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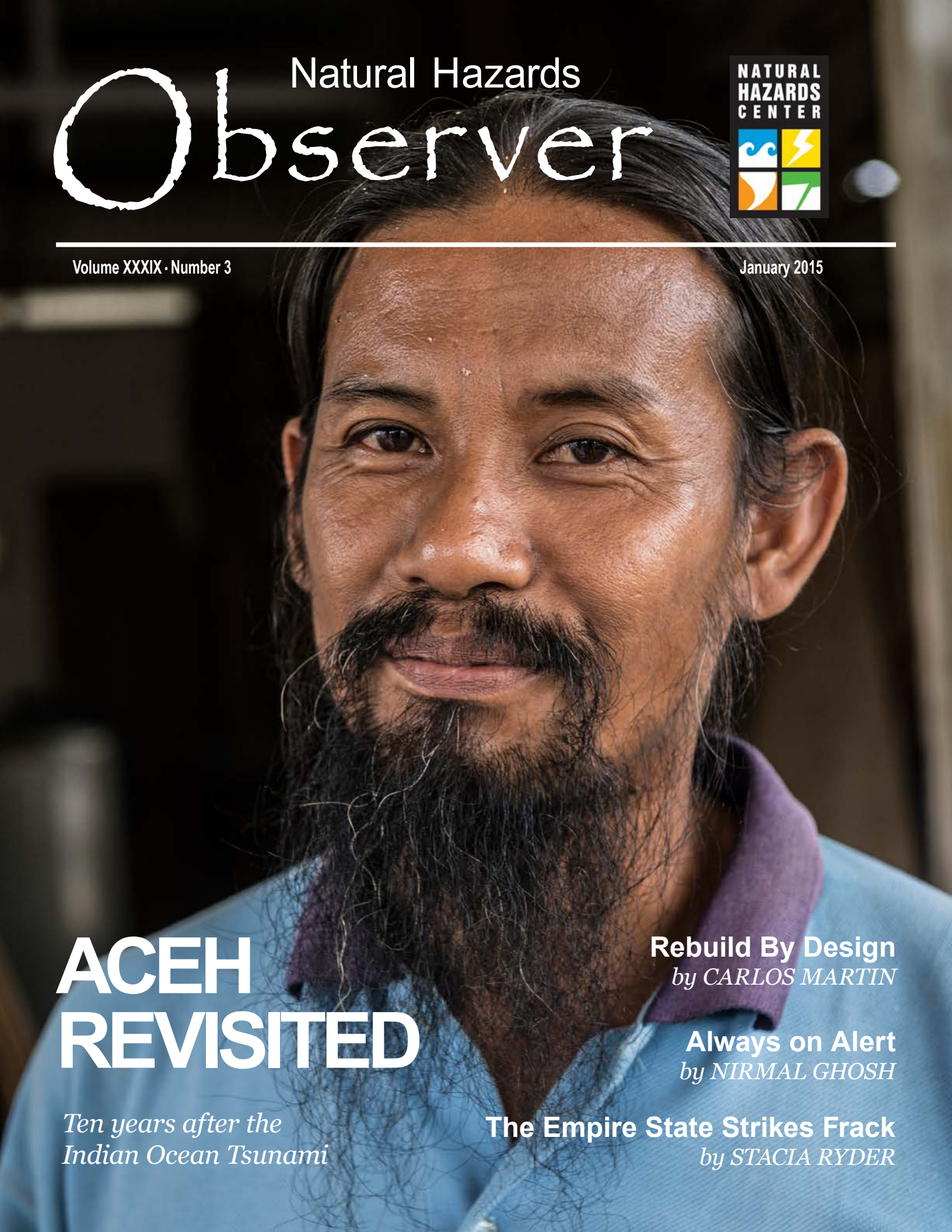

# ACEH REVISITED

*Ten years after the Indian Ocean Tsunami*

**Rebuild By Design**
*by CARLOS MARTIN*

**Always on Alert**
*by NIRMAL GHOSH*

**The Empire State Strikes Frack**
*by STACIA RYDER*

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.



*Observer* cartoons are drawn by Rob Pudim.

## Contents

# Contributors

**Carlos Martín, PhD,** is a Senior Research Associate in the Urban Institute's Metropolitan Policy Center, where he leads research and evaluations on the physical qualities of housing and communities and the social outcomes for residents and the cities and regions that occupy them.

Trained as an architect, construction engineer, and historian of technology, Dr. Martín has served in many housing design and construction research roles prior to joining the Urban Institute. He was the Assistant Staff Vice President at the National Association of Home Builders for Construction Codes and Standards, SRP Professor for Energy and the Environment at Arizona State University's Del E. Webb School of Construction and School of Architecture; and coordinator for the US Department of Housing and Urban Development's Partnership for Advancing Technology in Housing (PATH).

He received his BSAD in Architecture from MIT, and his MS and PhD degrees in Civil & Environmental Engineering from Stanford. Dr. Martin most recently served as the Principal Investigator for the Rockefeller Foundation-funded formative evaluation of Rebuild by Design's competition phase.


**Rein Skullerud** is the Photo Editor and Senior Photographer for the World Food Program (WFP), the largest humanitarian organization fighting hunger worldwide. He has over 25 years of experience; his photos have been published worldwide, on the web, as well as international magazines, newspapers and countless publications in the world of humanitarian aid.

Over the last two decades WFP has sent him all over the world to some incredible but also challenging places. Skullerud has covered natural disasters, the effects of climate change, drought, floods, diseases such as HIV/AIDS and Ebola, and worked in conflict situations. He has been on the frontlines of hunger, witnessed communities picking up pieces in the wake of disaster or building resiliency to face the next crisis.

**Nirmal Ghosh** is an award-winning journalist, conservationist, writer, photographer and film maker, now Senior Foreign Correspondent in Thailand for *The Straits Times.*

He was President of the Foreign Correspondents Club of the Philippines in 1998-99, and of the Foreign Correspondents Club of Thailand in 2008 and 2012. Covering politics, elections, conflict, natural disasters, and social and environmental issues, his work has been featured across media platforms in India, South East Asia and the USA.

Ghosh is part of the Global Initiative Against Transnational Organised Crime, a Trustee of The Corbett Foundation working in the Corbett Tiger Reserve area in India, and a former member of the Steering Committee of India's Project Elephant. He has chaired or spoken at conferences on wildlife, environment and media in India, Singapore, Thailand and Malaysia.

Ghosh has contributed to several books on aspects of environment and wildlife, and exclusively authored three on Indian wildlife and natural history.

**Stacia Ryder** is a PhD student in the Department of Sociology at Colorado State University. Currently, Ryder serves as the Assistant Editor for the *Society & Natural Resources* journal. In addition, she is the research coordinator for the Environmental Justice CSU Global Challenges Research team and a Graduate Research Assistant for the Center for Disaster and Risk Analysis.

In general, Ryder is interested in resource extraction, environmental sociology, sociology of disasters, and the unequal distribution of costs and benefits in the context of these focal areas. More specifically, her research focuses on the social impacts and potential risks of unconventional oil and gas development.

Her most recent research project evaluates local regulations of oil and gas development in the Colorado Front Range, and is supported through the Center for Collaborative Conservation Fellows Program. She has authored and co-authored several papers related to policy and risks related to oil and gas development, particularly hydraulic fracturing.

# From the Editor

WELCOME TO THIS YEAR'S first issue of the revamped *Observer*. While maintaining its familiar identity, I've created a brand new layout and added several photo-heavy features.

This makeover is only the beginning of my efforts to renew the *Observer*. Many more exciting changes are in the pipeline, but to realize these plans we need your help, which is why I would like to invite you to submit photo essays, field reports, opinion articles, and book reviews (see page 26 for further details).

This month's issue is all about rehabilitation and reconstruction. Ten years ago, World Food Program photographer Rein Skullerud was sent on a mission to Aceh to examine the impact of the Indian Ocean tsunami. Deeply affected by the sheer destruction, Skullerud felt compelled to revisit the communities he documented in the aftermath of the devastating disaster. When he returned to the area in December 2014, he was stunned by what he saw. In his own words, "Banda Aceh today looks like the tsunami never happened."

Skullerud's observations are accurate—the physical recovery of Aceh has been a remarkable success story. Thanks to the guidance of the Indonesian government and with the help of thousands of donors and aid agencies, Aceh, which bore almost half of the global damage and losses caused by the tsunami, was rebuilt to be stronger and more resilient.

Building Back Better, the catchphrase coined during post-tsunami recovery efforts, was a guiding principle after Superstorm Sandy as well. The initiative Rebuild by Design (RBD) was launched in New Jersey and New York as an experiment in rebuilding local communities that are smarter about risk, safer, and more resilient than before. Multidisciplinary design teams comprised of experts in architecture, design, and social and physical sciences competed to develop concepts that would revolutionize traditional disaster recovery. In an invited comment, Carlos Martín of the Urban Institute Metropolitan Policy Center discusses the ins and outs of the RBD design competition and the challenges it faced along the way.

A common flaw in past disaster relief and recovery effort was the immediate rush to build back to the way things were before. Much has been done to address this issue and improving — rather than just rebuilding — areas destructed by disaster is now a priority. But besides creating resilient infrastructure and buildings, making lasting economical, political, and social differences is equally important. But to do so, community participation is key. After all, disaster recovery programs and policies can't be developed or implemented in a vacuum.

This was seen in Aceh, where physical rebuilding achievements masked deeper social and economic problems that made long-term recovery difficult. Aceh remains one of the poorest provinces in Indonesia, characterized

## On the cover

Amin Mariadi, 45 years old, Kuta Padang, Meulaboh
© WFP/Rein Skullerud

Amin moved from Central Java to Banda Aceh in 1990. He built a life for himself and his family by training and then successfully working as a carpenter. Both his business and his home were destroyed when the tsunami hit in 2004. A week after this deadly disaster struck the region Amin began working as a day-laborer helping people repair their damaged houses. "My family managed to survive on the little money I earned helping to clean debris and to rebuild other people's homes, but the work was intermittent and on some days I didn't get any work," he said. "If we hadn't received the food assistance from WFP it would've been much harder for us to survive, your food saved us.

by a stagnant economy and ravaged by unemployment. Large numbers of Acehnese have left the country's west coast in search of better opportunities. Houses built with aid money were consequently abandoned because, without a regular income, people were unable to maintain their new homes.

Although the international aid community isn't responsible for Aceh's longstanding economic problems, the decisions it made about how aid money was spent did have a significant impact on the region's continued lack of economic development. Ten years later, reflections on recovery efforts make it clear that careful thought needs to be given to how to help people the most in the long run, rather than focusing on short term solutions.

The short- and long-term needs of affected communities have been more actively addressed in recent disasters. Although there is plenty of room for improvement, initiatives such as RBD show that local communities can be more involved in disaster recovery decisions. One notable aspect of the program was that it required designers to host community meetings to engage residents, municipal leaders, state and local planners, business owners, and local nonprofits on issues of recovery and rebuilding.

