

REFRAMING RESILIENCE

Proceedings of the AIA 2015 Resilience Summit
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A message from the CEO of the American Institute of Architects

Nowhere are hard lessons more starkly preserved than in the built environment. Rapid population growth, degradation of natural resources, and the many physical and social impacts of a changing environment, including the first global climate refugee crisis in our lifetime, are evidence of the challenges we now face, as a profession, and a society. Resilience involves planning, design, construction, and operations in concert with the natural environment. Getting ahead of these challenges is our greatest opportunity.

On this, the tenth anniversary of the AIA's Disaster Assistance Program, we have clear evidence we can and in fact are making progress. Evidence includes an unprecedented Building Industry Statement on Resilience, jointly signed in May 2014 that today represents the commitment of 31 organizations. Most recently, last October's 2015 AIA Resilience Summit has shown that members of the building and construction professions are now partnering with the scientific community, government, and industry to work together to address these challenges.

Herein lies the key to moving forward. The "answer" to some of the toughest questions facing us is not just to design buildings that are more resistant and resilient to natural hazards, but to recognize that new challenges require new approaches. This is where we all have a part to play.

The built environment is a network of natural resources, infrastructure, buildings, and of course, people. These interdependencies mean that a change in one part affects the whole. If the 75 attendees gathered at the National Building Museum last October achieved nothing else—and, as readers will see, in fact they achieved much, much more—it showed we are beginning to reframe the challenge of shaping more resilient communities. We're doing so not by assigning the task to any single profession or group, however well intended, but by working together. This report shows collaboration has begun.

Robert Ivy, FAIA

EVP/Chief Executive Officer

The American Institute of Architects



The AIA Resilience Summit was hosted at the National Building Museum on October 16, 2015.

PHOTO: JAMES GRIMES, AIA

In Summary: the AIA 2015 Resilience Summit

“One can build a robust structure. But if that resilient building is situated in a non-resilient community, then what has been achieved? Site selection, infrastructure, availability of natural resources, and community services are all critical to a building’s performance and functionality before and after a disaster.”

Executive summary

What makes a community “resilient”? What are the primary threats our communities need to be resilient against, and how do those differ by geography, income, size, or economy? Perhaps most important, who is responsible for creating—and maintaining—resilience at the community level, and how does one community learn from another?

To tackle these questions and more, the American Institute of Architects (AIA) convened leaders representing architecture, engineering, and construction, as well as government agencies, scientists, policy experts, and the insurance industry at its inaugural 2015 Resilience Summit.

The summit built upon AIA’s current work in defining, designing, and promoting resilient communities. This work runs the gamut, encompassing our Sustainability Strategic Initiative; the position statement on resilience and the Building Industry Statement on Resilience AIA helped to craft; targeted work in Energy, Materials, Resilience, and Health as they relate to the built environment; and

longstanding initiatives such as the Disaster Assistance program and the work of the Center for Communities by Design.

In two provocative sessions, *Policies + Practices for Positive Change* and *Resilience Indicators for Long Term Sustainability*, six architects with diverse backgrounds in design, insurance, education, and civic leadership shared their expertise in addressing hazards and climate threats. Critical to the conversation was analyzing the notion of “resilience” itself, and the inherent interconnections the concept evokes.

For instance, one can build a robust structure. But if that resilient building is situated in a non-resilient community, then what has been achieved? Site selection, infrastructure, availability of natural resources, and community services are all critical to a building’s performance and functionality before and after a disaster. The panel experts also reframed the value of resilient building as future cost avoidance: reinforcing a benefit-cost analysis over the service life of the building.

Other key discussions included strategies to enhance hazard mitigation and climate adaptation, including municipal resilience plans, revisions to model building codes, and the development of professional design guidance.

Perhaps most consequential, a series of common themes began to emerge through the discussions:

- Industry partnerships are needed to tackle complex design problems at scales of efficiency to achieve greater cost-benefits;

- Experienced professionals need to continuously reeducate the profession about disaster prevention and resilience and provide awareness and hope to the public;
- Existing policies, tools, and programs must be coordinated at the state and federal level to resolve contradictions, identify opportunities and synergies, and fill gaps; and

- Greater collaboration across the building industry with the public’s participation is needed to align community performance goals and to determine design thresholds

These themes demonstrate the challenge that is before us, but they also provide a clear road map for moving forward. With a shared vision and deliberate action, the building industry can make strides towards a more resilient tomorrow.

Summit at a glance

With positive movement in the field of resilience—from statewide resilience plans to new incentives for resilience goals, the AIA hopes to build on this momentum to drive collaboration, encourage thoughtful research and experimentation, capture case studies, and inspire new solutions.

To that end, the AIA convening was structured to maximize engagement, dialogue, and knowledge-sharing. Members and partners gathered at the National Building Museum for a day of interactive presentations, discussions, and strategic planning to overcome hurdles to resilient built environments by identifying key objectives, exploring emerging policies, and recognizing the partnerships and collaborations that have brought success to resilience goals. The summit’s objectives were:

- **Challenge assessment.** “Resilience,” “resiliency,” and “resilient buildings” are terms seen and heard in the building industry and beyond, yet consistency is lacking. In reframing resilience, the AIA endeavors to analyze the technical applications of resilience and develop a common consensus about the anticipated results of something considered “resilient.” The performance goals and outcomes associated with a resilient building, a resilient community, or a resilient material are critical to determine in order to maintain the credibility of the building industry. With further investigation, we hope to uncover not only the direct results of solutions employed, but the indirect impacts as well.

- **Solution development.** Leveraging expert architects, the summit positioned attendees to gain a deeper understanding of the complex factors, trade-offs, and underlying requirements of resilience and uncover the programmatic challenges and related barriers to implementing resilience strategies once goals are established. The following channels are determined critical to success: materials and construction methods, resilience project programming, building codes and standards, public policy, incentives, liability and standard of care, metrics, and data for decision-making.
 - **Coalition building.** Architects won't solve complex problems alone. To build a foundation for future innovation, the AIA and its members shared knowledge and expertise in climate and hazard resilience with their colleagues and collaborators. The summit provided the opportunity for a diverse group of advocates—comprised of building industry leaders, government organizations, scientists, and nonprofits—to share intentions, establish relationships, and identify synergies. The hope is that together, these minds will channel that data into actionable policy.
- To achieve these objectives, the day's meeting was designed in four parts:
- **Welcome session.** To frame the topic of resilient built environments, leaders from the American Institute of Architects and the National Building Museum began the summit by providing a historical context of natural disasters, sharing lessons learned, and invoking a call to action.
 - **Panel presentations.** Expert architects shared their work in two panel discussions designed to highlight the impact of emerging approaches and spur new ideas for the future. In *Policies + Practices for Positive Change*, panelists shared case studies outlining the incompatibilities of existing building stock with current regulations and building codes; performance variations due to such seemingly disconnected factors as materials selection and proper inspections; public-private partnerships fostering new community resiliency strategies and public assistance programs; and the latest resilience-focused policies and regulations for the urban environment. In *Resilience Indicators for Long Term Sustainability*, speakers explored methodologies for the development, analysis, and implementation of resilient strategies and metrics to support their cost effectiveness and performance capacities. The panel also noted that financial underwriting, liability, and standard of care will continue to evolve along with strategy recommendations.
 - **Audience discussion.** Donald Watson, FAIA, facilitated a high-level discussion for summit participants to apply issues covered in the panel discussions to their own unique work in the field—from political challenges and economic incentives to technical capabilities.
 - **AIA member working session.** To drive conversations from the day forward, working groups further analyzed current challenges specific to the architectural profession, ways in which resilience can become a design priority, how to acquire and utilize projected climate data to improve building performance, and how to address changing liability risk and evolving standard of care.

