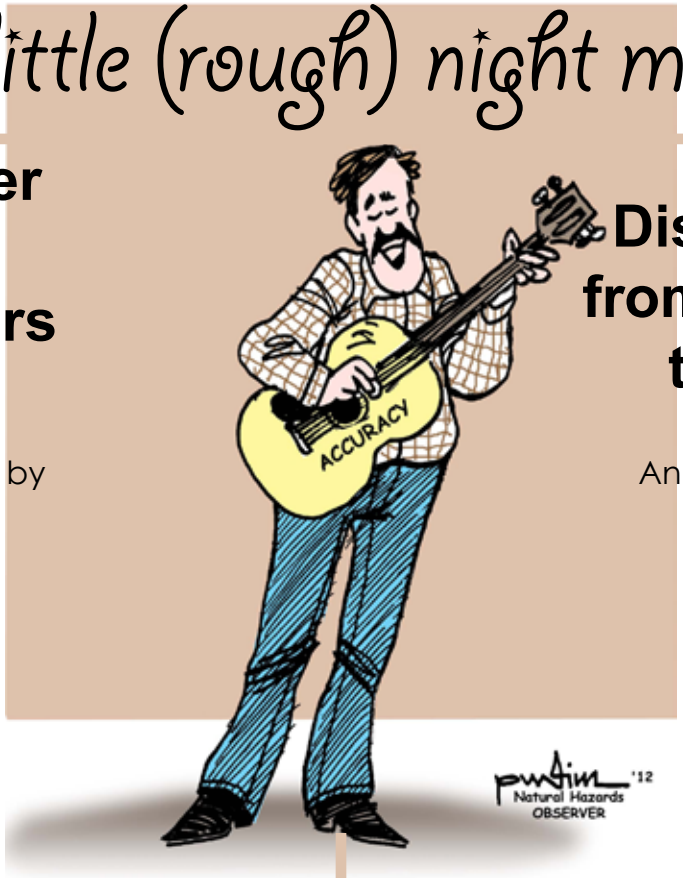
Natural Hazards Observer

Volume XXXVI · Number 5 May 2012

♩ A little (rough) night music ♩



How disaster music gets disasters right

An invited comment by Joe Scanlon

It's now more than a century since the White Star passenger liner *Titanic* sunk in the North Atlantic after colliding with an iceberg. But the *Titanic*'s legend is as alive today as it was in April of 1912, when the "unsinkable" ship went down. Anyone with even a passing familiarity with the ship's story could answer this *Jeopardy!* challenge: The tune the orchestra played as the ship went down.

The answer (in the form of a question) would be, "What is 'Nearer My God to Thee?'"

But Alex Trebek might have to say, "Ahem. I'm sorry." A *New York Times* interview with *Titanic* junior wireless officer Harold Bride, published on April 19, 1912, four days after the disaster, has a different answer.

Bride had been running messages until the ship began to tilt nose down. He grabbed on oarlock as waves washed over the deck. He was almost certainly the last person to escape from *Titanic*.

He told the *Times* that as he swam away from the sinking ship, the second to last thing he heard was the band playing a ragtime tune.

Please see "Disaster folk," page eleven

Disaster songs from street tunes to YouTube

An invited comment by James Revell Carr

Popular ballads and songs are always found at the forward edge of media technology, from the printing press to cylinder recordings to radio and now the Internet. Because they are easily transmitted and diffused, popular songs are an effective way to spread information and opinions about all areas of human society: war and politics, the economy, human rights, morality, and even current fashion.

Disaster songs are part of the tradition of topical ballads that can be traced to the broadside ballads of the seventeenth century, and probably earlier. Disasters—floods, fires, tsunamis, volcanic eruptions, earthquakes, shipwrecks, train wrecks, airplane crashes, and mine explosions—are all frequent topics in vernacular songs.

Artistic responses to natural disasters have existed for hundreds of years in an interface between mediated and oral traditions. Twenty-first century catastrophes, like the 2010 Haitian earthquake or the 2011 earthquake and tsunami in Japan, have inspired songwriters around the world to compose new disaster songs. They can use online social networking sites where their aural memorials can be posted to be potentially heard by thousands.

Few people today who post disaster songs online are aware of the historical provenance of the folk song genre to which they are contributing. The may only know of this tradition in its current guise as an Internet meme. Nevertheless, at least in North America, many online disaster songs use the centuries-old tropes of the disaster song genre.

Please see "YouTube disasters," page fourteen

INSIDE

2011 disasters hit wealthy nations hard

$380 billion in losses, 27,000 fatalities

2011 was a bad year to be a rich country, disaster-wise.

Analysts agree that 2011 was history's most expensive year in disaster losses, primarily because a lot of disasters hit wealthy nations. "Globally, the economic cost of disasters in 2011 was $380 billion, of which $210 billion were the result of the earthquake and tsunami in Japan," says the Brookings Institution's report *The Year that Shook the Rich*. "This was 72 percent higher than the losses in 2005, the second costliest year in history for disaster-related losses."

The Brookings report is based in part on data from reinsurer Munich Re. That company says in its original report, "With economic losses amounting to some $380 billion, 2011 has been the most expensive natural disaster year to date."

Swiss Re, a second reinsurer, says in its *sigma* series report that losses were over $370 billion in 2011, with the cost to insurers being approximately $116 billion. "Insured losses were the second highest on record since *sigma* began collecting natural catastrophe data in 1970s," the company says.

The Brookings and the Swiss Re data disagree, however, on the human fatality toll from disasters. Swiss Re says that about 35,000 were killed in catastrophic events, the majority, 19,000, in a single event, the Japan Tohoku quake. The Brookings report has total fatalities at 27,000. It isn't clear from comparing the two reports where the difference comes from, although the Swiss Re data includes terrorism fatalities and a few other categories that the Brookings report doesn't tally. In addition, *The Year that Shook the Rich* tallies 15,000 Japan earthquake deaths, compared to 19,000 estimated by Swiss Re.

On the other hand, Swiss Re reaches its higher fatality number on a considerably smaller number of catastrophic events. Swiss Re counts 325 "catastrophic events" in 2011, while a Munich Re and Worldwatch report, *Vital Signs*, based in part on Munich Re data, registers 820.

The reports agree, however, that while disasters were expensive in 2011, they weren't particularly prolific, or unusually distributed by hazard type. "The breakdown of loss-relevant events among the main hazards—geophysical, meteorological, hydrological, and climatological events—is more or less in line with the average over the past 30 years," says *Vital Signs*.

The Brookings report cites the International Disaster Database (EM-DAT) as registering 302 disasters in 2011. The report says, "In terms of both the number of disasters and the number of people affected by them, 2011 was a below-average year in comparison with the previous decade. With 302 disasters recorded by EM-DAT, 2011 saw the lowest number of disasters since the beginning of the millennium. The number of disasters was almost 20 percent below the average annual figure of 384 natural disasters from 2001-2010. There were 206 million disaster-affected persons in 2011, which is about ten percent below the ten-year average."

The Swiss Re *sigma* report says, "Out of the 325 catastrophic events that occurred in 2011, 175 were natural catastrophes, while the remaining 150 events were man-made disasters. In 2011, for the second consecutive year, the number of man-made disasters was lower than the number of natural catastrophes. Since 2005, man-made disasters have been declining."

They Said It ...

"Research from a number of fields, including neuroscience, psychology, sociology and economics confronts us with compelling evidence that, as rational we'd like to think we are, the perception of risk is not just a matter of dispassionate objective analysis. It is instead a subjective process of intellect and instinct, reason and gut reaction, facts and feelings."—**David Ropeik in the February 26, 2012** *New York Times*.

"Many people lament the absence of educational material suitable for K-12 students on global warming that isn't alarmist or overtly political. Heartland has tried to make material available to teachers but has had only limited success. Principals and teachers are heavily biased toward the alarmist perspective."—**Leaked Heartland Institute memo on the foundation's educational strategy, posted on thinkprogress.org**.

"There is a pressing need to integrate up-to-date sea-level rise data into planning and engineering activities to anticipate coastal land loss patterns, protect coastal communities and adequately design restoration projects. Based on an analysis of the available scientific literature on the topic, the draft report recommends that state restoration project planners and designers plan for a one-meter (3.3 feet) mean rise in the sea level of the Gulf of Mexico by 2100 compared to the late 1980s and that analyses be bounded by global sea level rise ranges of 0.5-1.5 meters (1.4 feet-4.9 feet) by 2100."—**Louisiana Applied Coastal Engineering and Science Division of the Coastal Protection and Restoration Authority of Louisiana in its draft technical report on sea level rise in the Gulf of Mexico**.

"New Taipei City in Taiwan recently initiated a lottery as an inducement for dog owners to clean up after their pets. Owners who deposited dog waste into a special depository were made eligible for a lottery to win gold ingots, thus literally turning dog waste into gold. The top prize was worth about $2,000. The city reports that it halved the fecal pollution in its streets."—**Richard Thaler in the February 13, 2012** *New York Times*.

"Today's licensing action sounds a clarion call to the world that the United States recognizes the importance of expanding nuclear energy as a key component of a low-carbon energy future that is central to job creation, diversity of electricity supply, and energy security."—**Marvin Fertel, president of the Nuclear Energy Institute on the United States' approval of the first new nuclear plant in 30 years.**

"More than 25 years after the Chernobyl accident, there is no scientific consensus on the impact that chronic exposure to radiation has had on wildlife in the area around the nuclear power plant, from which the human population was evacuated. This is largely due to a lack of multidisciplinary and long-term research. In another 25 years we should not be equally ignorant of the impact of the Fukushima accident on the natural environment."—**Nick Beresford and Jordi Vives i Batlle in the March 1, 2012 issue of** *The Scientist*.

Crazy fish, speeding isotherms, and climate change

Real life catches up with climate models

Models of climate change are severely underestimating the future loss of plant and animal diversity, while signs of this impending mass extinction already may be appearing on the ground, according to new research.

In a January 4 paper in the *Proceedings of the Royal Society B: Biological Sciences*, University of Connecticut researcher Mark Urban and colleagues found that climate models don't account for species mobility, competition, and other factors, so very likely underestimate the extent of biodiversity loss in a warming world.

"We have really sophisticated meteorological models for predicting climate change," Urban says in a news release. "But in real life, animals move around, they compete, they parasitize each other and they eat each other. The majority of our predictions don't include these important interactions."

Two papers (Sandel and Burrows) in the journal *Science* in November 2011 reinforce this conclusion by measuring the "climate space" inhabited by species, the "speed" of change in that space, and mapping the changes over time from the changing climate. One paper, by Michael Burrows of the Scottish Marine Institute and 18 other authors, looks at global temperatures over the past 50 years to track the "velocity of climate change," which they define simply as the shift of isotherms over time.

"High velocity" areas are those in which an animal must cover a large distance to reach areas that in 2009 had the same average temperature as the animal or plant inhabited in 1960. "Low velocity" areas are those where the temperature is little changed.

In general, mountain regions are "low velocity," while lowland areas are high velocity. Expectations of simple poleward shifts of temperature and species movement are "highly oversimplified, especially in heterogeneous landscapes," writes Durham University's Ralf Ohlemüller in a commentary.

The faster isotherms have shifted since the last glaciation, the fewer species found regionally. The finding is less true for highly mobile species like birds, but more true for less mobile ones like amphibians. "When applying climate space analyses to ecological questions, three main things matter to species," writes Ohlemüller. "The extent to areas with particular climate conditions, how far away these areas are, and whether there are any obstacles in the direction of these areas."

The Urban et al. study echoes these findings. Animals with small geographic ranges, specific habitat needs, and difficulty dispersing are likely to go extinct under climate change, their model shows. Further, these animals are more likely to be overrun by other species that can tolerate a wider range of

habitats.

"When a species has a small range, it's more likely to be outcompeted by others," Urban says. "It's not about how fast you can move, but how fast you move relative to your competitors."

A pan-European study published in *Nature Climate Change* by the University of Vienna's Michael Gottfried and colleagues provides evidence this kind of change is already under way in some regions. Biologists from 13 different European nations analyzed 867 mountaintop vegetation sites: "Climate change is having a more profound effect on alpine vegetation than at first anticipated." Cold-loving plants have been pushed out of alpine regions by ones adapted to warmer climates.

"We expected to find a greater number of warm-loving plants at higher altitudes, but we did not expect to find such a significant change in such a short space of time," Gottfried said. "Many cold-loving species are literally running out of mountain. In some of the lower mountains in Europe, we could see alpine meadows disappearing and dwarf shrubs taking over within the next few decades."

In another study, also in *Nature Climate Change* on January 15, 2012, researchers find that carbon dioxide in seawater from anthropogenic sources is driving fish crazy and damaging their central nervous system. "For several years our team have been testing the performance of baby coral fishes in sea water containing higher levels of dissolved CO_2—and it is now pretty clear that they sustain significant disruption to their central nervous system, which is likely to impair their chances of survival," James Cook University's Phillip Munday said.

The paper says that impaired olfactory function makes larval fish attracted to odors they normally avoid, including ones from predators and unfavorable habitats.

"We've found that elevated CO_2 in the oceans can directly interfere with fish neurotransmitter functions, which poses a direct and previously unknown threat to sea life," he said. Fish with high oxygen consumption will probably be most affected. These include many important commercial species.

Climate change is not the only factor—or even necessarily the most important factor—in biodiversity loss. Loss of habitat to development by the world's expanding population, pollution, disease, overhunting, poaching, and other factors are stressing the world's plants and animals. Amphibians, for instance, are currently being ravaged by a fungal disease. But climate change adds an additional stressor.

