

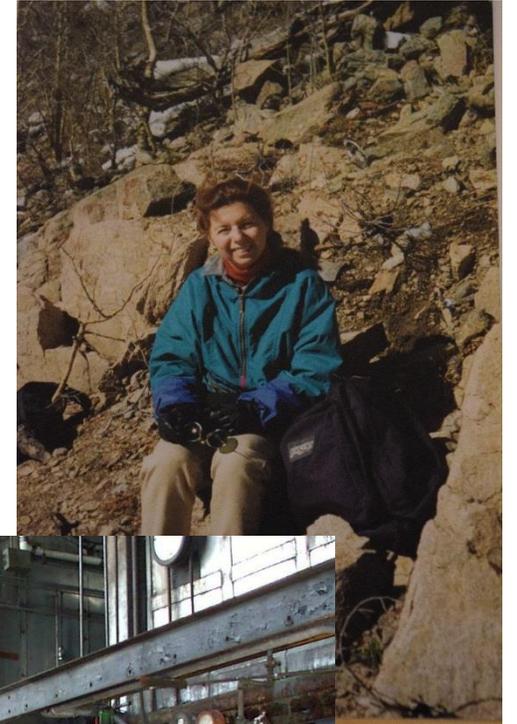


How Money responds to Climate Change



How did a Scientist and Engineer end up in the Financial Insurance Industry?

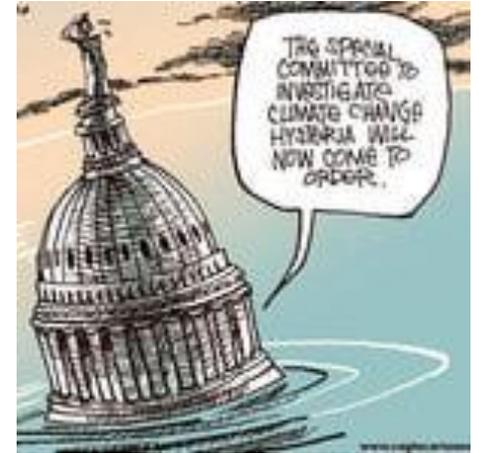
Could this Happen to YOU?



Start with Science ...and add some politics

The Existence of Climate Change

Observations – Measurements – Calculations – Models – Reality – Debate



Regardless of the Cause, the Occurrence of Storms and Natural Disasters are Increasing in Intensity and Frequency all over the Earth resulting in catastrophic damages and loss.

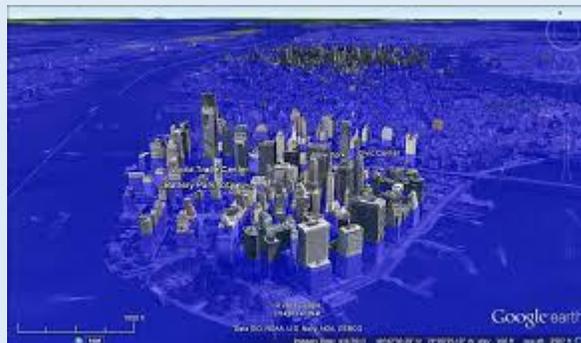
Climate Risk



Climate Risk

Occurrence

- Large Scale Flooding
- Massive Wildfires
- Windstorms
- Hurricanes
- Drought
- Earth Movements from Permafrost Melt
- Subsidence and Sink Holes
- Pattern Changes
- Sea Level Rise



Loss

- ✓ Infrastructure Damage
- ✓ Crop Damage
- ✓ Building Damage
- ✓ Mold & Moisture Damage
- ✓ Drinking Water Supplies
- ✓ Wildlife & Habitat
- ✓ Disease & Injury to People
- ✓ Business Interruption

Insurance Industry “Talks” Climate Risk

“It is clear that global warming could bankrupt the industry.”

