ShakeOut Scenario 20 years Later:

What worked and what didn't

Dr. Lucy Jones

Director, Dr. Lucy Jones Center for Science & Society

California Institute of Technology

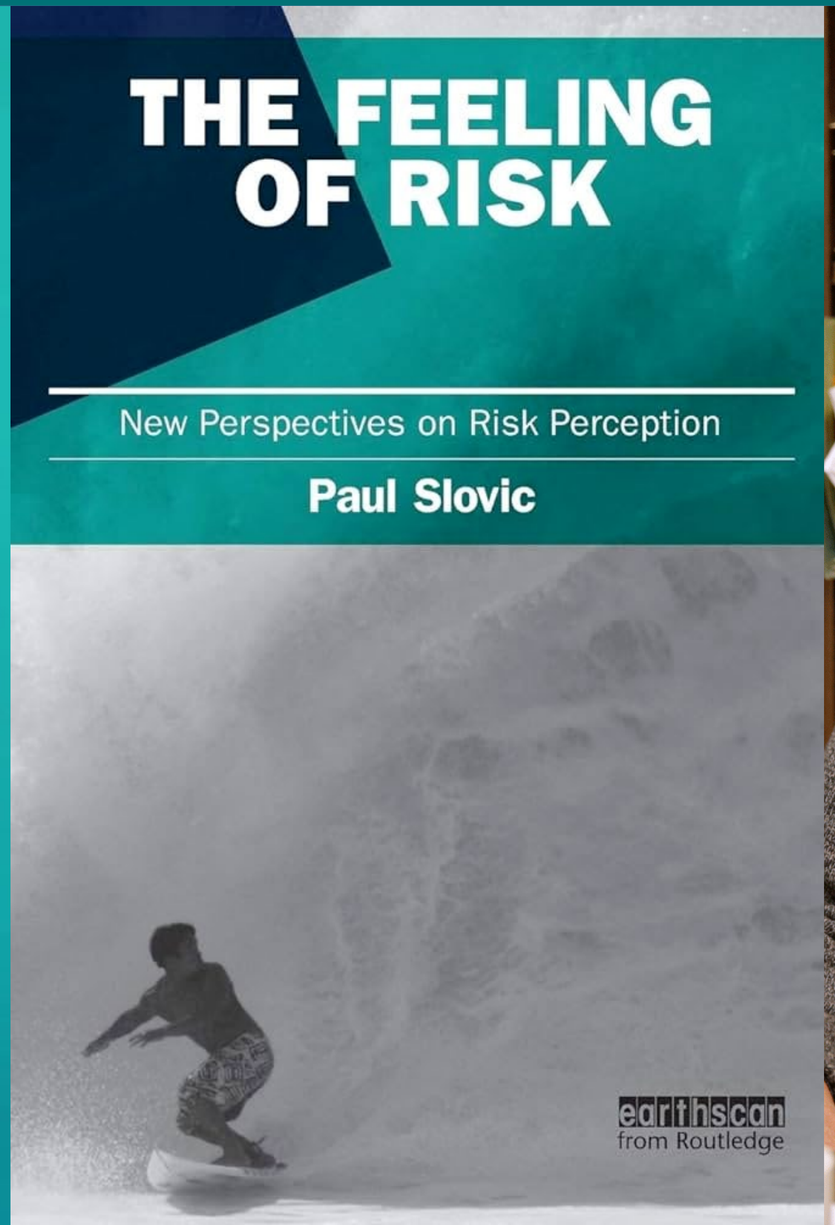
Today’s Topics

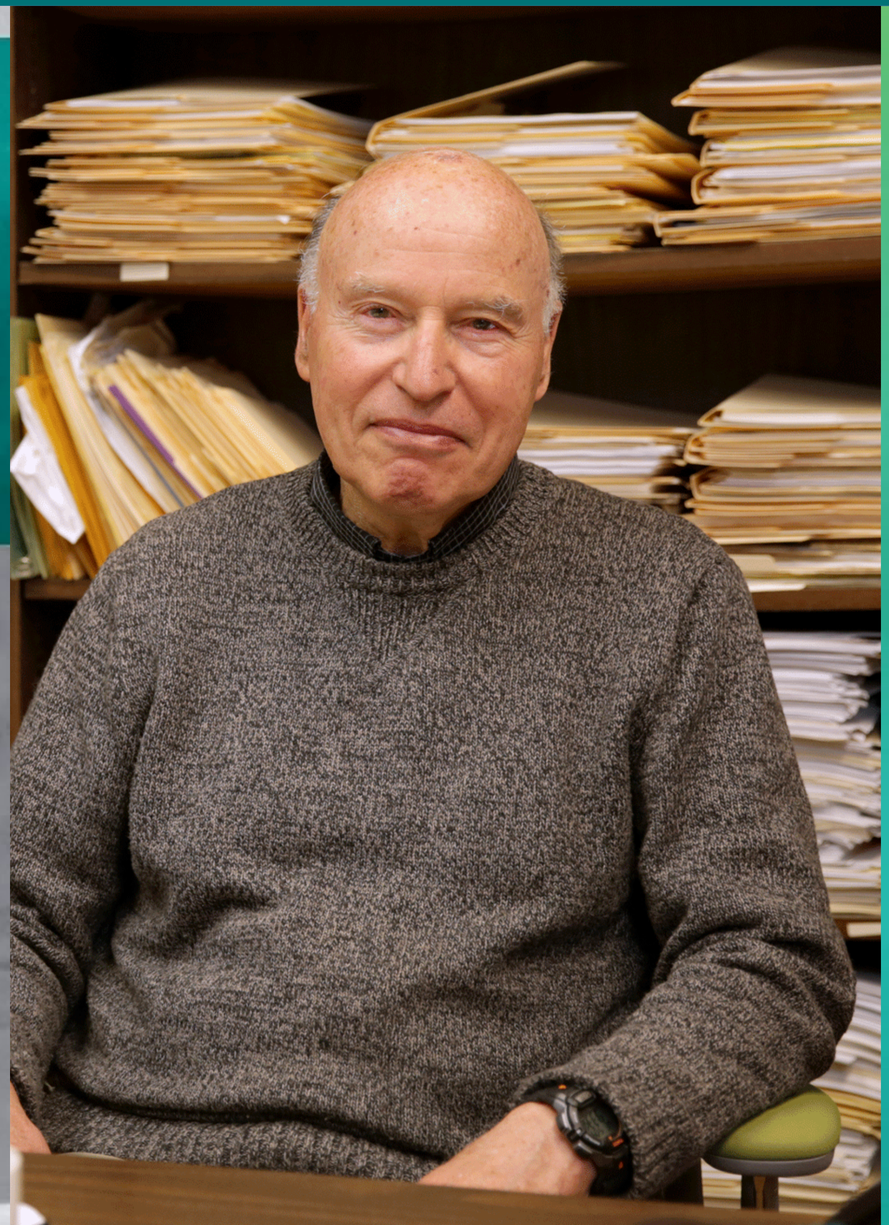
1. Why we created ShakeOut and the principles we used to communicate it.
2. How ShakeOut was used successfully to change outcomes.
3. What didn’t work. What we haven’t been able to change…
4. Yet. ShakeOut 2.0 and what we will do next.

