

COUNTRY EXPOSURE MODEL

Review main statistic of a exposure model and create summaries for a given Country.

/home/risk/venvs/py38w/lib/python3.8/site-packages/geopandas/_compat.py:111: UserWarning: The Shapely GEOS version (3.9.1-CAPI-1.14.2) is incompatible with the GEOS version PyGEOS was compiled with (3.10.0-CAPI-1.16.0). Conversions between both will be slow.
warnings.warn(

Parameters

country = "Canada"

Exposure files:
Exposure_Com_Canada.csv
Exposure_Ind_Canada.csv
Exposure_Res_Canada.csv

Sanity checks and formats

Canada

.../Exposure/North_America/Exposure_Com_Canada.csv
.../Exposure/North_America/Exposure_Ind_Canada.csv
.../Exposure/North_America/Exposure_Res_Canada.csv
Not possible to check if No_dwellings >= No_buildings.
Missing column 'Dwellings' in DataFrame
Occupants / Buildings = 3.9
WARNING - Check avg household size:
UN 2019 avg household = 2.45
PRB 2019 avg household = 2.5
Population (exposure / UN_2021) = 0.92
Exposure models OK

Exposure at National level

Summary by occupancy type

	Occupants	Buildings	Cost_USD	Buildings_%	Cost_USD_%
Occupancy					
Res	34,898,777	8,871.9K	\$3,958.8B	92.50%	63.56%
Ind	1,273	85.5K	\$315.5B	0.89%	5.07%
Com	134,474	634.1K	\$1,954.4B	6.61%	31.38%

Other metrics to consider

	Area_sqm	Cost_Building_USD	Cost_Per_Capita	Avg_Building_Area_sqm	Avg_Cost_Per_Building_USD
Occupancy					
Total	3,485.5M	\$5,329.1B	\$178.5K	363	
Res	2,561.8M	\$3,639.2B	\$113.4K	289	
Ind	114.7M	\$233.6B	\$9.0K	1,341	
Com	809.1M	\$1,456.3B	\$56.0K	1,276	

Exposure summary at Admin level 1

	Cost_USD	Buildings	Occupants	Cost_USD_%	Buildings_%	Occupants_%
Name_1						
Ontario	\$2,196,317.9M	3,458.5K	13,428.2K	35.26%	36.06%	38.33%
Quebec	\$1,385,888.7M	2,115.9K	8,144.1K	22.25%	22.06%	23.25%
British Columbia	\$1,076,204.8M	1,186.5K	4,628.1K	17.28%	12.37%	13.21%
Alberta	\$720,127.6M	1,187.1K	4,052.8K	11.56%	12.38%	11.57%
Saskatchewan	\$264,183.4M	389.3K	1,086.8K	4.24%	4.06%	3.10%
Manitoba	\$211,341.7M	387.8K	1,267.3K	3.39%	4.04%	3.62%
Nova Scotia	\$138,817.3M	322.0K	919.4K	2.23%	3.36%	2.62%
New Brunswick	\$113,437.9M	272.2K	745.2K	1.82%	2.84%	2.13%
Newfoundland and Labrador	\$76,666.3M	191.5K	513.9K	1.23%	2.00%	1.47%
Prince Edward Island	\$23,292.1M	50.5K	138.3K	0.37%	0.53%	0.39%
Northwest Territories	\$9,708.5M	11.3K	40.8K	0.16%	0.12%	0.12%
Yukon	\$8,873.2M	12.9K	35.5K	0.14%	0.13%	0.10%
Nunavut	\$3,850.4M	6.1K	34.0K	0.06%	0.06%	0.10%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

	Cost_USD	Buildings	Occupants	Cost_USD_%	Buildings_%	Occupants_%
Macro_Taxo						
OT	\$6,228.7B	9.6M	35.0M	100.00%	100.00%	100.00%

