

## It isn't always '... because climate change'

An invited comment by Scott Miles

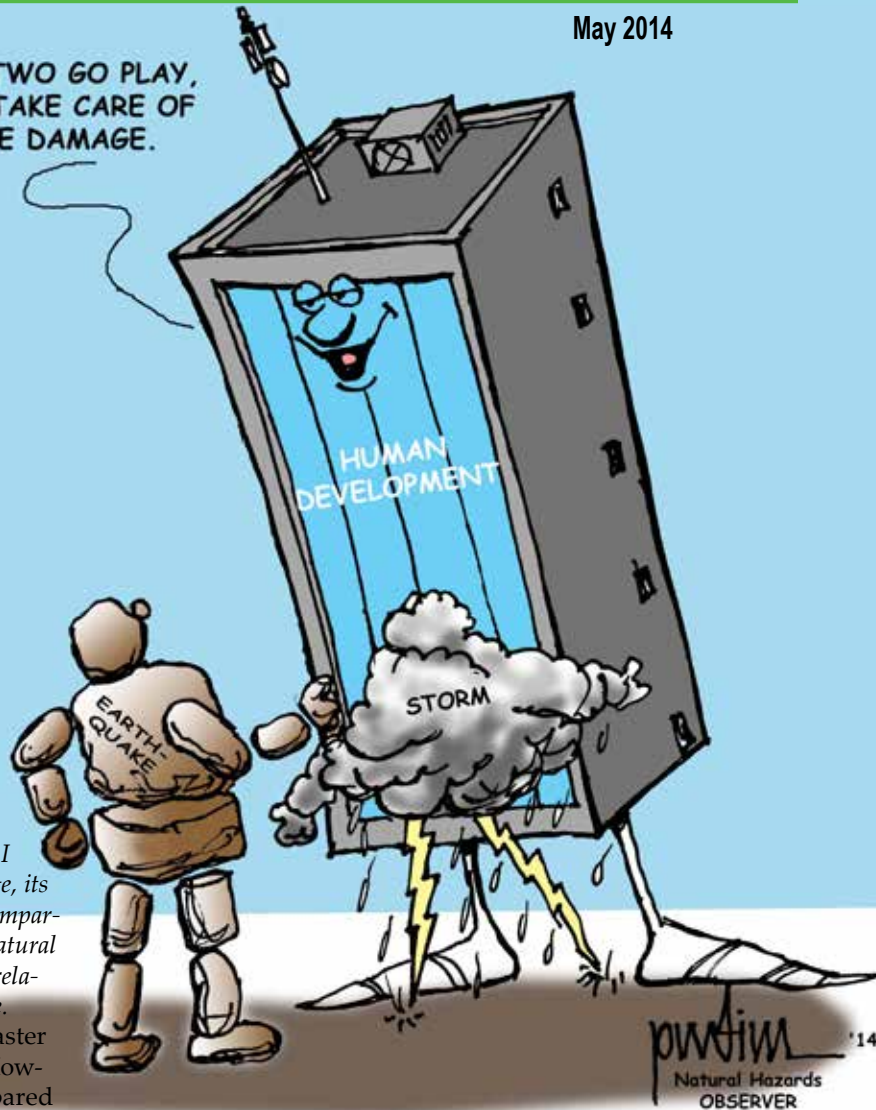
**W**hat can we learn from global-level data describing occurrence of disasters and their impacts? I'm talking about the kind of data collected by large reinsurance companies and intergovernmental organizations. I see statements about climate change based on this type of data, but I don't think this data allows us to say much about climate change, its impacts, or our resilience to it. The data is useful for making comparison between the occurrence and impacts of different types of natural hazards. We can use this insight to make statements about the relative progress towards community resilience to each hazard type.

Based on global disaster data, the trend in storm disaster occurrence is rising compared to earthquake disasters. However, the relative impacts of storms are going down compared to earthquake impacts. It's possible that climate change is influencing storm disaster occurrence, but there's nothing in the data that is directly representing climate change. Alternatively, it doesn't appear that climate change is a useful explanation for trends in disaster impacts, since we seem to be increasingly more resilient to storms than to earthquakes.

But let's back up a bit ...

MOST OF US HAVE HEARD that the cost of disasters is on the rise. Swiss Re and Munich Re release the data, media report it,

YOU TWO GO PLAY,  
I'LL TAKE CARE OF  
THE DAMAGE.



researchers crunch it, pundits dissect it, and those in the real world say it's not very useful for getting things done.

While reporting on the rise in disasters, media and pundits often mention rising carbon dioxide emissions and research about increasing storm intensity or frequency. This raises the question (and sometimes suggests an answer) of whether the rise in disaster costs is related to climate change.

Some researchers—discussed [here](#) or [here](#) or [here](#), de-

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# News and Notes

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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*Observer* cartoons are drawn by Rob Pudim.

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We're gearing up for our annual workshop here, and there are several interesting events scheduled to occur in concert with our usual activities.

One of them is that the U.S. National Platform for the United Nations International Strategy for Disaster Reduction will host a listening session at our 39th Annual Natural Hazards Center Workshop on Sunday, June 22, 2014 from 7:00-9:00 p.m. MDT in Interlocken A at the Omni Interlocken Resort in Broomfield, Colorado.

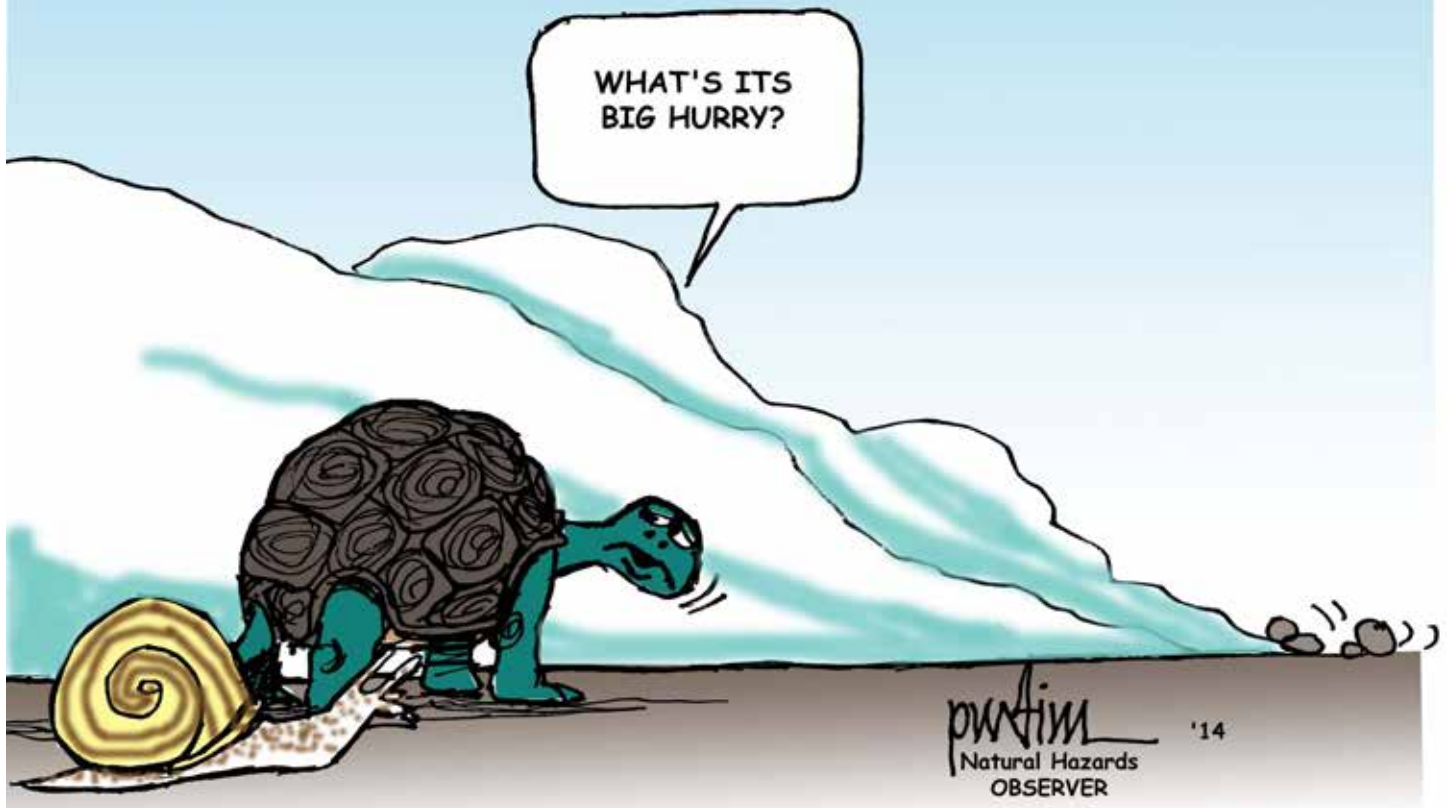
The platform is facilitated by the White House National Science and Technology Council Subcommittee on Disaster Reduction, which consists of members from 28 different federal departments and agencies. The goal is to facilitate national strategies for reducing disaster risks and losses that are based on effective uses of science and technology. It will also provide a federal interagency forum for information sharing, development of collaborative opportunities, formulation of science- and technology-based guidance for policy-makers.

This listening session will be to hear from multi-sectoral perspectives from nongovernmental organizations, academic institutions, local and state officials, and private corporations on the development of UNISDR's successor strategy to the Hyogo Framework for Action to be launched in 2015, known as HFA2.

This event is free and open to the public. All workshop participants are encouraged to attend.

For further information about the event, please contact: David Applegate (applegate@usgs.gov; 703-648-6600), associate director for natural hazards with the U.S. Geological Survey; Dennis Wenger (dwenger@nsf.gov; 703-292-8606), program director for Infrastructure Systems Management and Extreme Events at the National Science Foundation; or Bret Schothorst (bret.schothorst@mantech.com, 703-388-0312), NSTC Subcommittee on Disaster Reduction executive secretary.

# Antarctica's glaciers are speeding up



Racing along at four kilometers a year

In his 1880 *A Tramp Abroad*, Mark Twain came up with several innovative ideas for speeding up travel by glacier. Traveling to Zermatt by glacier, Twain was appalled to discover that Switzerland's Gorner Glacier travels at an average rate of a little less than an inch a day.

"I have seldom felt so outraged. I have seldom had my confidence so wantonly betrayed," Twain wrote of his plan to travel the three-and-one-eighteenth miles to Zermatt on Gorner, "Time required to go by glacier, A LITTLE OVER FIVE HUNDRED YEARS!" (emphasis in original).

Informing traveling companion Harris of this fact, his friend said, "Well then it's a government glacier ... Over here the government runs everything—so everything's slow; slow and ill-managed." Harris suggested turning the glacier over to private enterprise, because "governments don't care, individuals do."

It turns out Twain didn't have to wait 500 years for the glaciers to speed up, but only about 135—at least for the ones in Antarctica. Researchers report that six large glaciers in western Antarctica are moving considerably faster than they did 40 years ago, increasing the amount of ice draining into

the oceans, and speeding up global sea level rise.

The most active of the six glaciers, the Pine Island Glacier, has increased its speed by 75 percent in 40 years—increasing by 1.7 kilometers (one mile) per year to four kilometers (2.5 miles) a year.

The six glaciers studied produce about 10 percent of the global sea level rise annually. The amount of ice released by these six glaciers each year is comparable to the amount of ice draining from the entire Greenland ice sheet annually, according to Jeremie Mouginot, a glaciologist at University of California-Irvine. If melted completely, the glaciers' disappearance would raise sea levels another 1.2 meters (about four feet), according to coauthor and UC-Irvine Professor Eric Rignot.

The decades of increasing speeds and ice loss are "a strong indication of a major, long-term leakage of ice into the ocean from that sector of Antarctica," Rignot said.

The National Oceanic and Atmospheric Administration says, "Global sea level is now rising at an increased rate and will continue to rise during this century. While studies show that sea levels changed little from AD 0 until 1900, sea levels began to climb in the 20th century." Sea level is increasing by about three millimeters (0.12 inches) per year. "This is a significantly larger rate than the sea-level rise averaged over



## They Said It ...

"Human activities are changing the climate. Climate change impacts are already widespread and consequential. But while science can quantify climate change risks in a technical sense, based on the probability, magnitude, and nature of the potential consequences of climate change, determining what is dangerous is ultimately a judgment that depends on values and objectives."—**IPCC WGII AR5 Volume frequently asked questions.**

"The real challenge of dealing effectively with climate change is recognizing the value of wise and timely decisions in a setting where complete knowledge is impossible. This is the essence of risk management."—**IPCC WGII AR5 Volume frequently asked questions.**

"Are we seeing impacts of recent climate change? Yes, there is strong evidence of impacts of recent observed climate change on physical, biological, and human systems. Many regions have experienced warming trends and more frequent high-temperature extremes. Rising temperatures are associated with decreased snowpack, and many ecosystems are experiencing climate-induced shifts in the activity, range, or abundance of the species that inhabit them. Oceans are also displaying changes in physical and chemical properties that, in turn, are affecting coastal and marine ecosystems such as coral reefs, and other oceanic organisms such as mollusks, crustaceans, fishes, and zooplankton."—**IPCC WGII AR5 Volume frequently asked questions.**

the last several thousand years," the agency says. (<http://1.usa.gov/1m6MDrG>)

A recent report in *Nature Climate Change* found that despite the recent "pause" in global warming, there hasn't been any change in the rate of sea level rise over the past 20 years, once the data is corrected for interannual variability.