Risk Perception

Affective & Analytical

Slovic et al, 2004
Risk as Analysis and Risk as Feelings: Some Thoughts about Affect, Reason, Risk, and Rationality





Factors in Risk Perception

Dreadedness

- Globally catastrophic
- Fatal
- Inequitable
- Involuntary
- Multiple victims

Uncertainty

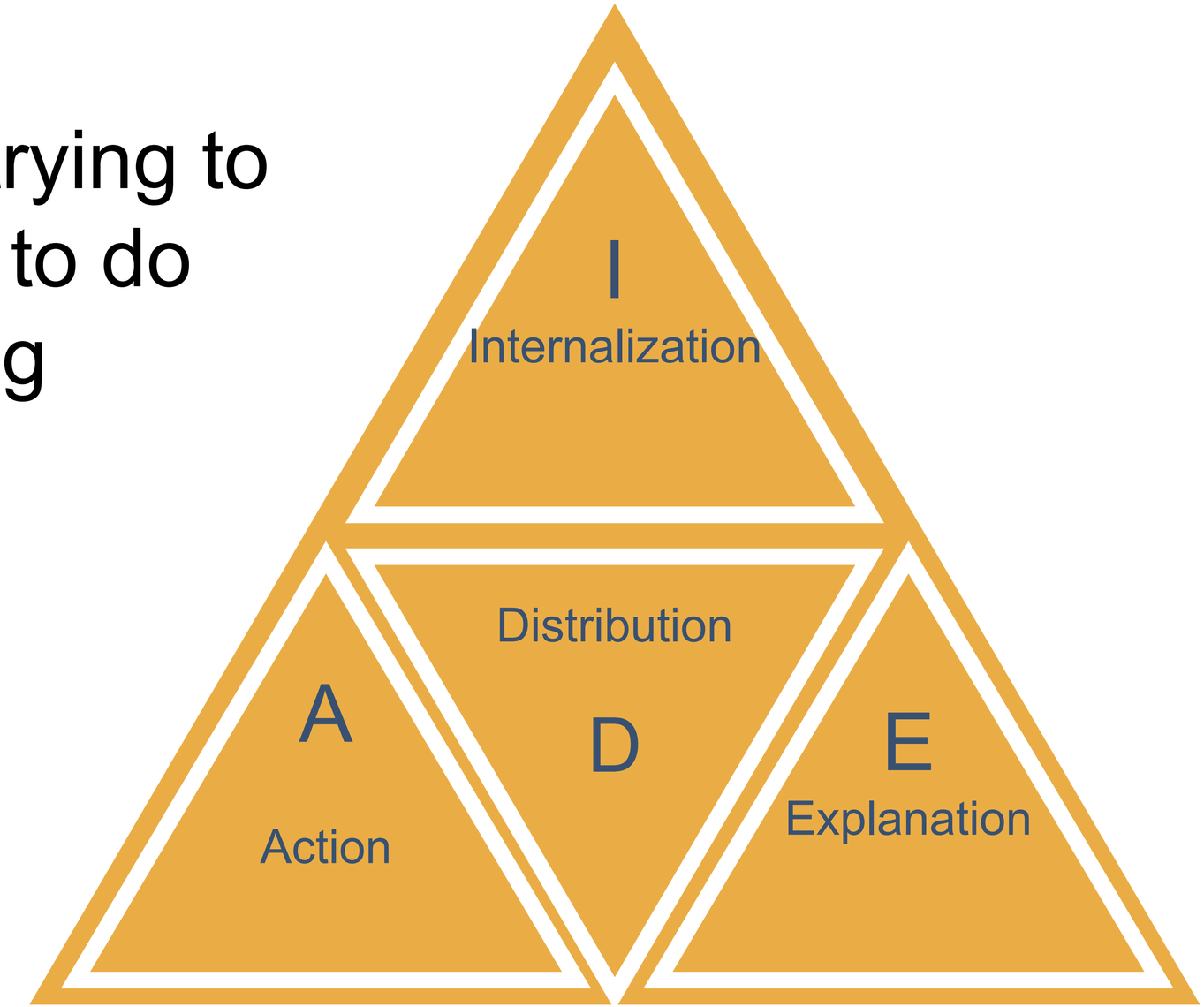
- Unseen
- Unpredictable
- Unknown to science
- Unknown to those exposed
- New Risk

