Scientific Climate **Indices**
An EDHEC Venture

Product Review

July 2026

SciX
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Transparency Matters When Tackling 'Physical Climate Risk'

Key Takeaways

• **Physical climate risks present insidious threats to the world economy.**
Institutional investors understand this is not just another dimension of ESG or sustainability: they are increasingly aware of the financial materiality of climate risks and exploring how to measure and mitigate exposure, with both 'acute' and 'chronic' physical climate-related damage in mind.

• **Confusion persists, however, on how exposure to physical climate risks should be calculated and mitigated.**
Various methodologies may produce radically different estimates of potential losses, explaining why most investors find physical risk analytics "*insufficient for decision-making*".[1] Company-level data remains patchy, problematic and not necessarily compatible with robust index construction. Complex approaches can result in higher cost than required by the strategy and, perhaps even more problematically, weak transparency. Meanwhile, investment strategies typically blend multiple objectives alongside physical risk reduction.

• **Strong governance is therefore paramount when seeking to improve resilience.**
Investors must understand what they are buying, especially given the potential unintended consequences for future returns. Our SciX Climate Resilient Index offering relies on a 'baseline-plus' approach, beginning with core equity indices that are tightly focused on physical risk, methodologically transparent, founded on high-consensus data, and suitable for efficient low-cost index implementation. While further complexity is often beneficial, such as additional granularity regarding company-specific physical climate exposures or adjusting portfolios to address other objectives (both financial and non-financial), these enhancements and their associated trade-offs should be clear and distinct.

Our SciX Climate Resilient Indices help equity investors meaningfully reduce their exposure to physical risks, even with tight constraints: a 15% reduction in estimated future losses relating to physical risk can be achieved in exchange for an annual tracking error of just 1% versus market capitalization-weighted benchmarks.

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on August 27th, 2026

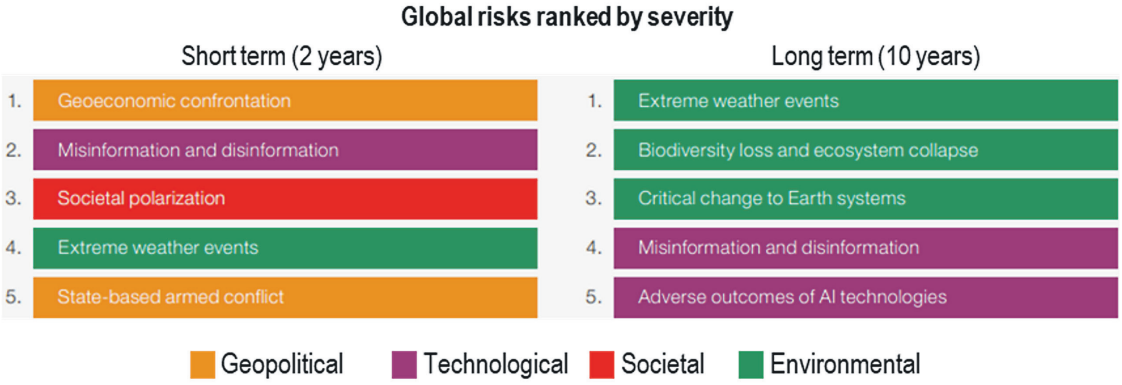
Physical climate risks demand attention

If the extreme heat conditions witnessed across multiple continents in 2026 remind us of anything, it is the financial materiality of physical climate risks. The consequences are becoming more visible every year, with weather disruption in particular highlighting the potential for asset damage, production chain disruption, infrastructure stress and productivity reduction. The potential for both acute and chronic damage is becoming both more visible and more complex in a world where strategic dependencies, trade relationships and global institutions are being reshaped by geopolitical tensions.

While physical climate risks are increasingly viewed as significant in the short term, their perceived importance rises dramatically over a medium-term horizon, as illustrated by the World Economic Forum's recent Global Risks Report (see Exhibit 1).

