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# Climate Risk, insurance retreat and mortgage exposure: implications for UK households and housing finance<sup>1</sup>

↳ By Mark Andrew, James Culley, Nicole Lux and Alex Skouralis

## 1. Introduction

Climate change poses a growing material financial risk to the UK housing system and the institutions that underpin it. While transition risks linked to policy change, technology and shifting stakeholder preferences have dominated regulatory and policy discourse, physical climate risks are becoming more immediate and disruptive. In particular, flooding and subsidence are already driving up insurance claims and premiums, prompting withdrawal from high-risk markets and exposing structural weaknesses in mortgage lending.

Unlike traditional financial risks, climate hazards are non-linear, irreversible in some cases and deeply uncertain. They unfold over long time horizons but can produce acute financial shocks. These characteristics give rise to both systematic risks, affecting entire local and regional housing markets, and systemic risks, where localised hazards like flood uninsurability disrupt credit, property valuations and prices and financial stability more broadly.

In the UK, record weather-related claims, affordability pressures, and concerns about access to insurance cover have made climate risk more visible. The Bank of England and Prudential Regulation Authority have warned that under high-emissions scenarios, some properties could become uninsurable or suffer sharp devaluations, posing growing exposure to lenders holding long-term mortgages on climate-vulnerable assets.

This article examines how physical climate risks are reshaping the UK home insurance market and how these changes are transmitted to mortgage lenders, property markets and households. The next section investigates the

potential climate hazards which are relevant to the UK: flooding, sea-level rise, subsidence and heat stress, and classifies them according to their intensity, persistence and financial transmission profile. Section three explores the evolution of insurance pricing and coverage, focusing on the transition toward risk-based pricing, affordability pressures and early signs of market withdrawal. The fourth section assesses the implications for mortgage pricing, loan eligibility and asset quality, drawing on emerging research on the financial transmission of climate risk through house prices and credit conditions. Section five evaluates policy and regulatory responses, with particular attention to the design and limitations of the Flood Re scheme, the Bank of England's stress testing, mandatory climate disclosures, and the lack of property-level risk data in housing transactions. In section six we consider innovation in insurance and mortgage products, including parametric insurance and resilience-linked lending, as well as the widening protection gap in high-risk areas. The conclusion reflects on the systemic risks, distributional impacts and policy reforms needed to ensure continued access to insurance and credit in the face of accelerating physical climate risk.

## 2. Physical climate hazards and UK housing

The UK housing sector is increasingly exposed to a range of physical climate hazards that vary in intensity, geographic concentration, duration and financial impact. These include flooding, sea-level rise, coastal erosion, subsidence, heat stress, windstorms, wildfires, and landslides. Some are acute, triggered by short-term weather events such as storms or heavy rainfall, while others are chronic,

unfolding over decades like sea-level rise or increasing heat. Each hazard can be classified not only by its physical characteristics but also by its financial transmission: idiosyncratic (affecting individual properties), systematic (affecting regions or sectors), or systemic (disrupting financial markets more broadly). Some of these hazards are already material and expected to worsen with climate change.

### 2.1 Flood Risk

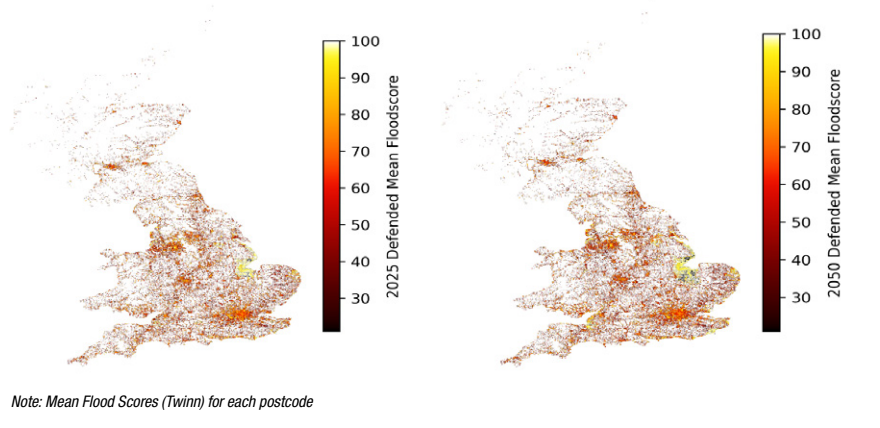
Flooding is the most significant and multidimensional physical hazard facing UK housing. It presents both an acute risk, such as pluvial flooding caused by intense rainfall, and a chronic threat in areas subject to recurrent inundation, ageing drainage systems or sea-level rise. The Environment Agency's 2024 National Flood Risk Assessment estimates that around 3.4 million homes in England are exposed to flood risk under a medium likelihood defended scenario. Of these, 1.43 million face fluvial and coastal threats, and 2.67 million are at risk from surface water flooding. Natural Resources Wales<sup>2</sup> reports that 272,817 residential properties are exposed to flood risk in 2023/24. For Scotland, the Scottish Environment Protection Agency estimates a figure of 284,000, but this includes non-residential properties. The prevalence of pluvial flooding in urban areas reflects infrastructure pressures and impervious surface coverage.

