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The Emergency Mind: How We Adjust to and Cope with Living in Dangerous Places

Matt Davis

Department of Psychology, Dominican University of California, matt.davis@dominican.edu

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The Emergency Mind:

How We Adjust to and Cope with Living in Dangerous Places

Professor Matt Davis
Dominican University of California
Department of Psychology

Really Ready 3
Sacramento, California - January 25, 2012

Natural Disasters in Myth, Legend, & 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)**

Was there really an “Atlantis”?



**Santorini, Greece:
Eruption of Thera
(1600 BC)**

Subsequent
disappearance of
the Minoans and
their culture

Notable Disasters Throughout History



Eruption of Vesuvius Southern Italy (79 AD)

**Destruction of the Roman Cities of
Pompeii & Herculaneum**

Notable Disasters Throughout History



San Francisco Earthquake of 1906

Approximately 3,000 deaths caused by the earthquake and subsequent fires

A Decade of Disasters



In the past 10 years or so the world has experienced a seemingly endless number of major natural disasters...

Indian Ocean Tsunami: December 26, 2004



- Resulted from an earthquake off Indonesia
- Affected 12 nations around the Indian Ocean
- Left more than 240,000 people dead or missing

Hurricane Katrina, August 2005: U.S. Gulf Coast & New Orleans



- **Costliest natural disaster in U.S. to date**
- **Resulted in approximately 1,800 deaths**
- **Caused massive homelessness and displacement of residents**

And just in the last two years:

- Haiti Earthquake (January 2010)
- Chile Earthquake and Tsunami (February 2010)
- Iceland Volcano (massive air travel disruption worldwide (Summer 2010)
- Massive Flooding in Pakistan (August 2010)
- Japan Earthquake & Tsunami (March 2011)
- Christchurch, New Zealand Quakes (June 2011)
- Earthquake in Virginia (August 2011)
- Hurricane Irene in Northeast (August 2011)

Is this the End of Days?

- **The Mayan calendar ominously ends in December 21, 2012...**
- **But natural disasters are a fact of life; they've happened throughout history and will continue to occur in the future... (probably far beyond 2012!)**



Are Natural Disasters on the Increase?

- **EXPLANATIONS:**

- Easier/Faster Global Communication
- Media Coverage & Sensationalism
- There are Cyclical Trends in Disasters
- Increasing World Population is resulting in More People Living in Dangerous Places:

- **THE FACTS:**

- A greater number of natural events are being labeled “disasters”
- Death tolls from natural disasters are **decreasing**, but...
- The economic and social impacts of natural disasters have been **increasing** dramatically.

