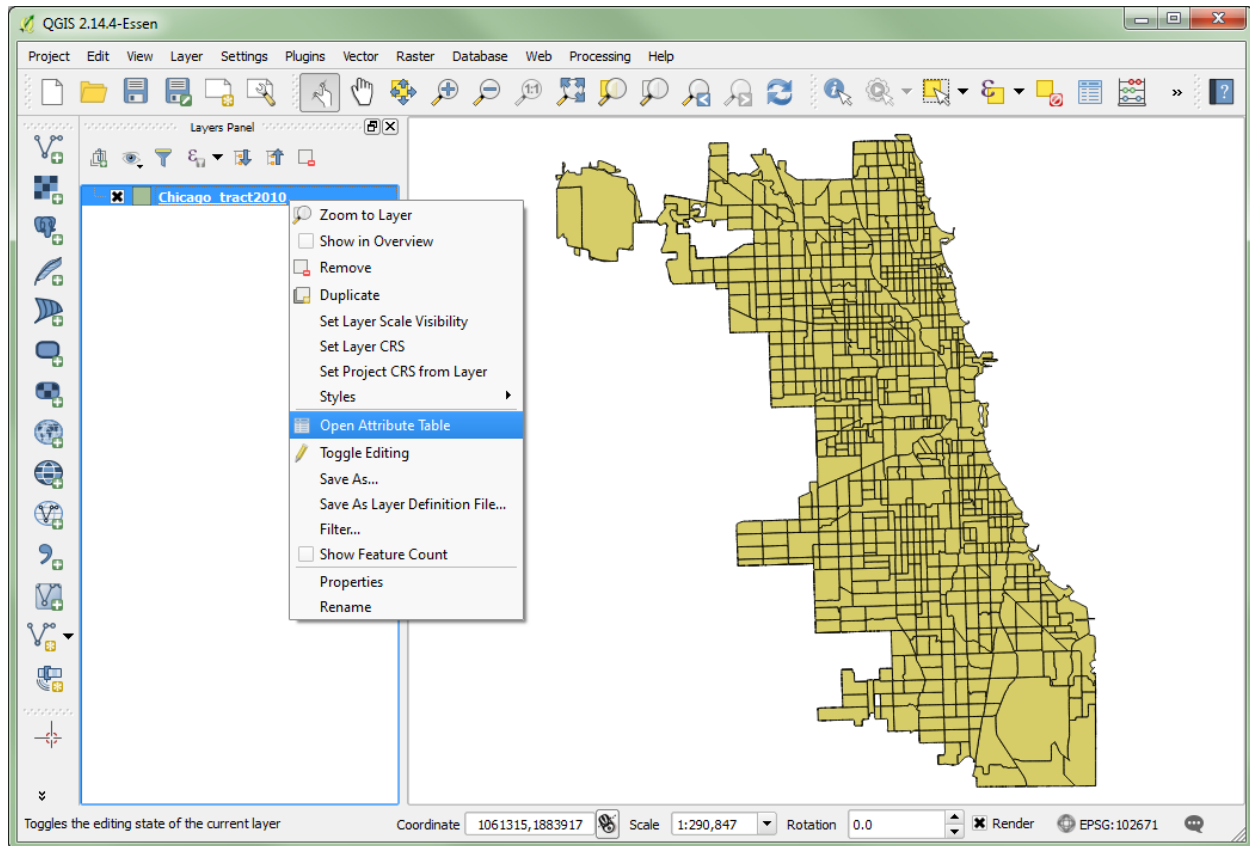



## Use QGIS Field Calculator: Calculate Polygon Area

- Open **QGIS Desktop** and **Add the Vector Layer**
- In the Layers Panel, right-click on the layer and select **Open Attribute Table**.



- In the Attribute Table dialog window, click on the **Toggle editing mode** button  (see image below). The editing mode will allow you to make changes to the attribute table, such as *creating a new column* or *deleting an existing column*.

Attribute table - CensusTract2010 :: Features total: 874, filtered: 874, selected: 0

Toggle editing mode (Ctrl+E)

			Asian	White	Black	American_I	Other	Med_Income
0	0.00062340679	2999	123	1863	36	22	955	60793
1	0.00001792824	2382	61	1643	71	36	571	34867
2	0.00009009214	3950	706	1710	104	46	1384	40197
3	0.00009009521	2338	1359	651	55	11	262	58415
4	0.00012394646	7254	6447	401	260	0	146	22000
5	0.00006780896	5262	17	2340	242	83	2580	37363
6	0.00012553640	1578	405	729	219	8	217	73325
7	0.00010672509	5711	27	3583	79	57	1965	56339
8	0.00017227144	5345	4	25	5231	4	81	60135
9	0.00014018006	5402	3	26	5257	17	99	38327
10	0.00008252654	6236	384	5323	169	15	345	40722
11	0.00057101983	3109	0	4	3076	3	26	14030
12	0.00041168702	3373	2	59	3200	4	108	14913
13	0.00005753634	5060	4	13	4964	14	65	26596
14	0.00005600957	7311	1052	4989	905	10	355	73423
15	0.00005182088	2278	660	1362	124	4	128	56058
16	0.00004352187	2212	549	1471	100	4	88	39300
17	0.00005833402	2561	110	454	1830	12	155	21979
18	0.00008916859	1713	377	412	850	5	69	28587
19	0.00010002183	6895	730	4751	1121	10	283	104930
20	0.00012864809	4350	712	2737	607	13	281	73425
21	0.00001623270	4012	424	2179	1050	16	343	32636
22	0.00002018054	2976	569	1592	602	8	205	42810

Show All Features

- Then click on the **Open field calculator** button .