These threats to biodiversity don't come as any surprise to conservation scientists. In a survey from the journal *Conservation Biology*, the University of York's Murray Rudd found that 99.5 percent of conservation scientists felt that a serious loss of biological diversity is either "likely," "very likely," or "virtually certain."

"In this survey, 79.1 percent of respondents stated that acceleration of the loss of biological diversity by human activities is virtually certain. In the other survey, by comparison, 61.9 percent thought climate change was underway, whereas 55.1 percent believed it to be accelerated by humans." Tropical coral ecosystems were considered the most severely endangered—like those found to have the nervous system-impaired fish.

So is that the bad news or the good news?

Living to age 80 doesn't improve your chances of living to age 100. Research from NORC at the University of Chicago has found that the "flattening" of mortality after the age of 80 doesn't exist.

About six years ago, assuming this widely accepted mortality flattening would occur, the U.S. Census predicted there would be 110,000 people aged 100 or older by 2010. Instead there are about half that number.

Research by Leonid Gavrilov and Natalia Gavrilova found that the reported flattening of death rates among people aged 80 and over was a statistical anomaly resulting from the way earlier studies were conducted. "Earlier reports of mortality deceleration … at ages below 100 appear to be artifacts of mixing together several birth cohorts with different mortality levels and using cross-sectional instead of cohort data," they write. "Age exaggeration and crude assumptions applied to mortality estimates at advanced ages may also contribute to mortality underestimation at very advanced ages."

They conclude, "In our study we found no significant mortality deceleration at advanced age for humans."

We don't want to live forever, anyway.

Terrorism hits five metro areas hardest

U.S. terrorist attacks have declined since 1970s

Nearly one-third of all the terrorist attacks in the United States over the last 40 years have occurred in just five metropolitan areas—Manhattan, Los Angeles, San Francisco, Miami-Dade (Fla.), and Washington D.C., according to a report from the National Consortium for the Study of Terrorism and Responses to Terrorism.

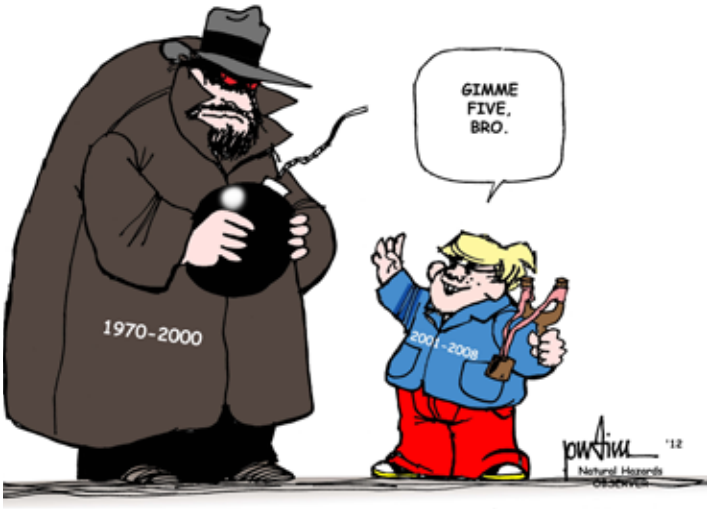
The **START report**, *Hot Spots of Terrorism and Other Crimes in the United States, 1970 to 2008*, counted more than 2,600 terrorist attacks during the study period. Manhattan saw 343 attacks between 1970 and 2008; L.A. County, 156 attacks; Miami-Dade, 103; San Francisco, 99; and Washington, D.C., 79.

But the trends seem to be changing a little in recent years as some more rural counties—notably Maricopa County in Arizona, which includes the Phoenix metro area—have seen an increase in domestic terrorism.

Gary LaFree, START director and lead author of the report, said, "Mainly, terror attacks have been a problem in the bigger cities, but rural areas are not exempt. The main attacks driving Maricopa into recent hot spot status are the actions of radical environmental groups, especially the Coalition to Save the Preserves. So, despite the clustering of attacks in certain regions, it is also clear that hot spots are dispersed throughout the country and include places as geographically diverse as counties in Arizona, Massachusetts, Nebraska and Texas."

Political motivations for the attacks have changed over time. In the 1970s, left-wing groups dominated terrorist incidents. Ethno-national and separatist terrorism was concentrated in the 1970s and 1980s. Religiously motivated attacks occurred mostly in the 1980s. And extreme right-wing terrorism was concentrated in the 1990s, the report says.

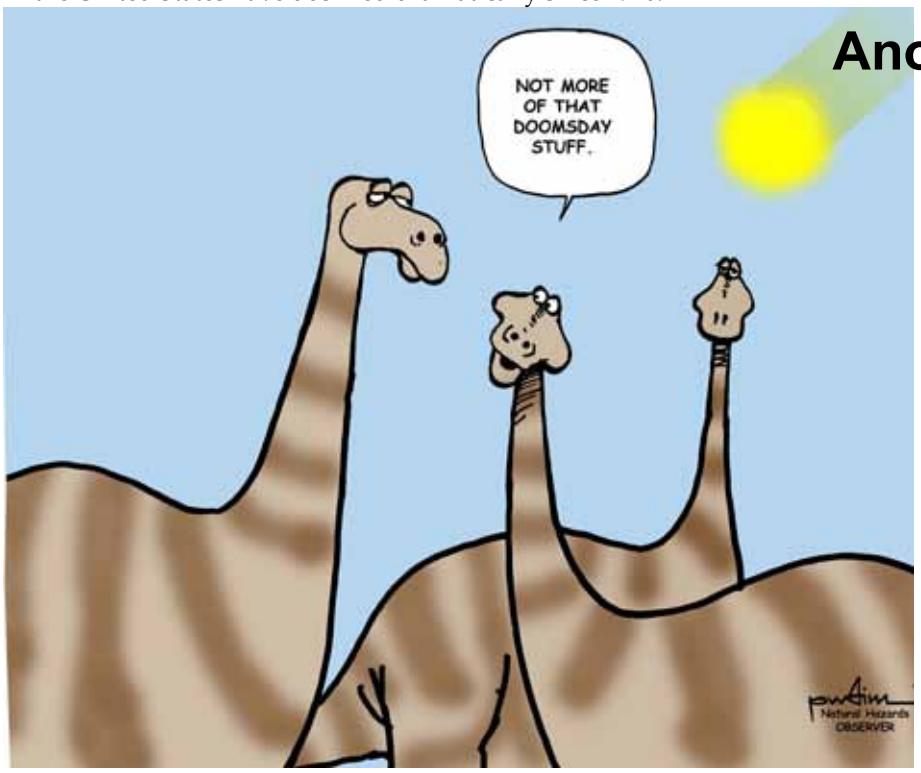
One finding from the research that stands out is the fact that, despite widespread public concern, terrorist attacks in the United States have declined dramatically since 1970.



"Whereas nearly 1,500 events took place in the 1970s, just over 200 occurred from 2000 to 2008. The number of fatal attacks has also decreased over this same period of time from a high of 26 in the 1970 calendar year to a low of 15 for the entire 2000 to 2008 time period," the report says. Terrorist attacks in which fatalities have occurred have also decreased substantially—even falling to zero in 2003-2005.

Although 2001t is famous for the September 11 attacks, that year does not rank particularly high as a year in which a large number of fatal terrorist attacks occurred, compared to the 1970s.

According to the report, left-wing politics was the motivation for 364 attacks; "single issue" motivated 337; ethno-national separatism, 320. Extreme right wing political leanings were credited with 58 attacks and religious motivations only 14.



Another asteroid scare?

"Nondescript space rock" takes aim

The sky isn't falling—yet. The National Aeronautics and Space Administration is calming a media mini-hysteria about the possible collision of asteroid 2011 AG5 with Earth in 2040.

But the interest in this "nondescript space rock" may be an opportunity to focus attention again on the general global lack of interest in protecting the planet from asteroid collisions.

2011 AG5 is 460 feet in diameter—about the size of a football stadium, as one commentator described it—moving in an orbit that carries it beyond Mars and "as close to the sun as halfway between Earth and Venus," NASA says. Early reports, based on

only nine months of observation of the asteroid, indicated it had a non-zero chance of hitting Earth. NASA's current estimate is that it has a one in 500 chance of hitting the planet—or an 99.8 percent chance of missing. Estimates of its orbit track show it passing our planet well outside the moon's orbit in 2040.

2011 AG5 will next be nearby in February, 2023, when it will pass Earth no closer than about one million miles. In 2028, the asteroid will again be in the area, coming no closer than about 10.4 million miles.

Because of its current position in the sky, NASA is unable to make Earth-based observations of the asteroid. But, says the manager of NASA's **Near-Earth Object Program Office** Don Yeomans, "In September 2013, we have the opportunity to make additional observations of 2011 AG5 when it comes within 91 million miles (147 million kilometers) of Earth. It will be an opportunity to observe this space rock and further refine its orbit. Because of the extreme rarity of an impact by a near-Earth asteroid of this size, I fully expect we will be able to significantly reduce or rule out entirely any impact probability for the foreseeable future." Even better observations will be possible in late 2015.

The Near-Earth Object Program Office says the Earth's gravitational influence on the asteroid has the potential to place the space rock on an impact course for Feb. 5, 2040. But this has very unlikely chance—1-in-625—of occurring.

NASA says that 2011 AG5 is one of two space rocks that are ranked as a 1 on the Torino Impact Hazard Scale. That places it in the "normal (green zone)" of that ranking: "A routine discovery in which a pass near the Earth is predicted that poses no unusual level of danger. Current calculations show the chance of collision is extremely unlikely with no cause for public attention or public concern. New telescopic observations very likely will lead to re-assignment to Level 0."

But some scientists are using the excitement generated by the observation to generate new interest in programs to prevent Earth-asteroid collisions. This effort has attracted little global attention (*Natural Hazards Observer*, November 2009) .

Former Apollo astronaut Rusty Schweickart, a leader in trying to get more attention to this issue, sent a **letter** in early March to NASA administrator Charles Bolden urging more attention to the "deflection challenge."

In his letter, while acknowledging that the chances of an impact on Earth were small, Schweickart urges a "solid engineering analysis" to consider how the asteroid could be deflected, if necessary.

"If deflecting asteroid AG5 turns out to be significantly more difficult, then we may find that by waiting until after the 2013 apparition, it will be too late to prevent AG5 from passing through the 2023 keyhole. In other words we will have waited too long to act which would have potentially deadly consequences. For these reasons I believe a more thorough engineering analysis of a deflection campaign for AG5 is warranted now," Schweickart writes.

A "keyhole" is a small area of space near Earth in which gravitational effects can significantly change the course of a space object.

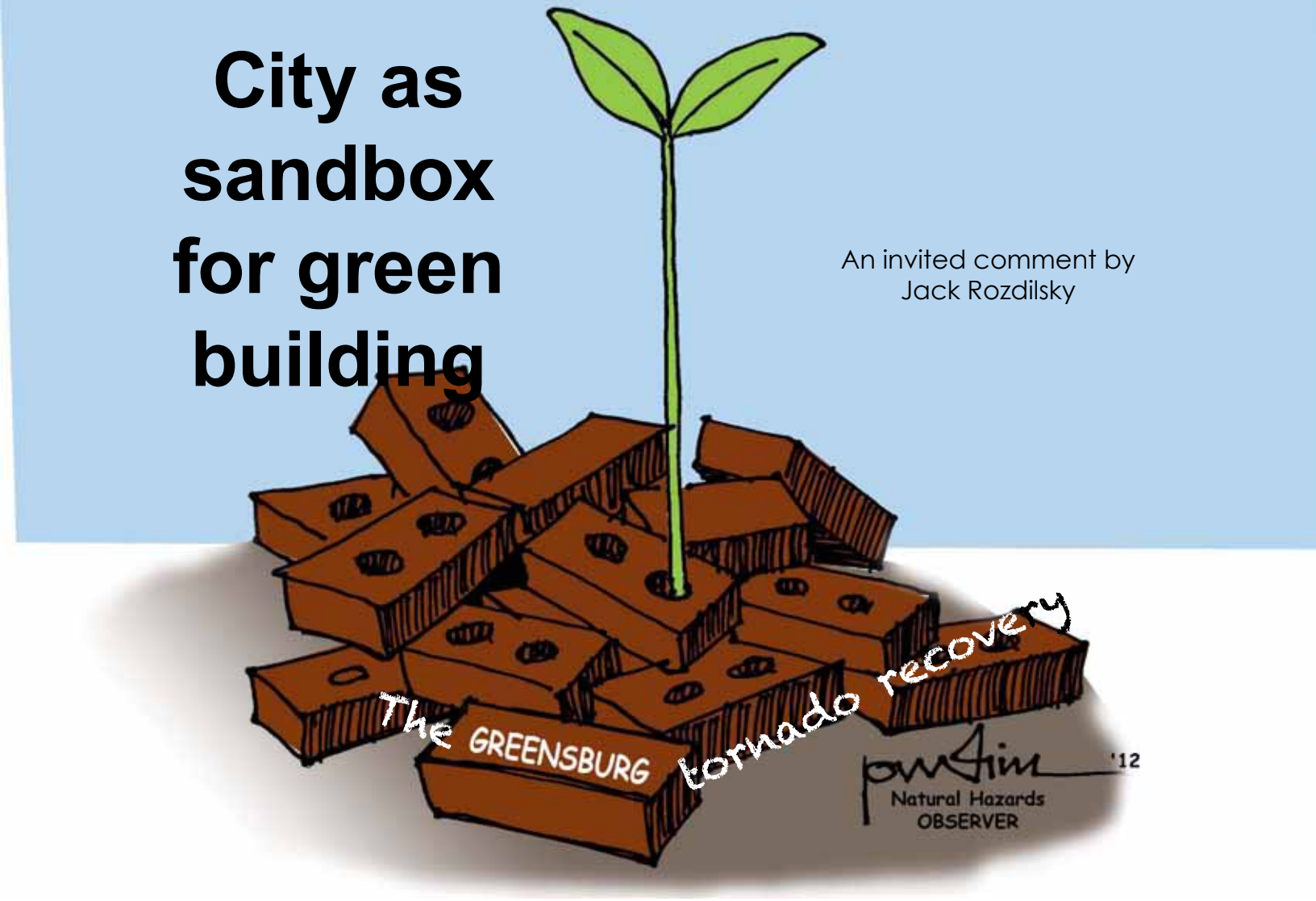
An asteroid collision with Earth is natural disaster theory writ large—a very low likelihood, very high impact scenario. But the cost of preparation is very small—about $500 million for a deflection mission—compared to the potential damage. An earlier near-Earth object, Apophis, was estimated to cause $400 billion in economic losses if it should hit the planet.