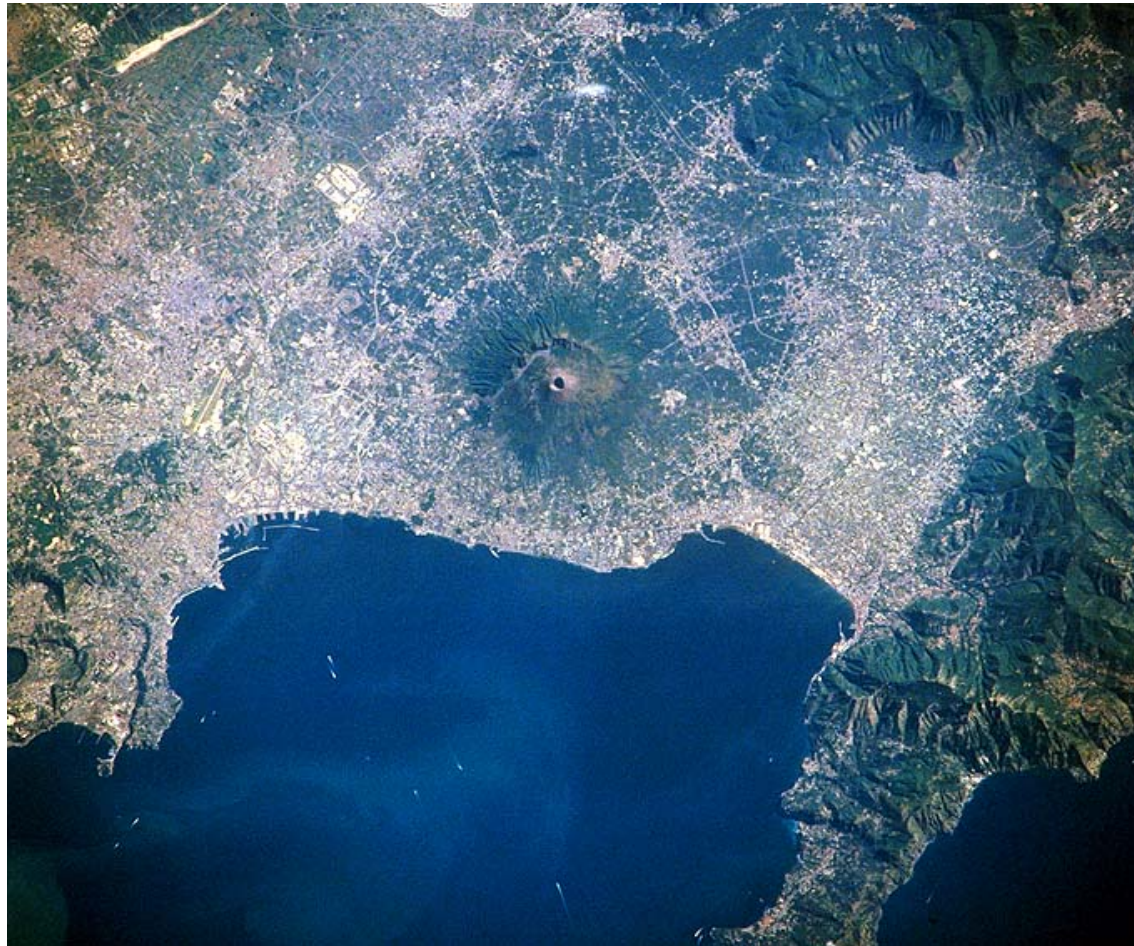
Some Places **Are** Riskier Than Others...

- **90% of all earthquakes, volcanic eruptions and tsunami occur around the “Ring of Fire”:**

West Coasts of North and South America, Japan, Alaska, New Zealand, Indonesia, Southeast Asia

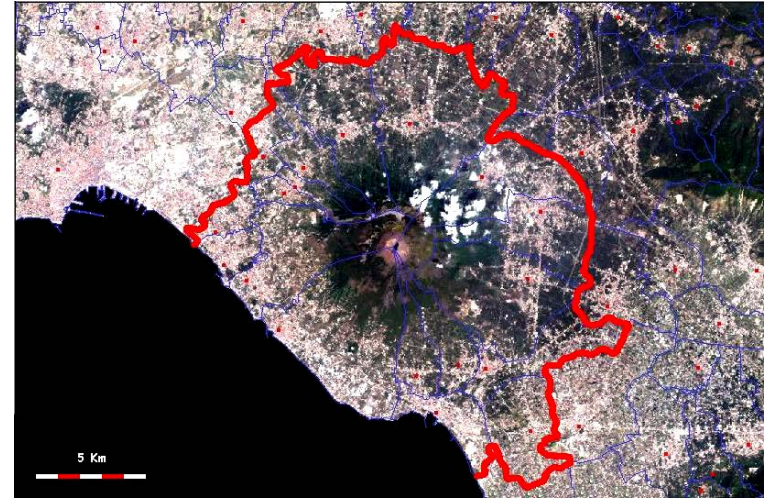
- **Hurricanes only form in and travel to areas with warm ocean water (the Caribbean, the southeastern U.S. & the Gulf Coast)**
- **80% of all tornadoes occur in the U.S. Midwest’s “tornado alley” – Texas, Oklahoma, and Kansas**
- **75 of the world's 100 largest metropolitan areas are at high risk for at least one hazard:**
Tokyo, Mexico City, L.A.