The glacial news in Antarctica may have important consequences for future estimates of changing sea levels. "This paper is important in showing that a glacier can actually 'feel' what is happening far downstream of itself," said glaciologist Robert Thomas of the NASA Wallops Flight Facility. "It means that if you disturb the ice sheet near the coast, the glaciers will feel the push and rapidly respond hundreds of kilometers inland."

This finding suggests that glacier acceleration models may need to be reevaluated. Most current models only take into account isolated speed changes resulting from a local disturbance, rather than representing how these changes affect the glacier as a whole.

And all of this without any input from private enterprise. So there may be hope for glacier travel after all. Twain wrote, "I have traveled by canal-boat, ox-wagon, raft, and by the Ephesus and Smyrna railway; but when it comes down to good solid honest slow motion, I bet my money on the glacier. As a means of passenger transportation, I consider the glacier a failure; but as a vehicle of slow freight, I think she fills the bill. In the matter of putting the fine shades on that line of business, I judge she could teach the Germans something."

## The IPCC brings the climate news ...

...and it's not real good

In September 2013, the Intergovernmental Panel on Climate Change released the first part of its *Fifth Assessment Report*, addressing the physical science of climate change.

That report, the first from the panel since a 2011 special report, makes the strongest assertion to date that humans are driving climate change. It says that it is 95 percent certain (up from 90 percent stated in the previous report) that "human influence has been the dominant cause of the observed warming since the mid-20th century."

The report also contains ominous warnings about what to expect if nations are unable to curb greenhouse gas emissions, including sea level rise of up to 39 inches by the end of the century and global surface temperature increases of up 8.6 degrees Fahrenheit.

The report is part of an ongoing series in which several United Nations-appointed scientific working groups provide a comprehensive analysis of available climate research and suggestions for actions that might be taken to mitigate the impacts of a warming climate.

The IPCC, which released the second part of the *Fifth Assessment Report* in early April, continued to emphasize the need for immediate response to climate change.

"We're not in an era where climate change is some sort of future hypothetical," Chris Field, a scientist at the Carnegie Institution and co-chair of Working Group II, told reporters in Yokohama, where the scientists convened. "There is no question that we live in a world that's already altered by climate change."

The latest report addresses the impact of climate change on everything from oceans and agriculture to human society and finds that human and



natural systems are already suffering and will continue to suffer.

Changes in water quality and quantity, negative impacts on crop yields, a downturn in human health are among the effects to be expected if change isn't forthcoming, according to a summary of the report for policy makers. The report also claims that non-climatic factors will be exacerbated by climate change in the coming years.

"Throughout the 21st century, climate-change impacts are projected to slow down economic growth, make poverty reduction more difficult, further erode food security, and prolong existing and create new poverty traps, the latter particularly in urban areas and emerging hot spots of hunger," the report states.

Institut Méditerranéen de Biodiversité et d'Ecologie professor Wolfgang Cramer, [writing](#) on the website *RealClimate*, said, "Impacts of anthropogenic climatic change are observed worldwide and have been linked to observed climate using rigorous methods. Such impacts have occurred in many ecosystems on land and in the ocean, in glaciers and rivers, and they concern food production and the livelihoods of people in developing countries. Many changes occur in combination with other environmental problems (such as urbanization, air pollution, biodiversity loss), but the role of climate change for

them emerges more clearly than before."

Although the report is grim, it's not all gloom and doom. The authors report that while a certain amount of climate impact is already locked in, adaptations, especially those that slow greenhouse gas emissions, can reduce future impacts and the need for even more costly adaptation."

The recent report is the second of four to be released by the IPCC. The Working Group III report, which will address mitigation measures, is expected soon, while a synthesis report will be delivered in late October 2014.

Governments around the world are also preparing for a UN for a climate conference to be held in Paris in 2015. The Fifth Assessment Report will deeply inform those talks and there's some hope the IPCC's lack of word mincing will give the talks more teeth than those of the Durban and Warsaw talks that came before.

In the meantime, there is no need to ask for whom the climate change bell tolls, according to IPCC Chairperson Rajendra K. Pachauri. It tolls for all of us.

"In view of the impacts [presented in the report] and those that we have projected for the future, we know that nobody on the planet will be untouched by climate change."

—Jolie Breeden

## Another bird flu jumps the species barrier

First death from H10N8 in China

In early February, Chinese scientists reported the first human death associated with a new bird flu virus, H10N8. The new virus showed a disturbing ability to replicate in humans.

The infected person, a woman from Nanchang City in China, died nine days after contacting the virus, despite antibiotic and antiviral treatment.

"A genetic analysis of the H10N8 virus shows a virus that is distinct from previously reported H10N8 viruses having evolved some genetic characteristics that may allow it to replicate efficiently in humans. Notably, H9N2 virus provided the internal genes not only for the H10N8 virus, but also for H7N9 and H5N1 viruses," said Dr. Yuelong Shu from the Chinese Center for Disease Control and Prevention, Beijing.

"The pandemic potential of this novel virus should not be underestimated," the medical team wrote in *The Lancet*.

The patient had visited a live poultry market, but stayed only for about five minutes and didn't handle any birds herself. The birds in the market were examined, and no flu virus found. Analysis in *The Lancet* paper showed a genetic similarity of haemagglutinin genes in wild birds.

A group of scientists publishing in early March in the online journal *PLoS One* identified 116 avian flu strains in wild birds. "This is roughly twice the number that were found in domestic birds, and more than 10 times the number found in humans," said a news release on the report.

In 2013, an H7N9 avian flu strain caused a deadly outbreak in people in China. The strain had never before caused disease in humans. So far there have been more than 300 clinical cases of H7N9 with a 33 percent mortality rate.

When avian flu jumps from its bird hosts to humans, it can usually be traced to human contact with domestic poultry. Although avian flu often originates in wild birds, "it is the mixing of viruses among poultry, pigs, and people that substantially heightens the disease risk in humans," the release

says.

"Mallards carry the highest number of strains at 89 and ruddy turnstones were second with 45. The more a strain was shared across wild bird types, the more likely it was to be found in domestic birds, a risk factor for spillover events. They also noted that some strains could be specific to certain bird types. For example, gulls and shorebirds carried ten strains that have not been identified in any other bird order," the scientists found.

Another report issued in mid-March found that Tamiflu reduced the risk of death in adults who had contracted the H1N1 flu virus. People treated with neuraminidase inhibitors (NAIs) like Tamiflu were 25 percent less likely to die from the disease.

"The researchers report that to maximize survival, ideally NAIs should be started within two days of symptoms developing. The risk of death was halved when starting treatment within 48 hours of symptom onset compared with later treatment, or no antiviral treatment. Each day that starting antiviral treatment was delayed after two days from illness onset was associated with about a 20 percent increase in the risk of death compared with treatment started within 2 days," according to a release from *The Lancet*.



## Data ...

(Continued from page one)

pending on your inclinations—have pointed out that disaster losses aren't really going up if you normalize by gross domestic product, an economic accounting. That is, the total cost of disasters around the world is going up each year because global wealth is going up as well. This trend, they say, holds up even if you look at disasters related only to extreme weather events.

This cycle of communication about global-scale data that shows a rise in disasters and associated impacts makes me curious about how the data compares between disasters that might be related to climate change and those that probably aren't. Does this kind of comparison using the easy-to-access data add more to the conversation beyond looking at the raw data on its own or the data in comparison to some representation of wealth or economic output?

I grabbed data from the international disaster database ([www.emdat.be](http://www.emdat.be)) called EMDAT to give this a quick go.

SPECIFICALLY, I DOWNLOADED DATA ON OCCURRENCE, loss (in dollars), deaths, injuries, and homelessness from storms and earthquakes. EMDAT defines disaster occurrences as any event with more than 10 dead or 100 affected or international assistance was requested or an emergency was declared. They define storms as tropical storms, winter storms, and local/convective storms. Earthquakes are things that make the ground shake that are not caused by living creatures. (Okay, I made that one up.)

The graph in Figure 1 shows the occurrence and loss trends for both storms and earthquakes since 1900.

The occurrence of storm disasters and storm related

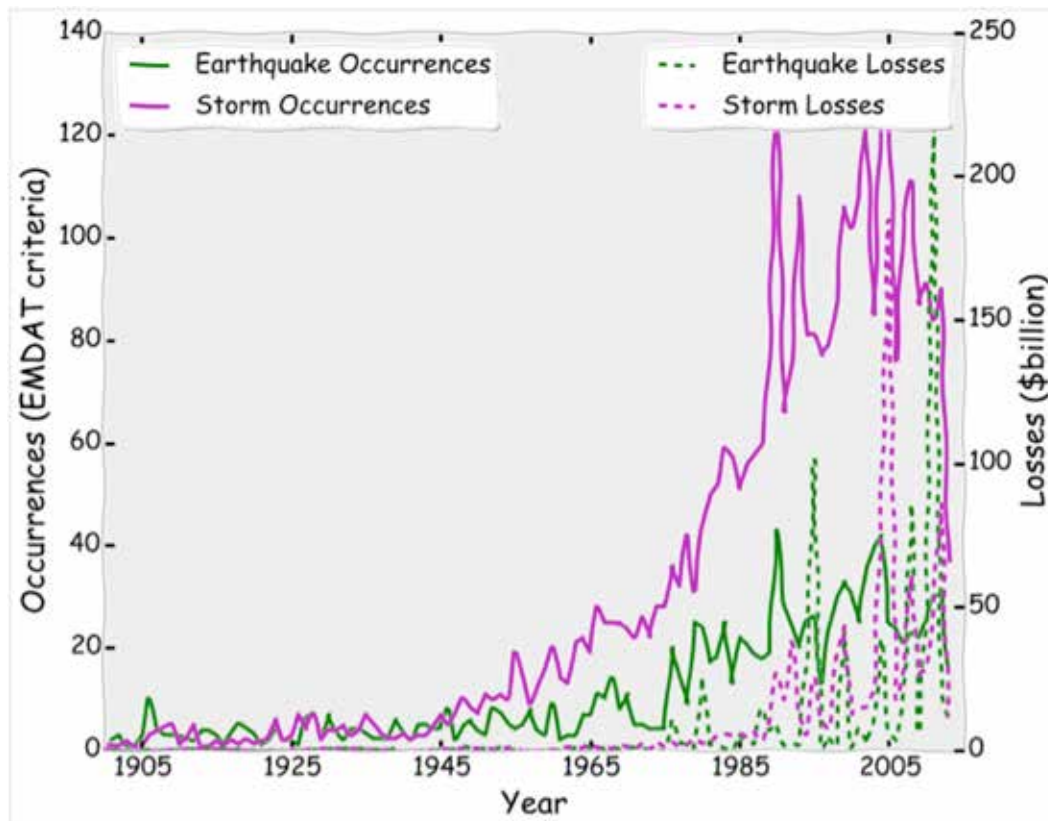


Figure 1

losses have been trending upwards. The rate of storm disaster occurrence looks like it starts going up around 1945-ish. The rate seems to increase even more in the 1980s. In the mid-80s to early-90s the rate of storm losses starts increasing.

Earthquake disaster occurrences have also gone up over time, though it's a little tougher to say when—maybe in the 1960s. Losses associated with earthquakes have also gone up. From the graph it's hard to see a distinct difference compared to storms, but the increase does seem to happen at about the same time.

HOW CORRELATED ARE ALL OF THOSE SQUIGGLES? It's pretty simple to calculate Spearman correlation coefficients. Spearman correlation looks to see if two curves increase in a similar manner. It doesn't check for linearity, just any monotonic relationship. The trends in Figure 1 are clearly not linear. A "perfect" correlation is 1.0, while 0.0 means there is no correlation at all.

As we'd expect there's a relationship between whether disasters occur and the cost associated with them. For earthquakes, the correlation between occurrence and losses is 0.85 between 1900 and 2013. For storms and losses, the correlation coefficient is 0.94.

If we look at only the data between 1980 and 2013, we see that in the past few decades there's been much less of a relationship between the occurrence of disasters and monetary losses from them. This is particularly so for earthquakes. For storms, the correlation coefficient is 0.74; the rate of occurrence is increasing faster than the rate of loss. For earthquakes, the coefficient is a very low 0.28. Since 1980, the trend in earthquake disaster occurrence is relatively flat, but earthquake losses went up.