- 1972** AIA formally recognizes the role of architects in emergency response
- 1974** The Disaster Relief Act of 1974 establishes the presidential declaration process for federal disaster aid
- 1978** FEMA created as an independent agency
- 1988** Congress passes the Stafford Act to codify the federal role in disaster assistance and improve planning, preparedness, and coordination

AIA Disaster Assistance and Resilience

- 2005** Hurricane Katrina strikes the United States, raising awareness of disaster risk in the built environment
- 2006** AIA establishes the Disaster Assistance Program and appoints a Disaster Assistance Committee to lead the charge
AIA creates the Disaster Assistance Comprehensive Response System
AIA develops model Good Samaritan legislation for licensed architects
- 2008** AIA Disaster Assistance Committee launches the AIA Safety Assessment Program, uniformly training architects, engineers, and building inspectors in post-disaster building assessments
- 2011** AIA joins the Buildstrong Coalition of designers, first responders, and insurance industry representatives to advocate for safer building codes and improvements to federal disaster programs.
- 2013** AIA Sustainability Scan identifies four critical issues: Energy, Materials, Health, and Resilience
AIA becomes a Platform Partner of the 100 Resilient Cities Initiative.
AIA makes a commitment to Clinton Global Initiative and creates the Architect's Foundation to launch the National Resilience Initiative
- 2014** AIA adopts a Resilience Position Statement
AIA co-authors the Building Industry Statement on Resilience
- 2015** Architect's Foundation establishes three regional design studios
AIA Resilience Summit

Looking Back: building resilience at AIA

“This issue is not just about disasters; it’s about the necessity to adapt other environmental changes that impact buildings and communities.”

AIA Disaster Assistance: lessons from the field

The AIA formally recognized the role of architects in emergency response in 1972, and in 2006 the AIA’s unique Disaster Assistance Program was formed so architects could prepare, respond, and rebuild communities nationwide. Under this program, architects have responded both internationally and domestically, providing municipalities with professional volunteer services to assess the habitability of homes and businesses after natural disasters. A Community Response System was constructed to efficiently integrate and dispatch this service, and a national training program for architects and engineers was developed. Architects have also worked steadily to advocate for safer building codes and Good Samaritan Legislation and have been a valuable resource for their communities and their fellow building industry partners by sharing mitigation techniques, providing preparedness tips, and creating industry resources and training courses such as the HURRIPLAN Resilient Building Design for Coastal Communities

workshop and the Safety Assessment Program.

From the Boulder floods to Hurricane Katrina to the Nisqually earthquake, the work of the AIA Disaster Assistance Committee and other AIA member advocates has ushered in an understanding that the disturbances, disasters, and changes we face are no longer a one-off, once in a lifetime event, but a compounding issue that affects us all as global citizens and US taxpayers. This issue is not just about disasters: it’s about the necessity to adapt to other environmental changes that impact buildings and communities.

Resilience at AIA

Today’s dynamic financial markets and shifting regulatory environment, combined with variations in weather patterns, growing resource limitations, and rapid urbanization, reinforce the fact that we are part of a changing world. The AIA recognized these evolving challenges within the built environment and conducted



Beyond the economic loss lies the irreplaceable cultural and communal value intrinsic to the built environment. PHOTO: RACHEL MINNERY, FAIA

Ten years of Disaster Assistance:

- 29** Good Samaritan state laws passed
- 18** International and Domestic Disaster Response missions
- 34** States and territories trained in AIA's Safety Assessment Program
- 4** Countries trained in AIA's Safety Assessment Program

the AIA Sustainability Scan in 2013 to examine emerging roles within the architecture profession and reevaluate AIA priorities within the broad sphere of sustainability. The scan revealed four priority issues which became the Institute's Sustainability Strategic Initiative: Energy, Materials, Health, and Resilience. These are facets of design that architects touch every day in their work. Given the scale of the profession's collective work, addressing these areas provides an opportunity to positively impact the "triple bottom line" outcomes of economy, social equity, and environment.

To fulfill the goals of its Sustainability Strategic Initiative and build upon the work of the AIA Disaster Assistance program, the AIA Board of Directors defined the Institute's position on

resilience in 2014. It recognizes the architect's role in addressing and mitigating the negative impacts of climate change, environmental degradation, and population growth—all significant challenges to achieving a sustainable built environment.

“Energy, Materials, Health, and Resilience. These are facets of design that architects touch every day in their work.”

Co-authored by the AIA and the National Institute of Building Sciences, the Building Industry Statement on Resilience was an equally important step towards recognizing and acting on the critical need to absorb, recover from, and more successfully adapt to adverse events. This statement brings together leaders

in the design, construction, and building management sectors, each committing to resilience research, education, advocacy, and planning. The AIA and its members have taken action on this commitment with professional educational courses

and webinars, resources such as *Understanding Resilience* and *Qualities of Resilience*, co-authoring resilient design guidelines such as USGBC's LEED Resilience Pilot Credits and the Federal Alliance for Safe Homes' (FLASH) *Resilient Design Guide for High Wind Wood Frame Construction*. The AIA advocates for change in the industry by informing

recommendations, incentives, and policies for resilient built environments when co-authoring and contributing to studies, reports, and white papers including the National Institute of Standards and Technology’s *Community Resilience Planning Guide for Buildings and Infrastructure Systems*, the National Institute of Building Science’s *Developing Pre-Disaster Resilience Based on Public and Private Incentivization*, and the Applied Technology Council’s *Strategies to Encourage State and Local Adoption of Disaster-Resistant Codes and Standards to Improve Resiliency*. Furthermore, the AIA is a committed member of the Build Strong Coalition and has actively supported legislation that encourages community resilience such as the Safe Building Code Incentive Act which would increase FEMA disaster assistance grant funding for states that adopt and enforce up-to-date model building codes. As a member of the Build Strong Coalition, the AIA has also endorsed the PREPARE Act which creates an interagency council on resilience and codifies agency efforts to undertake resilience and climate planning.

As part of AIA’s continued efforts to advance the mission of the Building Industry Statement, the AIA 2015 Resilience Summit was conceived with the goal of bringing together diverse stakeholders to further refine the problems and propose solutions to some of the greatest challenges of our time.



