Toward More Resilient Futures:

Putting Foresight Into Practice

Highlights from the Strategic Foresight Initiative (SFI)

May 2013

FEMA

Join the SFI Community

FEMA is but one member of the emergency management community. The Strategic Foresight Initiative (SFI) exists due to the participation of a diverse network of more than 900 individuals from across the United States and the international community. Since 2010 SFI has engaged all levels of government, non-profits, businesses, and individuals. The SFI community spans a broad range of fields and disciplines, and includes both emergency management professionals and members of the general public.

FEMA is dedicated to creating space for collaboration and dialogue around the future of disaster management and our community's future strategic needs. To this end, SFI has and will continue to use various media, virtual collaboration tools, and in-person meetings or conferences to promote engagement.

We invite you to get involved or deepen your engagement with SFI. For more information and materials, check out our website:

www.fema.gov/strategic-planning-analysis-spa-division/strategic-foresight-initiative

We rely on the community to identify new ideas, highlight examples of future-looking best practices, and promote greater foresight across our Whole Community. Email us if you'd like to join our listserv, receive our monthly newsletter, participate in an upcoming event, or if you plan to put SFI materials to use to meet your unique needs.

To join the SFI community or engage, please email FEMA-OPPA-SFI@fema.gov.

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Image courtesy of Flickr user *Stuck in Customs*

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About SFI

Launched in 2010, SFI is a transformative, community-wide effort to create an enduring foresight capability. SFI seeks to catalyze two outcomes:

- an emergency management community positioned and prepared for whatever challenges the future holds,
- a common sense of direction and urgency, to drive action toward meeting our shared future needs—starting today.

Note from David Kaufman,

FEMA Associate Administrator for Policy, Program Analysis, and International Affairs

This document builds on the foundation of last year's capstone Strategic Foresight Initiative (SFI) report. In the *Crisis Response and Disaster Resilience 2030* report, **SFI established a framework for foresight**: deepening our understanding of the forces driving change in emergency management (EM) and delivering insights into the capabilities, tools, and partnerships needed for success in the future.

With *Toward More Resilient Futures,* we take another step forward as we seek to **apply** our collective foresight toward more resilient futures. This step moves us beyond the analytical world of process and "theory" toward the **real world of practice**. And this focus on practical applications is the cornerstone of this document—distilled into the three parts of the Features. Each Feature has a specific aim.

- Sustaining Foresight: to **spark future-thinking** and discussion about recent key trends, and what they may signal for America over the coming years – Page 1
- Future Strategic Needs in Practice: to **spotlight efforts from the Whole Community** that exemplify how we can develop the capabilities, tools, and partnerships to meet our future needs – Page 12
- Big Issues. Strong Leaders. Bold Action: to **inspire our community into action** by profiling innovators working to solve big problems and make our Nation more resilient – Page 23

The document closes with a brief recap of SFI's recent work and an outlook for what's next. We hope that you have fun with this document, and get engaged or deepen your involvement with this project.

1 – Sustaining Foresight

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For further reading, click on any of the over 100 hyperlinks in this section to explore relevant and accessible source materials

Notes

In *Crisis Response and Disaster Resilience 2030,* SFI identified nine major drivers of change shaping our strategic environment. The themes in this Feature capture key elements of all nine SFI drivers.

The analysis here draws upon a robust scenario-building exercise developed as part of the SFI process. For more detail about the development of the "emerging themes," visit Appendix A; for references, visit Appendix C.

Overview of this Feature

This feature seeks to **spark future-thinking** and discussion about key trends, and what they may signal for America in the coming years. It uses a tool called **scenario planning**, a common method used by organizations like the U.S. National Intelligence Council. By considering **a broad range of alternative possibilities for the future,** scenario planning helps account for the unpredictability of real life. Instead of simply assuming that there's one "most likely" future, we should critically assess **how an uncertain future may play out in many different ways**. We do this by analyzing a wide spectrum of drivers like technology and socio-economic factors, drivers that may **fundamentally change the way the world works**. Understanding what our future needs will be requires us to stretch our imaginations and explore the underlying forces of change—seeking to be more prepared, regardless of **how the future unfolds.**

In Feature 1, we packaged this scenario planning analysis into a narrative approach to make it more interesting and accessible. We offer four themes covering the following dimensions: Economic, Environmental, Technological, and Security. These themes draw from, but are not themselves the five scenario "worlds" SFI used in our 20-year assessment of the future environment (see notes). **They are not FEMA policy or official positions. They are simply plausible dynamics the Whole Community may need to contend with in the future.** Within each theme are two storylines that are structured like a "devil's advocate" argument, where we imagine how various converging trends may play out to change the future of disaster management. In the end, we hope to spark long-term and innovative thinking as to how the Whole Community can better prepare for emerging challenges and opportunities.

ECONOMY

The American Revival

The Great Stagnation

The U.S. economy may be at a major inflection point—with our future prospects playing out along two starkly different yet interconnected narratives.

The brighter side places the United States on the cusp of a technological and industrial renaissance. Advances in information technology and social networks will combine with American ingenuity to transform business, government, and society at-large. The recent financial crisis and recession, while deeply painful, is considered more of a temporary phenomenon. The economy is moving toward a sustainable recovery. The United States still draws the world's top talent to its universities, remains a hub for innovation, and promotes a top-tier competitiveness environment for business. "Big data" drives smarter decisions and uncovers new value in existing businesses. The economics of globalization are starting to shift, making America a place in which to invest and produce again.

key trends

Taming the deficit Leading economists assert that improving underlying conditions in the U.S. economy, led by a resurgent housing market and gains in the labor market, indicate a likely acceleration in economic growth in 2013. Sustained growth can help shrink deficits and make the national debt manageable again. There's hope this can ultimately lead to expansive thinking. And ultimately action about big national challenges like education, healthcare, critical infrastructure, global competitiveness, and the environment.

Driving innovation Silicon Valley remains the world's mecca and benchmark for innovation—having mastered the "startup ecosystem." America is a leader in producing cutting-edge breakthroughs. Major companies like Apple and Google are only the best-known of an expanding pack of dynamic U.S. firms. The culture of innovation is spreading to government, boosting the efficacy of public services. In addition, automation and advances in manufacturing are shifting competitive advantages back to the United States, with substantial spill-over benefits across the entire economy—particularly in old Rust Belt areas once seen as irreversibly in decline.

Background image courtesy of Logan Lindquist

VS

On the darker end, while the economy is bouncing back from the financial crisis, there are concerns that the current challenges are deep and structural. Gone are the economic dynamics that underpinned vast improvements in living standards in the United States between World War II and the 1970s. And in a globalized, interconnected world, there is no substitute for the "rising tide" of a dynamic U.S. economy. Some experts argue we've consumed most of the "low-hanging fruit" that's enabled our long-term growth. American stock markets may be surging, but unemployment remains at historically high levels. Concerns remain over high debt, middle-class job security, weak GDP growth, and fewer booming industries. The wild cards of potential financial market volatility, a Eurozone breakup, and other global shocks only worsen the downside risks.

key trends

Slow job recoveries The last three economic recoveries have produced historically lower job growth—raising questions about the longer-term economic landscape. Technology, automation, and competition from abroad have displaced many American jobs. Our education system is struggling to fill the "skills gap" in many sectors. Technology appears to be booming, but unlike traditional manufacturing and many service industries, this sector does not create enough jobs to rebuild the middle class.

Hardening inequality Many measures reveal a growing gap between the so-called haves and have-nots: concentration of income at the top, high levels of youth unemployment, and growing gaps in life expectancy between the rich and poor, among many others. A stagnant economy and political gridlock tend to reinforce these disparities. Lack of long-term investment in health services and education will only exacerbate these trends. Long-lasting inequality can seriously increase social risks that may heighten the vulnerability of communities to disasters, particularly for groups who lack "emergency" resources.

Background image courtesy of Deviant Art user KittenKiss

Resourcefulness The tightened budget environment has driven greater efficiency and focus on performance and outcomes. This shift is driving action that achieves "more with less" throughout all sectors, including government. Success of public-private partnerships and competitive grant programs like the Department of Education's Race to the Top point to innovative ways to deliver essential services, even through tougher times.

Pent-up capacity A future flood of investments from companies with strong cashflows may help unleash a new cycle of economic growth and create demand for workers. The housing market is rebounding; consumers have shed a lot of debt and are spending again. The resulting rise in government coffers may enable the delivery of essential services and improve the business environment. Together, these forces could spark a resurgence of economic activity.

implications for government and emergency management

- **Strong, sustained economic growth** would ease fiscal pressures at all levels of government, enabling policymakers to tackle big-ticket problems like infrastructure in an integrated fashion. Adopting solutions that address safety, efficiency, and environmental considerations all at once. As a beacon for global talent and ambition, the United States would continue to provide a healthy climate for innovative thinking and entrepreneurial risk-taking. Rising immigration would boost the tax-base and the population pyramid, but cities may struggle to expand services for new immigrants.

- Over time, **fiscal reform, job recovery, and stable growth** would free up resources for new hires, equipment purchases, and investment in capabilities. While officials may gain scope to plan for big projects related to infrastructure and disaster resilience, government would need to compete to attract technical talent. The growth of technology and consumer applications raise the public's expectations of government. New housing patterns and urban growth may present fresh challenges for emergency managers, as they attempt to serve immigrant populations that are less connected with traditional outreach channels.

takeaways

Inter-agency cooperation is likely to be essential, pushing officials to come together to better serve the needs of the community throughout all phases of disasters. This may involve partnering with community organizations trusted by hard-to-reach immigrant populations. Fiscally, there is a risk that recent gains made in cost-efficiency and regional resource-sharing may backslide. A growing economy may again lead to development in high-risk or resource-scarce regions.

VS

Money problems The struggling economy has further squeezed budgets across all levels of government. Austere fiscal conditions are likely to extend into the foreseeable future. This could have serious impacts on the underlying structures of resilience, such as healthcare and essential social services. These constraints further delay long-term investment in critical infrastructure projects.

The end of big thinking There are real consequences to the partisanship of our political system. It is increasingly difficult to garner the consensus needed to pursue essential government projects, from critical critical infrastructure to education investment. The Nation must work on systemic challenges together in order to resolve persistent issues to resolve persistent issues, including disaster-specific ones like misguided incentives that encourage development in hazardous areas and contribute to "repeat loss events." The fear is that we may seed the next crises with delayed action and band-aid solutions.

implications for government and emergency management

- **More of the U.S. population would be vulnerable to disasters** if the Nation undergoes a prolonged period of slow growth characterized by strained fiscal resources and reduced social services. This may lower community resilience, which means that when disasters do occur, their impacts are felt disproportionately among a larger population—resulting in prolonged disaster recoveries.

- **Slow growth** would exacerbate debt and deficit pressures on the economy and in turn feed a national sense of *limitation*—leaving little scope for bold new projects. A tough job market would force more workers to rely on part-time or contract work with minimal benefits. Fewer citizens would be able to volunteer in key public service activities. Under chronic fiscal pressures, U.S. infrastructure would continue to decay, "patch-and-repair" practices would prevail over large-scale improvements, and managers at all levels would operate with scarce resources.

takeaways

Interoperability is likely to be even more important when it comes to sharing capital goods, systems, and people in this highly interdependent environment. There is a heightened risk of environmental disaster if regulatory constraints are eased or if enforcement is diminished. There is likely a strong need to revisit post-disaster planning to ensure that response and recovery goals are realistic. This is especially true given the potential for lower resilience in communities and among a greater number of Americans vulnerable to disaster.

ENVIRONMENT

Out of the Frying Pan

Making Lemonade

The forces of global environmental change are expected to bring major challenges and new opportunities to the United States. How we choose to cope with them may well be the biggest unknown we face.

Considering the environmental landscape, two forces are combining to increase the Nation's risks to natural hazards. First, the frequency of extreme weather is accelerating, with events like Hurricane Sandy threatening to become the norm. Secondly, fiscal pressure and political gridlock has resulted in piece-meal action to mitigate future risks and adapt to the growing dangers. Meanwhile, critical infrastructure is undermined by extreme weather and overburdened by increased use. Insurance companies are increasingly pulling out of risky areas, leaving the public to address the increased risk. This trajectory points to higher vulnerability for the Nation, unless we move now to take substantive preventive and adaptive action.

VS

While severe weather remains a major threat, opposing dynamics propel the United States to make the best of a difficult situation. Recovery efforts in New York and New Jersey after Hurricane Sandy, for example, were buoyed by improved remote-sensing data and new technology that sped up the distribution of relief funds. The wide-spread damage from Hurricane Sandy forced government to seriously focus on adaptation planning and reducing risk exposure. Relatedly, research shows that growing first-hand experience with extreme weather impacts increases public support for climate action. While weather and climate are not synonymous, the public continues to link the two ideas, complicating outreach efforts. Meanwhile, states, cities, and businesses are instituting collaborative efforts to tackle climate change adaptation and improve mitigation. This path, therefore, has silver-linings: the challenges posed by climate change encourage collective, cost-effective actions, which bolster disaster resilience.

key trends

Unforeseen accelerations 2012 was the warmest year ever recorded in the contiguous United States since the first weather records began in 1895. In summer 2012, Arctic sea ice shrunk to its smallest extent on record, melting at a much faster rate than scientists anticipated. In the future, melting permafrost and thinning ice are expected to further accelerate warming by mechanisms and magnitudes that are difficult to predict with scientific models. This raises concerns that climate models underestimated the rate of warming and sea-level rise observed to date, raising prospects that climate change impacts will be felt faster.

No drive to act At the 2012 climate meeting in Doha, Qatar, negotiators were unable to forge an emissions reduction agreement that would keep global temperature increases below 2°C—a threshold that most climate scientists believe is on the outer bounds of "safe" warming. Without meaningful action to reduce emissions today, scientists believe impacts will increase in magnitude over the medium and long-term, with temperatures potentially reaching 4-6°C by the end of this century.

Background image courtesy of Flickr user *grongar*

key trends

(Momentary) positives Melting sea ice opened new Arctic shipping routes and enabled extraction of useful minerals and oil deposits. Changes like increased atmospheric CO2 and a decline in the number of frost days expected to initially increase crop yields in North America (with strong variations). In the long run, food production may suffer from shifts in temperature and rainfall. Emissions in the sensitive Arctic may further accelerate the rate of melting and warming, especially with added pressures from burning oil and gas uncovered in the region. But for now, these momentary positive impacts are being exploited.

Catalyzing events Hurricane Sandy, the worst U.S. drought in a half-century, and the 2012 Colorado wildfires brought new attention to the topic of climate change. In the same vein that public opinion shifts with growing exposure to severe weather, recent events demonstrated the need to further embrace a more forward-looking and adaptive position. The drive to implement an integrated approach to reducing risk exposure now influences rebuilding decisions for housing and infrastructure. Relatedly, the modeling and management of risk is changing, and stronger design standards are being developed.

Critical infrastructure Beyond risks from events like hurricanes, our 18 critical infrastructure sectors are also vulnerable to other environmental changes, especially heat waves—the deadliest domestic natural hazard. In many ways, the U.S. power grid may be the most fragile. Events like 2012's *derecho* storm that left 1.2 million in the Washington, DC-area without power during a heat wave highlight the growing risks to infrastructure from more extreme weather.

Increasing exposure Homeowners' growing desire for access to natural amenities has led to more development in areas with more exposure to extreme events (coastlines, wildland-urban interface). This negatively impacts the insurance industry—a key component of individual resilience. As companies seek to limit their risk, they're seeing more homes as uninsurable. As extreme events become more frequent, individuals, communities, and governments are forced to manage the complex trade-offs regarding the increased risk exposure.

implications for government and emergency management

- **The acceleration in warming and melting rates** are indicators that warrant better preparation for and mitigation of extreme events. Storm surge, flooding, and heat wave threats, in particular, require costly, large-scale and long-term infrastructure improvements *now*. But scientific uncertainty combined with relatively low public concern may make it difficult to prepare and plan.

