

Preparing for the Next Disaster

Best Practices & Takeaways for a Resilient Recovery in Los Angeles

Case Studies

SEISMIC



Christchurch Earthquake
Slides 4 - 9

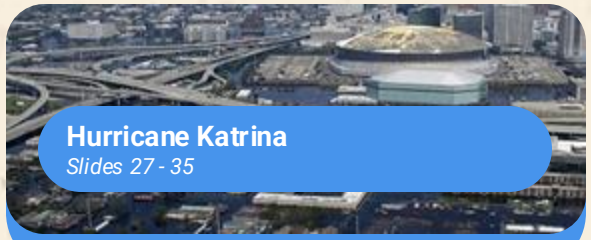


Nepal's Gorkha Earthquake
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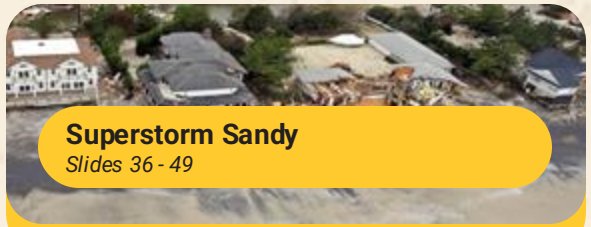


Tohoku Earthquake & Tsunami
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STORMS



Hurricane Katrina
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Superstorm Sandy
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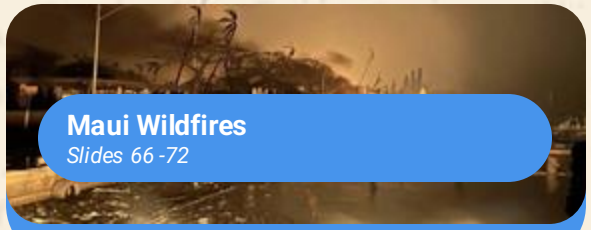


Caribbean Tropical Storms
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WILDFIRE



Spanish Wildfires
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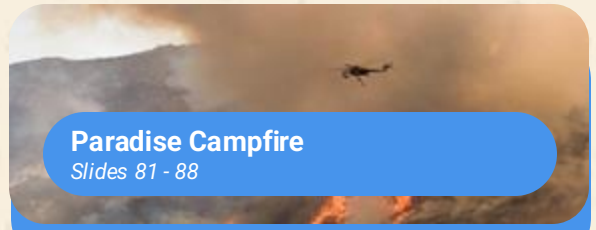


Maui Wildfires
Slides 66 -72



Manitoba Wildfires
Slides 73 - 80

CALIFORNIA



Paradise Campfire
Slides 81 - 88



Woolsey Wildfires
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Representing a variety of disaster types in a diversity of domestic and international geographies, each case has an unique and relevant recovery and/or response approach that has been dissected to provide valuable lessons learned and specifically contextualize them to the LA wildfire recovery.

Methodology

Research & Case Selection

- Conducted high-level analysis of 21 global disasters since 1995, encompassing tropic storms, earthquakes, tsunamis wildfires, and flooding
- Identified array of pivotal case studies for in-depth analysis representing diversity of geography, disaster type, and XXX
- Examined each disaster and its impacts, interventions, stakeholders, outcomes, and key lessons and implications for Los Angeles

Ultimate Goal

- Provide LA policymakers with global examples of innovative, bold, and scalable disaster recovery models, offering actionable lessons adaptable to the LA context for wildfire recovery
- Guide philanthropy towards effective investment in a more resilient recovery



Canterbury Earthquake Recovery Authority (CERA)

Christchurch Earthquake (2010)

International Earthquake Policy

Infrastructure & Utilities - Building Codes & Fire Safety - Emergency Management



Canterbury Earthquake

Disaster

6.3 Magnitude earthquake in Christchurch, New Zealand and surrounding Canterbury region hit less than a year after a devastating 7.1 magnitude earthquake impacted the same geography

Damages

- 185 casualties
- ~7,000 injuries
- ~10,000 homes destroyed
- ~$40 billion recovery

CANTERBURY EARTHQUAKE RECOVERY AUTHORITY (CERA)

Overview

- The Canterbury Earthquake Recovery Act 2011 established the Canterbury Earthquake Recovery Authority (CERA) to build a multi-stakeholder strategy guiding Christchurch's recovery
- CERA identified the appropriate institutions to address economic, social, built, cultural, and natural issues through local authorities' recovery plans and engaged communities in recovery decisions
- The multi-agency “Stronger Christchurch Infrastructure Rebuild Team” rebuilt city roads and freshwater, wastewater, and stormwater networks with resilience in mind

- CERA launched a Land Use Recovery Plan (LURP) to integrate land use policies in recovery, and facilitate changes to the Canterbury Council’s district plans, the Canterbury Regional Policy Statement, and other regulations
  - Implemented a purchase offer for residential relocation to lower-risk areas
  - Red Zone Buyout: Residential areas which experienced severe damage and were deemed infeasible to rebuild on
  - Funded through a variety of sources including: National government, the Natural Disaster Fund, secured reinsurance; local authority funding, including borrowing, rates, and other contributions, and private insurance companies, which covered billions in losses





CANTERBURY EARTHQUAKE RECOVERY AUTHORITY (CERA)

Overview

Operations

CERA operated as the central coordinating body for Canterbury's post-earthquake recovery, working under ministerial direction with broad powers to align local, regional, and national efforts

Partnered with Christchurch and regional councils, Indigenous organizations, and the private sector to guide planning, infrastructure, and housing recovery

Community voices were included through forums, advisory panels, and stakeholder engagement to ensure inclusive, resilient rebuilding

Partners

→Minister for Canterbury Earthquake Recovery Institutions

→New Zealand Government & Parliament

→Christchurch City Council & Regional Councils

→Ngāi Tahu Indigenous People and their Council, known as Te Rūnanga o Ngāi Tahu

→The Ministry of Business, Innovation and Employment (MBIE)

→Private sector & insurers

→100 Resilient Cities



CANTERBURY EARTHQUAKE RECOVERY AUTHORITY (CERA)

Outcomes + Outputs

- **Building codes were** significantly **changed** to allow buildings to withstand large earthquakes, including retrofitting old historical buildings with "shock absorbers" in foundation
- **Centralized coordination** allowed faster infrastructure repair
- **A new urban plan** reshaped Christchurch's layout with a greener, **more resilient core**
- **Government-led, voluntary Red Zone Buyouts program** relocated more than 8,000 properties, transferring land back to the city council for non-residential use – two options: residents could **sell their entire property** (land and house) to the government, or **sell only the land to the government and handle the insurance claim** for their house separately



CANTERBURY EARTHQUAKE RECOVERY AUTHORITY (CERA)

Key Takeaways

What did and didn't work well?

CERA had sweeping powers to coordinate recovery, enabling rapid zoning changes, infrastructure planning, and regulatory streamlining

The recovery of core infrastructure (roads, sewers, etc.) progressed quickly due to **centralized decision-making and financing**

CERA's disbandment in 2016 left gaps in long-term recovery oversight and institutional memory

Residential recovery continued over the long term and CERA could have explored mechanisms to accelerate work and repairs

What was innovative about the model?

The Canterbury Earthquake Recovery Act gave CERA unparalleled authority to override local laws and fast-track rebuilding

Indigenous engagement was formalized and integrated into governance, **an early example of co-governance in disaster recovery**

How did it change business as usual for that place?

CERA set precedent for national governments to take charge during urban-scale disaster recovery

What innovations on this approach would be more impactful for other applications?

A single, well-resourced, multi-sectoral recovery authority can accelerate and coordinate recovery, and variations on this model could be explored across diverse national and subnational contexts

The **use of emergency legislation** to enable fast, flexible, and accountable recovery action could be applied elsewhere with proper checks

CANTERBURY EARTHQUAKE RECOVERY AUTHORITY (CERA)

Applications for Los Angeles in Wildfire Recovery

What won't work in context of the LA wildfire recovery?

- Federal buyouts and financially incentivized relocation have not been widely tested in the United States
- Cultural differences and cost of living may impact the effectiveness of the buyout approach

What are components that align, or may prove relevant in LA?

- Opportunity to explore how a unified cross-jurisdictional authority to coordinate housing, infrastructure, insurance, and environmental rehabilitation might be adopted for the LA context
- Exploration of land use and zoning tools to discourage development in most wildfire-prone zones (and increase density elsewhere)



Rural Housing Reconstruction Program

Nepal's Gorkha Earthquake (2015)

International | Earthquake | Innovative Financing + Community Led Rebuild

Community Engagement & Equity - Infrastructure & Utilities - Housing & Affordability - Building Codes & Fire Safety



Disaster

- 7.8 magnitude earthquake
  - Aftershocks of 7.3, 6.6, 6.7 magnitude

Damages

- ~ 9,000 casualties
- ~ 750,000 structures damaged or destroyed
  - Nearly 20% of Nepal's housing stock impacted
- Initial damage estimates: $5–10 billion
  - Estimated housing recovery cost ~ $3.3 billion (nearly 14% of Nepal’s GDP)



RURAL HOUSING RECONSTRUCTION PROGRAM (RHRP)

Overview

The Post-Disaster Needs Assessment (PDNA) revealed that housing and human settlements were the top recovery need

$4.4
billion

~ $4.4 billion was pledged through a multi donor trust fund towards building a more resilient Nepal

Nepal's government led a nationwide housing reconstruction effort through the RHRP to build a more resilient Nepal

14
rural districts

→ RHRP targeted reconstruction in 14 rural districts and supported long-term disaster resilience

→ Provided training, technical support, and subsidies for safer core housing construction

→ RHRP served as a framework to standardize housing policy across funding sources



RURAL HOUSING RECONSTRUCTION PROGRAM (RHRP)

5 Stage Process

1

The Survey

A comprehensive door-to-door assessment of damage to the housing stock in the affected districts, conducted by the Central Bureau of Statistics (CBS)

2

Identification and Validation

58,503 households in Gorkha and 51,762 in Dolakha identified as damaged or destroyed

3

Enrollment

Eligible beneficiaries could enroll in the program by signing a legally binding Participation Agreement (PA) with their municipality

4

Reconstruction

The owner-driven reconstruction process included support via the Logistics Hub for training, subsidies, implementation, and inspection and certification

5

Completion

Beneficiaries received a “Building Construction Completion Certificate” required to reoccupy reconstructed housing units.

