

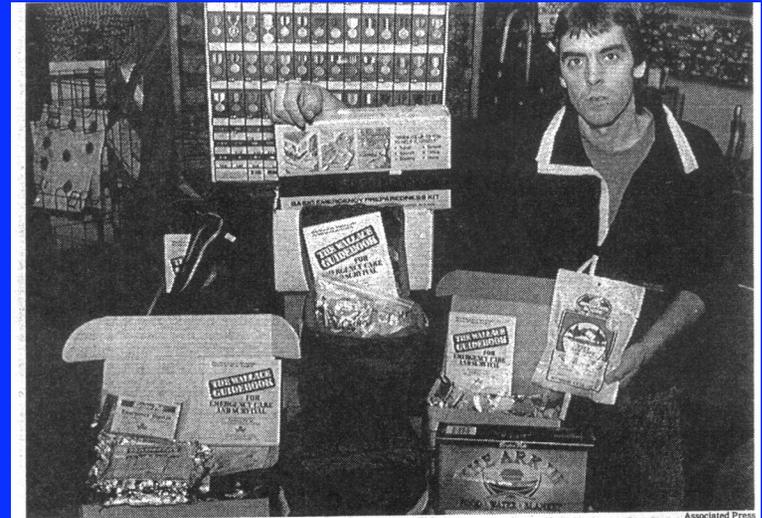
3. Disasters, Pseudodisasters & Critical Thinking

Disaster: a calamitous event, esp. one occurring suddenly and causing great loss of life, damage, or hardship



SUN-TIMES/Jon Sall
Teacher Chris Jalove checks as kindergartners take cover during an earthquake drill Thursday. St. Mary Star of the Sea School is ready for Monday's predicted earthquake.

11/12/90
NYT



Associated Press
A projection for a Dec. 3 earthquake on the New Madrid Fault has sent Midwesterners rushing to prepare. Tom Tarrant displayed a variety of earthquake survival kits at Sam's Safari Outfitters in St. Louis.

On Fear of Quake, a Business Bonanza

ST. LOUIS, Nov. 12 (AP) — The Middle West is thinking about earthquakes. Survival kits are turning up on store shelves and companies are selling anti-shatter window film, portable chemical toilets and other emergency gear.

Such products are more familiar to Californians, who have been rattled by many quakes over the years, but for

Velcro fasteners and chemical toilets are catching on.

CEPP is one of at least a dozen companies or groups selling emergency kits that cost \$15 to \$150 and include thermal blankets, pouches of water and food guaranteed to last five years; flashlights, first-aid supplies and other items.

Another California company, The Emergency Lifeline of Santa Ana, is conducting intensive emergency-preparation

Pseudodisaster: a situation in which the public incorrectly believes that a disaster is either under way or imminent

Tough question: how to decide when to worry?

11/30/90 Chicago Sun-Times

New Madrid earthquake disaster regularly predicted



Television trucks near Main Street in New Madrid, Mo., Sunday afternoon are just part of the flood of media that has poured into the town on the now-famous fault for the predicted quake.

AP

December 1990 prediction didn't materialize

Forecasts of doom get even louder as 1811-12 bicentennial approaches

Government warns of "catastrophic" U.S. quake

Thu, Nov 20 2008

By [Carey Gillam](#)

KANSAS CITY, Missouri (Reuters) - People in a vast seismic zone in the southern and midwestern United States would face catastrophic damage if a major earthquake struck there and should ensure that builders keep that risk in mind, a government report said on Thursday.

The Federal Emergency Management Agency said if earthquakes strike in what geologists define as the New Madrid Seismic Zone, they would cause "the highest economic losses due to a natural disaster in the United States."

FEMA predicted a large earthquake would cause "widespread and catastrophic physical damage" across Alabama, Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri and Tennessee -- home to some 44 million people.

Tennessee is likely to be hardest hit, according to the study that sought to gauge the impact of a 7.7 magnitude earthquake in order to guide the government's response.

In Tennessee alone, it forecast hundreds of collapsed bridges, tens of thousands of severely damaged buildings and a half a million households without water.

Transportation systems and hospitals would be wrecked, and police and fire departments impaired, the study said.

The zone, named for the town of New Madrid in Missouri's southeast corner, is subject to frequent mild earthquakes.

Experts have long tried to predict the likelihood of a major quake like those that struck in 1811 and 1812. These shifted the course of the Mississippi River and rang church bells on the East Coast but caused few deaths amid a sparse population.