While those efforts were laudable, they weren't without problems of their own. There were many in the community who were proponents of doing things the old way—they didn't necessarily care about building back better, they just wanted their communities quickly rebuilt. Who could blame them? Innovation and big-picture planning take time while disaster survivors want to get back on their feet and resume their lives as quickly as possible.

In brief, there is no magic bullet when it comes to disaster recovery. Yet, with each anniversary, we can look back and see many positive changes, both sweeping and incremental.

**With that in mind, enjoy your *Observer*.**




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

Invited comment by Carlos Martín

# REBUILD BY DESIGN

*Lessons learned from the evaluation of HUD's post-Sandy resilience design competition*

*Image 1. Survey of Sandy damage on New Jersey shoreline, October 30, 2012. Source: Courtesy of Tim Larsen, N.J. Governor's Office*

HURRICANE SANDY MADE LANDFALL in southern New Jersey on October 29, 2012. The federal response to this disaster was unlike most others in the amount of resources as well as the strategy for recovery. Among the changes in approach was a new emphasis on resilience and rebuilding in a way that make future disaster impacts easier to absorb. This was made clear in the Hurricane Sandy Rebuilding Task Force Public Report (2013).

"More than ever, it is critical that when we build for the future, we do so in a way that makes communities more resilient to emerging challenges such as rising sea levels, extreme heat, and more frequent and intense storms,"Shaun Donovan, former U.S. Department of Housing and Urban Development secretary (HUD), stated in the report.

The U.S. Congress appropriated approximately $60 billion for recovery activities—including the novel application of $1 billion to sponsor a design competition. The competition, funded from HUD's Community Development Block Grant Disaster Recovery (CDBG-DR) program, was created to gather infrastructure development proposals that increase regional resilience beyond simple local rebuilding. This innovation was Rebuild by Design (RBD). With the integration of Henk Ovink, the Dutch water management and design specialist, and more than $3 million in support from funders in the Sandy-affected areas, the concept crystallized and RBD was launched in June 2013 (HUD and Rockefeller Foundation 2013).

RBD's goals were ambitious. Rather than letting affected states and municipalities determine priorities, RBD selected design teams comprised of multidisciplinary experts in architecture, design, and the social and physical sciences to help assess the needs of communities. Rather than defining work scope, the design teams were iteratively exposed to climatological, geological, engineering, and social science research before developing regional or regionally applicable local solutions. Finally, the design teams then garnered community and local political support for their design solutions with sites and concepts in mind. RBD, it was thought, would revolutionize traditional disaster recovery.

Ultimately, ten design teams were selected. These teams—coordinated by regionally known community design organizations and managers from government and philanthropic organizations—underwent an intensive process of research and exploration, design development, 50 community outreach events, and more than 350 meetings with elected officials in selected sites for eight months. Nearly a year later, Donovan announced six winning projects and the corresponding state and city grantees that would be awarded funding (Table 1).

In the end, RBD met all of its planned milestones and proved to be an inventive approach to building resilience with recovery funding.

## What did we learn from RBD?

To reach these goals and objectives, the Task Force and RBD partners pursued a practice common to architectural design and planning disciplines: a national design competition. Unlike traditional design competitions, however, RBD explicitly chose to not define key terms in an effort to foster innovation. For example, there was no specific a priori problem statement or definition in either geography (e.g., a specific site) or program (storm surge protection, wetland conservation, etc.). RBD did not set any quantitative environmental or social targets for the design opportunity. In fact, even the scope of the final project budget and the competition award (or contract) were unknown at the start. RBD purposefully reimagined the challenges and constraints that mark typical competitions.

Several key inputs and activities were critical to RBD, such as the overarching model, the involvement and commitment of talented designers, and the funding for both the team competition and project implementation. The ways in which these components were integrated into a wider, national recovery plan through a uniquely structured project suggest some lessons about how similar efforts could be used for other disaster scenarios.

## Money matters

Raising enough funds for a robust design competition was in itself critical to making the RBD vision feasible, especially given the limitation of HUD resources. Yet, in the end, RBD was able to gather enough funds to catch attention and even, in some cases, convince Sandy stakeholders to suspend skepticism when there were no tangible designs or built projects in sight.

There were two sources of funds, the first being philanthropies that could front resources quickly. The Rock-

efeller Foundation committed more than $3 million, which supported design team activities ($1 million), as well as the RBD project manager and supporting partners in enacting management logistics ($2.07 million). The Rockefeller Foundation was instrumental in enlisting other philanthropic organizations to support complementary efforts, particularly with small grants to local community groups to frame workshops and presentations for design teams. This effort resulted in an additional $1 million for the design team efforts (which allowed the ten design teams to be awarded $200,000 each) and funds for evaluation and community engagement activities.

The largest pool of funds, however, was the $1 billion allocated by HUD for awards to the jurisdictions where winning design concepts were proposed. These funds were used as seed capital for further project design, development, and potentially for construction. HUD committed CDBG-DR funding to incentivize implementation of winning projects and proposals out of the approximately $15 billion in CDBG-DR funds for disasters between federal fiscal years 2011 and 2013 laid out in the congressional appropriations. This sum was held both as the prize to Sandy-affected communities and as the work scope for the ten design teams.

### Leadership matters

Early input and, in fact, the driving force of the work came from the leadership of two central individuals—HUD Secretary Shaun Donovan and his senior advisor Henk Ovink. Donovan, in particular, identified the need for an initiative such as RBD and ensured that the resources were made available.

Donovan publically credited Ovink, a Dutch water-management expert on loan from the Dutch Ministry of Infrastructure and the Environment, for RBD's vision and execution (Shorto 2014). Ovink's infrastructure expertise, connections in the global design community, and involvement in efforts such as the 2008 post-Hurricane Katrina "Dutch Dialogues" positioned him professionally for the tasks at hand.[1] Ovink served as an ongoing mentor to and generator of goodwill among the design teams, a driving force for RBD outputs, and a public face for the RBD vision. Donovan and Ovink were repeatedly held up as the central drivers of RBD by all stakeholder groups.

A different form of leadership was put forth by the Rockefeller Foundation, which provided a collective body of knowledge, networks, and financial resources. More than just a funder, the Rockefeller Foundation was a champion for the RBD effort, as well as key partner to HUD.

### Vision matters

Conceptualizing what RBD could be at an early phase was as critical to its outcome as how it was implemented. Elaborating on the vision preceded the effort and enabled additional activities and outputs later. The problem the region faced was not simply rebuilding and recovering from Sandy, but rather preparing for future Sandies.

As scholars and practitioners in disaster recovery fields know too well, the immediate needs of recovery often reduce opportunities to imagine what a more resilient city (or other system) might look like—and in the rush to rebuild, the same features that reduced resilience might be replicated. The challenge of resilience, as posed by RBD staff, was in finding innovative ways to recover and prepare that went beyond a traditional cut-and-paste response (Ovink 2013a). The impetus to create a rallying vision early on was spurred by both HUD and the Rockefeller Foundation.

RBD's vision was to accentuate resilience and do so in a purposively ambiguous way. RBD designers embraced fuzziness of ideas—leaving terms like resilient and region unsettled and subjective. Ovink used the analogy of the "sabbatical detour" to distinguish the RBD process from traditional recovery efforts. Each milestone in the detour is meant to foster interaction between the design team and the community, thereby creating a product superior to that produced by a "regular process" (Ovink 2013b).

The immediate needs of recovery often reduce opportunities to imagine what a more reslient city would look like

Design was a key component of innovation in both the product and the alternative process. As RBD leaders pointed out, design does more than create attractive and functional physical products.

Good design can help drive the cohesion, sustainability, and economic wellbeing of the community. The power of design, then, became an integral and indispensable component of the vision. Teams affirmed the prominence of design throughout the work and in response to skeptics. One member of a team defined RBD as a "rare opportunity for design to lead."[2] Other stakeholders noted how RBD is "piloting how thoughtful design can be used efficiently" where traditional practice in disaster recovery is to "act like there's no time to design."

RBD's vision was not without critics. Some—including RBD's own research advisors and some government and the development community representatives—questioned the focus on design as the chosen conduit considering the amount of other community needs. Cynics described the vision as being "top-down" and "not based in reality,"

1 The "Dutch Dialogues" were a series of workshops held in 2008 between Dutch and American engineers, designers, and planners to investigate strategies in the built environment—paticularly water management—as a consequence of Hurricane Katrina (dutchdialogues.com).

2 This direct quote and subsequent uncited quotes come from interviews held with anonymous informants for the Rebuild by Design evaluation. Citations can be found in Martín et al. (2014).

despite attempts to integrate feasibility and community engagement into the competition. Many were willing to suspend skepticism as the projects developed and community engagement unfolded with the expectation that later implementation would be inclusive of diverse opinions and more grounded in local social and political realities. There were others that criticized the concept on different grounds, including local community groups who questioned the need to innovate. They were more concerned that traditional recovery strategies such as home rebuilding hadn't been successfully rolled out after Sandy. Dissenters prioritized rebuilding individual properties and stabilizing affected households over longer-term, community-driven mitigation strategies—or, at least, the effective and efficient rollout of the promised rebuilding. Many in this group chose not to participate in RBD town hall meetings or related activities. In the context of this tension, RBD design teams held extensive outreach events and met with local citizens to explain challenges and enlist support for design team concepts.

## Community matters

An essential innovation of RBD was that it explicitly required that designers engage with residents and community groups in the areas devastated by Sandy. This practice isn't traditionally included in design competitions, often resulting in less-than-appropriate products. Although it does play a part in traditional city planning and disaster recovery, community participation was novel—but critical—at this stage of conceptualization. As noted early in the RBD planning process: "Without dedicated resources to support community engagement, the RBD process runs the risk of becoming an abstract, impractical process, detached from the real concerns of local people and deprived of the benefits that diverse participants provide to create effective, implementable solutions" (Multiple Arts Society 2013). As a result, design teams were given assistance to conduct extensive engagement and outreach to identify regional problems and develop design solutions.

Most community groups consulted had already been organizing around post-Sandy efforts as well participating in long-term master planning, development projects, and economic development initiatives in their communities. The community groups were consulted despite the significant potential that the designs would not be implemented if HUD did not select them. Though all groups noted the breadth of the design teams' outreach, many criticized what they saw as shallow community engagement that primarily involved traditional town-hall style presentations. In all cases, the design teams altered and modified their designs based on community feedback despite the abbreviated consultation period.