Figure 1 shows the distribution of flood exposure across Britain in 2025 and under a central scenario for 2050, based on Twinn's mean flood scores for each postcode. The first map illustrates that flood risk in the UK is spatially systematic, clustering in specific geographies such as the Thames Estuary, the Somerset Levels, parts of Yorkshire and the Severn catchment, and the second map that these patterns are likely to persist or

<sup>1</sup> The authors would like to thank Twinn Haskoning for its continued research support with data and specialised flood risk expertise.

<sup>2</sup> <https://naturalresources.wales/evidence-and-data/research-and-reports/flooding-reports-evidence-and-data/flood-risk-management-annual-report-2023-2024/>

**FIGURE 1: FLOOD RISKS IN BRITAIN IN 2025 AND 2050<sup>3</sup>**



intensify under climate change. The risk is spatially concentrated but widespread, with systematic financial consequences in high-exposure regions. The maps further highlight the potential for flood risk to become systemic, when financial impacts propagate through the financial system, undermining insurance affordability and coverage, disrupting mortgage lending or triggering localised house price declines. The Bank of England (2022) projected that flood-related insurance losses could increase up to 70% by 2050 under a high emissions scenario, with significant implications for homeowners and lenders holding collateral in flood-exposed areas.

## 2.2 Sea level rise risk

Sea-level rise and coastal erosion represent chronic, long-duration risks that primarily affect coastal housing markets. Unlike acute events, these processes unfold gradually but can result in irreversible land loss, asset devaluation and insurance market exit. Financially, the effects are systematic, geographically concentrated in vulnerable coastal regions.

The UK Met Office projections suggest that sea levels could rise by over a metre by the end of the century under high-emissions scenarios. Approximately 370,000 homes are in areas vulnerable to coastal flooding. By the 2080s, projections suggest 1.2 million homes could face significant risk (CCC 2018).

Coastal erosion already affects over 1,800km of England's shoreline and appears to be accelerating due to a combination of rising sea levels, increased storm surge activity and sediment depletion. Around 8,900 properties in England

are currently at risk of coastal erosion. Unless intervention measures are implemented, future estimates indicate this could exceed 100,000 properties by the 2080s from shoreline retreat and cliff or dune erosion (CCC 2018). These changes not only increase the likelihood of coastal flooding but may render some sites undevelopable or uninsurable, posing long-term financial risks for households, lenders and insurers.

## 2.3 Subsidence risk

Subsidence arises when soil contracts, often during extended dry periods, causing ground movement that damages foundations. It is most commonly associated with acute episodes of extreme heat and drought, but its geographic distribution is persistent and highly predictable. Though often regarded as an idiosyncratic risk due to its dependence on property-specific features such as soil type, foundations and vegetation, in regions such as London and the Southeast where shrink-swell clay soils are prevalent, subsidence is a systematic hazard, with insurers reporting repeated claims clustered across neighbourhoods. Climate change is anticipated to expand the risk zone northwards, potentially affecting areas of the Midlands that were historically at lower risk. The British Geological Survey (BGS)<sup>4</sup> has forecasted that the proportion of homes facing a high or extremely high risk of shrink-swell subsidence will rise to 6.5% by 2030, and exceed 10% by 2070, equivalent to around 4 million homes.

## 2.4 Heat stress risk

Heat risk is a chronic hazard whose financial effects, though less immediate than those associated with flooding or subsidence, are becoming increasingly noticeable.

The proportion of UK households experiencing overheating has risen sharply from 18% in 2011 to 80% in 2022, ironically driven in part by modern energy-efficient housing that retains heat but lacks adequate ventilation. Approximately 4.6 million homes in England experience overheating in bedrooms during the summer (Bouhi et al., 2022), with projections suggesting that up to 90% of homes could be affected under a 2°C global warming scenario (Lomas et al., 2021). Properties in dense urban areas, particularly those with poor ventilation and insufficient shading, are especially vulnerable.

Although overheating risk is often idiosyncratic, shaped by factors such as building orientation, insulation and local microclimates, its financial implications are potentially systematic. In cities with older or poorly retrofitted housing, overheating is a concern. It can reduce property appeal, increase the risk of breaching building regulations and lead to future retrofit costs. New regulations such as the introduction of Part O to the Building Regulations require measures to reduce indoor heat, formalising overheating as a compliance issue. As thermal comfort standards evolve, insurers may need to assess whether existing policy coverage and pricing reflect emerging risks.

## 2.5 Windstorm risk

Windstorm is an acute hazard that continues to drive significant insurance claims in the UK. However, it is not currently considered a climate-aggravated risk in the UK context. Projections do not indicate a statistically significant upward trend in the frequency or intensity of windstorms (UKCP18). Windstorm risk is understood and integrated into insurance pricing and catastrophe models, and as a result, comprehensive coverage is widely available. While windstorm is a systematic peril, it is not considered to be a growing climate-driven threat in the UK.

