

Analytics in Action



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Agenda

- Overview of Verisk and AIR Worldwide
- Goals for Today's Session
- Moving From Process to Progress in Analysing Data
 - Exposure Data
 - Interpreting Loss Data



Climate Change

Goals for Today's Session



Interpreting Key Data Elements in Catastrophe Modelling Workflow



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Exposure Data





Evaluating Risk During the Selection Process

- What is exposure data?
- What are some important considerations with each data element?
- How much can poor exposure data affect my loss results?
- What are some common user errors when preparing exposure data to be modelled?
- What hazard or risk information can I use to determine whether or not I should underwrite a risk?

What is Exposure Data?



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Let's look at a sample D&F account...



PROPERTY BROKERAGE CORP

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POLICY No. AIR_TPX_005_1

LAYER TERMS / RISK DETAILS

Туре:	Package
Insured:	Lux Hotels America Incorporated, Grand Lux Hotels Group Incorporated, Lux Motels of America Incorporated
Period:	From: 1 st January 2019 To: 31 st December 2019
Limit/Sum	
Insured (100%):	USD 10,000,000 (100%) any one loss or series of losses arising out of any one Event
	Excess of
	USD 2,000,000
Policy Sub-Limits:	Applicable to any one loss or series of losses arising out of any one event subject further to the Sub-Limits below:
	USD 2,500,000 for Florida Wind Storm
	USD 5,000,000 for California Earthquake
Premium:	USD 1,230,000 (100%) Annual
Order Hereon:	40% of 100%
Brokerage:	12%



Schedule of Values for D&F Account

Location	Construction	Occupation	SQ Ft	ISO Protection Class	ATC Quake Zone	Buildings A\$	Contents	Business Interruption	Claims Costs	Revenue/Income	Total Declared Value
High-rise hotel 4 stories 480 BOYNTON BEACH BLVD Boynton Beach FL 33436	4-story concrete	hotel, office, conference space	18000.0000	2	5	\$ 4,700,00	0 \$ 50,000	\$ 470,000		\$ 2,154,000	\$ 7,374,000
Lux Hotels Lakeside Resort 103 EASTPARK DR Brentwood TN 37027	low rise wood frame	hotel with 8 separate bungalows	21000.0000	2	5	\$ 5,000,00	0 \$ 50,000	\$ 500,000	\$ 1,455,000	\$ 832,500	\$ 7,837,500
5001 W 79 ST Burbank IL 60459		hotel, hotel	24000.0000	2	5	\$ 6,300,00	0 \$ 60,000	\$ 630,000		\$ 1,048,500	\$ 8,038,500
Hillside Resort 150 ANZA BLVD Burlingame CA 94010	masonry, swimming pool	low rise hotel	19000.0000	2	5	\$ 40,800,00	0 \$ 410,000	\$ 4,080,000		\$ 6,793,500	\$ 52,083,500
3135 S ATLANTIC AVE Daytona Beach FL 32118	concrete	hotel, conference room	20000.0000	2	5	\$ 7,900,00	\$ 80,000	\$ 790,000		\$ 1,315,500	\$ 10,085,500
Houstonian Lux Flagship 302 FM 1960 RD W Houston TX 77073	reinforced concrete	high-rise hotel, б stories, two towers	1076740.5900	3	5	\$ 1,502,24	1 \$ 1,112,763	\$ 625,000		\$ 486,001	\$ 3,726,005
13232 NORTHWEST FWY Houston TX 77040	masonry, indoor/outdoor pool	low rise hotel	980497.9000	2	7	\$ 1,684,41	0 \$ 1,018,342	\$ 625,000		\$ 499,163	\$ 3,826,915

Importance of Accurate Geocode Results



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Impact of Changing Geocodes on Loss

	AAL	5.00%	2.00%	1.00%	0.40%	0.20%	0.10%
Exact	1,247,972	4,663,147	14,539,134	30,804,848	54,922,366	76,883,667	108,006,549
Relaxed	1,160,006	4,490,843	13,061,845	28,923,811	49,907,901	69,969,493	97,463,301
ZIP Centroid	996,462	3,954,456	10,642,893	23,093,934	42,298,559	66,261,219	84,785,907
City Centroid	285,327	1,192,848	3,375,207	6,250,623	11,697,261	15,539,587	24,141,491

