Five Urban Futures for a Hot Planet: U.S. Legal Scenarios

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If current climate change trends continue, flooding, extreme heat, wildfires, and water scarcity will make the homes of millions of people in the United States increasingly uninhabitable. This change could happen by the end of the century, perhaps sooner. Most people will want to stay in their current homes, but there is no coherent policy to fortify the most vulnerable places. Nor is the current legal system equipped to handle what may become one of the largest migrations in U.S. history, as people flee intolerable climate conditions. This Article envisions five scenarios for cities in the future: sprout, grow, stay, shrink, or leave. It argues that every city, and perhaps each neighborhood, will need to decide which scenario to follow and analyzes the legal implications of each.

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I. INTRODUCTION

A. *Trends*

If current climate change trends continue, portions of some major cities and the entirety of some small ones will be uninhabitable. This could happen by the end of the century, perhaps sooner.[1] The most severe displacement will be in other countries, but the United States is also subject to flooding and other extreme weather events that will drive millions or tens of millions of people from their homes.[2]

Cities or parts of them may choose to remain in place or relocate, but either way, serious legal issues will arise. Staying safely will require new land use and building restrictions that will disrupt economies and arguably invade property rights, and cost many building owners and tenants large sums. It will also entail the disruptive construction of costly new infrastructure, such as sea walls or drainage systems. On the other hand, if large populations move, where do they go? The possibilities are chiefly creating new cities or expanding existing ones (in geographic extent, in density, or both). Some cities suffering from climate change will need to adjust to much smaller populations, and some communities may vanish altogether. Some people could also move to rural areas, but a large-scale rural relocation would create significant land use, transportation, and other infrastructure difficulties.

Every one of these scenarios will strain the familiar legal structures.

Little adaptation would be needed in the accustomed world of

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1. *See generally* MIGRATION AND CLIMATE CHANGE (Etienne Piguet, Antoine Pecoud & Paul de Guchteneire, eds., 2011) (global survey of relationship between migration and climate change); GREGORY WHITE, CLIMATE CHANGE AND MIGRATION: SECURITY AND BORDERS IN A WARMING WORLD (2011) (exploring how North Atlantic states have increasingly securitized climate-induced migration); KIRA VIRGINIA VINKE, REDRAWING HUMANITY'S MAP: HOW CLIMATE CHANGE IS SHAPING MIGRATION (2025) (surveying the intersection of climate change and human migration through case studies); RESEARCH HANDBOOK ON CLIMATE CHANGE, MIGRATION AND THE LAW (Benoît Mayer & François Crépeau eds., 2017) (surveying perspectives on the relationship between climate change, human mobility, and the law); ROUTLEDGE HANDBOOK OF ENVIRONMENTAL DISPLACEMENT AND MIGRATION (Robert McLeman & François Gemenne eds., 2018) (reviewing research on how environmental variability and climate change influence global migration patterns).

2. JEFF GOODELL, THE WATER WILL COME: RISING SEAS, SINKING CITIES, AND THE REMAKING OF THE CIVILIZED WORLD 13-14 (2017).

a stable climate. But that world is gone.[3] We have entered conditions that have not been experienced since the dawn of human civilization.

Carbon dioxide, the greenhouse gas (GHG) that is the principal driver of anthropogenic climate change, was at about 280 parts per million (ppm) before the Industrial Revolution[4] but reached about 430 ppm in 2025.[5] The last time levels were this high was during the Pliocene epoch about three million years ago,[6] when sea levels were up to 63 feet higher than they are today.[7] By 2100, carbon dioxide levels may reach 1,000 ppm.[8] Largely as a result of the GHGs in the atmosphere, 2025 was the third warmest year in recorded history. [9] The warmest was 2024.[10] And the eleven warmest years have been the most recent eleven.[11] Following the Paris Climate Agreement of 2015, the internationally accepted goal has been to keep global average temperatures within 1.5˚C above pre-industrial conditions.[12] However, temperatures are already hovering around that level[13] and current trends would take us to at

3. *See generally* Robin Kundis Craig, *"Stationarity Is Dead" – Long Live Transformation: Five Principles for Climate Change Adaptation Law*, 34 HARV. ENVTL. L. REV. 10 (2010) (arguing that ecological stationarity assumptions underlying U.S. environmental law are obsolete in a climate change era, necessitating a paradigm shift to increasing resilience and adaptive capacity).

4. Rebecca Lindsey, *Climate Change: Atmospheric Carbon Dioxide*, NAT'L OCEANIC AND ATMOSPHERIC ADMIN. (MAY 21, 2025), https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide [https://perma.cc/T47Z-WNZN].

5. *The Keeling Curve*, SCRIPPS INST. OF OCEANOGRAPHY AT UNIV. CAL. S.D., https://keelingcurve.ucsd.edu/ (last visited Mar. 28, 2026).

6. Rich Pancost, *The Pliocene – The Last Time Earth Had 400 ppm of Carbon Dioxide*, UNIV. OF BRISTOL: THE UNCERTAIN WORLD (July 9, 2018), https://richpancost.blogs.bristol.ac.uk/2018/07/09/the-pliocene-the-last-time-earth-had-400-ppm-of-carbon-dioxide/ [https://perma.cc/F4UM-TCLD].

7. U.S. GLOB. CHANGE RSCH. PROGRAM, FIFTH NATIONAL CLIMATE ASSESSMENT ch. 2, at 11 (2023), https://repository.library.noaa.gov/view/noaa/61592 [https://doi.org/10.7930/NCA5.2023].

8. MARTIN SIEGERT ET AL., WHAT ANCIENT CLIMATES TELL US ABOUT HIGH CARBON DIOXIDE CONCENTRATIONS IN EARTH'S ATMOSPHERE 1 (2020).

9. Robert Rohde, *Global Temperature Report for 2025*, BERKELEY EARTH (Jan. 14, 2026), https://berkeleyearth.org/global-temperature-report-for-2025/ [https://perma.cc/ZC6R-JKWC].

10. *Id.*

11. *Id.*

12. Taryn Fransen, *1.5 Degrees C: Understanding World's Critical Warming Threshold*, WORLD RESOURCES INST. (June 18, 2025), https://www.wri.org/insights/1-5-degrees-c-target-explained [https://perma.cc/ZC6R-JKWC].

13. *Copernicus: 2024 Is the First Year to Exceed 1.5C Above Pre-Industrial Level*,

least 2.6˚C by 2100.[14] That level would lead to extreme coastal and inland flooding, heat waves, wildfires, droughts, intense precipitation, biodiversity loss, food insecurity, and many other impacts.[15] Globally this would drive hundreds of millions of people—perhaps more than a billion—from their homes.[16]

Average sea level along the continental U.S. coastline has risen about eleven inches over the last century.[17] By 2100, they may be between two and four feet over 2000 levels with 2˚C of warming.[18] Heavy precipitation events are becoming more frequent and intense across much of the country.[19] The Fifth National Climate Assessment, published in 2023, the most definitive statement of climate trends in the United States, paints a dismal picture of conditions in 2050, and even worse in 2100, if trends continue.[20]

The combustion of fossil fuels, the source of around 68 percent of human-caused GHG emissions, largely drives these trends.[21] Although many countries and companies embraced the Paris Climate Agreement's goal of achieving "net zero emissions" by mid-century, and many countries and companies declared that goal, no major economies are anywhere near on course to meeting it, and many companies are backing away from their pledges.[22] The current Trump administration is moving in the opposite direction, trying to maximize fossil fuel extraction and use while discouraging

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COPERNICUS PROGRAMME (Jan. 10, 2025), https://climate.copernicus.eu/copernicus-2024-first-year-exceed-15degc-above-pre-industrial-level [https://perma.cc/BRY4-DEKL].

14. U.N. ENV'T PROGRAMME, EMISSIONS GAP REPORT xi (2024), https://wedocs.unep.org/handle/20.500.11822/46404.

15. Sophie Boehm & Clea Schumer, *10 Big Findings From the 2023 IPCC Report on Climate Change*, WORLD RESOURCES INST. (Mar. 20, 2023), https://www.wri.org/insights/2023-ipcc-ar6-synthesis-report-climate-change-findings [https://perma.cc/CE6E-BUS4].

16. *Id.*

17. U.S. GLOB. CHANGE RSCH. PROGRAM, *supra* note 7, at 2-13.

18. U.S. GLOB. CHANGE RSCH. PROGRAM, *supra* note 7, at 2-27.

19. U.S. GLOB. CHANGE RSCH. PROGRAM, *supra* note 7, at 2-19.

20. *See generally* U.S. GLOB. CHANGE RSCH. PROGRAM, *supra* note 7.

21. *Causes and Effects of Climate Change*, UNITED NATIONS, https://www.un.org/en/climatechange/science/causes-effects-climate-change [https://perma.cc/X57D-EGWK] (last visited Mar. 28, 2026).

22. *Climate Action Tracker: Countries*, CLIMATE ACTION TRACKER, https://climateactiontracker.org/countries/ [https://perma.cc/RNM2-RLZW] (last visited Mar. 28, 2026); Abigail Bassett, *Countries Are Rolling Back Their Climate Commitments*, CLIMATEBASE (Oct. 7, 2024), https://stories.climatebase.org/p/countries-are-rolling-back-their-climate-commitments [https://perma.cc/3PXX-77LS].

wind and solar energy, electric vehicles, and energy efficiency.

Even if the major emitting countries suddenly reversed course and net zero emissions was achieved, global temperatures would remain steady for several centuries and today's climate impacts would persist. The world at nearly 1.5˚C is already experiencing severe climate phenomena.[23] But we are nowhere near achieving net zero emissions, and conditions will continue to worsen.

B. *Overview*

These climate impacts will render some areas uninhabitable, forcing large numbers of people to move. This article envisions five scenarios for cities in the future, and analyzes the legal implications of each:

1. *Sprout*: Create entirely new cities to take in those who fled places where they could no longer live.
2. *Grow*: Increase the population of existing cities.
3. *Stay*: Stay within existing cities, and defend against the water, heat and smoke, or find ways to live with it.
4. *Shrink*: Lower the population living in the vulnerable cities.
5. *Leave*: Abandon some cities or portions of them entirely and move, either to dispersed locations or together as a community.

The focus of this article is entirely on U.S. law, though it draws on examples from other countries. Many other parts of the world will face far more desperate conditions than most or all of the United States, which is exceptionally well equipped to deal with climate impacts; it is a wealthy developed country with ample land and resources spread across many climates. If the United States cannot adapt to climate change, then perhaps no nation can.

My focus here is also on the built environment, especially in cities and suburban and exurban areas. Agricultural land, ecosystems, and wildlife face their own major problems in coping with climate change, but those too are beyond the scope of this article, which is intentionally anthropocentric.

One overarching theme is how the United States is moving in the opposite direction from where it should if it is going to cope

23. Zeke Hausfather, *Explainer: Will Global Warming "Stop" as Soon as Net-Zero Emissions Are Achieved?* CARBON BRIEF (Apr. 29, 2021), https://www.carbonbrief.org/explainer-will-global-warming-stop-as-soon-as-net-zero-emissions-are-reached/ [https://perma.cc/WS7V-UV9T].

with climate change. A top priority, of course, should be to reduce our GHG emissions, primarily by transitioning away from fossil fuels and toward clean energy.[24] The federal government today is instead attempting to reverse this effort.[25] More to the point of this article, however, the population is moving in the wrong direction. As discussed below, when people move, it is too often to coastal areas that are facing sea level rise, to places in the south that are wilting in the heat, and to the edges of forests that are threatened by wildfires.

A sounder approach would be to focus more growth on the Rust Belt cities of the upper Midwest and Northeast that are remote from the oceans and forests, have ample water and tolerable summers, and, due to population declines, have sufficient infrastructure and an oversupply of housing (though much of it needs upgrading). But unlike some other countries, the government of the United States will not be telling people where to move. The right to travel is a constitutional constraint on doing this,[26] and there are innumerable political and cultural constraints. However, the government may encourage redirection. For example, it can focus infrastructure investment, housing assistance, and industrial growth in some places and not others.

Even still, these policies will not happen under our current federalist structure. Land use decisions (except for federal lands) have always been made at the state and local levels. The House of Representatives heavily influences the allocation of federal money, where the southern coastal states of Texas and Florida are seeing growing representation, mostly at the expense of California and several northern states, especially New York.[27] The Electoral College that determines the winner of presidential elections follows the same pattern.

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24. Legal tools to accomplish this are set forth in LEGAL PATHWAYS TO DEEP DECARBONIZATION IN THE UNITED STATES (Michael B. Gerrard & John C. Dernbach, eds., 2019).

25. *See* Michael B. Gerrard, *Trump's Multi-Pronged Attack on Renewable Energy*, N.Y.L.J. (July 20, 2024), https://scholarship.law.columbia.edu/faculty_scholarship/4735/ [https://perma.cc/RK67-F9P7].

26. *See* Saenz v. Roe, 526 U.S. 489, 498-500 (1999); Memorial Hospital v. Maricopa County, 415 U.S. 250, 254-55 (1974); Shapiro v. Thompson, 394 U.S. 618, 629 (1969).

27. Michael Li, *Big Changes Ahead for Voting Maps After Next Census*, BRENNAN CTR. FOR JUSTICE (Dec. 20, 2024), https://www.brennancenter.org/our-work/analysis-opinion/big-changes-ahead-voting-maps-after-next-census [https://perma.cc/2KFX-Y79M].

Perhaps one day the negative impacts of climate change will come to dominate national politics and the relevant policies will change. Until then, the federal government can help perform the studies that will allow prospective property owners, developers, and tenants better to understand the climate risks facing particular parcels. It can help develop and promote the technologies that will help buildings and cities better cope with climate change as well as reduce their emissions. It can reform federal flood insurance policy, which now encourages growth in vulnerable areas. It can better assist the communities that want to move, and begin thinking about creating the entirely new cities that may be needed if the worst case climate scenarios come to pass. The legal tools to accomplish these and other actions, and the legal constraints on some of them, are the focus of this article.

C. *How Many Might Flee*

Most people in the United States will be negatively affected by climate change and many will have to move. Just how many, and when, cannot be precisely predicted, but there are several estimates.

The best-known estimates are from Mathew Hauer, a professor of sociology at Florida State University. In a 2021 study, he and his colleagues have calculated that by 2100, under the most likely emissions scenario, about four million people in the United States will be exposed to annual flooding from sea level rise. [28] Under a high emissions scenario, that number rises to about 13 million.[29] A 2026 study, using machine learning, produced higher estimates—that 20.49 million people in the U.S. Atlantic and Gulf coasts are already at high risk of extreme flooding.[30]

Professor Jesse Keenan of Tulane University has suggested that tens of millions of Americans could be displaced by climate change

28. Mathew E. Hauer et al., *Assessing Population Exposure to Coastal Flooding Due to Sea Level Rise*, 12 NATURE COMMC'NS, 2021, at 1, 3 (estimating 4.13 million exposed to annual flooding under the IPCC's Representative Concentration Pathway (RCP) 4.5 scenario).

29. Mathew E. Hauer et al., *Millions Projected to Be at Risk From Sea-level Rise in the Continental United States*, 6 NATURE CLIMATE CHANGE 691, 691 (2016) (finding 13.1 million facing inundation under 1.9m of sea level rise); *see also* Caleb Robinson et al., *Modeling Migration Patterns in the USA Under Sea Level Rise*, PLOS ONE, Jan. 22, 2020, at 1, 11 (finding around 13 million "directly affected" under a high sea level rise scenario).

30. *See generally* Hemal Dey & Wanyun Shaq, *A Tale of Two Coasts: Unveiling US Gulf and Atlantic Coastal Cities at High Flood Risk*, 12 SCIENCE ADVANCES 17 (2026), https://www.science.org/doi/10.1126/sciadv.aec2079.

by the end of the century.[31] This estimate considers not only coastal flooding but also many other climate-related phenomena that could also drive people to move, such as inland flooding, wildfires, extreme heat, or water shortages. Also including these other factors, Abrahm Lustgarten and Al Shaw calculated that around 162 million people in the United States will live in places that will be vulnerable to climate impacts by 2100 under a high emissions scenario, though they caution that this figure is highly uncertain and by no means will all of them need to move.[32] Other estimates of current and future flood risk have been issued by the First Street Foundation[33] and the Union of Concerned Scientists.[34]

While the estimates vary considerably, there is widespread agreement that large numbers of people in the United States will be displaced by climate change later in this century. To make matters worse, as discussed below, many of the areas that are most vulnerable to flooding or wildfires are becoming more populated, not less.

In a nationwide survey conducted in 2021, 57 percent of respondents reported that weather or climate-related issues would have a moderate or greater influence on their decision to move in the coming decade.[35] Obviously climate hazards are not the only reasons people decide to move (or to stay); jobs, families, schools, social connections, crime rates, and other factors all play a role in individuals' decisions. Often these are wrenching decisions as families try to balance all the factors.[36]

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31. JESSE KEENAN, NORTH: THE FUTURE OF POST-CLIMATE AMERICA 8 (2025).

32. ABRAHM LUSTGARTEN, ON THE MOVE: THE OVERHEATING EARTH AND THE UPROOTING OF AMERICA 199, 298-99 (2024); E-mail from Abrahm Lustgarten, Reporter, ProPublica to author (June 25, 2025) (on file with author).

33. FIRST STREET FOUNDATION, THE 13TH NATIONAL RISK ASSESSMENT: CLIMATE, THE 6TH "C" OF CREDIT 15 (2025) (finding 17.7 million properties currently facing 1-in-100 flood risk, over double the number identified by FEMA).

34. UNION OF CONCERNED SCIENTISTS, WHEN RISING SEAS HIT HOME 2 (2017). *See also* UNION OF CONCERNED SCIENTISTS, UNDERWATER: RISING SEAS, CHRONIC FLOODS AND THE IMPLICATIONS FOR US COASTAL REAL ESTATE 2 (2018).

35. Byungdoo Kim, David L. Kay & Jonathon P. Schuldt, *Will I Have to Move Because of Climate Change? Perceived Likelihood of Weather- or Climate-Related Relocation Among the U.S. Public*, 165 CLIMATIC CHANGE, Nov. 18, 2020, 1. *See also* Lily Katz, *Nearly Half of Americans Who Plan to Move Say Natural Disasters, Extreme Temperatures Factored into Their Decision to Relocate: Survey*, REDFIN (Apr. 5, 2021), https://investors.redfin.com/news-events/press-releases/detail/115/redfin-survey-nearly-half-of-americans-who-plan-to-movehttps://www.redfin.com/news/climate-change-migration-survey/ [https://perma.cc/5RQZ-XAS7].

36. *See* William Solecki, Robin Leichenko & David Eisenhauer, *Extreme Climate Events,*

Of course, many people who are vulnerable will stay put. Some will find ways to stay safe, while others will accept the risks to keep their homes, their communities, or their jobs. But perhaps most likely, they will stay simply because they have no other choice. If a house is in such a perilous location that the owner wants to flee, its sale price has likely crashed and it is unlikely to fetch enough for the owner to afford a comparable house in a safe place. More broadly, interregional mobility has declined overall, due to high housing costs (partly due to land use regulations that constrain new housing supply), eligibility standards for public benefits, public employee pension policies, occupational licensing that impedes moving to different states, and many other factors.[37]

Some climate hazard projections show more people moving as a result of climate change than those who moved in the two largest migrations within the United States of the 20th century. In the Great Migration, around six million African Americans moved from the rural South to the urban North and West between about 1910 and 1970, driven by racial segregation, discrimination, and violence, and attracted by better economic opportunities. During the 1930s, the Dust Bowl—an extended drought with dust storms and degraded soil—drove about 2.5 million people from Oklahoma, Texas, Kansas, Colorado, and New Mexico, to the west, mostly California.

All these numbers are tiny in comparison to the migration that climate change can cause in other parts of the world. In 2021 the World Bank estimated that by 2050, over 216 million people could be displaced by climate change in six regions it studied—86 million from Sub-Saharan Africa; 49 million from East Asia and the Pacific; 40 million from South Asia; 19 million from North Africa, 17 million from Latin America; and 5 million from Eastern Europe and Central Asia.[38] The report assumed all of these people would be displaced within their own countries, but many will attempt to cross borders into other countries.

Under some theories of justice, the countries responsible for

Household Decision-Making and Transitions in the Immediate Aftermath of Hurricane Sandy, 21 MISCELLANEA GEOGRAPHICA 139 (2017).

37. David Schleicher, *Stuck! The Law and Economics of Residential Stagnation*, 127 YALE L.J. 78, 81-84, 111-14 (2017). *See generally* YONI APPELBAUM, STUCK: HOW THE PRIVILEGED AND THE PROPERTIED BROKE THE ENGINE OF AMERICAN OPPORTUNITY (2025).

38. VIVIANE CLEMENT ET AL., WORLD BANK, GROUNDSWELL PART II: ACTING ON INTERNAL CLIMATE MIGRATION xv (2021).

the most GHG emissions should accept a portion of the world's climate-displaced people proportional to its contribution to its historic emissions and hence to climate change.[39] The United States is the source of about 26 percent of the load of carbon dioxide now in the atmosphere.[40] Under these theories, the United States would be taking in hundreds of millions of people from other countries.[41] However, I write this during the second Trump administration, which is all about deportation, not immigration. A U.S. political environment that would accept anything like this level of immigration is unimaginable today. Hence this article is examining only internal migration—Americans moving within the United States. Perhaps someday U.S. politics and culture will change and we again embrace Emma Lazarus's words on the Statue of Liberty, welcoming the "huddled masses yearning to breathe free." If that happens, the sorts of new and expanded cities discussed in this article will need to increase by orders of magnitude. Meanwhile, accommodating only internal migrants will be challenging enough.

D. *Policy Incoherence*

Though the United States is facing even more extreme climate-related events in the decades to come than the devastating hurricanes, floods, wildfires, and heat waves that it has already endured, the country has embraced no policy on adapting to climate change.[42] In September 2023, the Biden administration issued its "National Climate Resilience Framework," but it was mostly a discussion of six laudable objectives (such as "mobilize capital, investment, and innovation to advance climate resilience at scale") without firm commitments to achieve them or a plan to pay for them.[43] On January 10, 2025—ten days before President

39. *See* Carmen G. Gonzalez, *Migration as Reparation: Climate Change and the Disruption of Borders*, 66 LOY. L. REV. 401, 434-40 (2020); SUKETU MEHTA, THIS LAND IS OUR LAND: AN IMMIGRANT'S MANIFESTO 208-10 (2019); Michael B. Gerrard, *America is the Worst Polluter in the History of the World. We Should Let Climate Change Refugees Resettle Here*, WASH. POST (June 25, 2015).