## 2.6 Wildfire risk

Historically rare in the UK, wildfire is emerging as an acute and spatially concentrated hazard, particularly in peri-urban areas of southern and eastern England. Increased vegetation density, rising temperatures, and drier summers have all contributed to elevated risk. During the July 2022 heatwave, the UK experienced a record number of wildfire-related callouts, including several instances of property damage. While wildfire currently remains an idiosyncratic

<sup>3</sup> Flood risk in the maps is based on the average score for each postcode using Twinn's defended flood scores. The Flood Score for 2050 under scenario RCP 4.5 represents a moderate global warming trajectory in which emissions peak around mid-century and then decline due to sustained but not aggressive climate policy action.

<sup>4</sup> BGS GeoClimate UKCP09 and UKCP18.

hazard, its increasing frequency<sup>5</sup> and severity raise the possibility that it could become a more regular and regionally significant risk in certain fringe urban areas<sup>6</sup>.

### 2.7 Landslide risk

Landslides pose a risk to an estimated 350,000 properties across the UK, particularly in geologically susceptible areas such as parts of North Yorkshire, Bath and South Wales. These are acute hazards, typically triggered by heavy rainfall, land saturation or slope instability. Given their highly localised nature, landslide-related financial risks are usually idiosyncratic. However, where land use pressures coincide with underlying geomorphological vulnerability, they have the potential to generate concentrated financial impacts within specific local authorities. This is especially relevant where clusters of at-risk properties influence local housing markets, damage infrastructure or place strain on council resources.

In summary, physical climate risks in the UK housing system differ in how they occur and how they transmit through financial markets. Flooding stands out as both an acute and chronic risk with the greatest potential for systemic impact, particularly if insurability and mortgage access are compromised. Sea-level rise and subsidence are also highly consequential, though more chronic and spatially concentrated in nature. Heat stress is emerging as a chronic underpriced risk with implications for housing quality and long-term value. Landslides and wildfire are more localised but may take on greater significance if exposure increases. Despite its potential for damage, windstorm is a well-characterised hazard with no projected increase in frequency or intensity under existing climate scenarios.

## 3. Climate hazards and home insurance: pricing pressures, market withdrawals and reinsurance limits

The growing intensity and frequency of physical climate hazards are putting increasing strain on the UK home insurance market. Even more localised risks such as coastal erosion, landslides and wildfires, which are currently less prominent are projected to intensify under future climate scenarios. As insurers adjust underwriting models to reflect updated hazard data and loss experience, home insurance is becoming less affordable and, in some areas,

less available. Risks which were once considered idiosyncratic are becoming more spatially concentrated and persistent, placing systematic pressure on high-risk housing markets.

### 3.1 The role of insurance in climate change

Home insurance plays a dual role in the housing finance system. It protects households from loss and safeguards lenders against collateral impairment. For owner-occupiers, it mitigates the financial burden of climate-related damages. The ABI estimates that the average cost of repairing a flood-damaged home during the 2020 storms was £33,600 (ABI, 2020). For mortgage lenders, insurance coverage secures the value of collateral. In the absence of adequate cover, borrower defaults may increase following climate-related damage, particularly where uninsured losses reduce repayment capacity or where property values fall below outstanding loan balances. In this way, physical climate hazards affect not only insurers, but also households and financial institutions. By distributing risk across policyholders, insurance contributes to the stability of the housing market, enabling households, property owners, and lenders to operate with greater financial resilience.

### 3.2 The shift toward risk-based pricing

The UK home insurance market has historically relied on pooled pricing principles, distributing risk across households and regions to preserve premium affordability and coverage access. It is often supported by mechanisms like Flood Re, a public-private reinsurance scheme designed to maintain the affordability and availability of insurance in high-risk areas by pooling and redistributing risk across a broader base of policyholders. However, insurers are increasingly adopting property-level risk-based pricing, driven by regulatory pressure, mounting losses, and investor scrutiny of climate exposure. Insurers are making greater use of high-resolution geospatial data and modelling to assess exposure at the level of individual properties (ABI, 2021). Reinsurers in response to financial pressures have been recalibrating climate risk models based on recent catastrophic events, which has led to a tightening of underwriting capacity. While this shift has improved the precision of risk assessments, it raises distributional and systemic concerns. Properties in high-exposure areas, especially those subject to multiple hazards or previous claims, could become unaffordable to

insure. Premium increases have already begun to outpace wage growth in some regions, and in certain postcodes, policy terms have tightened significantly. In 2023, the Association of British Insurers (ABI) reported a 36 percent increase in weather-related home insurance payouts compared to 2022, with total claims exceeding £573 million. This spike was driven by a series of severe storms which caused widespread flooding and property damage across the UK.

