



# NATURAL HAZARDS Observer

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## Worst-Case Thinking An Idea Whose Time Has Come

— an invited comment

*Editor's Note: This past year the **Observer** examined six great catastrophes threatening the United States and the world. We thought it appropriate to wrap up the "Disasters Waiting to Happen" series with a general discussion of worst-case thinking and the value it lends to disaster policy.*

Some people say that 9-11 changed everything. That's wrong. It changed some things. But, aside from increasing feelings of vulnerability to disaster, too much remains unchanged. Too much disaster policy continues to take a command-and-control stance. Too many officials still believe the panic myth. And there's been precious little preparation where disasters really happen—at the local level: in offices, schools, trains, and the like. Recognizing our local needs and adopting a strategy of preemptive resili-

ence to foster response abilities before catastrophe strikes would mark a significant change in how we approach disaster, a much needed change. So, what might get us closer to preemptive resilience? An increase in the frequency and intensity of disasters could prompt a reorientation in thinking. So could efforts by academics to further establish the practical applications and general relevance of what we study, and so could an emphasis on worst cases. It's tough to make a case for the latter; I need to build up to it.

## Disaster Is Normal

Start with the claim that disaster is normal, not special. Disasters, and even worst cases, are part of and not separate from the normal ebb and flow of social life. That's how Pitirim A. Sorokin, W. I. Thomas, E. L. Quarantelli, Russell Dynes, and others approached disaster, and that's what we need to get back to. Sadly, "disaster studies" is often viewed narrowly. That's unfortunate because studying disasters is an excellent way to learn important things about how and why people think and behave as they do. Seeing disaster as special also fosters bad policy by pushing policy makers to operate on incorrect assumptions about human behavior.

I think that we are at greater risk for worst-case disasters today than in the past, even in wealthy societies. This is because of hubris, interdependence, and population concentration. An example of hubris is the attempts by the U.S. Army Corps of Engineers to control the Mississippi River, actions that in part set the conditions for the Great Flood of 1993. The dangers of interdependence are apparent in the SARS outbreak, the significance of which is not its mortality rate but how quickly it spreads. Finally, the issue of concentration is well demonstrated by Airbus Industries' new A380, a four-aisle, two-story behemoth that will carry 555 people. The first time one CFITs (controlled flight into terrain) into a mountain, we'll call it a worst case.

## Worst Case: A Definition

I'll spend a few words on defining worst case. Large body counts matter, but only in events where we have a lot of experience: airplane crashes, earthquakes, shipwrecks, oil spills, and so on. Some disasters, such as the Space Shuttles Challenger and Columbia (where the worst case happened twice) and the Hindenberg, the Titanic of the sky, are called worst cases even when body counts are low because they are unfamiliar and unexpected.

Three other factors are key in the social construction of the idea of the "worst." Worst cases make observers feel out of control. The Triangle Shirtwaist factory fire in 1911 is often referred to as one of the worst disasters since the beginning of the Industrial Revolution. It must have been horrible to watch people, many of them young females, jump to their deaths. Worst cases are also overwhelming (this is connected to feeling out of control). Social similarity also matters (its darker side is ethnocentrism). The more like us the victims are, the more likely we are to judge their suffering relevant to our own experience. For example, on July 17, 1998, a tsunami killed more than 2,200 people in Papua New Guinea. According to the U.S. Geological Survey, it may have been the most devastating tsunami of the twentieth century. In the week that followed, the disaster garnered a mere six stories in the *New York Times*, only one of which made the front page. Imagine the coverage if a tsunami killed 2,000 people in New Jersey.

## Possibilistic Thinking

Now to the heart of the matter. Thinking about worst cases is fundamentally an exercise in thinking about the

social organization of imagination. It concerns the categories and processes people use to look forward, and to the past, to envision the worst. There's theoretical and practical payoff for focusing on worst cases. Who would argue otherwise? Well, lots of people: for worst-case thinking is *possibilistic* thinking and that is decidedly not the usual way to think about risk and disaster, or the future. From Aaron Wildavsky on the right to Barry Glassner on the left, the refrain is that probabilism is the correct way to approach possible futures. So, what's the difference? Probabilism attends to the likelihood of something happening; possibilism portends what could happen when it does.

We are constantly exhorted to be reasonable and rational in how we think about risky things. The advice is to think probabilistically. When pilots tell us at the end of a long and turbulent plane ride that we've "just completed the safest part of our trip," they mean the chances were in our favor as we flew. When officials worry about panic, they worry about people reacting unreasonably, which is to say out of proportion to the actual risk. In his book *Culture of Fear*, sociologist Barry Glassner argues that people worry about the wrong things. What he means is that people's worries don't match the probabilities of actual harm. In an August 9, 2003, *New York Times* op ed, David Ropeik, the director of risk communication at the Harvard Center for Risk Analysis said

When asked in the abstract about the term "risk," Americans correctly tend to talk in terms of statistical probability. Yet, when they are faced with specific threats, emotion overrules logic pretty quickly—we fear the unlikely and are relatively unconcerned about the truly dangerous. Probabilism is of course entirely modern, and it is unquestionably an advance that we know what probability is and how to use it. But probabilistic thinking isn't everything, and the equation of it with reason itself is not natural but a convention.