	AAL	5.00%	2.00%	1.00%	0.40%	0.20%	0.10%
Exact	-	-	-	-	-	-	-
Relaxed	-7%	-4%	-10%	-6%	-9%	-9%	-10%
ZIP Centroid	-14%	-12%	-19%	-20%	-15%	-5%	-13%
City Centroid	-71%	-70%	-68%	-73%	-72%	-77%	-72%

Reasonability of Construction/Occupancy Codes



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Checking Individual Locations' with Unknown Values

- Location has the following fields coded as unknown
 - Construction
 - Year Built
 - Height
- There is additional information that could help better represent the risk
 - First floor height above garage?
- What about the hazard??





Ensure the Correct Perils Are Included in Your Analysis

- Recall the slip indicates earthquake and windstorm cover
 - Does earthquake include all perils? E.g. landslide, tsunami, liquefaction
 - Does windstorm include storm surge?





Question 1

- •Which of the four elements is most important for classifying exposure data?
- A. Construction or Occupancy Information
- B. Address Information
- C. Perils Covered
- D. All of the Above

Interpreting Loss Data



Catastrophe Models Provide a Wide Range of Outputs

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rear	Event ID	Peril	Mean	Mean	Mean 🔻
9847	1696677	ST	327,298,791	119,584,106	207,714,684
1536	13331	EQ	189,593,513	0	189,593,513
4390	37400	EQ	175,905,551	0	175,905,551
720	19227	TC	591,894,763	441,225,189	150,669,573
3995	107597	TC	630,968,446	480,954,249	150,014,196
5964	161180	тс	643,179,222	495,180,625	147,998,597
8470	228600	TC	580,641,838	432,966,874	147,674,964
106	2754	TC	317,250,176	170,920,233	146,329,942
9725	262342	TC	499,306,546	354,242,290	145,064,256





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Average Annual Loss (Expected Value)

• We can average the mean annual losses to arrive at the Expected Value (EV) for the portfolio by summing them and dividing by the number of event years in the catalogue:

Summary EP Ta	ble								
Agg/Occ 🔺	Perspective 🔺	AAL(EV)	SD	20	50	100	250	500	1,000
AGG	Ground Up	6,630,536	24,753,884	30,886,184	65,842,762	95,130,374	167,601,978	225,760,876	371,719,930
	Retained	4,694,386	17,067,704	22,626,276	41,566,458	66,643,214	104,231,455	161,829,671	244,552,125
	Gross	1,936,150	9,400,331	7,081,307	22,815,924	40,152,431	68,563,509	116,955,551	143,440,838
	Net of Pre-Cat	1,936,150	9,400,331	7,081,307	22,815,924	40,152,431	68,563,509	116,955,551	143,440,838
осс	Ground Up	6,015,196	23,605,984	27,770,160	60,079,085	89,660,760	162,588,072	217,879,127	344,790,310
occ	Retained	4,229,041	16,363,640	19,909,887	37,191,259	59,281,633	99,172,459	156,816,491	244,536,739
	Gross	1,824,107	8,987,294	6,675,370	22,202,705	39,498,091	68,519,883	111,110,691	140,808,555
	Net of Pre-Cat	1,824,107	8,987,294	6,675,370	22,202,705	39,498,091	68,519,883	111,110,691	140,808,555

 The EV is often also referred to as the Average Annual Loss (AAL) and can be expressed on an occurrence or aggregate basis

Calculating Average Annual Loss

 Event losses from all simulated years are summed and divided by the total number of years in the catalogue

$$\frac{\$10,000}{10 \ years} = \$1,000 \ AAL$$

Year	Loss (\$)
1	0
2	0
3	2,500
4	0
5	1,250
5	1,250
6	0
7	0
8	5,000
9	0
10	0
Total Loss	10,000

How Should We Interpret the Average Annual Loss?