“It’s time to be proactive.” The AIA Disaster Assistance Committee has a long history of helping architects--and communities--understand their role in emergency response. PHOTO: LINDSAY BRUGGER, AIA



After a tornado struck Birmingham, Alabama, AIA volunteers provide safety assessments of homes and businesses for the city of Birmingham. AIA Disaster Assistance Committee member Michael Lingerfelt, FAIA finds this building “unsafe” for occupancy and identifies it as such with a red building placard. In six days, volunteers assessed 5,000 structures providing a value of \$300,000 to the city. PHOTO COURTESY OF: MICHAEL LINGERFELT, FAIA



The National Building Museum's *Designing for Disaster* curator, Chrysanthe Broikos urged the room to engage all individuals, families and businesses' in the global issue of resilience and adaptation in the built environment.

PHOTO: BUTCH GRIMES, AIA

Moving Forward: summit proceedings

Resilience: the time is now

Architects, building industry experts, and agency representatives from around the country convened at the 2015 AIA Resilience Summit to tackle some of the greatest resilience challenges of today. To frame the topic of resilience in built environments, leaders from the AIA and the National Building Museum began the summit by providing a historical context of natural disasters, sharing lessons learned, and invoking a call to action.

The day began with a welcome from AIA Chief of Staff Abigail Gorman, MBA, who highlighted how architecture impacts the mind, spirit, and environment. For this reason, architects have an obligation to address the challenges of climate change. Turning to the subject at hand, Gorman reminded the audience that “we have all experienced the effects of climate change – every one of us. It is something that ties each and every one of us together as human beings. As those that work in the built environment, both in the private sector as well as government, we have a particularly urgent stake in it -- because we can do something about it.”

Chrysanthe Broikos, who curated the National Building Museum’s Designing for Disaster exhibit, led a virtual tour through the exhibit; exploring new approaches in design and engineering to protect life and property against a range of natural


hazards. As she developed the exhibit, Broikos, was surprised to learn just how many organizations, businesses, and non-profits had a vested interest in disaster resilience. She urged participants to take this as a lesson in collaboration and engage all individuals, families, and businesses in the global issue of resilience and adaptation in the built environment.

“We have all experienced the effects of climate change ... As those that work in the built environment, both in the private sector as well as government, we have a particularly urgent stake in it -- because we can do something about it.” –Abigail Gorman, MBA, AIA Chief of Staff

AIA Disaster Assistance Committee Co-Chairs Thomas Hurd, AIA and Michael Lingerfelt, FAIA recounted the volunteerism of hundreds of architects who provided pro bono building safety evaluations for

thousands of homes and businesses after various natural disasters. These volunteer services saved municipalities hundreds of thousands of dollars in disaster recovery and lessons learned first-hand contributed to the development of building design and construction standards that prevent unnecessary damage from natural disasters like tornados, hurricanes, earthquakes, and floods. Hurd encouraged signatories of the Building Industry Statement on Resilience to continue to turn their good words into actions and to share their knowledge to advance the resilience capacity of the building industry.

With these opening remarks, the summit turned to the audience of experts to take the lead in exploring current challenges and successes in resilience and help set a shared vision for future action and collaboration.



“ A ‘disaster’ comes from the overlap between the hazard and vulnerable systems that must withstand it; the smaller the overlap, the smaller the risk. ”

-Jay Raskin, AIA

Hurricane Katrina, Gulfport,
Mississippi 2005.

PHOTO: NOAA

PANEL ONE

Policies and practices for positive change

Experts shared case studies outlining the incompatibilities of existing building stock with current regulations and building codes; performance variations due to such seemingly disconnected factors as materials selection and proper inspections; public-private partnerships fostering new community resiliency strategies and public assistance programs; and the latest resilience-focused policies and regulations for the urban environment.

ROSE GEIER GRANT, AIA, RESEARCH ARCHITECT, STATE FARM INSURANCE, demonstrated the benefits of risk mitigation and several financial incentives for homeowners. The examples she cited exhibited how seemingly minor construction details and material selection can affect the durability of the entire structure. For instance, the use of impact resistant roofing in hail-prone areas can reduce vulnerability as well as insurance premiums. Similarly, instituting wind-resistant construction methods can make an entire home more robust. This is seen in states like Florida where stringent codes for hurricane-force winds have been implemented. Homes constructed to these codes provide hard evidence of avoidable building failures. Now, Midwestern states in tornado alley

are implementing standards similar to those in Florida and finding parallel benefits: reduced damage in tornado-hit towns. While building owners may spend more upfront with certain design choices, the costs are saved over the life of the building, and hazardous risks are reduced. Grant noted, however, that insurance incentives are only part of the solution. Site selection is the first step to creating a resilient building. To emphasize this point,

“Insurance incentives are only part of the solution. Site selection is the first step to creating a resilient building.”

–Rose Geier Grant, AIA

Grant referred to two articles linking location and risk: *Tons Of People Are Moving To The Coast Amid A Lull In Hurricanes* and *Despite Wildfire Danger, Wildland Urban Interface Continues to Grow*. It’s not just how we build, but where.

JAY RASKIN, AIA, PRINCIPAL, JAY RASKIN ARCHITECT, was one of the pioneers of the Oregon Resilience Plan (ORP), a unique public-private collaborative plan to address the impacts of a catastrophic earthquake. The ORP has inspired numerous resilience initiatives in Oregon, including revisions to the state land use plan that restrict certain development within the tsunami inundation zone, and the development of a Resilient Transportation Plan that includes a

tiered backbone system for the State’s highways and other transportation means. Most notably, ORP stimulated a large increase in funding of the state’s Seismic Retrofit Grant Program for upgrades to schools and essential facilities. The first-of-its-kind state fund requires that grantees’ school facilities be retrofitted to “life safety standards” and emergency service facilities to “immediate occupancy standards” as defined by the American Society of Civil Engineers. The success

of the Grant Program is in large part due to community education on the risks of a Cascadia earthquake and the vulnerabilities of Oregon schools. This education empowered voters and taxpayers with an understanding of risk and the knowledge of how such a fund (and the resulting retrofits) can reduce vulnerability. Raskin emphasized that still more work remains to be done in Oregon to fulfill the plan, particularly in regards to social resilience. Raskin proposed a conceptual framework for hazards that range from “stealth hazards” that are generated by human activities on one end, to geologic and weather related hazards on the other.

An underlying challenge identified by Raskin is the prevalent misunderstanding of how risk and

vulnerability contribute to a disaster. He aptly describes that a “disaster” comes from the overlap between the hazard and the vulnerable systems that must withstand it—the smaller the overlap, the smaller the risk. People can reduce their vulnerability by forging interdependent relationships in their community, maintaining emergency preparedness plans and kits, and ultimately removing themselves from the highest risk areas to reduce exposure and, therefore, risk. In Oregon’s case, this might mean building away from liquefaction areas or coastlines to reduce the potential of secondary hazards such as foundation failure or tsunami inundation. If vulnerability, and therefore risk, can be reduced, then so too can the effects of

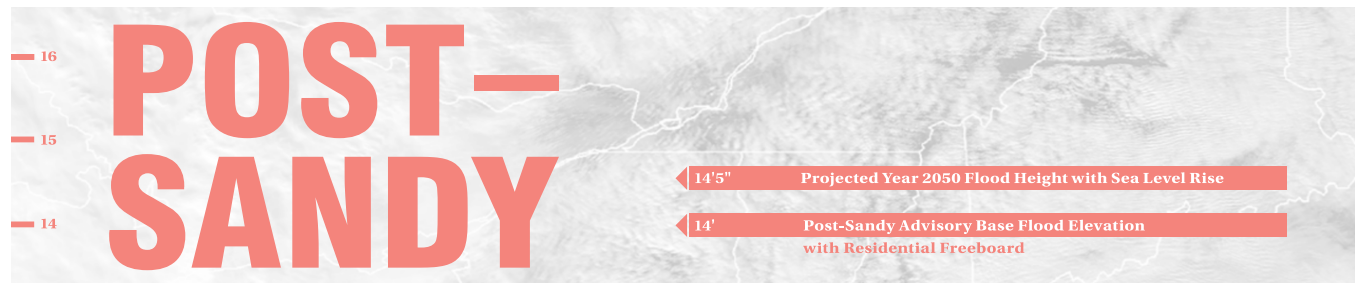
disasters. Ultimately, the goal of resilience must be to dilute disasters into inconveniences.

