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 S
hapely GEOS version (3.9.1-CAPI-1.14.2) is incompatible with the GEOS version PyGEOS was compil
ed with (3.10.1-CAPI-1.16.0). Conversions between both will be slow.
  warnings.warn(
```

```
# Parameters
country = "Cuba"
```

```
Exposure files:
   Exposure_Com_Cuba.csv
   Exposure_Ind_Cuba.csv
   Exposure_Res_Cuba.csv
```

Sanity checks and formats

```
Cuba
   Exposure/Exposure/Exposure_Com_Cuba.csv
   Exposure/Exposure/Exposure_Ind_Cuba.csv
   Exposure/Exposure/Exposure_Res_Cuba.csv
   Occupants / Dwellings = 3.0
   No refence household size data available
   Population (exposure / UN_2021) = 0.99
   Exposure models  OK
```

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	11.2M	3,160.5K	$158.6B	94.50%	74.76%
Ind	0.0M	70.2K	$25.2B	2.10%	11.87%
Com	0.0M	113.7K	$28.4B	3.40%	13.36%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	406.0M	$153.4B	121	$523
Res	331.8M	$121.5B	105	$478
Ind	37.1M	$13.5B	528	$680
Com	37.2M	$18.5B	327	$762

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Ciudad de la Habana	$46,645.8M	530.5K	2,106.1K	21.98%	15.86%	18.86%
Santiago de Cuba	$17,728.5M	311.6K	1,049.1K	8.36%	9.32%	9.39%
Holguín	$17,331.9M	311.7K	1,035.1K	8.17%	9.32%	9.27%
Villa Clara	$14,964.9M	256.7K	791.2K	7.05%	7.67%	7.09%
Camagüey	$14,621.9M	246.9K	771.9K	6.89%	7.38%	6.91%
Pinar del Río	$14,386.1M	249.3K	721.7K	6.78%	7.45%	6.46%
Granma	$13,667.8M	245.3K	834.4K	6.44%	7.33%	7.47%
Matanzas	$12,959.7M	215.2K	694.5K	6.11%	6.43%	6.22%
Las Tunas	$9,392.6M	165.3K	532.7K	4.43%	4.94%	4.77%
Guantánamo	$9,288.7M	153.3K	515.4K	4.38%	4.58%	4.62%
Sancti Spíritus	$9,013.9M	149.1K	463.5K	4.25%	4.46%	4.15%
Ciego de Ávila	$8,291.8M	137.8K	426.0K	3.91%	4.12%	3.82%
Cienfuegos	$7,955.5M	122.8K	404.2K	3.75%	3.67%	3.62%
La Habana	$7,784.9M	110.4K	360.0K	3.67%	3.30%	3.22%
Mayabeque	$6,420.4M	112.3K	376.8K	3.03%	3.36%	3.37%
Isla de la Juventud	$1,732.4M	26.3K	84.7K	0.82%	0.79%	0.76%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MCF	$70,074.0M	676.6K	2,343.1K	33.02%	20.23%	20.98%
RC	$52,532.8M	362.9K	1,494.2K	24.76%	10.85%	13.38%
MR	$49,171.9M	614.3K	2,310.1K	23.17%	18.37%	20.69%
W	$17,401.8M	690.0K	2,049.1K	8.20%	20.63%	18.35%
MUR	$16,191.7M	864.1K	2,643.7K	7.63%	25.84%	23.67%
S	$5,071.9M	29.7K	0.0K	2.39%	0.89%	0.00%
ADO/E	$1,014.9M	58.9K	180.7K	0.48%	1.76%	1.62%
OT	$727.7M	47.9K	146.5K	0.34%	1.43%	1.31%

Exposure by taxonomy

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

