



2022

RESILIENCE SUMMIT

EVENT SUMMARY AND KEY FINDINGS



About the Urban Land Institute

The Urban Land Institute is a global, member-driven organization comprising more than 45,000 real estate and urban development professionals dedicated to advancing the Institute's mission of shaping the future of the built environment for transformative impact in communities worldwide.

ULI's interdisciplinary membership represents all aspects of the industry, including developers, property owners, investors, architects, urban planners, public officials, real estate brokers, appraisers, attorneys, engineers, financiers,

and academics. Established in 1936, the Institute has a presence in the Americas, Europe, and Asia Pacific regions, with members in 80 countries.

Drawing on the work of its members, the Institute recognizes and shares best practices in urban design and development for the benefit of communities around the globe.

More information is available at uli.org. Follow ULI on [Twitter](#), [Facebook](#), [LinkedIn](#), and [Instagram](#).

About the Urban Resilience Program

ULI's Urban Resilience program is focused on how buildings, cities, and communities can be more resilient to the impacts of climate change and other environmental vulnerabilities. The program works with ULI members to provide technical assistance, advance knowledge through research, and

catalyze the adoption of transformative practices for real estate and land use policy.

For more information, visit <https://americas.uli.org/resilience>



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Overview:

2022 ULI Resilience Summit

“The ULI Resilience Summit provided us with direct access to the top thought leaders on this challenging and rapidly evolving set of issues. Presenters struck a perfect balance between innovative case studies, interdisciplinary relevance, and critically framed insights. Practitioners and policymakers left not only with a new set of resources and tools for their own work, but also had a lens into the research and analysis that is changing [the] field today and will inform the future of urban resilience in the years to come.”

— RAND Corporation

The Urban Land Institute’s third annual Resilience Summit brought leaders in the field of real estate and resilience together to share practicable solutions to protect communities and investments from future climate risks.

Hosted by the ULI Urban Resilience program, the event built on the foundation of previous ULI Resilience Summits. This exclusive event, which ran from January 25 to January 27, 2022, continued the tradition of addressing not only the moral imperative, but also the economic necessity of adapting to and mitigating climate change. This year’s summit also gave attendees the ability to engage in candid conversations about climate risk and enabled open discourse on tackling difficult, long-term, global challenges to real estate and the communities it supports through topical programming and numerous engagement and networking opportunities.

At the summit, more than 355 attendees heard from speakers including insurance experts, finance and investment leaders, scientists, engineers, economists, federal agency leads, and city officials. This broad range of professional experience among speakers created a valuable platform for critical cross-disciplinary discussion and formation of collaborative solutions concerning the shared challenges of building resilience against climate change.

This year’s summit came on the heels of a year of record-smashing temperatures and devastating storms. At the local level, many communities still recovering from the economic and social strain of COVID-19 are tasked with adapting to new extremes. The [2022 Intergovernmental Panel on Climate Change \(IPCC\) Working Group II report](#) states that “widespread and severe loss and damage to human and natural systems are being driven by human-induced climate changes increasing the frequency . . . intensity, [and] duration or extreme weather events.” For instance, according to the National Oceanic and Atmospheric Administration (NOAA), in 2021 alone, the United States experienced 20 separate billion-dollar weather and climate disasters, including Hurricane Ida, the mid-February winter storm and cold wave, and the western wildfires totaling about \$145 billion in damages.

Recognizing the urgency of the situation, the 2022 Resilience Summit supported real estate industry firms as well as local governments in their efforts to build community resilience, in part by providing a platform for exchange of information about opportunities to form partnerships as well as innovative financing mechanisms for building adaptive capacity to climate change.

More than 40 percent of Americans live in counties hit by climate disasters last year. But even though these events may ravage thousands of acres, they do not affect the people residing in impacted areas equally. Populations such as racial and ethnic minorities, low-income individuals, and the elderly are disproportionately harmed by climate disasters and climate change impacts more broadly because of historical

disinvestment and exclusionary land use policies. Within the real estate industry, rectifying this problem is often framed purely as a moral imperative. However, economic principles, abundant social science research, and countless real-world examples demonstrate the direct connection between productivity, economic growth, and quality of life. Therefore, as communities and private actors rally to protect their assets from climate impacts, they must do so in a way that is accessible to all.

Nationwide, climate resilience efforts are a top concern for public and private interest groups. Climate change is revolutionizing the way actors in both the public and private sectors approach capital investment, underwriting, and disclosure requirements for development. The 2021 U.S. Bipartisan Infrastructure Law (Infrastructure Investment and Jobs Act) offered billions of dollars of funding for community resilience projects across federal agencies; the Federal Emergency Management Agency (FEMA) adjusted its methodology for calculating flood insurance rates; and the U.S. Securities and Exchange Commission announced forthcoming regulations for climate-related financial risk disclosure echoing similar policies in Europe and Asia.

Given the competitive nature of many of these infrastructure funding opportunities, it is critical for applicants to demonstrate a robust understanding of climate vulnerabilities and have resilience plans in place. To that end, Resilience Summit programming provided helpful guidance and resources to assist interested parties in moving from planning to action in support of ongoing global action.

From October 31 to November 12, 2021, the United Nations held its 26th annual Conference of the Parties (COP26) in Glasgow, which was attended by both world leaders and several Resilience Summit speakers and participants. At the COP, meeting global and state emissions targets alongside addressing ongoing loss of life and property caused by climate impacts was at the center of discussion.

This year's COP also included a wake-up call to global leaders, noting that immediate action would need to be taken to meet the emissions reductions goals outlined in the Paris

Climate Accord. As climatologist Hans-Otto Pörtner aptly stated shortly after release of the 2022 IPCC Working Group II report, “Any further delay in concerted global action will miss a brief and rapidly closing window to secure a livable future.”

The private sector was similarly charged with rising to the challenge, and companies including the 450 firms comprising Glasgow Financial Alliance for Net Zero (GFANZ) made new commitments to reporting and emissions reductions. GFANZ, in particular, composed of members managing 40 percent of global financial assets, committed to achieving net zero emissions by 2050 through their operations, investing, and lending activities.

As the world recovers from COVID-19, and nations and private actors rise to the challenge of confronting climate change, the real estate industry must identify the ways in which it can adapt and take action at all levels. Now is a critical time to tackle the challenge of building resilience to climate change impacts. After this successful virtual gathering, ULI looks forward to hosting its fourth annual Resilience Summit in spring 2023.