### 3.3 Insurance retreat and withdrawal

Insurance retreat refers to the gradual reduction of coverage in high-risk areas, driven by shifting market conditions or strategic decisions by insurers. In contrast, insurance withdrawal denotes the complete discontinuation of coverage for a particular property or location. Insurance retrenchment occurs in various forms, from policies becoming unaffordable due to elevated premiums or excesses, exclusion of specific perils from coverage such as flooding or storm surge or refusals to renew policies or underwrite new ones in certain areas. In some cases, insurers have withdrawn entirely from the most climate-exposed submarkets or have significantly narrowed coverage terms, reflecting increasing concern over the long-term viability of insuring assets exposed to escalating physical risks.

While UK-wide data on insurance retreat and withdrawal is limited, regional reports and anecdotal evidence suggest the trend is growing. Hilson and Arnall (2024) highlighted early signs of insurance withdrawal in Fairbourne, a coastal village in Wales marked for managed retreat by Gwynedd Council due to rising sea levels. Locals report increasing difficulty in securing or renewing home insurance, with some insurers refusing coverage outright, while others impose sharp premium increases or coverage exclusions. The study linked these issues to uncertainty about the village's future and its official designation as "no longer sustainable." Although insurance companies have not fully exited Fairbourne, the authors argued that anticipatory retreat is already evident in pricing decisions, non-renewals and coverage restrictions. Similarly, CISL (2023) found that affordable flood insurance is tightening in high-risk areas, particularly where reinsurance costs are climbing and historical losses are increasing. While not yet a system-wide issue, the trends resemble those seen in other climate-vulnerable markets in other countries, such as California and Florida.

<sup>5</sup> National Fire Chiefs Council Wildfires Position, <https://nfcc.org.uk/our-services/position-statements/wildfires-position-statement/>

<sup>6</sup> If the policy proposal to build a significant number of homes in the 'greybelt' is implemented, it could increase exposure to this risk.

### 3.4 Underinsurance

Underinsurance occurs when the sum insured is insufficient to cover the full cost of repairing or rebuilding a property after a loss, with serious consequences for household recovery and financial resilience (Sastry et al., 2024). In the UK, it is estimated that over 5.6 million homes are underinsured for contents alone (Insurance Edge, 2024). Traditionally, underinsurance has been explained by adverse selection and rational underinsurance, reflecting household preferences and budget constraints (Akerlof, 1970; Mossin, 1968; Einav and Finkelstein, 2011). However, more recent evidence suggests that behavioural factors such as inattentiveness, product complexity, and poor information also play a role. Cookson, Gallagher, and Mulder (2025) described widespread “coverage neglect” in the US, which they attribute to information frictions rather than deliberate cost-saving. In the UK, rising complaints to the Financial Ombudsman Service (FOS, 2024) from policyholders who believed they were adequately covered but later encountered significant shortfalls suggest similar dynamics are at play.

Structural features of the UK insurance market also contribute to persistent underinsurance. These include reliance on outdated valuation models, static rebuild cost assumptions, and limited reassessment of sums insured at policy renewal. There is no regulatory requirement for insurers to review coverage adequacy, which leads to misalignment between insured values and actual rebuilding costs particularly during periods of inflation. Between January 2020 and October 2024, the BCIS/ABI House Rebuilding Cost Index rose by 42.6%, reflecting steep increases in material and labour costs (BCIS, 2024). The continued application of the ‘average clause’, which proportionally reduces payouts when a property is underinsured, exposes households to significant financial loss even when premiums have been consistently paid (Chartered Institute of Loss Adjusters, 2022). This mechanism reinforces underinsurance as a systemic problem, particularly for households unaware of the consequences of undervaluation.

### 3.5 The protection gap

The insurance protection gap refers to the shortfall between the economic value of assets exposed to risk and the level of insurance coverage in place. This gap emerges when risks become uninsurable or where exclusions,

deductibles, or rising premium costs render adequate coverage inaccessible. It is particularly salient for lower-income households or those in high-risk areas, who often lack the financial buffers or mobility to adapt.

Swiss Re<sup>7</sup> estimated that the UK’s natural catastrophe protection gap over the ten-year period (2015 to 2024) was approximately 22 percent. This implies that around one-fifth of total economic losses from natural disasters, equivalent to 2 billion US dollars, were not covered by insurance. With climate change, this gap is expected to widen unless matched by expanded coverage or adaptation. The protection gap also has a distributional issue with significant financial stability implications. When losses are not covered by insurance, they are either absorbed by households, which may lead to debt or default, or by governments through disaster relief, with consequences for public finances. Moreover, the inability to secure insurance can affect mortgage eligibility, reinforcing spatial and socioeconomic inequalities in housing markets.

### 3.6 Regional disparities in insurance premium affordability

Rising costs in climate-exposed areas are creating affordability pressures, contributing to underinsurance and market withdrawal. But the spatial concentration of physical climate risks, combined with the shift to risk-based pricing,

has led to significant variation in insurance affordability across the UK.

