

# **Global Data and Analytical Challenges in the 21<sup>st</sup> Century**

CAS Spring Meeting, Vancouver 2013

# Property

# Agenda

- **Need for Benchmarking**
- **Adjusting US Data for Use in Other Countries**
  - Property Per Risk Example
  - Establish strong US benchmark
    - Validation to external sources
  - Explicitly adjust for differences between US and target countries
    - Using COPE (ARM) adjustments
- **International Data Collection**
  - Global Benchmarking
  - Collecting carrier specific data
- **“Tripod” Approach – Integrating Multiple Applications**
  - Ground-Up Loss Costs
  - Excess Layers for Non-Cat Business
  - Cat modeling

# Need for Benchmarking

- Supplements Individual Company Experience
- Helps to place Individual Company Experience in a Broader Context
- Enhances the Credibility and Stability of the Analyses
- Provides Greater Knowledge about Very Large Events
  - May be Under-estimated/Mis-estimated in Smaller Views of Experience
- Regulatory (e.g. Solvency II) pressures to establish benchmarking framework

*Source: CArE-IT1 – June 2012; Perspectives from America – May 2012 by John Buchanan*

# Adjusting US Data for International Use

# Basic Steps in Adjusting US Excess Loss Curves for International

- **Step 1: Validate US Curves – Want Strong Proxy Anchor**
  - US Commercial Property market is 1.5 x size of 7 initial target countries combined
  - Evaluate credibility of US original and fitted data – in total and by component
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  - Compare actual vs. expected claim counts at various attachment points
  - Cross country comparisons – counts and occupancy differences



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  - Industry large loss information (FPA-UK, other sources)
  - Compare actual vs. expected claim counts at various attachment points
  - Cross country comparisons – counts and occupancy differences
- **Step 4: Further Validate with Participant Data Collection** *(Second Level)*
  - Submissions: individual large claims
  - Aggregated exposure information

# Establish Credibility of Collected Claim Information

## Growth In Claims – 2002 to 2012

PSOLD 2002 Distribution of losses

Range (millions)		Loss count	
low	high	between	above
1	2.5	1363	4250
2.5	5	2094	2887
5	8	502	793
8	10	139	291
10	25	62	152
25	50	69	90
50	80	15	21
80	100	2	6
100	+	4	4

PSOLD 2004 Distribution of losses

Range (millions)		Loss count	
low	high	between	above
1	2.5	2142	5614
2.5	5	2518	3472
5	8	533	954
8	10	178	421
10	25	121	243
25	50	88	122
50	80	21	34
80	100	2	13
100	+	11	11

32.1%

PSOLD 2006 Distribution of losses

Range (millions)		Loss count	
low	high	between	above
1	2.5	2797	6554
2.5	5	2683	3757
5	8	586	1074
8	10	205	488
10	25	140	283
25	50	103	143
50	80	23	40
80	100	2	17
100	+	15	15

16.7%

PSOLD 2008 Distribution of losses

Range (millions)		Loss count	
low	high	between	above
1	2.5	3593	8402
2.5	5	3469	4809
5	8	717	1340
8	10	272	624
10	25	182	352
25	50	114	170
50	80	38	55
80	100	2	17
100	+	15	15

28.2%

PSOLD 2010 Distribution of losses

Range (millions)		Loss count	
low	high	between	above
1	2.5	4139	9687
2.5	5	4028	5548
5	8	801	1519
8	10	320	718
10	25	206	399
25	50	137	193
50	80	38	55
80	100	0	17
100	+	17	17

15.3%

PSOLD 2012 Distribution of losses

(excluding additional data sources)

Range (millions)		Loss count	
low	high	between	above
1	2.5	6472	12928
2.5	5	4587	6456
5	8	973	1869
8	10	372	897
10	25	304	525
25	50	150	221
50	80	50	71
80	100	2	20
100	+	18	18

33.5%

PSOLD 2012 Distribution of losses

(including additional data sources)

Range (millions)		Loss count	
low	high	between	above
1	2.5	12563	19566
2.5	5	4863	7003
5	8	1058	2140
8	10	427	1082
10	25	414	655
25	50	161	241
50	80	57	79
80	100	2	22
100	+	20	20

51.3%

Total Change from 2010 to 2012

Range (millions)		Total Change
low	high	
1	2.5	102.0%
2.5	5	26.2%
5	8	40.8%
8	10	50.6%
10	25	64.1%
25	50	24.8%
50	80	43.2%
80	100	28.8%
100	+	15.2%

# Review Granularity – Results by Occupancy Paired Average Severity Relativities

New PSOLD	PSOLD	Count of	Sum of 20- year Total Claim	Relativity High/Low	Relativity High/Low
RG #	RG name	CSP	Count	20 yr	5 yr
1	Apartment/Condo under 10 units	7	72,360	1.00	1.00
2	Apartment/Condo over 10 units	8	76,568	1.64	1.74
6	Hotels and Motels - With Restaurant	4	11,871	2.19	1.91
7	Hotels and Motels - Other	7	58,438	1.00	1.00
15	Other Mercantiles - Retail/Wholesale	4	79,980	1.81	1.78
16	Other Mercantiles - Other	17	440,504	1.00	1.00
25	Agricultural - Greenhouses	1	3,177	1.00	1.00
26	Agricultural - Grain Elevators	6	2,982	6.75	5.75
27	Food Processing - Other	7	16,221	1.00	1.00
28	Food Processing - Severe	3	1,324	1.98	2.82
31	Light Manufacturing - Printing	1	14,274	1.00	1.00
32	Light Manufacturing - Other	5	12,551	2.00	2.48
33	Heavy Manufacturing - Wood	4	23,910	1.48	1.73
34	Heavy Manufacturing - Other	7	32,300	1.00	1.00
36	Highly Protected Risks - Low	17	4,453	1.00	1.00
37	Highly Protected Risks - Medium	15	7,950	2.47	1.66
38	Highly Protected Risks - Heavy	46	4,703	8.28	5.41
Grand Total		230	2,520,239		

Underlying actual average severities by Rating Group range from 9k (Billboards), to over 500k (Petro)