1 - Responsible Investor's Climate Risk & Resilience Survey 2026

Exhibit 1: Global risks ranked by severity by the World Economic Forum, 2026

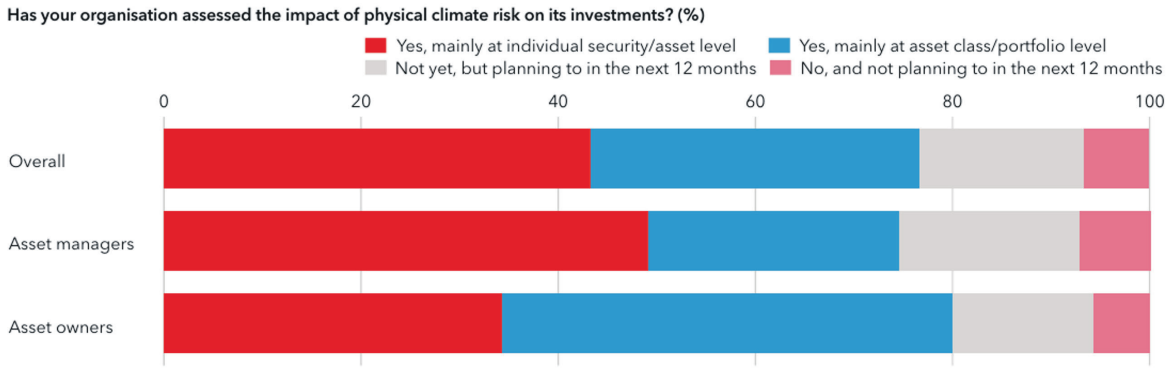


Source: World Economic Forum, Global Risks Report 2026, January 2026.

Insurance alone cannot provide an answer to these challenges, even for 'acute' climate physical risks. Global natural catastrophe damages totaled $320 billion in 2024, 56% of which were uninsured.[2] Boston Consulting Group[3] has estimated that, for unprepared businesses, individual physical risks alone could put 5-25% of their EBITDA at risk. Without an expectation of protection, impact on equity investors remains unavoidable.

Investors are paying growing attention to this subject. This year, for example, Norges Bank Investment Management has been in the headlines[4] with its new stress tests including physical climate risk scenarios for the first time. Meanwhile, a recent survey from Responsible Investor suggested that 80% of asset owners have assessed the impact of physical climate risk on their investments to at least some extent, while a further 15% plan to do so in the next twelve months (Exhibit 2). Interestingly, the increase in extreme weather events was the most common driver for why these evaluations have been taking place (57% of asset owners cited this as a 'prompt') – followed by fiduciary expectations (53%), and ahead of regulation (44%) or climate modelling (38%). In other words, perceptions of financial materiality are paramount. Still, the survey also reports that investors currently do not trust the physical climate risk assessments enough to make genuine allocation decisions.

Exhibit 2: Asset owners and asset managers are assessing physical risk impact



Source: Climate Risk Resilience Survey, Responsible Investor, 2026

2 - Natural Disasters in 2024, Munich Re
3 - The Cost of Inaction, World Economic Forum and Boston Consulting Group, 2024
4 - Norway's $2tn wealth fund stress tests effects of climate shocks and AI correction (Financial Times)

Physical climate resilience ≠ 'climate investing' ≠ ESG investing

While physical climate risk is often considered by providers of climate indices and climate data, available approaches typically blend physical risk resilience with other aspects of 'climate investing' such as climate alignment, portfolio decarbonization or the delivery of certain regulatory obligations. While each of these objectives may be legitimate, they are different: they rely on different data, different assumptions and different portfolio construction choices. More importantly, climate resilience falls outside the scope of sustainability and extra-financial objectives. The governance and transparency challenge can therefore grow still larger when climate risk objectives are grouped with wider ESG considerations across a range of extra-financial topics.

Over time, adopted strategies typically need to be defended through possible periods of underperformance and/or compared against competing approaches. This can become difficult when multiple objectives and methodological complexity have muddied the waters.

We believe that the next phase of evolution in this space will involve an emphasis on greater transparency, clarity and pragmatism. Institutional investors need solutions that are scientifically grounded, clear in their objectives (and the trade-offs associated with these objectives) and compatible with the fiduciary constraints that allow strategies to be maintained over time.

Calculating physical climate risk: 'top-down' versus 'bottom-up'?

If we look purely at the subject of resilience to physical climate risk, the subject is far from straightforward. For example, acute physical climate risks that bring immediate localized disruption to assets, supply chains or demand are not the same as chronic physical climate risks (Exhibit 3).

Exhibit 3: Acute versus chronic physical risk

	Climate Drivers	Financial Consequences
Acute physical risk	Climate change exposes portfolios to more frequent disruptions from floods, fires, heatwaves, grid failures, transport shocks.	Reveals asset-location and supply-chain concentrations missed by sector/country breakdowns and traditional risk models.
Chronic physical risk	Rising temperatures, water stress, sea-level rise, and lower factor productivity can gradually erode assets, operations, and competitiveness.	Slow change can compound into capex pressure, margin pressure, demand destruction, and impact long-duration investments and earnings.

The fundamental question becomes: how should climate physical risk exposure be assessed and reduced? There are, perhaps, two potential paths to consider, which—while not mutually exclusive—are distinct: **bottom-up** approaches rely on (company) asset-specific data collection, while **top-down** approaches look at macroeconomic GDP data and consider the sensitivity of different regions and industries to climate scenarios.

