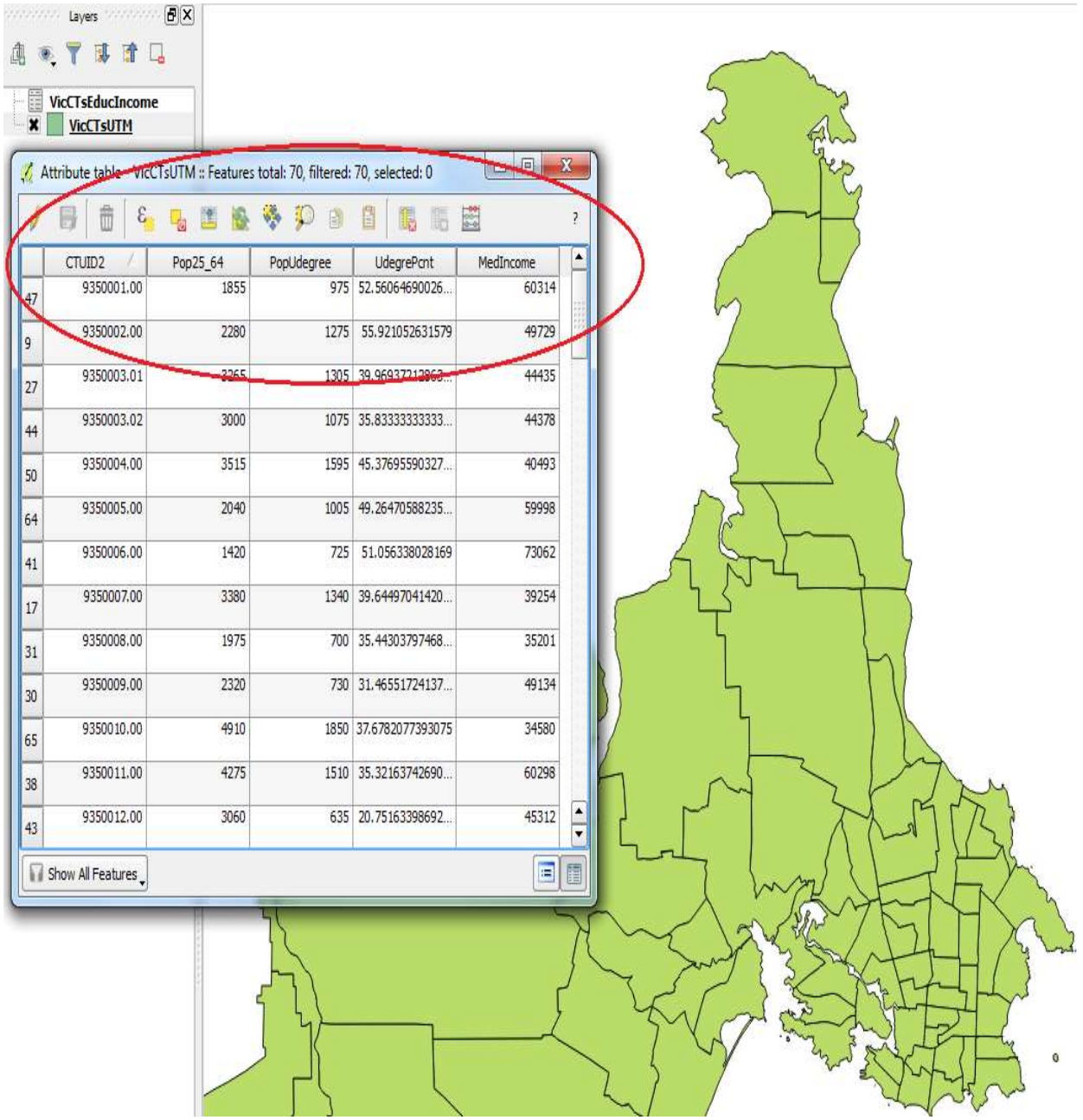
- .shp / .dbf / .shx
.dbf’s only allow 10 character column titles
-awkward for public web maps

GeoJson (!?) allow unlimited column title characters!

or

web maps fields could be edited in “code”

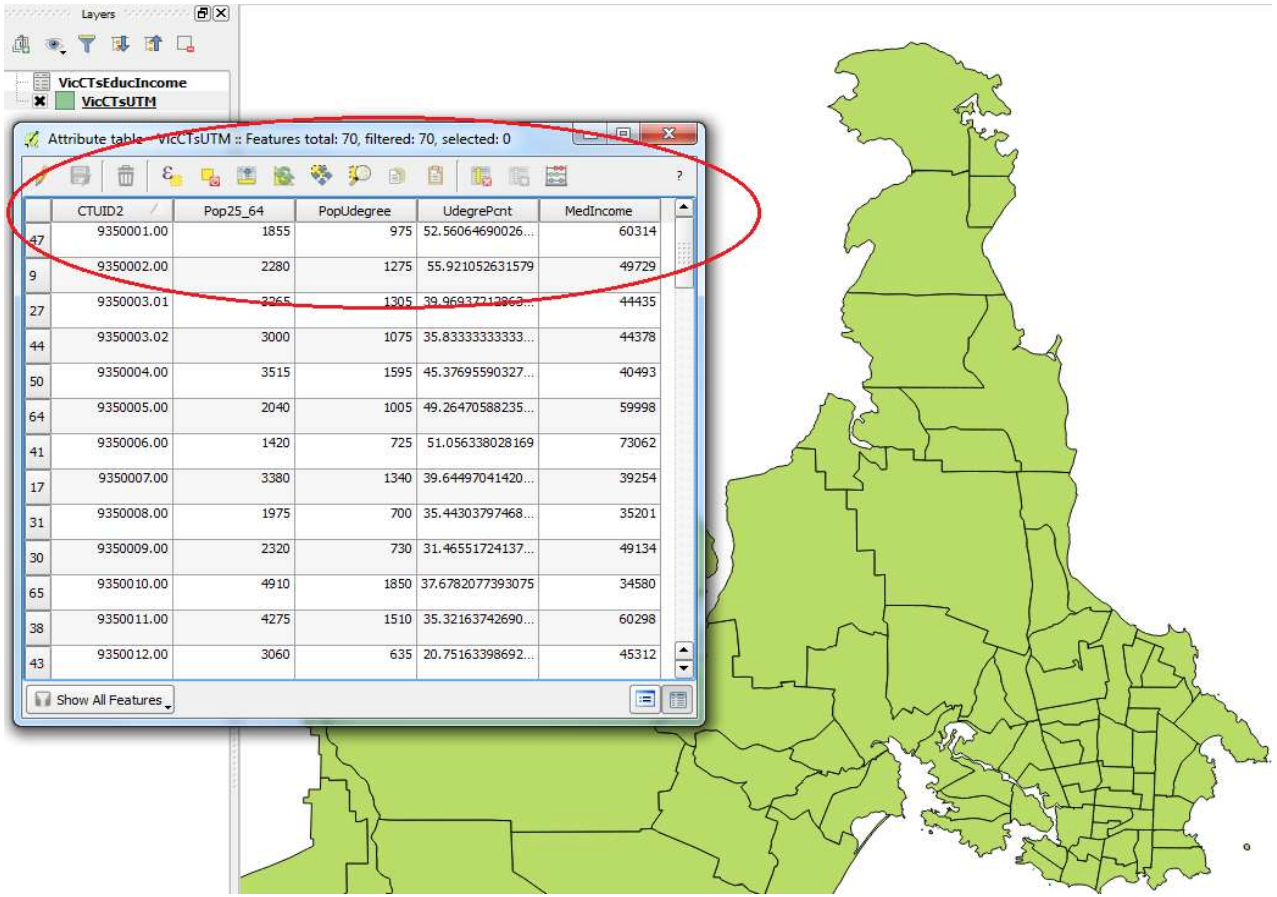
more later…



	CTUID2	Pop25_64	PopUdegree	UdegrePcnt	MedIncome
47	9350001.00	1855	975	52.56064690026...	60314
9	9350002.00	2280	1275	55.921052631579	49729
27	9350003.01	3265	1305	39.96937212863...	44435
44	9350003.02	3000	1075	35.83333333333...	44378
50	9350004.00	3515	1595	45.37695590327...	40493
64	9350005.00	2040	1005	49.26470588235...	59998
41	9350006.00	1420	725	51.056338028169	73062
17	9350007.00	3380	1340	39.64497041420...	39254
31	9350008.00	1975	700	35.44303797468...	35201
30	9350009.00	2320	730	31.46551724137...	49134
65	9350010.00	4910	1850	37.6782077393075	34580
38	9350011.00	4275	1510	35.32163742690...	60298
43	9350012.00	3060	635	20.75163398692...	45312

(NOTE) .dbf's only allow 10 character column titles

if your .xls has
Median Household Income
it becomes
MedianHous
(in the joined saved shapefile)
not reader friendly!

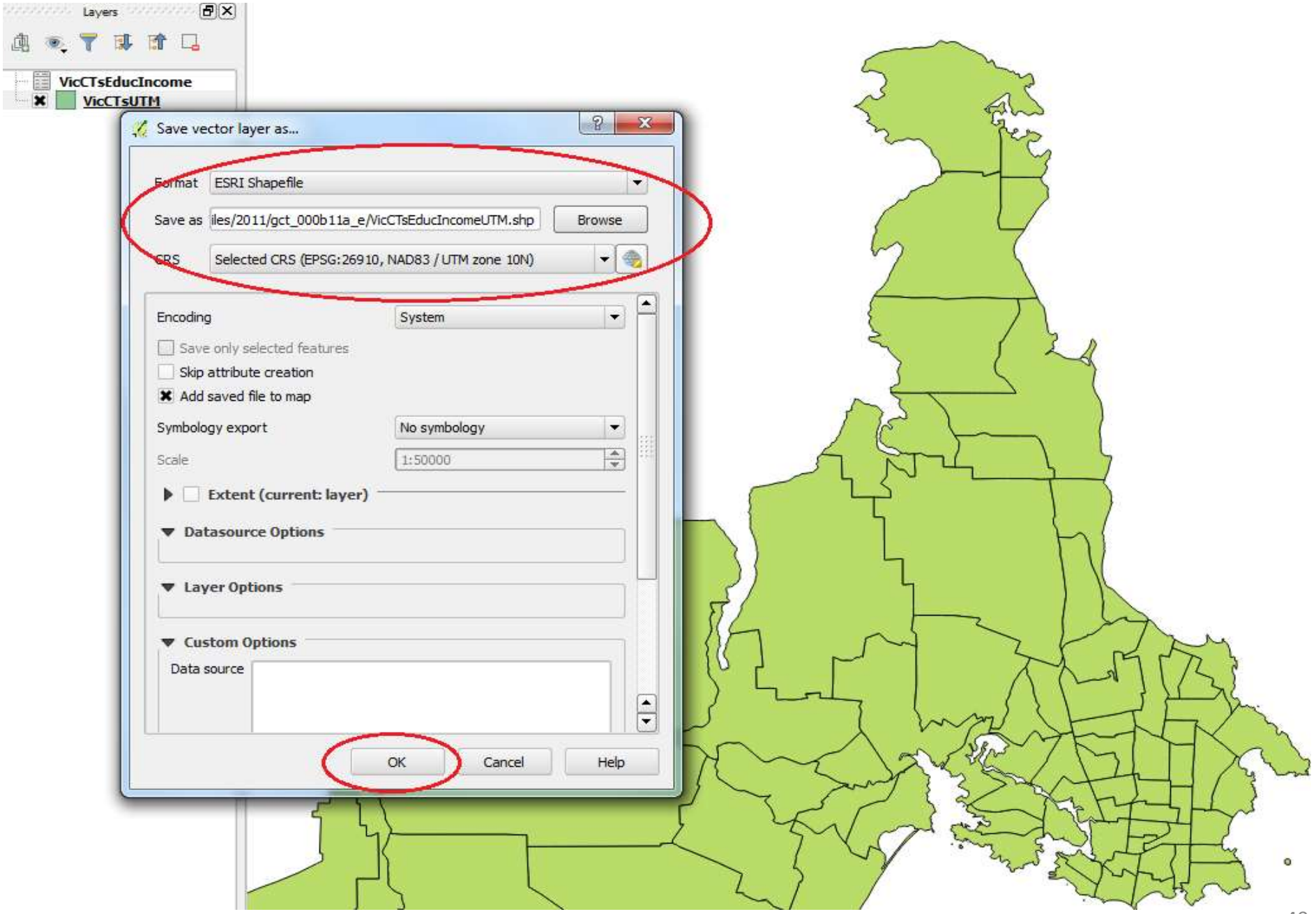


	CTUID2	Pop25_64	PopUdegree	UdegrePcnt	MedIncome
47	9350001.00	1855	975	52.56064690026...	60314
9	9350002.00	2280	1275	55.921052631579	49729
27	9350003.01	3265	1305	39.96937212863...	44435
44	9350003.02	3000	1075	35.83333333333...	44378
50	9350004.00	3515	1595	45.37695590327...	40493
64	9350005.00	2040	1005	49.26470588235...	59998
41	9350006.00	1420	725	51.056338028169	73062
17	9350007.00	3380	1340	39.64497041420...	39254
31	9350008.00	1975	700	35.44303797468...	35201
30	9350009.00	2320	730	31.46551724137...	49134
65	9350010.00	4910	1850	37.6782077393075	34580
38	9350011.00	4275	1510	35.32163742690...	60298
43	9350012.00	3060	635	20.75163398692...	45312

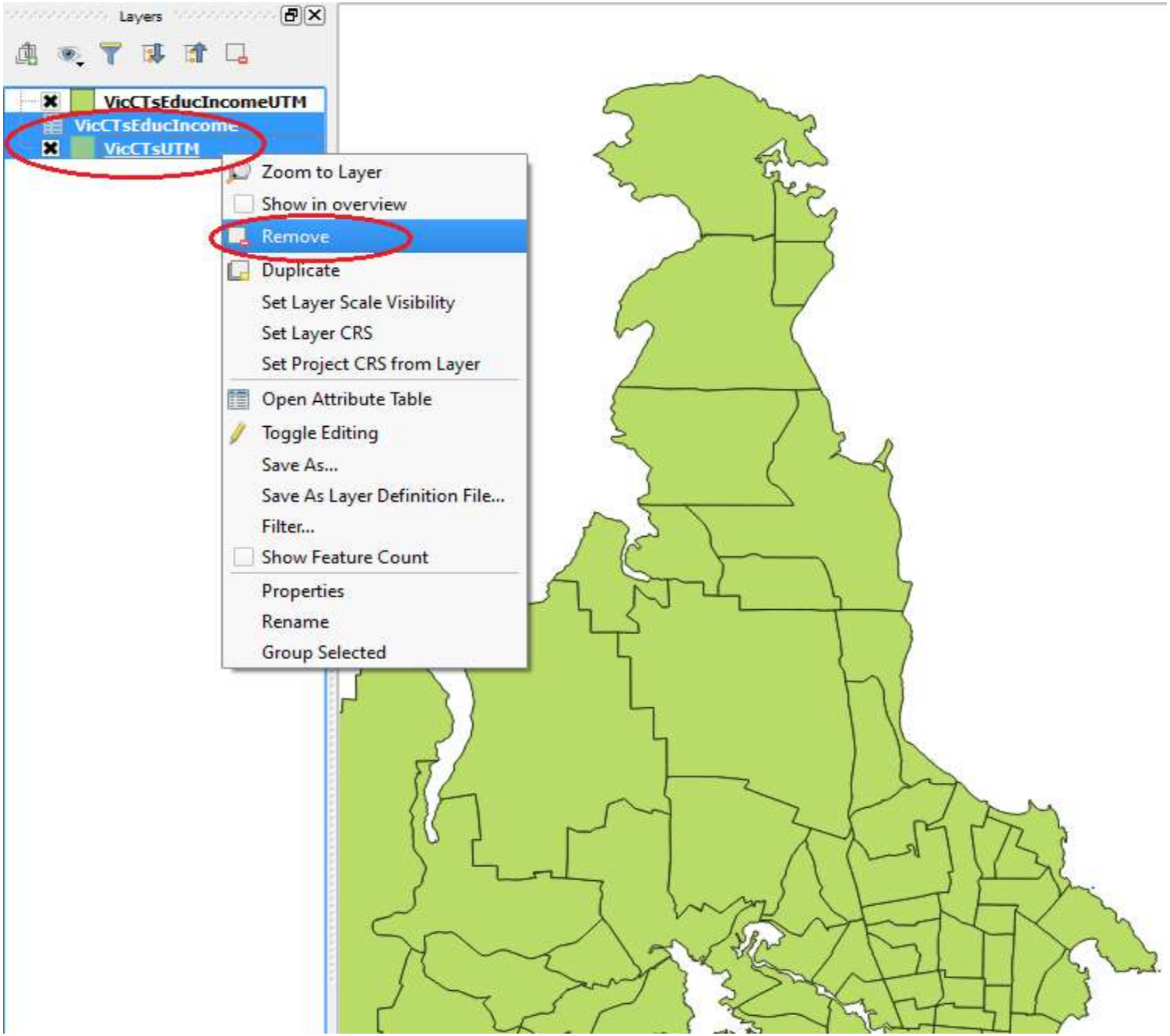
GeoJson (!?) allow unlimited column title characters!
-important for a web map to have friendly readable fields