40. Jason Hickel, *Quantifying National Responsibility for Climate Breakdown: An Equality-Based Attribution Approach for Carbon Dioxide Emissions in Excess of the Planetary Boundary*, 4 LANCET PLANETARY HEALTH e399, e400 (2020).

41. Gerrard, *supra* note 39.

42. *See* KEENAN, *supra* note 31, at 72-89 (discussing political reasons for the country's failure to embrace a national adaptation policy)

43. WHITE HOUSE, NAT'L CLIMATE RESILIENCE FRAMEWORK (2023)

Biden left office—the United States submitted to the United Nations, as called for by the Paris Climate Agreement,[44] its U.S. National Adaptation and Resilience Planning Strategy.[45] Its summary resembles the 2023 report, and it attaches the climate adaptation plans of nine federal agencies. It has been ignored and implicitly rejected by the second Trump administration, which rejects the idea that climate change is a serious problem.

Instead of a coherent plan, the United States has a wide variety of policies and legal requirements that often push in opposing directions. Some are federal, but most are at the state or local levels. The table below illustrates some of the most prominent ways to deal with climate problems occur in coastal areas. I have listed them in this table, arrayed along a spectrum that goes from maximal retreat (moving away from coastlines and other vulnerable areas) to maximal defense (rebuild places that have already been devastated by climate-related impacts and are still vulnerable). The items listed are specifically about sea level rise; some of them would also be relevant to inland flooding and wildfires, and a few to heat. These are contradictory policies. Retreating and defending do not readily coexist in the same place at the same time. This hodgepodge is no way for a country to prepare for the worsening climate that is our future.

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https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/09/National-Climate-Resilience-Framework-FINAL.pdf [https://perma.cc/EYX2-T265]; *see also* Exec. Order No. 13690, 3 C.F.R. 268 (2016) (Establishing a Federal Flood Risk Management Standard; the order was issued by President Obama, revoked by President Trump in his first term, reinstated by President Biden, and revoked again by President Trump in his second term).

44. Paris Agreement to the United Nations Framework Convention on Climate Change, art. 7, ¶10, Dec. 12, 2015, T.I.A.S. No. 16-1104.

45. U.S. NAT'L ADAPTATION AND RESILIENCE PLANNING STRATEGY (2025), https://unfccc.int/sites/default/files/resource/US-National-Adaptation-and-Resilience-Planning-Strategy-2025.pdfhttps://unfccc.int/documents/645358.

Table 1: Sea Level Rise Adapation Policies
(arrayed from maximum retreat to maximum defense)

Description	Examples or cases
Maximum Retreat	
Relocate communities	Isle de Saint Charles; Newtok
Remove existing vulnerable uses	Conditions in California Coastal Commission (CCC) permits
Plan for relocation when needed	Kivalina v. ExxonMobil
Ban reconstruction of existing uses	Arlington v. Texas General Land Office; nonconforming uses in most zoning codes
Disinvest in infrastructure	But: Jordan v. St. John's County
Allow only temporary uses	Tahoe-Sierra v. Tahoe Regional (US 2002)
Ban shoreline protection, beach nourishment	CCC permits; some rolling easements
Ban new uses in hazard areas	Lucas v. South Carolina Coastal Council
Inhibit financing of new uses in hazard area	Some insurance policies
Substantive limitations, e.g. buffers, setbacks	Nollan, Dolan
Procedural hurdles	Require environmental impact statements in hazard areas
Voluntary buybacks	New York, New Jersey after Hurricane Sandy
Financial disincentives for development	Reform National Flood Insurance Program
Consideration and disclosure	Former guidelines under National Environmental Policy Act
Neutrality	
Do nothing; allow shoreline to migrate inland; do not protect or relocate	Most places
Accommodation: Require new uses to be resilient to floods	Some post-Sandy and post-Katrina building code revisions
Require public infrastructure to take sea level rise into account	Consolidated Edison Co. climate resilience plan
Publicly funded beach nourishment	Stop the Beach Renourishment v. Florida Department of Environmental Protection
Hard armoring of shoreline	Long Island, N.Y. north and south shores
Raise land elevation for new development	Miami Beach, Florida
Sea walls and levees	Netherlands; Japan; New Orleans
Sea barriers	Thames; Venice
Rebuild destroyed areas that continue to be vulnerable	New Orleans
Maximum Defense	

II. SCENARIOS

It is time to bring some coherence to U.S. policy on adaptation to climate change. I propose that one of the following choices be made for each location where relevant. Who makes these choices, and over what kinds of areas, will be discussed below.

1. *Sprout*: Create a new city, if the magnitude of population displacement requires it
2. *Grow*: Increase the density or size of existing cities
3. *Stay*: Remain in place and defend against rising waters and other climate threats
4. *Shrink*: Do not rebuild damaged structures; allow gradual decline in population
5. *Leave*: Abandon or relocate existing buildings; fully retreat

I will now discuss each of these five options and their legal implications.

A. *Sprout*

If the number of people who need to move because of climate change is around four million, as in one of Mathew Hauer's scenarios, they can go to existing cities and towns. But if it is closer to 100 million, as some scenarios envision, then new cities will need to be built. If approached creatively, this might be not just an undesired necessity, but a promising development for a clean slate of green cities.

Much of the urban growth in the United States for many years has been the sprawl of existing cities, a trend that worsens many environmental and social problems. The country is no longer in the business of building new cities. Las Vegas, Nevada was incorporated in 1911 and now has a population of about 642,000.[46] After Alaska became the 49th state in 1959, Anchorage grew rapidly from a few thousand residents to about 290,000 people.[47] Irvine, California was incorporated as a city in 1971 and now has about 315,000 residents. These are the sole recent examples; all other

46. *Las Vegas City, Nevada*, U.S. CENSUS BUREAU, https://data.census.gov/all?q=Las+Vegas+city,+Nevada (last visited Mar. 29, 2026).

47. *Quickfacts: Anchorage Municipality, Alaska*, U.S. CENSUS BUREAU, https://www.census.gov/quickfacts/anchoragemunicipalityalaska [https://perma.cc/L92W-P4AS] (last visited Mar. 29, 2026); Eric Sandberg, *A History of Alaska Population Settlement*, ALASKA DEP'T. OF LAB. AND WORKFORCE DEV. 11-12 (2013), https://live.laborstats.alaska.gov/pop/estimates/pub/pophistory.pdf [https://perma.cc/SF7U-2XZ2].

large cities date from the 19th century or earlier. But other countries have built new cities much more recently and quickly.[48] One study found 150 entirely new cities being built in more than forty countries, but none in North America.[49]

While large new cites in the United States are scarce, government actors and private companies have spurred the creation of small ones. Private companies have launched substantial developments in the United States, often within other municipalities, but none come close to 100,000 residents.[50] Some arose on empty or low-density private land, aided by state legislation that enabled developers to issue tax-exempt debt to fund new infrastructure within special districts and sometimes to govern the communities without formal incorporation of a municipality.[51]

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48. Brasilia, Brazil was founded in 1960 and has a population of 2.8 million. *The History Behind Brasilia*, USP BRASILIA, https://uspbrasilia.wordpress.com/the-history-behind-brasilia/ [https://perma.cc/N8EX-B3XK] (last visited Apr. 30, 2026); *Brasilia Population*, WORLD POPULATION REV., https://worldpopulationreview.com/cities/brazil/brasilia [https://perma.cc/ECP9-Y5LX] (last visited Apr. 30, 2026). A district in Zhengdong, Hunan, China was designed as a new city in 2001. Charlie Q.L. Xue et al., BUILDING NEW TOWNS IN CHINA – A CASE STUDY OF ZHENGDONG NEW DISTRICT (2013). After a slow start, it expanded rapidly starting in the mid-2010s and now has a population of more than 1.1 million. *Zhengdong New Area*, ALCHETRON ENCYCLOPEDIA, https://alchetron.com/Zhengdong-New-Area [https://perma.cc/WTW2-TXVL] (last visited Apr. 30, 2026). China has also founded an extraordinary number of smaller units: By one count, in the past 40 years it has more than 3,800 new towns that are the homes of 150 million people, or an average of about 40,000 people per town, occupying nearly 30,000 square kilometers of land. Boqian Xu, *China's New Towns in Controversy: A Literature Review*, 37 J. PLANNING LIT. 236, 236 (2022).

49. Sarah Moser, *New Cities: Engineering Social Exclusions*, 2 ONE EARTH 125, 125 (2020) [https://doi.org/10.1016/j.oneear.2020.01.012].

50. For example, in 1947 the Levitt family company founded a planned community they called Levittown on New York's Long Island, largely for the families of returning World War II veterans. It now has about 51,500 people and has been called America's first suburb. The same company launched a Levittown in Bucks County, Pennsylvania in 1952; it has grown to about 53,000 people. Levittown, New Jersey was founded in the 1950s, though it reverted to its historic name of Willingboro in 1963, in part because, before the ZIP code was launched, a lot of mail intended for the New Jersey Levittown was being misdirected to the New York Levittown. Bill Barlow, *Did You Know New Jersey Had a Levittown?* WHYY (Nov. 2, 2017), https://whyy.org/articles/know-new-jersey-levittown/ [https://perma.cc/4GU7-DVSH]. Willingboro Township now has about 32,000 people. In 1964 a developer named Robert E. Simon, Jr. founded Reston, Virginia, as a planned city near Washington, D.C.'s Dulles Airport. Tom Grubisch, *Obituary: Robert E. Simon, Jr.*, FAIRFAX COUNTY TIMES (Sep. 25, 2015). Its population in 2020 was 63,226. (All population figures in this paragraph are from the 2020 Census, see *supra* note 46.)

51. *See Municipal Utility Districts: What are They and How Do They Benefit Developers and Residents?*, Quiddity, Jan. 28 2020, https://quiddity.com/municipal-utility-districts-what-are-they-and-how-do-they-benefit-developers-and-residents/ [https://perma.cc/CH42-

During the New Deal era, President Franklin Roosevelt created an agency called the Resettlement Administration, which planned to develop new residential areas outside existing cities for those displaced from small-scale farming, and to create construction jobs for unemployed workers. It originally planned to build 60 "greenbelt" communities. In the end, only three were built, none of them large.[52]

In 1943, the U.S. government created a secret city on the site of the Los Alamos Ranch School in New Mexico to design the first atomic weapons under the leadership of J. Robert Oppenheimer. About 6,000 people—scientists, engineers, and other workers and their families—lived there.[53] The city of Los Alamos now has a population of about 19,400. The Manhattan Project also led to what are now the city of Richland, Washington (site of the Hanford nuclear facility),[54] with a population now of about 64,000, and the city of Oak Ridge, Tennessee,[55] population about 33,400.

A new major federal effort to build cities from scratch was proposed by Donald Trump in March 2023 while campaigning for

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8LMS]; Gina Scutelnicu & Sukumar Ganapati, *Community Development Districts: An Innovative Institutional Framework for Financing and Managing Infrastructure in Florida?* 26 ECONOMIC DEVELOPMENT QUARTERLY 361, 361 (2012).

52. *See* Rexford G. Tugwell, *The Resettlement Idea*, 33 Agricultural History 159, 162-163 (1959). Congress appropriated enough money only for four. One of those, in New Jersey, was cancelled; the town where it would be located sued, and the D.C. Circuit Court of Appeals found that Congress had exceeded its power in delegating the creation of these communities to a federal agency. *See* Franklin Tp. In Somerset County, NJ v. Tugwell, 85 F.2d 208 (D.C. Cir. 1936). The court cited *Schechter Poultry Corp. v. United States*, 295 U.S. 495 (1935), a famous case limiting Congressional power using a legal doctrine, "nondelegation," that after much controversy the Supreme Court shortly abandoned, Williamjames Hull Hoffer, THE SICK CHICKEN CASE: THE US SUPREME COURT AND THE NEW DEAL (2025), though today there are efforts to revive it. Three of these communities were built—Greenbelt, Maryland (population now about 25,000), a suburb of Washington, D.C.; Greenhills, Ohio (population about 3,700), near Cincinnati; and Greendale, Wisconsin (population about 14,900), a suburb of Milwaukee.). PAUL K. CONKIN, TOMORROW A NEW WORLD: THE NEW DEAL COMMUNITY PROGRAM 305-325 (1959); Gilbert A. Cam, *United States Government Activity in Low-Cost Housing*, 1932-1938, 47 J. POLITICAL ECONOMY 357 (1939); David R. Goldfield, *Greenbelt Towns*, in ENCYCLOPEDIA OF AMERICAN URBAN HISTORY (2006).

53. *See Making Public What Was Once Secret: Los Alamos and the Manhattan Project*, THE NAT'L WWII MUSEUM (May 11, 2022), https://www.nationalww2museum.org/war/articles/making-public-what-was-once-secret-los-alamos-and-manhattan-project [https://perma.cc/7PY4-AGY4].

54. Jim Kershner, *Richland – Thumbnail History*, HISTORYLINK.ORG (Jan. 8, 2008, https://www.historylink.org/file/8450 [https://perma.cc/S88C-GZAA].

55. *About Oak Ridge*, CITY OF OAK RIDGE, TENN., https://www.oakridgetn.gov/182/About-Oak-Ridge [https://perma.cc/84RL-FKWZ].

his second term. He called for holding a contest to design and create up to ten new "Freedom Cities" on federal land.

In the 2020s, various groups of tech billionaires, including Elon Musk, Bill Gates, Peter Thiel, and Marc Andreessen, began buying land to build new planned cities in Texas, Arizona, and California. None of them have yet taken off,[56] and some of these proposals are facing strong local opposition.[57] But when Trump announced his Freedom Cities idea, some of the same billionaires and others latched onto it. Several groups formed to advance the concept and to draft legislation to enable it.[58] A key part of the proposals is to free the new cities from many otherwise-applicable federal and state laws to enable construction to proceed much more rapidly, presumably making the projects much more profitable for their private developers.[59] This idea, that Freedom City also means freedom from regulations, has led to much criticism[60] and does not seem to have advanced, at least publicly.

The historical antecedents thus exist: both private and public sector actors have built small cities. However, to meet the scale that may be needed to address climate migration, new efforts must be more ambitious. A critical first challenge is identifying where and on what lands should new cities be built.

New cities could sprout on federal lands. The Constitution gives Congress the power to regulate such lands.[61] Many statutes

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56. Adina Solomon, *Billionaire-planned smart cities in the US: What's the latest?*, SMART CITIES DIVE (Nov. 13, 2023), https://www.smartcitiesdive.com/news/billionaire-smart-cities-update-elon-musk-telosa-utopia/699348/ [https://perma.cc/8S6W-9CY4].

57. Gil Duran, *The People of Solano County Versus the Next Tech-Billionaire Dystopia*, THE NEW REPUBLIC (Jan. 4, 2024), https://newrepublic.com/article/177733/billionaire-solano-california-tech-secession [https://perma.cc/9E65-HNB6].

58. Caroline Haskins & Vittoria Elliott, *'Startup City' Groups Say They're Meeting Trump Officials to Push for Deregulated 'Freedom Cities'*, WIRED (Mar. 7, 2025, 2:48 pm), https://www.wired.com/story/startup-cities-donald-trump-legislation/ [https://perma.cc/GZ92-KL59].

59. *See* Mark Lutter & Nick Allen, Building Freedom Cities, CITY J. (Dec. 6, 2024), https://www.city-journal.org/article/building-freedom-cities [https://perma.cc/KKK4-QRAL] (naming deregulation as a goal of the program).

60. *See* J.J. Anselmi, *Trump's "Freedom Cities" Are a Devious Scam*, THE NEW REPUBLIC (Mar. 26, 2025), https://newrepublic.com/article/192741/trump-freedom-cities-company-towns [https://perma.cc/3UAE-4HSY] (subtitled "The president and his Silicon Valley oligarch pals want to bring back the bad old 'company towns' of yesteryear with a fresh coat of modern cryptofascist varnish"); *see also* Michael Booth et al., *Selling Off Colorado: Tech Bros and Conservatives Have Grand Plans for Federal Lands*, THE COLORADO SUN (Jun. 29, 2025), https://coloradosun.com/2025/06/29/colorado-freedom-cities-federal-lands/ [https://perma.cc/Q5S6-QZHF].

61. U.S. Const. Art. IV, § 3, cl. 2.

govern the agencies that manage federal lands, and Congressional action would be needed to exempt any of these projects from these statutes. The largest amount of federal land is administered by the Bureau of Land Management (BLM),[62] followed by the U.S. Forest Service, part of the Department of Agriculture.[63] Other federal agencies controlling large amounts of land include the Fish and Wildlife Service, the National Park Service, and the Department of Defense.[64] Each agency has its own statutory mandates and limitations. All of these agencies are also subject to the National Environmental Policy Act (NEPA), which requires detailed environmental review;[65] the Endangered Species Act, which limits the use of the critical habitat of endangered species;[66] and other environmental laws.

Selling or leasing federal lands for private development is very controversial. A serious attempt to sell off three million acres of public land was a major subject of debate during Congressional deliberations over President Trump's "One Big Beautiful Bill" in 2025; the proposed sale faced intense opposition and failed.[67] But the idea is embedded on a smaller scale in an executive order that President Biden issued on January 14, 2025, a week before leaving

62. *See* Bureau of Land Mgmt., *What We Manage Nationally*, https://www.blm.gov/about/what-we-manage/national [https://perma.cc/X8R9-N9RV] (last visited Mar. 20, 2026) (explaining that the Bureau of Land Management administers 245 million acres of land—about one-tenth of all the land in the United States); U.S. Bureau of Land Mgmt., Public Land Stat. 2022 1, 11-12 (2023) (showing that of this, 77 million acres are in Alaska, and the great bulk of the rest is in the other western states); 43 U.S.C. § 35 (stating that the use and disposal of land by the BLM are governed by the strict procedures of the Federal Land Policy and Management Act).

63. *See* U.S. Dep't of Agriculture, *Meet the Forest Service*, https://www.fs.usda.gov/about-agency/meet-forest-service [https://perma.cc/5LVP-7RFD] (last visited Mar. 20, 2026) (stating that USFS manages 193 million acres of land, roughly the size of Texas). It is governed by the Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. §§528-531, and the National Forest Management Act of 1976, 16 U.S.C. §§1600-1614. The Forest Service's lands are divided into different units that have differing governing rules, but some of the units have ski resorts, historic sites, mining, and other non-forest activities. It is possible that some land could be designated for housing, but Congressional action would probably be required to locate a large city. *See* Jessica Owley, *Climate-Induced Human Displacement and Conservation Lands*, 58 HOUSTON L. REV. 665, 665 (2021).

64. CONG. RSCH. SERV., FED. LAND OWNERSHIP: OVERVIEW AND DATA (2020), https://www.congress.gov/crs-product/R42346.

65. 42 U.S.C. §§4321 *et seq.*

66. 16 U.S.C. §1536.

67. Brad Plumer, *G.O.P. Revives Plan to Sell Public Land for Housing*, N.Y. TIMES (June 13, 2025); Jack Healy, A *Sale of Federal Land For Colorado Housing Runs Into a Brick Wall*, N.Y. TIMES (June 26, 2025).

office, "Advancing United States Leadership in Artificial Intelligence Infrastructure." It called for leasing federal lands for AI data centers and for expediting the necessary permitting processes.[68] This order is in the same spirit as the Building Chips in America Act, which passed both the House and the Senate with strong bipartisan support and was signed by President Biden in October 2024. It exempts federally funded chip manufacturing facilities from NEPA.[69]

One other major potential source of land on which new cities could be built has not been raised in any of the discussions, to my knowledge.[70] The largest amount of farmland in the United States is devoted to growing corn—about 91.5 million acres.[71] About 40 percent of the corn produced in the United States is used to make ethanol, which is utilized as a biofuel in motor vehicles to supplement gasoline and diesel.[72] That comes to 36.8 million acres. To the extent that electric vehicles displace internal combustion engines, the use of ethanol and hence the need for corn will decline. That explains why many large agricultural companies have joined the oil companies in opposing the transition to electric vehicles.[73] A decline in corn-for-ethanol production of just 10 percent would free up about 3.5 million acres.[74] That is enough

68. Exec. Order No. 14141, 90 FR 5469 (2025).

69. 15 U.S.C. 4651, 4652 and 4659 (2024).

70. *But see* Hannah Ritchie, *We Could Produce a Lot of Electricity on the Land Used For Biofuels*, BY THE NUMBERS (Jan. 27, 2026), https://hannahritchie.substack.com/p/biofuels-vs-solar-land [https://perma.cc/S6AL-DFK9] (suggesting that some of the land now used to grow biofuels would be better used for solar panels).

71. U.S. Dep't of Agriculture, *Corn Planted Acreage Down 3% from 2023, Soybean Acreage Up 3% from Last Yea*r, NAT'L AGRIC. STAT. SERV. (June 28, 2024), https://www.nass.usda.gov/Newsroom/2024/06-28-2024.php [https://perma.cc/2N5K-2A38].

72. Aaron M. Ates, *Corn-Based Ethanol Production in the United States Has Plateaued in Recent Years*, U.S. DEP'T OF AGRIC. ECON. RSCH. SERV. (Feb. 8, 2024), https://www.ers.usda.gov/data-products/chart-gallery/chart-detail?chartId=58346 [https://perma.cc/RBB5-DKVV].

73. Kim Chipman & Jennifer A. Dlouhy, *Big Oil Embraces corn as Former Foes Unite Against EV Threat*, BLOOMBERG (Feb. 6, 2024, at 3:30 pm PST), https://www.bloomberg.com/news/articles/2024-02-06/big-oil-and-corn-unite-for-more-ethanol-to-combat-ev-threat.

74. The numbers just presented would lead to about 4 million acres, but the production of ethanol from corn yields byproducts, including distillers grain, which is also used for animal feed, and distillers corn oil, which is also used as animal feed and as a feedstock for biodiesel production. *Ethanol Plants in Nebraska Produce More than Just Ethanol*, NEB. CORN BOARD, https://nebraskacorn.gov/cornstalk/corn101/ethanol-plants-in-

land for about eighty cities the size of Washington, D.C. (which is 43,766 acres). Even more land for new cities could be obtained by converting a small portion of the land that is now used to grow soybeans for biodiesel.[75]

The land where corn and soybeans are grown tends to be flat and to have water; in contrast, much BLM land is desertic, mountainous, forested, or (in Alaska) covered with ice. The great bulk of farmland (not counting grazing) in the United States is privately owned. Thus, acquisition would not be subject to the complex BLM procedures, but it would have to be purchased or taken by eminent domain. The vast fields of corn and soybeans tend to be monocultures, so converting some of them to cities would not entail much loss of biodiversity.[76]

A new city built on flat land with access to water could be designed in a way that is shielded from many climate impacts. If its location is far enough north, it would not experience the worst heat waves. Ideally, there would be no nearby forests so there would be no wildland-urban interface where wildfires are a great concern.[77] The new city's drainage and water absorption systems could be built large enough to handle severe storms. It could be laid out with ample greenery to minimize the urban heat island effect. Its buildings could be designed to be energy efficient and air conditioned, with heat pumps, electric vehicle plugs, rooftop solar panels, and fire-resistant exteriors. There should be an ample supply of affordable housing.[78] The building materials should be fabricated with low-emission methods. The new city's density could

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nebraska-produce-more-than-just-ethanol/ [https://perma.cc/HM98-UBYX] (last visited Apr. 30, 2026). So I am reducing the saved acreage to reflect the need to grow more corn as animal feed to make up for the lost byproducts.