Allowing for community participation in the targeted communities, as well as generating awareness of resilience challenges for the broader American public, was arduous, but had some positive results. The engagement resulted in statements of support by local organizations for designs—even those who felt the outreach had not vigorous. This engagement and support were requirements of HUD and the other funders, but also became critical factors in the jury's decisions. The ideas have been featured in other com-

| CDBG-DR Grantee | Total Available CDBG-DR Funds | Third Round of Available CDBG-DR Funds (Source of RBD Grants) | RBD Designated Awards in Third Round | RBD Project Awards | RBD Design Team | RBD Project Site | Project Title |
|---|---|---|---|---|---|---|---|
| Connecticut | $159 | $21 | $10 M | $0 | WB/unabridged | Bridgeport | Resilient Bridgeport Network |
| New Jersey | $4,174 | $882 | $380 M | $230 | OMA | Lower Hudson | Resist, Delay, Store, Discharge |
| | | | | $150 | MIT | Meadowlands | New Meadowlands |
| | | | | $0 | Sasaki | Jersey Shore | Resilience & the Beach |
| New York | $4,417 | $606 | $185 M | $125 | Interboro | Nassau County | Living with the Bay |
| | | | | $60 | SCAPE | Staten Island | Living Growing Breakwaters |
| New York City | $4,214 | $994 | $355 | $335 | BIG | Manhattan | Big "U" |
| | | | | $20 | PennDesign/OLIN | South Bronx | Hunts Point Lifelines |
| Rhode Island | $20 | $0.7 | N/A | N/A | N/A | N/A | N/A |
| Maryland | $29 | N/A | N/A | N/A | N/A | N/A | N/A |
| Regional | N/A | N/A | N/A | $0 | HR&A | Rockaways/Red Hook, Asbury Park | Commercial Resiliency Financing |
| | | | | $0 | WXY/WEST 8 | Offshore Islands | Designing with Nature |
| **TOTAL** | **$13,013** | **$2,504** | **$930** | **$920** | N/A | N/A | N/A |

*Table 1. RBD Grant Funds and Design Projects, Source: Martín 2014.*

petitions before, but the RBD process, combined with the innovations noted above, suggest a new model for community integration.

**Management matters**

RBD differed significantly from traditional federal competitions through the exceptional public-philanthropic partnership in which foundations provided competition resources and federal resources provided awards. In addition to CDBG-DR outlays, both HUD and the Rockefeller Foundation committed staff and management time to RBD. They also relied on a network of four New York-based arts and planning organizations to execute the extensive logistical and managerial demands for meeting HUD's timeframes—all of which were met.

RBD produced an efficient, streamlined organization that managed detailed tasks with no preexisting blueprint. RBD's management structure existed parallel to, but separate from, traditional federal grant solicitations and awards which can be burdensome, highly regulated, and lengthy. Key challenges, however, constrained the execution of the competition. Among them was a lack of precedents and preexisting plans for a program like RBD, which led to changing and growing requirements for deliverables, participation, and the need to reconfigure teams in some cases. While RBD responded to the ever-evolving environment by providing multiple channels of information for the design teams, there were inevitable miscommunications and misinterpretation of deliverables and of post-jury award criteria.

The design teams also faced significant resource constraints, spending about three to six times as much as was allotted. Stakeholders also agreed that the intense timeframe was taxing, though the final design deadlines were met. The process of competition, research, design development, jurisdictional negotiations, media outreach, and community engagement typically takes two years at a minimum—RBD accomplished it in 10 months. One federal official noted that if RBD could manage the process so quickly, "why couldn't it be done in regular public procurement?"

RBD produced an efficient, streamlined organization that managed detailed tasks with no preexisting blueprint

**Reality matters**

RBD leadership and staff also helped design teams anticipate and address potential barriers to implementation in the final stages of the competition—a critical step in realizing the projects but another clear departure from the earlier open-ended inquiry and design concept. What began as innovative, visionary, and collaborative designs had to become practical, cost-effective, and actionable public infrastructure projects for final award funds to be allocated. RBD required implementation planning and feasibility analysis to be completed in five months—a relatively short timeframe. Procedural constraints included the determination of the appropriate type of cost estimates and cost-benefit analyses; procurement regulations after receipt of CDBG-DR funds that may preclude sole-source contracting with the original design teams; remaining national and local regulatory assessments and approvals that may require several years of negotiation; and the persistent demands from local and state governments for related recovery efforts that could compete with RBD attention and resources.


This transition

was strenuous for many stakeholders, not just the ten design teams. This stage required quick adaptation to evolving directives and effective transformation of conceptual projects into physically, financially, and politically feasible designs. For the teams, this final development stage tempered early thinking about design solutions to resilience challenges in positive (in terms of addressing technical constraints and making political concessions) and negative (with regard to rushing through the design phase before considering alternatives) ways. Other constraints such as possible cost and regulatory compliance altered their earlier visions as well.

The CDBG-DR grantees—that is, the communities themselves—were also caught in a difficult bind during this final stage between wanting the RBD designs and dealing with other expenditures of rebuilding in their localities, such as affordable housing or public transportation. Without more information about the designs or the funding process, CDBG-DR grantees were hesitant to support RBD designs. Much of the difficulty associated with this transition from high-level concept to realistic implementation was inevitable yet expected.

Although the lessons learned about what a project like RBD can do are helpful, more compelling are the lessons about what should be done for RBD right now. Even after funding agreements are made, continued investment is needed during implementation to ensure that current RBD projects remain innovative, that communities remain engaged, and that the wealth of knowledge gained from the design competition is gathered and disseminated.

**What's next for RBD?**

Much of the design team and receiving jurisdiction work is undone, and there's more to do in RBD jurisdictions that did not receive awards, as well. As HUD Regional Administrator Holly Leicht said, "This is really the end of the beginning. The rubber hits the road now" (Beck 2014). Even though the next phase encompasses a complex set of practical processes and

*Image 2. Henk Ovink Long Island site visit, October 2013*
*Source: Courtesy of Cameron Blaylock for Rebuild by Design.*


*Image 3. Community hearing in Lower East Side Manhattan for RBD Project.*
*Source: Courtesy of Rebuild by Design.*

*Image 4. B.I.G. Design team presentation. Source: Courtesy of Rebuild by Design.*

challenges associated with traditional infrastructure development, it hasn't been defined in the RBD vision. Fortunately, RBD laid some groundwork towards this end, though, by requiring preliminary implementation plans as a requirement of competition. Yet, without significant additional resources and time, the winning designs remain far from reality.

In particular, RBD has been forced to fall back into traditional federal procurement patterns despite the early exuberance and innovation of its design competition. Though HUD selected the final six grantees on June 2, 2014, the procedural constraints noted earlier now pose real implementation challenges in this post-competition phase. These challenges may collectively jeopardize the innovativeness of the final designs, and could deteriorate the collaborative spirit between the stakeholders. Additionally, the community groups and general citizens that participated and contributed their time and feedback to individual projects may be deterred in the long journey of implementation.

Given the sense of finality from the HUD award announcement, many of elected officials and government workers associated with the competition could lose interest in long-term implementation of RBD projects. There is evidence that several RBD communities were inspired to include resilience in existing master plans and thanks to RBD designs, regardless of award. But with the ongoing challenges of unrelated Sandy recovery, the attention and resources allocated to broader resilience concerns as and the opportunities presented by RBD could be compromised. Promoting connections and ongoing conversations with the federal government after the competition is needed to sustain the focus on resilience and the opportunity to think innovatively about achieving it.

Along with the RBD projects' future, there are open questions about the RBD concept. HUD and the Rockefeller Foundation recently announced a second effort, the National Disaster Resilience Competition, to competitively award $1 billion in CDBG-DR funds to eligible communities in different regions in the United States. Rather than tie funds to design team projects, this competition is structured around awards to jurisdictions, which must apply before the March 2015. The finalists will be selected in June, with preference going to communities that "frame the recovery needs, identify relevant risks and vulnerabilities, and other community development opportunities (HUD 2014). Finalists will then compete based on planning and design of projects. Like RBD, this new competition is an opportunity to highlight mitigation during recovery. Also like RBD, the long-term outcomes and impacts will not be seen for some time.

## Summary

Superstorm Sandy served as a reminder not only of possi-

ble future events, but also of our recent national history in relation to disaster. It took an event like Sandy to confirm the notion that traditional relief and recovery efforts can simply not be sustained. The Hurricane Sandy Rebuilding Task Force Report emphasized resilience not just in disaster policy but also in individual relationships to the environment. The May 2013 National Mitigation Framework confirmed this need, but also put the burden squarely on a collective effort: "Working together, risks can be recognized and addressed through a culture of preparedness and mitigation that is built and sustained over time" (DHS 2013).

While the projects remain castles in the sky for the near future, the RBD program shows that design thinking is an innovative strategy for resilience challenges. Several RBD municipalities are now including resilience in their formal planning processes. RBD-affiliated community groups have expressed a deeper awareness of local resilience challenges and, similarly, the architectural, engineering, and planning community is paying new attention to resilience strategies. All these achievements are the documented results of the design competition.

Significant innovations are often the product of open-ended problems, unrestricted methods of inquiry, and imprecise goals. The processes employed in the RBD design competition have been no exception. Referred to by many stakeholders as "flying the plane as it is being built," RBD efforts to catalyze design teams' innovations while exposing them to environmental, regulatory, financial, political, and social realities have resulted in many proposed advances for resilient infrastructure design and for Sandy-affected populations.

It took an event like Sandy to confirm the notion that traditional relief and recovery efforts can simply not be sustained

With the exception of a few stakeholders who wanted to focus exclusively on rebuilding and those that are withholding judgment, almost all are enthusiastic about the RBD vision and fascinated by RBD's activities and output. Many stakeholders interviewed during and after the competition appreciated management effort and the desire to include so many components (especially research, community participation, and implementation planning) in design competitions. These activities increase awareness about resilience challenges in the target communities, as well nationally. Yet, much more remains to be seen before those outcomes are realized and measured.

Consequently, RBD's most important outcome has been conceptual—to the ability to use design to spark regional discussions on problems that affect multiple jurisdictions. RBD presented a window not just for resilience action, but also for reconsidering the federal role in moving toward that action. There has been nearly unanimous support for the vision.

RBD gives hope that overarching national concerns such as resilience can be addressed with multidisciplinary knowledge, design thinking, and federal oversight. As one design team lead summarized, RBD let stakeholders imagine possibilities when the opportunity for "investments of large resources for big ideas is simply non-existent in the US now" (HUD 2014) In fact, RBD was a big idea for which large resources were brought forth. The return on the investment will be the resilience of the Sandy-affected region and its people.

*This article is based on the Urban Institute evaluation of RBD first phase—that is, only the design competition held from June 2013 through April 2014. The evaluation report was published by the Rockefeller Foundation in September 2014. The authors would like to thank the Rockefeller Foundation's Evaluation Office for granting permission to reproduce findings in the Natural Hazards Observer.*

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# ACEH REVISITED

*Ten years after the Indian Ocean tsunami*

By Rein Skullerud


IN THE WAKE of the 2004 Indian Ocean tsunami, the city of Banda Aceh was little more than a flattened sea of wrecked homes and ruined infrastructure. Ten years later, the landscape shows a resilient city methodically recovering from one of the most devastating disasters in recent memory. Taken ten years apart, Rein Skullerud's photographs, chronicle the story of a city rebuilt.