• The expected value (EV) is the mean of the annual losses

Summary EP Ta	ble								
Agg/Occ 🔺	Perspective 🔺	AAL(EV)	SD	20	50	100	250	500	1,000
AGG	Ground Up	6,630,536	24,753,884	30,886,184	65,842,762	95,130,374	167,601,978	225,760,876	371,719,930
	Retained	4,694,386	17,067,704	22,626,276	41,566,458	66,643,214	104,231,455	161,829,671	244,552,125
	Gross	1,936,150	9,400,331	7,081,307	22,815,924	40,152,431	68,563,509	116,955,551	143,440,838
	Net of Pre-Cat	1,936,150	9,400,331	7,081,307	22,815,924	40,152,431	68,563,509	116,955,551	143,440,838
осс	Ground Up	6,015,196	23,605,984	27,770,160	60,079,085	89,660,760	162,588,072	217,879,127	344,790,310
occ	Retained	4,229,041	16,363,640	19,909,887	37,191,259	59,281,633	99,172,459	156,816,491	244,536,739
	Gross	1,824,107	8,987,294	6,675,370	22,202,705	39,498,091	68,519,883	111,110,691	140,808,555
	Net of Pre-Cat	1,824,107	8,987,294	6,675,370	22,202,705	39,498,091	68,519,883	111,110,691	140,808,555

- Actual losses in any given year can be significantly higher or lower than the mean
 - The AAL should not be used on its own for pricing or ratemaking, since it is not a reliable measure of the likely loss from one year to the next
 - The AAL represents the **long-term** average loss



How Might We Use the Standard Deviation?

• The standard deviation (SD) is displayed along with the AAL in the user interface of the software:

Summary EP Ta	ble								
Agg/Occ 🔺	Perspective 🔺	AAL(EV)	SD	20	50	100	250	500	1,000
AGG	Ground Up	6,630,536	24,753,884	30,886,184	65,842,762	95,130,374	167,601,978	225,760,876	371,719,930
	Retained	4,694,386	17,067,704	22,626,276	41,566,458	66,643,214	104,231,455	161,829,671	244,552,125
	Gross	1,936,150	9,400,331	7,081,307	22,815,924	40,152,431	68,563,509	116,955,551	143,440,838
	Net of Pre-Cat	1,936,150	9,400,331	7,081,307	22,815,924	40,152,431	68,563,509	116,955,551	143,440,838
occ	Ground Up	6,015,196	23,605,984	27,770,160	60,079,085	89,660,760	162,588,072	217,879,127	344,790,310
occ	Retained	4,229,041	16,363,640	19,909,887	37,191,259	59,281,633	99,172,459	156,816,491	244,536,739
	Gross	1,824,107	8,987,294	6,675,370	22,202,705	39,498,091	68,519,883	111,110,691	140,808,555
	Net of Pre-Cat	1,824,107	8,987,294	6,675,370	22,202,705	39,498,091	68,519,883	111,110,691	140,808,555

- SD can be useful in ratemaking in conjunction with the AAL
 - Actuaries might use "mean plus K standard deviations" as a proxy for loss costs including a cat risk load when allocating revenue need to territory (e.g. county)
 - AAL plus (e.g.) 20% of standard deviation once common in reinsurance pricing

