

Climate Havens as a Form of Transformative Climate Adaptation

Definition, Evaluation Framework, and Recommendations



The framework was applied to 20 U.S. cities anchored in the Great Lakes region, shown here by resulting typology, with comparators from the Pacific Northwest, Mountain West, and Southeast.

● Eco-Resilient and Prosperous ● Ruggedized yet Risky
● (Un)Intentional Enclaves ● False Havens

Geography sets the floor. Governance sets the ceiling.

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Introduction

Climate change is reshaping patterns of risk, investment, and migration across the United States. The past eleven years have been the eleven warmest ever recorded, and even under rapid decarbonization the warming already locked in will continue to stress the infrastructure being built today. As wildfire, flooding, extreme heat, and water scarcity intensify, regions perceived as relatively insulated from the most catastrophic impacts have begun attracting attention. These places are often called “climate havens.”

Yet the term remains conceptually ambiguous. It first surfaced around 2018, partly through the “Climate-Proof Duluth” campaign, and it has since been embraced by cities seeking economic revitalization and contested by experts who note that prominent “havens,” including Asheville, North Carolina, have suffered catastrophic disasters. The label too often conflates relative hazard exposure with genuine, lasting resilience. Geographic advantage is not a substitute for the fiscal stability, governing capacity, and infrastructure required to manage long-term economic and demographic shifts.

This study, an 18-month capstone collaboration between the University of Michigan School for Environment and Sustainability and Zurich Insurance, addresses that gap with two contributions. First, a working definition: a climate haven is a region that combines manageable long-term climate exposure with sufficient adaptive capacity to sustainably respond to environmental, demographic, and economic stress over time. Second, a transparent, replicable evaluation framework, built on open-source data, that operationalizes the definition and was applied to 20 U.S. cities.

The findings emerge from a targeted literature review, 13 semi-structured expert interviews, and an AI-assisted case study application focused on the Great Lakes region with comparators from the Pacific Northwest, Mountain West, and Southeast. The framework is a decision-support tool for planners, policymakers, insurers, and investors, not a predictive ranking system. Its central message is that climate havens are made, not found: geography sets the floor, and governance sets the ceiling.

About this study

**U-M SEAS
× Zurich
Insurance**

This report is the product of a master’s capstone project at the University of Michigan School for Environment and Sustainability, conducted in partnership with Zurich Insurance as client. The student team comprised Alice Yeom, Arielle Smith, Kunjal Pamami, Yejin Kim, and Zhao Lu, with Justin D’Atri of Zurich Insurance as client partner and Professor Andrew Hoffman as faculty advisor.

The research combined peer-reviewed and gray literature, interviews with practitioners and researchers in climate adaptation, planning, real estate, and insurance, and a structured application of the framework to 20 cities using public data and AI-assisted research. All scores reflect publicly available evidence and are intended to support comparative reasoning and strategic discussion rather than definitive city rankings.

The repricing of risk

Climate exposure is increasingly intertwined with financial viability. Insurance pricing, mortgage eligibility, infrastructure reliability, and property values are all becoming climate-sensitive variables, and they are moving faster than public planning.

\$182_B in U.S. damages from 27 separate billion-dollar disasters in 2024	18+ states where residential insurance has become effectively unavailable	4× growth in California FAIR Plan enrollment since 2019	30% of Americans cite climate change as a motivator to move
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Sources: NOAA National Centers for Environmental Information (2025); Federal Reserve Bank of San Francisco (2024); Habegger (2026); Forbes Home (2024).

Disasters are forcing the issue. The January 2025 Los Angeles wildfires burned more than 57,000 acres, displaced over 200,000 residents, and caused an estimated \$250 billion to \$275 billion in total economic losses, ranking among the costliest disasters in U.S. history. In Florida, surging premiums have pushed homeowners toward the state-backed insurer of last resort, which itself faces solvency concerns. In Arizona, groundwater limits have halted new approvals on the fast-growing edges of metropolitan Phoenix.