Skullerud, head photographer for the World Food Program, originally traveled to Aceh in 2005, to document the damage caused by the tsunami, as well as the relief efforts that were then underway. In 2014, he revisited the same places to see how the reconstruction fared. His pictures are testimony to the community's spirit and ability to rally, yet they also serve as an reminder of the devastation wrought when the 100-foot waves hit the shore .

Skullerud had photographed many dire situations in his 15-year career, but his experience didn't prepare him for the unreal conditions in Banda Aceh.

"What used to be a large city was completely flattened by the earthquake and the raging tsunami waters that followed," he said. "When I arrived, I got onto a WFP helicopter to get the aerial view of the situation and I realized that the amount of devastation was immense. Every little square that I could see on the land—thousands of them—was the ground floor or foundation of a house with no walls left standing. Everything was washed away."

Although he had previously witnessed war, natural disasters, and disease, it was the tsunami's aftermath that disturbed him the most.

"All of these tragedies have had great impact on me, yet the amount of death and devastation that I saw in Sumatra was visually and maybe psychologically, the most horrifying."

Skullerud's work depicts issues that impact humanity as a whole and highlights the challenges emergency relief workers face when arriving in an area struck by disaster.

"I feel that showing these issues from the humanitarian worker's point of view gives a more practical sense of perspective and maybe of use for people to understand why it is important to help," he said. "My aim is, of course, to show the needs but also to do this with the dignity and respect of the people that we serve."

## Banda Aceh today looks like the tsunami never happened

Skullerud found much to respect when he returned nearly ten years after the disaster. His photographs here show progress that he wouldn't have believed possible as he took that first flight over the city in 2005.

"I went back to witness the successful recovery of the incredibly resilient Acehnese community," he said. "Members of the community were assisted by the government, WFP, and other aid organizations and together they achieved the unimaginable. Banda Aceh today looks like the tsunami never happened.

Banda Aceh was the closest and largest city to the epicenter of the earthquake that hit on 26 December 2004. The city suffered major damage when the tsunami struck shortly after. It was the most severley hit out of all the locations affected. 167,000 people died and tens of thousands were injured. © WFP/Rein Skullerud

At the outset WFP was delivering emergency food to over 500,000 people in the region. From 2004 to 2006 WFP covered 1.2 million people in the 14 districts in Aceh, followed by a three year recovery program. Finally, in 2008, WFP successfully handed over its operations to the government and our office in the region was closed. © WFP/Rein Skullerud

I met a group of fishermen who had been searching for family members for days, checking all the bodies that were pulled out of the rubble created by the coastal villages flattened by the fury of the raging wave. It was so saddening and overwhelming that sometimes I would forget about my camera and help out wherever I could. © WFP/Rein Skullerud

Ten years later, I returned to the same places and it was so heartening to meet again with members of the fishing community. It was impressive to see how things have been rebuilt, for example, the big fishing port of Banda Aceh with its annexing fish market. © WFP/Rein Skullerud

This is Bukhari or "Ari" as he prefers to be called, at the fish market at Lampulo, Banda Aceh. Ari told us that when the tsunami hit in 2004, he managed to outrun the waters but lost seven family members including two of his children. 44 days after the Tsunami, he was able to return to work. He recalled the food assistance he received from WFP as soon as he saw our logo ten years later. He was really thankful for the food. "With the food I received I had one less crucial thing to worry about and was able to concentrate to get back on my feet both emotionally and financially" he said. © WFP/Rein Skullerud

It took six years for the fishing industry to return to normality. Thanks to the aid received, the support of the government, the hard work of the fishermen combined with high spirits and resilience of the Acehnese people, the industry has grown exponentially over the last four years. "After the tsunami, there was much more fish in the sea and fishermen have been catching tons of fish to sell. Banda Aceh lost many fishermen to the tsunami but those who survived and continued were back on their feet quickly, the fishing business grew bigger than it ever was before the tsunami" said Ari. © WFP/Rein Skullerud

I will never forget the eyes of the children I met after the tsunami. It was truly devastating. Their eyes had seen the face of death and had lost the innocence that children's eyes should naturally have. © WFP/Rein Skullerud


The children I met in Aceh during my latest visit are exactly how children should be, innocent and free with eyes full of life. © WFP/Rein Skullerud


A number of tall buildings were built after the tsunami. These serve as safe havens to run to should a new tsunami hit the area. They are strong enough to withstand an earthquake of 9-10 on the scale of Richter and 10 meter high tsunami wave. The top floors host helipads for emergency evacuation. The buildings are used during the region's annual tsunami drill.
© WFP/Rein Skullerud

Most of the people from the coastal villages had lost their homes and temporarily relocated to makeshift shelters on the hillsides. © WFP/Rein Skullerud


Gradually the fishing villages were rebuilt and people's lives returned to normalcy. © WFP/Rein Skullerud


Some of the fishing boats were washed inland, destroying any obstacle they hit on their path. The square in front of Hotel Medan is located in the middle of the city about seven hundred meters from the sea. © WFP/Rein Skullerud

The square in front of Hotel Medan today. © WFP/Rein Skullerud

In Banda Aceh, the slaughterhouse had just opened when the violent waters hit, blocking and killing most of the people who were inside. © WFP/Rein Skullerud

The slaughterhouse today, rebuilt and vibrant with activity. © WFP/Rein Skullerud

The tsunami memorial monument was built next to a 780 ton electricity plant, which was anchored at sea near the port to help overcome electricity shortage. The tsunami moved the plant four kilometers inland destroying everything in its way.

Left in its new position, it was turned into huge landmark to commemorate the disaster and its victims.It also shows how powerful the tsunami actually was. © WFP/Rein Skullerud

# Aceh's Long Road to Recovery

*Successes and limitations of the 2004 tsunami recovery efforts*

by Elke Weesjes

© WFP/Rein Skullerud

THE 2004 INDIAN OCEAN TSUNAMI triggered an unparalleled international response. Hundreds of aid agencies and thousands of people from around the world were involved in the recovery efforts and billions of dollars were raised for disaster relief.

The Indonesian province of Aceh, where 130,000 people died and 37,000 were declared missing, was the area most devastated by the disaster. Half a million people lost their homes and 750,000 people lost their livelihoods.

Even before the tsunami came, though, the region had already been ravaged by war. For three decades, Aceh had been the stage of a bloody conflict between the separatist group Gerakan Aceh Merdeka (GAM) and the Indonesian central government. The fighting claimed thousands of lives and left the province politically disorganized, economically crippled, and largely isolated from the rest of the world. Before the tsunami, foreigners—including journalists and aid workers—were not allowed into the region and accurate reports of the conflict situation were difficult to obtain (BBC 2005).

Aceh's isolation came to an abrupt end two days after the tsunami struck, however. On December 28, Indonesian president Susilo Bambang requested international assistance and declared Aceh open to the international community to provide emergency relief. Humanitarian relief agencies and nongovernment organizations began pouring into the affected region. Within a few weeks more than 50 international organizations were on the ground and by January the number rose to more than 200. These groups worked closely with thousands of Indonesian volunteers and relief workers (Fan 2014).

An estimated $7.2 billion was raised to fund the reconstruction effort—an amount that provided national and international actors with the opportunity to make a real change in improving Aceh's housing and infrastructure. (Kok 2014).

The tsunami tragedy also created a moral, political, economic, and social imperative to end the 30-year conflict between the Indonesian government and GAM. Peace talk initiatives were revived and a new era of peace began on August 15, 2005, when both parties signed an agreement officially ending hostilities.

The link between the tsunami and the new-found accord was explicitly recognized in the document. "The parties are deeply convinced that only the peaceful settlement of the conflict will enable the rebuilding of Aceh after the tsunami disaster on December 26, 2004 to progress and succeed" (Fan 2013).

A joint government-United Nations Disaster Management Centre within the Office of the Indonesian Vice President was established to assist with coordinating national disaster relief. In addition, the Indonesian agency for the Rehabilitation and Reconstruction of Aceh and Nias (BRR) was created in April 2005. The BRR oversaw and coordinated the reconstruction activities for the next four years. Its main functions were to direct all rebuilding efforts by national and international assistance agencies and develop and implement a reconstruction master plan (Relief Web 2006).

Those involved in the disaster response envisioned an effort that would not only rebuild and reinstate what had been destroyed during the disaster, but to make the affected communities fairer, more peaceful, and more resilient than before. These lofty intentions were consolidated in the newly coined phrase—Building Back Better—which became the guiding principle during the reconstruction phase (Fan 2014).

International and national assistance agencies saw opportunities to improve affected communities through programs that were intended to empower tsunami survivors

in a number of ways. These initiatives included a large cash-for-work intervention, a campaign to provide information and shelter options to internally displaced persons, and new efforts in disaster risk reduction. A public information campaign was launched to raise awareness about ways to reduce vulnerability to future disasters. Early building back safer activities were organized to introduce communities to the importance of disaster risk reduction through community awareness, community-based planning, and disaster-sensitive construction (BRR 2006).

The response went beyond ensuring good practices in reconstruction—it actively tried to transform political and social relationships. For instance, the BRR issued housing and settlement guidelines that paid special attention to the needs of renters, the landless, and secondary rights holders, including widows and orphans. A land titling policy was developed to ensure men and women have equal land ownership rights and equal access to the economic benefits associated with them. This initiative became one of the BRR's flagship examples of building back better (Fan 2013).

For the BRR, government reform was an integral part of the Building Back Better principle. For example, an independent Anti-Corruption Unit (ACU) was established to prevent and investigate corruption during the reconstruction and rehabilitation phase. The ACU also served to build local and national capacity to ensure long-term good governance. With initiatives like the ACU, the BRR succeeded in building trust within communities and at different levels of government (Fan 2013).

In 2007, the Indonesian Parliament passed a new Disaster Management Law that shifted the national focus from disaster response to disaster risk reduction. A year later the Indonesian National Board for Disaster Management (BNPB) was established to assist the president in coordinating disaster management, disaster prevention, emergency handling, and recovery. In the years since, Indonesia has worked with international and non-profit organizations to realize a number of initiatives, including the establishing regional disaster agencies, creating early warning systems, and increasing public knowledge about mitigation in disaster-prone areas (UNDP Indonesia 2012).

It wasn't long before Indonesia was able to apply the lessons learned in Aceh to new disaster scenarios— the region was faced with a series of disasters after the 2004 tsunami, including the Nias earthquake in 2005 and the earthquakes, tsunamis, and volcanic eruptions that struck Java in 2008 and 2010. These events illustrated how the country's new knowledge of disaster management and preparedness led to stronger government policies and institutions.