# Review Curve Fitting Applications

## Empirical vs. Fitted – Three Sample AOI Bands

	Avg AOI		Avg AOI		Avg AOI	
Mean	1,368,552		27,255,431		136,185,954	
Loss Size	Empirical	Fitted	Empirical	Fitted	Empirical	Fitted
500,000	0.0172178	0.0171748	0.0176866	0.0215390	0.0222923	0.0234397
600,000	0.0150256	0.0142887	0.0143784	0.0187130	0.0208845	0.0201597
800,000	0.0109457	0.0103353	0.0129809	0.0148345	0.0168243	0.0157731
1,000,000	0.0080962	0.0078440	0.0104765	0.0122890	0.0132677	0.0129889
1,500,000	<b>0.0020511</b>	<b>0.0045626</b>	0.0082228	0.0085986	0.0096213	0.0091371
2,000,000	<b>0.0003422</b>	<b>0.0030018</b>	0.0055385	0.0065622	0.0074156	0.0071112
2,500,000	<b>0.0000129</b>	<b>0.0021048</b>	0.0042232	0.0052358	0.0056390	0.0058152
3,000,000	<b>0.0000000</b>	<b>0.0015378</b>	0.0039346	0.0042981	0.0052654	0.0049014
4,000,000	<b>0.0000000</b>	<b>0.0009013</b>	0.0025593	0.0030694	0.0041492	0.0036959
5,000,000	0.0000000	0.0000000	<b>0.0018377</b>	<b>0.0023086</b>	0.0032391	0.0029362
6,000,000	0.0000000	0.0000000	<b>0.0010690</b>	<b>0.0017950</b>	0.0029111	0.0024114
8,000,000	0.0000000	0.0000000	<b>0.0003996</b>	<b>0.0011570</b>	0.0027151	0.0017330
10,000,000	0.0000000	0.0000000	<b>0.0002325</b>	<b>0.0007939</b>	0.0024732	0.0013206
15,000,000	0.0000000	0.0000000	<b>0.0000694</b>	<b>0.0003805</b>	0.0016055	0.0007901
20,000,000	0.0000000	0.0000000	<b>0.0000000</b>	<b>0.0002214</b>	<b>0.0015689</b>	<b>0.0005421</b>
25,000,000	0.0000000	0.0000000	<b>0.0000000</b>	<b>0.0001420</b>	<b>0.0008368</b>	<b>0.0003992</b>
30,000,000	0.0000000	0.0000000	<b>0.0000000</b>	<b>0.0000960</b>	<b>0.0008368</b>	<b>0.0003075</b>
40,000,000	0.0000000	0.0000000	<b>0.0000000</b>	<b>0.0000487</b>	<b>0.0001046</b>	<b>0.0002010</b>
50,000,000	0.0000000	0.0000000	<b>0.0000000</b>	<b>0.0000278</b>	<b>0.0001046</b>	<b>0.0001442</b>
60,000,000	0.0000000	0.0000000	<b>0.0000000</b>	<b>0.0000174</b>	<b>0.0001046</b>	<b>0.0001097</b>
80,000,000	0.0000000	0.0000000	<b>0.0000000</b>	<b>0.0000081</b>	<b>0.0000000</b>	<b>0.0000700</b>
100,000,000	0.0000000	0.0000000	<b>0.0000000</b>	<b>0.0000000</b>	<b>0.0000000</b>	<b>0.0000481</b>
250,000,000		0.0000000		0.0000000		0.0000072

Sample 2010 PSOLD Curve Fit: All years, excl all cat, Buildings+contents+time element, 300% AOI cap

# Review Macro Industry Application for Validation (US)

## Summary – Actual vs. Expected # of Claims (All Occupancies vs. Severe)

Threshold (mm's)	All Occupancies 20 year NFPA			Severe Occupancies *			Severe /All Occupancies
	PSOLD 2012		PSOLD 2010	PSOLD 2012			
	Actual	2.5mm Scaled	2.5mm Scaled	2.5mm Scaled	Fitted Range		
500	3	0.5	0 - 1	0.4	0.3	0 - 0	66.3%
400	6	1.4	1 - 2	1.3	0.9	1 - 1	66.1%
250	12	7.1	6 - 11	7.7	4.6	5 - 6	65.5%
200	13	12.4	11 - 19	13.9	8.0	8 - 11	64.8%
150	19	21.8	19 - 33	24.6	13.7	14 - 19	62.9%
100	40	43.7	38 - 67	47.5	25.2	25 - 35	57.7%
80	52	59.1	51 - 91	62.1	31.8	32 - 44	53.9%
50	89	108.4	93 - 166	106.5	47.4	47 - 65	43.7%
25	182	314.0	270 - 481	292.1	84.0	84 - 116	26.7%

Actual claims from National Fire Protection Association largest claims 1991-2010

- trended to 2012, but not developed beyond 1st report; does not include indirect losses such as TE
- does not include potential protection improvement credits (9 of the 13 >=200mm are from 1990s-trended)

Fitted using all rating groups (38) and states combined; adj. for 50% market share (last 20 year 40-60%)

\* Severe Manufacturing/Petroleum & Highly Protected Risks-Heavy (52 CSP Classes; PSOLD RGs-35,38)

# US to International Property Risk Excess Loss Factors

## COPE Assessment Matrix – Steps

### 1. Start with a list of potential differences between the US and target countries

- Standard in Property Underwriting is COPE – Construction, Occupancy, Protection, and Exposure
- To this list, we add ARM: Amounts of Insurance, Rebuilding costs, Miscellaneous

### 2. Assess whether each item would favorably or unfavorably impact expected loss results compared to the US

- e.g. expected to **reduce (positive)** or **increase (negative)** the excess losses, no impact or unknown

### 3. Attempt to evaluate magnitude of the impact of each item

- Low, Medium, High, or unknown

### 4. Tally the expected cumulative effect of each of the COPE (ARM) items

- Include direction and magnitude of all items
- Could vary for example by groups of occupancies (e.g. Facilities)

### 5. Reconcile total impact assessment to historical excess loss layers vs. US

- Review actual number of large claims to US, using exposure base such as \$B of subject premium
- Review cross country comparisons