Naples, Italy is Europe's most densely populated city: over 3 million people live in close proximity to Mount Vesuvius



If Vesuvius becomes active...

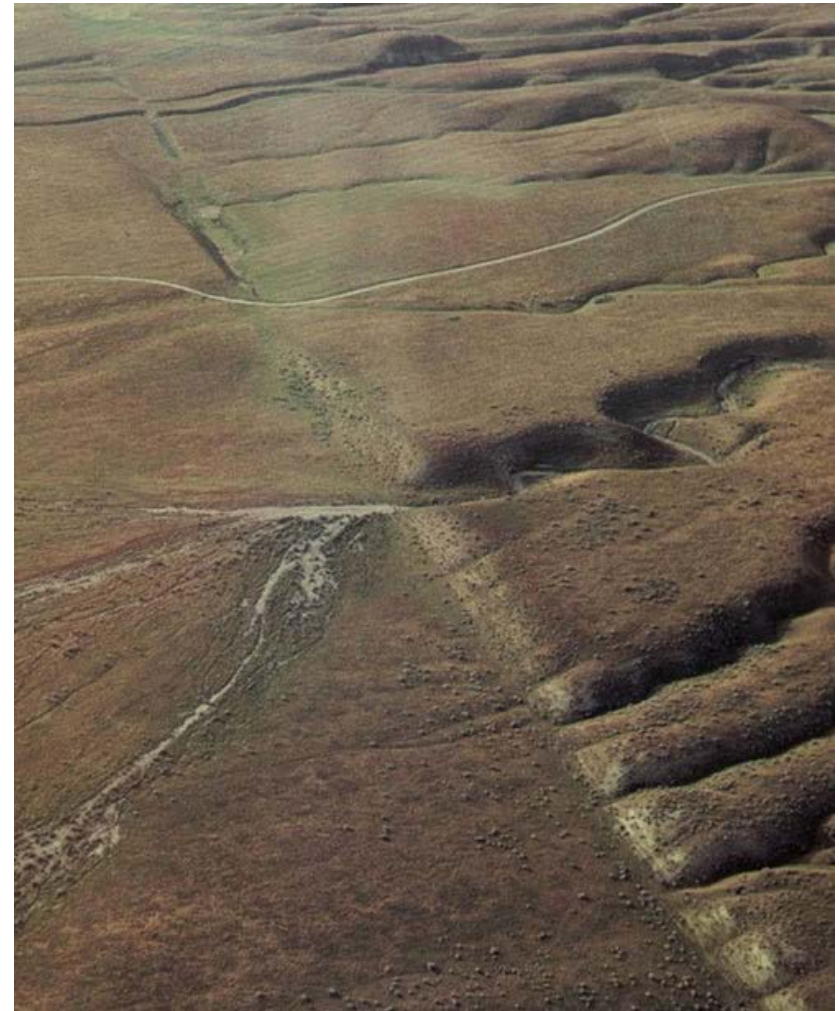
**18 cities (600,000 people)
are within the high risk
“Red Zone” and would
need to be evacuated**