Ten years later, Aceh is widely regarded as a success story in disaster reconstruction. The region's physical reconstruction, which includes 140,000 new homes, 1,700 schools, 36 airports and seaports, and 2,300 miles of road, is indeed impressive (Lamb 2014). Indonesia as a whole is a rapidly growing middle-income country. Poverty levels have dropped in the past few decades, with the GDP growing at more than an average of six percent between 2009 and 2012 (UNDP Indonesia 2013). Yet, even after receiving more than $7 billion in aid, Aceh remains one of the poorest provinces in Indonesia with 18 percent of the population living under the country's poverty level. In this region, an economic renaissance on the back of the reconstruction bubble was predicted, yet Aceh's economy has been stagnant for some time now and unemployment is high (Fan 2014).

Lilianne Fan, Humanitarian Policy Group Research Fellow, argues that Aceh's impressive physical reconstruction obscures deep structural and political problems that "have made long-term recovery for many Acehnese difficult and elusive" (Fan 2014). Rather than characterizing Aceh's situation as a "success story," Fan prefers to call it an "unfinished journey" and urges the international community to regard the ten year anniversary as an opportunity to recommit its efforts to support Aceh and "complete the last mile so that the response to the tsunami can be a proud legacy for us all."

Beate Trankmann, director of UNDP Indonesia, agrees with Fan and recognizes the ongoing challenges in Aceh. She recently told *The Wall Street Journal* that reconstruction funds provided money and short-term employment in Aceh, but have not presented the region with long-term solutions (Schonhardt 2014).

"Securing livelihoods and making sure people have access to services are needed if the peace that came out of the recovery is to continue paying dividends," the Journal quotes her as saying. "The challenge for Aceh is now to get investment into its economic infrastructure and create the employment and create the markets and attract the private sector investment that will keep the economy going."

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# Always on Alert

## *Tsunami sentinels in the Indian Ocean*

by Nirmal Ghosh

LIKE ELECTRONIC TENTACLES, they sit anchored to the ocean floor miles below the surface, constantly measuring the vast volume of water around them for pressure changes that could indicate the build-up of a tsunami.
The data is relayed by acoustic telemetry – coded bleeps – to buoys bobbing on the surface, which in turn relay the information to a satellite. Ten operational Deep-ocean Assessment and Reporting of Tsunamis (Dart) buoys are deployed in the Indian Ocean. From the satellite the data is shared across a network of listening posts on the Indian Ocean rim.

Three countries are designated as Regional Tsunami Service Providers (RTSPs) – Australia, India and Indonesia.
At the RTSP nerve centres, technicians are at their terminals round the clock, listening to the earth. Banks of computers hum and blink as they process data from a range of sources, including seismometers which measure earthquakes, and close to 100 tidal gauges which measure sea level. Sophisticated computer models in seconds determine if a tsunami has been generated and then forecast its size, speed and arrival times on land masses.

While the surface buoys are regularly vandalised – mostly by fishermen anchoring their boats to them and thus dragging them out of position – the system, which cost an estimated $400 to $500 million to develop and set up, has worked well, experts say. It has detected every tsunami since it was set up a few years after the 2004 disaster.

### Memories fade

But as memories of that disaster that killed more than 226,000 people across coastal Asia fade, experts warn against complacency – among the residents at risk, and at the highest level of governments. Political will and financial commitment are a must to keep the system running and, undoubtedly, save lives in the event of another tsunami.

Within minutes of data being received at the RTSPs, the conclusions are sent to other national centres at the edge of the ocean. These then trigger a chain of "tsunami watch" or "tsunami warning" messages, if warranted, to the local authorities, agencies like the police, coast guard and the fire department, the media, and finally local non-governmental organisations and community leaders.

Speed is of the essence to save lives. The target time, from detecting an earthquake and a tsunami to getting a warning out from the RTSPs, is 10 minutes.

Then, it is up to the national systems in individual countries to issue warnings.

"Forecast and warning is only one component of the warning system," says Seattle-based Dr. Vasily Titov, chief scientist at the United States' National Oceanic and Atmospheric Administration Centre for Tsunami Research.

"If there is a warning but people don't know what to do, then the warning doesn't work. If people know what to do but there is no warning, it doesn't work."

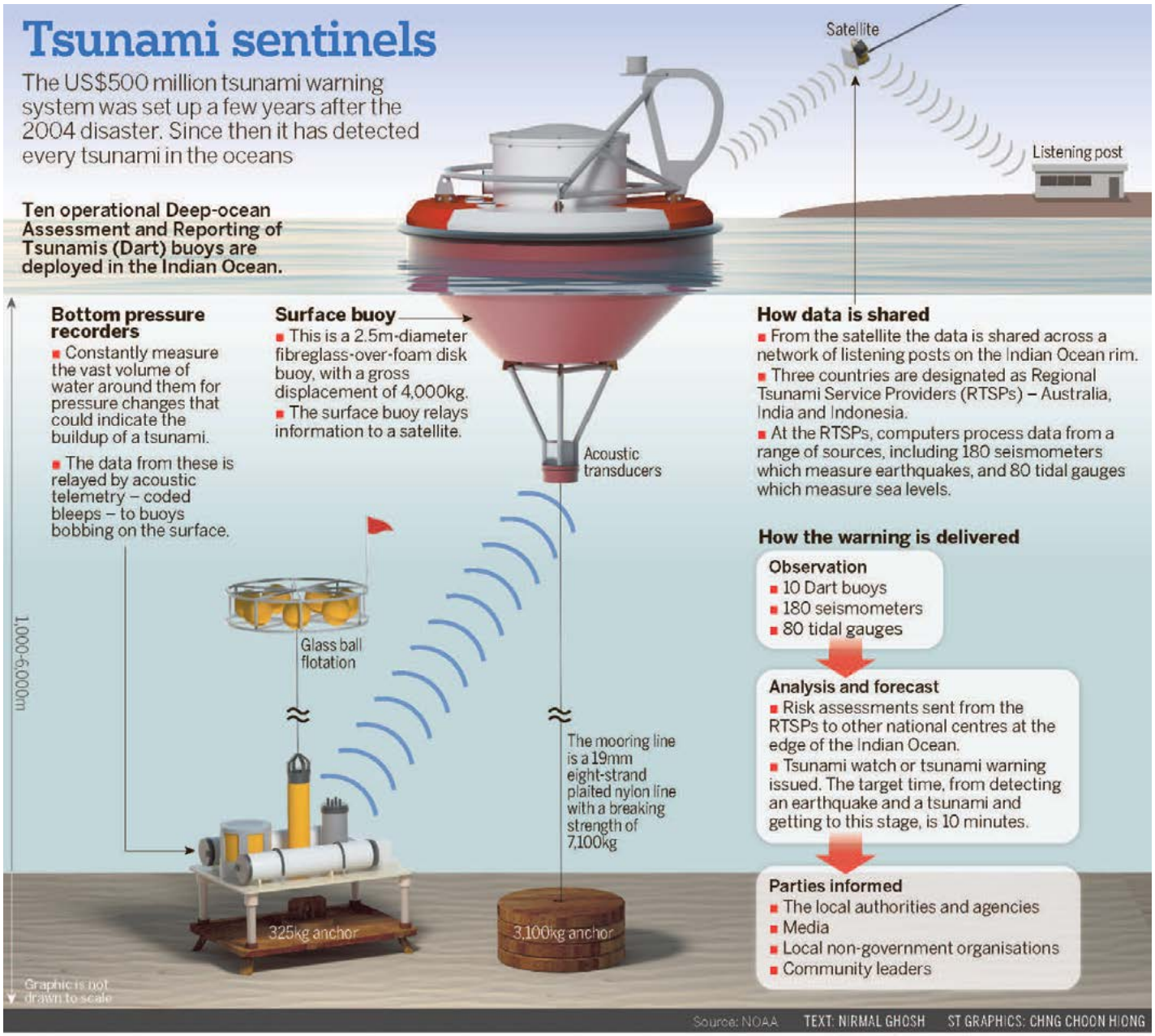
In Thailand, technicians at the National Disaster Warning Centre in Bangkok override and interrupt ongoing TV and radio programming, call key government departments and the local town authorities through hotlines, and send out thousands of text messages to mobile phones. Finally, they trigger warning announcements and sirens at 328 towers nationwide, more than 130 of which are on the Andaman coast that in 2004 had no such system.

Political will and financial commitment are a must to keep the system running and, undoubtedly, save lives in the event of another tsunami

In India, the warning system relies more on swift communication with designated agencies, teams and individuals on the ground, mostly on mobile phones.

Scientist R. Elangovan, from the M.S. Swaminathan Foundation, is one of many point individuals in the network. The foundation installs and runs communications equipment for fishing communities, and disaster warning and response is a part of its remit.

In an interview in Cuddalore – one of the districts worst hit in 2004 – Mr Elangovan said "knowledge workers" and




disaster mitigation teams were in place at the village level. The foundation could send a "voice SMS" or recorded phone message to reach about 7,000 fishermen on their mobile phones virtually simultaneously, from Cuddalore in Tamil Nadu to Kanya Kumari at India's southernmost tip, he said.

"Within five minutes of getting the message from Incois (the Indian National Centre for Ocean Information Services), we get the message out to the fishing communities," he said.

Perth-based Tony Elliott, head of the secretariat of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System, described the data from deep-sea sensors and buoys, from the network of 180 seismometers available in real time and from sea-level gauges, as the "life blood" of the warning system.

"The technical challenge is maintaining a highly complex system with many different components," he said. "Each part of the warning chain is essential; if any link in that chain breaks, then of course the whole system would have failed."

Scientists have more than 10 years of experience now and have gone through three generations of technology and are working on a fourth, said Dr Titov in a phone interview from Seattle.

"Since 2004, every single tsunami has been detected. Most of the time, Dart was the first to detect them. We are confident that the system works pretty well."

However, professor of coastal oceanography Charitha Pattiaratchi of the University of Western Australia, who worked with Dr. Titov, warned: "The longer you go without an incident, the less people are going to spend money. "Maintaining the funding is probably the biggest challenge."

Tsunami warnings were also a delicate business, he said. "Sri Lanka has taken a safety-first approach, it's been more liberal with evacuation warnings. Then the question is, if you have too many of these warnings people may not have confidence in them any more."

At the most recent Indian Ocean Wave 2014 tsunami warning exercise in September, based on a simulated powerful earthquake, warnings were transmitted down to the sub-district level in India but not beyond that. That means there were no warnings at the village-community level.

But in at least one spot – the waterfront in the former French colonial enclave of Pondicherry, police did arrive about an hour after the alert from the Incois and cleared the busy promenade of people and traffic.

A couple of hours' drive south, though, on the beach in Nagapattinam district, families played as usual in the surf about 100m away from the imposing, centuries-old Basilica of Our Lady of Health – the same spot where hundreds died in 2004 as they waited for the Sunday service.

This scene, in which the 2004 disaster is far from the minds of most ordinary people, cannot but underline the critical importance of the warning system.

