

# CLIMATE MIGRATION AND REAL ESTATE INVESTMENT DECISION-MAKING



**HEITMAN**  
A REAL ESTATE INVESTMENT MANAGEMENT FIRM



Cover: The Boston waterfront (top) and flooding in central Europe (bottom).

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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.

The extraordinary impact that ULI makes on land use decision-making is based on its members sharing expertise on a variety of factors affecting the built environment,

including urbanization, demographic and population changes, new economic drivers, technology advancements, and environmental concerns.

Peer-to-peer learning is achieved through the knowledge shared by members at thousands of convenings each year that reinforce ULI's position as a global authority on land use and real estate. In 2021 alone, more than 2,700 events were held in cities around the world.

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](http://uli.org). Follow ULI on [Twitter](#), [Facebook](#), [LinkedIn](#), and [Instagram](#).

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## About Heitman

Founded in 1966, Heitman LLC is a global real estate investment management firm with approximately \$51 billion in assets under management. Heitman's real estate investment strategies include direct investments in the equity or debt capitalization of a property or in the securities of listed and publicly traded real estate companies. Heitman serves a global client base with clients from North American, European, Middle Eastern

and Asia-Pacific institutions, pension plans, foundations and corporations and individual investors. Headquartered in Chicago, with additional offices in North America, Europe, and Asia-Pacific, Heitman's approximately 350 employees offer specialized expertise—from a specific discipline to local insight.

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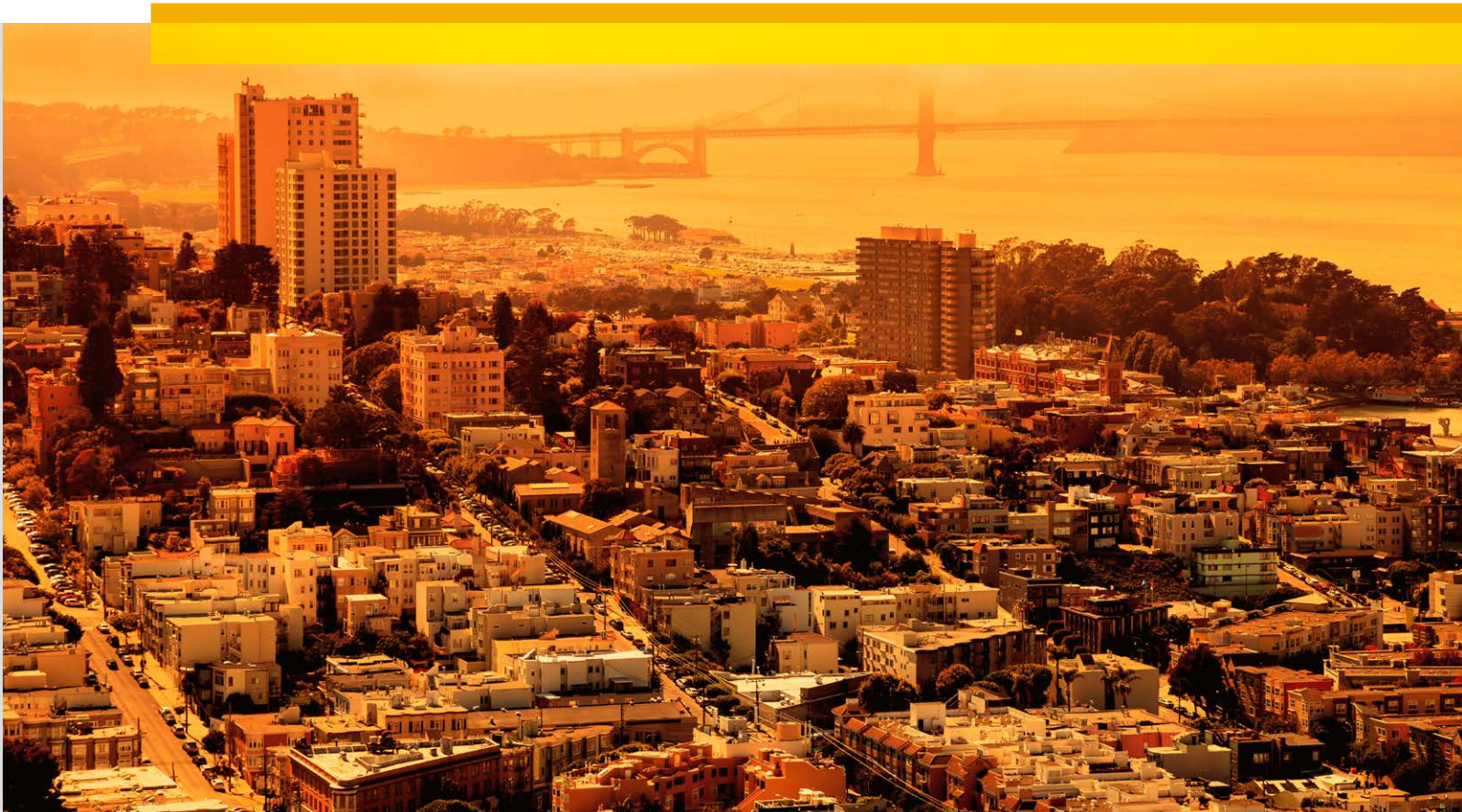
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# Executive Summary

This report focuses on a dimension of climate change that has yet to be fully incorporated in real estate investment decision-making: climate migration, or the relocation of people due to environmental change and the social and economic disruptions it causes. Climate migration presents profound societal challenges that are directly relevant for real estate investors for two core reasons.

Climate migration is happening around the world—gradually but slowly in some places, and rapidly in others. Climate relocation will lead to significant shifts in demand for real estate as individuals and communities respond to changing environmental conditions. Some property markets, or segments of them, could decline as individuals and businesses locate away from communities unable to manage the effects of climate change. New real estate investment opportunities are also likely to emerge in neighborhoods and regions better poised to absorb climate shocks and stressors.

In addition, climate migration points to the need for proactive real estate investment approaches. Sustained investment activity in high-risk areas that are likely to see population decline poses investment risk. More broadly, real estate investment and development strategies that are not sensitized to climate risks may diminish societal adaptive capacity, meaning governments and taxpayers could be forced into costly and inefficient forms of infrastructure and service provision at precisely the time when fiscal resources will be needed to reduce carbon emissions and to shift people out of harm's way. Failure to advance integrated, forward-looking public and private investments that reduce climate-risk exposure represents a significant social equity and stability concern.

This report aims to help real estate investors break down climate migration into a core set of factors and considerations that can be examined in the context of their asset- and market-level climate-risk management strategy. Although written for investors, the report is relevant for all real estate professionals. The first section of the report presents perspectives from leading real estate investors, land use professionals, and researchers, who are beginning to define and address climate migration. These thematic insights link climate migration to the key asset- and market-level drivers of climate risk and resilience and lay out barriers and opportunities for acting on these insights within investment decision-making.

The second section of the report introduces a two-step framework for assessing climate migration-related risks in the real estate investment decision-making process. This framework integrates investor insights with current best practices and illuminates pathways to action relevant to investors at all stages of their climate-risk management journey. The first step entails a preliminary market screening, through which investors can identify key markets to prioritize for more granular assessment. The second step involves a deeper analysis of the climate migration-related criteria that shape market-level risk and resilience and, in turn, influence investment performance.

The report concludes by underscoring two key ways for investors to deepen their engagement with climate migration.

First, real estate investors should continue to build their capacity to assess and manage migration-related and broader market-level investment risks. Investors can use the two-step framework in this report to assess these complexities, prioritize key factors, and pinpoint crucial data and methodological gaps. Investors must continue to develop new approaches to understand and manage these interconnected financial, physical, and social risks—and can do so through sustained collaboration across the real estate value chain, in the highest-risk communities in which they invest, and with broader professional and scientific communities.

Second, real estate investors should actively understand climate change adaptation needs for key markets. This requires investors to shift from an asset-centric view to a market-level appraisal of risk and resilience drivers. Investors should consider ways to leverage technical expertise to build the capacity of communities to absorb climate shocks and stressors. To these ends, investors can support the creation of robust community resilience and recovery plans, and should direct their investment to infrastructure and real estate asset classes that are climate responsive, adaptable to changing environmental conditions, and enhance the overall social and ecological resilience of communities.

# 1. Introduction and Overview

Climate change—and how society responds to its causes and impacts—has profound long-term implications for the real estate investment community. From adaptation to physical shocks and stressors like sea-level rise and extreme heat, to the mitigation of harmful greenhouse gas emissions, climate change poses challenges even as it creates opportunity for real estate professionals.

Since 2019, the Urban Land Institute has partnered with Heitman, a global real estate investment management firm, to present a series of reports that have framed climate risk from the real estate investment community perspective and promoted best practices for addressing those risks. Over this period, industry awareness and engagement with climate risk have clearly shifted. The industry has developed new approaches to physical risk assessment, revised investment underwriting criteria and asset management practices, and experimented with new forms of cross-sectoral and community-level collaboration related to climate resilience.

Building on that momentum, this report focuses on a dimension of climate change that has yet to be adequately incorporated in real estate investment decision-making: climate migration. The International Organization for Migration broadly defines *climate migration* as the movement of people who, because of sudden or progressive environmental changes, are forced or choose to leave their place of residence, temporarily or permanently, by moving within or between communities, states, or nations.<sup>1</sup>

In 2020 alone, extreme weather events are estimated to have displaced nearly 31 million people globally.<sup>2</sup> The Internal Displacement Monitoring Centre projects that approximately 14 million people could be displaced each year by sudden-onset disasters like hurricanes, floods, and earthquakes, including hundreds of thousands of individuals in North America and Europe.<sup>3</sup> These estimates focus only on a limited set of drivers, scenarios, and time horizons for climate migration. Nevertheless, they illustrate the potential for profound shifts in where and why populations will locate or relocate in a climate-changed world.

Climate migration is increasingly at the top of international policy agendas. In October 2021, the Biden administration in the United States released an extensive report on the potential impacts of climate change on international and domestic migration, for example.<sup>4</sup>

Although climate migration may not seem to be of immediate concern to real estate investment decision-making, the COVID-19 pandemic demonstrates how unexpected shocks can suddenly and substantially transform individual and institutional location decisions. These migration decisions have had multifaceted ramifications for real estate markets and investors. Recent catastrophes have also shown, in real time, how even the most prosperous of communities struggle to manage climate shocks. In 2021, global insured catastrophe losses exceeded the \$100 billion threshold for the fourth time in five years.<sup>5</sup>

Climate migration presents profound societal challenges directly relevant for real estate investors and other land use professionals for two core reasons. First, climate migration may lead to significant shifts in demand for real estate as individuals and communities respond to changing environmental and economic conditions. Some property markets, or segments of them, could decline as individuals and businesses locate away from communities unable to manage the effects of climate change. New real estate investment opportunities are also likely to emerge in neighborhoods and regions better poised to absorb climate shocks and stressors. When, where, and to what extent are these dynamics going to have a material financial impact on real estate investment? How can potential acquisitions and existing holdings be assessed with climate migration in mind, and how can this insight be translated into sound investment management strategy?