Loss Exceedance Probability Curves

	Agg/Occ 🔺	Perspective +	By Peril 🔺	AAL(EV)	SD	20	50	100	250	500	^
	AGG	Ground Up	All Perils	11,472,138	31,969,829	53,024,704	96,273,634	147,605,450	241,019,781	318,055,335	
			EQ	3,387,900	16,719,644	14,670,491	47,054,249	78,020,654	141,333,625	175,905,551	-
			ST	1,038,870	5,147,669	2,464,119	4,347,851	6,972,570	19,032,139	38,536,994	
			тс	7,045,367	26,938,340	31,740,093	68,210,736	104,576,802	192,471,368	289,681,838	
		Retained	All Perils	8,069,376	23,547,762	34,614,990	66,770,096	103,676,234	185,188,505	256,923,481	
			EQ	2,374,253	12,737,954	9,613,177	31,864,160	56,765,421	97,065,148	128,502,335	
			ST	649,074	3,210,067	1,465,612	2,415,372	3,213,056	6,565,721	24,457,731	
			TC	5,046,049	19,623,530	22,917,257	42,714,953	70,126,672	131,047,972	209,793,032	
•	AGG	Gross	All Perils	3,402,762	11,423,819	16,112,994	36,947,944	54,975,158	81,245,584	122,208,658	
			EQ	1,013,647	5,828,679	3,891,654	13,812,747	27,081,001	47,186,048	57,977,469	
			57	390 706	2 970 147	1050.047	2 554 084	4 000 167	0 740 540	10 201 001	
			31	365,190	2,019,147	1,050,042	2,334,004	4,069,167	8,740,548	18,201,961	~
<			31	565,750	2,019,147	1,050,042	2,334,004	4,069,167	8,740,348	18,201,961	>
< Annua	il EP Chart - Al	R_Institute_Evw_A	6	305,170	2,0/9,14/	1,000,042	2,334,004	4,059,167	8,740,348	18,201,961	>
< Annua 2.000	il EP Chart - Al	R Institute Evw AS	5	365,750	2,079,147	1,050,042	2,334,004	4,059,167	8,740,548	18,201,351	
< Annus 2.000 1.800	il EP Chart - Al % %	R Institute Evw_A	\$	305,190	2,0/9,14/	540,000,1	2,349,000	4,089,167	8,740,348	15,201,361	
 Annus 2.000 1.800 1.600 	il EP Chart - Al % %	R_Institute_Evw_A	5 	305,190	2,0/9,14/	240,000,1	£,340	4,089,167	8,740,348	15,201,561	
 Annus 2.000 1.800 1.600 1.400 	I EP Chart - Al % % %	R_Institute_Evw_A		305,190	2,0/3,14/	240,000,1	2,349,004	4,089,107	8,740,348	16,201,561	
 Annus 2.000 1.800 1.600 1.400 1.200 	1 EP Chart - Al % % % %	R_Institute_Evw_A		305,190	2,0/9,14/	240,000,1		4,069,167	8,740,348		
 Annus 2.000 1.800 1.600 1.400 1.200 1.000 	N EP Chart - Al	R Institute Evw A		305,190	2,0/3,14/			4,069,167	8,740,348		
 Annus 2.000 1.800 1.600 1.400 1.200 1.000 0.800 	N EP Chart - Al	R_Institute_Evw_A		305,190	2,0/9,14/			4,089,107	8,740,348		
Annus 2.000 1.800 1.600 1.400 1.200 1.000 0.800 0.600	N EP Chart - Al	R Institute Evw A		305,190	2,0/9,14/			4,089,107	8,740,348		
 Annue 2.000 1.800 1.600 1.400 1.200 0.800 0.600 0.400 	I EP Chart - Al	R Institute Evw A		305,190	2,0/9,14/			4,065,167	8,740,348		

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Loss Exceedance Probability Curves

- Exceedance probability curves are calculated on an annual occurrence or annual aggregate basis.
- Start with event losses by simulation year and prepare the data in one of two ways:
 - Occurrence basis: Obtain the *largest* event loss within each simulated year
 - Aggregate basis: Obtain the *total* of all event losses within each simulated year
- The aggregate EP curve is generally preferred as it gives a more complete picture of the potential loss

Return Periods are Frequently Misinterpreted

"Katrina was a 1 in 20 year hurricane loss for the U.S."



"There is about a 5% annual probability that a Katrina-sized hurricane loss could occur in the U.S."



2019 ~5% Probability



2020 ~5% Probability



Long Return Periods May Be Dismissed As "Not In My Lifetime"

- Return periods are associated with imprecise "PML"
 - PML stands for "Probable Maximum Loss"
 - Holdover from pre-modeling days
- PML means different things to different people
 - "It's the worst case scenario"
 - "Something that will never happen"
 - "The one in one hundred event"
 - "Whatever A.M. Best asks us for"
- Today's models provide a full probability distribution of potential losses
 - Communicate in terms of probabilities ("1% probability")
 - Avoid other interpretations

