

# PHYSICAL CLIMATE RISKS AND UNDERWRITING PRACTICES IN ASSETS AND PORTFOLIOS



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

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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 [americas.uli.org/resilience](https://americas.uli.org/resilience).

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# Introduction

The landscape of physical risk assessment has shifted from a period of data scarcity to one of arguable data abundance. Most large firms now have access to substantial information on physical risks from a variety of commercially available providers. However, the challenge is evolving from acquiring data to understanding and interpreting it effectively in decision-making. Whereas the 2022 report *How to Choose, Use, and Better Understand Climate-Risk Analytics* shed light on tools and techniques to understand analytics providers' data, this report focuses on how to leverage the data in investment decision-making globally.

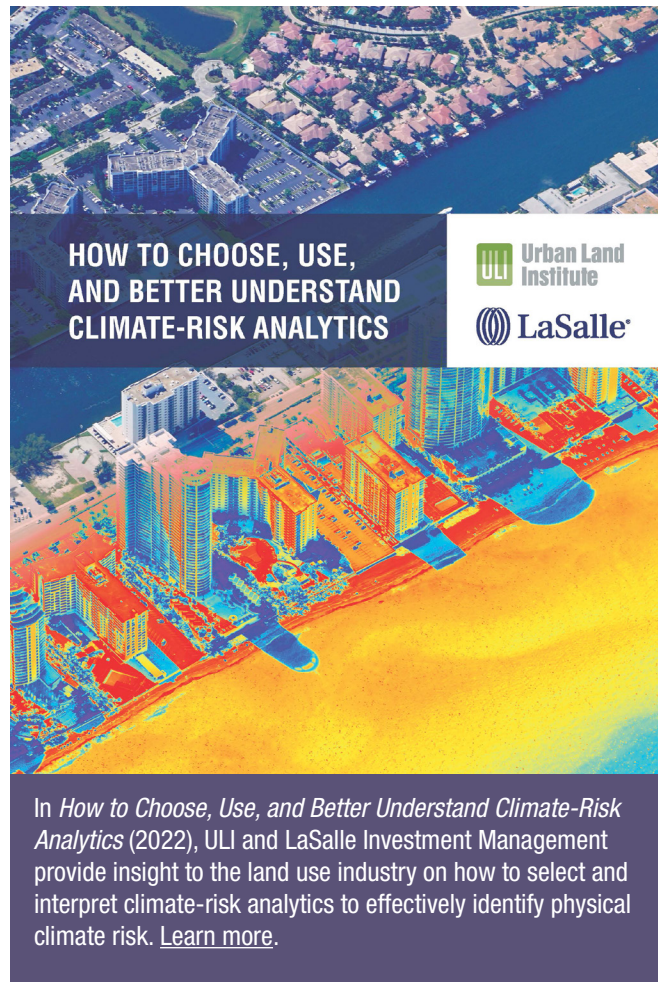
## You have your data, now what are you doing with it? How is climate-risk information being used in your business decisions?

As the industry contends with the complexities of the impact on the built environment from climate change, stakeholders across the real estate investment value chain continue to look for effective processes to estimate future capital expenditures to harden assets and select appropriate risk-adjusted discount/capitalization rates in financial projections.

Pressures to address physical risk stem from the regulatory sphere, the demands of capital market allocators, and perhaps most importantly, from fiduciary responsibility. In a classic economically efficient market, equilibrium pricing is achieved when all market participants possess equal and accurate information to assess the market value of an asset. At present, market actors are struggling to reconcile their physical climate risk data with investment decisions and portfolio management practices. However, even a well-functioning market allows for different interpretations of current "true" value and unique perspectives on the acceptable financial incentives to accept risks—in this case physical risk.

Considering this, the information asymmetry and decentralized decision-making in the current market create both risk and opportunity. After all, as one real estate investment manager remarked, "These tools are imperfect and give you directionality but not much more than that." Another added, "These are all just clues. Every model has assumptions; this is a clue we have a risk." In keeping with these sentiments, this report illustrates how firms are leveraging physical climate-risk data into decision-making while navigating a terrain characterized by ambiguity and shifting paradigms.

This report is based on in-depth interviews with real estate leaders and is divided into three sections, each addressing an aspect of the industry's response to physical climate-risk data.



- The [State of the Industry](#) section outlines the industry's current status with respect to physical climate-risk analytics, discussing implications of the dichotomy between leading and early-stage firms. This section also describes some of the inherent challenges in using emerging approaches to decision-making and sheds light on the rapidly evolving regulatory environment and its implications for physical risk.
- The [Using Climate Data in Decision-Making](#) section shifts focus to the process of gathering physical climate-risk data and the practical application of that data in decision-making processes. It discusses the ways firms are beginning to approach portfolio assessment for managing physical risk at the investment level and examines, at a high level, how leading firms weigh and measure underlying risk factors.

The section addresses advantages and disadvantages of assessing aggregate versus individual perils, conceptualization of “Climate Value at Risk” (CVaR), identification of unexpected perils, and strategic integration of external consultants in interpreting and operationalizing physical climate-risk data.

- The Acquisition, Underwriting, and Disposition Practices section addresses acquisition, underwriting, and disposition practices and market divestment as each action relates to physical climate risk. It highlights how firms estimate the capital expenditures required for mitigating physical climate

risk at the asset level and to what extent firms adjust their projected reversion capitalization rates to account for climate-related uncertainties, thereby affecting long-term investment valuations.

Given the rapidly evolving analytics tools, regulatory challenges, and municipal interventions keeping the state of these assessments in seemingly perpetual flux, this report aims to provide a nuanced view of how real estate investment firms are navigating the challenges and opportunities presented by physical climate risks while highlighting some of the innovative practices being adopted by industry leaders.





# State of the Industry

The following subsections provide an overview of challenges and solutions that are emerging as part of investment management firms' ongoing efforts to incorporate physical climate-risk data into decision-making processes.

Investment professionals hoping to understand the processes and procedures that leading firms use will find these insights throughout the report—and especially in the last section on acquisition, underwriting, and disposition. The industry has matured over the past year and continues its rapid progress. The insights from market leaders will inform and aid industry-wide decision-making practices, but they also recognize a continuing need for practices to mature.

## Section Takeaways

- *Leading firms actively coach their teams on physical risk.*
- *Regulatory trends affect, but do not motivate, physical risk assessment.*
- *Different geographies approach physical risk with their own level of urgency.*
- *Investment managers tend to focus on fund risk, capital providers on portfolio risk.*
- *Tools to understand and price physical risk are still in a nascent stage.*

## Leading and Early-Stage Firms in Physical Climate-Risk Mitigation

The 2022 report *How to Choose, Use, and Better Understand Climate-Risk Analytics* categorized investment firms into “leading” and “early stage” to describe where these firms’ processes and procedures stand in the rapidly evolving landscape of climate-risk analytics. Upon reflection just over a year later, those distinctions remain, and both leading and early-stage firms have yet to converge on a market-leading solution or implementation framework for integrating climate analytic insights into investment decision-making. In the long run, differentiation in approaches and interpretations toward decision-making on physical climate-risk data would characterize a healthy market. However, the level of variability in understanding and applying these data remains a source of uncertainty in real estate valuation.

As an example, several firms that would have been characterized as early stage declined interview requests, citing insufficient knowledge in the implementation domain to participate in interviews. Early-stage firms that did participate in interviews struggled in areas such as selecting analytics providers and understanding the nuances of providers’ reports—let alone strategically using the information to guide decision-making.