Second, climate migration points to the need for proactive real estate investment approaches that promote effective, efficient and equitable climate change adaptation at the market and asset level alike. Sustained investment activity in areas likely to see population decline caused by climate-related disruption poses a direct investment risk and can erode societal adaptive capacity. Governments and taxpayers could become locked into costly and inefficient forms of infrastructure and service provision at precisely the time when fiscal resources will be needed to reduce carbon emissions and to shift people and capital out of harm's way. What types of real estate investment, and in which locations, will promote stable returns on investment, yet can also help society cope with the challenges of climate migration, in particular, and the climate transition, more broadly?

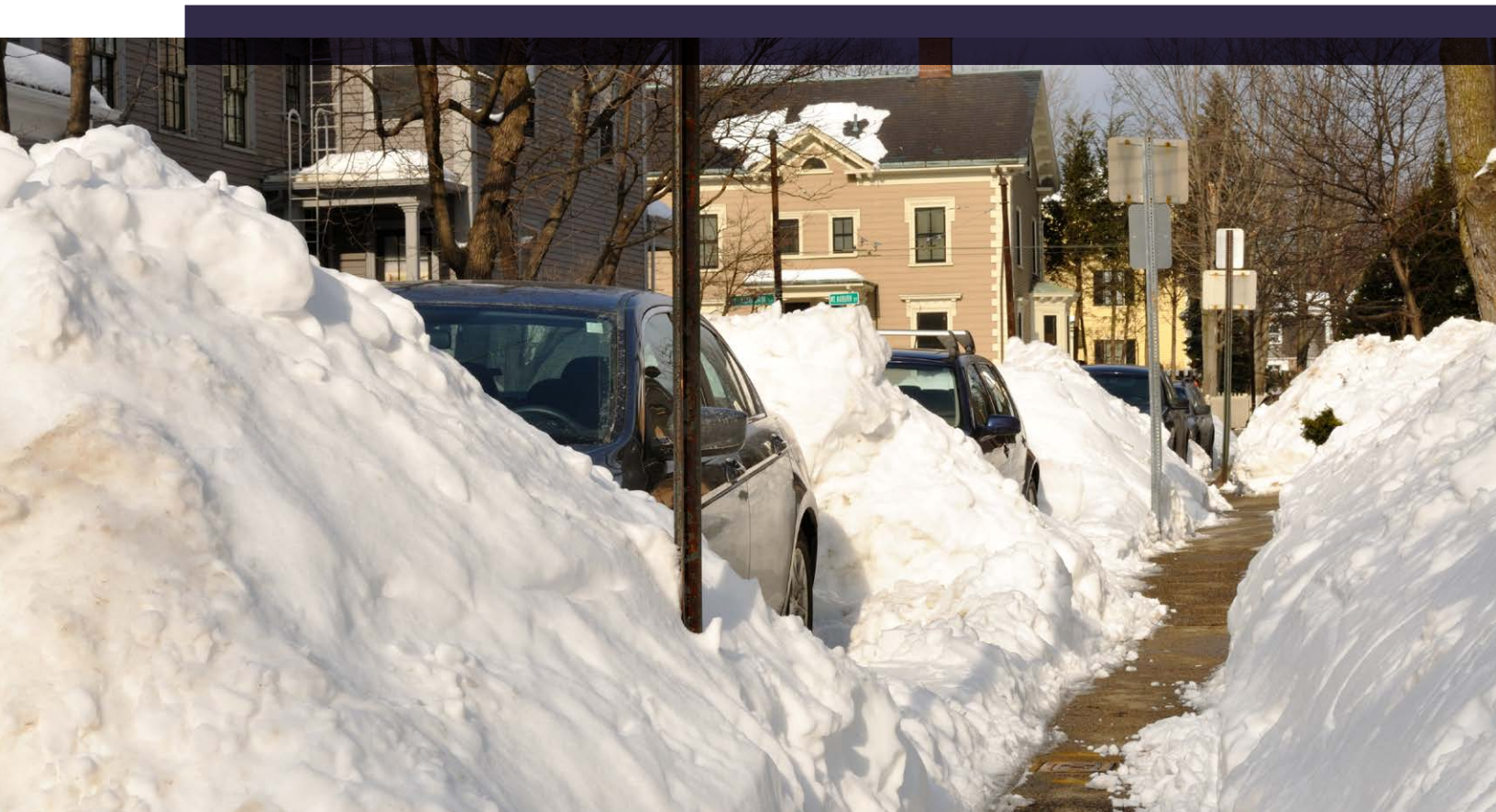
Moving from high-level recognition of these macro-level economic and political challenges to a more granular appraisal of climate migration and its implications for real estate poses several analytical challenges. Migration patterns and location decisions are shaped by a wide range of personal and systemic factors, such that the “climate” aspect of migration cannot be easily isolated and explained. Researchers have pointed to several limits with the concept of climate migration, given the many factors that shape human mobility decisions.<sup>6</sup> Climate change, and its effects and governance, are uncertain and geographically variable, particularly when analyzed in the context of long-term investments in the built environment. Responses at the urban area and asset levels to highly localized climate needs and opportunities are wide-ranging and difficult to assess, generalize, and compare for investors. In these ways, climate migration adds an additional and cross-cutting layer to the real estate investment decision-making landscape.

Given these analytical challenges, real estate investors will need to break down climate migration into a core set of considerations that can be examined in the context of their asset- and market-level climate-risk management strategy.

The report presents perspectives from leading real estate investors and land use professionals, who are beginning to define and address climate migration in relation to what

they see as the key asset- and market-level drivers of climate risk and resilience. Because climate migration is a new concept for many real estate investors, some investors could share their long-term plan to assess, price, and mitigate migration-related risks, whereas others were new to the topic. This analysis blends these perspectives and identifies opportunities and challenges relevant to investors at every stage of this analytical journey. While participants broadly recognized the importance of climate migration as a global challenge and humanitarian issue, in-depth discussion was generally focused on a smaller geography of markets where real estate investment is currently concentrated. Interview participants included leading investment practitioners, researchers, and consultants based in North America, Europe, Asia, and Australia; their affiliations are listed at the end of the report.

The report also outlines a framework for assessing climate migration-related risks in the real estate investment decision-making process, building on the best practices and insights presented in the first section. Finally, the report identifies actions the industry should take to deepen its engagement with climate migration, be it at firm-level investment management, across the real estate value chain, or within the communities in which they invest.







## Climate Migration in the United States

As Louisiana and other U.S. states recover from Hurricane Ida's devastating landfall in August 2021, data compiled by the Center for American Progress illuminates the long-term impact of Hurricane Katrina (2005) on migration patterns and population dynamics along the Gulf Coast.<sup>7</sup> Of the 1.5 million people who evacuated in advance of Katrina, roughly 40 percent had not returned to their prestorm residence after a decade. Only a quarter stayed within 10 miles of their initial county of residence, and roughly 10 percent relocated at least 830 miles from their previous home.

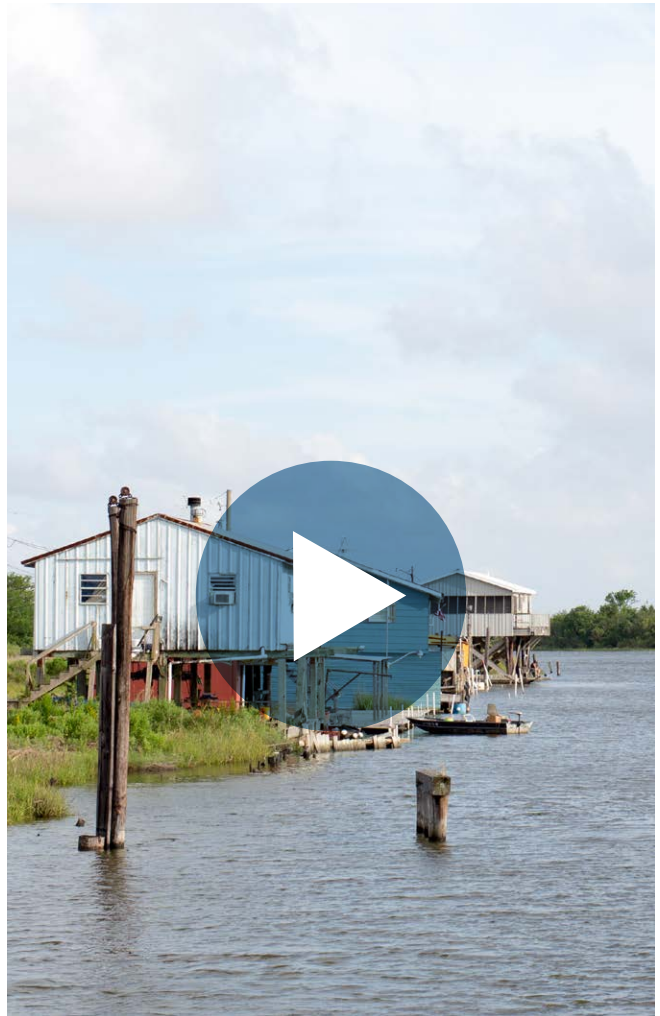
Extreme events like Katrina and Ida are not the only drivers of coastal migration in Louisiana, however. Nearly 98 percent of the Isle de Jean Charles is now underwater from the combined effects of rising seas, land subsidence, and erosion, the latter two of which have been driven by levee building and canal-dredging works in the Mississippi Delta. Since 1950, the island has lost almost 90 percent of its population. In 2016, the U.S. Department of Housing and Urban Development awarded the indigenous residents of Isle de Jean Charles a \$48 million grant to fund the community's permanent relocation. Residents have subsequently been named Louisiana's first "climate refugees."<sup>8</sup>

While post-Katrina infrastructure improvements appear to have insulated New Orleans from the worst of Ida's impacts, less well-resourced communities like Isle de Jean Charles must decide whether to rebuild in harm's way or to retreat.<sup>9</sup> The Isle de Jean Charles example shows how individual and collective experiences of disaster, the personal and institutional challenges posed by recovery, attachments to place, and perceptions of future environmental and economic risks and opportunities come together to shape migration decisions and pathways.

Climate migration in the United States can also be seen in several other contexts—and in their interconnected futures. Hurricane Maria's devastating landfall in Puerto Rico in 2017 prompted hundreds of thousands to leave—estimated at between 4 and 17 percent of the island's population, depending on the data source and assessment approach—or to move from rural to urban areas.<sup>10</sup> Many relocated to New York and Florida, where existing Puerto Rican communities have thrived for decades. Yet in both New York and Florida, recent disasters and worsening exposure to sea-level rise are actively informing efforts to shift people and capital out of harm's way.

