

INNOVATIVE RISK TRANSFER SOLUTIONS

Reducing disaster risks and building resilience for wildfires

Case Study: California Wildfire Fund

Issue: Wildfires have caused severe impacts in California over the past several years. Due to inverse condemnation laws in the state, the investor-owned utilities (IOUs) are held strictly liable. As claims skyrocketed, the IOUs found themselves unable to cover the costs leaving the state of California to compensate victims.

First-hand knowledge: Marsh was the insurance brokerage for the largest utilities in the State and each was struggling with financial liquidity.

Policy change: On July 12, 2019, Governor Gavin Newsom signed Assembly Bill 1054 creating a \$21 billion wildfire fund to pay claims on catastrophic losses should the IOUs become insolvent.

Marsh McLennan solution set: Our reinsurance brokerage Guy Carpenter [structured a reinsurance program](#) for the claims fund and our economic consulting firm, NERA, performed an economic analysis to determine appropriate surcharges and tariffs for ratepayers.

Quantifying Insurance Benefits of a Nature-based Approach to Reducing Risk: Wildfire Risk Reduction Buffers

The project: Together with The Nature Conservancy of California, we undertook a [research project](#) to quantify the benefits of a nature-based approach to reducing wildfire risk by using the town of Paradise, California as a case study.

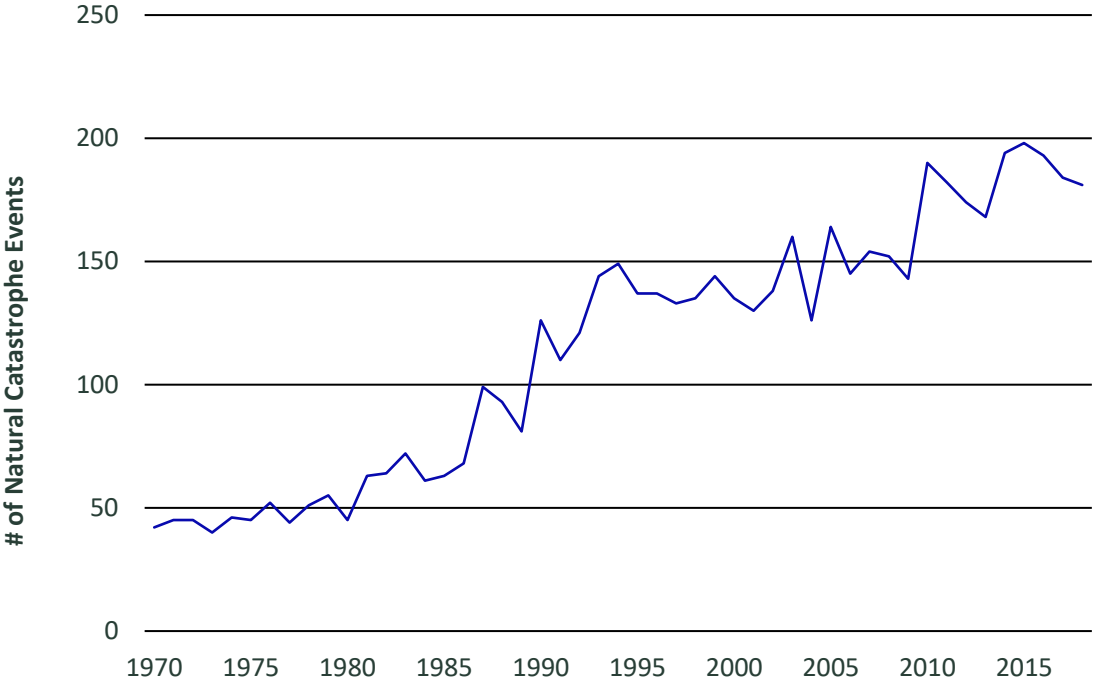
Findings: We found that building codes, coupled with the use of wildfire-risk reduction buffers, can have measurable financial and wildfire risk reduction benefits for communities and minimize ecological impacts.

Implications for Paradise: Natural buffers and strong building codes together would have reduced the 2018 Camp Fire loss by 42%.