Slovic (1987), Perception of Risk, *Science*

Application from Communication studies

IDEA Model

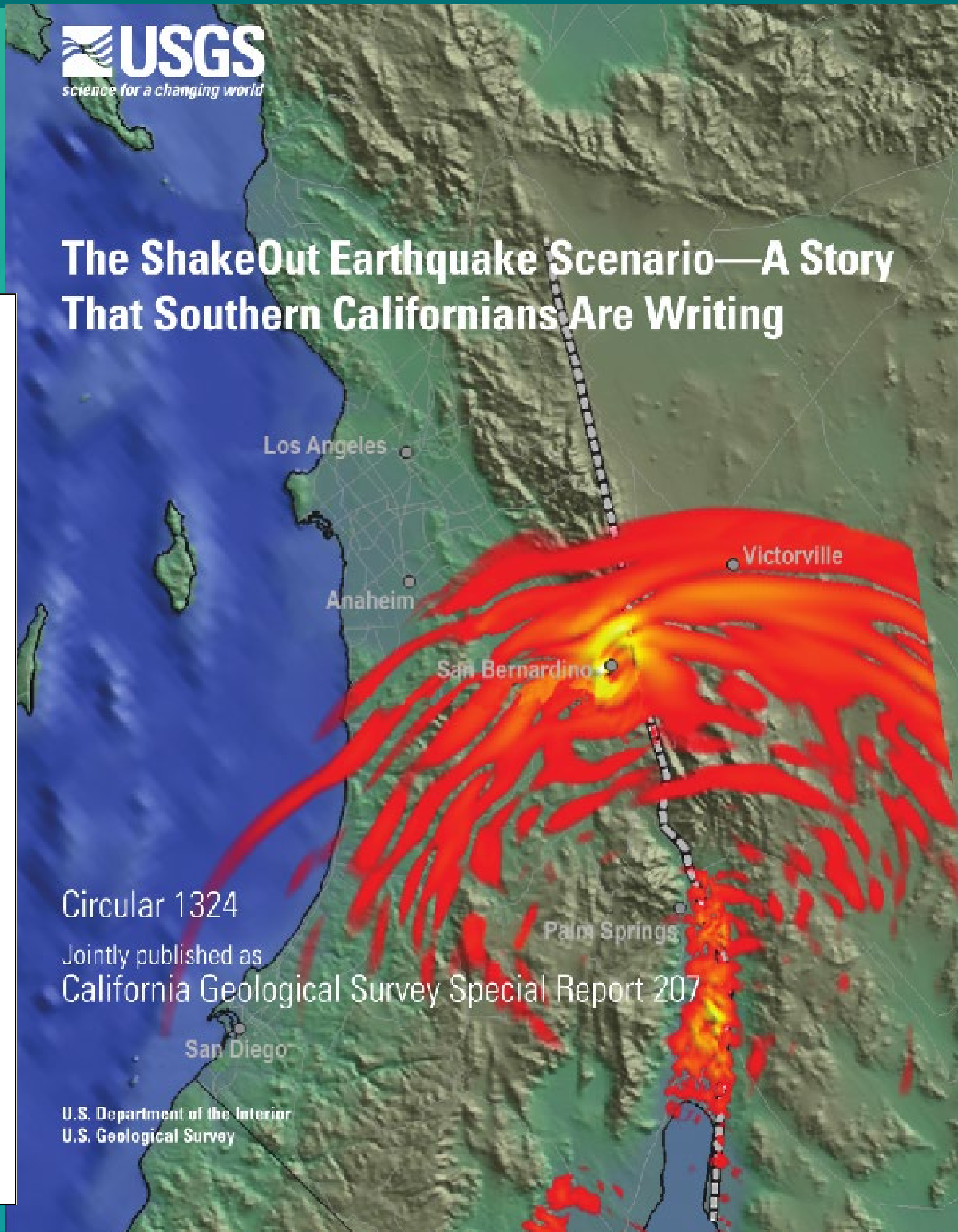
- You are trying to get them to do something



