## **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 compiled 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\_Com\_Cuba.csv

**OCCUPANCY** 

Res

Ind

Com

Res

Ind

Com

NAME\_1

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

11.2M

0.0M

0.0M

#### OCCUPANTS

Other metrics to consider							
	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD			
OCCUPANCY							
Total	406.0M	\$153.4B	121	\$523			

COST\_USD

\$158.6B

\$25.2B

\$28.4B

COST\_USD\_%

**BUILDINGS\_%** 

105

528

327

**BUILDINGS\_%** 

94.50%

2.10%

3.40%

COST\_USD\_%

74.76%

11.87%

13.36%

\$478

\$680

\$762

**OCCUPANTS\_%** 

**BUILDINGS** 

3,160.5K

70.2K

113.7K

\$121.5B

\$13.5B

\$18.5B

### COST\_USD BUILDINGS OCCUPANTS

**Exposure summary at Admin level 1** 

331.8M

37.1M

37.2M

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	\$1 <mark>7,331.9M</mark>	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							

## RC \$52,532.8M 362.9K 1,494.2K MR \$49,171.9M 614.3K 2,310.1K

**BUILDINGS** 

676.6K

MR/LWAL+CDL+DUL/HEX:2/RES

MCF/LWAL+CDL+DUL/HEX:1/RES

Adding `MACRO\_TAXO` column

MACRO\_TAXO

MCF

MR

RC

W

S

MCF

CR/LFM+CDL+DUL/HEX:1/COM

MCF/LWAL+CDL+DUL/HEX:3/COM

S+SL/LFM+CDM+DUM/HEX:1/IND

W+WLI/LWAL+CDL+DUL/HEX:2/COM

\$1,161.4M

\$1,088.2M

\$1,069.9M

\$975.8M

9,656

2,304

4,144

3,247

0.61%

0.57%

0.56%

0.51%

COST\_USD

\$70,074.0M

Showing only MACRO_TAXO	taxonomies t	hat represent			_	GS COST_US	D_% BUILDINGS_%	
Showing only	taxonomies t	hat represent			_	GS COST_US	D_% BUILDINGS_%	
Showing only	taxonomies t	hat represent	90% of the	total `COS	T_USD`			
Showing only taxonomies that represent 90% of the total `COST_USD`								
Exposure by taxonomy								
ОТ	\$727.7M	47.9K	146.5K	0.	34%	1.43%	1.31%	
ADO/E	\$1,014.9M	58.9K	180.7K	0.	48%	1.76%	1.62%	
S	\$5,071.9M	29.7K	0.0K	2.	39%	0.89%	0.00%	
MOK	\$16,191.7M	864.1K	2,643.7K	7.	63%	25.84%	23.67%	
MUR								