Even leading firms interviewed were still grappling with the question of what to do with physical climate-risk reports. An investment officer highlighted the stressful nature of managing these





complexities and challenges, noting, “It’s a relief to hear we are not behind.” Another investment manager echoed this sentiment with a more personal inflection, sharing that “this interview felt like a counseling session!” These and similar statements support the idea that the journey to understanding and mitigating climate risks is a collective endeavor, and even the frontrunners are continuously learning and improving.

**Leading firms embrace the learning process, remaining committed to accelerating their knowledge both in their management suite and, perhaps more important, throughout their organization. For example, leading firms actively coach their teams to challenge existing assumptions about investment theses for real estate assets and how climate risk may (or may not) change their investment perspective.**

Although senior management leads decision-making, analysts represent the front line of information gathering and often serve as asset-level experts. Ensuring that the front line consistently raises pertinent questions about climate and specific concerns the firm might have about the risk associated with an asset engages multiple levels in the information-gathering process. One executive emphasized that, “Our analysts need to be the critics; what worries them should worry us.” In other words, junior staff members are being tasked with the responsibility of posing these significant questions, fostering a culture of inquiry, and aiding in the development of robust investment risk scenario modeling. This proactive stance, in the long term, will lead to broader diffusion of information in the industry; as analysts change roles or firms, become associates and executives, the lessons they learn today will carry throughout their careers.

## Regulatory Trends

The regulatory environment remains fast moving and will continue to evolve after publication of this document. The greater focus generally in the industry appears to be on the regulatory impact of transition risk, or greenhouse gas (GHG)–focused, reporting, given the expected material costs of both physical upgrades and compliance reporting involved. However, physical-risk reporting is required by major regulatory frameworks and presents a potential compliance risk for firms. While all interviewees discussed the importance of aligning to regulatory requirements, few cited compliance with regulatory requirements as their motivation for analyzing physical risk.

With respect to physical risk, arguably the most influential recent development was the launch of the International Sustainability Standards Board (ISSB) guidelines in June 2023.<sup>1</sup> The standard, titled *International Financial Reporting Standards (IFRS) S2 Sustainability Disclosure Standard, June 2023 Climate-related Disclosure*, requires, among other items related to physical risk, that firms disclose quantitative and qualitative information about

## CLIMATE-RISK-DISCLOSURE RESOURCES

Learn more about the current state of climate-risk disclosure regulation through these ULI resources:

- [\*Change Is Coming: Climate-Risk Disclosures and the Future of Real Estate Investment Decision-Making\*](#)
- [\*Mapping ESG: A Landscape Review of Certifications Reporting Frameworks and Practices\*](#)
- [\*ULI Global Green Building Policy Dashboard\*](#)

“costs arising from physical damage to assets from climate events; and expenses associated with climate adaptation or mitigation (16.d).” It requires disclosure on “the amount and percentage of assets or business activities vulnerable to climate-related physical risk (29.c).” Further, it requires that climate scenarios used for physical risk should have “a reasonable and supportable basis (Appendix B, B12).”<sup>2</sup>

Notably, the International Organization of Securities Commissions (IOSCO) endorsed the ISSB standards.<sup>3</sup> IOSCO represents 95 percent of the world’s global market capitalization, and its 35 board members include both the U.S. Commodity Futures Trading Commission (CFTC) and the U.S. Securities and Exchange Commission (SEC).<sup>4</sup> The widely influential Task Force on Climate-related Financial Disclosures (TCFD) announced that the ISSB “new standards can be seen as a culmination of the work of the TCFD.” The IFRS then took over responsibilities of the TCFD as it will slowly phase out.<sup>5</sup>

Many market participants expect the SEC final climate rules to reference the ISSB standards.<sup>6</sup> In the European Union, the Corporate Sustainability Reporting Directive (CSRD) already heavily, but not exclusively, references them as well.<sup>7</sup> In addition, Singapore has proposed mandatory climate reporting for listed and large nonlisted companies starting from 2025,<sup>8</sup> and the Hong Kong Stock Exchange has issued guidance for all listed companies to report in line with the ISSB framework.<sup>9</sup>

Regulatory compliance increasingly represents a component of managing physical risk. Not only do firms need to be comfortable with the financial risks associated with physical hazards, but they also need to ensure proper reporting to their appropriate regulatory entities.

## Differences by Region

Geographical differences play a meaningful role in shaping the perception of physical climate risk. From 2012 to 2022, the United States experienced annual weather-related damage costs ranging from a low of \$200 billion to a high exceeding \$500 billion as estimated by the U.S. National Center for Environmental Information.<sup>10</sup> By contrast, over the same period, the European Union experienced annual weather-related damage costs ranging from a low of approximately €6 billion to a high of €59 billion as

estimated by the European Environment Agency.<sup>11</sup> A third-party insurance agency estimated 2022 damage in the Asia Pacific region to be around \$80 billion.<sup>12</sup>

Consensus among interviewees was that the European Union, in both investment and regulatory spheres, has been more concerned with addressing transition risks, while the United States has placed greater emphasis on addressing physical risk—perhaps due to the frequency and intensity of hazard events in the United States—especially hurricanes and wildfire. In the European Union, some respondents suggested higher-intensity acute hazard events overlap less with institutional investment centers. A Europe-based real estate manager commented on the European perspective on physical risk, “There seems to be a degree of denial on the severity of physical risk in Europe [there is a] sense of safety because of more temperate climates.”

That said, the highest two damage years in the last 40 years of tracking were 2021 and 2022 in the European Union.<sup>13</sup> The banking sector has taken note, with the Bank of England recently stating, “historic data sets are not likely to be a good predictor of how climate risks may affect firms’ future losses.”<sup>14</sup> Anecdotally, perceptions may be changing in real time throughout 2023, but at the time of the interviews, the E.U. constituents appeared less concerned with physical risk than their U.S. counterparts.

### Differences between Capital Providers and Investment Managers

The 2022 publication *How to Choose, Use, and Better Understand Climate Risk-Analytics* highlights two important points. First, it shows that institutional capital providers frequently require asset managers and investors to report on both physical and transition risk. Second, it shows there is misalignment of physical risk

Variations across Providers among Overall Physical Risk				
Asset	State	Vendor A	Vendor B	Vendor C
A	CA	High	Very low	Low
B	DC	Medium	Very low	Low
C	FL	Low	Medium	Very low
D	IL	Medium	Very low	High
E	NY	Very high	Low	Medium
F	TX	Medium	Very low	Low
G	VA	Medium	Very low	None

*An example of variation between three climate risk analytics providers’ aggregate physical risk scores for a group of seven assets in different geographic locations originally featured in How to Choose, Use, and Better Understand Climate-Risk Analytics (2022).*

scores for the same asset alongside competing methods for calculating value and value at risk among analytics providers. These issues remain unresolved, and their persistence places financial and reporting burdens on capital providers.

Specifically, many large capital providers require and receive reports from their asset managers’ preferred physical climate-risk vendors. However, because of these reports’ varied risk assessments and formats, many capital providers feel compelled to perform their own independent due diligence. One capital provider expressed frustration, “It feels like we often have to pay twice for this information.” Many market participants hope that standardization, perhaps forthcoming by way of ASTM International’s Property Resilience Assessment standard, will help address this issue (see [ASTM’s Standard Guide for Property Resilience Assessment](#) sidebar).

### Portfolio Management

When evaluating geographic portfolio concentration for large portfolios, institutional real estate investors undertake a multifaceted assessment process that considers both risks and opportunities. Although sectoral concentrations are frequently considered in portfolio balancing, when assessing physical risk, firms analyze historical and projected future real estate market trends for a region; they consider fundamental economic trends, supply and demand for new property, rental yield trend, and expected capital appreciation. Political and regulatory considerations frequently are included. These factors and the analysis process are an integral part of effective risk management.