ILLYA AZAROFF, AIA, DIRECTOR OF DESIGN, +LAB ARCHITECTS, gave a field report of Post-Superstorm Sandy recovery plans and policy innovations from New York City, providing some of the first guidance on recovery for dense urban cities. The Resilient Neighborhoods initiative and the One NYC plan account for city growth, equity, sustainability, and resilience, and utilizes these topics to inform and prioritize urban solutions. Many of the local laws passed since Hurricane Sandy either match or are related to FEMA’s Mitigation Assessment Team (MAT) recommendations; yet resilience challenges remain for property

owners in older communities that are densely populated. Illegal basement apartments and rows of townhouses are retrofit challenges when they share walls. Furthermore, site retrofit strategies can pose more problems than solutions if not carefully considered in policy and design practice. For example, berms to deter encroachment of flood waters may add protection for the homeowner, but steer the flood waters around the house, increasing flood damage to adjacent properties. Land use in New York City compounds this issue. As the city ran out of space to accommodate its booming population, it built permanent housing in areas previously identified as uninhabitable—barrier islands and wetlands—and now the notion of retreat from these vulnerable areas may cause displacement of whole neighborhoods and communities. AIA NY’s Design for Risk and Reconstruction Committee mounted a redevelopment strategy with planning and design colleagues, developing numerous resources and design guidelines. Many resources were created in concert with the non-profit sector, the city, and community members; including AIA NY’s Post-Sandy Initiative and the award-winning Sandy Design Help Desk that provided a place for homeowners and small business owners to have their nuanced rebuilding questions answered by volunteer architects and design professionals trained in the most current post-Sandy codes and regulations.

The Oregon Resilience Plan (ORP)

- **Public/private collaboration.** Directed by the state, Oregon’s Seismic Commission worked with a diverse group of volunteers, including architects, engineers, and government officials to create the plan.
- **Gap analysis and recommendations.** A resilience gap analysis and resulting recommendations were made for: Business and Workforce Continuity, Coastal Communities, Critical and Essential Buildings, Transportation, Energy, Information and Communications, Water and Wastewater Systems
- **Stakeholder engagement.** The ORP was successful because legislators, seismic-experts, built environment professionals, and the public understood the need for such a plan and knew the value resulting actions could provide.



AIA New York Post-Sandy Initiative:

an award-winning response by the planning + design community

Initiated by the American Institute of Architects New York Chapter (AIANY) and the AIANY's Design for Risk and Reconstruction Committee (DfRR) in the weeks that followed Superstorm Sandy, in collaboration with a wide range of other professional organizations and concerned individuals, the planning and design community responded to support a variety of local, regional, state, and national public agency efforts. The Post-Sandy Initiative convened Working Groups to focus on several areas key to resilience, including:

- Transportation & Infrastructure
- Housing
- Critical & Commercial Building
- Codes & Zoning and Waterfront

Over 150 professionals gave their time to explore important issues about the emergency planning for and response to Sandy, both in terms of short-term recovery efforts and long-term resilience. Their contributions form the basis of the Post-Sandy Initiative Report, released on May 1, 2013 with a corresponding exhibit, informed several recommendations, guidelines, and reports for the city and region including NYC's *Retrofitting Buildings for Flood Risk* and PlaNYC, a Special Initiative for Rebuilding and Resiliency. Recommendations include the following:

NYC building code

- Permit handicapped lifts in flood zones;
- Wet floodproofed buildings should have an emergency exit at the first floor above flood elevation; and
- As an alternative to floodproofing individual buildings, allow block-wide or neighborhood-wide floodproofing.


NYC zoning resolution

- Make alignment provisions in contextual districts more flexible. Some currently prevent setting a building far enough from the property line to have a ramp, a flood-dampening landscape, or permeable paving in front of the building.
- Where a building may have to be set back from the street line to accommodate flood zone-related steps and ramps, rear yard requirements should be reduced.

FEMA

- Dry floodproofing of lobbies, currently permitted for mixed-use residential only, should be allowed for all multi-family buildings.
- Evacuation in place—FEMA's objective is to evacuate flood areas before floods occur, and to minimize the risks, especially to first responders. This may not always be possible in a dense urban environment. It is important in a flood event that those who do not follow government orders, for whatever reason, have a way to get out of their buildings and to safety during a flood.

IMAGE + REPORT CONTENT: AIA NEW YORK CHAPTER



“Explore how resilience best manifests at the building, neighborhood, or regional scale by evaluating the efficiency and effectiveness of technologies at different scales.”

-Z Smith, AIA

Eskew+Dumez+Ripple's Rosa F. Keller Library and Community Center in New Orleans augments the functions of a traditional library and community center with outdoor meeting spaces and a locally managed cafe to encourage relationship building and the development of social capital.

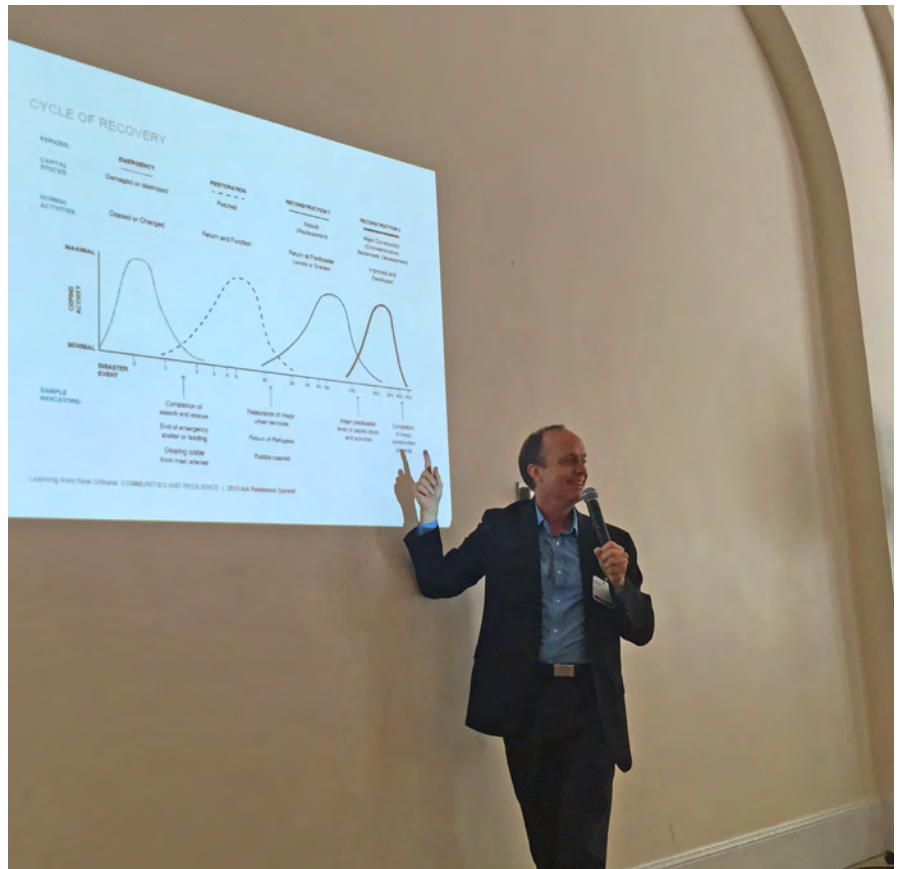
PHOTO: TIMOTHY HURSLEY, ESKEW+DUMEZ+RIPPLE

