

PPF's Role in Advancing Physical Risk Dialogue

Hidden Risks, Visible Opportunities



Claire Curtin,
Head of ESG & Sustainability

Claire Curtin (Head of ESG & Sustainability) joined the PPF investment team in May 2018 to support the PPF's ambitions to further develop and implement its Responsible Investment strategy.

Claire is responsible for contributing to the management of long-term risks, and to the achievement of long-term sustainable investment returns, by aligning the PPF's investment portfolio with the consideration of environmental, social and corporate governance (ESG) factors. More recently, her role has expanded to also develop and oversee the PPF's broader sustainability strategy and approach.

Claire has twenty-five years of experience within institutional investment and ESG analysis, during which she has built a deep technical understanding of ESG issues across a wide range of asset classes. She was awarded the Investment Management Certificate in 2000, the Chartered Alternative Investment Analyst certification in 2007 and the CFA UK Certificate in Climate and Investing in 2022.

Introduction

In October 2025, MSCI published the study **Hidden in Plain Sight: Physical Risk in Asset Owners' Portfolios**, an aggregate analysis of 18 global asset-owner equity portfolios representing around USD 2 trillion in listed equities under management. The study combined approximately 500,000 physical asset locations linked to more than 11,000 listed companies and assessed their exposure to acute and chronic climate hazards using the MSCI GeoSpatial Asset Intelligence and MSCI Physical Risk Solutions frameworks.

That report indicated that physical climate risks are already financially material across institutional portfolios. The findings underscored that location, rather than sector or domicile, can be a key determinant of financial vulnerability and opportunity in a warming world. In this context, location may be considered a financial risk factor.

Building on those aggregate portfolio insights, the Pension Protection Fund (PPF) received an individual report providing a focused assessment of portfolio exposures and information that can inform resilience and engagement strategies.

Findings

Physical climate risk is no longer a distant threat – it is increasingly reflected in today's portfolios and may shape financial outcomes in ways that are only now becoming visible. As one of several of asset owners providing equity portfolio data for MSCI's landmark analysis, the PPF has helped illuminate how location, not just sector or domicile, can be a decisive factor in financial vulnerability and opportunity.

Traditional portfolio analysis often stops at sector and domicile, leaving location-driven risks hidden. By sharing its holdings-level data across 3,226 companies, the PPF has supported MSCI in carrying out a more granular asset-level assessment for over 340,000 physical assets, indicating that physical risk is not solely tomorrow's problem – it may already be affecting companies and portfolios.

Market impact is observable

Companies with assets exposed to any of the observed 2022–2024 tropical cyclones underperformed, starting around five trading days before impact and for around 30 business days after.

Investors themselves increasingly recognize this materiality, shifting the debate from “if” to “how fast?”*

Physical risk exposures are global, regardless of regional investment focus. Hazards such as wildfires, droughts and heat waves often compound and are already affecting portfolio companies worldwide.

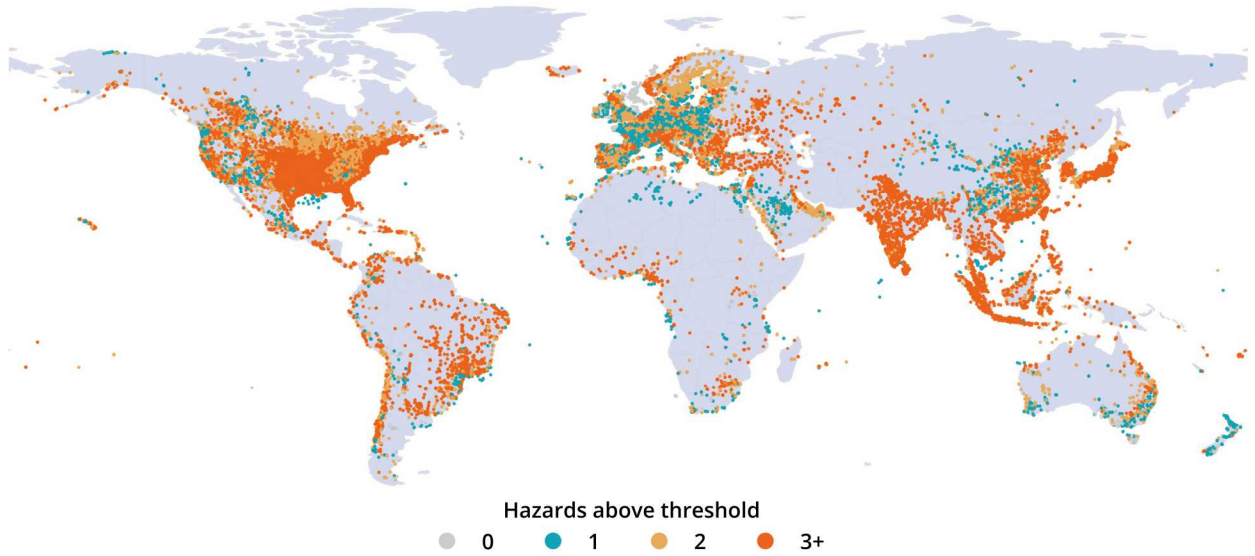
Approximately 45 per cent of company output for companies in PPF's equity portfolio is generated outside their country of domicile, and 67 per cent operate in three or more countries. This global spread means that in reality, while a company is domiciled in one country, it may be exposed to hazards across continents – from heat waves and water scarcity to floods and cyclones.