In the aftermath of Hurricane Sandy, New York City has ramped up home buyouts in highly vulnerable neighborhoods and instituted zoning restrictions in the most flood-prone areas. The city is considering a new comprehensive waterfront plan that could incorporate “housing mobility” programs that facilitate residents’ relocation and new development on higher, safer ground.<sup>11</sup>

In low-lying South Florida, where “sunny-day” floods regularly inundate city streets, shifting infrastructure, planning, and real estate investment approaches are reshaping community demographics.<sup>12</sup> This is most clearly documented in debates over climate gentrification, which focus on how property investment in higher-elevation areas displaces lower-income communities of color, often to areas with less physical, economic, or social resilience.<sup>13</sup>



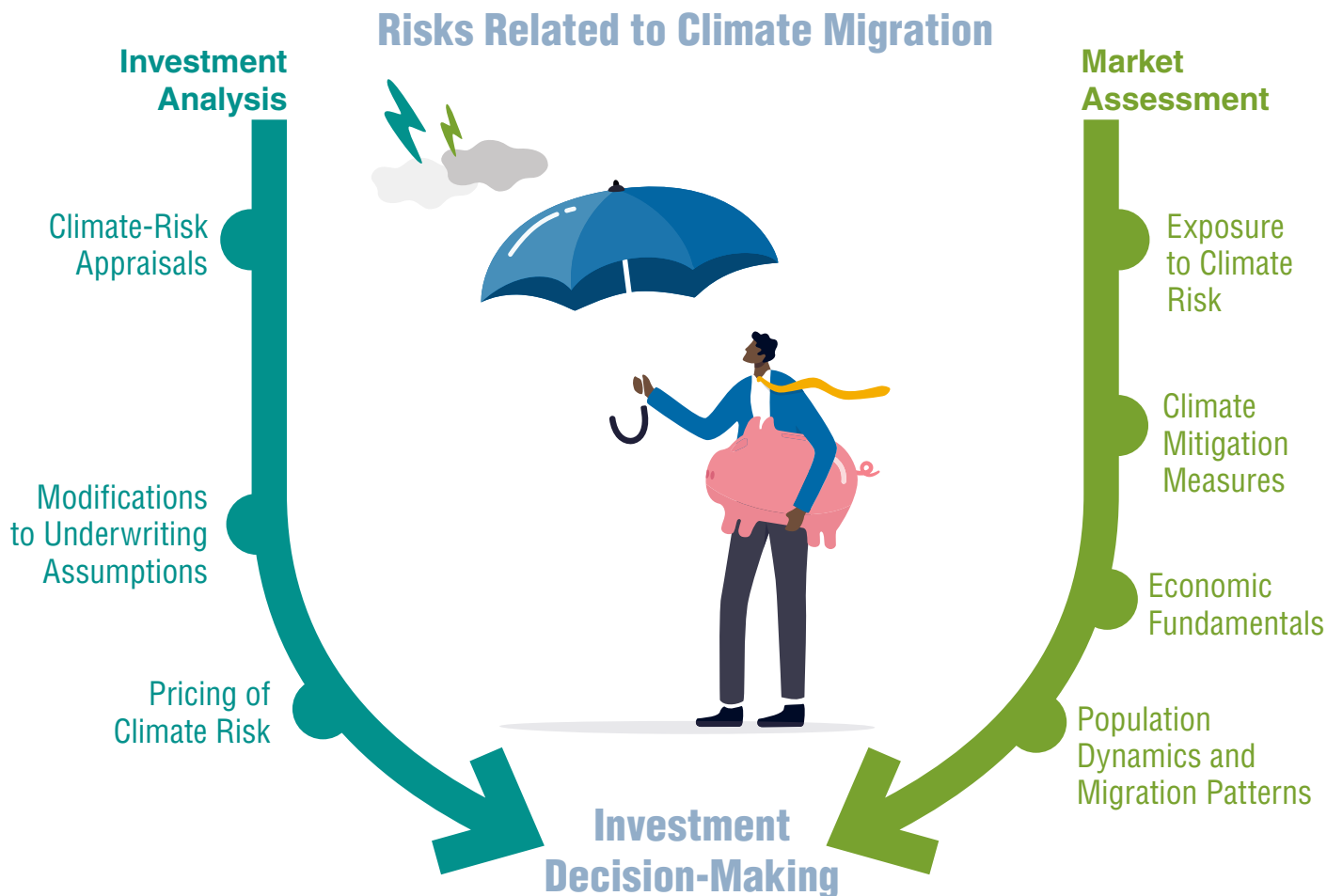
### THE VANISHING ISLAND

Listen to perspectives from the last residents of the Isle de Jean Charles, Louisiana, in this short *New York Times* documentary.

[\*\*CLICK HERE TO PLAY\*\*](#)



## 2. Connecting Climate Migration to Real Estate Investment: Emerging Perspectives



### Climate Migration–Related Risk Assessment Builds on Existing Climate-Risk Appraisal Strategies

Climate-risk assessment is increasingly standard practice in real estate investment decision-making. For the head of strategy at a large international real estate investment manager, the climate-risk assessment process begins by screening a portfolio against a suite of climate risks. If investments surpass a predefined threshold of physical risk exposure based on the probability of hazards like flooding or wildfire, the investment team begins a more robust process of scrutiny. At this stage, they look for evidence of existing or feasible asset- and community-scale risk management

measures. Decisions about investment in resilience measures, adjustments to the financial performance of the asset, and other forms of engagement follow.

For this investor and several others we spoke to, consideration of migration-related factors begins at a second, deeper stage of assessment. Climate migration–related investment risks are generally understood to include a dynamic set of factors that determine whether or not the market or neighborhood in which an investment is located will be able to adapt to climate change.

One investor poses a series of open questions: “How successful are the industries in that area? How nice of a place to live is it? Are there places that are similar and nearby that people could migrate to without their way of life being fundamentally changed? What kinds of work are people doing in that area, and how easy is it to get a similar job elsewhere, or to transfer within a company?”

How strong are the municipal adaptations, and how much confidence does the local population have that they will be improved in the future?”

Like many peers in the field, this investor is now on a journey to identify how to address and prioritize these questions in relation to key investment markets with high physical risk exposures. Moving forward, they expect to systematize this research process, which may include a standardized output that acquisition and asset management teams can use to monitor climate risks in the most vulnerable markets in which they invest.

### Assessing Market-Level Risk Governance in the Context of Climate Migration

Following an initial appraisal of physical risk exposure, investors ask if the asset is protected by local infrastructure and resilience measures or if there is sufficient market-level adaptive capacity. Adaptive capacity can be defined as the ability of place-based institutions to mitigate climate risks and implement effective adaptation strategies.<sup>14</sup>

On one hand, investors generally frame adaptive capacity as a function of existing or ongoing physical infrastructure projects, resilience plans, and complementary adaptation interventions (e.g., risk mitigation and recovery programs). Multiple respondents reflected on how they gather, assess, and integrate this type of data in their investment decision-making process.

For one long-term global investor with substantial investment exposure in a high-risk market, this process began with a trip to that region, when the investor met with local resilience officials to review climate-related policies and plans. The visit helped the investor evaluate whether the institution’s asset-level adaptation measures were sufficient, and it offered greater assurance about the position of the investment in the context of community-scale resilience interventions. The trip also inspired an ongoing process of learning and exchange with local resilience officials, which continues today.

In addition to monitoring updates from public officials in the region, this firm recently weighed in on a large infrastructure project and funded alternative design studies to inform the public debate about how to incorporate additional community priorities in the infrastructure program. A broader community campaign to amend the proposal was ultimately successful, and new plans are now in development. Building on these insights, the investor has developed its internal capacity to evaluate resilience beyond the asset level, and the firm has taken up similar conversations with public-sector stakeholders in other risk-exposed markets where it invests.

On the other hand, adaptive capacity is seen in terms of the fiscal capacity of a community to finance risks through municipal bond markets, property tax levies, government grants and transfers, or other means. In the U.S. context, highly localized public finance systems tend to rely on real estate market stability, which both increases their economic vulnerability to physical climate risks and incentivizes governments to implement measures that protect their property tax base. This also means that communities have widely disparate fiscal capacities to deliver infrastructure and services.

Multiple investors noted that current-day local government fiscal capacity is not a sufficient indicator of long-term adaptive capacity, however. The capacity to finance adaptation is connected both to the degree of physical risk exposure and to the alignment of interests needed to support and sustain adaptation interventions over time. For example, a community may have a large property tax base but may not have the political support required to increase tax assessments to finance resilience projects, or the necessary co-funding or requisite regulatory approval from other government agencies.

One participant captures part of these complexities by walking through the types of dilemmas that high-exposure communities are beginning to face: “If sea-level rise impacts a local community, then somehow we need to value what we will lose [e.g., property value or economic activity], then determine how much it would cost to not lose it. Fundamentally I think that’s what it will come down to, as much as we can look at how we build resilience at a community level. . . . If the only road that’s going into that community is going to be underwater, the community can’t really do much about it without some form of capital.”

## THE MAYORS' PERSPECTIVE

Read the Global Mayors Action Agenda on Climate and Migration.

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One participant emphasizes that a number of localized institutional, legal, and cultural factors—above and beyond fiscal capacity and access to capital—will further shape how communities navigate the challenges and opportunities of climate adaptation. This source highlights three related points relevant to investors.

First, current community development and planning guidelines, along with infrastructure and insurance market subsidies, can enable problematic development in vulnerable areas. This increases a community's long-term economic exposure to climate risks and creates deferred adaptation costs:

*"I'm watching developers build in the floodplain, and they're adding miles of road that they won't have to pay to elevate or to maintain. The state will have to pay to maintain it. They're building in the floodplain and they're building new assets that other people will have to pay to maintain and to adapt."*

Deferred adaptation costs are likely to constrain municipal fiscal capacity in the future, forcing communities to make financial tradeoffs—either existing public funds will be diverted to adaptation or taxes will have to increase—or to otherwise revise their legal system, which in many contexts require local governments to maintain services to properties or to compensate property owners accordingly. In addition to raising several social equity concerns, these dynamics pose direct real estate investment risks, should higher property taxes and asset insurance costs intersect with declining public amenities and property values.

Second, the financial system that underpins local real estate markets and public finance has yet to be sensitized to climate risk, or depends on subsidies that may not be sustained in the future. The potential removal of insurance subsidies, the incorporation of climate risk in municipal bond ratings, and the inclusion of climate risks in mortgage lending and other real estate finance practices could increase the costs of capital in high-exposure communities, diminishing their overall fiscal capacity. Investors could experience these changes directly and indirectly in the form of higher expenses and diminishing asset valuations. Investors could experience these changes in the form of higher operating expenditures and costs of capital, or declining asset valuations.