46,638 (79.7% of eligible households) concluded cash agreement in Ghorka

21,540 (41.6% of eligible households) concluded cash agreements in Dolakha



RURAL HOUSING RECONSTRUCTION PROGRAM (RHRP)

Funding & Building Codes

Grants were disbursed in three tranches, linked to key reconstruction stages

First Tranche: 50,000 Nepal Rupees (~365 USD)
→Disbursed to activate the beneficiary bank account

Second Tranche: 150,000 Nepalese Rupees (~1096 USD)
→Disbursed upon completion and verification of plinth-level construction

Third Tranche: 100,000 Nepalese Rupees (~731 USD)
→Disbursed after completion of construction

757,394	Started Construction	**611,241**	Completed Construction

Nepal National Building Code 105: Seismic Design of Buildings in Nepal

Decentralized Implementation

Led by local governments with support from community engagement, training, and practical experience

Core Seismic Design Principles

→ Design structures to withstand seismic forces
→ Use clear, continuous load paths for force transmission
→ Ensure uniform structural layout for balanced force distribution
→ Resist horizontal motion from all directions
- Provide torsional stiffness to prevent uneven stress
- Build stiff, well-connected floors and roofs
- Design foundations for consistent seismic response



RURAL HOUSING RECONSTRUCTION PROGRAM (RHRP)

Stakeholders

Key Development Partner

Japan International Cooperation Agency (JICA)

Operations

The Government of Nepal managed the recovery with developmental assistance from JICA and financing through their Multi Donor Trust Fund

Multi-Donor Trust Fund (MDTF)

→ US Agency for International Development (USAID)
→ Swiss Agency for Development and Cooperation (SDC)

Nepalese Government

National Reconstruction Authority (NRA) provided guidance, oversight, and facilitated communication across Government of Nepal
→Program Management Unit (PMU): Established Donor Coordination Committee (DCC). Provides oversight on rural reconstruction

Government of Nepal Project Implementation Units (PIUs)
→Department of Urban Development and Building Reconstruction (DUDBC) Project Implementing Unit (PIU)
→Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) Project Implementing Unit (PIU)

Fourteen District Development Committees (DCCs)
→Village Development Committees (VDCs)
→Worked with community members to complete reconstruction



RURAL HOUSING RECONSTRUCTION PROGRAM (RHRP)

Outcomes & Outputs

- **Community-Driven Process** that provided training, grants, and support in coordination with partner organizations to assist the reconstruction process
- As of 2022, the RHRP had **rebuilt approximately 800,000 private homes** that met resilience standards
- The program resulted in **77,000 masons trained in resilient construction** (15,000 of whom were women)



RURAL HOUSING RECONSTRUCTION PROGRAM (RHRP)

Key Takeaways

What did and didn't work well?

Community-Driven Rebuild Process
- Provided training, grants, and support in coordination with partner organizations
- Workforce training

Resilient reconstruction frameworks were encouraged across government levels, but community-level resilience education was not as successful

What was innovative about the model? How did it change business as usual for that place?

Scale of reconstruction and positive impacts on workforce development
- Relative to the impacted population, the community-driven recovery effort resulted in huge grassroots mobilization and economic shift

Financial distributions increased individual bankability and financial sovereignty

Rebuilding to a more resilient design standard will protect communities from future events

What innovations on this approach would be more impactful for other applications?

Community driven rebuild process with emphasis on workforce training for long-term economic prosperity

RURAL HOUSING RECONSTRUCTION PROGRAM (RHRP)

Applications for Los Angeles in Wildfire Recovery

What won't work in the context of LA wildfire recovery?

- Economic and development conditions vary greatly (e.g., economic capacity, level of development, cost of reconstruction)
- Homeowners directly rebuilding their homes after receiving training is more difficult or impossible under standard practices in the United States
- Permitting, approval standards, and construction processes differ significantly
- California won't qualify for development funding mechanisms used in Nepal

What are components that align, or may prove relevant in LA?

- Direct public support for homeowners for home reconstruction sped recovery
- Workforce training in reconstruction created more skilled labor jobs, particularly for women
- A multi-donor fund was established, allowing for the leveraging of various funding streams
- Decentralized implementation through local governments enabled faster and more tailored dissemination to communities
- Specific requirement to meet new resilience standards were established, guided by international standards and models



Japanese Recovery Framework

Great East Japan Earthquake & Tsunami (2011)

International | Earthquake & Tsunami | Policy + Programs

Community Engagement & Equity - Housing & Affordability - Emergency Management



Great East Japan Earthquake & Tsunami

Disaster

- Magnitude 9.0 earthquake
- Hundreds of aftershocks, some registering as high as 7.2 in magnitude
- Series of tsunami waves up to 33 feet

Damages

- Estimated 19,729 casualties, 2,559 people still listed as missing, and 6,223 injuries
- 470,000 people were evacuated
- Direct financial damages estimated at $154 billion (Japan's GDP 2011- 6.2 trillion)
- Also led to the Fukushima Daiichi nuclear disaster

震度
(JMA Seismic Intensity)



JAPANESE RECOVERY FRAMEWORK: RECONSTRUCTIVE TAX

Overview

The Recovery Framework for the 2011 Japan earthquake was a comprehensive national strategy to fund rebuilding efforts. The Reconstructive Tax was the primary mechanism to finance this framework. The funds were used for reconstruction of infrastructure and communities, including those impacted by the subsequent nuclear disaster, and repayment of government-issued reconstruction bonds

Rationale:

- Spread the burden fairly across citizens and businesses
- Ensure predictable, multi-year revenue for recovery
- Symbolize national solidarity and commitment to resilience

Structure:

- Progressive tax structure designed with rates determined by individuals' prior income levels, ensuring that contributions were fair and proportional to each citizen's financial capacity
- Flat 2.1% surtax imposed on national income tax from 2013–2037, but with a progress structure meant that higher earners paid a greater absolute amount for reconstruction
- ¥1,000 annual surcharge on local inhabitant tax (residential tax based on income) per person (2014–2023)
- 10% surtax on corporate tax (2012–2014, repealed one year early)



MENTAL HEALTH CARE

Katariba

A social program supported through the Recovery Framework, Kataria provided after school services referred to as “collaboration school” that provides mental health care and learning support for children affected by the earthquake and tsunami.

Five collaborations with schools:

→Onagawa in Miyagi Prefecture, Otsuchi in Iwate Prefecture, and Hirono in Fukushima Prefecture, areas affected by the 2011 Great East Japan Earthquake

→Mashiki in Kumamoto Prefecture (which was affected by the 2016 Kumamoto Earthquake)

→Yakage in Okayama Prefecture, which was hit by heavy rains in 2018





Stakeholders

Operations

The Government of Japan designed and managed the Reconstructive Tax, with funds collected from individuals and corporations

Local governments led recovery projects, while civil society groups like Katariba, supported by private and public funding, provided community-level support

Government

Ministry of Finance, National Diet, Reconstruction Agency designed and implemented the tax; managed fund allocation

Local government led on-the-ground reconstruction projects

Civil Society & NGOs

→ Advocated for transparency and monitored use of funds through direct involvement in relief projects, coordination with international partners, capacity building for local groups, and advocacy for government transparency

→ Katariba was funded through private sector donations, crowdsourcing, and government support



Outcomes & Outputs

Reconstructive Tax

→By 2037 the tax will have covered 40% of the reconstruction budget

→Recovery Framework created community support, unity, and collaboration for more effective recovery

→Broad public support and national solidarity for the implementation of the tax.

$223

Billion USD allocated to infrastructure

Katariba

→Specific focus on mental health provided unique focus for recovery

→Two crowdsourcing campaigns raised $300,000, exceeding fundraising goals

1,277

Programs grew to over 1,277 students by 2018



JAPANESE RECONSTRUCTIVE TAX & MENTAL HEALTH CARE

Key Takeaways

What did and didn't work well?

Recovery framework shaped the national narrative of the disaster as a shared burden and helped overcome any differences

Proactive mindset pushed for action that would not defer the burden to future generations

Particular focus on trauma and mental health during recovery, particularly for youth, supported more effective, holistic recovery

What was innovative about the model? How did it change business as usual for that place?

Universal taxation shared burden of recovery and set precedent for future disasters

Social programs supported through crowdsourcing campaigns demonstrated community investment

What innovations on this approach would be more impactful for other applications?

Examining the reconstructive tax and trying to apply a similar approach for major recoveries

Iterating upon Katariba's approach for assisting the mental health of victims and needs of students



JAPANESE RECONSTRUCTIVE TAX & MENTAL HEALTH CARE

Applications for Los Angeles in Wildfire Recovery

What won't work in context of the LA wildfire recovery?

- Receptiveness to taxation differs widely in LA, and will likely be unfavorable
- California-specific mechanisms for adoption of taxes (i.e. ballot measure) and necessary mechanisms to build public support must be considered
- Given the diversity of characteristics of the three separate fires and subsequent tensions a narrative of shared and collective burden has become increasingly difficult to adopt

What are components that align, or may prove relevant in LA?

- Special focus on mental health support for survivors has demonstrated need according to LA survivor survey data
- Consistent revenue streams for recovery will provide the best avenue to rebuilding for LA
  - Despite public views on taxation, a professionally organized and creative campaigns may have success
- Long-term, big picture thinking is critical for LA's recovery
- Despite fractured dynamics, community cohesion messaging like "LA Rises" and "LA Strong" gained traction and may again strengthen as long-term recovery resources increase



Unified New Orleans Plan

Hurricane Katrina (2005)

Domestic | Hurricane | Policy + Community Led Rebuild

Community Engagement & Equity - Infrastructure & Utilities - Housing & Affordability - Permitting & Approval Process



Disaster

Category 4 hurricane that devastated New Orleans through a combination of storm impacts and manmade failures like the levee break.