Leading firms have started to include physical risk specifically in portfolio assessment, but their approaches to weighting, underlying risk measurements, and processes vary significantly. Since even leading firms are in the early stages of incorporating portfolio-level analysis, it is difficult to identify industry-wide best practices and decision-making techniques to optimize portfolio risk management with respect to physical risk. One manager at a firm with sophisticated climate analytics integration characterized the firm’s journey to optimize portfolios as “kind of like an experiment. We are basically starting from scratch. We get our reports and then look at them, but we are still figuring out what to do.”

Some firms apply a risk-weighting approach in portfolio optimization, though the optimal weight to assign physical risk remains a matter of debate. “We just put weight X on our risk assessment because at least we have it in there; we’re not really sure what the right number is,” shared a portfolio manager.

Portfolio assessment practices diverge notably between general partners (GPs) and limited partners (LPs). GPs tend to scrutinize risk on an individual fund basis. Their firms expressed strategic focus on ensuring each pool of capital they manage was sufficiently diversified against physical risk; however, few felt it relevant to measure their larger portfolio across funds from different capital sources.



By contrast, portfolio managers in LP firms maintain responsibility for the broader task of evaluating the entire portfolio, which often spans investments across multiple GPs. Given the significantly larger pool of assets, as compared to a single fund, the need seems greater for effective tools to manage portfolio-level risk across the variety of direct and managed investments they oversee. These firms express the goal of portfolio-wide understanding of physical risk and are actively trying to determine best practices. However, much like other leading firms, they are still in the process of learning what strategies are best suited for achieving that objective.





# Using Climate Data in Decision-Making

Risk assessment represents a core aspect of real estate capital markets, and risk-adjusted return estimates underpin the language of decision-making. Historically, asset managers have categorized funds into core, value-add, and opportunistic categories, meticulously scrutinizing tenant risk, credit risk, growth potential, spatial factors, and environmental concerns to align with the capital pool's risk profile. Leading firms now integrate physical risk assessment into their risk/return spectrum analysis.

A real estate manager explained, "We talk to our LP clients about risk/return and what they are looking for, and that should include our assessment of physical risk." Consider whether a currently "core" asset, profiling as low risk with a corresponding low expected return, would retain its classification when incorporating significant physical risk. As the industry begins to systematize best practices on physical risk assessment, leading firms challenge the status quo, discussing these stylistic questions.

Interpreting this complex set of inputs and crafting appropriate business processes to manage the risk are neither simple nor straightforward. Sometimes the forward-looking and opaque nature of the future risk makes achieving firmwide buy-in challenging. Similar to how the importance of backing up electronic data may only be appreciated after a loss, sometimes corporate engagement with physical risk policies only intensifies following an actual hazard event with realized loss. Illustrating this, a real estate manager shared an anecdote from the underwriting of an industrial portfolio, where an analyst inquired, "Industrial buildings are

supposed to have *four walls*, right?" One of the walls had recently been blown off by a tornado, leading to the memorable conversation centered around "Where's the wall?"

Of course, a building without four walls shows obvious vulnerabilities to physical risk factors. For this specific analyst and her manager, the abstract future risk of a possible event became crystallized into a realized and observable one. However, most of the forward-looking physical risk at the asset level is hidden from casual observation. How are firms using available data to assess this risk?

## Section Takeaways

- *Aggregate physical risk is a screening tool; individual hazard risk is actionable information.*
- *Climate Value at Risk remains opaque; the utility of the single number offers value but needs increased transparency.*
- *Atypical hazard risk (e.g., flood in a desert) merits increased attention.*
- *External consultants frequently can fill skill gaps, especially for firms with less in-house expertise.*
- *While no predominant time frame or Representative Concentration Pathway (RCP) emerged as industry standard, the 2030 and 2050 benchmarks were the most commonly referenced time horizon.*



## Aggregate versus Individual Peril

Physical-risk reports frequently provide an overall risk score, which typically reflects an aggregate score derived from assessment of multiple perils. However, most analytic platforms also provide more granular detail on individual peril risk that users can investigate. Many firms begin their risk assessment by considering the former composite risk score, which encapsulates multiple climate risks. This approach provides a high-level view of the potential climate-related threats to a property. A real estate manager explained the rationale behind this approach: “We look at the big picture first, assessing the cumulative impact of various climate risks before deciding whether we should dive into specifics.” This strategy enables firms to prioritize their efforts, focusing on properties with elevated risk scores for in-depth analysis.

Typically, when a material risk is posed by a single hazard, climate-risk analytics platforms will flag the overall score, minimizing the chance of overlooking a risk. However, because climate-risk analytics providers’ products are each unique, it is hard to say whether a material risk will be consistently flagged in all scenarios across all platforms. As processes mature, methodology for systematically identifying assets with elevated physical climate risk based on aggregate scores may be an area of special concern, particularly given the consequences of potential oversights.

Conversely, a small number of firms adopt a more granular approach, examining each climate risk independently. This method involves assessing risks such as flooding, wildfires, or extreme weather events separately, rather than relying on aggregating them into a single score. The advantage of this approach lies in its specificity, because it allows for a more detailed understanding of each individual risk. However, it can be more time-consuming and may require more specialized expertise. This approach tends to focus more on the asset level than the portfolio level. Even then, firms continue to examine optimal ways to use the data; as one capital provider commented, “We have market-level dashboards available and how much AUM [assets under management] exposed to what hazards but no physical risk thresholds to any particular hazards.”

## Climate Value at Risk

The *How to Choose, Use, and Better Understand Climate-Risk Analytics* report examined the merits and limitations of CVaR. CVaR aims to quantify the potential financial loss an asset might face due to climate-related risks, combining the asset’s value and the likelihood of climate hazards. Potential impediments to effective use as an investment guide discussed include lack of standard definitions. Key inputs, like the asset’s valuation and associated climate risks, differ across climate analytics providers, leading to inconsistencies. Asset value ranges from market value to replacement value, and the variability of the physical risk assessment itself was well documented, summarized in the table showing the same asset ranges of low to high risk from different providers.

The variability of approaches to CVaR from climate-risk analytics providers leads to a wide range of outcomes, challenging real estate professionals to rely on these assessments for decision-making. Many interviewees expressed skepticism about CVaR’s validity with the primary concern revolving around the assumptions underlying these models. As one manager candidly expressed, “We don’t trust someone else to tell us value at risk. It’s just hard to trust someone else’s assumptions. We have seen a few tools, and they are a big black box of assumptions.” This manager also conveyed that when they asked the front-line sales staff, and even engineering teams, to explain the assumptions behind the CVaR, that they struggled to communicate its foundational elements. Interviewees justified their choice to pass on CVaR saying, “If they don’t understand it, I won’t use it.” This sentiment reflects a broader industry apprehension about relying on external tools whose methodologies and assumptions may not be fully transparent or understood.

Arguably, the primary advantage of the CVaR metric is to put a financial number on the physical climate risk. For those who elected to forgo using this metric, they relied more on a top-down assessment of risk set of analyses, rather than point estimates of financial costs. Those processes, outlined in the [Asset Risk Resilience and Underwriting Flowchart](#), generally involve identification of risk, modeling of risk mitigation costs, and evaluation of long-term risk.

While the majority of firms determined the opaque complexity behind the calculations too poorly understood to use CVaR for decision-making, a minority of firms extolled the simplicity of the output. While admitting that the inputs could use increased transparency, the simple dollar or percentage risk number easily conveyed manageable risk levels to senior management and portfolio teams. They believed that consistent application of a tool throughout their portfolio would identify pertinent risks and provide substantive guidance on the financial risk.