75. Repurposing this land for cities would also help to alleviate the financial shock if a drop in corn or soybean production leads to a steep drop in land value. *See* Becca Moss, *Factors That Affect the Value of Agricultural Land: A Complete Guide for Buyers and Sellers*, UNITED FARM & RANCH MGMT., https://web.archive.org/web/20251214065834/https://ufarm.com/factors-that-affect-the-value-of-agricultural-land-a-complete-guide-for-buyers-and-sellers (last visited Apr. 30, 2026).

76. James D. Plourde et al, *Evidence for Increased Monoculture Cropping in the Central United States*, 165 AGRIC., ECOSYSTEMS, AND ENV'T 165, 50, 50-59.

77. *See generally* Robert G. Haight et al, *Assessing Fire Risk in the Wildland-Urban Interface*, J. OF FORESTRY, Oct./Nov. 2004, 41.

78. *See* Sheila R. Foster, *Racialized Landscapes and Climate Adaptation Economics*, 5 J. L. & Polit. Economy 689, 689 (2025) (bond issue adopted by Miami for climate adaptation included funds for affordable housing); *10 Smart City Energy Solutions: Solutions to Make Your City More Sustainable*, ENERGY FLOORS (Sept. 14, 2023), https://energy-floors.com/10-smart-city-energy-solutions-kinetic-floors/ [https://perma.cc/EC2R-ZQCN].

encourage bicycling, walking, and mass transit. As one commentator wrote, "Creating a completely new city on raw land is an opportunity that has intoxicated architects and urban planners since the dawn of civilization."[79]

Of course, growing a city from scratch would entail enormous challenges. Per acre consumption of water to grow corn is much less than per acre for a city. Roads, rail lines, telecommunications, sewage systems, waste disposal systems, water supply systems, and other infrastructure would be needed. A new airport might be required unless an existing airport is a reasonable distance away. With ample land in and surrounding the city, the electricity could be supplied by solar, wind, batteries, and perhaps geothermal and nuclear. Schools, hospitals, parks, civic buildings, houses of worship, and all the other features of a city would be required.[80] The residents would need jobs, and the new city may not be able to generate sufficient employment within itself or within commuting distance. (In the early years, construction work would create a great many jobs). Building all of this would be very expensive, and the national government would probably need to provide financing.

This is all daunting, but it shows that if the United States really does need to find new homes for many tens of millions of people, it could be done. The countries that have built very large new cities such as China and Brazil have managed to surmount all these challenges. Indonesia has especially bold plans; largely due to flooding, it is endeavoring to move its capital from Jakarta, on the island of Java, to a new city on what had been a jungle on the island of Borneo, with a pledge to achieve net-zero emissions.[81] Time will tell how that goes.

Many legal issues would arise in creating a new city in the United States.

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79. Edward Ring, *New Cities Offer Unpredictable but Exciting Urban Future*, PACIFIC RSCH. INSTITUTE (May 11, 2023), https://www.pacificresearch.org/new-cities-offer-unpredictable-but-exciting-urban-future/ [https://perma.cc/B94J-DW8]; Liam Sides, *Why Do Governments Favour Building New Cities?* Oxford Economics (Sept. 24, 2025), https://www.oxfordeconomics.com/resource/why-do-governments-favour-building-new-cities/ [https://perma.cc/46QD-BUUM].

80. Andrew Cole, *Checklist of Things Your City Needs Before You Move There*, INMYAREA.COM (Jan 24, 2023), https://www.inmyarea.com/blog/what-your-city-needs-checklist [https://perma.cc/5UB3-FBY5].

81. Bryan Pietsch, *Why Indonesia Moved its Capital to a Jungle Hundreds of Miles Away*, WASH. POST (Aug. 17, 2024), https://www.washingtonpost.com/world/2024/08/16/nusantara-indonesia-capital-jakarta/ [https://perma.cc/4BB5-2Y5G].

For starters, who would decide to build a new city? The likely candidates are the federal government, a state government, or a private company. If it is the federal government or if federal money is involved, the decision would be subject to NEPA (absent a congressional exemption). In some states, a state or private decision to move forward would be subject to the state environmental impact assessment law. The decision would be so consequential, need to be implemented over so many years, and involve so much government money that it could probably not be made unilaterally by a president or a governor, at least not in a way that would almost certainly stick. Instead, Congress or the state legislature would need to write it into law. Such a law could create special environmental review procedures for the new city, or exempt the creation of the city entirely.

Who would acquire the land? If the federal or state governments allocate their own land, they would have to follow their own procedures, such as the planning process under the Federal Land Policy Management Act for BLM lands. State procedures for use of state land vary considerably.[82] If private land needs to be acquired and a purchase cannot be negotiated, both the federal and state governments have the power of eminent domain to seize property in return for payment of just compensation. Private companies do not have that power unless some level of government has given it to them. For example, public utilities are generally given the power of eminent domain to acquire right-of-way for railroad tracks, transmission lines, pipelines and the like.[83]

How would the new city be governed? Cities are creatures of the states. In some states, state law requires approval by the state legislature to create a unit of government that would be classified as a city. In others, the county where the city is located may create a city, or other procedures are followed.[84] Cities are ordinarily

82. *State by State Laws*, OWNERS COUNSEL https://www.ownerscounsel.com/state-by-state-laws/ [https://perma.cc/8CWB-L333] (last visited Mar. 21, 2026).

83. Bernard Bell, *Delegation of Eminent Domain Powers to Private Entities: In Re PennEast Pipeline Co.*, YALE J. REGUL. (Sept. 16, 2019), https://www.yalejreg.com/nc/delegation-of-eminent-domain-powers-to-private-entities-in-re-penneast-pipeline-co/ [https://perma.cc/QBX3-782X].

84. *A Brief Summary of Municipal Incorporation Procedures by State*, CARL VINSON INSTITUTE OF GOV'T, https://www.senate.ga.gov/committees/Documents/CarlVinsonSummaryMunicipalIncorporationProceduresbyState.pdf [https://perma.cc/2QNY-KBT5] (last visited Mar. 21, 2026).

formed from preexisting towns, within counties or other units with substantial populations. The voters typically adopt, or propose to the state legislature, a charter or similar document that sets the form of government—usually an elected mayor and an elected city council, with specified powers for each. The new cities discussed here would probably have no existing population if they are built on federal land or farmland, though they would likely be within a populated county that could draw up the charter. If anyone already lives within the boundaries of the proposed new city, issues could arise about their role in forming the new city government.

The state constitution or statutes indicate what powers cities do and do not have. Most states are classified as either "home rule" states, meaning municipalities can adopt their own laws provided they do not conflict with state laws, "Dillon's Rule" states, meaning that municipalities can only adopt those laws that the state has specifically allowed, or various hybrid combinations.[85]

What, if any, additional legal requirements should be imposed on new cities? States may dictate or preempt local law.[86] As noted above, the cities and their buildings should be designed to be energy efficient, low-emitting, cool, and resistant to flooding, fires, and other extreme events. Left unconstrained, real estate developers and builders will provide some but not all of these features. Either the federal or state governments could mandate these elements through planning and building regulations. Congressional action would be needed for federal preemption of state or local law. If a state wanted to impose energy efficiency requirements on appliances that go beyond U.S. Department of Energy standards for those appliances, for example, it would need special waivers.[87] A tradeoff in all of this is that more regulation could make the growth of new cities lengthier and more expensive.

Who would select the designs for these buildings? Most existing cities have planning commissions, architectural review boards, or other bodies that set parameters or approve specific designs. Again, left unconstrained, real estate developers will build

85. *Prinicples of Home Rule for the 21st Century,* NATIONAL LEAGUE OF CITIES (2020), https://www.nlc.org/wp-content/uploads/2020/02/Home-Rule-Principles-ReportWEB-2-1.pdf [https://perma.cc/A5EP-D4PE].

86. Vincent M. Nolette et al., *Navigating State Law in Local Climate Action*, SABIN CTR. FOR CLIMATE CHANGE LAW (Jan. 2026), https://scholarship.law.columbia.edu/sabin_climate_change/266/ [https://perma.cc/HB2U-JJA4].

87. Energy Policy and Conservation Act, 42 U.S.C. §6297(d).

whatever is most profitable for the market they are seeking. Some of the suburban communities built after World War II such as the Levittowns[88] were widely derided for having block after block of nearly identical, monotonous houses. A popular song from 1962 included these lyrics, sometimes associated with the Levittowns: "Little boxes on the hillside, little boxes made of ticky-tacky, little boxes on the hillside, little boxes all the same."[89] But this mass production of identical houses made them affordable. This highlights one of the tradeoffs that will be involved—housing that is affordable is often not beautiful. In a climate crisis with millions of people displaced, affordability will almost certainly be the prime consideration. And since in many places affordable housing is less profitable than market-rate housing, some level of government will need to ensure that a sufficient amount of affordable housing is built.[90] (Of course, the definition of "affordable" will vary considerably). Subsidies may be required. An alternative is public housing, though its history is not always a happy one.[91]

When would the new cities be built? For some slow-onset displacement events such as sea level rise, people may know years in advance that they will have to leave. In theory, the members of a community could collectively decide to move to a particular place and jointly participate in its design. However, the experience with Newtok and Isle de Jean Charles, described below, is not encouraging. A disaster with widespread destruction such as a hurricane or wildfire will cause rapid evacuation, and people will immediately need new places to live (or at least stay temporarily). Having decent housing already available and vacant would be a godsend. Pre-building a city so that it is ready when needed sounds

88. *See supra* note 50.

89. *See* Tom Leatham, *The Story Behind the Song: Malvina Reynolds and Pete Seeger's Housing Crisis Satire 'Little Boxes'*, FAR OUT MAGAZINE (Jan. 27, 2023, at 11:00 GMT), https://faroutmagazine.co.uk/story-behind-pete-seeger-little-boxes/ [https://perma.cc/V89E-L2QL].

90. Paul Fiorilla & Jacob Gonzalez, *The Interplay Between Market-Rate and Affordable Housing Rents*, CREFC WORLD (Fall 2025), https://www.crefc.org/common/Uploaded%20files/Learn/CREFC%20World/CREFC-World-08-2025.11.26.pdf; Center on Budget and Policy Priorities, Federal Rental Assistance (Sept. 30, 2024), https://www.cbpp.org/research/housing/policy-basics-federal-rental-assistance.

91. *See* Jake Blumgart, *The Rise and Fall of American Public Housing*, NAT'L TRUST FOR HISTORIC PRESERVATION (Apr. 18, 2018), https://savingplaces.org/stories/the-rise-and-fall-of-american-public-housing [https://perma.cc/BHQ6-WXRV]; Lily Geismer, *America Needs a New Approach on Affordable Housing. History Offers a Guide*, TIME (Mar. 25, 2024, at 7:48 PT) https://time.com/6900050/public-housing-biden-plan-history/.

wonderful, but its construction would need to be funded by the government. (I return to this idea below).

While physical infrastructure might be built quickly, it can be much more challenging to create a social infrastructure, especially one providing livelihoods for large numbers of people. Private employers would need to be persuaded to locate within commuting distance of the city. A city that relies mostly on government subsidies rather than its own income is difficult to sustain; subsidies can vanish with a shift in the political winds, as occurred when many of the subsidies for renewable energy in the Inflation Reduction Act of 2022 were repealed by the One Big Beautiful Bill Act of 2025.[92]

These challenges are among the reasons that a Grow scenario may be much more likely than a Sprout scenario.

B. *Grow*

1. *Where?*

It is much easier to increase the population of an existing city than to create a new one. A city already has infrastructure, housing, governance, and jobs. These may be insufficient for a large sudden influx of new residents, but they form a solid foundation.

From a pure climate perspective, best of all might be an inland city in a northern clime (perhaps along one of the Great Lakes, an ample fresh water source) that has experienced population decline, leaving behind much unused housing and underutilized infrastructure. That fits the profiles of several cities of the Rustbelt—once thriving cities mostly in the northeastern and midwestern United States that declined as industries moved south or abroad.[93] Bruce Springsteen sang of them: "Seems like there ain't nobody / Wants to come down here no more / They're closing down the textile mill / Across the railroad tracks / Foreman says, 'These jobs are going, boys / And they ain't coming

92. Jack Andreasen Cavanaugh et al., *Assessing the Energy Impacts of the One Big Beautiful Bill Act*, CTR. ON GLOBAL ENERGY POL'Y (Jul. 14, 2025), https://www.energypolicy.columbia.edu/assessing-the-energy-impacts-of-the-one-big-beautiful-bill-act/ [https://perma.cc/3AGU-NDHF].

93. Stephen Eide, *Rust Belt Cities and Their Burden of Legacy Costs*, MANHATTAN INST. (Oct. 2017), https://media4.manhattan-institute.org/sites/default/files/R-SE-1017.pdf [https://perma.cc/75XK-5LX4].

back'/ To your hometown."[94]

Several of these cities have already been touted by their leaders as climate havens, largely immune from sea level rise and pervasive extreme heat, and as welcoming to people fleeing newly hostile climates—Duluth, Buffalo, and Cincinnati.[95] Detroit would also qualify; its population dropped from 1,838,517 in the 1950 Census to 639,471 in the 2020 Census.[96] Duluth, Buffalo, and Cincinnati also had big drops during that period, though not as large as Detroit.[97] Other Rust Belt cities that saw significant population declines over the last 40 or 50 years are Baltimore, Pittsburgh, Rochester, St. Louis, Missouri, and Gary, Indiana.[98] Except for Baltimore, they are all on lakes or rivers, and not on a body of water subject to sea level rise.

Unfortunately, most recent resettlement in the United States has been in the opposite direction from the Rust Belt.[99] Eleven of the fifteen fastest-growing large cities in the country are in Arizona, which is increasingly exposed to extreme heat, and Texas and Florida, both of which endure extreme heat, flooding, and hurricanes.[100] Atlanta, which faces heat stress as well as looming water shortages, is also a potential in-migration magnet.[101] Many

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94. BRUCE SPRINGSTEEN, *My Hometown*, on *BORN IN THE U.S.A.* (Columbia Rec. 1984).

95. Timothy A. Schuler, *Climate Boomtowns and Receiver Cities*, PLACES J. (Oct. 2024), https://placesjournal.org/article/climate-migration-boomtowns-and-receiver-cities.

96. Detroit Bureau, *Detroit's Population Decline Should Prompt Property Tax Reforms*, CITIZENS RSCH. COUNCIL OF MICH. (Aug. 19, 2021), https://crcmich.org/detroits-population-decline-should-prompt-property-tax-reforms [https://perma.cc/925Q-CW2L].

97. For the 1950 statistics, *see* U.S. Census Bureau, U.S. Dep't of Commerce, *Census of Population: 1950*, vol. I, Number of Inhabitants pt. 23, at 23-11 (Minn.) (Duluth); pt. 32, at 32-24, 32-25 (N.Y.) (Buffalo, Rochester); pt. 35, at 35-30 (Ohio) (Cincinnati); pt. 20, at 20-9 (Md.) (Baltimore); pt. 38, at 38-37 (Pa.) (Pittsburgh); pt. 25, at 25-27 (Mo.) (St. Louis); pt. 14, at 14-15 (Ind.) (Gary) (1952). For the modern statistics, *see* U.S. Census Bureau, U.S. Dep't of Commerce, *2020 Census of Population and Housing*, Summary File, tbl. P1 (Total Population), https://data.census.gov (last visited Feb. 20, 2026).

98. *See* U.S. Census Bureau, *supra* note 97, pt. 32, at 32-25 (Rochester); pt. 20, at 20-9 (Baltimore); pt. 38, at 38-37 (Pittsburgh); pt. 25, at 25-27 (St. Louis); pt. 14, at 14-15 (Gary); U.S. Census Bureau, supra note 97, tbl. P1 (Total Population).

99. Bryan Walsh, *Americans Keep Moving to Where the Water Isn't*, VOX (Aug. 28, 2022, at 4:00 PT), https://www.vox.com/2022/8/28/23322006/climate-change-heat-wave-phoenix-drought-housing-population.

100. U.S. Census Bureau, *Heading South: 15 Fastest-Growing Large Cities in the United States: July 1, 2021-July 1, 2022* (May 18, 2023), https://www.census.gov/library/visualizations/2023/comm/heading-south-fastest-growing-large-cities.html [https://perma.cc/F5S4-88KU].

101. Abrahm Lustgarten, *On the Move*, *supra* note 32, at 229-231.

people find the oceans, the mountains, and freedom from frigid winters to be irresistible; today's amenities beat what seem like the hazards of future decades. Low taxes and housing costs and high wage rates also attract people to some risky areas.[102]

One study by Mathew Hauer examined the places from which people were most likely to migrate because of sea level rise, and then looked to where people from those locations had often moved in prior years. The study concluded that the locations most likely to receive climate migrants are (in order) Austin, Orlando, Atlanta, and Phoenix.[103] Many people from south Florida are expected to migrate, and it is natural that Floridians want to move to other warm cities.

When people must flee a disaster, they typically either move nearby or go to places where they have friends and family, or at least places that have similar demographics. One large study of government buyouts of flood-prone homes found that fifty-eight percent of retreating homeowners stayed within a ten-mile drive of their bought-out homes, and seventy-four percent stayed within a twenty-mile drive.[104] Doing so allowed people to keep their jobs and their social networks. After Hurricane Maria hit Puerto Rico, driving off the island was not an option; the biggest destinations were Orlando and Miami, but many people went to Buffalo, New York and Springfield, Massachusetts, where there were already large Puerto Rican populations.[105]

Under current climate and migration trends, the U.S. population exposed annually to flooding has been projected to be ninety-seven percent higher in 2050 than it was in 2022.[106] The

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102. Lily Katz & Elijah de la Campa, *Thousands More People Are Moving In Than Out of Fire- and Flood-Prone America, Fueled by Migration to Texas and Florida*, REDFIN NEWS (Aug. 5, 2024), https://www.redfin.com/news/climate-migration-real-estate-2024/ [https://perma.cc/NZ2R-P6ST]; Qin Fan et al., *Climate Change, Migration, and Regional Economic Impacts in the United States*, 5 J. ASS'N ENV. & RESOURCE ECON. 643 (2018).

103. Mathew E. Hauer, *Migration Induced by Sea-Level Rise Could Reshape the US Population Landscape*, 7 NATURE CLIMATE CHANGE 321, 323 (2017).

104. James R. Elliott & Zheye Wang, *Managed Retreat: A Nationwide Study of the Local, Racially Segmented Resettlement of Homeowners from Rising Flood Risks*, 18 ENVTL. RSCH. LETTERS 064050, 4-5 (2023).

105. JAKE BITTLE, THE GREAT DISPLACEMENT: CLIMATE CHANGE AND THE NEXT AMERICAN MIGRATION 260-61 (2023).

106. Oliver E.J. Wing et al., *Inequitable Patterns of US Flood Risk in the Anthropocene*, 12 NATURE CLIMATE CHANGE 156, 159 (2022) [https://doi.org/10.1038/s41558-021-01265-6]. For other projections of the growing U.S. population that will be exposed to flood risks in 2100, *see* D.L. Swain et al., *Increased Flood Exposure Due to Climate Change and Population Growth in the United States*, EARTH'S FUTURE, Oct. 2020.

wildland-urban interface, where wildfire hazards are especially severe, is also experiencing rapid population growth.[107] In view of climate change, this pattern of moving toward rather than away from the hazards needs to be reversed.

However, U.S. law does nothing to discourage the current pattern, and some laws support it. The National Flood Insurance Program was designed by Congress in 1968 to create an incentive to avoid construction in flood-prone areas by providing otherwise unavailable flood insurance to communities that undertook strong land use controls.[108] The program has indeedexpanded access to insurance, but its link to strong land use controls has largely failed. Despite its original purpose, the program may have the perverse effect of encouraging development in the places most prone to flooding by, for example, making insurance and therefore mortgages available there.[109]

The United States has no national plan for where people displaced by climate change will go, how they will get there, or what will happen when they arrive. In 2023, a bipartisan group of members of the House and the Senate introduced the National Coordination on Adaptation and Resilience for Security Act, which would have created an office in the White House that might have performed this function.[110] This bill did not get out of committee before the 118th Congress ended.

To reverse the pattern of movement, Yuliya Panfil and Tim Robustelli have suggested that "the US needs a whole-of-government plan to incentivize climate transplants to the Great Lakes, the northern Great Plains and the Northeast."[111] As part of this, "[t]he federal government can incentivize significant public

107. Margaret Walls & Matthew Wibbenmeyer, *Shaping Land Use Patterns in the Wildland-Urban Interface: The Role of State and Local Governments in Reducing Exposure to Wildfire Risks*, RESOURCES FOR THE FUTURE, pt. 1 at 1 (2025), https://media.rff.org/documents/Report_25-11.pdf [https://perma.cc/JT92-R5FR].

108. Diane P. Horn, *A Brief Introduction to the National Flood Insurance Program*, CONGRESSIONAL RESEARCH SERVICE (2025), https://www.congress.gov/crs-product/IF10988.

109. Sarah J. Adams, *Federal Flood Policy & Maladaptation: A Story of Collective Forgetting*, 34 SOUTHERN CAL. INTERDISC. L.J. 1, 39-40 (2025); Omri Ben-Shahar & Kyle D. Logue, *The Perverse Effects of Subsidized Weather Insurance*, 68 STANFORD L. REV. 571, 574-75 (2016).

110. H.R. 6311, 118th Cong. (2023).

111. Yuliya Panfil & Tim Robustelli, *Nobody's Moving to US 'Climate Havens.' The Federal Government Could Help*, BLOOMBERG CITYLAB (July 10, 2024, at 5:00 PT), https://www.bloomberg.com/news/articles/2024-07-10/as-heat-storms-intensify-us-climate-migrants-are-going-the-wrong-way.

sector investment in these geographically resilient communities by partnering with key industries to create relocation and reskilling programs," and loans and grants can be directed to businesses in the Northeast and Midwest.[112] However, as the population of the southern states increases, so do their seats in the House of Representatives, and it is difficult to envision Congress supporting a federal program that is explicitly designed to move people from the South to the North.