### 6. Can do the same for Ground-up Loss Costs as proxy outside the US

# US to International Property Risk Excess Loss Factors COPE Assessment Matrix (for illustration only)

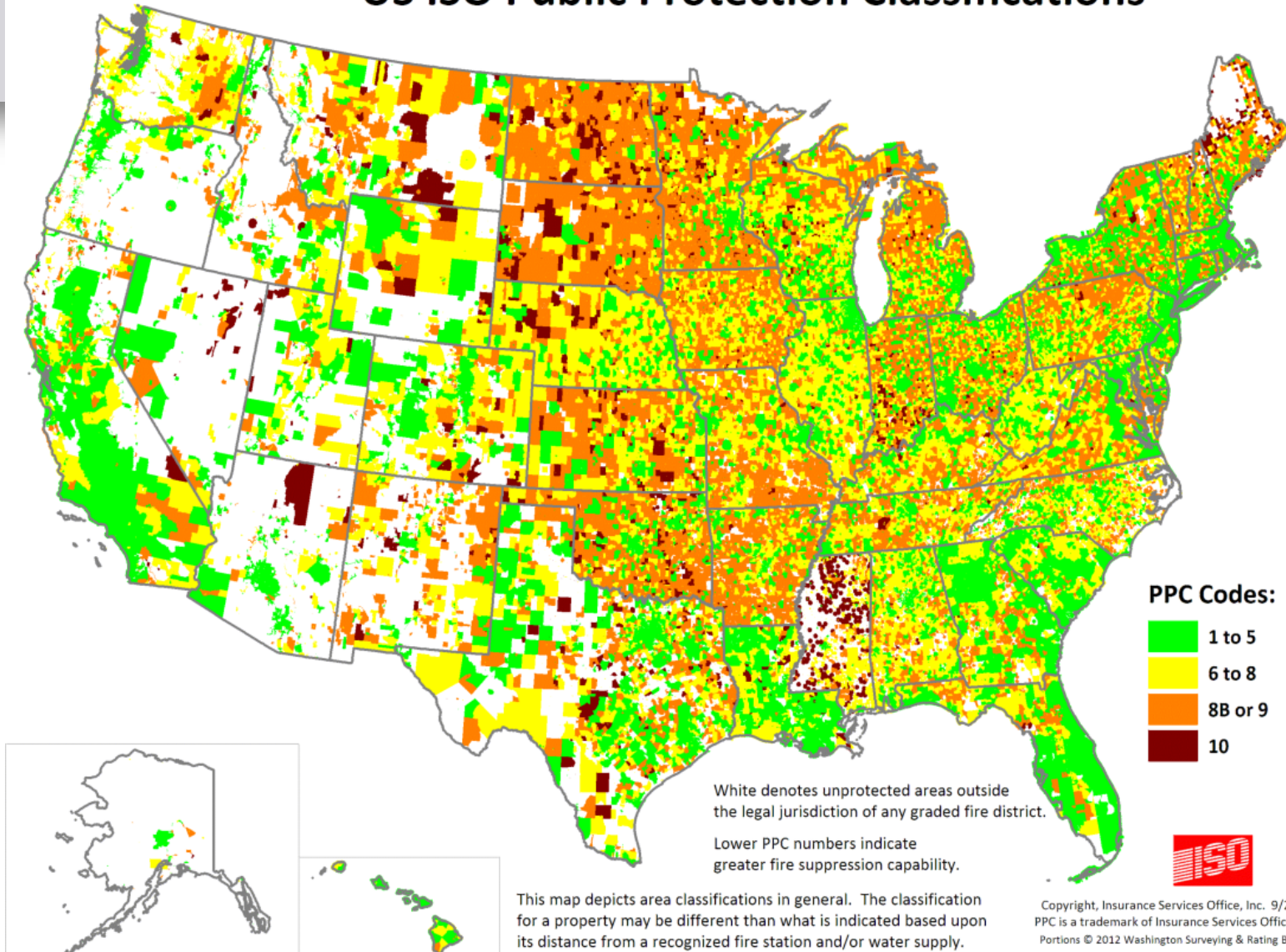
## Commercial / Industrial

		US	Country A	Country B	Country C	Country D	Country E	Country F	Country G
Construction	<b>C</b>		H	M	L		M	M	M
Occupancy	<b>O</b>		L	H		M		H	L
Protection	<b>P</b>			M	M	M	H	M	H
Exposure (e.g. industrial facilities)	<b>E</b>			M	L	H			L
Amount of Insurance	<b>A</b>		M			M	L	H	M
Replacement Costs	<b>R</b>		M	L	H	L	L	H	M
Miscellaneous	<b>M</b>			M		L		H	
<b>Total Indicated (before validation)</b>				H		M	L	L	H

Impact Key (compared to US)	
Direction	Worse
	Better
	No difference
Magnitude	H = High
	M = Moderate
	L = Low

Same procedure can be applied for Ground-up Loss Costs

# US ISO Public Protection Classifications

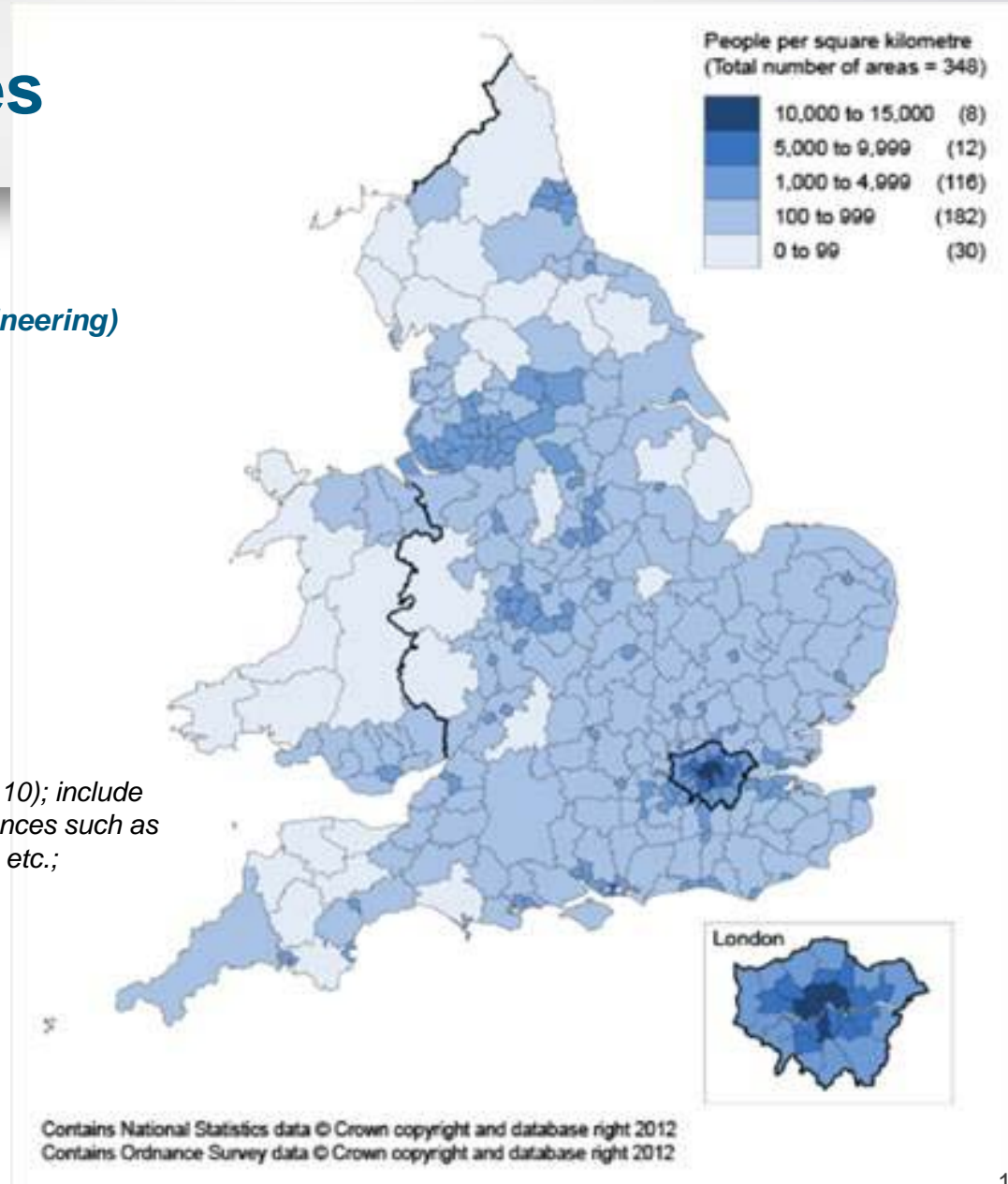




# UK Protection Classes

- A. Major Cities (and highly maintained fire engineering)
- B. Other Cities
- C. Suburban
- D. Rural

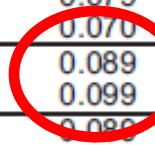
Goal: Distribute PPC Equivalentents 1-10 (could be beyond 10); include other general expected fire protection engineering differences such as sprinkler usage / maintenance, industrial park pipe sizes, etc.;



# PSOLD – Adjustments for Construction

## ISO Manual – Sample Loss Cost Page by Construction

CSP Class Code	Coverage	Construction (Code)				
		Frame (1)	Joisted Masonry (2)	Non-Comb. (3)	Mas. Non-Comb. (4)	Mod. F.R. (5) Or Fire Res. (6)
0701	Building (1)	0.025	0.023	0.020	0.017	0.015
	Contents (2)					
	A	0.028	0.025	0.024	0.021	0.020
	B	0.042	0.037	0.035	0.031	0.029
0702	Building (1)	0.053	0.048	0.042	0.034	0.032
	Contents (2)					
	A	0.063	0.057	0.053	0.047	0.043
	B	0.087	0.079	0.074	0.065	0.061
0742	Building (1)	0.099	0.089	0.080	0.064	0.061
	Contents (2)	0.109	0.099	0.093	0.082	0.077
0743	Building (1)	0.099	0.089	0.080	0.064	0.061
	Contents (2)	0.109	0.099	0.093	0.082	0.077
0744	Building (1)	0.099	0.089	0.080	0.064	0.061
	Contents (2)	0.109	0.099	0.093	0.082	0.077
0745	Building (1)	0.043	0.039	0.034	0.028	0.026
	Contents (2)	0.047	0.043	0.040	0.036	0.033
0746	Building (1)	0.043	0.039	0.034	0.028	0.026
	Contents (2)	0.047	0.043	0.040	0.036	0.033
0747	Building (1)	0.043	0.039	0.034	0.028	0.026
	Contents (2)	0.047	0.043	0.040	0.036	0.033