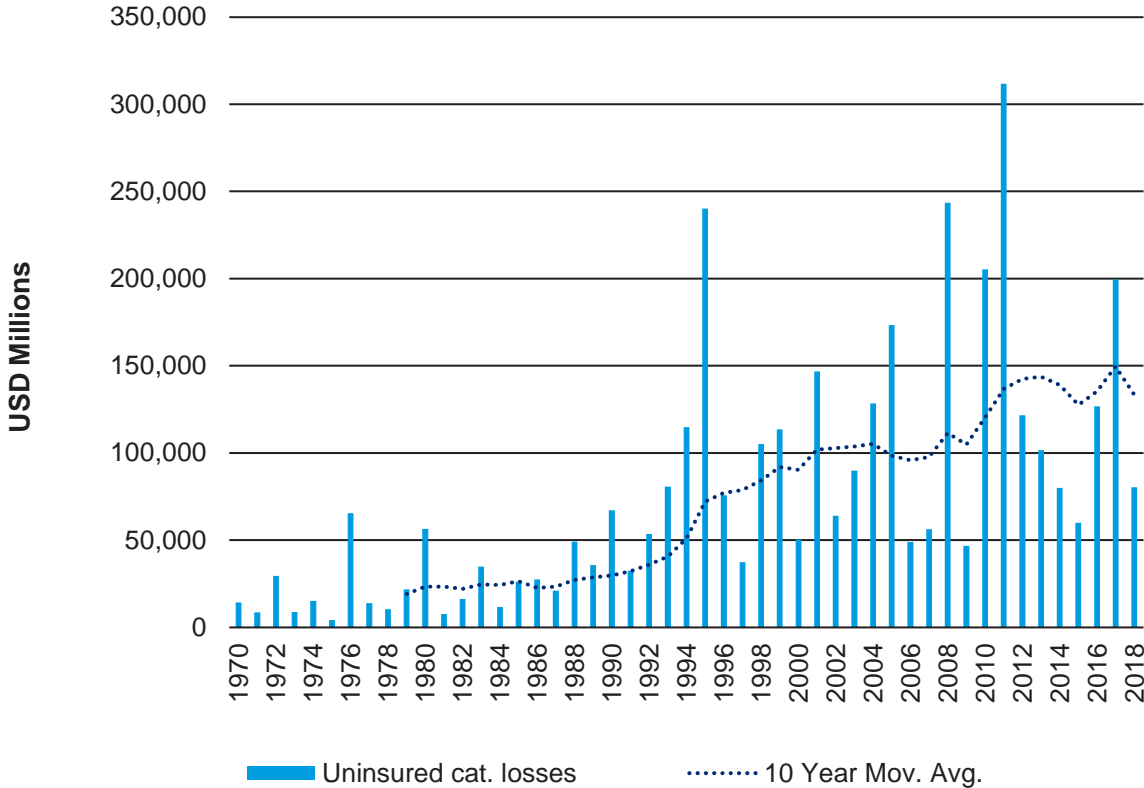
Broader implications: The research demonstrates the economic value of a community-level focus on catastrophe resilience and the potential for Community-Based Catastrophe Insurance (CBCI) to capture the financial benefits for residents through reduced insurance premiums and increased supply of risk capital.

Disasters are becoming more frequent and more costly

Natural catastrophe loss frequency is on the rise...



...along with the value of related uninsured losses



Too few have insurance

Why?