Without it, there is a danger that the memory will fade. The neglected memorial tower nearby and the granite plaques along the long coast listing the names of the dead will be just signposts, until the next big earthquake below the sea, which is only a matter of time.

*This article was originally published in* Ocean's Fury, *an ebook presented by* The Straits Times *Singapore on the ten year anniversary of the Indian Ocean Tsunami. Download a free copy of this interactive publication via the Straits Times Star App: on iPads: bit.ly/1qvdMqY and on android devices: bit.ly/TuFM24*


## Call for Submissions

*The Observer* invites readers to submit items of interest for publication in upcoming issues. *The Observer* is undergoing a makeover and many more exciting changes are in the pipeline. Throughout this process we would love to hear from you. All comments and suggestions are welcome. Our mission is to close the gap between scientists, policy makers, and practitioners by providing coverage of disaster issues, recent disaster management and education programs, hazards research, political and policy developments, resources and Web sites, upcoming conferences, and recent publications. We are looking for papers and field reports that help narrow the aforementioned divide In additon we are looking for book reviews that contribute to the debates and dicussions in the field of disaster research.

**The deadline for the next issue of the** *Observer* **is March 7, 2015.**

Items of interest can be sent to
Elke Weesjes
(303) 492-2151 (fax);
elke.weesjes@colorado.edu (email).

# Greener AIRPORTS

## *Climate action in the aviation sector*

A RECENT EUROPEAN UNION funded study found that EU airports consume excessive amounts of energy and contribute disproportionately to climate change. In fact, the daily electricity and thermal energy used by a large airport compares to that of a city of 100,000 people (CASCADE 2012).

Under pressure to reduce carbon dioxide (CO2) emissions, the aviation sector has pointed out that it is only responsible for three percent of man-made CO2 emissions worldwide, and 13 percent of the total emissions from the transportation industry as a whole. Compared to private cars— which produce 74 percent of transportation emissions—aviation emissions are relatively low, according to aviation rebuttals to criticism.

Those statistics, however, often focused solely on aircraft emissions and did not take into account the energy consumed by airports—which is significant. Emissions caused by heating, ventilating, and air-conditioning (HVAC) plants, for instance, consume about 50 percent of all energy at airports.

International tourism and business travel have grown extensively in the past few decades. Consequently, new airports and large terminals have mushroomed around the globe. This growth has led the European Commission to declare it high time to address large-scale pollution by airports.

In response, the EU funded a three year project called CASCADE. The project, which ends March 2015, is aimed at helping airport managers reduce energy needs and cut CO2 emissions by 20 percent. It addresses excessive airport emissions by implementing software coupled with an energy action plan based on the international management standard ISO 50001 and algorithms for fault detection and diagnostics. The CASCADE software allows airports to regulate HVAC for faults before too much energy is wasted. That ensures airport maintenance teams can take the appropriate action to improve the performance of the equipment in plants (Müller, Rehault, and Rist 2013).


Italy's two busiest airports—the Milano Malpensa Airport and Fiumicino Airport in Rome—agreed to take part in a six-month pilot study. After implementing the CASCADE software at both airports, engineers found a number of issues. They discovered that some equipment, particularly conditioning units, cooling towers, and chiller plants, were running when they weren't needed; heating and cooling settings were incorrect; sensors and actuators (motors responsible for controlling the system) were poorly positioned; and there was a general lack of maintenance. The CASCADE team concluded that low investment measures such as resetting heating controls and replacing faulty sensors could reduce each airport's CO2 emissions by 3,5000 tons a year—a savings of $70,000 (CASCADE 2014)

Since completion of the pilot study in 2014, interest in the project has increased significantly and Airports Council International has committed its support to the proposal by providing a platform to demonstrate its result to hundreds of airports across the EU. The CASCADE consortium is hopeful that more airports will integrate the energy saving software into their energy management plans.

CASCADE's simple solution for cutting CO2 emissions is good news for airports, but it doesn't have to end there. Project coordinator Nicolas Rehault, head of Group Building Performance Optimization at the Fraunhofer Institute for Solar Energy Systems in Freiburg, Germany, states there are other applications for CASCADE software, as well.

"Airports are very complex infrastructures," he said. "We have gained a lot of know-how on how these infrastructures work. This can be replicated to other highly complex buildings such as hospitals and banks. And it would be down-scaled to simpler things, too" (CORDIS 2014).

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# GROUND WARS
## THE EMPIRE STATE STRIKES FRACK
### The ongoing controversy over hydraulic fracturing in New York

*Invited opinion by Stacia Ryder*

LAST MONTH NEW YORK GOVERNOR Andrew Cuomo implemented a statewide ban of high-volume hydraulic fracturing (HVHF). The ban followed a State Department of Health report that stated the HVHF process might expose the public to air or water contaminants and radiological materials and adversely impact communities. Essentially, the report concludes that there are too many uncertainties about potential negative health impacts (i.e., birth outcomes, exposure symptoms, stress, and quality of life issues) as well as questions about the effectiveness of procedures to mitigate these risks. The ban comes in the midst of a broader debate where the regulation of hydraulic fracturing remains controversial. While I believe that overall this is a good policy decision, like any contentious issue, the state level ban will likely have both positive and negative impacts.

This decision is a win for activists in the state of New York, and, in part, for those who advocate for risk-related research to influence policy. At the same time, the ruling could spell trouble for those who support regulating oil and gas production at the local level. The implications of this ruling are interesting since New York has been one of the few states where the courts have favored local municipality rights to regulate oil and gas production via zoning ordinances (see Nolon 2013; Taylor and Kaplan 2014).

Considering the favor previously given to local municipalities in New York courts, there is a certain irony in the fact that a statewide fracking ban may result in a loss of local control over land use for New York towns and cities. It leaves a lot up in the air as municipal ordinances that ban or regulate fracking in other states are being preempted by state laws. For example, courts in Colorado have consistently ruled that established local fracking bans or moratoriums are in violation of state law. With a loss of local control in a state that previously favored it, it is questionable how successful the local governance movement can be moving forward.

However, despite my reservations about the ban's potential to take away local governing powers and diminish collaboration between state and local governments and the oil and gas industry, I believe the overall implications of this decision are positive. I say that cautiously, however, as the New York ban on HVHF may ignore the root of the issue when it comes to exposure-related public health outcomes. What I mean is that "fracking" exists largely as a political buzzword. A ban on hydraulic fracturing only prohibits the use of one particular technique for natural gas extraction—it does not actually prevent drilling or oil and gas production.

The good news is that the decision to ban fracking appears focused on long-term, unknown risks and consequences of the practice. The United States' political inaction on climate change demonstrates how difficult it can be to establish environmental policies based on these

concerns, especially in situations where risk-based regulation could slow industry progress and economic growth. In particular, Cuomo's trust in, and his staff's reliance on, scientific research conducted by experts is a breath of fresh air in light of recent attempts to weaken scientific influence on environmental policy formation at the Environmental Protection Agency (Burr 2014).

Frequently the extraction industry is too focused on the bottom line identify and mitigate unknown risks. This is problematic. When industry operators refuse to publicly acknowledge real risks related to the practice of hydraulic fracturing (or extraction processes more generally) their credibility is compromised. This can thwart reasonable compromise and risk reduction as easily as a policy ban.

As a social scientist concerned with public health and environmental risk, I believe we should all work together to first identify risks related to HVHF, then develop and implement mitigation strategies that address them before the practices are allowed on a large scale. Uncovering risks and establishing regulations before to allowing heavy industrial activities such as oil and gas drilling is, in its most simple form, best practice.

I remain optimistic about the promise of substantive risk research being established before to the widespread use of new extraction technologies. The rhetoric from both sides of this issue, however, has had a polarizing effect on constructive conversations about the safety and risk of oil and gas development in U.S. communities. As such, semantics are overshadowing areas that deserve real attention, such as equipment failure (i.e., faulty casings), lack of enforcement and accountability when incidents or infractions occur (Opsal and Shelley 2014), and human error. In many ways, a ban sidesteps dealing with real issues that will continue to persist in the oil and gas industry at large. It will be imperative to continue to question not only this ban's effectiveness, but also whether this decision was good policy or merely a symbolic gesture to appease a particular class of New York voters.

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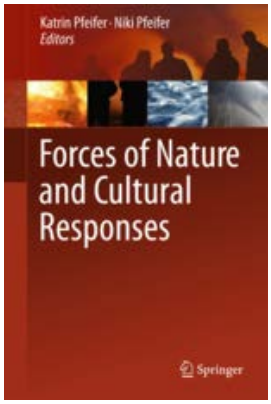
## Natural Hazards Library

THE NATURAL HAZARDS LIBRARY is a recognized resource for researchers and practitioners who wish to obtain the most current knowledge available to solve hazards and disaster-related problems. With more than 40,000 holdings, the collection contains a wide spectrum of material print, digital, audio and video – that address the social aspects of disasters. Professional library staff is available to conduct custom searches of the collection, help answer questions, or direct you to the experts who have the answers you need.

HazCat, our new catalog is set to debut in March 2015. A combination of a traditional public access catalog and an open repository, HazCat offers easier navigation with features that allow you to virtually browse the bookshelves, create custom lists for private or shared use, and digitally access some full-text documents.

We are always working to improve our library services. Future plans include implementing an updated, electronic version of the *Research Digest*, (a quarterly compilation of new research that has been added to the collection), a photo collection, and greater sharing of our resources through interlibrary loan. Please watch for news of when our new catalog to go live. If you have any questions about locating resources, please contact Wanda Headley at Wanda.Headley@Colorado.Edu. We welcome your feedback and suggestions.

# Librarian's Pick




**Forces of Nature and Cultural Responses.**
**Katrin Pfeifer and Niki Pfeifer, eds. 2013.**
**ISBN: 978-94-007-4999-3.**
**214 p., $129 (hardcover), $99 (ebook). Springer Science + Business Media Dordrecht.**

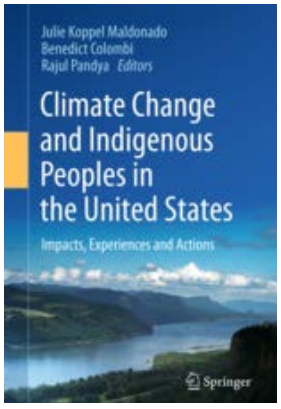
**By Saptarishi Bandopadhyay**

With *Forces of Nature and Cultural Responses*, the editors and their collaborators make a notable contribution to the robust body of literature that has developed around the subject of how human societies understand and respond to natural disasters.

The collection pursues its central question of how "people, peoples, and states" deal with events beyond their control, by offering nine carefully drawn case studies which discuss disasters ranging from the controversial, ('ball lightening' as a force of nature), to the dangerously mundane (earthquakes, tsunamis, and plagues).

Bridging sciences and the humanities, the volume explores society's response across a variety of metrics, such as the impact of calamities on academic achievement and the use of jam-sessions as a means of coping with widespread devastation.