- **More housing development in increasingly risky areas,** combined with the reduction in private insurance services, would seriously impact individual and community resilience. After disasters, government faces immense pressure to step in and provide assistance. As a result, certain areas prone to disaster have historically been buffered by federal insurance programs and post-disaster relief and rebuilding funds. With the anticipated increase in the frequency and magnitude of extreme events, policies, programs and decision-making that limit risk and exposure *prior to a hazardous event* will become even more important.

takeaways

The growing consensus is that current harsh weather conditions will likely worsen, and that warming and sea-level rise estimates are conservative. Integrating and further institutionalizing catastrophic planning efforts, like FEMA's 'Maximum of Maximums' initiative, across the Whole Community can be a great starting point. Updating local building standards and codes to higher standards of resilience are just a few examples of good risk management. A critical reexamination of the policies and incentives that subsidize settlement in dangerous areas is also needed.

VS

Fruitful collaboration U.S. cities are playing leadership roles in climate change mitigation and adaptation, producing many meaningful collaborations. These initiatives provide the groundwork for public officials to take bold action—responding proactively to degrading infrastructure, the exposure of vulnerable populations, and other issues often ignored until after a hazard event.

Green sprouts The growing success of new initiatives built around "green" products in countries like China and India has gathered international attention. Meanwhile, homegrown local, state, and industry-level programs to curb emissions domestically have begun to show that the economic impact of greenhouse gas mitigation could, in fact, be positive. These successes fortify arguments for broader-scale climate change action, and put pressure on businesses and policymakers to keep up with international competition.

implications for government and emergency management

- **Weather is not synonymous with climate**, as scientists often remind us. With individual weather events as the basis for climate change concern, there is a risk that public commitment to action could turn to apathy if weather patterns change. This "recency effect" can complicate public outreach and activity because it may dilute consideration of the complexity and uncertainty inherent in the science of climate change. While a lot of national adaptation measures are driven from the top, resulting from federal action or mandates, cities and states will continue to play a big, and possibly leading role. Emergency managers at all levels may be called upon to support grassroots efforts adapt to climate change.

- **Increased traffic in the Arctic** represents a range of new challenges. The resource-richness of the region attracts energy exploration, and economic factors attract new commercial passage. But harsh weather conditions, floating ice, and lack of communications and rescue infrastructure impose new risks on both people and the environment. Managing environmental catastrophes or emergency operations are likely to be daunting tasks.

takeaways

If public support for climate adaptation waivers, multi-faceted solutions will be needed. With the mounting impacts of harsher, potentially more frequent severe weather, such solutions should contribute to both climate resilience and other national goals (e.g., a more modern, efficient infrastructure). As the Arctic becomes a more economically active area, ensuring safety and resilience in these physically challenging environments requires better planning for more robust disaster management infrastructure.

TECHNOLOGY

Technotopia

Technical Difficulties

Technological innovation continues to accelerate—working its way into much of our lives. We may benefit greatly from new tools, but troubling trends reveal that a world awash in technology also presents downsides.

With the speed of product development and adoption, new technology is changing and redefining how we live and work more than ever. In the developed world, advances have turned mobile phones into always-on, hand-held personal computers—the iPhone is 100 times faster and 12,000 times cheaper than the world's best supercomputer from the 1970s. In developing countries, mobile technology has spurred huge innovations. And transformed entire industries like banking and given communication access to millions. And these advances, highlighting just one sector, only scratch the surface of what's possible. Experts believe we are in the midst of the next industrial revolution that will fundamentally change *who* makes things, *how*, and *where*. The resulting business models, tools, and capabilities may have many disaster management benefits.

key trends

New business models "Crowdfunding" platforms like Kickstarter and Neighbor.ly are democratizing forces in both business and government—helping to launch new products or services and fund community projects. This opens completely new ways to fundraise, enabling individuals to directly support projects they care about. In 2012, the Kickstarter community pledged $99.3 million for projects or about ten percent of all seed investment in the United States. Moreover, the broader move toward "crowdsourcing" of all kinds signals a major shift in how we work and the way people interact with organizations (even helping to tackle diseases).

Data, data everywhere Big data and social networking redefined how we think about and manage information. The meteoric growth in the collection of data creates new insights and applications. In just one example of how analytics can inform real-world decisions, candidates in the 2012 presidential election mined voter data to pitch personalized campaigns (micro-targeting) and mobilize voters. The Red Cross aggregates data from social media like Twitter and Facebook to aid disaster response efforts directly. Some of the hype may fade, but the impacts—like improved planning, business intelligence, and situational awareness—indicate big things are on the horizon.

VS

Technical advancement is typically looked upon favorably, especially in the United States. But the pace of technological change today may be counter-productive, both economically and socially. It raises serious concerns related to privacy, power, and inequality. It also forces us through rounds of creative destruction, often without drastic improvements in living standards, and with wide-ranging impacts. For instance, Wall Street software glitches can measure in the millions in just seconds. Is it possible that technology, by adding speed and complexity to our environment, may actually be making things fundamentally less secure and stable? If so, how do we respond? With facial detection technology spreading and even government data now held "in the cloud," it is becoming increasingly difficult (and costly) for individuals to opt-out of this hyper-connected system.

key trends

Privacy and data (in)security Online "cloud storage" services grew exponentially by creating new uses for data and offering convenient, anywhere access. However, common security measures are flawed, offering multiple points of entry for hackers and thieves. Recent data breaches exposed the underlying vulnerability of these measures, which fuel entire black markets in stolen data. Meanwhile, companies legally collect, buy, and sell detailed information about their users. Cyber-crime is now one of the most lucrative forms of criminal activity, and the risk of identity theft is a serious issue affecting individuals, businesses, and government.

Walled gardens Tech giants like Apple and Google are now ubiquitous—they provide the remote controls for many people's digital lives. But critics fear that their size and power may become a problem for consumers, and even governments. The platforms they offer—suites of services and apps that operate on smartphones and tablets—are like "walled gardens," making it difficult for consumers to move content between products, and locking consumers into long-term dependency. Moreover, patent wars between technology firms threaten to stifle innovation and competition, ultimately hurting the consumer and industry.

The Maker Movement The Makers, a technological subset of the DIY movement, are changing the way all kinds of things are produced. 3-D printers can now generate everything from custom tools, to hearing aids, jewelry, even body parts. Printing services offer custom-manufacture of pre-designed products, and home-based printers download files from the web that can be turned into real objects. Synthetic biologists and biohackers are designing and building whole new biological parts, organisms and systems. The Maker Movement aims to decentralize and compress the idea of "just in time production," putting more power in the hands of consumers. This idea could redefine the manufacturing process, fundamentally change our economy, and enable people to create on-the-fly solutions to issues encountered during emergency response and recovery.

implications for government and emergency management

- **These tools and platforms offer new opportunities** for government and emergency managers to engage with communities, target services, and improve efficiency. For instance, non-traditional public-service organizations like Code for America are helping government at all levels work better by leveraging technical expertise and the power of the internet. Also, online platforms have been developed by survivors and organizations to aid communities in disaster preparedness and recovery (see pages 14 and 16).

- **The role of social media in shaping** the public's experience with disasters is growing—connecting people in new ways. For instance, one Hurricane Sandy survivor reportedly received $10,000 in crowfunded donations for recovery efforts in her neighborhood. While the benefits of quick and easy post-disaster funding are clear, this direct connection bypasses traditional aid organizations and networks. This may complicate how funds are tracked and distributed—with areas in greatest need not always benefiting.

takeaways

The increasing openness inspired by today's technological innovations means that there's a great need to make better use of a broad swath of new information, systems, and processes. Decentralized and collaborative ways of producing and communicating may prove threatening to existing, hierarchical structures (perhaps even those in emergency management). Overall, managers are likely to be forced to use a variety of platforms while balancing the risk of new options with "tried-and-true" methods of getting things done.

VS

The Digital Divide The falling cost of consumer electronics has made technology more accessible to the poor, but in other ways the digital divide persists. Mobile technology has allowed some low-income people to access the internet, but broadband access still lags behind in many poor and rural areas, hampering economic growth and possibly exacerbating underlying inequalities. Likewise, the speed of change and the growing level of technical sophistication represents a significant barrier to entry for seniors, about half of whom don't use email or the internet at all. For the seniors who are active online, many fall victim to novel cyber crimes like phishing schemes and other online fraud.

implications for government and emergency management

- **Harnessing quickly-evolving technology applications** has been a perpetual challenge for government and other large institutions, especially those that struggle with underperforming legacy systems. The speed of technology creates a digital divide of sorts between public and private sectors. However, as government seeks out new capabilities, groups that are digitally disconnected may pose an increasing outreach challenge, forcing managers to operate along both digital and analog capacities in order to reach the Whole Community. This could be resource-intensive and make the operating environment more complex.

- **The U.S. government is courting several big tech companies** to provide cloud computing services services. However, questions about individual data security and protection persist. Among other things, a breach of government data has the potential to greatly undermine public trust. Nonetheless, growing technological advances will continue to raise the question about what gets done "in-house" versus contracted out. This places greater pressure on decision-makers to balance costs, internal capabilities, and dependence on outsourced services.

takeaways

Being digitally disconnected is a big issue for senior citizens and other vulnerable populations. Thus, it is good practice to maintain various outreach methods and avoid overreliance on the newest forms of technology—special, non-digital efforts will likely be required to reach some of these groups. Meanwhile, data security and privacy issues are likely to remain a top concern. It's important to take the long view about privacy issues, especially when applying emerging technologies to disaster situations—where people are most vulnerable and exposed.

SECURITY

Fears of a New Age

Threats, Reloaded

Since 9/11, the United States has focused intensely on homeland security, emphasizing the dangers of "unconventional threats." Meanwhile, conventional threats like nation-state conflicts still loom large...and may be on the rise.

As the world grows more complex so do the threats to life, safety, and security. Since the 9/11 terror attacks, the world has shifted focus to 21st century "unconventional" threats. NATO, for example, established an Office of Unconventional Threats; security experts argue that the likeliest and most dangerous future security challenges will be unconventional. While some threats arise from technological advances, the upsurge in mass shootings that has gripped the Nation over the last year shows the destruction possible with relatively low-tech but highly lethal tools purchased legally on the free market. Moreover, terrorists today have a wide range of tools at their disposal. To cope with gaps in our ability to manage these dangers—whether from global governance or intelligence sharing—our security focus has turned to these emergent challenges.

VS

While novel dangers often steal the spotlight, traditional threats have hardly disappeared. Far from "old news," nation-state conflicts, geopolitical instability, and the threat of pandemic outbreak are interwoven with the new security considerations that have characterized the early 21st century. For instance, independent hacking attacks or the exposure of secret data can have diplomatic or defense-related fallout. Cyber weapons may be used by states against one another, adding new dimensions to otherwise traditional conflicts. The contemporary context of globally integrated markets and communications systems heightens the complexity and consequences of conventional hazards. To ensure the safety, security, and resilience of our Nation, we cannot overlook them.

key trends

Cyber attacks on critical infrastructure In a hyper-connected world, cyber threats to government and society are real and pervasive. In 2012, then Defense Secretary Leon Panetta talked of the possibility of "a cyber-Pearl Harbor." Security experts warn especially of rising threats to critical infrastructure, including power plants, water systems, energy pipelines, transportation systems and financial networks. While the U.S. government is developing policies and practices to mitigate cyber-threats, including guidelines to help private firms responsible for managing critical infrastructure nodes, some argue it's not enough.

Environmental hazards Man-made environmental threats are a large and unsettling unknown, especially those related to biotechnology. Critics fear that engineered plants or animals could destabilize ecosystems and disrupt global food supplies. Extensive research in bioengineering may increase the probability of an accidental (or intentional) release of a destructive bioengineered agent. Others argue that other sources of risk may include drilling processes like hydraulic "fracking," which uses up large amounts of clean water and may carry other environmental consequences.

key trends

Nation-state conflicts The end of the Cold War, 9/11, and other factors shifted attention away from conventional state-on-state conflicts. A return of those kinds of tensions is plausible. "Natural Security" involves other factors, including the demand for energy, food, and water resources. How such tensions play out in the future is unclear. Even seemingly dated issues, like territorial disputes (e.g., in the South China Sea) are potential flashpoints for U.S. allies. The prospect of war is terrifying given the lethality of modern warfare and the increasing availability of both conventional nuclear weapons and tools of asymmetric warfare.

Fragile states Economic and political turbulence over the last few years has destabilized many parts of the world. Global and regional institutions stuggled to fully contain or manage border and civil conflicts, with Syria being the most vivid recent example. Instability can spill over across regions. Potential disruption in the Middle East remains a heightened risk due to existing or aspirational possession of nuclear armaments. Closer to home in the Western Hemisphere, drugs, violence, poverty, and political instability pose ongoing risks. Given the interconnectedness of trade and political relationships in the region, the United States is not able to isolate itself from these pressures.

Background image courtesy of Daniel Foster

Catastrophic terrorism More than a decade after the 9/11 terror attacks, terrorism remains a risk to the United States . Innumerable potential targets include ports, utilities, dams, mass transit, air transit, bio-research facilities, military installations, and dense concentrations of people. Weapons could include explosives (from conventional to nuclear), electronics, nanotechnology, or pathogens directed against the U.S. population or food and water supplies.

Mass shootings 2012 was a bad year for mass shootings in the United States—highlighting a distressing trend. The Nation has suffered 62 mass shootings since 1982, with 25 of these occurring since 2006. Seven attacks happened in 2012 alone. The 2012 tragedy at Sandy Hook Elementary in Connecticut reminds us of the domestic threat of mass shootings, and how it can strike anywhere, targeting even the most vulnerable and defenseless.

implications for government and emergency management

- **Scientific and technical knowledge are key** to successful management of unconventional threats. This means that to stay ahead of potential adversaries, government—and its partners in industry and academia—must be at the forefront of science and technology. In some cases, social sciences (e.g., geography, social psychology) may be as important as so-called "hard" science in the development of strong emergency communications and community-response actions.

- **Unconventional threats often require innovative responses,** as the disciplines of law enforcement, intelligence, homeland security, and emergency management are learning. Employing cybersecurity professionals and undercover agents, for instance, have been fruitful ways to discover new vulnerabilities. The structures we put in place today to deal with these challenges will likely endure well into the future; rigid and inflexible systems may be costly.

takeaways

The new dynamics of emerging threats raise the need to improve knowledge-sharing and exchange between emergency managers and scientific and technical communities. Similarly, new training, equipment, technology, and facilities are also key. Inter-disciplinary and jurisdictional collaboration, especially with law enforcement, is likely to be a top priority. Such collaboration may help identify unique threats, like areas of risk to mass shootings (e.g., schools), establish emergency plans, and educate the public about how to respond to a range of emergencies.

VS

Pandemics Perhaps the oldest human threat, pandemics are now back to the fore. The ease of transmission and contagion has accelerated with global commerce, transportation, and supply chains. The 2003 SARS outbreak, the H5N1 flu scare of 2008, and the H1N1 pandemic of 2009-2010 had international implications. Health officials worry about another strain transmittable from human-to-human that may have catastrophic consequences, both in terms of infectiousness and lethality. In 2012, two cases from abroad surfaced a previously unrecorded coronavirus. Meanwhile, infections like "mad cow disease" are a potent reminder that pandemics can also attack via the food supply.

implications for government and emergency management

- **Pandemic planning needs to be well thought-out,** but not overly complex. The implications of an actual event need to be understood and response plans well-rehearsed. Public health officials and emergency planners say that pandemic crises could last months, not weeks. They could have pervasive societal effects, with up to 40 percent of workers affected at a time, in any affected community. And this doesn't even factor in the economic effects. The CDC estimates even a typical flu-season outbreak costs employers over $10 billion, just in *direct* doctor and hospital visits alone. Planning considerations include stockpiling of essential supplies, protocols for sharing healthcare resources, and supporting emergency responders and their families.