Third, infrastructure investment patterns are often contoured to areas with the highest concentration of property value at risk, rather than vulnerable demographics. This could make migration the de facto adaptation response for residents who do not own valuable property, according to one participant. "So, if your home is worth more, it's more cost-effective to protect it. If your home is not worth more, it's not cost-effective to protect it. And so, this is what I mean about relocation becoming the default. If we don't protect it, then you see more relocation, both in terms of managed retreat and also, I imagine, people just abandoning their homes." This source believes these converging factors will prompt difficult local conversations about where to defend and where to retreat.

## EVERYTHING YOU WANTED TO KNOW ABOUT MANAGED RETREAT

Dr. A.R. Siders makes the case for managed retreat on *America Adapts: The Climate Change Podcast*.

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The predominance of this property value-driven approach to infrastructure provision, the fragmentation of government fiscal and technical capacities, and the uncertain future of financing mechanisms that enable high-risk development (such as subsidized flood insurance) all point to highly variable market-level adaptation trajectories in the United States. This suggests that real estate assets in relatively high-value communities or neighborhoods may be given priority for adaptation investment. Yet those very adaptation measures could exacerbate social and spatial inequalities, with losses and displacement accruing in lower-income and housing cost-burdened residential areas first. Social conflict and political destabilization may increase if these inequities are not addressed within local climate strategies. In this context, markets, states, and nations with robust climate strategies may offer comparatively safe investment opportunities in the future. When discussing the adaptive capacity challenges facing cities in the United States, participants cite Singapore and the Netherlands as places they believe will be better positioned to absorb climate shocks and stressors, for example.

## Residential Markets Could Signal Where Migration-Related Risks Are Most Acute

“We have talked about residential being the ‘canary in the coal mine,’ residential being the early indicator of what’s happening first,”

explains one investor, who believes that the higher volume of residential transactions will reveal climate migration trends before they appear in commercial real estate segments.

One set of residential trends relates to the economic fundamentals of ownership and tenure. In addition to residential property tax costs, insurance costs, climate retrofits (e.g., solar panels, hurricane shutters), disaster damages, and property reappraisal driven by perception risk could directly affect residential market economics. Changing market economics could put ownership out of reach for would-be buyers, or make it unaffordable for existing owners. In markets with intersecting social, economic, and environmental vulnerabilities, resource-strained owners may begin to sell their homes, as is already happening in areas like Little Haiti in Miami. One investor speculates that such markets could become dominated by renters rather than owner-occupiers over the longer term.

This set of dynamics could have several direct and indirect impacts on real estate investment. A transition from a diverse residential ownership base to a renter-dominated market could see a growing share of climate risk held by institutional owners, which could present both an investment risk and a management challenge for investors, for example. Given that tenants typically do not hold significant amounts of property insurance relative to owner-occupiers, this may place greater risk on the investor-owner. Indirectly, the growing costs of climate change could increase affordability challenges in real estate markets, eroding consumer demand for goods and services and decreasing demand for commercial real estate. Businesses may revisit location challenges should they face labor recruitment challenges—because of either high costs of living, diminished quality of life, or both—which could also result in reduced demand for commercial real estate.

## IS CLIMATE GENTRIFICATION HAPPENING IN MIAMI?

Miami stakeholders unpack the links between real estate, climate resilience, and social equity in this PBS short.

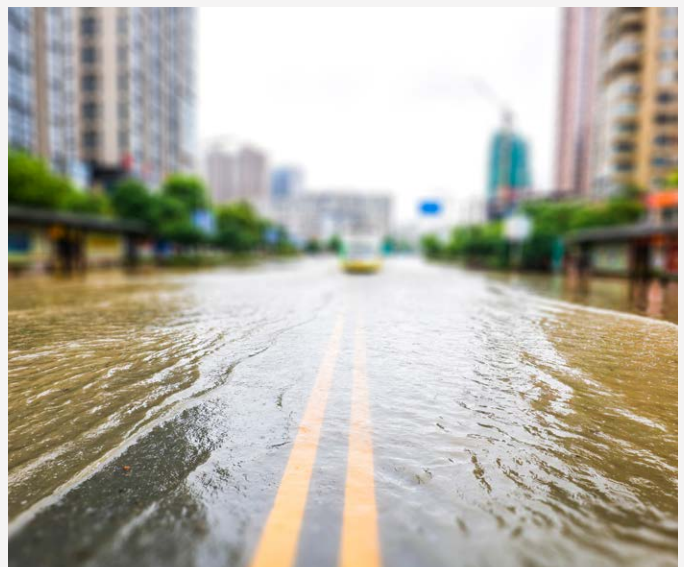
[CLICK HERE TO PLAY](#)

A related set of dynamics stems from a link to the variable adaptive capacity of residential market actors—and low-income residents in particular. Several respondents asked if climate-exacerbated housing affordability issues will worsen inequality, and they raised concerns about the implications for societal stability.

One consultant who advises both investors and governments on climate governance expressed this succinctly: “I think well-resourced people will be able to make decisions in some way, either with insurance or not. I’m much more concerned about the people who are going to be left behind, which is the majority of people, particularly in the United States. If you look at people who purchase second homes and retirees who’ve moved to coastal places like Florida or the Carolinas, and then the poor working communities on the coast who don’t have access to capital, and you actually talk to them,

... it’s not that [residents] don’t know what’s going on; they literally don’t have the capital to move.

If you look at this at a global scale, this is exactly what’s happening in the Pacific Islands.” An investor at a large fund echoed the concern that those who remain in “compromised locations” are “the ones who will bear the brunt of the climate emergency because they have no other financial choice.”



## Market-Level Economic Fundamentals Will Influence Location Decisions

Investors highlight the need to rethink conventional market-level economic research in relation to climate and migration-related risks. Several participants pointed to opportunities to complement well-established indicators like gross domestic product, median income, or education attainment with more granular sector- and firm-level indicators of climate-risk sensitivity to better understand the durability of real estate demand within high-risk markets.

First, investors can connect market-level economic resilience to the climate-risk sensitivity of key sectors within a market. The agricultural sector has heightened sensitivity to physical risks, whereas the energy sector faces comparably high exposure to transition risks. While markets and key sectors may be broadly sensitive to both physical and transition risks, the analytical challenge is to interpret the extent to which a specific market's economic fundamentals are contingent upon sectors with elevated risk exposure. For example, does the energy sector contribute an above-average share to market output? How would decline in agricultural production impact market-level economic performance?

Second, investors need to evaluate the extent to which climate-sensitive sectors are able to manage risks. For example, to what extent can the logistics sector mitigate their exposure to physical disruptions along supply chains or adapt to transition risk-related costs like higher taxes on emissions-intensive transportation activities? Investors need to consider how these dynamics are spatialized in relation to market-level resilience. To this point, one investor compares recovery trajectories after Hurricane Katrina in New Orleans and Superstorm Sandy in New York. The participant speculates that the presence of large and diversified corporations and other anchor institutions facilitated a faster recovery in New York in comparison with New Orleans, where the tourism sector and smaller firms are more predominant. According to this investor, both sectoral composition and firm-level dynamics are two of multiple factors that explain these diverging recovery trajectories.

Notwithstanding important differences between these two cities, this divergence could in part be attributed to the comparably strong risk management capacities of larger

businesses, including better access to insurance and capital for mitigation and recovery. Larger firms may also wield more influence over the scope and speed of recovery, rebuilding, and resilience efforts. At the same time, disaster assistance and resilience planning support for small businesses may not be sufficient.

Third, investors need to be aware that sector- and firm-level resilience dynamics could have ramifications for individual and corporate location decisions. For example, one investor notes that

*a growing number of firms have shifted operations to areas with lower physical risk exposure after experiencing disasters or near misses firsthand, which suggests that climate risk may become a significant factor in firm location decision-making.*<sup>15</sup>

Drawing on firsthand experience in Puerto Rico and other Caribbean island communities affected by Hurricane Maria, a second participant contends that declining local economic opportunities and the comparative opportunities available in other regions have prompted substantial outward migration over the post-disaster period. Transition risks could similarly induce firm-level relocation as certain markets or regulatory contexts become unfavorable for carbon-intensive industries, or if tax policies and other public subsidies are used to attract new carbon-neutral industries, as examples.

Sector- and firm-level climate-risk sensitivities could directly and indirectly shape real estate demand within a market. On one hand, investors should be aware of the risk management capacity of a market's key tenants (e.g., an energy firm that is the main tenant of a large office tower the investor owns). On the other hand, investors must make a broader appraisal of market-level economic resilience and any disruptions that could more indirectly undermine demand for space. For example, increasing costs of living or declining quality of life caused by climate risks and growing costs of adaptation could contribute to the outward migration of key demographic segments. This could winnow the client base of retailers or create recruitment and retention challenges for major employers. In this scenario, declining demand for residential, retail, and office space is a possibility that investors might consider.

## Types of Climate Risk



**Physical risks** relate to the physical impacts of climate change, such as increasingly severe storms, sea-level rise, extreme heat, and wildfires.



**Transition risks** are the broader risks associated with climate change and a transition to a low-carbon economy, such as regulatory change, resource availability, and reputational and market shifts.

## “Downside” Markets Dominate Investor Climate-Risk Concerns

Investor discussion about climate migration tends to focus on places likely to be adversely affected by climate stressors and outward mobility, rather than on the geographies that may grow because of retreat and relocation. “We’re not placing a premium on higher-ground assets at the moment, so we’re probably focused more on the downside risk of climate,” says a senior executive at a major international investment firm. Participants touched upon several decision-making factors that may explain this oversized concern with the downside of climate risk. Potential explanatory factors range from the need to make near-term investment decisions about current or potential acquisitions in high-exposure markets, to the uncertainties associated with medium- to long-term climate science and modeling techniques.

This investor focus contrasts with an emerging conversation about “receiving communities,” which centers on places seen to be well positioned to absorb growth as people and capital shift out of harm’s way. In the United States, Duluth, Minnesota, and Buffalo, New York, have dubbed themselves as “climate proof” and a “climate refuge,” respectively, given relatively favorable climate projections.<sup>16</sup> In the Netherlands, the country’s top water management official recently called on government ministries to begin studying ways to shift populations and investment from high-risk areas to comparably safer ground, including a shift from the highly urbanized Randstad region in the low-lying west of the country, to the higher-elevation, less urbanized east.<sup>17</sup> Officials in Indonesia are pursuing a plan to relocate the nation’s capital from Jakarta to Borneo, given the former’s chronic struggles with flooding, land subsidence, and other urban and environmental challenges.<sup>18</sup>

While the participants who cite these examples stress that these are early plans or speculative visions, they join a growing number of commentators calling for managed retreat from high-risk areas, which range from neighborhood to intercontinental scales.<sup>19</sup>



## ASIA’S SINKING CITIES: JAKARTA

See how land subsidence, sea-level rise, and other interconnected development challenges are being addressed in Jakarta in this CNA Insider investigation.