Early discussions and models relating to physical risk mitigation have, broadly, emphasized the bottom-up style. This is not surprising: the approach has considerable intellectual overlap with the insurance sector, which has been addressing physical climate risk mitigation with individual companies for multiple decades. Indeed, we observe a presumption voiced by many climate investing practitioners that bottom-up models represent the only effective way of addressing this issue.

While necessary, bottom-up analysis is, however, unlikely to be sufficient – particularly if the goal is to implement large, diversified portfolios. Company data, even in its increasingly vast quantities, remains

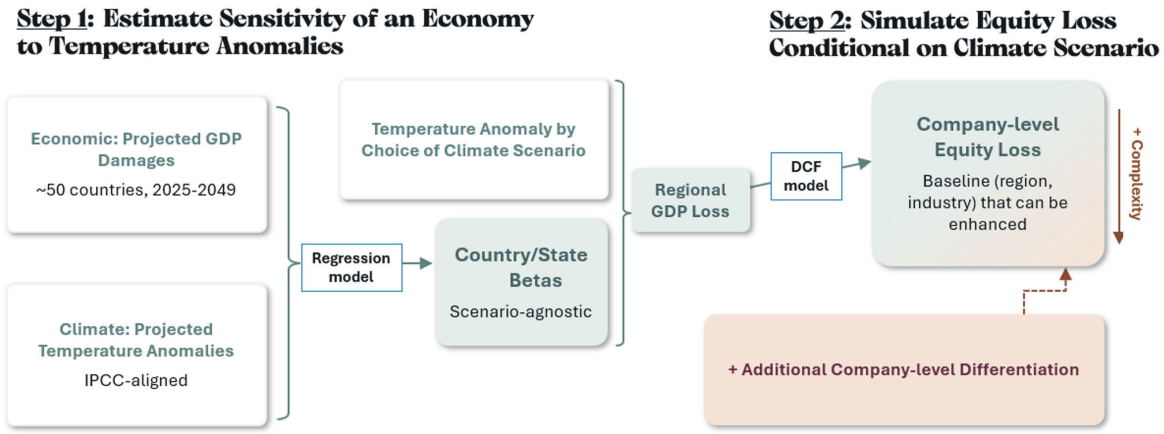
patchy and imperfect; it is, by its nature, subject to aggregation and comparability issues, thus reducing its suitability for reliable portfolio construction and index design. In addition, an asset-based bottom-up approach tends to skew analysis heavily toward 'acute' physical risks, while 'chronic' risks tend to remain under-addressed because they do not necessarily correlate with physical asset impairment or destruction: this bias is problematic for long-term investors such as pension funds and sovereign wealth funds who are considering portfolio resilience over multi-decade horizons.

Models founded on top-down macroeconomic and climate data, meanwhile, have different other benefits. They can be calibrated on widely recognized data sources, such as the climate change projections produced by the Intergovernmental Panel on Climate Change (IPCC) and the work done by the Network for Greening the Financial System (NGFS) to quantify the macroeconomic materiality of those projections. They provide broad market coverage, by definition. They can be used for scalable, resilient index construction with relatively low implementation complexity. On the downside, they lack company-level granularity, which makes them highly complementary with bottom-up approaches.

Designing a framework that combines the best of both worlds is at the heart of our efforts: we rely on the EDHEC climate research ecosystem, revolving around the EDHEC Climate Institute, for research-backed methodologies and advanced bottom-up climate data.[5]

Exhibit 4 illustrates a 'top-down-first' approach that forms the basis of our new climate resilient indices, calculating prospective equity losses (caused by physical risk) with macroeconomic data as the starting point and 'bottom-up' company-specific data treated as additional potential customizations to improve conviction. This provides a 'baseline-plus' model that is both governance-friendly and supportive of low-cost index construction.

Exhibit 4: Estimating equity losses with a 'top-down' starting point



Back-testing on the core SciX Climate Resilient Index, for example, delivers a consistent 15% reduction in estimated losses relating to physical risk versus market capitalization-weighted benchmarks with a tracking error of approximately 1% for the period 2019-2026.