Often unaffordable



Sometimes unavailable



Poor understanding of risk exposure



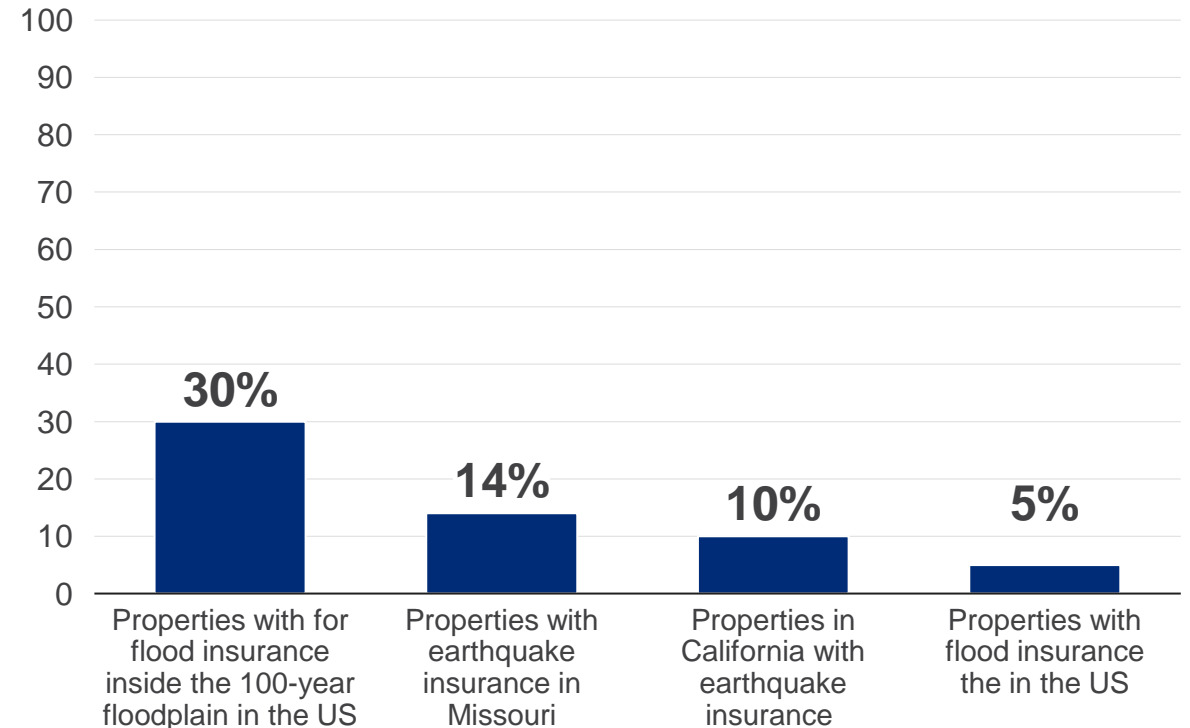
Limited understanding of disaster insurance



Biases in decision-making

These present economic and social challenges, but also opportunities for innovation

We have a long way to go



Catastrophic events have widespread and lingering financial impacts on communities

Individuals

Individuals typically buy inadequate voluntary catastrophe insurance and when coverage is purchased, high deductibles and uncovered losses can still lead to financial distress

Businesses

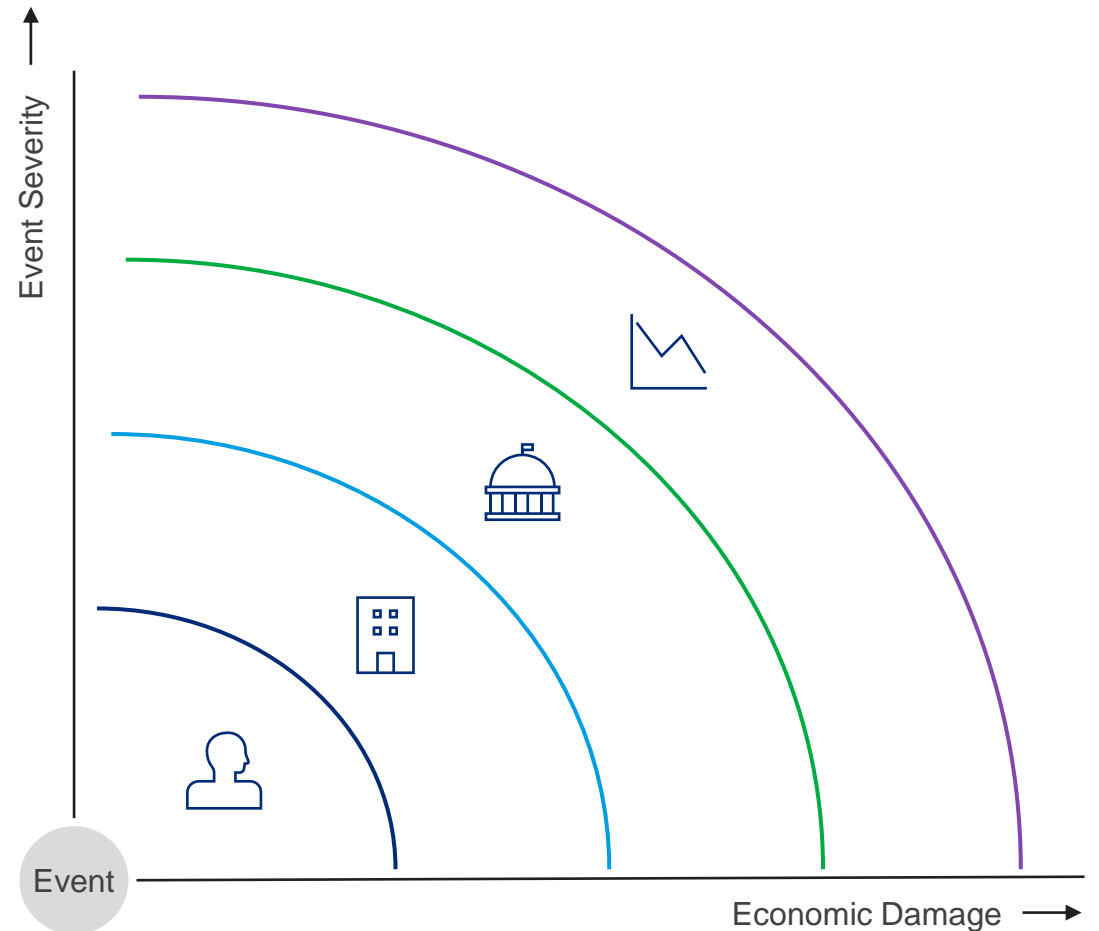
Businesses typically have better insurance coverage than individuals however certain areas are stretched (e.g., typically only 30% of small businesses are insured)