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However, one participant underscores that most research on migration in the United States shows that long-distance relocation—for example, from Miami to Minnesota—is currently the exception rather than the norm, with most people moving within the same county or just beyond it. “It seems to be more than likely the receiving communities are going to be the communities five miles inland,” the participant speculates.

Nevertheless, the managed retreat debate draws attention to the potential destinations of populations and the mechanisms that could shape the character and pace of migration. As this contributor notes, roughly 40 million people in the United States are living in areas with high flood-risk exposure: “If they all move tomorrow that’s a big deal. If they’ll move over the next hundred years, that’s not a big deal.”

Public and private investment decisions that locate infrastructure, jobs, and amenities in settings with lower physical risk exposure may create a positively reinforcing migration pull effect. New public investments, like hospital and school building, or decisions about where to locate municipal utilities moving forward, could steer future private development and location decisions. Transition risk–related investments decisions, such as a decision to site large-scale renewables investment in new regions, could also alter real estate market demand. Whether these pull mechanisms will counterbalance push factors—such as a major coastal disaster or the removal of subsidized flood insurance—remains to be seen.

These exploratory, longer-term planning and policy questions are difficult to directly link to near-term real estate investment decision-making. Local, national, and international governments will play a decisive role in shaping these new geographies of opportunity and/or decline. However, participants and commentators broadly note that investors will invariably shape these dynamics as they sensitize their investments to climate risk, redeploy capital, and share their risk management expertise with communities. These larger and proactive possibilities are explored in further detailed in the “Next Steps” section of the report.



## Investors Face Barriers to Acting on Insights

The majority of investors interviewed see both migration and climate risk as important determinants of market performance and return on investment, but they are only beginning to integrate these issues into their investment decision-making processes.

“For investors, it’s really a challenging time because all of these traditional indicators and models are pointing to conclusions that may be different from a climate-centric way of thinking about migration,”

says one respondent based at a large international property investor. A second investor echoed a similar frustration: “How do we start to make decisions in the absence of clear information which is aligned with what we believe to be the right long-term trajectory for our investments?”

Teasing apart this challenge reveals two issues that investors find difficult to square. First, existing models and risk management tools have significant analytical limits. Second, market dynamics continue to drive investment in (and returns from) many of the most climate-risk-exposed places. These dual issues pose barriers to identifying and addressing climate migration-related risks in existing investment horizons and frameworks, creating what one investor called a “perfect storm that’s stopping a lot of product evolution.”

As noted, existing assessment tools and models do not adequately capture the complexities of climate migration. This is a systemic, rather than sector-specific challenge, given the multiple factors that shape human migration and the rate of climate change and the distribution of its effects. Nevertheless, specific industry approaches may need to be complemented with new research methodologies and performance indicators.

For example, one investor emphasizes the limits of mainstream approaches to measuring real estate climate risk, which use value-at-risk (VAR) projections of the potential asset-level damage that may be incurred because of a variety of physical shocks and stressors. “That’s helpful for an insurance company. I don’t know how helpful that is for a real estate investor because the value-at-risk to us shows up quite differently to that. . . . I think there’s a huge amount that goes into the value-at-risk and I think that just purely looking at this as the ‘damage divided by the value of the building’ is overly simplistic.”

The investor cautions that VAR outputs may distort perceptions of risk. Estimates can overplay risk in some

cases, yielding striking loss estimates without taking into consideration market-level factors that mitigate or exacerbate that risk. In addition, insight about the potential costs of physical damages does not necessarily shed light on the impacts of climate risks on key performance indicators like net rent or exit yield. Finally, focus on physical damage estimates may obscure the systemic economic and social factors that will shape the resilience of a given investment or the adaptive capacity of key demographics or markets.

Similarly, one participant points out that investor sentiment is shaped by the extent to which new knowledge is taken up within the industry. Factors that are well defined by the industry may be overemphasized in investment decision-making, at the expense of those that are not yet widely understood.

To underscore this point, the participant compares sentiments about the unfunded costs facing Chicago and South Florida, related to pension obligations and climate resilience investment, respectively. “For one an actuary can tell you what those are, and for the other you need a whole bunch of underdeveloped disciplines to pitch in to contribute their views on climate adaptation and risks. And as we’ve learned, every kind of risk provider has different answers for the same piece of land, as to what those risks are, so it doesn’t surprise me that no one can quantify that.” To this end, this investor points to several established data sources and performance indicators that can be adapted or triangulated to construct a more robust appraisal of climate migration risk-related factors. “Fiscal conditions have tended to be big predictors of migration patterns,” the investor notes, adding that the company’s team has considered loading climate adaptation costs into existing fiscal models.

At the same time, this investor believes in relying on a blend of qualitative and quantitative insights, rather than focusing on model outputs. The investor argues that

“We need to build into our models as much as we can, but we also need to be aware of when we should be making a thematic call on inflection points and when our knowledge of the past is not relevant to our decision for the future.”

## DIVE DEEPER INTO DATA

“Data analytics are a starting place, not the ending.”  
Learn more about how investors use climate-risk assessments.

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## NEW TO SCENARIO ANALYSIS?

Construct climate scenarios with guidance and data provided by the Task Force on Climate-Related Financial Disclosures and Climate Disclosure Standards Board.

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## INCORPORATING DISPLACEMENT RISK

Explore the Internal Displacement Monitoring Centre’s Global Displacement Risk Model for insights.

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To the second point challenging investors, countervailing market and migration forces may be creating near-term opportunities in regions with longer-term climate risks. According to one investor,

“All of the economic and secular trend patterns are pointing to conclusions that perhaps would be dampened by including climate in those models. Some of the metro areas that have been doing very well have fundamental, existential threats from climate risk.”

The analytical challenges of defining and addressing systemic risk and resilience factors like migration run up against the need to make immediate investment decisions about opportunities in high-risk areas. As a result, a second investor is concerned that the industry runs the risk of maintaining “business as usual,” of approaching investment decision-making only “a little bit differently so that we don’t get in trouble” with regulators or clients, despite the clear need for more climate-sensitive strategies.

Grappling with this dilemma, investors offer a variety of responses. Multiple respondents say they have turned down opportunities in markets with strong near-term fundamentals yet significant long-term climate-risk exposures. In contrast, the head of one large global fund has adopted a much more agnostic outlook on climate migration-related risks. This investor operates with the assumption that these risks are not likely to be material over the fund’s investment horizon, which at most consists of two or three 10-year investment cycles, or that there will be sufficient opportunities to shift capital—potentially to other markets or to different types of assets in high-risk areas.

Other investors have taken an intermediate route, focusing on ways to develop their capacity to assess climate migration-related risks that they believe are material in a given investment context. Several investors now closely monitor a number of factors on a recurring or deal-by-deal basis. These insights are increasingly taken up in deal-specific deliberations or investment strategies more broadly. They are reflected in ongoing asset management decisions, ranging from capital expenditure planning to financial performance analysis. This knowledge also increasingly shapes how and why institutions engage their asset managers, insurers, research consultants, or public-sector resilience officials. This remains an emerging domain of investment decision-making, one that varies among institutions and will continue to evolve as industry participants continue to adopt and iterate on their approaches to climate-related risk assessment.



### 3. Taking Action: Assessing Climate Migration in Real Estate Investment Portfolios



This section distills investor insights about climate migration–related risk factors into a two-step framework for assessment. The framework is a high-level decision-support tool real estate investment institutions can use to arrive at a preliminary understanding of which climate migration–related and broader market-level risk factors may be material to their investment strategies. In **Step 1: Preliminary Market Screening**, users can prioritize markets that require more thorough assessment. **Step 2: Deep-Dive Market Assessment** facilitates a more granular and expanded consideration of climate migration–related factors. At the end of the exercise, investors should be able to assess the following:

- Which markets and submarkets have heightened exposure to climate migration–related risks;
- Which place-specific factors are most likely to exacerbate or mitigate climate migration–related risks and push/pull dynamics; and
- Which factors are likely to be material within particular investment horizons.

Investors can use these insights to facilitate dialogue regarding how their investment decision-making and management practices can be adapted, as needed. Opportunities for further analysis and integration with investment decision-making are suggested in the “Additional Steps” section.

Before beginning the exercise, investors should first identify the strategic issues they wish to address.

- Is the institution looking to assess climate migration in relation to its existing holdings or new acquisitions?
- Is this exercise intended to support ongoing due diligence or to inform discussions about long-term investment strategy?

These questions will vary based on where the institution invests and the extent to which its existing climate-risk management approach and overall environmental, social, and governance (ESG) strategy and research capacities are established. These questions can be used to foster consensus about the strategic issues that are highest priority, to identify the types and number of markets on which to focus more-detailed assessments, and to identify the stakeholders that need to be involved in further assessments.

After defining these initial parameters and considerations, investors should proceed to **Step 1: Preliminary Market Screening**. Using insights from leading investors, this step is intended to help investors prioritize which markets require more thorough assessment. The following table offers a checklist of criteria, strategic issues, and potential indicators to address in Step 1. Given the preliminary scope of this assessment, users can respond to each question with a rough appraisal of relative risks. The “Hypothetical Comparative Heat Map Framework” on page 18 provides an example of how responses can be recorded to create a qualitative “heat map” that enables a high-level comparison across markets.

This design and approach can be refined given the level of capacity and existing market-level insights available within the institution. For example, some real estate investment institutions have developed quantitative and composite asset- and market-level risk scores, based on proprietary internal and third-party data weighted according to firm-specific criteria.

Based on these results, investors can prioritize which markets should be more closely scrutinized in **Step 2: Deep-Dive Market Assessment**.