(…can't edit a GeoJson in QGIS…)

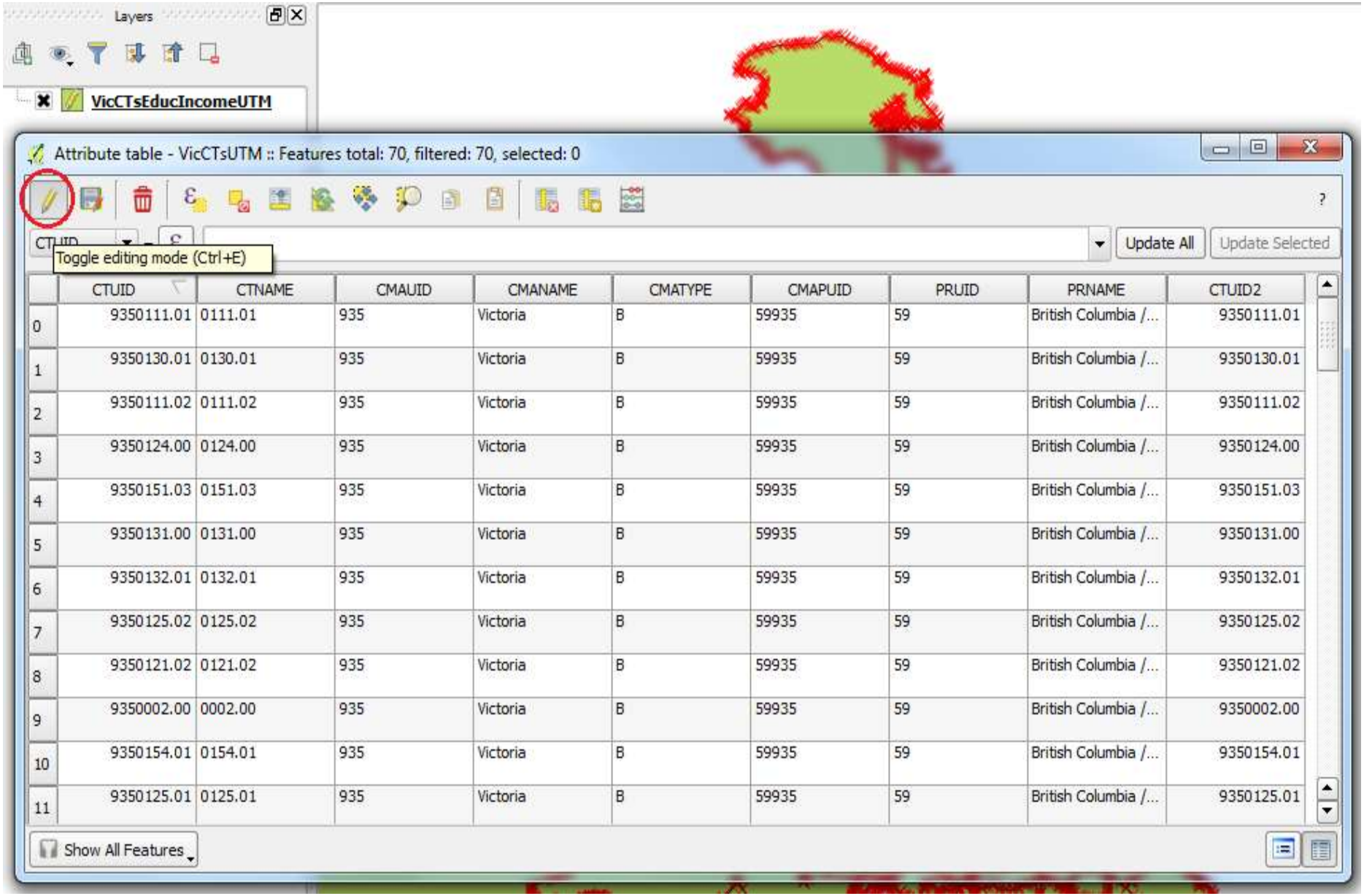
(to con't…) Save (joined .csv/.xls and boundary files) and rename new file



remove (now unneeded) files

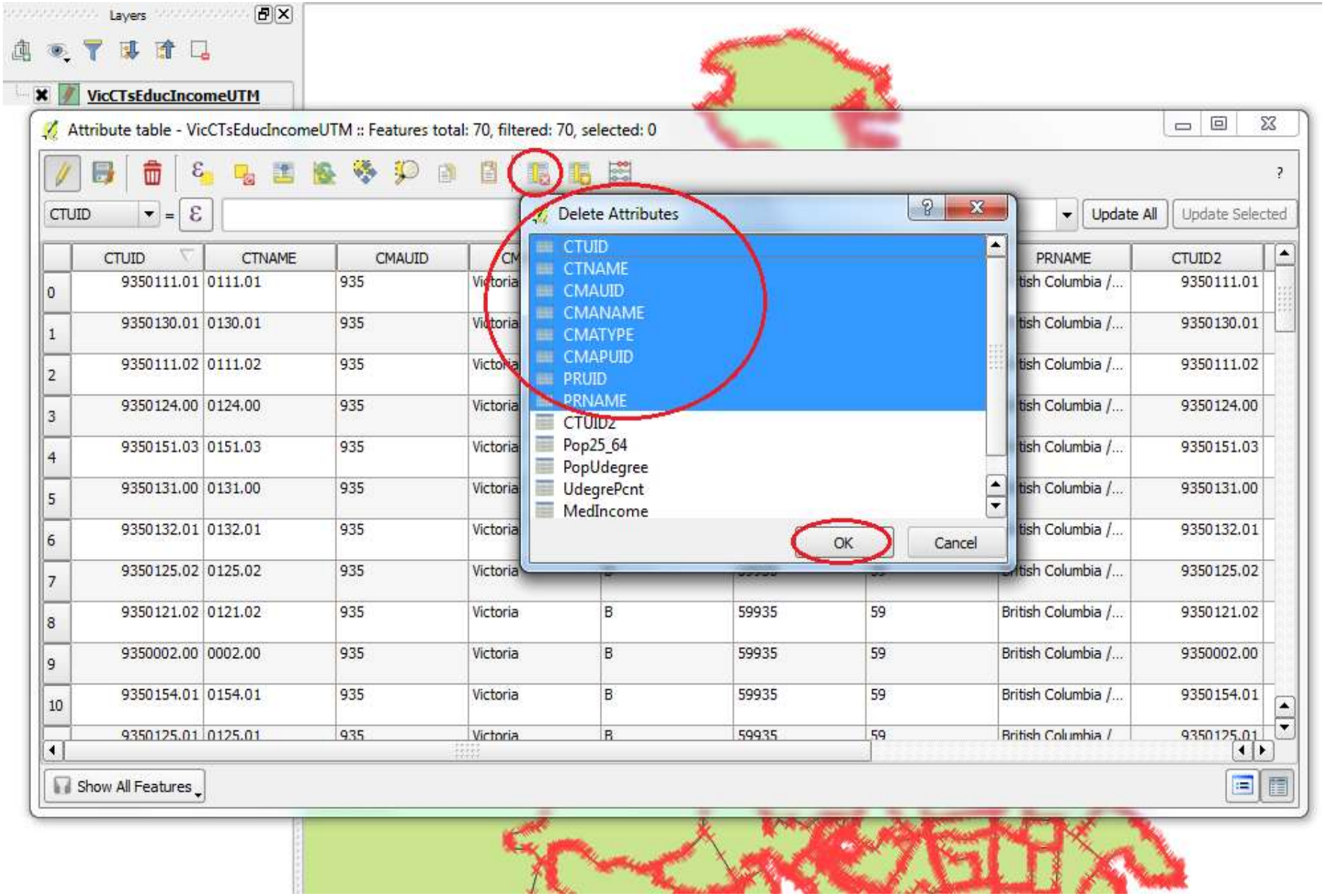


edit attribute table to delete unnecessary columns (for public display)

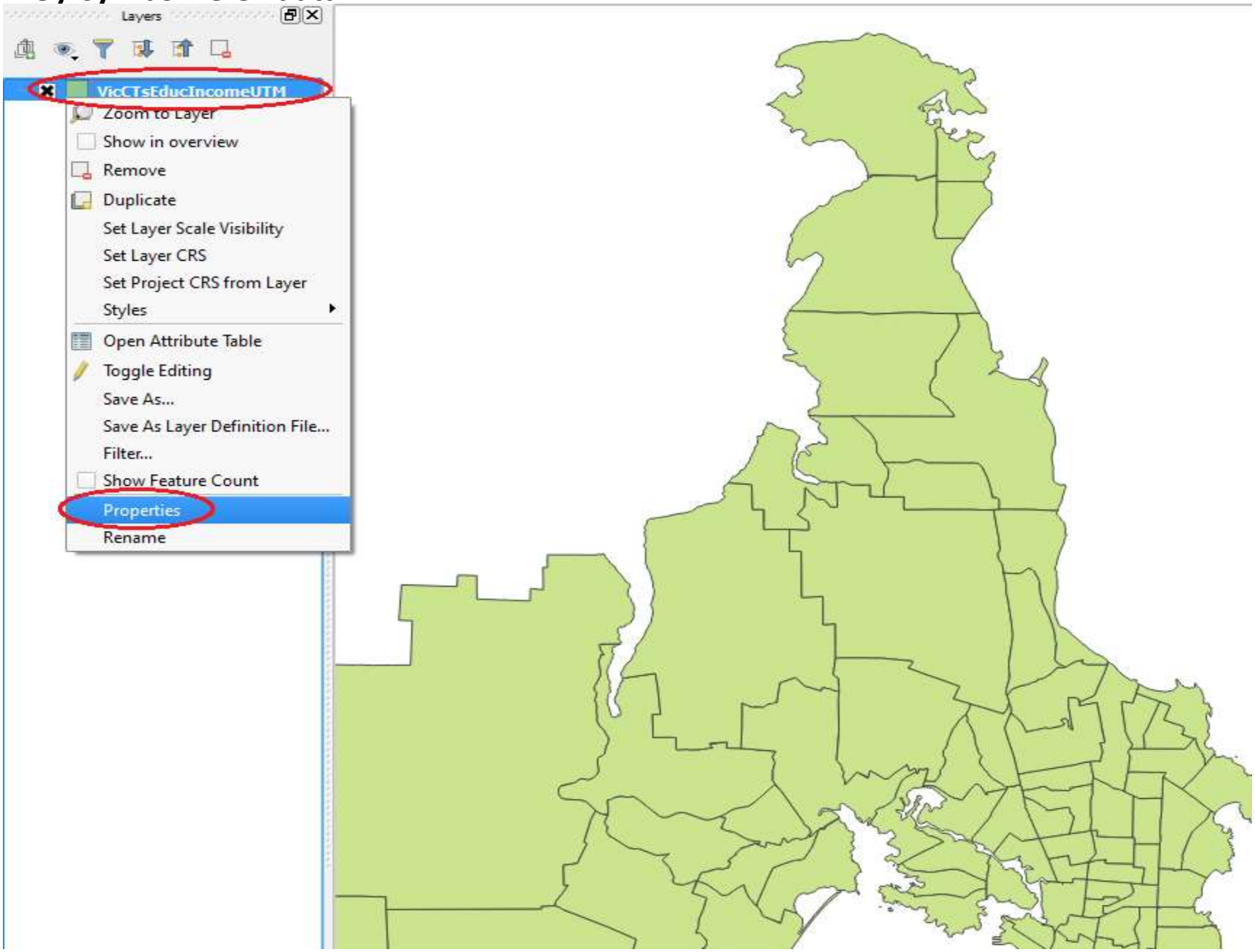


	CTUID	CTNAME	CMAUID	CMANAME	CMATYPE	CMAPUID	PRUID	PRNAME	CTUID2
0	9350111.01	0111.01	935	Victoria	B	59935	59	British Columbia /...	9350111.01
1	9350130.01	0130.01	935	Victoria	B	59935	59	British Columbia /...	9350130.01
2	9350111.02	0111.02	935	Victoria	B	59935	59	British Columbia /...	9350111.02
3	9350124.00	0124.00	935	Victoria	B	59935	59	British Columbia /...	9350124.00
4	9350151.03	0151.03	935	Victoria	B	59935	59	British Columbia /...	9350151.03
5	9350131.00	0131.00	935	Victoria	B	59935	59	British Columbia /...	9350131.00
6	9350132.01	0132.01	935	Victoria	B	59935	59	British Columbia /...	9350132.01
7	9350125.02	0125.02	935	Victoria	B	59935	59	British Columbia /...	9350125.02
8	9350121.02	0121.02	935	Victoria	B	59935	59	British Columbia /...	9350121.02
9	9350002.00	0002.00	935	Victoria	B	59935	59	British Columbia /...	9350002.00
10	9350154.01	0154.01	935	Victoria	B	59935	59	British Columbia /...	9350154.01
11	9350125.01	0125.01	935	Victoria	B	59935	59	British Columbia /...	9350125.01

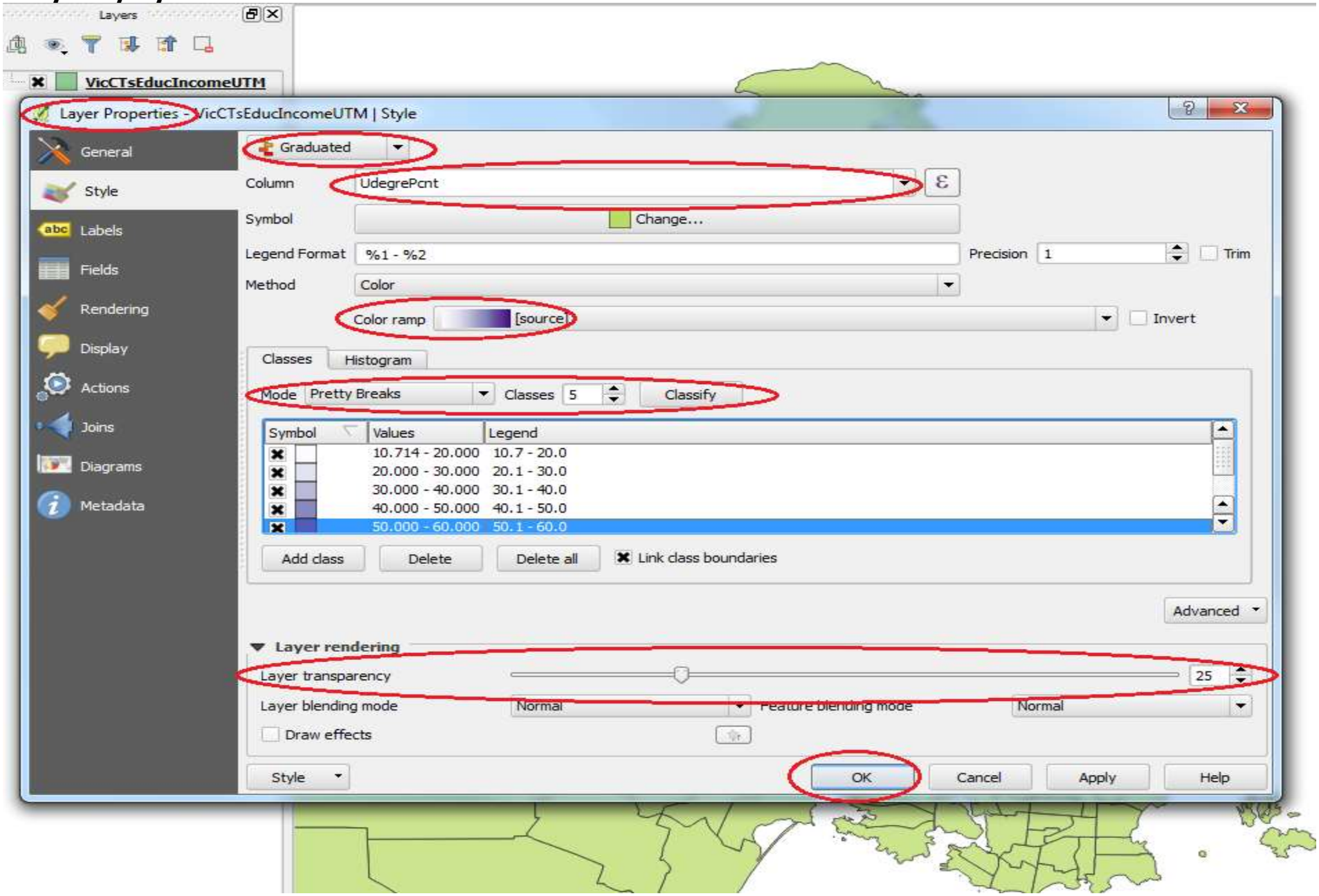
delete “unnecessary” columns (for public display)