This exposure is not limited to future time horizons. MSCI found that 31 per cent (as a percentage of AUM) of PPF's equity portfolio companies could face at least one potentially severe physical hazard today, noting that this figure does not represent a value-at-risk measure. Compound extremes (where multiple hazards strike together or in sequence) can amplify disruption across power, water, transport and labour.

The PPF portfolio contains asset locations that are potentially exposed to multiple high-intensity physical climate hazards. When assessing hazards with an intensity score of 8 out of 10 or higher, we find that a significant share of sites could face more than one such risk at the same location. A portion of assets may experience only a single high-intensity hazard, but many are potentially exposed to two, and a smaller subset could face three or more hazards simultaneously. These multi-hazard exposures are not confined to one region: they occur across North America, South America, Europe, and parts of South and Southeast Asia. This means that the PPF's physical-risk profile is geographically diverse, with clusters of assets situated in areas where climate-related threats such as extreme heat, flooding, and water scarcity can overlap. The distribution of exposures indicates that multi-hazard risk is a material consideration across the portfolio rather than an isolated or region-specific issue.

* Underperformance is measured by residual returns after controlling for country, industry and style factors. We use MSCI Global Equity Factor Model - Trading. For further detail, please refer to: Xinxin Wang et al. “Anticipating Hurricane Risk Before It Strikes,” MSCI Sustainability & Climate Research Services, September 2025.

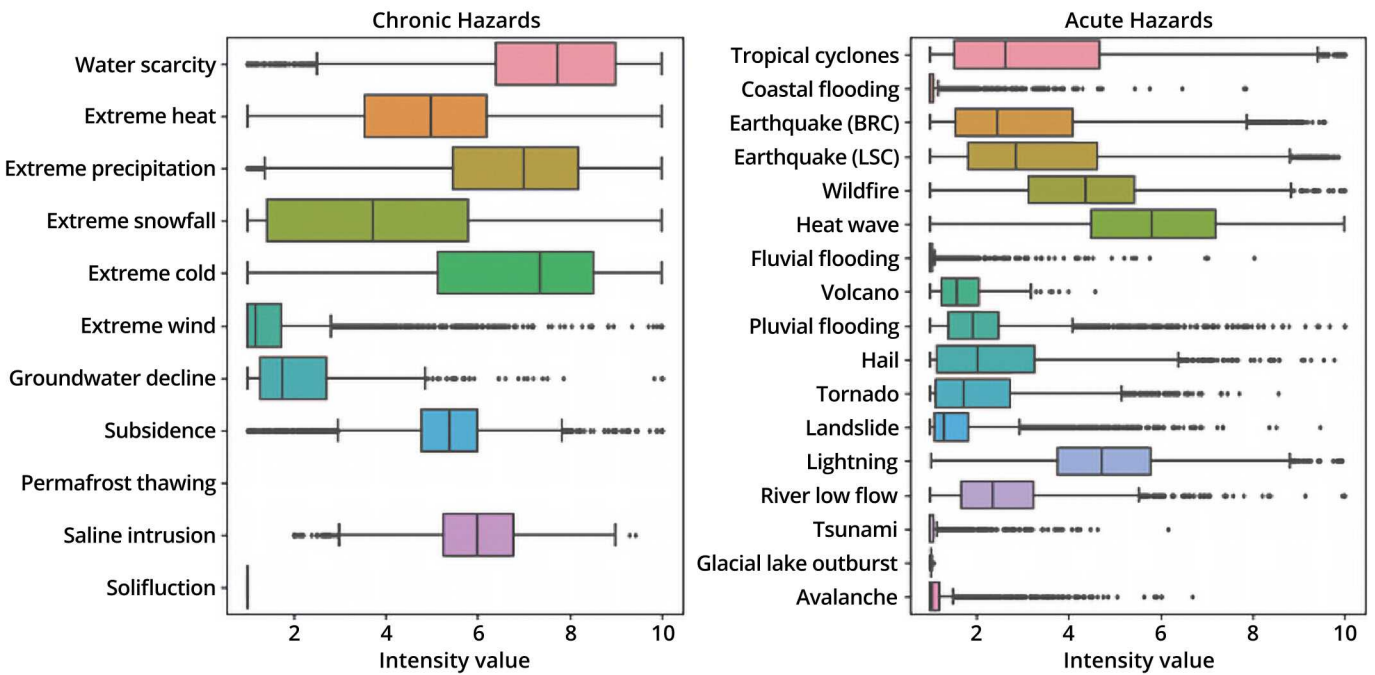
Large share of companies face exposure to two or more hazards at the same assets locations