Frank Nutter, President Reinsurance Association of America



- A survey by Ernst and Young of top insurance industry analysts from around the world disclosed that climate change was deemed to be the **number one risk** in the insurance industry.
- Lloyd's of London Chairman says, “**climate change is the number one issue for the insurance markets.**”

“AIG recognizes the scientific consensus that climate change is a reality and is highly likely in large part the result of human activities that have led to increased concentrations of greenhouse gases in the Earth’s atmosphere.”



MONEY TALKS

The world’s largest reinsurer has examined the recent rise in the number and severity of natural disasters worldwide, and finds the trend bears the unmistakable fingerprints of climate change.

Types of Insurance



A
[Alien abduction insurance](#)

[Assumption reinsurance](#)

[Aviation insurance](#)

B

[Bond insurance](#)

[Builder's risk insurance](#)

[Business interruption insurance](#)

[Business overhead expense](#)

[Business owner's policy](#)

C

[Casualty insurance](#)

[Catastrophe bond](#)

[Chargeback insurance](#)

[Computer insurance](#)

[Contents insurance](#)

[Credit insurance](#)

[Crime insurance](#)

[Cyber-Insurance](#)

D

[Death bond](#)

[Deposit insurance](#)

[Disability Insurance](#)

[Directors & officers liability insurance](#)

[Dual trigger insurance](#)

E

[Earthquake insurance](#)

[Expatriate insurance](#)

F

[Fidelity bond](#)

[Financial reinsurance](#)

[Flood Insurance](#)

G

[GAP Insurance](#)

[General insurance](#)

[German Statutory Accident Insurance](#)

[Group insurance](#)

[Guaranteed asset protection insurance](#)

H

[Health insurance](#)

[Home insurance](#)

I

[Income protection insurance](#)

[Inland marine insurance](#)

[Interest rate insurance](#)

K

[Key person insurance](#)

[Kidnap and ransom insurance](#)

L

[Landlords' insurance](#)

[Legal expenses insurance](#)

[Lenders mortgage insurance](#)

[Liability insurance](#)

[Lincoln Income Life Insurance Company](#)

[Longevity bond](#)

[Longevity insurance](#)

M

[Marine insurance](#)

[Mortgage insurance](#)

[Multiple-peril insurance](#)

[Mutual insurance](#)

N

[No-fault insurance](#)

P

[Parametric insurance](#)

[Payment protection insurance](#)

[Pension term assurance](#)

[Perpetual insurance](#)

[Pet insurance](#)

[Political risk insurance](#)

[Pollution insurance](#)

[Prize indemnity insurance](#)

[Professional liability insurance](#)

[Property insurance](#)

[Protection and indemnity insurance](#)

R

[Reinsurance](#)

[Rent guarantee insurance](#)

S

[Satellite insurance](#)

[Shipping insurance](#)

T

[Terminal illness insurance](#)

[Terrorism insurance](#)

[Trade credit insurance](#)

[Travel insurance](#)

U

[UCC Insurance](#)

[Uninsured employer](#)

[Workers' compensation employer defense](#)

V

[Vehicle insurance](#)

W

[Wage insurance](#)

[War risk insurance](#)

[Weather insurance](#)

[Wind Farm Insurance](#)

[Workers' accident compensation insurance \(Japan\)](#)

[Workers' compensation](#)

Z

[Zombie fund](#)

Insurance is the Business of Risk

Risk is based on:

- Type and Nature of **Occurrence**
- Probability of that **Occurrence (frequency)**
- Cost of that **Occurrence**

Law of Large Numbers

- Aggregating risk and spreading it among a larger risk group.
(Build up capital to use for paying damages that occur later)
- ***Who should pay*** for the impacts of climate change?

The “**Occurrence**” that triggers a claim?