## STEP 1 Preliminary Market Screening

Criteria	Strategic issues	Indicators
1.1 Economic fundamentals	Real estate investment decision-making begins with an assessment of the economic fundamentals of a region: Are job growth and incomes strong? Is the economy diversified across sectors and anchored by large and committed employers? Is the area attractive to newcomers or for retaining talent? Does the area have a high rate of inequality? Is housing available and affordable at multiple price points? In sum, is the economy strong enough to absorb and recover from a climate shock?	<p>Levels of protection offered by existing infrastructure and insurance systems</p> <p>Area median income; disposable income</p> <p>GDP sectoral composition</p> <p>Corporate and/or anchor institution presence</p> <p>Inequality</p> <p>Housing affordability</p>
1.2 Physical risk exposure	<p>Physical risk assessment is increasingly standard practice among real estate investment institutions. Investors should consider market-level physical risk exposure, how it is are likely to change over time and in line with high- and low-emissions and government response scenarios, and the extent to which their asset-level exposure merits closer scrutiny of the market. Value-at-risk assessments derived against a suite of hazard exposures provide a preliminary approach to quantify physical risk.</p> <p>Investors underscored the need to consider a wide range of physical hazards, including hurricanes, flooding and sea-level rise, wildfires, and heat and water stress. How will various physical shocks and stressors affect assets, their users, and markets at large? For example, will a commercial tenant dependent on water have sufficient or affordable access needed to maintain operations? What about residential water restrictions and their impacts on the use or cost of amenities? What is the net financial impact of a lack of and/or higher cost of water access, and when does relocation make sense as a result?</p>	Physical risk exposure of assets and market, including value-at-risk for a suite of hazards

Criteria	Strategic issues	Indicators
<p>1.3 Transition risk exposure</p>	<p>Real estate investors are primarily concerned with transition risk from an asset-level perspective. Will assets need to be retrofitted to meet new energy efficiency standards, for example? How will this impact investment performance, including capital expenditures, future operational costs and savings, and tenant demand for space? Transition factors may indirectly relate to migration risk, as prospective tenants seek real estate which complies with high standards, or as current tenants can no longer afford the additional costs incurred due to asset retrofits, as potential examples.</p> <p>It is important that investors also consider market-level transition risks as they relate to the economic fundamentals of a region. Areas where the energy sector constitutes a relatively high share of economic activity may face greater transition risk–related disruptions that directly or indirectly hamper demand for real estate, for example. The transition from fossil fuel–intensive energy production to renewables may affect markets unequally as production is shifted between firms or geographies. This, in turn, could impact real estate demand trajectories between markets. Within markets, higher energy costs may translate into higher commuting costs, sparking greater demand for public transit–accessible real estate.</p> <p>Tools are also emerging to assess the economic impacts of climate scenarios (e.g., weak or strong policy response). These tools can offer preliminary insights on the relative economic exposure of regions, but may have a low spatial resolution (e.g., U.S. state level).</p>	<p>Transition risk exposure of assets and primary tenants</p> <p>Transition risk exposure of key economic sectors</p>
<p>1.4 Market-level adaptive capacity</p>	<p>Migration-related risks are likely to be higher in places without sufficient capacity to absorb the physical and transition risks screened. Real estate investors can make an initial appraisal of the extent to which markets have the technical, fiscal, and institutional capacity to absorb climate risks. Do existing infrastructure and insurance systems sufficiently mitigate key hazards? Can governments afford to maintain or expand this infrastructure? Are robust plans in place to address future risks? Are established institutions able to align the necessary stakeholders and resources needed to address climate risks for the long term?</p> <p>Initial answers to these questions can focus where and what investors more closely evaluate in Step 2.</p>	<p>Credibility of resilience plans</p> <p>Fiscal capacity of relevant public-sector agencies</p> <p>Presence and track record of local institutions addressing resilience</p>

The table below provides a hypothetical example of how investors can record and synthesize their **Step 1: Preliminary Market Screening** findings as a means to prioritize which markets to focus on in Step 2. In this case, three markets are compared according to two basic scenarios: a “2 degree” global response to climate change (i.e., in line with the effects expected under a 2° Celsius scenario, which is the target of the 2015 Paris Agreement) versus a “3 degree” global response (i.e., assuming a failure to meet 2015 targets, leading to more severe effects in line with a 3° Celsius scenario). Qualitative market-level appraisals can be made for each of the criteria (low, medium, or high sensitivity) and averaged for both scenarios to help prioritize the markets on which to focus additional assessment.

Investors can develop more elaborate or quantitative scenarios, or both, using guidance and data compiled by the Task Force on Climate-Related Financial Disclosures and a range of other climate and catastrophe risk assessment service providers. An example of how Heitman approaches this assessment is presented in the sidebar on the following page.

Following the example provided in Step 1, investors can identify next steps based on the strategic priorities established at the beginning of the exercise. If the aim is to identify areas with the greatest near-term return on investment, Market A may offer an acceptable reward for the potential risk. If the purpose is to adjust the portfolio weightings over time so the portfolio is overall less exposed to markets with higher climate-related risks, Markets B and C may look comparably stronger. Given these types of strategic considerations and depending on the preliminary insights that follow, investors may choose to proceed to Step 2 with a smaller number of markets identified for closer analysis.

### Hypothetical Comparative Heat Map Framework

	Market A, U.S. coastal		Market B, U.S. inland		Market C, European inland	
	2 degrees	3 degrees	2 degrees	3 degrees	2 degrees	3 degrees
<b>1.1 Economic fundamentals</b>	Low	Medium	Medium	Medium	Low	Medium
<b>1.2 Physical risk</b>	Medium	High	Low	Medium	Medium	High
<b>1.3 Transition risk</b>	Low	High	Low	Medium	Medium	Medium
<b>1.4 Infrastructure/ adaptive capacity</b>	Low	High	Medium	High	Low	Medium
<b>Cumulative risk</b>	Low	High	Medium	Medium	Medium	Medium

Key: low risk medium risk high risk

## DEEP-DIVE CLIMATE-RISK ASSESSMENT: HEITMAN

Laura Craft, global head of ESG strategy at Heitman, describes the company's process, which integrates climate-risk assessment into acquisition analysis, portfolio construction, and asset management. An asset's exposure to physical risk such as floods, sea-level rise and storm surge, hurricanes and typhoons, earthquakes, heat stress, water stress, and wildfires is identified during acquisitions underwriting and monitored throughout the investment life cycle. Heitman and a third-party service provider have established value-at-risk concentration exceedance thresholds for each climate risk, which are calculated at the asset, market, and portfolio level.

When an asset under consideration for acquisition is identified to have a physical-risk score that exceeds the firm's target value-at-risk concentration threshold, a deeper analysis of the location's risk exposure (or exposures) and asset/market-mitigating aspects is completed. Lack of asset, portfolio, and market mitigation triggers adjustments in underwriting assumptions to account for the possible financial impact of the identified risk or risks. This analysis is completed in conjunction with Heitman's ESG evaluation, which considers a broader set of risks and opportunities related to each investment.

As part of the assessment, climate relocation is a factor increasingly being scrutinized in investment decision-making. When underwriting an asset in a market vulnerable to a climate risk such as sea-level rise or hurricanes/typhoons, Heitman conducts additional analysis to determine if this risk is affecting economic or population trends. Key indicators reviewed include current migration patterns, with a focus on the ratio of in-migration to out-migration, an economy's composition, the relationship between area median income and cost of living, and an overall assessment for quality of life. Climate migration affects markets differently according to the economic strength of the underlying market and the economic cost to be in that market.



**Step 2: Deep-Dive Market Assessment** provides an overview of key market criteria. Investors can distill, integrate, and act on Step 2 findings in a number of ways. One approach is to create a market monitoring report or memo, which can be regularly updated and used by investment and asset management teams to evaluate new and existing acquisitions in markets of concern. Over time,

these insights can be shared throughout the organization to facilitate internal discussions about the appropriate risk management strategy at each point in the investment process, from asset acquisition to exit. The “Market Monitoring Report” table on page 23 provides an example of what this monitoring report may look like.



## STEP 2 Deep-Dive Market Assessment

Criteria	Strategic issues	Indicators
2.1 Market-level demographic trends	<p>What are current market-level demographic trends, and how durable are they likely to be into the future? How do high-level demographic trends vary across key cohorts (e.g., segmented by income or age)?</p> <p>What is the current net migration rate for the market? Are there identifiable factors that could change this rate of migration within the time horizon of concern (e.g., one or two investment cycles)?</p> <p>What are the existing push or pull factors shaping net migration for key demographics? How sensitive are these push and pull to factors climate shocks and stressors?</p>	<p>Market-level migration trend assessments</p> <p>Disposable income and other fundamentals for key demographics</p> <p>Push and pull factors for key demographics, such as climate risk perceptions, place attachment, financial capacity, or desired (environmental) amenities/quality of life</p>
2.2 Economic resilience—sectors and firms	<p>Is the economy of the market resilient to climate shocks and stressors? This can be tackled by considering economic composition: Does the local economy have sufficient scale and diversity to withstand sectoral shocks?</p> <p>Further questions can be explored at the sector level. Is the local economy overexposed to a climate-sensitive sector (e.g., energy)? How exposed are key sectors to climate shocks and stressors (e.g., globalized/localized production or distribution processes)?</p> <p>Investors may also wish to assess key businesses and institutions: Are large anchor institutions in place to stabilize the economy in the event of a shock? Do these institutions have sufficient risk management strategies in place? Is access to insurance and disaster recovery assistance widely available for firms?</p>	<p>Market GDP and top sectoral contributors to GDP</p> <p>Sectoral-level exposure, with focus on climate-sensitive sectors (e.g., energy, tourism, agriculture) and the relative vulnerability of production, distribution, and consumption dynamics within key sectors</p> <p>Presence of large anchor institutions (e.g., corporate headquarters, large public employers)</p> <p>Presence of risk management strategies and resources (e.g., resilience plans for key firms; long-term accessibility of insurance; public assistance for business recovery and resilience)</p> <p>Estimated firm-level net revenue impacts of climate-related expenses (e.g., mitigation, insurance, evacuation, recovery costs)</p>



Criteria	Strategic issues	Indicators
<p>2.3 Economic resilience— individuals and households</p>	<p>What is net impact of climate-related costs on individual incomes across demographics (e.g., higher- and lower-income population segments)? Are incomes sufficient to pay for real estate with greater resilience features (e.g., higher-elevation homes, built-in flood defenses, or hurricane shutters)? Will income pressures lead to reduced consumer spending and demand for space (e.g., high-end commercial real estate)?</p> <p>Individual and household-level economic resilience can also be considered from a distributional perspective. To what extent will climate-related economic disruptions trigger market-level destabilization (e.g., labor market dislocation, political conflict)?</p>	<p>Income levels across demographic segments</p> <p>Cost of living across demographic segments</p> <p>Estimated individual/household net income after climate-related costs (e.g., mitigation expenditures, property taxes/fees, insurance premiums, evacuation costs, recovery costs)</p> <p>Impacts of net income reduction on consumer demand, including net impact on demand for space across real estate segments</p>
<p>2.4 Physical resilience measures</p>	<p>Will current or planned infrastructure be sufficient to address changing climate risks? Are plans coherent, inclusive, and well integrated across key urban systems and geographies? What levels of protection and risk horizons are addressed in infrastructure? Do they incorporate a credible range of climate scenarios and leave room for adaptive decision-making? Are sufficient public policies in place to offset the limits of physical infrastructure (e.g., robust insurance programs)?</p> <p>Are community interests aligned to create robust and well-supported resilience planning processes? Are stakeholder or sectoral interests integrated to ensure the efficacy of existing or planned resilience measures?</p>	<p>Robustness of existing or proposed infrastructure and planning instruments</p> <p>Robustness of institutions, including resilience planning departments, public/private collaborations, or other civil society partnerships to promote resilience</p> <p>Political capacity, such as alignment of key local stakeholder interests, or higher-level government bodies</p> <p>Public-sector fiscal capacity, such as depth of property tax base, balance sheet strength, creditworthiness and access to capital markets</p> <p>Presence of public mechanisms that incentivize migration from risky areas, e.g., managed retreat programs, other incentives or penalties</p>