Models Provide Probabilities of Loss, Not Probabilities of Events



73

Stochastic Hurricane Catalogue Includes Many Parameters

Year	Event ID	Day	LF Num	SS	LF Seg	СР	Max Wind Speed	Landfall Lat	Landfall Long	Radius Max Wind	Forward Speed	Landfall Angle
1	1	280	1	1	7	984	80	28.291	-96.492	12	15	20
3	2	231	1	3	22	963	113	29.472	-83.236	11	14	23
4	3	269	1	2	43	979	96	34.891	-76.42	13	23	32
4	4	230	1	2	5	969	102	27.048	-97.297	12	19	45
5	5	285	1	2	4	975	97	26.002	-97.16	14	18	34
8	6	289	1	4	10	944	132	29.689	-93.713	9	20	18
8	7	204	1	1	39	987	76	32.937	-79.563	16	18	19
9	8	245	1	3	30	957	114	25.952	-80.131	12	16	23
11	9	290	1	2	43	979	98	34.93	-76.33	18	16	20
•						1.1			1.1			

- In nature, there are an infinite number of combinations of storm parameters
- When we create stochastic events for the catalogue, we have to use continuous probability distributions for each parameter in order to reflect reality

What is the Probability of a **Specific Event?**



$$\mathsf{P}(\mathsf{Single Event}) = \mathbf{1} / \infty = \mathbf{0}$$

What is the Probability of a Category 4 Hurricane?



73

Models Provide Probability of Different <u>Types</u> of Events...

Event ID	Year	State	County	SS Scale	Longitude	Latitude	Central Pressure	Max Windspeed	Industry Loss
270012931	3888	LA	Plaquemines	3	-89.17	29.37	962.8	109.1	2,379,385,213
270002073	638	ТΧ	Galveston	4	-94.39	29.49	943.8	126.4	1,169,523,187
270004331	1304	MS	Jackson	3	-88.42	30.27	958.7	116.2	2,425,661,519
270000660	200	LA	Iberia	3	-91.68	29.49	957.7	114.7	1,467,115,619
270012025	3617	LA	Lafourche	5	-90.5	29.16	897.7	165.8	32,179,256,355
270000349	103	LA	Iberia	4	-92.07	29.58	934	133.7	4,550,417,528
270023237	7015	ТΧ	Brazoria	3	-95.18	29.05	951.2	121.7	6,552,011,909
270011455	3438	MS	Jackson	3	-88.52	30.22	956	113.6	4,130,229,662
270014646	4414	LA	Plaquemines	4	-89.07	29.87	931.3	135.3	27,758,529,327
270000935	277	ТΧ	Brazoria	4	-95.61	28.78	942.8	126.3	6,029,080,432
270029991	9057	AL	Baldwin	3	-87.59	30.34	955.6	115.8	1,580,530,915
270020334	6128	AL	Baldwin	4	-87.74	30.34	930.9	140.9	4,993,300,124
270012769	3842	MS	Jackson	5	-88.5	30.23	911.3	158.7	16,793,312,346
270018283	5529	MS	Jackson	5	-88.42	30.27	897.4	164.5	56,942,806,766
270019373	5853	AL	Baldwin	3	-87.74	30.34	962.4	107.3	1,004,149,493
270000363	108	LA	Plaquemines	5	-89.07	29.85	915.7	150.9	11,024,114,242
•	•	:					Gulf	:	•
•	•	•				H	lurrica	ne [.]	•
			P (Cat 3)	= 2,	355/10,	000	23.	6%	
			P (Cat 4)	=	956/10,	000	9.	6%	
			P (Cat 5)	=	132/10,	000	1.	3%	

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Don't Focus Too Much on Specific Scenarios