- **With unpredicatable volatility abroad,** domestic resources could be diverted to address international issues and be unavailable to aid in domestic emergency efforts. Likewise, global threats requiring new U.S. military build-ups could delay or disrupt investments in competing domestic programs, like those earmarked for desperately-needed infrastructure improvements.

takeaways

Given the potential impact from conventional threats, there may be a critical need for plans that reinforce local disaster response and resilience amidst competing resource demands. Collaboration between emergency managers and public health officials would be key to evaluate and strengthen existing public health capacities in preparation for a pandemic or nuclear exposure event. The underlying assumption should be not if, but when, a pandemic strikes. Meanwhile, greater humanitarian demands abroad may increase the need for international emergency management services and coordination, including resources from the United States.

SFI research highlights

ISSUE PAPER ABSTRACT

Community Capacity & Emergency Management

Forthcoming

No matter their size, location or purpose, all human communities share at least one thing: their susceptibility to disasters, both natural and manmade. In the context of disaster resilience, what often separates communities is their *community capacity* to respond to and recover from such incidents. Yet, this issue is largely missing as a crucial element of planning and preparedness. The FEMA SFI team developed an issue paper that explored the effects, interconnections, and implications of communities' social capacity as it relates to disaster resilience. Our research highlights various dynamics about this complex issue that matter for emergency managers, including:

- **Recovery from disasters is both a physical and social process**. It involves the restoration of social and economic activities as well as the repair of the built environment.
- **Community context plays an important part in understanding social capacity.** Cities, towns and villages develop in response to economic opportunity and the human propensity for cooperation—and these realities need to be accounted for in our planning and response efforts.
- **Government policies shape disaster planning efforts.** Do current policies and programs address social capacity and emergency management in potentially hazardous areas to help ensure the resiliency of the community?

***Community capacity** is an amalgam of various factors such as geography, demographics, politics, and policies that can affect a community's ability to cope and adapt.*

SFI will soon publish this issue paper. A link will be posted on the SFI website to enable our community to dive deeper into this issue. With more than 50 references, the paper includes a wealth of additional resources.

Hurricane destruction in Galveston, TX - 1900

ISSUE PAPER ABSTRACT

Risk Management & Insurance

Forthcoming

Over the past three decades, North America has seen a fivefold increase in losses from weather-related natural disasters. According to Munich Re, North America accounted for $510 billion of insured losses from weather-related catastrophes between 1980 and 2011, or 69 percent of the global total. While insurance is the most common tool used to address risks associated with disasters, statistics for the United States show that many individuals and businesses still do not have risk insurance. That leaves millions of dollars in uninsured losses that must be covered by an "insurer of last resort." Currently, that burden falls on the Federal government.

The FEMA SFI team developed an issue paper that explored existing insurance tools. The paper highlights various issues that matter to emergency managers, including:

- **Decisions on whether to insure against certain risks affect emergency management planning and response.** If homeowners choose not to insure against floods, the government's costs for disaster assistance can rise.
- **The National Flood Insurance Program (NFIP), which currently covers about 5.6 millions households and businesses for a total of $1.25 trillion in exposure, faces regulatory crossroads.** Reform efforts that aim to deal with the program's existing debt burden and long-term solvency confront several trade-offs among four key public policy goals: charging premium rates that reflect risks, limiting ad hoc federal spending on disaster relief assistance, encouraging broad participation in the program, and encouraging private markets to provide flood insurance.
- **Emergency managers should remain focused on the community's threats and hazards.** They should also remain conscious of the current insurance environment, which will greatly affect a community's ability to recover, following an incident.

Through federal insurance programs and direct aid, the US government takes responsibility for a large amount of catastrophic loss coverage. For the years 1989 through 2008, federal disaster spending covered 45% of total catastrophic losses.

SFI will soon publish this issue paper. A link will be posted on the SFI website to enable our community to dive deeper into this issue. With more than 50 references, the paper includes a wealth of additional resources.

North Dakota flooding - 2011
Image courtesy of Sharida Jackson

2 – Future Strategic Needs in Practice

Image courtesy of Lee Krohn Photography/Manchester Vol. Fire Department

In this Feature…

- Ten anecdotes from the field: examples of independent efforts that fulfill strategic needs and help make our Nation more resilient.....Page 13

Notes

References to any specific non-Government products, entities, or services do not constitute or imply an endorsement by the Federal Emergency Management Agency (FEMA), the Department of Homeland Security (DHS), or the United States. The views and opinions expressed by individuals quoted in this document do not necessarily represent the views of FEMA, DHS, or the United States.

Overview of this Feature

The aim of this Feature is to **spotlight efforts from the Whole Community** that exemplify how individuals, organizations, and governments can develop the capabilities, tools, and partnerships to meet our future needs. Two key factors explain how these 10 anecdotes demonstrate our needs **in practice**.

First, SFI developed 15 strategic needs that identify **requirements for success** across a range of futures (see Appendix B for details). These 15 strategic needs—grouped into Essential Capabilities, Innovative Models and Tools, and Dynamic Partnerships—serve as guideposts to inform our planning, investments, and actions so that we can deal with the changing demands of the future operating environment. A core part of SFI is to seek and promote success stories of real world applications of these strategic needs.

Second, the 10 anecdotes captured here are independent efforts that emerged organically—because people and organizations sought to deliver **better solutions to existing challenges**. They represent a diverse spectrum of organizations and causes—from non-profits to education and disaster response. We believe they are models that can be leveraged, replicated, or scaled to help move us toward more resilient futures. Each offers concrete outcomes sought or achieved as well as key success factors.

The 10 captured here were developed largely in response to a call for anecdotes sent via the monthly SFI newsletter. Most were identified through networking and knowledge-sharing sessions; a few by FEMA representatives following disaster response and recovery operations. We invite our wider community to engage with us and spotlight more cases of future strategic needs in practice.

The American Red Cross:
Community Resilience Pilot

THE BACKSTORY

The Community Resilience Pilot was initiated to empower communities to become more resilient in the face of disaster. By engaging with and supporting community networks in emergency preparedness, the Red Cross moves beyond its traditional role of preparedness educator to foster community connections and capacity-building. The aim is to increase cross-sector collaboration under non-emergency circumstances, so that when a disaster occurs, communities are better prepared. The resulting partnerships and systems also benefit response and recovery efforts. The Asian American Network was created as a part of this pilot.

Image courtesy of the American Red Cross

CONTACT INFO: Jacqueline Yannacci, Director, Community Resilience: jacqueline.yannacci@redcross.org | 202.303.6724 | redcross.org

THE CHALLENGE

Connecting local organizations and resources to improve community resilience and meet the needs of each community.

THE OUTCOMES

- multi-organizational collaboration in region to provide cultural competency training, delivered to over 130 people
- spin-off network launched by BFD to build trust and resilience among various non-English speaking groups
- preparedness events provided to more than 1,400 people

THE PROJECT

The Asian American Network was created to help overcome language barriers and cultural differences that hampered Biloxi, Mississippi's ability to respond, recover, and build resilience in the face of disaster. The network held cultural competency trainings, which created the impetus for a new, community-driven network initiated by the Biloxi Fire Department (BFD) to build trust between first responders and non-English speaking communities. The network has reached over 1,400 community members and includes the BFD and a Hispanic American network. It serves to break down cultural barriers between first responders and their community to get people help when they need it most.

THE TAKEAWAYS

SUCCESS FACTORS

- Community-led action by various local minority groups & stakeholders
- Neutral broker to facilitate community collaboration
- Making assessments with community input to identify concerns & needs
- Collaboration across agencies to convene well-attended trainings
- Strong connections developed between Red Cross, communities & first responders

SFI STRATEGIC NEEDS

The Community Resilience Pilot supports various capabilities to help communities deal with future challenges, including these strategic needs:

#1 – Develop capabilities to address dynamic population shifts

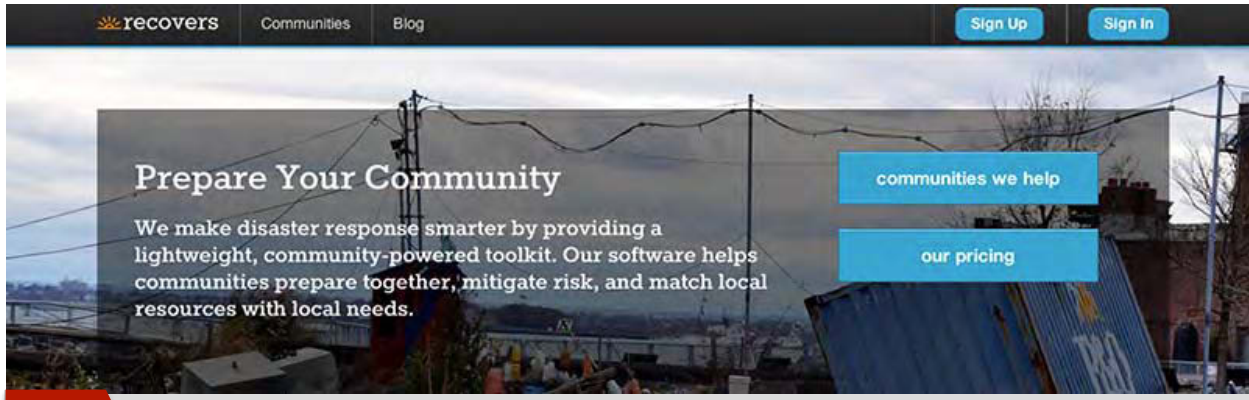
#9 – Plan around shared interests for maximum use of EM capabilities

#12 – Empower individuals & communities to play a greater role throughout all phases of disasters

Recovers.org:
Community-powered disaster recovery

THE BACKSTORY

After a tornado ripped through Monson, MA in the summer of 2011, the small town got a taste of community-powered, high-tech recovery. Sisters Morgan and Caitria O'Neill quickly realized that the aid organizations swooping in to the area could not leverage spontaneous volunteers, could not gather donation items, and could not stay long-term. Local organizers, on the other hand, could effectively utilize these resources for the immediate and long-term recovery. In response, the two created a locally-managed system for volunteer, donation and case management, enabling a faster, cheaper recovery in Monson.



CONTACT INFO: Chief Operating Officer, Chris Kuryak: chris@recovers.org | 512.632.5144 | recovers.org

THE CHALLENGE

Provide residents and local organizations with simple tools that leverage existing community skills and resources to build greater disaster resilience.

THE PROJECT

Recovers.org is a community software platform that organizes volunteers, donations and information at the local level. Used primarily as a preparedness tool, the system helps residents map their neighborhoods and gives emergency management a detailed view of preparedness levels across the area. Multiple organizations can collaborate, volunteers can sign up and release liability remotely, donors can list resources rather than dropping them off, and those with needs can easily and privately request help from all relevant agencies at once.

THE OUTCOMES

- better coordinated and more effective volunteer efforts (via volunteer management tools)
- organized database and mapping of resources and community needs (case management features)
- centralized information hub for community updates and situational awareness

THE TAKEAWAYS

SUCCESS FACTORS

- Scaling startup with philanthropic support (backed by Knight Enterprise Fund, MIT Ideas Competition, Code for America)
- Focusing on capacity building for enduring impact
- Developing a user-friendly interface
- Designing lightweight toolkits tailored to the needs of individual communities

SFI STRATEGIC NEEDS

Recovers.org is an effective tool that provides a platform for communities to form partnerships, which helps address these strategic needs:

#5 – Leverage volunteer capabilities across all EM phases

#9 – Plan around shared interests for maximum use of EM capabilities

#11 – Influence development of emerging, EM-relevant technologies

Alaska Community Rebuilding:
A Whole Community Effort

THE BACKSTORY

In May 2009, unseasonably warm temperatures and the breakup of an ice jam on Alaska's Yukon River sent massive floating ice chunks into the small town of Eagle, a rural community located along the U.S.-Canada border. Eagle Village, a tiny tribal settlement dating back prior to European exploration, was virtually destroyed. In the town of Eagle many homes, buildings and roads near the river were severely damaged. President Obama declared the Yukon River flooding part of a national disaster on June 11, 2009. Rebuilding damaged homes, buildings and critical infrastructure in these rural Alaska communities was a Whole Community effort.

THE CHALLENGE

Rebuild the small town of Eagle and Eagle Village after flooding that destroyed and damaged homes and critical infrastructure.

THE PROJECT

In the immediate aftermath of the flood, individuals and businesses in Fairbanks, AK, donated over 10,000 lbs of relief supplies. Faith-based voluntary organizations including the Mennonite Disaster Service and Samaritan's Purse provided building materials and labor to ensure residents had safe and secure housing before winter. Nearby tribal councils donated food and supplies. Alaska Voluntary Organizations Active in Disaster provided support in locating, organizing and transporting donations to the Eagle communities, and FEMA provided grants to fund building supplies and voluntary agency travel for the recovery effort. The U.S. Army Corps of Engineers provided technical assistance for operations.

Image courtesy of Ben Brennan/FEMA

CONTACT INFO: Ben Curran, Chief, Voluntary Agency and Donations Coordination Section, FEMA: ben.curran@dhs.gov | 202.212.1074

THE OUTCOMES

- an approach for sharing and marshaling resources in an extremely remote context
- a model for how to empower communities and individuals to improve disaster resilience

THE TAKEAWAYS

SUCCESS FACTORS

- Collaborating across sectors and leveraging disparate resources for shared goals
- Incorporating tribal, faith-based & secular voluntary agency services
- Sharing of regional & sub-regional assets, infrastructure, & logistics capabilities
- Involving individuals, neighborhoods, tribal organizations & communities

SFI STRATEGIC NEEDS

The rebuilding efforts of Eagle and Eagle Village support the following strategic needs:

#5 – Leverage volunteer capabilities across all EM phases

#7 – Employ alternative surge models

#13 – Proactively engage business in all EM phases, especially policy development

#15 – Enable access to military capabilities to augment capacity as needed

Community and Regional Resilience Institute:
The Community Resilience System (CRS)

THE BACKSTORY

The Community and Regional Resilience Institute is a collaborative effort funded by DHS and FEMA. Headed by the not-for-profit Meridian Institute, the Community Resilience System (CRS) was developed over 18 months. The CRS combines the insights of over 200 scholars, community leaders, and business executives with practical experience in a number of US communities. Its purpose is to provide an immediately useable approach to assess, measure, improve, and reward community resilience. The system is currently being piloted in seven communities across the United States.

CONTACT INFO: Warren Edwards, Executive Director: warren@resilientus.org | 865.382.7125 | resilientus.org

THE CHALLENGE

Help the Whole Community facilitate, track, and measure a disaster response and recovery action plan.

THE OUTCOMES

- assistance for communities to find and use the tools and processes that support development of essential EM capabilities across the Whole Community
- national recognition of locally created EM capabilities and processes

THE PROJECT

A key feature of the CRS is a web-based software that guides a community and its champions through a process to improve resilience, provides access to the resources in user-friendly formats, and documents the results of the community's actions. It leads the community through the creation of innovative social networks and encourages use of all forms of communication at every step. The CRS is based on the recognition that cross-sector collaboration improves resilience, and channels of communication must be open and strong within the community *prior* to a crisis.