Data as of Sept. 29, 2025. Asset locations can be significantly exposed to multiple hazards. The map shows all asset locations of the individual client portfolio. Asset locations are coloured by the number of hazards with an intensity value of 8/10 or higher. Source: MSCI Sustainability & Climate Research Services

Exposure to heat waves is the most prominent of acute hazards, while exposure to chronic hazards is led by water scarcity. Material impacts don't just arise from asset damage, but also costly business interruptions, like reduced productivity, lost output or delayed shipments, which can erode returns and amplify volatility.

Distribution of hazard-intensity values across the individual client portfolio



Data as of Sept. 29, 2025. Box plots illustrate the range of company-level hazard-intensity values across the individual client portfolio. Hazards are listed in approximate order of impact, with those higher on the chart generally considered more influential in determining losses than those lower down. This ordering is indicative only and does not represent a precise ranking of impact relevance for the portfolio. Source: MSCI Sustainability & Climate Research Services

Whilst measuring exposure itself does not directly translate into financial impact, it presents an important opportunity for measuring progress on readiness (managing the risk) and adaptation (reducing the risk). The actual realised loss depends on the vulnerability of assets and the readiness of individual companies. With 53 per cent of the most exposed companies in the PPF portfolio disclosing that they are identifying and assessing physical risks, and 49 per cent already disclosing how they integrate physical risk into their enterprise risk management (compared with 16 per cent for the overall study), this may indicate momentum that could be further supported.

By encouraging more companies to formalise and communicate their adaptation strategies, asset owners may contribute to strengthening resilience across portfolios. This creates a meaningful opening for constructive engagement – using capital allocation and stewardship dialogue to champion adaptation, strengthen capabilities, and assist companies in addressing physical risk challenges to capitalise on long-term value opportunities.

By integrating geospatial intelligence and engaging with issuers on resilience, asset owners can shift from being exposed to being prepared. The ability to visualise where risk concentrates, and how it connects to financial outcomes, turns physical risk analysis from a compliance exercise into a strategic tool for portfolio resilience and long-term value preservation.

In summary

PPF's leadership in providing portfolio data has helped move the industry from hidden risks to visible opportunities. The age of unseen physical risk is over; asset owners who act now can reduce losses, close adaptation gaps, and capture opportunities in resilience-driven investment.

What can asset owners do next?

Now is the time for asset owners to move from awareness to action by:

- Integrating location intelligence and physical risk analytics into investment processes where possible, for internally managed assets.
- Engaging with external managers and investee companies to ensure adaptation and resilience are prioritised, not just disclosed.
- Using asset-level insights to inform allocation, risk oversight, and stewardship priorities.

By doing so, you could not only protect your portfolios from hidden vulnerabilities but also position yourself at the forefront of resilience-driven investment turning today's risks into tomorrow's opportunities.