# Further Validate Proxied Curves to Actual Claims

## Summary – Actual vs. Expected # of Claims (All Occupancies) (Illustrative)

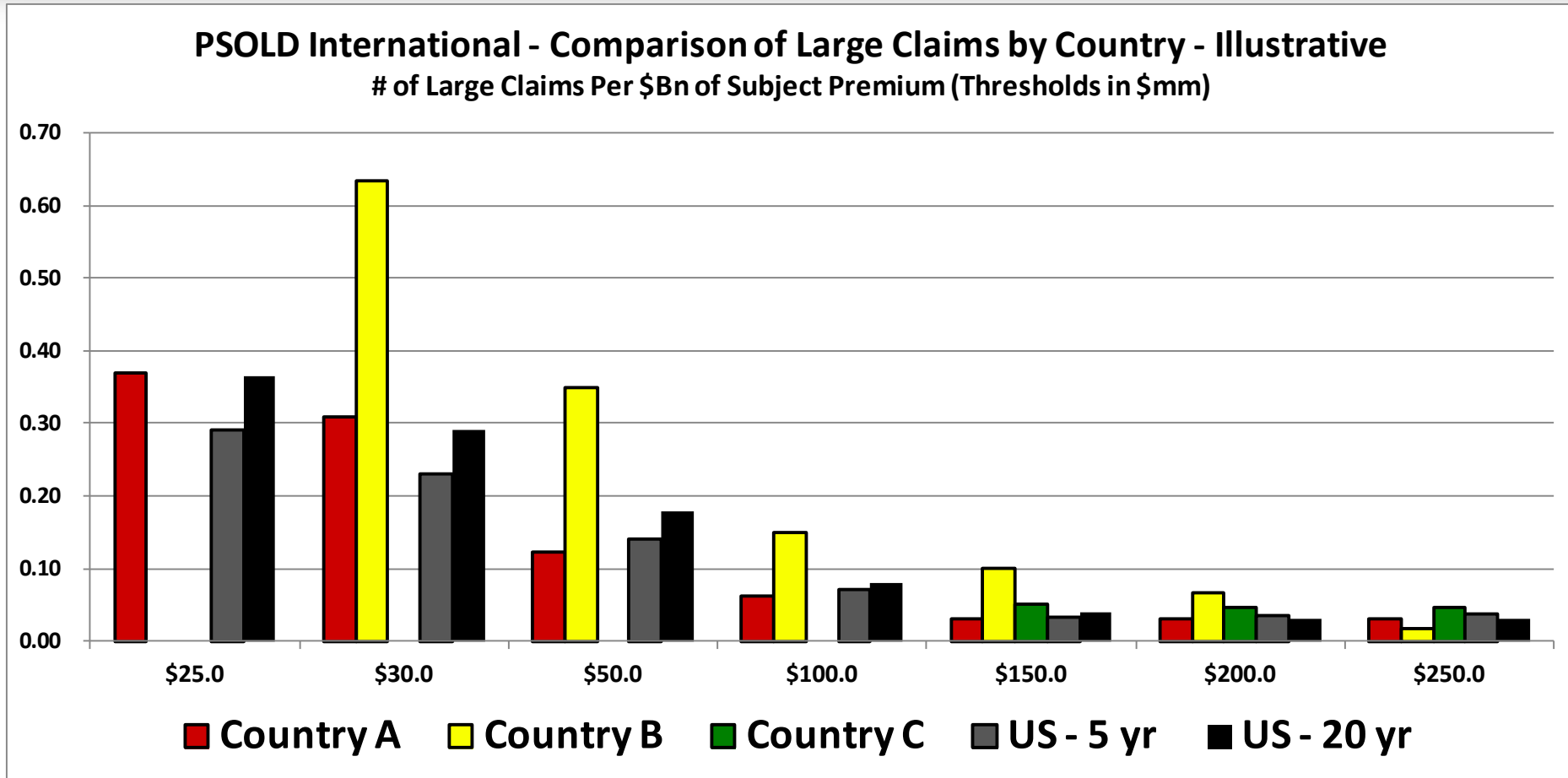
Threshold (GBP)	Threshold (\$mm)	Actual		PSOLD Int'l		
		Raw	Trended	Low	Med	High
3.1	5			21.39	31.84	42.86
6.3	10	4.8	7.2	7.09	10.88	15.09
12.5	20	2.4	2.6	2.25	3.45	4.80
15.6	25	2.0	2.4			
18.8	30	1.2	2.0			
31.3	50	0.6	0.8	0.69	0.96	1.24
62.5	100	0.4	0.4	0.24	0.38	0.51
93.8	150	0.2	0.2			
125.0	200	0.2	0.2	0.03	0.09	0.14
156.3	250	0.0	0.2			
218.8	350	0.0	0.0			

**Assumptions: All Industry using 4bn GBP; 40% attritional LR; Bldgs plus contents plus Time Element (BI); All perils x minor and major Cat; All industry AOI and Occupancy based on PSOLD US CP distributions; Time element cap of 300% (PSOLD US Default); Overall loss scalar of .8 to reflect COPE analysis vs. US; Differences in COPE uses various sources including AIR's Industry Exposure Database**

**Range varies overall Loss Scalar, Attritional LR, and Time Element cap**

**Actual losses from Axco Insurance Information Services - 2012- trended using 3% per year**

# PSOLD International Cross Country Comparison (Illustrative)



# International Data - Global Benchmarking

# Global Benchmarking – Data Collection

## ➤ **Further Validate with Company Data Collection**

- Market Size / concentration
- Submissions: individual large claims
- Aggregated exposure information
- Estimate actual and expected claim counts and ratios for various layers
- These ratios could be used to further scale up or down the US Proxy curves

# PSOLD International – Countries

## ➤ 2013 Target Lines / Countries

- Further validate initial countries:
  - 3 initial: UK, Germany, France
  - Others in process: Australia, Brazil, Japan, Netherlands
- Other potential targets:
  - Belgium, China, Hong Kong, Ireland, Italy, Japan, Mexico, Switzerland, Turkey

# “Tripod” Approach Integrating Multiple Applications



# Overall Approach

- **Steps to Price – Case Study**
- **Ground-up Loss Costs**
- **Excess Pricing**
- **Linkage – PCImport Macro Facility**
  - Expansion of LOI's larger than 10M
- **Using Portal – for non-admitted business**
  - 6 month updates
  - Can also use as proxy to estimate non-US class based loss costs, using similar COPE and LOI scaling procedure used in PSOLD International
- **Cat / Noncat – Tripod - 2014**