Damages

- ~ 1,800 deaths
- Millions were left homeless
- ~ $161 billion in damages
- Within a week, 80% of New Orleans was underwater



UNIFIED NEW ORLEANS PLAN (UNOP)

Overview

→ After a few false starts and mis-steps, a civil society led, philanthropically funded effort was officially adopted by city, state, and federal partners to unlock essential funding streams and unify fragmented recovery efforts

→ Combined bottom-up community planning with top-down strategic alignment

→ Community members led local planning through public meetings, charrettes, and workshops

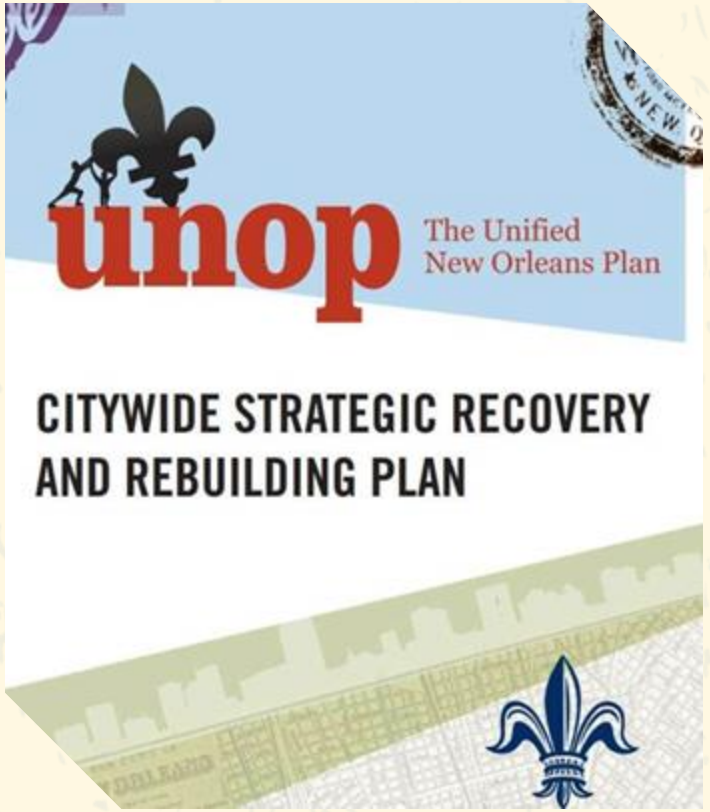
→ City leaders and technical experts aligned plans with broader infrastructure, housing, and economic goals

→ Included extensive neighborhood-level planning across 13 districts

→ Established a unified vision for rebuilding, consolidating more than 100 individual recovery plans into a single, actionable citywide strategy

→ Helped secure billions in federal and state recovery funding by presenting a coherent and comprehensive recovery agenda

→ Established an independent authority to manage the distribution of recovery funds and reduce bureaucracy





UNIFIED NEW ORLEANS PLAN (UNOP)

Stakeholders

Operations

UNOP coordinated operations between local communities, city officials, and state and federal agencies through a centralized planning framework

Public input was gathered through public meetings, with collaborative process ensuring alignment between grassroots needs and top-down funding and policy decisions

Partners

→City Planning Commission
→Greater New Orleans Foundation
→Mayor's Office and City Council
→Bring New Orleans Back Commission
→Urban Land Institute (ULI)
→Local residents & neighborhood groups
→Federal and state partners: Louisiana Recovery Authority, HUD, FEMA





Shifting Recovery Priorities

Priority Areas by Timeframe	Short-Term (0-2 years)	Mid-Term (3-5 years)	Long-Term (6-10 years)
Flood Protection	23%	58%	19%
Neighborhood Stabilization	20%	40%	40%
Housing	42%	58%	0%
Economic Development	57%	34%	9%
Infrastructure and Utilities	47%	39%	14%
Transportation	7%	16%	77%
Healthcare	72%	28%	0%
Education	51%	47%	2%
Community Services: Public Safety	52%	45%	3%
Community Services: Environmental Services	34%	58%	8%
Community Services: Recreation and Libraries	22%	46%	32%
Other Municipal and Cultural Resources	20%	30%	50%
Historic Preservation/Urban Design	19%	31%	50%
Implementation – Staffing and Regulatory Amendments	31%	39%	30%



UNIFIED NEW ORLEANS PLAN

Outcomes & Outputs

- **UNOP** can serve as a model for streamlined recovery in a complex jurisdictional context
- Allowed for **$14.5 billion dollar plan,** allocated over the ten-year timeline, to be successfully managed
- **Community Congress method** successfully integrated public input into recovery planning
- Embracing a **whole community approach** is vital to developing a successful long-term recovery



UNIFIED NEW ORLEANS PLAN (UNOP)

Key Takeaways

What did and didn't work well?

UNOP successfully brought together fragmented efforts across neighborhoods into a single, citywide recovery strategy

Grassroots input was prioritized through district-level planning teams, extensive public meetings, and outreach

Restoring trust and ensuring local voices shaped priorities was a central priority

Wealthier areas could better advocate and organize, while poorer or more damaged neighborhoods lacked resources or technical assistance, **so recovery was not always equitable**

What was innovative about the model?

Alignment among many complex processes and authorities: UNOP balanced centralized coordination with deep local participation

How did it change business as usual for that place?

It elevated public engagement as a cornerstone of post-disaster planning

What innovations on this approach would be more impactful for other applications?

Building on approaches for community engagement as a central method of informing recovery in a way that addresses long-standing inequities

The creation of **a separate authority** sped recovery process through streamlined distribution of funds and reduced jurisdictional conflict

RURAL HOUSING RECONSTRUCTION PROGRAM (RHRP)

Key Applications for Los Angeles

What won't work in context of the LA wildfire recovery?

- Coordination of local plans under a single regional recovery strategy streamlined aid and helps foster alignment among multiple jurisdictions, however given the unique dynamics of LA governance and the three respective fires make this very likely unachieveable
- Absence of federal government financial supports for FEMA and direct aid leaves the same gap in relief funding in LA
- Receipt of international aid is similarly unlikely

What are key pieces that align, or are relevant in LA wildfire recovery?

- Coordination of local plans under a single regional recovery strategy would help address the inefficiencies among local agencies and organizations
- An independent governance structure would eliminate jurisdictional tensions and reduce bureaucratic delays



Rebuild by Design

Hurricane Sandy (2013)

Domestic | Hurricane | Design Competition

Community Engagement & Equity - Infrastructure & Utilities - Emergency Management

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Disaster

In 2012, Sandy emerged as the largest Atlantic hurricane on record with tropical-storm-force winds spanning 1,150 miles. By the time it hit the US, Sandy, then categorized as a powerful "superstorm," caused extensive wind and flooding damage in the Mid-Atlantic and Northeast, particularly in New York City.

Damages

- More than $70 billion in damages
- ~8.5 million people lost power, many for protracted periods of time
- 147 casualties



REBUILD BY DESIGN

Overview

Rebuild by Design began as a design competition for resilience projects, launched in response to Hurricane Sandy, to raise the bar for response, preparedness, and resilience. The Design Competition format spurred innovation, while still integrating a research-based, collaborative approach to prepare communities for future challenges.

STAGE 1
Convening Talent:

➔From the initial 150 international applicants, 10 teams were selected to work with local stakeholders

➔Teams were selected based on background, approach, and willingness to participate in comprehensive research

STAGE 2
Collaborative Research:

➔10 teams spent 3 months, guided by partner organizations and a Research Advisory Group, researching the affected region.

➔At the end of this research stage, the teams presented 41 design opportunities to a jury of partners and local government

➔One design per team was ultimately selected for further development

STAGE 3
Collaborative Design:

➔Through work with community stakeholders and local government to build community support and develop an effective implementation plan, each team further refined their final proposals

➔For final selection, the 10 teams publicly showcased their proposals at public exhibitions in NY and NJ

STAGE 4
Winning Designs and Implementation:

➔Following public exhibitions, a Jury led by the HUD Secretary announced the winning 6 designs, and one finalist to receive the $930 million in funding



REBUILD BY DESIGN

Winning Designs

THE BIG U

- Designed to protect Lower Manhattan from floodwater, storms, and climate change, the Big U envisioned 10 miles of tailored flood protection along Manhattan’s east side, integrating flood defenses with community amenities
- Strategies include berms, deployable floodwalls, and elevated landscapes that double as public spaces and ecological features
- The $335 million project was divided into self-sufficient yet connected zones: East River Park, Two Bridges/Chinatown, and Brooklyn Bridge to the Battery



REBUILD BY DESIGN

Winning Designs

LIVING WITH THE BAY

- Living with the Bay, a $135 million project designed for Long Island, sought to mitigate damage from storm surges, manage stormwater, improve habitat and water quality, and increase access to the Mill River
- The project was based around four core principles: flood defense, ecological restoration, access and urban quality, and social resilience

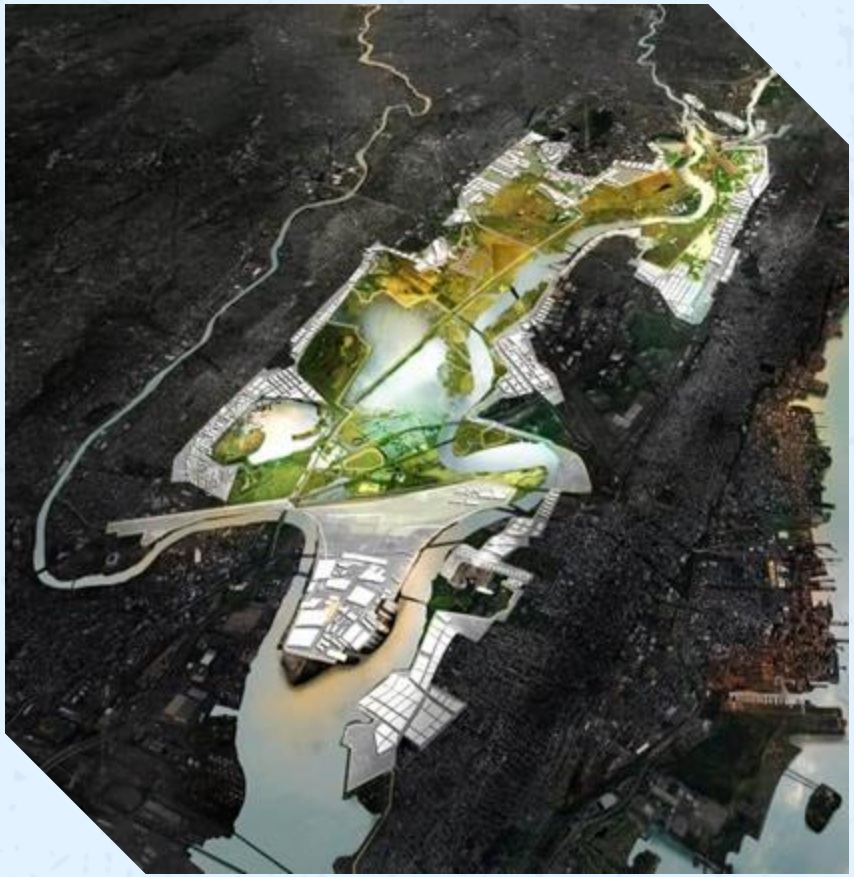


REBUILD BY DESIGN

Winning Designs

NEW MEADOWLANDS

- The New Meadowlands project integrated complementary flood reduction projects to protect, connect, and grow Meadowlands, NJ
- “Meadowpark, " transformed the Meadowlands into a flood-protected regional public park, expanding marshland restoration through a system of berms, and built a “Meadowband” to increase flood protection and create bike lanes and public transportation for improved public access
- The $150 million project also proposed housing development opportunities and new energy distribution systems