PANEL TWO

Resilience indicators for long-term sustainability

Speakers explored methodologies for the development, analysis, and implementation of resilient strategies and metrics to support their cost effectiveness and performance capacities, noting that financial underwriting, liability, and standard of care will continue to evolve along with strategy recommendations.

Z SMITH, AIA, PRINCIPAL; DIRECTOR OF SUSTAINABILITY + BUILDING PERFORMANCE, ESKEW+DUMEZ+RIPPLE, asserted that “building back better” demands doing more than maintaining the status quo. Opportunities to address other programmatic desires, building performance goals, code upgrades, and even selection of a safer site are available when making design choices. In the “Cycle of Recovery,” homes, jobs, and schools are critical to community recovery. Sustainability co-benefits contribute to community resilience when site design provides initial defenses—rainwater storage tanks for cooling systems reduce city water dependency and energy efficiency reduces carbon emissions from fossil fuel consumption. The Rosa F. Keller Library and Community Center is an example of post-disaster opportunity that incorporated demolition, retrofits, and redesign for sustainability and resilience. The former library was



Z Smith, AIA, describes the process of recovery at the AIA Resilience Summit at the National Building Museum. PHOTO: LINDSAY BRUGGER, AIA

devastated by levee flood breaks and the site was designated by the city to serve as a park or open space, indicated as such with a “green dot” on the city’s recovery map. The community outcry was strong, and the city conceded to construct a new library and retrofit the original 1917 residence to serve as an adjacent community center with outdoor meeting spaces and a locally-managed café. An example

of social resilience and building performance, the neighbors of Broadmoor were an integral part of design from its conception, even naming the center’s café the Green Dot Café. With each case study, Smith referred to the environmental, social, and economic aspects within any city system that are required to function appropriately to make it sustainable and promote resilience. Smith posed a key challenge to the

Sustainable? Resilient? or both?

Reframing stormwater management practices

Some strategies, first introduced as green building techniques, are more compelling when they do double duty for their hazard risk reduction capabilities. For stormwater management, a common set of short- and long-term challenges, and their responses, is described in this scenario:

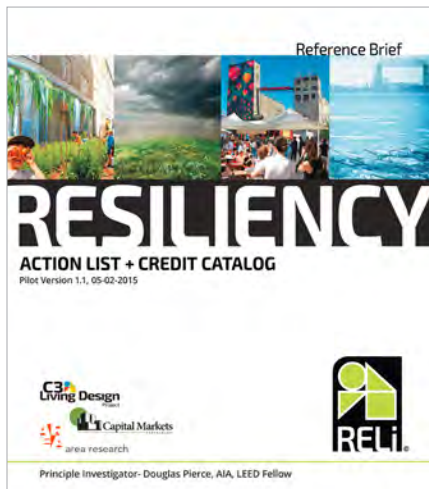
With intensifying heavy rains, particularly those following a period of drought, excessive stormwater runoff carries contaminants like oil, rubber, and even trash from hardened surfaces, blocking catch basins to create unfortunate urban flood conditions. All of this is funneled into an outdated combined city sewer system—already functioning at capacity due to urban growth—which then pollutes and floods local waterways with stormwater overflow. The most effective stormwater management practices slowly replenish groundwater supplies on site with rainfall, reducing the transfer of foreign contaminants off site, therefore behaving most similarly to a natural system where flooding and soil erosion risk is reduced and water quality is maintained. Familiar green building and site design techniques, such as rainwater harvesting

and greywater reuse reduce water demand, and low-impact design practices including smaller building footprints, pervious paving, rain gardens, and bioswales can contribute to sustainable stormwater management goals.

Now for the resilience twist: when considering the impacts of climate change, averages and extremes in precipitation will change, and so will temperatures. Yesterday's rain may be tomorrow's snow, and vice versa, potentially affecting design dead loads for structural design, the sizing of roof drains, downspouts, and rain gardens all the way through the selection of both flood and drought tolerant plants. As climate change increases the risk for evolving forms and amounts of precipitation, just-right-sized green features like bioswales are now undersized and could contribute to temporary flooding if comprehensive stormwater management strategies are not employed for a fluctuating capacity. Thus, green design strategies can provide multiple co-benefits, when properly designed, to achieve both short and long-term adaptive performance goals.

Rain gardens at Eskew+Dumez+Ripple's Rosa F. Keller Library and Community Center in New Orleans.

PHOTO: GLADDEN, ESKEW+DUMEZ+RIPPLE



The *Resiliency Action List Rating System* (RELi) highlights actionable steps that can be influenced or addressed through design, the built environment and project related organizations. IMAGE: C3 LIVING DESIGN / PERKINS+WILL

audience: Consider not only what may constitute successful resilient design strategies, but explore how resilience best manifests at the building, neighborhood, or regional scale by evaluating the efficiency and effectiveness of technologies at different scales.

DOUGLAS PIERCE, AIA, SENIOR PROJECT ARCHITECT, SENIOR ASSOCIATE, PERKINS+WILL, introduced the emerging RELi (REsiliency action List) rating system, a programming and design tool developed with an ANSI-approved National Consensus Process. Much like other green building rating systems which include credits or points toward an overall score that translates into a measurable result, RELi seeks to provide a methodology for quantifying resilience. The system integrates a wide-ranging listing

fill gaps between existing guidelines and rating systems that address various qualities of resilience. The rating system covers three areas: Risk Adaptation + Mitigation; Comprehensive Adaption + Mitigation; and Innovation + Creativity. Credits include quarterly education events to advance the public’s understanding of safety and resiliency topics, developing on-site aquaponics and poultry production, and siting the building within a half mile of a storm shelter, a health food cooperative, or an affordable daycare center. Knowing that capturing all-things resilient or salient to a specific project is more than a single list can accomplish, RELi includes space in its Innovation + Creativity category for project-specific applied creativity, innovation, and leadership within the RELi framework.

