

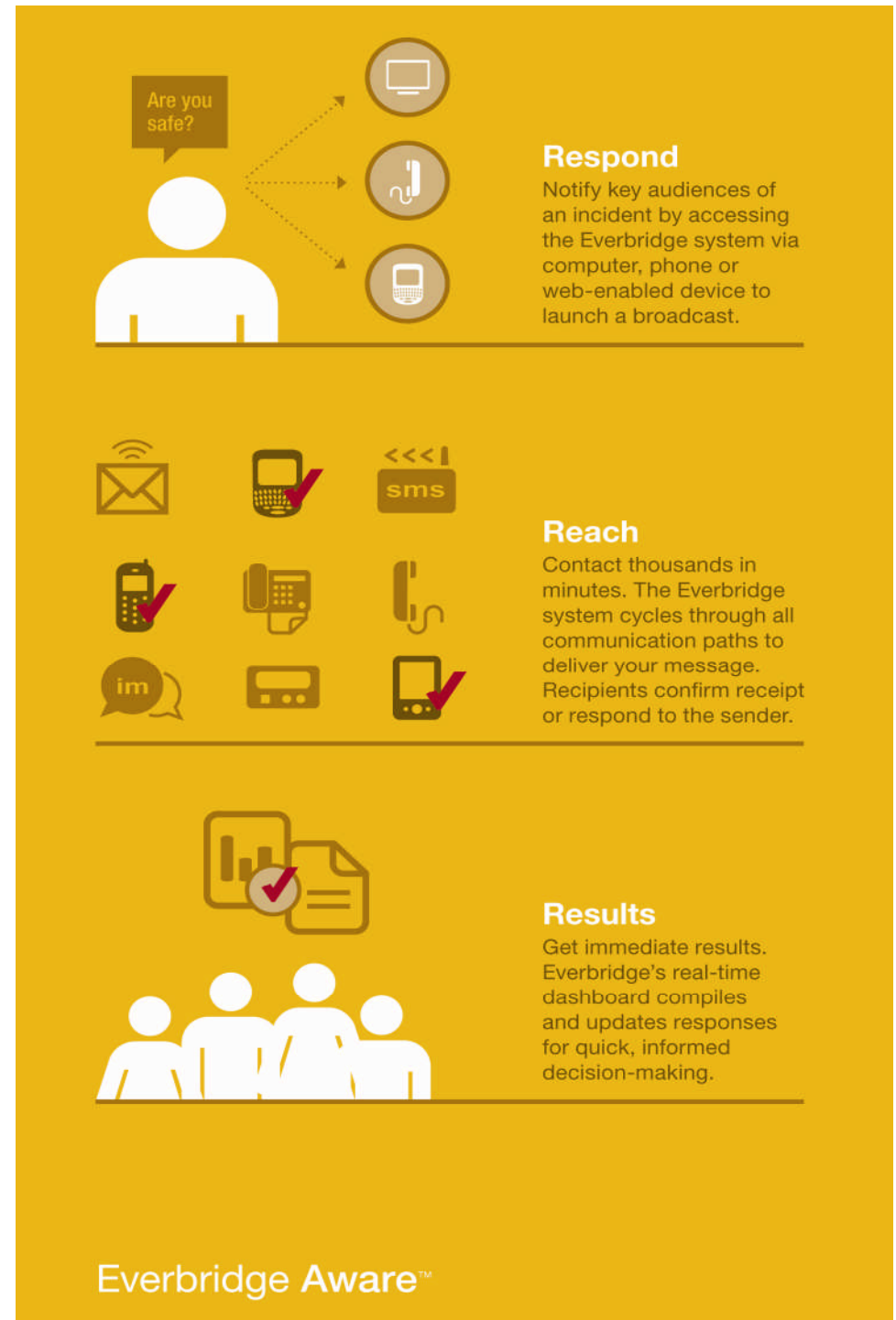


The Psychology of Disasters: Why Do We React the Way We Do?

Professor Matt Davis
Dominican University of California
Department of Psychology

About Everbridge

- Leader in incident notification systems
- Fast-growing global company with more than 1,000 clients in more than 100 countries
- Serve the Global 2000, federal government organizations, healthcare systems, state and local government, military, financial services firms, and universities
- 100% focused on incident notification solutions that merge technology and expertise



Agenda

Part 1: Presentation

- How individuals view risk
- How individuals respond during and after a crisis
- How to recognize the obstacles to preparedness and action

Part 2: Q&A



Q&A

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submit your
questions.



technology + expertise

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Disaster Psychology: Why Do We React the Way We Do?