Government

Uninsured liability overwhelms private sector capacity, while uninsured damage to public buildings and infrastructure stress reserves

Economy

Large catastrophe events in areas of low insurance penetration can drive-up short-term expenses and decrease revenue, negatively impacting long-term growth



**Community Based
Catastrophe Insurance (CBCI)
is an innovative mechanism to
increase insurance coverage
and enhance resilience**

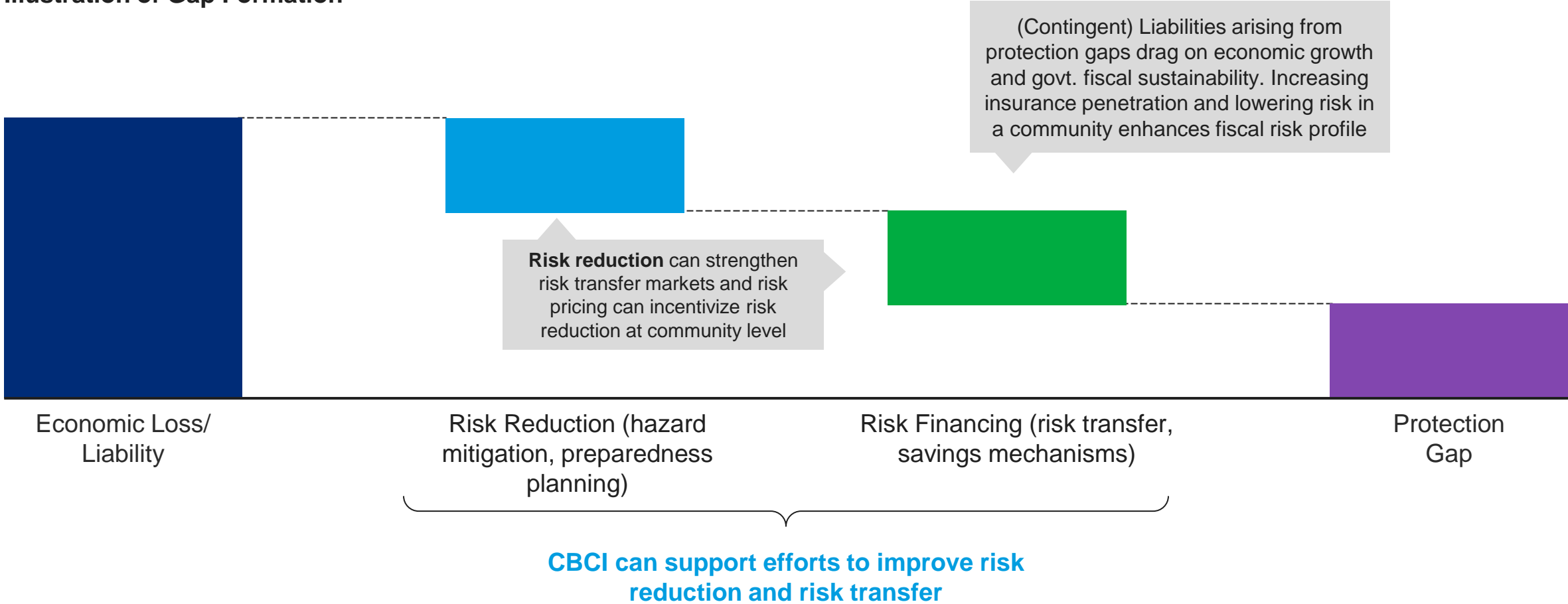


**Insurance arranged
by a local governmental
or quasi-governmental
body to cover a group
of designated
properties or
individuals within
the community's
jurisdiction.**