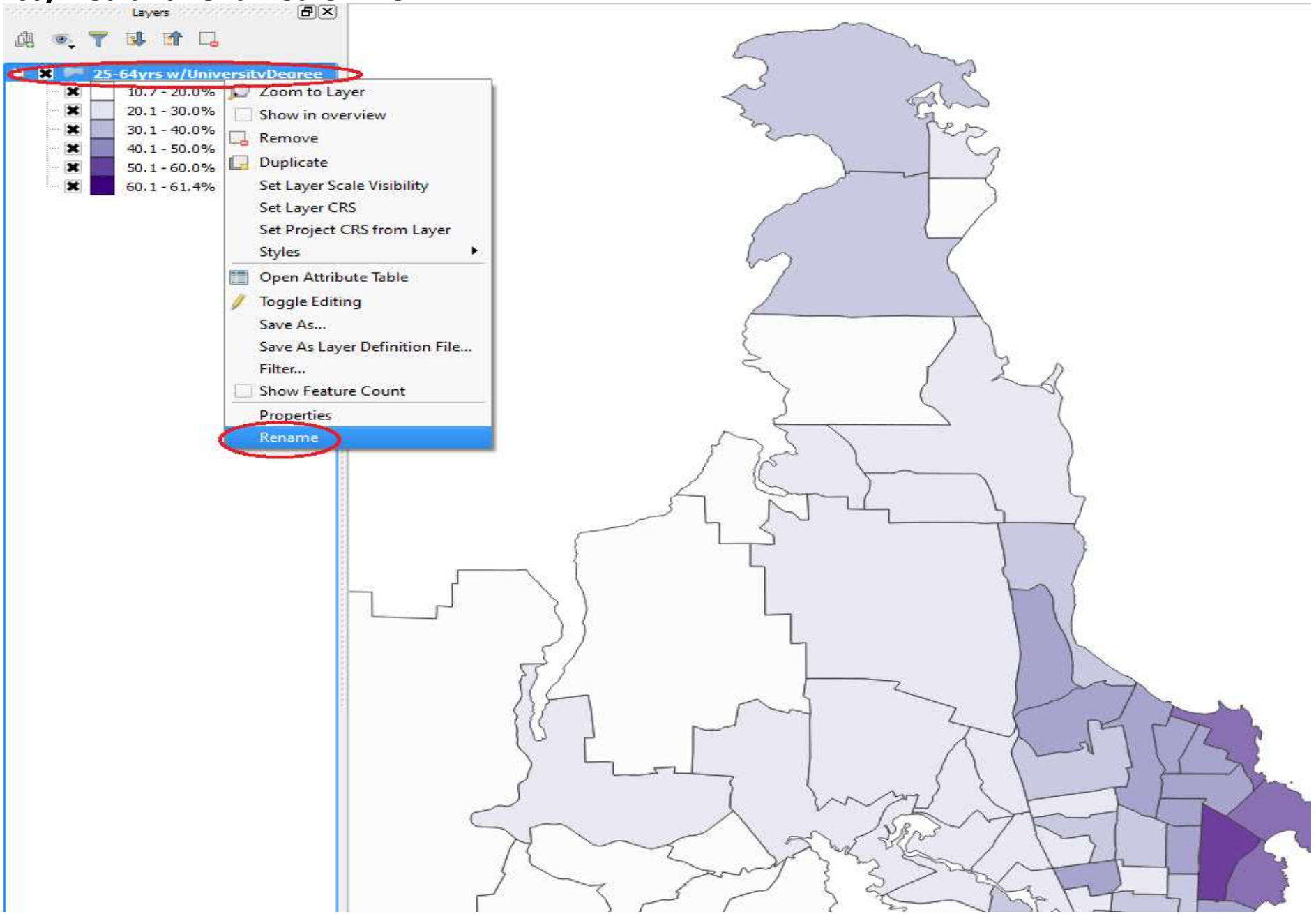
stylize / symbolize CT data



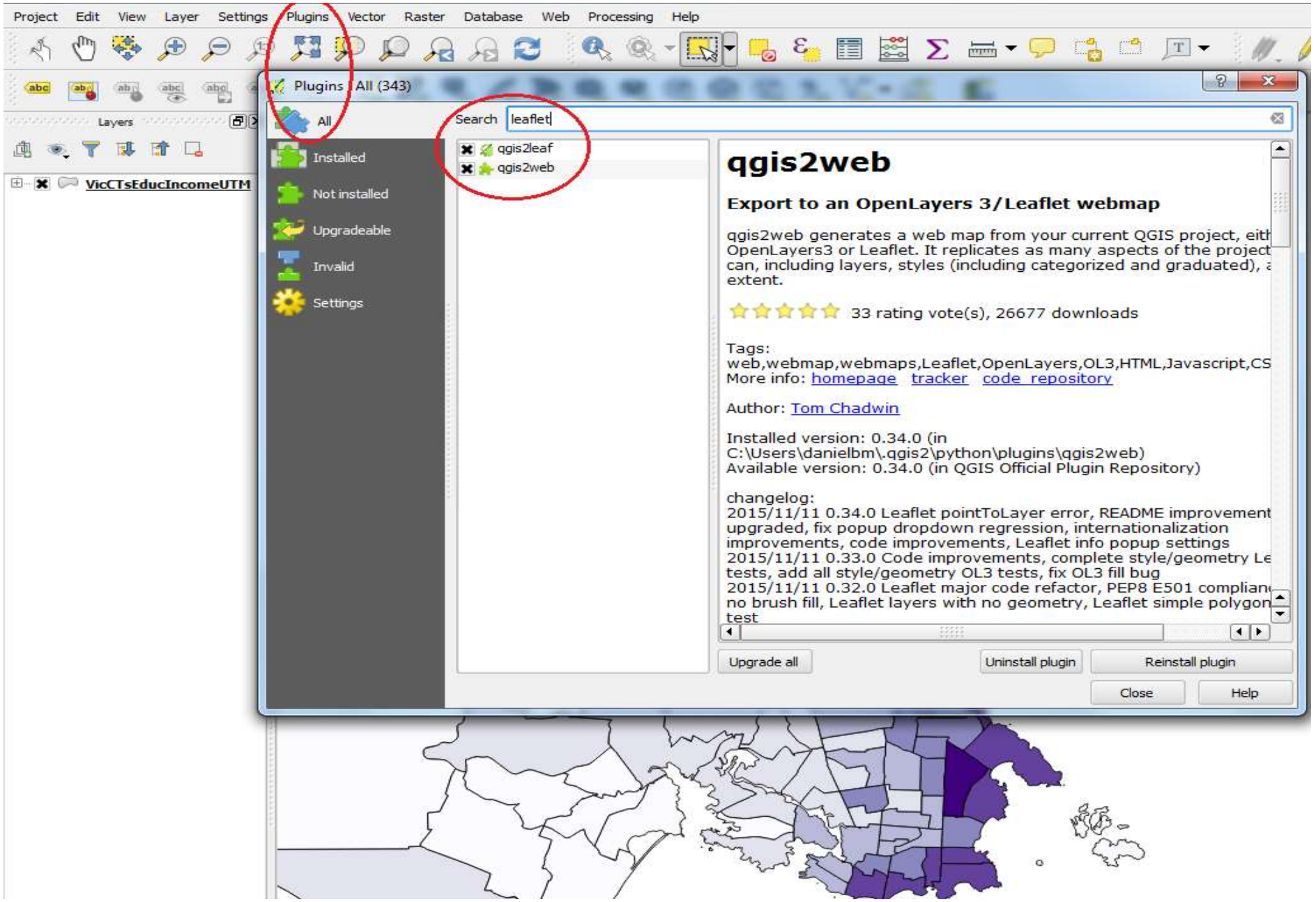
stylize / symbolize CT data



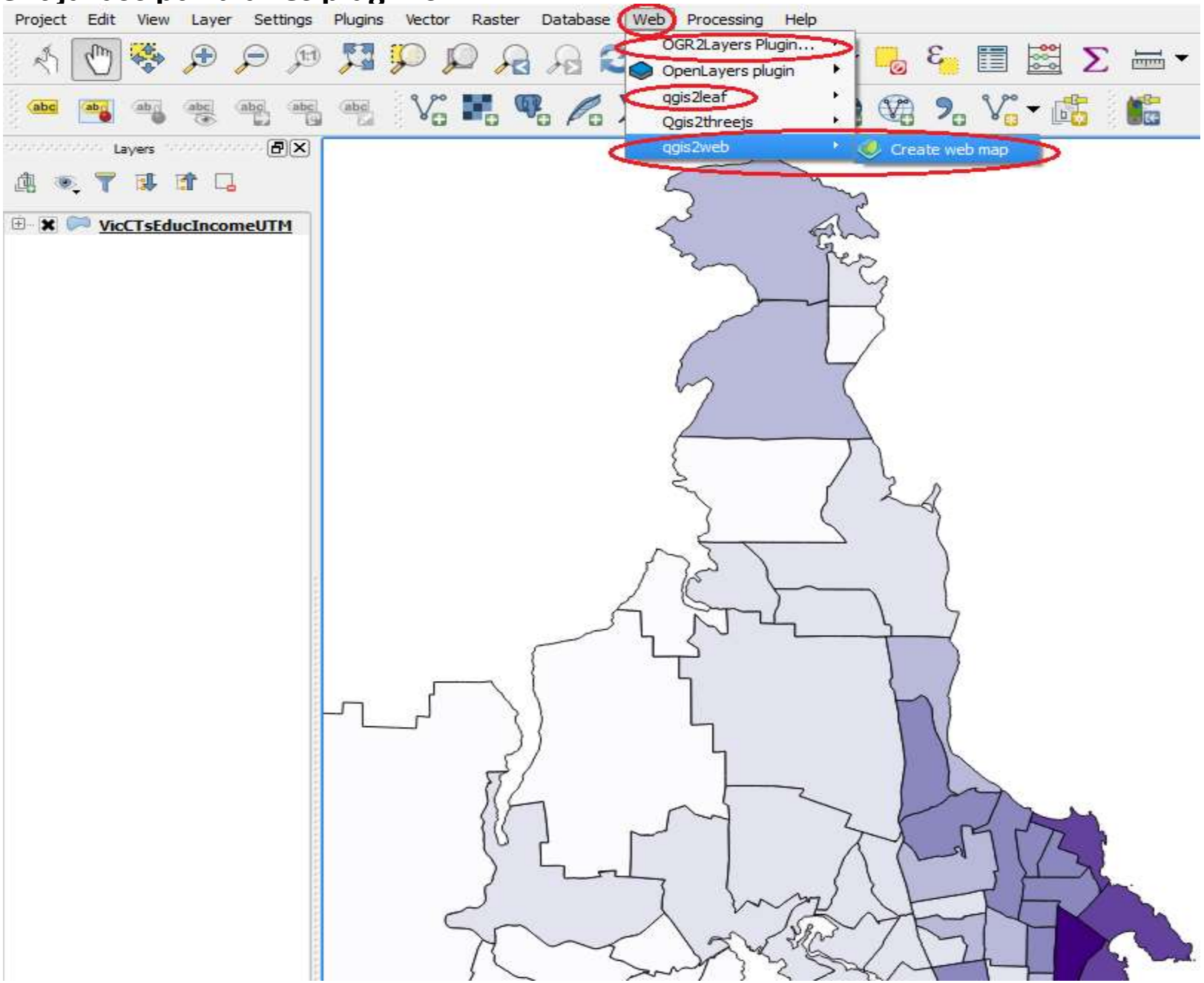
stylized and renamed CT file



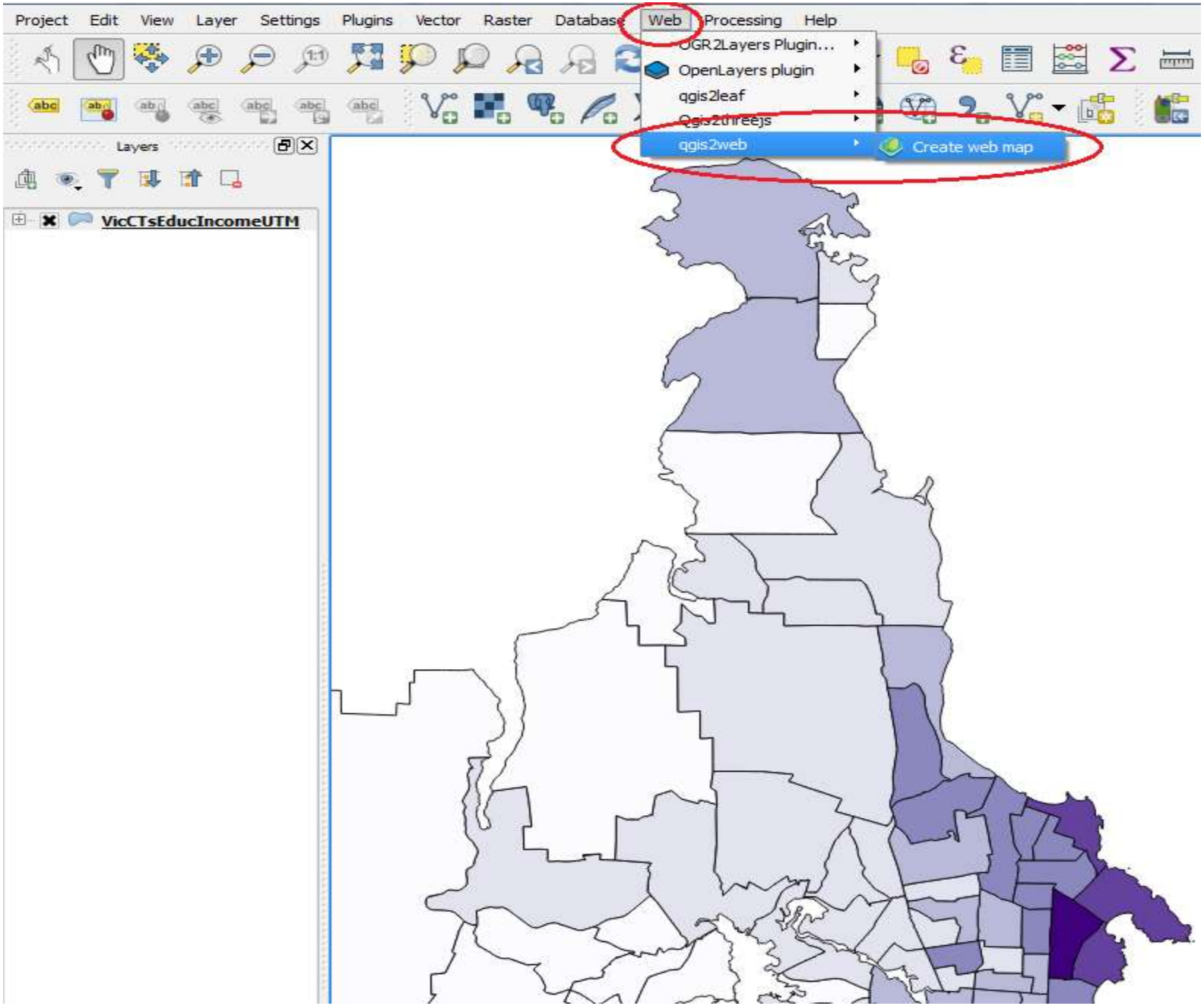
(add and) utilise (selected) leaflet plug-in