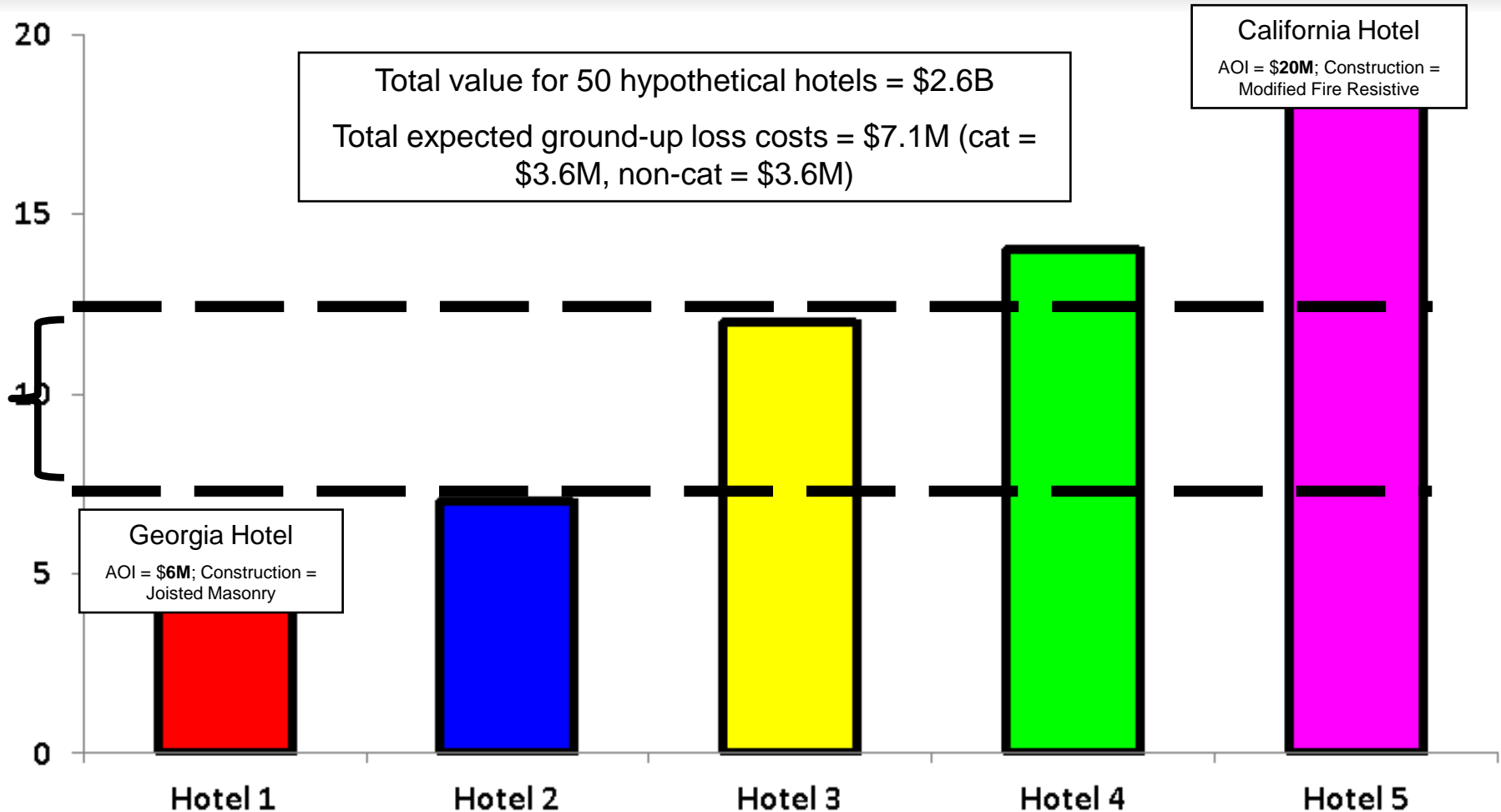


## Illustrative Case Study: Large U.S. Hotels

- A hypothetical hotel chain needs insurance on 50 hotels spread over 17 states
- Individual property values range from \$6M to \$120M; aggregate value: \$2.6B
- Coverage: “All Risks of Direct Physical Loss, Damage, or Destruction....”; terrorism exclusion
- Layers starting: \$5M xs \$5M, ..., \$200M xs \$100M
- Sublimit of \$100M for California earthquake peril only

# Illustration of Excess Layering: \$5M excess of \$5M

*What are the expected cat and noncat losses for this layer?*



## Step 1: Will Want to Estimate Ground-up Loss Costs

- **ISO's advisory loss costs**
  - Licensed by 1,500 U.S. insurers — 90% of the Commercial Lines market and 45% of Personal Lines market
  - Broad database with credible data at a very detailed level
  - Useful benchmark for underwriting, pricing, and compliance with solvency regulations
- **Can be used to estimate**
  - Ground-up loss costs on class basis in absence of other information
  - Comparison to actual charged or expiring premiums

## Portal to ISO US Information

- **Provides ISO's advisory loss costs and Rating Factors**
  - Full Detail Available
  - State/National Averages Also Available
  - Available in level of detail used in CAT Modeling
- **Primarily for Non-Admitted Market**
  - Updated twice yearly
- **Ease of Use**
  - Quick Access to Information
  - May be downloaded/exported

# Portal Initial Screen



A Verisk Analytics Company

[Comments](#) [Download](#) [User Guide](#)

## ISO Portal For Non-U.S. And Non-Admitted U.S. Business

[Logout](#)

[Reset Password](#)

### Class of Business

- Commercial Property
- Commercial Property Earthquake
- General Liability
- Medical Professional
- Management Protection (D&O)
- Employment Practices Liability
- Financial Institutions
- Commercial Automobile
- E-Commerce
- Commercial Inland Marine
- Crime & Fidelity
- Dwelling Property
- Dwelling Property Earthquake
- Homeowners
- Homeowners Earthquake
- Personal Inland Marine
- Lawyers Professional Liability
- Reinsurance Information
- Detailed Class Information (DCI)
- Actuarial Service Circulars



### What's New?

Commercial Property Earthquake - Loss costs are now available

Terrorism Loss Costs (and Rating Factors) for Commercial Property, General Liability and Commercial Automobile are now available

Reset Password Option is now available.

Commercial Auto: Public Rating Information, e.g., taxis and buses, is now available.

ISO Commercial Lines Manual is now available in enhanced Print-Ready format

#### History

[ISO Property Claim Services \(PCS\)](#)

[ISO Forms Library](#)

[ISO Forms Information Report System \(FIRST\)](#)

[ISO Circulars](#)

[ISO Commercial Line Manuals](#)

[ISO Multi-Line Class Table](#)

[ISO Legislative Monitoring](#)

[ISO Community Mitigation Classification](#)

[ISO LOCATION® Territory Download](#)

[Enterprise Risk Management for Insurers](#)

[Perspectives From America](#)

[ISO News](#)

# Portal Sample Heat Map



A Verisk Analytics Company

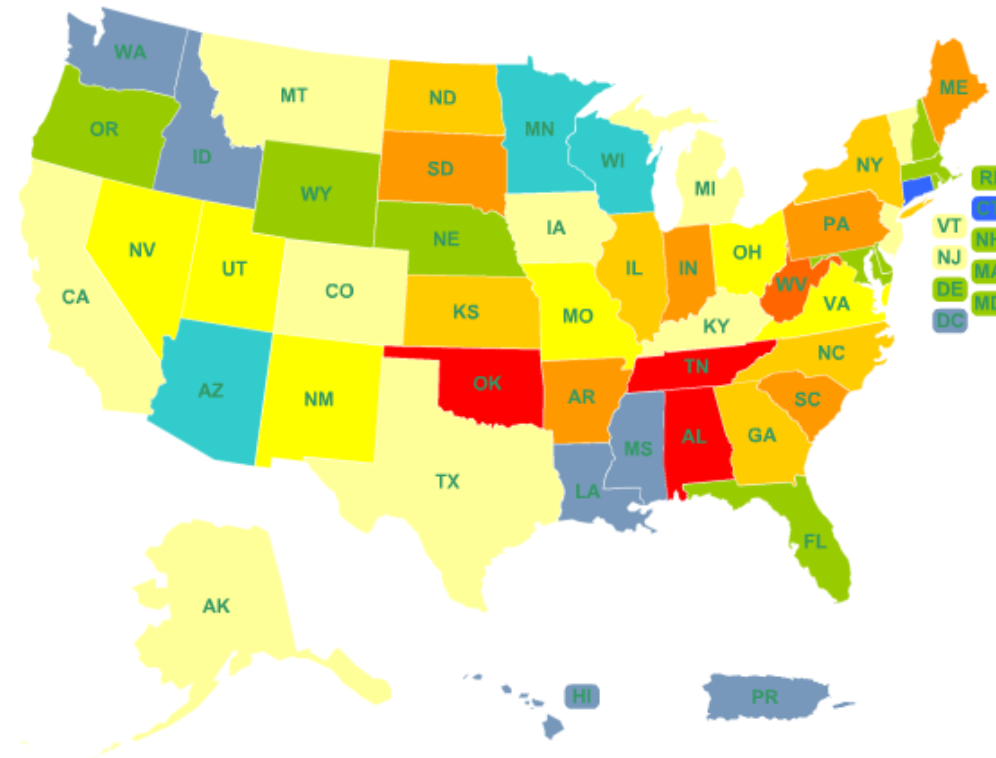
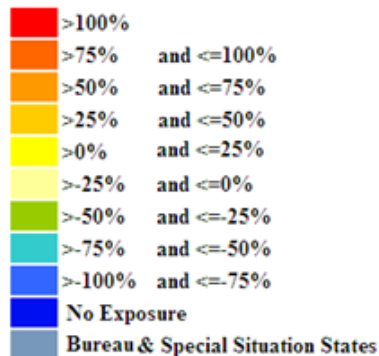
Protection: 5 | Deductible Level: \$500 | Limit of Insurance: 250,000 | Exposure Basis: Per \$100 Coverage/Exposure:

304-----Temporary Lodging

Commercial Property-----Basic Group I/Coverage: 1-----Building/Construction: 2-----Joisted Masonry

[Logout](#)

[Comments?](#)



# Loss Cost Table: Sample (Basic Group 1)

## Arizona Motel/Hotel - Simplified Illustration

State	<b>AZ</b>
Territory	<b>Balance of State</b>
CSP Class Code (Occupancy)	<b>744</b> Motels and Hotels with Restaurant - Over 30 Units

### Building

	<b>250K</b>	<b>10M</b>	<b>50M</b>
(1) BG1 base class loss cost	0.089	0.089	0.089
(2) Amount of insurance	250,000	10,000,000	50,000,000
(3) Limit of insurance factor	1.000	0.950	0.900
<b>(4) BG1 Loss Cost</b>	<b>223</b>	<b>8,455</b>	<b>40,050</b>

### Construction Type

0%	(1) Frame
100%	(2) Joisted Masonry
0%	(3) Non Comb
0%	(4) Mas. Non-Comb
0%	(5,6) Mod FR or Fire Res
100%	

### Contents

	<b>50K</b>	<b>750K</b>	<b>2.5M</b>
(1) BG1 base class loss cost	0.099	0.099	0.099
(2) Amount of insurance	50,000	750,000	2,500,000
(3) Limit of insurance factor	1.000	0.950	0.900
<b>(4) BG1 Loss Cost</b>	<b>50</b>	<b>705</b>	<b>2,228</b>

<b>Buildings and Contents - BG1</b>	<b>272</b>	<b>9,160</b>	<b>42,278</b>	<b>Balance of State</b>
<b>Buildings and Contents - BG1</b>	<b>463</b>	<b>15,600</b>	<b>71,999</b>	<b>Phoenix</b>

Basic Group 1 Perils: Fire, lightning, explosion, vandalism, and sprinkler leakage.



## Step 2: Estimate Excess Layer Expected Losses

- **ISO's Property Size of Loss Database (PSOLD)**
  - PSOLD curves based on 20 years of U.S. claims data reported to ISO with loss detail linked to exposure information by amount of insurance, state, occupancy, coverage, peril, etc.
  - Combines very detailed distributions in appropriate mix reflecting location-level ground-up losses
  - Linkage to primary CSP industry and AIR cat model occupancies
- **Macro industry validation for working and high excess layers**
  - Validation to NFPA data on all-industry basis to 200M
- **PSOLD has over 1 million individual curves**
  - 60 AOI bands, 38 occupancies, 50 states, 4 sets of perils, etc.

# Property Excess Rating: Noncatastrophe Losses

## First Loss Scale Illustration — \$5M Excess of \$5M

% of AOI	% of Loss
0.0%	0.0%
10.0%	40.0%
20.0%	50.0%
<b>25.0%</b>	<b>60.0%</b>
30.0%	65.0%
40.0%	70.0%
<b>50.0%</b>	<b>75.0%</b>
60.0%	80.0%
70.0%	85.0%
80.0%	90.0%
90.0%	96.0%
100.0%	100.0%

**AOI = \$20,000,000 (insured value)**

**60% of losses are less than or equal to 25% of AOI. Therefore, 60% of the total ground-up loss costs pays for losses related to the first \$5,000,000 of building value [ $\$5,000,000 = 25\% \times 20,000,000$ ]**

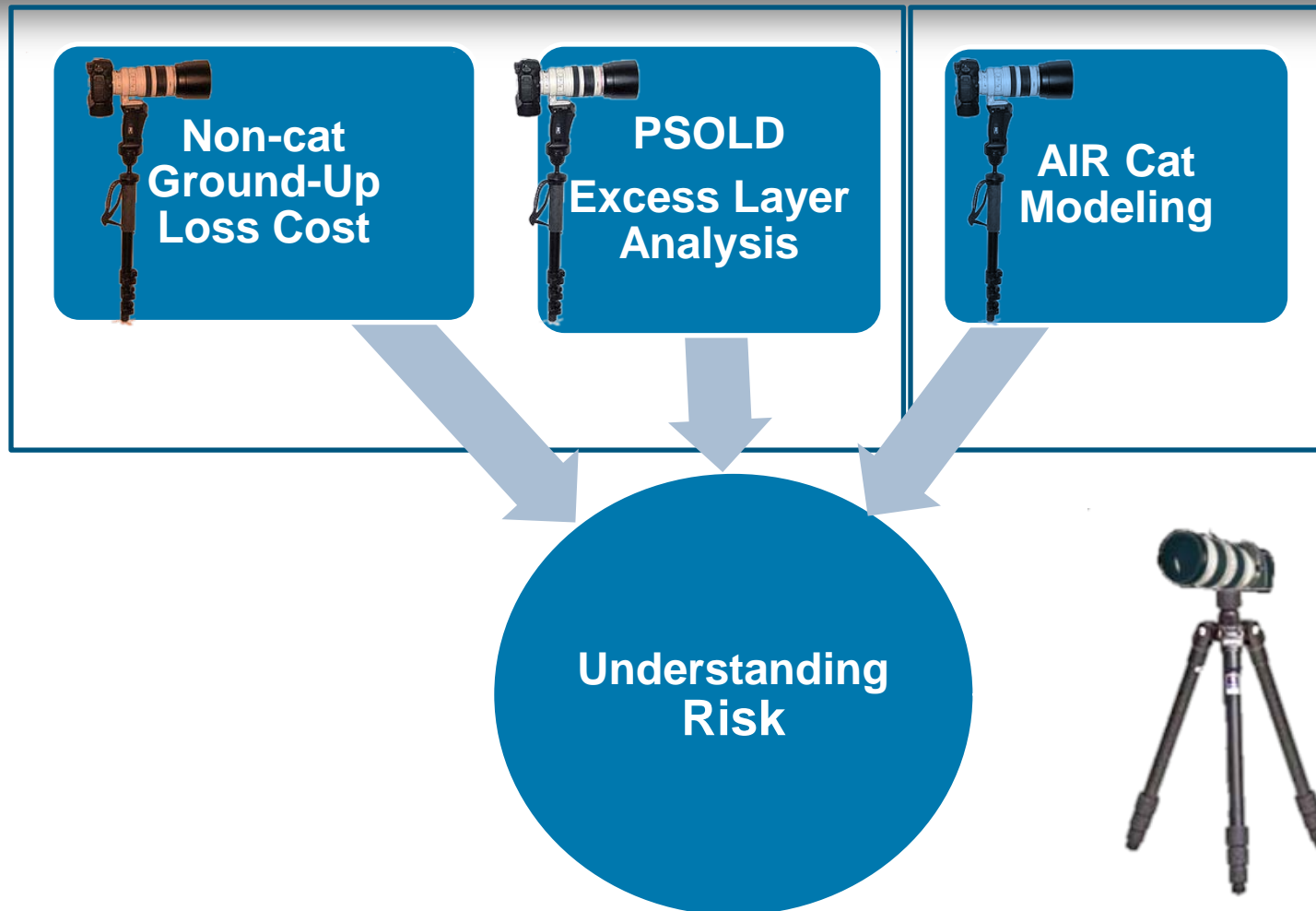
**75% of the ground-up losses pays the losses for the first \$10,000,000 of building value [ $\$10,000,000 = 50\% \times 20,000,000$ ]**