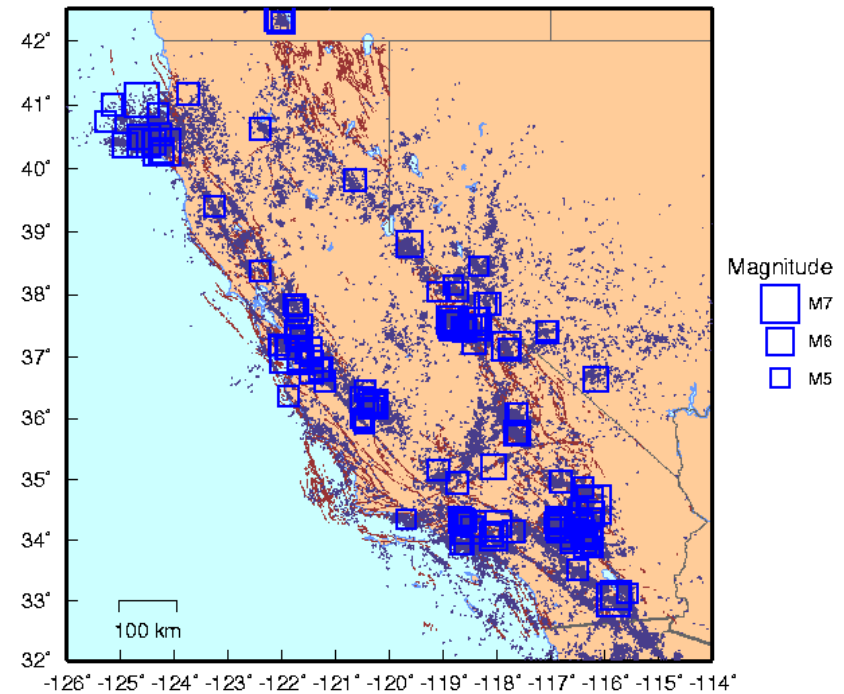
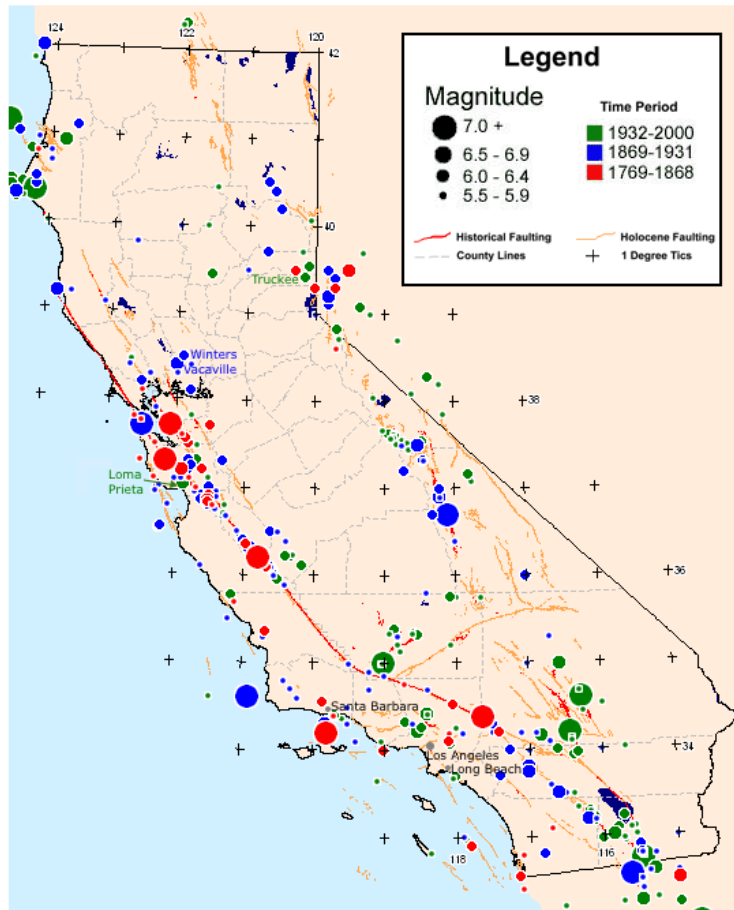
- Traffic, extreme population density will make an orderly evacuation difficult.
- Experts hope for at least a 2 week advance warning to evacuate this many people.
- How and where do we care for 600,000 people, perhaps indefinitely?

California's Earthquake Risks

The San Andreas Fault



Statewide Earthquake Activity



Seismicity 1970-2003

California's Risk from Earthquakes

- **Over-population of a dangerous place**
 - 36 million people now live in California (1/10 of the total U.S. population)
 - San Francisco Bay Area: 7 million people
 - Los Angeles Metro Area: 15 million people
- **Projected effects of a future quake**
 - Casualties: 5,000 – 10,000 deaths
 - Injuries: up to 100,000 people
 - Crippling impact on U.S. and world economy; will surpass the costs of Katrina

Why do people live in such dangerous places?