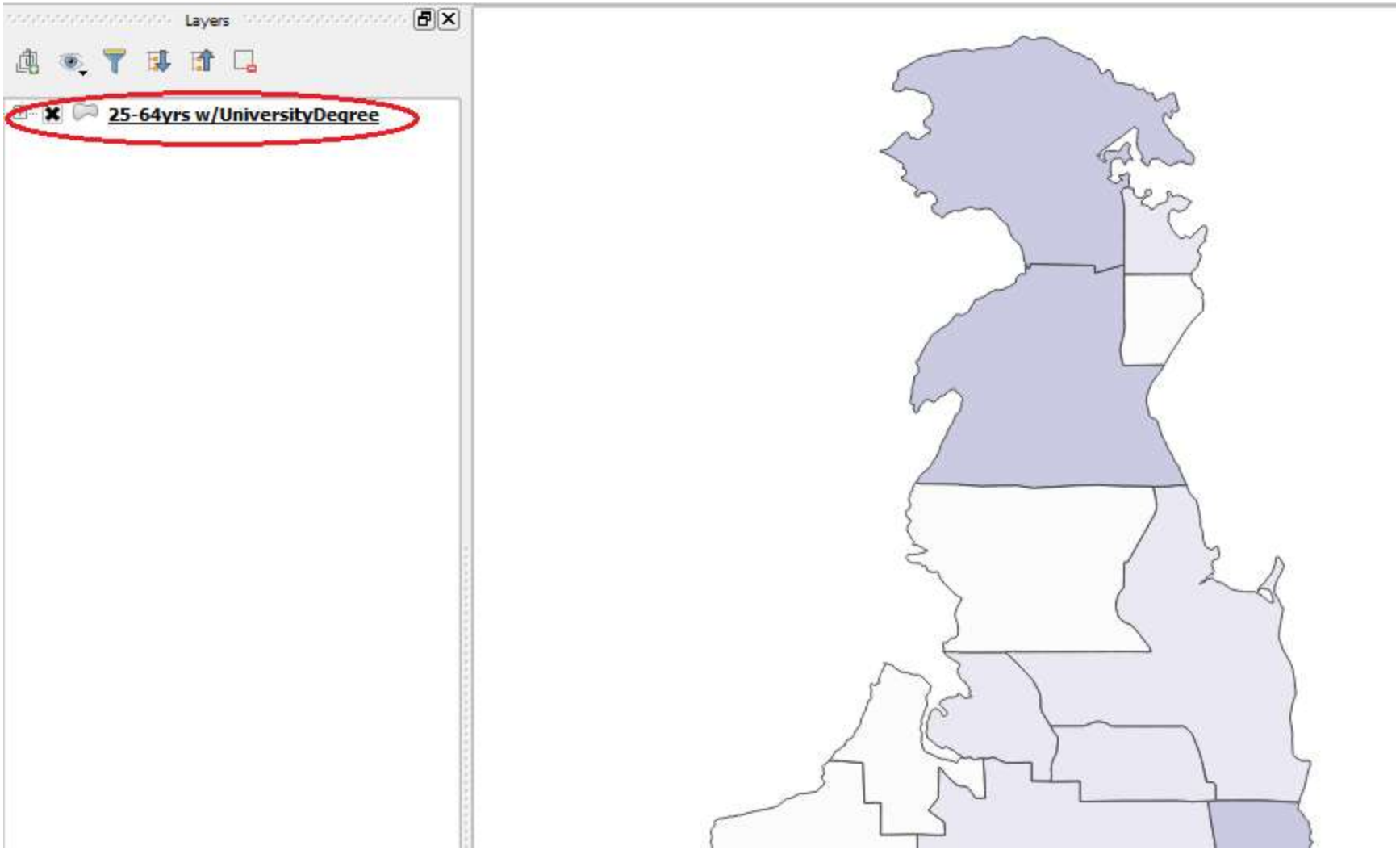
different javascipt libraries plug-ins



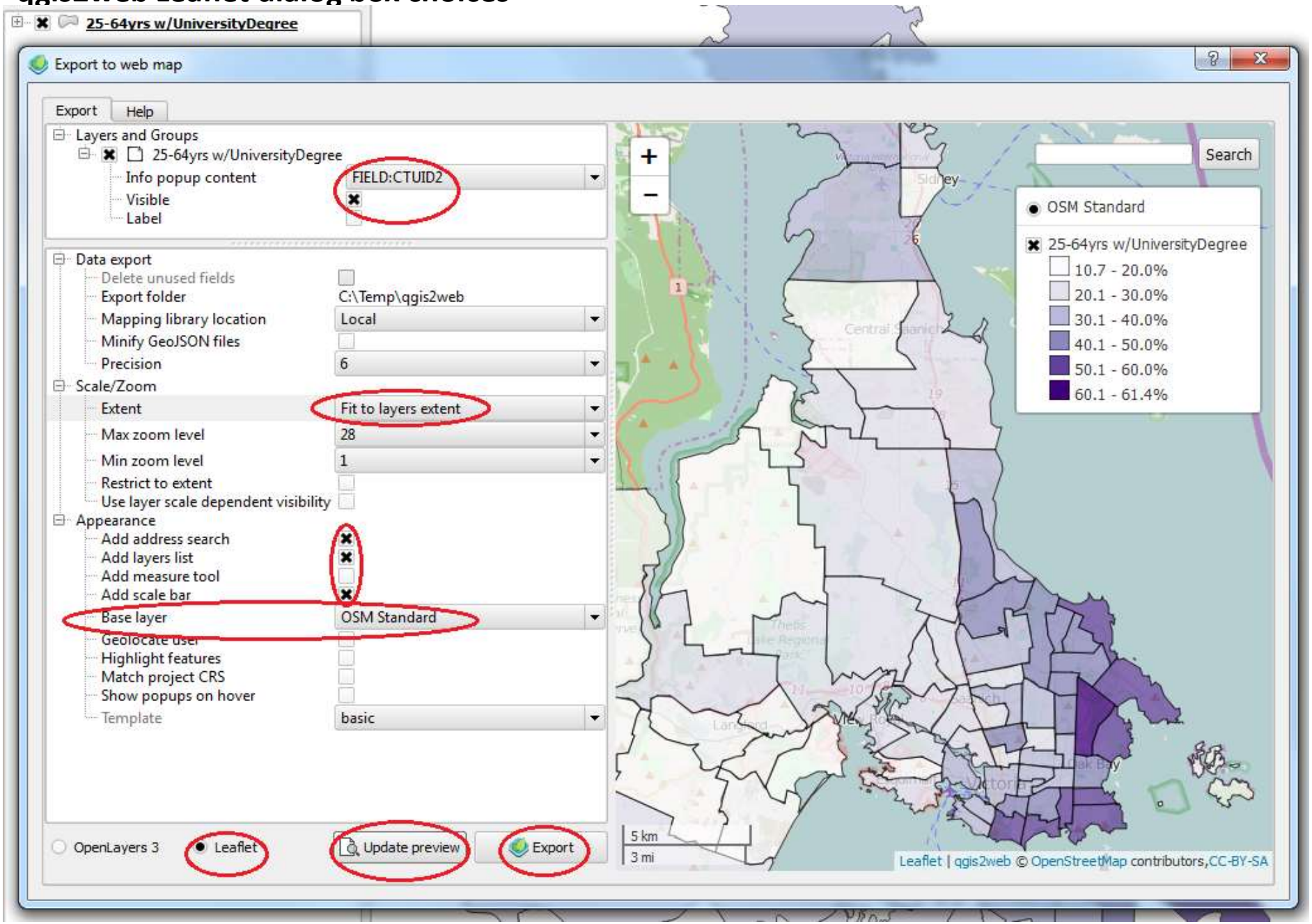
qgis2web


Project
Edit
View
Layer
Settings
Plugins
Vector
Raster
Database
Web
Processing
Help
OGR2Layers Plugin...
OpenLayers plugin
qgis2leaf
Qgis2threejs
qgis2web
Create web map
Layers
VicCTsEducIncomeUTM