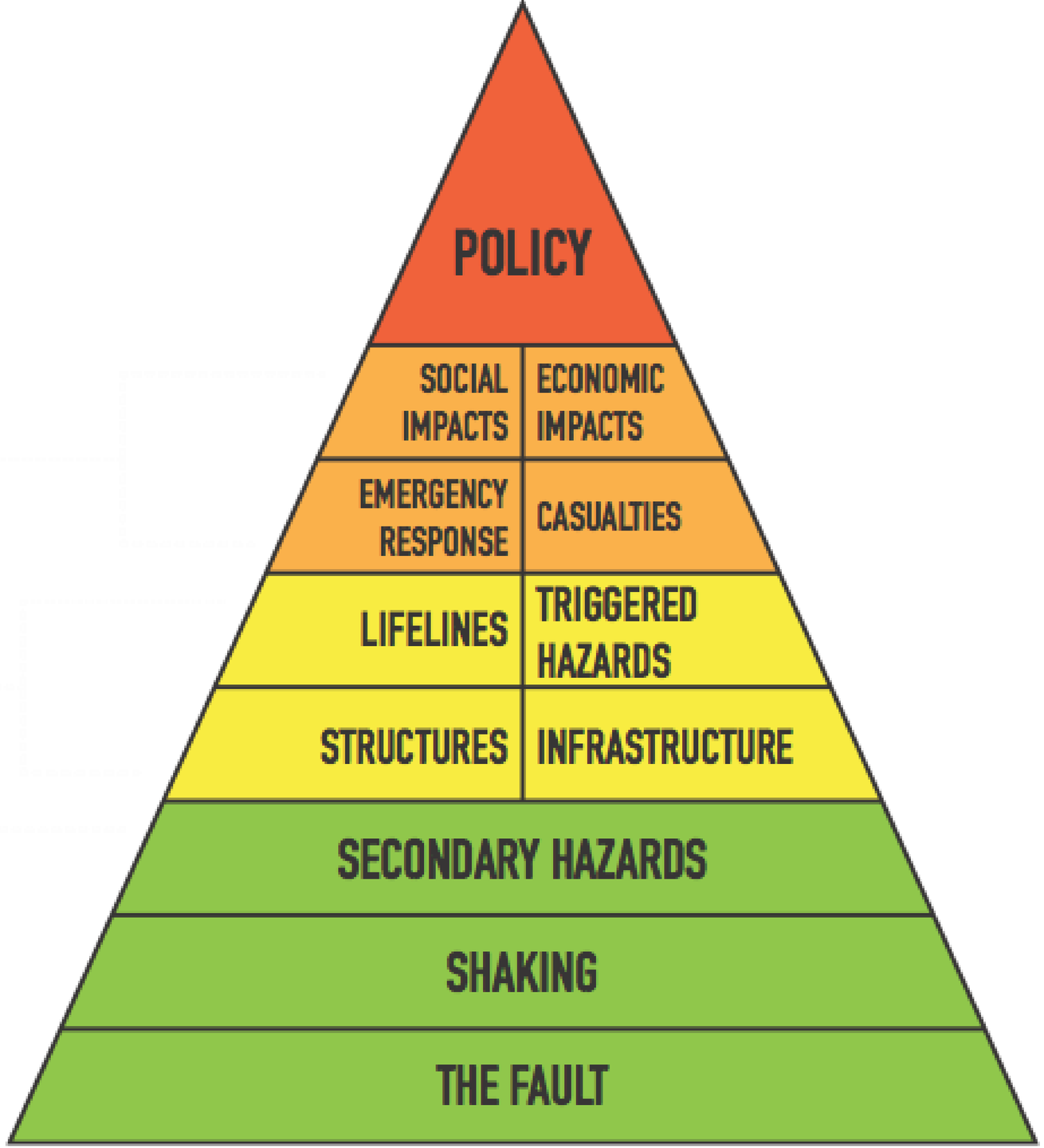
Sellnow et al., 2017, in *Communication Studies*

2008: ShakeOut Scenario

- A scenario … consensus … AD



Integrated comprehensive disaster scenario