"People who live in these areas and the people who build in these areas certainly need to take into better account that at some time there is ... expected to be a catastrophic earthquake in that area, and they'd better be prepared for it," said FEMA spokesperson Mary Margaret Walker.

(Editing by [Andrew Stern](#) and [Xavier Briand](#))



RFI for Pre-Packaged Commercial Meals

Solicitation Number: HSFEHQ-11-R-Meals
Agency: Department of Homeland Security
Office: Federal Emergency Management Agency
Location: Logistics Section

Posted Date:

January 20, 2011

Response Date:

Feb 03, 2011 11:59 pm Eastern

The Federal Emergency Management Agency (FEMA) procures and stores pre-packaged commercial meals to support readiness capability for immediate distribution to disaster survivors routinely. The purpose of this Request for Information is to identify sources of supply for meals in support of disaster relief efforts based on a catastrophic disaster event within the New Madrid Fault System for a survivor population of 7M to be utilized for the sustenance of life during a 10-day period of operations. FEMA is considering the following specifications (14M meals per day):

- Serving Size - 12 ounce (entree not to exceed 480 calorie count);
- Maximum calories - 1200 and/or 1165 per meal;
- Protein parameters - 29g-37g kit;
- Trans Fat - 0;
- Saturated Fat - 13 grams (9 calories per gram);
- Total Fat - 47 grams (less than 10% calories);
- Maximum sodium - 800-930 mg;

Requested Menus to include snacks (i.e. fruit mix, candy, chocolate/peanut butter squeezers, drink mix, condiments, and utensils). All meals/kits must have 36 months of remaining shelf life upon delivery. Packaging should be environmentally friendly.

Activity 3.1 Disaster Preparation

What would the total
cost be?

Does this seem to
you like a good use
of public funds?



Mid-America Earthquake Center

Project funded by
Federal Emergency Management Agency

2009

New Madrid Seismic Zone Catastrophic Earthquake Response Planning Project

Apocalyptic claims:

215,000 people looking for shelter

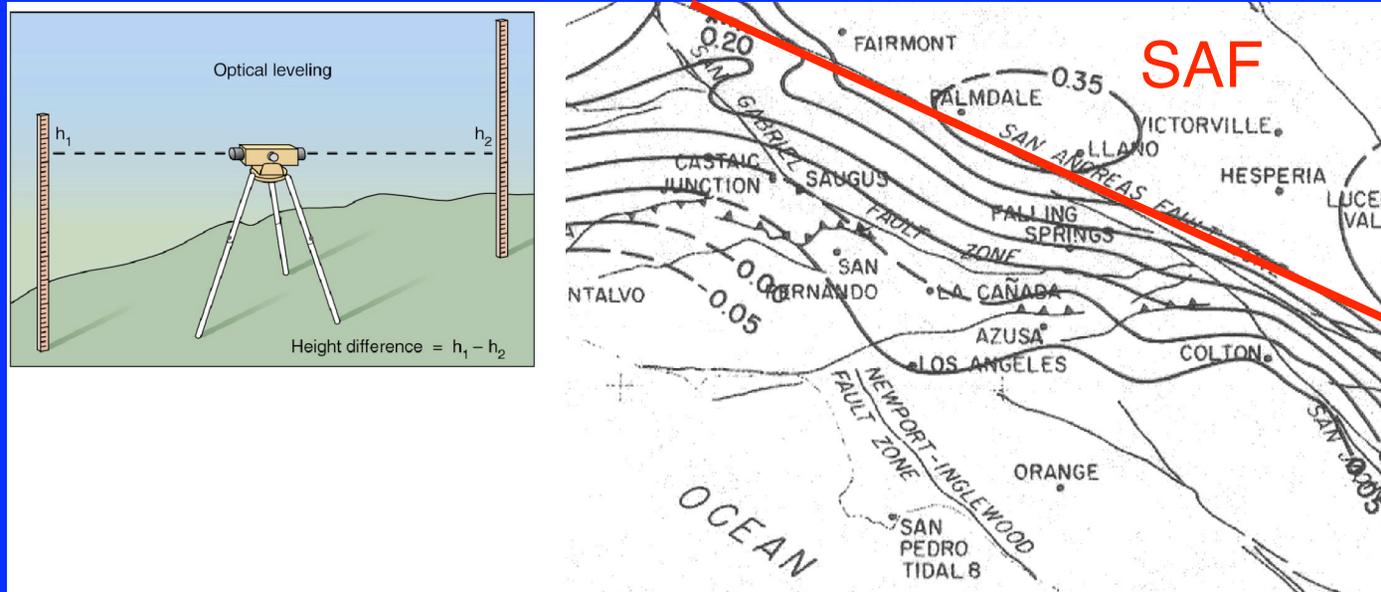
715,000 buildings damaged

86,000 casualties, including 3,500 fatalities

\$300 billion in direct economic loss

How can we decide whether to worry?
One way, look at other disaster predictions

1975 PALMDALE BULGE – uplift reported



USGS director stated that *“a great earthquake” would occur “in the area ... possibly within the next decade”* that might cause up to 12,000 deaths, 48,000 serious injuries, 40,000 damaged buildings, and up to \$25 billion in damage. California Seismic Safety Commission stated that *“the uplift should be considered a possible threat to public safety”* and urged immediate preparations...