There seems to be a decent relationship (monotonic, not linear) between the occurrence of earthquake disasters and

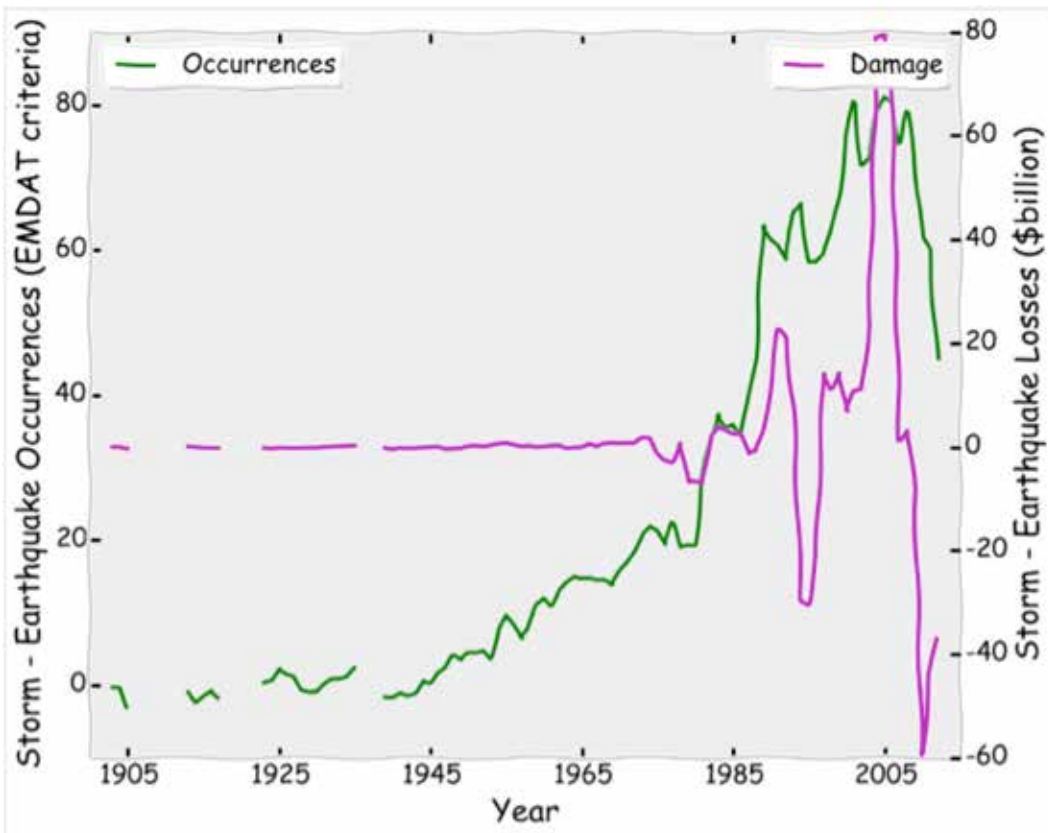
the occurrence of storm disasters. From 1900 onwards, the respective occurrence trends for storm and earthquake disasters have a correlation coefficient of 0.92. I wasn't expecting to see that. The relationship isn't as strong with respect to monetary loss, but the coefficient is still relatively high at 0.84. Between 1980 and 2013, correlation of the trends for both metrics goes down: 0.82 for occurrence and 0.60 for losses.

ANOTHER WAY WE CAN COMPARE earthquake and storm disasters is by looking at the differences between the various metrics: storm metrics minus earthquake metrics.

Figure 2 is a plot of the difference between both occurrence and loss for storms and earthquakes.

Earlier I noted that storm and earthquake disasters were occurring at a higher rate. Now we see there is an increase in





plotted a linear trend line for the time period since 1900 in addition to 1980. This makes it easy to see how trends might have shifted recently

WHAT ARE THE TRENDS and how have they changed in the past few decades?

Storm disaster occurrence has been going up over time relative to earthquake disasters and is going up slightly quicker since 1980. Based on the 1980 trend line, relative occurrence of storm disasters has gone up by about 40 disasters. The occurrence variability goes down a good amount with the smoothing, but there are still noticeable oscillations for the other metrics. So, we can probably feel pretty good about the general direction of the occurrence trends.

Those oscillations since 1980 didn't seem to change the trend for difference in losses.

Figure 2 The trend for losses has stayed relatively flat from 1900 and 1980.

And there isn't much difference on top of that—a small edge towards storms. The relative monetary loss from storm disasters has gone up by about \$8.5 billion since 1980.

Other researchers have found that disaster loss has been

storm disaster occurrences relative to earthquake disasters. Well, storm disasters seemed to take a break after 2005. The difference in occurrence trends seems to start around 1940. (The line is not continuous because there is no data for both hazard types in each year.)

It isn't easy to see a trend with respect to storm losses minus earthquake losses. Things get kind of crazy after about 1980. Interestingly, at around the same time, it looks as though the trend rate increases for storm occurrences relative to earthquakes.

You might be wondering what the trends look like for EMDAT's other disaster metrics. Money isn't everything.

FIGURE 3 INCLUDES DEATHS, injuries and the number of homeless, as well as occurrence and loss. Again, it's the difference between storms and earthquakes. I smoothed the data by taking a rolling average (n=3). (This explains why the plotted lines don't reach 2013.) Smoothing lessens the variability, helping to visualize, calculate, and compare simple trends. (It also has obvious downsides.) The figure only shows the crazy years since 1980. However, I

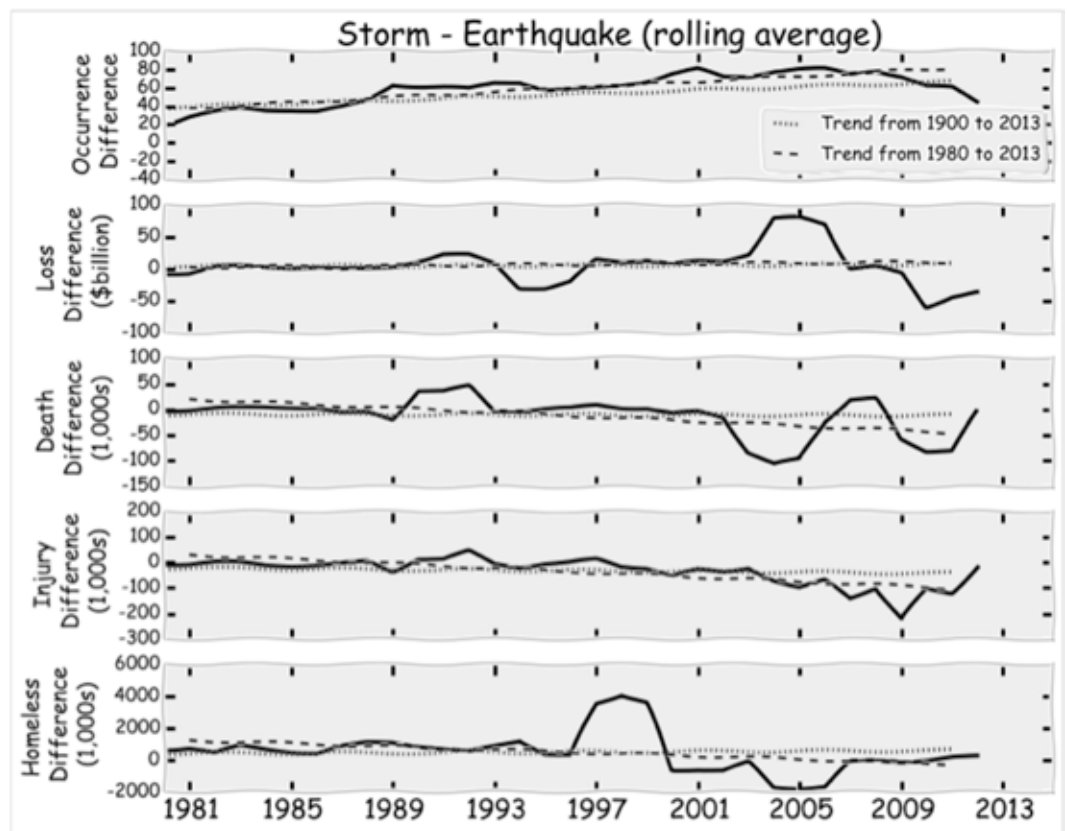
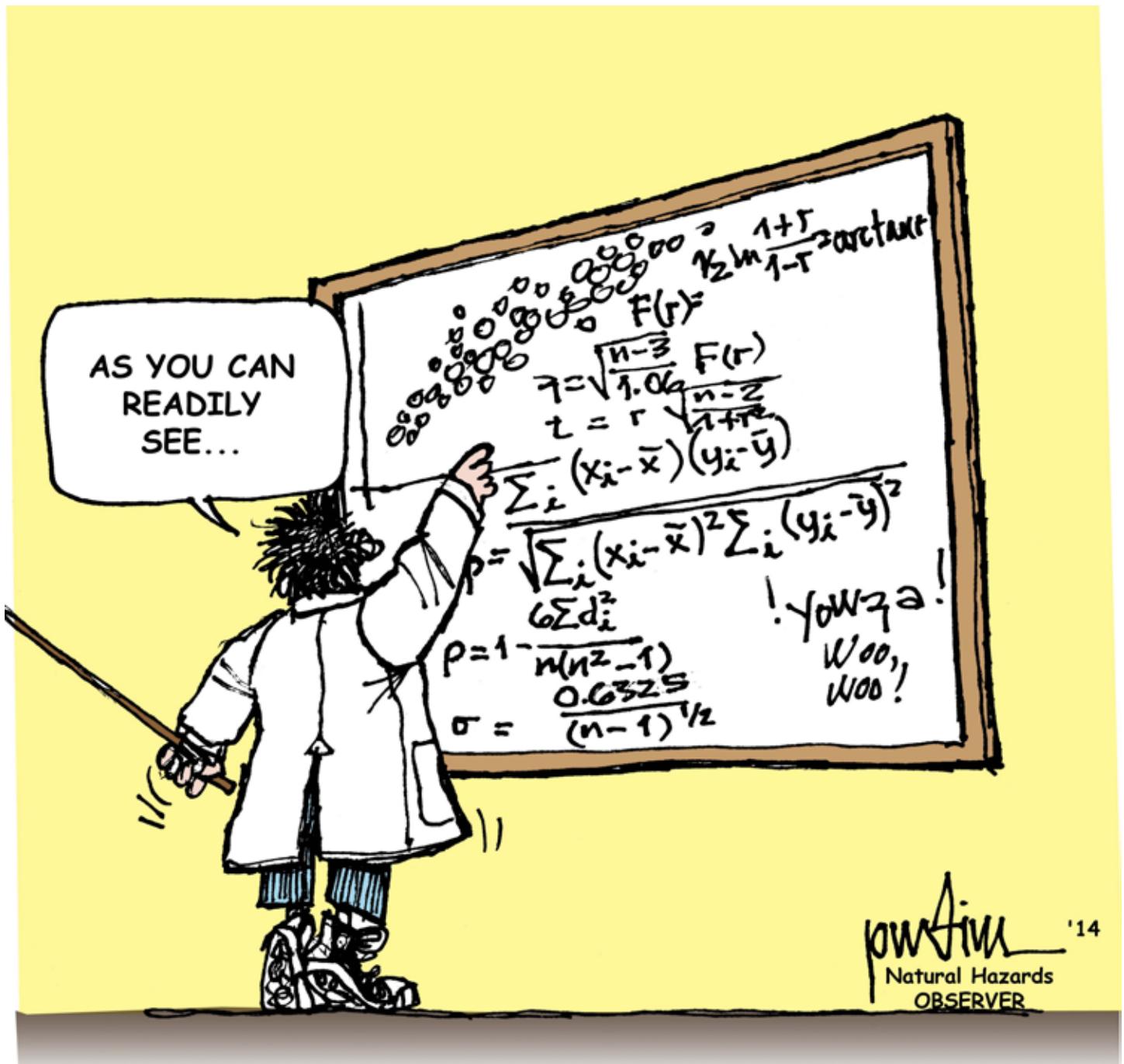


Figure 2



relatively flat when you normalize by GDP. Remember, part of the reason I wanted to compare storms to earthquakes is that it might serve to cancel out the commonality between the two types of disasters—trends in global human development.

Looking at the death trend since 1900, it's hard to say one hazard is much more of a killer than the other. It's easier to conclude that storms have less associated death since 1980 relative to earthquakes. The number of deaths from storm disasters compared to earthquakes has gone down by about 70,000.

The same thing seems to be happening for the metrics of injuries and homeless. In the past few decades, the trends have been getting better from the perspective of storms. The number of injuries from storm disasters has gone down around 40,000 since 1980 relative to earthquake disasters, with about 1.5 million fewer homeless.

In sum: Figure 3 shows earthquakes are the big losers.

So...

Can we draw any conclusions about whether, as a global community, we have become more or less resilient to storms than to earthquakes?

Any answer can only be in terms of the loss side of resilience. This data doesn't have anything to say about the recovery side. Clearly, if there is zero loss, there isn't any recovery and a community is perfectly resilient. But this never happens. So any conclusion is with respect to a very partial representation of resilience.