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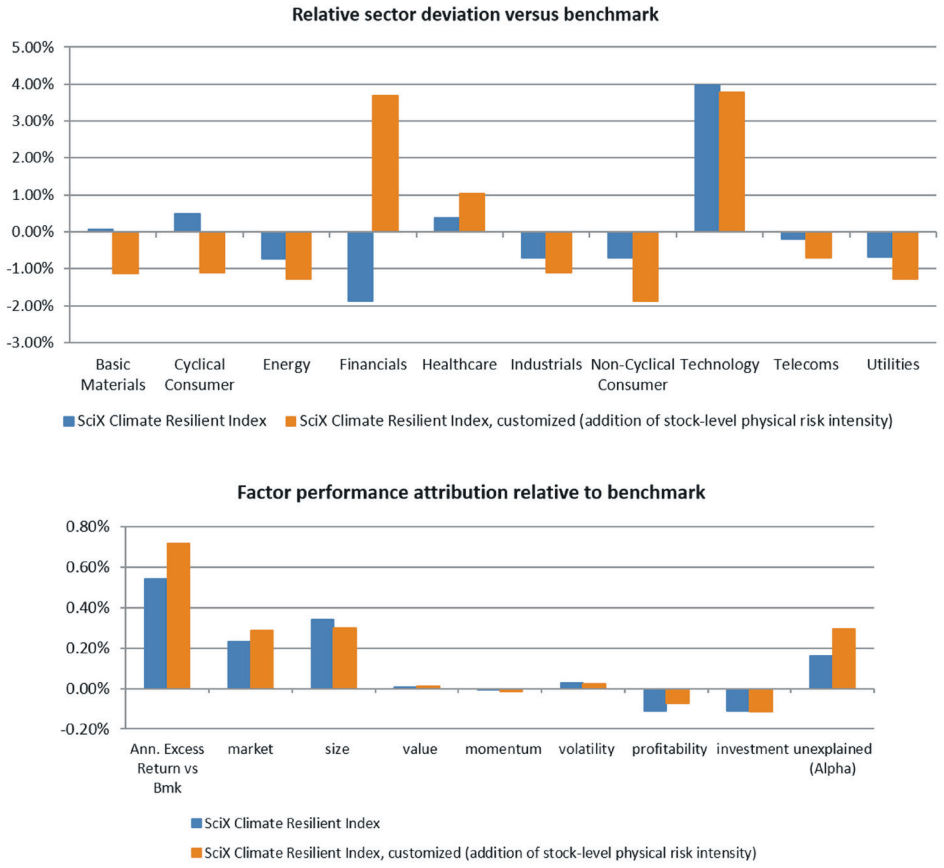
5 - Our recently published papers (in collaboration with EDHEC Climate Institute) show the approach in more depth, including the use of a discounted cashflow (DCF) model to estimate the impact of physical climate risk on a company's valuation. They cover the European equity market and the US equity market.

Controlling financial risk exposures

Strategies for mitigating physical climate risk can be undermined by poor portfolio construction. If an index is too concentrated, too exposed to unintended sector biases or too far from the investor's own reference benchmark, the strategy may become difficult to maintain, even if the long-term physical risk reduction rationale is sound. Indeed, this is a challenge that was recently faced by climate strategies more broadly, such as Net Zero products, where the financial risk and performance consequences of climate-specific ambitions were not fully anticipated and perhaps not precisely quantified by investors.

As such, the management of financial risk exposures is of critical importance. Exhibit 5, for example, highlights the sector deviations and factor performance attributions relative to the benchmark for the core SciX Climate Resilient Index (using only the top-down methodology outlined in Exhibit 4) as well as a customized variant that includes some additional company-specific physical asset intensity. In the case of these two examples, average sector deviations range between zero and four per cent for the period (though deviations vary over time) and the addition of some company-specific data makes a very substantial difference, particularly in Financials exposure – which shifts from an underweight position to a marked overweight. An extensive review of the financial sector's exposure to climate physical risk goes beyond the scope of this document but this simple example shows the importance of transparently assessing the impact of each customization: banks will typically have a small proportion of physical assets on their balance sheet (which implies more climate resilience) but many will argue that their loan books are heavily (although indirectly) exposed to physical assets. Investors will therefore want to carefully consider the implications of introducing more granular data points and perhaps request more advanced customization features (e.g., a special treatment applied to Financials) as a result.

Exhibit 5: Relative sector deviation and factor performance attribution vs. benchmark



Source: Scientific Climate Indices. Benchmark is a global developed markets cap-weighted equity index. The market factor and the other fundamental equity factors are described here. Physical asset intensity for a given company is the ratio of the net value of its tangible physical assets relative to the total size of its balance sheet. Results are based on hypothetical back-tested performance (Jun2019-Jun2026), not actual performance.

One size does not fit all

Investors have different investment beliefs, horizons or tolerance for deviations from their reference benchmarks. Indeed, they also have different climate and ESG objectives. When it comes to physical risk mitigation, they will have a view on the short-term risk budget (often expressed in terms of tracking error) they are willing to spend in exchange for a reduction in their future expected climate physical losses.

An off-the-shelf index cannot easily reflect this diversity: as such, customization is highly desirable. Yet the challenge is not simply to obtain customization (whether or not it is offered by an index provider). It is to ensure that customization remains methodologically robust, transparent on any trade-offs involved and compatible with fiduciary obligations.

Find out more

*Sign up for the **Building Efficient Climate Resilient Indices** webinar (August 27th, 2026) to learn more about the new family of SciX indices.*

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