San Francisco, 1989 Quake



Why do people live **HERE?** Mt. Rainier, Washington



Why the hell do people live here?

Campi Flegrei area, Italy



Why DO people live in hazardous places?

- **Family & Cultural Connections**
 - Where else do you go? (Japan, Bangladesh, Montserrat)
- **Benefits of Disaster-Prone Areas**
 - **Earthquake Zones:**
 - Oil, Water Supplies, Scenic Natural Beauty
 - **Volcanoes:**
 - Rich Farmland, Geothermal Power, Tourism & Economic Benefits, Natural Beauty, Recreation
 - **Coastlines & Flood-Prone Areas:**
 - Recreation, Scenery, Weather, Transportation, Economic Benefits



So how do we cope with the threat of Natural Disasters?





Hazard Mitigation: Societal Level

How do we deal with natural hazards?

- **Our Priorities are Backward!**
 - 90% of all \$ spent on Natural Hazards is for clean up and rebuilding; 10% is used for educating and preparing the public
 - 90% of all research on Natural Hazards looks at RECOVERY after a disaster; only 10% is devoted to studying how we react to risk and trying to educate the public

Hazard Mitigation: Societal Level

- Society uses various methods to prevent disasters or reduce their impact:
 - **Building Safety Codes & Retrofitting** (constructing buildings to withstand winds in hurricanes or ground shaking during quakes)
 - **Zoning/Land Use Planning** (prohibiting construction in dangerous locations: vulnerable coastlines, on top of earthquake faults, or in the path of volcanic lava flows)
 - **Protective Works** (dams, levees, tsunami or hurricane barriers to prevent flooding)

Hazard Mitigation: Societal Level

- **Prediction, Forecasting and Warning**
(trying to predict quakes, track hurricanes, and tornadoes, monitor and alert 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...**

Limitations of Hazard Mitigation

- Building Codes
 - Increased costs; never put to the test
- Zoning
 - Unpopular with developers, government
- Protective Works
 - Ugly; encourage development in unsafe areas
- Prediction/Warning & Evacuation
 - Ability to forecast varies by disaster type; false alarms and warning fatigue; lack of compliance

Individual Preparedness

Even in the BEST of circumstances, governments can only do so much to protect citizens; the responsibility must fall on all of us as individuals to prepare and protect ourselves

- **Storing Food, Water, Emergency Supplies**
- **Making the Home/Workplace Safer**
- **Knowing the Appropriate Actions to Take**
- **Complying with Evacuation Orders**
- **Purchasing Insurance**

Getting Individuals to Prepare

- **Practical 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**
 - **Unclear messages from media or government about the risk or the proper actions to take**

Delivering 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)**

What would you do?



Will residents follow recommendations they think are counter-intuitive or which seem flawed or unrealistic to them?

Preparedness, to a great extent, depends on various psychological factors and how the public perceives and reacts to risk and warning messages

Are people really in denial??

Denial:

“It will never happen...”

“I don’t think about it.”

Denial is:

- a Freudian concept
- helpful after trauma
- maladaptive if actions need to be taken
- rarer than the media would have you believe...



How do people deal with risk psychologically?

Optimistic Bias:

“It know it will happen, but I won’t be personally affected...”; “I’ll come through a crisis better than other people...”

Low Salience of Threat: “I know it’s an issue, but I have lots of other things to worry about...”

Preference for Crisis Response: “I’ll deal with it if and when it happens...”

Other psychological issues...

Low Self-Efficacy: “I feel like nothing I do will make a difference...”

Procrastination

“I know I should do something and I will get to it eventually...”

Social influences/conformity

“No one else seems worried; why should I be?”