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Natural Disasters

An enduring part of our history,
myths, legends, and religious teachings

- **The Biblical Story of the Great Flood**
250 different tribes & cultures worldwide
- **Earthquakes as Divine Punishment**
Sodom & Gomorrah, Lisbon (1755), SF (1906)
- **Volcanoes as Sacred Places/Gates to Hell**
- **The Atlantis Legend (Atzlan)**

Notable Natural Disasters Throughout History:

- Santorini, Greece: Is this what's left of the real "Atlantis"?
- The Eruption of Thera (1600 BC)



The World's Most Famous Volcanic Eruption: Mt. Vesuvius, Italy (79 AD)



Destruction of the Roman Cities of
Pompeii & Herculaneum

The World's Most Infamous Quake: San Francisco, 1906



Approximately 3,000 deaths resulted from the earthquake and subsequent fires

The Indian Ocean Tsunami: December, 2004



Affected a dozen nations and
left over 240,000 people dead or missing

Hurricane Katrina, U.S. Gulf Coast August, 2005



- Most Costly Natural Disaster in U.S. History (to date)
- Resulted in approximately 1,800 deaths, massive homelessness, dislocation of residents

And in just the last 9 months ...

- Haitian earthquake
- Chilean earthquake and tsunami
- Iceland volcano caused massive disruption to air travel worldwide
- Massive flooding in Pakistan
- Christchurch, New Zealand earthquake

What's happened before will probably happen again!

Natural disasters are a fact of life; they will continue to occur in the future...

Are natural disasters on the increase?

- Easier and faster global communication
- Media coverage and sensationalism
- There are cyclical trends in disasters
- Increasing world population is resulting in more people living in dangerous places
- A greater number of natural events are being labeled as disasters
- Death tolls from natural disasters are **decreasing**, but...
- The economic and social impacts of natural disasters have been **increasing** dramatically.

Some places are riskier than others!

- 90% of all earthquakes, volcanic eruptions and tsunamis occur around the “Ring of Fire”:
 - West coasts of Canada, U.S., Mexico, South America, Japan, Alaska, New Zealand, Indonesia, Southeast Asia
- Hurricanes only form in and travel to warm ocean water:
 - The Caribbean, southeast U.S. and the Gulf Coast
- 80% of all tornadoes occur in the U.S. Midwest:
 - “Tornado alley”

75 of the world's 100 largest metropolitan areas are in areas of high risk for at least one hazard:

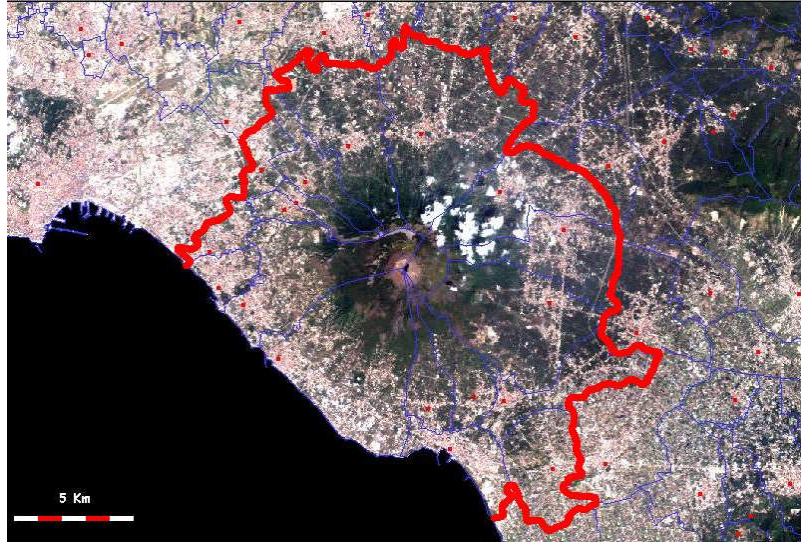
i.e. Tokyo, Mexico City, Los Angeles

**Naples Italy is Europe's
most densely populated city**



Over 3 million people live
in close proximity to Vesuvius

When Vesuvius becomes active again:



18 cities (600,000 people)
are within the high risk
“Red Zone” and would
need to be evacuated...