## Unexpected Peril

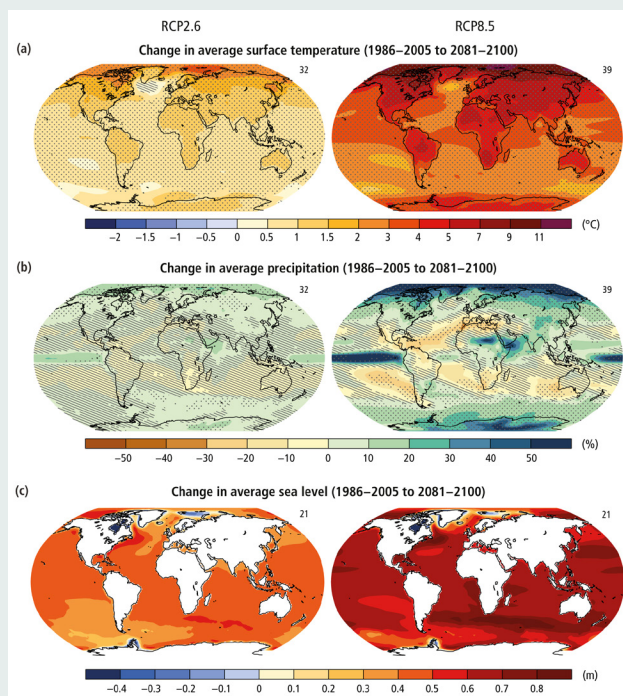
Properties in certain locations, such as South Florida, Northern California, Mumbai, or Amsterdam, come with obvious risks like hurricanes, floods, or wildfires. However, the most valuable insights from a physical climate risk analysis often emerge from identification of risks that may be less intuitive. In some cases, leading firm managers indicated that these somewhat surprising high-hazard risks yielded greater information; one provided an example of this phenomenon: “We were underwriting a property in an arid region, and the report identified high flood risk. At first it made no sense, but it turns out the property was located in a mountain drainage path. This information helped us underwrite the property and go into the deal understanding how to mitigate that risk.”

This story underscores the need to critically assess the unique risks associated with each asset and its locale. Of course, market-level knowledge and municipal resilience measures are important, but as this anecdote shows, perils, like floods, may arise in unexpected places—even in a desert.

## What and When? RCPs and Time Horizons for Physical Risk

**“Some investors’ questionnaires just ask for one Climate Value at Risk number, but that one number is useless and incomparable to peers without understanding the RCP scenario, time frame, and other inputs.” – Global investment manager**

Representative concentration pathways developed by the Intergovernmental Panel on Climate Change (IPCC) define scenarios that outline different climate futures based on varying levels of expected global warming from greenhouse gas concentrations. RCPs range from a 2.6-degree Celsius increase by 2100 to an 8.5-degree Celsius increase by 2100, with accelerated climate impacts associated with higher global warming.



*Average projections from multiple climate models for the years 2081–2100, comparing two of the available scenarios (RCP 2.6 and RCP 8.5) in terms of temperature, precipitation changes, and sea-level rise, relative to 1986–2005, with stippling indicating regions of high confidence in the projections and hatching showing areas of lower confidence. (Source: IPCC.)*

Many consultants and climate-risk analytics providers offer options for scenarios on which to estimate physical risk—both in terms of the degrees of warming and the expected time frame (e.g., 10 years, 2050, 2100, etc.). Interviewees familiar with RCPs exhibited a wide range of preferences under both of these variables. A minority of respondents selected the RCP 8.5 scenario, projecting to 2100, representing a high-risk scenario with significant greenhouse gas emissions, acknowledging it as a downside-scenario risk assessment. Conversely, some preferred the RCP 2.6 scenario paired with a shorter-term outlook, underwriting to an expectation of relatively moderate climatic shifts. This divergence in approach reflects the variability in perceptions of risk and the strategies firms employ to estimate it.

A lack of consensus on applying and interpreting RCPs may be appropriate at this point in our understanding, given the variability in organization/portfolio structure, size, jurisdiction, geographic distribution, and so on. However, a significant segment of interviewees admitted to using the provided data without a clear understanding of how it was generated, effectively choosing the “default installation” of a product. One real estate manager candidly revealed, “I honestly don’t think most people have a sense of RCP.” This uncertainty can lead to challenges in accurately interpreting climate risk data and making informed decisions. It underscores the need for real estate analysts to more thoroughly understand the foundation of the risk analysis methodology they use for decision-making.

Of those who were familiar with RCPs, many indicated that most of their management team “simply have no grasp of the year 2100” and that attempts to highlight this risk fell on deaf ears. One manager attempted to take an informational approach, trying to provide as much information as could be concisely presented with their goal to “bring information to the team and let them make an informed decision.” In contrast, one firm that frequently handled investments with 15-year or greater time horizons said, “Some investments we help oversee are intergenerational wealth, long-term horizons, [and] we need to match those time horizons.”



## Integration of External Consultants

Given the complexity and specialized nature of physical climate-risk assessment, real estate firms commonly enlist the expertise of consultants. These consultants typically encompass expertise in engineering and managing physical and environmental due diligence processes. In some instances, firms relied heavily on outside consultants to manage the entire physical risk (and sometimes climate risk broadly) analysis process for them. For leading firms, external consultants tended to help bound the identified risk into actionable mitigation strategies.

Specifically, architecture, engineering, and consulting firms helped identify property-level resilience or adaptation strategies, estimate their costs, and shed light on neighborhood-level hazard mitigation measures in place. Capital expenditures estimated by consultants to mitigate the impact of physical hazards were seen as an increasingly important component of property underwriting, as discussed later in this report. Virtually all firms, regardless of whether they focused their risk analysis in house or externally, relied on an external consultant for guidance on cost estimation of risk and appropriate asset-level risk mitigation strategies.

## ASTM'S STANDARD GUIDE FOR PROPERTY RESILIENCE ASSESSMENT

Many market participants may already be aware of the *ASTM Standard Guide for Property Resilience Assessment*, which is under development as of the publication date of this report. The ASTM standard involves assessing the structural integrity, design features, and other characteristics that determine how well a property can withstand and recover from climate impacts. Many consultants and a small number of leading firms already incorporate the draft standard into their formal due diligence activities. The adoption of the Property Resilience Assessment (PRA) marks a shift toward standardization of the risk assessment process. Arguably, this standardization not only helps in safeguarding investments but also contributes to the broader goal of creating sustainable and resilient communities.



# Acquisition, Underwriting, and Disposition Practices

The adage “money is made on the buy” remains relevant today, even as today’s investment managers understand that value can be created throughout the entire life cycle of holding an asset. This section focuses on acquisition screening, underwriting both the expected capital costs to properly harden an asset and strategies for addressing financial uncertainty, and disposition practices. The domain expertise of the interviewees lay more in these areas than in asset management itself, an important area outside the scope of this report but worthy of separate discussion.

Evaluating physical risk has become a routine part of the assessment and screening of potential new acquisitions for leading firms. Although the nuances and implementation of these practices differ from firm to firm, the broad steps to identify and consider this risk are somewhat ubiquitous.

- **First**, they seek to identify the risks.
- **Second**, they evaluate strategies and quantify costs to mitigate or effectively bound the issue(s) of concern.
- **Third**, they use this information as part of their toolkit to assess whether the risk-adjusted return of the asset meets their fund or capital objectives or whether adjustments to deal terms need to be made.

## Section Takeaways

- *Start with a top-down assessment of physical risk.*
- *Market concentration of physical risk is analogous to other concentration risks—a nuanced analysis is required.*
- *Capital expenditure for resilience projections is a key forecast but rife with uncertainty.*
- *Local-market climate mitigation measures are important to understand but difficult to forecast.*
- *Exit cap rate discount for estimated physical risk is an increasingly common tool, frequently 25 to 50 basis points.*
- *Firms infrequently disclose physical risk, but the market needs increased transparency.*



## Initial Assessment

Typically, firms begin with a high-level, aggregate risk score screen of the asset. Some leading firms make a point to examine each individual hazard risk. If the overall risk score signifies a moderate to high risk, this sparks additional due diligence. Properties that exhibit any higher risk require adjustments to the underwriting to account for that risk. In many cases, leading firms look for ways to mitigate or bound the risk rather than exit the deal altogether. However, each property is unique.