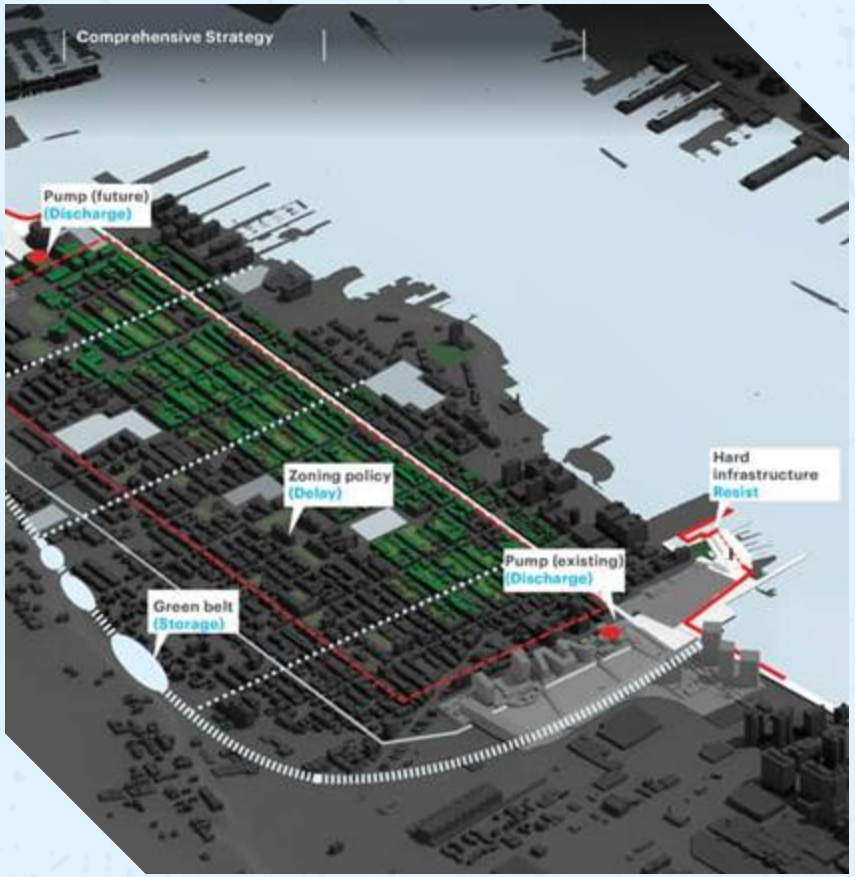


REBUILD BY DESIGN

Winning Designs

RESIST, DELAY, STORE, DISCHARGE

- This comprehensive strategy integrated coastal barriers and green infrastructure, while also upgrading sewer systems to better resist, delay, store, and discharge floodwaters, reducing the impact of high tides and storm surges
- This $230 million project combined hard infrastructure, soft landscape features, policy reforms, and system upgrades to enhance urban resilience in Hoboken, Jersey City, and Weehawken, NJ



REBUILD BY DESIGN

Winning Designs

HUNTS POINT LIFELINES

- The Hunts Point Lifelines resilience plan sought to shield the Hunts Point peninsula from coastal flooding, made possible through a “Levee Lab,” which integrated flood defenses, emergency maritime supply lines, and a clean-energy micro-grid
- This $20 million project also sought to create local jobs and reconnect residents to the waterfront in the Bronx, NY



REBUILD BY DESIGN

Winning Designs

LIVING BREAKWATERS

- Living Breakwaters aimed to reduce erosion and storm damage, improve the Raritan Bay ecosystem, encourage environmental responsibility, and enhance shoreline access
- This $60 million coastal green infrastructure project specifically addressed building resilience in Staten Island, NY



REBUILD BY DESIGN

Winning Designs

RESILIENT BRIDGEPORT

- Resilient Bridgeport created a pilot project to support dry egress adjacent to a stormwater park that also served as a recreational space when dry and a rainwater detention and drainage catchment during storms
- The $10 million project built a public plaza with an integrated pump station to collect and redirect stormwater to a repurposed outfall at the head of Cedar Creek





REBUILD BY DESIGN

Stakeholders

Operations

→ HUD coordinated the overall competition and funding framework, ensuring alignment with national recovery efforts

→ The Rockefeller Foundation played a key role by offering early financial backing and strategic guidance to support the initiative's innovative, cross-sectoral approach

→ Independent design teams collaborated closely with local communities and governments in the NY/NJ region to develop context-specific solutions

Partners

→HUD

→The Rockefeller Foundation

→Independent design teams

→Local communities and governments in the NY/NJ region

REBUILD BY DESIGN



REBUILD BY DESIGN

Outcomes & Outputs

- **A Design Competition model** established a new process for innovation, starting with hundreds of designs and filtering to 6 final designs that received $930 million in funding
- **Projects integrated flood protection with environmental, social, and economic co-benefits** such as green infrastructure, recreational spaces, habitat restoration, and job creation
- **A more resilient recovery process shifted the approach to disaster recovery funding,** prioritizing resilience and future climate risks over simply rebuilding pre-disaster conditions



REBUILD BY DESIGN

Key Takeaways

What did and didn't work well?

Emphasis on **comprehensive research** within affected communities to inform designs and projects

Collaborative, inclusive design process brought together designers, scientists, local leaders, and communities to co-develop solutions

Implementation delays due to coordination challenges, regulatory hurdles, and local capacity constraints

What was innovative about the model?

CDBG block grants targeted for better outcomes

Multi-benefit projects didn't just address flood protection—they also delivered open space, equity, and ecological benefits

How did it change business as usual for that place?

Increased community co-design, access, and greenspace

Encouraged long-term resilience instead of rebuilding through business-as-usual

What innovations on this approach would be more impactful for other applications?

International design competition established a new process for innovation and allowed for **thinking big** in disaster recovery



REBUILD BY DESIGN

Key Applications for Los Angeles

What won't work in context of the LA wildfire recovery?

- Federal government support for large initiatives like this are unlikely in current policy environment
- Given the timeframe for deployment, to meet the needs of LA residents in their recovery, this process would need to be launched immediately

What key pieces align or are relevant for the LA wildfire recovery?

- Large scale projects are possible in a post disaster moment and recovery is an opportunity to think bigger
- Community-led visioning is essential in LA's diverse, fire-prone communities
- Multi-benefit projects can help in a place like LA with multiple hazards and climate challenges



Caribbean Catastrophe Risk Insurance Facility

The Caribbean (2007)

International | Severe Weather Events | Innovative Financing

Community Engagement & Equity - Infrastructure & Utilities - Emergency Management



Disasters

Since 2000, natural disasters have affected more than 190 million people in Latin America and the Caribbean

Damages

- Caribbean nations face annual storm damage averaging 17% of their GDP
- In 2017 alone, Dominica lost the equivalent of 253% of its GDP (during Hurricane Maria), just two years after it lost the equivalent of 92% of its GDP (during Hurricane Erika)



CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY

Overview

Improving access to catastrophe risk insurance

Small island states historically have difficulty absorbing the financial impacts of disasters due to:

- Limited budgetary capacity that prevents establishing financial reserves
- High debt levels limit their access to credit after disasters
- High transaction costs

Driven by the increasing frequency and intensity of extreme weather events throughout the early 2000s, the Heads of Government of the Caribbean Community & Common Market, now known as CARICOM, sought assistance from the World Bank to improve access to catastrophe risk insurance and to explore new applications of parametric insurance.

Launched in 2007, CCRIF is the world's first multi-country, multi-peril parametric insurance pool for tropical cyclones, hurricanes, and earthquakes

- First regional catastrophe fund that pools risk and provides insurance coverage at a lower cost than individual governments would incur to limit the financial impact of hurricanes and earthquakes to Caribbean governments
- Shift toward parametric insurance, which is cheaper than traditional indemnity insurance and deploys funds quicker through increased short term liquidity, enables a more efficient recovery for both governments and individuals



CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY

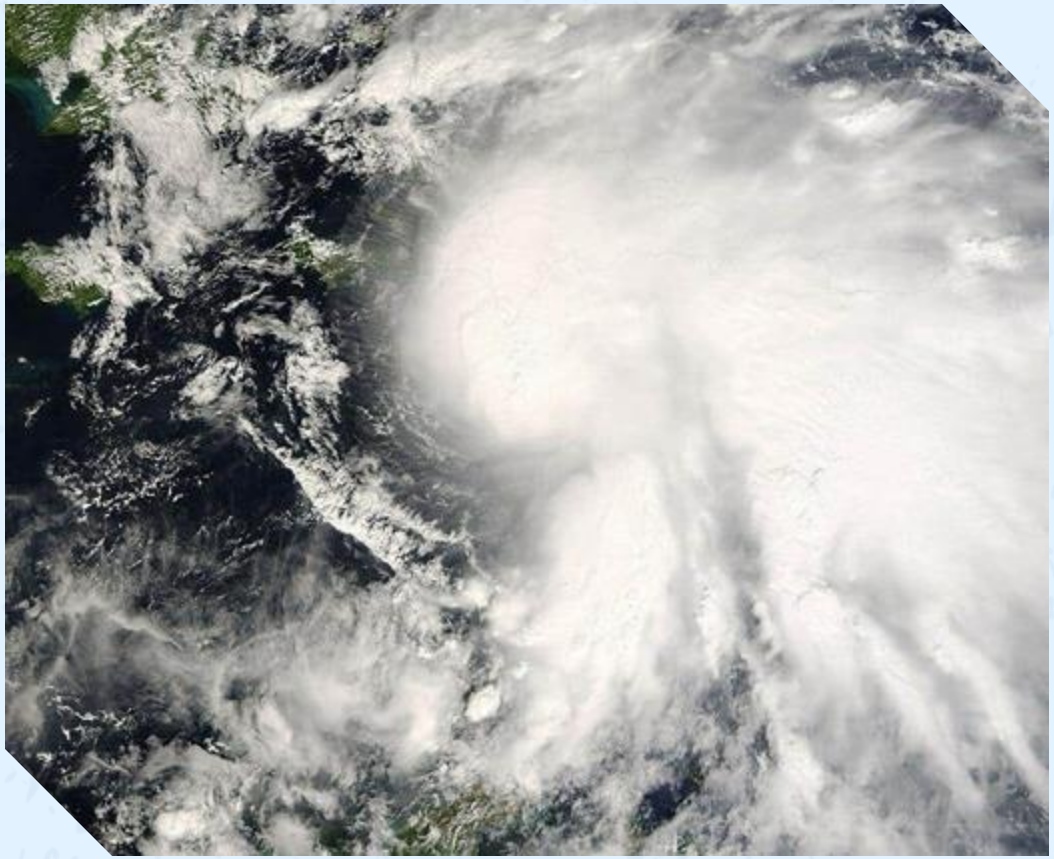
Products

Offerings
CCRIF SPC offers Earthquake (EQ), Tropical Cyclone (TC), and Excess Rainfall (XSR) policies to Caribbean and Central American governments