Summit Themes

The overarching theme of the 2022 summit was driving progress on climate resilience through adaptation and mitigation. Each day of the summit was divided into one of

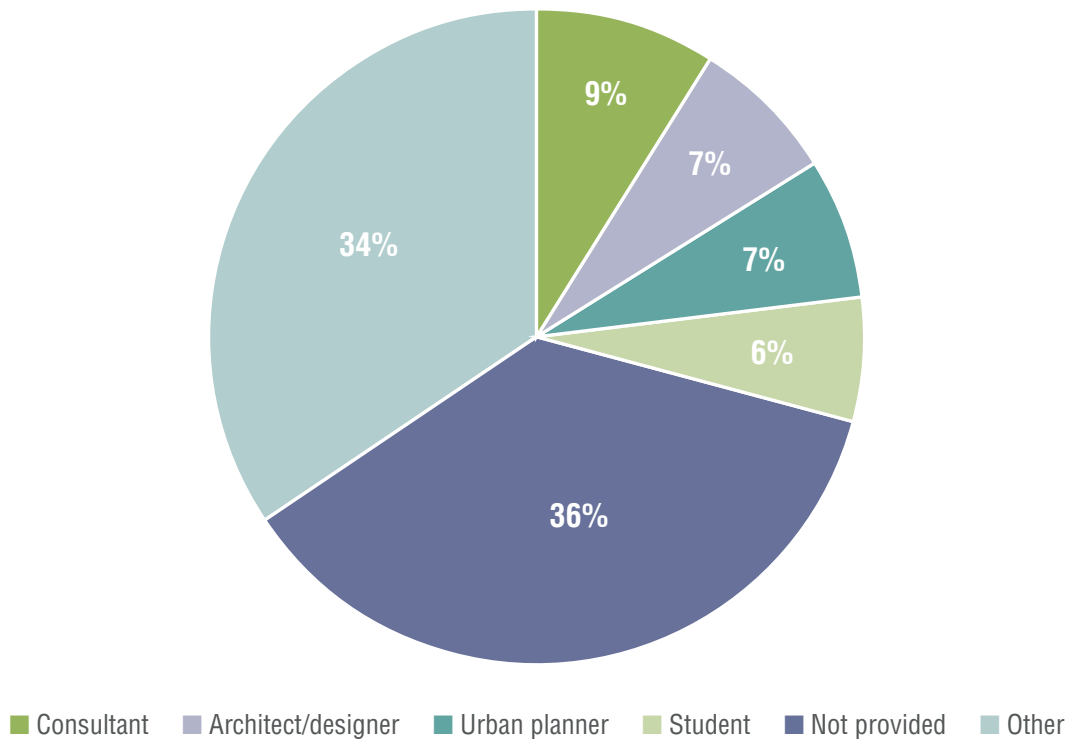
three topic areas—Frontiers of Law and Policy, Design and Planning, and Risk and Investment. Over the span of three days, attendees both learned about and engaged in discourse on this action-oriented theme and around these topic areas.

DAY 1 Frontiers of Law and Policy	DAY 2 Design and Planning	DAY 3 Risk and Investment
<ul style="list-style-type: none"> I. Government priorities and programming <ul style="list-style-type: none"> a. Program availability across levels of government b. Program characteristics <ul style="list-style-type: none"> i. Financing (RLFs) ii. Technical assistance iii. Grant funding II. Equitable development <ul style="list-style-type: none"> a. Local, state, federal initiatives to engage BIPOC communities, low-income communities, historically marginalized communities III. Consequences of inaction <ul style="list-style-type: none"> a. Loss of life and property b. Legal liability 	<ul style="list-style-type: none"> I. Leveraging science and data <ul style="list-style-type: none"> a. Economic scenario modeling b. Measuring and reporting risk <ul style="list-style-type: none"> i. Informing stakeholders ii. Making informed decisions about acquisitions and sales iii. Insuring properties against natural hazards II. Environmental justice <ul style="list-style-type: none"> a. Case studies detailing successful local adaptation measures <ul style="list-style-type: none"> i. Consensus building ii. Planning iii. Funding III. Community engagement <ul style="list-style-type: none"> a. Case studies detailing successful local adaptation measures <ul style="list-style-type: none"> i. Consensus building ii. Planning iii. Funding IV. Leading by example <ul style="list-style-type: none"> a. Frameworks for measuring and reporting physical risk b. Reuse of building materials <ul style="list-style-type: none"> i. Disaster recovery and mitigation c. Case studies detailing successful local adaptation measures <ul style="list-style-type: none"> i. Consensus building ii. Planning iii. Funding 	<ul style="list-style-type: none"> I. Market assessment/business case <ul style="list-style-type: none"> a. ROI on resilient investment b. Approaches to quantifying risk II. Emerging practices in insurance <ul style="list-style-type: none"> a. Catastrophic risk modeling b. Criteria for underwriting assets III. Financing resilience at the community and asset levels IV. Bonds (CAT bonds, resilience bonds, municipal bonds) V. Mitigation and resilience through PACE

