

The Social-Ecological Consequences of Future Wildfire in the West: A Workshop. **National Academies of Sciences, Engineering and Medicine.** Irvine, California. June 13-24, 2024.

Lahaina Fire Disaster: Preliminary Observations and Research Trajectories



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Planning: *Knowledge to Action*

Knowledge to Action

Widening Choice

Ends/Means

Managing Uncertainty

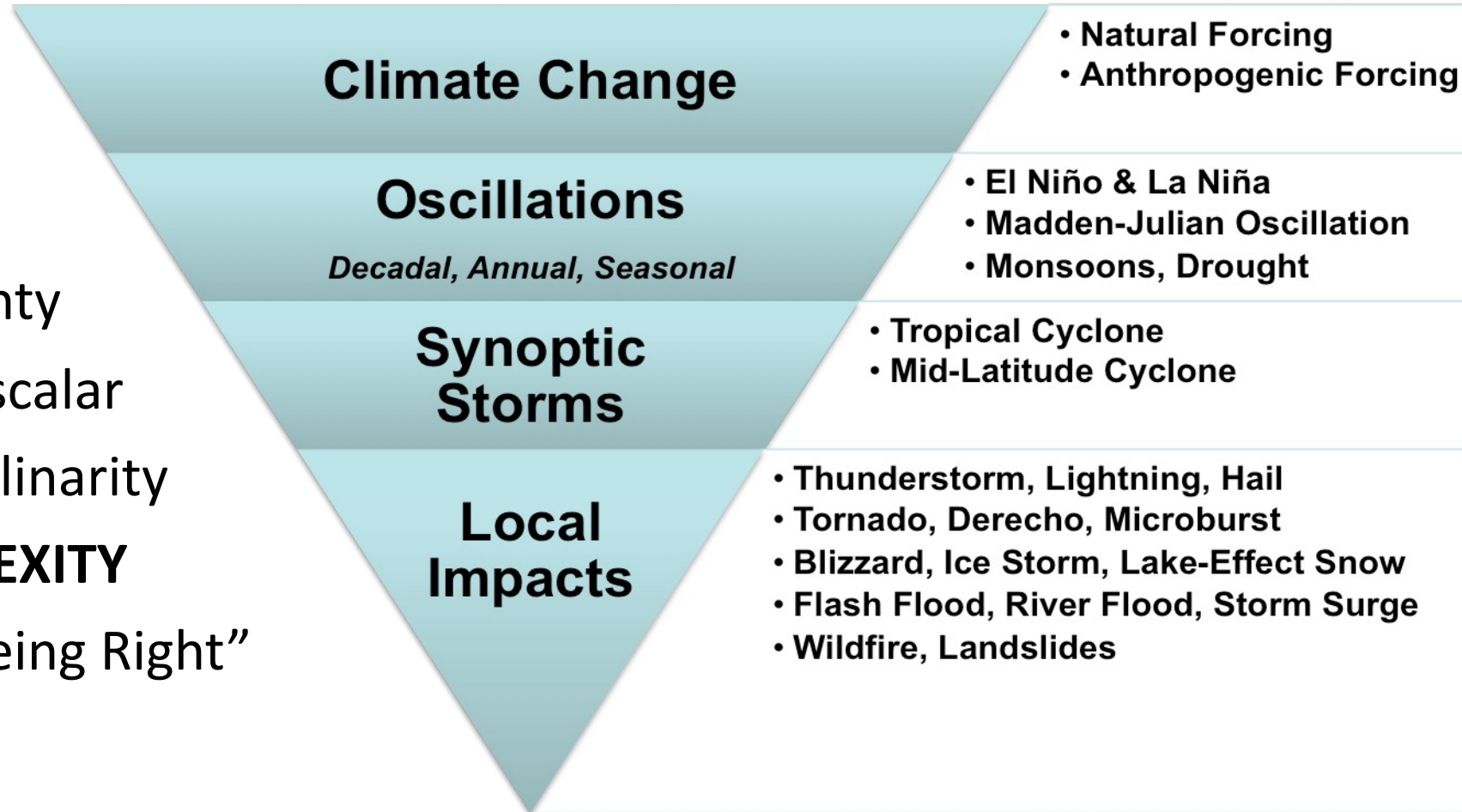
Multi-scalar

Trans-disciplinarity

COMPLEXITY

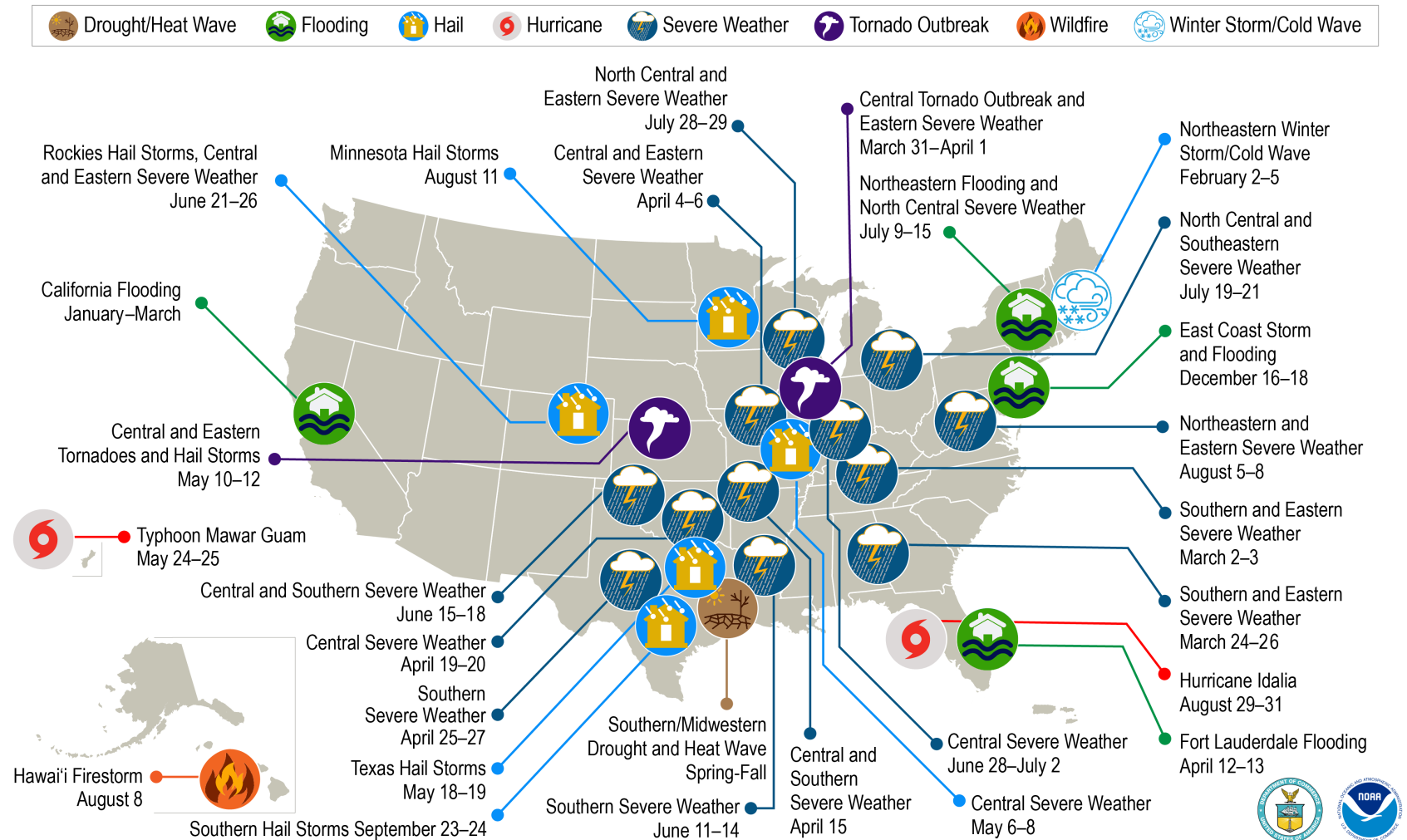
“Doing Good + Being Right”