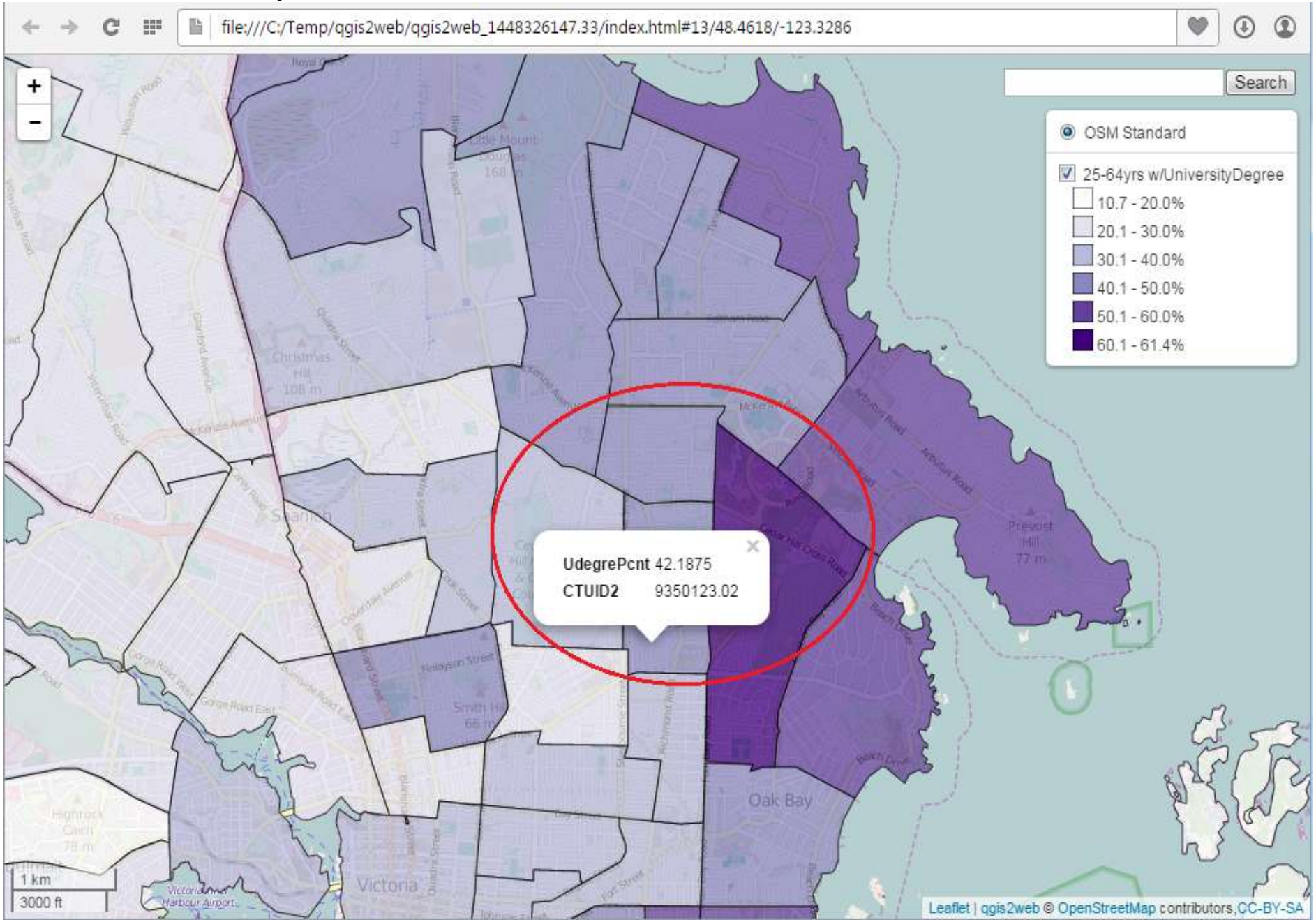
rename layer to web-friendly title



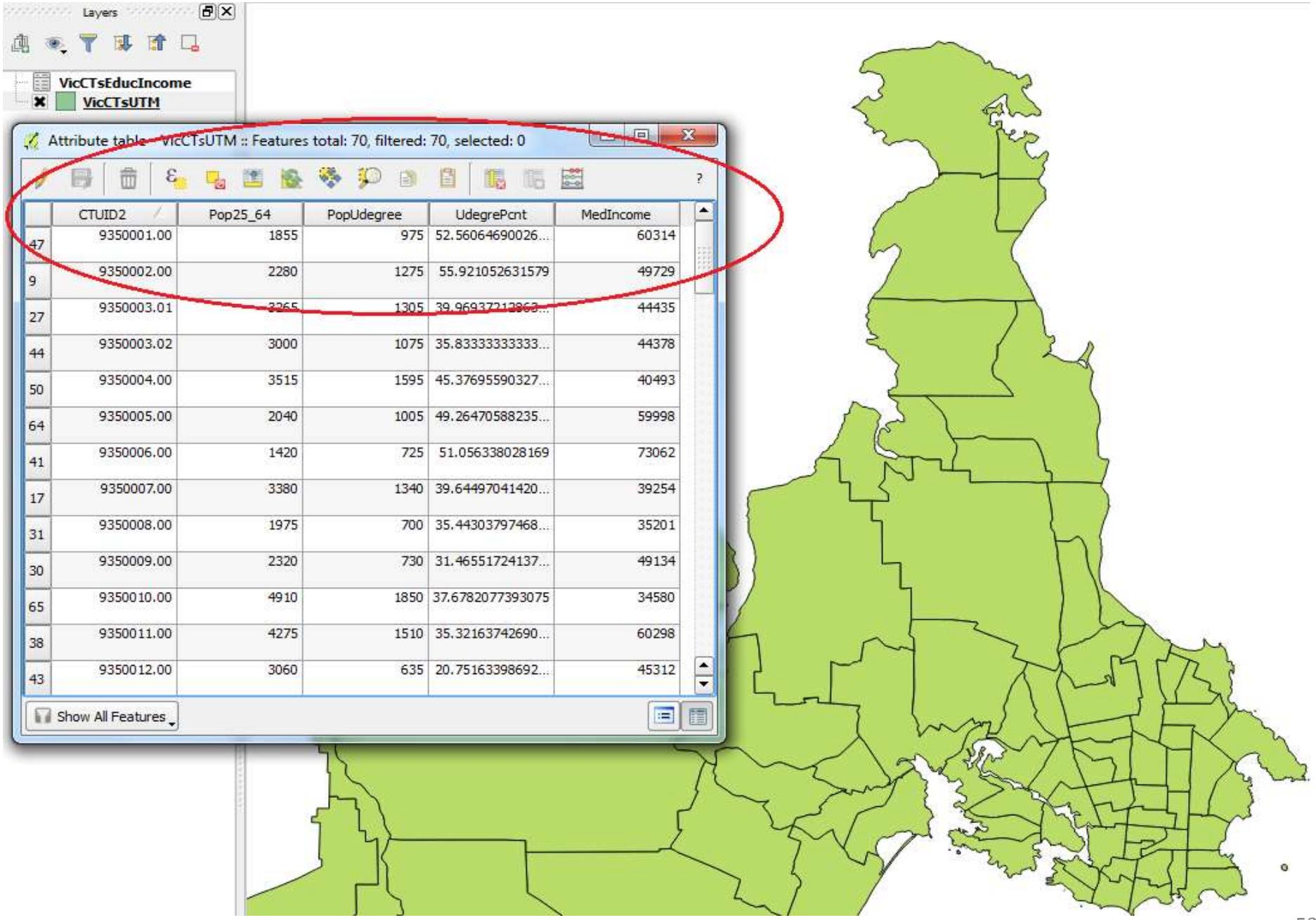
qgis2web Leaflet dialog box choices



“finished” web map in a browser! **but… note the awkward field titles**

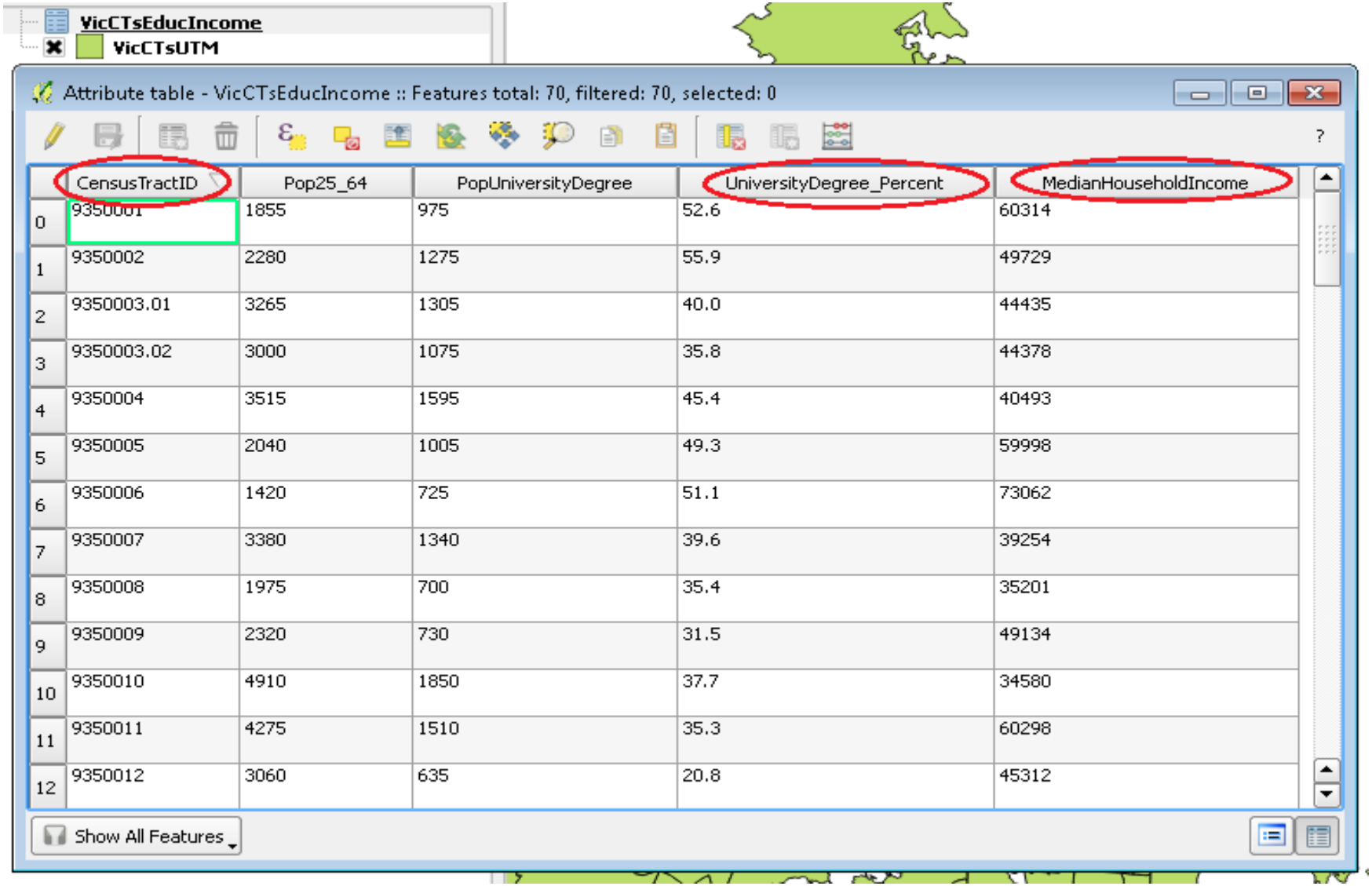


recall the .csv/.xls with awkward field titles joined to boundary file



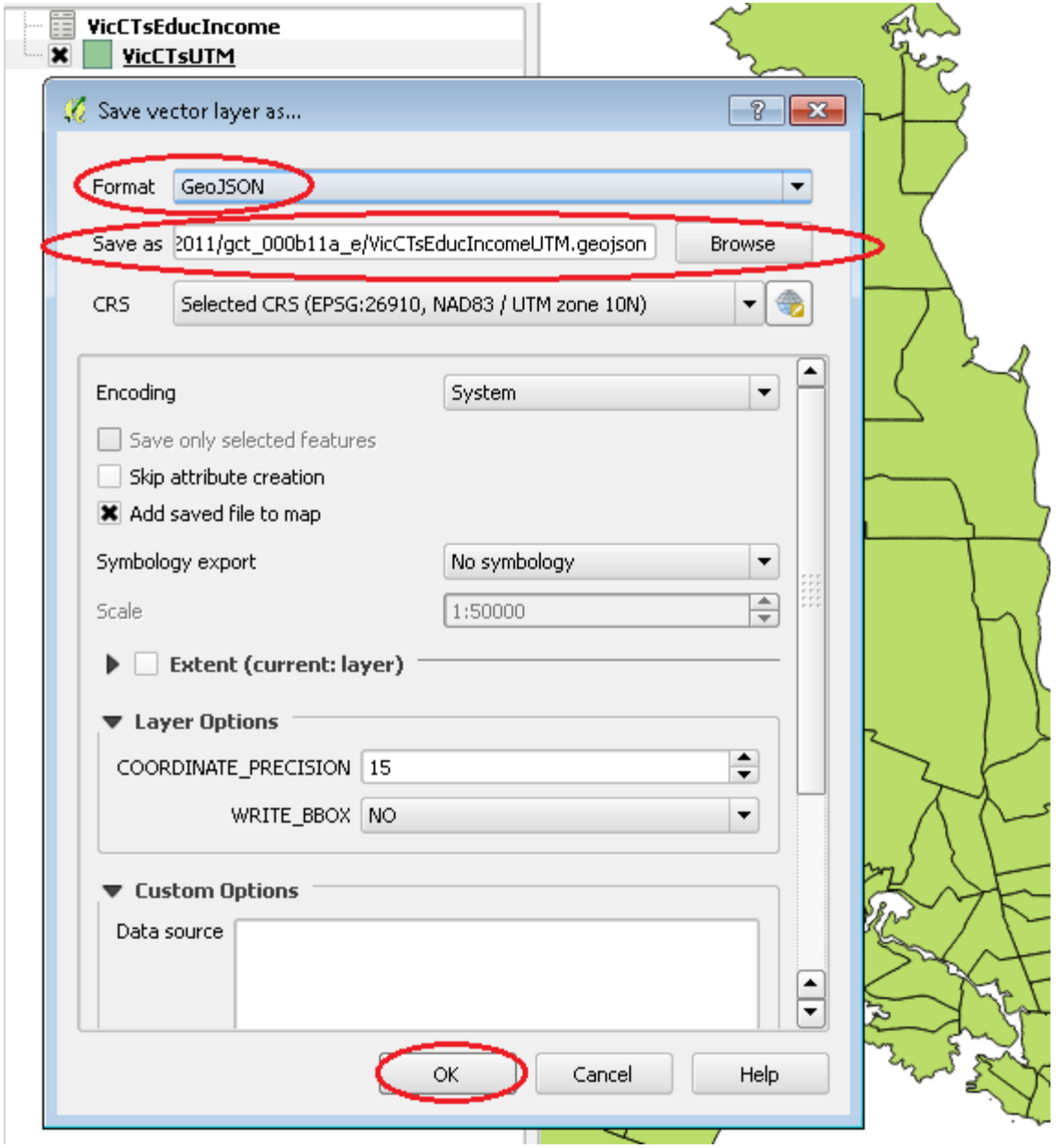
	CTUID2	Pop25_64	PopUdegree	UdegrePcnt	MedIncome
47	9350001.00	1855	975	52.56064690026...	60314
9	9350002.00	2280	1275	55.921052631579	49729
27	9350003.01	3265	1305	39.96937212863...	44435
44	9350003.02	3000	1075	35.83333333333...	44378
50	9350004.00	3515	1595	45.37695590327...	40493
64	9350005.00	2040	1005	49.26470588235...	59998
41	9350006.00	1420	725	51.056338028169	73062
17	9350007.00	3380	1340	39.64497041420...	39254
31	9350008.00	1975	700	35.44303797468...	35201
30	9350009.00	2320	730	31.46551724137...	49134
65	9350010.00	4910	1850	37.6782077393075	34580
38	9350011.00	4275	1510	35.32163742690...	60298
43	9350012.00	3060	635	20.75163398692...	45312

use .xlsx with “public friendly” column titles to join to boundary file…then…

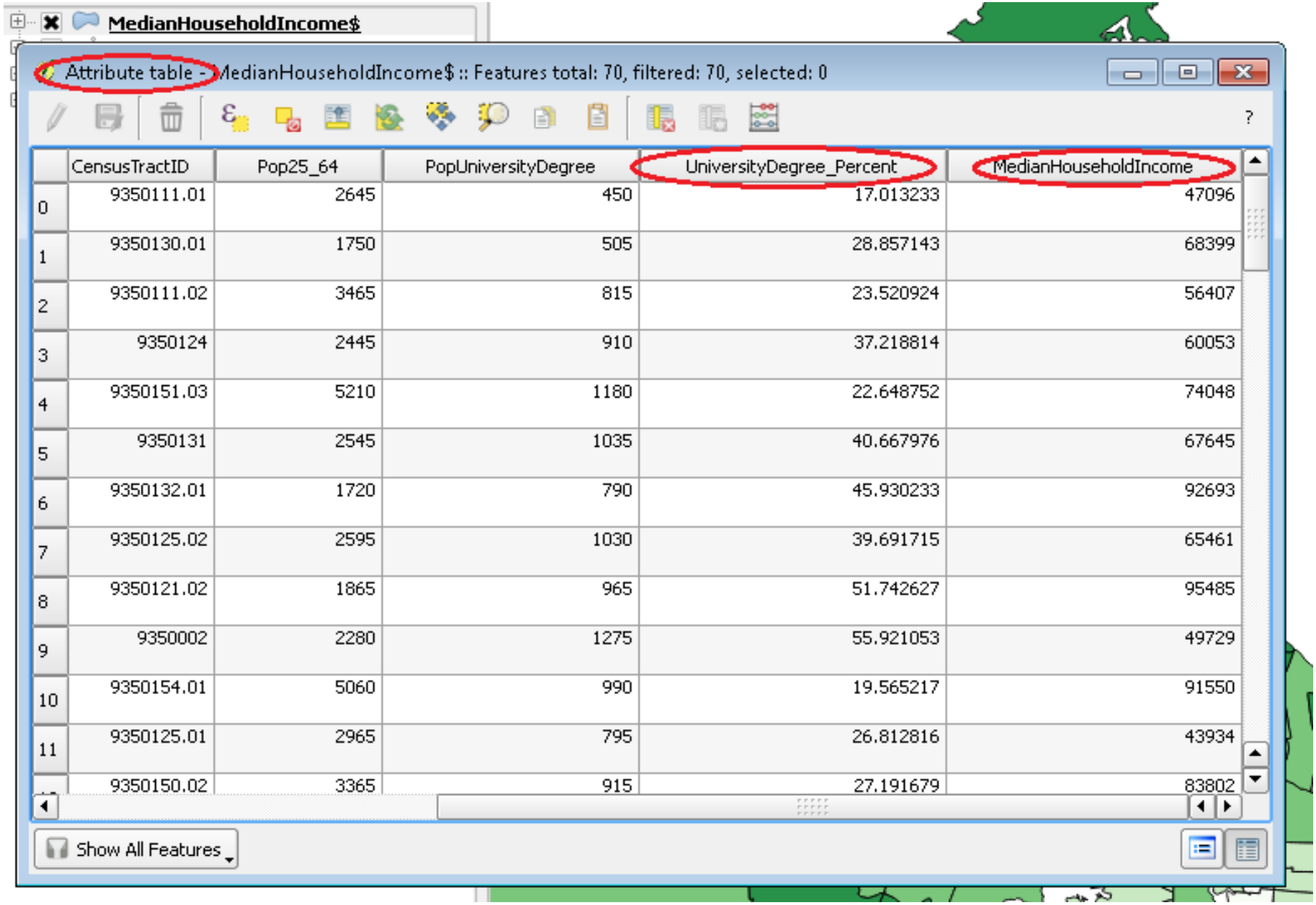


	CensusTractID	Pop25_64	PopUniversityDegree	UniversityDegree_Percent	MedianHouseholdIncome
0	9350001	1855	975	52.6	60314
1	9350002	2280	1275	55.9	49729
2	9350003.01	3265	1305	40.0	44435
3	9350003.02	3000	1075	35.8	44378
4	9350004	3515	1595	45.4	40493
5	9350005	2040	1005	49.3	59998
6	9350006	1420	725	51.1	73062
7	9350007	3380	1340	39.6	39254
8	9350008	1975	700	35.4	35201
9	9350009	2320	730	31.5	49134
10	9350010	4910	1850	37.7	34580
11	9350011	4275	1510	35.3	60298
12	9350012	3060	635	20.8	45312

…save as GeoJson…and…



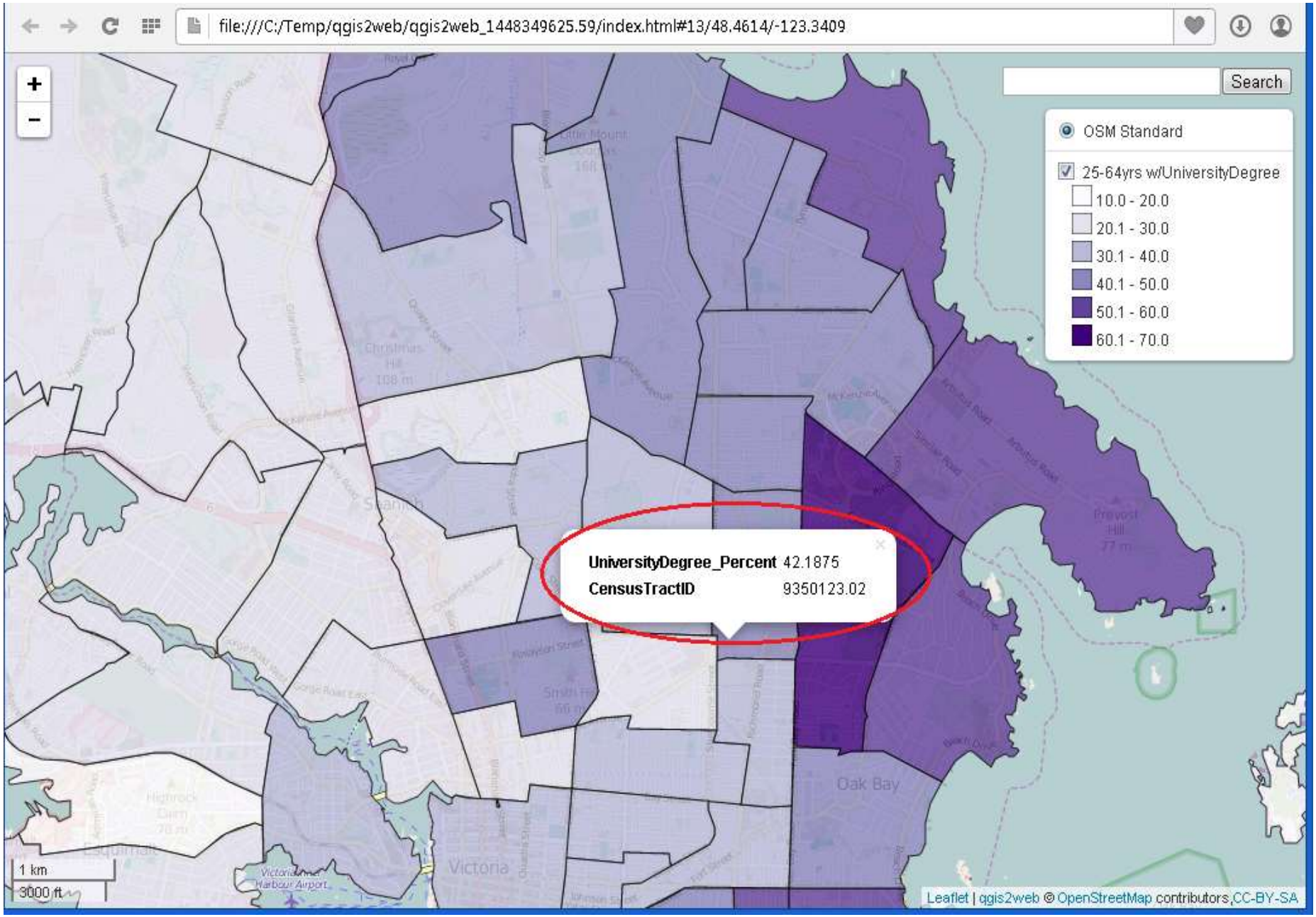
GeoJson retains “public friendly” column titles !