A key indicator of insurance cost pressure is the Average Annual Loss (AAL), which represents the modelled expected annual loss from hazard-related events for a given property. AALs are a fundamental input into risk-based insurance pricing. Premiums generally rise with higher AALs, and in cases where modelled losses exceed underwriting thresholds, insurers may choose to restrict coverage or withdraw entirely. We outline the implications using the example of flooding.

Table 1 displays our own AAL calculations for flood risk by UK regions and homeowner household income groups<sup>9</sup>. The bands represent the average AAL for postcodes exposed to medium and high risk of flooding. The rows represent the region of the postcodes, and the columns homeowners grouped according to their position in the regional household income distribution. For example, the mean AAL for low-income households in the East Midlands exposed to medium and high risk of flooding are £217 and £528 respectively.

In nearly all regions, low-income households bear significantly higher AALs than their middle- or high-income counterparts. In the East Midlands, for example, the AAL for low-income households is projected to be from £217 – £528 in 2025, compared to just £203 – £491

**TABLE 1<sup>8</sup> The Distribution of Postcode Average Annual Loss (AAL) within Regions**

Region	Low Income 2025	Middle Income 2025	High Income 2025	Low Income 2050	Middle Income 2050	High Income 2050
East Midlands	£217 - £528	£213 - £506	£203 - £491	£215 - £543	£211 - £521	£203 - £506
East of England	£209 - £493	£207 - £478	£205 - £450	£214 - £522	£210 - £507	£208 - £468
London	£217 - £431	£214 - £437	£211 - £436	£218 - £432	£215 - £437	£215 - £434
North East	£213 - £456	£207 - £464	£208 - £472	£218 - £458	£211 - £469	£209 - £477
North West	£216 - £476	£213 - £467	£209 - £482	£228 - £479	£221 - £468	£212 - £478
Scotland	£214 - £476	£208 - £469	£205 - £458	£213 - £473	£207 - £469	£205 - £459
South East	£217 - £477	£214 - £460	£208 - £447	£224 - £495	£217 - £472	£210 - £451
South West	£219 - £467	£211 - £461	£204 - £453	£235 - £499	£227 - £488	£218 - £469
Wales	£212 - £455	£207 - £451	£199 - £439	£226 - £456	£220 - £449	£218 - £435
West Midlands	£212 - £462	£207 - £456	£197 - £443	£213 - £462	£208 - £456	£198 - £442
Yorkshire and The Humber	£211 - £499	£210 - £487	£205 - £457	£232 - £494	£226 - £481	£216 - £455

Note: Authors’ own calculations using Twinn’s Flood Scores, weighted by Experian household data.

<sup>7</sup> <https://www.swissre.com/risk-knowledge/mitigating-climate-risk/natcat-protection-gap-infographic.html#/country/UK>

<sup>8</sup> The projected AALs for 2050 are based on RCP4.5, a central scenario reflecting moderate emissions and climate adaptation assumptions.

<sup>9</sup> Low-, middle- and high-income homeowners are grouped according to their position in the regional household income distribution. Low-income households represent the lower quartile, high income households the upper quartile and the middle the remainder.

for high-income households. By 2050, this disparity widens further, with particularly sharp increases in the East, Southwest and Wales. Conversely, Scotland sees only modest increases, highlighting regional variation.

The projected increase in AALs across all income groups and regions by 2050, reinforces concerns about rising exposure and growing inequality in who bears flood risk. These trends directly affect insurance pricing. In areas where premiums are already elevated, further increases risk breaching affordability thresholds, particularly for low-income households. With Flood Re scheduled to end in 2039, the full implementation of risk-based pricing could make flood insurance unaffordable for many households, potentially leading to increased levels of underinsurance or withdrawal from the insurance market.

Full withdrawal of insurance cover has serious implications for mortgage eligibility, property liquidity and household stability. The Bank of England (2022) projected that up to 7 percent of insured households, particularly in the most exposed 10 percent of postcodes in Yorkshire and the Humber, the East and East Midlands, could become uninsurable or unable to afford cover under its 'No Additional Action' scenario. In these areas, claims costs could quadruple, pushing premiums up by as much as one third nationally. Without policy intervention, flood insurance may become increasingly regressive, deepening inequality and heightening systemic risk in the housing finance system.

#### 4. Household finance, mortgage market and systemic implications

Rising insurance premiums are making coverage increasingly unaffordable for many households, contributing to growing protection gaps and underinsurance. While these effects are often geographically concentrated, they pose wider financial risks for mortgage lenders and may contribute to broader instability in housing finance. Climate-related risks affect households both directly through uninsured losses and indirectly by increasing the cost of insurance and reducing affordability in high-risk areas. These pressures influence relocation decisions, dampen demand and depress property values. As buyer and lender behaviour adjusts, climate exposure will be increasingly reflected in housing market dynamics.