Attendees' Professions

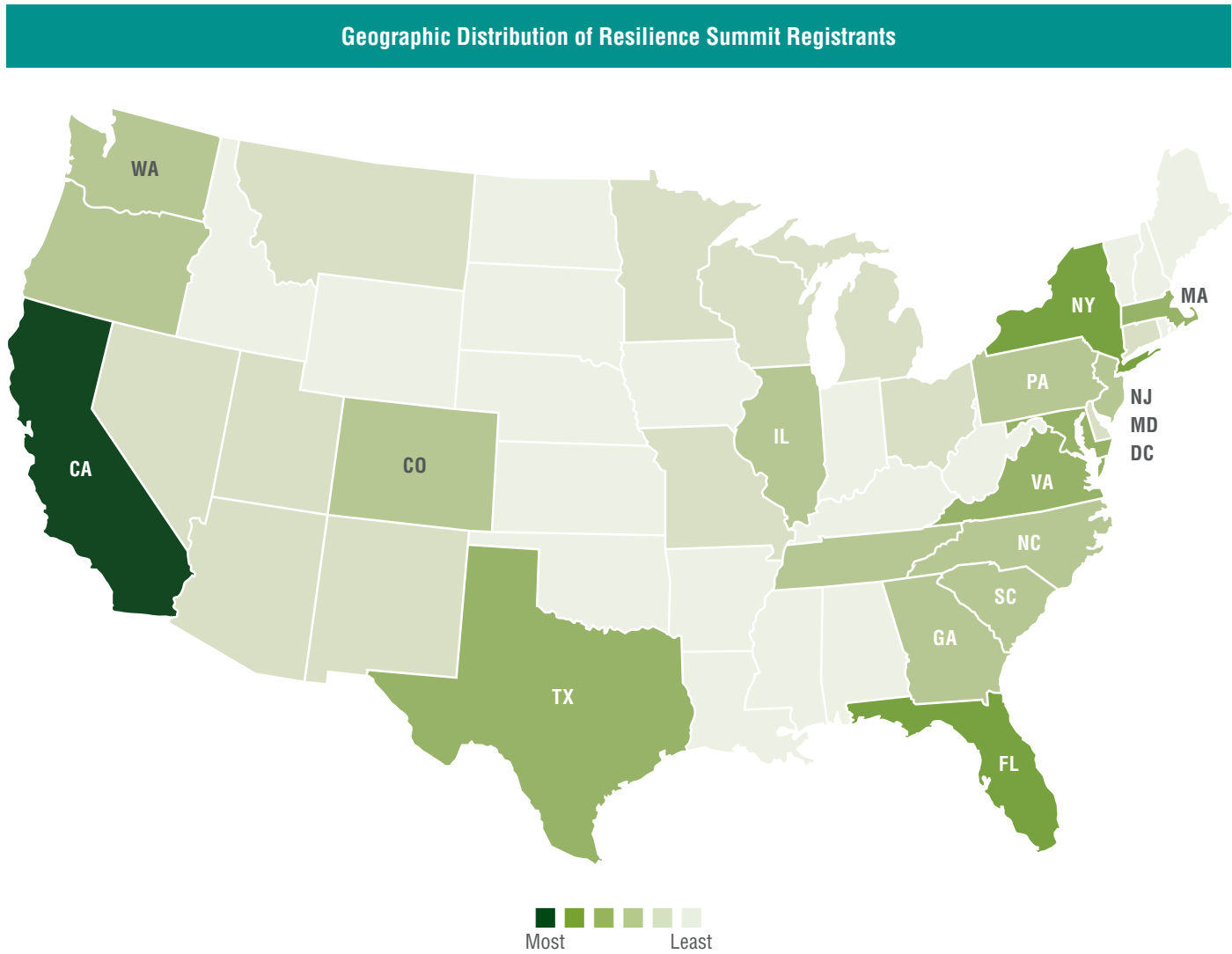
As was the case for previous summits, the 360 attendees at the 2022 Resilience Summit hailed from a variety of professional backgrounds (see figure below). It is worth noting, however, that a large share of attendees were consultants, or architects and designers, and urban planners.

Professional Role of Attendees



Regional Attendance

The 2022 Resilience Summit was largely attended by professionals from the United States, with some representation from Canada, the United Kingdom, Mexico, and Peru. The following figure displays the geographic distribution of registrants across the states.



Key Findings from Feedback Survey

Shortly after the Resilience Summit, a feedback survey was distributed to attendees to gather information about their experiences with regard to programming content, quality, relevance, and accessibility, among other things. Summit attendees who participated in the survey were generally satisfied with the ease of access to linked resources, duration and timing of the event, value of session content, ease of use of the conferencing platform, and relevance of session content. Key findings from this survey are summarized below:

- Survey respondents generally agreed that the summit increased their understanding of resilience and climate risk (87 percent).
- Survey respondents generally agreed that the summit included real-life, practical examples and/or anecdotes that can be used in their work (78 percent).
- When asked to elaborate on their choices, respondents noted that resources such as data sources, modeling and analysis methodology, reports, frameworks, case studies and examples, in addition to information about topics such as the importance of building resilience in housing and reduction of embodied carbon could be applied to their work.

“The speakers were fantastic. Each one of them was knowledgeable in the field they represented, and the presentations reflected this capacity. They were also accessible, answered questions, and engaged. Overall, a great conference where I came out with new tools and questions to further sustainability within my organization.”

— Isis Spinola-Schwartz, chief operations officer, Forge Development Partners LLC

Session Summaries

Programming for each day of the Resilience Summit conforms to three topic areas—Frontiers of Law and Policy (Day 1), Design and Planning (Day 2), and Risk and Investment (Day 3). Although each of these topic areas was intended to guide discussion, speakers were encouraged to explore intersections between them. Over the span of the summit's three days, a total of 16 sessions were held. Each session's content is summarized in the following subsections.

Day 1: Frontiers of Law and Policy

A HISTORIC CONTRIBUTION



Ed Walter



Randall Lewis

The 2022 Resilience Summit began with Ed Walter, ULI global chief executive officer, and real estate executive Randall Lewis announcing the [largest single donation in ULI's 86-year history](#)—\$10 million to fund the organization's efforts to make the built environment more sustainable.

Through his donation, Lewis sees an opportunity to impact three crucial issues:

- Building resilience against effects of climate change,
- Creating healthier places for people to live and work, and
- Reducing carbon emissions in a holistic way.

In honor of this historic contribution, ULI has renamed the former Center for Sustainability and Economic Performance, of which the Resilience Program is a part, the ULI Randall Lewis Center for Sustainability in Real Estate.

KEYNOTE: ALICE HILL



Featured in this session (from left):

- **Alice Hill**, David Rubenstein fellow, Council on Foreign Relations
- **Mary Ludgin**, senior managing director and director of global investment research, Heitman
- **Lindsay Brugger** (not shown), vice president, urban resilience, ULI

Following remarks by Ed Walter and Randall Lewis, ULI's Lindsay Brugger kicked off a fireside chat with Mary Ludgin and keynote speaker, Alice Hill. Their discussion set the stage for the first day of the Resilience Summit, neatly focusing attention on the topic of climate resilience as it pertains to emergent law and policy.

At the heart of the discussion was the concept of adapting to unprecedented events caused by climate change. Hill noted that over the span of the last year, natural disasters had occurred for which many municipalities and individuals were unprepared. It was acknowledged that adaptation plans such as those released on October 7, 2021, by federal agencies including the Department of Housing and Urban Development (HUD), Department of Defense (DOD), and Department of Energy (DOE) are essential because they outline the underlying science behind adaptation, help identify vulnerabilities, prioritize investment, and provide incentives for change, alongside metrics for performance.

Hill lauded federal agencies for their recent adoption of [climate action plans](#) and observed that a national adaptation plan could support these individual agencies initiatives by defining the role of federal government in the nation's efforts to build resilience against climate impacts.

