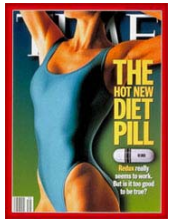
Casualty Risk, Models, and Scenario Libraries

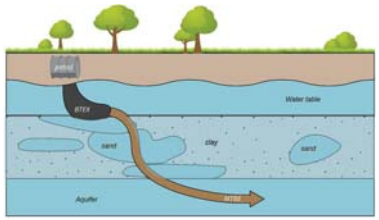
PREPARED FOR CAMBRIDGE SCENARIO CONFERENCE

SEPTEMBER 6, 2017

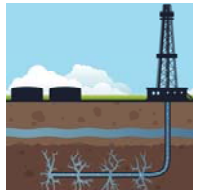
Liability and the Vexing Problem of Emerging Risk

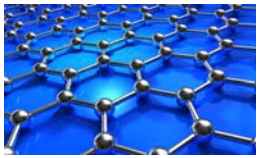
Coverage: All Perils with exclusions





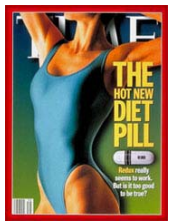
What's Next?

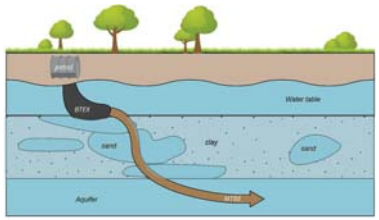




Liability and the Vexing Problem of Emerging Risk

Coverage: All Perils with exclusions





What's Next?

?

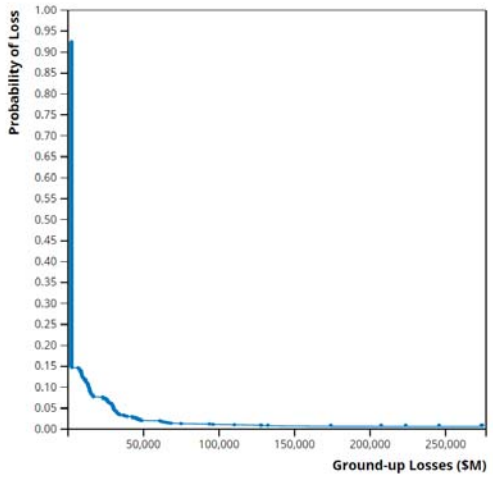
The Human Scale Solution: The Emerging Risk Group

- Emerging Risk List
- The Underwriting Strategy
- The Casualty Realistic Disaster Scenario

The Human Scale Solution:
The Emerging Risk Group

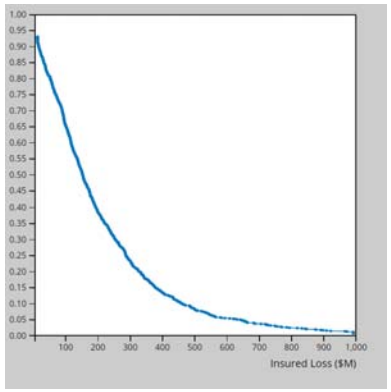
- ✓Rise of Exclusions
- ✓Lack of Alignment of Risk Management and Underwriting
- ✓Shrinking Casualty Insurance Market

The Machine Scale Solution: The Latency Catastrophe Model



Named Peril latency cat EP curve

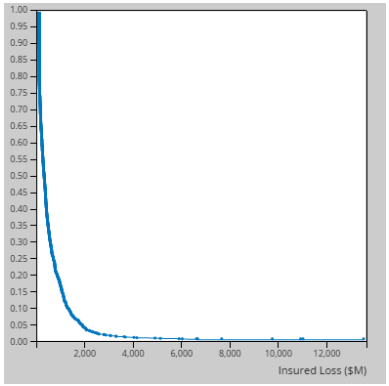
EL	$5,394.46M
PML(5)	$30,519.94M
PML(1)	$116,285.50M



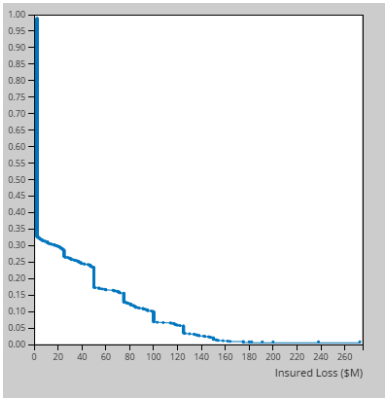
Paint company latency cat EP curve

EXCEEDANCE PROBABILITY CURVE - Bisphenol A (BPA)

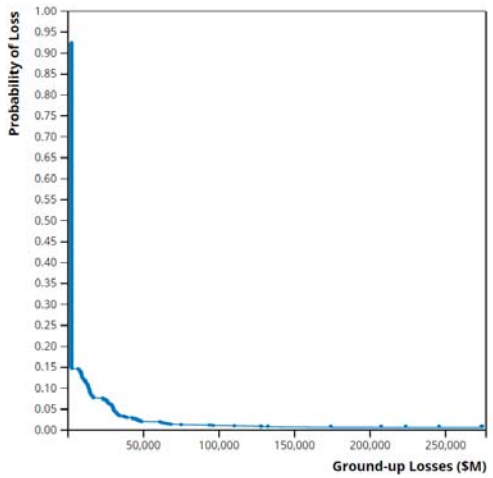
Adhesives industry latency cat EP curve



Bermuda insurer latency cat EP curve



The Machine Scale Solution: The Latency Catastrophe Model



EXCEEDANCE PROBABILITY CURVE - Bisphenol A (BPA)

Named Peril latency cat EP curve

EL	$5,394.46M
PML(5)	$30,519.94M
PML(1)	$116,285.50M

- Forward-looking modeling using peer-reviewed science
- Portfolio steering and aggregation management
- Epidemiology-based latency estimates to inform reserving
- Named-peril market solutions

✓Black box?