For instance, an investor described a scenario where there were “12 different garden-style buildings on one site. We discovered during our due diligence that half were at a lower elevation than the other six. As we looked at additional reports, our physical risk assessment showed that the lower six were not in the flood zone when originally built. However, they now were and would require several feet of elevation to properly mitigate the risk. The costs were too much to properly address the issue, so we passed on the deal.” This type of assessment typifies the process leading firms follow.

## Deciding Whether to Exclude Markets Due to Physical Risk

Frequently, firms limit concentration levels to certain geographies for many of the reasons listed previously (e.g., macroeconomic analysis, expected future returns, political uncertainty, etc.). In addition, some firms limit concentration for the simple reason of avoiding a concentration risk. For example, any prudent investor at this point understands specific markets have higher hurricane risk, chronic heat risk, or wildfire risk. Potential ways to address this risk include more stringent portfolio concentration limits or higher return hurdles. One point of discussion during the interviews was whether markets with higher expected physical risks might be excluded altogether from a portfolio.

### Today's Trends

No firm that was interviewed categorically excludes markets based solely on market-level physical risk, yet most acknowledge and evaluate concentration risk within these markets. Some of the leading firms indicated they have excluded a few micro-markets within a larger metropolitan area, but not the area itself. Some investment managers focus more on fund-level sensitivities to exposure to physical risks within portfolios.

Market-level risk remains important because certain markets, somewhat self-evidently given recent disasters, possess greater risks of specific hazards; however, respondents conveyed that property-level analysis yields more detailed and nuanced assessment of the risks. One manager's comment on the

importance of asset-level analysis over market level can be paraphrased as follows: we can control what happens at the property level but much less so at a market level.

While the asset and portfolio managers interviewed expressed their preferences for property or micro-market risk analysis, they also mentioned that a few limited partners (LPs) had directed them to avoid certain types of risks. For example, one manager commented on a specific fund's unwillingness to take on hurricane risk, “We have funds that are on the ‘life's too short for Florida’ list.” Consequently, while most asset managers pursue a broadly inclusive investment strategy across geographies, a minority of capital sources are starting to selectively exclude specific markets. Although interviewees were unable to articulate the specific rationale for market exclusion, the general sense was certain funds relying on intuition rather than detailed analytics as decision criteria.

### Tomorrow's Strategy

The allocation of capital in the near term appears to require a greater focus on asset-level risk metrics relative to market-level analysis. However, many leading firms are actively developing forward-looking strategies addressing the dynamic nature of physical risk. Specifically, the strategic consideration of chronic stressors, such as heat stress and potential climate migration were discussed.<sup>15</sup> These forward-looking plans included potential capital expenditures on water and managing indoor temperature ranges. Reflecting on a recent strategy session, an investment manager summarized, “We were just talking about how we can't take our eye off heat stress and planning for resilience in occupant comfort and safety.”

The possibility of excluding cities based on risk in the future remains an ongoing topic of discussion. “What is the moment where the risk is just too high in city XYZ?,” pondered a manager. Certain markets whose investment theses have been underpinned by expectations of population and economic growth now merit inclusion of physical risk in these assessments. Of course, factors driving population growth for these markets include livability and desirability of the location. Assets within markets maintain and grow their value when the market remains attractive to occupiers; if a location becomes inhospitable or unjustifiably risky due to physical climate risks, this will affect capital values, vacancies, and long-run cash flows.

Investors are asking whether current assumptions about population and economic growth can stay intact in the face of a changing climate. For example, one investor queried, “Is there a point where chronic heat becomes too difficult to bear in a *Sun Belt city*, or hurricane risk destroys one too many homes in a *coastal city*?” Simply put, the question is: Should long-term market assumptions be re-evaluated in light of evolving climate risks?



## Underwriting and Value Impacts

Similar to the preceding assessment and screening procedures, underwriting physical risk into a potential acquisition serves as a routine and common function in leading firms. However, little consistency across various firms' policies and strategies was found. This section highlights a few of the more common tactics and provides an overview of the techniques firms found beneficial.

### Capital Expenditure Estimation for Resilience

Nearly all firms incorporating physical risk assessment into their underwriting commonly estimated the expected capital expenditures to improve the building's climate resilience where needed. However, hardening a building to reduce vulnerability to potential physical risks remains both an art and a science. Estimating the capital expenditures required to modernize buildings to meet current resilience needs may be a multiyear undertaking. However, this proactive approach to risk management potentially yields beneficial long-term outcomes.

As climate-risk analytics firms continue to improve their ability to identify physical risks in the built environment, real estate firms continue to improve their processes and procedures to incorporate this risk into underwriting. Nonetheless, real estate managers frequently struggle with the question of how to relate catastrophic and physical risks to the cost of building resilience measures at the asset level.<sup>16</sup> Although most firms enlist external consultants for this process, they acknowledge that even the best estimates involve numerous assumptions and uncertainties.

One real estate manager encapsulated this situation with an analogy, "We are challenged to objectively underwrite resilience measures in the same way we would underwrite a new lobby

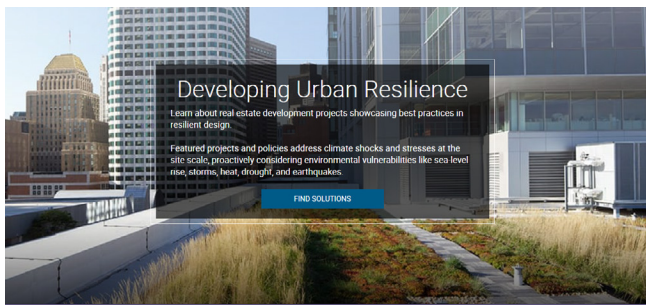
renovation." They relayed how difficult this approach made estimation in contrast to more easily forecast projects. Although uncertainty in budgeted line items such as concrete, lumber, and labor exist in any forecast, the rapid pace of technological innovation and nascent stage of best practices in quantifying physical risk increase the volatility of cost forecasting. For example, the materials and best practices used in wind resistance differ from those a decade ago. Numerous managers identified the uncertainty over what resilience measures would cost and how long they might be considered best practices as a key and ongoing challenge.

Regardless of the uncertainty behind the cost forecasts, most interviewees felt this strategy resonated with senior management and capital providers. The somewhat abstract nature of potential future climate hazards, especially when using longer-term forecasts, often felt like challenging justification to make actionable decisions. However, the reported perception of senior management for adding resilience, or hardening, the building resonated in a more practical and actionable way. Perhaps because of the comparatively easier senior management endorsement, this strategy for underwriting physical risk was by far the most common.

### What about Local Market Resilience?

Property owners in gateway cities frequently operate under a set of assumptions that influence their investment and management strategies. The majority of property owners expressed belief that these markets, due to their population density, economic significance, and resources, will prioritize and construct large-scale municipal resilience measures. This general sentiment often fueled the investment thesis behind remaining in these significant urban centers.