THE TAKEAWAYS

SUCCESS FACTORS

- Engaging & activating all parts of communities
- Recognizing the connections & interdependencies within communities
- Generating interest & enthusiasm among the non-governmental parts of communities, particularly the non-profit sector
- Drawing upon experience & expertise across different sectors & fields

SFI STRATEGIC NEEDS

By helping the Whole Community develop resilience-enhancing action plans, CRS addresses several strategic needs, especially:

#2 – Practice omni-directional knowledge sharing

#6 – Adopt risk management tools to manage complex event consequences

#12 – Empower individuals & communities to play a greater role throughout all phases of disasters

Canada-United States Cooperation:

Action Plan for Critical Infrastructure

Image courtesy of Flickr user US Mission Canada

CONTACT INFO: Gregory Solecki, Calgary Emergency Management Agency (CEMA): greg.solecki@calgary.ca | 403.268.8802 | publicsafety.gc.ca/prg/ns/ci/cci-eng.aspx

THE BACKSTORY

In addition to critical energy, supply, and transportation networks, the Canada-United States border region is home to many key infrastructure components including refineries, nuclear facilities, and large manufacturing operations. This interconnectedness means that impacts from disruptions can and do span international jurisdictions. As a result, Canada and the U.S. have recently agreed to promote a more integrated approach to critical infrastructure resilience. The Canada-U.S. Action Plan establishes a framework for both nations to respond jointly to emerging threats and work together to protect communities.

THE CHALLENGE

Facilitate cross-border cooperation in preventing and responding to emergencies

THE PROJECT

The Action Plan strengthens the safety and security of Canada and the United States by establishing the basis on which the two countries may help one another. During or after an emergency, for example, the countries may share supplies and equipment, emergency personnel, or expert support. As a direct result of the Action Plan, water sector representatives from Canada and the United States agreed to use a single online portal, the WaterISAC, where members can share lessons learned and best practices. By promoting cooperation like this, the Action Plan allows both countries to more effectively address a range of cross-border critical infrastructure issues and work together to improve resilience.

THE OUTCOMES

- a comprehensive cross-border approach to critical infrastructure resilience
- an integrated and collaborative approach to manage critical infrastructure protection issues

THE TAKEAWAYS

SUCCESS FACTORS

- Identifying specific deliverables to support joint critical infrastructure objectives
- Providing a framework for Canada & the United States to better manage risks
- Strengthening the resiliency of critical infrastructure in both countries
- Supporting regional cross-border relations by promoting awareness of common critical infrastructure issues

SFI STRATEGIC NEEDS

By facilitating cross-border cooperation, the Action Plan for Critical Infrastructure directly addresses the following SFI strategic needs:

#8 – Establish flexible frameworks for collaboration

#10 – Remediate vulnerabilities across EM supply chains & critical infrastructure

#14 – Intensify disaster-response collaboration & planning with Canada and Mexico

Institute for Sustainable Communities (ISC):
The Resilient Vermont Project

Image courtesy of Lee Krohn Photography/Manchester Vol. Fire Department

CONTACT INFO: Stephanie Rust, D.C. Office Director: srust@iscvt.org | 202.777.7544 | iscvt.org

THE BACKSTORY

ISC was founded in 1991 by former Vermont Governor Madeleine Kunin and her planning director George Hamilton. ISC is a Vermont-based, global nonprofit organization partnering with communities around the world to develop the tools and skills needed to inspire active citizenship, protect the environment, and take on climate change. ISC has led 90 projects in 25 countries and currently works in the United States, China, Serbia, and India. Some key U.S. regional projects include the Western Adaptation Alliance and the Southeast Florida Climate Compact, helping local leaders tackle climate issues.

THE CHALLENGE

Build upon successful ongoing initiatives to help Vermont prepare for, respond to, and bounce back from future natural disasters.

THE PROJECT

The Resilient Vermont Project sets out to make the State a model of community, economic, and environmental resilience. In collaboration with Vermont's Governor, state agencies, and local organizations, the 18-month project (which which began in October 2012) will accelerate the transition from disaster recovery from Tropical Storm Irene to long-term resilience. The goal is to forge more coherent and comprehensive approaches to climate adaptation and resilience by bringing together stakeholders across many sectors, and building an action-oriented roadmap to achieve long-term impacts.

THE OUTCOMES

- an inventory of ongoing efforts to bolster resilience
- a common vision of resilience for Vermont
- an action agenda including policy, infrastructure and governance improvements

THE TAKEAWAYS

SUCCESS FACTORS

- Partnering across organizational & jurisdictional boundaries
- Focusing on enduring capacity building
- Incorporating measures of economic, environmental & social resilience
- Drawing from expertise, experience and influence of all partners
- Gaining buy in & support from both community leaders & high-profile officials
- Securing funds from diverse sources—including non-profits, grants, & philanthropy

SFI STRATEGIC NEEDS

This work supports various capabilities needed to be resilient in the face of future challenges, while addressing these strategic needs:

#4 – Build a shared EM future vision with appropriate plans & contingencies

#5 – Leverage volunteer capabilities across all EM phases

#12 – Empower individuals & communities to play a greater role throughout all phases of disasters

California State University Long Beach:
CSULB using SFI in the Classroom

Image courtesy of Wikipedia user Buchanan-Hermit

CONTACT INFO: Instructors: Shirley Feldmann-Jensen, RN MPH: shirley.jensen@csulb.edu | 562.985.7489 | Dr. Steven Jensen: sjensen@csulb.edu | 562.900.4532

THE BACKSTORY

CSULB offers a Master of Science in Emergency Service Administration. The program's students tend to be early to mid-career professionals from emergency services, health, business and the military. As such, their experience brings richness to their pursuit of scholarship and leadership, as well as a desire for addressing the limitations and needs observed in the field. Equipping the students with an understanding of the changing physical and social world, and preparing them to meet complex challenges is central. SFI provided well-developed material to test students' aptitude in strategic planning and change management.

THE CHALLENGE

Integrate SFI and strategic thinking about the future of emergency management into the curriculum of a Master's degree program.

THE PROJECT

One of the program's required courses, covering organizational theory, decided to apply strategic foresight in the classroom. Using publically-available SFI documents, students were asked to explore future trajectories in emergency management. The main objective was to show them how organizational structures can be adapted to better meet the needs of our changing world. The final exam asked students to: summarize how SFI might lead to a more proactive approach to emergency management, discuss theories and concepts that could facilitate greater resilience, and assess the organizational changes needed.

THE OUTCOMES

- a model for how to integrate SFI into higher education
- understanding of changes needed in local communities and agencies to implement SFI strategic needs
- insights into how the field may need to manage future change drivers of change to promote greater resilience

THE TAKEAWAYS

SUCCESS FACTORS

- Prompting students to explore how SFI might lead to a more proactive approach to emergency management
- Accounting for & integrating trends from many diverse fields into coursework
- Using scenario-based approaches to assess alternative futures & potential opportunities
- Understanding that the 15 SFI strategic needs require a more proactive culture

SFI STRATEGIC NEEDS

The integration of SFI into the CSULB Master's in Emergency Service Administration addresses these strategic needs:

#3 – Infuse EM practices & skills across the entire educational experience

#4 – Build a shared EM future vision with appropriate plans & contingencies

The 2012 Challenge:

Inspiring Community Innovation & Resilience

THE BACKSTORY

Financial support can be used to draw attention to important issues, and to both inspire and reward innovation. In response to the continuing threat to communities from terrorist attacks and natural disasters, in September, FEMA and the Rockefeller Foundation established the 2012 Community Resilience Innovation Challenge. The program is designed to encourage communities to develop a collective, local ability to withstand the initial impacts of disaster events, respond quickly, and recover and rebuild the community to an enhanced level of resiliency. It will support both existing initiatives and new collaborations.

Image courtesy of Flickr user 2day929

CONTACT INFO:
Brent Woodworth, LAEPF: brent.woodworth@laepf.org | 818.585.5995
David Ashley, FEMA: david.ashley@dhs.gov | 202.646.2971 | resiliencechallenge.org

THE CHALLENGE

Encourage local communities to engage in creative activities that enhance disaster resilience.

THE OUTCOMES

- innovative ideas to enhance community resilience
- collaboration with community stakeholders
- sustainable and repeatable processes and approaches that can be used by other communities
- support for community-based disaster resilience projects

THE PROJECT

The 2012 Challenge program will support a broad range of creative activities and may include organizing resources, partnerships, and leadership activities among small neighborhood groups, civic or faith-based organizations, private sector entities, or educational institutions. Selected projects will be funded up to $35,000. The funding for this opportunity is provided by the Rockefeller Foundation in cooperation with FEMA. The grant is being administered by the Los Angeles Emergency Preparedness Foundation. At the close of the initial application period, over 2,000 award applications were submitted. Awards were announced on May 7, 2013 (details available at resiliencechallenge.org).

THE TAKEAWAYS

SUCCESS FACTORS

- Providing support for innovative thinking at the grassroots level
- Bringing residents together to confront local problems & to expand opportunities
- Assisting with catalyzing newly formed networks, groups or institutions that come together specifically to design & test innovative approaches to community resilience

SFI STRATEGIC NEEDS

Opening the emergency management system to the Whole Community through innovation competitions addresses these strategic needs:

#3 – Infuse EM practices and skills across the entire educational experience

#4 – Build a shared EM future vision with appropriate plans & contingencies

#12 – Empower individuals & communities to play a greater role throughout all phases of disasters

Islamic Relief USA:

Disaster Assistance Response Team

CONTACT INFO: Abed Ayoub, Chief Executive Officer: aayoub@irusa.org| 703.370.7202 | irusa.org/disasterresponse/

THE BACKSTORY

Islamic Relief USA was founded in California in 1993. It strives to alleviate suffering, hunger, illiteracy, and diseases worldwide regardless of color, race, religion, or creed, and to provide aid in a compassionate and dignified manner. In 2011, IRUSA developed the Disaster Assistance Response Team (DART) program. As DART team members, IRUSA volunteers from around the country attend Red Cross and FEMA training in post-disaster aid work. Trainings cover everything from first aid, to sheltering, to post-disaster relief registration. Once certified, these trained volunteers can be mobilized rapidly when a disaster strikes.

THE ISSUE

Provide rapid deployment of relief supplies and aid to survivors of Hurricane Sandy in Staten Island.

THE PROJECT

In 2012, IRUSA trained and certified over 600 volunteers as DART team members, and deployed DART teams to six different disasters. With Hurricane Sandy nearing landfall, a DART team of 20 members mobilized to New Jersey to help with relief efforts. Staff and volunteers provided shelter management services to over 600 people at two separate hurricane shelters on the campus of Rutgers University. In addition, IRUSA worked in cooperation with a group from the church of Jesus Christ of Latter-day Saints to help affected homeowners tear out flooring and drywall from their flooded homes in preparation for reconstruction.

THE OUTCOMES

- over 600 trained and certified rapid response disaster relief volunteers, located across the country
- a model for collaboration between multiple faith-based organizations and relief/recovery agencies

THE TAKEAWAYS

SUCCESS FACTORS

- Collaborating with multiple faith-based voluntary agencies
- Developing cross-sectional partnerships for training & certification
- Establishing a framework for training prior to disaster impact, allowing for rapid deployment
- Focusing on youth volunteer recruitment

SFI STRATEGIC NEEDS

IRUSA's Hurricane Sandy relief efforts support these strategic needs:

#2 – Practice omni-directional knowledge sharing

#5 – Leverage volunteer capabilities across all EM phases

#7 – Employ alternative surge models

9 – Plan around shared interests for maximum use of EM capabilities

Universities & Colleges Caucus:

International Association of Emergency Managers

THE BACKSTORY

The International Association of Emergency Managers (IAEM), was formed in 1952 as the National Civil Defense Council. A non-profit professional organization now comprised of over 5,000 members worldwide, the IAEM sponsors a certification program in Emergency Management, publishes a monthly newsletter, and hosts an annual conference. The Universities & Colleges Caucus (UCC) of the IAEM was formed to provide emergency managers from higher education institutions a national and international voice to ensure the needs of campus communities are being addressed by government and industry officials.

THE ISSUE

Improve information-sharing between higher education emergency management agencies.

THE PROJECT

In preparing for, responding to, recovering from, and mitigating the impacts of disasters, college and university campuses have unique needs and capabilities. In addition to providing a forum for those in the academic community to share information about all aspects of the disaster planning process via listserv, blog, and social media, the UCC also engages directly with emergency management officials at multiple levels. For example, in 2012 the UCC created a site on the DHS First Responder Communities of Practice to enable members to share confidential reports, exercise documents, incident after-action reports and more on a secure web portal.

Image courtesy of www.iaem.com

CONTACT INFO: Andre LeDuc, Caucus Chair: leduc@uoregon.edu | 541.346.5833 | iaem.com/committees/College/index.htm

THE OUTCOMES

- a robust multimedia system for information sharing to improve on-campus resilience
- a secure database managed by individual users
- networking and mentoring support for members

THE TAKEAWAYS

SUCCESS FACTORS

- Leveraging opportunities created by major planned campus events (e.g., football games) to incorporate emergency management exercises and training
- Building new, interdisciplinary networks within larger organizational frameworks (IAEM)
- Coordinating committee meetings around broader networking opportunities

SFI STRATEGIC NEEDS

By improving information-sharing in a higher education context, the IAEM-UCC efforts address these strategic needs:

#2 – Practice omni-directional knowledge-sharing

#3 – Infuse emergency management practices & skills across the entire educational experience

#4 – Build a shared EM future vision with appropriate plans & contingencies

3 – Big Issues. Strong Leaders. Bold Action.

Image courtesy of Bob McMillan/FEMA

Volunteers from CARD display tools they've developed (p.27)

In this Feature…

- Seven profiles from the Whole Community: innovators discuss the future and share ideas that can lead us toward greater resilience.....Page 24

Notes

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Overview of this Feature

The aim of this Feature is to **inspire our community into action** by profiling innovators working to solve big issues and make our Nation more resilient. A key piece of the Whole Community approach to emergency management is the recognition that government-centric efforts cannot fully meet the challenges posed by disasters. Scattered throughout the Whole Community are many **individuals who are innately innovative** and interested in delivering better solutions that improve how our Nation manages disasters.

By profiling innovators from the Whole Community, we recognize the extraordinary contributions that individuals make to enhance our national resilience. Whether it's by improving government collaboration, developing better business services, or **serving the unique needs of their communities**, these innovators are undoubtedly leaders—taking bold action to solve big-ticket issues. We applaud their work and passion, and hope their stories and ideas resonate with others across the EM community.

These seven profiles were developed either through edited phone interviews or through written submissions during email exchanges with members of the SFI team. The individuals identified in this Feature are not, of course, representative of all the innovation taking place throughout the Whole Community. Rather, they are but a small sampling that we hope can inspire broader and deeper action around disaster resilience. They were identified by SFI from its networking and research efforts supporting this document. We invite our wider community to engage with us and help us spotlight other innovators.

Michael McDaniel

Designer, Inventor, Hacker

michaelmcdaniel.com

Michael, the principal designer at Frog, is a social-impact entrepreneur "obsessed with creating meaningful design in order to make this world a better place."

Q: What is the **biggest disaster resilience problem** you are trying to solve? Why does it matter?

I am working to solve the "housing gap" – basically the lack of housing options immediately following a disaster up to 90 days post-disaster. Currently there are no shelter systems that can be stored and transported efficiently, erected in just minutes, then reused over and over again. Shelter is one of the most basic of human needs, yet it is rarely addressed in an adequate manner following most disasters.

Q: What does the **future** of disaster resilience look like to you?

I believe the future of disaster response will be transformed in several areas: shelter, communication, and power distribution. Advances in power storage will make our fragile centralized power grids much more resilient in the coming years. Soon, technology will allow social media streams to be tamed, converting them into powerful replacements for the Emergency Alert System. Innovative design work, typically only applied within the private sector, will move into the public sector to drive new solutions to old problems such as mass housing.

Q: What do you want to **inspire others to do**? What is your "call to action" to the Whole Community?