✓Unmodeled perils?

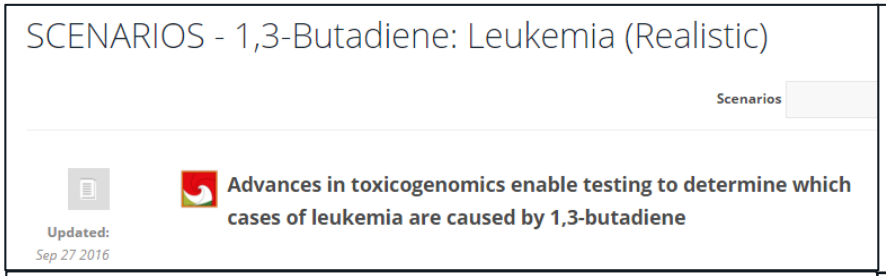
✓Model risk?

Scenario-Enhanced Modeling provides the ultimate solution

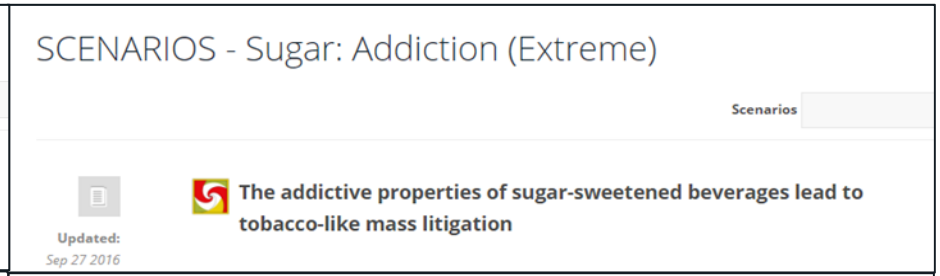
- Model foundations are needed to drive market solutions
- Internal consistency driven by model foundation reduces risk aversion and inform
- Scenario-based assumption stressing facilitates robust risk management
- Scenarios allow better communication of model results to management
- Scenarios with loss allocation to companies can be used in underwriting

Scenario-enhanced modeling is the use of scenario libraries built on top of models

Two Kinds of Model-based Scenarios: Realistic and Extreme



- Realistic scenarios are consistent with event set data
  - Designed for regulatory reporting, and results communication
  - Can be associated with probabilities to quantify realism



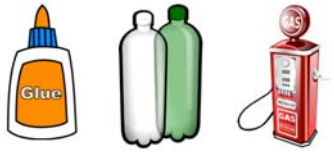
- Extreme scenarios realistically break a model assumption
  - Addresses model uncertainty, explores unmodeled parameters
  - Can be used to model legal change scenarios

Praedicat's scenario library: present and future

	1,3-Butadiene: Leukemia (Realistic)
	2,3-Pentanedione: Bronchiolitis Obliterans (Extreme)
	Aluminum: Neurodegenerative Disease (Extreme)
	Aluminum: Pneumoconiosis (Realistic)
	Atrazine: Birth Defects (Extreme)
	Atrazine: Infertility (Extreme)
	Benzene: Acute Myeloid Leukemia (Realistic)
	Benzene: Multiple Myeloma and Non-Hodgkin Lymphoma (Realistic)

- Currently have 50 scenarios in software
  - Focus on potential for latent bodily injury connected to product exposures
- Scenarios are the leading edge of our model development
  - Developing models to address property damage, latent and short-tail; exploring legal change

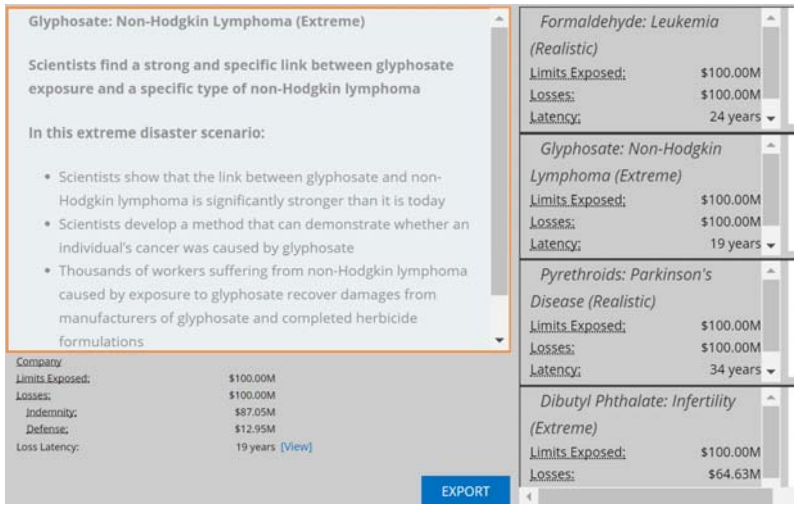
"Realistic"



"Extreme"

Underwriting with scenarios

- Scenarios by company can be built into underwriting platforms
  - Facilitates alignment of underwriting and risk management
  - Drives better communication of model results to clients
  - Reduces underwriter biases and blind spots



"It's not about AI, it's about IA – intelligence amplification"
-- Sid Dalal

Best Practices for Casualty Scenario Development and Application

- Models provide a strong foundation for scenario development
  - Encourage product innovation and sound underwriting
  - Can drive scenario development at scale for broader coverage
  - Facilitate internal consistency in risk assessment
- Scenario-enhanced modeling reduces model risk and improves communication
- Shared scenario platforms for risk management and underwriting drives alignment

The Coming Golden Age of Scenario-Enhanced Cat-Modeled Casualty