In addition to wiping out the dinosaurs 65 million years ago, asteroid collisions have indeed affected Earth. In 1908, an asteroid fragment of only 30 or 40 meters in diameter is believed to have flattened 2,100 square kilometers (810 square miles) in Tunguska in Siberia. Tunguska-sized events may occur on Earth about every 300 years.

NASA's Jet Propulsion Laboratory estimates that 0.5 to 1.0 kilometer diameter asteroids (0.3 to .6 miles) may hit Earth every 100,000 years, and comets in this size range impact only every 500,000 years.

City as sandbox for green building

An invited comment by
Jack Rozdilsky



In spring 2012, the middle of this year's tornado season, the memory of the record setting tornado year of 2011 is still fresh for many cities and towns. While all tornadoes are dangerous, storms rated as EF-4 or EF-5 tornadoes are especially destructive. Wind speeds start at 166 miles per hour for EF-4 storms and 200 miles per hour for EF-5 storms.

Of the 1,690 tornadoes recorded in 2011—the second highest number of tornadoes in any year for the record keeping period 1950-2011—22 were rated as EF-4 or EF-5. This was the fourth highest number of EF-4 or EF-5 tornadoes recorded in any year since 1950 (NWS 2011). During 2011, six cities, including Joplin, Missouri, were stuck by EF-5 tornadoes. During the entire decade between 2000 and 2010, only two EF-5 tornadoes were recorded—one in 2007 at Greensburg, Kansas, and the other in 2008 at Parkersburg, Iowa.

May 4, 2012, represents the five-year anniversary of the Greensburg EF-5 tornado. In the past five years, Greensburg has made significant strides in its disaster recovery. The city is emerging as a role model for towns that want to combine sustainability initiatives with disaster recovery (Berkebile and Hardy 2010; Pless, Billman and Wallach 2010; White 2010; Paul and Che 2011).

Because Greensburg has adopted an aggressive media outreach and branding strategy, Greensburg's green disaster recovery program will probably be prominently featured in the national media during its anniversary week. After last year's record tornado swarms, Greensburg's recovery story takes on special significance. Many places that suffered in last year's tornado season are now doing their own recovery, wondering what their own five-year prospects may be. But because of the special circumstances Greensburg has faced, the recovery lessons there may be of limited usefulness to other communities. Leonardo DiCaprio can't be everywhere.

This article highlights key aspects of Greensburg's tornado disaster and recovery, focusing on the degree to which the lessons from Greensburg can be applied in other places.

Greensburg's tornado disaster

On the evening of May 4, 2007, supercell storms capable of producing strong tornadoes were tracked across Kansas by the Dodge City Office of the National Weather Service. In Greensburg, storm sirens sounded approximately 20 minutes before the tornado hit. A rare tornado emergency—an alert level above a tornado warning that is issued when a tornado is headed directly into a population center—was issued at 9:37 p.m. when the EF-5 tornado pointed directly at Greensburg. The tornado struck the community at 9:46 p.m. It was estimated at more than 1.5 miles wide, with wind speeds of 205

miles per hour when it swept into the town center. There were 11 casualties. Ninety percent of the city was destroyed. For the town of 1,574 people, the degree of damage and the casualty count were catastrophic.

As early as May 11, seven days after the tornado's impact, discussions were taking place regarding linking Greensburg's recovery to sustainable development initiatives. Kansas Gov. Kathleen Sebelius said she had discussed with Greensburg's officials the possibility of rebuilding the devastated town using energy efficiency practices. "We have an opportunity of having the greenest town in rural America," Sebelius said during a statehouse news conference. "The 'greenest town' could include energy-efficient schools and hospitals, for starters, it also could use energy driven by wind turbines" (Carlson 2007).

Greensburg showed strong local support for an environmentally sensitive disaster recovery effort. The city's administrator, mayor, school superintendent, and a group of active citizens (who went on to form the Greensburg Greentown organization) all actively supported a new green vision for the postdisaster city. In the first six months after the tornado, momentum had built to remake Greensburg as an eco-city, using green technologies to reduce long-term costs and to increase energy efficiency (Hall 2007).

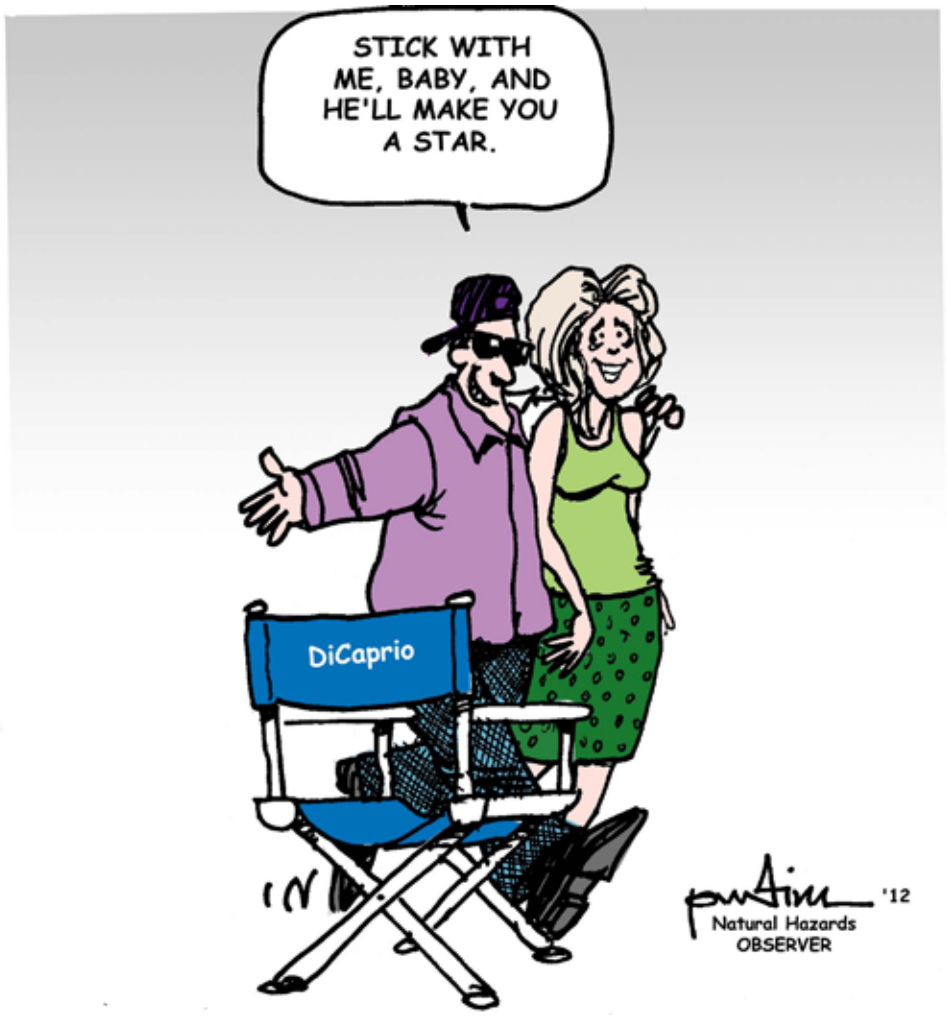
Greensburg's physical disaster recovery

Today, five years after the tornado, Greensburg does not seem to be a disaster-stricken city. But a close look reveals oddly shaped trees and similar age of all the buildings. There are numerous blank spaces in neighborhoods, indicating that something had happened. The author first visited Greensburg six months after the initial impact of the tornado, and last visited the city in March 2012. Much progress has occurred during the first five years of the reconstruction effort.

One element of the recovery that especially stands out is the degree to which Greensburg has built out a new green, or environmentally friendly, community. The new city hall, the Kiowa County Commons Building, the Sun Chips Business Incubator, the Big Well Museum, the Greensburg Greentown Silo Eco House, the Kiowa County Memorial Hospital, and the new K-12 school building are all excellent examples of state-of-the-art green construction. Windmills are also a new feature in the city's landscape. Greensburg has more LEED Platinum certified buildings per capita than any other city in the United States. (Paul and Che 2011). The LEED Platinum standard is the highest rating for eco-architecture that is awarded by the U.S. Green Building Council.

Greensburg had availed itself of a unique confluence of planned and ad hoc opportunities to facilitate its recovery efforts. These included hosting presidential visits and working with various agencies of the federal government to get technical guidance on such matters as energy and rural development. Community organizations such as the Greensburg Greentown organization proved to be key local stakeholders. Such activities are common in postdisaster environments. But Greensburg's relation to celebrity, television programming, media, and branding are unique among postdisaster cities.

In the months following the disaster, Greensburg was approached by Hollywood celebrities and producers with unique propositions. In late July 2007, Craig Piligian—whose credits include the first three seasons of Survivor and popular Discovery Channel shows like "Dirty Jobs with Mike Rowe" and "American Chopper"—joined Discovery Communications and outspoken actor/environmentalist Leonardo DiCaprio to put together a 13-part series about the recovery called "Eco-Town" (Neil 2007).



DiCaprio helps the brand

DiCaprio was the program's producer. Greensburg residents were characters. The program's narrative was based on Greensburg's environmental initiatives and to a lesser extent the tornado disaster. The network attempted to attract sponsors who would also contribute to the recovery effort. Greensburg's city administrator said that once he was satisfied that the producers weren't interested in making a negative, controversial reality show, he was on board. "Some of the things we want to do cost money and time, and if we can use the Discovery Channel to speed up the recovery efforts as well as help financially, we should look into that," he said (Neil 2007). The reality-based, non-fiction program was named "Greensburg." It first aired on the Discovery Channel's Planet

Green Network in 2008, running for three seasons. The program raised the profile of the city tremendously.

The television program created collateral activities to benefit the city. In terms of funding one of the green projects, the business incubator, "Actor Leonardo DiCaprio added $400,000 to state and federal emergency funds and corporate donations to construct the $3.4 million building" (Mann 2009). The Frito-Lay Corporation and other businesses also gave generous donations to the city. In Greensburg, it was possible for the mercantile-related aspects of the television program to create opportunities like direct sponsorship, in-kind donations, and product placement opportunities. Greensburg's situation facilitated many cross-platform marketing opportunities leading to some unique public-private partnerships. Examples of the partnerships are evident in the names of buildings on Greensburg's main street, such as the Sun Chips Business Incubator Building.

Greensburg has also actively engaged other media in the aftermath of the disaster. In 2008, on the one-year anniversary of the disaster, the community hosted CBS's "The Early Show" morning television program for an entire week. The town and its residents were used as the set for the program. Co-hosts Julie Chen and Harry Smith participated in projects like the construction of an eco-playground, donated by the network.

In today's sophisticated media environment, it is not a chance occurrence that any city, even a disaster city, will gain so much positive, on-message media coverage. Greensburg has been very successful in creating itself as a brand. This brand fits well into a variety of story lines—tragedy to triumph; Midwestern American spirit resounding on the plains; eco-pioneer village; and "if we can do it here (eco-friendly lifestyles in the middle of conservative Kansas), it can be done anywhere."

Because of the special circumstances Greensburg has faced, the recovery lessons there may be of limited usefulness to other communities. Leonardo DiCaprio can't be everywhere.

Greensburg has used its brand to maintain long-term support and attention towards its plight during disaster recovery.

In one of the few analyses of this branding effort, Figueiredo (2009) suggested that the branding of Greensburg was related to sophisticated architectural imagery. In the article "Branding Catastrophe," he wrote, "The central fact of Greensburg's media strategy to date has been that the architectural principles of its reconstruction are more potent than the resulting images. This has led to the suppression of images and a projection of discourse in their place (Figueiredo 2009)." In addition, one must consider the ethical implications of being the focus of multiple narratives, and the longer-term social impacts that becoming a cultural icon for a cause can have on local identities.

Greensburg as a "sandbox"

Greensburg at the five-year anniversary of its natural disaster has become a "virtual sandbox," a safe test bed for new and experimental ideas. Regardless of whether one is referring to a playground or the testing of new computer programs, the characteristics of the "sandbox" include a designated area which is a safe space for creativity, exploration, experimentation, and innovation.

Greensburg has emerged as a sandbox for innovation and experimentation in building an eco-city. As early as 2008, I noticed a sandbox-like aura of creativity and innovation in Greensburg. In the temporary trailers which once housed city government functions, there were numerous architectural renderings of futuristic structures to be rebuilt in place of the devastated businesses and dwellings. At the time, I harbored doubts about whether the eco-buildings would ever be realized in a small Kansas town. In 2012, what stands out in the city is the degree to which the architectural renderings of futuristic looking structures that were once mounted on foam-core poster boards are now physically in existence.