Insurance is the early signal. When insurers withdraw, raise premiums, or tighten underwriting, they signal escalating risk before markets and governments fully react. Practitioners describe a “Great Repricing” in which assets in high-risk geographies lose value while formerly undervalued regions, such as the Rust Belt, appreciate in relative terms. Unpriced or uninsurable risk cascades: collateral becomes unprotected, property values fall in localized ways, tax bases erode, and municipal fiscal stability weakens.

Migration is already shifting. The 50-year Snow Belt to Sun Belt trend has weakened, most sharply among college-educated movers and the age groups making long-term location choices. Disaster-driven exits accelerate after major events, and repeated low-level impacts such as chronic flooding also drive movement. Sea-level rise alone is projected to displace up to 13 million Americans by 2100.

Receiving regions are the blind spot. Significant research effort has gone into predicting which places will suffer most; far less has gone into preparing the places people will move to. Without proactive planning, regions perceived as safe risk replicating the unsustainable development patterns that worsened other regions’ vulnerabilities. Preparing receiving regions for growth is very likely more cost-effective, and more equitable, than indefinitely defending locations that cannot be defended.

“A place that cannot house people, cannot educate people, cannot feed people cannot be a climate haven.”

BETH GIBBONS, EXPERT INTERVIEW

Two axes, four typologies

Climate haven status cannot rest on geography alone. The framework deliberately separates a region's inherited geographic conditions from its institutional readiness to act, so the two are never confused.



Why two axes, not one score. A composite would obscure the distinction that makes the framework useful. A region with strong institutions but constrained geography faces a fundamentally different strategic challenge than one with favorable geography and fragile governance. Keeping the axes distinct prevents geographic determinism and surfaces the specific levers available for improvement.

Typology is diagnosis, not destiny. No region sits permanently in any quadrant. An (Un)Intentional Enclave can move toward Eco-Resilient and Prosperous through sustained governance investment; a Ruggedized yet Risky place can improve suitability through ecosystem restoration and targeted hazard mitigation. The framework identifies where deliberate action most improves long-term outcomes.

A threshold safeguard. A region whose primary economic center faces high flood exposure receives an automatic Low Suitability classification regardless of other strengths. This rule, designed around the Asheville case, prevents the false signals of safety that haven promotion can generate.

FROM SCORING REGIONS TO ACTIONABLE TYPOLOGIES

Running the assessment takes six steps, designed to be completed efficiently using public data and AI-assisted research with a detailed implementation guide.

1	2	3	4	5	6
Define geographic unit	X-axis assessment	Y-axis assessment	Human review	Aggregate scores	Identify typology
Hold the unit consistent across all sub-indicators, typically the county.	Locate the region on the CVI, agricultural land, watershed stress, and growth maps; apply the flood threshold.	Run AI research prompts for all 21 sub-indicators; record scores and evidence.	Adjust AI findings against local knowledge; prioritize low-confidence indicators.	Average modules and domains; map the region onto the two-axis matrix.	Engage the strategic guidance for that quadrant to set priorities.

Geography sets the floor. Governance sets the ceiling.

THE FRAMEWORK'S CENTRAL PREMISE

Scoring the two axes

Every dimension is scored on the same transparent three-point scale, using publicly accessible, standardized sources. The design favors interpretability over false precision and is replicable across regions with different data environments.

X-AXIS · LOCATION SUITABILITY · 4 MODULES

Community Resilience
Inverse of the Climate Vulnerability Index: compound hazard exposure across heat, wildfire, flooding, and storms

Local Food Security
Acres of nationally significant agricultural land, averaged across the study county and its neighbors

Local Water Security
Inverse of projected 2050 watershed stress under a business-as-usual scenario (WRI Aqueduct)

Future Growth Prospects
First Street Neighborhood Growth Trajectory designations

Threshold rule
High flood exposure in the primary economic center triggers automatic Low Suitability, regardless of module scores

Suitability Score = (CR + LFS + LWS + FGP) / 4, scored manually from public maps and datasets.