	CensusTractID	Pop25_64	PopUniversityDegree	UniversityDegree_Percent	MedianHouseholdIncome
0	9350111.01	2645	450	17.013233	47096
1	9350130.01	1750	505	28.857143	68399
2	9350111.02	3465	815	23.520924	56407
3	9350124	2445	910	37.218814	60053
4	9350151.03	5210	1180	22.648752	74048
5	9350131	2545	1035	40.667976	67645
6	9350132.01	1720	790	45.930233	92693
7	9350125.02	2595	1030	39.691715	65461
8	9350121.02	1865	965	51.742627	95485
9	9350002	2280	1275	55.921053	49729
10	9350154.01	5060	990	19.565217	91550
11	9350125.01	2965	795	26.812816	43934
	9350150.02	3365	915	27.191679	83802

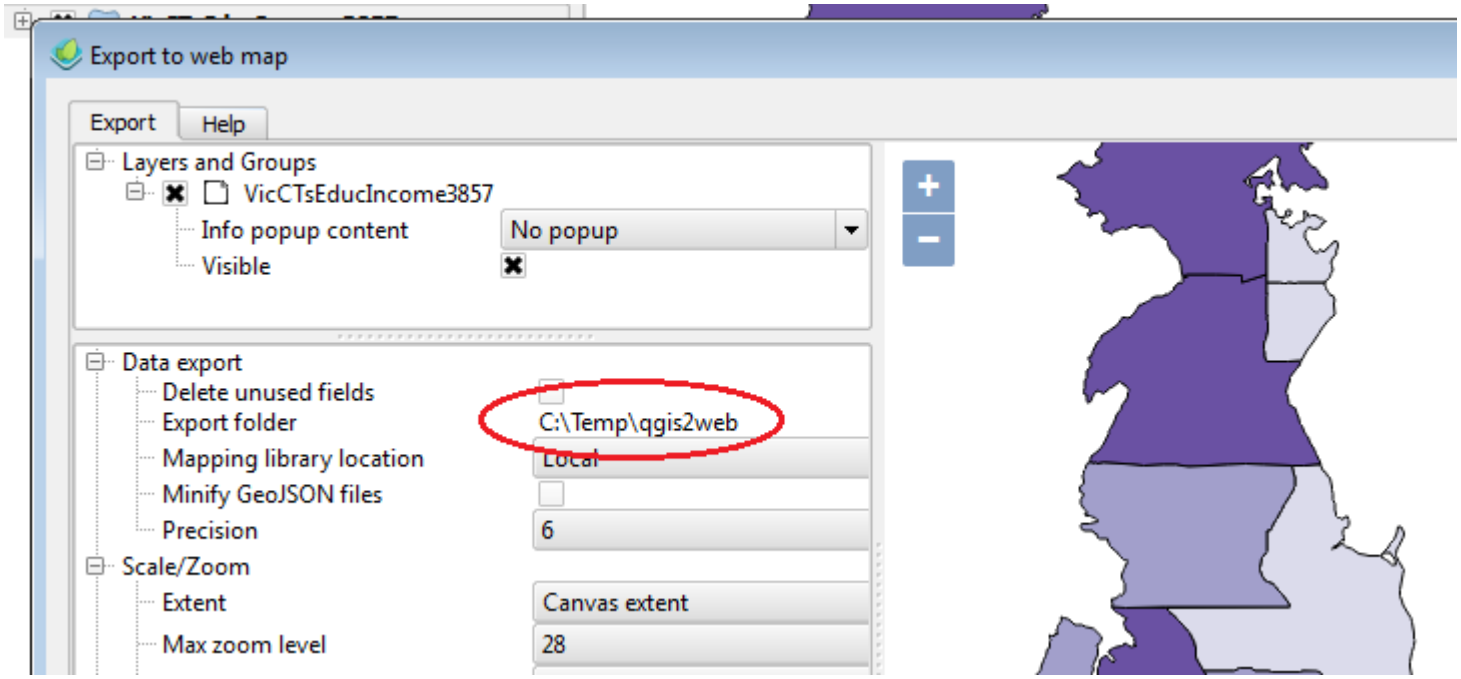
better friendlier field titles…

but now…need to "serve up" the map…

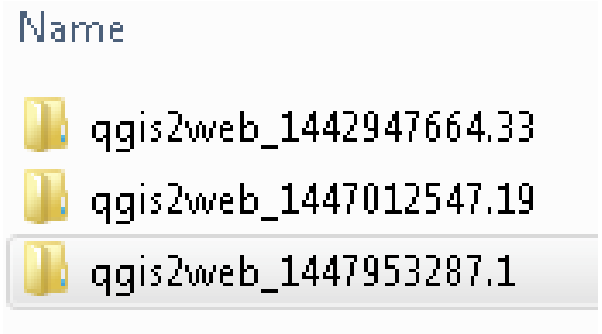


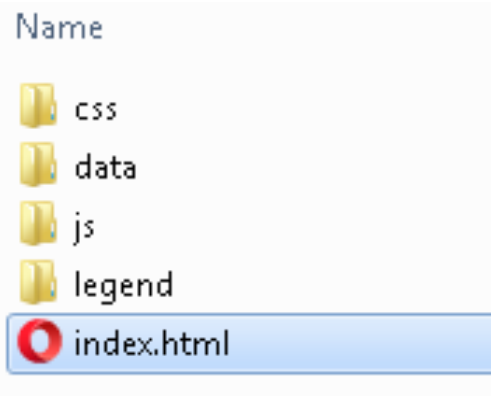
need to “serve up” the map…

the map worked in your browser b/c the files were saved and accessed there…

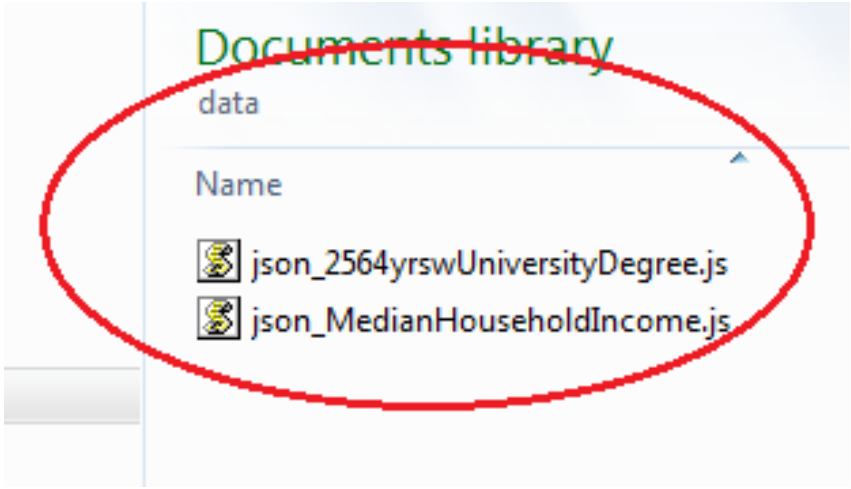


1 of the files is the .html



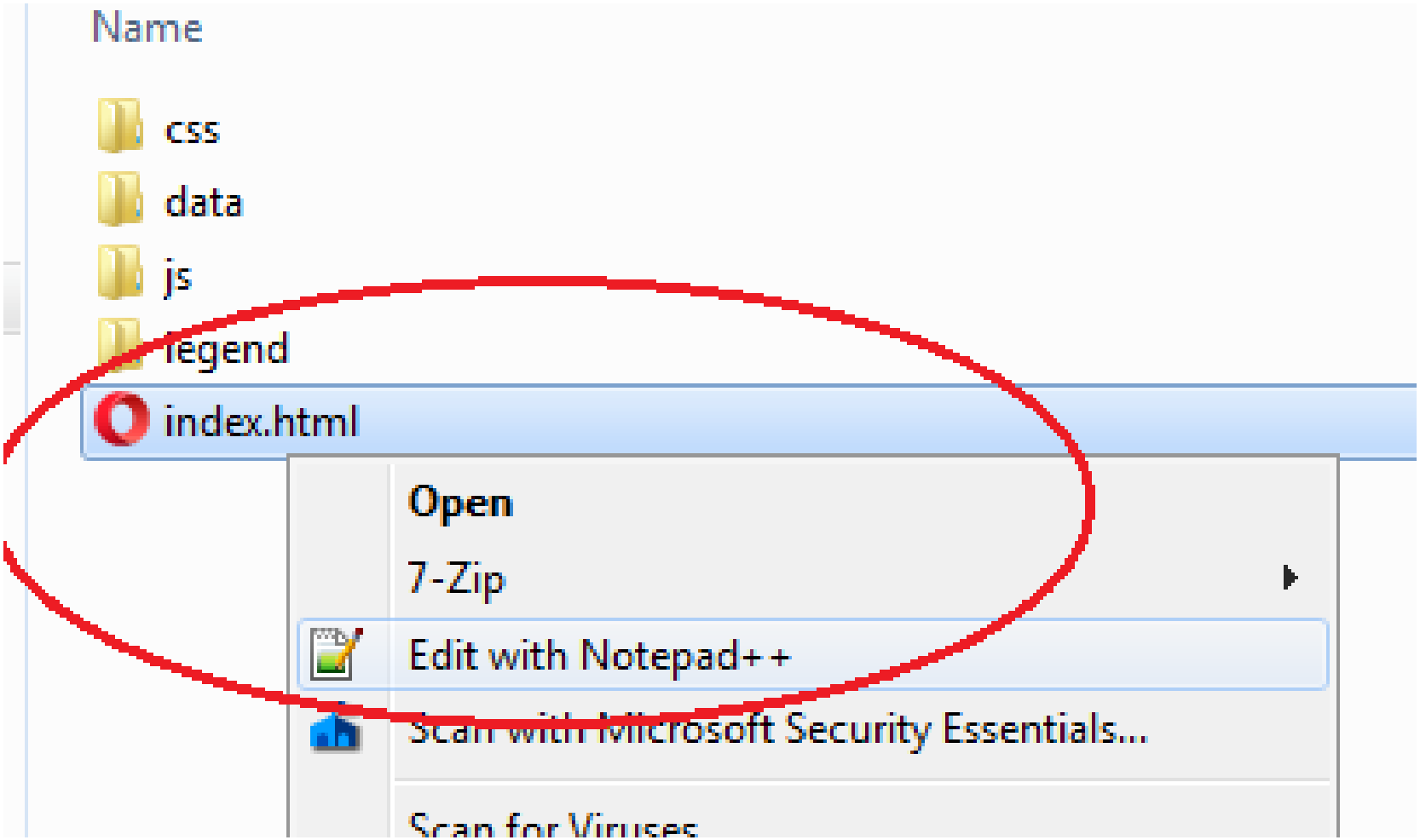


other files are:



…etc

use Notepad++ to open index.html



index.html open in Notepad++

File Edit Search View Encoding Language Settings Macro Run Plugins Window ?

index.html

```
1  <!DOCTYPE html>
2  <html>
3      <head>
4          <title>qgis2web Leaflet webmap</title>
5
6          <meta charset="utf-8" />
7          <link rel="stylesheet" href="css/leaflet.css" />
8          <link rel="stylesheet" href="css/MarkerCluster.css" />
9          <link rel="stylesheet" href="css/MarkerCluster.Default.css" />
10         <link rel="stylesheet" type="text/css" href="css/qgis2web.css">
11         <link rel="stylesheet" href="css/label.css" />
12         <link rel="stylesheet" href=http://k4r573n.github.io/leaflet-control-osm-geocoder/Control.OSMGeocoder.css" />
13         <script src="js/leaflet.js"></script>
14         <script src="js/leaflet-hash.js"></script>
15         <script src="js/label.js"></script>
16         <script src="js/Autolinker.min.js"></script>
17         <script src="http://k4r573n.github.io/leaflet-control-osm-geocoder/Control.OSMGeocoder.js"></script>
18         <script src="js/leaflet.markercluster.js"></script>
19         <meta name="viewport" content="initial-scale=1.0, user-scalable=no" />
20     </head>
21     <body>
22         <div id="map"></div>
23         <script src="data/json_MedianHouseholdIncome.js"></script>
24         <script src="data/json_2564yrswUniversityDegree.js"></script>
25         <script>
26         var map = L.map('map', {
27             zoomControl:true, maxZoom:19, minZoom:1
28         }).fitBounds([[48.3663750176,-123.674769418],[48.727702253,-122.769256988]]);
29         var hash = new L.Hash(map);
30         var additional_attrib = '<a href="https://github.com/tomchadwin/qgis2web" target ="_blank">qgis2web</a>';
```

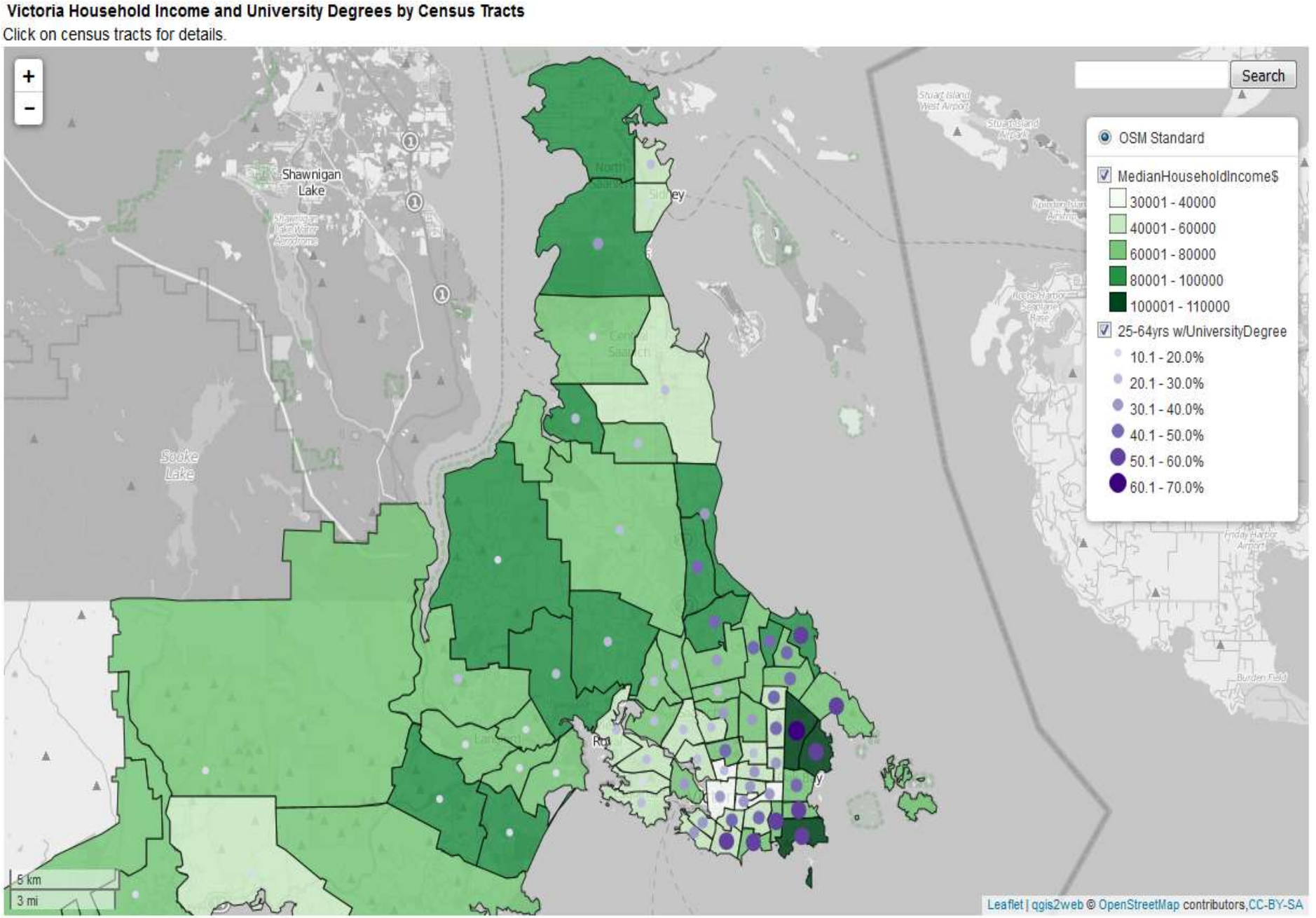
change locations of the files from

```
<meta charset="utf-8" />
<link rel="stylesheet" href="css/leaflet.css" />
<link rel="stylesheet" href="css/MarkerCluster.css" />
<link rel="stylesheet" href="css/MarkerCluster.Default.css" />
<link rel="stylesheet" type="text/css" href="css/qgis2web.css">
<link rel="stylesheet" href="css/label.css" />
<link rel="stylesheet" href=http://k4r573n.github.io/leaflet-control-osm-geocoder/Control.OSMGeocoder.css" />
<script src="js/leaflet.js"></script>
<script src="js/leaflet-hash.js"></script>
<script src="js/label.js"></script>
<script src="js/Autolinker.min.js"></script>
<script src="http://k4r573n.github.io/leaflet-control-osm-geocoder/Control.OSMGeocoder.js"></script>
<script src="js/leaflet.markercluster.js"></script>
<div id="map"></div>
<script src="data/json_MedianHouseholdIncome.js"></script>
<script src="data/json_2564yrswUniversityDegree.js"></script>
```