I want people to look beyond the known and have the courage to try new ideas. Innovation is NOT born from risk mitigation. True innovation is the direct result of people who are willing to give the crazy idea, person, or product a chance. Innovative solutions require bravery more than any other thing. To advance things for the greater good, we must be willing to be brave, bold, and perhaps even a little crazy ourselves. Well, at least crazy enough to think that we can actually change things for the betterment of all.

Richard Ruge

Chairperson

DP4VP - Disaster Preparedness for Vulnerable Populations

sonoma-county.org/health/meetings/dp4vp.asp

Richard has worked in the field of disabilities since 1972. The organization he founded, DP4VP, promotes community empowerment and self-sufficiency in the face of disasters through networking, workshops, materials, and engagement.

Q: What is the **biggest disaster resilience problem** you are trying to solve? Why does it matter?

If as many people as possible are going to survive future disasters, what is needed is the awakening of an international cultural shift from dependency on others to individual, to communal, to planetary self-sufficiency. As a culture we tragically believe that disaster preparedness is really someone else's job. We repeatedly react to disasters, rather than reflect on our innate responsibility to prepare, which in reality is as necessary as brushing our teeth, buckling our seat belts and refraining from drinking and driving.

We call this cultural shift the ROSE Initiative - Reflecting on Safety in Emergencies. This is a great adventure teeming with joy, power and magic. As the shift occurs solutions will wondrously appear in which we were not previously conscious, alliances will be made, partnerships formed, lifelong friendships forged in not only families, neighborhoods and communities, but in cultures, religions, nations. This is our planet - we all have a role to play.

Q: What does the **future** of disaster resilience look like to you?

Q: What do you want to **inspire others to do**? What is your "call to action" to the Whole Community?

To inspire others to reflect and awaken to our innate responsibility to take care of each other, our families, our neighborhoods, our community. We all have a deep yearning for safety and security. We all want to be respected and cared for. We all want to care for others and to make a meaningful difference, to participate, to be leaders. We must recognize that emergency management can never be all things to all people in the aftermath of a disaster, that true safety and resiliency lies in the awakened and empowered community.

Image courtesy of Richard Ruge

Caitria O'Neill

Co-founder & CEO

Recovers.org

recovers.org

After an EF3 tornado struck her hometown of Monson, Massachusetts, Caitria and her team developed recovers.org, a recovery software framework that can be deployed before a disaster to prepare communities (see anecdote on p.14).

Q: What is the **biggest disaster resilience problem** you are trying to solve? Why does it matter?

Our focus is creating a system that connects city and emergency managers to the rest of the community, before a disaster. By providing common tools for local churches, nonprofits, and residents to use for preparedness and recovery, we can help the city contain and quantify those efforts.

Q: What does the **future** of disaster resilience look like to you?

I believe that harnessing the incredible power of mutual aid is possible in the near future of disaster resilience. In every community, after every disaster, we see communities come together and meet local needs with locally reported resources. With something as simple as a common toolkit, we can build the community preparedness and recovery efforts into emergency planning.

Q: What do you want to **inspire others to do**? What is your "call to action" to the Whole Community?

My call to action is pretty simple. Organizational systems need to be put in place before a disaster. If you are trying to teach people a new system in a disaster zone, it is too late to do so efficiently. Resilience planning everywhere should include a focus on providing residents with tools to get involved more actively with preparedness and recovery.

Ana-Marie Jones

Executive Director

CARD - Collaborating Agencies Responding to Disasters

CARDcanhelp.org

A nonprofit agency based in Oakland, CA and created in the wake of the 1989 Loma Prieta earthquake, CARD's "Prepare to Prosper" fear-free, alternative preparedness programs provide customized emergency tools and services to nonprofits, faith agencies and others serving Access and Functional Needs (AFN) communities.

Q: What is the **biggest disaster resilience problem** you are trying to solve? Why does it matter?

Despite all the evidence proving that fear-based approaches do not create sustainable behavior change, as a nation we have spent decades using the threat of impending disaster as the backbone of preparedness messaging. These traditional approaches create unintended consequences, hurt emergency services agencies, waste valuable resources, and leave us unprepared. We are missing enormous opportunities to transform the health, wealth and resilience of our nation.

Q: What does the **future** of disaster resilience look like to you?

In the future, readiness will not be measured by binders and plans, nor will resilience and readiness be framed around 'disasters.' Readiness and resilience will be woven into everyday habits and behaviors, so that our everyday brilliance becomes our disaster resilience. In the future, we will invest the time, treasure and talents of our community in building our individual and collective capacity to solve problems, mobilize our assets to achieve goals, and we will build strong, united communities—where all people can survive, thrive and prosper in the face of disasters and any other challenges we face.

Q: What do you want to **inspire others to do**? What is your "call to action" to the Whole Community?

I want to inspire everyone to embrace their inner MacGyver, to awaken their secret superhero, and band together to say no to fear, threat, bureaucracy and everything else that divides us and leaves us feeling vulnerable. Rather than merely saying "I've got a kit," be proud to say "I've got your back!" Use whatever talent or ability you have to build stronger, more united, truly resilient communities. Every talent counts, every skill has a place in building unity and resilience. Walk this world feeling confident and safe—and pass it on.

Image courtesy of @CARDcanhelp

Joanne Drummond

Executive Director

Fire Safe Council of Nevada County, CA

areyoufiresafe.com

In the foothills and mountains of the Sierra Nevada, Joanne works with multiple sectors of the Whole Community to reduce community vulnerability to wildfire hazard.

Q: What is the **biggest disaster resilience problem** you are trying to solve? Why does it matter?

Our mission is catastrophic wildfire mitigation. We recognize that fire is a natural part of our ecosystem, but due to the unnatural accumulation of vegetation as fuel to wildfire, our watersheds cannot withstand a wildfire without devastating effects. It is important because our community is embedded in the forest, and more and more people are leaving urbanized areas for the wildlands and a rural way of life. Catastrophic wildfire is devastating to our forestland, wildlife habitat, watersheds, air quality and threatens homes and lives.

Q: What does the **future** of disaster resilience look like to you?

Many groups have missions that align with ours in one way or another and finding these critical intersections provides for mutual benefits. Where we have been able to find willing partners, our results have been remarkable. There is no point in creating a community fuel break, for instance, if there is not a commitment to maintain it. There will never be enough grant money to solve our issue—vegetation is growing every day! The future of disaster resilience in my mind means meeting multiple objectives across jurisdictional and community boundaries with sustainability of the objective at the top of mind.

Q: What do you want to **inspire others to do**? What is your "call to action" to the Whole Community?

I want to inspire others to see the hazard that is present and work to establish a fire resilient landscape. We should be able to have a natural fire—from a lightning strike for instance—and have it be a positive impact in terms of our natural resources, not catastrophic. My call to action is to educate the community in order to have them understand what needs to be done and invest in their property for the greater good of our entire community and the environment we all treasure.

Jase Wilson

Founder & CEO

Neighbor.ly

An MIT graduate in urban planning, Jase created a civic-oriented crowdfunding website to help people invest in places and civic projects they care about, and to help cities greenlight tough projects—while saving money on capital. These kinds of civic-minded tools can also support efforts that improve disaster resilience.

Q: What is the **biggest disaster resilience problem** you are trying to solve? Why does it matter?

With extreme weather becoming more frequent due to climate change, crowdfunding allows for people to get involved in a wide variety of public projects, from helping with disaster recovery, to building resiliency, to promoting climate change adaptation and mitigation. Neighbor.ly facilitates collaboration between individuals, communities, government, and the private sector to design and fund any number of projects like storm shelters, wetland restoration, or green infrastructure.

Q: What does the **future** of disaster resilience look like to you?

The future is a world where people participate in manifesting their own resilience. Where communities band together to slow the pace of climate change by investing in green infrastructure, and by funding and building their own wind turbines, solar arrays, and alternative modes of transport. Where people are empowered to imagine, design and fund thousands of little interventions, that together make a big difference. In this future, the civic project is humanized – people want to use it, take care of it, and advocate for it. That's the true cake of crowdfunding. The money is all icing. The cake is the buy-in from the people.

Q: What do you want to **inspire others to do**? What is your "call to action" to the Whole Community?

D.I.Y. – Do It Yourself. Government is not just this big entity out there—it's something you can interact with, you can work with, and you can initiate change yourself. The Internet has opened up so many possibilities, and now's as good a time as any—don't wait on an agency to step in save the day! By saying Do It Yourself, I'm not saying we should abandon government, but rather, we should help the government help us. It's a powerful idea that can lead to an improved quality of life for everyone. D.I.Y.

Kristin Pierre

Program Manager, EPA

Economy, Energy, and the Environment (E3)

e3.gov

Kristin is one of the leaders behind E3: a multi-agency initiative dedicated to supporting manufacturing leadership. It is an innovative approach to inter-agency collaboration and private sector integration. While not explicitly disaster-focused, the outcomes achieved by E3 support the underlying pillars of disaster resilience.

Q: What is the **biggest disaster resilience problem** you are trying to solve? Why does it matter?

While not set up to address disaster resilience directly, the structure and purpose of our program apply to nearly all government agencies. E3 is designed to bring together the many technical services of the Federal government into a stronger and more coherent package for the private sector. All the agencies involved in E3 have a common agenda: to help manufacturers thrive, reduce their environmental impact, and stay in the US—and specifically in their communities. By working together to bring our services under one umbrella, we are able to break down silos, provide comprehensive service offerings, and empower local communities to design solutions that make sense for them.

Q: What does the **future** of disaster resilience look like to you?

In an era of reduced budgets and a slowly recovering economy, the Federal government should be finding ways to innovate and reinvent itself. We need to look at all opportunities to improve how we serve the American people and support our economy. A more dynamic government would enhance disaster resilience. We could do this by expanding on the E3 model—creating a mechanism for government, private, philanthropic and non-profit stakeholders that have the same common agenda to come together to learn and leverage each others' resources and expertise.

Q: What do you want to **inspire others to do**? What is your "call to action" to the Whole Community?

Ask "why not?" first! Innovation in a large organization like a Federal agency is difficult. But difficulty should not be a barrier to action. The E3 team took the challenge of innovating a solution to a problem. We asked "Why not?" and that set us off an a journey of discovery and success. You have to challenge the status quo and take a risk or nothing ever changes. Our "call to action" needs to be to act. Move the ball forward!

Recap of 2012 & A Look Ahead

Image courtesy of Flickr user *Stuck in Customs*

Image courtesy of Flickr user *d_pham*

In this section…

- Review of Major SFI 2012 Activities and Accomplishments……Page 32
- Outlook for SFI in 2013……Page 35

Overview of this Section

The aim of this section is to provide context for how, building on the foundation of its work since 2010, SFI has transitioned toward a focus on practical applications for foresight. It also gives an overview of where SFI is headed in 2013 and beyond.

The Recap of 2012 covers key SFI activities from the past year and spotlights notable accomplishments. The Look Ahead distills onto one page SFI's trajectory for 2013 and beyond, summarizing the major areas of work that will structure and guide how we plan to bring our body of knowledge into practice.

SFI is coordinated by FEMA in conjunction with the emergency management community writ large. We owe much to the pioneering work of the U.S. Coast Guard's *Project Evergreen*. *Project Evergreen* provided a scenario planning foundation, which SFI expanded and oriented around disaster management. Over the past years, SFI has deepened these intra-departmental roots, continuing to collaborate with USCG and engaging with broader foresight efforts under the DHS umbrella. In particular, SFI provided substantial contributions to DHS efforts to characterize the current and future strategic environment leading up to the development of the next Quadrennial Homeland Security Review (QHSR). Intra-departmental collaboration around strategic foresight will continue to be a key part of SFI moving ahead.

SFI Engagement & Outcomes

Event | Key Accomplishment

JAN
- Annual International Disaster Conference & Exposition

FEB
- FEMA National Advisory Council (NAC)
- SFI contributes to DHS's strategic planning process, including work on the Current Strategic Environment

MAR
- Annual Transport-ation & Infrastructure Convention

APR
- National Science & Technology Council, Infrastructure Sub-Committee Meeting
- Naval Post-Graduate School uses SFI in experiential strategic planning seminars

MAY
- National Homeland Security Consortium
- National Science & Technology Council, Disaster Reduction Sub-Committee Meeting
- National Association of Amateur Radio publishes implications of SFI findings for members
- Annual Voluntary Organizations Active in Disaster (VOAD) Conference
- National Homeland Security Conference, Urban Areas Security Initiative

The Strategic Foresight Initiative

SFI's work is the product of a Whole Community effort, aimed at driving our Nation toward more resilient futures. It is only possible with the participation of a diverse network of more than 900 professionals from across the United States, spanning many fields and disciplines, as well as our international colleagues. This *SFI Highlights* document serves as an important launchpad as we set out to move beyond the world of analysis and theory toward the real world of practice. But before looking ahead to SFI's plan for 2013 and beyond, it's important to reflect on how we've transitioned toward this focus on practical applications, and spotlight the key activities from 2012 that put us on this trajectory (see timeline).

The broader context of SFI

Launched in 2010, SFI is a transformative, community-wide effort to create an enduring foresight capability. Its fundamental purpose is to advance strategic planning and thinking about the future, to prepare the community both for emerging challenges and the key opportunities presented by our changing environment. A critical and enduring element of this foresight capability is to continuously assess and understand the factors driving change in our world. Our analysis is oriented toward gaining insights about how these drivers of change will impact the emergency management field in the United States over the next 20 years (with our latest analysis of key near-term trends captured in Feature 1, Pages 1-11). We believe that thinking more broadly, rigorously, and over a longer timeframe will help us:

- Hedge against uncertainty
- Avoid strategic surprises
- Promote information sharing across disciplines and organizations
- Understand what changes may affect the future of emergency and disaster management, and their impacts and implications
- Prepare and plan to more effectively operate in our future environment

Our work from 2010-2011 established the foundation for SFI. Although we've always strived for SFI to help practitioners in the real world, as with many "futures" projects, the starting point is closer to the analytic world of process and theory. The foundation for SFI was set through 3 key parts:

1. Building the analytic process
2. Identifying the 9 critical SFI drivers of change most significantly influencing our collective futures in emergency management (see Appendix A)
3. Broadening awareness about SFI and our findings through engagement with the Whole Community

This work—including intensive scenario-planning workshops and outreach activities with practitioners and experts—culminated with our capstone *Crisis Response and Disaster Resilience in 2030* report issued in January 2012.

Recap of SFI in 2012

Our efforts throughout 2012 centered on bringing to life the contents of our capstone report. This meant broadening awareness about and engagement with SFI, as well as sparking discussion and catalyzing action around the emergency management community's *future strategic needs*. The result of our activities and experiences, which influenced the design and content of the 3 Features contained in this document, brought us a step closer toward developing immediately practical applications for our collective foresight. We learned that our work to date provides a solid body of knowledge about our changing strategic environment and what it means for disaster management. But more guidance, support, and tools are needed to help make SFI truly actionable—a focus that shaped this document and that we'll carry through 2013 and beyond. The timeline to the left provides a summary of the major activities and accomplishments from 2012 that brought us to this point.

As a major component of SFI in 2012, much of our efforts were dedicated to creating space for collaboration and dialogue around the future of disaster management and our community's future strategic needs. To this end, we have and will continue to use various media, virtual collaboration tools, and in-person meetings or conferences to promote engagement. In 2012, SFI hosted 5 webinars that drew an average of 85 participants during each session (next page). We also participated in 26 events with groups and organizations across FEMA and emergency management community.