35 years later, nothing yet..

1976 SWINE FLU “*APORKALPSE*”



CDC reported "strong possibility" of epidemic. HEW thought "chances seem to be 1 in 2" and "virus will kill one million Americans in 1976."

President Ford launched program to vaccinate entire population despite critics' reservations

40 million vaccinated at cost of millions of dollars before program stopped by reactions to vaccine

About 500 people had serious reactions and 25 died, compared to one person who died from swine flu

Much ado made that on January 1, 2000 computer systems would fail, collapsing technological society

U.S. led by FEMA & other governments established major programs

Estimated \$300 billion spent on preparations



Few major problems occurred, even among businesses and countries who made little or no preparation

Terror alerts create a run on duct tape

With new warnings out, officials release the first widespread advice on readying for terror.



By *Linda Feldmann*, Staff writer of The Christian Science Monitor / February 13, 2003

WASHINGTON

In only days, the American public - especially in New York and Washington, D.C. - has gone from "I'd rather not think about another terrorist attack" to a shopping spree for disaster supplies, clearing store shelves of duct tape, plastic sheeting, and bottled water.

This zero-to-60 mobilization, based on the federal government's

**2003
bioterrorism
scare**



ON ALERT: Hardware stores are selling more plastic sheeting and duct tape

Activity 3.2

Duct tape sales rise amid terror fears

February 11, 2003 | Jeanne Meserve CNN

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Americans have apparently heeded the U.S. government's advice to prepare for terror attacks, emptying hardware store shelves of duct tape.

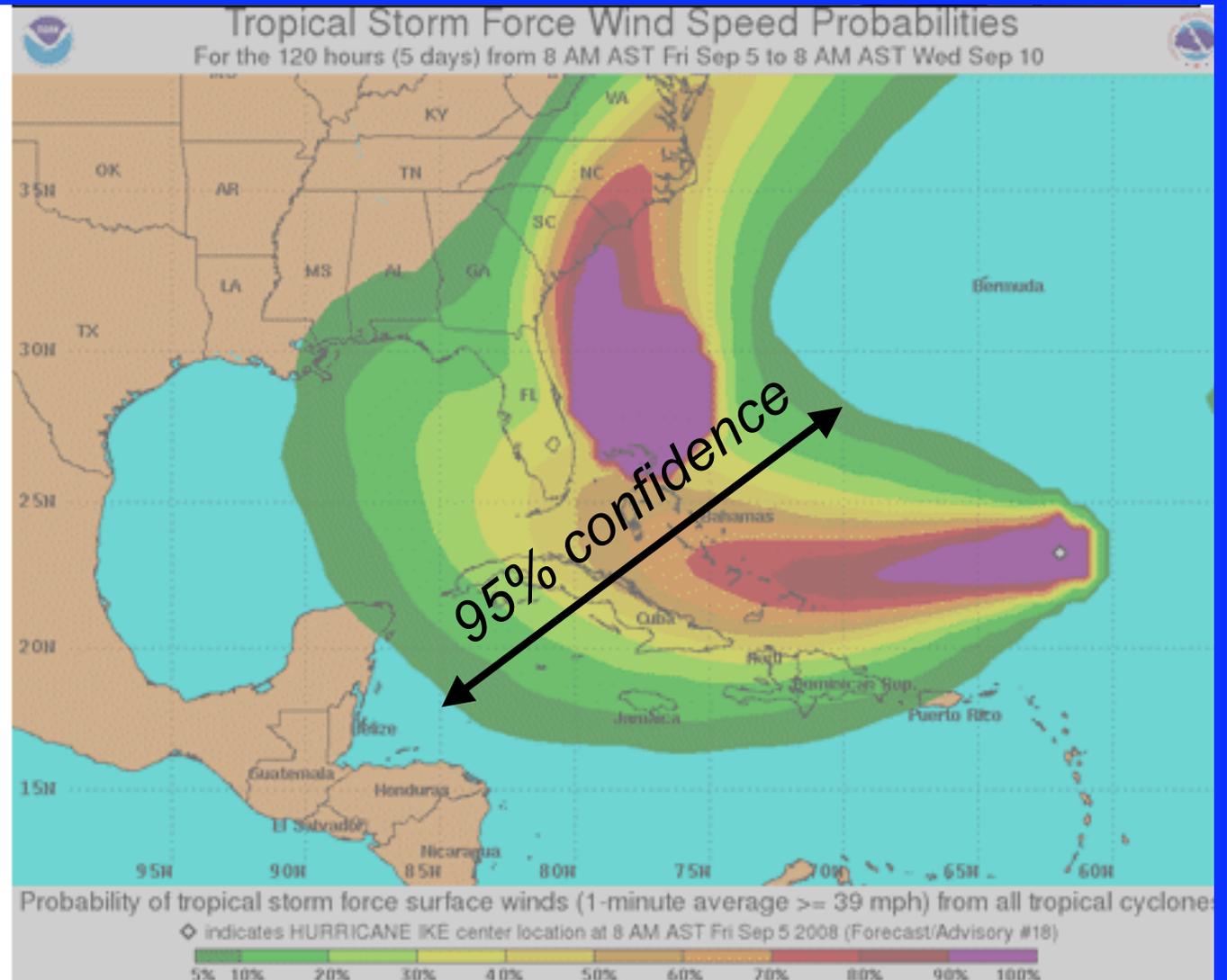
On Tuesday, less than 24 hours after U.S. Fire Administrator David Paulison described a list of useful items, stores in the greater Washington, D.C. area reported a surge in sales of plastic sheeting, duct tape, and other emergency items.