CONTEXT is everything



Growing costs of damages and losses

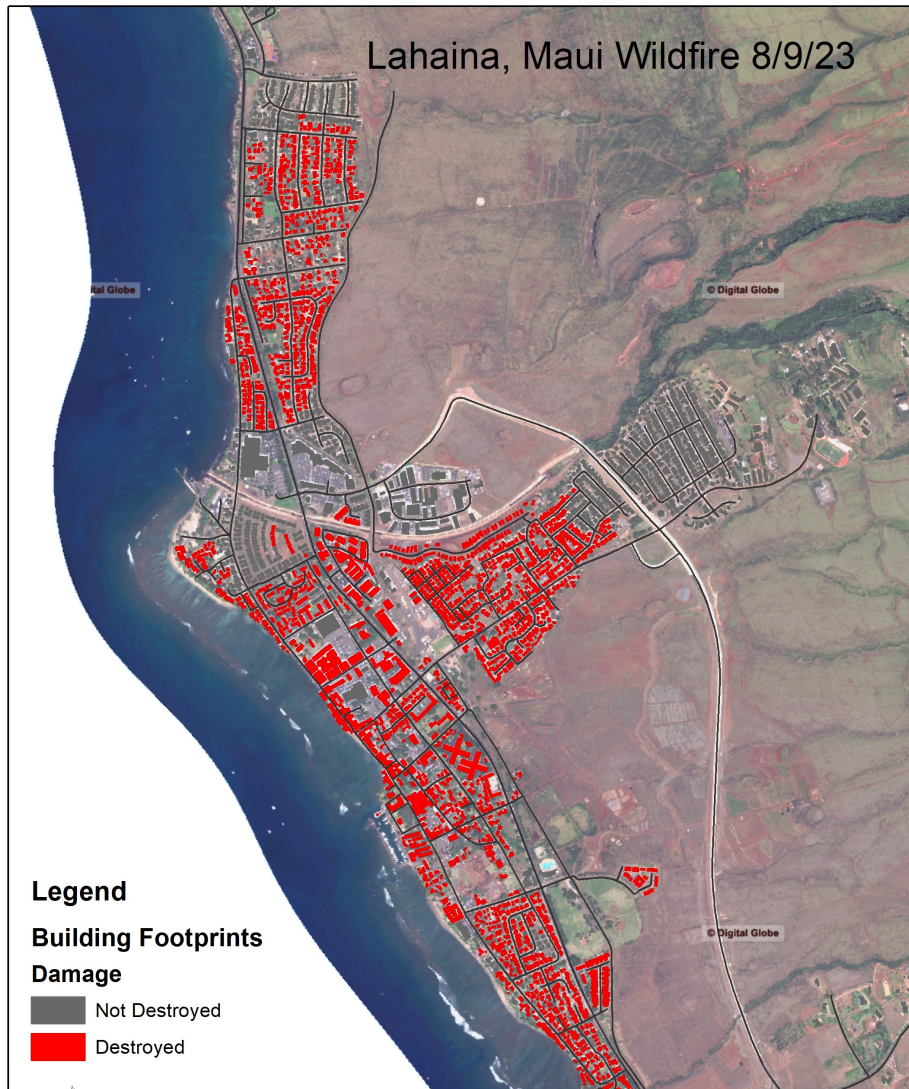
U.S. 2023 Billion-Dollar Weather and Climate Disasters



This map denotes the approximate location for each of the **28 separate billion-dollar weather and climate disasters that impacted the United States in 2023.**