Hill also described the nexus between insurance, affordability, and migration, noting that parametric insurance and advance

“But the role of courts in adaptation, I believe, as a former trial judge, will also be defined not by just lawsuits against emitters, but lawsuits against those who fail to act in anticipation of climate change. And this will become more and more evident as the science of attribution improves.”

—Alice Hill, David Rubenstein fellow,
Council on Foreign Relations

planning could offset the upfront cost associated with disaster preparedness. She acknowledged the significant role the private sector plays in climate adaptation, as well as the ways the private sector might be affected—citing supply chain risk, and Hurricane Maria’s impact on Puerto Rico, and Norfolk, Virginia’s facilities suffering from subsidence and flooding due to sea-level rise.

Before taking questions from the audience, Hill shared her thoughts on the outcomes of COP26, noting that while there was some disappointment about the degree of progress made, there were a few notable victories. The reaffirmation of the 1.5 degree Celsius goal, the agreement to share progress toward emissions reductions among nations, and private-sector commitments to emissions reductions were all counted by Hill as being among those successes.

At the close of the session, Hill advised that Resilience Summit attendees in the real estate profession think collectively about constructing “sturdier” or “collapsible” buildings, reconsider how and where structures are built, ensure insurance availability for market products bought and sold, maintain information on and develop products for keeping people safer in the future, and work with communities to maintain their resilience.

DAY 1 CRITICAL TAKES SESSION— THE SCIENCE OF RESILIENCE



Featured in this session (from left):

- **Ko Barrett**, senior adviser for climate, NOAA
- **Christopher Benosky**, national stormwater resilience lead, AECOM

In this Critical Takes session, Ko Barrett offered expertise on emerging trends and strategies to address the impacts to the built environment that result from the changing climate in a conversation facilitated by Christopher Benosky. Barrett outlined NOAA’s major ongoing activities, including provision of “useful and usable” climate information to stakeholders throughout the United States and ongoing listening sessions with representatives working in the fields of insurance, reinsurance, architecture, engineering, and other professional disciplines. Both Benosky, who witnessed the destruction wrought by Hurricane Sandy on New York City in 2012, and Barrett called attention to the efficacy of appealing to stakeholders in terms of concrete impacts in inspiring action to mitigate and adapt to climate change.

During the conversation, Barrett, who also serves as the vice chair for the [IPCC](#), shared many resources with attendees and noted that the IPCC would be releasing three major reports, each containing short summary sections designed to be accessible to the general public:

- [AR6 Climate Change 2022: Impacts, Adaptation and Vulnerability](#);

ABOUT THE CRITICAL TAKES SERIES

The Critical Takes Series was composed of 10-to-15-minute interviews and testimonials.

- [AR6 Climate Change 2022: Mitigation of Climate Change](#); and
- AR6 Synthesis Report: Climate Change 2022 (available September 2022).

FRONTIERS OF LAW AND POLICY PANEL



Featured in this session (from left):

- **Jane Gilbert**, chief heat officer, Miami-Dade County, Florida
- **Samantha Medlock**, senior counsel, Select Committee on the Climate Crisis, U.S. House of Representatives
- **Kathleen Theoharides**, secretary, Executive Office of Energy and Environmental Affairs, state of Massachusetts
- **Jack Smith**, partner, Nelson Mullins Riley & Scarborough LLP

During the Frontiers of Law and Policy panel, attendees heard from three leading climate resilience experts at the forefront of developing and implementing current and proposed climate legislation at the national, state, and local levels. This session was moderated by ULI member leader Jack Smith, with panelists Samantha Medlock, Kathleen Theoharides, and Jane Gilbert. They discussed the application and impacts of climate adaptation and climate mitigation policies for cities and regions, and by extension, the real estate industry as a whole, and provided an opportunity for attendees to engage directly with policymakers on collective action across all sectors of government.

Samantha Medlock, representing the federal arm on the panel, provided a comprehensive overview of the Biden administration's efforts to combat climate change equitably and holistically. Medlock said the administration's aim is to ensure that at least 40 percent of the overall benefits of federal investments in climate and clean energy accrue to disadvantaged communities. She also spoke about the critical nature of FEMA's efforts to update flood resilience standards and the imperative for local and state input regarding dispersal of funding tied to the [Bipartisan Infrastructure Law](#).

Kathleen Theoharides, representing the state arm on the panel, stressed the role of science and data in building community resilience. She also expounded on some of the measures Massachusetts is taking to enable community resilience, citing the [Massachusetts State Hazard Mitigation and Climate Adaptation Plan](#), development of the [Climate Resilience Design Standards Tool](#), and the ongoing [Municipal Vulnerability Preparedness Program](#), through which the state provides technical support and funding to local governments.

Finally, Jane Gilbert, representing the local arm on the panel, echoed the sentiments of Theoharides regarding the critical role of science and data in building resilience in communities nationwide. Gilbert elaborated on the concrete design requirements and programming that support resilient development in Miami-Dade County as well as how they came to be. Measures such as increased setback requirements, the factoring in of sea-level-rise impacts, and formation of scientific advisory committees both outlined the concrete threats of climate change and demonstrated the importance of local action to reduction of risk throughout U.S. communities.

DAY 1: NETWORKING SESSION SUMMARY

Day 1 of the summit concluded with a 30-minute networking opportunity that brought two panelists from the Frontiers of Law and Policy panel, a Critical Takes session interviewee,

ABOUT THE NETWORKING SESSIONS

Each day of the Resilience Summit closed with a networking session open to all summit attendees. Networking sessions brought speakers and attendees together, thereby allowing them to explore ways to apply the concepts and strategies of each day of the event to everyday practice.

and a ULI staff member together with summit attendees to discuss city policies, federal approaches to the climate crisis, the science of resilience, and resilience retrofits for buildings.