Y-AXIS · ADAPTIVE CAPACITY · 7 DOMAINS, 21 INDICATORS

Adaptation Planning
Dedicated plans, staffed offices, nature-based solutions

Food Resilience
Local food systems, public land, soil and biodiversity

Water Resilience
Supply security, stormwater, flood mitigation

Energy Resilience
Transit, renewables, grid hardening

Sustainable Housing
Affordability policy, building performance

Social Infrastructure
Schools, healthcare, workforce development

Ability to Secure Funding
Bond ratings, grant track record, insurance stability

AI-assisted assessment
Scored with Claude from standardized public sources; each indicator carries an AI confidence rating, and human review prioritizes lower-confidence indicators

WHAT EACH SCORE SIGNALS

High	Adopted policy, funded programs, active investment, strong institutions. Momentum, not aspiration, is the relevant signal.
Medium	Partial progress: awareness without coordination, or state policy coverage without local action. A directional signal rather than a neutral assessment.
Low	No meaningful policy, programs, or institutional capacity in the assessed domain.

AI CONFIDENCE, MADE EXPLICIT

Because much of the Y-axis evidence-gathering is AI-assisted, every sub-indicator carries a confidence rating reflecting how reliably it can be assessed from standardized public sources. Assessors invest review time accordingly, scrutinizing lower-confidence indicators most closely.

14 High-confidence indicators: bond ratings, FEMA CRS scores, school report cards, EPA records	5 Medium-High: findable evidence requiring interpretation across multiple source types	2 Medium: proxy measures or inconsistently reported local data; prioritized for human review
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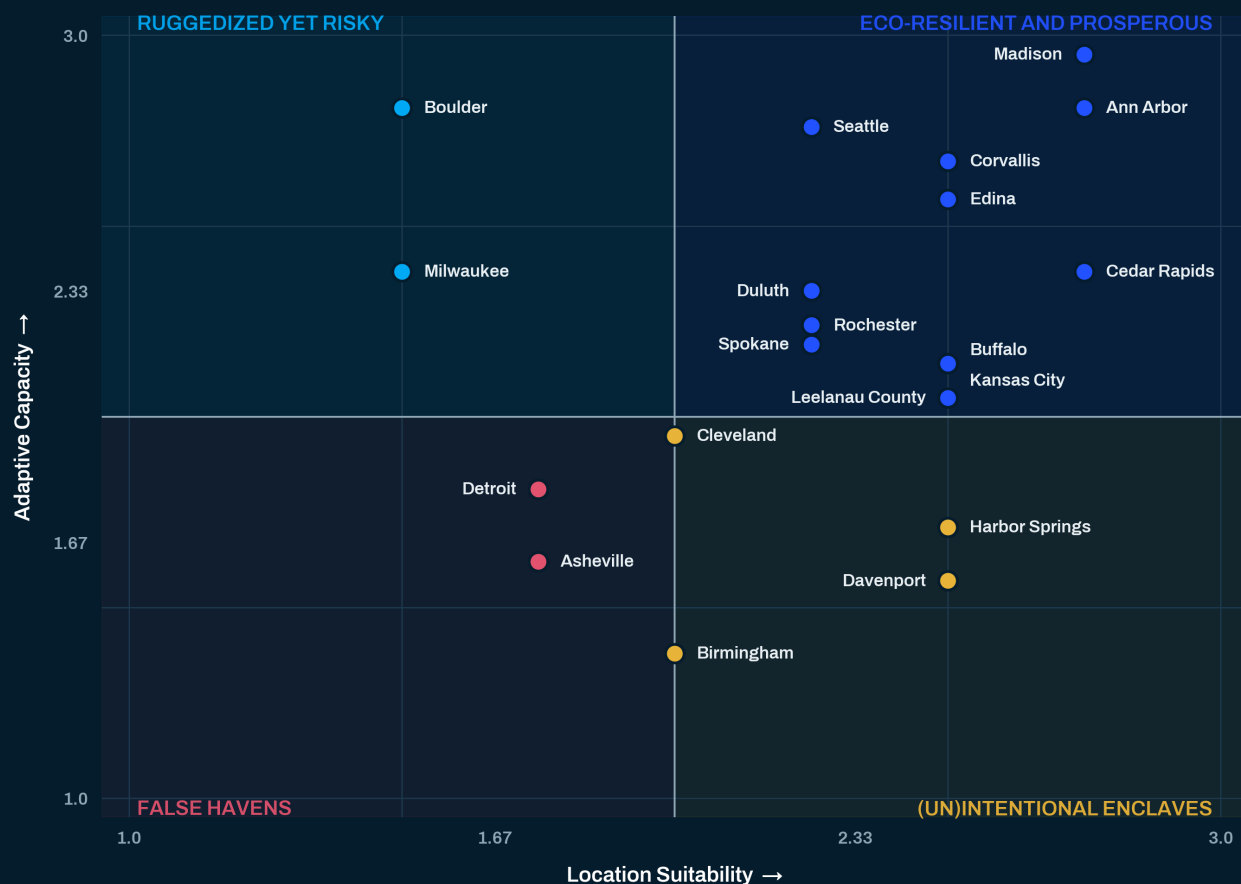
Twenty cities, four typologies