While most of the attention goes to large and mid-sized cities, small cities outside of metropolitan areas also have considerable potential for growth. Many of these places have also lost population, and numerous examples exist of their revitalization and their populations growing again. Their revival has usually involved a combination of federal and philanthropic assistance and strong local leadership.[113] A nonprofit organization called the Proactive Leadership Advocating for Climate & Equity (PLACE) Initiative has identified 256 small towns with a population between 5,000 and 20,000, and 160 medium-sized cities of 20,000 to 50,000 people, mostly far from metropolitan areas, as potential "receiver communities" that could potentially accommodate climate-displaced people.[114] They all have low risk of flooding, extreme heat, and other climate extremes.[115]

Not all cities would welcome an increase in their population. Even when city policy supports growth, many residents may fight it. Zoning and building code changes can encourage more multi-family and affordable housing,[116] but they often face the NIMBY (Not In My Backyard) problem. NIMBY challenges are especially acute when it comes to "infill development"—building housing units within an established neighborhood.[117] A few cities have allowed greater densities by ending single-family zoning and

112. *Id.*

113. HILLARY BROWN, REVITALIZE RESETTLE: HOW MAIN STREET USA CAN OFFER NEW BEGINNINGS FOR AMERICA'S CLIMATE-DISPLACED 25-39 (2024).

114. *Id.* at 121.

115. *Id.* at 118-125.

116. Christopher K. Tokita et al., *Infill Housing & Land Use as a Tool to Fight Climate Change*, ABUNDANT HOUS. LA ET AL. (2024), https://abundanthousingla.org/wp-content/uploads/conference/housing-for-climate-white-paper.pdf [https://perma.cc/5LQY-GRWX].

117. Andrew H. Whittemore & Todd K. BenDor, *Reassessing NIMBY: The Demographics, Politics, and Geography of Opposition to High-Density Residential Infill*, 41 J. URB. AFFS. 423 (2018) [https://doi.org/10.1080/07352166.2018.1484255].

encouraging infill development, but they remain the exceptions.[118]

The NIMBY phenomenon is widespread and can lead to tortuously long approval processes and even longer litigation. NIMBY opposition to housing restricts supply, raises housing prices, and may increase income inequality and segregation by income and race.[119] Land use regulations as deployed by existing residents have helped slow the rates of housing construction in many places, urban and suburban alike.[120] This opposition is famously one source of California's acute housing shortage. In response, in 2025 California exempted much housing from its environmental review law, which had been a fertile basis for litigation.[121] In 2026, Governor Kathy Hochul of New York proposed similar legislation.[122] In 2025, Texas also adopted a suite of laws to ease the approval process for new housing.[123] Efforts to relax all manner of rules that inhibit construction have been called the "abundance agenda," taking its name from the title of a popular book on the subject.[124]

Land use regulations are by no means the only things standing in the way of denser development within existing cities. The costs of acquiring land and assembling lots are higher in city centers

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118. RICHARD D. KAHLENBERG, EXCLUDED: HOW SNOB ZONING, NIMBYISM, AND CLASS BIAS BUILD THE WALLS WE DON'T SEE 13-15, 178 (2023).

119. Vicki Been, *City NIMBYs*, 33 J. OF LAND USE & ENV'T. 217 (2018); Michael B. Gerrard, *The Victims of NIMBY*, 21 FORDHAM URB. L.J. 495 (1994); KATHERINE LEVINE EINSTEIN, DAVID M. GLICK & MAXWELL PALMER, NEIGHBORHOOD DEFENDERS: PARTICIPATORY POLITICS AND AMERICA'S HOUSING CRISIS 1-23 (2019).

120. EDWARD L. GLAESER & JOSEPH GYOURKO, AMERICA'S HOUSING SUPPLY PROBLEM: THE CLOSING OF THE SUBURBAN FRONTIER? (National Bureau of Economic Research, May 2025), https://www.nber.org/system/files/working_papers/w33876/w33876.pdf; *see also* Einstein, *supra* note 119.

121. Liam Dillon & Taryn Luna, *How Major New Housing Reform Will Affect Homebuilding in California*, L.A. TIMES (July 1, 2025, at 15:37 PT), https://www.latimes.com/homeless-housing/story/2025-07-01/what-will-the-new-change-to-ceqa-do [https://perma.cc/DS2G-A9UY].

122. FY 2027 N.Y. Exec. Budget, Transp., Econ. Dev. and Env't Conserv., art. VII, Part R, § 4 (proposed amendments to N.Y. Env't. Conserv. Law § 8-0111), https://www.budget.ny.gov/pubs/archive/fy27/ex/artvii/ted-bill.pdf.

123. *Pew Applauds Texas Lawmakers for Passage of Much-Needed Housing Legislation*, PEW (June 23, 2025), https://www.pew.org/en/about/news-room/press-releases-and-statements/2025/06/23/pew-applauds-texas-lawmakers-for-passage-of-much-needed-housing-legislation.

124. *See generally* Ezra Klein & Derek Thompson, ABUNDANCE: HOW WE BUILT A BETTER FUTURE (2025); MARC J. DUNKELMAN, WHY NOTHING WORKS: WHO KILLED PROGRESS – AND HOW TO BRING IT BACK (2025).

than in suburban and exurban areas, and large apartment buildings cost more per unit than single-family houses due to more expensive materials and systems and the need for more skilled labor.[125]

When the demand for housing rises faster than the supply, housing prices and rents go up, forcing out people with lower incomes and small marginal businesses, and leading to gentrification. Jesse Keenan has demonstrated the phenomenon of "climate gentrification" in Miami—places on the beach long had higher property values than those on higher ground, but that is now reversing as the affluent want to be safe from the rising sea. This trend is forcing out the low-income residents and altering the character of historically Black neighborhoods like Little Haiti.[126] Much the same is happening in the Los Angeles area as the wealthy flee areas that are especially prone to wildfires.[127]

A number of legal techniques are available to protect current residents from rising rents, but they all have downsides. Rent

125. Michael D. Eriksen & Anthony W. Orlando, *The Causes and Consequences of Development Costs: Evidence from Multifamily Housing* (Sep. 28, 2022) (unpublished working paper), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4225004; Anthony W. Orlando & Christian L. Redfearn, *Houston, You Have a Problem: How Large Cities Accommodate More Housing*, 52 REAL EST. ECON. 1045 (2024).

126. Jesse M. Keenan, Thomas Hill & Anurag Gumber, *Climate Gentrification: from Theory to Empiricism in Miami-Dade County, Florida*, ENVTL. RSCH. LETTERS, Apr. 23, 2018; Elizabeth Santiago, *Weathering the Storm: Climate Gentrification in Miami's Little Haiti*, UNIV. OF MICH. SCH. OF PUB. HEALTH (Feb. 10, 2020); Zac J. Taylor & Manuel B. Aalbers, *Climate Gentrification: Risk, Rent, and Restructuring in Greater Miami*, 112 ANNALS OF THE AM. ASS'N OF GEOGRAPHERS 1685 (2022); Erika Bolstad, *Gentrification Fears Grow as High Ground Becomes Hot Property*, E&E NEWS (May 1, 2017, at 8:18 ET), https://www.eenews.net/articles/gentrification-fears-grow-as-high-ground-becomes-hot-property/ [https://perma.cc/MA9G-KRCV]; Diana Kenealy, *Climate Gentrification: Addressing Displacement from Sea Level Rise*, 32 GEORGETOWN J. POVERTY L. & POL'Y 135 (2024); Sheila R. Foster, *Racialized Landscapes and Climate Adaptation Economics,* 5 J. L. & POLIT. ECONOMY 689 (2025), https://escholarship.org/uc/item/1f56v96k#main. *See also* Dylan E. McNamara et al., *Policy and Market Forces Delay Real Estate Price Declines on the US Coast*, NATURE COMMC'NS, Mar. 2024, at 1 [https://doi.org/10.1038/s41467-024-46548-6] (government subsidies like tax advantages and beach nourishment may induce high-income people to stay in vulnerable areas, but this effect is likely temporary and may "only delay precipitous declines [in property values] as total inundation approaches.").

127. Abdallah Fayyad, *What Happens When the California Fires Go Out? More Gentrification.*, VOX (Jan. 17, 2025, at 15:15 PT), https://www.vox.com/policy/395261/california-wildfires-los-angeles-gentrification-displacement [https://perma.cc/5P8Y-99MR]; Thor Benson, *In Los Angeles, Climate-Change Gentrification Is Already Happening*, DAILY BEAST (Feb. 25, 2019, at 4:43 ET), https://www.thedailybeast.com/in-la-climate-change-gentrification-is-already-happening/ [https://perma.cc/B4CC-WX34].

controls tend to lower housing quality and supply.[128] Subsidies for affordable housing are subject to the vicissitudes of government appropriations. Ordinances can regulate the conversion of multifamily rental apartment buildings into condominiums, but can be politically controversial.[129] So are "just cause" eviction laws, which restrict the ability of landlords to evict tenants.[130] The Fair Housing Act of 1968 has been used to challenge gentrification, but the success is mixed.[131] One federal effort to address the shortage of affordable housing was the Department of Housing and Urban Development's Affirmatively Furthering Fair Housing (AFFH) program, which required participation by local governments receiving federal housing money. This program started during the Obama administration; halted in the first Trump administration; restarted under President Biden; and stopped again in the second Trump administration.[132] One approach used in a few places is community land trusts, which are nonprofit organizations that acquire land and lease it for the construction of affordable housing, with restrictions on resale price; they require up-front funding.[133] Several cities have created special development zones to promote local control or ownership of projects, directing or leveraging public and private investments toward the most marginalized neighborhoods.[134]

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128. Konstantin A. Kholodilin, *Rent Control Effects Through the Lens of Empirical Research: An Almost Complete Review of the Literature*, 63 J. HOUS. ECON. 101983 (2024).

129. Marsha D. Rosenthal, *The Legality and Practicality of Condominium Conversation Moratoriums*, 34 U. MIAMI L. REV. 1199 (1980).

130. Caitlin Dewey, *Some States to Landlords: You Can't Evict Tenants Without a Good Reason*, STATELINE (June 29, 2023, at 5:00 PT), https://stateline.org/2023/06/29/some-states-to-landlords-you-cant-evict-tenants-without-a-good-reason/.

131. *See* Olatunde C.A. Johnson, *Unjust Cities? Gentrification, Integration, and the Fair Housing Act*, 53 U. RICHMOND L. REV. 835 (2019); *see also* Hannah Weinstein, *Fighting for a Place Called Home: Litigation Strategies for Challenging Gentrification*, 62 UCLA L. Rev. 794 (2015).

132. Steve Berg, *Why the Affirmatively Furthering Fair Housing Rule Matters*, NAT'L ALL. TO END HOMELESSNESS, (Jan. 17, 2024), https://endhomelessness.org/blog/why-the-affirmatively-furthering-fair-housing-rule-matters/ [https://perma.cc/4ZSQ-H9F9]; Alice Kaswan, *Creating Home Multilevel Governance Structures For Emerging Climate Migration*, 93 TEMPLE L. REV. 735, 756 (2021); Katy O'Donnell, *Trump Scraps Biden-Era Fair Housing Rule*, POLITICO, (Feb. 26, 2025, at 17:11 ET), https://www.politico.com/news/2025/02/26/trump-scraps-fair-housing-initiative-00206274.

133. *See* Kiara Taylor, *Community Land Trusts Explained: Benefits, Drawbacks, and Real-World Costs*, INVESTOPEDIA, (Sept. 18, 2025), https://www.investopedia.com/community-land-trust-5206374.

134. Sheila R. Foster, *Racialized Landscapes and Climate Adaptation Economics*, 5 J.L. &

2. *Growing, fast and slow*[135]

As Ira Feldman has written, "There is no strategy, no accepted best practices, no legal framework, and little serious research to prepare receiving communities in the United States for a massive influx of climate refugees."[136] One major issue that might dictate success is whether the influx is planned and occurs over a period of time, or happens suddenly.

Everything will benefit from advance preparation, but typically there is no time for that after a natural disaster.[137] No city anticipates a disaster many miles away that will cause a sudden influx of thousands of people. When that happens, some can handle it better than others.

About 250,000 people fleeing New Orleans from Hurricane Katrina in 2005 temporarily relocated to Houston, and about 100,000 of them stayed permanently. [138] Houston is a large and wealthy city and was able to absorb this influx with little harm to jobs and wages for native Houstonians,[139] though some tensions arose.[140] After Hurricane Maria in 2017, about 120,000 people left Puerto Rico for the U.S. mainland; as noted above, the city that received the largest number of these was Orlando. About 24,000 people went there, representing around 1 percent of Orlando's pre-hurricane population and around 2 percent of its pre-

POL. ECON. 685 (2025).

135. Tip of the hat to DANIEL KAHNEMAN, THINKING, FAST AND SLOW (2011).

136. Ira Feldman, *Receiving Communities*, ENV'T F., Sept./Oct. 2023, at 32.

137. *See, e.g.*, Rachel Bogardus Drew & Ayate Temsamani, *Policy Brief: Preparing Receiving Communities for Climate Migrations*, ENTER. CMTY PARTNERS, (Feb. 2023), https://www.enterprisecommunity.org/sites/default/files/2023-02/Policy-Brief-Preparing-Receiving-Communities-for-Climate-Migrations-final4.pdf [https://perma.cc/329V-AVBB].

138. *See* Molly Fifer McIntosh, *Measuring the Labor Market Impacts of Hurricane Katrina Migration: Evidence from Houston, Texas*, 98 AM. ECON. REV. 54 (2008).

139. *Id.*

140. *See* Tom Dart, '*New Orleans West': Houston Is Home for Many Evacuees After Katrina*, GUARDIAN, (Aug. 25, 2015), https://www.theguardian.com/us-news/2015/aug/25/new-orleans-west-houston-hurricane-katrina [https://perma.cc/X8GJ-8YFN]; Jake Bittle, *They Settled in Houston After Katrina – and Then Faced a Political Storm*, GRIST, (Aug. 27, 2024), https://grist.org/extreme-weather/they-settled-in-houston-after-katrina-and-then-faced-a-political-storm/ [https://perma.cc/MZ29-67Y4]; Stephen L. Klineberg, *Four Myths About Katrina's Impact on Houston*, RICE UNIVERSITY KINDER INSTITUTE FOR URBAN RESEARCH, (Aug. 26, 2015), https://kinder.rice.edu/urbanedge/four-myths-about-katrinas-impact-houston [https://perma.cc/JW4C-AYQN].

hurricane total employment. Orlando handled that influx well.[141]

But Chico, California (previous population, 93,000) was overwhelmed by the 19,000 residents of Paradise who moved there after their homes were destroyed in the Camp Fire of 2018. Traffic congestion, car crashes, the worsening of an existing housing shortage, an overburdened hospital, and increased crime were all reported.[142] A survey conducted seven years after the Camp Fire found that 74% of those who had been living in Palisades were still in temporary housing.[143]

Exceptions to the lack of advance planning are the Ohio cities of Cincinnati and Cleveland, which have created plans that would position them as climate havens, including short- and long-term preparedness to receive climate migrants.[144] However, so far, migrants are arriving only in modest numbers—little is driving them there; climate isn't, at least so far.[145]

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141. *See* Giovanni Peri, Derek Rury & Justin C. Wiltshire, *The Economic Impact of Migrants From Hurricane Maria* (Nat'l Bureau of Econ. Rsch., 2020), https://www.nber.org/system/files/working_papers/w27718/w27718.pdf [https://perma.cc/YCA4-G9C4] (finding that "the new workers were fully absorbed by the local economy without displacing native workers and without any significant overall negative effect on earnings, though there was some downward pressure on construction earnings for natives and less-educated workers," but "retail employment and hospitality earnings were both positively impacted.").

142. Madison Wade, *City of Chico 'Overwhelmed' by Influx of Camp Fire Survivors*, ABC 10 (Mar. 15, 2019), https://www.abc10.com/article/news/city-of-chico-overwhelmed-by-influx-of-camp-fire-survivors/103-3bb43c11-124a-4742-8278-3b8b6af08648; Nicole Lambrou et al., *Disaster Recovery Gentrification in Post-Wildfire Landscapes: The Case of Paradise, CA*, 118 INT'L J. DISASTER RISK REDUCTION 105235 (2025); Anna Marandi & Kelly Leilani Main, *Vulnerable City, Recipient City, or Climate Destination? Towards a Typology of Domestic Climate Migration Impacts in U.S. Cities*, 11 J. ENVTL. STUD. & SCI. 465 (2021) [https://doi.org/10.1007/s13412-021-00712-2].

143. Embold Research, *Community Voices: LA Fire Recovery Report*, DEPARTMENT OF ANGELS (Jan. 2026), https://static1.squarespace.com/static/6792c245599ed84703227b1e/t/6959797a4c0de667333503fc/1767471494384/Department+of+Angels+LA+Fire+Recovery+Report_January+2026.pdf [https://perma.cc/SMS3-CGET].

144. *See* Green Cincinnati & City of Cincinnati, Green Cincinnati Plan 2023, (2023), https://www.cincinnati-oh.gov/oes/climate/climate-protection-green-cincinnati-plan/green-cincinnati-plan-2023-spreads/ [https://perma.cc/XC4L-KZKS]; *see also* Helen Bonnyman, *Bolstering Our Climate Havens: How Cities Can Prepare for Climate Migration*, NEW AMERICA, Apr. 2, 2024; Terry Schawrz et. al, *Anticipated But Unpredictable*, (Aug. 2023), https://www.lincolninst.edu/publications/working-papers/anticipated-unpredictable/ [https://perma.cc/73VZ-ZX4L].

145. *See* Clay LePard, *What's a 'Climate Migrant' and Will Thousands of Them Really Move to NE Ohio in the Future?*, NEWS 5 CLEVELAND (Jun. 14, 2024), https://www.news5cleveland.com/news/local-news/whats-a-climate-migrant-and-will-thousands-of-them-really-move-to-ne-ohio-in-the-future [https://perma.cc/TL2X-4KGH]; Tim Craig, *A Home in Ohio for African Immigrants With Nowhere to Go*, WASH. POST,

Another exception to the failure to anticipate population growth is New York City. Michael Bloomberg became a billionaire by creating a company that analyzes and disseminates data. After he was elected Mayor in 2001, he looked at data that showed that by 2030 the population of the city would increase by more than one million. In 2007, he launched PlaNYC, a comprehensive plan to build 250,000 new homes and upgrade the city's infrastructure to accommodate a larger population in an environmentally sound manner.[146] To an extent, this succeeded. Between 2008 and 2023, the City's housing stock increased by 377,000 units.[147] However, New York was not prepared for an influx of about 210,000 migrants from the southern border who arrived in 2022-2024, and many tensions resulted.[148] There was an important climate nexus here: a persistent drought in Central America and other climate shocks were major drivers of some of this migration.[149]

Anna Marandi and Kelly Leilani Main have described the characteristics of cities that are receptive to in-migration as 1) more manageable climate impacts, i.e., not prone to sea level rise, wildfires, or prolonged heat waves; 2) ready access to fresh water supply; 3) high vacancy rates or abundance of affordable housing; 4) post-industrial, legacy cities with infrastructure designed for

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(Jun. 9, 2024), https://www.washingtonpost.com/nation/2024/06/09/africa-immigration-shelter-mauritanians-cincinnati-ohio/ [https://perma.cc/RSG7-CTPV]; Zachary Smith, *Cleveland Area is Home to Nearly a Third of the Refugees Who Came to Ohio in the Last Year*, CLEVELAND.COM (Oct. 16, 2024), https://www.cleveland.com/news/2024/10/cleveland-area-is-home-to-nearly-a-third-of-the-refugees-who-came-to-ohio-in-the-last-year.html.

146. Diane Cardwell & Charles V. Bagli, *Bloomberg to Unveil Long-Term Vision for City*, N.Y. TIMES, Apr. 20, 2007.

147. N.Y.C. Dep't of Hous. Pres. & Dev., 2023 New York City Housing and Vacancy Survey: Selected Initial Findings (Feb. 2024), https://www.nyc.gov/assets/hpd/downloads/pdfs/about/2023-nychvs-selected-initial-findings.pdf [https://perma.cc/7W5J-GBVZ].

148. Luis Ferre-Sadurni, *What to Know About the Migrant Crisis in New York City*, N.Y. TIMES, Aug. 19, 2024.

149. *See* Paula Beltran & Metodij Hadzi-Vaskov, *How Climate Shocks Are Linked to Cross-Border Migration in Latin America and the Caribbean*, International Monetary Fund, (2023), https://www.imf.org/en/News/Articles/2023/12/08/cf-how-climate-shocks-are-linked-to-cross-border-migration-in-latin-america-and-the-caribbean [https://perma.cc/DRM9-CEKH]; Michael Mendez, Manuel Pastor & Angelu C. Lesaca, *Climate Change, Migration, and Health Disparities at and Beyond the US-Mexico Border*, 331 JAMA 696 (2024). Once people decided they needed to flee to the U.S., extreme heat killed thousands of them as they attempted to walk across the sweltering Sonoran Desert. *See* Sarah Kennedy, *The Deadly Connections Between Climate Change and Migration*, YALE CLIMATE CONNECTIONS (July 20, 2022), https://yaleclimateconnections.org/2022/07/the-deadly-connections-between-climate-change-and-migration/.

larger population; 5) expressed desire to grow and be welcoming; and 6) history of sustainability or resilience efforts.[150]

Now, for one off-the-wall idea.

The United States has or had a Strategic Petroleum Reserve (in four different locations), a Defense National Stockpile Center, a Food Security Wheat Reserve (renamed the Bill Emerson Humanitarian Trust), a National Helium Reserve, a Northeast Home Heating Oil Reserve, and a National Pharmaceutical Stockpile (renamed the Strategic National Stockpile). In each of these, the federal government purchases large quantities of certain items, stores them, and releases them during emergencies, or buys or sells when it wants to move prices.[151] Could the United States create a National Housing Reserve, a supply of housing for people who are displaced by climate change?

A host of questions would arise in establishing a National Housing Reserve. Who would select the multiple locations, and on what basis? What is the relevance of proximity to the displaced families' jobs, schools, houses of worship, etc.? Would we avoid places in the hot south or the flood-vulnerable coasts and riverbanks? How many units would be built? How much money would Congress need to provide to build them? (Private financing might be possible, to be paid back from purchases or rents, but credit support and possibly other money would be needed from the government up front).