Conclusions also depend on what variables you think should be used to represent resilience. Broadly, I think those variables are well-being, identity, services, and capital. (You can find a wide-ranging discussion of this at my blog: [www.resilience.com](http://www.resilience.com).) The EMDAT metrics are very imperfect ways of representing only the variable of well-being—not the other three variables.



Regardless, we can say something about the data. Given a clear increase in the number of storm disasters, I'm comfortable saying that the world is becoming more resilient to storm disasters, but only as represented by deaths, injuries, and homelessness. Relative storm losses have gone up. This is true even though the annual occurrence of storm and earthquake disasters is well correlated monotonically and so are losses for both hazards (less so). Anyway, \$8.5 billion relative difference since 1980 isn't a lot in the grand scheme of things. Plus, actual losses (that haven't been smoothed) have been extremely erratic since the 1980s—sometimes a lot more for storms and sometimes less.

Most concerning to me is that correlation between earthquake disaster occurrence and associated losses has gone down precipitously since 1980 relative to the past century. There has been much more earthquake loss each year from about the same number of earthquake disasters. The correlation went down for storms too, but not nearly as much. Losses from storms and earthquakes used to be fairly well correlated, but not now. It appears that vulnerability to storms is either going down or it's going up for earthquakes.

AND WHAT'S UP WITH THE 1980s? Reaganomics? Miami Vice? Leg warmers?

Climate change?

One might wonder if increasing storm disaster occurrence and loss is somehow associated with climate change. Keep in mind that occurrence refers to the occurrence of a disaster as defined by EM-DAT and not the occurrence of extreme weather events or increased seismicity. It is impossible to say with just this data. Given the temporal scale of climate change there is probably no combination of data right now to come to a definitive conclusion.

But considering just this data, one might expect that all of the trends associated with storms would be increasing relative to earthquake disasters. No doubt there's a bigger climate signal in storms than earthquakes. But clearly earthquake disasters are on the rise too. It's not just storm disasters.

Because of the large variability since 1980, it is also tough to make a case for a climate change signal with respect to monetary losses—an association I've seen many times in the media. More so, the increase in earthquake-related losses appear to happen around the same time as storm losses. These two trends are relatively correlated.

Rather than climate change, it's worth considering another (or additional) possibility.

Human development plays a larger role in loss from storms than from earthquakes. Development exposes more stuff to both types of hazards, but it also increases storm hazards because of things like parking lots and moving dirt around—not the case for earthquakes.

Development might be, in essence, double counted in EM-DAT's storm occurrence metric. The point has been made elsewhere that you can explain away a possible climate change signal by accounting for rising global wealth and output. This makes sense to me. And so what if you account for the dual role of development in creating storm disaster risk?

There have been reactions that concern me in the media from some pundits, members of the public, and scientists in response to statements that storm disaster trends are not well correlated with climate change metrics.

I hear assumptions that researchers who say that increasingly common weather-related disasters are not strongly

linked to climate change are also saying that climate change is not occurring or isn't anthropogenic. But that's not the point at all. (The point isn't even necessarily that there won't be a stronger link in the future.)

The point is that we can't let issues of climate change distract from disaster-related issues associated with extreme weather or other natural hazards. Resilience to natural hazards and climate change resilience are not the same thing.

The reaction may be based on confusion, whether because of poor communication or poor comprehension. That is much less concerning to me than if the reaction is based on defensiveness or willfulness. Are there agenda-driven folks who don't want some data and analysis to muddle their well-crafted message? Probably.

For those whose agenda is to have research inform public and political dialogue, I think it's important that we at least leave the door open that climate change does not explain past disaster trends. Certainly, things may change in the future.

Natural hazard mitigation is needed, as well as climate change mitigation. Perfect climate change resilience is not enough to be resilient to extreme weather events or any other hazard events. There are no doubt commonalities in the capacity to be resilient to climate change and natural hazards. However, it is important the two aren't confused.

Resilience to natural hazards, such as storms and earthquakes, is about the capacity to minimize the losses due to some distinct event and then recovering from those losses. Yes, loss and recovery can be represented or defined in many different and sometimes disputed ways. But recovery doesn't really make sense for climate change. It isn't a single distinct event, at least not within the time frame of typical community recovery from hazard events.

The difference in temporal scale and the diminished role of community recovery means that climate change isn't a necessary consideration for resilience to natural hazards. Disaster practitioners and researchers can succeed at their work towards resilience without ever thinking about climate change resilience. I'm not saying that we don't or shouldn't.

We need to spend more time thinking about and dealing with major changes in vulnerability that have occurred the last few decades, regardless of climate change.

Climate change resilience and disaster resilience are separate things that should not be confused or assumed to overlap so much that one of them can be ignored. I personally think that this confusion and using disasters to motivate climate change resilience often distract from a real and separate need to make communities resilient to disasters, including to disasters not related to climate change like earthquakes. If our climate wasn't changing, disaster resilience would still be necessary.

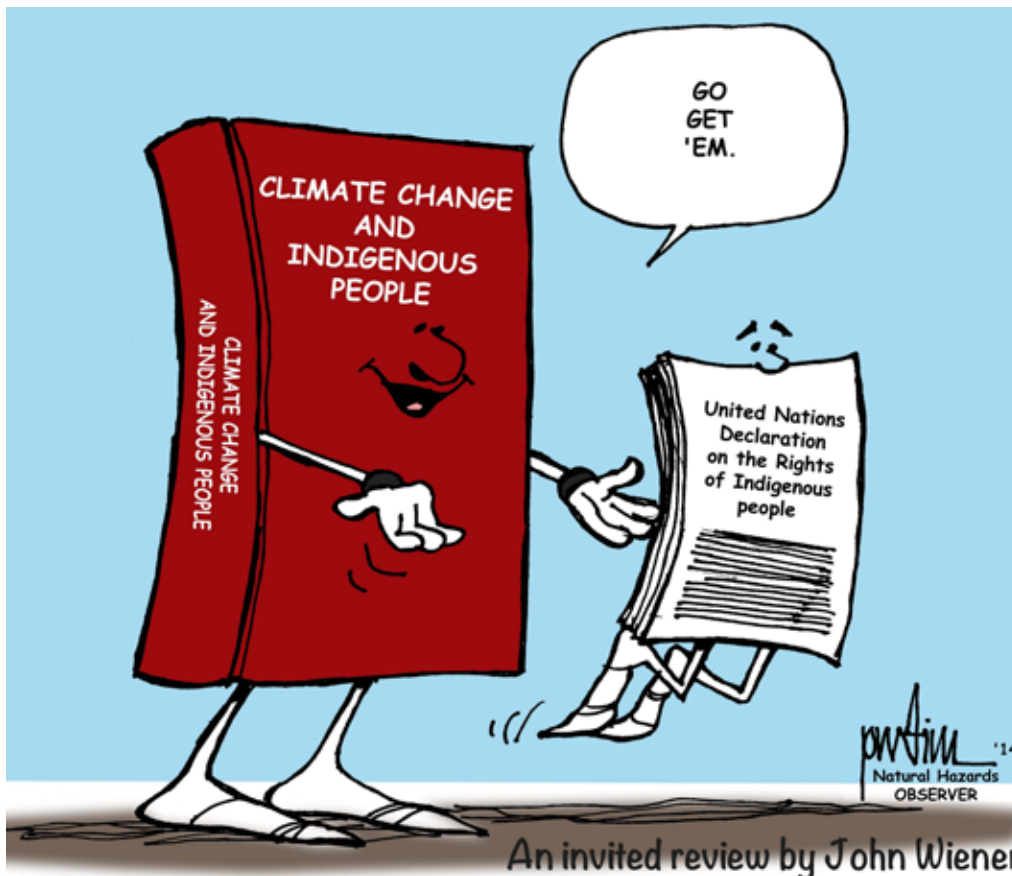
FOR THOSE WHO AREN'T HAPPY with my analysis or the representation of it, you can get the EM-DAT data at [www.emdat.be](http://www.emdat.be) and my computer code is at <http://tinyurl.com/disaster-trends>. Non-programmers should check the code link too; it's pretty fun to look at.

*Scott Miles is director of the Resilience Institute at Huxley College at Western Washington University, and an associate professor of environmental studies.*

# 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](mailto:wanda.headley@colorado.edu).



An invited review by John Wiener

**Climate Change and Indigenous Peoples: the Search for Legal Remedies**, edited by Randall S. Abate and Elizabeth Ann Kronk. 2013. ISBN: 978-1-78100-179-0. 616 pp., \$46.60 (softcover). Edward Elgar, <http://bit.ly/1krNc1k>.

This book is important for the hazards community concerned with the intersection of global change and the search for ways forward. It adds to work examining the roots of human choice in response to hazards and resource management. This is important for researchers seeking approaches to climate impacts based on fundamental social norms, expressed through legal processes. It isn't light reading. It's a law book as well as a set of case studies, including excellent syntheses of the issues.

The importance of shifting from individual human rights ideas to a new respect for groups and cultural continuity is a theme here. Readers will be rewarded for working through the first chapters. This essay will provide some context for those with limited access to hefty academic undertakings like this excellent work.

This is not a pragmatic book in the sense of providing technical guidance on response. But any investment or re-allocation of effort or resources from outside indigenous people will be ultimately framed in some legal fashion. Within the

communities directly at risk, the imperatives are brutally clear, though their diversity is as broad as the diversity of environments in which they have lived. The focus on legal remedies is necessary, since many indigenous peoples face dissolution of ancient cultures—loss of place. The place-based traditional knowledge with which humans have succeeded for millennia in every environment is terribly endangered.

*Climate Change and Indigenous Peoples* makes a substantial contribution to the literature on the legal framings that led up to the United Nations Declaration on the Rights of Indigenous People, adopted in 2007. It was the culmination of decades of change. The evolution of international law on human rights is covered well. It is the structure that serves as the background to the specific cases. Lillian Aponte Miranda's chapter, an "introduction to indigenous people's status and rights under international human rights law" ought not to be separated from the editors' opening chapter on issues common to indigenous peoples despite their diversity. The chapter on regulatory efforts—or lack of efforts—by Deepa Badrinarayan is heroically concise. Eugenia Charles-Newton and Elizabeth Ann Kronk introduce concepts of sovereignty in law, richly illustrating with U.S. History. Rebecca Tsosie extends the discussion further into climate change and how sovereignty may take on meaning. The sixth chapter in this introductory section, by Maxine Burkett, bridges the basic perceptions of human relations with each other and with the world that appear frequently in indigenous worldviews, in sharp contrast to those of the dominant commercial culture.

These chapters serve as the foundation for the cases that comprise the rest of the book, in chapters seven through 24. Burkett's extension of the basic point about the collective or cultural aspects of the injuries to indigenous peoples is a fine summary of basic values for the long-lived cultures. Rescuing individuals from imminent harm is unquestionably desirable, but throughout recent history we have seen that interpreted at great cost to indigenous people. Their own culture was regarded as harmful (e.g. the boarding schools and deculturation tragedies). Now, the cultures themselves are again at

risk, and their values internally and as sources of knowledge for those outside are a human legacy must not be damaged further.

The moral case for indigenous values and the technical case for their resilience and long-term success has been made, but without much progress toward legal characterizations which would provide security. A few exceptions have appeared in recognition of group ownership and operation of some resources, such as forests and some fisheries, sometimes called "common property," as opposed to individual property, state/government property or resources without ownership or non-property (one review is provided in National Research Council, 2002, *The Drama of the Commons*.) Now, with truly global-scale threats, the new basis of at least a far-stronger articulation of the norms emerging in public international law is very welcome after so many years of steady progress in diagnosis of damage without much sense of direction for a prescription.

Readers may be pleased to know that the great work, *Cultural and Spiritual Values of Biodiversity*—a splendid collection from dozens of leading scholars—is available on-line at no charge now. It was produced in response to a call from the United Nations Environment Programme in 1997. Cross cultural differences on resource and human relations must not be regarded as unscientific, uninformed, or static encodings of accidental success. On the contrary, the amazing duration of peoples all over the world demonstrates just the contrary.

THERE IS NO NAIVETE HERE about the translation of moral norms into nation-state policies with enforcement and investment in resistance to accelerating climate change. But there is hope that basic issues will be clarified through the urgency of indigenous peoples under siege. There are increasing problems of ideas about resource ownership based in pre-colonial principles of the divine rights of Western European royalty. To quote Miranda: "Ultimately, indigenous peoples' internationally agreed-upon human rights offer a legal and normative vantage point for evaluation and addressing the impacts of climate change." And as Tsosie and excellent chapters by Sarah Krakoff and Jon-Daniel Lavallee, and by Judith Royster explain, far too many groups within the United States and its territories need all the help they can get in mobilizing that normative force into action, whether in terms of positive adaptive acts or as reduction of obstacles to adaptation.