Criteria	Strategic issues	Indicators
<p>2.5 Asset ownership and tenure</p>	<p>What is the ratio of asset owners to renters in the region? Is there a large and stable base of long-term asset owners or a high number of renters? Who owns rental properties, and what is their risk exposure, adaptive capacity, and exit strategy? Given that renters can move away, who ultimately holds responsibility for prudent long-term decisions about assets?</p> <p>Will individual ownership become less viable given net climate costs? What is the spatial geography and extent of climate-exposed, cost-burdened housing? Are provisions in place to stabilize affordability and mitigate risks, or is there elevated displacement risk? How will displacement directly and indirectly affect demand for real estate at the market level?</p> <p>Are there risks associated with housing unaffordability (e.g., challenges in labor retention) or unmanaged tenure changes (e.g., housing abandonment)? Are there credible strategies in place to address these challenges?</p>	<p>Tenure data (i.e., composition of owners and renters) assessed across real estate assets, demographic groups, and locations/physical risk exposure</p> <p>Institutional rental ownership patterns, including market share of single-family or multifamily rental property segments</p> <p>Scope of climate-exposed housing-cost-burdened geographies (e.g., zip codes where physical risks intersect with housing costs that exceed affordability benchmarks)</p> <p>Presence and strength of housing tenure-specific climate-risk mitigation and anti-displacement programs, such as programs targeting multifamily or single-family home retrofitting</p>
<p>2.6 Countervailing forces</p>	<p>Are there countervailing forces that sustain real estate demand or supply in high-exposure markets, such as public policies that subsidize risks (e.g., public insurance), or structural incentives to maintain real estate (e.g., property taxes)? How durable are these countervailing forces over the short, medium, and long terms?</p>	<p>Profile of inward migrants, including relocation drivers, preferences, and other factors</p> <p>Presence and durability of mechanisms that subsidize or obscure climate-related costs of real estate markets, including public insurance programs, land use plans or building codes that do not factor risks, absence of risk disclosure for consumers</p> <p>Presence of misaligned financial incentives that sustain growth, such as local government dependence on property tax for service delivery</p>

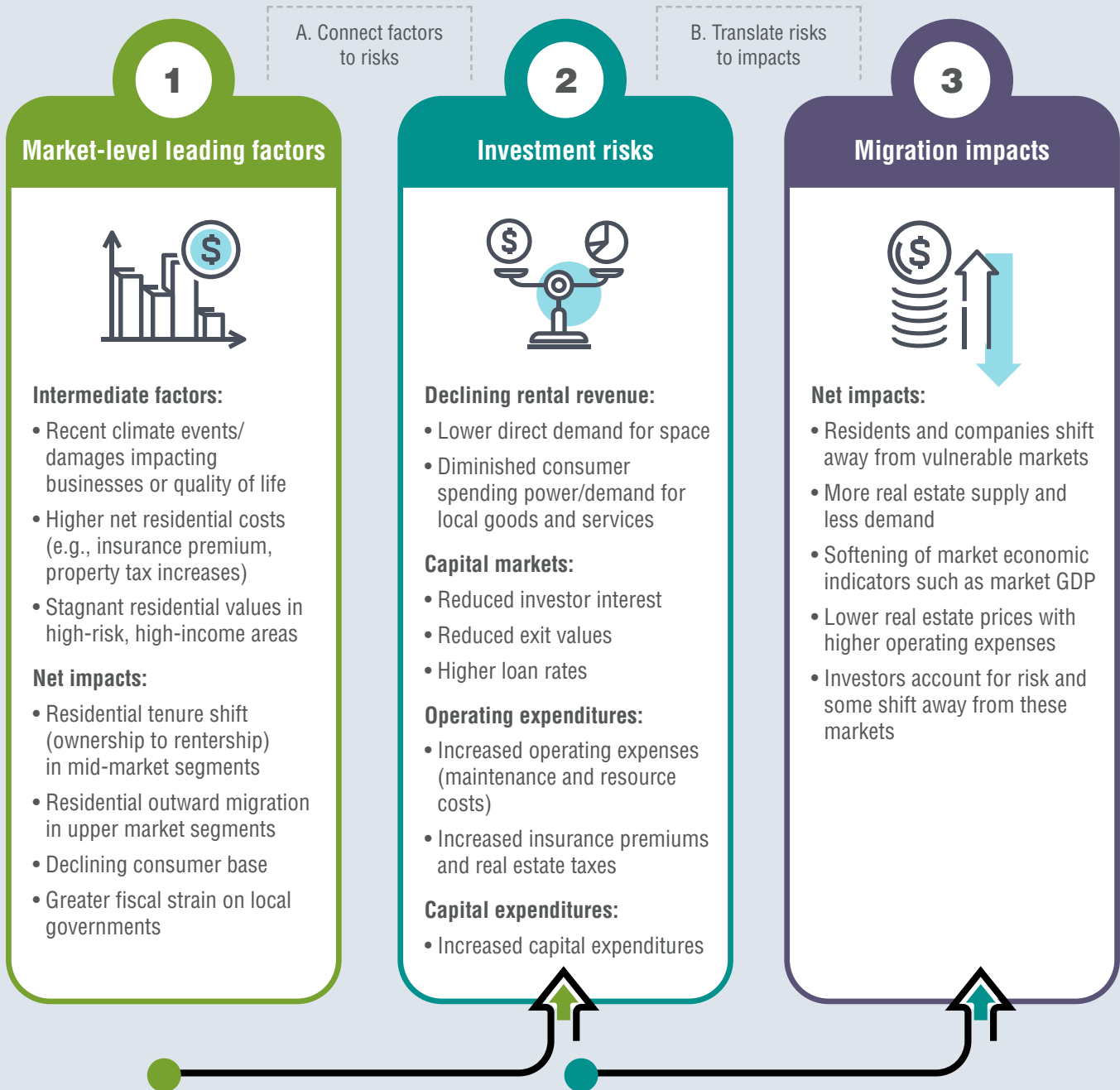
Criteria	Strategic issues	Indicators
2.7 Net appraisal and thematic tipping points	<p>Given the preceding factors, what key factors lay the foundation for migration in the event of a climate shock or series of stressors?</p> <p>Are there climate, policy, or market scenarios that could trigger a tipping point in a market (i.e., sudden or gradual decline)?</p> <p>How are these factors connected (e.g., cumulative, countervailing, or mutually reinforcing)? Is it possible to draw a net positive/negative appraisal of these factors in relation to the market-level investment strategy?</p>	<p>Given complexities, consider real estate segment-specific risk factors</p> <p><b>For example:</b></p> <p>Residential-sector push indicators: declining quality of life due to physical events, declining levels of protection/public amenities, prohibitively increasing property costs (e.g., insurance, taxes), declining employment opportunities, no capacity to return or rebuild after disaster, state collapse or failure</p> <p>Residential-sector pull factors: Better quality of life due to lower risks, lower cost of living, presence of family/existing support connections, presence and attractiveness of managed retreat policies</p>

Market Monitoring Report			
Market name	Market A – U.S. coastal		
Summary of physical and transition risks	Narrative summary		
Leading tipping-point factors, indicators, and weight (e.g., high, medium, low)	Factor 1	Indicator(s)	Weight
	Factor 2	Indicator(s)	Weight
	Factor 3	Indicator(s)	Weight
Status report and overall appraisal	For example, annual update on market-level risks/ risk mitigation and market trends/active measures being undertaken		

## Additional Steps

Investors can use the insights generated through this two-step framework to reevaluate assumptions about the financial performance of a given investment. Climate migration and broader climate risks and their management can have direct and indirect impacts on several dimensions of financial performance. However, market-level climate

risks and resilience measures can be difficult to quantify or translate into direct financial terms. The graphic below offers a high-level example of how investors can connect the market-level leading factors identified at the end of Step 2 with investment risks by prioritizing and weighting key factors. These investment risks can in turn be translated into an asset-level financial impact analysis.



Precise weightings and adjustments will vary depending on the investor's confidence in the results of the market-level risk assessment conducted in Step 2, among other factors that can add or minimize uncertainty. Hypothetical and simplified scenarios illustrate how the Step 2 analysis can help investors make financial adjustments depending on these context-specific risks and uncertainties. To illustrate this point, consider how assets with the same key characteristics (a like-for-like multifamily property valued at \$50 million) might be managed by investors operating in two different contexts—one where the investor has robust information about investment risks and their impacts (Example 1), and one where the investor has insufficient information and opts for a precautionary approach (Example 2).



### Example 1: Discounting Cash Flows

Five years ago, Investor A acquired a multifamily asset in a booming yet hurricane-exposed region, which it planned to hold for 10 years. The asset was valued at \$50 million with a 5 percent cap rate and annual net operating income of \$2.5 million (based on revenues of \$5.5 million and \$3 million in operating expenditure). The investor initially assumed that rental income growth would be strong in initial years and consistently stable in later years. For years 1 and 2, the investor assumed 5 percent and 4 percent rental income growth rates, respectively, followed by normalization at 3 percent from year 3 onward. After a hurricane made landfall in the region in year 3, the investor saw a 5 percent decline in rental income, followed by a 10 percent decline in year 4. Due to declining rental demand alone, the property would suffer approximately 7 percent losses in rental revenue and 15 percent in value from the original purchase of the property in year 1. However, the region has a promising recovery trajectory, including strong annual growth in rental demand. Accounting for short-term increases in property expenses, the investor models approximately a three-year timeline to return to the original cash flows. However, the investor also expects investor sentiment regarding the market to be negative in the medium term. Investor A must decide how to balance strong market recovery trajectory and modeled financial performance against the risk that negative investor sentiments depress resale value.