However, the capacity of cities to effectively build and maintain resilience varies widely, influenced by factors such as budget constraints, political will, and the complexity of the challenges posed by climate change. In the United States, the Bipartisan Infrastructure Law and Inflation Reduction Act together invest more than \$50 billion in climate resilience and adaptation.<sup>17</sup> However, the adaptation finance needed to implement domestic adaptation priorities is estimated at \$387 billion per year.<sup>18</sup> Some cities, such as New York City, are proactively publishing planned projects and the methodology for cost/benefit analysis.<sup>19</sup> Others, such as Chicago, have been spending significant resources but are realizing they may require additional infrastructure.<sup>20</sup> Venice constructed a \$6 billion flood prevention system, a system of inflatable sea walls, which has prevented at least one potential flood.<sup>21</sup> Meanwhile, China, through its "sponge city" initiative, has spurred buildout of local projects like the Qunli National Urban park and wetland (also called Qunli Stormwater Park) in Harbin to enhance urban water absorption and flood management. These projects cost between 100 and 150 million RMB per square kilometer.<sup>22</sup>



**HARDENING ASSETS**

More than 140 strategies for building resilience can be found in the [ULI Developing Resilience Toolkit](#), and many are showcased on ULI's [Developing Urban Resilience](#) website, an interactive library of real estate development projects demonstrating how resilience creates value.

However, who bears the cost of these resilience measures and through what vehicles remains an open question. Consider a thought experiment of two extremes:

- Scenario 1: property owners construct and pay for a flood wall, protecting their asset.
- Scenario 2: a government entity, either local or national, constructs and pays for a flood wall.

Under the first scenario, owners would evaluate a detailed cost/benefit analysis, while under the second scenario, property owners might benefit from publicly funded protective measures without directly incurring the cost. This, however, begs the question of whether the financial burden of these government-funded projects would be primarily borne by property owners through increased taxes, special assessments, or similar measures.

As countries, states, and local governments continue to grapple with the challenges of climate change, property owners must balance their reliance on municipal initiatives with their own resilience strategies, including thoughtful consideration of the costs.

### Cap Rate Sensitivity

Underwriting scenarios that include sensitivity analysis on the reversion, or exit, capitalization rates have long been a cornerstone of effective risk management. Time-tested practices by institutional capital dictate that exit cap rates typically be modeled at a higher expected yield than entry ones. Of course, higher expected yield (cap rate) means a lower valuation. Using this technique means that the long-term value from an investment would be generated by one or more of predictable and stable cash flows, favorable macroeconomic trends, or value creation at the asset level. Simply modeling a lower expected yield (higher valuation) at exit relies on an uncertain future to meet investment objectives.

Different investment vehicles reflect varying appetites for risk, time horizon, and strategic priorities. Firms constantly seek information on inflection points from other related indicators, such as market trends, environmental risk assessments, and regulatory changes. This holistic approach enables a more comprehensive understanding of the potential impact of cap rate changes on investment returns. Although specific fund objectives vary in scope and strategy, fundamentally they all rely on the expertise of the investment manager to deliver returns rather than a large-scale economic shift affecting all owners.

A number of the leading firms, but certainly not all, included an additional discount to their exit capitalization rate for individual assets and occasionally for assets in markets with heightened physical climate risk. What if the reversion cap rate has materially deteriorated due to increased awareness, perceived risk, or actual operating cost of the asset in a market? The conservative approach

to underwriting the exit cap entails accounting for this potential risk as equally relevant to the inflection points listed above. Firms practicing this approach typically apply a 0.25 to 0.50 percent discount to the exit cap rate, accounting for increased risk.

Many investment firms, particularly those whose portfolio includes core funds, or funds typically charged with investing in stable, cash-flowing assets with credit tenants in excellent locations, offered a forward-looking perspective. They considered not just the immediate investment horizon and their hold period but further reflected on the subsequent market dynamics. One core investor conveyed a common sentiment: “We look at our own hold period plus the next buyer.” This perspective frequently involves looking at a 30- to 50-year potential time horizon, understanding the current acquirer’s hold period along with the expected hold of a future investor. This horizon elides into the realm of perpetual analyses, or considering a perpetual hold on the property (*mathematically, the present value of a \$1,000 payment stream over 50 years at a 10 percent discount rate, incorporating both r and g, is \$9,915, or over 99 percent of the perpetuity value of \$10,000*). This perpetual viewpoint provides a more comprehensive picture of the investment’s potential, influencing decisions about when and at what price to exit the investment.

### Perpetuity Formula

$$PV = \frac{C}{(r-g)}$$

#### Where:

PV = Present value of the perpetuity

C = Constant annual payment

r = Discount rate

g = Growth rate

#### Example:

Annual payment (C) = \$1,000

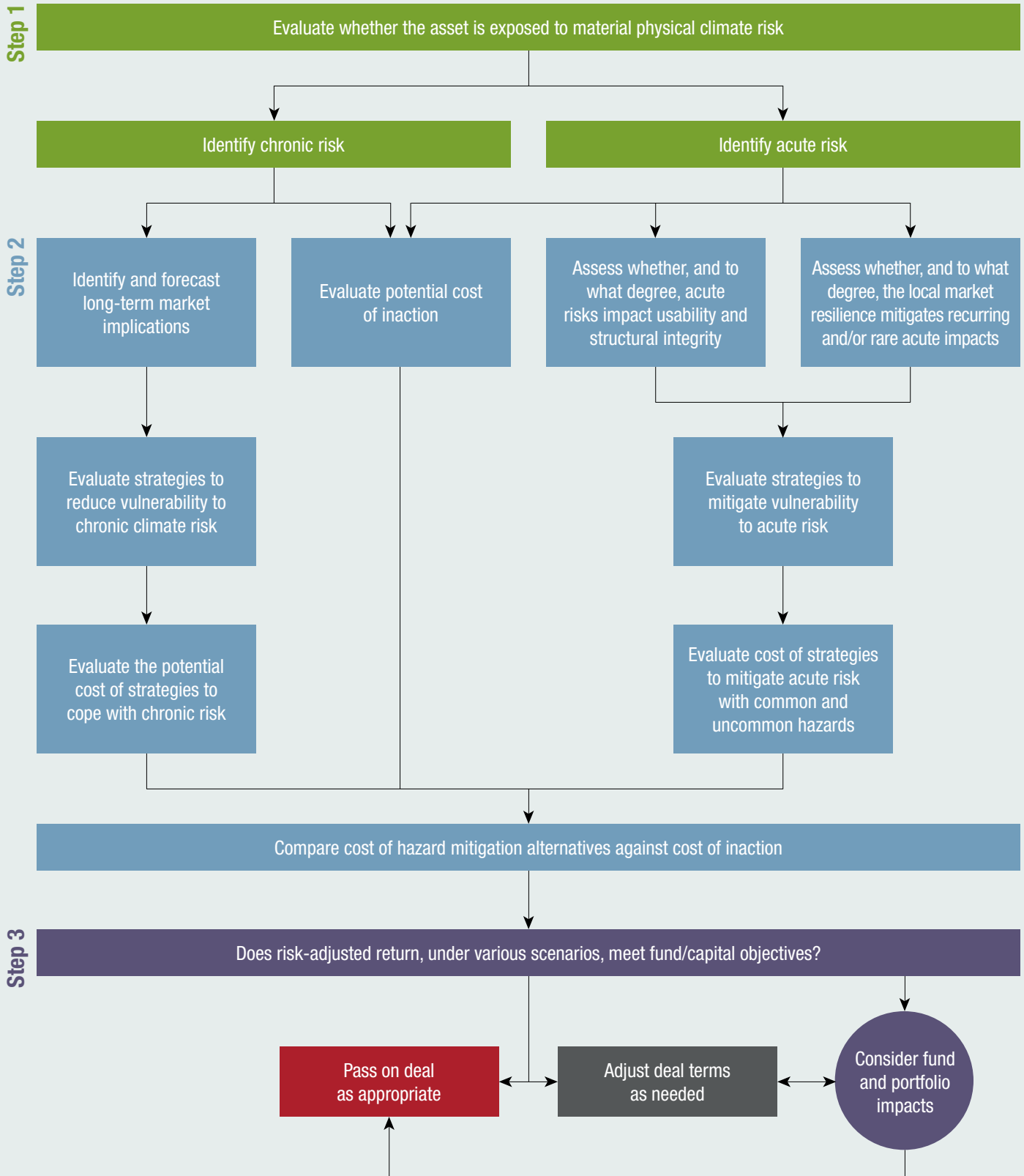
Discount rate (r) = 10% (or 0.10)

#### The formula becomes:

PV = \$1,000 / 0.10

Having reviewed aspects of the underwriting process as well as potential instances where value may be affected by the presence of physical climate risk in this section, the following flowchart outlines the process of investment decision-making, focusing on underwriting steps and their effects on property valuation.