Crucially, who would be eligible for this housing? The Federal Home Loan Mortgage Corporation (Freddie Mac) estimated in 2024 that there is a nationwide housing shortage of 3.7 million units.[152] The National Low Income Housing Coalition estimated in 2025 that extremely low-income renters face a shortage of 7.1 million affordable and available rental homes.[153] At a time when

150. Anna Marandi & Kelly Leilani Main, *Vulnerable City, Recipient City, or Climate Destination? Towards a Typology of Domestic Climate Migration Impacts in U.S. Cities*, 11 J. ENVIRON. STUDIES & SCI. 465 (2021).

151. *See* Anshu Siripurapu & Noah Berman, *The State of U.S. Strategic Stockpiles,* COUNCIL ON FOREIGN RELATIONS, (Mar. 2, 2023), https://www.cfr.org/backgrounders/state-us-strategic-stockpiles [https://perma.cc/JLC6-Z2MT].

152. Freddie Mac, *Economic, Housing and Mortgage Market Outlook – November 2024. Spotlight: Housing Supply*, (Nov. 26, 2024), https://www.freddiemac.com/research/forecast/20241126-us-economy-remains-resilient-with-strong-q3-growth [https://perma.cc/G8LG-9G68].

153. *National Low Income Housing Coalition, The Gap: A Shortage of Affordable Homes* (Mar. 2026), https://nlihc.org/gap [https://perma.cc/7S8U-45RS]. The magnitude of the

millions of people are looking for better housing, it would be untenable to hold many units vacant while awaiting tenants who meet climate-related eligibility requirements.

I do not purport to answer these questions, but the idea is worth considering.

C. *Stay*

1. *General*

Despite climate hazards, almost everyone wants to stay where they are or to return home after a temporary evacuation. Moving somewhere else permanently is almost always the last choice. My other scenarios—Sprout, Grow, Shrink, and Leave—are irrelevant or at least unappealing to most people, as they are attached to their homes, jobs, and communities and want to stay if they possibly can. In many places, doing so will require a considerable amount of adaptation to climate change.

Other scholars have divided the methods of adapting to climate change into three types—defend, accommodate, and retreat.[154] "Defend" involves shielding property from the hazard; "accommodate" means letting the water wash under or around the property; "retreat" involves moving (or not going there in the first place). All three apply to sea level rise and other causes of flooding, but "defend" is the principal method for dealing with such climate-related hazards as extreme heat, wildfire smoke, and chemical hazards.[155] Both "defend" and "accommodate" fit within my "Stay" scenario. The "retreat" option is covered further down in this article.

When it comes to flooding, defending usually means the erection of physical barriers to keep the water out. Some of these are enormous, such as a movable barrier that crosses a river or a bay and costs billions of dollars, or the massive system of pumps that Miami and other parts of South Florida are building in an

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housing shortage is in dispute. *See* Julie Z. Weil, *Why Nobody Knows the Scale of the U.S. Housing Crisis,* WASH. POST (Feb. 4, 2026), https://www.washingtonpost.com/business/2026/02/04/us-housing-shortage-millions/.

154. *See* J. B. Ruhl & Robin Kundis Craig, 4°C, 106 MINN. L. REV. 191 (2021). This article uses the terms "resistance" and "resilience" instead of "defend" and "accommodate," but the concepts are the same.

155. *See infra* notes 156-159.

attempt to remove the water.[156] Some are very modest, such as a watertight gate that can be placed in front of a door to protect a single building. Accommodation could involve such items as putting a building on stilts, or raising sensitive equipment like furnaces and electrical boxes above the possible flood level.

Each of these methods raises its own legal issues, as discussed below.

The Stay mode will continue to be the most prevalent. No federal policy and very few state or local policies are to the contrary. When an area has experienced serious damage, the focus of the Robert T. Stafford Disaster Relief and Emergency Assistance Act ("Stafford Act"), the principal U.S. law on the subject, is generally on repairing and rebuilding in place, not on relocating.[157] Fortunately, communities can defend against climate hazards in many ways, at least on an interim basis. However, this approach only works until the seas have risen up to overwhelm any protections that have been erected, or it has become so hot that being outside for more than a few hours is life-threatening and it is impossible to grow crops and raise livestock. A bright side to the economics is that the costs of preventing damage before it happens are often much less than the costs of repairing the damage after it has occurred.[158] A dark side is that the up-front costs can be very high and, without assistance, can be unaffordable both to individuals and to businesses, including building owners and (as the costs are passed down) to their tenants.

Measures at a citywide or broader scale must be undertaken by the government itself. As I have shown elsewhere, reducing urban flooding often involves major changes to drainage systems, street and park design, and other features;[159] changes in city design can

156. Nicolas Rivero, *Demand for Pumps Jumps with Rising Seas and Flood Risks. Florida's Bill Will Be Massive,* MIAMI HERALD, (Dec 15, 2022), https://www.miamiherald.com/news/local/environment/climate-change/article267793222.html [https://perma.cc/3368-CJXY].

157. Kevin Sack & John Schwartz, *As Storms Keep Coming, FEMA Spends Billions in 'Cycle' of Damage and Repair,* N.Y. TIMES (Oct. 8, 2018), https://www.nytimes.com/2018/10/08/us/fema-disaster-recovery-climate-change.html; Randall S. Abate & Aashina Choksi, *Coastal Migration With Dignity: Safeguards for Vulnerable Communities*, 54 ENVTL. L. REP. 10744, 10748 (2024).

158. *See The Most Expensive Commercial Property Repairs And How to Avoid Them*, PROPERTY MANAGER INSIDER (Nov. 5, 2019), https://propertymanagerinsider.com/expensive-commercial-property-repairs-how-to-avoid [https://perma.cc/D3D2-VLGT].

159. Michael B. Gerrard, *Urban Flooding: Legal Tools to Address a Growing Crisis*, 39 FLA.

reduce the urban heat island effect;[160] different forest management measures can reduce wildfires and their smoke;[161] and stronger design and operational standards can reduce the hazards from chemical releases.[162] These changes are not impossible; some cities have successfully taken several of these actions. For example, Hoboken, New Jersey, with federal financial help, has built new parks and playgrounds with underground tanks and pumps for stormwater. It also built safer roads that double as floodwater drainage devices. These, combined with rebuilt sewers, allowed Hoboken to withstand with minimal damage a torrential rainstorm in October 2023 that caused serious flooding across the Hudson River in New York City. Hoboken was badly hurt by Hurricane Sandy in 2012, and it learned its lesson.[163]

The most prominent measures to defend against or accommodate climate impacts involve coastal flooding. This section will discuss those measures in detail, then turn to defending buildings.

2. *Protecting Shorelines From Sea Level Rise and Flooding*

Governments and property owners have used several techniques to protect buildings and infrastructure located on shorelines and riverbanks from sea level rise and flooding so that residents and businesses can stay. All of them have legal implications.

a. *Hard armoring*

When the waves wash away the sand that protects a beachfront house, the owners frequently want to erect hard structures such as sea walls, bulkheads, or revetments (sloping piles of rocks) to protect the sand between their house and the ocean. When built, the force of the waves then bounces to the adjoining properties,

J. LAND USE & ENVTL L. 139 (2024).

160. Michael B. Gerrard, *Heat Waves: Legal Adaptation to the Most Lethal Climate Disaster (So Far*), 40 UA LITTLE ROCK L. REV. 515 (2018).

161. *See* Michael B. Gerrard, *Wildfire Smoke and U.S. Law*, 50 COLUMBIA J. ENVTL. L. 209 (2025).

162. *See* Michael B. Gerrard, *Waste and Chemical Management in a 4°C World*, 53 ENVTL L. REP. 10114 (2023).

163. Michael Kimmelman, *A Climate Change Success Story? Look at Hoboken*, N.Y. TIMES, Nov. 3, 2023.

worsening the erosion that the neighbors experience.[164] After some time, the armored area juts out while the neighboring unprotected areas erode even faster. The shore can look like a person with just one front tooth. The coastal armoring also halts the natural flow of sand down the beach, depriving the down-beach areas of sand nourishment. Armoring blocks public access to the water and impairs the living shorelines discussed below. Even though these impacts are known, about 14 percent of the total U.S. coastline has been armored,[165] and by 2100 that might rise to one-third.[166]

Because armoring usually involves work in navigable waters, it typically requires permits under Section 404 of the Clean Water Act[167] and Section 10 of the Rivers and Harbors Act,[168] which are administered by the U.S. Army Corps of Engineers (the Corps). For routine activities with minimal impacts, the Corps issues "nationwide permits" (NWPs)—standard, automatic approvals with preestablished conditions, bypassing the need for case-by-case applications. One of these permits is NWP 13, covering "bank stabilization"—actions to prevent the edges of shorelines or riverbanks from washing away or shifting. NWP 13 allows for installation of hard armoring with minimal fuss; whoever wants to put up this armoring need only notify the Corps (or not even that, if the project is small enough). Armoring often has significant impacts, and environmental groups have long called for the Corps to abolish or restrict NWP 13, but to little avail.[169] State permits are usually also required for this work.[170]

The Corps itself engages in armoring, sand replenishment, and other ways to protect beaches and the property behind them. The

164. *See* CORNELIA DEAN, AGAINST THE TIDE: THE BATTLE FOR AMERICA'S BEACHES 51 (Addison–Wesley 1999); ORIN H. PILKEY & KATHARINE L. DIXON, THE CORPS AND THE SHORE 51-53 (Island Press 1996).

165. Rachel K. Gittman et al., *Engineering Away Our Natural Defenses: An Analysis of Shoreline Hardening in the US*, 13 FRONTIERS IN ECOLOGY AND THE ENVIRONMENT 301 (Aug. 2015).

166. *Id.* at 306

167. 33 U.S.C. § 1344.

168. 33 U.S.C. § 303.

169. Travis O. Brandon, *A Wall Impervious to Facts: Seawalls, Living Shorelines, and the U.S. Army Corps of Engineers' Continuing Authorization of Hard Coastal Armoring in the Face of Sea Level Rise,* 93 TULANE L. REV. 557 (2019).

170. Cora L. Sutherland & Melissa K. Scanlan, *Great Lake States' Coastal Armoring Laws: A Comparison* (University of Milwaukee Ctr. for Water Pol'y, 2024).

Corps conducts cost-benefit analysis for many of its activities.[171] For sand replenishment projects, an important part of this analysis is the value of the property to be protected. Using this metric means the analysis tends to favor more affluent areas with higher-value homes; a trailer park may have many more residents but much less financial value than a few large beach homes.[172]

The Clean Water Act generally does not preempt stronger state regulation,[173] and several states and cities ban or restrict construction of this hard armoring.[174] For example, the California Coastal Act allows hard armoring only "when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply," but does not allow it for new buildings.[175] The courts have generally upheld these prohibitions against claims that they are takings, even though without armoring the houses may decline in value and eventually be washed away.[176]

Around the country there is no uniformity, and often little clarity, in the restrictions on hard armoring. Wealthy property owners (just about the only ones who have beachfront property they can afford to protect) often hire lawyers to assert a "right to

171. Corps of Engineers Agency Specific Procedures To Implement the Principles, Requirements, and Guidelines for Federal Investments in Water Resources, 89 Fed.Reg. 103992 (Dec. 19, 2024), https://www.govinfo.gov/content/pkg/FR-2024-12-19/pdf/2024-29652.pdf [https://perma.cc/LGQ3-3UPU].

172. A.R. Siders, *Social Justice Implications of US Managed Retreat Buyout Programs*, 152 CLIMATIC CHANGE 239 (2018); Lisa Song, Patrick Michels & Al Shaw, *Flood They Neighbor: Who Stays Dry and Who Decides?* PROPUBLICA (Aug. 6, 2018,) https://www.propublica.org/article/levee-valley-park-flood-thy-neighbor-who-stays-dry-and-who-decides; Jim Morrison, *A Proposed Army Corps Change Could Affect Hundreds Of Billions In Federal Funding*, VA. MERCURY (Feb. 29, 2024), https://virginiamercury.com/2024/02/29/a-proposed-army-corps-change-could-affect-hundreds-of-billions-in-federal-funding/. The rule went was adopted and went into effect Jan. 17, 2025. 33 CFR Part 234 (2025).

173. 33 U.S.C. §1370.

174. Meg Caldwell & Craig Holt Segall, *No Day at the Beach: Sea Level Rise, Ecosystem Loss, and Public Access Along the California Coast*, 34 ECOLOGY L.Q. 533, 572-574 (2007); Anne Siders, *Managed Coastal Retreat: A Legal Handbook on Shifting Development Away From Vulnerable Areas*, ch. 3 (Columbia Law School Sabin Center for Climate Change Law, Oct. 2013).

175. Cal. Pub. Res. Code § 30235.

176. Shell Island Homeowners Ass'n v. Tomlinson, 134 N.C. App. 217, 219-20 (1999); Stevens v. City of Cannon Beach, 854 P.2d 449, 454-457 (Or. 1993) (en banc), cert. denied, 510 U.S. 1207 (1994); Casa Mira Homeowners Ass'n v. Cal. Coastal Comm'n, 107 Cal.App.5th 847a (2024), pet. denied, Mar. 12, 2025; Lindstrom v. Cal. Coastal Comm'n, 40 Cal. App. 5th 73, 101-02 (2019).

armor." These owners seek to take advantage of special exemptions, grandfathering (saying that an old structure can stay forever), and claims that what they have put up is just temporary.[177]

b. *Levees*

A levee is an artificial embankment or other linear structure built to hold back the water, typically made of earthen materials. There are about 40,000–50,000 miles of levees along rivers and coasts in the United States.[178] They have long been a favored method of preventing flooding, but their disadvantages are increasingly apparent.

Catastrophic floods have often inspired massive programs to build levees, going back at least to 1844's floods on the Mississippi River. They led to the Swamp Land Acts of 1849 and 1850, which provided funding for levee development.[179] An even larger flood on the Mississippi River in 1927 showed these levees were inadequate and spurred still more levee construction. Similar patterns with levees have recurred in other parts of the country: build, fail, rebuild, repeat.[180]

When they hold, levees protect the land behind them, and they allow what had been floodplains outside the levees to be used for farming, towns and cities. Levees must be built on both sides of a river; otherwise, the water is just pushed to the side without the levee. Between the two levees, the now-contained river runs faster and higher. Outside them, the land is protected from flooding but is starved of the sediment and water that formed the natural systems that had been there.[181]

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177. MARGARET PELOSO, ADAPTING TO RISING SEA LEVELS: LEGAL CHALLENGES AND OPPORTUNITIES 132-37, 262-65 (2018). *See also* Lindstrom v. Cal. Coastal Comm'n, 40 Cal.App.5th 73 (2019).

178. Association of State Floodplain Managers, National Flood Programs & Policies in Review (2015), pl. 4, https://asfpm-library.s3-us-west-2.amazonaws.com/ASFPM_Pubs/ASFPM_NFPPR_2015.pdf [https://perma.cc/C4ZL-XUUL]. Another estimate is that there are more than 100,000 miles of levees in the U.S. U.S. GOV'T ACCOUNTABILITY OFF., Levee Safety: Army Corps and FEMA Have Made Little Progress in Carrying Out Required Activities, GAO-16-709, at 1 (July 2016), https://www.gao.gov/assets/gao-16-709.pdf

179. Willy Blackmore, *A Better Way to Decrease Disastrous Flooding on the Mississippi River*, AUDUBON, Fall 2019.

180. *See* Joshua Paul Fershee, *The Rising Tide of Climate Change: What America's Flood Cities Can Teach Us About Green Energy Policy, and Why We Should Be Worried*, 39 ENVTL. L. 1109 (2009).

181. Warren Cornwall, *Losing Ground: Starved of Sediment and Losing Protective Reeds, the*

The precipitation and storms worsened by climate change are too much for many levees to handle. In the words of a Led Zeppelin song inspired by the Mississippi River floods of 1927, "If it keeps on raining, levee's going to break./ If it keeps on raining, the levee's going to break./When the levee breaks, have no place to stay."[182] When the levees break or are overtopped, the deluge can cause massive damage. That happened during Hurricane Katrina in 2005. Levees failed and much of New Orleans and nearby areas were flooded.[183] Multiple breaks in levees caused massive flooding in Nebraska, Iowa and Missouri in the spring of 2019.[184]

The American Society of Civil Engineers' 2025 infrastructure report card gave the country's levee system a grade of "D+". It reported that 23 million Americans live and work behind the nation's levees, which are on average 61 years old, and many were built using engineering standards that are far less rigorous than today's.[185] The Corps' "factor of safety" for levee design is just 1.3, meaning that the structure needs to be designed to withstand only 1.3 times the projected force of the water it will hold back.[186] With climate change, this standard is less and less adequate.[187] Most new levees are built to withstand a 100-year flood; the Association of

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Mississippi River's Sprawling Delta Could Soon Vanish, 387 SCIENCE 128 (2025), https://www.science.org/content/article/starved-sediment-iconic-piece-mississippi-river-delta-could-vanish.

182. Tina Benitez-Eves, *Behind the Song Lyrics: "When the Levee Breaks," Led Zeppelin*, AM. SONGWRITER (Feb. 17, 2022), https://americansongwriter.com/when-the-levee-breaks-led-zeppelin-behind-song-lyrics/ [https://perma.cc/9V6D-J7VB].

183. Mark S. Davis, *Twenty Years After Hurricane Katrina and the Failures of the Federal Levees: Are We There Yet?*, BROOKINGS (2025), https://www.brookings.edu/articles/twenty-years-after-hurricane-katrina-and-the-failures-of-the-federal-levees-are-we-there-yet/ [https://perma.cc/AY9W-SZNL].

184. Mitch Smith & John Schwartz, *'Breaches Everywhere': Flooding Bursts Midwest Levees, and Tough Questions Follow*, N.Y. TIMES (Mar. 31, 2019), https://www.nytimes.com/2019/03/31/us/midwest-floods-levees.html.

185. AM. SOC'Y OF CIVIL ENGINEERS, 2025 REPORT CARD FOR AMERICA'S INFRASTRUCTURE (2025), 105-106, https://infrastructurereportcard.org/wp-content/uploads/2025/03/Full-Report-2025-Natl-IRC-WEB.pdf [https://perma.cc/Z4UZ-ZJQK]. *Similarly,* Farshid Vahedifard, *West Coast Levee Failures Show Growing Risks From America's Aging Flood Defenses*, THE CONVERSATION (Dec. 29, 2025), https://theconversation.com/west-coast-levee-failures-show-the-rising-risks-from-americas-aging-flood-defenses-272556 [https://perma.cc/3H4S-2PX3].

186. ROBERT R.M. VERCHICK, FACING CATASTROPHE ENVIRONMENTAL ACTION FOR A POST-KATRINA WORLD 226 (2010).

187. Tyler J. Kelley, *The Fight to Tame a Swelling River With Dams That May Be Outmatched by Climate Change*, N.Y. TIMES (Mar. 21, 2019), https://www.nytimes.com/2019/03/21/climate/missouri-river-flooding-dams-climate.html.

State Floodplain Managers has recommended changing this to a 500-year flood.[188] Safety standards for levees have been in a state of flux for years. Various Congressionally mandated studies have gone back and forth, with limited progress in implementing the studies' recommendations.[189] Organized resistance by levee owners and others further inhibits stronger standards.[190]

The Federal Emergency Management Agency (FEMA) does not map areas protected by levees as within flood hazard areas; it assumes the levees will hold if they meet certain standards.[191] So property owners are not required to (and seldom do) buy flood insurance. Many of these owners do not realize their land would be in a floodplain were it not for levees, and when the levees fail, they are shocked to be flooded and even more shocked to learn they are uninsured.[192]

America's levees are not a system. They are an agglomeration of structures built over a century and a half, under varying forms of public and private ownership and supervision, and in widely disparate states of repair or decrepitude. Many are not up to the challenges that rising coastal and inland waters will pose in the decades to come. There has been little basis for optimism that funds will be available to maintain them and to raise them when needed. The Infrastructure Investment and Jobs Act (also known as the Bipartisan Infrastructure Law) of 2021 provided some funding,[193] but the Trump administration cut it back.[194]

A more modest version of levees is artificial sand dunes. Their construction often faces opposition when they are built in front of

188. Association of State Floodplain Managers, *National Flood Policy Challenges Levees: The Double-edged Sword*, 3 (Apr. 17, 2007), https://biotech.law.lsu.edu/climate/floods/Levee_Policy_Challenges_4-17-07.pdf [https://perma.cc/Z5UF-G4A5].

189. CONG. RSCH. SERV., NONFEDERAL LEVEE SAFETY: PRIMER, STATUS, AND CONSIDERATIONS (May 22, 2023), https://www.congress.gov/crs-product/IF12404.

190. Lisa Song, Patrick Michels & Alex Heeb, *Inside a Secretive Lobbying Effort to Deregulate Federal Levees*, PROPUBLICA (Mar. 30, 2018), https://www.propublica.org/article/deregulate-federal-levees-section-408-permit-secretive-lobbying-effort [https://perma.cc/M38C-4NU6].

191. 44 C.F.R. §§ 65.10, 65.12.

192. Andrea Thompson, *The Overlooked Risk of Levees as Rainfall Rises*, CLIMATE CENTRAL (May 5, 2017), https://www.climatecentral.org/news/the-overlooked-risk-of-levees-as-rains-rise-21426 [https://perma.cc/8KRD-KL7B].

193. Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429 (2021).

194. Sabrina Tavernise, *When Federal Cuts Imperil a Crucial Project In a Red County*, N.Y. TIMES (June 9, 2025), https://www.nytimes.com/2025/06/09/us/trump-cuts-washington-levees.html [

expensive beach homes and block the owners' views of the ocean. But without the dunes, these homes can be severely damaged in a large storm.[195] When New Jersey used eminent domain to take private property so that it could build dunes and berms, multiple lawsuits ensued. The courts upheld the state's authority to take these actions.[196] Two New Jersey landowners, Harvey and Phyllis Karan, sued for damages because their ocean views were blocked by dunes,[197] but the state supreme court held that the loss in value from the obstructed views must be offset by the gain in value from the reduced flood risk afforded by the dune.[198] The jury had awarded $375,000 to the Karans for the loss of their views, but after the state supreme court ruling, they accepted a settlement of $1.[199] To add another wrinkle, flood protection actions by the Corps that involve condemnation of private property as well as various construction projects require review under NEPA.[200]

c. *Tidal gates*

Among the largest engineering projects to address coastal flooding are tidal gates. These tend to be massive structures that are ordinarily in the open position, but are closed with the approach of a major storm. The world's largest barrier system is the Delta Works in the Netherlands, built after a devastating storm in 1953 that killed more than 1,800 people. Another example is London's Thames Barrier, completed in 1962. It was originally thought that the nine gates would be closed only a few times a year, but now they are being closed as many as 50 times a year and may ultimately need to be replaced.[201] There are also storm barriers in,

195. Mireya Navarro & Rachel Nuwer, *Resisted for Blocking the Views, Dunes Prove They Blunt Storms*, N.Y. TIMES, (Dec. 3, 2012), https://www.nytimes.com/2012/12/04/science/earth/after-hurricane-sandy-dunes-prove-they-blunt-storms.html; Molly Murray, *Water View Versus Shoreline Protection*, NEWS J. (DEL.) (Oct. 27, 2014), https://www.delawareonline.com/story/news/local/2014/10/25/water-view-versus-shoreline-protection/17945111/ [https://perma.cc/F9QL-CKR5].