**Therefore, would want to collect 15% (75.0%-60.0%) of the total ground-up expected loss costs for the \$5M excess of \$5M layer**

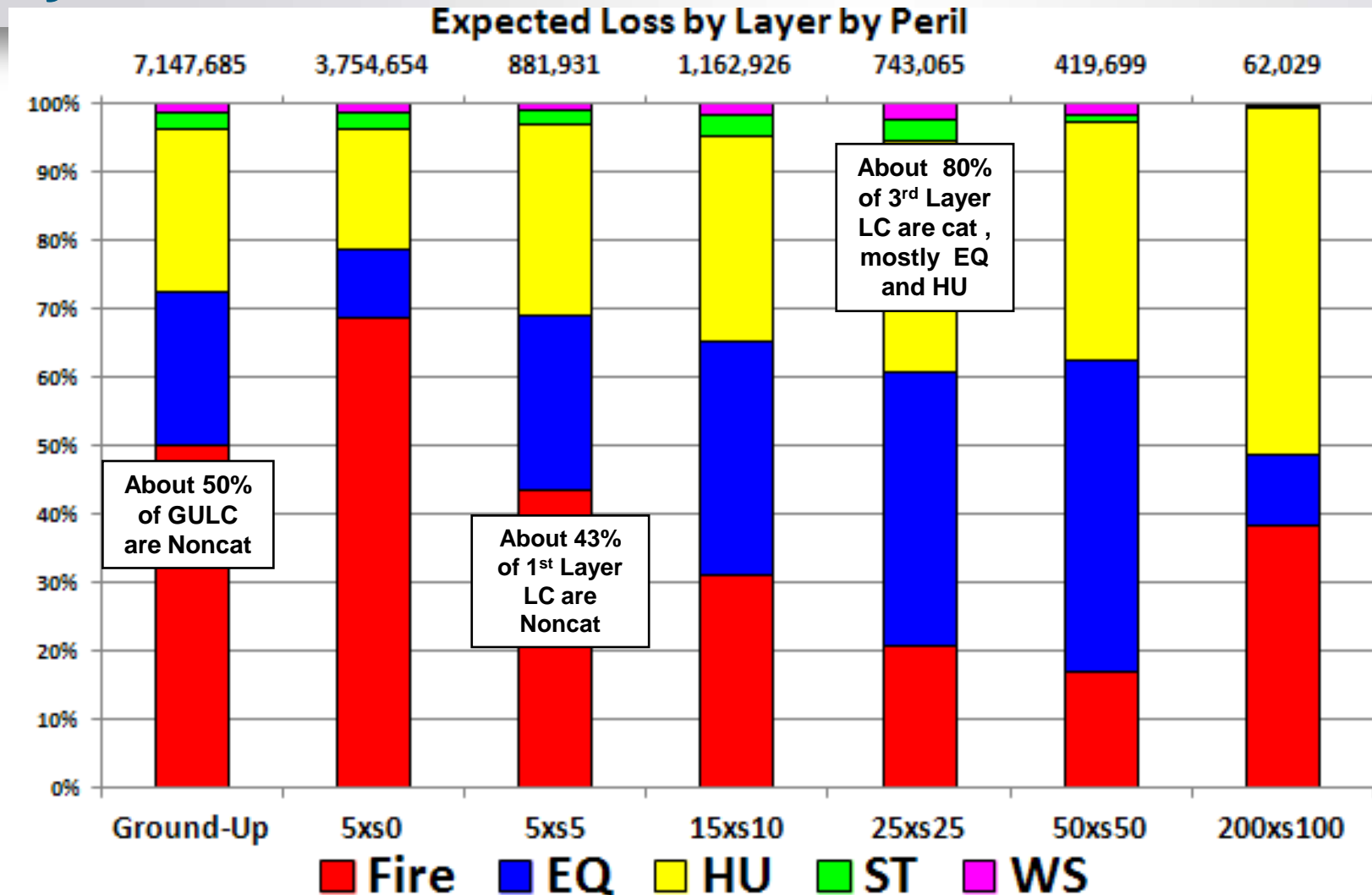
\* PSOLD has over 1 million individual curves for 60 AOI bands, 38 occupancies, 50 states, 4 sets of perils, etc.

# Tripod Concepts

## Cat / Noncat - Verisk (ISO / AIR) Solution



# Case Study: 50 U.S. Location Results: By Peril



# View both Cat/Non-cat analyses results in tandem

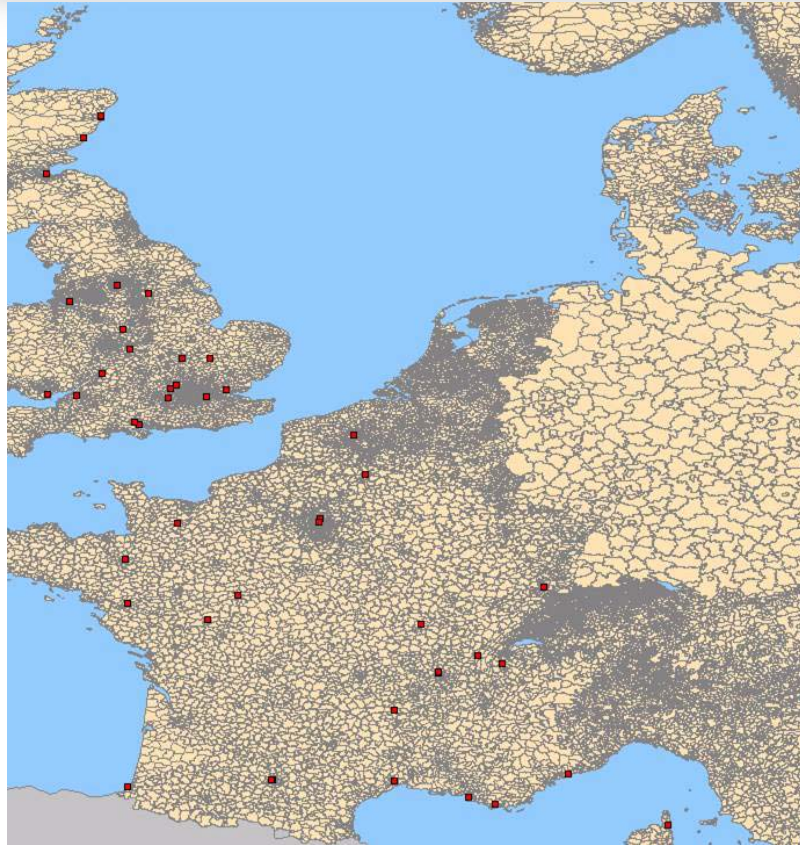
## By Location

Location ID	Cat Expected Losses			Non-Cat Expected Losses		
	Full Cover	5xs5	...	Full Cover	5xs5	...
33	999	88	...	25,000	1,422	...
69	16,828	467	...	12,075	1,111	...
1	1,759	252	...	14,140	1,417	...
35	1,959	452	...	12,425	1,280	...
64	2,559	254	...	7,210	744	...
61	154,302	22,923	...	11,655	1,400	...
3	1,510	141	...	27,510	2,939	...
70	7,597	709	...	32,235	3,857	...
...	...	...	...	...	...	...
<b>Total 50 Hotels</b>	<b>3,581,188</b>	<b>480,391</b>		<b>3,566,510</b>	<b>382,389</b>	...