- Traffic and extreme population density will make an orderly evacuation difficult.
- Experts hope for at least a 2 week advance warning to evacuate this many people.
- How and where do we care for 600,000 people, perhaps indefinitely?
- The “paternalistic” approach of local officials is discouraging public involvement in planning

So why do people live in dangerous places?



Why do people live here?

San Francisco, CA: Loma Prieta Earthquake, 1989

Why the heck do people live here?



Mount Rainier, WA

Why the heck do people live here?



Campi Flegrei area, Italy

Why do people live in hazardous places?

- People have family and cultural connections
- Sometimes there's nowhere else to go:
 - Japan, Bangladesh, Montserrat
- There are benefits of disaster-prone areas:



Earthquake Zones:

Oil, water supplies, scenic natural beauty



Volcanoes:

Rich farmland, geothermal power, tourism and economic benefits, natural beauty, recreation



Coastlines & Flood-Prone Areas:

Recreation, scenery, weather, transportation, economic benefits

So, how do we deal with natural hazards?

Our Priorities are Backward!

- Research:
 - 90% of all Natural Hazards research looks at RECOVERY after a disaster
 - Only 10% is devoted to studying how we react to risk and trying to educate the public beforehand
- Money Spent:
 - 90% of all \$ spent on natural hazards is for clean up and rebuilding
 - Only 10% is used for educating and preparing the public

Hazard Mitigation at the Societal Level

- We use various methods to prevent disasters or to try and reduce their impact:
 - **Building Safety Codes & Retrofitting**
Constructing buildings to withstand winds in hurricanes or ground shaking during earthquakes
 - **Zoning/Land Use Planning**
Prohibiting construction in dangerous locations: On vulnerable coastlines, on top of earthquake faults, or in the path of volcanic lava flows
 - **Protective Works**
The use of dams, levees, tsunami or hurricane barriers to prevent flooding

Other Hazard Mitigation Strategies

- **Prediction, Forecasting and Warning**

Trying to predict earthquakes, monitoring volcanoes, satellite tracking of hurricanes or tornadoes, and alerting the public to danger

- **Evacuation**

Moving people to safety in the event of eruptions, tsunami, storms, floods and fires

* Such measures **DO** save lives and property, but all have their costs and limitations: Cost, Quality of Life, False Alarms...

The Importance of Individual Preparedness

Even in the **BEST** circumstances, governments can only do so much to protect their citizens...

Responsibility must fall on individuals to prepare and protect themselves:

- Store food, water, emergency supplies.
- Make the home/workplace safer.
- Know appropriate actions to take.
- Comply with evacuation orders.



Getting Individuals to Prepare



Some explanations for the public's failure to prepare:

- Belief that government, scientists or our technology will warn, protect and rescue us.
- Lack of knowledge or awareness regarding the risk or about preparedness strategies.
- The cost of preparedness may be prohibitive.
- To a great extent, preparedness depends upon **PSYCHOLOGICAL FACTORS** and how the public perceives and reacts to risk and warning messages.

How do people psychologically deal with risk ?

- **Denial:**
“It won’t happen; I don’t think about it”
- **Optimistic Bias:**
“It know it will happen, but I won’t be personally affected”
- **Low Salience of Threat:**
“I know it’s an issue, but I have other things to worry about”
- **Preference for Crisis Response:**
“I’ll deal with it if and when it happens”
- **Low Self-Efficacy:**
“I feel like nothing I do will make a difference”



How do we deliver effective messages to an at-risk population?

People are unlikely to be motivated to prepare or to evacuate if:

- The message comes from unreliable, untrustworthy or inconsistent sources (media vs. government vs. scientists)
- The message is too vague and doesn't provide specific actions to be taken (low self-efficacy)
- The message is not fear-arousing enough (low salience) or is too fear-arousing (denial)



California: One Example of an At-Risk Population and a Need for Preparedness



San Andreas Fault



The Hayward Fault

The result of some of California's faults...