Results of Research on Californians' Perception of Risk

- **Surveys I conducted of Californians in 1989, 2005 and 2007 revealed that:**
 - Issues like cost of living, traffic, and crime are the most important problems people mention (low salience of the threat)
 - Most people don't show signs of denial: there are high levels of concern, and a belief that quakes/tsunami will happen

Additional Findings

- **Many people have actually taken some precautionary measures**
- **Obstacles to preparedness include:**
 - **lack of information/awareness**
 - **high costs**
 - **procrastination**
 - **feelings of helplessness (low self-efficacy)**

Risk Perceptions at Mt. Vesuvius



Studies I conducted of residents living close to Vesuvius in 2003 & 2006 revealed:

- **The volcanic threat is not as salient to residents as issues like trash collection, crime, crowding, and traffic**

The Residents of Vesuvius

- **However, there are high levels of fear of an eruption and a belief that an eruption will have serious consequences; no evidence of DENIAL!**
- **Residents feel they have little control (low self efficacy), a lack of awareness of the evacuation plan and little confidence in government officials**

Improving the Situation in Naples

- **Strong need for a more effective public education and disaster training program for area residents**
- **Involve residents in planning:**
“What do YOU think would be the best route to safety?”



How Effective is Disaster Preparedness Training?

- Recent studies I've conducted in Marin County, California looked at the impact of participating in disaster preparedness programs:

Get Ready Marin

CERT Training



How does training affect the participants?

- Results revealed:
 - **Participants showed significantly improved knowledge of how to prepare**
 - **They had stronger feelings of “self-efficacy” and “sense of community” after participating**
- These variables are linked to greater likelihood of people actually taking self-protective measures



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

Effects of such events on the population can linger for weeks, months, or even years after

People who are prepared for a disaster are more likely to survive and tend to recover more easily and quickly in the aftermath

Looting after Hurricane Katrina



Heroism in the Haiti Earthquake



**Anti-Social vs. Pro-Social
Behavior In Disasters**

Reactions to Disaster Events

- **Affiliation – desire to be around others or to talk to loved ones**
- **Curiosity**
- **Shock and Denial**
- **Post Traumatic Stress Disorder (PTSD)**
 - **Flashbacks, Nightmares, Reliving the Event**
 - **Hyper-Arousal, Nervousness**
 - **Psychological Withdrawal (Drugs and Alcohol)**

Psychological Intervention for Disaster Survivors

- **Psychological “First-Aid”**
 - **Calm the victim, restore a sense of control, encourage victim to talk about their experience**
- **Individual Psychotherapy**
 - **Anxiety Disorders**
 - **Grief, Depression & “Survivor Guilt”**
- **The Value of Group Therapy/Support Groups for Trauma Survivors**

Speeding the Road to Recovery

**The danger of developing a
“Victim Status” - the Importance of
Resuming Normal Routines**



The Effects of Natural Disasters Can Continue Over Time

- **Higher incidence of social problems:**
 - **Divorce, Domestic Abuse**
 - **Suicide, Drug & Alcohol Abuse**
 - **Homelessness**
 - **Elevated Need for Psychological Services**
- **Chronic economic problems/unemployment**
- **Resilience:** Why do some people or some communities bounce back more easily and quickly after traumatic events?

The Importance of Resilience

- Resilience is a variable increasingly studied in the field of Positive Psychology - especially in the aftermath of 9/11 and Hurricane Katrina
- Resilience is the norm, not the exception!
- Some people are more resilient:
 - The Elderly, People with Lower Levels of Education
- Resilience can be enhanced by:
 - prior preparedness
 - stronger bonds to community/ greater social support
 - a stronger sense of self efficacy

In most cases, survivors DO return and rebuild following disasters...



San Francisco, 1906 and 2012

Why do we rebuild?

- Similar issues as to why people live in dangerous places to begin with:
 - **Attachment to place; Positive aspects of living in the area; No alternatives**
 - **Ancestral or family ties to a place**
 - **Belief that “Lightning doesn’t strike twice in the same place...”**
 - **Psychologically: Feelings of triumph over adversity or natural forces**

Questions??

San Andreas Fault Rupture, Marin County 1906