196. State of N.J. v. North Beach 1003, LLC, 451 N.J. Super. 214 (App. Div. 2017).

197. Wayne Parry, *2 Big Payouts May Endanger New Jersey's Post-Sandy Dune Work*, ASSOCIATED PRESS (Feb. 8, 2019), https://apnews.com/general-news-e4d98c5c4550455f9f618050603a2fca [https://perma.cc/29MH-G48H].

198. Borough of Harvey Cedars v. Karan, 214 N.J. 384 (2013).

199. MaryAnn Spoto, *Harvey Cedars Couple Receives $1 Settlement For Dune Blocking Ocean View*, NJ.COM (Sept. 25, 2013), https://www.nj.com/ocean/2013/09/harvey_cedars_sand_dune_dispute_settled.html.

200. Ondrusek v. U.S. Army Corps of Eng'rs, 123 F.4th 720, 733 (5th Cir. 2024).

201. Karen McVeigh, *Before the Flood: How Much Longer Will the Thames Barrier Protect*

among other places, Tokyo, Saint Petersburg, Russia, and (now, hopefully, nearing completion after more than two decades of construction) Venice.[202]

The United States has several hurricane barriers, including in Providence, Rhode Island; Stamford, Connecticut; and New Bedford, Massachusetts. After Hurricane Katrina, a 1.8-mile concrete wall called the IHNC (Inner Harbor Navigational Canal), Lake Borgne Surge Barrier was built in Louisiana.[203] Many larger barriers to protect entire regions are under consideration in New York, Houston (the "Ike Dike"), and Boston. They would each cost tens of billions of dollars and require approvals from the Corps as well as the state governments, and all would be subject to exhaustive environmental impact studies under NEPA. All have engendered ferocious local controversy over their environmental and economic impacts, and their effects on the nearby communities that are not within their protection.[204]

These tidal gates are moveable barriers that are designed to protect against the worst storms. If they were closed at all times, they would create stagnant lagoons, and neither fish nor ships could pass through them. But because they must ordinarily remain open, they only protect against the worst storms—not against ordinary sea level rise. So the water levels inside the barriers continue to rise, and storm surge continues—just not at the most catastrophic levels. Therefore in most places, these regional barriers have to be accompanied by more local approaches. A persistent debate is whether these local approaches could be enough on their own, without incurring the enormous expenses of tidal gates.

d. *Sea walls and other local approaches*

Many places that are threatened by sea level rise consider sea walls, and some build them. They are typically immovable and protect only a small geographic area. The massive tidal gates

London?, GUARDIAN (June 30, 2023), https://www.theguardian.com/environment/2023/jun/30/before-the-flood-how-much-longer-will-the-thames-barrier-protect-london.

202. ADAM SOBEL, STORM SURGE: HURRICANE SANDY, OUR CHANGING CLIMATE, AND EXTREME WEATHER OF THE FUTURE 189-202, 240-41 (2014).

203. Flood Protection Authority, IHNC-Lake Borgne Surge Barrier, https://www.floodauthority.org/wp-content/uploads/2018/04/Info-Sheet-IHNC-Surge-Barrier.pdf [https://perma.cc/PJ24-57MC] (last visited July 16, 2021).

204. ORRIN H. PILKEY ET AL., RETREAT FROM A RISING SEA: HARD CHOICES IN AN AGE OF CLIMATE CHANGE, 53-54 (2016).

protect broader regions and could allow the walls within those regions to be shorter, since the highest storm surge would be blocked, but the walls still separate people from the water. A plan to build sea walls to protect Hoboken, New Jersey from a recurrence of the devastation caused by Hurricane Sandy was opposed by residents who would lose their wonderful (and property-value-enhancing) views of Manhattan across the Hudson River.[205] If built along a beach, sea walls, like other hard armoring, eventually destroy the beach and damage areas along the sides of the walls.[206] Every extra unit of height adds to the cost, and perhaps to the amount of land that can be developed behind the wall, to the number of people who are counting on the wall to protect them, and to the number of people who will lose their views.[207]

Many states and cities are working with the Corps to design and build sea walls, tidal gates, and other coastal protection measures.[208]

Going forward, the materials used to construct the sea walls—typically concrete—should be fabricated using low-emissions methods. Michael Vandenbergh and colleagues call this approach "mitigate-while-adapting."[209]

Governments decisions to build protections against flooding and other hazards face a dilemma. Governments ordinarily enjoy sovereign immunity from most kinds of liability, but Congress has waived this immunity under the Federal Tort Claims Act for ministerial acts but not for discretionary acts. [210] A decision whether to build a protective measure like a flood wall is discretionary, but, once built, the duty to maintain it may be

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205. Patrick McGeehan, *Plan to Flood-Proof Hoboken Runs Into a Wall*, N.Y. TIMES (Feb. 7, 2016), https://www.nytimes.com/2016/02/08/nyregion/plan-to-flood-proof-hoboken-runs-into-a-wall.html. Fort Lauderdale, Florida is another city where residents opposed sea walls because they would obstruct views of the water. Christian Stirling Haig, *Enlisting Private Law to Regulate Private Climate Adaptation Failure*, 55 ENVTL. L. REP. 10424, 10429-10430 (2025).

206. CORNELIA DEAN, AGAINST THE TIDE: THE BATTLE FOR AMERICA'S BEACHES 52-56 (1999).

207. ROBERT MUIR-WOOD, THE CURE FOR CATASTROPHE: HOW WE CAN STOP MANUFACTURING NATURAL DISASTERS 23-26 (2016).

208. Max S. Miller & Katrina M. Wyman, *Collaborative Climate Change Adaptation: A Case Study of Army Corps Coastal Protection Projects*, 51 COLUMBIA J. ENVTL. L. 77 (2025).

209. Michael Vandenbergh et al., *Adaptation as Mitigation*, 38 GEORGETOWN ENVTL. L. REV. (forthcoming 2026).

210. 28 U.S.C. § 2680(a). *See also* 42 U.S.C. § 5148 (provision of Stafford Act declaring government not liable for discretionary acts).

considered ministerial. This risk could discourage governments from taking precautionary measures because doing so, and failing, could expose them to greater liability than not doing so at all.[211]

e. *Beach nourishment*

Natural erosion can wash the sand off beaches. Higher seas and stronger storms from climate change can make this worse. But beaches attract people and are economically important. Congress appropriates tens of millions of dollars every year for the Corps to dig up sand from various onshore or offshore locations and haul or pump it onto beaches that have lost some of their sand. One study calculated that more than 2,500 beach nourishment projects over the last century have cost nearly $16 billion in 2022 dollars.[212] All these measures can harm the ecological balance of the places from which the sand is removed and disrupt normal coastal hydrological processes. It is also temporary; the sand will eventually wash away again (sometimes just a year or two after placement), requiring that it be done over again, sometimes repeatedly if the money is there.[213]

A case on beach nourishment reached the U.S. Supreme Court in 2010.[214] A city and a county in Florida were planning to restore seven miles of beach that had been eroded by several hurricanes. They wanted to add about 75 feet of dry sand seaward of the mean high-water line. The state environmental department approved the project. However, owners of the beachfront property did not want to lose their land's direct contact with the water, or the right of accretion—the right to own any new land that is gradually formed by the flow of sand. So they sued, claiming that Florida's proposed action would be a taking of their property without just compensation. The Supreme Court disagreed. Property law is a matter of state law, and the law of Florida, as declared by the state

211. Mark Nevitt, *Sovereign Immunity in a Warming World*, 126 COLUMBIA L. REV. (forthcoming 2027).

212. Stephen Stock et al., *Sand Dollars: Federal Agencies Spend Millions Every Year Replacing Sand on Beaches. Some Experts Say It's a Waste of Tax Money*, CBS NEWS INVESTIGATIONS (June 25, 2024), https://www.cbsnews.com/beach-nourishment/ [https://perma.cc/J969-6PLE].

213. Jennifer L. Miselis et al., *Impacts of Sediment Removal from and Placement in Coastal Barrier Inland Systems*, U.S. Geological Survey Open-File Report 2021–1062 (2021) [https://doi.org/10.3133/ofr20211062].

214. Stop the Beach Renourishment, Inc. v. Florida Dep't of Env't Prot., 560 U.S. 702 (2010).

supreme court, was that the landowners did not really own the land seaward of their lots; instead, submerged land is owned by the state, and therefore the state can fill it and keep it. Thus, the landowners did not own what was being taken. This case turned on some fine points of Florida property law, highlighting that anyone wanting to undertake work in the coastal zone must pay close attention to state as well as federal laws.

f. *Living shorelines*

Natural features like marshes, mangroves, dunes, and oyster reefs are important wildlife habitat and help slow erosion, protect against flooding, buffer storm surge, purify the water, and store carbon. When these features become submerged by rising seas or are washed away in storms, one option may be to artificially recreate the features that have been lost. These nature-based solutions are called "living shorelines."[215]

Like most of the other approaches discussed above, living shorelines usually require the approval of the Corps as well as the state. As also discussed above, hard armoring has long enjoyed the use of NWP 13, which provides a swift path to federal compliance. Every living shoreline project formerly required an individual permit. Obtaining one was expensive and took at least several months. However in 2017, as part of the five-year cycle of updating nationwide permits, the Corps added NWP 54, Living Shorelines.[216]

The addition of NWP 54 was designed to put living shorelines on a more or less equal regulatory footing with hard armoring. The equal footing does not always work at the state level, however. All these projects require state approvals, and state permitting requirements vary considerably, one from the other.[217] Maryland may be the most favorable to living shorelines; its Living Shoreline Protection Act, enacted in 2008 in the wake of flash floods

215. NOAA Fisheries, *Understanding Living Shorelines*, https://www.fisheries.noaa.gov/insight/understanding-living-shorelines [https://perma.cc/QL3J-BKQG] (last visited Apr. 4, 2026).

216. The current version of NWP 54 is Department of the Army, Corps of Engineers, Reissuance and Modification of Nationwide Permits, 91 Fed. Reg. 768, 871 (Jan. 8, 2026) (to be codified at 33 CFR Ch. II).

217. Christopher Hilke et al., *Softening Our Shorelines: Policy and Practice for Living Shorelines Along the Gulf and Atlantic Coasts* (National Wildlife Federation 2020); Maria Dolan, *Eroding Coasts Need Protection – and New Solutions Are at Hand*, ENSIA (Mar. 5, 2018), https://ensia.com/features/living-shorelines/ [https://perma.cc/Q2QE-SV8U].

triggered by a hurricane, requires applicants to prove that this approach will not work before they can be allowed to undertake a hard armoring project.[218] In all, 13 states have statutes, regulations, or guidance documents that encourage living shorelines.[219] These projects must also undergo review under the federal Coastal Zone Management Act to make sure they are consistent with state coastal management plans.[220]

3. *Protecting Buildings*

The above section discussed how communities can be protected from coastal and inland flooding so that residents and businesses can stay. I now turn to ways that the law can protect individual buildings.

a. *Codes*

Every year, many buildings are damaged or destroyed by floods or storms. The principal legal mechanism to ensure they are soundly designed and built is building codes. These are creatures of state law. No federal building codes exist except for federal buildings and for manufactured homes, such as trailers. However, FEMA encourages building codes by assisting states and municipalities in adopting them and making use of such codes a condition of certain grant programs.[221] The Department of Energy provides technical assistance and tracks state code adoption.[222] The American Society of Civil Engineer's *Flood Resistant Design and Construction* (ASCE 24) standard is referenced in model building codes like the International Building Code and International Residential Code; these codes, in turn, are adopted by local

218. PEW CHARITABLE TRUSTS, *Maryland's 'Living Shorelines' Help Communities Become Resilient* (Nov. 19, 2019), https://www.pew.org/en/research-and-analysis/issue-briefs/2019/11/marylands-living-shorelines-help-communities-become-resilient [https://perma.cc/K3YV-RBXL].

219. Eric Moorman et al., *States Shift from Seawalls to Living Shorelines*, PILLSBURY WINTHROP SHAW PITTMAN LLP, (July 10, 2019).

220. RESTORE AMERICA'S ESTUARIES, *Living Shorelines: From Barriers to Opportunities*, (2018).

221. CONG. RSCH. SERV., R47612, BUILDING RESILIENCE: FEMA'S BUILDING CODES POLICIES AND CONSIDERATIONS FOR CONGRESS (2023), https://www.congress.gov/crs-product/R47612.

222. U.S. Dep't of Energy, Resilient and Efficient Codes Implementation Initiative, https://www.energycodes.gov/ [https://perma.cc/TDN5-LGBJ]. It is uncertain whether these federal efforts continue under the second Trump administration.

communities to meet the minimum requirements of the National Flood Insurance Program.[223] Some states have codes that apply to virtually all kinds of buildings (residential, commercial, schools, and others); others have codes only for certain kinds of buildings, or none at all. Some states allow cities to adopt their own codes, which may be weaker or stronger than the state codes. Almost all cities and many smaller municipalities also have zoning codes. Local governments generally have great discretion over how they zone their land, even in states that do not allow local changes to statewide building codes.[224]

As with flood maps,[225] most building codes are backward looking. They assume a continuation of the precipitation rates, temperatures, and other conditions in the historical record, and not what a changing climate will bring.[226]

While states or cities enact their codes, almost all start with model codes developed by others and adopt them, fully or with modifications, as their own. The dominant drafter of model codes used in the United States is the International Code Council (ICC). It has developed nearly two dozen codes and standards covering buildings, fire, plumbing, energy conservation, and other subjects. It reviews and updates the codes every three years.

The National Association of Home Builders and many of its chapters have often fought standards that would make construction more expensive, including by imposing greater energy efficiency and climate resilience standards.[227] The stakes

223. John L. Ingargiola et al., *ASCE 24: Improving the Performance of Buildings and Structures in Flood Hazard Areas*, in ADVANCES IN HURRICANE ENGINEERING: LEARNING FROM OUR PAST (Jan. 9, 2013) [https://doi.org/10.1061/9780784412626.006].

224. A major exception is common state preemption of zoning laws that block affordable housing. *State Preemption of Local Zoning Law as Intersectional Climate Policy*, 135 HARVARD L. REV. 1592 (2022).

225. Michael B. Gerrard & Edward McTiernan, *The Perils of Relying on FEMA Flood Maps in Real Estate Transactions*, N.Y. L.J. (Sep. 9, 2020).

226. U.S. GOV'T ACCOUNTABILITY OFF., GAO-17-3, CLIMATE CHANGE: IMPROVED FEDERAL COORDINATION COULD FACILITATE USE OF FORWARD-LOOKING CLIMATE INFORMATION IN DESIGN STANDARDS, BUILDING CODES, AND CERTIFICATIONS (2016); CONG. RSCH. SERV., BUILDING RESILIENCE, *supra* note 221, at 6.

227. *See, e.g.*, *International Code Council Caves to Special Interests, Axes Decarbonization Measures from Model Building Code*, AM. COUNCIL FOR AN ENERGY EFFICIENT ECON. (Mar. 21, 2024), https://www.aceee.org/press-release/2024/03/international-code-council-caves-special-interests-axes-decarbonization [https://perma.cc/4BLN-5BN5]; Amy Boyce, *Codes Ruling Hinders Building Decarbonization Progress, Rejects Expert Recommendations*, INST. FOR MKT. TRANSFORMATION, Mar. 22, 2024), https://imt.org/news/building-energy-codes-ruling-hinders-decarbonization/ [https://perma.cc/9RKG-7DZT]; Daniel J.

are high for the builders. In 2019, St. Louis County, Missouri, which had been using the 2009 version of the ICC codes, adopted the 2018 version, with its stronger energy efficiency rules. This change so outraged the local builders' association that they contributed $250,000 to the primary election campaign of the county executive's opponent—a very large amount for such a race. (The Sierra Club supported the incumbent; he won.[228]) Lobbying by builders, together with anti-regulatory sentiment, is a major reason that a few states have weakened their building codes despite facing stronger storms.[229] In 2025, Michigan paused implementation of a new residential construction code in the face of lawsuits filed by builders challenging the code.[230] Despite builders' complaints about the cost, a representative of the ICC testified to Congress in 2024 that "modern model building codes have no appreciable implications for housing affordability."[231]

A locality's choice of building codes can make a big difference. Nashville, Tennessee has one of the nation's strictest codes with respect to flooding, requiring the ground floor of new houses to be at least four feet above the expected height of a major flood. Many nearby towns lack any building codes. When catastrophic flooding hit in August 2021, those places suffered, leaving at least 20 people

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Metzger, *IECC Appeals Could Undermine Electrification Requirements in New Construction*, CLIMATE LAW: A SABIN CTR. BLOG (Mar. 5, 2024), https://blogs.law.columbia.edu/climatechange/2024/03/05/iecc-appeals-electrification-requirements/ [https://perma.cc/J43F-NYT7].

228. Jacob Barker, *After St. Louis County Updated Building Codes, Home Builders Put Big Money Behind Page, Dunaway Opponents*, ST. LOUIS POST-DISPATCH (July 5, 2020); Jeremy Kohler, *Sam Page Wins Democratic Primary for St. Louis County Executive*, ST. LOUIS POST-DISPATCH (Aug. 5, 2020).

229. Christopher Flavelle, *As Storms Get Stronger, Building Codes Are Getting Weaker*, BLOOMBERG, Mar. 19, 2018; Cameron Smith & William Booher, *When It Comes to Louisiana Floods, How Much Does a Foot Really Matter?*, NOLA.COM (Feb. 14, 2017), https://www.nola.com/opinions/guest-column-when-it-comes-to-louisiana-floods-how-much-does-a-foot-really-matter/article_a0ea1d2a-9498-5a36-a923-cd0829067643.html [https://perma.cc/3BDX-L374]. *See also* INSURANCE INSTITUTE FOR BUSINESS & HOME SAFETY, RATING THE STATES 2021: HURRICANE COAST (2021).

230. Carolyn Muyskens, *Michigan Halts Construction Code Rollout Amid Builders' Suit*, LAW 360 (July 8, 2025), https://www.law360.com/energy/articles/2362089/michigan-halts-construction-code-rollout-amid-builders-suit [https://perma.cc/Y96X-WAT6].

231. *Examining the Role and Effectiveness of Building Codes in Mitigating Against Disasters*, Hearing Before the H. Comm. on Transp. and Infrastructure, 118th Cong. 5 (2024) (testimony of Cindy L. Davis, Past President, International Code Council Board of Directors), https://democrats-transportation.house.gov/imo/media/doc/Cindy%20L%20Davis%20Testimony.pdf [https://perma.cc/YS56-3UBV].

dead.[232] In Florida, the state code requires more wind-resistant features in buildings in the southern part of the state, which was thought to be more prone to hurricanes than the north. However, a Category 5 storm, Hurricane Michael, hit the Florida Panhandle, in the northern part of the state, in 2018 and devastated several towns where weaker standards were in place.[233] Some houses there survived amid their toppled neighbors because they were erected by Habitat for Humanity, which goes beyond code with more secure ties of the roofs to the walls, thicker lumber, windstorm plywood, and metal roofs.[234]

Houses can be constructed to withstand many hurricane winds, floods, and wildfires, but few are built that way where it is not legally required.[235] After major hurricanes or wildfires, overhead photos often show one or two houses standing amid the rubble, presumably built beyond code requirements. Voluntary standards have been developed for new or modified buildings to help them better withstand hurricanes and certain other extreme events.[236] Some developers tout that they are building to more resilient standards than required by law.[237]

Where states or localities have imposed especially strong standards or granted variances to allow more resilient buildings,

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232. Christopher Flavelle, *How Government Decisions Left Tennessee Exposed to Deadly Flooding*, N.Y. TIMES (Aug. 26, 2021), https://www.nytimes.com/2021/08/26/climate/tennessee-flood-damage-impact.html.

233. Daniel Cusick, *Extreme Weather: Michael Roared Through Loophole in Vaunted Building Code*, E&E NEWS (Oct. 19, 2018), https://subscriber.politicopro.com/article/eenews/1060103727 [https://perma.cc/553M-GLS7]; Andres Viglucci et al., *Florida's Building Code Is Tough, but Michael Was Tougher. Is It Time for a Rewrite?*, MIA. HERALD (Oct. 13, 2018), https://www.miamiherald.com/news/state/florida/article219862625.html [https://perma.cc/K5RU-KZ88].

234. Patricia Sullivan et al., *Houses Intact After Hurricane Michael Were Often Saved by Low-Cost Reinforcements*, WASH. POST (Oct. 17, 2018), https://www.washingtonpost.com/politics/panhandle-houses-intact-after-michael-were-often-saved-by-low-cost-reinforcements/2018/10/17/d3ca97c0-d152-11e8-b2d2-f397227b43f0_story.html.

235. Christopher Flavelle, *Hurricane-Proof Homes Are Real. Why Isn't Anyone Buying Them?*, BLOOMBERG (June 20, 2018), https://www.bloomberg.com/news/features/2018-06-20/hurricane-proof-homes-are-real-why-isn-t-anyone-buying-them; Patricia Mazzei, *Among the Ruins of Mexico Beach Stands One House, Built 'for the Big One,'* N.Y. TIMES (Oct. 14, 2018), https://www.nytimes.com/2018/10/14/us/hurricane-michael-florida-mexico-beach-house.html.