Catastrophe risk models
Catastrophe risk models are based on robust datasets containing separate hazard, exposure, vulnerability, damage, and loss modules

Payment calculations
Payments are based on the intensity of an event and the amount of loss calculated in a pre-agreed model caused by these events

Short-term liquidity
The insurance delivers short-term liquidity quickly after a disaster to limit the financial impact of recovery





CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY

Stakeholders

Operations

CCRIF was developed with World Bank technical support and a grant from Japan, and capitalized through a Multi-Donor Trust Fund

In 2014, a second fund was established by the World Bank to support CCRIF's product expansion and regional growth.

Member Countries

- ➔ Anguilla
- ➔ Antigua and Barbuda
- ➔ The Bahamas
- ➔ Barbados
- ➔ Belize
- ➔ Bermuda
- ➔ British Virgin Islands
- ➔ The Cayman Islands
- ➔ Dominica
- ➔ Grenada
- ➔ Guatemala
- ➔ Haiti
- ➔ Jamaica
- ➔ Montserrat
- ➔ Nicaragua
- ➔ Panama
- ➔ Saint Kitts and Nevis
- ➔ Saint Lucia
- ➔ Sint Maarten
- ➔ Saint Vincent and the Grenadines
- ➔ Trinidad and Tobago
- ➔ Turks and Caicos

Partners

- ➔ World Bank
- ➔ Caribbean Development Bank
- ➔ Rockefeller Foundation
- ➔ Association of Caribbean States (ACS)
- ➔ Caribbean Disaster Emergency Management Agency (CDEMA)
- ➔ Center for the Prevention of Natural Disasters in Central America (CEPREDENAC)
- ➔ United Nations Economic Commission for Latin America and the Caribbean (UNECLAC)



CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY

Outcomes & Outputs

CCRIF SPC has been activated **78 times** and made **$390M in payouts** through 2024, including for:

- Tropical cyclones: $205,487,932
- Earthquakes: $50,003,222
- Excess rainfall events: $121,791,867
- Sector payouts (e.g. fisheries, water utilities, etc.): $20,286,389

Case Study: **Hurricane Beryl, 2024**

- CCRIF issued **US$85M in payouts** across **12 parametric policies to five countries**
- **Grenada received US$55.5M** for immediate relief services, rebuilding, and long-term community support, including:
  - Emergency food, water & health services
  - Distribution of house repair materials and relocation of elderly citizens from damaged facilities
  - Restoration of schools hospitals, roads, bridges, utilities, and water systems
  - Business recovery support, as well as direct income supports to vulnerable populations, including farmers and fisherfolk



CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY

Key Takeaways

What did and didn't work well?

Spreading risk pool across multiple geographies decreases impact to insurance and recovery financial implications during any given disaster "season" (i.e. hurricane or wildfire season)

Has been successful in distributing money quickly to governments following disasters; however, governments in CCRIF SPC have been slow in creating lasting impacts with the insurance payouts

Successfully replicated in South East Asia and demonstrating success

What was innovative about the model? How did it change business as usual for that place?

Amidst diverse Caribbean nations, this created a **common governance structure to manage multi-hazard risks they share**

Insurance facility acted as cross-jurisdictional entity to manage funding following various disasters, created swift liquidity, and reduced bureaucratic roadblocks for distributions

What innovations on this approach would be more impactful for other applications?

CCRIF is the world's first multi-country, multi-peril parametric insurance pool for tropical cyclones and earthquakes

Utilizing some of the technical knowledge and structures to apply a similar model in other disaster prone regions, including for diverse disaster applications

CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY

Key Applications for Los Angeles

What won't work in context of the LA wildfire recovery?

- Finding technical and funding partners (in the absence of development banks and other multilateral organizations that supported CCRIF)
- A broader focus on multi-hazard risk may be necessary (versus a focus on just wildfire) for developing successful sustained funding sources

What pieces align or are relevant for the LA wildfire recovery?

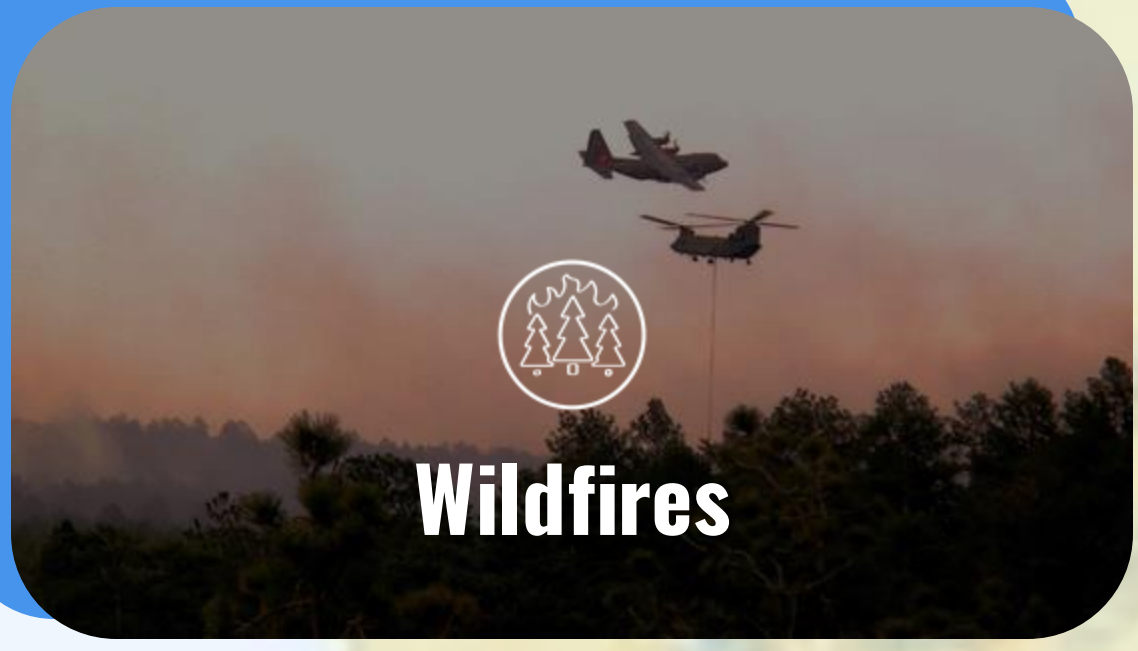
- Federal government support for large initiatives like this are unlikely in the current policy environment
- Given the timeframe for deployment, to meet the needs of LA residents in their recovery, this process would need to be launched immediately

Restoration and Rewilding for Wildfire Prevention

Spain's Alt Empordà Wildfires (2012)

International | Wildfires | Nature Based Solutions

Infrastructure & Utilities - Emergency Management



Wildfires

Disaster

As a result of severe drought, two wildfires in Alt Empordà, Catalonia burned over three days in July 2012.

Damages

- ~3,000 people forced to evacuate
- ~14,000 hectares were burned
- 19 municipalities affected

REWILDING FOR RESTORATION AND WILDFIRE PREVENTION

Overview

Rewilding for restoration is an innovative approach to nature conservation and ecological restoration that can contribute significantly to rural development by building healthier and more diverse landscapes with richer biodiversity. The approach involves rehabilitating land devastated by wildfires through planting the most resilient native tree species in a less dense fashion and providing aftercare and forest management through a three-step process:



1

Before reforestation

Site and surrounding environment are assessed for fire damage, historical incidents, and climatic conditions. This evaluation aids in selecting fire-resistant species. If fire risk is too high, the project is abandoned.

2

During the planting

In wildfire-prone areas, decrease planting density and favor resilient native tree species. Improve landscape resiliency by integrating the site into the wider landscape, including roads, fire breaks, and fire buffers (e.g., planting fire-resistant species).

3

Aftercare and management

Forest management is essential. Managers proactively reduce wildfire risk by maintaining fire breaks, forest thinning, and prescribed burning.

Overview

Rewilding for Resilience

Ecological restoration through increased natural grazing, planting seedbeds, cutting dead wood, and constructing small ponds leads to greater environmental resilience and reduces the risk of wildfire. The reintroduction of wild horses mitigates wildfire risk by reducing the volume of combustible vegetation within the landscape.

→ In Spain, wild horses electively graze on highly flammable gorse
→ Roaming animals forage, and subsequently protect, more than 5,700 hectares of public forest





RESTORATION AND REWILDING FOR WILDFIRE PREVENTION

Stakeholders

Operations

→Land Life, a technology-driven forest restoration company, collaborated with regional governments, NGOs, and local councils to implement wildfire land restoration in Spain

→Rewilding Europe, a European non-profit, worked with local governments, NGOs, and wildlife parks in Spain and across Europe to implement rewilding initiatives that further resilience

Rewilding Europe

→Group for the Rehabilitation of Native Fauna and its Habitat (GREFA)

→La Maleza Wildlife Park

Partners

→Gobierno de Cantabria

→SUPERB, an EU nature restoration consortium.