What lessons can be learned from Greensburg to apply to other places for disaster recovery. The main lesson is that it's possible for the sandbox environment to emerge and sustain itself in the postdisaster environment. The safe space created for exploration and creativity grew into the entire environmental planning and sustainability initiatives that Greensburg excelled in implementing.

The perfect storm

Greensburg's innovative sustainability initiatives was described by White (2010) as the "perfect storm." This included the unique confluence of innovators, the innovations themselves, and the context in which all the new practices pointed in the same direction. This description is consistent with the innovation theme of the sandbox. From an architectural or urban planning perspective, a clean slate is an exciting concept. But, any excitement needs to be tempered by the emergency management perspective of a natural disaster that killed 11 community members and destroyed approximately 90 percent of the city. For Greensburg, it was noted, "Having a clean slate for sustainable approaches in the built environment is not a condition any community would wish upon itself" (White 2010).

If, as suggested by many analysts, Greensburg is emerging as a national model, we must consider exactly to what domain the model is most relevant? Greensburg's rebuilding model may have more applicability to site-specific eco-architectural design, or neighborhood-level environmentally based urban and suburban design solutions, than disaster recovery. In this case, the tornado disaster just happened to provide the clean slate for the new eco-development.

Looking forward

Looking at what small towns will face after a tornado disaster, Greensburg is more the exception than the rule. The guidance it offers to other recovering communities—even those superficially similar—is limited. After most disasters, the mundane day-to-day imperatives of disaster recovery require so much focused attention that any remaining energy to make a sandbox-like creative thinking environment is sapped by the constant demands that even a basic back to business-

as-usual recovery takes on time, energy, and resources. In terms of disaster recovery, Greensburg has demonstrated that it is possible to carve out a safe space for creativity, exploration, experimentation, and innovation even under the worst of circumstances. Going from zero to high eco-friendly development in postdisaster reconstruction is not a realistic goal for most places.

Consider the case of Harrisburg, Illinois. On February 29, 2012, the city—population 9,000—was struck by an EF-4 tornado. One third of the town was devastated. Seven people died. While it is not possible to make perfect comparisons between cities struck by tornadoes, what happened in the aftermath of Harrisburg's tornado is a more probable outcome for most small towns.

Harrisburg did not experience the "perfect storm" to move forward from a clean slate. Illinois sought federal disaster aid for the Harrisburg tornado but the aid request was denied. The subsequent appeal of that decision was rejected. Specialized assistance from federal agencies will not be forthcoming.

Media interest quickly subsided. The city will not be branding its catastrophe. The name Harrisburg will not be monetized. Hollywood celebrities have not taken an interest in the city. There will not be a "Harrisburg" television program. Suggesting Harrisburg could closely follow Greensburg's path would be at best distracting, and at worst an unwise diversion of scarce resources to non-essential activities.

The concept of the "sandbox" could be applied to postdisaster planning in other small towns, or perhaps even neighborhood-unit post-disaster planning in large cities. If after a tornado, an impacted city could create a safe space for creativity, exploration, experimentation, and innovation in the midst of other enormous disaster recovery demands, the city could then determine its own path towards community betterment activities. In this era of limited resources for small towns, even after disasters, an example of creativity and innovation may be something as simple as deciding to rebuild the firehouse or church in a conventional fashion, then adding a community room to the newly reconstructed building.

While Greensburg's disaster recovery path is inspiring for many reasons, it is not a realistic standard recovery model to follow. It is unique, not easily transferable to other places. The primary lesson we can take away from Greensburg is that a sandbox, or a safe space for creativity, exploration, experimentation, and innovation, is possible in the postdisaster environment. That sandbox can lead to good things, large or small. In the case of Greensburg, the sandbox has led to big things—the building of an eco-city. Greensburg should be commended for creating the space of the sandbox, then allowing ideas from the sandbox to take root.

Coming out of the record 2011 tornado year, and into an already active 2012 tornado season, many American cities have been and will be impacted by deadly and destructive tornadoes. On April 14 of this year alone, a tornado outbreak produced an estimated 122 tornadoes, many of them in Kansas. In the postdisaster environment, if these cities can create a safe space for creative and innovative thinking, despite the overwhelming day-to-day imperatives of disaster recovery, then these places can carve their own paths out of the ruins to community betterment.

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Disaster folk ...

(Continued from page one)

He didn't know the name. He continued, "The way the band kept playing was a noble thing … and the last I saw of the band when I was floating out in the sea … it was still on the deck playing, 'Autumn.'"

Not "Nearer My God to Thee?"

Apparently not. Bride was intimately familiar with the tune "Autumn" because it was in the band's regular repertoire. They probably played it every night. Given such a clear account of what happened, why is it that those of us who were not there, who were not born until long after *Titanic* sank, are so sure the band was playing, "Nearer my God to Thee?"

The answer (not in the form of a question this time) is that events live on not just in fact but in fallible, impressionable memory and in legend. Scientists analyze data to determine the power and depth of a disaster—Richter scale, financial loss, number killed and injured. But in the popular mind, a disaster's legend grows through many forms of retelling, in media, then in nonfiction and fictional recounts, movies, in song. These retellings in legend—sometimes accurate, often not—can have more impact on whether the lessons of disaster live on than a hundred academic studies.

I suspect that many people—like me—got their early education about the *Titanic* disaster from a song, often sung at parties. The lyrics were like this:

> Oh, they built the ship *Titanic*, to sail the ocean blue
> And they thought they had a ship that the water wouldn't go through.
> But the good Lord raised His hand, said the ship would never land
> It was sad when the great ship went down.
>
> *Chorus*
> Oh, they swung the lifeboats o'er the deep and raging sea.
> When the band struck up with "Nearer My God to Thee"
> Little children wept and cried as the waves swept o'er the sides.
> It was sad when the great ship went down.

The legends of the *Titanic* have insinuated themselves into popular culture in other ways. "Nearer My God to Thee" has become a semi-official last-gasp disaster song. By the time Hollywood produced James Cameron's Titanic with Leonardo DiCaprio, moviegoers would have thought something was wrong if the band had played anything else. In her 1989 PhD dissertation, Morgiana Halley found four different songs about the wreck of the schooner *Mollie* at Grates Cove, Newfoundland, in 1944. At least one mentions "Nearer My God to Thee" as the song sung in the communities as the dead sailors' bodies were returned there. And the lyrics of a song about the 1914 wreck of the *Empress of Ireland*, claiming 1,012 lives, says the band was playing on the deck as the ship went down—in this case the song was allegedly, "God Be With You Until We Meet Again."

"Do we really think that the bands in two separate shipwreck incidents managed to keep playing as their respective ships went down?" asks Cape Breton University ethnomusicology professor Heather Sparling. "These accounts almost certainly stem from the same 'myth.'"

The actual name of the song the band was playing as the *Titanic* went down is probably not a matter of immediate national concern. But the growth of the legend illustrates how it is has evolved in the popular culture. In some cases—"Autumn" or "Nearer My God to Thee?"—it may matter little whether or not the story is accurate. But in others, the distortions can affect the way that organizations respond.

The legend of the *Titanic* provides a useful object lesson beyond the identity of the band's final tune. The moving but accurate story that the musicians carried on until their deaths is a vivid counter to the idea that people panic in disasters.

It's well known that "music hath charms …" But it is curious that disaster folk songs often offer accurate portrayals of disasters. How does this come to be?

The beginnings of legend

The first accounts of disasters are local news stories. My students and I took a sample of disaster news items from local dailies to see if they were factually accurate. We did the checking by referring to documentary sources and by doing interviews. We stuck to local stories because the documents and people we needed were readily available.

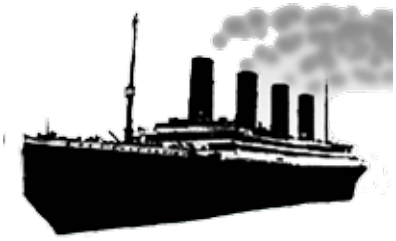
Our findings can be summed up pretty easily. It is a very rare newspaper story that does not have a factual error. In fact we found that on average there were two and a half factual errors per story.

We also found out a few things about why errors occur. For example, seemingly simple sounding names like Braun and Smyth were often misspelled while more complicated ones like Kovacevic or Mordacewicz were usually spelled correctly. We also discovered people in public life were more concerned about the tone of a story than its factual accuracy. If a story's tone was positive, it pleased them. If it was negative, the opposite was true.

Canada's worst catastrophe—and a watershed event in the history of disaster research—was the December 6, 1917 explosion of the French munitions ship *Mont Blanc* in Halifax, Nova Scotia. At 9:04:35, the ship detonated with one-seventh the force of an atomic bomb. The result was massive devastation, injury, and death. Within seconds, roughly 11,000 people, nearly one-fifth of the city's population, were dead or dying and there were thousands of fires. The explosion created a wave that lifted the tug *Hilford*, dropping it on shore in the railway yards.

Disaster scholars remember the explosion because it led to one of the first studies of human and organizational behavior in disaster—*Catastrophe and Social Change*—the doctoral thesis at Columbia University by a Canadian Anglican priest named Samuel Henry Prince.

Nuclear scientists remember it because some of those working on the Manhattan Project went to Halifax to get a sense of the impact an atomic bomb

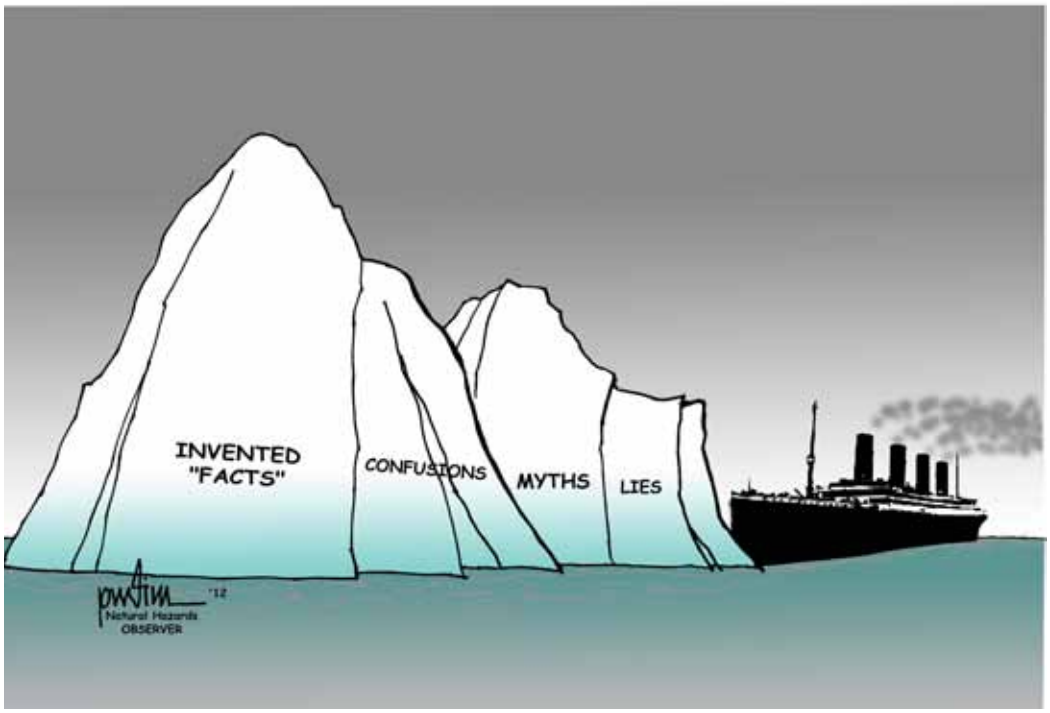


Gordon Lightfoot had a hit with "The Wreck of the Edmund Fitzgerald." The song originally said the ship went down after the main hatchway caved in. Recent research has learned more about the reason the ship sank. Lightfoot changed the words of the song.

would have.

People in Halifax and Nova Scotia remember it because so many have heard about it from family members. The stories have been passed on from generation to generation. There are photos and other memorabilia in the Citadel on Halifax Commons and at the Maritime Museum of the Atlantic.

The people of Boston remember it because each year just before Christmas the people of Halifax send a Christmas tree to that city in appreciation of its response in the wake of the explosion.



Canadian school children remember it because there are six works of fiction about the explosion, including *Barometer Rising* by one of Canada's best known novelists, Hugh MacLennan. It is a standard work for study in Canadian schools. The explosion is also remembered because many of those involved—including MacLennan—have written personal reminiscences. MacLennan was a 16-year-old school boy in Halifax when *Mont Blanc* exploded and he later wrote an article for a school magazine in Montreal recalling his experience.

But many of those "memories" are wrong. MacLennan, for example, states that *Mont Blanc* loaded her deadly cargo in Halifax. She brought it from New York City. He says she was outbound when the explosion occurred. She was inbound. MacLennan says *IMO*—the ship *Mont Blanc* collided with before she caught fire—was Swedish. She was Norwegian, a former whaling supply ship from Sandefjord, Norway, that had been pressed into wartime service to carry relief supplies from the United States to Belgium.

It is easy to find other surviving distortions. It is true that Boston responded to Halifax in the wake of the explosion. But it is also true that there was a more immediate and more thoughtful response from Maine and from various cities in Canada. Sydney, Nova Scotia, for example, sent a trainload of skilled craftsmen. They included on that train a dining and sleeping car and sufficient food supplies so the men would not be a drain on beleaguered Halifax. That response has been largely forgotten.

Most of those distortions don't matter because they are not likely to affect our perceptions of what people and organizations do in disaster. Nor do they affect the way modern organizations respond. But other distortions are important because they color our view of society or lead to inappropriate decisions in a future disaster.