236. CONG. RSCH. SERV., BUILDING RESILIENCE, *supra* note 221, at 7-8.

237. Michele Lerner, *Escondido, Calif., A Showcase for Fire Preparedness*, N.Y. TIMES (Aug. 27, 2025), https://www.nytimes.com/2025/08/13/realestate/escondido-san-diego-california-real-estate.html.

they have tended to withstand legal challenges.[238] In three Connecticut cases, for example, the local governments had approved variances or zoning changes to allow houses to be raised; the neighbors challenged these approvals, and in each case the neighbors lost.[239]

In a 2020 poll of 999 American adults, 84 percent of the respondents favored requiring new building codes to minimize flood damage, and 57 percent supported prohibiting development in flood-prone areas.[240] Several cities have adopted forward-looking building or zoning codes that are stronger than the ICC's with respect to climate resilience, including New York City,[241] San Francisco,[242] and Boston.[243]

The nonprofit U.S. Green Building Council, which maintains the influential Leadership in Energy and Environmental Design (LEED) standards, has developed rating guidelines for resilient design and construction.[244] In January 2015, President Obama, by executive order, established the Federal Flood Risk Management Standard requiring flood planning for federal and federally-funded buildings.[245] Under the Obama administration, several federal agencies took steps to advance building resilience, though

238. Lindstrom v. Cal. Coastal Comm'n., 40 Cal. App. 5th 73 (2019); Martin v. Cal. Coastal Comm'n, No. D076956, 2021 WL 3021356 (Cal. Ct. App. June 23, 2021).

239. Mayer-Wittmann v. Zoning Bd. of Appeals of Stamford, 333 Conn. 624 (2019); Lauridsen Fam. Ltd. Partnership v. Zoning Bd. of Appeals of Greenwich, Docket No. LND CV-17-608021-S (Conn. Super. Ct. July 12, 2018); Murphy v. Zoning Bd. of Stamford, FST CV 14-5014294 S (Conn. Super. Ct. Nov. 16, 2016).

240. Bo MacInnis & Jon A. Krosnick, *Climate Insights 2020: Surveying American Public Opinion on Climate Change and the Environment*, 8, RES. FOR THE FUTURE (2020).

241. N.Y.C., N.Y., ADMIN CODE § 2021/041 (2021) (passed Apr. 18, 2021); Office of the Mayor, *Recovery for All of Us: New York City Adopts New Zoning Rules to Protect Coastal Areas From Climate Change*, THE CITY OF N.Y. (May 12, 2021), https://a860-gpp.nyc.gov/downloads/hd76s235c?locale=en; N.Y.C. MAYOR'S OFF. OF RECOVERY AND RESILIENCE, CLIMATE RESILIENCY DESIGN GUIDELINES VERSION 3.0 (2019).

242. CITY AND CNTY. OF S.F., GUIDANCE FOR INCORPORATING SEA LEVEL RISE INTO CAPITAL PLANNING IN S.F.: ASSESSING VULNERABILITY AND RISK TO SUPPORT ADAPTATION (2015).

243. *Coastal Flood Resilience Guidelines & Zoning Overlay District (Article 25A)*, CITY OF BOS. PLANNING DEP'T, https://www.bostonplans.org/planning-zoning/planning-initiatives/flood-resiliency-building-guidelines-zoning-over [https://perma.cc/44QF-S8NT] (last visited Apr. 30, 2026).

244. U.S. GREEN BUILDING COUNCIL, *RELi: Rating Guidelines for Resilient Design + Construction* (Dec. 2018, updated Feb. 2020).

245. Exec. Order No. 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input, 80 Fed. Reg. 6425 (Jan. 30, 2015).

falling short of imposing binding regulations on purely private activities not receiving federal funding.[246] The first Trump administration rolled back several of these actions in 2017 shortly before Hurricane Harvey hit Houston.[247] After the 2020 election, in advance of President Biden's inauguration, several groups petitioned the federal government for more stringent building standards for homes and infrastructure along rivers and coasts.[248] Both FEMA and the Department of Housing and Urban Development (HUD) issued new regulations in 2024.[249] Shortly after taking office, the second Trump administration began repealing, or at least ignoring, these and many other rules and procedures designed to protect against floods.[250]

Strong codes make buildings much safer and are highly cost effective. The National Institute of Building Sciences has calculated that the benefit-cost ratio for adopting the ICC's 2018 codes versus codes represented by 1990-era design was 11-to-1.[251] At least before the second Trump administration, FEMA advocated for strong building codes, and it calculated that those that are in place avoid a total of $1.6 billion in losses from floods, hurricanes and earthquakes per year nationwide.[252] After Hurricane Andrew

246. White House, Fact Sheet: Obama Administration Announces Public and Private Sector Efforts to Increase Community Resilience Through Building Codes and Standards (May 10, 2016).

247. Harriet Sinclair, *Trump Rescinded Obama's Flood-Risk Rule Weeks Before Hurricane Harvey Hit*, NEWSWEEK (Aug. 27, 2017, at 3:24 PM EDT), https://www.newsweek.com/trump-signed-away-obamas-flood-risk-rules-weeks-hurricane-harvey-hit-655712.

248. Christopher Flavelle, *Early Biden Climate Test: Groups Demand Tougher Rules on Building*, N.Y. TIMES, Jan. 6, 2021, https://www.nytimes.com/2021/01/06/climate/flood-zone-building-restrictions.html.

249. FEMA, Updates to Floodplain Management and Protection of Wetlands Regulations to Implement the Federal Flood Risk Management Standard, 89 Fed. Reg. 56929 (July 11, 2024); Dep't of Hous. and Urb. Dev., Floodplain Management and Protection of Wetlands; Minimum Property Standards for Flood Hazard Exposure; Building to the Federal Flood Risk Management Standard, 89 Fed. Reg. 30850 (Apr. 23, 2024).

250. Katie Myers, *Trump Axed a Rule Designed to Spare Taxpayers the Burden of Future Flooding*, GRIST (Apr. 9, 2025), https://grist.org/extreme-weather/trump-axed-a-rule-designed-to-spare-taxpayers-the-burden-of-future-flooding/ [https://perma.cc/97CQ-74HS]; Christopher Flavelle, *FEMA Quietly Eases Rules Meant to Protect Buildings in Flood Zones*, N.Y. TIMES (Feb. 14, 2025), https://www.nytimes.com/2025/02/14/climate/fema-quietly-eases-rules-meant-to-protect-buildings-in-flood-zones.html.

251. NAT'L INST. OF BUILDING SCIENCES, NAT. HAZARD MITIGATION SAVES: 2019 REPORT 1 (2019). *See also* Kevin M. Simmons et al., *Economic Effectiveness of Implementing a Statewide Building Code: The Case of Florida*, 155 LAND ECON. 94 (2018).

252. FEMA, BUILDING CODES SAVE: A NATIONWIDE STUDY 9 (2020). *See also* Thomas Frank, *Harvey Spared Homes Built to New Codes, Flood Maps*, E&E NEWS (Apr. 5, 2019); Ralph

in 1992 destroyed 90 percent of the mobile homes in parts of Florida,[253] Congress directed HUD to adopt national standards for mobile homes (since they are manufactured in different places than where they are used),[254] and the homes built to those standards have proven themselves much more resilient to storms than older units.[255]

b. *Retrofitting*

When a building first goes up, certain features can be installed at a modest cost to make it more resilient, such as stronger roofs, windows, doors, and bracing, and many owners or purchasers will be willing and able to pay. Retrofitting an existing building so that people can stay in the face of climate hazards is another matter entirely, both financially and legally. Once a building is erected in accordance with the then-applicable codes, the building generally does not need to be modified to reflect later changes to the codes.[256] The building enjoys a grandfather status. In some cities it loses this status as to certain codes (such as the fire code) if it is undergoing major modifications, as opposed to mere maintenance.[257]

Sometimes a major disaster will lead to a law that requires retrofitting. For example, starting in 1984, New York City required new high-rise buildings to have sprinkler systems, but older buildings were exempt. In 2004, in response to the destruction of the World Trade Center in the attacks of September 11, 2001, the

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Vartabedian & Ben Welsh, *How Houston's Newest Homes Survived Hurricane Harvey*, L.A. TIMES (Nov. 8, 2017), https://www.latimes.com/projects/la-na-houston-harvey-home-survivors [https://perma.cc/MZ8V-QE6A].

253. Danielle Paquette, *Florida Has 828,000 Mobile Homes. Less Than a Third Were Built to Survive a Hurricane.*, WASH. POST (Sept. 12, 2017), https://www.washingtonpost.com/news/wonk/wp/2017/09/12/florida-has-828000-mobile-homes-only-half-are-insured/; *How Hurricane Andrew Changed Manufactured Housing*, HOMEFIRST (Mar. 25, 2015).

254. National Manufactured Home Construction and Safety Standards Act of 1974, 42 U.S.C. §§ 5401-5426; 24 C.F.R. pts. 3280, 3282, 3284, 3285, 3286, 3288, 3800.

255. Joseph B. Treaster & Henry Fountain, *Considered Vulnerable, Mobile Homes Are Battered But Largely Intact*, N.Y. TIMES (Sept. 14, 2017), https://www.nytimes.com/2017/09/14/us/mobile-homes-florida-irma.html.

256. Int'l Code Council, International Building Code §102.6 (2021). https://codes.iccsafe.org/content/IBC2021P2/chapter-1-scope-and-administration [https://perma.cc/XT3S-EVU6].

257. CONG. RSCH. SERV., R47665, BUILDING CODES, STANDARDS, AND REGULATIONS: FREQUENTLY ASKED QUESTIONS 25 (2025), https://www.congress.gov/crs-product/R47665.

City required all tall buildings built before 1984 to install sprinklers by 2019.[258] Deadly fires have induced other states or cities as well to require that buildings be retrofit with sprinklers or other fire safety measures.[259]

Washington, D.C. has a Building Energy Performance Standards Program that requires large buildings that do not meet certain energy standards to retrofit or take other measures to achieve them. The deadlines vary depending on the size and type of building.[260] Under Tokyo's cap-and-trade program, buildings that do not meet certain energy performance standards must pay a penalty; this fee has driven a substantial amount of retrofitting.[261] Several other cities have laws that require or encourage energy efficiency retrofits, including Chicago, Boston, Mexico City, London, and Shenzhen.[262] But laws requiring buildings to be retrofit to better withstand floods, wildfires, and other climate-related hazards are unusual. Even New York City's robust post-Sandy building codes only mandate retrofitting for flood resilience if the cost to restore a building after it has been damaged is at least 50 percent of the market value of the building.[263] One study found that only 3.5 percent of the structures in the current 100-year

258. *Installing Fire Sprinklers in Commercial Buildings: Evolving Code & Tragedies Drive Laws*, QRFS: QUICK REFERENCE FIRE SUPPLY, https://blog.qrfs.com/212-installing-fire-sprinklers-in-commercial-buildings-evolving-codes-tragedies-drive-laws/ [https://perma.cc/EZL5-9KBQ] (last updated Feb. 6., 2026).

259. Brian Crandall, *How Rhode Island Fire Codes Have Changed Since The Station Nightclub Fire*, 10 WJAR, https://turnto10.com/news/the-station-nightclub-fire/rhode-island-fire-code-sprinkler-pyrotechnics-venue-grandfather-rules-change-improvement-strict-tough-marshal-safety-danger-february-20-2023 (last updated Feb. 20, 2023); *Mayor Adams Signs Legislation Strengthening Fire Safety Enforcement and Education in Wake of Bronx Apartment Fire*, N.Y. CITY OFF. OF THE MAYOR (June 1, 2022), https://www.nyc.gov/office-of-the-mayor/news/357-22/mayor-adams-signs-legislation-strengthening-fire-safety-enforcement-education-wake-bronx#/0 [https://perma.cc/M3R8-X8Y4].

260. Amy L. Edwards, *Are You Ready? Building Performance Standards Deadlines Loom in D.C.*, HOLLAND & KNIGHT, (Feb. 8, 2023), https://www.hklaw.com/en/insights/publications/2023/02/are-you-ready [https://perma.cc/266M-G7LQ].

261. Maggie Comstock, *Innovative Green Building Policy Achieves 23% Reductions in Second Year,* U.S. GREEN BUILDING COUNCIL (Feb. 27, 2013), https://www.usgbc.org/articles/innovative-green-building-policy-achieves-23-reductions-second-year [https://perma.cc/B6BS-BQNV].

262. Benjamin Tweed, *Innovations in City-Level Climate Policy: Building Energy Efficiency and Retrofitting Programs in C40 Cities*, CLARK UNIV. (2016), https://commons.clarku.edu/cgi/viewcontent.cgi?article=1062&context=idce_masters_papers.

263. N.Y.C. DEP'T OF BUILDINGS, REBUILDING NYC AFTER HURRICANE SANDY: A GUIDE TO NEW CODE AND ZONING STANDARDS FOR INDUSTRY PROS. 11 (2015), https://www.nyc.gov/assets/buildings/pdf/rebuilding_after_hurricane_sandy.pdf [https://perma.cc/Q5W3-C9WF].

floodplain in New York were obligated to institute resilience measures.[264]

Carrots are more readily accepted than sticks. In 2019, California enacted a law to provide financial incentives for buildings in high-fire-hazard areas that opt to retrofit for fire resistance.[265] Some insurance policies offer discounts to homes that are fire resistant.[266]

Another approach is voluntary guidelines on retrofitting existing buildings for greater resilience.[267] One example, FORTIFIED, is a construction and re-roofing program designed to strengthen buildings against severe weather that was launched by the insurance industry and has seen meteoric growth in recent years.[268] Numerous technologies exist, and more are being developed, to increase building resilience.[269] Investment firms are being established that specialize in them.[270] The consulting firm McKinsey estimated in 2025 that technologies that support climate resilience could become a market of up to $1 trillion by 2030.[271]

New buildings may well adopt these technologies if the price is

264. N.Y.C. COMPTROLLER, TEN YEARS AFTER SANDY: BARRIERS TO RESILIENCE (2022), https://comptroller.nyc.gov/reports/ten-years-after-sandy/ [https://perma.cc/HM93-L2EC].

265. A.B. 38, 2019 Gen. Assemb., Reg. Sess. (Cal. 2019).

266. Avery Ellfeldt, *California Insurers Begin Giving Discounts for Fire-Proofed Homes*, E&E NEWS (Sept. 19, 2024), https://www.eenews.net/articles/california-insurers-begin-giving-discounts-for-fire-proofed-homes/.

267. *See, e.g.*, *Wind Retrofit Guide for Residential Buildings FEMA P-804*, FEMA (Dec. 2010), https://www.wbdg.org/FFC/DHS/fema_p_804.pdf [https://perma.cc/WEZ8-FX2K]; *Retrofitting Buildings for Flood Risk*, N.Y.C. DEP'T OF CITY PLAN. (Oct. 18, 2014), https://www.nyc.gov/content/planning/pages/our-work/plans/citywide/retrofitting-buildings-flood-risk [https://perma.cc/7GV5-6QK6]; Hurricane Retrofit Guide, FLA. DIV. OF EMERGENCY MGMT. (2010), https://apps.floridadisaster.org/hrg/downloads/index.pdf [https://perma.cc/6AGS-4T8G].

268. FORTIFIED, https://fortifiedhome.org/about/ (last visited May 4, 2026); Alexis Trittipo et al., *Climate Resilience Technology: An Inflection Point for New Investment*, MCKINSEY (Sept. 29, 2025), https://www.mckinsey.com/capabilities/sustainability/our-insights/climate-resilience-technology-an-inflection-point-for-new-investment.

269. *See* Emilie Mazzacurati, *Taxonomy for Adaptation and Resilience Investments*, TAILWIND (May 6, 2024), https://www.tailwindfutures.com/taxonomy/ [https://perma.cc/U76W-X4YA]; ALICE C. HILL & LEONARDO MARTINEZ-DIAZ, BUILDING A RESILIENT TOMORROW: HOW TO PREPARE FOR THE COMING CLIMATE DISRUPTION 31-35 (2019); Patrick Sisson, *New LA Home Designs, Reimagined By Fire*, BLOOMBERG (Jan. 7, 2026), https://www.bloomberg.com/news/features/2026-01-07/la-s-wildfire-rebuilding-brings-new-home-design-construction-tech.

270. Ben German, *1 Big Thing: A Climate Investing Thesis for its Time*, AXIOS (Oct. 17, 2025).

271. Trittipo et al., *supra* note 268.

right; old buildings probably will not unless required by law. State and local building and zoning codes *could* require defensive actions in existing buildings to allow people to stay in climate-vulnerable places. Political rather than legal constraints prevent them from being enacted more widely. For example, in rental buildings, the costs will almost certainly be passed down to tenants, impairing an already serious issue of housing affordability. The government could instead subsidize the work and impose the costs on taxpayers, which may be no easier politically.

It might be within the constitutional power of the federal government under the Commerce Clause to impose building retrofit requirements to prepare for climate change, though there are arguments that this kind of direct control over buildings falls within the police power that is reserved to the states. This argument should not apply, however, if the retrofit rules are simply conditions to federal funding, such as through federally-subsidized mortgages or flood insurance.[272] Congress has seldom exercised this power except for federally owned, occupied, or financed buildings, but it did so in enacting the Americans With Disabilities Act, which imposes nationwide standards on building accessibility.[273] The constitutionality of this law has been upheld.[274] Other examples of federal preemption of local land use controls include regulations on religious buildings and telecommunications towers, but they mostly involve new buildings, not retrofits.[275] The Waxman Markey bill, the major climate legislation that narrowly passed the House of Representatives in 2009 but died in the Senate, included a little-noticed provision that would have imposed nationwide energy efficiency requirements on new buildings and major renovations.[276]

The principal legal, as opposed to political, constraint on state and local governments imposing building retrofit requirements or

272. Adams, *supra* note 109, at 46-47.

273. 42 U.S.C. §§12183, 12186(d)(1), 12204.

274. Tenn. v. Lane, 541 U.S. 509 (2004); Pinnock v. Int'l House of Pancakes, 844 F. Supp. 574 (S.D. Cal. 1993).

275. John R. Nolon, *Historical Overview of the American Land Use System: A Diagnostic Approach to Evaluating Governmental Land Use Control*, 23 PACE ENVTL L. REV. 821, 840-842 (2006); Ashira Pelman Ostrow, *Process Preemption in Federal Siting Regimes*, 48 HARVARD J. LEGIS. 289, 290 (2011).

276. Edward Mazria, *Oh, Those Sexy Building Codes: More Powerful than 100 Nuclear Plants*, GRIST (July 24, 2009), https://grist.org/article/2009-07-23-building-energy-codes-are-best-part-of-waxman-markey/.

limitations would be the Takings Clause of the Fifth Amendment of the Constitution, which says "nor shall private property be taken for public use, without just compensation." As interpreted by the Supreme Court in *Lucas v. South Carolina Coastal Council*, if a regulation deprives a property owner of *all* economic uses of their property, that could be a taking requiring just compensation.[277] If government action deprives an owner of much but not all of the value of their property, the courts instead apply what is called the *Penn Central* test, a balancing test under which the courts examine the economic impact of the regulation on the claimant, the extent to which the regulation "has interfered with distinct investment-backed expectations," and "the character of the government action."[278]

However, several states have adopted laws that restrict local governments from adopting building codes that a stricter than the model national codes,[279] or not let them take "any action that materially increases the regulatory burden on a business,"[280] or prevent them from restraining land use development to reflect recent hurricane damage.[281] In 2025, Florida Governor Ron

277. Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992).

278. Penn Central Transportation Co. v. City of N.Y., 438 U.S. 104 (1978); Steven J. Eagle, *The Four-Factor* Penn Central *Regulatory Takings Test*, 118 PENN STATE L. REV. 601 (2014).

279. Tex. Gov't Code § 3000.002 ("[A] governmental entity may not adopt or enforce a rule, charter provision, ordinance, order, building code, or other regulation that ... (2) establishes a standard for a building product, material, or aesthetic method in construction, renovation, maintenance, or other alteration of a residential or commercial building if the standard is more stringent than a standard for the product, material, or aesthetic method under a national model code published within the last three code cycles that applies to the construction, renovation, maintenance, or other alteration of the building.")

280. Ariz. Rev. Stat. Ann. § 9-841(A) (2016) ("Unless authorized by federal, state or local law a city or town may not take any action that materially increases the regulatory burdens on a business unless there is a threat to the health, safety and welfare of the public that has not been addressed by legislation or industry regulation within the proposed regulated field.")

281. Chapter No. 2023-349 § 14, Laws of Fla. (2024) ("Due to the impacts of Hurricane Ian, Charlotte, Collier, Desoto, Glades, Hardee, Hendry, Highlands, Lee, Manatee, and Sarasota Counties, and any a county or municipality located within one of those counties, may not propose or adopt any moratorium on construction, reconstruction, or redevelopment of any property damaged by Hurricane Ian; propose or adopt more restrictive or burdensome amendments to its comprehensive plan or land development regulations; or propose or adopt more restrictive or burdensome procedures concerning review, approval, or issuance of a site plan, development permit, or development order, to the extent that those terms are defined by [Florida Law] before October 1, 2026, and any such moratorium or restrictive or burdensome comprehensive

DeSantis signed a law that prohibits local governments from requiring builders to undertake certain measures that would reduce storm damage.[282] This law is being challenged in state court in Florida on, among others, substantive due process grounds.[283]

Political and legal challenges aside, retrofitting can come at high economic costs. But several innovative techniques can help. For example, a public benefit company called the National Energy Improvement Fund (which absorbed the prior group MyStrongHome) arranges financing and identifies contractors who strengthen roofs and other home elements so that they can better endure extreme weather. This work also lowers insurance premiums. Several foundations assisted with the financing in the early stages.[284] As another example, the North Carolina Insurance Underwriting Association provided $10,000 subsidies to homeowners who were reroofing their houses to use especially wind-resistant roofs. The Association concluded that it will recoup $72 million over ten years from this investment, both due to avoided losses and also from having to purchase less reinsurance because their portfolio is less risky.[285]

In sum, the experience with buildings demonstrates that construction and retrofitting techniques can be very cost effective in guarding against certain climate-related risks, but building owners are unlikely to undertake them unless the government or

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plan amendment, land development regulation, or procedure shall be null and void ab initio.")

282. Fla. Chapter 2025-190, "Committee Substitute for Committee Substitute for Senate Bill No. 180," https://laws.flrules.org/2025/190; Amy Green, *These Florida Communities Wanted to Be More Sustainable and Resilient. A New State Law Blocks Their Efforts*, INSIDE CLIMATE NEWS (Oct. 8, 2025), https://insideclimatenews.org/news/08102025/florida-hurricane-disaster-policies/ [https://perma.cc/HR27-73P2].

283. Complaint, 1000 Friends of Florida, Inc. v. Kelly (Circuit Court, Second Judicial Circuit in Leon County, Florida, Filed Oct. 7, 2025), https://1000fof.org/wp-content/uploads/2025/10/233155699-Complaint-Concerning-Constitutional-Challenge-To-Statute-Or-Ordinance.pdf [https://perma.cc/3XBL-78EF].