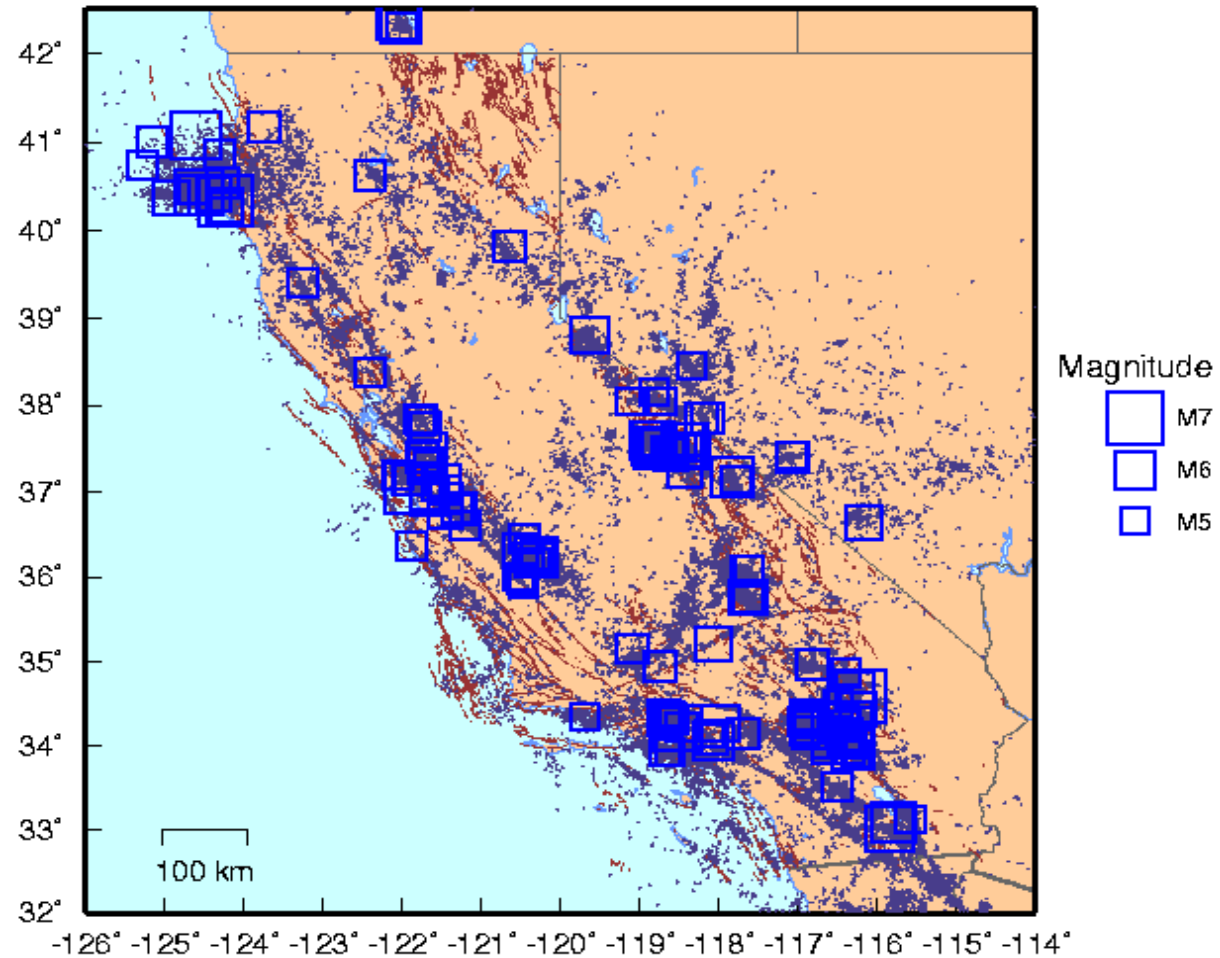


Marin County, 1906



El Centro, 1979

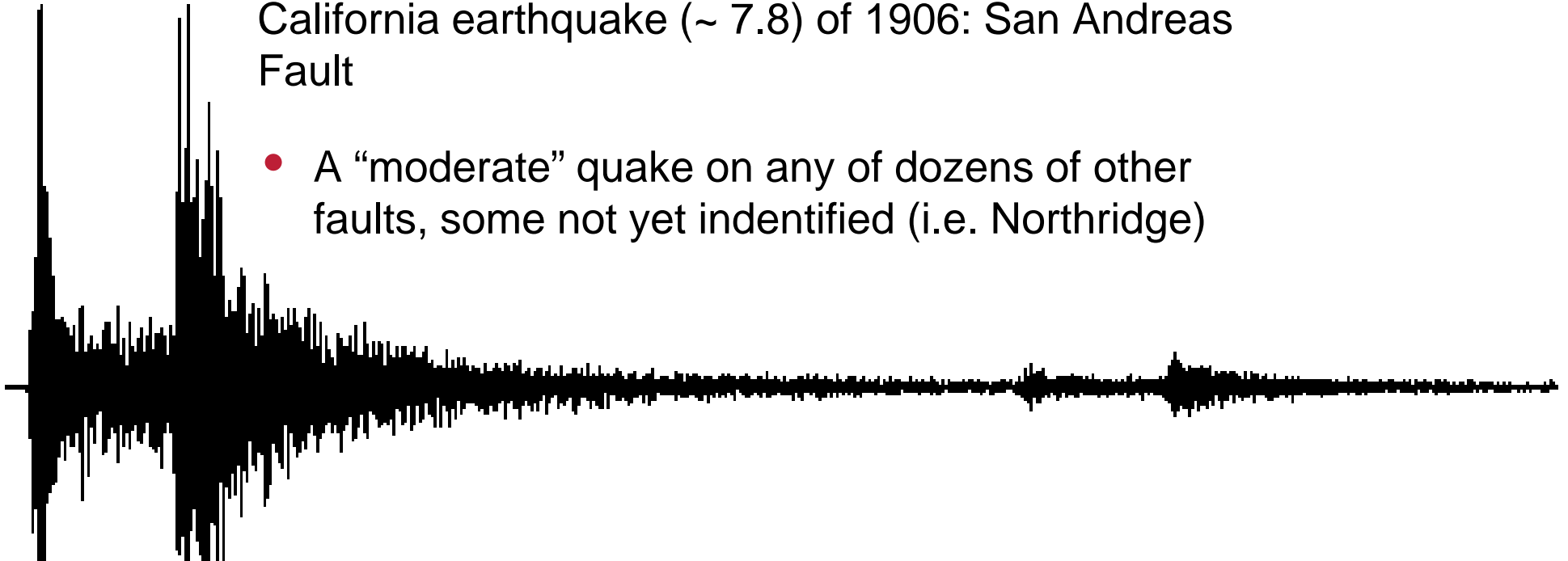
Statewide Earthquake Activity