Exposure by taxonomy

Showing only taxonomies that represent 90% of the total `Cost_USD`

OT	PC	\$117,852.5M	404,135	2.10%	4.53%
	COM4-W3-PC	\$99,778.9M	27,340	1.78%	0.29%
	RES1-W4-LC	\$98,009.9M	340,307	1.75%	3.64%
	RES3F-W2-LC	\$93,195.6M	4,768	1.66%	0.05%
	RES3D-W2-PC	\$91,680.7M	39,082	1.64%	0.42%
	COM4-URML-PC	\$88,019.9M	22,757	1.57%	0.24%
	RES3E-W2-PC	\$86,660.4M	15,687	1.55%	0.17%
	COM4-S5L-PC	\$76,494.3M	21,619	1.36%	0.23%
	COM4-URMM-PC	\$72,351.5M	8,039	1.29%	0.09%
	RES3A-W1-MC	\$62,798.1M	96,604	1.12%	1.03%
	RES3D-W2-LC	\$51,153.1M	22,080	0.91%	0.24%
	COM4-RM1L-LC	\$48,052.3M	13,412	0.86%	0.14%
	RES3F-C2H-PC	\$47,998.6M	2,397	0.86%	0.03%
	RES3A-W4-PC	\$46,607.4M	85,063	0.83%	0.91%
	RES3D-W4-PC	\$44,307.2M	18,865	0.79%	0.20%
	COM4-C2H-LC	\$40,025.3M	525	0.71%	0.01%
	RES3F-W2-MC	\$38,127.1M	1,747	0.68%	0.02%
	COM4-C1L-PC	\$37,259.2M	9,734	0.66%	0.10%
	RES3E-W2-LC	\$37,207.1M	6,773	0.66%	0.07%
	COM1-RM1L-PC	\$34,680.5M	22,981	0.62%	0.25%
	RES4-W3-PC	\$34,648.2M	5,260	0.62%	0.06%
	RES3F-URMM-PC	\$34,595.4M	1,761	0.62%	0.02%
	COM4-S4L-PC	\$34,319.5M	9,132	0.61%	0.10%
	COM4-S1L-PC	\$32,254.3M	8,644	0.58%	0.09%
	COM4-PC1-PC	\$29,120.1M	7,859	0.52%	0.08%
	RES1-W1-HC	\$28,946.6M	76,711	0.52%	0.82%
	RES1-W4-MC	\$28,487.1M	89,244	0.51%	0.96%
	COM4-S2L-PC	\$28,225.6M	7,575	0.50%	0.08%
	COM4-S2H-PC	\$27,597.8M	375	0.49%	0.00%
	COM4-W3-LC	\$27,419.9M	7,406	0.49%	0.08%
	IND1-C2L-PC	\$26,918.0M	4,353	0.48%	0.05%
	COM4-C2H-MC	\$26,205.2M	324	0.47%	0.00%
	COM4-C2L-PC	\$26,053.4M	6,870	0.46%	0.07%
	IND1-W3-PC	\$25,523.0M	4,318	0.46%	0.05%
	IND1-RM1L-PC	\$23,455.1M	3,729	0.42%	0.04%
	RES3D-W2-MC	\$23,161.8M	8,644	0.41%	0.09%
	COM3-URML-PC	\$21,229.8M	37,611	0.38%	0.40%
	RES3B-URML-PC	\$21,201.3M	21,694	0.38%	0.23%
	COM2-S1L-PC	\$20,622.1M	8,725	0.37%	0.09%
	IND1-URML-PC	\$20,133.8M	3,179	0.36%	0.03%
	RES2-MH-PC	\$19,767.5M	126,739	0.35%	1.36%
	COM3-C3L-PC	\$19,762.1M	36,795	0.35%	0.39%
	RES3E-W4-PC	\$19,555.9M	3,524	0.35%	0.04%
	COM1-URML-PC	\$19,403.4M	12,642	0.35%	0.14%
	COM1-W3-PC	\$18,891.1M	12,140	0.34%	0.13%
	RES3A-URML-PC	\$18,463.0M	34,643	0.33%	0.37%
	COM4-RM1L-MC	\$17,773.3M	4,518	0.32%	0.05%