→Foro de Bosques y Cambio Climático

→Junta de Castilla y León

→Fundación Oxígeno

→Asociación Española de Educación Ambiental

→Fundación Oso Pardo

→Post-Wildfire Land Restoration in Fresno De Rodilla, Spain:

- Quintanapalla City Council, Fresno de Rodilla City Council, and the Junta of Castile and León

RESTORATION AND REWILDING FOR WILDFIRE PREVENTION

Outcomes & Outputs

Land Life
Innovative Technology & Operations

- Pioneered an analysis engine to assess site suitability and project carbon/nature impacts
- Precision planting through tools like smart-coated seeds and automated planting vehicles to scale and optimize reforestation
- Developed the world's leading monitoring system and reforestation database to track and improve planting efforts

Rewilding Europe

The reintroduction of free roaming horses in 2006 proved successful in helping manage the Faia Brava Reserve which has seen no serious wildfires since program inception



RESTORATION AND REWILDING FOR WILDFIRE

Key Takeaways

What did and didn't work well?

Multiple simultaneous fires complicated response recovery by dividing firefighting resources, worsening the overall damage, and creating varied post-fire recovery scenarios based on burn severity

Dual fires and changing wind patterns created diverse burn intensities, **which led to different recovery needs and speed.** For example, vineyards largely survived with little damage, while forests were severely affected

Nuanced restoration prioritized reintroducing native species **to increase ecosystem resilience** and streamline aftercare

What was innovative about the model?

Focus on **restoration and rewilding** for wildfire prevention.

How did it change business as usual for that place?

Put in place systems that will eventually become self **sustainable**

What innovations on this approach would be more impactful for other applications?

Exploring how these kinds of ecological solutions could be applied in a more urban context

Key Applications for Los Angeles

What won't work in context of the LA wildfire recovery?

- Rewilding is often best suited in more rural context, rather than densely populated areas with significant housing and rebuilding needs
- California's open space rules and regulatory processes are also unique and frequently cumbersome
- Multi-sector collaborations must be approached cautiously in LA with complicated jurisdictional dynamics and the influx of new, possibly inexperienced non-profit organizations

What pieces align or are relevant for the LA wildfire recovery?

- Despite its urban context, opportunities to utilize approaches that include restoration, rewilding, fire defensible spaces, and naturally fire resistant ecological solutions are still needed in for rebuilding with resilience for LA their right contexts
- Mobilizing multi-sector collaborations including via an innovative private sector partnerships might unlock new, but available streams of funding in LA



Lahaina Recovery Framework

Hawaii's Maui Fire (2023)

Domestic | Wildfires | Research Backed Rebuild

Infrastructure & Utilities - Building Codes & Fire Safety - Emergency Management



Disaster

Hurricane Dora created conditions that exacerbated the wind-driven Maui wildfires, which burned significant portions of the Hawaiian island in August 2023

Damages

- ~3,000 structures damaged or destroyed
- 102 casualties
- Significant cultural and environmental sites were lost



LAHAINA RECOVERY FRAMEWORK

Overview

1

Independent Incident Investigations

→Science and evidence based review using FSRI fire research and expert input examined fire behavior, emergency response, and impact on Lahaina

→Highlighted importance of vegetation management, infrastructure resilience, and planning

→Aligned with National Cohesive Strategy: resilient landscapes, fire-adapted communities, and effective wildfire response

2

Forward-Looking Recovery Planning (In Progress)

→Developing: Community Risk Assessment (CRA), Community Risk Reduction Plan (CRR), Standards of Cover (SOC)

→Code and standards review for Maui

→Evaluating Maui Fire Department capabilities

→Identifies Hawaii's top 10 wildfire readiness priorities (e.g., education, evacuation, fire weather, vegetation management)



LAHAINA RECOVERY FRAMEWORK

Overview

Operations

The Hawaii Department of the Attorney General contracted the Fire Safety Research Institute to conduct technical investigations, coordinating with the Governor's Office, Maui County, and federal agencies like FEMA and HUD ensures aligned recovery efforts

Native Hawaiian cultural organizations, local nonprofits, technical partners, and first responders collaborated to integrate cultural, humanitarian, and emergency management priorities into a cohesive response

Partners

→Department of the Attorney General (DOAG)

→Fire Safety Research Institute (FSRI)

→Hawaii Governor's Office & Maui County

→FEMA and HUD

→Native Hawaiian cultural organizations

→Hawaii Wildfire Management Organization (HWMO)

→Maui Emergency Management Agency (MEMA)

→Maui Fire Department and Police

→Local nonprofits



LAHAINA RECOVERY FRAMEWORK

Outcomes & Outputs

- **State-mandated task force** on long-term land use and **equity**
- Commitment to preserve **cultural landmarks** in future land use
- **Temporary and permanent housing** efforts prioritizing affordable housing, community-driven process, protections against land grabbing, and moving utilities underground
  - ➔ Temporary **modular homes** like the Kilohana Project
  - ➔ Permanent rebuilding programs, including the Deferred Payment Loan Program and the **Lahaina Community Land Trust's insurance gap program**
- **Phase Two Recommendations**
  - ➔ Establish sustained funding for Hawaii Wildfire Management Organization to coordinate wildfire prevention and preparedness
  - ➔ Increase funding for public land vegetation and incentivize active vegetation management on private lands
  - ➔ Implement a sustainable statewide outdoor warning system



LAHAINA RECOVERY FRAMEWORK

Key Takeaways

What did and didn't work well?

The framework **laid out short, mid, and long term goals,** helping organize recovery actions by urgency and feasibility

Public meetings, translated materials, and digital town halls **increased accessibility and visibility** into decision-making

Despite efforts, temporary and permanent housing solutions lagged, and **displaced families remained in hotels or shelters for extended periods**

What was innovative about the model?

Phased approach outlining a clear process for recovery and a more resilient future

Nonprofits and **cultural practitioners became core partners** in decision making process

How did it change business as usual for that place?

Community involvement was significant, to ensure their voices to be heard in rebuilding

What innovations on this approach would be more impactful for other applications?

Immediate independent **analysis and data collection** surrounding the events leading up to and throughout the disaster

LAHAINA RECOVERY FRAMEWORK

Key Applications for Los Angeles

What won't work in context of the LA wildfire recovery?

- Despite efforts, temporary and permanent housing solutions lagged and displaced families remained in hotels or shelters for extended periods, something LA should proactively avoid
- Rebuilding efforts were significantly hampered by regulatory burdens and what some consider "anti-growth policies" that have also surfaced in LA
- Similar challenging political dynamics will also slow LA's recovery unless addressed

What key pieces align or are relevant for the LA wildfire recovery?

- LA proactively addressed debris clean up that compounded delays in recovery for Lahaina, but must revisit approaches to effective remediation to maintain progress
- Nonprofits became partners in key decision-making processes
- Immediate independent analysis and data collection helped increase transparency
- California quickly eliminated many bureaucratic hurdles and regulatory burdens that plagued Maui, but more must still be done to facilitate rebuilding

Indigenous Led Recovery and Evacuation

Central Canadian Wildfires (2025)

International | Wildfires | Innovative Financing + Indigenous Led Recovery

Community Engagement & Equity - Emergency Management



Wildfires

Disaster

The 2025 Canadian Prairie Wildfires, which burned in Saskatchewan and Manitoba, were part of one of the worst wildfire seasons in Canada’s history, second only to 2023’s record-breaking devastation

Damages

- More than 4,600 fires burned more than 7.6 million hectares, an area more than twice the seasonal average
- 280 fires remained still active in mid-August
- By early June, the fires had burned ~2.7 million hectares, forcing ~33,000 evacuations.
- Smoke created major air quality crisis in the United States, affecting ~117 million people on a single day



MULTI-JURISDICTIONAL INVESTMENT & INDIGENOUS LED RECOVERY

Overview

→ In 2025, the **Resilient Communities FireSmart (RCF) Program, received $59.9 million in joint investments** from the federal, provincial and territorial governments, bringing the program's total funds since its 2023 launch to $104 million

→ National FireSmart Canada **developed a four-year wildfire prevention and mitigation plan** and simultaneously launched "Don't feed the wildfires" awareness campaign

→ Canadian Interagency Forest Fire Centre (CIFFC) conducted a **province-wide, landscape-level risk assessment** to prioritize communities at high wildfire risk, helping to focus efforts more effectively

→ The Government of Manitoba also **launched MB Ready, a data-sharing platform** for better coordination across federal, provincial, and local agencies

→ **Indigenous Services Canada disbursed $20.9 million to First Nations** for recovery and damages





Overview

Indigenous Leadership in Disaster Evacuation

→ Creemergency, a First Nations led organization, provided full wraparound service for evacuees, including transportation, meals, security, and clear communication on the fires

→ First Nations leaders advocated for Manitoba laws to be amended to ensure First Nations have the same authority as municipalities to declare emergencies and that they receive the full support of government





MULTI-JURISDICTIONAL INVESTMENT & INDIGENOUS LED RECOVERY

Stakeholders

Operations

Federal and provincial governments jointly invested in the Resilient Communities FireSmart (RCF) Program

Wildfire response was coordinated through a multi-stakeholder partnership including Manitoba Emergency Management Organization, Indigenous Services Canada, and First Nations leadership, federal and provincial governments, local municipalities, fire authorities, and the Canadian Red Cross

Indigenous leaders and Creemergency led emergency evacuations

Partners

→Indigenous Services Canada & First Nations leaders

→Manitoba Emergency Management Organization (EMO)

→The Canadian Interagency Forest Fire Centre (CIFFC)

→Creemergency

→Canadian Red Cross

→Governments of Canada, British Columbia, Alberta, Newfoundland and Labrador, Yukon, Nova Scotia, Prince Edward Island and Manitoba

→Local municipalities and regional fire authorities



INDIGENOUS LED RECOVERY AND EVACUATION

Outcomes & Outputs

- First Nations leaders took early and decisive action, leveraging their knowledge and experience in wildfire emergencies to develop processes even as the fires were on-going
- Advocacy from Grand Chiefs and other leaders reinforced the call for legislative reform to allow First Nations the same emergency powers as municipalities
- Multi-jurisdictional government invested historically unprecedented amounts to grow the Resilient Communities FireSmart (RCF) Program



INDIGENOUS LED RECOVERY AND EVACUATION

Key Takeaways

What did and didn't work well?