Breakout Room 1—City Resilience Policies

A conversation with Jane Gilbert, chief heat officer, Miami-Dade County

Topics covered:

- 1995 Chicago heat wave
- Value of social ties in reducing negative impacts of extreme heat events on vulnerable populations
- Financing mechanisms and the need to scale strategies for coping with extreme heat

Breakout Room 2—Federal Approaches to the Climate Crisis

A conversation with Samantha Medlock, senior counsel for the House Select Committee on the Climate Crisis

Topics covered:

- Applications of funding sources, including the Bipartisan Infrastructure Investment and Jobs Act
- Opportunities for and challenges to implementation, noting unprecedented interest from all levels of government
- Eagerness of federal agencies to deploy funding and technical assistance to ignite innovative thinking and strategies reflective of local communities

Breakout Room 3—How NOAA and the IPCC Can Empower Resilient Development

A conversation with Ko Barret, senior adviser for climate, NOAA

Topics covered:

- Cross-disciplinary/interdisciplinary coordination of adaptation through ongoing agency outreach

- Information and resource sharing
- Understanding the underlying scientific basis for adaptation and mitigation

Breakout Room 4—Resilient Retrofit Policies

A networking session facilitated by August Williams-Eynon, senior associate, ULI

Topics covered:

- Overlap between decarbonization retrofits and resilient retrofits
- Methods for addressing multiple types of climate risks simultaneously
- Need to develop supportive finance strategies for building owners—especially in areas with mandatory retrofit policies
- Owners' requirement of technical assistance and phased implementation strategy, given complexities and costs associated with retrofitting structures

Day 2: Planning and Design

AECOM's environmental, social, and governance (ESG) market lead (Americas), Bob Beinstein, provided thought-provoking opening remarks on Day 2 of the Resilience Summit. In his address, Beinstein teed up the day's theme of Planning and Design by lamenting the inefficiency of current adaptation solutions and calling for a more holistic approach to the design process as well as a greater degree of collaboration and mentorship between design teams and generations of real estate industry professionals.



Bob Beinstein

THE FOURTH NATIONAL RISK ASSESSMENT: CLIMBING COMMERCIAL CLOSURES



Featured in this session (from left):

- **Ibrahim “Ibby” Almufti**, associate principal, Arup
- **Matthew Eby**, executive director, First Street Foundation

Policy advocates, financiers, and design professionals alike are calling for a more data-driven approach to quantifying and identifying climate change–related risk. However, differences in approach among providers of climate risk analytics on how to go about conceptualizing, quantifying, and communicating financial risk to assets complicate the real estate industry’s efforts to mitigate and adapt to climate change impacts. This presentation, led by Ibby Almufti and Matthew Eby, shared details on how First Street Foundation and Arup are working in partnership to address this issue.

No widely accepted standard for assessment of physical risk to assets exists in the real estate industry. However, the methods described in this session for quantifying flood risk provide some insight into the underlying methodology, and they use output on cases generated by risk analytics providers. During the session, Eby and Almufti described how they evaluated annualized average losses associated with flooding for retail, office, and multiunit residential properties in the contiguous United States. The evaluation of losses considered both tangible and intangible impacts such as business disruptions, noting that the output could be aggregated across portfolios for a comprehensive picture of flood risk for investors. The session closed with brief remarks from ULI leader and Arup principal Brian Swett, who encouraged attendees to review the [full report](#) online.

“This has some interesting implications for investment decisions—and how that drives mitigation priorities for communities at risk.”

—Molly McCabe, chief executive officer, HaydenTanner/The Lotus Campaign

DAY 2 CRITICAL TAKES SESSION—INTERSECTIONS OF EQUITY COMMUNITY DEVELOPMENT AND RESILIENCE



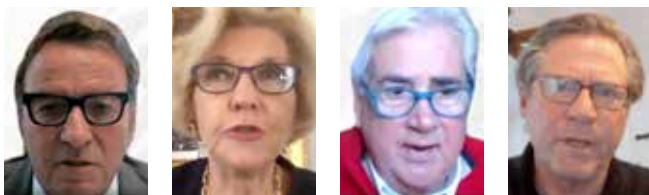
Featured in this session (from left):

- **Crystal Bergemann**, senior adviser for climate, HUD
- **Jacqueline Gonzalez Touzet**, Touzet Studio

The Day 2 Critical Takes session included a two-part interview with Crystal Bergemann facilitated by Jacqueline Gonzalez Touzet. During this session, Bergemann offered her expertise on HUD’s approach to building resilience in communities across the United States. Gonzalez Touzet prompted Bergemann with some of the critical issues of equitable development and challenges of implementing HUD’s climate adaptation goals in communities across the nation. Bergemann noted that in the agency’s newly adopted [climate action plan](#) there were approximately 100 discrete action items, including rulemaking to implement federal flood risk management standards and update floodplain management regulations. This would include increasing communities’ resilience to flooding, clarifying processing standards, addressing environmental justice concerns in floodplain decision-making, and minimizing adverse impacts to floodplains and wetlands.

Bergemann also noted that an ongoing climate resilience cohort of a couple of dozen Community Development Block Grant grantees would receive resources and technical support for equitable and resilience initiatives. This support is in addition to the \$90 billion allocated to helping primarily historically marginalized communities adapt to climate impacts and recover from disasters, and partnerships with other agencies such as the U.S. Environmental Protection Agency (EPA) to weatherize and maintain HUD properties.

BREAKOUT TRACK 1A—UNLOCKING ECONOMIC DEVELOPMENT IN A HISTORIC COMMUNITY: HOW COMMUNITY INVOLVEMENT AND GREEN INFRASTRUCTURE CAN REVITALIZE THE PUBLIC REALM AND EXISTING BUSINESSES



Featured in this session (from left):

- **Gavin Buckley**, mayor, city of Annapolis
- **Eileen Fogarty**, president, Fogarty Group
- **Robert Clark**, president and chief executive officer, Historic Annapolis Inc.
- **Bryce Turner**, president, BCT Design Group

In this breakout session, Annapolis mayor Gavin Buckley was joined by Eileen Fogarty, Robert Clark, and Bryce Turner in a panel discussion concerning the city of Annapolis’s planning efforts to address rising coastal waters and generate economic development for the city and existing businesses. Annapolis, like other coastal communities, is increasingly struggling with the effects of sea-level rise and flooding. Of particular concern for this historic coastal community is the effect of hazards on historic structures and critical infrastructure such as roadways.

Session panelists described how the design team leveraged the momentum and consensus from an intentional, equity-based, community-led process to bring together community stakeholders and generate green infrastructure investment.

They also shared insight on specific measures for developing a community-led process to build consensus with municipal governments, institutions, and nonprofits that highlighted the importance of working collaboratively to achieve climate resilience through adaptation. These measures included the following:

- Formation of a resilience finance authority;
- Identifying, funding, and constructing green and gray infrastructure improvements;
- Ensuring ongoing equitable outreach and engagement through involvement of racial and ethnic minority stakeholder groups; and
- Creation of a local task force comprising stakeholders, government officials, and subject matter experts.