How did you and people you know respond to the “duct tape” warning?

Why?

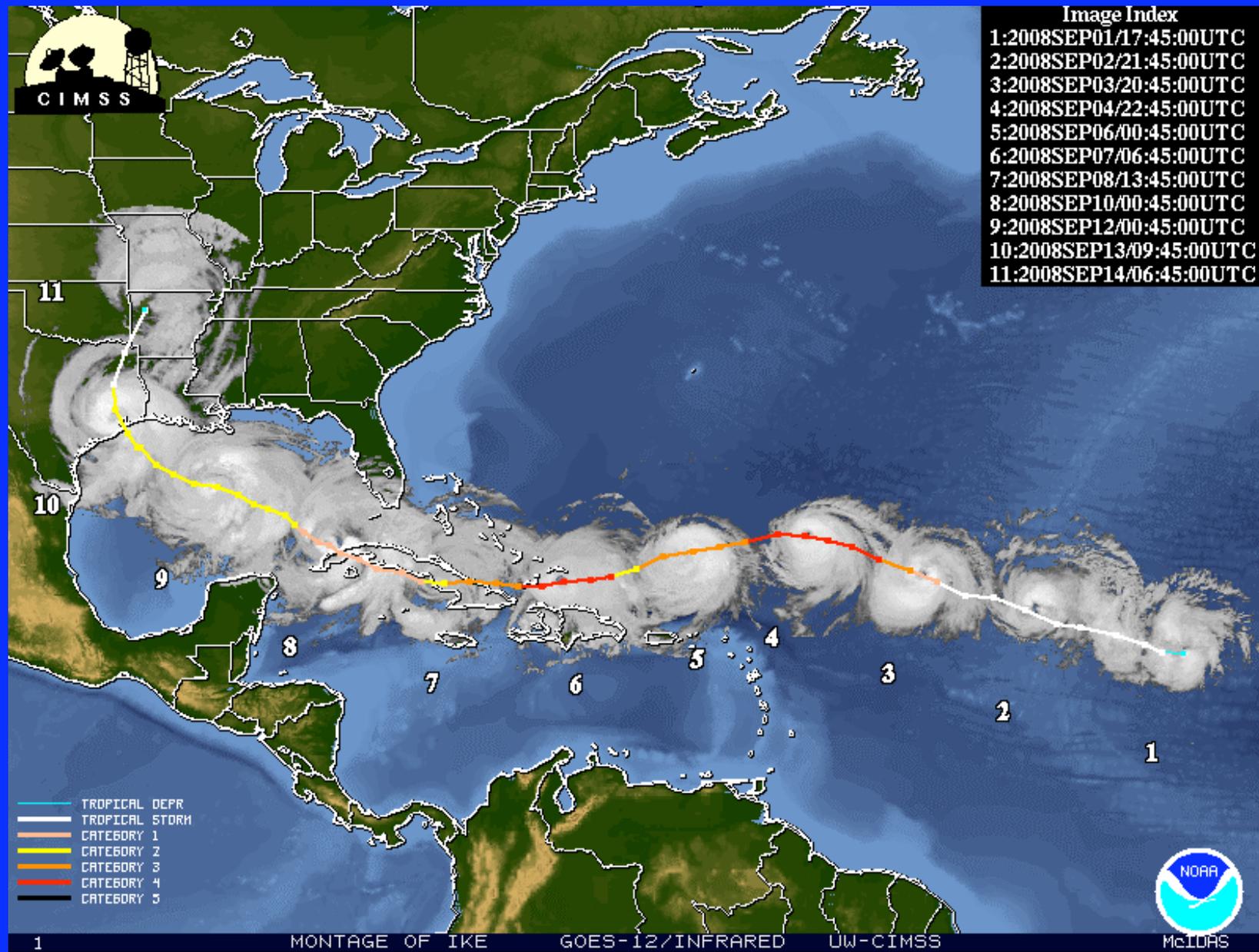
Today, how do you feel about your decision?