##### 4.1 Climate risks and house prices

Recent research has begun to examine the financial transmission channels linking physical

climate risk to insurance costs, house prices, mortgage performance, and systemic stability. In the UK, Skouralis, Lux, and Andrew (2024) found that flood-exposed properties sell at an average discount of 8.1%, with high-risk homes facing discounts of over 30%. Flood risk affects both buyers and sellers. Both sellers' asking and buyers' offer prices are more steeply discounted when risk is high, especially shortly after extreme weather events. Similarly, Atreya and Ferreira (2015) reported that homes in floodplains are priced lower due to perceived risk, with flooded properties experiencing even steeper discounts. However, past studies have found that price discounts can fade over time, a phenomenon known as "flood amnesia" (Lamond et al., 2010; Beltrán et al., 2019). Beltrán et al. (2019) noted that inland flood discounts tend to disappear after five years, while coastal effects dissipate within four. Lower-priced properties experience steeper and more persistent discounts, suggesting that flood risk is more acutely priced by lower-income buyers (Skouralis et al., 2024).

In a number of coastal areas, sea-level rise risk has been at least partially capitalised into housing markets. US-based studies by Bernstein et al. (2019) and Baldauf et al. (2020) showed that exposure to sea-level rise reduces property values, though the effect is mitigated by behavioural frictions and amenity preferences. As mentioned earlier, Hilson and Arnall (2024) document early signs of price suppression and mortgage withdrawal in Fairbourne in Wales, where managed retreat policies and rising sea levels have created anxiety among residents and uncertainty in lending.

##### 4.2 Insurance costs, availability and house prices

Several empirical studies have established that climate-related insurance costs and coverage availability can significantly influence mortgage lending, property prices, and housing market dynamics, although most of the evidence originates from the US. Insurance affordability plays a critical role in these outcomes. Eastman, Kim and Zhou (2024) established a causal link between insurance costs and home values, showing that a 10% increase in premiums reduces house prices by 4.6%, with larger effects in mortgage dependent areas. They also found that hurricane-related non-renewals lead to lower sales volumes and further price suppression, independent of recent disaster history. These results highlight that premium hikes and insurance coverage withdrawal can lead to housing market repricing.

Insurance costs are also linked to financial distress. Ge, Johnson and Tzur-Ilan (2025) showed

that rising premiums increase both mortgage and credit card default rates, particularly among borrowers with high debt-to-income ratios. Ge, Lam and Lewis (2025) found that the removal of flood insurance subsidies in the US caused sharp and lasting declines in house prices in flood-prone areas. They interpret this as a "risk updating" mechanism, in which rising insurance costs signal climate exposure and prompt market repricing, even in the absence of recent flood events. Together, these studies suggest that insurance pricing acts as a key transmission channel through which climate risk affects property values, credit conditions, and financial resilience.

In the UK, the transmission of these risks is amplified by the structure of the mortgage market. Unlike the US, where risk is often dispersed through securitisation, most UK mortgages remain on lenders' balance sheets. This means that insurers' decisions and property price adjustments feed directly into bank exposures. Nguyen et al. (2022) found that US lenders charge higher interest rates for properties exposed to sea-level rise, a "climate premium", with the effect concentrated in loans retained on a balance sheet. They also showed that mortgage pricing does not fully reflect physical climate risks, and that lender beliefs and climate awareness play a role in how risk is assessed. These findings are increasingly relevant in the UK context, where climate data is improving and lender scrutiny of high-risk assets is intensifying.

##### 4.3 Mortgage market

Mortgage default risk is increasingly influenced by climate shocks. Calabrese et al. (2024) found that hurricanes and extreme rainfall increase mortgage default risk, particularly in areas with low flood insurance take-up. Kousky et al. (2020) reported similar results, showing that default rates are significantly higher in uninsured areas following natural disasters. While the UK has not experienced climate events of comparable scale, the rising frequency of heavy rainfall, flash flooding and subsidence suggests that climate-related credit risk may be emerging. Rossi (2021) and Ouazad and Kahn (2021) further found that lenders in the US respond to post-disaster risk by offloading mortgages into securitised pools, a strategy unavailable to most UK lenders.

These studies point to a growing need for UK mortgage lenders to integrate physical climate risk into underwriting, valuation and capital planning. Hazards such as flooding, subsidence and sea-level rise affect both the affordability of homeownership and the stability of credit markets. Their effects are often non-linear,

persistent, and spatially concentrated. Without stronger climate risk disclosure, scenario analysis, and local adaptation, mortgage lenders may face increasing concentrations of risk in exposed postcodes and create conditions for systemic fragility within the housing finance system.

## 5. Policy, regulatory and market responses

As awareness of climate risks has increased, a range of policy, regulatory and market-led interventions has emerged, including insurance affordability schemes, stress testing, disclosures and product innovation.

The most significant policy instrument to date remains Flood Re, the government-backed reinsurance scheme introduced in 2016 to preserve access to affordable household flood insurance in high-risk areas. The scheme allows insurers to cede eligible residential policies into a pooled fund in exchange for a fixed risk-based premium. As of 2023, Flood Re had supported cover for over 350,000 homes (Flood Re, 2023). However, the scheme is legislated to end in 2039, at which point the market is expected to transition to risk-reflective pricing. Its time-limited structure is designed to send early signals to insurers, lenders and households, encouraging behavioural adaptation ahead of market reversion.