“RELi integrates a wide-ranging listing of design criteria for developing resilient communities, neighborhoods, buildings, homes, and infrastructure.”

of design criteria for communities, infrastructure, neighborhoods, buildings, and homes from numerous standards and rating systems such as the FORTIFIED Standard, LEED, and FEMA’s 141 Guide, *Emergency Management for Business and Industry*. The system supplements these references with their own “unique RELi” criteria to

ANN KOSMAL, AIA, ARCHITECT, U.S. GENERAL SERVICES ADMINISTRATION, offered a different perspective with urgency—the time is now to address incremental environmental change and the variability associated with direct and indirect consequences of rising temperatures, increasing precipitation, and longer droughts.



Resiliency Action List (RELi)

an innovative system to encourage and measure resilience

Much like other green building rating systems which include credits or points toward an overall score that translates into a measurable result. The Resiliency Action List (RELi) seeks to provide a methodology for quantifying resilience. RELi integrates a wide-ranging listing of design criteria for resilient communities, neighborhoods, buildings, homes, and infrastructure.

- **Common reference standards.** The system integrates a wide-ranging list of design criteria from numerous standards and rating systems including the FORTIFIED for Safer Business Standard, LEED, Energy Star, 2030 Palette, Center for Active Design, Sustainable Sites Rating System, Envision Sustainable Infrastructure System, American Red Cross Ready Rating Program, U.S. Small Business Administration's Prepare My Business.org and FEMA's 141 Guide. The RELi system supplements these references with "unique RELi" criteria.
- **Panoramic Approach to Planning, Design + Maintenance.** Addresses hazard preparedness and mitigation, integrative processes, community stakeholder involvement, commissioning, and long-term maintenance. Credit examples include performing a post-occupancy evaluation and analyzing the business case for long-term sustainability.
- **Risk Adaptation + Mitigation:** Addresses risk with hazard preparedness and hazard adaption and mitigation for acute events. Credit examples include providing automated external defibrillators and hosting quarterly education events to advance the public's understanding of safety and resiliency topics.
- **Comprehensive Adaption + Mitigation:** Addresses community cohesion, economic vitality, health, diversity, energy, water and food, and material selection. Credit examples include developing on-site aquaponics and poultry production and siting the building within a half mile of community resources such as a health clinic or an affordable daycare center.
- **Applied Creativity, Innovation + Exploration:** Knowing that capturing all-things resilient or salient to a specific project is more than a single list can accomplish, RELi includes space in its Applied Creativity category for project-specific innovation and leadership within the RELi framework.
- **Characteristics:** The RELi system is driven by resilience, restoration, regeneration, sustainability, and wellness; aiming to create shock resistant, flexible buildings and communities that have the capacity to replenish, endure and contribute to holistic health.

IMAGE: C3 LIVING DESIGN / PERKINS+WILL

“The Government Accountability Office (GAO) has identified climate change as a high-risk fiscal threat to the federal government.”

-Ann Kosmal, AIA

The Government Accountability Office (GAO) has identified climate change as a high-risk fiscal threat to the federal government and, as the largest U.S. civilian landlord, the General Services Administration (GSA) is working to operationalize climate adaptation. The GSA's intent is to be “future ready,” avoid obsolescence, and develop strategies that can accommodate change. “It is not possible to precisely predict future risks, thus positioning with robust capacity is imperative,” Kosmal explained. Climate data in design standards is based on historic information. If unprecedented conditions are to be anticipated, the baseline design data needs to be informed by scientific climate projections to ensure the facility is appropriate and of a necessary standard for its intended use and duration. This safeguards the investment that the American public is making with their tax dollars. To design building enclosures or site development to serve beyond 2050 means design data must account for extremes of heat or precipitation that are not the same as today, and that both averages and extremes will change and need to be accommodated

to achieve performance goals. It is critical to engage in scenario planning (i.e. exploring alternative futures) as well as “backcasting,” which Kosmal defined as setting a target performance condition and building service life and determining the adaptive management steps required to achieve that performance leading throughout the operation of the building. Backcasting provides for clearer choices today to prevent disruption and added expense later. Kosmal considers that the cost-benefit of climate adaptation actions will include “cost-avoidance” as a bonus return on investment. For example, a company may avoid decreased mission capacity and functional interruption because the design supported long-term business or mission continuity. This is a potential benefit overlooked in typical financial decision making. The U.S. Climate Resilience Toolkit and the National Climate Assessment are valuable references and resources for climate and adaptation information, and are just the start of a growing library of guidance and regulations on adapting to climate change.



SURPRISE

DELIGHT

CLARITY

What is the future we want?

BUILDING MUSEUM

Don Watson, FAIA, probes the audience of over 70 built environment professionals and government leaders for actionable next steps on the technical and economic aspects of resilience and partnerships to make it possible.

PHOTO: BUTCH GRIMES, AIA

Engaging Together: summit discussions

Discussion + outcomes

DONALD WATSON, FAIA, EARTHRISE DESIGN, compelled the attendees to examine the case studies, explorations, and data from the speakers and offer reflections from their own experience, express challenges, and consider prospects for future engagement. With challenges around the technical capabilities of materials, lack of political will, and typical financial hurdles, recommendations gravitated around methodical design research and analysis that would make resilient choices a no-brainer. Isolating design variables is a significant challenge to measure success in any given strategy, yet focused innovation, technical assistance, and compliance support will enable better decision-making. Costs are partially covered by insurance incentives, yet the premiums for this method of “risk transfer” will undoubtedly rise to reflect an increasing level of risk and growing debt from past disasters. Market incentives will be created to target specific cost avoidance measures, and the remaining balance to meet resilience goals

will need to be augmented by policy and regulations. Voluntary practices will be insufficient to meet desired community and building performance. Members of the audience appealed to one another to engage their constituents in these efforts.

Watson shared personal reflections: This is not the first time in history that the United States has faced a monumental challenge with high stakes or, with similar effect, other interventions that turn the status quo on end. Watson has tracked the building industry’s innovation success and failures in responding to the energy crisis of the 1970s, the design profession’s conversion from drafting to building information modeling in the 1990s, and the adoption of city-wide sustainable policies—most recently addressing flood and other hazard risks. “We can do this. We have yet to fully engage the opportunities for innovation to address resilience,” he proclaimed. Watson turned attention to the summit sponsor, reminding the audience of the resilience opportunity present within their professional responsibility—“architects contribute

design imagination, integration, and innovation to advance the quality of our buildings, cities, and cultures.” And that’s just what the AIA and its members sat down to do in a post-summit afternoon session—to roll up their sleeves and cultivate ideas informed by the morning’s insights to address key questions brought forth upon adoption of AIA’s resilience position statement.

AIA MEMBERS seized Watson’s charge and evaluated public and industry awareness of built environment resilience and adaptation; strategized resilience-based training and education resources that empower building industry professionals; and identified implementation barriers to resilient practices and policy solutions.

Former Disaster Assistance Committee member and co-creator of HURRIPLAN, Dean Sakamoto, FAIA and his focus group provided recommendations for tools that augment the expertise of built environment professionals in disaster recovery, hazard-resistant material selection and detailing, and



Members make the difference.