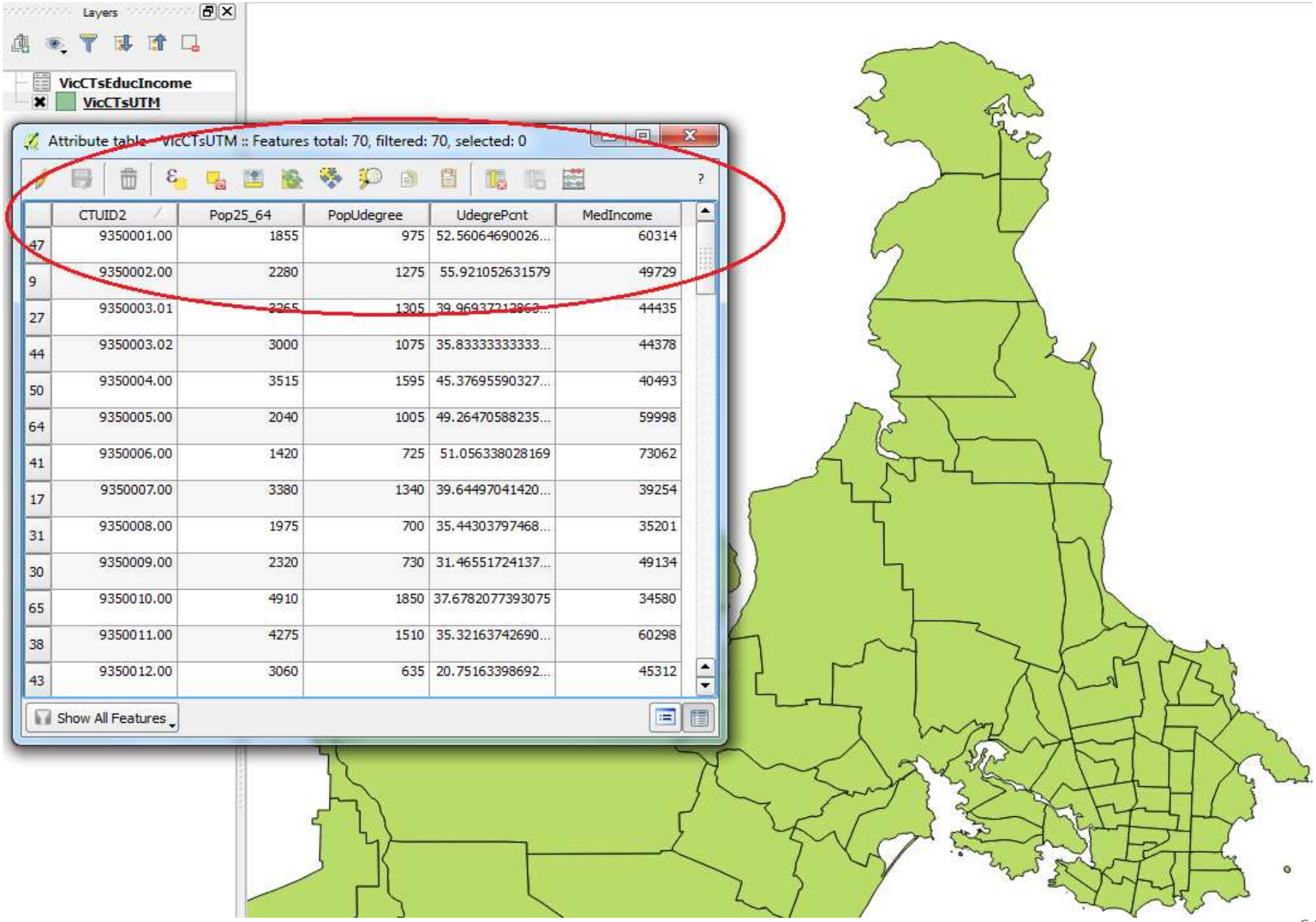
to

```
<meta charset="utf-8" />
<link rel="stylesheet" href="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/css/leaflet.css" />
<link rel="stylesheet" href="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/css/MarkerCluster.css" />
<link rel="stylesheet" href="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/css/MarkerCluster.Default.css" />
<link rel="stylesheet" type="text/css" href="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/css/qgis2web.css">
<link rel="stylesheet" href="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/css/label.css" />
<link rel="stylesheet" href=http://k4r573n.github.io/leaflet-control-osm-geocoder/Control.OSMGeocoder.css" />
<script src="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/js/leaflet.js"></script>
<script src="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/js/leaflet-hash.js"></script>
<script src="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/js/label.js"></script>
<script src="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/js/Autolinker.min.js"></script>
<script src="http://k4r573n.github.io/leaflet-control-osm-geocoder/Control.OSMGeocoder.js"></script>
<script src="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/js/leaflet.markercluster.js"></script>
<div id="map"></div>
<script src="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/data/json_MedianHouseholdIncome.js"></script>
<script src="http://maps.library.uvic.ca/Q2WebLflt/VicCTs/data/json_2564yrswUniversityDegree.js"></script>
```

voila…

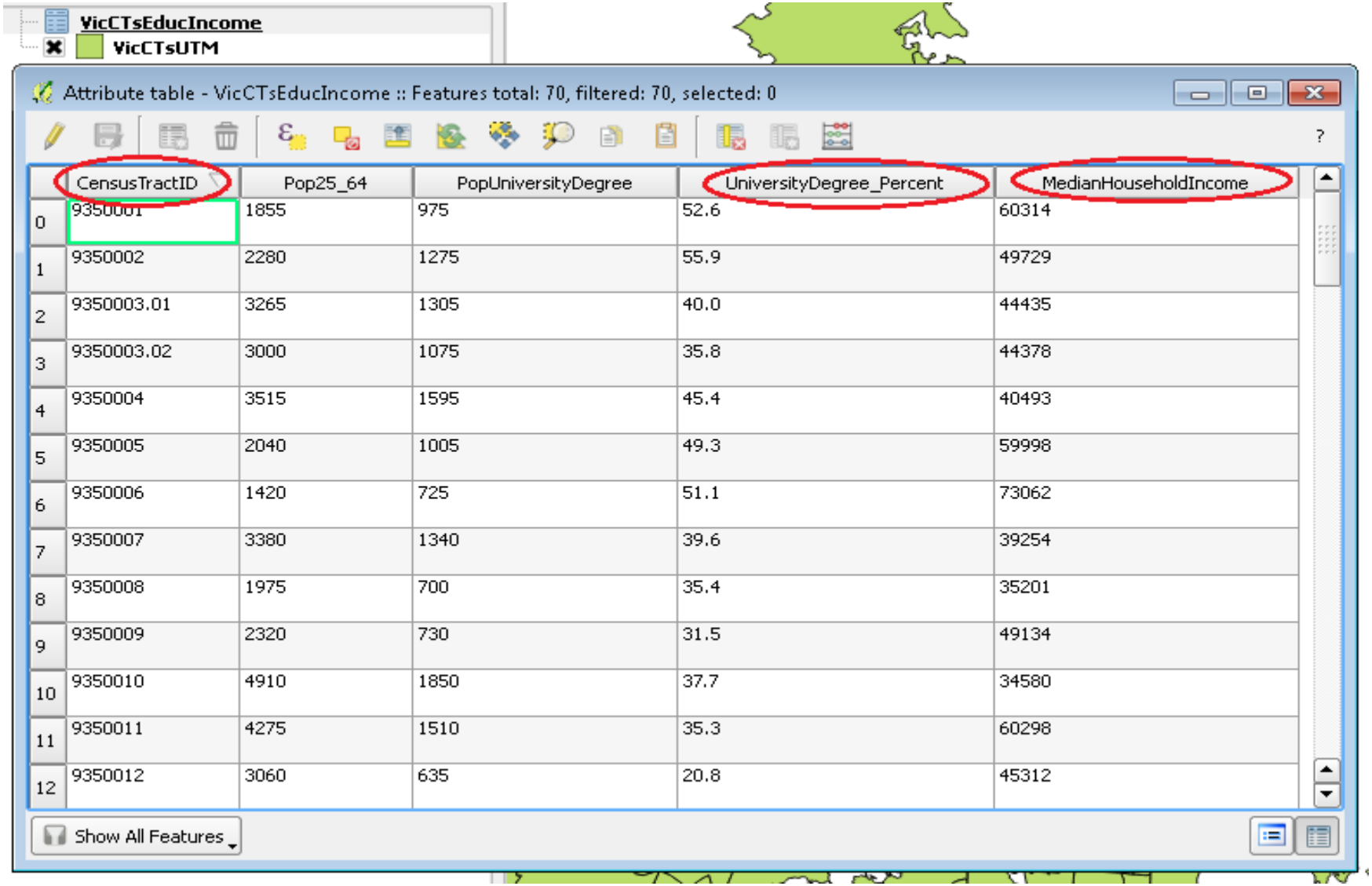

Victoria Household Income and University Degrees by Census Tracts
Click on census tracts for details.
Search
OSM Standard
MedianHouseholdIncome$
30001 - 40000
40001 - 60000
60001 - 80000
80001 - 100000
100001 - 110000
25-64yrs w/UniversityDegree
10.1 - 20.0%
20.1 - 30.0%
30.1 - 40.0%
40.1 - 50.0%
50.1 - 60.0%
60.1 - 70.0%
Shawnigan Lake
Sooke Lake
5 km
3 mi
Leaflet | qgis2web © OpenStreetMap contributors, CC-BY-SA

recall the .csv/.xls with awkward field titles joined to boundary file…



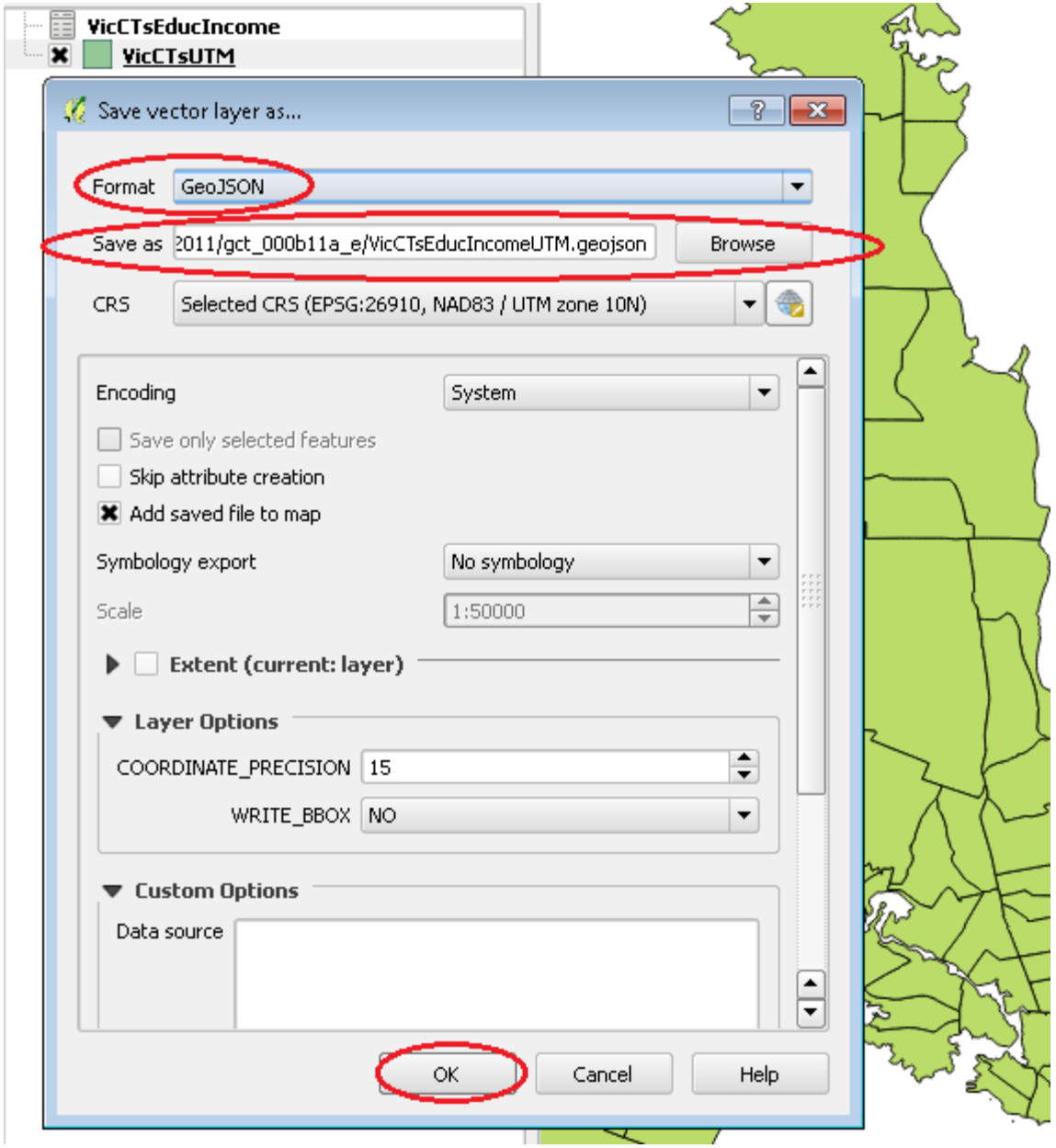
	CTUID2	Pop25_64	PopUdegree	UdegrePcnt	MedIncome
47	9350001.00	1855	975	52.56064690026...	60314
9	9350002.00	2280	1275	55.921052631579	49729
27	9350003.01	3265	1305	39.96937212863...	44435
44	9350003.02	3000	1075	35.83333333333...	44378
50	9350004.00	3515	1595	45.37695590327...	40493
64	9350005.00	2040	1005	49.26470588235...	59998
41	9350006.00	1420	725	51.056338028169	73062
17	9350007.00	3380	1340	39.64497041420...	39254
31	9350008.00	1975	700	35.44303797468...	35201
30	9350009.00	2320	730	31.46551724137...	49134
65	9350010.00	4910	1850	37.6782077393075	34580
38	9350011.00	4275	1510	35.32163742690...	60298
43	9350012.00	3060	635	20.75163398692...	45312

and .xlsx with “full public” column titles…



	CensusTractID	Pop25_64	PopUniversityDegree	UniversityDegree_Percent	MedianHouseholdIncome
0	9350001	1855	975	52.6	60314
1	9350002	2280	1275	55.9	49729
2	9350003.01	3265	1305	40.0	44435
3	9350003.02	3000	1075	35.8	44378
4	9350004	3515	1595	45.4	40493
5	9350005	2040	1005	49.3	59998
6	9350006	1420	725	51.1	73062
7	9350007	3380	1340	39.6	39254
8	9350008	1975	700	35.4	35201
9	9350009	2320	730	31.5	49134
10	9350010	4910	1850	37.7	34580
11	9350011	4275	1510	35.3	60298
12	9350012	3060	635	20.8	45312

and saved as GeoJson…well…



make changes in the code…

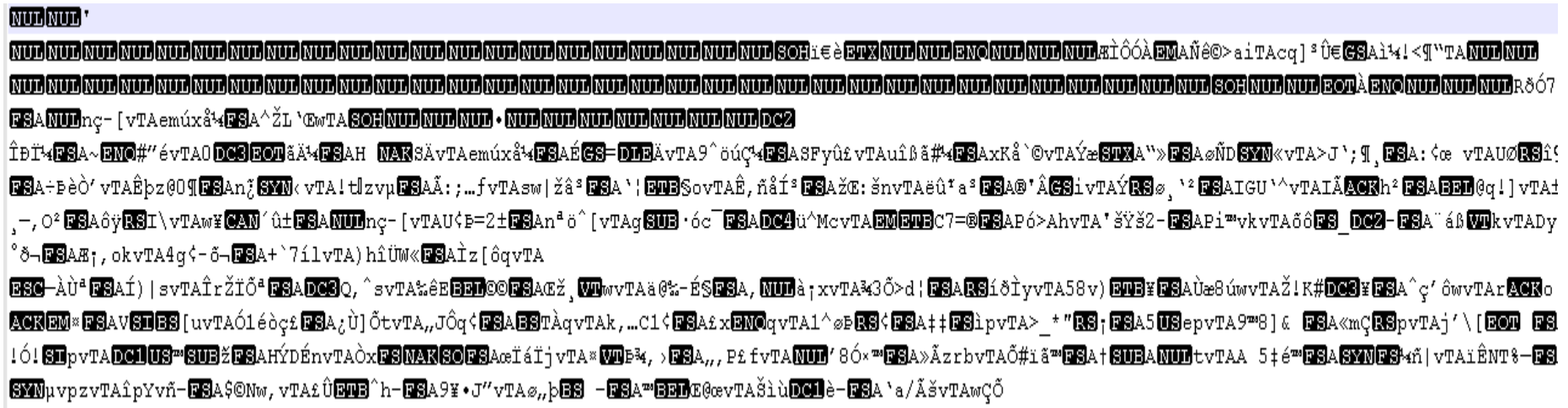
- **change pop-up field titles to friendly terms**

```
var popupContent = '<table><tr><th scope="row">MedianHouseholdIncome$</th><td>' + Autolinker.link(String(feature.properties['MedianIncome'])) + '</td></tr><tr><th scope="row">CensusTractID</th><td>' + Autolinker.link(String(feature.properties['CTUID2'])) + '</td></tr></table>';
layer.bindPopup(popupContent);
```