## Consequences of Neglect

Neglecting worst-case possibilities can lead to serious mistakes. Two examples:

- It used to be that pilots didn't practice flying jumbo jets nearly upside down. The reason is that it wasn't likely that such skills would ever be used. Then a handful of 737s started flying upside down; things changed.
- In August 1900, a monster hurricane passed over Cuba. A few days later it was over Galveston, Texas. A Cuban forecaster sent warnings, but experts at the U.S. Weather Bureau ignored them. The experts didn't trust Cubans (in spite of the latter's considerable expertise in hurricanes), and said that in all probability the storm wouldn't take a hard right turn. But it did, and it was the worst natural disaster in American history.

Similarly, attending to worst-case possibilities can be wise. If you're 30,000 feet in the sky and your plane runs into another plane, there is no probability of survival. Indeed, in commercial plane crashes, the likelihood that you'll die is higher than for automobile crashes. So, prob-

abilistically you're more likely to experience a car crash than an airplane crash; possibilistically you're more likely to die if your plane crashes than if your car crashes. That's why it isn't irrational to fear flying.

In July 2001, a train carrying hazardous materials derailed and caught fire inside a Baltimore, Maryland, tunnel. Some reports say the fire burned out of control for three days at 1,500 degrees Fahrenheit. Consider a similar scenario in the future where spent nuclear fuel is the cargo being transported through the city. The Nuclear Regulatory Commission's regulation for spent nuclear fuel casks is 1,475 degrees Fahrenheit for 30 minutes. If not contained within that time, 24 square miles around the accident site could be "lightly contaminated" (or worse) with radio-nuclides. Cleanup costs would approximate \$14 billion.

To be clear, I do not advocate that we jettison probabilistic thinking. But ultimately, we do need to complement it with possibilistic thinking. Worst-case thinking is possibilistic thinking. We need to start seeing disasters and even worst cases as normal, ordinary. When we fail to imagine the worst that could happen we do so at our intellectual peril. When our officials disregard the value of worst-case thinking they do so at the risk of much greater consequence. Just imagine the possibilities.

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Note: This issue is further explored in Clarke's forthcoming book *Worst Cases*, which will be published by the University of Chicago Press in the fall of 2005.

## FEMA/EPA Community Planning Fellowship Program

In an effort to raise awareness and ensure that hazard mitigation is effectively incorporated into future urban and rural planning, the Federal Emergency Management Agency (FEMA) has announced its 2005-2006 Community Planning Fellowship. Open to graduate planning students, the program offers fellows an opportunity to familiarize themselves with hazard mitigation as an aspect of planning. This year, the Office of Wetlands, Oceans, and Watersheds of the Environmental Protection Agency (EPA) has joined with FEMA to provide funding to support the fellows' exploration of how communities, regional organizations, and states can effectively address watershed planning and floodplain management issues.

Fellows will be provided with funding sufficient to support one year of field research focusing on local and state hazard mitigation and community planning issues. The fellowships will involve orientation work at FEMA and EPA headquarters and at other federal agencies in Washington, DC, extensive fieldwork within communities to be selected jointly by the student and FEMA, and independent study follow-up work during the 2005-2006 academic year.

The application deadline is January 31, 2005. Download the announcement and application at <http://www.nibs.org/MMC/mmactiv4.html>. For more information, contact the *Multihazard Mitigation Council of the National Institute of Building Sciences, 1090 Vermont Avenue NW, Suite 700, Washington, DC 20005*.

## IBHS and ACSP Scholarship in Planning and Natural Hazards

The Institute for Business & Home Safety (IBHS) and the Association of Collegiate Schools of Planning (ACSP) are collaborating to recognize scholarship in the general area of planning and natural hazards. The organizations are seeking papers in conjunction with the ACSP conference in Charleston, South Carolina, October 27-30, 2005. One winner will be awarded a \$500 prize and will present their paper at the conference. The winner will agree to first publication rights by IBHS in its quarterly publication *Disaster Safety Review*.

Papers should address land use or other types of planning that incorporate natural hazards, including, but not limited to, flooding, coastal erosion, land subsidence, earthquakes, and other geologic or meteorological hazards whose risks can be minimized through community, regional, and state planning. Undergraduate, graduate, and joint faculty/student papers are eligible. For joint faculty/student papers, the student must be the first author and designated presenter of the paper.

Submit abstracts directly to the ACSP conference organizers between January 17 and February 28, 2005. Ab-

stract submission procedures can be found at <http://www.acsp.org/>. (Note: Put "IBHS Award Submission" in one of the key word boxes on the submission form.) At the same time, send copies of the abstracts by e-mail to Ann-Margaret Esnard, Department of City and Regional Planning, Cornell University, 219 West Sibley Hall, Ithaca, NY 14853; e-mail: [ame7@cornell.edu](mailto:ame7@cornell.edu). Include a cover memo indicating intent to submit a paper for the ACSP-IBHS award.

Only papers accepted for presentation at the conference are eligible for the award. Authors whose abstracts are accepted for presentation will be notified and expected to submit final papers electronically to Ann-Margaret Esnard by May 25, 2005, with full student author information: name, institutional affiliation, name of faculty advisor or coauthor (indicate clearly if faculty member is co-author), degree program (undergraduate, masters, PhD), degree status (in progress or awarded), mailing address, phone, fax, and e-mail. Papers are not to exceed 20 pages. Final papers will be reviewed during the summer of 2005 with notification in September.