The framework was applied to 20 cities identified in public discourse as potential or contested climate havens. Results distributed across all four typologies, demonstrating that the two-axis structure produces differentiated, interpretable assessments.

EXHIBIT 2

Climate haven typology applied to 20 U.S. cities

Location Suitability (X) plotted against Adaptive Capacity (Y), each on a 1.0–3.0 scale with quadrant boundaries at 2.0. Cities drawn primarily from the Great Lakes region, with comparators from the Pacific Northwest, Mountain West, and Southeast.



Note: X-axis scores assigned manually from public datasets (Climate Vulnerability Index, USDA agricultural land, WRI Aqueduct 2050 projections, First Street growth trajectories); Y-axis scores assessed with AI-assisted research across 21 sub-indicators and reviewed by the study team. Source: study analysis, 2026.

The frontier. Madison (2.75, 2.95) and Ann Arbor (2.75, 2.81) combine top-tier governance with favorable Great Lakes geography, making them the cities best positioned to earn the climate haven designation in the full sense the framework intends. Their risk is not failure but success: housing costs in both are already growing faster than incomes.

Governance versus geography. Boulder (1.5, 2.81) ties Ann Arbor on capacity yet scores among the lowest on suitability, the cleanest illustration that institutional readiness and geographic advantage are independent. Cleveland (2.0, 1.95) sits almost exactly on both boundaries, with legacy fiscal constraints the primary obstacle to capacity its geography would otherwise support.

What the results reveal

Four cross-cutting findings emerge from the analysis, alongside structural patterns with direct relevance for adaptation strategy and risk assessment.

1 Climate haven status is dynamic

Regions can move between typologies through sustained governance investment, or, conversely, through neglect. The label describes a trajectory, not a permanent condition, and deliberate action can change it.

3 Unmanaged in-migration erodes advantage

In cities positioned to receive climate-driven growth, housing affordability, infrastructure strain, and displacement risks must be addressed proactively. Across the sample, housing affordability emerged as a universal constraint binding even the strongest performers.

2 Adaptive capacity is the limiting factor

A city with strong institutions and moderate geographic risk may ultimately score similarly to one with favorable geography and fragile governance. Institutional readiness, not geography, separates the leaders.

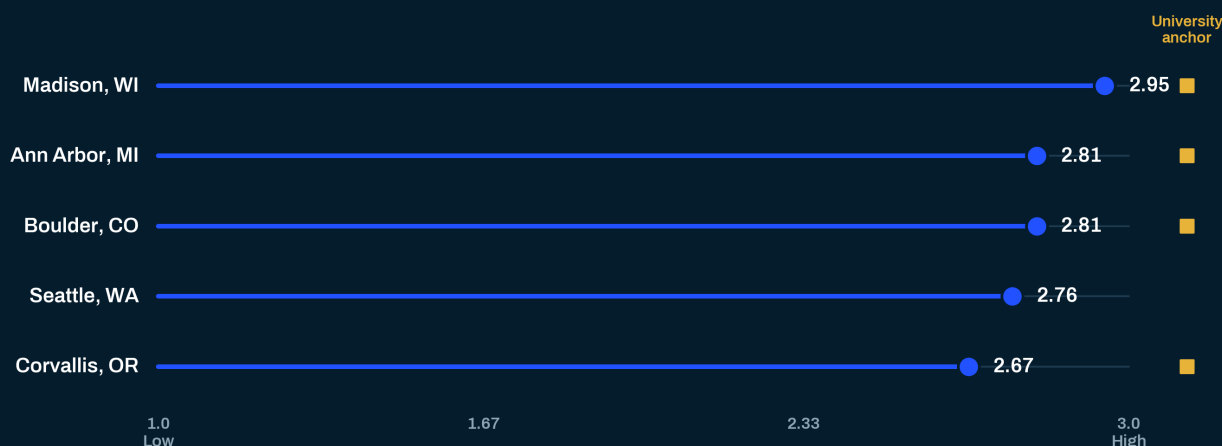
4 Transformation requires structural reform