## Application to International Risks

- **Start with ISO's advisory loss costs**
  - May be Used in ISO Occupancy Class Code Detail
  - May be Aggregated --- Mapped to AIR Level of Detail
  - Detailed Starting Point Available for US
    - Match Attributes of Risk
- **Employ COPE Adjustments**
  - Use Adjustments based on Comparisons with Other Countries
- **Supplement with Local/Risk Specific Knowledge**
- **Use Country-Specific PSOLD Curves (as previously described)**
- **Run Country-Specific CAT Model**

# Case Study: 50 European Locations



About 90% of GU and 1<sup>st</sup> Layer LC are Noncat in UK and FR

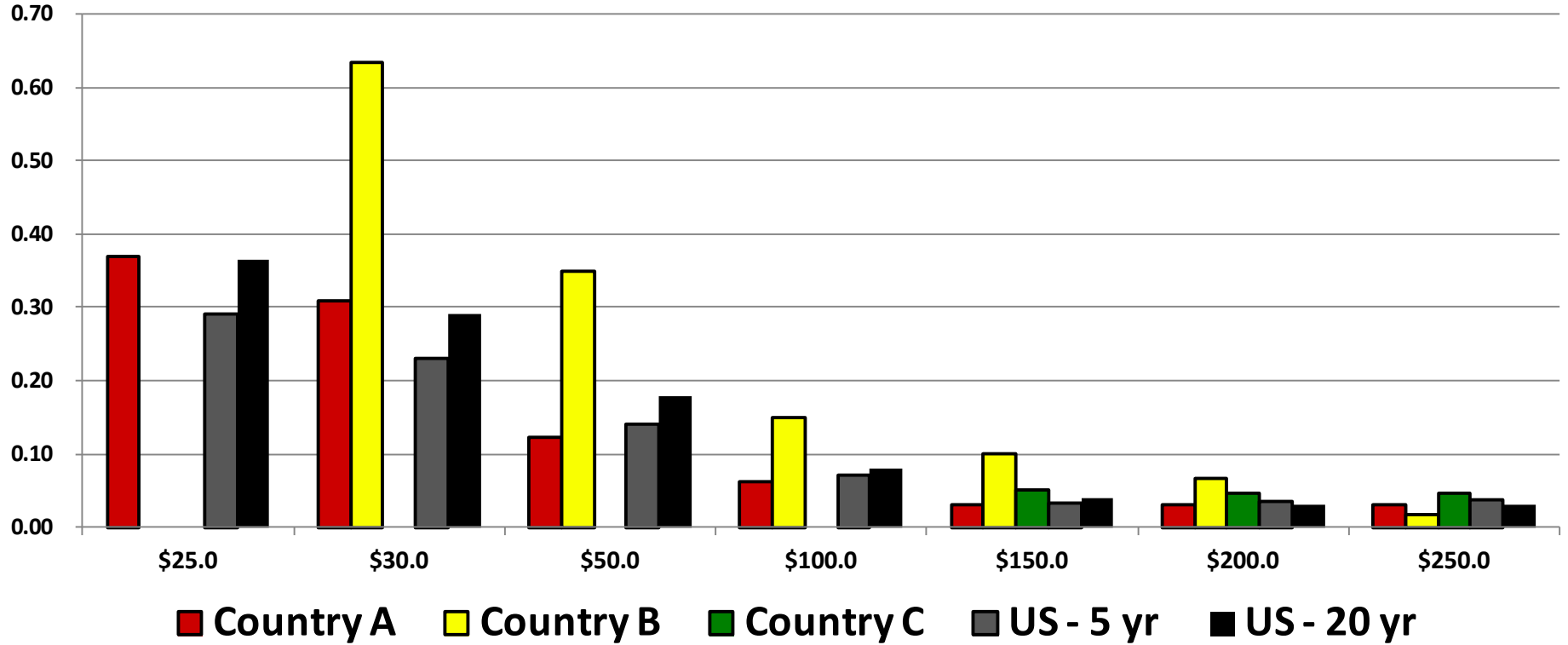
Cat / Non-Cat Inputs								
Loc ID	Country	City	Region (Prot)	Cresta	Stories	YearBuilt	Construction Desc	Total Value
33	FR	Paris	A	75009	5	1988	Reinforced Concrete	5,873,617
69	FR	Toulon	B	83000	12	1984	Light Metal	7,067,592
1	FR	Biarritz	C	64200	8	1987	Steel	11,979,678
35	UK	Cheltenham	A	GL52 8SF	2	1989	Precast Concrete	14,394,014
64	UK	Edinburgh	B	EH9 3JL	9	1986	Reinforced Concrete	24,049,661
61	UK	Montrose	C	D10 9SL	7	1982	Light Metal	36,282,526
3	FR	Le Puy	A	43000	5	1985	Reinforced Masonry	37,006,477
70	FR	Limonest	B	69760	10	1984	Reinforced Concrete	37,097,538
68	FR	Marseille	C	13005	17	1987	Unknown	37,299,874
67	UK	Cardiff	A	CF4 7YJ	8	1981	Reinforced Concrete	37,532,053
<b>Total - 50 Hotels</b>								<b>2,645,540,948</b>

Cat / Non-Cat Results							
Loc ID	Cat Expected Losses		NonCat Expected Losses		Combined		
	Total	5xs5	Total	5xs5	Total	5xs5	
	(GroundUp)		(GroundUp)				
33	245	24	25,000	190	25,245	214	
69	869	72	12,075	373	12,944	445	
1	865	89	14,140	1,102	15,005	1,191	
35	1,777	120	12,425	866	14,202	986	
64	3,525	153	7,210	724	10,735	877	
61	19,576	1,004	11,655	1,302	31,231	2,306	
3	1,064	94	27,510	1,193	28,574	1,286	
70	755	71	32,235	1,612	32,990	1,683	
68	2,746	213	43,505	3,826	46,251	4,039	
67	3,812	260	43,680	3,363	47,492	3,622	
		<b>334,008</b>	<b>24,004</b>	<b>3,566,510</b>	<b>281,113</b>	<b>3,900,518</b>	<b>305,117</b>

# Excess Layer Validation Illustration

## Cross Country Comparison

**PSOLD International - Comparison of Large Claims by Country - Illustrative**  
 # of Large Claims Per \$Bn of Subject Premium (Thresholds in \$mm)





# Ongoing Development

- **Enhanced Integration of Ground Up Loss Costs and Excess Layers**
  - Linkage of GULC and PSOLD excess factors
  - Extend GULC threshold from 10M up to 100M – 200M
- **Enhanced Scale Adjustment Factors (US and International application)**
  - Protection / Occupancies comparisons to defaults when using PCImport Facility
  - COPE and LOI enhancements
  - PSOLD and Ground Up Loss Costs
- **Integration with AIR Cat Models (2014)**
  - Combined Cat/Non-cat information
  - Location specific information on a combined basis
- **Portal to ISO US Information**
  - Updated twice a year
  - State and National Averages

# Questions ?