Prioritized mental health and emergency housing needs were met with cultural sensitivity

Emergency response spending in First Nations rose nearly 400% in the last decade, but **still goes to short-term relief, rather than long-term preparedness**

Indigenous-led response and advocacy prioritized the well-being of the First Nations people and increased their capacity for future response

Aligning Indigenous disaster communications with national government created Indigenous authority to provide national warnings and will help streamline disjointed communications

What was innovative about the model?

Approach that is **indigenous-led**, culturally sensitive, and harnesses indigenous knowledge

First Nations advocated to align disaster communications with national government to prevent different timing in disaster declaration and create authority to provide national warnings

MB Ready data sharing platform shows ongoing challenges while making it **easier to navigate resources**

How did it change business as usual for that place?

Demonstrates the need for **increased authority for indigenous communities** in natural disasters

What innovations on this approach would be more impactful for other applications?

Utilizing opportunities to **train more community-based fire and evacuation teams** in indigenous practices in order to amplify this knowledge and scale in advance of future events

INDIGENOUS LED RECOVERY AND EVACUATION

Key Applications for Los Angeles

What won't work in context of the LA wildfire recovery?

- Tribal politics differ greatly between Canada and the US and elevation of their leadership may be less feasible
- Emergency response spending increases in Canada, despite their need to expand from short-term relief to long-term preparedness, are still significantly further along than in the US

What key pieces align or are relevant for the LA wildfire recovery?

- Good data, clear communications, and early warning system infrastructure can make a difference for future emergencies
- Elevation of tribal knowledge, leadership, and best practices will increase overall resilience for LA
- Elevating traditionally underrepresented voices in recovery, rebuilding, and resilience initiatives will prove particularly impactful for LA's recovery



Paradise Long Term Recovery Plan

Camp Fire (2018)

Domestic | Wildfire | Community Led Rebuild

Community Engagement & Equity - Infrastructure & Utilities - Housing & Affordability - Permitting & Approval Process



Wildfires

Disaster

In 2018, the Camp Fire burned for over two weeks, devastating Paradise, CA.

Damages

- 85 casualties
- ~50,000 people displaced
- ~ 19,000 homes, businesses, and other structures destroyed and significant smoke damage in 1,300 of the remaining 1,800 structures

PARADISE LONG TERM RECOVERY PLAN

Overview

Paradise Long Term Recovery Plan (PLTRP)

- Created to guide Paradise through years of regrowth, the Long-Term Recovery Plan sought to rebuild a safer, more resilient town, with a focused on housing, infrastructure, economic development, and fire prevention
- PLTRP was framed around five goals in support of the community vision to make Paradise:
  - Safer
  - Welcoming
  - Stronger
  - Better
  - Greener
- All priorities and projects were developed with residents through a series of community-wide meetings
- Recovery Projects included town and partner-led projects, leveraging collaboration and execution of concurrent, parallel initiatives
- Launched 2 months after the fire (January 2019), the PLTRP has since been revisited and updated (November 2022) to incorporate lessons learned





PARADISE LONG TERM RECOVERY PLAN

Projects

Hazard Trees

→ Focused on removing burned and hazardous trees that pose risks to public safety and hinder reconstruction following the Camp Fire

→ Benefits included enabling safe rebuilding, reducing future fire hazards, and protecting community health and safety

Focus on Housing

→ Restoring affordable housing required tackling high construction costs, regulatory barriers, insurance rates, and limited infrastructure

→ Loans, grant programs, and partnerships with developers, along with reduced unit sizes, aimed to expand affordable housing options

Workforce Development Plan

→ The creation of a new workforce training center for trades and 3D printing, with support from Butte College, CSU Chico, and other partners, sought to restore job security and economic stability in the region

→ The $18.7 million initiative aims to connect job seekers with employers, support business recovery, and rebuild the regional workforce over 1 to 3 years



PARADISE LONG TERM RECOVERY PLAN

Stakeholders

Operations

The Town of Paradise led recovery planning with support from Butte County, FEMA, HUD, Cal OES, and Cal Fire

Urban Design Associates conducted community outreach through the “Make It Paradise” website and advisory committees

The Rebuild Paradise Foundation provided technical assistance and support for local rebuilding efforts

Partners

→Cal OES & Cal Fire

→FEMA and HUD

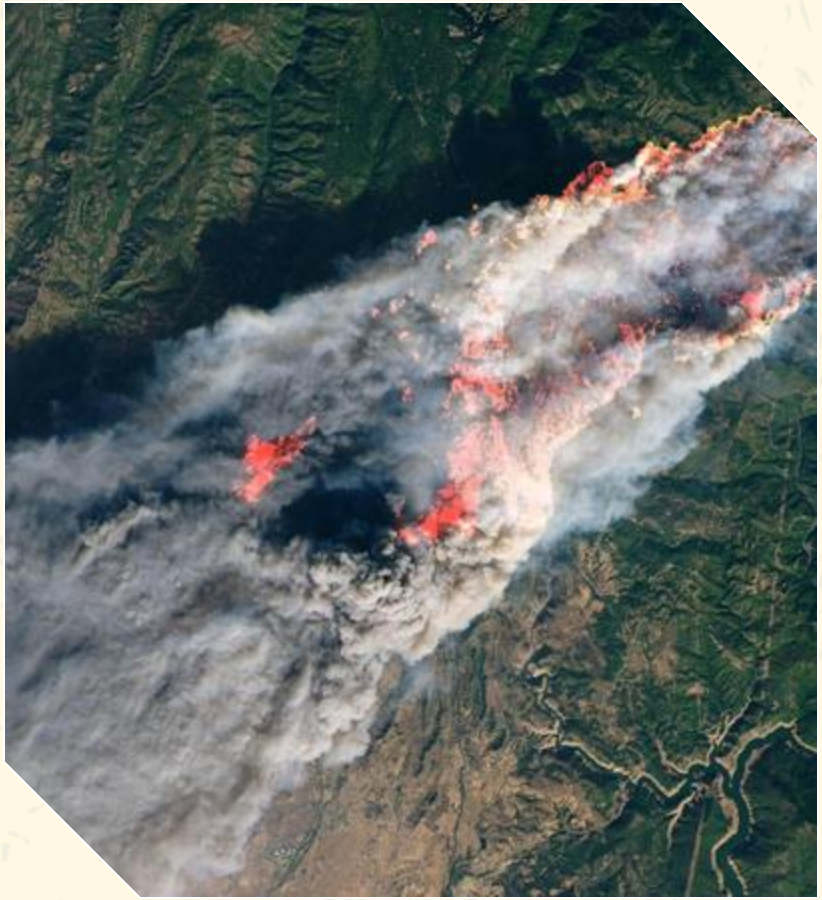
→Town of Paradise

→Butte County

→Urban Design Associates (UDA)

→Rebuild Paradise Foundation

→Community Advisory Committees





PARADISE LONG TERM RECOVERY PLAN

Outcomes & Outputs

- Established rebuilding around five goals: Welcoming, Safer, Stronger, Better, Greener
- Paradise's Long Term Recovery Plan won Helen Putnam award for Excellence in Planning
- Paradise, CA recovery is an ongoing process, but shows early signs of success:
  - ➔ Upgrading critical infrastructure
  - ➔ New investments in public infrastructure
  - ➔ Rebuilding to higher standards, meeting tougher wildfire codes
  - ➔ Ensuring affordable housing
  - ➔ Landscape changes to increase resilience create more scenic views for residents
  - ➔ Ensure schools, churches, and businesses reopen sooner
  - ➔ Establishment of fire-smart community initiatives like Firewise Community and Firesafe Councils, a Wildfire Resiliency Task Force, and public "burn associations"



PARADISE LONG TERM RECOVERY PLAN

Key Takeaways

What did and didn't work well?

Strong local engagement through public workshops, surveys, and visioning sessions gave residents a direct role in shaping recovery priorities

Close collaboration with FEMA, Cal OES, and HUD **helped unlock critical recovery funding**

Many homeowners were underinsured or uninsured, limiting their ability to rebuild

What was innovative about the model?

The plan **deliberately matched recovery goals** with potential federal and state funding sources, streamlining implementation

Paradise **invested in early warning systems and emergency communication upgrades** as a core part of the rebuild

Communications approach included a website with a central repository of information and a social media campaign (led by an external PR firm) to **facilitate effective engagement**

How did it change business as usual for that place?

Plan is used in **decision-making** for about 40 recovery projects, including funding decisions

The Plan also influenced **policy change via building codes** now strengthened for resilience

What innovations on this approach would be more impactful for other applications?

The **public engagement** practices in Paradise can be built upon in other contexts