Most notably, obstacles appear in places such as disaster recovery assistance not encompassing more than restoration, limited purposes for other state and federal programs, inability or unwillingness of agencies to collaborate, and sometimes perverse-seeming limits such as state limits on water rights peculiar to tribes. None of the chapters disappoints, though there is the conventional avoidance of population size issues as perhaps a "third-rail" topic in global change discourse, made lethal by the moral complexities. Another "non-topic" is the problem of sustainability of current conventional agriculture, though recognition of trouble is beginning to emerge. The area where the next edition or volume might expand most fruitfully is food sovereignty and problems of self-supply in marginally productive environments where long-term practices were at lower population densities. That invokes a substantial literature but one hopes for linkage to scholarship such as this book provides.

GIVEN THE QUALITY OF THE WORK HERE, from a great di-

versity of disciplinary approaches, choosing highlights is a reflection of the reviewer's interests and pleasure in discovery. From the point of view of law and climate change, two works stand out. Hari Osofsky wrote on the significance of the Inuit petition to the Inter-American Commission on Human Rights. The petition did not stimulate direct action or an action-seeking response, but Osofsky points out the value of the effort in focusing attention on conflicts between stated values and increasingly inarguable consequences of behavior by the United States and other national governments. With trillions of dollars spent on defense against a few threats while others are already severely damaging critical resources, what can indigenous peoples do to bring attention to contradictions between claims and deeds?

Another chapter, by Kerry Boom, is an informative analysis of hypothetical litigation by the small island state Tuvalu versus Australia. This chapter serves well with Osofsky's chapter to illustrate the frustrations of norms without teeth. The international experience with domestic ethnic violence within many nation-states is not a cheerful basis for seeking respect for relatively small groups whose resources may already have been effectively taken under various legal ideas. The prospects for Tuvalu are interesting because of the return to norms and values where there is no judicial or political likelihood of assertion of rights. Boom finds that the United Nations Convention on the Law of the Sea may be a more fruitful avenue than the climate rhetoric, because of the stronger language previously agreed to by signatories. Evidence of oceanic change is mounting, as water becomes more acidic while heat and circulation are also changing, but establishing jurisdiction may be easier than compelling the kinds of national commitments needed to slow the increases in damage. The prospect Boom illuminates, however, may include the potential for a large number of joined complainants as well as respondents, at least increasing the attention-focusing power of such an effort.

READERS MAY FIND DISAPPOINTING the role of the World Bank and other multilateral financial organizations in the REDD+ and other efforts. REDD+ is a modification of an initiative on Reducing Emissions from Deforestation and Degradation. Leonardo Crippa describes the role of the World Bank as "gateway for carbon finance programs" involving purchasers buying carbon emission credits from forest holders. History does not offer optimism, but Crippa argues policy could improve. The following chapter by Andrew Long takes on REDD+ and Brazil's indigenous peoples, showing potential for benefits but challenges in design and implementation. Philomena Kebec's chapter recounts the impacts of forest exploitation in North America, in the history of the Ojibwe peoples, as a cautionary example of commercializing long-term values into short-term uses.

The economic valuation issues are not a bright thread in this discussion, but they are not invisible. The relative values of the present versus the future are a major challenge for economic analysis, as a large literature has shown, on intergenerational equity and discounting future to present value—and the rate of discount to apply. One of the virtues of the careful elaboration of the indigenous peoples' worldviews is illustration that the cost-benefit analysis we commonly employ is the answer to a question that most cultures simply do not ask about the long-term or their families and descendants. The symbolic expression becoming more widespread is "the sev-



enth generation" forward. The net present value of an asset that far in the future is trivialized by a typical discount rate (which may be thought of as compound interest, only working backward from the future and shrinking rather than growing as if moving forward into the future). What are the moral norms for framing the question of the value of the future? Beyond classics in the economic literature, the question that this book goes to is: Who should decide? For whom? What rules do we play by? What values do we seek in enforceable rules about the obligations of people to other people, alive now and in the future.

Use rights or ownership of a resource has not always meant authority to destroy, nor authority to impose costs and losses on all others or future generations. This book joins the increasingly rich literature demonstrating the profoundly different moral basis of stewardship such as practiced by the humans in most of the world for millennia, before the technology-assisted invasions, colonization, and transformations of the world. This is far too large to do more than mention here; readers might want to begin with Wolf (1982) and some of the great work on how the Americas and Europe interacted both culturally and biologically (Weatherford 1988).

Readers should be advised that the context for this book is important. It fits well with some other important resources, including an archived video of an excellent conference, and a special issue. The video (<http://bit.ly/OXU75u>) is from the University of Colorado School of Law's conference, held November 1, 2013 on "free, prior and informed consent." What rights, if any, do indigenous peoples have over their places and those seeking extraction or development of resources? The issues for people facing new forms of oil and gas extraction in the

United States and Europe are not very far removed from those facing massive changes in their places elsewhere in the world, but the legal framing and distributions of rights, to participate as well as to affect the outcomes, are often very different. The presentations at the Colorado conference grapple with the fundamental issues of who can do what to whom: who has a moral or a legal right to be consulted or to consent to the most profound damage humans have done and are doing to each other and the planet? American Indian law scholar Walter Echohawk is featured in the conference, bringing a view of his new book (2013) on the coming central role of the United Nations Declaration on the Rights of Indigenous Peoples, as a codification of emerging norms that should inform law and regulation.

For the United States, readers should know about the special issue of the journal *Climatic Change*, in 2013, edited by Julie Maldonado, Raj Pandya, and Benedict Colombi, on "Climate Change and Indigenous People in the U.S.: Impacts, Experiences and Actions." The United States encompasses large areas of the Pacific as well. Among these chapters, coastal hazards people may want to see Maldonado, Shearer, Bronen, Peterson and Lazrus on climate change and displacement of people, but as with other special issues the whole is greater than the sum of its parts. In addition, substantial work on native peoples and climate and weather is reported in work with federal agencies and native peoples, including Alvord et al. 2010, Collins et al. 2010, Ferguson et al. 2011, Maynard, Ed., 2002, and the subsequent Native Peoples, Native Homelands Workshop II, 2009, Redsteer et al. 2013, and see also Wildcat 2009; law reviews and other journal literature are appearing increasingly frequently. The work listed here is particularly

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reflective of the values issues that demand attention. Much of the U.S. work fed into the *Third National Assessment of Climate Change* (United States Global Change Research Program 2013) and chapters on native peoples as well as regional summaries.

Internationally, important groundwork for the Intergovernmental Panel on Climate Change and the forthcoming *Fifth Assessment Report* was compiled in Nakashima et al. 2012. As with the U.S. studies, there is increasing respect not only for the technical or practical responses Indigenous Peoples have learned for weather and climate resilience; there is also increasing respect for the value basis of other worldviews that we may shorthand as including stewardship.

Abate and Kronk have brought us an important contribution to understanding stewardship, the meanings of thinking long-term, and scholarship about the very threatening disconnection between those ideas and the legal framing of our relationships to other human beings and to the future. The coverage includes places from Nepal and China to the Pacific, Kenya and the Arctic, with a cumulative impact this review was intended to reflect. In a last editorial selection, a quote from Navajo legal scholar Rebecca Tsosie: "As a collective global society, we have lost our capacity to generate any meaningful limitation on the 'right to develop,' and we jeopardize the survival of our planet, not to mention the legacy of the future generations, by this failure." Whose values and whose future do we care about? Who gets to decide?

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## ALL HAZARDS

**Acting as if Tomorrow Matters: Accelerating the Transition to Sustainability.** By John C. Dernbach. 2012. ISBN: 978-158576-158-6. 369 pp., \$42.95 (softcover). Environmental Law Institute. <http://bit.ly/KmTPSV>

This is a collaborative effort in which 51 coauthors are listed, but “principal author” John Dernbach weaves their work into a single narrative. The result is a more coherent argument than you usually get in books where authors each take responsibility (and credit) for individual chapters. On the other hand, the book is so packed with information and perspective that you get the feeling that all those 51 authors are looking over your shoulder to make sure their voice is heard.

Sustainability is a much-abused concept. Dernbach offers seven components of what he means by the terms, based on the concept that “sustainability provides a framework for humans to live and prosper in harmony with nature rather than, as we have tended to do for centuries, at nature’s expense.”

Achieving sustainability is not the responsibility of one entity—government, say, or business. It requires that just about everyone buy into it. In chapter eight, Dernbach writes, “There is simply too much to do to achieve a sustainable society, in too many places, for government to do it by itself. Broad, supportive public opinion, voiced in conversations with neighbors and in the workplace, through the purchase (or not) of goods and services, and also through elections, is an indispensable requirement for sustainability.”

The book cites some polling data about people’s understanding of and attitudes toward the components that may make a sustainable world possible. A lot of it is not encouraging, as the author admits: “Some of the opinion trends presented here do not bode well for continued public concern for the environment and global climate change—and therefore support for sustainability policies.” But there is considerable difference between the cohorts of young and old. Dernbach finds reason to hope that younger people—those born after about 1982—“could be an important voice in solving future environmental problems.”

Despite the difficulties in building an, ahem, sustained sustainability movement, Dernbach and his coauthors conclude on an optimistic note. Creating a sustainable world will improve the quality of lives, be economically attractive, further the cause of justice and equality. “Many of today’s political problems—the budget deficit, the economic recession, and climate change—all have a common root: a tendency to act in ways that privilege today over tomorrow, and ourselves over our children and our grandchildren,” he writes. “Jonas Salk, the inventor of the Salk polio vaccine, said, ‘Our greatest responsibility is to be good ancestors.’ That is precisely the worldview required for intergenerational equity.”

**Natural Disasters: Opposing Viewpoints.** Margaret Hae-

rens and Lynn M. Zott, eds. 2013. ISBN: 978-0-7377-6060-6. 233 pp., \$44.95 (hardcover). Greenhaven Press. [gale.cengage.com/greenhaven](http://www.gale.cengage.com/greenhaven).

This book offers a non-technical starting point for discussion about the various issues surrounding natural disasters. Most of the pieces have been published elsewhere, in newspapers, magazines, or as book chapters. They explore various contentious issues. The idea is that “careful examination of others’ views can lead to the readers’ understanding of the logical inconsistencies of their own opinions, perspective on why they hold an opinion, and the consideration of the possibility that their opinion requires further examination.”

Topics examined include the government’s role in disaster relief, media coverage of disasters, what contributes to the frequency of disasters, and others.

**3.11: Disaster and Change in Japan.** By Richard J. Samuels. 2013. ISBN: 978-0-8014-5200-0. 274 pp. \$29.95 (hardcover). Cornell University Press. [www.cornellpress.cornell.edu](http://www.cornellpress.cornell.edu).

Can disaster bring about political change for the better? Perhaps, but not so dramatically as might be expected, Richard Samuels concludes in his exhaustively documented study of Japan after the earthquake, tsunami, and nuclear crisis of March, 2011.

“We are left with a paradox,” he writes in his conclusion. “The 3.11 catastrophe was not the ‘game changer’ many policy entrepreneurs desired. It did not cause structural change to the Japanese body politic. Normal politics prevailed, with all its imperfections, and ‘staying the course,’ rather than the more forward leaning ‘put it in gear,’ seemed to prevail.”

The 3.11 disaster was an enormous catastrophe by any measure. The tsunami height ranged from 3.5 to 9.3 meters. 20,000 people died, a 300-mile stretch of coastline was destroyed, 70,000 homes washed away, and 160,000 people moved into temporary shelters.

But that’s not all. Three nuclear reactors melted down and bathed their surroundings in dangerous levels of radiation. “The government estimated that nearly 170 times more cesium 137 and more than twice the strontium were released in Fukushima than by the bomb that had leveled the city of Hiroshima in August 1945.”

Samuels documents a regulatory system that had been captured by the industry it was supposed to regulate. He explores the issues of resilience (though mercifully he doesn’t call it that) about how the local communities responded, identifying both strengths and weaknesses in the famed Japanese “social solidarity.” He writes, “The people of Tohoku were repeatedly (and by all accounts deservedly) applauded for their selflessness and resolve. They were widely admired—almost to the point of caricature—for their patient and persevering nature and for their acceptance of what had befallen them.”

But a close study also exposed some weaknesses in this



social solidarity narrative. “One of the most intractable problems,” Samuels writes, “for post-3.11 reconstruction—and for the discourse on community—was the shallowness of local identities.” Many of the municipalities were new creations from an administrative consolidation in the early 2000s. He says, “Reports of distrust among the new neighbors were reflected in choices of temporary shelters and undercut the ideals of community that were being spun by political leaders and editorialists.”

Samuels has set himself a large task with this book: to see if major political change can follow a disaster like this one. Japan has been in a much-publicized economic malaise for nearly 20 years. Samuels looks at the extent to which both leadership and public have been energized to shake off that malaise, politically, economically, socially. His answer is that is too soon to tell, but that at least Japanese public policy may have been pushed in the direction of increased transparency.

**Disasters Without Borders.** By John Hannigan. 2012. ISBN: 978-0-7456-5069-2. 195 pp., \$24.95 (softcover). Polity. [www.politybooks.com](http://www.politybooks.com).