Models Provide the Probability of a Specified Loss or Greater

Loss Exceedance(%)	Ann Agg Loss	Agg Year	Ann Occ Info
0.62	67,204,216,241	1914	Class 3 Hurr TX GOM OK LA MX
0.63	66,024,139,935	6582	Class 4 Hurr TX LA GOM MS AL
0.64	65,589,072,155	8340	Class 4 Hurr TX GOM LA MS AR
0.65	64,800,596,415	3880	Class 4 Hurr TX CU GOM PR LA
0.66	64,022,035,892	2429	Class 1 Hurr TX GOM LA MX CU
0.67	63,781,817,238	3307	Class 1 Hurr TX MX JM GOM LC
0.68	63,429,969,268	4852	Class 4 Hurr TX GOM LA MS AL
0.69	63,229,794,260	4459	Class 2 Hurr TX GOM LA BZ HN
0.7	61,442,909,554	3240	Class 1 Hurr TX GOM LA MQ CU
0.71	61,393,795,101	3260	Class 5 Hurr TX MX GOM JM LA
0.72	60,841,428,341	2038	Class 3 Hurr TX GOM OK MX LA
0.73	60,600,487,625	1242	Class 4 Hurr LA GOM MS CU DO
0.74	60,319,337,308	4697	Class 5 Hurr TX FL MX GOM CU
0.75	60,247,180,280	6009	Class 4 Hurr TX GOM LA AR TN
0.76	59,469,360,107	8076	Class 2 Hurr LA GOM MS MX AL
0.77	59,077,328,988	4655	Class 3 Hurr LA GOM MS JM CU
0.78	58,688,708,424	7761	Class 2 Hurr MS FL LA GOM AL
0.79	58.443.864.905	1289	Class 3 Hurr TX GOM GP LA DO

Gulf Hurricane

.67%



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3

Loss Probabilities Depend on Regions Considered



	Gulf Hurricane	U.S. Hurricane
P _{Loss} > \$64B	0.67%	5.3%



Question 2

- Which statement is **<u>not</u>** correct about return periods?
- A. Return periods and exceedance probabilities measure the probability of a given loss amount occurring in a certain year.
- B. An event with a 50-year return period will occur every 50 years.
- C. A 20-year return period loss for the entire U.S. does not equal a 20year return period loss in Florida.

Case Study: Standard Hotels





Understanding the Policy Conditions

- Key components:
 - Policy dates
 - 2020
 - Policy layer terms i.e. limit and attachment
 - \$15m excess \$5m
 - Perils covered
 - Wind storm, Earthquake and Flood
 - Peril-region specific conditions
 - \$2m limit for California Earthquake
 - \$1m limit for locations in 100-year Flood Zone

SHARD BROKERS LTD.

POLICY No. AIR_TPX_006_1

LAYER TERMS / RISK DETAILS

Туре:	Package
	-
Insured:	Standard Hotels North America Corp,
	Standard Resorts of America Corp
Period:	From: 1 st January 2020
	To: 31 st December 2020
Limit/Sum	
Insured (100%):	USD 15,000,000 (100%) any one loss or series of losses arising out of any one Event
	Excess of
	USD 5,000,000
Parila Covered	Wind Storm Forthquake Flooding
Perils Covered.	wind storm, Earthquake, Flooding
Policy Sub-Limits:	Applicable to any one loss or series of losses arising out of any one event subject further to the Sub-Limits below:
	USD 2,000,000 for California Earthquake
	USD 1,000,000 for 100-Year Flood Zone



Does the Policy Info Match the Slip?

- Policy layer terms i.e. limit and attachment
 - \$15m excess \$5m
- Perils covered
 - Wind storm, Earthquake and Flood
- Peril-region specific conditions
 - \$2m limit for California Earthquake
 - \$1m limit for locations in 100-year Flood Zone

Standard Hotels	Policy	Info for N	Aodelling	5				
InsuredName	LayerID	LayerPerils	LimitType	Limit1	AttachmentAmt	SublimitPerils	Sublimit	SubLimitOcc
Standard_Hotels	1	EQ/TC/FL	E	15,000,000	5,000,000	тс	FL_LIMIT	5,000,000
Standard_Hotels	1	EQ/TC/FL	E	15,000,000	5,000,000	EQ	EQ_LIMIT	2,000,000

How Complete is the Exposure?