Channels for Communities to Close Protection gaps via CBCI

CBCI is a potential mechanism for communities to increase insurance coverage, incentivize risk reduction and enhance fiscal solvency

Illustration of Gap Formation



Potential Benefits of CBCI



Enhance Financial Resilience

- Reduces the community's contingent disaster liabilities
- Enhances the community's credit risk profile
- Speeds the insured individuals and businesses to recovery
- Supports the community's post-disaster economic revitalization



Provide Affordable and Available Coverage

- Reduces premium costs by:
 - Increasing buying power and securing volume discounts
 - Enhancing data provision for risk analysis
 - Reducing administrative costs
 - Supporting means testing
- Increases insurance availability by:
 - Potential for lower premium costs
 - Guaranteeing coverage post-loss
 - Increased confidence in risk assessment and peril modeling.
 - Retaining and attracting catastrophe capacity.



Incentive for Community-Level and Individual Risk Reduction

- Enables capture of premium discounts for community-scale and household mitigation efforts
- Supports financing of risk reduction activity via premium surcharge
- Enhances decision-making around risk reduction through risk analytics and pricing

Five-part Framework for Implementation



Define the need

- Determine which groups could benefit
- Consider motivations for CBCI
- Identify residents' needs and key risk exposures

Determine authority to act

- Consider what entities have an interest
- Who has regulatory authority to implement
- Consider what policy reforms or institutional changes are necessary

Engage stakeholders

- Engage community early
- Communicate and educate community about risk and mitigation options

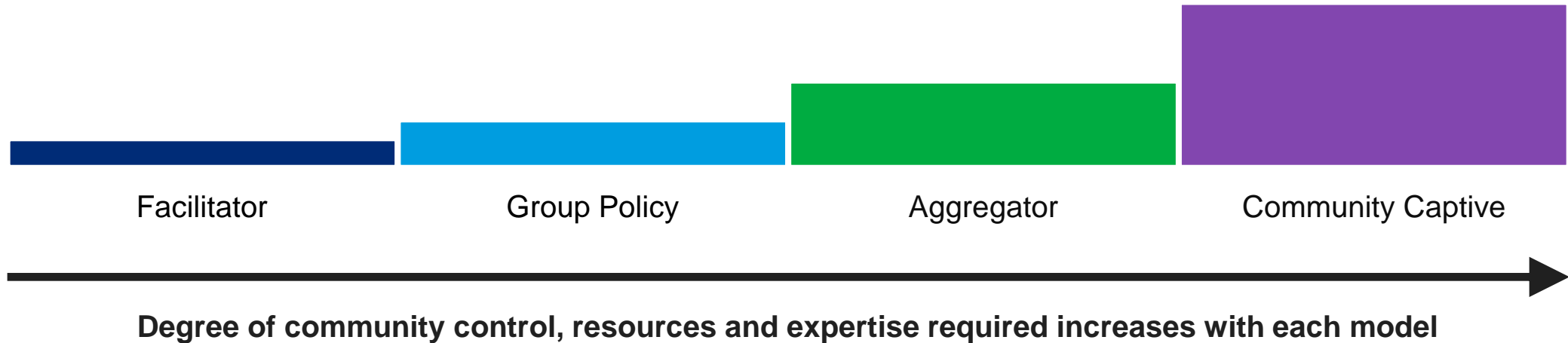
Analyze risk

- Capture data and modeling to design appropriate risk transfer structures and risk reduction mechanisms
- Understand the risk
- Set premiums

Transfer risk

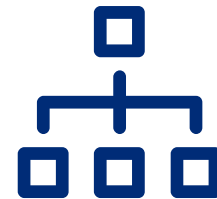
- Consider capital providers
- Determine premium payment options
- Map options for disbursing claims payment

The Spectrum of CBCI Solutions



Facilitator model

Community helps to establish a beneficial arrangement with an insurer for community members