Joan Payzant, for example, wrote a children's story about the explosion. Her heroine is a girl who does some remarkable things. But one scene in the book takes place on the Halifax-Dartmouth ferry. When *Mont Blanc* explodes as the ferry is crossing the harbor, a soldier takes charge and orders everyone to take cover. Payzant bases that story on a real incident—the ferry was in fact crossing the harbor when *Mont Blanc* exploded. But the real incident was somewhat different. A soldier did play a leadership role but he shared that role with a female passenger, Dorothy MacLennan.

Similarly, in Jim Lotz's book *The Sixth of December*, the military takes charge in the wake of the explosion. A Colonel Thompson immediately starts issuing orders: Set up first aid posts throughout the city. The Technical College will serve as the Central Medical Depot. Alert the hospitals. Use Camp Hill—move anyone out of it who can walk. Check Rockhead Hospital—see what its status is. The telegraph and telephone lines are probably down so use runners.

The Canadian Army did establish first aid posts at the armories and at Wellington Barracks, but it didn't do so right away. Its first concern was for the hundreds of injured soldiers and soldiers' families who needed help. The initial response was not by soldiers but by civilians, including many women. While it is true Technical University of Nova Scotia was turned into a supply centre, that wasn't done by the Army but by a committee appointed by the civilian Halifax Relief Committee. The center was not staffed by soldiers but by pharmacists, Red Cross volunteers, and commercial travelers, who did the deliveries (Scanlan 1999).

In testing the accuracy of novels one must accept a certain amount of literary imagination. The test is not whether the novel is factually accurate but whether what it portrays distorts the nature of human behavior in disaster.

For example Robert MacNeil in his novel *Burden of Desire* has a scene in which a dying woman asks to be given the last rites. The man she asks explains that he is Anglican, not a Roman Catholic, priest. The desperate woman tells him, "I don't care what you are, Father. For the love of God and the Blessed Virgin, give me the last rites."

The scene may be fictional, but it is very much in tune with what happened in Halifax with 11,000 people dead or dying. Hugh Upham, a Presbyterian minister from Shubenacadie, ran into an almost identical problem when he encountered a Roman Catholic woman who asked her to pray with him. He explained he was not a priest and she replied, "Well, it is all the same now. Would you kindly say a prayer for me?" He did.

The folk tradition

Curiously, a reliable source of narrative about disasters is folk music. When folk singers record a song about a specific incident, they for the most part try to get it right. They may be entertainers and storytellers but they are also part of a long tradition of chronicling what happened.

Our first study was of folk songs about mass death incidents in coal mines in Nova Scotia (Scanlan, Johnston, and Sparling 2012). The second is on the 43 folk songs we located about *Titanic* (Scanlan Vandervalk, and Chadwick 2012). Essentially both reach a similar conclusion—folk songs, unlike many books and movies, get things right.

But this still left the question: why do folk songs get it right?

We did find that some folk singers compose songs about subjects they know. For example when Montana Slim while in New York wrote a song about a Canadian incident, the Moose River mine disaster, he knew what he was writing about. His American stage name may have been Montana Slim, but Canadians know him as Wilf Carter from Nova Scotia, and Moose River is in Nova Scotia.

We also learned that some folk singers have a commitment to the truth. In 1976, Gordon Lightfoot had a hit with his song, "The Wreck of the *Edmund Fitzgerald*," about a ship that sank—all 20 crew went with her—during a violent storm in Lake Superior. The song says the ship went down after the main hatchway caved in. Recently researchers have learned more about that storm and the reason the ship sank. Lightfoot has changed the words of the song.

We wanted to know whether Lightfoot was unusual, or whether other artists were also concerned about factual accuracy. Heather Sparling, an ethnomusicologist at Cape Breton University, is interviewing folk singers about why they decided to compose a song about a particular event, where they got their information, and what they know or think they know about human behavior in disaster. Sparling is in an ideal location to do this research because most Canadian folk songs about death and disaster are songs about the sea or about mining, and Cape Breton is a center of both fishing and mining.

And listen to Canadian folk singer Stompin' Tom Connors as he describes "Sudbury Saturday Night."

The girls are out to bingo and the boys are gettin' stinko,
And we think no more of Inco on a Sudbury Saturday night.
The glasses they will tinkle when our eyes begin to twinkle,
And we'll think no more of Inco on a Sudbury Saturday night.

Inco is the International Nickel Company, Sudbury's largest employer. This is the folk flavor of Sudbury brought to life.

If we can learn by talking to folk singers why they get it right, perhaps we could learn by talking to novelists and those who write movie screenplays about why they often get it wrong. As we get a better understanding of that, perhaps we can find ways of doing something about it.

Joseph Scanlon is professor emeritus and director of the Emergency Communications Research Unit at Carleton University in Ottawa, Canada. He had been doing disaster research since 1970. In 2002, he received the Charles Fritz award for a lifetime contributions to the sociology of disaster.

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Listen to the music

There are many versions of the songs mentioned in these articles available via the miracle of the Internet. The following are links to some we found. The Web site **Disaster Songs** (http://bit.ly/JhtRc6) keeps an eye on the disaster song tradition, especially "songs of Atlantic Canada," since that area seems to wax expecially romantic about its disasters.

Titanic (the folk process at work)

http://www.youtube.com/watch?v=JcKttDHUv0E&feature=related

http://www.youtube.com/watch?v=S5ulu8bnlBk&feature=related

http://www.youtube.com/watch?v=8dzMFDxD--s

http://www.youtube.com/watch?v=EJ-OuHVP21M

Sudbury Saturday Night

http://www.youtube.com/watch?v=Dw7rzpvDvS0

The Wreck of the *Edmund Fitzgerald*

http://www.youtube.com/watch?v=Q0DqPSF2fyo

The Wreck of Old 97

http://www.youtube.com/watch?v=lyk3AEXvmLg

http://www.youtube.com/watch?v=et3fVvAbL7k

Avondale Mine Disaster

http://www.youtube.com/h?v=Ze1dXHNgEKs&context=C43b4825ADvjVQa1PpcFMZJNdXUH2JdlxX2eOSPq52RzS59Yn5so4=

Mighty Mount Saint Helens

http://rapidlibrary.com/files/mighty-mount-saint-helens-jeanie-bigbee-mp3_ulze8nm8cwi89on.html

There are No Words

http://www.youtube.com/watch?v=jtkC9Dx5JxI

Tie My Hands

http://www.youtube.com/watch?v=d5BaMAfUhXY

Our World (The BP Disaster Song)

http://www.youtube.com/watch?v=Ybw66xbFPVo

George Bush Doesn't Care About Black People

http://www.youtube.com/watch?v=UGRcEXtLpTo

Hell No, We Ain't Alright

http://www.youtube.com/watch?v=O2ZCpogav48

YouTube disasters ...

(Continued from page one)

The phenomenon of the Internet disaster song provides an interesting case study of a continuing mediated tradition that serves several distinct functions for human societies in the aftermath of disaster.

Unlike some song genres, which are categorized by their formal characteristics, the disaster song is not defined by its musical style or structure, but by its content and function. Today's disaster songs are performed in many idioms—country, punk, hip-hop, electronica, and even minimalism. Although disaster songs vary stylistically, there are several conventions that define them. Based on hundreds of disaster songs from a variety of manuscript, published, and recorded collections, the following is a list of six primary characteristics of the disaster song:

- The songs describe actual historical events, using specific dates, names, and places to establish their reference to a particular event.
- The events depicted involve significant loss of life. Songs about the death of one or two people are considered murder ballads or laments.
- Disaster songs draw upon stock formulae that signify the performance frame of "disaster song." Most standard of these is the date of the tragedy, usually stated at the song's beginning.
- The songs are voyeuristic and sensationalistic, often having a "tabloid" quality. Early broadside ballads provided gruesome details, just as many of today's Internet disaster song videos use graphic film footage.
- The songs convey empathy for the victims and the survivors, as if the singer is speaking for those who were there.
- There are recurring themes and motifs in disaster songs including: conflict with nature, unheeded warnings, and divine retribution for the arrogance of humanity.

A disaster song acts as the conscience of its community and as a living memorial to those who died. To quote sociologist Peter Shabad, "By elevating our experiences through their dramatization into the objectivity of something monumental we attempt to insure that the dignity of our experiences be taken seriously" (Shabad 2000). This seems to be true even when traumatic experiences are witnessed at home in front of

the television or computer.

A long history

Disaster songs have been a part of modern mediated Western popular culture since the peak of British blackletter broadside ballads in the seventeenth century. From the very earliest examples, these songs were both a commercial enterprise and a coping mechanism for communities struggling with crisis. Benedict Anderson has noted that the spread of printing and the dissemination of information through newspapers is crucial in the establishment of imagined communities, whether they are clubs, towns, cities, states, or nations. According to Anderson, the ceremony of reading the "news" becomes a shared ritual, and an imagined space where communities coalesce (Anderson 1991).

The dissemination of information through the printing and singing of broadside ballads, as a predecessor to the modern newspaper or newscast, fulfilled the same role. These ballads, written to popular tunes, were sung on street corners by ballad hawkers and sold for a penny or half penny per sheet, then sung again and again. The broadsheets were also literally posted on walls in homes, on the streets, and in public houses, not unlike the new tradition of posting songs or videos on Facebook "walls" (Fumerton 2012).

Disaster songs were easily adapted from the medium of print to that of recording in the early twentieth century. In 1912, the sinking of the steamship *Titanic* sparked a small song writing craze, resulting in over one hundred songs about the Titanic being copyrighted within the first eight months following the disaster (Cohen 1999). Most of these songs were never actually recorded, but many found their way into oral tradition, or onto the early wax cylinders, remaining popular well into the 1930s. Some are still widely known.

Titanic songs were written and published from a variety of ethnic traditions including Irish, French-Canadian, Yiddish, Czech, Polish, Finnish and Swedish (Cohen 1999). There were very few people in the industrialized world that did not understand the story of a *Titanic* song, or its underlying moral message.

The 1920s and 1930s saw an explosion of recorded disaster songs corresponding to the growth of the "hillbilly" record industry. Rural southern musicians recorded popular songs about railroad disasters, like "The Wreck of the Old 97," or mining disasters, like "The Avondale Mine Disaster." These recordings catalyzed the oral transmission of the songs, allowing them to enter the repertoires of folk singers across the continent.

Singer-songwriters often tread a fine line between empathy and exploitation when they write media-inspired disaster songs. Most describe a kind of calling, an overwhelming urge to speak for the victims. But they also clearly see the recordings of their songs as an opportunity to promote themselves as singers and songwriters.

In 1997, while writing my master's thesis at the University of Oregon, I interviewed people who had written about the 1980 eruption of Mount Saint Helens, asking them how and why they came to memorialize that cataclysm through song. The Mount Saint Helens songs were written by, and for, members of the geographic communities that were directly affected by the disaster. Jeannie Bigbee of Mossyrock, Washington, wrote one of the best-selling Mount Saint Helens songs, "Mighty Mount Saint Helens." People in Mossyrock asked Jeannie to write a song about the eruption, based on her long-term connection with the area, and her reputation as a popu-

lar local songwriter. Bigbee felt she was speaking for both the community and for the mountain itself. The community responded positively. Forty-five rpm discs and cassettes of her country-style song were sold at roadside stands—along with postcards and jars of volcanic ash—to tourists coming to view the devastation. For two decades, local radio stations played her song on the anniversary of the eruption as a ritualized aural memorial.

While Bigbee's song represents perhaps the most traditional type of disaster song, the product of a member of the community most immediately affected, many people write songs about disasters they have experienced only through the media. They create their own accounts of the disaster that are then fed back into the global mediascape. These songwriters, even in the pre-YouTube era, still found ways of self-recording, publishing, and disseminating their songs.

Whitney Rehr, an independent singer-songwriter from Denver, Colorado, wrote a song called "Above the Wreckage" about the 1996 crash of TWA flight 800 off the coast of Long Island. Rehr said that she had felt "called upon" to write her song, as if she needed to speak for the victims.

Rick Spencer of Mystic, Connecticut, wrote his song "The *Heidi Marie*," about the loss of a fishing boat and its crew in the nearby town of Stonington, not because he was personally related to any of the lost crew but because he saw how the loss had affected the entire community. He wanted to give voice to those feelings.

This was also the case with Kitty Donohoe, who performed her September 11 song, "There Are No Words," at the Ten Pound Fiddle Coffeehouse in East Lansing, Michigan, only three days after the 2001 attacks. According to Donohoe, people came to her afterward saying, "You put into words what I wanted to say" (2004). Although YouTube did not yet exist, Donohoe posted her lyrics and recordings of herself singing the song on a number of folk music websites like Mudcat Café. Recently she performed the song at the dedication of the 9/11 memorial at the Pentagon—her performance there is available on YouTube.

These singers were sincerely moved to write their songs. But all of these semi-professional musicians also used their disaster songs to publicize their songwriting. It seems, however, that the commercialism of the disaster song is balanced by the singer's attempt to draw attention to the disaster itself, helping the survivors to heal, memorializing the dead, and, in some cases, calling for social justice.

The Internet era

With the launch of YouTube in February 2005, Internet users were given a new tool. Anyone with a video camera and a computer could post their disaster songs online. In August of 2005, Hurricane Katrina hit the U.S. Gulf Coast, becoming the first major domestic disaster to become a viral phenomenon on YouTube. The use of personal video cameras and Web-based social networks to spread news about Katrina was unprecedented. YouTube quickly became a venue for people to voice their feelings about the disaster's political and social aftermath.

The majority of Katrina songs strongly express the anger and outrage at the seemingly callous indifference of the federal government, although many do it in a humorous way. A few songs achieved a certain level of notoriety. Considering the location of the disaster—in the cradle of rhythm and blues—it wasn't surprising that many of these disaster songs were R&B or hip-hop. "George Bush Doesn't Care About Black People," by The Legendary K.O., is a remix of Kanye West's "Gold Digger" that takes its title and refrain from the sentiments expressed by West during his infamous appearance on a national telethon to benefit Katrina victims. The racially charged song seeks to shame the government for its inaction.