MAY

SFI incorporates long-range planning language into the Presidential Policy Directive-8

JUN

Annual Emergency Management in Higher Education Conference, Emer. Mgmt. Institute

Germany Federal Ministry of Interior, Civil Protection and Disaster Response

European Union FOCUS (Foresight Security Scenarios) Transatlantic Wkshp

NASA & U.S. Army Corps of Engineers Inter-Agency Forum on Climate Change Adaptation & Impacts

SFI contributes to DHS work on the Future Strategic Environment

SFI collaborates with the FEMA Youth Preparedness Division & Community Emergency Response Teams (CERT) to integrate futures-thinking into communications

JUL

FEMA National Advisory Council (NAC)

Annual Natural Hazards Research & Applications Workshop

U.S. Northern Command Conference: "Building Resilience Through Public-Private Partnership"

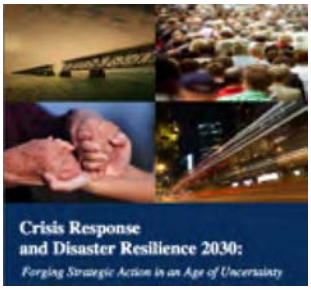
SFI 2012 Webinars

Visit the SFI website for more information about past and future SFI webinar events.

Crisis Response & Disaster Resilience in 2030 — January 26

The January 26, 2012 webinar featured David Kaufman, Associate Administrator of Policy, Program Analysis, and International Affairs in a discussion about the SFI findings presented in the *Crisis Response and Disaster Resilience 2030* report. Key topics included:

- Discussion of the 9 critical SFI drivers of change
- An overview of the 15 future strategic needs
- A glimpse of a strategically-prepared emergency management community in 2030



The 5 Essential Capabilities — June 5

The June 5, 2012 webinar focused on the 5 strategic needs classified as "Essential Capabilities." Ms. Regina Moran, Director Youth Preparedness Programs at FEMA and Mr. Albert H. Fluman from the Emergency Management Institute (EMI) discussed the role and contributions of their programs and initiatives.

Innovative Models & Tools — August 26

The August 26, 2012 webinar focused on the 6 strategic needs classified as "Innovative Models and Tools." Dr. Sophia Liu, Mendenhall postdoctoral research fellow at the U.S. Geological Survey (USGS), discussed the opportunities and challenges with integrating official and crowdsourced crisis information based on the evolutionary developments in the field of crisis mapping.

The FEMA External Affairs Digital Communications team presented FEMA's perspective on the current and anticipated use of social media platforms for emergency and disaster communication tools.

Dynamic Partnerships, Part I — September 26

The September 26, 2012 webinar covered the 4 strategic needs classified as "Dynamic Partnerships." Jacqueline Yannacci, Community Resilience Program Manager at the American Red Cross National Headquarters discussed the Community Resilience Strategy and pilot projects. Daniel Hahn, Santa Rosa County Plans Chief, discussed the Escarosa Business Continuity Initiative that is working with the business community enhance disaster resiliency and continuity.

Dynamic Partnerships, Part II — October 24

The October 24, 2012 webinar also covered the 4 Dynamic Partnerships strategic needs. Jeanie Moore, Senior Advisor for FEMA's Private Sector Division of the Office of External Affairs discussed the Agency's efforts to engage the private sector throughout the spectrum of emergency management. Kevin M. Burr, Program Specialist with the National Disaster Recovery Planning Division introduced the National Disaster Recovery Framework (NDRF) and how its core principles advance our future strategic needs.

JUL

- SFI inspires new course offered by FEMA's EMI: Emergency Mgmt. for the 21st Century (E682)

AUG

- FEMA National Preparedness Symposium
- SFI leads Futures Exercise at FEMA Sr. Leadership Offsite

SEP

- Conference Board of Canada, Council on Emergency Mgmt
- FEMA Federal Preparedness Coordinators Meeting
- Wilson Center Event: Grassroots to Gov't in Disaster Mgmt
- NATO, Civil Emrgncy Planning Committee

OCT

- American Red Cross Preparedness Academy
- InterAgency Board
- FEMA National Advisory Council (NAC)
- International Assn of Emergency Managers (IAEM) Meeting

DEC

- Multi-Nat'l Community Resilience Working Group

∞

- SFI informs FEMA's input into DHS QHSR

Featured Key Accomplishment: Futures Exercise

During a Senior Leadership Offsite on August 9, 2012, 40 FEMA officials participated in a discussion-based SFI-led futures exercise. The exercise included the FEMA Administrator and Deputy Administrator, the Regional Administrators, and Component leadership from across the Agency. The exercise was designed to analyze major cross-cutting challenges, questions, issues, and opportunities with respect to FEMA operations, business practices, and the Agency's mission to ensure the Nation's resilience in the face of future disasters.

The discussions were structured around a pair of "vignettes" that described two alternative futures set in the year 2025. The vignettes were informed by ongoing SFI work involving long-term trend/driver analysis and scenario planning. The exercise was designed to accomplish the following three objectives:

1. Explore a range of strategic challenges and opportunities for FEMA
2. Distill the most significant issues and questions that are critical to FEMA's future operating environment
3. Outline strategic guidance to shape Agency strategy and planning and inform development of FEMA's next Strategic Plan and the Agency's input into the DHS Quadrennial Homeland Security Review (QHSR)

High-level Takeaways

Senior Leadership provided insights and guidance around these three key themes:

1. **Strategic-level issues** that describe characteristics likely to significantly shape the future operating environment. The issues—increasing fiscal constraints, major community-level changes, rising social inequalities, and new/unfamiliar risks—at first blush may not appear directly related to core FEMA missions. But they are in fact intrinsically connected to the Nation's resilience. Together, these four strategic-level issues offer a compelling backdrop for the Agency's planning and strategy efforts—a lens from Senior Leadership that can help shape discussions about strategic priorities, resourcing decisions, and actions over the medium and long term.
2. **Organizational-level issues** that provide FEMA with three overarching principles that should guide FEMA's direction over the medium and long term. FEMA has ample influence and authority to leverage these principles—strengthen private sector roles and relationships, take Whole Community emergency management to the next level, and effectively manage FEMA's mission space—to continuously adapt and improve the delivery of emergency management service to face future challenges.
3. **Ground-level issues** that offer potential strategies that will help FEMA and the Whole Community enhance national preparedness and resilience in the face of disruptive change. With the benefit of a robust understanding of emerging issues and future requirements, FEMA can confidently identify strategic investments that will enable its future success, including building stronger analytic capabilities, ensuring a high-caliber workforce, embracing technology, and innovating to solve funding challenges.

SFI Outlook for 2013 and Beyond

As SFI continues into its fourth year, we build on our progress to date and forge ahead to make SFI continuously more practical and actionable. Research and analysis; outreach and engagement; and strategy formulation and planning will remain the backbone of this foresight initiative. Our focus now will be increasingly directed toward bringing these elements and our body of knowledge into practice.

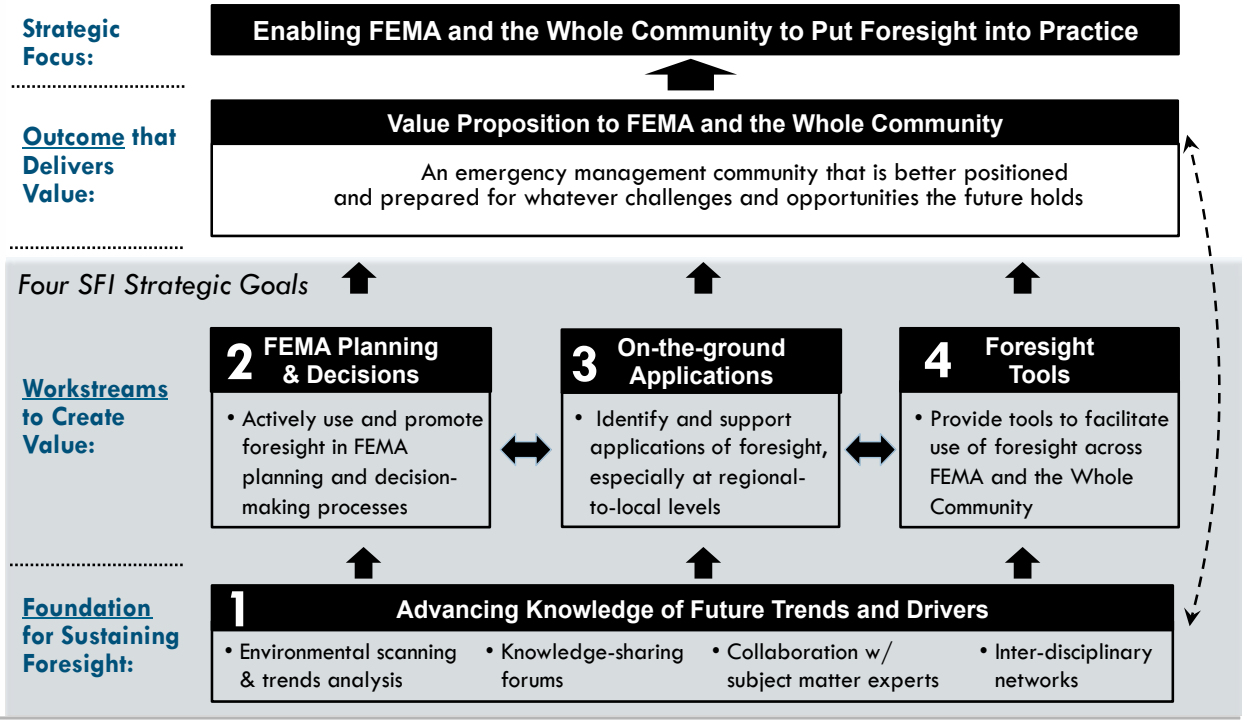
To this end, we've developed an SFI Strategy Map (see below) to structure and guide how we make this happen. Clearly defined at the top is our *strategic focus* for 2013 and beyond: **Enabling FEMA and the Whole Community to Put Foresight Into Practice.** All of our efforts will be oriented to achieve outcomes that serve this focus on practical applications. Our primary buckets of work, or workstreams, are organized around *four strategic goals*, which are to:

1. Advance FEMA and the Whole Community's knowledge of future trends and drivers of change
2. Actively use and promote foresight in FEMA planning and decision-making processes
3. Identify and support regional-to-local applications of strategic foresight
4. Provide tools to facilitate use of foresight across the Whole Community

In order to sustain foresight for FEMA and the Whole Community, the foundation of our work is based on continually looking into the future, understanding what is driving change in our world, and gaining insights about what it means for our Nation's resilience (Goal 1). One product of this workstream, the synthesis of our trends analysis and research highlights, is captured in Feature 1. Voices of inspiration and innovation—of individuals working to turn breakthrough ideas into action—are profiled in Feature 3. A key part of putting such knowledge to use is to integrate it into the development of FEMA strategy, policy, programming, and operations (Goal 2). The SFI-led exercise conducted at the FEMA Senior Leadership Offsite in August 2012 (see p. 34) is one example of this goal in action.

Perhaps SFI's greatest contribution to the Whole Community is to spotlight on-the-ground applications of the 15 strategic needs (Goal 3). We believe such examples—like the 10 showcased in Feature 2—serve as potential models of future capabilities, tools, and partnerships needed to enhance national resilience in the face of whatever unfolds in the future. Putting all of these pieces together, the critical link in building our collective capacity to develop and sustain strategic foresight is the provision of easy-to-use tools and processes (Goal 4). Developing these tools—like exercise development toolkits used at the Senior Leadership Offsite or templates for using trends analyses in planning sessions —and making them widely accessible is essential to help individuals and organizations put foresight into practice. As we work toward building more resilient futures, SFI's work through 2013 will be guided by these four strategic goals.

SFI Strategy Map:



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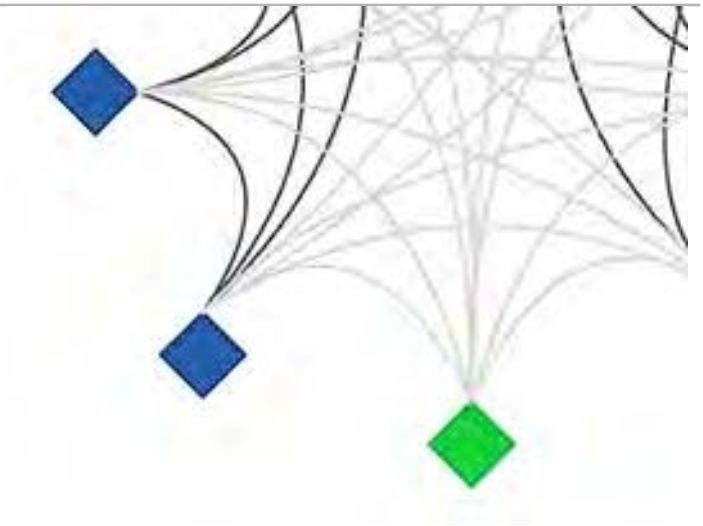
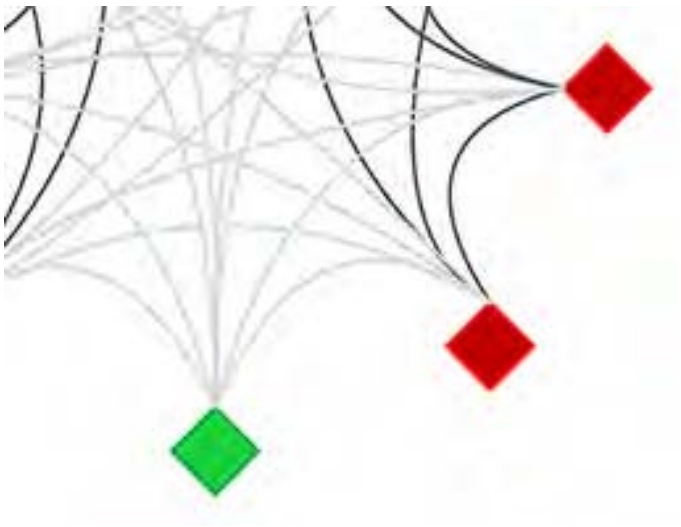
Appendices





In this part…

Appendix A – Sustaining Foresight…….Page 38
- The 9 SFI drivers in Feature 1

Appendix B – The 15 SFI Strategic Needs…Page 40
- Full descriptions and context for all 15 SFI Strategic Needs

Appendix C – Research References…….Page 41
- Links to publically-accessible resources that informed the analysis behind Feature 1

Overview of this Section

The *SFI Highlights* was designed as a user-centric document, focused on delivering the most readable and essential content right up front. Each section of the document offers only brief explanations behind the material and the thinking that went into producing it. Only the bottom-line information the reader needs to understand each piece. As a result, some important context and linkage between the content of this document and the broader work of SFI were glossed over.

The three appendices presented here bridge this gap—they bring together, into one document, the most critical resources from previous SFI work that contributed to the content of the *SFI Highlights*.