- **change legend terms**

```
L.control.layers(baseMaps,{'25-64yrs w/UniversityDegree<br />     <img src="
http://maps.library.uvic.ca/Q2WebLflt/VicCTs/legend/2564yrswUniversityDegree_107200.png" />  10.1 - 20.0%<br
/>     <img src="
http://maps.library.uvic.ca/Q2WebLflt/VicCTs/legend/2564yrswUniversityDegree_201300.png" />  20.1 - 30.0%<br
/>     <img src="
http://maps.library.uvic.ca/Q2WebLflt/VicCTs/legend/2564yrswUniversityDegree_301400.png" />  30.1 - 40.0%<br
/>     <img src="
http://maps.library.uvic.ca/Q2WebLflt/VicCTs/legend/2564yrswUniversityDegree_401500.png" />  40.1 - 50.0%<br
/>     <img src="
http://maps.library.uvic.ca/Q2WebLflt/VicCTs/legend/2564yrswUniversityDegree_501600.png" />  50.1 - 60.0%<br
/>     <img src="
http://maps.library.uvic.ca/Q2WebLflt/VicCTs/legend/2564yrswUniversityDegree_601614.png" />  60.1 - 70.0%<br />':
json_2564yrswUniversityDegreeJSON,'MedianHouseholdIncome$<br />     <img src="
http://maps.library.uvic.ca/Q2WebLflt/VicCTs/legend/MedianHouseholdIncome_3458040000.png" />  30001 - 40000 <br
/>     <img src="
http://maps.library.uvic.ca/Q2WebLflt/VicCTs/legend/MedianHouseholdIncome_4000060000.png" />  40001 - 60000 <br
/>     <img src="
http://maps.library.uvic.ca/Q2WebLflt/VicCTs/legend/MedianHouseholdIncome_6000080000.png" />  60001 - 80000 <br
/>     <img src="
http://maps.library.uvic.ca/Q2WebLflt/VicCTs/legend/MedianHouseholdIncome_80000100000.png" />  80001 - 100000 <br
/>     <img src="
http://maps.library.uvic.ca/Q2WebLflt/VicCTs/legend/MedianHouseholdIncome_100000105151.png" />  100001 - 110000 <br />':
json_MedianHouseholdIncomeJSON},{collapsed:false}).addTo(map);
```

remember GeoJson(s)? .shp versus…



GeoJson (!)

```
var json_MedianHouseholdIncome={"type":"FeatureCollection","crs":{"type":"name","properties":{"name":"urn:ogc:def:crs:OGC:1.3:CRS84"}},
"features":[{"type":"Feature","properties":{"MedianIncome":47096.000000,"CTUID2":9350111.010000},"geometry":{"type":"MultiPolygon",
"coordinates":[[[[-123.394283,48.434287],[-123.39431,48.432946],[-123.3942,48.432937],[-123.394291,48.431782],[-123.394847,48.431975],[-
123.395336,48.432034],[-123.39781,48.431649],[-123.399348,48.431147],[-123.399987,48.430867],[-123.400613,48.430592],[-123.401972,48.429873
],[-123.402042,48.429835],[-123.402406,48.429636],[-123.403106,48.429254],[-123.403246,48.429202],[-123.403329,48.429171],[-123.403612,
48.42913],[-123.404293,48.429141],[-123.405857,48.429415],[-123.406855,48.429589],[-123.407757,48.429701],[-123.407866,48.429686],[-
123.40798,48.4297],[-123.407963,48.429753],[-123.409363,48.429929],[-123.40979,48.429983],[-123.409803,48.429985],[-123.410821,48.430107],[-
123.412441,48.430159],[-123.413649,48.430196],[-123.414774,48.430127],[-123.414788,48.430126],[-123.415633,48.430029],[-123.415798,48.43001
],[-123.416958,48.429895],[-123.41728,48.429886],[-123.417342,48.429864],[-123.418209,48.429841],[-123.419046,48.429829],[-123.419161,
48.429826],[-123.420392,48.429776],[-123.421722,48.429628],[-123.423057,48.429473],[-123.424499,48.429316],[-123.424464,48.429948],[-
123.424447,48.43027],[-123.426839,48.430171],[-123.427017,48.430459],[-123.427485,48.431099],[-123.4273,48.431386],[-123.427056,48.431334
],[-123.426909,48.431523],[-123.426572,48.431614],[-123.426306,48.431956],[-123.426416,48.432208],[-123.426092,48.432479],[-123.425188,
48.432681],[-123.42529,48.432796],[-123.425172,48.432899],[-123.426397,48.433679],[-123.426644,48.433836],[-123.426518,48.433934],[-
123.425972,48.43359],[-123.424997,48.432974],[-123.424774,48.433054],[-123.424471,48.432762],[-123.42442,48.43278],[-123.424284,48.432828
],[-123.425376,48.434011],[-123.42399,48.433279],[-123.423883,48.433352],[-123.423475,48.433137],[-123.423596,48.433047],[-123.423336,
48.43257],[-123.422836,48.432662],[-123.42239,48.43261],[-123.4222,48.432476],[-123.422171,48.432251],[-123.422021,48.432188],[-123.421144,
48.432453],[-123.420415,48.432573],[-123.42025,48.433805],[-123.420346,48.433931],[-123.420874,48.433983],[-123.421481,48.433873],[-
123.422158,48.433916],[-123.422579,48.434121],[-123.423268,48.434253],[-123.42342,48.434495],[-123.42392,48.434701],[-123.423991,48.434898
],[-123.42387,48.435088],[-123.42352,48.435161],[-123.423422,48.434954],[-123.423328,48.434945],[-123.422859,48.435326],[-123.422888,
```

How?

- **html5**

- **css**

  Link to .css from the web:

  <link rel="stylesheet" href = "http://cdn.leafletjs.com/leaflet-0.7.3/leaflet.css"/>

  OR

  Download to some computer directory and link:

  <link rel="stylesheet" href = "SomeLocalComputer/C_drive/leaflet-0.7.3/leaflet.css"/>

- **javascript**

  Link to .js from the web:

  <script src = "http://leafletjs.com/dist/leaflet.js"></script>

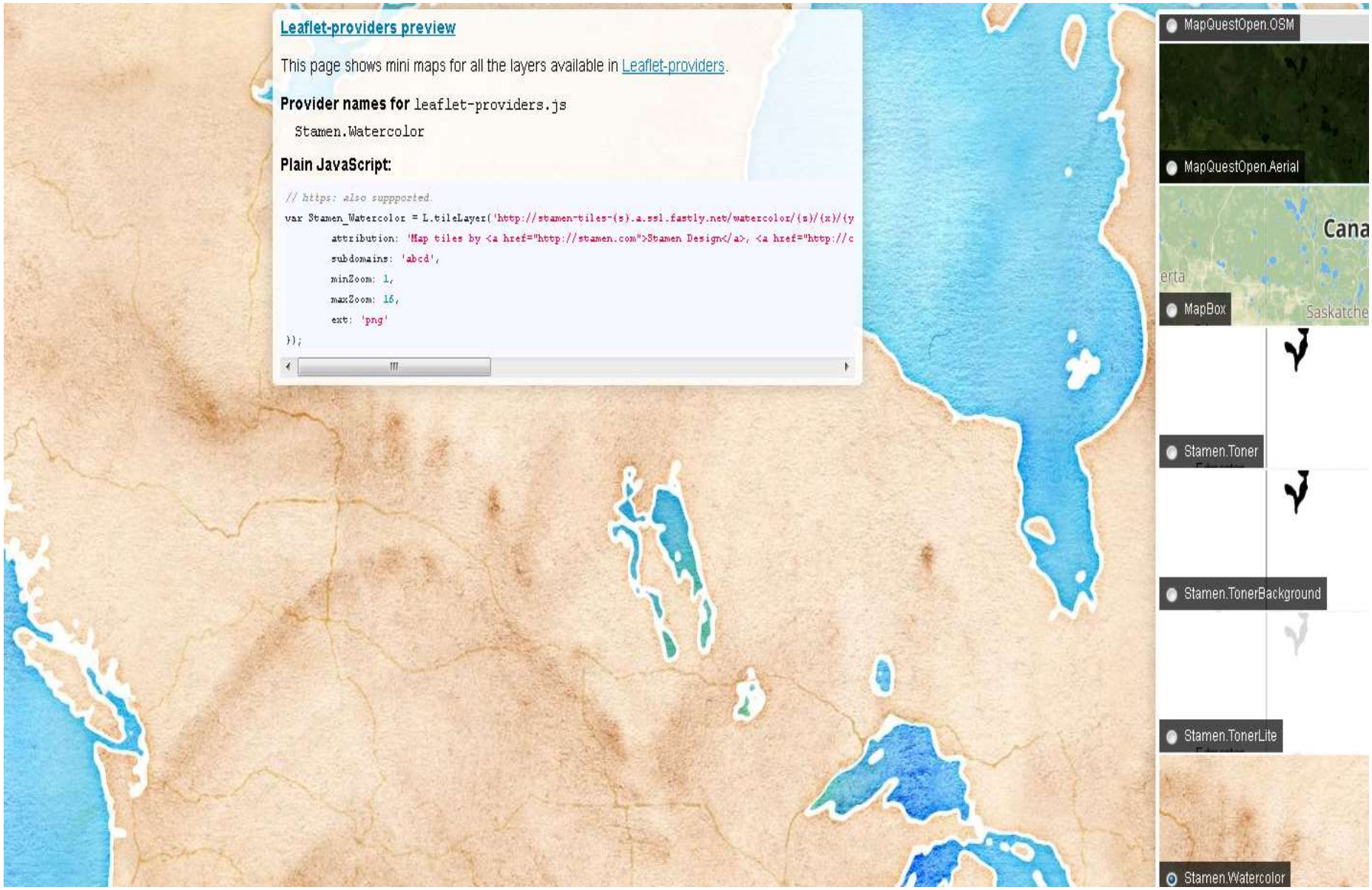
  <script src = "https://api.tiles.mapbox.com/mapbox.js/v2.1.6/mapbox.js" ></script>

OR

  Download to some computer directory and link:

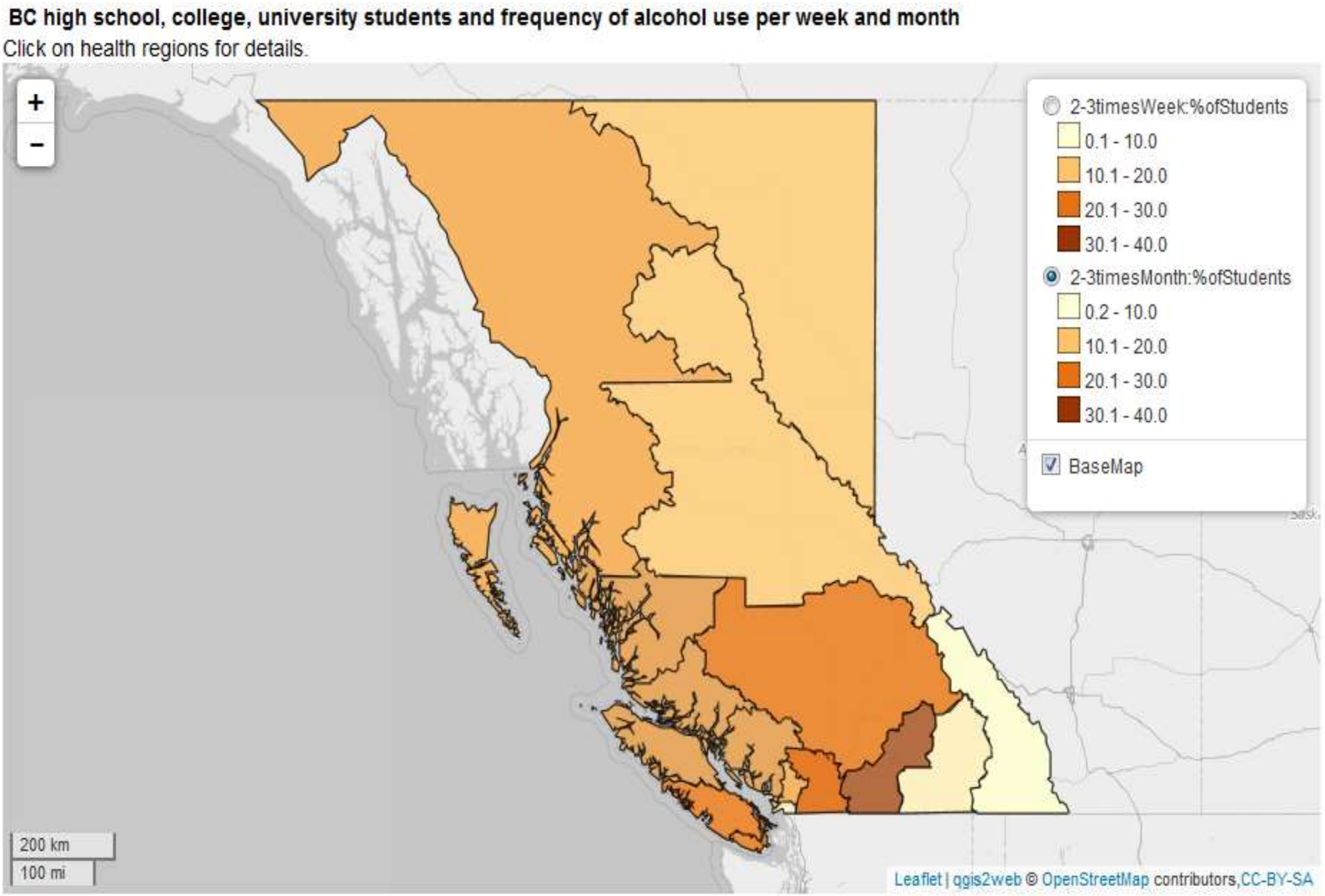
  <script src = "SomeLocalComputer/C_drive/Folder/leaflet.js"></script>

30+ Basemap(s)

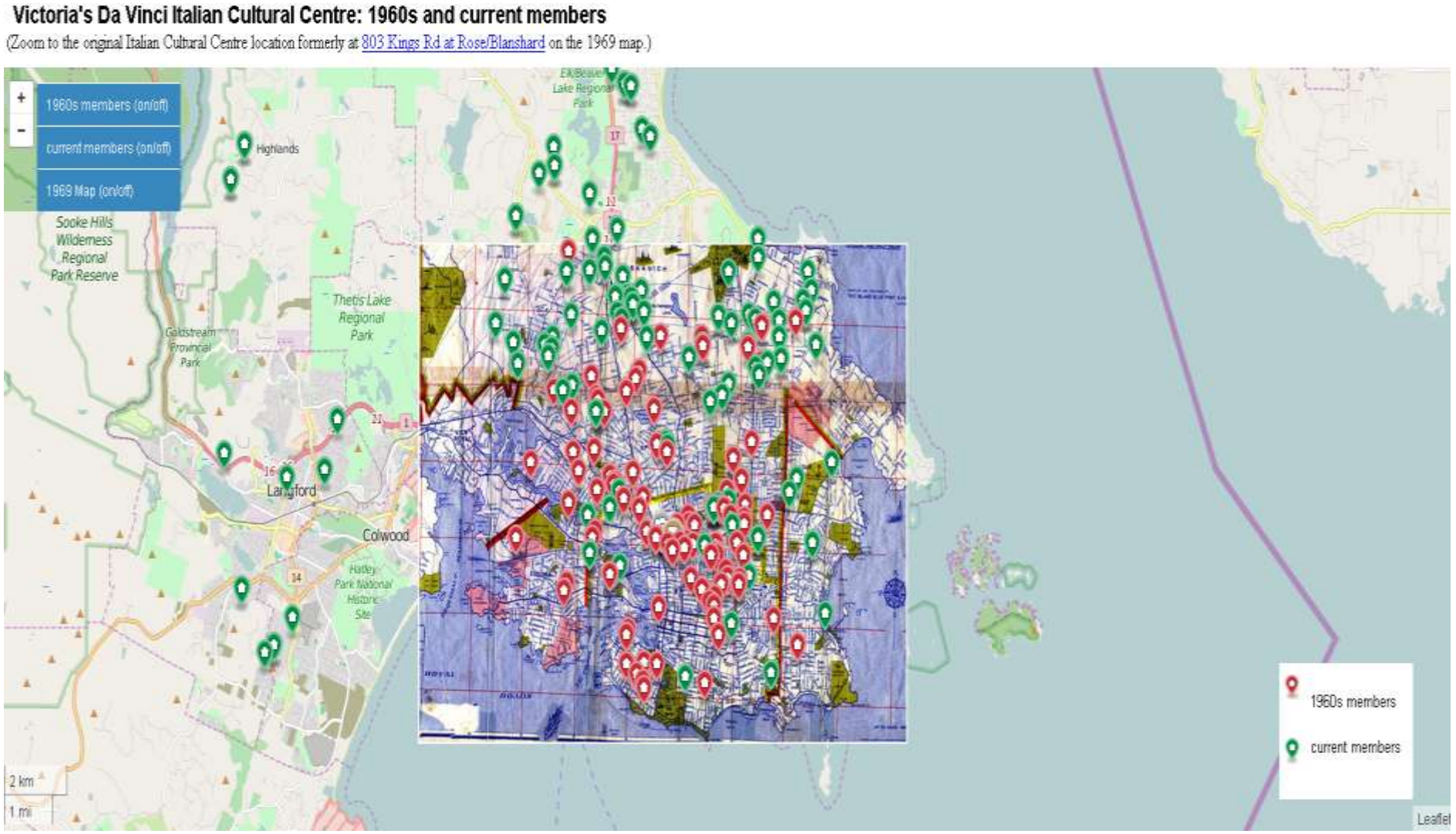


var Stamen_Watercolor = L.tileLayer('http://stamen-tiles-{s}.a.ssl.fastly.net/watercolor/{z}/{x}/{y}.{ext}',
{ attribution: 'Map tiles by Stamen Design, CC BY 3.0 — Map data © OpenStreetMap'

other changes and maps possible with some code…



other changes and maps possible with some code…



Considerations

- **utilize (open-source) JavaScript libraries to create web maps with custom features**

(OR

- **utilize web map providers with standard features)**

- **host and serve our maps ourselves**

OR

- **upload “our” maps to US server or cloud**

- **need to build for mouse and touch screens**

Data Libraries have amazing resources…

- **Can web maps highlight our data collections?**

- **Web maps: “hot like chicken s**t”**

- **Web maps: necessary geovisualisations in today’s digital world?**