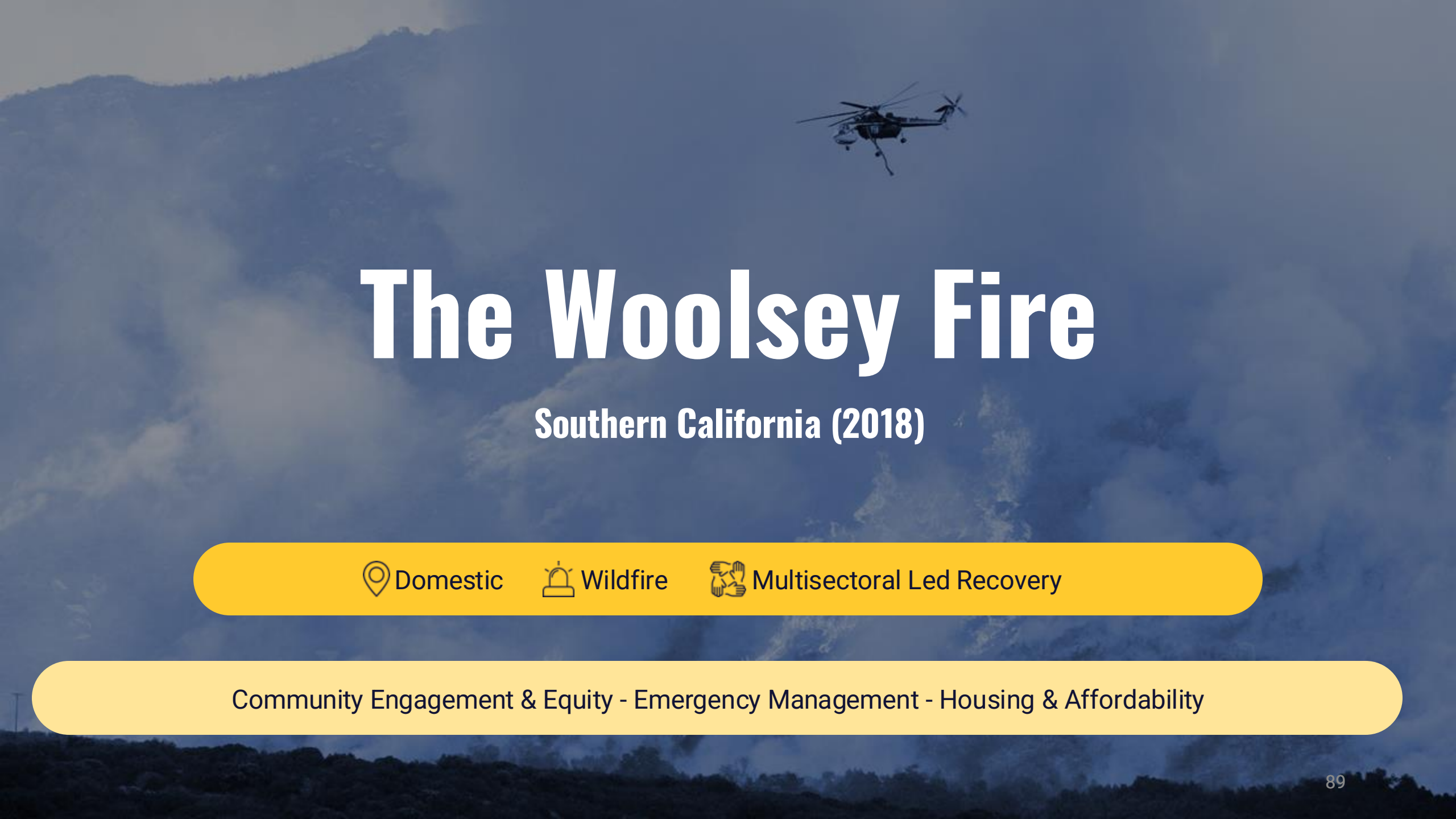
Key Applications for Los Angeles

What won't work in context of the LA wildfire recovery?

- Like in LA, many homeowners were underinsured or uninsured, which limited their ability to rebuild
- Deliberate matching federal and state funding sources to streamline implementation may be more difficult with the current national shift in disaster response and recovery

What key pieces align or are relevant for the LA wildfire recovery?

- LA communities can replicate Paradise's emphasis on inclusive, vision-based recovery planning, and similarly use comprehensive planning to inform funding, policy, and project approaches
- The particular focus on affordable and resilient housing models may provide lessons for LA
- Policy change to building codes for strengthened for resilience paved the way for a more resilient rebuild in LA



The Woolsey Fire

Southern California (2018)

Domestic | Wildfire | Multisectoral Led Recovery

Community Engagement & Equity - Emergency Management - Housing & Affordability



Disaster

In 2018, the Woolsey Fire burned across Ventura and Los Angeles Counties. Driven by Santa Ana winds, it burned for 28 miles until it reached the Pacific Ocean, becoming the most damaging wildfire to date in Southern California.

Damages

- 97,000+ acres burned
- ~1,600 structures destroyed, including 488 homes in the City of Malibu alone
- $6 billion+ in property losses
- ~295,000 people displaced, 3 casualties



Multi-Sectoral Led Recovery & Proposed Systemic Policy Change

Overview

→ **Widespread Evacuation:** Nearly **300,000 people** were forced to evacuate, although the region's abundant lodging capacity prevented a severe immediate housing crisis.

→ **Governing through Crisis:** The **City of Santa Monica** provided a model for **mutual aid via a compact** by hosting the **City of Malibu's** government operations for three weeks, ensuring services continued.

→ **Non-Profit Filling the Aid Gap:** Organizations like **The Malibu Foundation** and **LARCRO** provided aid and case management to the displaced and vulnerable workforce, filling the gap left by federal aid systems.

→ **Innovating with Data:** Academia (Chapman University) used **Facebook Disaster Maps (FBDM)** to successfully track evacuee movements, providing the first crucial data for where resources needed to be deployed.

→ **Driving Financial Flexibility:** Insurance companies offered flexibility by allowing homeowners to use **Additional Living Expenses (ALE)** to purchase mobile homes to live on-site while beginning the arduous rebuilding process.





Multi-Sectoral Led Recovery & Proposed Systemic Policy Change

Stakeholders

Stakeholder Group	Key Entities
Government (Local/County)	Los Angeles County Fire Department, Los Angeles County Office of Emergency Management, City of Malibu, City of Santa Monica (provided governmental continuity via mutual aid), and receiving communities (Conejo Valley, San Fernando Valley, Beverly Hills, Downtown Los Angeles), Ventura County, Los Angeles County Public Works
State Agencies	California Department of Insurance (CDI), California Environmental Protection Agency (CalEPA), CAL FIRE, California Attorney General's Office.
Non-Profits & Aid	American Red Cross, 211 Los Angeles County, Malibu Community Labor Exchange, Los Angeles Region Community Recovery Organization (LARCRO), The Malibu Foundation, Climate Resolve
Private	Airbnb, Uber, Lyft, Insurance companies (policy issuance and non-renewal), Southern California Edison (SCE)
Academic	Chapman University Researchers (evacuee tracking research)



Multi-Sectoral Led Recovery & Proposed Systemic Policy Change

Outcomes & Outputs

Successful Continuity of Government: The **mutual aid compact** between the City of Santa Monica and the City of Malibu was highly effective, allowing Malibu's government to operate from Santa Monica facilities and ensuring essential public services continued.

Adequate Short-Term Shelter Capacity: The vast availability of private short-term lodging (hotels, rentals) in the greater LA area meant the mass evacuation did **not** overwhelm the system or create an immediate, severe housing shortage in receiving communities.

Proactive Consumer Protection: The **City of Malibu** quickly instituted an **anti-price gouging policy** on rental properties, protecting displaced residents from predatory rent increases during the immediate recovery period.

Flexible Financial Relief: Insurance companies innovated by allowing homeowners to utilize their **Additional Living Expenses (ALE)** funds to secure mobile homes or trailers, enabling victims to stay on or near their property while rebuilding.

Effective Initial Humanitarian Response: Core emergency services, including the **American Red Cross** and **211 Los Angeles County**, provided prompt, critical aid, shelter, and referral services to thousands of affected households.



Multi-Sectoral Led Recovery & Proposed Systemic Policy Change

Key Takeaways

What did work well?

-Mutual Aid Governance: The City of Santa Monica allowed the City of Malibu to use its facilities for three weeks, ensuring crucial operational continuity.

- **Short-Term Shelter:** The high volume of short-term lodging and the affluence of most evacuees prevented the creation of an immediate, severe housing crisis in receiving communities.

- **Aid Services:** Organizations like the American Red Cross and 211 Los Angeles County provided prompt, effective initial aid.

What didn't work well?

- **Exclusion of Vulnerable Workers:** Service workers (especially undocumented laborers) were ineligible for formal disaster relief, exposing a major equity gap and forcing reliance on non-profits.

- **Chronic Underinsurance & Stalled Rebuilding:** Homeowners were **chronically underinsured**, leading to massive uninsured losses (estimated at $2.7 billion) and stalls in rebuilding due to the high cost of meeting new building codes.

- **Data Gap:** No government system tracks the movement of evacuees long-term (beyond 90 days), hindering effective long-term recovery planning.

What was innovative about the model?

- **Data-Driven Planning:** Pioneering the use of **Facebook Disaster Maps (FBDM)** by academia (Chapman University) to track population displacement in near real-time, providing decision-makers with crucial information that traditional systems lacked.

-Governance Experimentation: Utilizing the **mutual aid compact** for city-to-city operational support, demonstrating a viable model for maintaining public function during a crisis.



Multi-Sectoral Led Recovery & Proposed Systemic Policy Change

Key Takeaways

How did it change business as usual for that place?

The Woolsey Fire forced a necessary and painful shift in the discourse around **financial accountability and social equity** in high-risk zones:

- **Shifted Policy Focus:** Prompted state and local governments to urgently investigate new financial mechanisms (e.g., local bonds, TIF districts) and regulatory policies for the insurance sector (e.g., compulsory mitigation incentives).
- **Exposed the Workforce:** Brought the vulnerability of the essential service workforce (day laborers, housekeepers) out of the shadows, making the need for an **Equity-First Recovery** approach (like the proposed Disaster Worker Fund) a mainstream policy issue.

What innovations on this approach would be more impactful for other applications?

- **Local Funding Autonomy:** Creating **local bond measures or tax districts (TIF)** for climate adaptation empowers local governments to fund resilience independent of slow or inconsistent federal and state allocations.

- **Hazard-Agnostic Financial Resilience:** The recommendation to develop a **county-operated "Captive Insurance Policy"** allows local governments to spread financial risk across multiple climate hazards (fire, flood, heat), offering a stable, predictable funding source for recovery in multi-risk regions.

What innovations on this approach would be more impactful for other applications?

- **Pioneering Data-Driven Tracking:** The use of **social media data (FBDM)** to track long-term population displacement is highly transferable to any urban disaster, providing real-time, granular intelligence for resource allocation and long-term housing planning.

-**Equity-First Disaster Worker Funds:** The policy initiative to create an eligibility-agnostic fund for **vulnerable, low-wage workers** ensures that a crucial segment of the population is not excluded from financial aid, setting a new standard for social justice in disaster recovery nationwide.



Multi-Sectoral Led Recovery & Proposed Systemic Policy Change

Key Applications for Los Angeles

What won't work in context of the current wildfire recovery?

- Like in LA, many homeowners were underinsured or uninsured, which limited their ability to rebuild
- Deliberate matching of federal and state funding sources to streamline implementation may be more difficult with the current national shift in disaster response and recovery

What key pieces align or are relevant for the current wildfire recovery?

- Local measures (like bonds or TIF districts) create a sustainable, dedicated revenue stream for resilience projects independent of constrained or unavailable state and federal funds
- Dedicated local funds give LA the autonomy to finance hyper-local mitigation and recovery projects more quickly than the process timeline for external approvals or matching funds
- Local autonomy supports easier funding for social safety nets to close the equity gap, like the proposed Disaster Worker Fund to protect the vulnerable service workforce excluded from federal aid