- Appendix A provides an overview of the framework behind our analysis of the "recent emerging trends" and describes how the 9 SFI drivers play into the narratives of Feature 1 – Page 38
- Appendix B provides more details about 15 SFI Strategic Needs referenced in the 10 anecdotes in Feature 2. The 15 Strategic Needs serve as guideposts to inform our planning, investments, and actions so that we can deal with the changing demands of the future operating environment – Page 40
- Appendix C provides the live hyperlinks behind the underlined text in Feature 1, which link to the research used in our trends analysis – Page 41

Appendix A

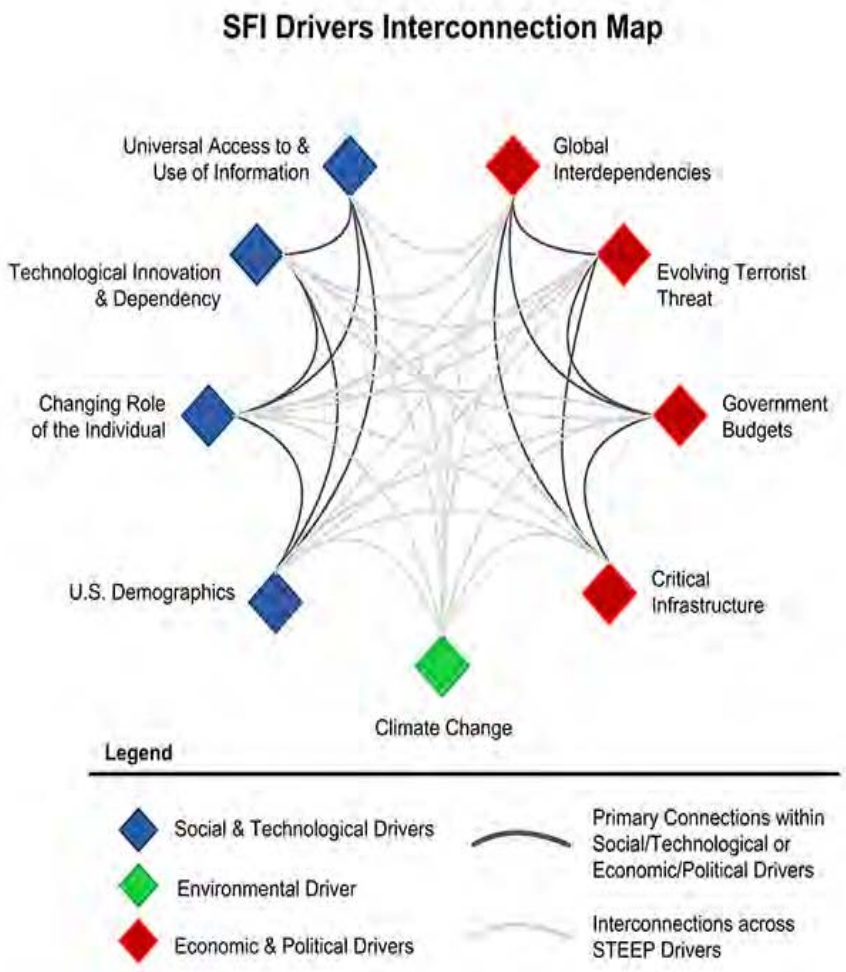
Sustaining Foresight

In an age of increasing complexity and uncertainty, there are many forces of change, or "drivers," reshaping our world. In Feature 1 – Sustaining Foresight, we've synthesized our analysis of these change-drivers and our future strategic environment into (what is hopefully) engaging narratives. These narratives are built around 4 vignettes that each contain a pair of "recent emerging trends." The dueling, yet interconnected themes tease out how various trends may play out over the coming years and, if they roughly follow the patterns of any given storyline, how they may ultimately drive us down very different paths. We believed that this approach to reflecting on recent events offered the most dynamic—and perhaps most memorable—way to provoke our community to think critically about the future. This appendix puts this framework and the background of our analysis into the broader context of Strategic Foresight Initiative and describes how the 9 SFI drivers play into the narratives of Feature 1.

Analytic Foundation for SFI

As a part of SFI's scenario planning and trends analysis, SFI employs an analytical approach used commonly by organizations such as the U.S. National Intelligence Council to identify macro-level factors that have significant influence in the world. These macro-level factors fall into five dimensions—Social, Technological, Environmental, Economic, and Political (STEEP). Using this STEEP approach, the SFI community of practitioners and subject matter experts identified 9 major drivers of change (categorized along the 5 STEEP dimensions as shown in the diagram below) that will likely have the most significant influence on disaster management in the U.S. over the next 20 years.

The potential changes will likely complicate the future emergency management environment, significantly alter how members of our community perform their jobs in the future, and require creative, and collaborative thinking and action.



Framework for Analysis of Feature 1

Rather than look individually across these nine drivers to see what new things we could learn about our future strategic environment, we explored different ways to assess the interplay of these drivers in the real world. From our literature review and expert elicitation, we recognized the most influential recent trends ended up clustering around dominant themes. And frequently the themes reflected big theories—like the *Great Stagnation* of the U.S. economy—put forward by thought leaders in recent years. So what we ended up with were four vignettes—focused on the Economic, Environmental, Technological, and Security dimensions—that offered the most concise yet comprehensive and balanced look into our immediate planning horizon. Nonetheless, the four vignettes are not intended to be exhaustive of all the possible trends and implications that affect emergency and disaster management. It is likely that some key trends or implications didn't receive enough mention, or were left off entirely. And that's where we turn to the broader community—for your input and perspective. We hope that this offers a starting point for deeper dialogue and analysis.

Appendix A

How the 9 SFI Drivers Played Out in Feature 1

Similarly, as the table below describes, the 9 SFI drivers helped form the analytical structure of the four vignettes depicted in Feature 1 – Sustaining Foresight. All of the drivers are represented in the vignettes in some respect. The following four drivers, however, play very prominent roles in shaping the themes:

- *Government Budgets* is a prominent feature of the vignette category Economy.
- *Climate Change* is dealt with head-on in the Environment vignettes.
- The *Technology Innovation and Dependency Driver* is explored in the two vignettes related to the Technology vignette.
- *Evolving Terrorist Threat* is captured in the Security section, particularly the theme labeled *Fears of a New Age*.

Important elements of each of the other five SFI drivers are sprinkled throughout each of the eight vignettes, thus providing broad and deep driver coverage. In all, the original nine SFI drivers continue to inform SFI team thinking about categories of threats and challenges facing the Whole Community.

SFI Driver	Elaboration in Vignettes
Changing Role of the Individual	An affluent and fast-paced society driven by competitive forces and technological innovation could weaken community bonds—and even national identity. See *American Revival* (Pages 2-3).Technology has broken down hierarchical barriers to engagement and enabled individuals to play a greater role in shaping society. See *Technotopia* (Pages 6-7).
Climate Change	What if recent harsh weather is not a fluke and once-a-century storms occur much more frequently? See *Out of the Frying Pan* (Pages 4-5). Reasonable steps can be taken now to both optimize climate change preparedness and simultaneously deal with other critical national challenges. See *Making Lemonade* (Pages 4-5).
Critical Infrastructure	Prolonged economic stagnation and fiscal pressures put infrastructure renewal at serious risk. See *The Great Stagnation* (Pages 2-3). Meanwhile, are our health system and emergency services up to the challenge of a global pandemic? See *Threats, Reloaded* (Pages 8-9).
Evolving Terrorist Threat	Is the terror threat waning, merely in pause mode or simply changing? Cyberspace may be the next major terror venue. The Sandy Hook school shootings shed light on another terrifying dimension. See *Fears of a New Age* (Pages 8-9).
Global Interdependencies	In a highly integrated world, there is no insulation from nation-state conflicts, civil and regional instabilities, or age-old threats like pandemics. See *Threats, Reloaded* (Pages 8-9). While the global economy remains deeply interconnected, new dimensions are reversing older trends like outsourcing—giving new life to domestic industries and national efforts. See *The American Revival* (Pages 3-4).
Government Budgets	U.S. fiscal developments will have big and complex impacts on emergency management plans and operations – at all levels of government. See both *American Revival* and *Great Stagnation* (both on Pages 3-4).
Technological Innovation and Dependency	Technological innovation is spawning revolutionary new means of production—like 3-D printing—and whole new business models built on social media and "crowdsourcing." *See Technotopia* (Pages 6-7). But social interests and government services may not benefit, as tech giants seek to lock-in customers into their proprietary "ecosystems." See *Technical Difficulties* (Pages 6-7).
Universal Access to and Use of Information	Will the benefits of the emerging high-tech era be shared equally? See *Technical Difficulties* (Pages 6-7). And how can emergency managers leapfrog ahead of legacy information systems and processes to reap the upside of "big data?" *See Technotopia* (Pages 6-7).
US Demographic Shifts	Demographic considerations touch on all facets of emergency and disaster management. An aging population can be a more vulnerable and often a more isolated one. See *Technical Difficulties* (Pages 6-7). And harsh weather events of the last two years illustrate the complex risks and costs associated with coastal over-development. See *Frying Pan* (Pages 4-5).

Appendix B

The 15 SFI Strategic Needs

The 15 SFI Strategic Needs resulted from a 2011 scenario-planning workshop. Representatives from FEMA, along with a diverse set of disaster management professionals, analyzed the strategic implications of five very different and plausible future operating environments ("scenarios"). The 15 Strategic Needs described below are the essential common elements of those implications. As such, they provide reliable guidance for a range of decisions with long-term, strategic implications, which emergency managers face on a regular basis. In other words, emergency managers can confidently embrace these strategic needs today, knowing that they have been rigorously evaluated in the context of hypothetical, but realistic, future worlds.

SFI Strategic Needs			Future Context for Strategic Needs
Essential Capabilities	1	Develop capabilities to address dynamic population shifts	Emergency managers will be faced with complex demographics shifts as the U.S. population increases, ages, and becomes more culturally and linguistically diverse.
	2	Practice omni-directional knowledge sharing	The proliferation of information from all sources intensifies the need to make emergency management information useful and accessible. The public's role as an information source will be vital.
	3	Infuse EM practices & skills across the entire educational experience	In an expectedly tight fiscal environment, schools will be critically important channels for promoting sound prevention practices, especially in the face of complex threats, like pandemics.
	4	Build a shared EM future vision with appropriate plans & contingencies	The SFI scenarios depict increasingly complex, rapidly changing worlds. Emergency managers will have to collaboratively explore innovative solutions as it prepares for the future.
	5	Leverage volunteer capabilities across all EM phases	Emergency and disaster management resources, especially personnel, are apt to be stretched in future operating environments marked by tight budgets and/or more frequent national emergencies.
Innovative Models & Tools	6	Adopt *new* risk management tools to manage complex event consequences	Current risk management tools and processes are already outdated. For one, current risk management models do not account for climate change impacts we are experiencing today.
	7	Employ alternative surge models	Chronic fiscal pressures require new approaches and models for marshaling resources to deal with the possibility of more frequent and complex emergencies.
	8	Promote EM inter-operability across all boundaries	Emergency managers will likely have to do more with few resources. Resource-sharing arrangements across jurisdictions—equipment, personnel, know-how, etc.—are essential.
	9	Plan around shared interests for maximum use of EM capabilities	Current regional planning approaches are limited. Planners need to look beyond short-term concerns and narrow stovepipes and capitalize on opportunities for collaboration.
	10	Remediate vulnerabilities across EM supply chains and critical infrastructure	Global and national supply chains for emergency management may be vulnerable to infrastructure degradation, interruptions in foreign trade, cyber attacks, and changes in warehousing and logistics practices.
Dynamic Partnerships	11	Influence development of emerging, EM-relevant technologies	Technology will become an even more essential element across emergency and disaster mission functions—information management, communications, sensing, transportation & logistics, and much more.
	12	Empower individuals & communities to play a greater role throughout all phases of disasters	Resource constrains and reduced government capacity challenge individuals and communities to assume greater responsibility for emergency planning and response.
	13	Proactively engage business in all EM phases, especially policy development	Strong private sector partnerships will be essential, especially in policy and planning. Business leads in many critical technologies and processes, such as data management and logistics.
	14	Intensify disaster-response collaboration with Canada and Mexico	US shares many interests with Canada and Mexico are growing around immigration, border security, drought, water management, disease surveillance, and critical infrastructure. Potential for fruitful collaboration and win-win solutions abound.
	15	Enable access to military capabilities to augment capacity as needed	Complex emergency and disaster situations, including WMDs and cyber-attacks, provide merit for broader access to the military for both surge capacity and specialized skill sets.

Appendix C

Links were active as of 4/2013

Research References

All of the underlined text in Feature 1 – Sustaining Foresight, between Pages 2-9, contained live links to the research used in our trends analysis. The links refer readers to accessible materials (not gated behind pay walls) that come from popular and credible media sources. That includes magazine articles, TED presentations, blog pieces, as well as a few academic references. We organized the links to mirror the content in Feature 1. Not all of the links embedded in Feature 1 are included in the list below; we pulled out the most significant ones that support the defining characteristics of each theme. Long links have been shortened using the goo.gl tool to make them easier to input manually.

Economy Theme

The American Revival The U.S. still draws the world's top talent to its universities, remains a hub for innovation, and promotes a top-tier competiveness environment for business (Universities, US News: http://goo.gl/osvlO; Competitiveness, World Economic Forum: http://goo.gl/p3WjK) The economics of globalization are starting to shift, making America a place in which to invest and produce again (See The Atlantic: http://goo.gl/047Uc).

Taming the deficit – Leading economists assert that improving underlying conditions in the U.S. economy, led by resurgent housing market and gains in the labor market, indicate a likely acceleration in economic growth in 2013. This growth can help shrink deficits and make the national debt manageable again.

- Acceleration of economic growth in 2013, The Conference Board: http://goo.gl/w5uZj
- Outlook for sustained U.S. growth over medium term, The Conference Board: http://goo.gl/Aa30A

Driving innovation – Having mastered the "startup ecosystem", Silicon Valley remains the world's mecca and a benchmark for innovation (See: Visually infographic - http://visual.ly/why-startups-fail). The culture of innovation is spreading to government, boosting the efficacy of public services.

- "Startup ecosystem" and innovation, AOL Tech: http://goo.gl/T5H3R
- Culture of innovation in public service, PBS News Hour: http://goo.gl/1akwp
- Government OpenData initiative, Data.Gov: http://www.data.gov

Resourcefulness – The tightened budget environment has driven greater efficiency and focus on performance and outcomes. This shift may result in producing "more with less" throughout all sectors, including government.

- Performance- and outcome-driven government, Performance.Gov: http://goo.gl/7rKFz
- Culture shift toward outcome-based performance, Department of Homeland Security: http://goo.gl/6yBgA
- Innovative funding models like the Race to the Top program, Center for American Progress: http://goo.gl/G2DKy

Pent-up capacity – A future flood of investments from companies with strong cashflows will help unleash a new cycle of economic growth and create demand for workers.

- Companies have cash, potential to invest, National Public Radio: http://goo.gl/tMNJ0

The Great Stagnation Some experts argue we've consumed most of the "low-hanging fruit" that enabled our country's long-term growth, (See The Economist: http://goo.gl/pbyvQ). Concerns remain over high debt, middle-class job security, weak GDP growth, and fewer booming industries (See The Atlantic: http://goo.gl/qUaBW).

Slower job recovery – The last three economic recoveries have produced historically low job growth—raising questions about the longer-term economic landscape.

- Slower job recoveries, Federal Reserve Bank of St. Louis: http://goo.gl/96z60
- Skills "gap" in many sectors, Brookings Institution: http://goo.gl/MYRWp
- Historic patterns of U.S. economic growth, VOX, Centre for Economic Policy Research: http://goo.gl/6wmXn

Hardening inequality – Many measures reveal a growing gap between the so-called haves, and have-nots, including concentration of income at the top, high levels of youth unemployment, growing gaps in life expectancy between the rich and poor.

- Income inequality, Bloomberg Business Week: http://goo.gl/sgax4
- Youth unemployment, Financial Times: http://www.ft.com/indepth/youth-unemployment
- Life-expectancy gap between rich and poor, The National Bureau of Economic Research: http://goo.gl/90XcG

Money problems – The struggling economy has further squeezed budgets across all levels of government, and austere fiscal conditions are likely to extend into the foreseeable future.

- Budget squeeze, International Monetary Fund: http://www.imf.org/external/pubs/ft/wp/2012/wp12184.pdf
- 20-50 year budget projections, the Congressional Budget Office: http://1.usa.gov/OEtWts

The end of big thinking – There are real consequences to the partisanship of our political system. It is increasingly to garner the consensus needed to pursue essential government projects. The fear is that we may seed the next crisis with delayed action and band-aid solutions.