Attribute table - CensusTract2010 :: Features total: 874, filtered: 874, selected: 0

Open field calculator (Ctrl+I)

	Shape_Area	POP10	Asian	White	Black	American_I	Other	Med_Income
0	0.00062340679	2999	123	1863	36	22	955	60793
1	0.00001792824	2382	61	1643	71	36	571	34867
2	0.00009009214	3950	706	1710	104	46	1384	40197
3	0.00009009521	2338	1359	651	55	11	262	58415
4	0.00012394646	7254	6447	401	260	0	146	22000
5	0.00006780896	5262	17	2340	242	83	2580	37363
6	0.00012553640	1578	405	729	219	8	217	73325
7	0.00010672509	5711	27	3583	79	57	1965	56339
8	0.00017227144	5345	4	25	5231	4	81	60135
9	0.00014018006	5402	3	26	5257	17	99	38327
10	0.00008252654	6236	384	5323	169	15	345	40722
11	0.00057101983	3109	0	4	3076	3	26	14030
12	0.00041168702	3373	2	59	3200	4	108	14913
13	0.00005753634	5060	4	13	4964	14	65	26596
14	0.00005600957	7311	1052	4989	905	10	355	73423
15	0.00005182088	2278	660	1362	124	4	128	56058
16	0.00004352187	2212	549	1471	100	4	88	39300
17	0.00005833402	2561	110	454	1830	12	155	21979
18	0.00008916859	1713	377	412	850	5	69	28587
19	0.00010002183	6895	730	4751	1121	10	283	104930
20	0.00012864809	4350	712	2737	607	13	281	73425
21	0.00001623270	4012	424	2179	1050	16	343	32636
22	0.00002018054	2976	569	1592	602	8	205	42810

Show All Features

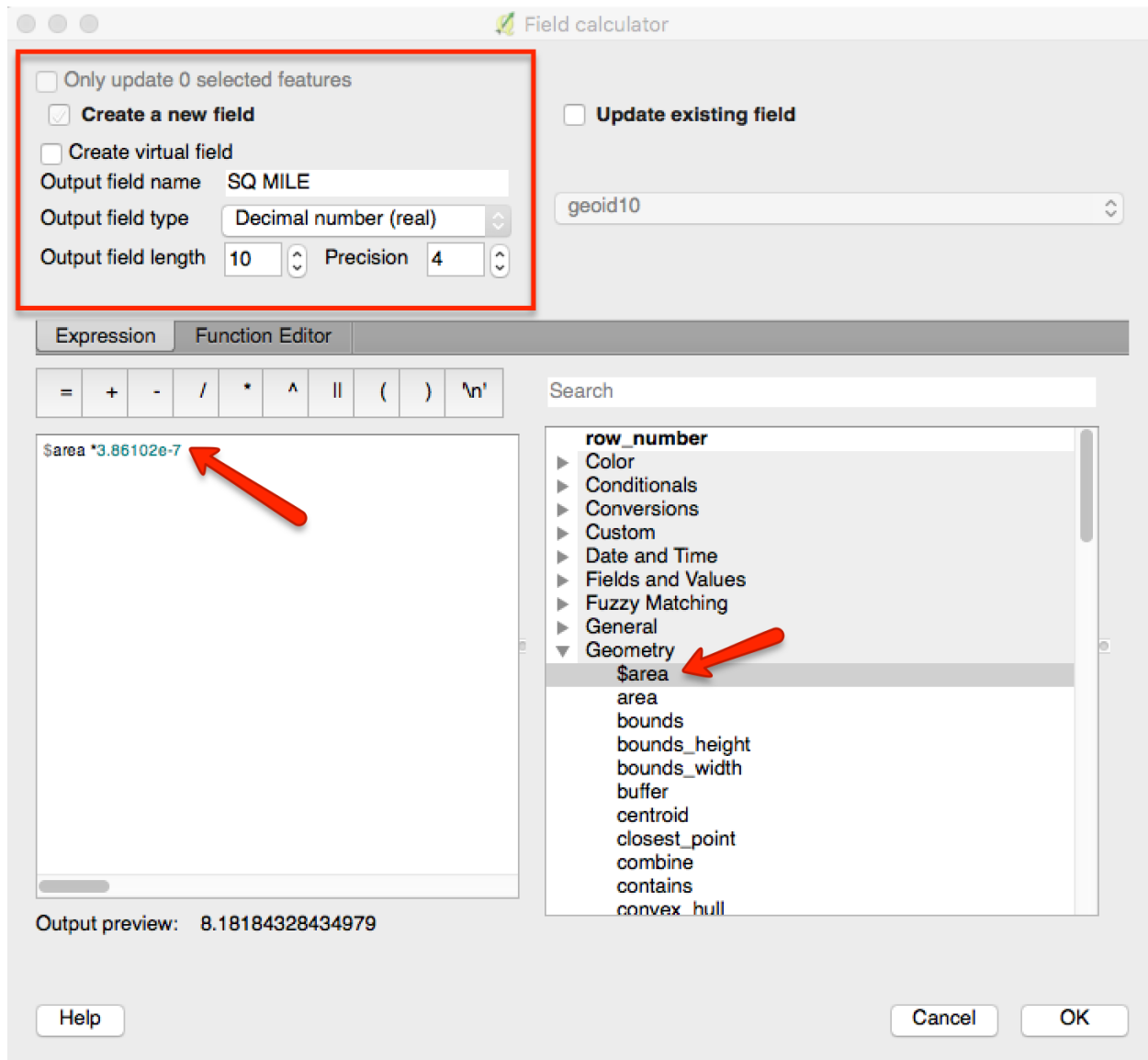
- Now, we are about to create a new field to calculate polygon areas in **square miles**.
  - Before doing this in QGIS, we need to figure out the formula to be used.
  - First, check the map unit is in feet under **Project Properties > General**
  - The default area measurement unit is shown under **Measurements**. The Chicago layer is in **square meters**.
  - To get square miles instead, I looked up the formula on Google:


Google search results for "sq meter sq mile". The search bar shows "sq meter sq mile" and the results indicate "About 13,000,000 results (0.64 seconds)".

The search results display a conversion tool for area. It shows a dropdown menu for "Area" with a value of "1" and a unit of "Square meter". This is equal to a value of "3.86102e-7" with a unit of "Square mile".

Below the conversion tool, a "Formula" section indicates: "divide the area value by 2.59e+6".

- This basically tells us that we could calculate square mile by **multiplying the square meters values by 3.86102e-7**
- In the Field calculator window, make the following changes:
  - Check the box next to **Create a new field** (we will create a new field to hold the area values)
  - Set the Output field name as **SQ MILE** (this is the name of the new field)
  - Set the Output field type as **Decimal number (real)** (the data type of the new field)
  - Set Output field width as **10 (total number of digits)**, **Precision as 4 (number of decimal places)**
  - Enter the Expression to calculate "**\$area \* 3.86102e-7**". You may double-click the \$area function from the **Geometry** section to add it. And you may complete the rest of the expression using your keyboard.
  - Click **OK** to calculate the polygon area in square miles.




- Be sure to save your changes by clicking on the **Save Edits** button .

Attribute table - ChicagoTracts2014 :: Features total: 801, filtered: 801, selected: 0

abc geoid10 =  Update All Update Selected

	total14	white	black	asian	mixed	other	med_income	Shape_Leng	Shape_Area	SQ MILE
0	3374	0	3374	0	0	0	35349	22777.47738...	21190885.52...	0.7601
1	4147	1885	108	828	193	1133	44554	16035.05499...	8947393.972...	0.3209
2	7622	358	302	6691	271	0	25292	15186.40024...	12306142.70...	0.4414
3	5685	2900	285	22	69	2409	31834	10472.23035...	6731931.228...	0.2415
4	1866	1019	448	293	57	49	47969	14719.44311...	12460159.24...	0.4469
5	5744	2935	2	99	191	2517	58485	13299.91218...	10608487.10...	0.3805
6	5147	68	5029	37	13	0	42355	19495.54978...	17631568.81...	0.6324
7	7343	5706	61	779	420	377	41132	17734.07520...	8184308.759...	0.2936
8	3268	74	3101	0	8	85	14932	39870.37023...	57013406.17...	2.0451
9	3922	72	3832	0	2	16	14005	34175.10771...	41617739.57...	1.4928
10	5343	28	5269	0	30	16	35861	11315.71668...	5721620.164...	0.2052
11	7868	4973	1086	1418	340	51	80091	9507.294470...	5559251.675...	0.1994
12	3538	2358	747	346	57	30	36413	8565.692847...	2721569.766...	0.0976
13	2961	1578	664	647	57	15	38300	7599.279582...	3054322.040...	0.1096
14	4512	2679	221	682	348	582	56027	10626.94529...	7060696.143...	0.2533
15	1772	579	966	6	8	213	36083	10983.12793...	6288924.120...	0.2256
16	3533	3103	109	310	11	0	77172	5161.796830...	1671998.046...	0.0600

Show All Features

- Then click on the **Toggle editing mode** button  again to exit the editing mode. Then close the attribute table.