Seismicity 1970-2003

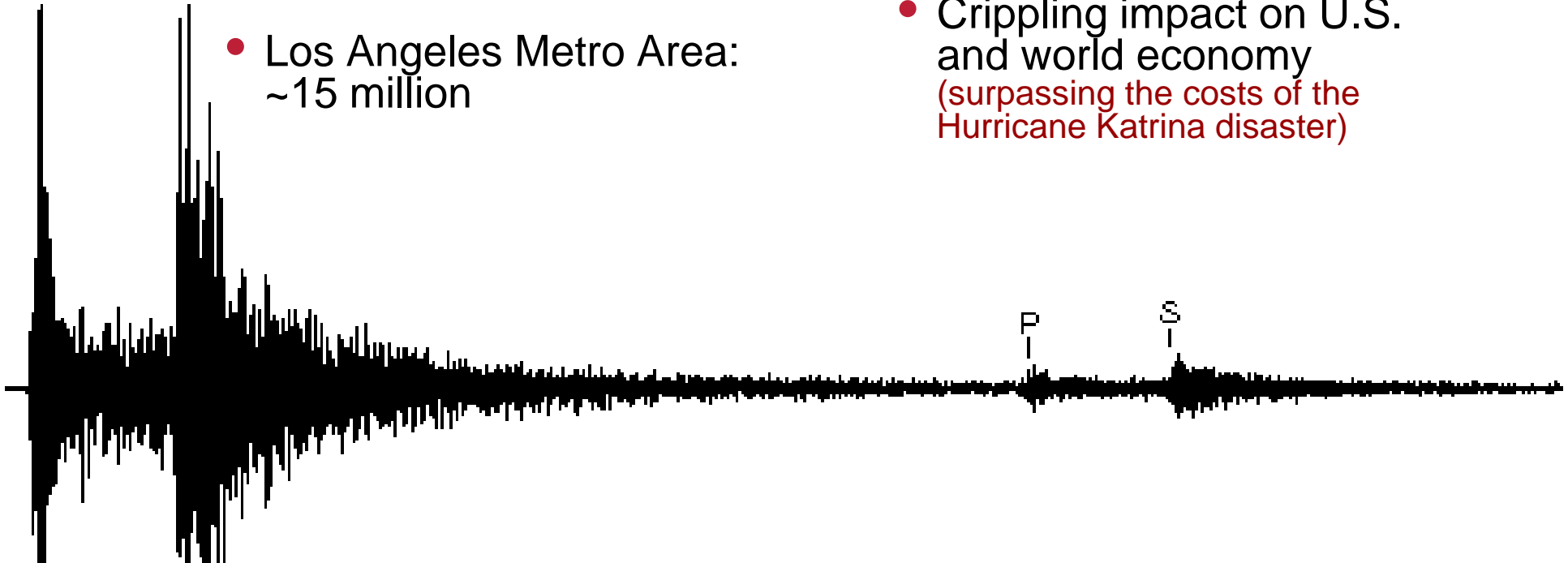
What should California expect in terms of earthquake risk in the future?