MACRO_TAXO	TAXONOMY	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MCF	MCF/LWAL+CDL+DUL/HEX:2/RES	$20,948.1M	191,581	11.02%	6.26%
MR	MR/LWAL+CDL+DUL/HEX:2/RES	$19,997.4M	182,886	10.52%	5.98%
MCF	MCF/LWAL+CDM+DUM/HEX:2/RES	$12,732.8M	209,606	6.70%	6.85%
	MCF/LWAL+CDM+DUM/HEX:1/RES	$9,233.2M	84,442	4.86%	2.76%
MR	MR/LWAL+CDM+DUM/HEX:2/RES	$9,233.2M	84,442	4.86%	2.76%
MUR	MUR/LWAL+DNO/HEX:2/RES	$9,206.9M	404,169	4.84%	13.21%
RC	CR/LFINF+CDM+DUM/HEX:2/RES	$7,093.4M	64,873	3.73%	2.12%
MUR	MUR/LWAL+DNO/HEX:1/RES	$6,984.8M	459,931	3.67%	15.03%
MCF	MCF/LWAL+CDL+DUL/HEX:3/RES	$6,702.3M	54,892	3.53%	1.79%
	MR/LWAL+CDL+DUL/HEX:3/RES	$6,702.3M	54,892	3.53%	1.79%
MR	MR/LWAL+CDL+DUL/HEX:1/RES	$6,366.4M	209,606	3.35%	6.85%
	CR/LFINF+CDM+DUM/HEX:1/RES	$4,727.6M	38,719	2.49%	1.27%
RC	CR/LDUAL+CDL+DUL/HEX:7/COM	$4,499.2M	2,475	2.37%	0.08%
MCF	MCF/LWAL+CDM+DUM/HEX:3/RES	$3,704.6M	30,341	1.95%	0.99%
MR	MR/LWAL+CDM+DUM/HEX:3/RES	$3,704.6M	30,341	1.95%	0.99%
RC	CR/LDUAL+CDH+DUH/HEX:7/COM	$3,680.9M	2,022	1.94%	0.07%
W	W+WS/LPB+CDL+DUL/HEX:1/RES	$3,538.2M	232,984	1.86%	7.61%
MCF	MCF/LWAL+CDM+DUM/HEX:1/RES	$3,168.0M	52,151	1.67%	1.70%
MR	MR/LWAL+CDM+DUM/HEX:1/RES	$3,168.0M	52,151	1.67%	1.70%
RC	CR+PCPS/LDUL+CDL+DUL/HEX:1/IND	$3,122.7M	8,830	1.64%	0.29%
	CR/LFM+CDL+DUL/HEX:1/IND	$3,122.7M	8,830	1.64%	0.29%
W	W+WLI/LWAL+CDL+DUL/HEX:2/RES	$3,107.7M	136,423	1.63%	4.46%
	W+WLI/LWAL+CDL+DUL/HEX:1/RES	$2,954.1M	194,523	1.55%	6.36%
RC	CR+PCPS/LFM+CDM+DUM/HEX:1/IND	$2,554.9M	7,226	1.34%	0.24%
	CR/LFM+CDM+DUM/HEX:1/IND	$2,554.9M	7,226	1.34%	0.24%
	MCF/LWAL+CDM+DUM/HEX:2/IND	$2,311.7M	6,601	1.22%	0.22%
MCF	MCF/LWAL+CDL+DUL/HEX:2/COM	$2,289.7M	10,366	1.20%	0.34%
	MCF/LWAL+CDM+DUM/HEX:2/COM	$1,891.4M	5,397	0.99%	0.18%
	MCF/LWAL+CDM+DUM/HEX:2/COM	$1,873.4M	8,478	0.99%	0.28%
W	W+WLI/LWAL+CDL+DUL/HEX:2/SOS/RES	$1,864.7M	81,856	0.98%	2.68%
RC	CR/LDUAL+CDH+DUH/HEX:12/RES	$1,721.8M	329	0.91%	0.01%
	CR/LDUAL+CDH+DUH/HEX:4/RES	$1,706.1M	489	0.90%	0.02%
S	S+SL/LFM+CDL+DUL/HEX:1/COM	$1,597.0M	12,346	0.84%	0.40%
RC	CR/LFINF+CDM+DUM/HEX:5/RES	$1,583.2M	2,085	0.83%	0.07%
S	S+SL/LFM+CDM+DUM/HEX:1/COM	$1,306.6M	10,102	0.69%	0.33%
RC	CR/LFINF+CDM+DUM/HEX:1/RES	$1,270.7M	46,484	0.67%	1.52%
S	S+SL/LFM+CDL+DUL/HEX:1/IND	$1,192.6M	3,971	0.63%	0.13%
RC	CR/LFM+CDM+DUM/HEX:2/RES	$1,188.5M	43,477	0.63%	1.42%
W	W+WLI/LWAL+CDL+DUL/HEX:2/IND	$1,187.0M	2,781	0.62%	0.09%
RC	CR/LFM+CDL+DUL/HEX:4/COM	$1,161.4M	9,656	0.61%	0.32%
MCF	MCF/LWAL+CDL+DUL/HEX:3/COM	$1,088.2M	2,304	0.57%	0.08%
W	W+WLI/LWAL+CDL+DUL/HEX:2/COM	$1,069.9M	4,144	0.56%	0.14%
S	S+SL/LFM+CDM+DUM/HEX:1/IND	$975.8M	3,247	0.51%	0.11%