This is a very insightful book about the international politics of disaster aid. Though littered with a little too much jargon—“multiple fracture points,” “axis of vulnerability,” and “normative principles” all within two sentences—Hannigan dissects the different currents running through the international aid community.

He provides a nice summary of the tensions among global aid organizations: “A split has lingered since the 1970s between those who treat vulnerability as a material and technical problem that can be remedied by designing stronger buildings, and more advanced monitoring and forecasting tools, and more times early warning systems, and those who place more importance on the relationship between disaster risk reduction and social vulnerability. Another philosophical difference exists between disaster practitioners and managers in the field, who prioritize the necessity for rapid life-saving responses, and development experts who argue for the importance of planning and collection of data. A third fault line has opened up between those who believe that the delivery of disaster relief must be regarded as being poetically neutral, and those who argue in favor of a more proactive ‘human rights’ approach to humanitarian aid.”

It would be hard to come up with more succinct summary of the tensions in international aid tensions than this. These tensions are played out in the book, as they are in the world.

## EARTHQUAKES

**Earthquakes and Engineers: An International History.** By Robert K. Reitherman. 2012. ISBN: 978-0-7844-1071-4. 749 pp. \$130 (softcover). American Society of Civil Engineers. [www.asce.org/pubs](http://www.asce.org/pubs).

To begin his first chapter, Robert Reitherman writes, “To avoid scaring off readers, I have refrained from putting ‘historiography’ into the title of this chapter.” It doesn’t seem likely that a person about to tackle a 750-page book on earthquake engineering would be put off by a little thing like historiography, but it’s nice to find an engineer with a sense of humor.

Reitherman interweaves a complex story here on a difficult topic. It’s not for the faint of heart. But he in-

cludes enough anecdotes to keep a general reader with an interest in the topic going through it. Reitherman writes this engagingly, but you really, really have to want to learn about earthquake engineering history to get to page 634, where the main text ends.

One important contribution this book makes is to focus on the contributions from the international engineering community alongside the Americans—mostly from California (well, duh).

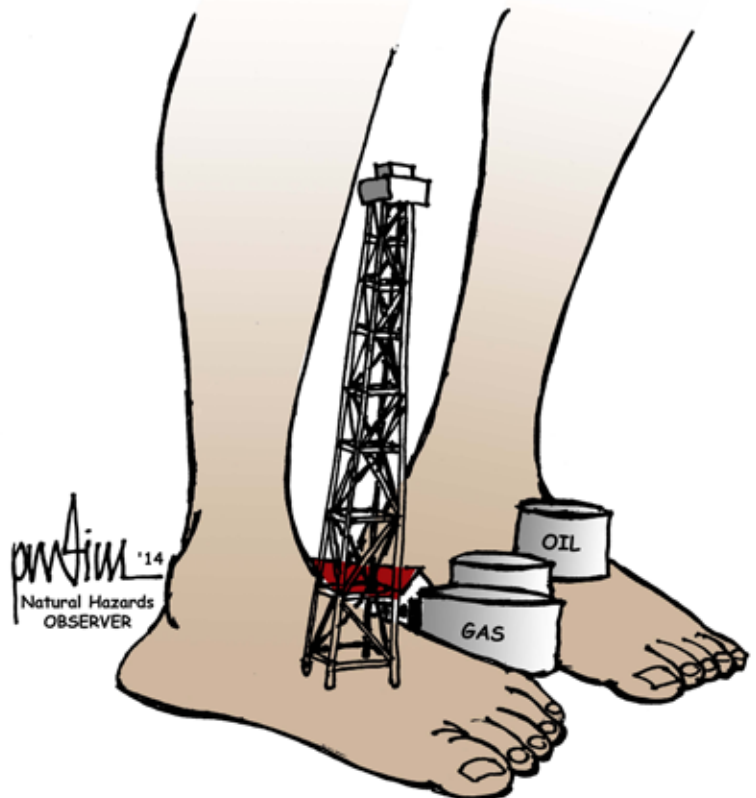
## CLIMATE

**The Great Disruption.** By Paul Gilding. 2011. ISBN: 978-1-60819-353-0. 290 pp. \$17 (softcover). Bloomsbury Press. <http://www.bloomsbury.com/us/bloomsbury/bloomsbury-press>.

This book by Australian activist Paul Gilding is a disheveled, optimistic assessment of humanity’s chances of dealing with global warming. Gilding wants to hold global average temperatures to an increase of one degree C, arguing that there must be a crisis before people take action, but that the rapid response to this crisis will make everything A-OK.

*The Great Disruption* uses the unfortunate choice of a “war” metaphor to drive home its points. I suppose the failure of the war on drugs, the war on the West, the war in Iraq, the war on poverty, and so on won’t discourage people from this description until, I suppose, some larger, more muscular metaphor suggests itself. I don’t know, maybe tsunami or thermonuclear explosion or something.

To find a good war for his purposes, Gilding’s “one-degree war” hearkens to World War II as its role model, specifically the unified and largely uncomplaining sacrifices the populations of the belligerent nations made to win it. Now predicting the future is fraught with peril, but I feel safe in saying that a lot of the sacrifices that Gilding proposes are



not going to happen. For instance: “Close one thousand dirty coal power plants in five years” (check); “Ration electricity, get dressed for war, and rapidly drive efficiency” (check); “Ration use of dirty cars” (check); “Strand half of the world’s aircraft” (check). There’s more, but you get the idea.

Gilding’s driving idea seems to be “we will act because we have to.” He paints a dystopic portrait of “system breakdown and a major economic crisis” to drive this action, assertion that the actions needed can be taken over a short period of time, relying largely, it seems on the demonstrated ability of humanity to adapt technology to almost any problem. We can only hope that he’s right.

**Biodiversity and Climate Change: Linkages at International, National and Local Levels.** Frank Maes, An Cliquet, Willemien du Plessis, and Heather McLeod Kilmurray, eds. 2013. ISBN: 978-1-78254-688-7. 462 pp., \$157.20 (hardcover). Edward Elgar. <http://bit.ly/OwscZC>.

This is a book about the legal precedents and protections for biodiversity around the world. And it’s kind of a depressing one at that. It necessarily focuses more on the failures to protect biodiversity in emerging economies, because there are so few successes to draw on. Gas flaring in Nigeria is damaging the rich and fragile Niger Delta. Loss of tropical forests. Drought and famine in Ethiopia. Human rights crises in Darfur. The vulnerability of the Amazon rainforest in South America.

One theme that emerges is the inability (or unwilling-

ness) of many countries to regulate the environmental damage that is occurring within their borders. A theme that also comes through—not one the authors intended, I think—is that climate change is not the biggest problem facing biodiversity around the world. Population growth, insatiable demand for irruptive energy supplies, political failures, poor planning, and habitat loss are all at least as large a problem as climate change for the world’s diverse ecosystems and their inhabitants.

On the other hand, the book explores what legal recourse there is in this arena. The authors do find some potentially powerful legal precedents to address biodiversity loss. It’s certainly a discussion worth considering closely. Is there any point in saving the world if in the process we kill off everything that makes living in it worthwhile?

## LANDSLIDE

**Landslides: Types, Mechanisms and Modeling.** John J. Clague and Douglas Stead, eds. 2012. ISBN: 978-1-107-00206-7. 420 pp., \$150 (hardcover). Cambridge University Press. [www.cambridge.org](http://www.cambridge.org).

When you cram 78 of the world’s leading landslide experts into a single textbook, it’s bound to be thorough and useful. Landslides will likely become a more frequent disaster if global warming, as predicted, increases rainfall intensity in many parts of the world. This book offers an assessment of all the relative contributors to landslides, from risk assessment to runoff prediction.

# Contracts and Grants

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

**Chemical contamination and remediation of plastic drinking water infrastructure during the West Virginia American Water drinking contamination incident.** National Science Foundation grant #1424627. [http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1424627](http://www.nsf.gov/awardsearch/showAward?AWD_ID=1424627). One year. \$49,999 to principal investigator Andrew Whelton, University of South Alabama, [ajwhelton@southalabama.edu](mailto:ajwhelton@southalabama.edu).

An accidental spill of a currently unknown quantity (estimated between 3,000 and 7,500 gallons) of 4-methylcyclohexane methanol from a coal preparation plant in Charleston, WV has compromised the drinking water supply for up to 300,000 water users in Charleston and nearby counties. This tragedy has caused the ban of use of potable water and has resulted in closure in several establishments including schools and business. President Obama issued a federal disaster declaration for the state on Friday, January 10, 2014 to provide federal aid for the state.

Utility and government responders do not have the information needed to determine the extent of plastic pipe contamination and their ability to be decontaminated by clean water flushing. It is well known that plastic drinking water pipes are particularly susceptible to chemical permeation. This project will explore the processes that control contaminant fate with plastic polyvinylchloride (PVC), high-density polyethylene (HDPE), and cross-linked polyethylene pipes and contaminant desorption during flushing activities. These materials are also used in ice makers, refrigerators, and dishwashers.

This project team will: (1) Investigate premise plumbing system drinking water quality; (2) Determine the role of contaminant concentration, pipe material type, and diameter on observed chemical concentration during stagnation; (3) Quantify diffusivity and solubility values for several organic contaminants and pipe materials; (4) Determine significant relationships between chemical fate, physiochemical properties, and plastic pipe properties; and (5) Elucidate the ability of flushing activities to remediate contaminated plastic pipes.

The results of the project will be: (1) incorporated several in-class drinking water contamination investigation activities that require them to go through the same fact finding processes as the emergency responders, utility staff, and homeowners; (2) presented results at an AWWA National conference to the drinking water utility and regulatory industry; and (3) submitted a research paper to an environmental science and engineering focused journal.

One of the larger gaps in our scientific understanding of the effect of chemical spill of 4-methylcyclohexanemethanol (MCHM), in the drinking water treatment plant and hence the potential risk to consumers, is the "solubility" of the chemical in plastic pipes or is adsorption to pipes, tanks and infrastructure in a treatment plant. Then, once adsorbed, how long will it take to be released into the water as time progresses. This information will then be evaluated in the overall long-term effect of the spill.

**Pre/post earthquake damage assessment for infilled RC**

**frame buildings.** National Science Foundation grant #1430180. [http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1430180](http://www.nsf.gov/awardsearch/showAward?AWD_ID=1430180). 22 months. \$312,687 to principal investigator Andreas Stavridis, SUNY at Buffalo, [astavrid@buffalo.edu](mailto:astavrid@buffalo.edu).

This project plans to dynamically test in the field an existing two-story reinforced concrete frame building infilled with unreinforced masonry walls. The building, located in El Centro, California, was built in the 1920s and is typical of the construction practice in California in that era. Buildings with similar characteristics are located in regions with high seismicity such as Los Angeles, San Francisco, the Mediterranean region, and Latin America. They often have historical significance but have proved vulnerable to earthquakes. Understanding their behavior has been a challenging task for engineers. The building selected in this study sustained damage during earthquakes in 1940, 1979, 1987, and 2010.

The building was repaired and retrofitted after the first three earthquakes. However, the damage induced during the 2010 event cannot be repaired cost effectively. The structure is scheduled to be demolished. This provides a unique opportunity to test a real building using mobile shakers. The testing will be incremental and is expected to bring the building to the verge of collapse.

The unique experimental data from the field will enhance our understanding of the complex behavior of these structures and their failure mechanisms, and it will be useful for future analytical, as well as laboratory shake-table studies since it will provide benchmark data for researchers and practitioners involved with earthquake engineering.

The research will develop a framework for the reliable assessment of damage in existing reinforced concrete frames infilled with masonry walls. The data obtained from field testing will be used to validate finite element models and damage identification techniques. The combination of the two tools will allow the derivation of a damage index that can be used to identify the state of a structure prior or after an extreme event.

Emphasis will be given in modeling the three-dimensional behavior of the structure including the out-of-plane behavior of the infill walls. Moreover, simplified models will be developed and validated with the results of the detailed analytical models.

The data obtained from the forced vibrations of the building will be also used for the validation of the analytical tools. In summary, the proposed research includes full-scale tests that will push a damaged structure further into the nonlinear behavior. Finite element models to capture the in- and out-of-plane interactions between the infills and the bounding frame; validation of the model with data obtained from the tests, as well as validation with data from previous earthquakes; and development and validation of a system and damage identification techniques for the quantification of damage in a real structure.

**Bangladesh Delta: Assessment of sea-level rise haz-**



**ards and integrated predictive development towards mitigation and adaptation (BanD-AID).** National Science Foundation grant #1433501. [http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1433501](http://www.nsf.gov/awardsearch/showAward?AWD_ID=1433501). 32 months. \$43,856 to principal investigator Faisal Hossain, University of Washington, fhossain@uw.edu.

This award provides support to U.S. researchers participating in a project competitively selected by a 13-country initiative on global change research through the Belmont Forum and the G8 countries Heads of Research Councils. The Belmont Forum is a high-level group of the world's major and emerging funders of global environmental change research and international science councils. It aims to accelerate delivery of the international environmental research most urgently needed to remove critical barriers to sustainability by aligning and mobilizing international resources.