The obvious strength of the collection is the depth of its individual studies and the diversity of interdisciplinary perspectives conveyed therein. As such, the book will certainly appeal to students of disaster management for its careful referencing of current research and empirical data related to disasters. But the narratively-varied cases and accompanying illustrations have much to offer to a general-interest readership curious about the nitty-gritties underlying the wider existential question of how ordinary people have struggled to make meaning out of the myriad calamities that threaten their lives and livelihoods.



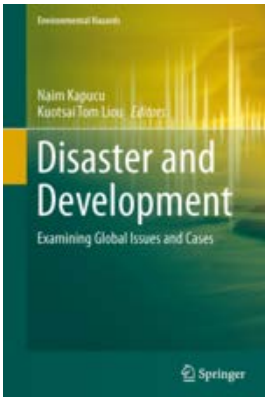

**Climate Change and Indigenous Peoples in the United States. Impacts, Experiences and Actions**
**Julie Koppel Maldonado, Benedict Colombi, and Rajul Pandya, eds. 2014 ISBN 978-3-319-05265-6. 174 p., $99 (hardcover), $69 (ebook). Springer.**

**By Rose Sayre**

Indigenous peoples are uniquely positioned in the challenge that climate change poses to humanity. *Climate Change and Indigenous Peoples in the United States* seeks to specify this position by presenting multidiscplinary perspectives that range from the vulnerability of indigenous peoples due to depletion of key resources and changes in local water sheds, to the consequences of colonialism and the moral imperative of engaging tribes in the process of mitigating and adapting to climate change.

The articles in this collection lend timely evidence and detailed research to individuals and organizations seeking new solutions to the climate change crisis. They offer new paradigms for viewing ecological shifts, and negotiating the relationship between lawmakers, environmental scientists, and tribes indigenous to the United States. It also offers new and useful vocabulary for future researchers and policy makers to draw upon, such as Kyle Powys Whyte's conception of "collective continuance:" the capacity of a community to be adaptive in ways that ensure its members will continue to "flourish into the future."

While self-admittedly non-exhaustive, the collection notably does not include articles that address indigenous-led environmental movements, which have grown rapidly in recent years, or an analysis of the power structures that have worked to produce both the degradation of the environment and the marginalization of indigenous peoples. But this book will undoubtedly support and inspire further research.




**Disaster and Development: Examining Global Issues and Cases.**
**N. Kapucu and K.T. Liou's, eds. 2014. ISBN: 978-3-319-04468-2. 469 p., $139. Springer.**

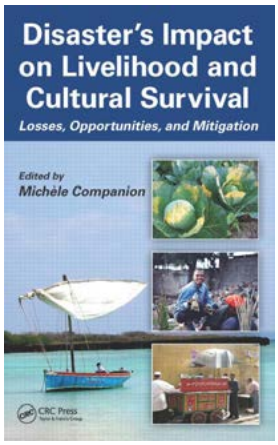
**By Jessica Bonnan-White**

Emergency management practitioners in the US face a complex future. On one hand, they are challenged by new federal programs, emphasis on developing local capacity, and pressure from citizens to respond effectively and efficiently to ever-costlier events. On the other, American agencies increasingly engage colleagues in a globalizing field. Lessons learned by international practitioners inform domestic response and shed light on the connectivity linking global communities.

Naim Kapucu and Kuotsai Tom Liou's *Disaster and Development: Examining Global Issues and Cases* is a welcome addition to a growing body of literature exploring practices in emergency management worldwide. Contributions to the edited volume include case-studies from the U.S., China, Pakistan, Ghana, Lebanon, Sweden, New Zealand, and Azerbaijian, among a host of others. The authors

weave theory with events experienced by both developed and developing areas with appreciation for the dynamic nature of mitigation measures and political challenges to disaster response and recovery.

The volume is ideal for advanced courses in emergency management and disaster studies or as a reference on the diversity of international approaches to recent disasters. Global climate adaptation, sustainable mitigation measures, cultural approaches to preparedness, responding to complex emergencies, and large-scale movement and relocation of people following disaster or conflict are all topics that should be at the forefront of education and professional development in the US and elsewhere. Kapucu and Liou's volume presents a breadth of information representing issues impacting the coastal areas of southern Asia and seismic areas in Turkey, as they do mountains of the Pacific Northwest or the New Jersey shoreline.




**Disaster's Impact on Livelihood and Cultural Survival – Losses, Opportunities, and Mitigation. Michele Companion, eds. Available: March 6, 2015. 352 p., ISBN 9781482248432, $79,96 (hardcover).**
**CRC press**

**By Michèle Companion**

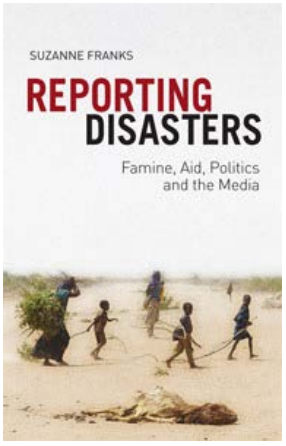
This edited volume offers a broad forum to discuss the impacts of large-scale disaster events on communities.

Chapters explore both losses and opportunities for cultural and livelihood adaptation, change, and disaster impact mitigation. The contributing authors, who include academics, policy makers, community leaders, urban planners, and emergency practitioners, look at different dimensions of livelihood challenges and cultural survival in the wake of disasters in 18 countries around the world.

Some chapters focus on developing best practices to enhance future event response, while others seek to assess new instruments or methodologies for better planning and assessment of disaster impacts. Multiple forms of disasters (drought, hurricanes, earthquakes, technological, conflict, climate change) are introduced to provide a comprehensive examination of the topic and the myriad long-term impacts disasters can have on communities. A section highlights indigenous populations: their concerns, their perspectives and voice, and their strategic plans.

Some key features of the volume include: analysis of the political relationships between threatened or damaged communities, highlighting indigenous communities, and public authorities, and discussions of human activity in regard to its impact on climate change, environmental conditions, and to an increase in sea level and disaster frequency and scope.

This book is ideal for practitioners, scholars, and text book adoption for graduate and undergraduate courses.




**Reporting Disasters, Famine, Aid, Politics and the Media. Suzanne Franks. 2013. 236 p., ISBN 978149042888**
**C. Hurst & Co. Ltd.**

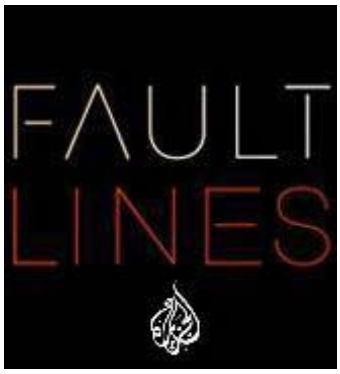
**By Jolie Breeden**

Even the most innocuous media reports can influence public perception, but when the story is far reaching, the ways in which news outlets frame events becomes even more impactful. Reporting Disasters uses BBC reporting of the 1984 famine in Ethiopia to examine that dynamic.

The telling of the Ethiopian famine story—and the subsequent aid efforts and policy directives that followed—could be considered an exemplar of the positive change that can be born of the media spotlight. Not so, says author Suzanne Franks, a former BBC reporter-turned-journalism-professor. Instead, Franks uses the BBC coverage

of famine to paint a picture of how one news agency can bend a story that bends public opinion, and then follows the bends in policy that result.

Using her inside knowledge of the BBC, Franks is able to reconstruct the decision making that led to the story's notoriety and scrutinize how choices at that level mushroomed into policy on and perceptions of Africa that persist to this day. The end result is a close look at the interlacing of media, humanitarian action, and government policy that is at illuminating and multi-faceted.




**Fault Lines:**
**Haiti in a Time of Cholera.**
**A production by Aljazeera.**
**2013, 30 min.**

**By Courtney Richard**

In 2010, a devastating earthquake hit the island of Haiti, killing more than 200,000 people and displacing more than one million, according to the U.S. Centers for Disease Control and Prevention. To make matters worse, several months after the earthquake, numerous cases of cholera were reported, an illness that had not affected Haiti for decades. UN peacekeepers were suspected of introducing the disease.

The Emmy Award winning documentary, *Haiti in a Time of Cholera*, explores the connection between UN peacekeepers and what the CDC called the worst cholera outbreak in recent history—an epidemic that claimed the lives of more than 9,000 Haitians to date.

The documentary follows investigative journalist Sebastian Walker of Al Jazeera America as he follows the unfolding tragedy of this fatal illness. Walker gathers scientific evidence, personal stories, and visits mass graves of those who died of cholera. He determines that the disease was almost certainly brought into the country by UN troops from Nepal—where cholera is endemic —and who failed to follow international rules on waste disposal.

Walkers' journey begins in Haiti, where he speaks to UN representatives in Port au Prince, the Haitian capital, and ends at the UN Headquarters in New York where he confronts high-level officials, including Secretary-General Ban Ki-moon with his findings.

Although he is stonewalled at every turn, Walker presses on in his relentless search for answers. Haiti in a Time of Cholera chronicles that search and the ongoing misery of the victims—and in the process provides them with leverage in their fight for justice and avenues of redress.


**ThuleTuvalu**
**A documentary by**
**Matthias Von Gunten.**
**2014 , 1h38m**

**By Elke Weesjes**

In *ThuleTuvalu*, award-winning Swiss filmmaker Matthias Von Gunten, creates a harrowing yet heartwarming portrait of two communities more than 12,000 miles apart; Thule in Greenland and the Polynesian island nation of Tuvalu in the Pacific Ocean.

These two places at the edge of the world epitomize the approaching environmental catastrophe of worldwide climate change and have become the poster children for this encroaching global disaster.

Tuvalu, a collection of reef islands and atolls midway between Hawaii and Australia, is the third least populous and fourth smallest sovereign state in the world. Its 10,837 inhabitants are dependent on agriculture (coconut and pulaka) and fishing for their livelihoods. Over the past years rainfall that provides much of the drinking water has become unreliable and saltwater intrusion due to rising sea-levels has made it difficult to grow traditional crops. If seawater continues to rise Tuvalu will likely be under water by the end of the century.

Thule is one of the northernmost towns in the world. Its 656 inhabitants rely on the hunting of seals, polar bears, narwhals, and walrus, as a means of survival. The effects of climate change in this region are dramatic, the ice is significantly thinner and glaciers are receding. The disappearing ice makes travel dangerous and hunting almost impossible. As such Thule's popluation is facing major threats to its food security and hunting cultures

In *ThuleTuvalu*, Von Gunten investigates how people cope with these challenges and examines losses and opportunities for cultural and livelihood adaptation, change, and mitigation. The people interviewed for this documentary discuss the hardships their communities are faced with, from a lack of drinking water, fallen palm trees and eroding soil, to shifting ice sheets and decreased hunting seasons.

*ThuleTuvalu*, which won best Swiss Film Award in 2014, is an honest and balanced account of the impact of climate change on two small and vulnerable indigenous communities.