# Asset Risk Resilience and Underwriting Flowchart



(Continued on next page)



## Asset Risk Resilience and Underwriting Flowchart (continued)

### Step 1: Identify risks

#### Leading firms...

- Examine a time horizon (e.g., 30 years) including acquirer's hold period as well as the expected buyer's
- Begin with a high-level, aggregate physical climate-risk screen of the asset with some firms also choosing to examine each individual hazard risk including chronic risks such as heat stress, water stress, or sea level rise and acute risks such as flood, wildfire, and severe storm
- Confirm there is no underrepresentation of risks in assessment data

### Step 2: Evaluate strategies and quantify costs to mitigate or effectively bound the issue(s) of concern

#### Leading firms...

- Look to standards such as ASTM's draft *Standard Guide for Property Resilience Assessment* for due diligence
- Engage with asset-level risk metrics while developing forward-looking strategies for physical risks, including both acute and chronic stresses
- Consider capital expenditure needed for hazard mitigation, most often in collaboration with consultants
- Account for items such as the needed CapEx, cost and/or availability of insurance, and exit cap rate when evaluating the cost of potential hazard mitigation strategies
- Evaluate impacts such as potential downtime, business disruption, and cost of repair when analyzing the cost of inaction
- Include an additional discount to exit capitalization rate for individual assets and occasionally for assets in markets with heightened physical climate risk such as flood, wildfire, and severe storm

### Step 3: Assess whether the risk-adjusted return of the asset meets fund or capital objectives or whether adjustments to deal terms need to be made

#### Leading firms...

- Actively coach their teams to challenge existing assumptions about investment theses for real estate assets and how climate risk may (or may not) change their investment perspective
- Look for ways to mitigate or bound the risk first rather than exit the deal altogether

## Disposition Considerations

Concerns about liability and market perception concerning potential physical risk represent important property disposition considerations; the implications of disclosure extend beyond mere transparency to potentially influence the asset's value and attractiveness to buyers. The dilemma is not trivial; it involves a careful balancing act between ethical transparency and the safeguarding of an asset's value. When interview participants were effectively asked if they do anything different in the course of asset disposition with assets they know have physical risk compared to those that do not or have unquantified risk, numerous interviewees voiced concerns over potential liability stemming from disclosure. This apprehension stems from the potential for such disclosures to negatively affect value, raise fiduciary issues, or even pose legal challenges.

### Physical Risk in Offering Memorandums

Of course, asset disposition requires a willing buyer. Offering memorandums (OMs) reflect the current practices in the market. Participants reported that they had rarely seen an OM include detailed information about a property's exposure to physical climate risks and only rarely saw discussion of completed mitigation measures. This omission is not necessarily indicative of a lack of awareness but perhaps a strategic decision influenced by the perceived risk of such disclosures.

Despite the general absence of climate risk information in OMs, most major asset buyers conduct their own due diligence regarding physical climate risks. Given the uncertainty around physical climate risk analytics and the divergent practices across firms, perhaps lack of disclosure reflects not just risk, but an understanding that each firm conducts independent analysis regardless.

### When to Proactively Disclose Physical Risk

Institutional sellers typically understand the existence and nature of asset-level physical risks at the time of disposition. Institutional buyers generally perform appropriate due diligence to uncover the presence and form of these risks. Given awareness by both parties, some interviewees recommended proactive disclosure primarily in scenarios where resilience measures have been undertaken.

As one real estate manager advised, "When there is a story to tell, the seller should tell it." This approach can include highlighting how a building withstood a natural disaster like a hurricane or detailing the resilience measures implemented. Showcasing resilience upgrades such as elevated equipment in a flood zone, increased wind resistance, firebreak installation, or any features that enhance the property's durability against climate threats, may add value. These types of disclosures can serve as a testament to the property's resilience and preparedness, potentially turning a perceived risk into a selling point, especially if the market-level risk for a hazard is elevated.

## PROPERTY INSURANCE

The degree of physical risk identified may be an indicator of insurance risk. A significant shift is already occurring in the residential lending sector, with insurers withdrawing from California and Florida because of heightened wildfire and hurricane risks, respectively.<sup>23</sup> The response from insurers to physical climate risk in these markets represents a clear example of how quickly attitudes can change. During the interviews held in summer 2023, this development was met largely with indifference by investment managers, who showed little concern about physical risk insurers abandoning commercial markets. One investment manager interviewed commented that the issue "Feels a bit far off; when I try to talk to folks about [it], it seems secondary."

Investment managers now recognize that since the fourth quarter of 2021 through the first quarter of 2023, insurance premiums have consistently risen by double digits.<sup>24</sup> In response, the standard practice for investment managers during this period has been to assume a doubling of projected insurance costs from the prior year's rates.

Looking ahead, consensus today from both industry experts and popular media is increasingly pointing to significant insurance risks on the horizon. This growing awareness, combined with industry experience, has already changed the perception of risk. This shift in attitude is crucial considering the mismatch between the typically year-to-year nature of insurance and the long-term horizon of owning assets, especially in a world facing escalating climate hazards.

# Charting a Path Forward

The landscape of real estate investment is constantly evolving. Recent years have seen shifts in consumer behaviors and professional work patterns, advancements in technology, and increase of costly damage from physical climate hazards to assets worldwide. Adapting to this ever-changing environment requires new practices to better understand and manage real estate portfolios.

## **Transparency, rather than rigid standardization, appears more effective for integrating climate-risk assessments into business processes.**

Climate-risk analysis, like other forecasting tools, involves data spanning multiple domains across numerous dimensions. Like other forecasting techniques, a range of methodologies for projecting potential future physical climate risk, as well as different ways of incorporating these insights into investment underwriting and management may be appropriate for a given analysis. As such, rather than pushing toward a common approach, transparency in data and strategies enables more nuanced and adaptable approaches to fit different investment strategies. This transparency will permit investors to make informed decisions tailored to their unique perspectives and risk appetites.

## **Looking ahead, investors will continue to play a leading role in integrating climate-risk analytics into business practices, as risk pricing in real estate remains a fundamentally investor-led decision.**

Most leading investors now understand physical climate risk is one among many investment considerations. Investors must harness physical climate-risk data and insights to develop models that reflect their understanding of risk and potential returns, in the context of their investment strategy. This may include an individualized approach to evaluating physical risk and resilience at the property, market, and macroeconomic levels in the context of the other market dynamics that impact investment decisions. For example, at the asset level, one firm may decide not to pursue an acquisition with elevated flood risk, while another may decide that hardening the asset adequately mitigates the risk. At a market

level, some firms may adjust their market weighting to account for elevated physical risk in some locations, others may choose to evaluate concentration of risk typology across markets (e.g., wildfire), and still others may assess the impact of local resilience on the market-level risk. At a macroeconomic level, one firm may believe climate migration markedly improves the 10- to 20-year investment horizon of more temperate geographies compared to warmer or coastal areas. Another may contend local resilience measures and global GHG reduction strategies sufficiently mitigate physical risk and continue to identify areas with high physical climate risk as target areas for growth. Firms' differing views on these factors will shape investment and underwriting decisions and resulting performance outcomes in the same way that their positions on other investment factors forecast growth and development in cities and across different property types.