The G8 Heads of Research Councils developed a funding framework to support multilateral research projects that address global challenges in ways that are beyond the capacity of national or bilateral activities. Each partner country provides funding for their researchers within a consortium to alleviate the need for funds to cross international borders. This approach facilitates effective leveraging of national resources to support excellent research on topics of global relevance best tackled through a multinational approach, recognizing that global challenges need global solutions.

This award supports research activities that will develop natural and social science frameworks to promote the adaptation to sea-level rise and related coastal hazards in coastal Bangladesh. Sea level rise, changes in land surface topography, and changes in the frequency of storms contribute to increasing vulnerability to coastal regions. This is especially true in Bangladesh, a low-lying coastal nation with a high population density that is also prone to hazards including monsoonal flooding, saltwater intrusion, erosion, and drinking water hazards.

This project will quantify the causes of sea level rise and land movement as well as the human interactions that govern coastal vulnerability in Bangladesh. An earth system analysis and prediction system will be constructed to promote the adaptation to and mitigation of these detrimental hazards. Using a range of satellite and ground instrumentation as well as socioeconomic tools, this project will integrate improved sea level rise predictions with land subsidence.

**Wave, surge, and wind hazard and damage from super Typhoon Haiyan.** National Science Foundation grant #1426445. [http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1426445](http://www.nsf.gov/awardsearch/showAward?AWD_ID=1426445). One year. \$30,000 to principal investigator Andrew Kennedy, University of Notre Dame, Andrew.B.Kennedy.117@nd.edu.

This project will collect perishable damage, wave, storm surge, debris, and wind data from Typhoon Haiyan that made landfall in Philippines. Haiyan may have been the strongest land falling tropical cyclone in recorded history. The data on wave, surge, and debris are characteristics of the storm and not highly dependent on the structures. Wind damage in the town of Tacloban and island of Samar sustained catastrophic wind and wave/surge damage. The Principal investigator will work in conjunction with representatives of Japan and Philippines Engineering Societies in collection of data.

Because Haiyan was (probably) the strongest recorded land falling storm in history, it represents one end of the en-

velope for design purposes. For this reason, ascertaining both the hazard and damage levels will give a good estimate of the types and quantities of damage, and failure mechanisms that might occur in the United States. Very strong low frequency wave and surge motions were noted during this storm with resulting catastrophic damage. Since these loadings do not exist in present standards, an improved understanding of the generation mechanisms, hazard levels, and structural damage will help to improve predictions of loading climate, and can be used to validate damage models. Documentation of damage of commercial buildings may permit assessment of wind speed intensity through reverse engineering.

**Threat perception on the first anniversary of the Boston Marathon bombings.** National Science Foundation grant #1426171. [http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1426171](http://www.nsf.gov/awardsearch/showAward?AWD_ID=1426171). Six months. \$50,272 to principal investigator Karen Quigley, Northeastern University, k.quigley@neu.edu.

On April 15, 2013, two bombs exploded near the finish line of the Boston Marathon, killing three and injuring more than 250. This tragedy was stressful for many of those living in the Boston metropolitan area, even those not attending the Boston Marathon. Social psychological research can help us understand how experiencing this type of event can affect us; for example, do these experiences influence how we perceive and respond to our social environment? Do we see the world as more threatening after experiencing this type of event?

Previous research demonstrated that in the weeks after the bombing, people had an altered tendency to see threats in ambiguous situations. The current research will use the context of the first anniversary of the Boston Marathon bombing to further examine this question. Specifically, we will longitudinally examine how media coverage surrounding the anniversary can change how people with low and high exposure to the initial event perceive potential threats. Participants will include people living or working in Boston at the time of the original event (high exposure group) and people not living in the area at the time of the original event (low exposure group).

The study will be conducted at three waves: two months before the anniversary (wave 1); within one month of the anniversary (wave 2), and two months after (wave 3) the anniversary. At each wave, participants' exposure to media coverage of the bombing will be assessed, and they will complete a threat perception task. In this task, participants view a person holding an object against a background scene for short intervals. Participants must quickly decide whether the person they see is threatening (e.g., holding a gun) or non-threatening (e.g., holding a soda can or wallet). The researchers hypothesize that those with more initial event exposure and those with more exposure to media coverage of the anniversary of the bombing will show a tendency to misidentify non-threats as threats, and decreased sensitivity to distinguishing threats from non-threats.

This study will be the first to examine the effect of news coverage of real-world mass violence on changes in threat perception over time. This research will have real-world applied impacts by showing how threat perception changes before and after a terrorism event anniversary with heightened media coverage. Alterations in seeing threats, such as "seeing" a person holding a gun when they are holding a wallet, can have serious implications for those working in jobs that require threat perception every day (e.g., police officers or

military personnel). This work also could reveal potential detrimental real-world consequences of highly evocative media reporting of the anniversary of a terrorism event, particularly for vulnerable individuals (such as those with higher event exposure).

**Ending a powerful explosive eruption: The case study of Novarupta 1912, Alaska.** National Science Foundation grant #1348080. [http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1348080](http://www.nsf.gov/awardsearch/showAward?AWD_ID=1348080). Three years. \$243,414 to principal investigator Bruce Houghton, University of Hawai'i, bhought@soest.hawaii.edu.

Short-lived but violent explosive episodes frequently occur during long-lived lava-forming eruptions at our larger volcanoes. Similar eruptions also occur during the build-up to or wind-down from powerful steady eruptions as seen at Mount Pinatubo in 1991. At least 24 such eruptions have occurred in the last 10 years in 12 different countries. These eruptions had few warning signs but yet impacted nearby regions with large, growing populations.

The novelty of this study is its focus on an well-studied event at Novarupta volcano, Alaska in 1912, which was the largest explosive eruption in the last 100 years. Three powerful eruption pulses, over approximately 60 hours, were followed by a series of violent, short explosions ejecting blocks showing a diverse range of magma textures. These textures form "fingerprints" to the processes that caused the change in style of activity at the volcano.

The project uses a variety of newly developed techniques to capture the rates of processes of gas release and escape in the shallow portions of the volcano's plumbing system. The techniques have in common that they are microanalysis of features of the erupted material on scales of millimeters to micrometers. They include two-dimensional and 3D imaging of vesicles, i.e., the gas bubbles in the erupted material, and measurement of the residual gases in and the permeability of the blocks. The study will reconstruct the architecture of the shallow magma plumbing, and constrain the conditions that led to a transition from a powerful steady eruption style into a series of short unsteady pulsing explosions.

**Precursory deformation at Southeast Asian volcanoes.** National Science Foundation grant #1345129. [http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1345129](http://www.nsf.gov/awardsearch/showAward?AWD_ID=1345129). Three years. \$115,265 to principal investigator Falk Amelung, University of Miami, amelung@rsmas.miami.edu.

The goal of the project is to use space-geodetic methods to search for precursory inflation at volcanoes in Southeast Asia. Indonesia and the Philippines are home for about 15 percent of the world's active volcanoes, which are responsible for some of the largest known historic eruptions, including the 1815 Tambora, the 1883 Krakatoa and the 1991 Pinatubo eruptions. Volcanic eruptions are inevitably preceded by the ascent of new magma to shallow storage levels, resulting in swelling of the ground surface, which is observable with satellites. The detection of inflation could pin-point to volcanoes, which are more likely to erupt in the near future.

We will use Interferometric Synthetic Aperture Radar (InSAR) observations from a variety of international SAR satellites. The data sources include the Japanese ALOS-1 satellite which operated from 2007 to 2011, and the European Sentinel-1 and Japanese ALOS-2 satellites which are both scheduled for launch in early 2014. Our objective is to develop

a 10-year inventory of deforming volcanoes for the region. Scientific questions this project will address include whether all or only particular types of volcanoes exhibit precursory inflation, whether inflation occurs immediately prior to an eruption and for how long, and how much inflation a volcano can sustain without eruption, and what are the controls for the ascent of magma towards the surface and for the depth of magma storage.

**Emergency evacuations and risk communication during the 2013 Colorado flood.** National Science Foundation grant #1431139. [http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1431139](http://www.nsf.gov/awardsearch/showAward?AWD_ID=1431139). One year. \$39,162 to principal investigator Hao-Che Wu, Sam Houston State University, tristanhcwu@shsu.edu.

This research will lead to better understanding of households' immediate response to a flash flood disaster in the United States and the short-lived aspects of disaster response data (evacuees' lasting memory). Scientists and emergency managers traditionally have used 100-year flood maps to demonstrate the occurrence of a major flood. Nevertheless, flood risk is not well understood by the general public. The time required to mobilize the resources for a major post-disaster survey delays the collection of data from households but little is known about whether people's recollections of their immediate pre-impact beliefs and actions change over time.

This study will use a flexible interview method and household surveys to acquire the data. The researchers will conduct field work at Colorado State. The interviews will help the researchers to validate the survey instruments and assess emergency managers' perspectives and experiences in the flood response. Three thousand households in the flooded areas will be identified through a random process. These households will receive the 2013 Colorado flood response surveys during March and September 2014. Statistical analyses will be used to analyze the survey data.

The researchers in this study expect to find useful emergency information that could affect the content of warning messages; risk area residents' perceptions of disaster information source and flood threat; and the speed of warning receipt and evacuation response. In addition, the result of this study can also provide empirical evidence on the recall of disaster response information.

The results of this project will benefit emergency planning professionals in the United States and throughout the world by providing important tests of emergency response theories, valuable information on methods of disaster response recall information for disaster researchers, and valuable practical information for emergency managers. In particular, identification of factors that affect people's responses to floods will improve the ability of government agencies to provide the general public with more useful information about how to protect themselves and their families.

**Flexible multi-scale models of transportation network service recovery.** National Science Foundation grants #136116 and #1361448. [http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1361116](http://www.nsf.gov/awardsearch/showAward?AWD_ID=1361116). Three years. \$215,942 to principal investigator Joost Santos, George Washington University, joost@gwu.edu, and \$158,864 to principal investigator Laura McLay, University of Wisconsin-Madison, lmclay@wisc.edu.

This research will transform emergency response planning for transportation service disruptions through the for-

mulation and integration of hierarchical multi-scale models: (1) network optimization and expected covering models to evaluate strategies for allocating emergency responders across highway networks; and (2) an economic interdependency model to optimize the multi-sector, multi-regional impacts of emergency response strategies on overarching productivity objectives.

In the first tier of the modeling hierarchy, we will formulate new transportation network optimization models to identify optimal configurations of emergency responders and dispatching protocols for resolving prioritized incidents based on utility and coverage metrics.

In the second tier of the modeling hierarchy, we will formulate an economic interdependency model to evaluate the efficacy of transportation network service strategies in minimizing congestion and higher-level objectives such as disruptions to workforce and commodity flows, economic loss, and sector inoperability.

This research will enhance the capability of transpor-

tation planners and emergency managers through flexible models for deploying emergency responders to resolve varying incident priorities, as well as expanding the optimization focus to include large-scale interdependent impacts due to disruptions in workforce and commodity flows. This research will benefit society through an integrated framework for managing transportation resources from tactical (response) to strategic (multi-sector, multi-region impact) levels. The results have the potential to inform national guidelines for managing disruptions to critical interdependent infrastructure systems.

## Conferences and Training

**May 5-8, 2014**

### **5th Africa Regional Platform for Disaster Risk Reduction**

**United Nations Office for Disaster Risk Reduction-Regional Office for Africa**

**Abuja, Nigeria**

*Cost: Not specified*

The meeting brings together stakeholders ranging from nongovernmental organizations to the private sector to share their common commitment to building resilience to disasters and climate change in African communities.

<http://www.unisdr.org/africa>

**May 5-7, 2014**

### **The Australian and New Zealand Disaster and Emergency Management Conference**

**The Australian Institute of Emergency Services, Australian and New Zealand Mental Health Organization, and others**

**Gold Coast, Australia**

*Cost: \$749*

This conference will discuss post-disaster psychological and physical problems, as well as community ability to prepare for and recover from disasters. Topics include managing animals in disasters, current trends in emergency management education, the role of local government in business recovery, trauma and disaster mental health mitigation, community resilience, and data protection.

<http://anzdmc.com.au/index.php>

**May 5-7, 2014**

### **Design for Urban Disaster**

**Harvard University**

**Cambridge, Massachusetts**

*Cost: \$75*

The conference is for humanitarian aid practitioners, government experts and physical space designers “to explore ways to improve actions before and after disasters. A release about the meeting says, “Urban disasters are on

the increase, with rapid urbanization causing more people to live in place vulnerable to hazards such as flood, earthquake, and fire.”

<http://www.designforurbandisaster.com/>

**May 6-7, 2014**

### **U.S. Catastrophe Modeling Conference EQECAT**

**Fort Lauderdale, Florida**

*Cost: \$995*

This conference addresses issues of catastrophic risk modeling for insurers and reinsurers. Topics include managing flood risk, validating models, earthquake and offshore energy modeling, loss simulations, designing flood insurance programs, Super Cat hurricanes, and Pacific Northwest earthquake scenarios.