Genuine transformative adaptation demands change in land use planning, fiscal policy, and institutional design, not surface-level sustainability initiatives layered onto business as usual.

EXHIBIT 3

The university-town advantage

Top five Adaptive Capacity scores in the 20-city sample. Four of the five are anchored by major research universities, the clearest pattern in the data.



Note: universities contribute healthcare infrastructure, research capacity, grant-writing expertise, workforce pipelines, and institutional stability across political cycles. Source: study analysis, 2026.

The disaster-learning pattern. Cedar Rapids' high capacity (2.38) was built not on a university anchor but on sustained flood mitigation investment after its 2008 flood. The same pattern appears in Duluth, Madison, and Boulder. The uncomfortable question is whether cities can build comparable momentum without a catalyzing disaster; the window for proactive investment closes quickly.

The validation case. Asheville, widely promoted as a haven before Hurricane Helene's catastrophic 2024 flooding, triggers the framework's flood threshold override and lands in False Havens (1.75, 1.62). Its capacity score does not compensate. The framework was explicitly built to catch the false signal of safety that Asheville's promotion generated.

Recommendations by stakeholder

The framework is built to drive decisions. Priorities differ by typology, but four audiences hold the levers that determine whether receiving regions are ready before growth arrives.

Insurers and investors

**MOST RELEVANT TO
ZURICH**

Reward governance alongside physical risk. Adaptive capacity is a leading indicator of long-term regional risk and value. The framework's insurance-market sub-indicator, tracking premiums, non-renewals, and reliance on insurers of last resort, signals escalating risk before it becomes a full crisis. Underwriting and capital allocation that recognize institutional momentum can both sharpen pricing and incentivize the governance investments that reduce loss over time.

Local governments

Act before the window closes. Use affordability policy, capital budgets, and grant capacity to get ahead of growth. Enroll in the FEMA Community Rating System as a first-year priority, resolve open EPA enforcement actions that block federal funding, and pass supply-side housing enablement together with anti-displacement protections before pressure becomes visible.

State and federal policymakers

Fund governance, not just infrastructure. Reduce funding barriers for lower-capacity places, whose grant-writing constraints compound their disadvantage. Tie funding to regional collaboration to overcome fragmented local decision-making. Equity is resilience strategy, not an ancillary concern.

Community organizations

Demand honest risk communication and early planning. Preparation must precede the pressure of immigration. Affordability and anti-displacement safeguards deliver the most benefit when adopted before growth, while the political constituency for them is still in place.

Climate havens are not predetermined by geography alone; they are shaped through governance, investment, and collective action.

LIMITATIONS

- **Data access:** full climate risk data is proprietary; the X-axis relies on public proxies.
- **Scale mismatch:** projections are county or regional; neighborhood variation is not captured.
- **Policy vs. implementation:** the Y-axis captures whether policies exist; local knowledge is needed to judge implementation quality.

ACKNOWLEDGEMENTS AND CITATION

The team thanks the 13 experts who shared their knowledge, Professor Andrew Hoffman (faculty advisor), and Justin D'Atri of Zurich Insurance (client partner).

Full report: Yeom, A., Smith, A., Parnami, K., Kim, Y., Lu, Z., & D'Atri, J. (2026). *Climate Havens as a Form of Transformative Climate Adaptation: Definition, Evaluation Framework, and Recommendations*. University of Michigan School for Environment and Sustainability.