\$19,997.4M

\$12,732.8M

182,886

**2**09,606

10.52%

6.70%

**OCCUPANTS** 

2,343.1K

COST\_USD\_%

33.02%

24.76%

23.17%

**BUILDINGS\_%** 

20.23%

10.85%

18.37%

**OCCUPANTS\_%** 

<mark>20.98%</mark>

13.38%

20.69%

5.98%

6.85%

0.32%

0.08%

0.14%

0.11%

MCF/LWAL+CDL+DUL/HEX:1/RES	\$12,732.8M	<b>2</b> 09,606	6.70%	6.85%
MCF/LWAL+CDM+DUM/HEX:2/RES	<b>\$9,</b> 233.2M	84,442	4.86%	2.76%
MR/LWAL+CDM+DUM/HEX:2/RES	<b>\$9,</b> 233.2M	84,442	4.86%	2.76%
MUR/LWAL+DNO/HEX:2/RES	<b>\$9,</b> 206.9M	404,169	4.84%	13.21%
CR/LFINF+CDM+DUM/HEX:2/RES	\$7,093.4M	64,873	3.73%	2.12%
MUR/LWAL+DNO/HEX:1/RES	<b>\$6</b> ,984.8M	459,931	3.67%	15.03%
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/LWAL+CDL+DUL/HEX:1/RES	\$6,366.4M	<b>2</b> 09,606	3.35%	6.85%
CR/LFINF+CDM+DUM/HEX:3/RES	\$4,727.6M	38,719	2.49%	1.27%
CR/LDUAL+CDL+DUL/HEX:7/COM	\$4,499.2M	2,475	2.37%	0.08%
MCF/LWAL+CDM+DUM/HEX:3/RES	\$3,704.6M	30,341	1.95%	0.99%
MR/LWAL+CDM+DUM/HEX:3/RES	\$3,704.6M	30,341	1.95%	0.99%
CR/LDUAL+CDM+DUM/HEX:7/COM	\$3,680.9M	2,022	1.94%	0.07%
W+WS/LPB+CDL+DUL/HEX:1/RES	\$3,538.2M	<b>23</b> 2,984	1.86%	7.61%
MCF/LWAL+CDM+DUM/HEX:1/RES	\$3,168.0M	52,151	1.67%	1.70%
MR/LWAL+CDM+DUM/HEX:1/RES	\$3,168.0M	52,151	1.67%	1.70%
CR+PCPS/LFM+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+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	<b>1</b> 94,523	1.55%	6.36%
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+CDL+DUL/HEX:2/IND	\$2,311.7M	6,601	1.22%	0.22%
MCF/LWAL+CDL+DUL/HEX:2/COM	\$2,289.7M	10,366	1.20%	0.34%
MCF/LWAL+CDM+DUM/HEX:2/IND	\$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+WLI/LWAL+CDL+DUL/HEX:2/SOS/RES	\$1,864.7M	81,856	0.98%	2.68%
CR/LDUAL+CDH+DUH/HEX:12/RES	\$1,721.8M	329	0.91%	0.01%
CR/LDUAL+CDH+DUH/HEX:7/RES	\$1,706.1M	489	0.90%	0.02%
S+SL/LFM+CDL+DUL/HEX:1/COM	\$1,597.0M	12,346	0.84%	0.40%
CR/LFINF+CDM+DUM/HEX:5/RES	\$1,583.2M	2,085	0.83%	0.07%
S+SL/LFM+CDM+DUM/HEX:1/COM	\$1,306.6M	10,102	0.69%	0.33%
CR/LFINF+CDL+DUL/HEX:2/RES	\$1,270.7M	46,484	0.67%	1.52%
S+SL/LFM+CDL+DUL/HEX:1/IND	\$1,192.6M	3,971	0.63%	0.13%
CR/LFM+CDL+DUL/HEX:2/RES	\$1,188.5M	43,477	0.63%	1.42%
W+WLI/LWAL+CDL+DUL/HEX:2/IND	\$1,187.0M	2,781	0.62%	0.09%
	MCF/LWAL+CDM+DUM/HEX:2/RES  MR/LWAL+CDM+DUM/HEX:2/RES  MUR/LWAL+DNO/HEX:2/RES  CR/LFINF+CDM+DUM/HEX:2/RES  MUR/LWAL+DNO/HEX:1/RES  MCF/LWAL+CDL+DUL/HEX:3/RES  MR/LWAL+CDL+DUL/HEX:3/RES  MR/LWAL+CDL+DUL/HEX:1/RES  CR/LFINF+CDM+DUM/HEX:3/RES  CR/LDUAL+CDL+DUL/HEX:7/COM  MCF/LWAL+CDM+DUM/HEX:3/RES  MR/LWAL+CDM+DUM/HEX:3/RES  MR/LWAL+CDM+DUM/HEX:1/RES  CR/LDUAL+CDM+DUM/HEX:1/RES  MCF/LWAL+CDM+DUM/HEX:1/RES  MCF/LWAL+CDM+DUM/HEX:1/RES  CR+PCPS/LFM+CDL+DUL/HEX:1/IND  CR/LFM+CDL+DUL/HEX:1/IND  W+WLI/LWAL+CDL+DUL/HEX:1/IND  CR/LFM+CDL+DUL/HEX:1/IND  CR/LFM+CDM+DUM/HEX:1/IND  MCF/LWAL+CDL+DUL/HEX:2/IND  MCF/LWAL+CDL+DUL/HEX:2/IND  MCF/LWAL+CDL+DUL/HEX:2/IND  MCF/LWAL+CDL+DUL/HEX:2/COM  MCF/LWAL+CDH+DUM/HEX:2/IND  MCF/LWAL+CDH+DUM/HEX:1/RES  CR/LDUAL+CDH+DUM/HEX:1/COM  CR/LFINF+CDH+DUM/HEX:1/COM  CR/LFINF+CDH+DUM/HEX:1/COM  CR/LFINF+CDH+DUM/HEX:1/COM  CR/LFINF+CDH+DUM/HEX:1/COM  CR/LFINF+CDH+DUM/HEX:1/COM  CR/LFINF+CDH+DUM/HEX:1/COM  CR/LFINF+CDH+DUM/HEX:1/COM  CR/LFINF+CDH+DUM/HEX:1/IND  CR/LFINF+CDL+DUL/HEX:1/IND  CR/LFINF+CDL+DUL/HEX:1/IND  CR/LFINF+CDL+DUL/HEX:1/IND	MCF/LWAL+CDM+DUM/HEX:2/RES         \$9,233.2M           MR/LWAL+CDM+DUM/HEX:2/RES         \$9,203.2M           MUR/LWAL+DNO/HEX:2/RES         \$7,093.4M           MUR/LWAL+DNO/HEX:1/RES         \$6,984.8M           MCF/LWAL+CDL+DUL/HEX:3/RES         \$6,702.3M           