> Hurricane came through, f___ed us up 'round here
> Government acting like it's bad luck down here
> All I know is that you better bring some trucks round here
> Wonder why I got my middle finger up round here.

Unsurprisingly, one of the most eloquently outspoken expressions of outrage following Katrina came from the inimitable New York rap group Public Enemy, who recorded a perfect example of the potency of the disaster song in the 21st century, titled "Hell No (We Ain't Alright)."

> I see here we be the new faces of refugees
> Who ain't even overseas but here on our knees
> Forget the plasma TV—ain't no electricity
> New worlds upside down and out of order
> Shelter? Food? Wassup, where's the water?
> No answers from disaster, them masses hurtin'
> So who the f**k we call?—Halliburton?
> Son of a Bush, how you gonna trust that cat?
> To fix s**t when help is stuck in Iraq?

In the five years since the introduction of YouTube, many natural disasters have attracted attention in the international media. All of them are commemorated by disaster song videos on YouTube. There are two distinct forms of disaster song videos currently found on YouTube.

The first type uses pre-existing songs as accompaniment for a slideshow or video montage showing scenes from the disaster and its aftermath, as exemplified by the Public Enemy and Legendary K.O. posts. Because they use previously recorded songs, they are the easiest form of disaster song video for amateurs to create.

In the second type of video, a songwriter presents his or her own version of a song composed about the disaster. Sometimes these videos simply show the song lyrics. In some cases they show the singer performing the song, either on stage or in their home or studio. Still photographs or video footage of the disaster accompany the majority of disaster song videos, which fulfills the traditional function of the disaster song as a way of bearing witness. These images also enhance the message of the songs' lyrics, which are usually a call for aid, empathy, or for justice.

As of this writing, you can find on YouTube original disaster songs written about earthquakes in Haiti, Chile, New Zealand, Pakistan, Sichuan (China), Tibet, Sumatra, California, and Peru; tsunamis in Samoa, the Solomon Islands, Sri Lanka, and South India; floods in Pakistan, Singapore, and Nashville; volcanoes in Iceland, Hawai'i, and most recently, Mount Merapi in Java.

Interestingly, very few of the disaster songs found on YouTube provide the viewer with any way to donate or contribute to relief efforts. The majority of these songs simply ask the viewer to pray for, or at least think about, the disaster's victims. Those that do ask for donations are just as likely to ask the viewer to buy a copy of the singer's CDs or MP3s as they

are to ask for a donation to an official charity.

Hundreds of these disaster songs are posted on YouTube or other social networking sites, yet their power to effect positive action or change is debatable. The vast majority of these videos have been viewed less than a thousand times. Usually, only the videos made of disaster songs by popular singers, like Lil' Wayne's Katrina song "Tie My Hands," or Buckcherry's song "Our World (The BP Disaster Song)" about the oil spill in the Gulf of Mexico, or crassly commercialized videos like the "We Are the World 25" project for Haitian relief, that tally views in the thousands. Unfortunately, the potential of We Are the World to raise money and awareness for the Haitian people was squandered due to the disastrous recording itself and the devastatingly poor audience response to it.

Based on the events of the last decade, which saw unprecedented tsunamis, tornadoes, floods, and hurricanes, some believe that we may be entering a new era of natural disasters. Popular fears of man-made global warming reflect the common disaster song motif of God or Mother Nature punishing mankind for our selfish ways. Ascribing culpability or blame has always been a central trope of disaster songs, even when, as in the case of some Mount Saint Helens songs, mankind's immorality or mistreatment of nature is perceived as the cause of a disaster that had no human cause. This motif has become even more prominent with high profile man-made accidents like the BP oil spill or the Copiao Mine Disaster in Chile, in which human villains could be identified.

It is not hard to predict that the disaster song will continue to hold a crucial place in our culture's artistic arsenal of weapons against cruelty, complacency, and callousness. As oral monuments, disaster songs become repeatable rituals of remembrance. Victor Turner said that "the word or act (or song) that appeared to heal or amend personal or social disorder comes to be accorded intrinsic power in isolation from its original context and is formally repeated in ritual and incantory utterance" (1974). This has proved particularly true of disasters, since the news broadcasts of such historic tragedies as the assassination of President Kennedy, the space shuttle *Challenger* explosion, and the 9/11 attacks, have become iconic moments in popular culture that are frequently replayed, evoking profound memories.

Those who write disaster songs, speaking out on behalf of the victims, their families, and society in general, may see no direct benefit from their song, but nevertheless they bring light into the darkest of times and we can replay and repeat their songs, at least until the next wave of disaster songs hits.

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Resources

Below are brief descriptions of some of the resources on hazards and disasters that have recently come to the attention of the Natural Hazards Center. Web links are provided for items that are available free online. Other materials can be purchased through the publisher or local and online booksellers.

All of the material listed here is available at the Natural Hazards Center Library. For more information contact librarian Wanda Headley at wanda.headley@colorado.edu

Review of books

How the military responds to disasters

Manuals reviewed

GTA 90-01-020, DSCA Handbook: Tactical Level Commander and Staff Toolkit and Liaison Officer. July 30, 2010. http://usacac.army.mil/CAC2/FM3-28/CommanderStaffDCSAHandbook.pdf

Center for Army Lessons Learned (CALL), No. 11-07, Disaster Response Staff Officer's Handbook: Observations, Insights, and Lessons. December 2010. http://usacac.army.mil/cac2/call/docs/11-07/11-07.pdf

Department of the Army, Field Manual 3-28, Civil Support Operations. August 2010. http://usacac.army.mil/CAC2/FM3-28/index.asp

The pace of military doctrine development sometimes mirrors the duality inherent in the concept of justice—alternatively described as being either a "swift sword" or a "slowly turning wheel." The past decade of U.S. military involvement in two wars focused military doctrine development mainly on traditional military roles.

Response to several catastrophic natural disasters around the world during this same period brought some doctrinal advancement in the U.S. military conduct of humanitarian operations overseas. Lacking were corresponding doctrine, tactics, and procedures on the U.S. military response to such disasters in the United States. Over the last two years, this shortfall has been remedied with the publication of three new military manuals. Two were issued as procedural handbooks while one focused on doctrine.

Defense Support to Civil Authorities (DSCA) Handbook

The first publication is actually a two-in-one reference book called the *DSCA Handbook*. The two parts consist of the *Tactical Level Commander* and *Staff Toolkit* and the *Liaison Officer Toolkit*. Though requested by the United States Northern Command, the manual was actually developed by the Joint Test and Evaluation Command (part of the Office of the Secretary of Defense) to ensure it was jointly applicable across all military services. NORTHCOM wanted a practical, user-level manual for military personnel responding to an all hazards disaster.

The first part of the handbook for commanders and staff begins with a quick reference guide showing the page location of all-hazards planning factors for various staff positions and five categories of natural disaster. The next 11 chapters and 14 annexes are organized into four sections focusing on *DSCA* background information, planning factors, staff information, and reference annexes. Covered are incident management, civil and military response, risk management, requests for assistance, and reporting formats, to name just a few topics. All this information makes up about two-thirds of the 570-page volume. Flipping over and reversing the book reveals the liaison officer toolkit handbook with nine additional chapters of information designed to assist any military service member assigned to work directly with a civilian federal, state, or local emergency management organization.

The *DSCA Handbook* is accurate, useful, and durable. It contains the most up-to-date information from federal and military sources at the time of printing, as evidenced by the dates of the documents in the reference section. The subject matter is well-organized and thorough, covering federal laws

and documents and progressing to tactical, field-level procedures and techniques.

Handy extras include color-coded boxes throughout indicating critical information, warnings, vignettes, and special topics of interest. Its spiral bound, waterproof, rip-proof pages are durable and intended for use in the field as a working source book rather than sitting as a volume on a library shelf.

There are some minor weaknesses, though, which must either be overlooked or will hopefully be corrected in subsequent reissues. The handbook may be all-hazards, but it is not all encompassing. Other than a few pages in the liaison officer toolkit, the handbook does not cover CBRNE (chemical, biological, radiological, nuclear, high explosive—pronounced See-burn-ee) or terrorist incidents. Although book size is a factor in determining its portability and utility in the field, a few dozen pages of additional material and the specific mention in each section of any extra considerations for CBRNE and terrorist incidents would be welcome. The final weakness is the changing nature of the information and the handbook's design. Changes to laws, organizations, and processes are inevitable. As opposed to the costly replacing of the whole volume, a better binder edge that allows for single page replacement would be preferable.

Center for Army Lessons Learned Handbook 11-07

Published by the Center for Army Lessons Learned, the *CALL Handbook 11-07, Disaster Response Staff Officer's Handbook: Observations, Insights, and Lessons* is designed for planners in both the Active Duty and Reserve forces who may receive short notice to deploy in support of American citizens. The genesis of the handbook was the discovery by *CALL* collection and analysis teams that few tactical military units were prepared to respond to a domestic emergency. Trained for overseas conflict, units had little or no knowledge of the complexities and constraints of civil support operations

The handbook consists of five main chapters that lay out the basics of disaster terminology, legal aspects, the NRF (National Response Framework), NIMS (National Incident Management System), ESFs (Emergency Support Functions), and the Defense Department's role at large. Seventeen appendices make up the remaining two-thirds of the handbook and focus on four main topics: planning factors, operations and organizations, incident characteristics, and contact information. References and links are provided at the end of each chapter and within the appendices. Chapter 3 is a very good overview of the National Response Framework and the National Incident Management System. Appendix A is titled Unit Planning Considerations and does an excellent job covering many of the personnel, logistics, communications, and operational challenges military units face. Additionally, at the conclusion of most appendices are other specific planning assumptions units must consider. There is much emphasis throughout the handbook on deliberate man-made disasters such as terrorist attacks or CBRNE incidents.

Detractors from the usefulness of the manual include too few useful diagrams or tables; for example \a chart of the ESF functions would be prefeable to verbiage. Many of the graphics are also too small and difficult to read. The organization of information in each appendix is haphazard and inconsistence in formatting. Some sections offer good explanations of the information presented while others merely have lists. The 8.5-by-11 inch format contains much white space on each page; a smaller size would be better for use in the field. All these aspects combine to disrupt the flow of the handbook and make finding information a bit difficult.

US Army Field Manual, FM 3-28

The U.S. Army operational concept of decisive action operations addresses offense, defense, stability, and defense support to civil authorities. The keystone Army doctrinal manual for DSCA is *FM 3-28, Civil Support Operations*. The manual provides doctrine guidance to those levels of Army units from battalion and above that are directly involved in DSCA operations and focuses on the planning, preparation, execution, and assessment cycle.

After providing an overview of domestics operations, several chapters hone in on the four main tasks that make up the Army's DSCA mission—support for domestic disasters, support for CBRNE incidents, support to law enforcement agencies, and other support as designated.

Responsibilities for Army units of all components—Active, Reserve, and National Guard—are clearly delineated and addressed. All four chapters go into sufficient detail on response actions and considerations for Army forces. The final three chapters of the main body of the manual discuss legal aspects, and the sustenance and medical requirements for deployed units (not logistics support to civil authorities or disaster victims). Eleven appendices provide further information to units including checklists (unit and staff officers), safety, CBRNE force capabilities, search and rescue, and media considerations. One appendix in particular compares DSCA operations (disaster response in the United States) to stability operations (outside the United States of which foreign disaster response is just one of several areas). This appendix clearly highlights the differences and legal restrictions the U.S. Army faces in conducting domestic support operations.

Army doctrine is not famous for its readability. But *FM 3-28 Civil Support Operations* is a clear, concise, and well-organized doctrinal manual. A major strength is the 60-plus pages of figures, tables, and checklists that clearly provide everything from a force package composition to an example of a logistics section in a joint field office. The Reference section is outstanding, with not only source documents from the federal, military, and state levels, but also links to many of those documents and a wide array of other sources. Though not reviewed here, there is a companion volume, *FM 3-28.1 Multi-Service Tactics, Techniques, and Procedures for Civil Support Operations*, that provides specific "how-to" guidance. It is currently under revision.

Conclusion

It is fitting that two of these books (*CALL* handbook and *FM 3-28*) originate at Fort Leavenworth, Kansas in the heart of Tornado Alley. All of these documents are excellent references and have much to offer not only their intended military audience, but civilian emergency management practitioners as well. They are good planning resources for military units new to the realm of defense support to civil authorities and also provide civilian agencies an inside look at military capabilities and operational planning. There is some overlapping material in each book and each has a slightly different focus, but despite their specific weaknesses, taken together these three volumes should be in any organizations' emergency management library or kit bag.

All of these books can be accessed online and downloaded in PDF format to any Nook, Kindle, iPad or other portable

electronic reading devices. A hardcopy of the *DSCA Handbook* can be ordered from the U.S. Government Printing Office bookstore for $52.00 or downloaded from the US Army Combined Arms Center (USACAC). The Army field manual, *FM 3-28*, is available online at the General Dennis Reimer Training and Doctrine Digital Library at www.train.army.mil. *CALL Handbook 11-07* is available at the unclassified public website of the Center for Army Lessons Learned.

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ALL HAZARD

Disaster Recovery Handbook: A Step-by-Step Plan to Ensure Business Continuity and Protect Vital Operations, Facilities, and Assets. By Michael Wallace and Lawrence Webber. 2011. ISBN: 978-0-8144-1613-6. 445 pp., $59.95 (hardcover). Amacom Books. www.amacombooks.org.