	COM4-C3L-PC	\$17,480.8M	4,649	0.31%	0.05%
	RES3E-W2-MC	\$16,947.3M	2,768	0.30%	0.03%
	COM7-C2H-PC	\$16,913.1M	348	0.30%	0.00%
	RES3C-W2-PC	\$15,891.4M	14,195	0.28%	0.15%
	COM2-PC1-PC	\$15,708.7M	6,616	0.28%	0.07%
	RES4-W3-LC	\$15,291.3M	2,289	0.27%	0.02%
	IND3-URML-PC	\$14,815.5M	1,507	0.26%	0.02%
	COM4-C2M-PC	\$14,784.4M	1,637	0.26%	0.02%
	RES3B-W2-PC	\$14,694.7M	15,122	0.26%	0.16%
	COM4-S3-PC	\$14,691.6M	3,935	0.26%	0.04%
	COM1-S5L-PC	\$12,901.1M	8,741	0.23%	0.09%
	RES3A-W4-LC	\$12,896.9M	23,653	0.23%	0.25%
	COM7-W3-PC	\$12,880.0M	4,750	0.23%	0.05%
	COM4-S5M-PC	\$12,868.5M	1,456	0.23%	0.02%
	RES3D-URML-PC	\$12,815.6M	5,528	0.23%	0.06%
	IND3-C2L-PC	\$12,745.9M	1,261	0.23%	0.01%
	RES3C-W1-LC	\$12,741.1M	11,423	0.23%	0.12%
	RES3E-URMM-PC	\$12,642.2M	2,304	0.23%	0.02%
	COM6-W3-PC	\$12,449.9M	238	0.22%	0.00%
	COM2-S2L-PC	\$12,327.7M	5,201	0.22%	0.06%
	RES3A-W1-HC	\$11,910.2M	17,300	0.21%	0.19%
	COM1-C3L-PC	\$11,838.9M	7,850	0.21%	0.08%
	IND1-C3L-PC	\$11,799.4M	1,877	0.21%	0.02%
	COM4-S1M-PC	\$11,547.0M	1,339	0.21%	0.01%
	RES3F-W4-PC	\$10,910.3M	552	0.19%	0.01%
	RES3C-RM1L-PC	\$10,846.3M	9,491	0.19%	0.10%
	COM4-W3-MC	\$10,789.5M	2,691	0.19%	0.03%
	RES3D-URMM-PC	\$10,711.1M	4,614	0.19%	0.05%
	RES3F-URML-PC	\$10,543.0M	543	0.19%	0.01%
	COM4-C2H-HC	\$10,534.8M	129	0.19%	0.00%
	COM7-RM1L-PC	\$10,522.7M	3,767	0.19%	0.04%
	COM4-C1L-LC	\$10,499.9M	2,748	0.19%	0.03%
	RES3E-URML-PC	\$10,428.9M	1,910	0.19%	0.02%
	RES3F-C2H-MC	\$10,383.0M	444	0.19%	0.00%
	COM2-C2L-PC	\$10,355.2M	4,357	0.18%	0.05%
	RES3D-RM1L-PC	\$10,272.2M	4,346	0.18%	0.05%
	RES3D-W4-LC	\$10,109.8M	4,316	0.18%	0.05%
	RES3C-W4-PC	\$9,933.1M	8,865	0.18%	0.09%
	IND6-C3L-PC	\$9,554.6M	6,176	0.17%	0.07%
	COM3-W3-PC	\$9,391.8M	15,934	0.17%	0.17%
	RES3B-W1-LC	\$9,157.4M	9,496	0.16%	0.10%
	COM4-S2M-PC	\$9,137.4M	1,054	0.16%	0.01%
	COM3-RM1L-PC	\$9,024.1M	17,420	0.16%	0.19%
	COM4-S4L-LC	\$8,889.7M	2,334	0.16%	0.02%
	COM1-S4L-PC	\$8,822.0M	5,621	0.16%	0.06%
	COM4-S1L-LC	\$8,795.9M	2,340	0.16%	0.03%
	RES3A-W4-MC	\$8,569.9M	13,523	0.15%	0.14%
	RES3C-W2-LC	\$8,514.7M	7,611	0.15%	0.08%
	COM1-RM1L-LC	\$8,453.4M	5,584	0.15%	0.06%