Outcomes of ShakeOut Scenario

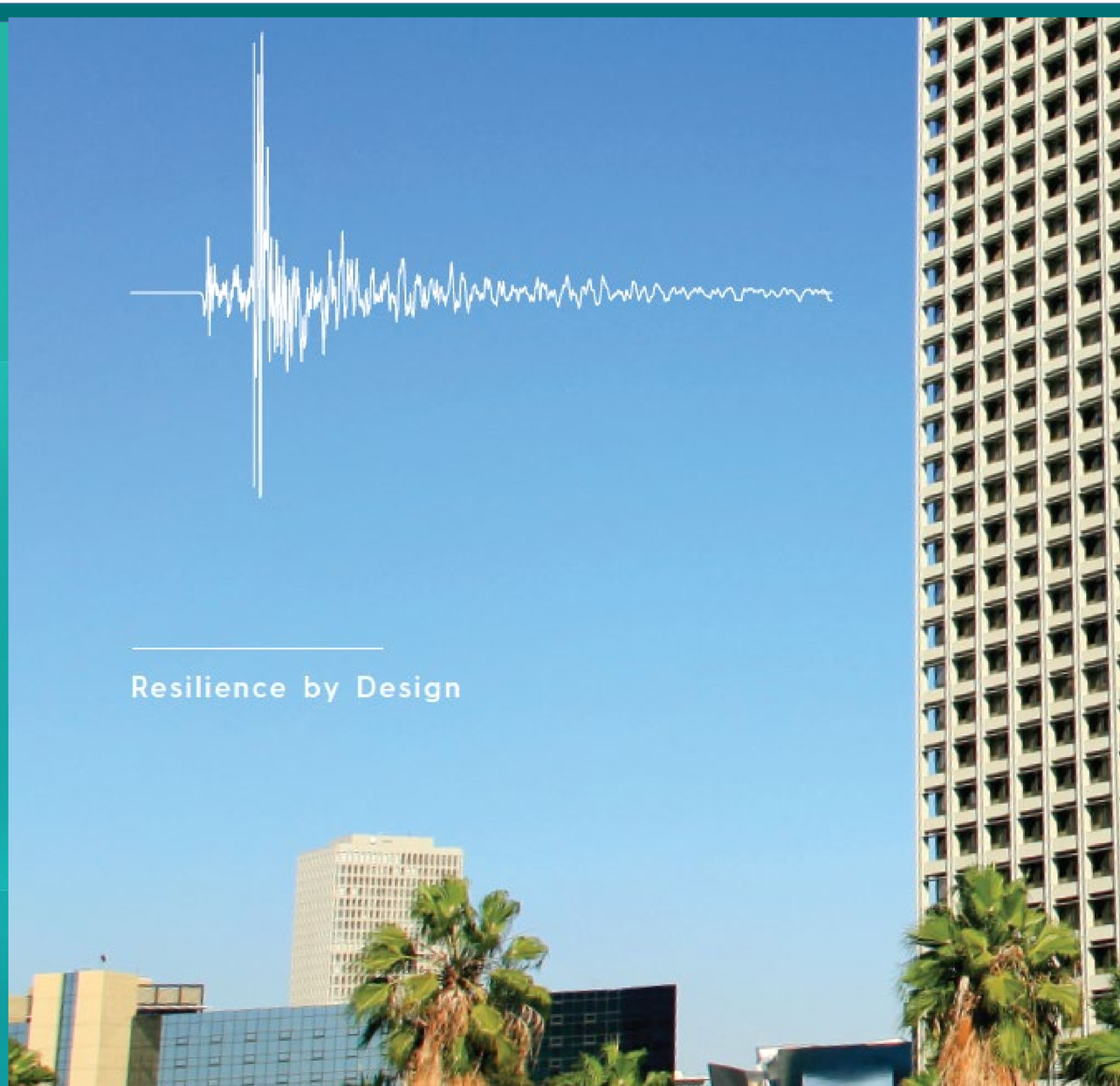
Figure 3. Oil, Electric Power, Highway, and Railway Lifelines in Relationship to the San Andreas Fault at Cajon Pass (Natural Gas Pipelines Not Shown).