## **Effectively managing physical risks also requires widespread diffusion of knowledge and changing business practices within the organization and the industry.**

Ideation, creative problem solving, and diversity of opinions on the impact of climate risk best originate from teams. Knowledge dissemination across all levels of an organization ensures a more unified approach to risk assessment and ensures it is being considered properly throughout all aspects of the investment life cycle. Firms building strategies and making investment decisions about physical risk will need to identify ways to distribute this information to all levels of their team. While decision-making typically resides at the most senior levels, the most talented leaders understand that the best ideas may originate anywhere across the organizational structure.

Physical risk will continue to influence real estate investment for the foreseeable future. Emphasizing transparency, empowering investor-led risk pricing, and fostering knowledge diffusion may help firms navigate the challenges and seize the opportunities in this evolving landscape. This approach not only provides the potential to mitigate firm-level risks but also positions investors for sustainable growth and success in a world where resilience matters.



# Notes

1. IFRS, "ISSB Issues Inaugural Global Sustainability Disclosure Standards," accessed January 23, 2024, <https://www.ifrs.org/news-and-events/news/2023/06/issb-issues-ifrs-s1-ifrs-s2/>.
2. David Zilberberg, Emily Roberts, and Loyti Cheng, "California Enacts Major Climate-Related Disclosure Laws," The Harvard Law School Forum on Corporate Governance (blog), October 22, 2023, <https://corpgov.law.harvard.edu/2023/10/22/california-enacts-major-climate-related-disclosure-laws/>.
3. IOSCO, "IOSCO Endorsement Assessment of the ISSB Standards for Sustainability-Related Disclosures," July 2023, <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD741.pdf>.
4. Rochelle Toplensky, "Stock Exchange Regulators Back Global Climate-Reporting Rules," *Wall Street Journal*, July 25, 2023, sec. WSJ Pro, <https://www.wsj.com/articles/stock-exchange-regulators-back-global-climate-reporting-rules-35ce71b9>.
5. Mark Segal, "IFRS to Take over Responsibilities of the TCFD," *ESG Today*, July 10, 2023, <https://www.esgtoday.com/issb-to-take-over-responsibilities-from-tcfd/>.
6. Securities and Exchange Commission, "The Enhancement and Standardization of Climate-Related Disclosures for Investors," April 11, 2022, <https://www.sec.gov/files/rules/proposed/2022/33-11042.pdf>.
7. European Commission, Finance, "Corporate Sustainability Reporting," accessed January 23, 2024, [https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting\\_en](https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en).
8. Gabrielle See, "Singapore among the First in Asia to Propose Mandatory Climate Reporting for Non-Listed Companies," *Eco-Business*, July 7, 2023, <https://www.eco-business.com/news/singapore-among-the-first-in-asia-to-propose-mandatory-climate-reporting-for-non-listed-companies/>.
9. Reuters, "Hong Kong to Make Climate Disclosures Mandatory for Issuers," accessed January 23, 2024, <https://www.reuters.com/business/sustainable-business/hong-kong-make-climate-disclosures-mandatory-issuers-2023-04-14/>.
10. Adam B. Smith, "U.S. Billion-Dollar Weather and Climate Disasters, 1980–Present (NCEI Accession 0209268)," NOAA National Centers for Environmental Information, 2020, <https://doi.org/10.25921/STKW-7W73>.
11. "Economic Losses from Weather- and Climate-Related Extremes in Europe," October 6, 2023, <https://www.eea.europa.eu/en/analysis/indicators/economic-losses-from-climate-related>.
12. Aon, "Aon: Catastrophes and Natural Disasters in the Asia Pacific Region in 2022 Led to Total Economic Loss of USD 80 Billion," Asia Newsroom, June 27, 2023, accessed January 23, 2024, [www.aon.com/unitedkingdom/employee-benefits/default.jsp](http://www.aon.com/unitedkingdom/employee-benefits/default.jsp).
13. European Environment Agency, "Economic Losses from Weather- and Climate-Related Extremes in Europe," October 6, 2023, <https://www.eea.europa.eu/en/analysis/indicators/economic-losses-from-climate-related>.
14. Bank of England, *Bank of England Report on Climate-Related Risks and the Regulatory Capital Frameworks*, January 23, 2024, <https://www.bankofengland.co.uk/prudential-regulation/publication/2023/report-on-climate-related-risks-and-the-regulatory-capital-frameworks>.
15. Urban Land Institute, *Climate Migration and Real Estate Investment Decision-Making* (Washington, DC: ULI, 2022), <https://knowledge.uli.org/en/Reports/Research%20Reports/2021/Climate%20Migration%20and%20Real%20Estate%20Investment>.
16. Maiclaire Bolton Smith, "Catastrophic Change Is Pushing Real Estate to Redefine Protection," CoreLogic®, May 11, 2022, <https://www.corelogic.com/intelligence/catastrophic-change-is-pushing-real-estate-to-redefine-protection/>. Catastrophic risk in the context of real estate and climate change refers to the significant financial and physical threats posed by climate-induced natural disasters, such as floods, hurricanes, and wildfires, to real estate asset.
17. The White House, "Fact Sheet: Biden-Harris Administration Makes Historic Investments to Build Community Climate Resilience," June 20, 2023, <https://www.whitehouse.gov/briefing-room/statements-releases/2023/06/19/fact-sheet-biden-harris-administration-makes-historic-investments-to-build-community-climate-resilience/>.
18. U.N. Environment Programme, *Adaptation Gap Report 2023: Underfinanced. Underprepared* (Nairobi, 2023). [www.unep.org/resources/adaptation-gap-report-2023](http://www.unep.org/resources/adaptation-gap-report-2023).
19. NYC Mayor's Office of Climate and Environmental Justice, *Climate Resiliency Design Guidelines Version 4.1*, May 2022, <https://www.nyc.gov/assets/sustainability/downloads/pdf/publications/CRDG-4-1-May-2022.pdf>.
20. Joe Barrett, "Chicago Is Spending \$3.8 Billion to Fight Flooding. It Might Not Be Enough," *Wall Street Journal*, August 30, 2023, accessed January 23, 2024, <https://www.wsj.com/us-news/climate-environment/chicago-is-spending-3-8-billion-to-fight-flooding-it-might-not-be-enough-f9a30bbd>.
21. Chico Harlan and Pitrelli Stefano, "An Engineering Marvel Just Saved Venice from a Flood. What about When Seas Rise?," *Washington Post*, November 26, 2022, <https://www.washingtonpost.com/climate-solutions/2022/11/26/venice-floods-mose-barrier-climate/>.

22. Lei Li, Alexandra M. Collins, Ali Cheshmehzangi, and Faith Ka Shun Chan, "Identifying Enablers and Barriers to the Implementation of the Green Infrastructure for Urban Flood Management: A Comparative Analysis of the UK and China," *Urban Forestry & Urban Greening* 54 (October 1, 2020): 126770, <https://doi.org/10.1016/j.ufug.2020.126770>.

23. Jon Sindreu, "Climate Risk Is Becoming Uninsurable. Better Forecasting Can Help," *Wall Street Journal*, October 30, 2023, <https://www.wsj.com/business/entrepreneurship/climate-risk-is-becoming-uninsurable-better-forecasting-can-help-b9c94ca6>.

24. Zoe Hughes and IvyLee Rosario, "Insurance in a Brave New World," *NAREIM* magazine, Fall 2023, <https://www.nareim.org/final-content/insurance-in-a-brave-new-world->.



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