- A repeat of the great (~8.0 Richter) Southern California quake of 1857: San Andreas Fault
- A “moderate” quake (~7.0) affecting the entire Bay Area: Hayward Fault near Oakland / Berkeley
- A repeat of the great San Francisco/Northern California earthquake (~ 7.8) of 1906: San Andreas Fault
- A “moderate” quake on any of dozens of other faults, some not yet indentified (i.e. Northridge)



California's Risk from Earthquakes

- Over-population of a very dangerous place:
 - Population: 36 million
(1/10 of U.S. population)
 - San Francisco Bay Area:
~7 million
 - Los Angeles Metro Area:
~15 million
- Projected effects of a future earthquake:
 - Casualties:
5,000-10,000 deaths
 - Injuries:
Up to 100,000 people
 - Crippling impact on U.S.
and world economy
(surpassing the costs of the
Hurricane Katrina disaster)



Californians' Perception of Risk

- Surveys I've conducted in **1989**, **2005** and **2007** revealed that:
 - Cost of living, traffic, and crime are the most important problems people mention (low salience of the threat)
 - Most people don't display denial: there are high levels of concern, a belief that quakes will happen, and some degree of optimistic bias
 - People **have** taken **some** precautionary measures
 - Obstacles to preparedness include: lack of information, high costs, procrastination and feelings of helplessness or low self-efficacy

Does Disaster Preparedness Training Work?

- **The *Get Ready Marin* Program**
 - Free, 2 hour long disaster preparedness training sessions
- **CERT (Community Emergency Response Team) Classes**
 - Certification in Fire Prevention, CPR, Search & Rescue
 - Regularly scheduled classes offered in various cities
- **Training Program Evaluations (2007 – 2009)**
 - *Get Ready* and CERT participants showed significant improvement in risk and preparedness knowledge
 - Showed a stronger feelings of “self-efficacy” and greater “sense of community” after participating

These results demonstrate the importance of getting the public directly involved in disaster planning!

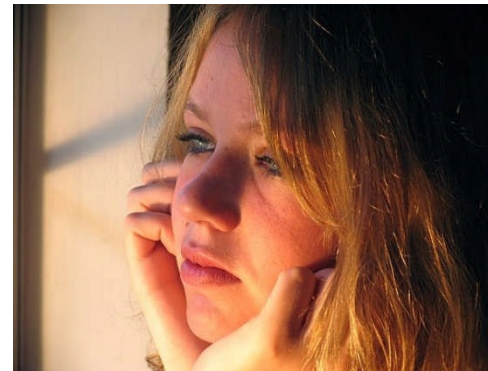
During and after a disaster: How do we cope and recover?

- Natural Disasters are large-scale events causing deaths, injuries, economic loss, psychological stress and trauma
- People who prepare for a disaster are more likely to survive, and tend to recover more easily and quickly in the aftermath



Psychological Reactions to Disaster Events

- Panic, looting, and anti-social behavior
- Altruistic, heroic and pro-social behavior
- Affiliation – desire to be around others or talk to loved ones
- Curiosity
- Shock and denial
- Post Traumatic Stress Disorder (PTSD)
 - Flashbacks, nightmares, reliving the event
 - Hyper-arousal, nervousness
 - Psychological withdrawal (including drug/alcohol use)



Psychological Intervention for Disaster Survivors

- Psychological “first-aid” in the immediate aftermath:
 - Calm the victim, restore a sense of control, encourage the victim to talk about their experience
- The value of group therapy/support groups for trauma survivors
- Individual psychotherapy treats:
 - Anxiety disorders
 - Grief, depression and “survivor guilt”
- Avoiding the development of a “victim status”: the importance of resuming normal routines as quickly as possible



The impact of a natural disaster can linger for weeks, months or years...