Maui Firestorm Urban Disaster, August 2023



101 Fatalities

1000+ Injuries

2,142 Buildings

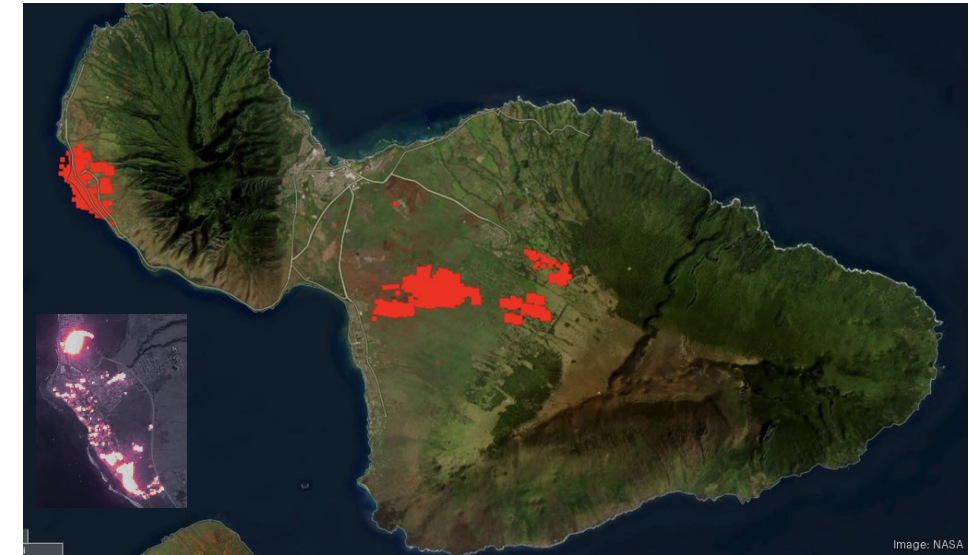
2,777 Motor Vehicles

5,000+ Displaced/Sheltered

10,000+ Job Losses

\$13m/day visitor spending

Billions in losses/damages



Satellite Imagery

Exacerbated by distance and isolation

Limited mutual aid

No highways/rail

Reliance on ports

Harsh conditions

ADAPTATION

Survival

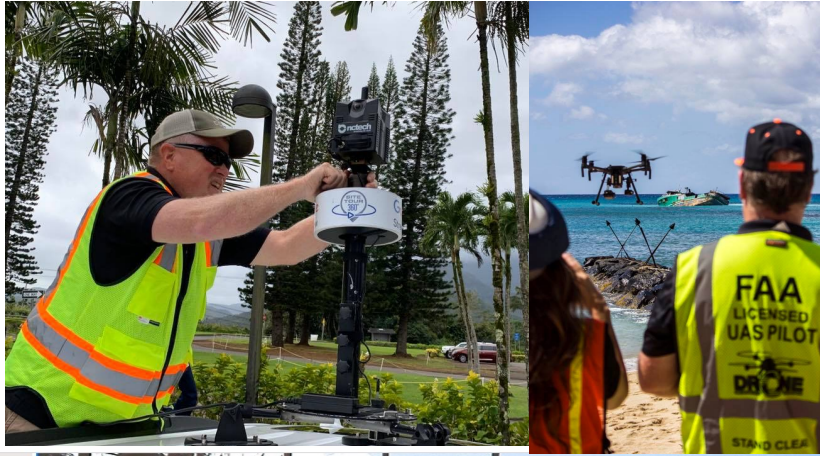
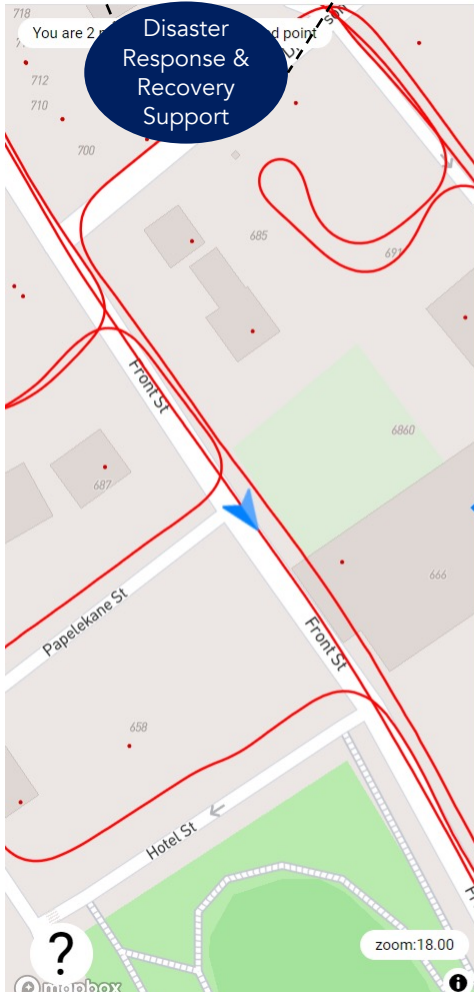
Sustainability

INNOVATION





Satellite imagery, social media, 360 Google Street View, GIS data and hazard models



Social Vulnerability Indices (SVIs) Island Style

Socioeconomic Status

Below Poverty

Unemployed

Income

No High School Diploma

Household Composition & Disability

Aged 65 or Older

Aged 17 or Younger

Civilian with a Disability

Single-Parent Households

Minority Status & Language

Minority

Speaks English "Less than Well"