The second edition of a thorough and carefully organized planning tome, *Disaster Recovery Handbook f*ocuses on business continuity in the face of unanticipated events. The book focuses on careful management of business operations, starting from the careful selection of the person who will manage the program—"Whoever assumes this role must remain involved with the project throughout its lifetime. As the sponsor's interest fades, so will the interest of your team"—to analyzing project results and keeping the plan current.

The book includes a CD-ROM with templates to compile a project plan, do risk assessment, and handle other chores for risk managers.

CLIMATE

The Economics of Climate Change. Graciela Chichilnisky, editor. 2010. ISBN: 978-1-84720-767-8. 984 pp. (two vols.), $477 (hardcover). Edward Elgar Publishing. www.e-elgar.co.uk.

These two volumes present 44 essays and research papers from 1976 to 2010 about the potential economic impacts of climate change.

The articles are presented based on four themes. First, climate change work has focused on world resources, especially in the face of increasing globalization of the economy. The second theme looks at the economic policy response to climate change, including the Kyoto Protocol, carbon markets, carbon taxes, and other forms of regulation, incentives, or economic penalties. Third, the essays examine the new risks posed by the changing climate. And finally, the essays look at how those changing risks may change the methodology of economics as economists may be forced to "rethink the notion of economic growth and the measurement of economic progress, such as sustainable development, sustainable international trade, new types of markets with privately produced global public goods, the knowledge revolution, and potential market solutions of the destruction of biodiversity in the planet," as Volume I says in the introduction.

These two volumes feature pieces by nearly all the important economic thinkers on climate, including Kenneth Arrow, Thomas Schelling, William Nordhaus, Nicholas Stern, and many others. It's a thorough education in this policy topic.

Urban Climate Change Crossroads. Richard Plunz and Maria Paola Sutto, eds. 2010. ISBN: 978-0-7546-7999-8. 184 pp., $100.75 (hardcover). Ashgate. www.ashgate.com.

This book strives to avoid climate change hysteria, but doesn't quite manage it. Mad Max dystopia post-climate change, urban competitiveness, failures of environmental justice—it's all here. Most of the book does not deal with disasters, per se, but with the potential for climate change to induce upheaval in urban areas.

Marianella Sclavi writes in one sidebar in the book, "Theodore Roosevelt once said that there are two types of people: those who learn by experience and those who learn by catastrophe. Actually there is also a third type of person: those who do not learn either from experience or from catastrophe. This third kind is becoming a little bit too common."

Urban planning in a changing climate regime is entering a "vicious cycle," says Cinzia Abbate in one essay. "Cities cover less than two percent of Earth's land surface but they account for some 75 percent of global energy demand and they produce 80 percent of CO_2 and greenhouse gases. In 1975 there were only five megacities with more than 10 million inhabitants. In 2007 there were nineteen. There are projected to be 27 in 2025, 22 of which will be in Third World countries." In China alone, 46 cities have passed a population of one million since 1992, making up a total of 102 cities. In the United States there are only nine."

She continues, "The current global drive towards urban agglomeration is the first stage of a new level of global economic development. Problems linked to urban poverty and inequality will lead to the creation of 21st century local and global policy beyond past precedents."

This book acknowledges that many of these serious urban issues must be faced whether the climate changes or not. Urban planners riding to Mad Max's rescue conjures an interesting mental picture of the solutions to a dystopian future.

The Climate Connection: Climate Change and Modern Human Evolution. By Renée Hetherington and Robert G.B. Reid. 2010. ISBN: 978-0-521-19770-0. 440 pp., $48 (hardcover). Cambridge University Press. www.cambridge.org.

There are 29 books in the *Observer* inbox awaiting perusal for inclusion in this Resources section. Of those 29, 15 have the word "climate" in their title. They aren't all specifically hazards related—*Climate Change and Arctic Sustainable Development, Climate Change and Growth in Asia, Climate Change and Environmental Ethics*, and so on—but their existence reflects the growing awareness of the far-reaching and uncertain impacts of global warming. The fact that their publishers send them to the Natural Hazards Center Library shows they know that the potential for increasing risk is hot on the heels of increasing average global temperatures.

One salutary result of this onslaught of weighty tomes—*The Climate Connection* comes in at just under two pounds—is that the effects of climate are being studied in many contexts that they were not much considered before. *The Climate Connection* has a long section on the effects of climate on human behavior. For example, they write, "A cooling and drying period might have desertified former hunting and gathering grounds. In the case of the European enlightenment of c. 50,000 years ago, several groups of *H. sapiens* may have congregated due to glaciation of formerly benign environments."

Hetherington and Reid reject the currently fashionable notion that behavior is moderated by genes. "We seriously

challenge the assumption that there are 'genes for behavior,'" they write. "Research that is 'theory-driven' is worthless if the theory is based on false premises."

This book, like many others on the reading list with "climate" in the title, is not generally about disasters, except insofar as a radically changing climate can be a disaster in itself. Disasters are one leg of their hypothesis: "In the wake of catastrophe there came population expansions because of immigration into refugia." It provides some clear thinking on the history of humanity and the likelihood of surviving into a future as lengthy as our past.

Climate Change and Environmental Ethics. Ved P. Nanda, editor. 2011. ISBN: 978-1-4128-1459-1. 262 pp., $49.95 (hardcover). **Transaction Publishers**. www.transactionpub.com.

This book argues, in part, that emergence of climate change as an overriding environmental concern changes the nature of our moral distinctions in relation to the biosphere. Freya Mathews writes, "The scale of the climate problem is so great as to simply, potentially, overwhelm environmental ethics: when the habitability of the planet per se is at stake, efforts to maintain its habitability for humans will *ipso facto* help to keep it habitable for all life systems. In past environmental struggles, human interests and the interests of the other-than-human world have often been locked in conflict; the moral issue in these cases has been whether we are justified in appropriating or destroying nonhuman beings or systems in pursuit of our own self-interest."

But our choices still matter. The use of nuclear power as a carbon emissions mitigation tool has different implications from conservation or climate engineering. Mathews argues for a "biosynergistic" effort, "in the sense of entering into active partnership with actual ecosystems to ensure both the regulation of the climate system and the sustainable provision of our own needs." She is not, however, optimistic about its adoption in the current political climate.

Environmental ethics can seem pretty abstract, especially in the context of such a large issue as climate. But all of the choices we make as individuals and as a civilization ultimately come down to our values. This book shines a light on those choices. The choices can be couched in many different terms. They are, for instance, temporal. How much do we owe future generations, and how far into the future? Most people would agree we owe something to our grandchildren, but what about their grandchildren, who will share only one-sixteenth of our genes—barely related at all. It can be difficult to convince someone to invest in four generations down the road when they are reluctant to help the person next door right now.

Continuing ethical concerns arise in the divide between rich and poor. Every serious report done on the changing climate finds that the usual suspects—the poor and underdeveloped in the world—will suffer more than the wealthy. Ved Nanda explores this ethical conundrum in this book. He writes, "the assistance of developed countries becomes imperative. International environmental law, as well as international human rights law, can play a robust role as appropriate mechanisms are crafted to support developing countries in their response to the adverse impacts of climate change. Linking human rights law to the ongoing debate on climate change will greatly assist decision-makers in being informed by a diversity of voices and perspectives on the climate debate and on the range of policies that they consider and ultimately adopt."

WATER

Decision Support for Natural Disasters and Intentional Threats to Water Security. Tissa Illangasekare, Katrina Mahutova, and John J. Barich III, eds. 2009. ISBN: 978-90-481-2712-2. 251 pp., $102.30 (softcover). **Springer**. www.springer.com.

This book summarizes the April 2007 proceedings from NATO's Advanced Research Workshop on Decision Support for Natural Disasters and Intentional Threats to Water Security held in Croatia. The participants looked especially at the lessons from recent water-related natural disasters and the use of environmental informatics and decision support to improve water security.

The authors cover numerous case studies including the Indian Ocean tsunami, Hurricane Katrina, water resource management in the south Caucasus, sustainable development for the Danube, and many others.

RISK

Learning from Catastrophes: Strategies for Reaction and Response. Howard Kunreuther and Michael Useem, eds. 2010. ISBN: 978-0-13-704485-6. 352 pp., $43.30 (hardcover). **Wharton School Publishing**. www.pearsoned.co.uk.

Businesses must prepare for catastrophes like anyone else. Howard Kunreuther and Michael Useem bring their experience in risk to bear on business' and society's preparation and response to catastrophe. "Before they can find strategies for expected loss reduction, societies need to identify areas of hazard that are worth investigating," they write in the first chapter. "And, in addition to finding strategies for addressing the hazards they focus on, societies need to carry those strategies into action. Thus, the risk-management framework needs to be seen as part of the larger challenge of organizing and mobilizing public action. The losses from hazards (and the benefits from hazard loss reductions) are intrinsically in the future, so we can view this wider challenge as a problem of 'acting in time'—that is, of taking action against future harms (or in favor of future opportunities) while there is still time to do so."

The book covers a lot of ground, from economics to climate change to the affordability of disaster preparedness and mitigation in poor countries.

TSUNAMI

Online Tsunami Modules. National Oceanic and Atmospheric Administration National Tsunami Hazards Mitigation Program. 2012. Free. **COMET Program**. www.comet.ucar.edu.

Tsunamis and tsunami preparedness have risen to the top of the disaster agenda, and with good reason—Japan, Banda Aceh. And then there are the genuine scares that don't pan out, but which require planning, training, and execution to make sure that they remain only scares and not disasters. NOAA has prepared these five educational models about the hazard tat will cover everything an American, at least, should need to know about this threat to its coasts.

Two of the modules focus on the tsunami threat to specific sites—the **Pacific** and the **Caribbean**. The other three—**Community Tsunami Preparedness**, **Tsunami Warning Systems**, and **Tsunamis**—provide the fundamental lessons that individuals and communities need to deal with the hazard.

This is a wonderful multi-media, pain-free way to learn about the tsunami threat, both in the United States and around the world.

Contracts and Grants

Below are descriptions of some recently awarded contracts and grants related to hazards and disasters.

Self-centering truss moment frames with resilient earthquake performance. National Science Foundation grant #1200237. http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=1200237. Three years. $305,748 to principal investigator Matthew Eatherton, Virginia Polytechnic Institute and State University, meather@vt.edu.

An innovative new self-centering truss moment resisting frame (SC-TMRF) will make building frames more resilient to earthquakes and reduce associated damage. The SC-TMRF consists of a truss with an assembly of concentric tubes at the bottom chord that creates restoring force in conjunction with post-tensioning strands. Conventional seismic force resisting systems use inelasticity in structural members and connections to dissipate seismic energy and protect buildings against collapse. However, the structural damage distributed throughout a building and related permanent residual drifts can make a conventional structure financially unreasonable to repair following a large earthquake. Recently developed seismic systems that mitigate residual drifts suffer from difficult or complex field construction, large cost premiums, and challenges associated with deformation compatibility. The unique configuration of the SC-TMRF solves many of these problems. Furthermore, steel plates with cutouts leaving butterfly shaped links act as structural fuses, dissipate seismic energy, and can be readily replaced if necessary. The SC-TMRF uses common materials in an innovative configuration. Preliminary design and analyses suggest that the SC-TMRF virtually eliminates permanent drifts, concentrates structural damage in structural fuses that can be easily replaced after severe earthquakes, can be shop fabricated allowing conventional field construction methods, and utilizes approximately the same amount of steel as conventional moment resisting frames.

Evolution and hydration of the Juan de Fuca crust and uppermost mantle: a plate-scale seismic investigation from ridge to trench. National Science Foundation grants #1029411 and 1029305. http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=1029411. Three years. Two grants. $223,709 to principal investigators Suzanne Carbotte, Mladen Nedlmovic, and Helene Carton at Columbia University, carbotte@ldeo.columbia.edu, and $161,357 to principal investigator Juan Pablo Canales, Woods Hole Oceanographic Institution, jcanales@whol.edu.

Subduction is a process in which oceanic crust and upper mantle are consumed beneath the margins of island arcs, such as Japan and Sumatra, or the margins of continents, as along the northwest coast of the United States. Subduction gives rise to violent volcanic eruptions as well as great megathrust earthquakes and tsunamis. Dramatic demonstrations of the destructive effects of subduction have occurred recently in Indonesia, Japan, and Chile. Water released from the subducted plate is a significant, but poorly understood, contributor to these events. This seismic survey of the Juan de Fuca Plate will characterize the plate from its formation at the ridge, through alteration and hydration of the plate as it ages, to subduction of the plate along the Cascadia margin.

Geodynamics of subducting slabs in the Earth's deep mantle from seismic anisotropy. National Science Foundation grant #1150722. http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=1150722. Five years. $106,108 to principal investigator Maureen Long, Yale University, maureen.long@yale.edu.

Subduction zones are among the most important tectonic features on the Earth's surface and represent prime sites for earthquakes, volcanoes, and tsunami hazards. Subduction is also vitally important for understanding the Earth's interior. Earth's long-term evolution is driven by the dynamics of the mantle, and the recycling of oceanic plates back into the mantle through subduction is a major driver for mantle processes. Understanding how slabs sink from the surface to the base of the mantle—and how they interact with the mantle around them—is crucial for understanding the mantle as a dynamic system.

Observations and modeling of seismic anisotropy will be used to probe subduction dynamics in three regions: the deep upper mantle, the transition zone, and the lowermost mantle. I will examine the pattern of anisotropy and flow in the deep upper mantle beneath subducting slabs, using detailed shear wave splitting data sets to test hypotheses for controls on subslab mantle flow. I will explore how subducting slabs deform the transition zone and uppermost lower mantle and whether the style of deformation is related to the dynamic behavior of "stagnant" vs. "non-stagnant" slabs.