- Higher incidence of social problems:
 - Divorce, domestic abuse
 - Suicide, drug, and alcohol abuse
 - Greater need for psychological services
- Chronic economic problems:
 - Unemployment and homelessness



- A new focus of psychological research is called “Resilience”
Why do some communities or individuals recover more quickly and with fewer long-term problems?
- Resilience is enhanced by several factors: prior preparedness, stronger bonds to community, social support, and a stronger sense of self efficacy



In most cases, survivors return and rebuild following disasters



San Francisco
1906



San Francisco
2010

**And unlike 79 AD, at least the new,
rebuilt city of Pompei has a McDonald's!**



Incident Notification

Marc Ladin

VP of Marketing, Everbridge

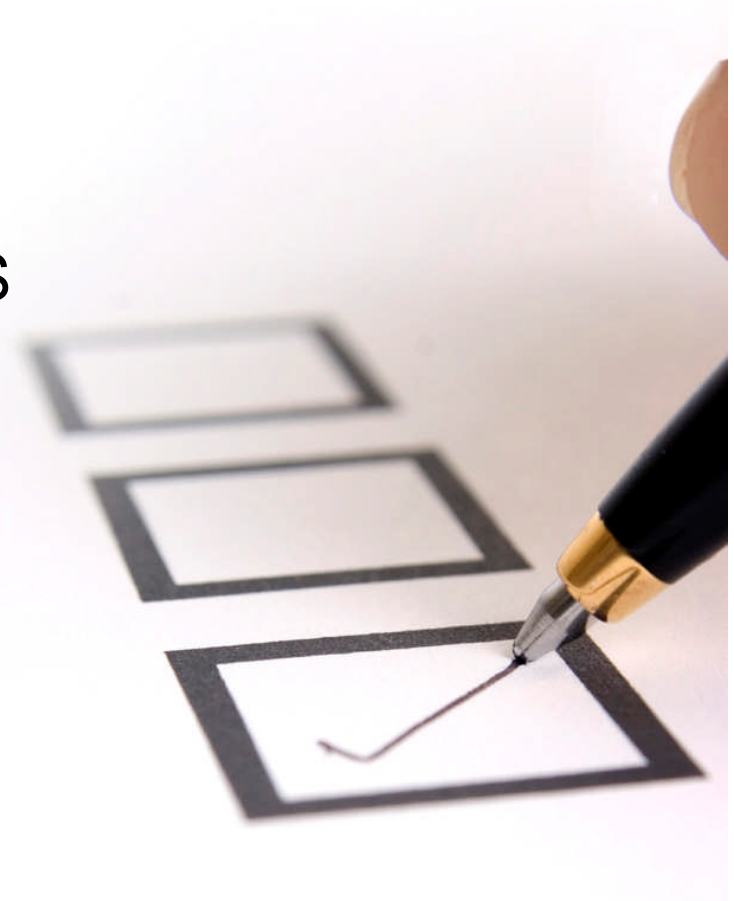


Incident notification solutions address common communication challenges

- **Communicate quickly, easily, and efficiently** with large numbers of people in minutes, not hours, making sure that the lines of communication are open
- **Use all contact paths** to reach constituents wherever they are
- **Ensure two-way communications** to get feedback from message receivers
- **Reduce miscommunications and control rumors** with accurate, consistent messages
- **Satisfy regulatory requirements** with extensive and complete reporting of communication attempts and two-way acknowledgements from recipients

Key evaluation criteria for an incident notification system

- Experience *and* expertise
- Ease of use
- Ability to reach all contact paths, including voice, email, native SMS (over SMPP and SMTP), IM, and more
- Ease of integration



Q&A

Missed anything?
Slides are currently
available on
blog.everbridge.com



Webinar

X	Question	Asker

Send Privately Send to All

Use the Q&A
function to
submit your
questions.



technology + expertise

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Communication resources





White papers, literature, case studies
www.everbridge.com/resources

Upcoming webinars:

- System Demo (*September 28*)
- Conquering Challenges for More Effective Emergency Communication (*October 21*)

To register: www.everbridge.com/webinars

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Activity Group: A

1 Point for each webinar