Cajon Pass Working Group 2009

Outcomes of ShakeOut Scenario

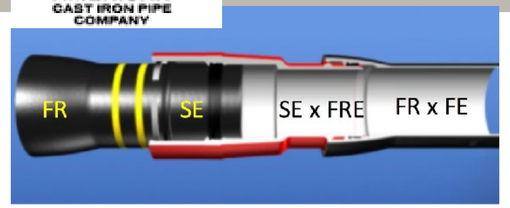
Los Angeles seismic safety plan

2014

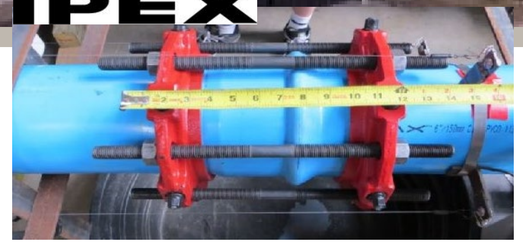


LADWP committed to a seismic resistant water system

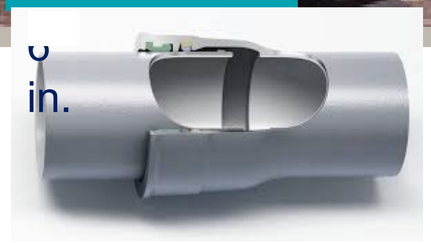
AMERICAN CAST IRON PIPE COMPANY



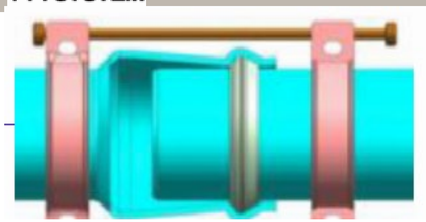
IPEX



Kubota

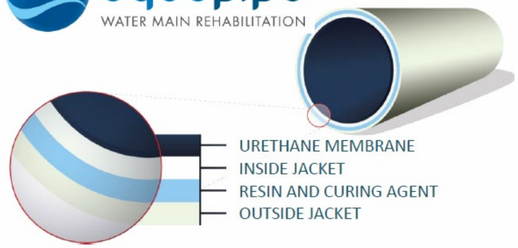


PPI SYSTEM



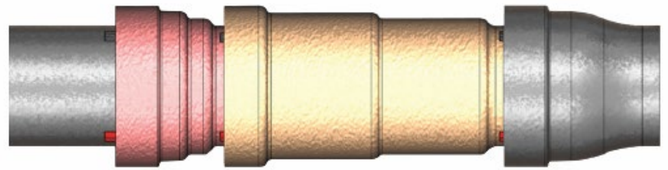
JFE

aquapipe
WATER MAIN REHABILITATION



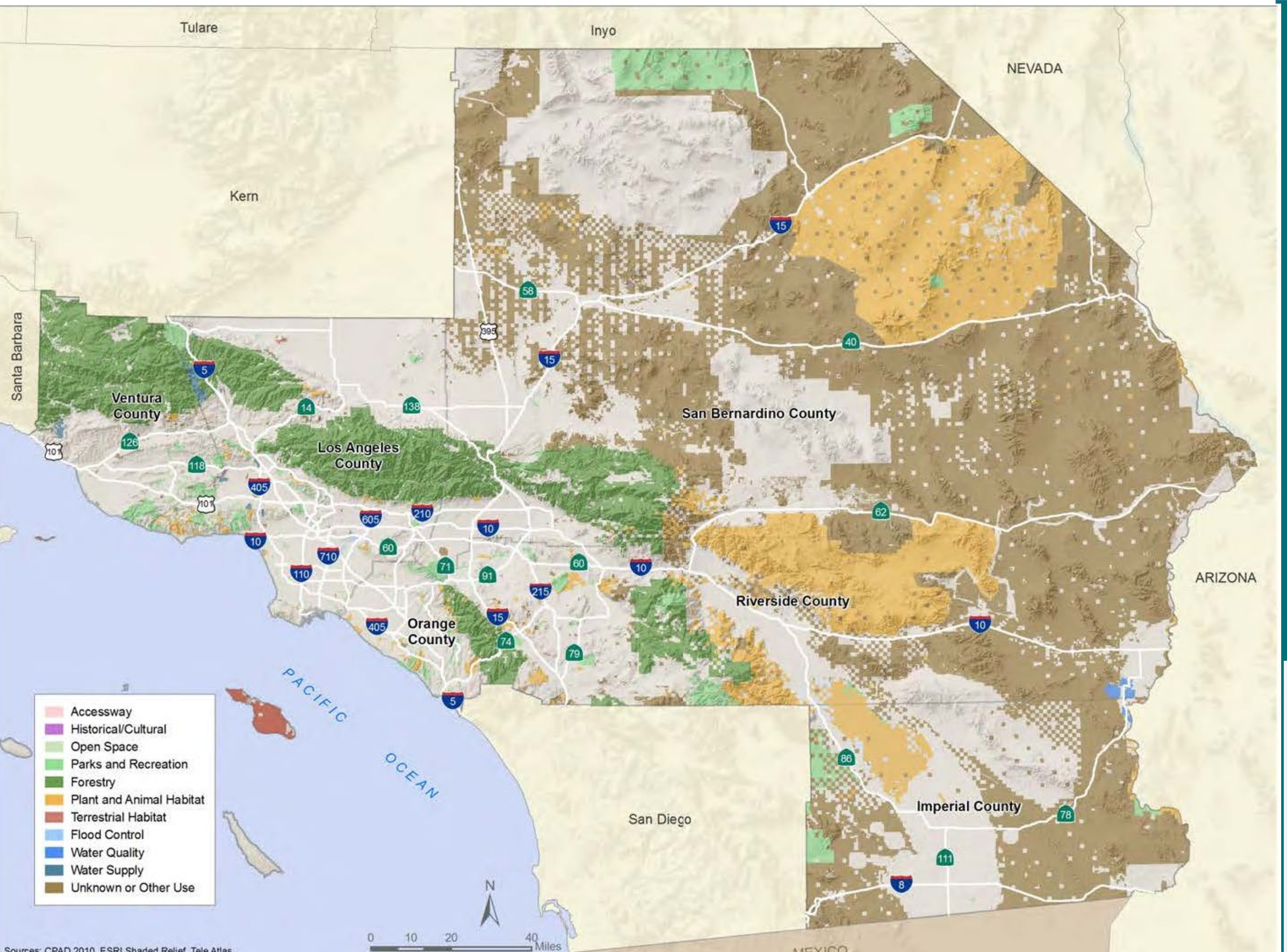
US PIPE

MD
McWANE DUCTILE
IRON STRONG



15,000+ dangerous buildings have been retrofitted

- Strengthen Our Buildings
  - Mandatory retrofit of soft-first story buildings
  - Mandatory retrofit of concrete buildings
  - “Back to Business” inspection program
  - Excessive Damage ordinance



Spreading to 191 other cities

SCAG™

INNOVATING FOR A BETTER TOMORROW

Outcomes of ShakeOut Scenario 2017-2024

Mandatory soft-first story retrofits in

- Santa Monica
- West Hollywood
- Pasadena
- Burbank
- Beverly Hills
- Torrance

Outcomes of ShakeOut Scenario 2015-2026

- Southern California Edison
  - Seismic Resiliency Program
  - Retrofit of the grid backbone and all structures

SOUTHERN CALIFORNIA EDISON®

- Southern California Gas Company
  - Shutoff valves on transmission lines on each side of the San Andreas fault