**2008:
National
Weather
Service
predicts
Hurricane
Ike's path,
with
uncertainty**



Hurricane Ike Projected Path:**Hurricane Ike Track - Hurricane Ike is currently a Category 3 hurricane with winds of 125 mph as of 5 a.m. EDT Friday. The national hurricane center revealed that Hurricane Ike will keep on weakening but is still a dangerous hurricane. Hurricane Ike is located about 460 miles north of the Leeward Islands and will hit the Turks and Caicos Islands and the Bahamas on Sunday.**

Ike's actual track



Hurricane Ike's 9-Foot Floods to Bring "Certain Death"

Willie Drye
for [National Geographic News](#)
September 12, 2008

[Hurricane Ike](#)'s expected massive storm surge and flooding have prompted National Weather Service officials to issue a rare and chilling "certain death" warning as the storm barrels toward the [Texas](#) coast tonight.

(See [Hurricane Ike photos](#).)



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"We rarely issue this warning unless there is a severe, impending catastrophe," said Chris Sisco, a meteorologist at the National Hurricane Center in Miami. "It's very serious."

The warning reads: "Neighborhoods that are affected by the storm surge ... and possibly entire coastal communities ... will be inundated during the period of peak storm tide."

"Persons not heeding evacuation orders in single-family, one- or two-story homes may face certain death. ... Widespread and devastating personal property damage is likely elsewhere."

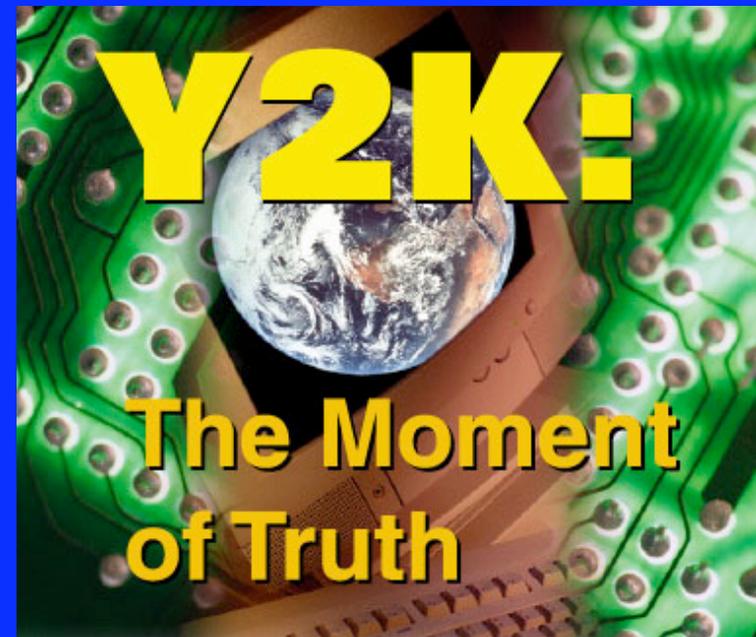
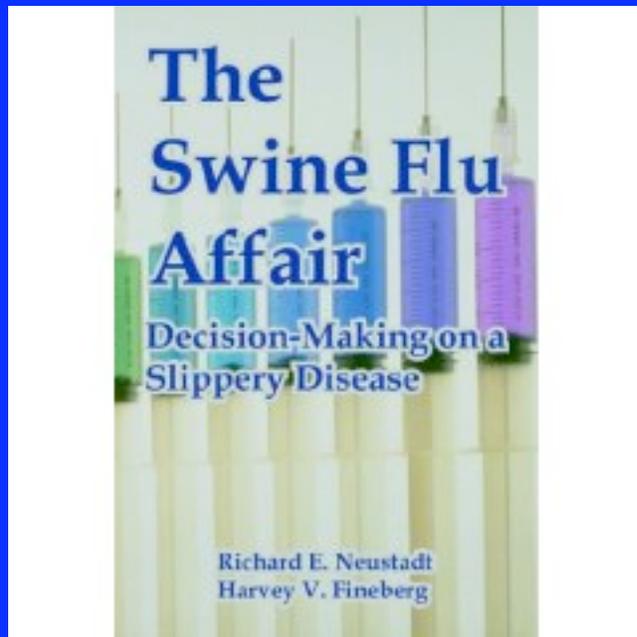
Sisco said Ike's storm surge—a mound of water created by a hurricane's winds—could reach 20 feet (6.1 meters) around the center of the storm.