Flood Re has notable limitations. It excludes homes built after January 2009, omits most leasehold, rental and mixed-use properties, and more importantly, does not reduce the underlying physical flood risk. Without substantial investment in local adaptation and

resilience, the affordability it provides is likely to be temporary.

The structural vulnerabilities become more acute when considering the spatial concentration of flood exposure among low-income households and low-income homeowners, as illustrated in Figure 2. These groups often face reduced mobility and limited financial resilience, increasing the risk of being effectively locked into high-risk flood zones. In the absence of affordable insurance or sustained access to mortgage credit, they may struggle to relocate, protect the value of their properties, or cover repair costs in cases where insurance payouts fall short.

Flood Re has published a Transition Plan setting out policy and market measures to support the continued availability and affordability of flood insurance. These include the proposed introduction of Flood Performance Certificates, the incorporation of resilience measures into building regulations, the use of Build Back Better principles in claims settlements, and better public communication of flood risk (Flood Re, 2023). But as Hampton and Curtis (2022) argued, market signals alone are insufficient. A credible strategy must also involve targeted subsidies, improved climate risk disclosure and substantial investment in adaptation infrastructure.

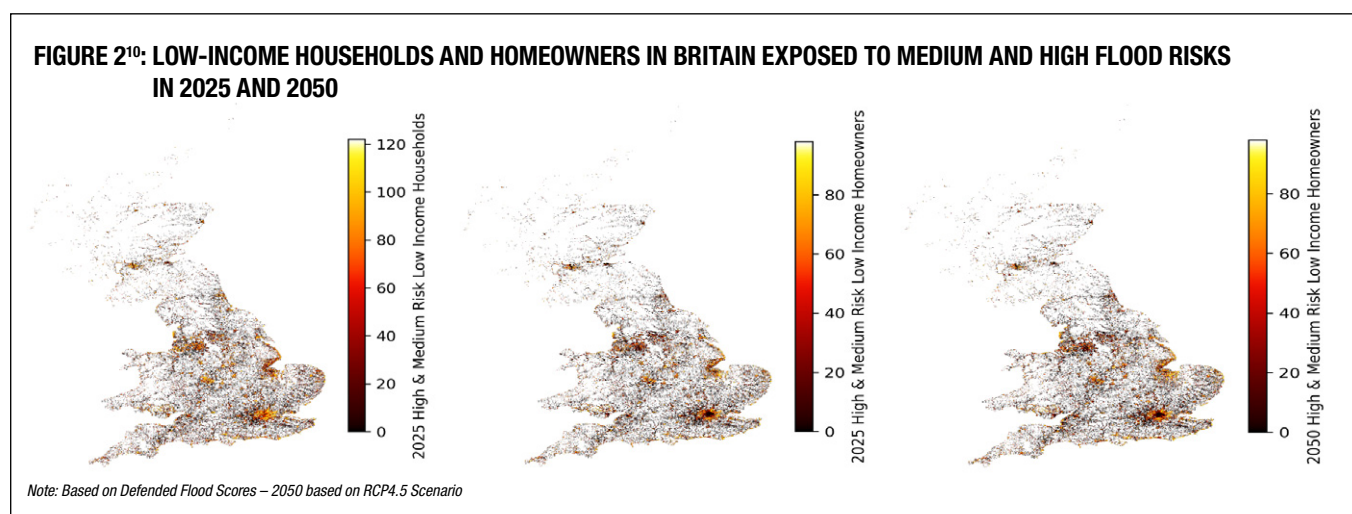
The vulnerability of current insurance arrangements is clear from the responses of insurers and banks in the Bank of England's Climate Biennial Exploratory Scenario. Under the No Additional Action pathway, the availability of household flood insurance falls sharply after 2039, with some properties becoming

effectively uninsurable. In response, insurers proposed extending Flood Re beyond its scheduled end or replacing it with a broader scheme to maintain affordability in high-risk areas (Bank of England, 2022).

Regulatory frameworks are evolving. The Prudential Regulation Authority (PRA) requires banks and insurers to integrate climate risk into governance, risk management and capital planning (PRA, 2019; 2022). The Financial Conduct Authority (FCA) has introduced pricing rules to ensure fairness in general insurance, which may affect households in exposed areas (FCA, 2021). Since 2022, large financial institutions and listed firms have been required to make climate-related disclosures aligned with the Task Force on Climate-related Financial Disclosures (TCFD), including how climate risks are assessed and managed (BEIS, 2022).

Despite these advances, a critical gap remains at the property level. Flood and subsidence risks are still not systematically included in mortgage valuations or underwriting decisions. Buyers rarely receive forward-looking flood risk information during conveyancing. CISL and Deloitte (2024) call for standardised hazard mapping, clearer disclosure protocols, and closer coordination between insurers and lenders. Without these reforms, both sectors risk carrying overlapping exposures without transparency or alignment.