LocID	Street	City	Area	ZIP Country	Lat	Lon	GeocodeMatch	BuildingValue	ContentsValue	Construction	Occ	YearBuilt	Stories
1	503 Broadway	NEW YORK	NY	10012 US	40.722	-74.000	Exact Address	2,240,784	-	Unknown	Hotel	1988	
2	666 5th Avenue	NEW YORK	NY	10019 US	40.760	-73.976	Exact Address	1,887,130	-	Unknown	Hotel		
3	1328 BROADWAY	NEW YORK	NY	10001 US	40.750	-73.988	Exact Address	16,758,158	9,036,512	Unknown	Hotel		
4	NWC 47TH and R	PALMDALE	CA	93552 US	34.563	-118.035	Exact Address	631,920	344,396	Unknown	Hotel		
5	1740 Broadway	NEW YORK	NY	10019 US	40.765	-73.982	Exact Address	94,400,739	-	Unknown	Hotel		
6	667 Madison Avenue	NEW YORK	NY	10065 US	40.765	-73.971	Exact Address	3,435,266	-	Unknown	Hotel		
7	15 COLMA BLVD	DALY CITY	CA	94014 US	37.677	-122.469	Exact Address	573,507	439,786	Unknown	Hotel		
8	4310 BUFFALO GAP RD	ABILENE	ΤХ	79606 US	32.399	-99.759	Exact Address	800,891	1,183,679	Unknown	Hotel		
9	5725 JOHNSTON ST	LAFAYETTE	LA	70503 US	30.174	-92.078	Exact Address	1,292,460	734,000	Unknown	Hotel	2010	
10	8133 HIGHFIELD DR	LEWIS CENTER	ОН	43035 US	40.170	-83.014	Relaxed Address	280,594	545,663	Unknown	Hotel		
11	9000 Smiths Mill Road	NEW ALBANY	ОН	43054 US	40.085	-82.787	Exact Address	776,359	695,735	Unknown	Hotel		
12	1357 S MAIN ST	ADRIAN	MI	49221 US	41.879	-84.043	Exact Address	2,531,213	1,437,500	Unknown	Hotel		
13	2441 WHISKEY RD S	AIKEN	SC	29803 US	33.512	-81.713	Exact Address	203	-	Unknown	Hotel		
14	1450 ALA MOANA BLVD	HONOLULU	HI	96814 US	21.289	-157.842	Exact Address	13,692,972	-	Unknown	Hotel		
15	3330 GARDEN RD	BURLINGTON	NC	27215 US	36.072	-79.505	Relaxed Address	534,636	342,426	Unknown	Hotel		
16	255 E BASSE RD	SAN ANTONIO	ΤХ	78209 US	29.494	-98.480	Relaxed Address	584,128	332,411	Unknown	Hotel	2002	
17	2601 DAWSON RD	ALBANY	GA	31707 US	31.614	-84.216	Exact Address	1,912,360	3,656,072	Unknown	Hotel	2005	
18	6416 LABEAUX AVE NE	ALBERTVILLE	MN	55301 US	45.244	-93.663	Exact Address	10,799,359	4,339,372	Unknown	Hotel		
19	3000 184TH ST SW	LYNNWOOD	WA	98037 US	47.832	-122.274	Exact Address	638,504	437,250	Unknown	Hotel		
20	2699 S MACARTHUR	ALEXANDRIA	LA	71301 US	31.270	-92.460	ZIP	2,348,608	1,333,796	Unknown	Hotel		
21	3437 MASONIC DR	ALEXANDRIA	LA	71301 US	31.280	-92.463	ZIP	652,948	483,777	Unknown	Hotel		
22	6827 ALEXANDRIA PIKE	ALEXANDRIA	KY	41001 US	38.986	-84.404	Exact Address	1,963,657	1,115,179	Unknown	Hotel		
23	1924 SOUTH RANDALL	ALGONQUIN	IL	60156 US	42.181	-88.335	Exact Address	1,306,395	741,914	Unknown	Hotel		
24	555 ALMEDA MALL	HOUSTON	ΤХ	77075 US	29.620	-95.257	Exact Address	558,638	470,116	Unknown	Hotel		
25	451 ALTAMONTE AVE	ALTAMONTE SPR	FL	32701 US	28.664	-81.379	ZIP	114,838	635,817	Unknown	Hotel		
26	200 ALTON SQUARE	ALTON	IL	62002 US	38.925	-90.176	Exact Address	1,196,946	680,069	Unknown	Hotel		
27	NEC MALVERN AVE	FULLERTON	CA	92833 US	33.875	-117.963	Exact Address	2,791,803	1,505,426	Unknown	Hotel		
28	3131 N MAIN ST	ANDERSON	SC	29625 US	34.539	-82.668	ZIP	637,230	534,683	Unknown	Hotel		
29	4601 E MAIN ST	FARMINGTON	NM	87402 US	36.765	-108.153	Exact Address	1,306,395	741,914	Unknown	Hotel		
30	119 ANNAPOLIS MALL	ANNAPOLIS	MD	21401 US	38.982	-76.533	ZIP	470,488	420,526	Unknown	Hotel		
31	1233 WEST AVE P	PALMDALE	CA	93550 US	34.602	-118.108	Exact Address	637,230	313,616	Unknown	Hotel	1981	
32	1200 12TH ST SW	ROCHESTER	MN	55902 US	44.007	-92.481	ZIP	694,581	457,377	Unknown	Hotel		
33	1850 APPLE DR	WINCHESTER	VA	22601 US	39.167	-78.162	ZIP	1,451,550	824,349	Unknown	Hotel		
34	SANDIFER BLVD	SENECA	SC	29678 US	34.684	-83.004	Exact Address	716,884	381,294	Unknown	Hotel		