BREAKOUT TRACK 1B—DISASTER AND SEA-LEVEL-RISE POLICIES AND PLANNING FOR EQUITABLE DECONSTRUCTION AND REBUILDING



Featured in this session (from left):

- **Timonie Hood**, zero waste and green building coordinator, U.S. EPA, Region 9
- **Shawn Wood**, construction waste specialist, city of Portland, Oregon
- **Frances Yang**, structures and sustainability specialist, Arup and co-founder of All for Reuse

Removing buildings from high-risk geographies and salvaging building materials keep valuable and historic building materials in a circular economy instead of landfills; reduce embodied carbon associated with the production, manufacturing, and disposal of building materials; reduce exposure to hazardous dust associated with demolition; reduce vulnerability to climate risk; and provide meaningful

construction job training and access to affordable, local building materials. Yet these benefits are largely untapped by the real estate industry. During this session, panelists Timonie Hood, Shawn Wood, and Frances Yang highlighted an emerging area ripe for policy, planning, and collaboration: reusing materials from buildings affected by sea-level rise and climate disasters to meet equity, environmental, and cultural/historic preservation priorities.

Panelists drew from numerous case studies to demonstrate the positive outcomes from building deconstruction and materials reuse initiatives. Examples included reuse of building materials in the wake of Hurricane Katrina and Hurricane Ida and outcomes from Portland's deconstruction ordinance. According to Hood, deconstruction and reuse of building materials could further local efforts toward environmental justice, including by reducing lead dust contamination from demolition, reducing disposal site health impacts, providing low-cost building materials, and creating jobs.

Wood added that deconstruction and reuse of building materials also has direct implications for community resilience if applied as part of efforts toward managed retreat and disaster response. As Yang and other panelists observed, the market for salvaged and refurbished building materials is continuously expanding from year to year, thus posing an opportunity to simultaneously save on construction costs and build in a more environmentally conscious fashion.

For additional information, see [EPA's Resiliency and Natural Disaster Debris Report](#).

“The cost to deconstruct has come down over the past five years . . . it's getting to the point where it's competitive with mechanical demolition.”

—Shawn Wood, construction waste specialist, city of Portland, Oregon

BREAKOUT TRACK 2A—PUBLIC/PRIVATE/NGO PARTNERSHIPS TO ACCELERATE DATA-DRIVEN CLIMATE ACTION ON EXTREME HEAT



Featured in this session (clockwise from top left):

- **Claire Bonham-Carter**, principal, director of sustainable development, AECOM
- **Anna Bettis**, Healthy Cities Program manager, The Nature Conservancy
- **Anne deBoer**, senior economist, AECOM
- **Nicole Lombardo**, business development environmental insights explorer, Google
- **Kate Gallego**, mayor, city of Phoenix

Extreme heat is a silent killer facing many U.S. cities, yet relatively simple urban interventions can mitigate its effects. For instance, Phoenix, referred to as the hottest large metropolitan area in the United States, saw 323 heat-associated deaths in 2020. In this session, panelists were joined by Phoenix mayor Kate Gallego to discuss the merits of public, private, and nongovernmental organization (NGO) partnership by examining the process and outcomes of recent collaborative efforts among Google, The Nature Conservancy, and AECOM aimed at providing cities such as Phoenix with data, tools, and targeted support to fight the climate crisis. In Phoenix, this kind of partnership was applied to define and measure the economic consequences of heat in the Phoenix metro region as well as the potential benefits offered by various adaptation solutions. However, similar approaches to understand impacts and costs of extreme heat have been carried out across the United States, including in Miami, Dallas, and Los Angeles.

Panelists Anne deBoer and Anna Bettis shared information about their role in the Phoenix economic assessment project. Nicole Lombardo then discussed some of the parameters of the open data and tools from Google's [Environmental Insights Explorer](#) (EIE) team (including the Tree Canopy Lab module) as well as Google's overarching goal of helping 500 cities and local governments reduce an aggregate one gigaton of carbon dioxide per year by 2030 and beyond. Mayor Gallego in turn was pleased to announce that her new Office of Heat Response and Mitigation will be able to leverage EIE tree canopy this year once Phoenix is added to the module. deBoer explained the three-step process used by AECOM (guided by an expert advisory panel including academics and city of Phoenix staff) to perform the assessment, summarized in brief here:

1. Analyzing climate condition to understand projected temperature change;
2. Estimating the cost of inaction (business-as-usual impacts to mortality and morbidity, shortened life cycle of infrastructure, energy demand, and labor productivity estimated at about \$1.9 billion annually over the 2020–2059 period for the RCP4.5 scenario); and
3. Evaluating adaption solutions: 25 percent urban tree canopy coverage and 100 percent cool roofs.

It was recommended that attendees review the Nature Conservancy's [full technical report](#), but the study ultimately concluded that for the two proposed solutions (25 percent urban tree canopy and 100 percent cool roofs), the benefit of implementation would far outweigh the costs of installation by nearly 4:1 and over 5:1, respectively.



BREAKOUT TRACK 2B—ASTM PROPERTY RESILIENCE STANDARD: ASSET ASSESSMENT FOR A CHANGING CLIMATE



Featured in this session (from left):

- **Willy Accame**, director of risk management, Panattoni Development Company Inc.
- **Holly Neber**, chief executive officer, AEI Consultants
- **Damian Wach**, vice president, PGIM Real Estate
- **Katie Wholey**, senior resilience consultant, Arup

The passage of new regulations worldwide governing corporate disclosure requirements for climate risk have, in recent years, inspired discourse among members of the scientific community, government officials, the general public, and private stakeholders. Such disclosures involve identification and quantification of climate risk, including physical and transitional risk. At present, many different approaches exist to representing physical risk to assets, but there is no widely accepted standard for understanding physical climate risk to real estate. The ASTM, an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services, is in the process of developing a standard to guide the way building owners and operators, developers, and investors and lenders work together to integrate resilience to natural hazards as part of the standard due diligence process in the coming years.

During the session, members of the ASTM committee charged with formulating this standard, Katie Wholey, Holly Neber, Damian Wach, and Willy Accame, provided an overview of the forthcoming standard and discussed its implications for developers, investors, and design and

engineering professionals. At a high level, the proposed standard will involve the following three-step process:

1. Examine publicly and commercially available maps and models to identify hazards of concern;
2. Conduct ground truthing of physical vulnerabilities identified and apply a vulnerability rating to the asset; and
3. Identify appropriate resilience measures and ballpark cost estimates to enhance the building's ability to withstand future hazards.