[Back Row: left to right] Michael Lingerfelt, FAIA, Disaster Assistance Committee Co-Chair; Ann Kosmal, AIA, summit speaker; Z Smith, AIA, summit speaker; Illya Azaroff, AIA, summit speaker; Jay Raskin, AIA, summit speaker, Donald Watson, FAIA, summit facilitator.

[Front Row: left to right] Rose Geier Grant, AIA, summit speaker; Thomas Hurd, AIA; Disaster Assistance Committee Co-Chair; Douglas Pierce, AIA, summit speaker.

PHOTO: BUTCH GRIMES, AIA

the practical application of climate forecast data—implications of life safety, liability, and standard of care are all impacted when implementing resilient strategies. Architecture firms must have business resilience to stay operational and provide client service when they need it the most and architects must be empowered to articulate the benefit of resilience to their clients. Finally, the architects recognized their limitations—interdependencies in the built environment. The performance capacity of a city and region, providing an economic base and natural resources respectively, is the foundation of any viable building and vibrant community. After all, a resilient building in a non-resilient community is not resilient.

AIA Component Executive and liaison to the AIA Disaster Assistance

Committee, Joseph Simonetta, CAE, and his group identified regulations that are barriers to resilient design and practice and strategized policy efforts that lead to change. A series of policy opportunities were identified; including the adoption of improved model zoning codes, performance codes that incorporate evidence-based outcomes that enhance resilience, and the creation and adoption of a federally-required “Resilience Impact Statement” that would require documentation of hazard and climate risk, resilience strategies to be utilized, and anticipated impacts to both the natural and built environment.

AIA Disaster Assistance Committee member, Paula Loomis, FAIA, and her team identified synergies and allies to enhance efforts to move the industry forward. Participants

recognized that when seeking to engage and educate the general public, it is important for partnerships to go beyond industry professionals to include commercial entities that cater to homeowners. To elevate the public’s awareness of critical issues and goals for resilience, the group recommended that the building industry create an ambitious, actionable advocacy campaign on the topic of resilience that would rally the community. Such a movement should create an avenue for measurable progress and would advance resilience goals.

Common themes emerged: alignment of local, regional, and national priorities when combined with systems-level design and an integrated, multi-disciplinary approach to problem solving, will provide optimal impact.

Workings session take-aways

- Implications of life safety, liability, and standard of care are all impacted when implementing resilient strategies.
- Architecture firms must have business resilience to stay operational and provide client service when communities need it the most.
- There are critical interdependencies in the built environment. The performance capacity of a city and region, providing an economic base and natural resources respectively, is the foundation of any viable building and vibrant community.
- Policies should encourage the application of improved model zoning codes and performance codes that incorporate evidence-based outcomes that enhance resilience.
- A federally-required “Resilience Impact Statement” that would require documentation of hazard and climate risk, resilience strategies to be utilized, and anticipated impacts to both the natural and built environment, would enhance community resilience.
- When seeking to engage and educate the general public, it is important for partnerships to go beyond industry professionals to include commercial entities that cater to homeowners.
- To rally the community, the building industry should create an ambitious, actionable advocacy campaign on the topic of resilience. Such a movement could create an avenue for measurable progress and advance resilience goals.
- Alignment of local, regional, and national priorities, when combined with systems-level design and an integrated, multi-disciplinary approach to problem solving, will provide optimal impact.



Sharing Insights.

AIA members participate in small working groups to address gaps and barriers in education, policy, and advocacy during the summit working session.

PHOTOS: LINDSAY BRUGGER, AIA

Building Industry Statement on Resilience

Representing more than 750,000 professionals, America's design and construction industry is one of the largest sectors of this nation's economy, generating over \$1 trillion in GDP. We are responsible for the design, construction, and operation of the buildings, homes, transportation systems, landscapes, and public spaces that enrich our lives and sustain America's global leadership.

We recognize that natural and manmade hazards pose an increasing threat to the safety of the public and the vitality of our nation. Aging infrastructure and disasters result in unacceptable losses of life and property, straining our nation's ability to respond in a timely and efficient manner. We further recognize that contemporary planning, building materials, and design, construction and operational techniques can make our communities more resilient to these threats.

Drawing upon the work of the National Research Council, we define resilience as the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events.

As the leaders of this industry, we are committed to significantly improving the resilience of our nation's buildings, infrastructure, public spaces, and communities.

- We research materials, design techniques, construction procedures, and other methods to improve the standard of practice.

- We educate our profession through continuous learning. Through coordinated and continuous learning, design, construction and operations professionals can provide their clients with proven best practices and utilize the latest systems and materials to create more resilient communities.
- We advocate at all levels of government for effective land use policies, modern building codes, and smarter investment in the construction and maintenance of our nation's buildings and infrastructure.
- We respond alongside professional emergency managers when disasters do occur. Industry experts routinely work in partnership with government officials to survey damage, coordinate recovery efforts, and help communities rebuild better and stronger than before.
- We plan for the future, proactively envisioning and pursuing a more sustainable built environment.

The promotion of resilience will improve the economic competitiveness of the United States. Disasters are expensive to respond to, but much of the destruction can be prevented with cost-effective mitigation features and advanced planning. Our practices must continue to change, and we commit ourselves to the creation of new practices in order to break the cycle of destruction and rebuilding. Together, our organizations are committed to build a more resilient future.

Signatories:

- The Air Barrier Association of America
- American Council of Engineering Companies
- The American Institute of Architects
- American Planning Association
- American Society of Civil Engineers
- American Society of Interior Designers
- American Society of Landscape Architects
- American Society of Plumbing Engineers
- American Society of Heating, Refrigerating, and Air-Conditioning Engineers
- Associated Builders and Contractors
- Associated General Contractors of America
- Building Owners and Managers Association
- Congress for New Urbanism
- EcoDistricts
- Federal Alliance for Safe Homes
- Green Building Initiative
- Illuminating Engineering Society
- Insurance Institute for Business & Home Safety
- International Association of Plumbing and Mechanical Officials
- International Code Council
- International Facility Management Association
- International Interior Design Association
- Lean Construction Institute
- National Association of Home Builders
- National Institute of Building Sciences
- National Ready Mixed Concrete Association
- National Society of Professional Engineers
- Portland Cement Association
- Royal Institution of Chartered Surveyors
- US Green Building Council
- Urban Land Institute

What's Ahead: next steps

“Innovation occurs when good ideas are made better by new perspectives.”

Taking action

Increasing vulnerabilities to hazards, climate change, and other constantly shifting conditions are a foregone conclusion for the future of our communities. What people need to know is what to do about it. The summit's six speakers, with input from the audience, provided answers. Action is taking place across the nation right now: statewide resilience plans, insurance incentives that guide common construction practices and retrofits, revisions to urban policy that engender hazard resilience, new building practices that marry innovative building science with emerging social science, growth and development in safer places, and standards-based metrics that incentivize financial investment in resilience goals. The hope is that these actions ignite responsive change by the building industry, drive collaboration, and provoke new solutions. Innovation occurs when good ideas are made better by new perspectives.