SoCalGas™

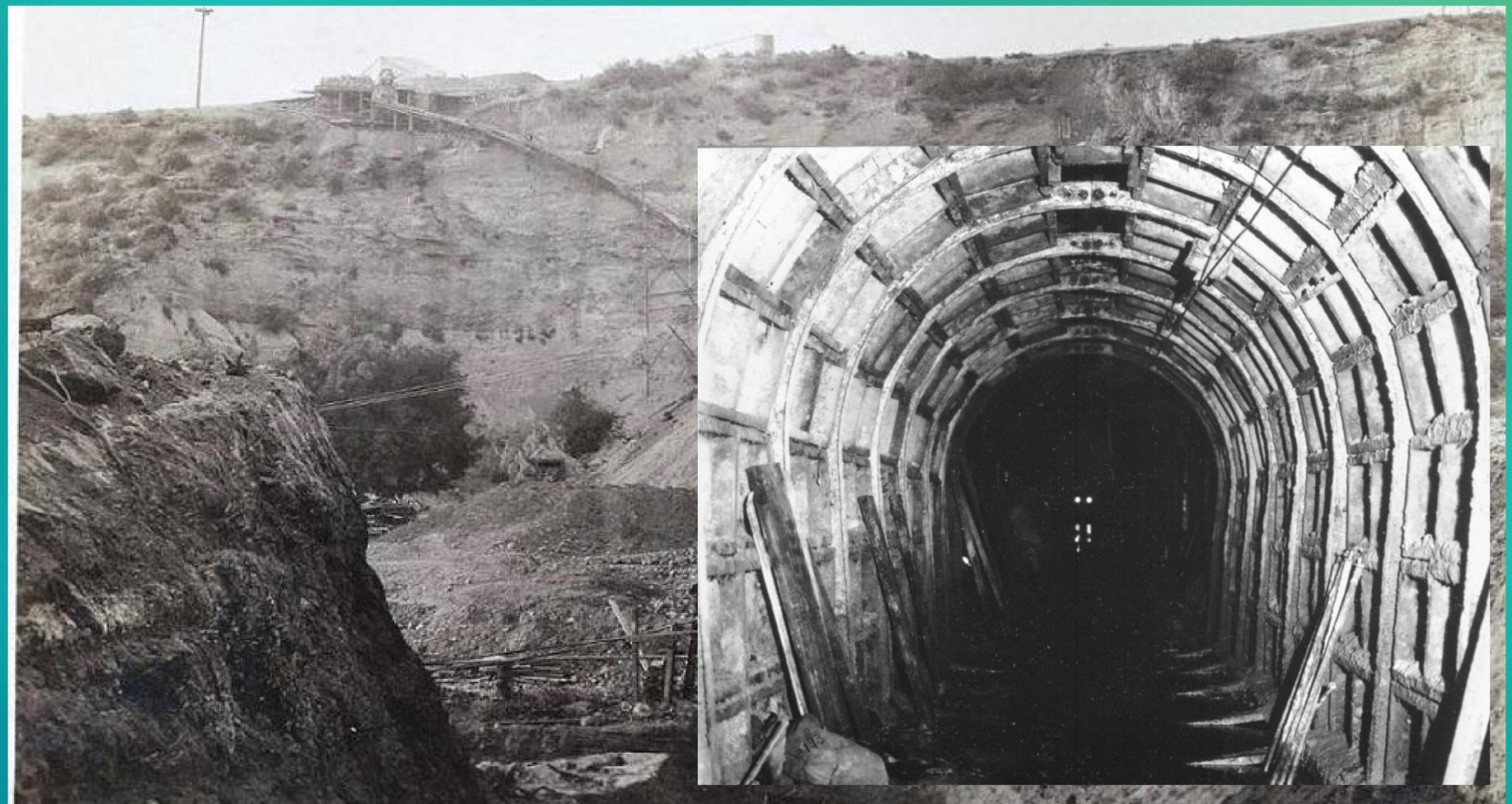
Glad to be of service®

Mitigation that didn’t happen

Los Angeles Aqueduct

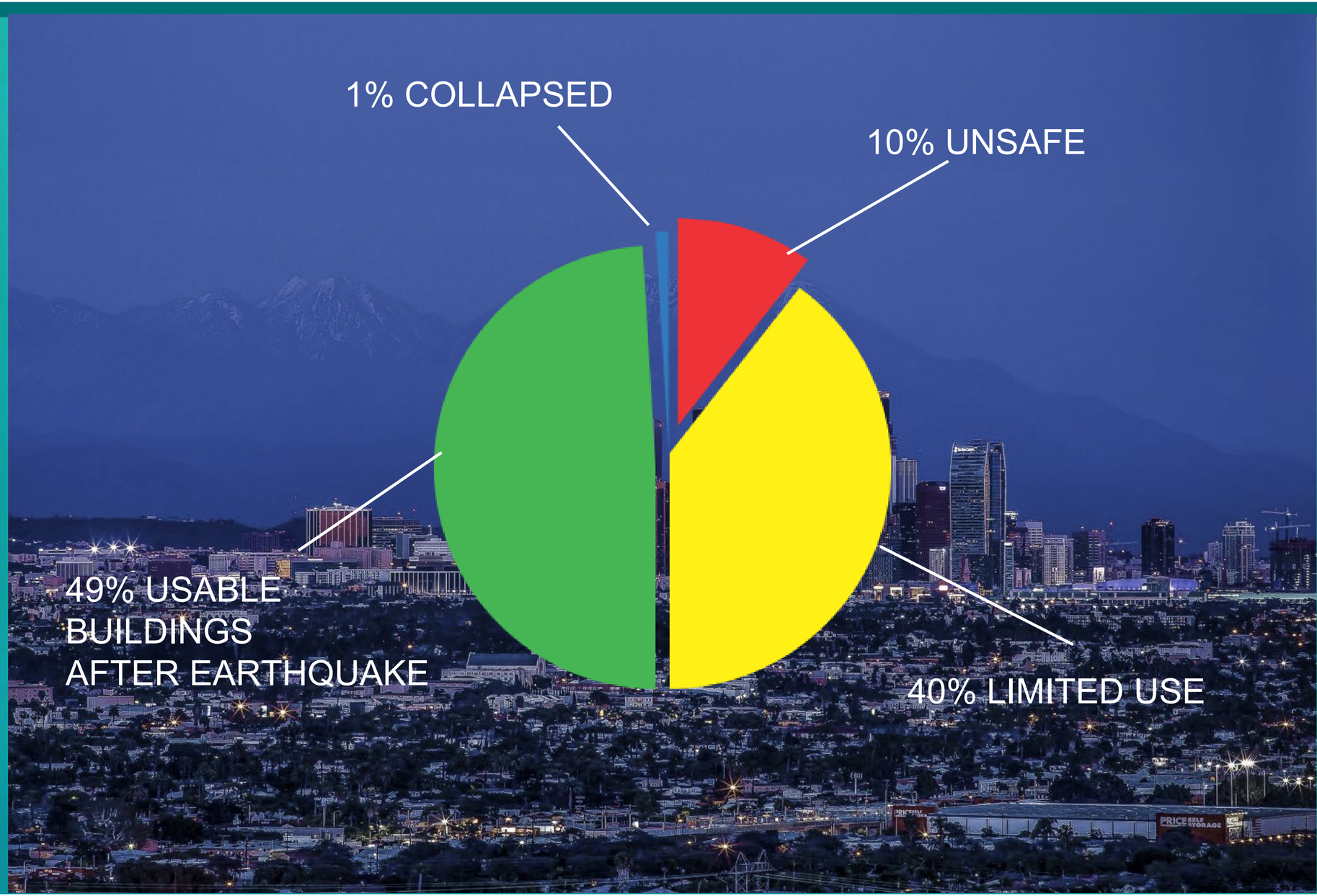
All imported water crosses the San Andreas fault without safeguards