Aggregator model

Community buys bulk parametric catastrophe insurance



Group Policy model

Community arranges a group policy on behalf of its members



Community Captive model

Community establishes its own risk-bearing entity (e.g., a captive)

Parametric Risk Transfer

Simplified (re)insurance structure where conditions for payment are defined pre-event occurrence & based on credible measurements or physical conditions

- Event based product rather than an indemnification of an incurred loss (appreciation of basis risk)
- Pre-defined limits will pay-out based on pre-defined terms and event characteristics
- Pay-out terms are set and defined by specific trigger mechanisms
- Triggers are directly related to the peril/event the protection buyer wants to protect against, e.g.
 - **Earthquake:** *magnitude, latitude, longitude, depth*
 - **Hurricane:** *Wind speed, track*
 - **Wildfire:** *Coordinates / area of burn*
- Contract **only** pays when defined trigger mechanisms are experienced and recorded

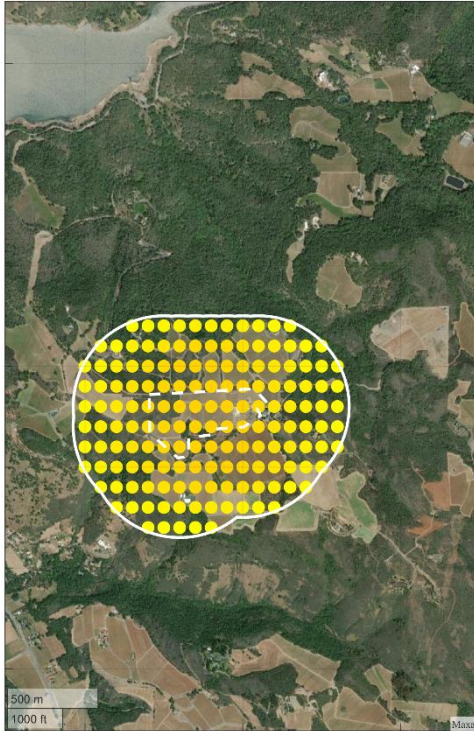
Structured as/for insurance, reinsurance or retrocession;

Insurance accounting treatment or derivative forms;

Utilizes insurance, reinsurance &/or ILS (Cat Bond / Collateralized Re) capacity

GC FIRECELLSM

US (Napa Valley)

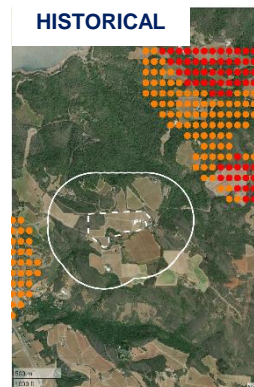
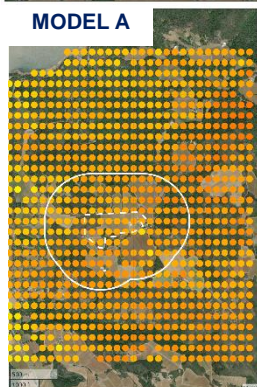


EXPOSURES

Client exposures are disaggregated to a high resolution grid of 0.001deg x 0.001deg (~100m). Client can associate exposures with geographic zones in order to consider property or other (BI, CBI) exposures.

NEAR-REAL-TIME MONITORING

GC FireCell uses NASA operated satellites to establish trigger conditions in near-real-time. If the detected fires overlap the exposure footprint, client obtains a proportional recovery.



MODELING

GC FireCell can be modeled with a variety of cat modeling tools, which enables the client to understand the risk and uncertainty of the transaction. GC FireCell also uses all available historical information to validate the parametric solution outcomes.

COVER TYPE: Parametric wildfire
PERILS COVERED: Wildfire
COVERED LOSSES: Any loss including property & time element
CLAIM PERIOD: Pays within 30 -70 business days; one year for justification
LIMITS: Typically \$5 - \$25 million via (re)insurance, higher limits available, potentially including insurance-linked securities (ILS)
MARKETS: Global reinsurance companies and capital markets funds
MECHANISM: High-res cat-on-a-grid index
GEOGRAPHIC AVAILABILITY: Global
REPORTING AGENCY: NASA Fire Information for Resource Management System (FIRMS)
REPORTING PARAMETERS: Geo-coordinates of the center of a pixel flagged as containing fire
CUSTOMIZATION: Any portfolio

CBCI Case Study: New York City

Inclusive Insurance: Promoting the Post-Flood Financial Resiliency of Low and Moderate Income Households



Project goal: Increase the financial resilience of low- and moderate-income households in New York City to flood risk through the use of inclusive insurance. These communities are increasingly vulnerable and in many instances, under or uninsured.