Subduction zone segmentation over multiple seismic cycles, south-central Chile. National Science Foundation grant #1145170. http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=1145170. Three years. $198,190 to principal investigator Lisa Ely, Central Washington University, ely@cwu.edu.

The possible segmentation of subduction zone faults currently presents one of the most significant questions to the physics and geology of earthquake occurrence and the assessment of future earthquake hazards. How will future large earthquakes be arrayed along a fault? How and why will individual earthquake ruptures stop?

Subduction zone faults form the tectonic plate boundaries that parallel the coastlines of many countries around the world. Advances in instrumentation and modeling in recent decades have produced important insights into fault behavior, yet these measurements span only fractions of the time interval between major earthquakes. This research will use an interdisciplinary array of evidence preserved in coastal landforms and sediments to investigate whether segmentation of subduction zone faults is maintained over multiple earthquake cycles spanning hundreds to thousands of years.

The Arauco Peninsula coast of south-central Chile, crosses the boundary between the rupture zones of two of the largest subduction zone earthquakes in the worldwide historic record, on May 22, 1960 (Mw 9.5) and February 27, 2010

(Mw 8.8). Prior to 2010, the study area for this project in south-central Chile was one of the most accepted hard fault segment boundaries along the Peru-Chile trench. It was believed to bound several historical ruptures, including the Great Chilean earthquake of 1960. The Chilean earthquake in February 2010 called this hypothesis into question, when the rupture extended south of this boundary and only partially overlapped with the previous earthquake in 1835.

This research project will test multiple hypotheses regarding earthquake behavior and coastal response: (1) fault ruptures over multiple earthquake cycles could terminate at fixed (hard), variable (soft), or random boundaries, or could include multiple segments; (2) large subduction zone earthquakes will produce a tsunami deposit simultaneous with an abrupt change in land level; and (3) the Holocene coastal evolution in this region reflects a modest net change in relative sea level in which the vertical uplift or subsidence during large earthquakes is largely reversed during the periods between earthquakes. To address these hypotheses the research team will reconstruct vertical land-level changes and tsunami history associated with multiple earthquake cycles using geomorphic, sedimentological and microfossil analysis. They will characterize the optimal environmental settings for the preservation of land-level changes and tsunami deposits in sedimentary sequences and analyze the impacts of these land-level changes on the coastal landscape.

Investigating the slip rate of the main frontal thrust in the eastern Himalaya, northeast India. National Science Foundation grant #1145038. http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=1145038. Three years. $248,824 to principal investigators An Yin and Edward Rhodes at University of California-Los Angeles, yin@ess.ucla.edu.

The 2,500-kilometer-long Himalayan Main Frontal Thrust is the longest active thrust fault in the world. It links the oceanic subduction zones via active left-slip and right-slip transpressional systems on the east and west sides of the Indian subcontinent. Together, these active faults accommodate on-going northward indentation of the Indian plate into the Eurasian plate and this deformation contributes to the current growth of the Himalayan mountain belt.

Although the Main Frontal Thrust may have absorbed more than 50 percent of the total current India-Asian convergence in the central Himalaya, how its slip rate varies along strike remains poorly known. It is not clear if the slip rate increases from west to east corresponding to the eastward increase in the rate of India-Asia convergence. Resolving this problem is a key to establishing the dynamic cause of the Himalayan formation.

A major difficulty in determining the slip-rate distribution is the lack of geologic information on the thrust in the eastern Himalaya. This project is addressing this issue by conducting detailed structural, morphologic, and geochronologic investigations. The final products of the project include: (1) a robust estimate of the Quaternary slip rate on the eastern Himalaya Main Frontal Thrust; and (2) a first detailed active-fault map of the eastern Himalaya.

Developing a comprehensive model of subduction and continental accretion at Cascadia. National Science Foundation grant #1144771. http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=1144771. Two years. $206,576 to principal investigator Yang Shen, University of Rhode Island, yshen@gso.url.edu.

Cascadia is a prime site to understand subduction dynamics and continental accretion, because it has one of the youngest subducting slabs in the world and a wide range of tectonic units. A variety of scientific questions can be addressed at Cascadia: What controls the subduction zone segmentation? What is the role of water transport in the subduction zone? Where does melting occur and how does magma migrate in the mantle and crust? And how does oceanic lithosphere accrete to the continent? Paleoseismic records show that Cascadia has a history of generating ~M9 megathrust earthquakes, so research is needed to improve the assessment of seismic and tsunami hazards from megathrust earthquakes.

This project develops and implements an advanced seismological method to construct a comprehensive, high-resolution velocity model of the crust and upper mantle for the entire Cascadia subduction zone. The velocity model provides a detailed structural framework and new understanding of the subduction processes. The structural correlations of a well-resolved model help address whether serpentinization of the forearc mantle varies substantially along strike and how it is related to the subduction of sediments, pre-existing features on the slab, and melt production beneath the volcanic arc.

The explosive volcanic history of the Central Oregon Cascades: Probing the changing state of the Neogene Cascade Arc. National Science Foundation grant #1144555. http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=1144555. Three years. $360,078 to principal investigators Adam Kent, Robert Duncan, and Anita Grunder at Oregon State University, adam.kent@geo.oregonstate.edu.

Subduction zones' volcanically active regions where one tectonic plate is pushed beneath another are home to most of the Earth's explosive volcanic eruptions. This is because the magmas that are produced and erupted in subduction zones tend to be both richer in water and in silica, both of which increase the propensity for eruptions to be explosive. The Cascade margin, running from Mount Lassen in northern California to southern British Columbia is host to a number of well-known volcanoes such as Mount Hood, Mount St. Helens and Mount Rainier, as well as numerous other volcanic edifices. Much of the region is heavily populated.

Explosive eruptions have occurred in the recent history of the Cascades. Examples include Mount St. Helens in 1980 and the prehistoric eruption of Mount Mazama at Crater Lake ~7,700 years ago. Although these younger eruptions are well documented, less is known about the long-term explosive record of the Cascade subduction zone over longer time scales, and the forces that influence such explosive behavior.

This project will help establish the long-term eruptive history of the Cascades in Central Oregon over the last 15 million years, by looking at volcanic rocks preserved within the Deschutes and Simtustus formations of central Oregon. Many examples of ash fall and ash flow deposits that result from large explosive eruptions are preserved in these sequences, and they can be used to estimate the frequency, composition, age and size of large explosive eruptions in this section of the subduction zone. This research will use a combination of approaches, including field, geochronological, geochemical and petrological studies and will enable us to study changes in eruption rate, eruption size and chemical and isotopic composition through time and to compare this to the more recent

behavior of the subduction zone.

Commercializing communication science: Weather disaster messaging systems. National Science Foundation grant #1237318. http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=1237318. Five months. $50,000 to principal investigators Henry O'Hair, Derek Lane, Wes Brooks, and Randall Stevens at the University of Kentucky, OHair@uky.edu.

This Innovation-Corps proposal will commercialize ongoing research focused on tailored messaging systems involving severe weather events. Success rates of messaging systems have yielded disappointing rates in previous events due to a "one size fits all" approach to broadcast strategies. Communication research has concluded that tailored messages have the best chance for influencing behavior and educating receivers. This effort investigates the potential to commercialize the research previously conducted to provide tailored communications.

Improved communication of hurricane information promotes more effective protective decision-making thus saving lives and property; the team employed demographic, socioeconomic, physiological, and psychological data to improve the accuracy and efficacy of advisories and warnings for weather systems. There is now an opportunity to make these scientifically optimized systems available to the public. The I-CORPS proposal to examine commercialization potential extends the scientific knowledge gained from the previous studies to improving communication platforms, which is a potential commercial as well as humanitarian opportunity.

May 6-8, 2012
2012 Southeast Regional Conference
Association of State Dam Safety Officials
Louisville, Kentucky
Cost: $375

This conference will present new approaches to risk management, the hydraulic design of spillways, dam break modeling and analysis, and construction management. Sessions topics include ways to increase dam lifespan, grouting in piedmont geology, rehabilitating five National Resource Conservation Service dams in 20 months, and modeling and mapping dam breaches for emergency preparedness planning.

http://damsafety.org/

May 6-9, 2012
National Flood Conference
Federal Emergency Management Agency
Austin, Texas
Cost: $395

This conference will discuss the importance of floodplain management and the benefits of flood insurance. Topics include repetitive loss mitigation, coastal flood risk education, commercial losses, private flood insurance, and updates on FEMA's Risk MAP Program.

http://www.nfipiservice.com/nfc2012/NFC2012_index.html

May 7-9, 2012
Sustainable City 2012
Wessex Institute of Technology
Ancona, Italy
Cost: $1,855

This conference addresses environmental challenges facing cities. Topics include natural resources consumption, the generation of waste and pollution, social and economic imbalances, sustainable urban tourism, natural hazards planning, urbanization of rural areas, and sustainable energy resources.

http://www.wessex.ac.uk/12-conferences/sustainable-city-2012.html

May 12-15, 2012
Third Global Forum on Urban Resilience and Adaptation
International Council for Local Environmental Initiatives—Local Governments for Sustainability
Bonn, Germany
Cost: $1,244

This conference will discuss how cities can develop resilience to global climate change. Specific areas of focus include urban infrastructure resilience, urban food security and biodiversity, renewable energy, reliable transportation options, and funding for climate adaptation. Topics include risk assessment methodologies, resilient building and construction, integrated adaptation approaches, community-based solutions to climate change mitigation, and new approaches to urban planning and design.

http://resilient-cities.iclei.org/

May 13-18, 2012
Governor's Hurricane Conference
Florida Governor's Hurricane Conference
Fort Lauderdale, Florida
Cost: $195

This conference will provide hurricane-focused emergency management training for businesses, elected officials, and the media. Topics include disaster frontline supervision, shelter management training, elevation certificate reviews, postdisaster redevelopment planning, social media for emergency managers, and issues in higher education emergency management.

http://www.flghc.org/

May 13-18, 2012
World Congress on Water, Climate, and Energy 2012
International Water Association
Dublin, Ireland
Cost: $1,382

Natural Hazards Observer
ISSN 0737-5425
Printed in the USA.
Published bimonthly. Reproduction with acknowledgment is permitted and encouraged.

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www.colorado.edu/hazards/

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This conference will look at technological, political, and economic challenges in creating resilient and sustainable cities. Topics include water resources management, sustainable drainage systems, water treatment technologies, climate adaptation strategies, wastewater utility improvements, integrated governance of water and energy, and the relationships between water, agriculture, and food supply. Additional workshops for forestry and young water professionals are also provided.

http://iwa-wcedublin.org/

May 14-16, 2012
Effective Risk Communication: Theory, Tools, and Practical Skills for Communicating about Risk
Harvard School of Public Health
Boston, Massachusetts
Cost: $1,595 before May 7

This program will present new research and international case studies on risk perception and communication. Attendees will learn about decision science methods for developing and evaluating risk communication strategies, the importance of trust in risk communication, and lessons from the media.

https://ccpe.sph.harvard.edu/programs.cfm?CSID=RCC0000&pg=cluster&CLID=1

May 15-17, 2012
Cross Border Workshop
Pacific Northwest Border Health Alliance
Tacoma, Washington
Cost: Free

This conference addresses emerging public health threats in the Pacific Northwest, including pandemic influenza, earthquake, tsunami, and volcanic eruption. Topics include health system challenges during a seismic event, federal medical resource support for a natural disaster, coordination of interstate healthcare volunteer responders, interstate medical surge planning, and post-seismic event health concerns.

http://www.pnwbha.org/

May 20-25, 2012
Mission Mitigation
The Association of State Floodplain Managers
San Antonio, Texas
Cost: $765

This conference will discuss new techniques, programs, and resources for flood mitigation and watershed management. Topics include climate variability, storm water retention standards, flood warning system design, education and outreach strategies, flood-frequency analysis determinations, national coastal policy issues, and the integration of hazard mitigation into floodplain management strategies.

http://asfpmconference.org/

May 30 through June 22, 2012
Natural Disaster Management
University of Iceland Earthquake Engineering Research Centre
Selfoss, Iceland
Cost: $2,037

This course provides an introductory overview of the disaster cycle, and examines local, national, and international roles in disaster management. Topics include multidisciplinary disaster cycle management, risk analysis, cost-benefit analyses of mitigation projects, and contingency planning for rescue, relief, and recovery. Following completion of the course, students will be able to lead or participate in multidisciplinary disaster management projects.

http://www.earthquake.is/

July 12-13, 2012
Fourth International Conference on Climate Change
University of Washington
Seattle, Washington
Cost: $400

This conference will examine scientific and political perspectives on climate change. Topics include climate change and disaster management, the impact of climate change on water resources, climate change education for children, climate change vulnerability related to racial and income disparities, and national mitigation strategies.

http://on-climate.com/conference-2012/

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Build the Center Endowment—Leave a charitable legacy for future generations.

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Boost the Mary Fran Myers Scholarship Fund—Enable representatives from all sectors of the hazards community to attend the Center's Annual Workshop.

To find out more about these and other opportunities for giving, visit:
www.colorado.edu/hazards/about/contribute.html

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The mission of the Natural Hazards Center is to advance and communicate knowledge on hazards mitigation and disaster preparedness, response, and recovery. Using an all-hazards and interdisciplinary framework, the Center fosters information sharing and integration of activities among researchers, practitioners, and policy makers from around the world; supports and conducts research; and provides educational opportunities for the next generation of hazards scholars and professionals. The Natural Hazards Center is funded through a National Science Foundation grant and supplemented by contributions from a consortium of federal agencies and nonprofit organizations dedicated to reducing vulnerability to disasters.

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