Housing Type & Transportation

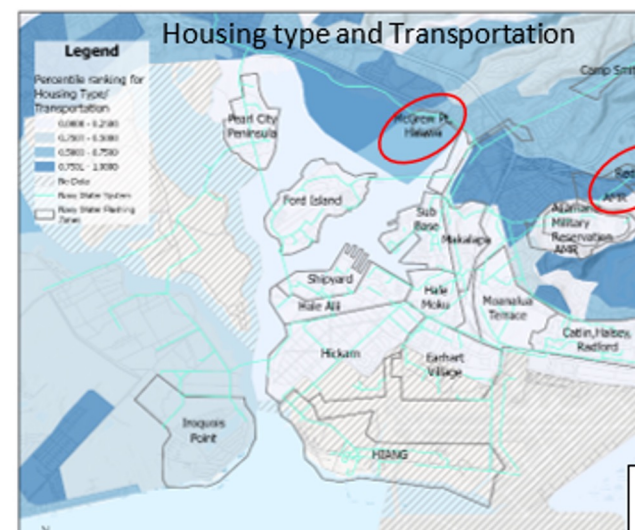
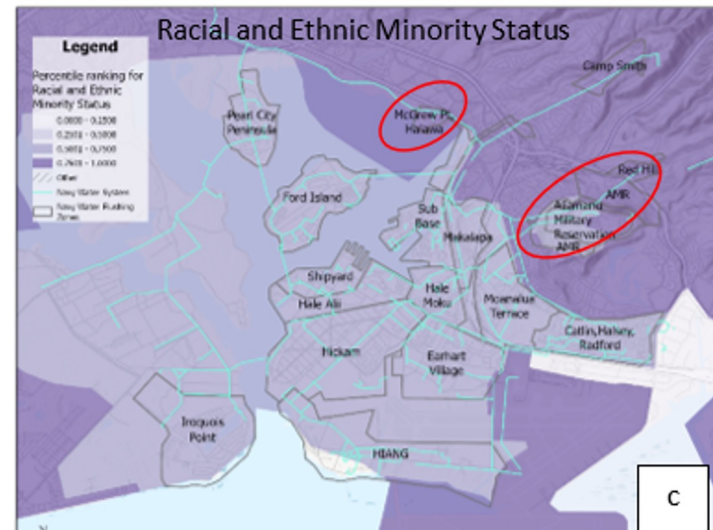
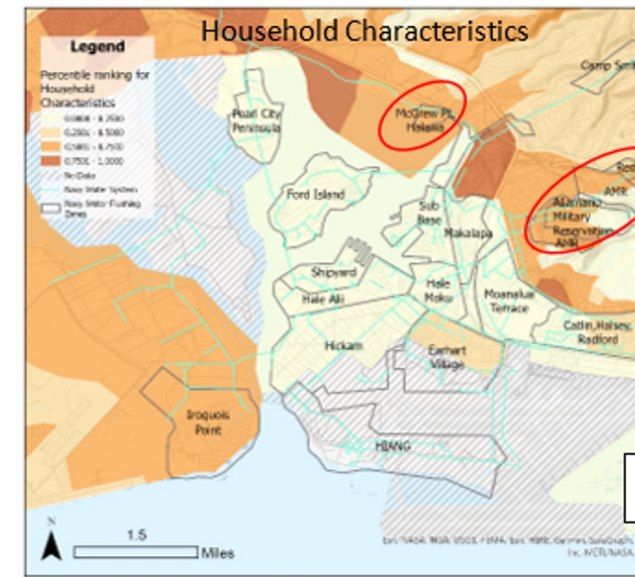
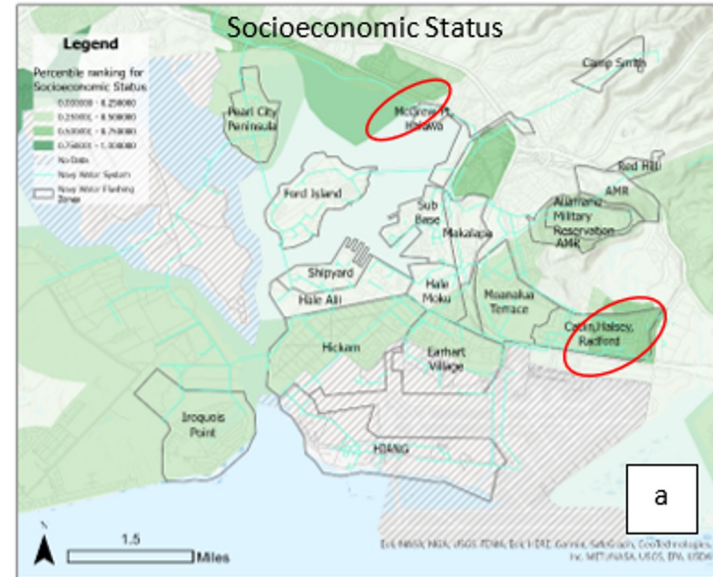
Multi-Unit Structures

Mobile Homes

Crowding

No Vehicle

Group Quarters



Focus on *social justice*, equity

- **Horizontal and Vertical Equity**
- Widening Disparities
- Pandemic: digital divide
- **Who can work from home?**
- **Uneven impacts** across sectors
- More attention to SVI
- *Splintered paddle*