**February 10-12, 2015**
**International Disaster Conference and Expo**
**International Disaster Conference and Expo**
**New Orleans, Louisiana**
*Cost and Registration: $375 before December 5, open until filled*

This conference will explore public and private disaster response from an international perspective and offer solutions to prevent property loss in catastrophes. Topics include, emergency management resilience, response and recovery technology innovations, public health and medical management, animals in disasters, and insurance considerations.
*http://internationaldisasterconference.com*

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**February 18-19, 2015**
**Disaster Resilience Workshop**
**National Institute for Standards and Technology**
**San Diego, California**
*Cost and Registration: $130, open until filled*

This workshop is one in a series of events that will focus on the role that buildings and infrastructure lifelines play in ensuring community resilience. Topics include resilient infrastructure, impacts on social systems, resilience tools and metrics, interdependencies among buildings, and reducing community vulnerability.
*http://www.nist.gov/el/building_materials/resilience/disaster-resilience-workshop.cfm*

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**February 20, 2015**
**Creating a Resilient Aging Society**
**World Health Organization**
**Kobe, Japan**
*Cost and Registration: Not listed, open until filled*

This conference will examine the health, psychosocial, and physical needs of aging populations in disasters. Topics include long-term health consequences, social welfare, community responsibilities, and case studies of the elderly population after the Great East Japan Earthquake.
*http://www.preventionweb.net/files/41787_wkcforum20feb2015outlineenjcc.pdf*

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**February 23-25, 2015**
**National Tornado Summit**
**University of Central Oklahoma**
**Oklahoma City, Oklahoma**
*Cost and Registration: $225 before December 5, open until filled.*

This summit will provide insights on improving mitigation, preparedness, response, and recovery to save lives and property in the United States. Topics include emergency management planning after disaster, the effect of climate change on severe weather, alternative building materials, improving building codes, increasing public safety, and enhancing storm shelters.
*http://www.tornadosummit.org/index.php*

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**March 5-6, 2015**
**Decentralized Disaster Governance in Urbanizing Asia**
**National University of Singapore**
**Singapore**
*Cost and Registration: Free, open until filled*

This conference will examine how citizens can take part in a decentralized decision-making process that improves disaster preparedness within the community. Topics include long-term disaster preparedness, post-disaster impacts on governments, and shared disaster experiences.

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**March 14-18, 2015**
**World Conference on Disaster Risk Reduction**
**UN International Strategy for Disaster Reduction**
**Sendai, Japan**
*Cost and Registration: not listed, closes February 20*

This conference will discuss international disaster risk reduction and recovery from the viewpoint of all levels of governance. Topics include earthquakes and tsunamis as mega disasters, disaster resilient cultural heritage, agriculture and nutrition, and resiliency in the tourism sector.
*http://www.wcdrr.org/home*

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**March 18-20, 2015**
**Virginia Emergency Management Symposium**
**Virginia Emergency Management Association**
**Hampton, Virginia**
*Cost and Registration: $425, open until filled*

This conference will examine the divide between practitioners and the academic study of emergency management using specific events. Topics include the Cherrystone Campground tornado, the efficiency of technology in emergency management, vulnerable populations and their experience with Hurricane Irene, and threats to the power grid.
*http://www.vemaweb.org/content/symposium/*

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**March 24-26, 2015**
**Preparedness, Emergency Response and Recovery Consortium (PERRC)**
**Chesapeake Health Education Program, Inc.**
**Orlando, Florida**
*Cost and Registration: $475 before February 1, open until filled*

This conference will examine the relationship between healthcare communities and emergency response management. Topics include evacuation of vulnerable populations, arctic emergency events, utilization of social media before, during, and after a disaster, and a case study of Hurricane Sandy.
*http://www.perrc.org*

**March 30 to April 2, 2015**
**Coastal Geo Tools**
**Association of State Floodplain Managers**
**North Charleston, South Carolina**
*Cost: $400 before March 1, open until filled*

This conference focuses on geospatial data, tools, technology, and information for coastal resource management. Topics include, digital coast tools for flood plain management, community resource planning and management, national ocean mapping, social and physical vulnerability assessments in the South East, and planning for coastal inundation.
*http://coastalgeotools.org*

**April 17-18, 2015**
**International Symposium on Anthropology and Natural Disasters**
**Department of Life Sciences, University of Coimbra**
**Coimbra, Portugal**
*Cost and Registration: $65 before March 1, open until filled*

This symposium will offer the possibility for a complementary dialogue between the various fields of anthropology, in the understanding and resolution of problems, and in the promotion of new research avenues. It will feature a blend of presentation formats, including keynote lectures, podium presentations, organized poster sessions, and photo exhibition(s). Topics include, bioarcheological responses in Byzantine Greece, impacts of natural disasters on human life, and the relationship between social and cultural anthropology and disasters.
*http://www.uc.pt/fctuc/dcv/eventos/2015/isand2015*

**April 20-24, 2015**
**13th Annual International Wildland Fire Safety Summit**
**International Association of Wildland Fire**
**Boise, Idaho**
*Cost and Registration: $550 before March 2, open until filled*

This conference will address the social aspects of fire management and problematic human behavior within fire management. Topics include, homeowner fire protection and hazard mitigation, organizational performance, collaboration within natural resource management, and assessing residential wildfire hazards.
*http://inawf.memberclicks.net/upcoming-conferences*

**April 28-30, 2015**
**South Asian Conference on Climate Change**
**Mehran University of Engineering and Technology**
**Sindh, Pakistan**
*Cost and Registration: $200 before March 15, open until filled*

This conference will focus on climate change and its impacts on vulnerable countries in Asia. Topics include, agriculture and future effects on rice yields, hazard prediction and preparedness in Asia, examining policy responses to climate change, and analyzing current Pakistani policy.
*http://climatechange-muet-rdf.org.pk*

**May 3-5, 2015**
**Australian and New Zealand Disaster and Emergency Management Conference**
**Disaster & Emergency Management**
**Jupiters Gold Coast, Australia**
*Cost and Registration: $880 before March 23, open until filled*

This Conference will feature multi-agency presentations covering all phases of emergency and disaster management – prevention, preparedness, response and recovery. There will be representation by fire, ambulance, emergency, rescue, volunteer, defence and health sectors.

Presentations will facilitate discussion and provide a spotlight on developing leaders in Disaster and Emergency Community. The conference program will include an extensive range of topics with Keynotes, Concurrent Sessions, Case Studies, Workshops and Posters.
*http://anzdmc.com.au*

**May 19-22, 2015**
**Floodplain Management Association National Conference**
**Floodplain Management Association**
**Brisbane, Australia**
*Cost and Registration: $1125 before March 20, open until filled*

This year's conference theme is "Building a Flood Resilient Australia" which will focus on building resilient communities and flood resilient buildings and infrastructure. Topics include issues in the Brisbane River catchment, Queensland's response and recovery programs, and floodplain risk management.
*http://www.floodplainconference.com/index.php*

## Mary Fran Myers Scholarship

The Mary Fran Myers Scholarship Committee is now accepting applications. Recipients will receive financial support allowing them to attend the 2015 Natural Hazards Research and Applications Workshop in Broomfield, Colorado, July 19-22. Recipients may also stay through July 23 to attend either the International Research Committee on Disasters or the Natural Hazard Mitigation Association add-on events for researchers and practitioners, respectively. Scholarships can cover part or all of transportation, meals, and registration costs.

The Mary Fran Myers Scholarship is awarded annually to at least one potential Workshop participant. Recipients are recognized at the Workshop and may be asked to serve as panelists, where they can highlight their research on or practical experiences with hazards and disasters.

As the longtime co-director of the Natural Hazards Center, Myers recognized that many of the people that could benefit from and contribute to the Workshop were among those least likely to afford it. The scholarship was established in 2003 to fulfill Myers' request that qualified and talented individuals receive support to attend.

Hazards practitioners, students, and researchers with a strong commitment to disaster management and mitigation and who reside outside North America or the Caribbean are eligible to enter. Eligibility is based on current place of residence, not citizenship.

Applicants from North America and the Caribbean will be eligible for the scholarship in 2016.

Previous attendees of the Natural Hazards Workshop are not eligible for the Mary Fran Myers Scholarship. Preference is given to those who can demonstrate financial need.

For more information on past scholarship winners and how to apply, visit the Mary Fran Myers Scholarship page at the Natural Hazards Center website.
*http://www.colorado.edu/hazards/*

**Applications must be received by March 27.**

## Gulf Research Program Funding

The Gulf Research Program's 2015 exploratory grants and fellowships competitions opened on December 18, 2014. Visit their grants and fellowship webpages to review competition details and access the online application.

**Exploratory Grants - Award Year 2015 Deadlines**
Letters of intent on the topics below are due on January 29, 2015 at 8pm ET. Full proposals are due on March 30, 2015 at 8pm ET. A letter of intent is required for this funding opportunity.

**Award Year 2015 Topics:**
- Exploring approaches for effective education and training of workers in the offshore oil and gas industry and health professions
- Linking ecosystem services related to and influenced by oil and gas production to human health and wellbeing.

**Fellowships - Award Year 2015 Deadline**
Applications for Gulf Research Program Early Career Research Fellowships and Science Policy Fellowships are due on February 6, 2015 at 8 pm ET.

For more information visit the National Academy of Sciences website.
*http://www.nas.edu/gulf/index.html*

## Department of Homeland Security Graduate Fellowship in Coastal Hazards

The Coastal Hazards Center of Excellence (CHC) based at the University of North Carolina at Chapel Hill is seeking one (or more) highly motivated individuals who is interested in pursuing either an MS or a PhD degree with focus in coastal hazards modeling. Funded by the U.S. Deparment of Homeland Security Science and Technology Directorate, this fellowship targets students interested in pursuing rigorous coursework and hazards modeling research with real-world applications. Studne support includes tuition, benefits, an annual stipend, travel funds to attend at least one conference or symposia and two 10-week paid summer internships. Fellowship recipients must be U.S. citizens and be either currently enrolled in, or gain acceptance into a CHC-approved graduate degree program at UNC-CH and identify a faculty advisor who agrees to supervise the graduate program. In addition the recipient must work at least one year after graduation in a homeland security-related position.

Students who are currently enrolled in gradudate studies at UNC-CH or who have independently applied for admission to graduate studies at UNC-CH may submit application materials until February 1, 2015, or until the fellowships are filled.

For more information visit the Coastal Hazards Center website.
*http://coastalhazardscenter.org/2014/10/e-news*

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# Support the Natural Hazards Center

The success of the Natural Hazards Center relies on the ongoing support and engagement of the entire hazards and disasters community. The Center welcomes and greatly appreciates all financial contributions. There are several ways you can help:

**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**

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

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A U.S.-based organization, the Natural Hazards Center is a nonprofit, tax-exempt corporation under Section 501(c)(3) of the Internal Revenue Code.