Committed, the AIA will continue to convene, collaborate, and catalyze new research and strategies to guide design and decision-making for a

better built environment; working to ensure architects have the knowledge and skillsets required to address issues of evolving climate and to be resources for their clients, communities, and fellow industry professionals. With this mission in mind, the AIA will:

- advocate for model building code application and supplemental technical support to identify and achieve performance targets;
- identify gaps in policy, create value propositions for resilient construction, and address the enormous stock of existing buildings;
- assess the evolving standard of care and associated legal liabilities;
- collaborate with a growing network of partners to advance the Industry Statement on Resilience; and
- encourage case studies and research of design processes and practices that strengthen community resilience.

Additionally, the AIA will advance the bold actions of the speakers by encouraging a collaborative process



Members analyze gaps in current professional education offerings during the AIA Resilience Summit at the National Building Museum. PHOTO: LINDSAY BRUGGER, AIA

of deliberate investigation. It is tempting to fix the problem in front of us without knowing the full impact of our actions, but if we are to be problem-seekers, we will not only fix the issue in front of us but uncover the root causes and address them in the process.

Struggles to meet a growing demand for affordable housing, drying out from unprecedented rainfall, and surviving sizzling temperatures in high rise apartments are now daily news, and the challenges ahead of us are new territory altogether. A swelling urban population intensified

by a growing global refugee crisis, an escalating demand for sufficient sources of clean water to sustain life, and chaotic meteorological events that transform typically rain-drenched regions into fuel for wildfire. These issues are symptomatic of complex challenges impossible to resolve with status quo tactics.

“It is tempting to fix the problem in front of us, without knowing the full impact of our actions, but if we are to be problem-seekers, we will not only fix the issue in front of us, but uncover the root cause(s) and address them in the process.”

It is without question that these issues will bring new disasters, and while opportunity for innovation is most often recognized post-disaster, that same opportunity is ripe at this very moment. Today we have the chance to influence our future.

Special thanks from the AIA resilience program team and summit facilitators:

We commend the building industry for recognizing the challenges ahead. It is their systems-solution methodology, stewarded by revolutionary scientific minds and collaboration with architects - mediators of social, environmental, and building science priorities in the built environment to execute and implement strategies of resilience and adaptation - that will allow us to answer the question that is before us now: how are the places designed today able to outlast the critical circumstances of tomorrow?

Rachel Minnery, FAIA + Lindsay Brugger, AIA

Connect: resilience@aia.org

Participants

Thank you for joining the AIA 2015 Resilience Summit

Speakers



ILLYA AZAROFF, AIA, +LAB Architects,
A recognized expert in disaster mitigation and community resilient planning strategies; Illya has worked at the federal level with

the National Disaster Recovery Framework, the Department of Homeland Security, FEMA, and the Regional Catastrophic Planning Team. Locally, Illya has contributed to the New York DCP Housing Retrofit Guidelines and the Federal Alliance for Safe Housing's Resilient Housing Guidelines. In 2011 he co-founded the AIA Design for Risk and Reconstruction committee, leading the Post Sandy Initiative with AIANY. He is also an instructor for the National Disaster Training Preparedness Center, a subject matter expert for the Rockefeller Foundation 100 Resilient Cities, and was honored with the AIA National Young Architect Award in 2014.



ROSE GEIER GRANT, AIA, State Farm Insurance, Ms. Grant is responsible for liaison activities within the building research community. She identifies construction trends

conducts research to determine performance attributes of buildings. Rose also assists with policyholder and public education on risk recognition and loss mitigation. Rose is the Executive Board Secretary of the National Consortium of Housing Research Centers and served as the Vice Chair for Research (2008-9). She serves as the staff liaison between State Farm and the Insurance Institute for Building and Home Safety's Research Laboratory. In 2011-12 she was a Steering Committee member on the EERI New Madrid Earthquake Scenario Task Group. Rose holds bachelor's and master's degrees in Architecture from the University of Illinois and is a licensed architect.



ANN KOSMAL, AIA, U.S. General Services Administration, Twenty plus years of diverse architectural experience from Walt Disney Imagineering and the Culver City colony with

Eric Owen Moss have tuned Ann's insights to outcome delivery. Ann has specialized knowledge in adaptive management and climate ready design. She is the Convener of the GSA Agency Climate Adaptation and Resiliency team. The team develops and implements GSA's climate change risk management plan and is a winner of the White House Green Gov Climate Champion Award. She uses her strengths as an integrator and technical resource to hone agency processes toward a climate ready enterprise.



DOUGLAS PIERCE, AIA, Perkins+Will, Doug is a pioneering Architect, Speaker and Writer with a passion for integrating art + science through poetic innovation. Working closely

with an original founder of the US Green Building Council + LEED, Doug is now defining a new integrative framework for sustainable design through development of the RELi Resiliency Action List + National Consensus Standard. RELi was launched in 2015 with support by the Minnesota Pollution Control Agency, Minnesota Green Step Cities, AREA Research, AIA Minnesota, USGBC Minnesota, the Capital Markets Partnership, and MTS. It is available on-line at C3LivingDesign.org.



JAY RASKIN, AIA, *Jay Raskin Architect*, An architect and leader in Cascadia earthquake and tsunami preparation for over 20

years, Jay championed both emergency preparedness and pre-disaster mitigation efforts in Cannon Beach and coastal communities, as a private citizen and elected official. He was instrumental in the creation of the Oregon Resilience Plan from its inception to completion and has an understanding of the vulnerabilities of buildings, infrastructure, and the community from a large seismic event. He is currently the Vice-Chair of the Oregon Seismic Safety Policy Advisory Commission, the chair of the AIA Oregon Resilience Committee and was selected as chair of Restore Oregon's roundtable workgroup that produced the Special Report: Resilient Masonry Buildings: Saving Lives, Livelihoods, and the Livability of Oregon's Historic Downtowns.



Z SMITH, AIA, *Eskew+Dumez+Ripple*,

Z Smith is Principal and Director of Sustainability and Building Performance at Eskew+Dumez+Ripple, winner of the 2014

AIA Firm Award. His built work includes academic, laboratory, and residential buildings earning LEED Gold and Platinum certification. He brings training and experience in physics (MIT) and engineering (Princeton) to the field of architecture (UC Berkeley), named as inventor on 10 patents and author on over 50 peer-reviewed scientific publications. He teaches at the Tulane School of Architecture, is Chair Ex Officio of the USGBC Louisiana Chapter, and serves on the national Advisory Group of the AIA Committee on the Environment (COTE).



DONALD WATSON, FAIA, An architect with focus on sustainability and resilience, recognized by numerous AIA Design Awards and USBGC certifications. He is author of

Design for Flooding: Resilience to Climate Change, co-authored with Michelle Adams, P.E., and Editor of the McGraw-Hill Time-Saver Standards Series, *Architectural Design* (2003) and *Urban Design* (2001). He is a member of the ACSA College of Distinguished Professors, and founding member of the Trumbull Connecticut Conservation Commission. He has served on the AIA Energy Committee 1976-1986, Joint AIA/ACSA Research Council 1990-94, and Committee on the Environment 1994-98 (Chair 1996).

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