< 50
deaths
from
40,000
who
ignored
warning
and stayed
on
Galveston
Island

Activity 3.3:

What features do the unsuccessful predictions have in common?

What questions might have been asked at the time that would have helped?



Problems common to many disaster forecasts:

Spurious precision (numbers)

Little attention to accuracy (how realistic)

Uncertainties ignored or underestimated

“Apocalyptic claims do not have a good track record... arguments that simple, easily understood numbers are proof that the future holds complex, civilization-threatening changes *deserve the most careful inspection.*”

More Damned Lies and Statistics: How Numbers Confuse Public Issues by J. Best

Activity 3.3: Why are disaster concerns common?

"Crime rates plunge, while surveys show Americans think that crime rates are rising. At a time when people are living longer and healthier, people are worried about iffy illnesses."

The Culture of Fear
Sociologist B. Glassner

Do you agree? Why or why not? If so, why is this happening?

Researchers hypothesize several causes:

1) For institutional reasons, government agencies feed them.

"Bureaucrats use fear by playing Chicken Little. They can claim at every turn that disaster may be coming, keeping their budgets high and avoiding blame should disaster really strike."

False Alarm: the truth about the epidemic of fear
M. Siegel, NYU Medical School

An official "may make speeches and promote policies that convey deep concern about the very waste spill that he actually considers harmless."

Risk and Reason
C. Sunstein (University of Chicago law school)

2) Scientists try to promote their research

“Many scientists who inform us do us a disservice by overdramatising their concerns.”

“Scientists need to learn to be excited by what we do without telling a premature story. We can alarm people unnecessarily. And then we're stuck with the story, right or wrong.”