There are early signs of adaptation in the mortgage and insurance markets. In 2024, Nationwide reported using flood risk data to screen mortgage applications and warned they may decline loans for properties in high-risk flood zones. Other lenders report similar



<sup>10</sup> Flood risk exposure is modelled using Twinn's defended flood scores, which account for existing flood defences. The figure compares 2025 baseline exposure with projected exposure under a 2050 RCP4.5 central scenario, reflecting moderate emissions and climate

adaptation assumptions. Households are classified as low-income if their income falls within the bottom quartile of regional household income distribution. Flood risk categories correspond to Twinn's medium and high flood probability thresholds.

concentrations of risk: NatWest estimates that 3.1 percent of its mortgage portfolio lies in high-risk flood zones and 1.6 percent in very high-risk areas; HSBC reports 2.7 percent and 0.9 percent respectively. Lloyds Banking Group states that 3.7 percent of its mortgage book falls into these categories. Lloyds' 2023 climate risk disclosure highlighted concerns about stranded assets and mortgage prisoners in the event of Flood Re's expiry.

Parametric flood insurance, which pays out when specific hazard thresholds such as rain-fall or river levels are reached, is being trialled by providers including FloodFlash and Aon. These products offer faster and more predictable compensation for properties excluded from traditional insurance. Policymakers and industry experts, including the Bank of England, Flood Re, the Green Finance Institute, and consulting firms like Deloitte, have proposed hybrid reinsurance models to succeed Flood Re. These models draw on international examples such as France's CatNat scheme and US state-backed pools (Bank of England, 2022). The Green Finance Institute (2022) also supports pilots of resilience-linked mortgages that offer better terms to borrowers investing in climate adaptation. Despite these innovations, uptake remains limited and uneven. Many lenders require households to invest in resilience to access improved insurance or mortgage terms. Lower-income households often lack the capital for such investments, risking exclusion and widening the insurance protection gap.

Behavioural barriers compound these challenges. Christophers (2019) argued that the UK was not prepared for fully risk-reflective insurance when Flood Re was introduced and may still be unready. Households often underestimate climate risks and rarely consult hazard maps before buying property. Flood Re may have muted risk signals, contributing to moral hazard and delaying necessary adaptation (Garbarino et al., 2024). Meanwhile, local planning authorities continue to approve new developments in exposed areas, often without assessing long-term insurability.

These dynamics are concerning given the structural shift in mortgage terms. The share of new mortgages with terms of 30 years or more has risen from 12% in 2005 to over 50% in 2024<sup>11</sup>, implying that borrowers entering long-term loans today will still be repaying them after Flood Re ends in 2039. If coverage becomes unavailable or unaffordable, properties could become unmortgageable

and illiquid, posing risks for both lenders and households. Without coordinated action on adaptation, disclosure, and financial support for vulnerable groups, the transition to fully risk-based pricing may amplify spatial inequality and increase systemic risk within the housing finance system.

## 6. Conclusion

Physical climate risks once considered distant or localised are clearly impacting the UK housing finance system. This article has shown how these hazards affect homeowners and insurers and are increasingly influencing mortgage lending, property values and financial resilience, with impacts varying by location.

The move toward risk-reflective insurance pricing is creating affordability pressures in high-risk areas. Premium increases, coverage exclusions, and insurer withdrawals from some markets are already occurring. A successful transition requires investment in adaptation, targeted financial support, and property-level risk disclosure. Price signals alone will not suffice. Governance, financial infrastructure, and communication must evolve alongside these changes. Educating households on climate risk and its financial implications is also critical. While Flood Re has protected many households, its scheduled expiry in 2039 poses a significant challenge. Without substantial adaptation and policy reform, a rapid shift to market pricing risks making many properties uninsurable and unmortgageable.

More lenders are factoring physical climate risks into mortgage decisions. Recent disclosures reveal a significant share of UK mortgage portfolios lie in high flood risk areas and, to a lesser extent, subsidence zones. This shows climate risk is already permeating the credit system, affecting lending strategies, borrower vulnerability, and asset quality.

Innovations in insurance and mortgage products offer potential solutions, but uptake remains limited, and their long-term affordability and accessibility are uncertain. These innovations may also risk exacerbating existing inequalities in protection and credit access.

Heat stress hazards are less likely to cause immediate claims or coverage losses but could have financial implications through effects on health, housing suitability and long-term asset values. Over time, these risks will probably

need to be integrated into insurance and mortgage assessments.

Climate risk is no longer solely an environmental issue. It has become a housing, credit, and financial stability challenge. Ensuring homes remain insurable and mortgageable will require coordinated action by insurers, lenders, regulators, and government. Equally important is ensuring that outcomes are equitable across all households.

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<sup>11</sup> UK Finance <https://www.ukfinance.org.uk/news-and-insight/press-release/half-new-first-time-buyer-mortgages-have-terms-over-30-years-quarter>

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