Claire Curtin in conversation with Steve Bullock, Head of Geospatial Intelligence and Transition products at MSCI

Steve, your work sits at the intersection of climate science, geospatial analysis and financial innovations. In your view, what do you see as the biggest misunderstanding investors still have about using geospatial intelligence in financial decision-making, and how should they be thinking about integrating it into portfolio-level risk analysis?

The biggest misconception is that geospatial data isn't mature enough to drive real investment decisions — that it's a future capability rather than a present one. That's no longer true. The data exists, the resolution is there, and the analytical frameworks to translate it into financial terms are well established.

What's perhaps underappreciated is how location-based risk extends well beyond climate. Geopolitical tensions, shifting trade and tariff regimes, AI infrastructure concentration — these all have strong geographic dimensions, and they interact with climate exposures in ways that can compound risk significantly. A facility in a flood-prone coastal zone that also sits inside a contested supply chain isn't just a physical risk, it's a convergence of multiple systemic pressures.

For integration, the cleanest path runs from a portfolio view that drills down into company- and asset-level risk profiles based on bottom-up analysis rather than country or sector proxies. That's where the risk signal lives.

How should risk appetite or hedging approaches change to capture business interruption risk?

The headline numbers are striking. In our recent research across 18 global asset-owner portfolios, we modelled potential business interruption losses of around USD 1.07 trillion over the next year, compared to roughly USD 76 billion in direct asset damage. Traditional risk frameworks — anchored around replacement cost — are missing the larger, more diffuse business interruption story: lost output, delayed shipments, operational downtime, which consistently outweighs repair bills in financial impact.

That said, not all business interruption risk is inevitable. The smarter portfolio response is twofold: adjust risk appetite to reflect interruption exposure at the asset level, and use adaptation and resilience data to differentiate between companies that are genuinely prepared and those carrying hidden vulnerability.

What is next for linking physical risk readiness with transition plans?

The next step is moving beyond treating physical risk and transition planning as parallel workstreams. They're increasingly interdependent. A company's exposure to physical hazards affects the feasibility and cost of its transition, and its transition strategy shapes how vulnerable its asset base will be over time. Analysing them together gives a much more accurate picture of long-term risk.

Climate metrics don't tend to correlate with each other in the way people might expect. Emissions intensity, temperature alignment, physical risk exposure, transition readiness – these capture genuinely different dimensions of a company's profile, and relying on any single metric lacks the granularity to identify winners and losers within industries.

That's part of what motivated MSCI's Energy Transition Score, which separates transition pressure – the business, policy, and technology headwinds a company faces – from transition readiness, how positioned it is to navigate them. Two steel companies or two utilities can look similar on paper but carry different risk profiles once you factor in asset locations, production footprint, regulatory environment, and the credibility of their plans. The transition is playing out unevenly across sectors and geographies, and that nuance only becomes visible when complementary data are layered together.

If you had one ask of asset owners to accelerate resilience, what would it be?

Start engaging with the data that already exists. Asset owners still waiting for a more complete picture risk missing the opportunity to build analytical foundations before the landscape becomes significantly more complex. Value chain relationships, supplier-level exposures, and cascading risk signals are already emerging as the next layer.

Beyond defensive positioning, the MSCI Institute has identified products and services from more than 800 publicly listed companies – around 11% of listed companies globally – contributing to climate adaptation and resilience: flood protection, heat resilience, water management, and critical infrastructure hardening. On average, these companies were not yet trading at a premium to their sub-industry peers, suggesting underappreciated growth opportunities.

The ask isn't to do more reporting. It's to recognise that the data already exists – and those who build fluency with it now will be better placed as the signals become richer and more complex.

Recognition for our ESG team



BVCA Excellence in ESG Award

Top recognition in the Limited Partner (LP) category



Pensions for Purpose Pension Fund Awards 2024

Shortlisted in the Best Climate Change Policy category



Asset Owners Awards 2024

Shortlisted for the Stewardship Disclosure Award and the Overall Paris Alignment Award

The PPF in numbers

Members of schemes we protect
at 31 March 2024

8.8m 

PPF assets under management
at 31 March 2025

£31.2bn 

Members in PPF assessment
at 31 March 2025

34,601 

PPF members at 31 March 2025

289,469

Of which:



200,504 in payment



88,965 deferred



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