	IND6-RM1L-PC	\$8,417.0M	6,373	0.15%	0.07%
	IND1-C2L-LC	\$8,301.8M	1,325	0.15%	0.01%
	RES3B-W2-LC	\$8,295.1M	8,543	0.15%	0.09%
	COM3-C2L-PC	\$8,110.1M	17,505	0.14%	0.19%
COM4-S2L-LC	\$8,028.8M	2,130	0.14%	0.02%	
IND1-RM1L-LC	\$8,026.3M	1,264	0.14%	0.01%	
COM4-C1M-PC	\$8,025.2M	931	0.14%	0.01%	
RES3D-W4-MC	\$7,858.2M	2,996	0.14%	0.03%	
COM4-PC1-LC	\$7,847.6M	2,073	0.14%	0.02%	
RES2-MH-LC	\$7,843.4M	49,415	0.14%	0.53%	
RES4-RM1L-PC	\$7,731.0M	1,135	0.14%	0.01%	
RES3F-W2-HC	\$7,709.0M	314	0.14%	0.00%	
COM2-RM1L-PC	\$7,603.3M	3,902	0.14%	0.04%	
RES3F-C2H-LC	\$7,485.9M	376	0.13%	0.00%	
COM7-S4L-PC	\$7,396.4M	2,643	0.13%	0.03%	
IND4-C2L-PC	\$7,337.4M	2,545	0.13%	0.03%	
RES4-RM1M-PC	\$7,283.8M	1,071	0.13%	0.01%	
COM4-C3M-PC	\$7,259.3M	826	0.13%	0.01%	
RES1-W1-PC	\$7,257.7M	23,459	0.13%	0.25%	
RES6-W4-PC	\$7,251.7M	763	0.13%	0.01%	
RES3F-C2M-PC	\$7,164.5M	356	0.13%	0.00%	
COM1-C2L-PC	\$7,096.8M	4,496	0.13%	0.05%	
COM2-RM1M-PC	\$7,091.7M	3,696	0.13%	0.04%	
COM2-W3-PC	\$6,917.0M	2,908	0.12%	0.03%	
RES3C-URML-PC	\$6,898.0M	6,269	0.12%	0.07%	
COM4-C2L-LC	\$6,864.2M	1,795	0.12%	0.02%	
COM4-S5L-LC	\$6,795.6M	1,654	0.12%	0.02%	
RES1-W4-HC	\$6,695.7M	18,308	0.12%	0.20%	
IND1-W3-LC	\$6,538.6M	1,087	0.12%	0.01%	
COM2-PC2L-PC	\$6,507.1M	2,755	0.12%	0.03%	
COM2-S1L-LC	\$6,425.5M	2,730	0.11%	0.03%	
COM4-S2H-LC	\$6,283.0M	84	0.11%	0.00%	
RES3C-RM1L-LC	\$6,207.4M	5,487	0.11%	0.06%	
COM2-URML-PC	\$5,958.1M	2,580	0.11%	0.03%	
COM4-URML-LC	\$5,834.8M	1,375	0.10%	0.01%	
COM4-PC2M-PC	\$5,813.5M	647	0.10%	0.01%	
RES3C-W4-LC	\$5,632.0M	5,017	0.10%	0.05%	
COM7-URML-PC	\$5,588.4M	2,019	0.10%	0.02%	
RES4-URMM-PC	\$5,453.4M	768	0.10%	0.01%	
RES3B-W4-PC	\$5,428.9M	5,775	0.10%	0.06%	
RES3E-W4-LC	\$5,374.1M	976	0.10%	0.01%	
COM7-S5H-PC	\$5,323.6M	92	0.09%	0.00%	
COM2-S3-PC	\$5,258.2M	2,220	0.09%	0.02%	
COM4-S4M-PC	\$5,247.3M	589	0.09%	0.01%	
COM6-MH-PC	\$5,215.6M	105	0.09%	0.00%	
COM2-PC1-LC	\$5,109.3M	2,185	0.09%	0.02%	
COM4-RM1L-HC	\$5,094.3M	1,203	0.09%	0.01%	
RES3F-C1H-PC	\$5,053.2M	255	0.09%	0.00%	
RES3A-W2-PC	\$4,990.8M	9,068	0.09%	0.10%	
IND2-URML-PC	\$4,978.5M	2,415	0.09%	0.03%	
IND2-RM1L-PC	\$4,904.9M	2,722	0.09%	0.03%	