### Example 2: Adjusting Cap Rates

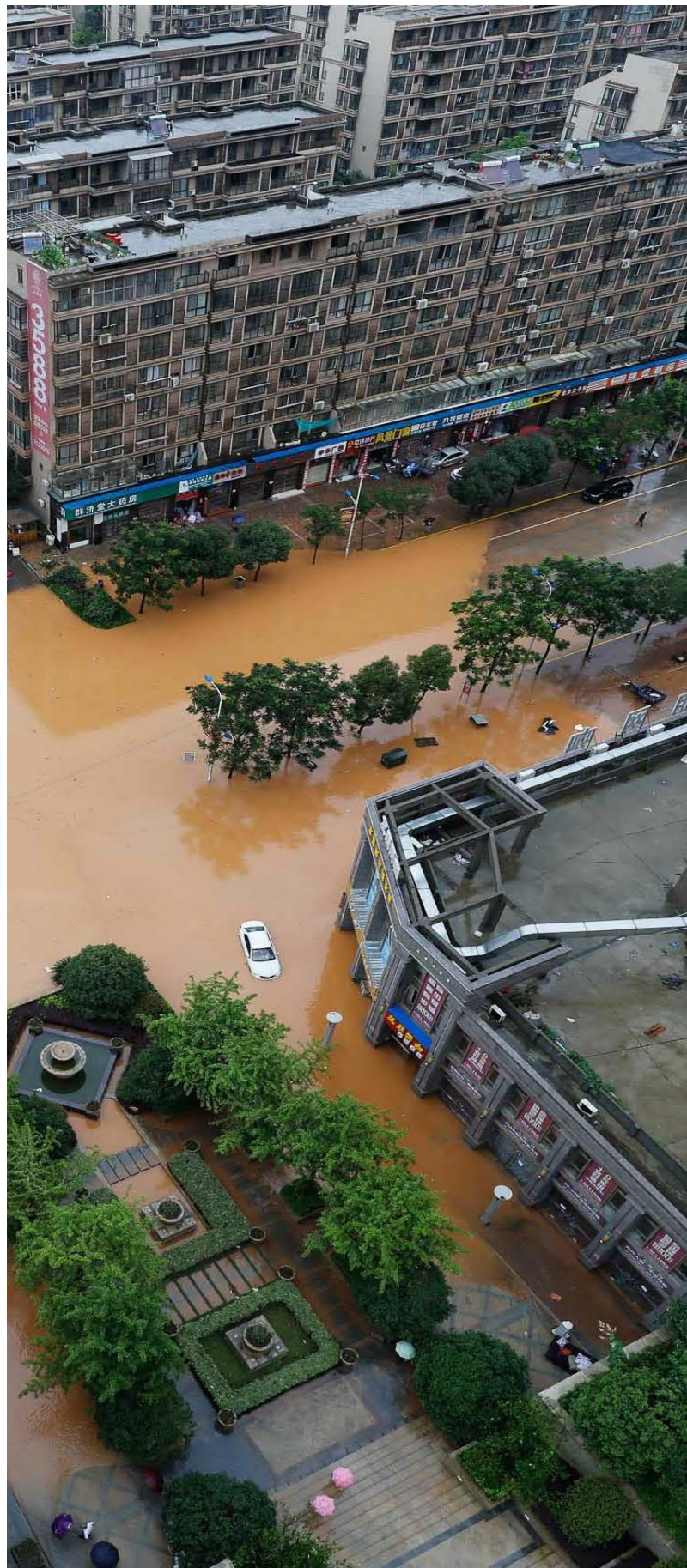
Investor B is evaluating a new acquisition in an area with substantial climate-risk exposure. Though confident with its appraisal of asset-level climate-risk mitigation measures in place, the investor lacks sufficient data about existing market-level risk and resilience factors, and cannot pinpoint specific climate-related investment risks with sufficient confidence. Given this uncertainty, the investor wishes to accommodate the possibility that it will need to adjust the sales price at the end of the holding period. In the base-case scenario, the asset is valued at \$50 million at the end of a 10-year hold with a 5 percent cap rate (net operating income of \$2.5 million). The investor adjusts the exit cap rate by 50 and 100 basis points and performing a sensitivity analysis to evaluate the impact on investment returns. If the exit cap rate is increased by 50 basis points to 5.5 percent, the valuation would fall to \$45.5 million, a decrease of 9.0 percent. Alternatively, if the exit cap rate is increased by 100 basis to 6.0 percent, the valuation would fall to \$41.7 million, a decrease of 16.7 percent. The overall internal rate of return would also be decreased in these cases. Based on these insights, Investor B reappraises its investment strategy.

Project participants provided several examples where financial adjustments like these have been considered or implemented based on climate-risk assessments. However, investors also underscored the need for continued industry dialogue about how to translate risk assessments into pricing decisions when faced with more complex and uncertain scenarios, like that presented in the second example.

In addition, investors and aligned stakeholders might also use agent-based models, serious gaming, and other analytical approaches to explore the interdependencies between the top migration-related risk drivers identified in Step 2 within specific market contexts. This type of analysis enables investors to enhance their qualitative understanding of the interactions between market-level risk and resilience dynamics under given climate-risk and response scenarios, and to identify asset-, firm-, and community-scale interventions that can enhance market-level adaptive capacity. Questions which could guide this analysis include the following:

- Could a leading risk driver reach a critical tipping point, and what kind of event or scenario would trigger this?
- What are the interactions between leading factors? Are cascading second- and third-order effects triggered when one leading factor reaches a tipping point?
- Are existing strategies in place to mitigate the risk of breaching a tipping point or to manage its effects? If not, can mitigation strategies be effectively developed?

Investors and aligned stakeholders can use this analysis to broaden conversations about climate migration-related risk and market-level resilience beyond asset screening and surveillance. This tool could be used to facilitate higher-level internal dialogue about long-term investment strategy or to shape conversations with external stakeholders in the real estate value chain, public sector, and civil society about how to align resources, roles, and interests related to climate action.



## 4. Next Steps: Ways to Move the Sector Forward

The incorporation of climate migration–related factors into real estate investment climate-risk management approaches is at a crucial stage of evolution. Leading investors are drawing connections between migration and both market- and asset-level climate risk and resilience dynamics. They are identifying methods and indicators to assess these links, and adapting their investment strategy accordingly. These practices are emergent, however. Most investors remain focused on short-term and asset-centric views of risks, and largely consider only the downside of climate migration and related risks. Several scientific, organizational, and societal challenges and opportunities face the real estate investment and broader land use community. The sector can move forward by taking two related next steps.

**First, real estate investors must build their capacity to pinpoint and manage migration-related and broader market-level investment risks.** Real estate climate-risk management practices have evolved tremendously in recent years. Investors and the broader land use community must continue to develop their analytical capacity to understand the complex and interconnected drivers of asset- and market-level climate risk and resilience.

As several investors noted, this requires an expansion of existing indicators and research methods, the development of new “thematic” appraisals of market inflection points and opportunities, and continued investment in models and decision-support tools that incorporate the latest scientific understandings of climate change and its governance. Long-term projections of climate risks and their interactions with social processes like migration will likely remain difficult to quantify, model, and generalize across communities. The ambiguity of place-specific policy and market responses to climate risks and their management pose added challenges. Investors can use tools like the two-step framework provided here to assess these complexities on a market-by-market basis, pinpoint key factors, address key data and methodological gaps, and decide how and when to take further actions to manage risks.

Real estate investors should also look across the real estate value chain and to broader professional and scientific communities to develop new approaches to assess and manage these interconnected financial, physical, and social risks. Many investors have turned to the reinsurance sector to enhance their analytical capacity to screen for physical risks, or to develop novel risk-transfer instruments to



manage specific financial risks. Investors are collaborating with research institutions and analytics firms to create new tools that address specific investment and asset management challenges. Investors are also actively learning from the most climate-risk-exposed regions in which they invest, seeking to better understand the place-specific dimensions of market risk and resilience, and to identify existing or potential strategies to enhance both asset- and market-level resilience.

**Second, real estate investors must actively understand the climate adaptation needs of key markets.** This requires shifting from an asset-centric view to a market-level appraisal of risk and resilience drivers. There are unaddressed needs and untapped opportunities to leverage the technical expertise and capital of the real estate investment community to proactively enhance the adaptive capacity of assets, communities, and society more broadly. Investors and aligned land use and financial market practitioners should explore ways to channel resources to real asset classes that improve resilience in both existing high-risk markets and neighborhoods, and “receiving” areas that can accommodate those who move from the most vulnerable locations. Investors and aligned professionals pointed to several ways that capital can be leveraged to reduce climate migration stressors by investing in affordable housing or resilient infrastructure as examples.

Investors can further support climate-responsive design and development solutions, including those which enable climate adaptation over time through the inclusion of landscape and building strategies that mitigate flooding or reduce heat stress, or by promoting modular building approaches that allow assets to be dismantled and relocated as environmental conditions change. Participants also suggest that the real estate investment community can leverage its analytical expertise by sharing data and research outputs with at-risk communities. Investors can continue to engage in two-way learning and problem-solving with local resilience actors to minimize the risks of displacement, ecosystem degradation, and other unintended consequences of adaptation measures.

More broadly, the real estate investment community can help make the case for integrated, comprehensive disaster management and climate adaptation approaches. This public policy agenda could advocate for better connections between the domains of real estate finance and investment on one hand, and land use planning, infrastructure design, and building design and development on the other. This ambition also requires investors to actively contribute to new and expanded institutional settings where planners, developers, and other stakeholders are beginning to work together to collaboratively develop long-term spatial strategies for managing climate risk and resilience in the built environment.

These strategies must proactively consider how to make existing and future assets and markets more resilient to climate shocks and stressors while laying out feasible pathways and investment models that facilitate larger-scale retreat and relocation from high-risk areas. Through partnerships, investors can help transcend longstanding divisions between investment, planning, design, development, and civil society. Leadership from the real estate investment community will be key if societal approaches to climate action are to be effective, efficient, and equitable.





# The ULI–Heitman Climate Risk Series

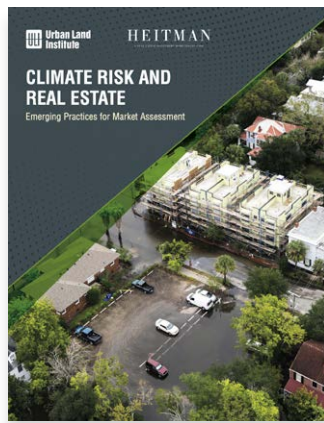


2019

## Climate Risk and Real Estate Investment Decision-Making

This agenda-setting report introduces the key links between climate risk and real estate investment and focuses on how real estate investors incorporate asset-level climate risks in their investment decision-making processes.

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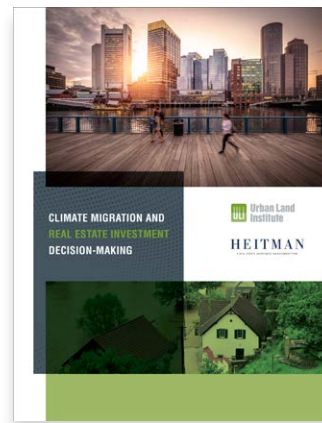


2020

## Climate Risk and Real Estate: Emerging Practices for Market Assessment

This report shows how leading investors are developing approaches to better understand climate risk at the city or market scale, rather than focusing primarily on risk at the asset level.

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2022

## Climate Migration and Real Estate Investment Decision-Making

This report examines how investors are assessing broader patterns of climate-related population migration in relation to their market- and asset-level climate-risk management approaches.

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# Notes

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