- Inclusive insurance refers to any program or policy that makes insurance coverage available to those previously locked out of the insurance market.
- Internationally, there has been a growing movement to identify low-cost insurance designs and establish public-private partnerships that can guarantee a more equitable recovery, however, these innovations have yet to be widely adopted in the US.

This [project](#) will establish NYC as one of the first local governments in the US to harness this approach.

Challenge: FEMA program disincentives

The Stafford Act disincentivizes communities and individuals from purchasing insurance

Disincentive 1: When evaluating requests for major disasters and making recommendations to the President, FEMA considers the amount of insurance coverage that is in force as a factor for a Presidential Disaster Declaration.

- Communities with high insurance rates will be less likely to receive a declaration.

Disincentive 2: If declared, FEMA will deduct the amount of insured losses from the eligible funding.

- Governments and individuals with insurance will not receive federal funding for their insured losses.

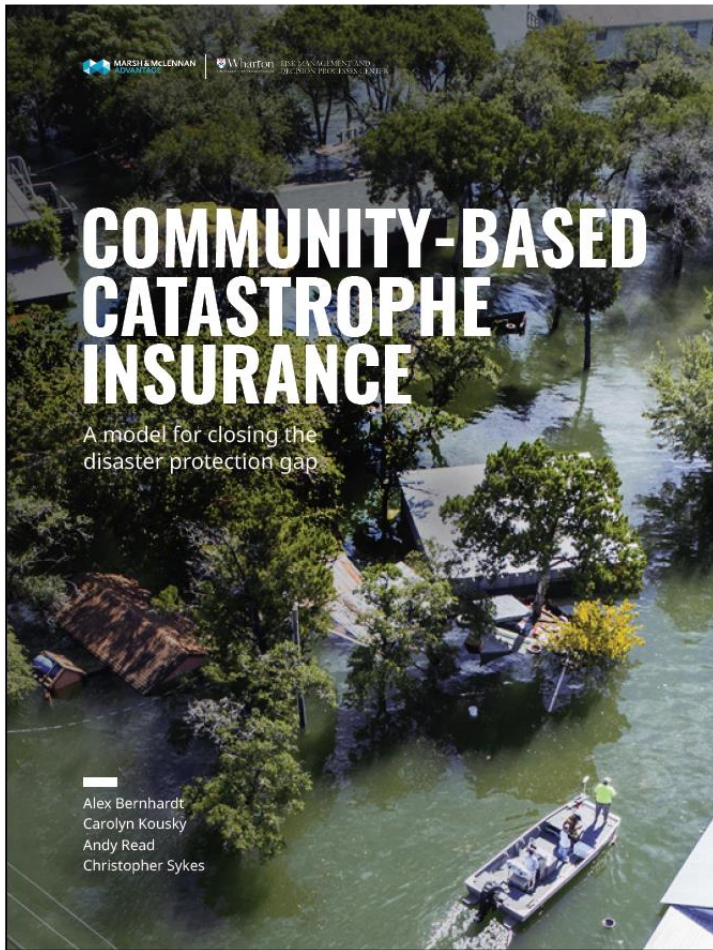
This disincentivizes governments and individuals from taking the proactive step of financially protecting themselves from disasters.

- It could also create a moral hazard by discouraging governments and individuals from mitigating their risks because disaster losses are born by the taxpayer, not by them. (Insurance premiums reflect the actual risks and incentivize risk reduction measures.)

Possible solutions:

- A. Remove insurance as a factor for disaster declarations and/or allow for reimbursement of insured losses.**
- B. Provide mitigation or preparedness grants in the amount of insurance premiums paid.**
- C. Allow for eligibility of insurance premiums for mitigation and preparedness grants.**

Learn more



Access the Marsh McLennan & Wharton report on CBCI [here](#):

Please contact us if you wish to discuss further or have any questions:

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We are leaders in risk, strategy and people. One company, with four global businesses, united by a shared purpose to make a difference in the moments that matter.

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