<http://www.eqecat.com/events/us-cat-modeling-conference/>

**May 8-9, 2014**

### **Conference on Disaster Mitigation, Preparedness, Response and Sustainable Education**

**Center for Rebuilding Sustainable Communities**

**Boston, Massachusetts**

*Cost: \$120*

This conference will examine the role of architecture, planning, and engineering education in preventing and mitigating natural hazards. Topics include cultural resources recovery, contingency planning, transportation infrastructure, future trends in education, ethical and political ethics, and Atlantic-based tsunamis.

[http://www.umb.edu/crscad/events/sustainable\\_reconstruction\\_2014](http://www.umb.edu/crscad/events/sustainable_reconstruction_2014)

**May 11-16, 2014**

### **Governor's Hurricane Conference**

**Florida Governor's Hurricane Conference**

**Orlando, Florida**



Cost: \$200

This conference will provide hurricane-focused emergency management training for businesses, elected officials, and the media. Topics include the role of shelter transition teams, Florida's regional evacuation studies, urban search and rescue, social media, wind forecasting, private sector disaster response, and infamous Florida hurricanes.

<http://flghc.org/>

**May 12-15, 2014**  
**2nd International Conference: Climate Change—The Environmental and Socio-Economic Response in the Southern Baltic Region**

**Baltic Sea Experiment and Szczecin University**

**Szczecin, Poland**

Cost: Not available

Progress has been made in the understanding of the climate system on the global scale. But understanding of regional scales is still needed. This conference will highlight: climate proxies and models; natural dynamics of climate and coastal areas; changing Baltic sea coasts; and adaptation of energy politics to climate change.

<http://www.baltex-research.eu/SZC2014/index.html>

**May 19-21, 2014**  
**Local Solutions: Northeast Climate Change Preparedness Conference**

**Antioch University, U.S. Environmental Protection Agency  
Manchester, New Hampshire**

Cost: \$240

The conference will be an educator's summit, facilitating networking with public and private stakeholders for training in climate preparedness. The conference will present "how-to" knowledge about the tools available to communities to deal with the changing climate. "Attendees will also learn how to craft effective communications and engagement approaches, and how to forge public-private and school-community partnerships that leverage resources. Above all, key decision-makers and other individuals will meet in an accessible setting to discover synergies and teach each other about how to protect what we all invest so much of our professional and personal lives in: safe, healthy, and thriving—resilient—communities," according to the website.

<http://www.antiochne.edu/innovation/climate-change-preparedness/>

**May 19-23, 2014**  
**Large Wildland Fires: Social, Political and Ecological Effects**

**International Association of Wildland Fire**

**Missoula, Montana**

Cost: \$415

This conference will the causes, effects, and opportunities to be found in large wildland fires, with an emphasis on fuel management, resiliency, and climate change. Topics include consequences of changing wildland fire regimes, fuel management, frontiers in fire economics, restoring fire-adapted forests, historical fire climatology, using satellites to observe fire behavior, and journalism skills for fire scientists.

<http://largefireconference.org/>

**May 22-23, 2014**  
**New Zealand's First Disaster Communications Conference**

**Emergency Media and Public Affairs, University of Auckland  
Auckland, New Zealand**

Cost: \$700

Attendees will hear some of the world's leading disaster communications professionals, including Denis McLean, Chief of Communications for the UN Office for Disaster Risk Reduction, discuss their experiences and give advice and tips on how to lead the community through a disaster. At a "fast five" session, some of New Zealand's most experienced public information managers sharing their top tips for communicating in emergencies.

[http://www.emergencymedia.org/site/conferences\\_nz.htm](http://www.emergencymedia.org/site/conferences_nz.htm)

**May 25-30, 2014**  
**First International Summit on Tornadoes and Climate Change**

**Aegean Conferences**

**Chaina, Crete**

Cost: \$1,950 (includes hotel)

This conference will apply climate science to the understanding of tornadoes in an effort to better predict how climate issues might affect future tornado activity. Topics include quantifying tornado risk, understanding the relationship between storms and climate, tools used to examine risk over time, and methods to advance tornado prediction.

<http://www.aegeanconferences.org/conferenceFront.do?method=openDetail&confid=87>

**May 29-31, 2014**  
**Resilient Cities 2014: Fifth Global Forum on Urban Resilience and Adaptation**

**Local Governments for Sustainability, World Mayors Council on Climate Change Secretariat**

**Bonn, Germany**

Cost: Not yet posted

The event will focus on: risk data and analysis; adaptation planning and policy; comprehensive adaptation approaches; collaborative and community-based adaptation; resilient infrastructure and city-region support systems; and governance and capacity building.

<http://resilient-cities.iclei.org/bonn2013/about/>

**June 1-3, 2014**  
**Emergency Media and Public Affairs Conference—Australia**

**Emergency Media and Public Affairs**

**Canberra, Australia**

Cost: \$1,335

Attendees will hear some of the world's leading disaster communications professionals, including Denis McLean, chief of communications for the UN Office for Disaster Risk Reduction, discuss their experiences and give advice and tips on how to lead the community through a disaster.

[http://www.emergencymedia.org/site/conferences\\_austr.htm](http://www.emergencymedia.org/site/conferences_austr.htm)

**June 1-6, 2014**

**ASPFM Conference: Making Room for Fish and Floods**  
Association of State Floodplain Managers

Seattle, Washington

Cost: \$625

This conference presents state-of-the-art techniques, programs, training and resources to better improve flood mitigation, watershed management, and other community goals. Topics include legislative updates, the Biggert-Waters Flood Insurance Reform Act, levees and dams, flood loss mitigation, and water resource management.

<http://asfpmconference.org/>

**June 7-9, 2014**

**2014 IRDR Conference**

Integrated Research on Disaster Risk

Beijing, China

Cost: \$400

This conference will emphasize the importance of science as a tool to address hazard risks and issues of sustainable development in a global contexts. Topics include community disaster risk reduction, forensic investigations of disaster, empowering local officials, indigenous and vulnerable populations, water and disasters, science and the media, and the gap between disaster knowledge, policy and practice.

<http://www.irdrinternational.org/>

**June 9-12, 2014**

**Second Arab Conference on Disaster Risk Reduction**  
Government of Egypt, League of Arab States, United Nations

Sharm El Sheikh, Egypt

Cost: Not yet posted

The Second Arab Conference for Disaster Risk Reduction will provide a forum for Arab governments, policy makers, planners, academia, other experts to discuss disaster risk reduction in the region.

<http://www.preventionweb.net/english/email/url.php?eid=36370>

**June 11-12, 2014**

**16th Futures Conference: Sustainable Futures in a Changing Climate**

Turku University, Finland Futures Research Centre

Helsinki, Finland

Cost: \$475

This conference brings together experts from the field of futures studies to look at sustainable development under the modern regime of changing climate. The conference will “present current academic research and give new viewpoints and novel ideas to decision-makers to assist them towards more feasible decisions for sustainable development.”

<http://www.futuresconference.fi/2014/>

**June 16-18, 2014**

**23rd SRA-E Conference**

Society for Risk Analysis

Istanbul, Turkey

Cost: \$750

The theme of this European-oriented conference will

be “Analysis of Governance and Risks Beyond Boundaries.” This means that risk is not constrained by the boundaries of nations, but can travel across regions. The conference will “promote recent scientific novelties in risk reduction and to enhance inter-disciplinary approaches to develop new strategies in both evaluating and coping with well-known and less-known risks.”

<http://srae2014.itu.edu.tr/>

**June 16-18, 2014**

**International Science—Policy Workshop 2014**

Partnership for Environment and Disaster Risk Reduction

Jakarta, Indonesia

Cost: Not yet posted

The workshop will examine how to maximize integration of disaster risk reduction and climate change adaptation through ecosystem based approaches and how these integrated strategies can help inform policies and programming that aim to build local and national resilience to disasters. While linkages between climate change and DRR are now acknowledged, these domains continue to develop in silos with different stakeholders, expert groups, funding mechanisms and processes. One way to promote the integration of climate change adaptation and DRR is through the adoption of ecosystem-based approaches. Ecosystem-based approaches integrate biodiversity and ecosystem services into an overall strategy to reduce vulnerability and increase resilience to natural hazards and climate change.

<http://ehs.unu.edu/article/read/call-for-abstracts-international-science-policy-workshop>

**June 16-20, 2014**

**34th EARSeL Symposium**

University of Warsaw

Warsaw, Poland

Cost: \$538

EARSeL is a scientific network of European remote sensing laboratories, both academic and private. The conference will cover a wide variety of topics, including natural and cultural heritage; remote sensing for archaeology; hydrological applications and many others.

<http://www.earsel.org/symposia/2014-symposium-Warsaw/index.php>

**June 18, 2014**

**IRDR Fourth Annual Conference**

University College London, Institute for Risk and Disaster

Reduction

London, England

Cost: Free, but registration is required

The conference will explore the themes of critical infrastructure and disaster risk management. Winter floods in the United Kingdom have shown the vulnerability of the national infrastructure. The conference will explore responses to and resilience of infrastructure, as well as the issue of cascading crises, exploring “the interaction between physical phenomena and society, emphasis cross-boarder and international aspects of cascading crises.”

<http://www.ucl.ac.uk/rdr/events-news-publication/annual-conference-2014>

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<http://ibs.colorado.edu/hazards/subscribe>

#### **July 1-2, 2014**

#### **Emergency Management Conference**

**Emergency Services Foundation**

**Melbourne, Australia**

Cost: \$588

The Emergency Management Conference is the annual conference presented by the Emergency Services Foundation to provide a forum for the exchange of the valuable information gained by emergency services workers in the line of duty, and in research. Along with emergency management, this year conference will cover topics of disaster risk management, including communicating and public information, responses in natural hazards, community recovery and resilience.

<http://www.esf.com.au/>

#### **July 21-25, 2014**

#### **National Conference on Earthquake Engineering**

**Earthquake Engineering Research Institute**

**Anchorage, Alaska**

Cost: \$975

The conference will address the many aspects of earthquakes and their impact on society. Topics include the 1964 Alaska Earthquake and Tsunami, megadisasters, the Network for Earthquake Engineering Simulation, resilient communities, planning for recovery, tsunami engineering, and subduction megaquakes.

<http://10ncee.org/>

#### **September 21-25, 2014**

#### **Dam Safety 2014**

**Association of State Dam Safety Officials**

**San Diego, California**

Cost: Not yet posted

This conference is the leading meeting in America concerning dam safety engineering and technology transfer.

[www.damsafety.org](http://www.damsafety.org)

#### **November 12-14, 2014**

#### **III International conference on ENSO**

**Instituto Nacional de Meteorología en Hidrología, International Research Centre on El Niño**

**Guayaquil, Ecuador**

Cost: \$300

The theme of this conference is "bridging the gaps between global ENSO science and regional processes, extremes and impacts." There has been significant progress in the ability to observe, understand and predict ENSO

because of the application of new theoretical approaches, significant advances on physical parameterizations of subgrid-scale processes, and a further strengthening of the technological processes. The conference will synthesize progress on ENSO research with a detailed view of the climate-society relationship, and to share experiences in vulnerability assessment methodologies used by the climate impact studies community.

<http://www.ciifen.org/>

#### **December 4-12, 2014**

#### **Disaster and Hazards Mapping Summit 2014**

**Resource Recovery Movement**

**Manila, Philippines**

Cost: Not yet posted

The Disaster and Hazards Mapping Summit 2014 will develop better approaches to mapping risks and dangers to communities in the Philippines and other countries with tropical climates. The data basing, mapping and full coordination of efforts towards use and sharing of a full function GIS on hazards, volcanoes, water, flood, forests in the Philippines and Asia, vulnerability areas, liquefaction potential, crisis and hot spots is long due because of the long-running phenomenon of climate change in the planet. This is also significant in that the Philippines, among other countries, lies in the Pacific Rim of Fire where a large number of earthquake faults lie.

<http://summit.hazmapping.org/>

#### **March 14-18, 2015**

#### **3rd World Conference on Disaster Risk Reduction**

**UNISDR**

**Sendai City, Japan**

Cost: Not posted

This conference is the major venue for international disaster risk reduction to complete the assessment and review of the implementation of the Hyogo Framework for Action and to review the experience obtained in regional and national programs. The conference will adopt a post-2015 disaster risk reduction framework.

<http://www.preventionweb.net/wcdrr/>





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**Support Center Operations**—Provide support for core Center activities such as the *DR* e-newsletter, Annual Workshop, library, and the *Natural Hazards Observer*.

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

**Help the Gilbert F. White Endowed Graduate Research Fellowship in Hazards Mitigation**—Ensure that mitigation remains a central concern of academic scholarship.

**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](http://www.colorado.edu/hazards/about/contribute.html)

Or call (303) 492-2149 to discuss making a gift.

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