DAY 2 NETWORKING SESSION SUMMARY

Day 2 of the summit concluded with a 30-minute networking opportunity that brought staff from ULI's district councils and local member leaders together with summit attendees to discuss extreme heat, drought, wildfire, and flood.

Breakout Room 1—Staying Cool in the Face of Extreme Heat

Facilitated by Michelle Landers, executive director, ULI Boston, and Devanshi Purohit, associate principal (urban design), CBT Architects

- Examined one of the deadliest climate hazards in the United States—extreme heat.
- Highlighted extreme heat as an immediate threat with widespread impacts and consequences. From Abu Dhabi to Miami, to Los Angeles, and Montgomery County, Maryland, participants drew connections across geographies and shared cooling solutions:
 - Expanding parks and open spaces;
 - Using water as a cooling agent;
 - Vertical shading techniques; and
 - Incentivizing the private sector to implement green infrastructure projects.

Breakout Room 2—Water-Smart Development to Combat Drought

Facilitated by Marianne Eppig, director, ULI Colorado, Boulder, and Marq Truscott, president, RQ Studio

- Drought-focused networking session acknowledged that “low-hanging fruit” strategies for drought (e.g., native landscaping) were well understood.
- Noted that more information was needed on more complex strategies (e.g., water recapture).
- Sought case studies of successfully implemented drought strategies that explored payback periods, failure points, and long-term performance.
- Discussed policies and regulations on the horizon for drought-stricken communities, noting that water is severely undervalued and a price spike would lead to shorter payback periods for many drought strategies.

Breakout Room 3—Sparking Ideas for Wildfire Resilience

Facilitated by Molly McCabbe, chief executive officer and founder, HaydenTanner

- Acknowledged broad questions regarding construction in the WUI (wildland-urban interface).
- Pivoted to question of whether developers should still build in these areas, and how to incentivize density to avoid construction in the WUI.
- Also considered how to build resilience in communities that opt to build in these areas:
 - Insuring properties in the WUI; and
 - Special incentives or financing for developers employing resilient building practices.
- Diverse participant backgrounds resulted in recommendations for resilient building practices and general tips for improving wildfire resistance.

Breakout Room 4—Flood Preparedness: Keeping Your Head above Water

Facilitated by CJ Reynolds, director of resilience and engagement, Tampa Bay Regional Planning Council, and Brian Cook, director of urban design, Applied Sciences

- Shared interest among participants in
 - Addressing compound flooding;
 - Sourcing capital to invest in resilience upgrades that do not generate revenue; and
 - Integrating resilience and carbon emissions reduction in buildings.
- Discussion centered on
 - Creating accessible, linked strategies for flood protection across neighborhoods;
 - Understanding multiple vulnerabilities of and possibilities for reimagining waterfront cities; and
 - Role of nature-based features in flood management.

Day 3: Risk and Investment

FRAMING THE CHALLENGE: THE EFFECT OF CLIMATE CHANGE ON THE HOUSING MARKET



Featured in this session (from left):

- **Dave Evans**, principal and consulting actuary, Milliman
- **Leighton Hunley**, senior financial consultant, Milliman
- **Brandon Katz**, executive vice president, KatRisk

Day 3 of the Resilience Summit began with a session that described how and why flooding and increases in flood risk caused by climate change represent a major exposure to both homeowners and lenders. While property values have been relatively resilient to flood events to date, the past may not be representative of the future. Potential homebuyers, investors,



and lenders could all become less willing to look past the costs of flood risk as climate change increases the frequency and severity of future flood events.

During this session, attendees heard from Dave Evans, Leighton Hunley, and Brandon Katz, who provided their expertise in insurance and catastrophic (CAT) risk modeling.

Evans, Hunley, and Katz described Milliman's and KatRisk's joint approach to leveraging CAT modeling to determine exposure to downstream financial risk, such as property value and mortgage default impacts. Using KatRisk's full physics models, it was possible to model 50,000 years' worth of daily temperature, precipitation, and sea surface temperature; predict future streamflow, runoff, and flash flood; and account for factors like groundwater change, transpiration, snow melt, and effects of topography using property data and climate scenarios.

This model output enabled quantification of risk to assets caused by climate change across different time horizons and under different climate change scenarios and has potential to assist in creating new development standards, determining financial risk to individual properties, measuring mortgage default risk when coupled with Milliman's mortgage modeling, and reevaluating property values and insurance rates. Because of this broad range of applicability, CAT modeling, which was previously used typically in the private sector, is now being used by government agencies such as FEMA.

The implications of widespread use of CAT risk modeling are significant. The single-family mortgage market alone has hundreds of billions of dollars of financial risk exposure due to projected climate impacts—all of which could be affected by revaluation of insurance rates.

RISK AND INVESTMENT FIRESIDE CHAT



Featured in this session (from left):

- **Franklin Nutter**, president, Reinsurance Association of America
- **Roy Wright**, president and chief executive officer, Insurance Institute for Business & Home Safety
- **Jeff Hébert**, president, HR&A Advisors

This fireside chat focused on innovation, sustainability, and equity. It was facilitated by Jeff Hébert and featured two leaders in insurance and risk management: Franklin Nutter and Roy Wright. Hébert noted that 2021 was an extraordinary year for the insurance and risk management industries because of the severe weather, wildfires, power outages, and heat waves exacerbated by climate change that “disrupted communities and families across the country and across the world.”

A large share of the discussion was concerned with the concept of making communities insurable. In this context, that meant making new construction more resilient and ensuring structures harmed during natural disasters are reconstructed to an appropriately high standard given the risk. As detailed information about climate impacts to properties becomes more accessible, insurers are increasingly factoring climate risk into their rates. As part of their discussion on insurability, panelists noted that reconciling the insurance industry business model with the need to protect structures can be challenging. Both also observed that for many homeowners, insurance is considered a luxury. Among the solutions proposed were leveraging of public-sector resources for information about risk to properties in addition to federal funding sources such as FEMA’s National Risk Index and about \$20 billion allocation for community resilience grants.

Despite the direness of the subject matter, a pragmatic and hopeful tone belied Wright’s and Nutter’s remarks. For instance, in his response to Hébert’s question about whether there was anything the reinsurance or real estate industry more broadly could do to make communities more resilient, Wright emphasized, “We can change the trajectory of disruption and displacement in communities.” Nutter then concisely responded, framing the necessity of an insurance industry response. He noted that the insurance industry is “engaged, largely because of its desire to continue to have insurable communities across the country.”