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Applying Sublimits to Locations

- Are the EQ and FL sublimits applied to the correct locations?
- Incorrect exposure will lead to inaccurate modelling and output
 - Bad data in = bad data out
- Analytics can be carried out at different granularities
- Here we are looking at the finest resolution output

LocID	LocPerils	Sublimit	Flood Zone	Earthquake Risk	AAL
1	TC/EQ/FL	FL_LIMIT	100-year	Low	397
2	TC/EQ/FL			Low	334
3	TC/EQ/FL			Low	6,370
4	TC/EQ/FL	EQ_LIMIT		Medium	2,833
5	TC/EQ/FL			Low	15,507
6	TC/EQ/FL			Low	647
7	TC/EQ/FL	EQ_LIMIT		High	1,160
8	TC/EQ/FL			Low	455
9	TC/EQ/FL	FL_LIMIT	100-year	Low	2,675
10	TC/EQ/FL			Low	23
11	TC/EQ/FL	FL_LIMIT	100-year	Low	757
12	TC/EQ/FL			Low	1,127
13	TC/EQ/FL			High	0
14	TC/EQ/FL		100-year	Low	21,583
15	TC/EQ/FL			Low	492
16	TC/EQ/FL			Low	557
17	TC/EQ/FL			Medium	2,109
18	TC/EQ/FL			Low	687
19	TC/EQ/FL	FL_LIMIT	100-year	Medium	1,112
20	TC/EQ/FL			Low	36,153
21	TC/EQ/FL			Low	12,043
22	TC/EQ/FL			Low	261
23	TC/EQ/FL			Medium	745
24	TC/EQ/FL	FL_LIMIT	100-year	Low	2,607
25	TC/EQ/FL			Low	697
26	TC/EQ/FL			Low	452
27	TC/EQ/FL	EQ_LIMIT		High	21,042
28	TC/EQ/FL			Medium	404
29	TC/EQ/FL			Medium	114
30	TC/EQ/FL			Low	127
31	TC/EQ/FL	EQ_LIMIT		Medium	1,905
32	TC/EQ/FL			Low	579
33	TC/EQ/FL			Low	400
34	TC/EQ/FL	FL LIMIT	100-vear	Low	291

Account Level Output and Breakdown

EP Curve

	Standard Gross EP Curve											
Agg/Occ	By Peril	AAL(EV)	10	20	30	50	100	200	250	500	1,000	
AGG	All Perils	136,642	160,442	597,445	990,821	2,081,390	2,452,978	2,859,599	3,036,136	5,060,242	6,181,031	
AGG	EQ	15,528	3,057	31,214	68,546	170,559	400,275	672,114	839,481	1,206,835	1,928,231	
AGG	ТС	32,926	23,514	59 <i>,</i> 026	102,205	223,038	540,258	1,526,385	1,808,830	3,293,613	5,436,711	





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Presenter Contact Details

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