Petroleum product pipelines cross the fault without shutoff valves



The ShakeOut earthquake in Downtown Los Angeles

- <10% of collapsing in 1 in 500 year event



2028 in Los Angeles

- 20 years since the release of ShakeOut
- 100 years since the San Francisquito Dam failure, the single deadliest day in the history of southern California
- The Olympics return to Los Angeles

ShakeOut 2.0

- Changed nature of work
- Mitigation accomplishments
- Shifting demographics
- New data
- Better models

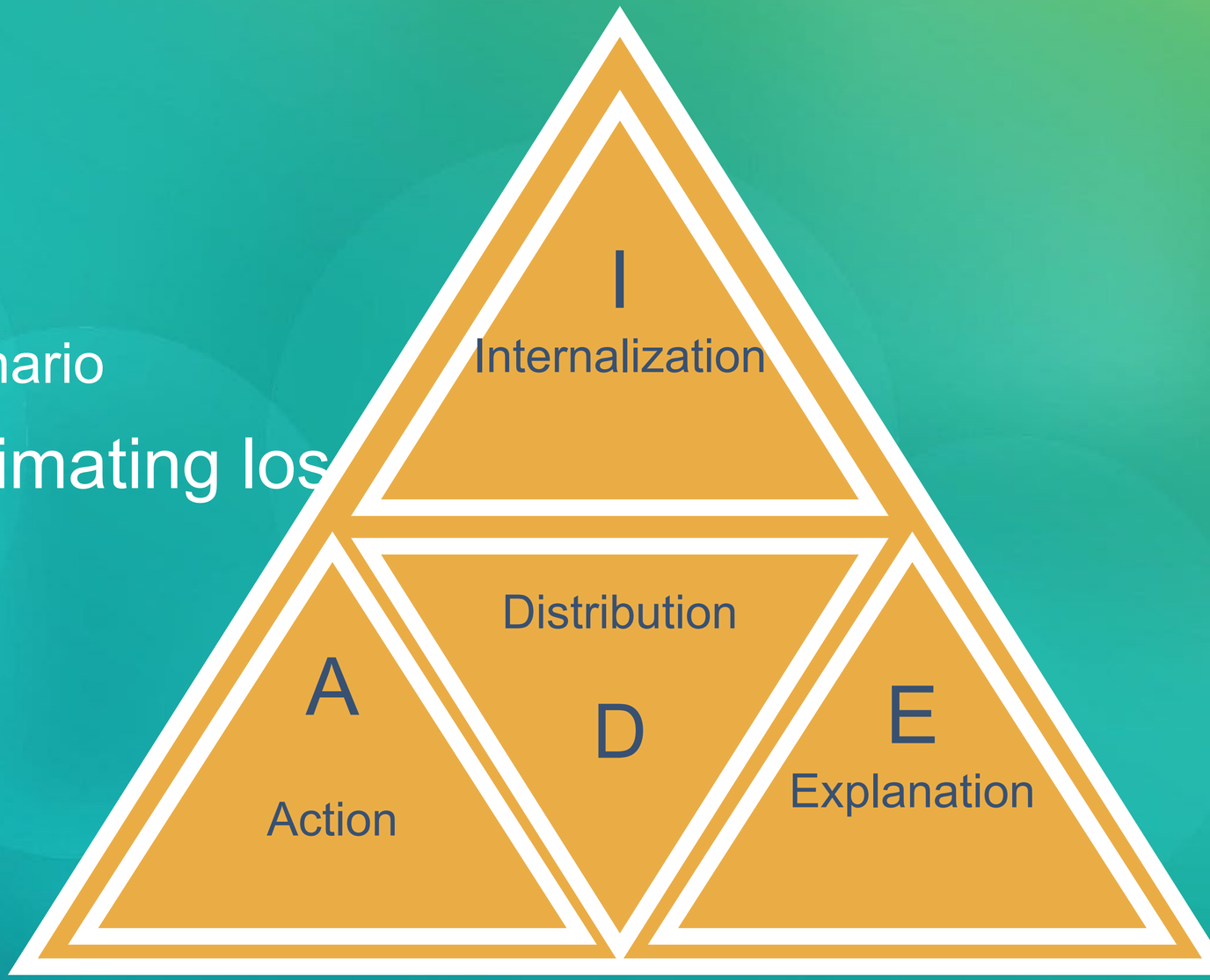
- Telecommuting
- Buildings
- Utilities
- Development near the San Andreas
- 2020 pandemic
- 2023 Türkiye earthquake
- 2025 Los Angeles wildfires

ShakeOut 2.0

- SCEC redoing earth science models adding a large aftershock on the Hollywood-Raymond fault
- Engineering consortium analyzing
  - losses prevented by retrofitting programs
  - cost of dithering on building code upgrades
- Adding air contamination and evacuation modeling
- Creating a new story for release in early 2028

Lessons Learned

- Follow the IDEA model
- Don’t use probabilities
  - We are making a plausible scenario
- Involve stakeholders in estimating los
- Keep the fights internal
  - Co-opt everyone



CONTACT

drlucyjonescenter.org