False Alarm: the truth about the epidemic of fear

M. Siegel, NYU Medical School

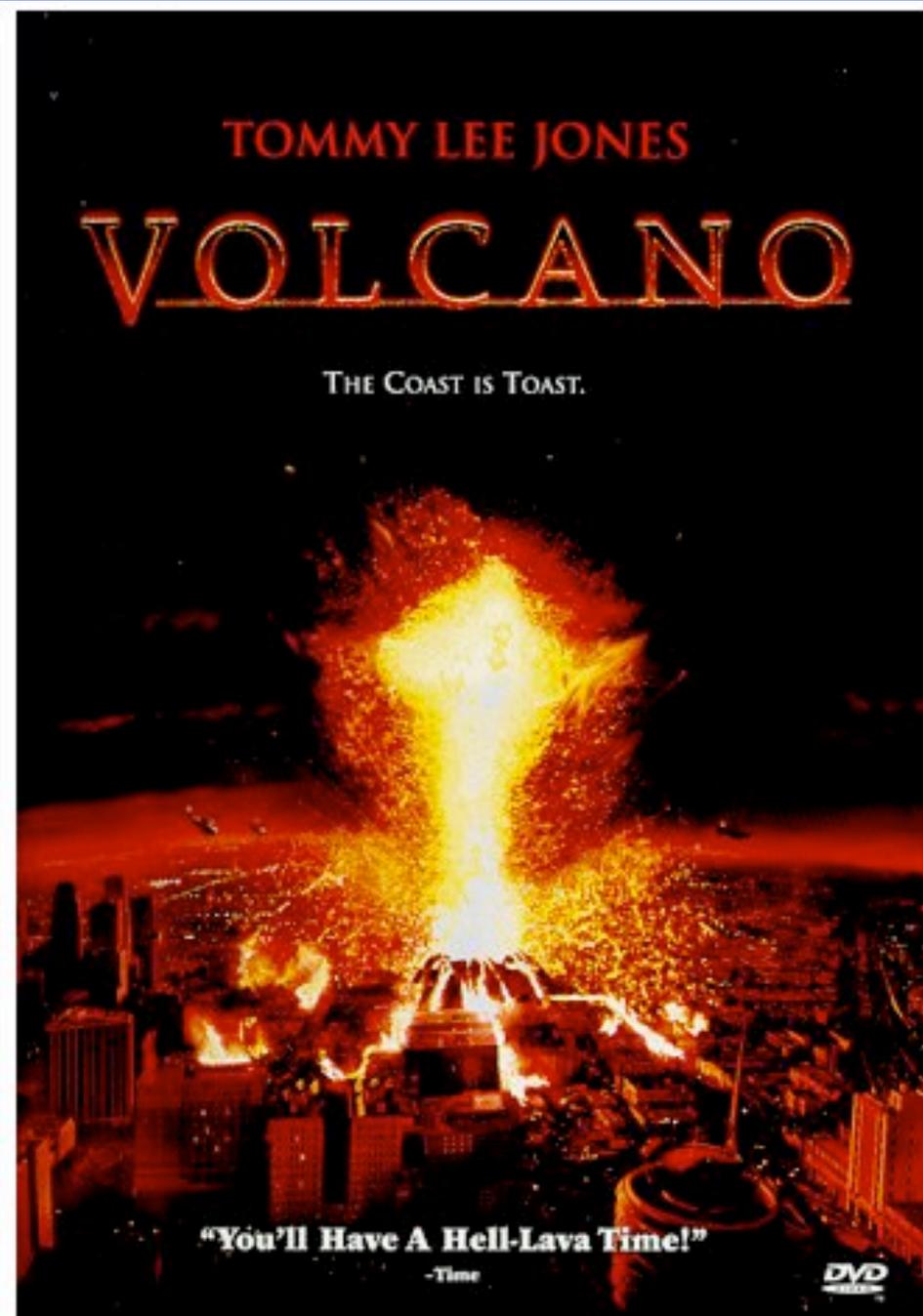
3) Media play up fears

In most cases they know the story is hype but the dynamics of the business encourage them not to say so. There's an incentive not to ask hard questions.

"I don't like reporting the overhyped stories that unnecessarily scare people, but these are my assignments."

"Many news teasers use the line 'Are you and your family at risk?' The answer is usually no, but that tagline generates concern in every viewer and keeps us tuned in. If we didn't fundamentally misunderstand the risk, we probably wouldn't watch."

False Alarm: the truth about the epidemic of fear
M. Siegel, NYU Medical School



4) We like being a little scared

We enjoy horror movies, Halloween, and roller coasters.

Because we know that the predicted disasters are unlikely, we aren't surprised when they don't happen and get excited when another is predicted.

“Disaster chic” is fun and harmless unless people believe the fears.

As H. Aldersey-Williams and S. Briscoe explain in their book *Panicology*,

"there are serious emotional, social and economic costs to panic... We'd be lot happier if we insisted that people prove their case before making dire pronouncements. We shouldn't be wasting time worrying about a lot of stupid things."

Need to think critically when assessing a disaster prediction

Distinguish between hazards and risks for earthquakes or other natural disasters.

Hazard is natural occurrence of earthquakes and the resulting ground motion and other effects.

Risk is the danger the hazard poses to life and property.

High hazard areas can have low risk because few people live there, and modest hazard areas can have high risk due to large populations and poor construction.