- A loss was experienced
- Financial consequences
- Remedy and Cost

“The risk is about probable loss, frequency, and severity,” says Christopher Smy, global environmental practice leader for Marsh, the world’s biggest insurance broker. “**They don’t necessarily have to label it.**”

Risk in Financial & Business Decision Making

Environmental Risk

Financial Risk

Social Risk

Sustainability

“At Zurich and in my jobs prior to that, I always worked in **a space where science, underwriting, and the law met,**” says Patton, who co-authored a book called *Climate Change and Insurance* that was published by the American Bar Association.



INSURANCE RESILIANCE

“Insurance is the first line of defense against extreme weather losses, but climate change is a game-changer for the models that insurers have long relied on,” said Washington State Insurance Commissioner Mike Kreidler.

“Companies will need to adapt if insurance is to remain available and affordable.”

The Cost of Climate Risk is Passed on to the Insured.

Insurance *Underwriting* Prices the Risk.

Underwriting the Cost of Climate Risk

- **Policy Premium:**

- Market Assessment of a defined Risk in a designated Risk Pool
- Insured protected against catastrophic occurrences and loss

- **Deductible:**

- Insured's share of the Loss in the event of an Occurrence

- **Exclusions:**

- Areas of Risk not covered by the Premium
- Conditions excluded to avoid losses to the company
- Insured can Buy-Back coverage at additional Cost



Insurance Exclusions – Buying Back Coverage

Pollution Exclusion

- ✓ Legacy Brownfield Properties
- ✓ Gas Stations
- ✓ Oil Terminals
- ✓ Mining
- ✓ Transportation of Chemicals
- ✓ Wastes

Mold Exclusion

- Flooding

Restrict New Uses of a Property

- Development
- Property Value

Time to Pay



Insurance companies seek to reduce the cost of payout to the Insured by questioning all disclosures, knowledge, *actions* that could have been prevented and adherence to the Policy stipulations.

Insured seeks to have the maximum cost paid out by the Insurance Carrier.

Cost effective and innovative remedies that reduce risk in the future.

Insurance Industry – Opportunity to Implement Positive Change in Addressing Claims & Loss

- Two major insurers, **Fireman's Fund and Lexington Insurance**, a member company of **AIG**, are launching **green insurance programs** that allow homeowners to reconstruct property after a loss and claim with environmentally-friendly materials and practices:
 - ✓ Fireman's is launching its program in Southern California where wildfires continue to destroy numerous homes.
 - ✓ Lexington is piloting its policy in a handful of East Coast states.
- Insurer's **hedge** against climate change and the natural disasters that occur more frequently with rising global temperatures (**Preventative Investing**)
- **Green building** is expected to grow from \$7.4 billion to \$40 or \$50 billion. New way to attract and retain customers.
- **Homeowners** who build with greener standards may be rewarded with insurance discounts and financial incentives and tax credits (**at a minimum – reduce personal loss**).



Travels Insurance Philosophy on Renewable Energy

- The development of products and services that are responsive to climate and "green" trends is a fundamental value that **Travelers** delivers as a leading property and casualty insurer.
- A commitment to supporting initiatives and actions that encourage *environmentally responsible practices* and conserve natural resources.
- Monitoring, assessing and responding to the risks and opportunities posed by an evolving climate and "green" trends.

Managing risks and controlling losses is central to the insurance business, and is evident in the industry's history as founders of fire departments and advocates for building codes.



**Opportunity
for Innovative
Technologies**

Case Study: Insurance & Litigation *(as a motivator)*

- ❑ Nine class action **lawsuits filed by Farmers Insurance** in April 2014 against dozens of cities in the Chicago area for failing to prepare for the floods that hit Illinois.
- ❑ Farmers Insurance argued that local governments **should have known** that rising global temperatures would result in heavier rains and did not do enough to secure sewers and storm drains.
- ❑ Farmers initiated the lawsuits to recover money on behalf of its policyholders for losses that could have been avoided by municipalities, as well as to encourage cities and counties to take more preventative actions to **reduce the risks** of future natural disasters.
- ❑ The lawsuit brought important issues to the attention of the respective cities and counties.
- ❑ Farmer's said policyholders' interests will be protected by the local governments going forward.