GREATER Propensity for Sharing Before/During/After Disasters in Islands

American Samoa



Other Islands

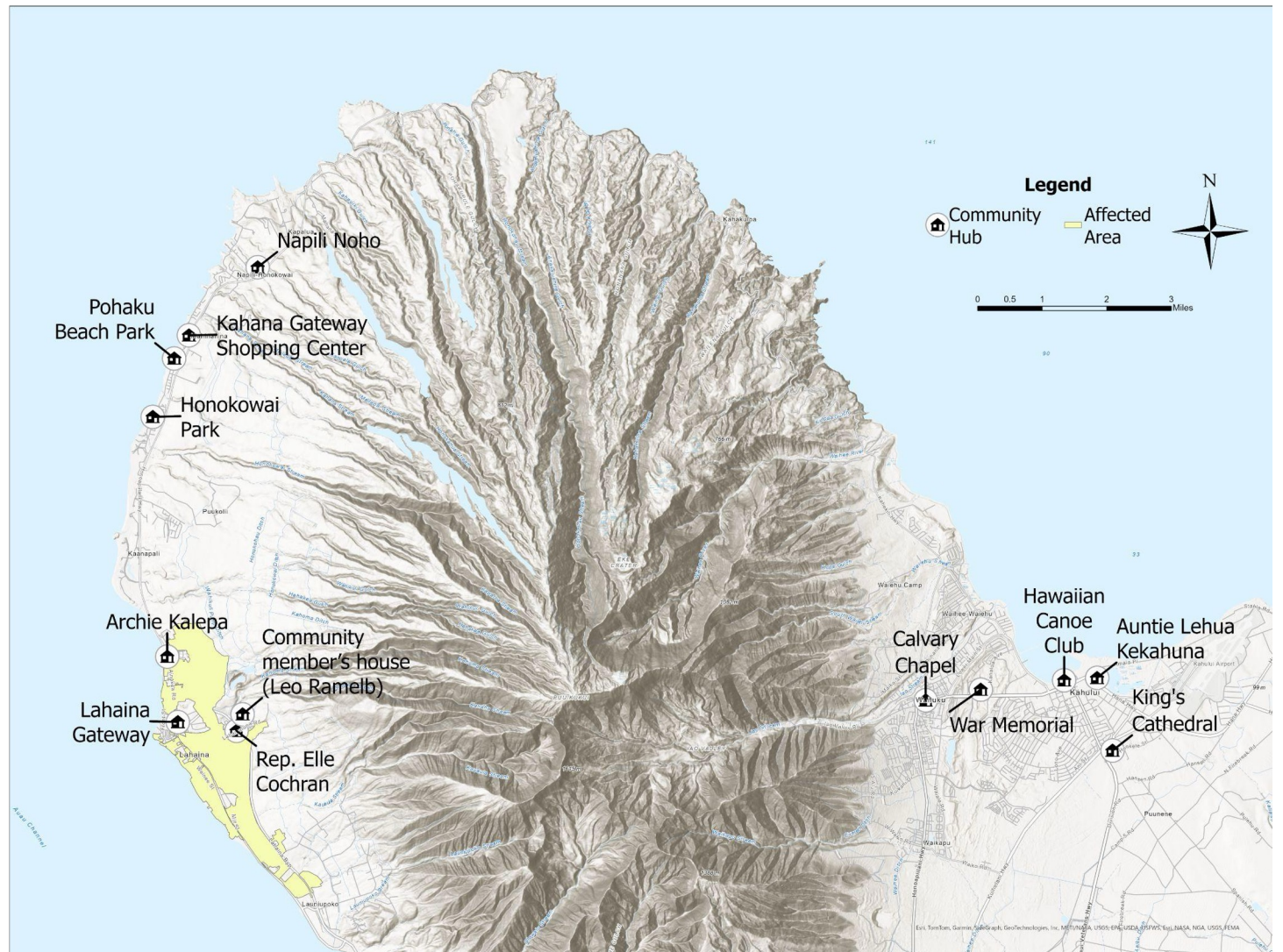


Social Capital
Bonding/Bridging
Cultural protocol
Roles
Responsibilities
Shared beliefs

<https://hazards.colorado.edu/public-health-disaster-research/sharing-during-disasters-learning-from-islands-preliminary-findings-and-initial-implications-for-action>

Resilience Hubs

- Permanent structures
- **Spontaneous emergence**
- Pre-staging goods
- Reinforced infrastructure
- Lifelines/Sphere standards
- Sheltering
- Distribution of Relief
- Other services
- RESEARCH/DESIGN/PLAN
 - 1) Learn from Spontaneous Hubs
 - 2) Codify and build systems for RAPID hub formation