MR/LWAL+CDL+DUL/HEX:3/RES         \$6,702.3M           MR/LWAL+CDL+DUL/HEX:1/RES         \$6,702.3M           MR/LWAL+CDL+DUL/HEX:1/RES         \$6,366.4M           CR/LDUAL+CDL+DUL/HEX:7/COM         \$4,499.2M           MCF/LWAL+CDM+DUM/HEX:3/RES         \$3,704.6M           MR/LWAL+CDM+DUM/HEX:3/RES         \$3,704.6M           MR/LWAL+CDM+DUM/HEX:1/RES         \$3,704.6M           MCF/LWAL+CDM+DUM/HEX:1/RES         \$3,704.6M           MCF/LWAL+CDM+DUM/HEX:1/RES         \$3,704.6M           MCF/LWAL+CDM+DUM/HEX:1/RES         \$3,704.6M           MCF/LWAL+CDM+DUM/HEX:1/RES         \$3,704.6M           CR+PCPS/LFM+CDL+DUL/HEX:1/RES         \$3,168.0M           MCF/LWAL+CDM+DUM/HEX:1/IND         \$3,122.7M           W+WLI/LWAL+CDL+DUL/HEX:1/IND         \$3,122.7M           W+WLI/LWAL+CDL+DUL/HEX:1/IND         \$2,954.1M           CR/LFM+CDM+DUM/HEX:1/IND         \$2,2954.1M           MCF/LWAL+CDM+DUM/HEX:1/IND         \$2,2554.9M           MCF/LWAL+CDM+DUM/HEX:2/IND         \$1,891	MCF/LWAL+CDM+DUM/HEX:2/RES         \$9,233.2M         84,442           MR/LWAL+CDM+DUM/HEX:2/RES         \$9,233.2M         84,442           MUR/LWAL+DNO/HEX:2/RES         \$9,206.9M         404,169           CR/LFINF+CDM+DUM/HEX:2/RES         \$7,093.4M         64,873           MUR/LWAL+CDL+DUL/HEX:1/RES         \$6,984.8M         459,931           MCF/LWAL+CDL+DUL/HEX:3/RES         \$6,702.3M         54,892           MR/LWAL+CDL+DUL/HEX:3/RES         \$6,366.4M         20,9606           CR/LFINF+CDM+DUM/HEX:3/RES         \$4,727.6M         38,719           CR/LDUAL+CDL+DUL/HEX:7/COM         \$4,499.2M         2,475           MCF/LWAL+CDM+DUM/HEX:3/RES         \$3,704.6M         30,341           CR/LDUAL+CDM+DUM/HEX:3/RES         \$3,704.6M         30,341           CR/LDUAL+CDM+DUM/HEX:7/COM         \$3,680.9M         2,022           W+WS/LPB+CDL+DUL/HEX:1/RES         \$3,168.0M         52,151           MCF/LWAL+CDM+DUM/HEX:1/RES         \$3,168.0M         52,151           CR+PCPS/LFM+CDL+DUL/HEX:1/IND         \$3,122.7M         8,830           W+WLI/LWAL+CDL+DUL/HEX:1/IND         \$2,554.9M         7,226           CR/LFM+CDM+DUM/HEX:1/IND         \$2,554.9M         7,226           CR/LFM+CDM+DUM/HEX:2/ROM         \$2,289.7M         10,366	MCF/LWAL+CDM+DUM/HEX:2/RES         \$9,23.2M         84,442         4.86%           MR/LWAL+CDM+DUM/HEX:2/RES         \$9,233.2M         84,442         4.86%           MUR/LWAL+DNO/HEX:2/RES         \$9,206.9M         404,169         4.84%           CR/LFINF+CDM+DUM/HEX:2/RES         \$7,093.4M         64,873         3.73%           MUR/LWAL+CDL+DUL/HEX:3/RES         \$6,984.8M         459,931         3.67%           MCF/LWAL+CDL+DUL/HEX:3/RES         \$6,702.3M         54,892         3.53%           MR/LWAL+CDL+DUL/HEX:3/RES         \$6,366.4M         209,606         3.35%           CR/LFINF+CDM+DUM/HEX:3/RES         \$4,727.6M         38,719         2.49%           CR/LDUAL+CDL+DUL/HEX:3/RES         \$3,704.6M         30,341         1.95%           MCF/LWAL+CDM+DUM/HEX:3/RES         \$3,704.6M         30,341         1.95%           CR/LDUAL+CDM+DUM/HEX:1/RES         \$3,538.80.9M         2.022         1.94%           W+WS/LPB+CDL+DUL/HEX:1/RES         \$3,168.0M         52,151         1.67%           MCF/LWAL+CDM+DUM/HEX:1/RES         \$3,168.0M         52,151         1.67%           MCF/LWAL+CDH-DUL/HEX:1/IND         \$3,122.7M         8,830         1.64%           CR/LFM+CDL+DUL/HEX:1/IND         \$3,122.7M         3,830         1.64%     <