Case Study: NYS Manages & Reduces Climate Risk

Infrastructure investment to improve the resiliency of water treatment facilities that were overwhelmed by flooding caused by hurricanes.

President Obama signed the “**Disaster Relief Appropriations Act**” (DRAA), providing \$340 million for the **NYS Storm Mitigation Loan Program**.

- **Communities rebuild smarter and stronger following the devastation of super-storms, like Sandy.**
- **Protect vital services from future storms – Drinking water systems.**
- **Enhance resiliency to rapid hydrologic change or natural disaster at treatment works.**
- **Reduce flood damage risk and vulnerability.**
- **Facilitates preparation for, adaptation to, or recovery from climate change or any other type of natural disaster.**



With these mitigation funds, New York will assist communities to create long-term resilience, helping them withstand or avoid higher flood levels expected from future storms.

Suffolk County, New York received the first loan from the state's Storm Mitigation Loan Program.

- The \$13.6 million loan -- made up of a \$3.2 million grant and \$10.4 million in no-interest financing -- is for wastewater and storm resiliency improvements at the county's Bergen Point Sewage Treatment Plant.
- The loan is the latest in a series of actions taken by New York State to help Long Island strengthen its coastal resiliency against future storms and will enable Suffolk County to improve its wastewater and storm water infrastructure.

Do you think the Cost of Insurance Claims from Hurricane Sandy influenced the Infrastructure Fund?



**Investment Money in Climate Risk Management
Reduce Litigation Potential**

Case Study – Engineering Design Standards

NYS Storm Mitigation Loan Program

Westchester County NY – Vulnerability Assessment Studies

Assess the susceptibility to flooding due to climate change:

- ✓ Sea level rise,
- ✓ High amounts of precipitation from storms, and
- ✓ Storm surge.

- Flood elevations standards being raised;
 - 5+ feet over the 100 year flood plane.
- Raise storm surge walls
- Location of critical equipment



***Design and Cost Estimating
Higher Climate Risk Management = Lower Insurance Premiums***

Case Study: Water & Business Interruption

Occurrence

- Manufacturing Facility is located on a fresh water lake it utilizes to source cooling water for its operations through a state permit.
- Severe storms caused extreme run-off from agricultural areas resulting in toxic algal blooms in the lake.

Loss / Claim

- Acceptable water for the facility operations and equipment was not available – the facility had to cease operations: Business Interruption
 - Payroll
 - Product Sales
- Water that was used contaminated equipment and pipes and required maintenance and repair.

Financial Markets

Bank of America issues \$500 million "Green Bond"



In November 2013, Bank of America issued the first ever corporate **"Green Bond."**

The funds are used specifically to finance renewable energy projects such as wind, solar and geothermal energy.

Funds finance energy efficiency projects that help **reduce energy consumption** per unit of output and include projects such as lighting retrofits, district heating, co-generation, and building insulation in residential, commercial and public properties.

The proceeds from this offering will be used to support a subset of assets that qualify for Bank of America's 10-year, \$50 billion environmental business initiative to **help address climate change**, reduce demands on natural resources and advance lower-carbon economic solutions.

Science, Engineering, Business and Insurance



Where could you fit in?

- ❑ **Underwriters** at Insurance Carriers to model and cost climate risk
- ❑ **Risk Managers** for Companies to identify & manage climate risk
- ❑ **Claims Management** for solutions to a loss from climate risk
- ❑ **Design Engineers** for building resiliency
- ❑ **Brokers** to explain climate risk to the insured



Insurance Money as a Change Agent

Money is not debating the existence of climate change –
it is responding, adapting, and investing in changes to protect itself
now and in the long term.

Money talks a universal language.

Money is influential.

Money is Green.

Money's influence can be for good.

Money is only as good as the hands it is in.