Updated Greenway Planning



1. Connectivity to Community Sites

- Number of connections
- Value of connections

2. Open Space and Recreation

- Green infrastructure/carbon capture
- Proximity to recreational facilities

3. Safety and Comfort

- Exposure to vehicle traffic
- Traffic Safety
- Evacuation routes

4. Hazard Exposure

- Wildfires
- Flooding
- Tsunami

5. Stormwater Management

- Sediment and contaminant capture
- Flood mitigation



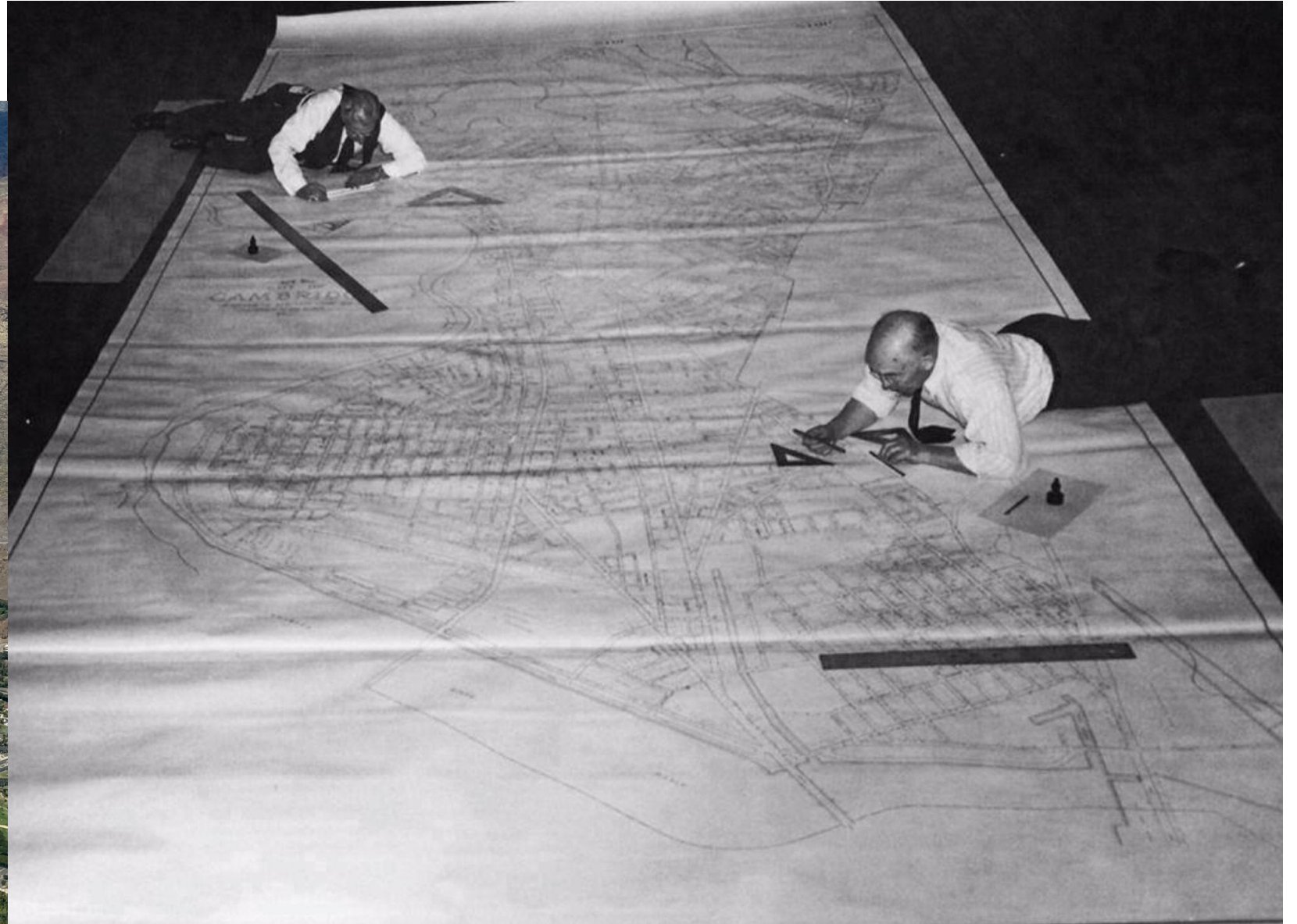
West Maui Greenway Plan: <https://mauimpo.org/west-maui-greenway-plan>