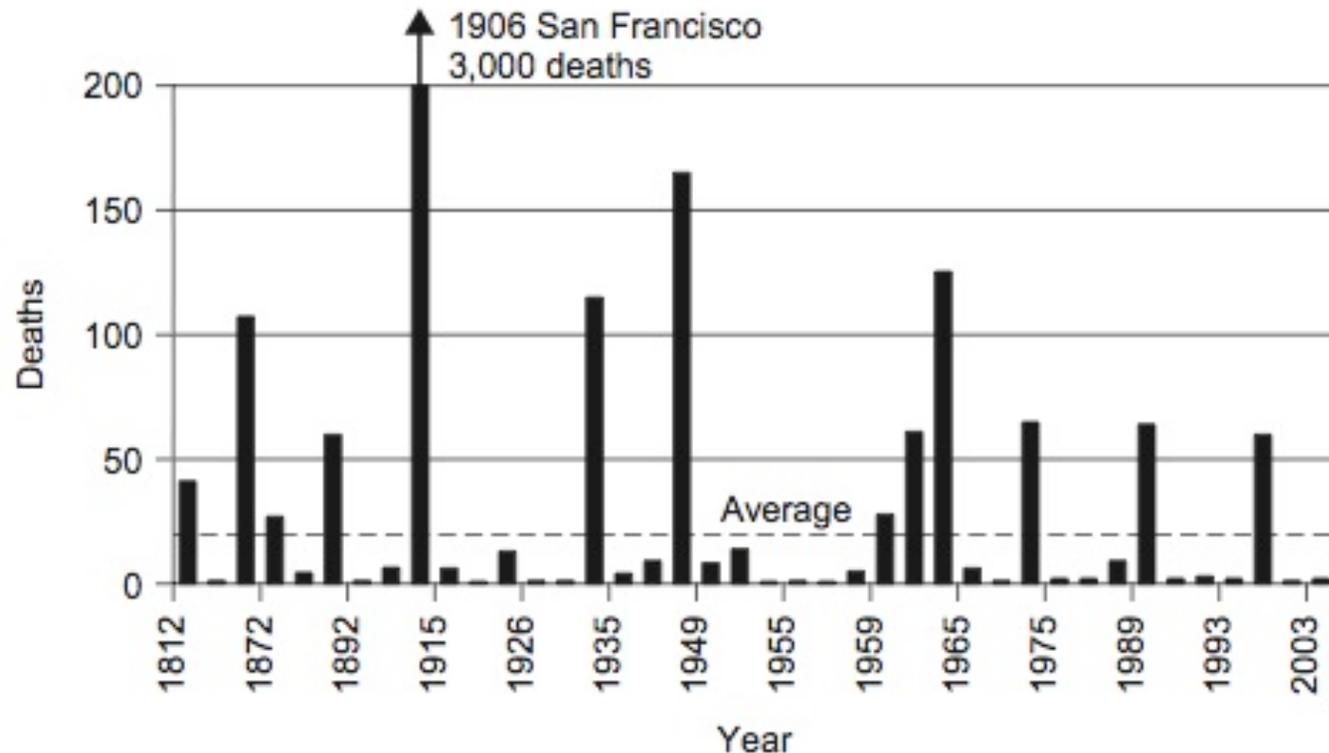
Disasters occur due to interaction of natural processes with society

Figure 1.2-7: Building collapse during the Dec. 7, 1988, earthquake in Armenia.



**Hazards can't be reduced by human actions -
but risks can.**

DD 3.1



U.S. average ~20 deaths per year, but can be many more for large earthquake

Some foreign countries much more (more people living along plate boundary, weaker construction)

~11,500 deaths/yr worldwide

U.S. EARTHQUAKES

Infrequent, but occasionally major, fatalities and damage

Moderate (M 6.7) 1994 Northridge earthquake: 58 deaths, \$20B damage

Challenge: find mitigation strategy that balances cost of safer construction with benefits, given other possible uses of resources

Needs careful thought

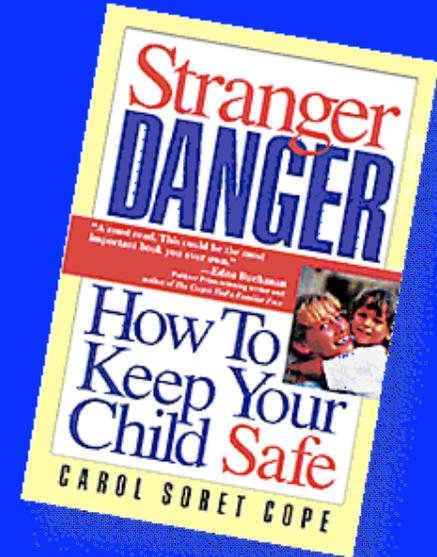
TABLE 3.1 *Typical annual US deaths*

Heart attack	733,834
Cancer	544,278
Motor vehicles	43,300
AIDS	32,655
Suicide	30,862
Liver disease/Cirrhosis	25,135
Homicide	20,738
Falls	14,100
Poison (accidents)	10,400
Drowning	3,900
Fire	3,200
Bicycle accidents	695
Severe weather	514
Animals	191
In-line skating	25
Football	18
Skateboards	10

**US earthquake average
~20 deaths per year**

Activity 3.4: Critical Thinking

The National Center for Missing and Exploited Children is quoted as having said, "Every day 2,000 children are reported missing."



- Use this number to estimate the fraction of the nation's children that would be missing each year*
- What would this predict for your school over any year and over your career?*
- How does this compare to your experience?*
- From your experience, estimate a realistic upper bound for this fraction*