- Implications of government inaction, American Enterprise Institute: http://goo.gl/sNs5q
- Systemic challenges, Mostly Economics blog: http://goo.gl/z77ak
- The next crisis, Quartz new media magazine: http://goo.gl/SChKy

Environment Theme

Out of the Frying Pan This trajectory points to higher vulnerability for a the Nation, unless we move now to take substantive preventative and adaptive actions.

Unforeseen accelerations – Arctic sea ice shrunk to its smallest extent on record in 2012, which was the warmest year ever recorded in the contiguous United States. These accelerations in warming and melting are occurring at a faster rate than most scientists anticipated.

- 2012 State of the Climate, NOAA: http://www.ncdc.noaa.gov/sotc/
- Arctic sea ice melting, New York Times: http://goo.gl/949wu
- Climate models have underestimated warming, melting, and sea-level rise, *Science*: http://goo.gl/ZCVX4

No drive to act – At the 2012 climate meeting in Doha, Qatar, negotiators were unable to forge an emissions reduction agreement that would keep global temperature increases below 2°C – a threshold that most climate scientists believe is the outer bound of "safe" warming. Without meaningful action to reduce emissions, impacts may increase in magnitude over the medium and long-term as warming reaches 4-6°C by the end of this century.

- Factors influencing public concern for climate change, Harvard Shorenstein Center: http://goo.gl/DL0Lo
- Is it possible to limit warming to 2°C?, United Nations Environment Program: http://goo.gl/5xfsp
- What rate of warming can be expected?, Price Waterhouse Coopers: http://goo.gl/n8s7Q

Critical infrastructure – Our 18 critical infrastructure sectors are vulnerable to various environmental changes. The U.S. power grid is especially vulnerable to an increase in heatwaves, the deadliest natural hazard in the United States.

- Critical infrastructure sectors are vulnerable, DHS: http://www.dhs.gov/critical-infrastructure-sectors
- U.S. power grid may be the most fragile aspect of U.S. infrastructure, Public Radio International: http://goo.gl/T37eR

Increasing exposure – The increase in population growth located in areas exposed to extreme events has affected the insurance industry. Some companies have pulled out of dangerous areas, putting pressure on the public to manage the increased risk faced by these areas.

- Population growth in the wildland-urban interface, Journal of Rural Studies: http://goo.gl/68DDs
- As premiums rise, Florida senior citizens consider going without insurance, Tampa Bay Times: http://goo.gl/tdDce
- The National Flood Insurance Program overview for Congress, Congressional Research Service: http://goo.gl/4X5RF
- New York Times discussion about the role of public funding in vulnerable places: http://goo.gl/ckAV8

Appendix C

Making Lemonade Opposing dynamics propel the U.S. to make the best of a difficult situation. New technologies aid in response and recovery efforts (See FEMA: http://fema.maps.arcgis.com/home/index.html), and extreme events have forced government to seriously focus on adaptation planning and reducing risk exposure. In the wake of events like Sandy, public support for climate action is growing, and states, cities, and businesses are collaborating on adaptation and mitigation initiatives.

(Momentary) positives – Melting sea ice has opened new Arctic shipping routes and enabled extraction of useful minerals and oil deposits. Crop yields in certain areas of North America are expected to rise initially, before decreasing due to precipitation and temperature shifts. Emissions from increased transportation in the sensitive Arctic may accelerate warming and melting, and burning of oil and gas uncovered in the Arctic will contribute to the carbon cycle. For now, however, these positive impacts are being exploited.

- Increased crop yields expected, Intergovernmental Panel on Climate Change: http://goo.gl/9PYxR
- Thawing Arctic opens new shipping routes, The Guardian: http://goo.gl/6QjPx

Catalyzing events – Hurricane Sandy, the worst U.S. drought in a half-century, and the 2012 Colorado wildfires have brought new attention to the topic of climate change. Emergency managers have begun to implement an integrated approach to reducing risk exposure. Meanwhile the modeling and management of risk is changing and stronger design standards are being developed.

- Public opinion on climate change influenced by recent events, Associated Press-GfK: http://goo.gl/bDV3v
- Stronger design standards, FEMA: http://www.fema.gov/residential-coastal-construction

Fruitful collaboration – Cities in the U.S. have taken leadership roles in climate change mitigation and adaptation, producing meaningful collaborations.

- PlaNYC, City of New York: http://www.nyc.gov/html/planyc2030/html/theplan/climate-change.shtml
- City of Boston Climate Action Plan, City of Boston: http://goo.gl/KBMji
- MIT's Science Impact Collaborative: http://web.mit.edu/dusp/epp/music/

Green sprouts – The growing success of new initiatives built around green products in countries like China and India has gathered international attention. Meanwhile, homegrown local, state, and industry-level programs to curb emissions in the U.S. have begun to yield evidence that the economic impact of greenhouse gas mitigation could in fact, be positive. These successes fortify arguments for broader-scale action on climate change.

- Local, state, industry initiatives, Mother Jones: http://goo.gl/erdc7, NYT: http://goo.gl/ACM1c, EPA: http://goo.gl/cqPJ6
- Arguments for promoting competitiveness in the clean energy market, C-SPAN: http://goo.gl/8WbG1

Technology Theme

Technotopia With the speed of product development and adoption, new technology is changing and defining how we live and work more than ever (See MIT Technology Review: http://goo.gl/QY2eD). Mobile technologies in particular have spurred innovation and granted communication access to millions worldwide (See The Guardian: http://goo.gl/8Q9w0). Experts believe we are in the midst of the next industrial revolution (See The Wilson Center: http://goo.gl/MChmw) – one that will change who makes things, how and where.

New business models – "Crowdfunding" platforms like Kickstarter and Neighbor.ly are democratizing forces in both business and government. In 2012, the Kickstarter community pledged about ten percent of all seed investment in the U.S. The broader move toward "crowdsourcing" of all kinds signals a major shift in how we work, solve problems, and interact with organizations – including government.

- Crowdfunding and Kickstarter, MIT Technology Review, http://goo.gl/PIhsF
- Crowdfunding Superstorm Sandy, National Public Radio: http://goo.gl/K0tgW
- Neighbor.ly civic crowdfunding platform: http://neighbor.ly/ (also see Innovator Profile on p.29)
- Crowdsourcing DNA sequencing for diseases, Nature: http://goo.gl/BnG64
- How technology is changing the nature of work, Institute for the Future: http://goo.gl/4TW7Y
- How Code for America is reinventing government, Mashable: http://goo.gl/aHLxK

Data, data everywhere – Big data and social networking redefined how we think about and manage information (See The Economist: http://www.economist.com/node/15557443). The meteoric growth in the collection of data creates new insights and applications.

- 2012 candidates mine voter data, MIT Technology Review: http://goo.gl/YJuhl, ABC News: http://goo.gl/hxPhn
- Red Cross Digital Operations Center uses social media to help during disasters, iRevolution: http://goo.gl/zvQyQ

The Maker Movement – The Makers, a technological subset of the DIY movement, are changing the way all kinds of things are produced, and may even change our economy (See Time Magazine: http://goo.gl/Gi9rr). 3-D printers can now generate everything from custom tools, to hearing aids, jewelry, even body parts. Printing services offer custom-manufacture of pre-designed products, and home-based printers download files from the web that can be turned into real objects. Synthetic biologists and biohackers are designing and building whole new biological parts, organisms, and systems. This idea could redefine the manufacturing process, fundamentally change our economy, and enable people to create on-the-fly solutions to issues like emergency response and recovery.

- 3-D printers, Bloomberg Business Week: http://goo.gl/7d8ho, The Inquisitr: http://goo.gl/BJCrr
- 3-D printing services, Shapeways: http://www.shapeways.com/, Sculpteo: http://www.sculpteo.com/, Redeye: http://redeyeondemand.com/, i.materialise: http://i.materialise.com/
- Synthetic biology and biohacking, Synthetic Biology Project: http://goo.gl/GLSzx, BBC News: http://goo.gl/dIAgu, Nature: http://goo.gl/C7Ftl
- Micro hydropower generator made after the earthquake in Japan, Thingiverse: http://www.thingiverse.com/thing:34813

Technical Difficulties-Technical advancement is typically looked upon favorably, especially in the United States. But the pace of technological change today may be counter-productive, both economically and socially. It raises serious concerns related to privacy, power, and inequality. It forces us through rounds of creative destruction, without drastic improvements in living standards. It's possible that technology, with the speed and complexity of our environment, may actually be making things fundamentally less secure and stable (See the Journal of Risk Analysis and Crisis Response: http://goo.gl/HwGoW).

Privacy and data (in)security – Online "cloud storage" services grew exponentially by creating new uses for data and offering convenient, anywhere access. However, common security measures (like passwords) are flawed, offering multiple points of entry for hackers and thieves. Meanwhile, companies legally collect, buy, and sell detailed information about their users. Cyber-crime is now one of the most lucrative forms of criminal activity, and the risk of identity theft is a serious issue affecting individuals, businesses, and government.

- Vulnerability of common security measures, Wired Magazine: http://goo.gl/5UXlx, NPR: http://goo.gl/mTOUX
- Companies collect, buy, and sell data, The Wall Street Journal: http://goo.gl/IgJBm, NYT: http://goo.gl/zuzBV
- Privacy concerns with "big data," The New York Times: http://goo.gl/M5y1b

Walled Gardens –Tech giants like Apple and Google are now ubiquitous – they provide "the remote control for many people's digital lives." But critics fear that their size and power may become a problem for consumers, and even governments.

- Concerns about the internet giants, The Economist: http://goo.gl/OWsvU, The New York Times: http://goo.gl/GofhQ
- Patent wars, The New York Times: http://goo.gl/pjwti

The Digital Divide – The falling cost of consumer electronics has made technology more accessible, but in other ways the digital divide persists.

- Mobile technology allows more low-income people access to the internet, Pew Research Center: http://goo.gl/Ze7Zd
- Broadband access lags behind in poor and rural areas, exacerbates inequality, Wired Magazine: http://goo.gl/TM9kl
- Senior citizens online are more likely to face online fraud, Center for Retirement Research: http://goo.gl/4RftV

Security Theme

Fears of a New Age – As the world grows more complex, so do the threats to life, safety, and security. Since the 9/11 terror attacks, the world has shifted focus to 21st century "unconventional" threats, which experts argue will be the likeliest and most dangerous future security challenges (See Strategic Studies Institute: http://goo.gl/YJDML). There is a wide range of means by which harm could be done – from digital, to the very low-tech (See Senate Transcript: http://goo.gl/3rvj1).

Cyber attacks on critical infrastructure – In a hyper-connected world, cyber threats to government and society are real and pervasive. Security experts warm especially of rising threats to critical infrastructure, including power plants, water systems, energy pipelines, transportation systems and financial networks. The U.S. government is developing policies and practices to mitigate cyber threats, but some argue it's not enough.

- Then-Defense Secretary Leon Panetta speaks of "a cyber Pearl Harbor," New York Times: http://goo.gl/ZBL1V
- U.S. mitigates cyber-threats, Wall Street Journal: http://goo.gl/XgIm5, U.S. Department of Defense: http://goo.gl/7Hrba

Environmental hazards – Man-made environmental threats are a large and unsettling unknown, especially those related to biotechnology. Critics fear that engineered plants or animals could destabilize ecosystems and disrupt global food supplies. Bioengineering research may increase the probability of the release of a destructive bioengineered agent. Other sources of risk include drilling processes like hydraulic "fracking," which uses up large amounts of clean water and may carry other environmental consequences.

- Genetically-engineered species may pose risks, Science Daily: http://goo.gl/ubLM6, The Guardian: http://goo.gl/GT9Gb
- Personalized bio-weapons could be used for assassination, The Atlantic: http://goo.gl/Jgn1I
- Scientists raise concerns about impact of hydraulic "fracking," Science Daily: http://goo.gl/gkbsw, MIT Technology Review: http://goo.gl/kHI7v

Catastrophic terrorism – More than a decade after the 9/11 terror attacks, terrorism remains a risk to the United States. Innumerable potential targets include the food system, ports, utilities, dams, mass transit, bio-research facilities, military installations, the air transit network, and other dense concentrations of people. Weapons range from explosives to nanotechnology.

- U.S. power grid is "inherently vulnerable," The National Academies: http://goo.gl/N67rs
- Amtrak remains vulnerable to terrorist attack, NBC Southern California: http://goo.gl/L2Zu7
- FBI briefing on agroterrorism, Federal Bureau of Investigation: http://goo.gl/0ZuCz

Mass shootings – 2012 was a bad year for mass shootings in the U.S. – highlighting a distressing trend of growing gun violence. The. U.S. has suffered 62 mass shootings since 1982, with 25 of these occurring since 2006, and 7 happening in 2012 alone. The 2012 tragedy at Sandy Hook Elementary in Connecticut reminds us that large-scale violence can strike anywhere, targeting even the most vulnerable and defenseless.

- A Guide to Mass Shootings in America, Mother Jones: http://goo.gl/r51XW

Threats, Reloaded While novel dangers steal the spotlight, traditional threats have hardly disappeared. Far from "old news," nation-state conflicts, geopolitical instability, and the threat of pandemic outbreak are interwoven with the new security issues that have characterized the early 21st century. For instance, independent hacking attacks or the exposure of secret data can have diplomatic or defense-related fallout (See Reuters: http://goo.gl/rKrgC, and NPR: http://goo.gl/WDpRW). Cyber weapons may be used by states against one another, adding new dimensions to otherwise traditional conflicts (See: http://goo.gl/1wbJC).

Nation-state conflicts – The end of the Cold War, 9/11 and other factors have shifted attention away from conventional state-on-state conflicts. A return of those kinds of tensions is plausible. Iran's acquisition of nuclear weapons continues to be a concern, while "natural security" risks play out worldwide. Even seemingly dated issues, like territorial disputes (e.g. the South China Sea) are potential flashpoints for U.S. allies.

- Trends Report 2030, the National Intelligence Council: http://goo.gl/DDJqn
- Overview of "natural security" issues, Center for a New American Security: http://www.cnas.org/naturalsecurity
- Tensions in the South China Sea, The Atlantic: http://goo.gl/jMWV3

Fragile states –Economic and political turbulence over the last few years has destabilized many parts of the world. Global and regional institutions failed to fully contain or manage border and civil conflicts, Syria being the most vivid example. Instability can spill over across regions. Potential disruption in the Middle East remains a heightened risk due to existing or aspirational possession of nuclear armaments. Closer to home in the Western Hemisphere, drugs, violence, poverty, and political instability pose ongoing risks.

- The regional implications of the Syrian crisis, Middle East Institute: http://goo.gl/JXRz1
- Partnership between the U.S. and Mexico to fight organized crime, U.S. State Dept: http://www.state.gov/j/inl/merida/

Appendix C

Pandemics – Perhaps the oldest human threat, pandemics are now back to the fore. The ease of transmission and contagion has accelerated with global commerce, transportation, and supply chains. The 2003 SARS outbreak, the H5N1 scare of 2008, and the H1N1 pandemic of 2009-2010 had international implications. Health officials worry about another strain of H5N1 "bird flu" transmittable from human-to-human that may have catastrophic consequences. In 2012, two cases surfaced outside of the U.S. of a previously unrecorded coronavirus. Meanwhile, infections such as BSE or "mad cow disease" are a reminder that pandemics can also attack via the food supply.

- World map of 2009 H1N1 infections, World Health Organization: http://goo.gl/2c5Zw
- Paper published describing how to make a strain of H5N1 transmittable to humans, NY Times: http://goo.gl/Sle3c
- New coronavirus found in the Arabian peninsula, NPR: http://goo.gl/bhZ5n
- CDC recommendations for employers on fighting the flu in the workplace: http://goo.gl/ZqR6w
- Preparing for a major pandemic flu outbreak, King County Public Health: http://vimeo.com/48042619

FEMA