DAY 3 CRITICAL TAKES SESSION

A short video in which ULI highlights its members’ contributions and reflections on the business case for resilience. Including quotes from members such as Owen Thomas, chief executive officer of Boston Properties, and Alec Bogdanoff, principal at Brizaga, as well as recent reports released by the Randall Lewis Center for Sustainability in Real Estate, namely:

- [Embedding Sustainability in Real Estate Transactions](#) (2019)
- [Climate Risk and Real Estate Investment Decision-Making](#) (2019)
- [Climate Risk and Real Estate: Emerging Practices for Market Assessment](#) (2020)
- [The Business Case for Resilience in Southeast Florida](#) (2020)
- [Climate Migration and Real Estate Investment Decision-Making](#) (2022)

MAKING CENTS: STRATEGIES FOR FINANCING RESILIENCE



Featured in this session (from left):

- **John Goldstein**, managing director, head of the Sustainable Finance Group, Goldman Sachs
- **Jacqueline Higgins**, head, North America, and senior vice president, Public Sector Solutions, Swiss Re
- **Billy Grayson**, executive vice president, Centers and Initiatives, ULI

While many agree the threat of climate hazards looms large, the question of how to finance climate resilience remains. During this session, moderator Billy Grayson, John Goldstein, and Jacqueline Higgins discussed the return on investment of resilience, innovative financing tools, and emergent drivers of investment in climate resilience. Early on, Goldstein introduced the idea that effective measurement should precede management of real estate assets, setting the tone for the remainder of the discussion. Because there is no universal standard for risk assessment, measurement and comparison of risk between assets and across portfolios that account for both physical and transition risk are still a way off, with tracking of physical risk lagging behind transition risk.

Goldstein shared a poignant reminder with attendees that even though one dollar invested in mitigation saves six dollars in recovery, that fact alone is not sufficient to inspire action. Both Higgins and Goldstein went on to explore the merits and drawbacks of some of the existing incentives and financing mechanisms for spurring necessary improvements for both resilience building and emissions reductions, including [catastrophic bonds](#), [resilience bonds](#), and [PACE financing](#). Both acknowledged the critical role of government in driving demand for adaptation and mitigation, given that many of these financial instruments can be created through legislation.

DAY 3 NETWORKING SESSION SUMMARY

The summit concluded with a 30-minute networking opportunity that brought insurance and finance experts and ULI staff together with summit attendees to discuss climate risk analytics, climate change impacts to the housing market, resilience financing strategies, and climate migration–related market impacts.

Breakout Room 1—Variations in VAR: Climate Risk Analytics

Facilitated by Spenser Robinson, professor and director of real estate, Central Michigan University; Andrew Sanderford, assistant director, Center for Investors and Financial Markets; and Lian Plass, senior manager, Urban Resilience, ULI

- Participants hailed from real estate investment management and asset risk assessment.
- They addressed secondary consequences and tradeoffs related to measuring climate risk.
- Participants were largely concerned with business impacts or long-term supply chain impacts.

Breakout Room 2—The Effect of Climate Change on the Housing Market

Facilitated by David Evans, principal and consulting actuary, Milliman; Leighton Hunley, senior financial consultant, Milliman

- Explored financial cost of severe repetitive loss properties and pros and cons of elevation and acquisitions as strategy to address repetitive loss properties.
 - Elevation maintains community ties and existing tax base.
 - Possibility that degree of physical risk faced by property in future, making acquisition most financially prudent solution.
- Practitioners using wide range of tools to analyze physical risk at site scale.
- Found that localized resources were most helpful but still need to be combined with a unique site conditions assessment, typically completed by a geotechnical or civil engineering consultant.

- For financing climate risk mitigation, insurance noted as key recovery driver.
- Discussed the idea of community-funded green or gray infrastructure improvements.

Breakout Room 3—Making Cents: Strategies for Financing Resilience

Facilitated by Billy Grayson, executive vice president, Centers and Initiatives, ULI, and Jackie Higgins, head of public sector solutions, Swiss Re

- Discussed benefits of more widespread use of PACE financing and challenges associated with traditional debt (e.g., home equity loans and mortgage refinance) for resilience.
- Identified opportunities to enhance climate resilience in the built environment, particularly development of new financing tools.
- Noted the strong potential of crowd-funded community-scale financing vehicles for infrastructure.
- Considered leveraging BRIC (Building Resilient Infrastructure and Communities) funding as an anchor for private capital investment.

Breakout Room 4—Climate Hot Spots and Havens: Climate Risk, Market Analysis, and Migration

Facilitated by Laura Craft, head of global strategy & investment ESG, Heitman

- Focused on how participants and their companies are assessing physical climate risks in their portfolios or work with clients.
- Noted that many are beginning to rely on more sophisticated risk analytics to better communicate with lenders, investors, and real estate clients.
- Noted that broader market- or portfolio-level risk assessment, and inclusion of climate-driven migration, is still limited.

LEARN MORE: RESILIENCE SUMMIT RESOURCE LIBRARY

The 2022 Resilience Summit Resource Library is a virtual cache of articles, tools, and data sources that supplements Resilience Summit programming and provides participants with easy means of accessing relevant resources from the event. The intent of the Resilience Summit Resource Library is to empower summit attendees to take collective climate action before, during, and after the event. This site was launched again this year.

Click here to visit the [2022 Resilience Summit Resource Library](#).

Acknowledgments and Sponsors

Program Committee

ULI would like to thank the following members who served on the 2022 Resilience Summit Program Committee for contributing their time and expertise and shaping the event.

- Alec Bogdanoff, principal and cofounder, Brizaga
- Claire Bonham-Carter, vice president, AECOM
- Laura Craft, senior vice president, head of global ESG strategy, Heitman
- Jackie Gonzalez Touzet, principal, Touzet Studio
- Jeff Hébert, president, HR&A Advisors
- Kiersten Ritchey, principal, Gensler
- Jack Smith, partner, Nelson Mullins
- Brian Swett, principal, Arup
- David Thompson, senior manager, sustainable asset management, MultiGreen Properties

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To learn more about ULI's Urban Resilience program and opportunities for partnership and involvement with future events, including the Resilience Summit in 2023, please reach out to resilience@uli.org.



2022

RESILIENCE SUMMIT

EVENT SUMMARY AND KEY FINDINGS



Urban Land Institute
2001 L Street, NW
Suite 200
Washington, DC 20036-4948
uli.org