Relevant case: Lafitte Greenway following Katrina



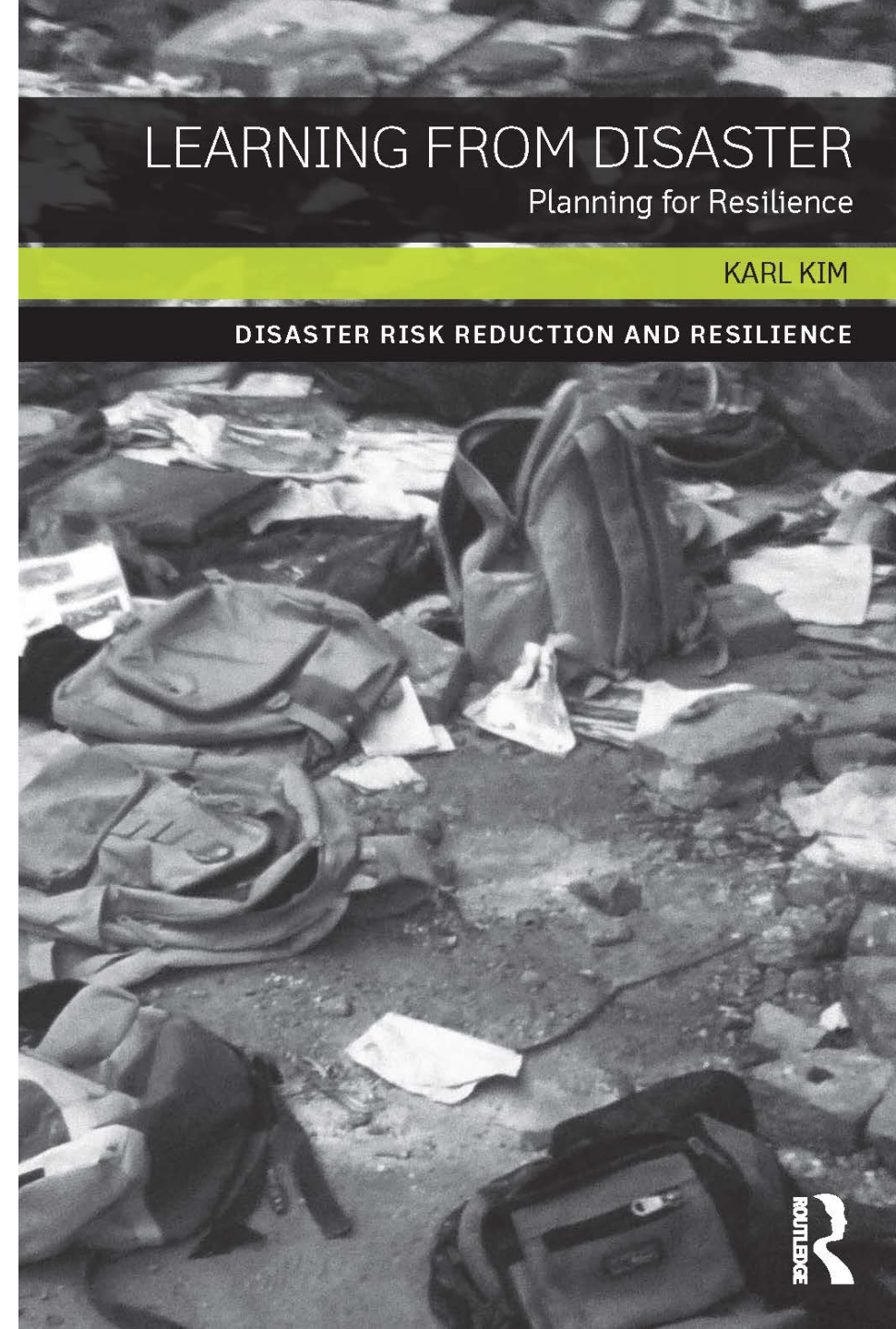
- Built using **Recovery Funds**
- Connects key activities, jobs, schools
- Integrated with stormwater management
- Landscaping, shade, canopy
- **Visitor, Resident, Recreational**
- Accommodate pedestrians, persons with disabilities and micromobility
- Sustained and maintained with public, private and volunteer assets and resources
- Adaptive planning
- Relevant to islands
- Disaster recovery

Use technology to improve design and planning



Adaptation is *learning*

- Integrate **diverse ideas**
- Corroborate sources
- **Reliability and validity**
- **Multi-Inter-Transdisciplinarity**
- CONVERGENCE
- PUBLIC, PRIVATE domains
- LEARN FROM **CITIES**
- Learn from **Disasters**
- Learn from **others**
- **Especially islands**



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