284. Calvert Foundation, *Calvert Foundation Announces $8 Million Investment in MyStrongHome*, PR NEWSWIRE (May 30, 2017 at 12:00 PM EDT), https://www.prnewswire.com/news-releases/calvert-foundation-announces-8-million-investment-in-mystronghome-300465403.html [https://perma.cc/9W36-HD3L].

285. Leslie Kaufman, *Super Roofs Rewarded Insurers, Cat Bond Investors and Homeowners*, BLOOMBERG L. (Dec. 1, 2025), https://www.bloomberg.com/news/articles/2025-12-01/super-roofs-rewarded-insurers-cat-bond-investors-and-homeowners; UNIV. OF NORTH CAROLINA AT CHAPEL HILL SCH. OF L., *Historic $600 Million Insurance Innovation Links Storm-Resilient Construction with Financial Markets* (Oct. 23, 2025), https://law.unc.edu/news/2025/10/historic-600-million-insurance-innovation-links-storm-resilient-construction-with-financial-markets/ [https://perma.cc/8VU4-HYT7].

insurance companies require them or provide serious incentives.

c. *Rebuilding*

Sometimes there is a choice between abandoning an area that has been devastated by flooding or fires or rebuilding it. Rebuilding, part of the Stay scenario, is usually chosen. After Hurricane Katrina, even those parts of New Orleans that were below the levels of the Mississippi River and Lake Pontchartrain were rebuilt. To protect the city after Katrina, the Corps spent $14 billion on a network of floodwalls and levees. However, in 2019, soon after it was completed, the Corps said that the system would become inadequate because of rising sea levels and shrinking levees, and the Corps needed another $800 million to further fortify the levees.[286] The system survived Hurricane Ida in 2021 but some suburban areas not protected by the levees flooded.[287] In 2023, the Corps said they said they needed another $3.7 billion for added protections.[288] So far the money is not available.[289]

To allow residents to rebuild their homes after Hurricanes Katrina and Rita, Louisiana used federal money to establish the $9.8 billion Road Home program. It did not go entirely well. The program awarded up to $150,000 per house based on the lower of

286. Thomas Frank, *After a $14-Billion Upgrade, New Orleans' Levees Are Sinking*, SCIENTIFIC AM. (Apr. 11, 2019), https://www.scientificamerican.com/article/after-a-14-billion-upgrade-new-orleans-levees-are-sinking/; David Hammer, *New Orleans Levees Sinking Faster Than Planned*, 4WWL (July 26, 2019), https://www.wwltv.com/article/news/investigations/david-hammer/new-orleans-levees-sinking-faster-than-planned/289-43f9762f-c321-4051-b14e-d04a8076fde9; Mark Schleifstein, *New Orleans Area Levee System "High Risk," and "Minimally Acceptable," Corps Says*, TIMES-PICAYUNE, May 22, 2018; Jake Bittle, *20 Years After Katrina, New Orleans' Levees Are Sinking and Short on Money*, GRIST (Aug. 27, 2025), https://grist.org/extreme-weather/katrina-levees-new-orleans-army-corps-trump-landry [https://perma.cc/54FV-B2U9].

287. Associated Press, *New Orleans Levees Passed Hurricane Ida's Test, But Some Suburbs Flooded*, NPR (Aug. 31, 2021). https://www.npr.org/2021/08/31/1032804634/new-orleans-levees-hurricane-ida-flooding [https://perma.cc/M2TB-UN4L].

288. James Leggate, *Corps Updates Cost for $3.7B Louisiana Levee System Proje*ct, ENR TEX. & SOUTHWEST (July 19, 2023), https://www.enr.com/articles/56810-corps-updates-cost-for-37b-louisiana-levee-system-project [https://perma.cc/ATY6-HB3C].

289. Mark Schleifsten, *New Orleans' Hurricane Protection System Faces Looming Threats. Money to Address Them is Lacking,* TIMES-PICAYUNE (July 6, 2025), https://www.nola.com/news/environment/new-orleans-hurricanes-flooding-corps-of-engineers-levees/article_431437d2-35c8-40b3-8660-aee88d97b805.html; Alex Lubben, *Sections of New Orleans Flood Walls Are Sinking Faster Than Sea Levels Are Rising, Study Finds*, TIMES-PICAYUNE (June 28, 2025), https://www.nola.com/news/environment/new-orleans-flood-walls-sinking-faster-than-seas/article_78743827-e52c-49e5-82e2-fad15efed2a0.html.

its pre-storm value and the cost of rebuilding. Since home values in most predominantly Black neighborhoods were lower than the values of similar homes in white neighborhoods—a legacy of segregated housing patterns—the grants for Black homeowners were more likely to be based on the pre-storm value, leaving them with too little money to rebuild, while white homeowners were more likely to receive grants based on the actual cost of repairs. In one predominantly Black neighborhood, the average property was valued at $121,000, with $203,000 in rebuilding costs; the average homeowner ended up with just 73 percent of what was needed to rebuild.[290] Two civil rights groups sued, saying this was discriminatory. The U.S. District Court agreed but the Court of Appeals reversed, finding insufficient proof of a disparate impact.[291] Six years after the storms, HUD settled and agreed to pay the cost of rebuilding.[292] However, the fine print in the grant agreements obligated the homeowners to elevate their homes or take other steps to protect them from flooding. In 2022, the State of Louisiana, under pressure from HUD, sued nearly 4,000 residents who had not raised their homes, seeking to take back more than $300 million in grant payments—even though the payments to each house were considerably less than it would take to elevate them.[293] This move led to such an outcry that the state quickly suspended the lawsuits.[294] Another problem was that many

290. Jeff Adelson, *Data Proves Louisiana's Home Rebuilding Program Unfair to Poor*, GOVERNING (Dec. 12, 2022), https://www.governing.com/community/data-proves-louisianas-home-rebuilding-program-unfair-to-poor [https://perma.cc/AHW5-9N62].

291. Greater New Orleans Fair Hous. Action Ctr. v. U.S. Dep't of Hous. and Urb. Dev., 639 F.3d 1078 (D.C. Cir. Apr. 8, 2011); James Perry, *"The Road Home" is a road to Nowhere for Black New Orleanians*, PN: PLANNERS NETWORK (Oct. 14, 2010), https://www.plannersnetwork.org/2010/10/the-road-home-is-a-road-to-nowhere-for-black-new-orleanians/ [https://perma.cc/X95U-ZG4T].

292. Michael A. Fletcher, *HUD to pay $62 million to La. Homeowners to Settle Road Home Lawsuit*, WASH. POST (July 6, 2011), https://www.washingtonpost.com/business/economy/hud-to-pay-62-million-to-la-homeowners-to-settle-road-homelawsuit/2011/07/06/gIQAtsFN1H_story.html; Davida Finger, *Post-Disaster Housing Through the Lens of Litigation: The Katrina Housing Justice Docket*, 61 LOY. L. REV. 591, 610 (2015).

293. David Hammer, *Louisiana Is Suing Nearly 4,000 Residents to Get Back $300 Million in Katrina Rebuilding Money*, 4WWL (May 14, 2022), https://www.wwltv.com/article/news/local/katrina/road-home-grants-elevation-law-suits-explained-history/289-b1c90955-dc52-4f1d-953e-167be93cd034.

294. *Staff editorial, Our Views: The end of the Road Home's mistreatment of Louisianans can't come soon enough*, THE ADVOCATE, (June 5, 2022), https://www.theadvocate.com/baton_rouge/opinion/our_views/our-views-the-end-of-the-road-homes-mistreatment-of-louisianans-cant-come-soon-enough/article_843501ee-e2c6-11ec-8c3c-67d3ca3b2467; Greg Larose, *Road Home Reaches Its End, Thousands of Lawsuits Against Recipients Pulled*, LA.

people needed to use much of their Road Home money for back taxes or mortgage payments on homes they could not live in for years.[295]

After Hurricane Sandy devastated parts of the New York City region in 2012, the City vowed not only to rebuild almost all areas (except for those discussed below in the "Leave" section of this article) but to continue development in still-vulnerable areas by making them more resistant. As a follow-up to Mayor Bloomberg's PlaNYC, in 2013 the City issued its *A Stronger, More Resilient New York* report, with more than 250 initiatives. They involved changing the building and zoning codes, hard armoring in some places on the shore and soft armoring on others, and competitions to build major shoreline protections. As that report contemplated, much construction including luxury high-rise condominiums still occurs along New York's waterfront, though with greater flood protections.[296]

D. *Shrink*

Overview: Certain laws and policies have the effect of shrinking cities—not their acreage, but their population. A few such policies have shrinkage as their objective, but for most, shrinkage is a side effect of measures that reduce the housing stock or prevent the city from growing. A number of legal doctrines make it harder to shrink, and some of those doctrines will have to change. Certain neighborhoods are so vulnerable to climate change that there will never be enough money to build the defenses to allow the residents to stay, and remaining will be dangerous.

A 2019 study identified 382 metropolitan areas in the United States and found that, between 2010 and 2017, 25 of them had

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ILLUMINATOR (Feb. 16, 2023), https://lailluminator.com/2023/02/16/road-home-reaches-its-end-thousands-of-lawsuits-against-recipients-pulled/.

295. VINCANNE ADAMS, MARKETS OF SORROW, LABORS OF FAITH: NEW ORLEANS IN THE WAKE OF KATRINA, 35 (Duke Univ. Press, 2013).

296. Ginia Bellafonte, *Why Is New York Still Building on the Waterfront?*, N.Y. TIMES, (Oct. 31, 2022), https://www.nytimes.com/2022/10/28/nyregion/waterfront-building-hurricane-sandy.html; Anna Rahmanan, *New Yorkers are still flocking to waterfront apartments despite sea level rise*, TIMEOUT (Nov. 21, 2022), https://www.timeout.com/newyork/news/new-yorkers-are-still-flocking-to-waterfront-apartments-despite-sea-level-rise-112122 [https://perma.cc/4FG6-QFFX]; New York City Dep't of City Planning, *The New York City Waterfront Revitalization Program: Climate Change Adaptation Guidance* (2018), https://www.nyc.gov/assets/planning/downloads/pdf/applicants/special-processes/policy-62-guidance-document-nov2018.pdf [https://perma.cc/CW7F-EMXL].

shrunk in population between 3 and 10 percent.[297] This is not to say that any of them wanted to lose population.

After its steel mills closed, the rust belt city of Youngstown, Ohio lost almost 60 percent of its population. The city adopted a plan in 2005 to adjust its zoning and downsize its infrastructure. However, later elected officials appeared to be less enthusiastic about this goal, and much of the 2005 plan was not implemented.[298] Many abandoned houses (often having become tax delinquents) were demolished rather than remaining as dilapidated eyesores and their parcels were put into a land bank, but there was less progress in removing infrastructure.[299] In one neighborhood that had been particularly afflicted by the job loss, 3.9 miles of roads (where illegal dumping had become rampant) were closed off and nine houses were torn down, but overall just 0.3 percent of the city's overall roadway network was closed. Despite the overall plunge in population, vacancies were scattered and there were few places where roads could be abandoned with little pain.[300] The city did decide to reduce the size of a planned wastewater project[301] and to consolidate its schools.[302]

Some cities that have experienced population loss and abandoned houses have adopted a policy of "greening"—taking over the houses, demolishing them, cleaning up the lots, and planting grass and shrubbery to turn them into pocket parks.[303] These lots can also help reduce neighborhood flooding by

297. Samuel Stebbins, *America's Fastest Shrinking Cities*, 24/7 WALL ST., (May 2, 2019), https://247wallst.com/special-report/2019/03/14/americas-fastest-shrinking-cities-5/ [https://perma.cc/DZJ9-M9SC].

298. Brent D. Ryan & Shuqi Gao, *Plan Implementation Challenges in a Shrinking City*, 85 J. AM. PLAN. ASS'N 424 (2019).

299. Shuqi Gao & Brent D. Ryan, *Can Neighborhood Planning in Shrinking Cities Achieve Demolition Goals? A Conformance and Performance Evaluation of Neighborhood Action Plans in Youngstown, Ohio*, 44 J. PLAN. EDUC. & RES. 143 (2024).

300. Terry Schwarz, *Reconfiguring Infrastructure in Youngstown, Ohio*, ARCHITECTURAL LEAGUE OF NY (2021).

301. David Skolnick, *Youngstown prepares for wastewater project downsized from $240M*, THE VINDICATOR (June 2, 2025), https://www.vindy.com/news/local-news/2025/06/youngstown-prepares-for-wastewater-project-downsized-from-240m/ [https://perma.cc/9A2L-U4TG].

302. Connor Morris, *'A New day for Youngstown.' School district plans consolidation of middle, high schools*, IDEASTREAM PUB. MEDIA, (May 15, 2025), https://www.ideastream.org/education/2025-05-15/a-new-day-for-youngstown-school-district-plans-consolidation-of-middle-high-schools [https://perma.cc/PSN6-ES82].

303. Sujata Shetty, S*hrinking Cities in the Industrial Belt: A Focus on Small and Mid-size Cities in Northwestern Ohio*, URB. AFF. CTR., 10 (Dec. 2009).

absorbing stormwater.

Other laws and policies are not explicitly about downsizing but do have the effect of restricting development in vulnerable areas. Some of these can readily be called laws that lead to shrinkage; others merely inhibit growth, but will be discussed here. They can be arrayed along a spectrum from the least to the most severe.

Barring reconstruction: At the mild end of the spectrum are laws that bar the reconstruction of buildings that have been destroyed or severely damaged by flood or fire. Many local codes do not allow the rebuilding of structures that were inconsistent with zoning; these are called prior nonconforming uses.[304] Beyond that, relatively few laws bar reconstruction. FEMA has designated some 45,000 Severe Repetitive Loss Properties, meaning that they have flooded multiple times; on average they have submitted five claims to the National Flood Insurance Program, and some have flooded more than 30 times and received federal insurance payouts for each. The states with the most such properties are Louisiana and Texas, with more than 9,000 each.[305] Homeowners who receive payouts for multiple claims can still keep their insurance and do not have to pay higher premiums.[306] The payouts sometimes add up to much more than the pre-flood value of the house. Some localities do bar the reconstruction of properties that have been repetitively damaged; more should, and Congress should place serious limits on payouts for such properties.[307] Congress did impose such limits in 2012 when, in the words of one account, "The program's critics on the right (who hated the taxpayer subsidies) and left (who hated its incentives for building in floodplains) formed a coalition called Americans for Smart Natural Catastrophe Policy to push reform."[308] With their support Congress passed the Biggert-Waters Act. However, when the limits were about to go in effect and flood insurance rates for many were about to go up,

304. Grant v. Mayor and City Council of Baltimore, 212 Md. 301, 129 A.2d 363 (Ct. App. 1957).

305. Anna Weber, *Losing (More) Ground: Updated Severe Repetitive Loss Data*, NAT. RES. DEF. COUNCIL, (Jan. 9, 2024); Rob Moore, *Seeking Higher Ground: Climate Smart Solutions to Flooding*, NAT. RES. DEF. COUNCIL (July 25, 2017).

306. Moore, *Seeking Higher Ground*, *supra* note 305. This is in stark contrast to automobile insurance, which, unlike federal flood insurance, is not subsidized.

307. Dena Adler & Joel Scata, *Breaking the Cycle of 'Flood-Rebuild-Retreat'*, SABIN CTR. FOR CLIMATE CHANGE LAW (2019).

308. Michael Grunwald, *Hell and High Water*, TIME (May 8, 2014), https://time.com/92068/hell-and-high-water/.

Congress in 2014 repealed most of this law.[309]

Setbacks: Next on the spectrum are laws that declare certain land off limits for new construction. An example is setback rules that require construction to be a certain distance from the ocean's mean high tide line (or some other designated line). If a setback rule renders a parcel completely unusable, the *Lucas* decision discussed above might require compensation.

California has a shoreline of 3,427 miles,[310] and the California Coastal Act[311] is the most detailed legislation in the United States on managing sea level rise and other coastal hazards. It gives the California Coastal Commission considerable powers and duties over land use in the coastal area[312] and requires the Commission to minimize coastal hazards through planning and development standards.[313] The Commission has issued detailed guidelines on what kinds of construction are and are not allowable in the coastal area,[314] and has required numerous applicants to move their planned developments further from the shoreline.[315] The state policy of preparing for sea level rise and other climate risks has been enhanced by executive orders issued by Governor Arnold Schwarzenegger in 2008,[316] Governor Jerry Brown in 2015,[317] and Governor Gavin Newsom in 2020.[318] However, one examination concluded that the implementation of the Coastal Act "has served exclusionary ends and contributed to an increasingly more affluent and demographically homogenous Coastal Zone," and has "contributed to the state's housing shortages and affordability issues."[319]

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309. *Id. See also* Kristina Alexander, *After the Deluge: The National Flood Insurance Program*, WATER LOG, 3-6 (Aug. 2018), https://masglp.olemiss.edu/waterlog/pdf/aug18/watlg38.3_article1.pdf [https://perma.cc/6F5C-8P79].

310. NAT'L OCEANIC AND ATMOSPHERIC ADMIN., OFF. OF COASTAL MGMT., *Shoreline Mileage of the United States* (undated), https://coast.noaa.gov/data/docs/states/shorelines.pdf.

311. Cal. Pub. Res. Code, §§ 30000 et seq. (West 2026).

312. Cal. Pub. Res. Code §§ 30330–30344 (West 2026).

313. Cal. Pub. Res. Code §§ 30001, 30001.5, 30253 (West 2026).

314. CAL. COASTAL COMM'N, *Sea level Rise Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits* (2018).

315. Charles Lester et al., *Shoreline Retreat in California: Taking a Step Back*, 38 J. COASTAL RSCH. 1207, 1214 (2022).

316. Cal. Executive Order No. S-13-08 (Nov. 14, 2008).

317. Cal. Executive Order No. B-30-15 (Apr. 29, 2015).

318. Cal. Executive Order No. N-82-20 (Aug. 14, 2020).

319. Jake Dow, *Priced Out of Paradise: The California Coastal Act's Role in Exacerbating*

Where development of a parcel requires a discretionary governmental approval such as a special permit, a variance, or a rezoning, denial of that approval might not be a taking because the landowner has no right to these discretionary approvals. For example, in New York, one developer bought a former golf course hoping to build a residential subdivision. The town rezoned the property to greatly reduce the number of houses that could be built, in part because of coastal flood risk. A federal court found that the developer was not entitled to the approvals it sought and could not make out a takings claim.[320] Several other decisions have upheld government actions that restricted use of property because of flooding or similar threats.[321]

Rolling easements: Another type of restriction on property use is rolling easements—rules that automatically "roll" the area where development is barred as the sea rises and the beach recedes. While *Lucas* required compensation for a regulation that "denies all economically beneficial use of land," it declared an exception for land whose use is restricted by "background principles of the State's law of property and nuisance."[322] Under the common law of some states, derived from the public trust doctrine (going back to the Justinian Code of the 6th century C.E.), the public owns the land seaward of a designated line, typically the mean high water line. Therefore, a law that prohibits development seaward of that line there might not be a "taking" because the public, not the upland owner, now owns the property whose use is restricted. State laws vary considerably in when these background principles automatically shift title to land overtaken by the water from private owners to the state.[323]

Flood hazard restrictions: Another restriction on development

California's Housing Supply Crisis, 27 LEGIS. & PUB. POL'Y 213, 213 (2024).

320. W.G. Woodmere LLC v. Town of Hempstead, No. 20-CV-03903, (E.D.N.Y. Dec. 1, 2022); Complaint at 38,W.G. Woodmere LLC v. Town of Hempstead, No. 20-CV-03903 (E.D.N.Y. Aug. 24, 2020).

321. *See* Doherty v. Planning Bd. of Scituate, 467 Mass. 560 (2014); Argos Properties II, LLC v. City Council for Va. Beach, No. CL18-4676, (Va. Cir. Ct., May 24, 2019); Martin v. Cal. Coastal Comm'n., 66 Cal. App. 5th 622 (Ct. App. 2021); Lindstrom v. Cal. Coastal Comm'n., 40 Cal. App. 5th 73 (2019); A Piece of Paradise, LLC v. Borough of Fenwick Zoning Bd. of Appeals, No. HHB-CV-14-6025015-S (Conn. Super. Ct., December 23, 2015); Downes v. Madison Planning & Zoning Comm'n, No. CV-21-6116048-S (Conn. Super. Ct., Sep. 20, 2024).

322. *Lucas*, 505 U.S. at 1015, 1029.

323. Meg Caldwell & Craig Holt Segall, *No Day at the Beach: Sea Level Rise, Ecosystem Loss, and Public Access Along the California Coast*, 34 ECOLOGY L.Q. 533, 570-574 (2007).

arises under the National Flood Insurance Act, which requires FEMA to encourage state and local governments to undertake measures to "constrict the development of land which is exposed to flood damage" and "guide the development of proposed construction away from locations which are threatened by flood hazards."[324] FEMA has issued regulations intended to have this effect.[325] When FEMA designated an area in South Carolina as a floodway, meaning that floodwaters should be allowed to flow unimpeded, the county barred a landowner from proceeding with a planned development there. The landowner sued the county, claiming this was an unconstitutional taking of its property. The South Carolina Supreme Court applied the *Penn Central* test discussed above and found that this restriction was not a taking.[326]

As already shown, some state and local laws bar coastal armoring, and those laws have been upheld by the courts. If a house is on the shore and the beach is eroding away, eventually the house may fall into the water. That could be called a form of shrinking the city.

Downzoning: Yet another way that local governments can restrict rebuilding and growth is "downzoning"— decreasing the intensity of permissible uses. The courts disfavor piecemeal as opposed to comprehensive downzoning, so targeting one or just a few parcels could be legally risky.[327]

Exactions: Local governments can also use exactions, or permit conditions that require the applicants to meet certain conditions, such as dedicating some land for a public purpose (such as floodplain preservation), restricting further development, refraining from armoring the beach, or removing structures as they become threatened by development or erosion.[328] The Supreme Court has held that exactions must bear an essential nexus to the expected impacts of the development, and their burden must be "roughly proportional" to these impacts.[329]

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324. 42 U.S.C. § 4102(c).

325. 44 C.F.R. § 60.3.

326. Columbia Venture, LLC v. Richland Cnty., 776 S.E.2d 900, 913 (2015).

327. Barb Marmet, *Using Zoning Tools to Adapt to Sea Level Rise*, VA. COASTAL POLICY CENTER (2013).

328. J. PETER BYRNE & JESSICA GRANNIS, *Coastal Retreat Measures*, in THE LAW OF ADAPTATION TO CLIMATE CHANGE 267, 272-274 (Michael B. Gerrard & Katrina Fischer Kuh, eds., 2012).

329. Sheetz v. Cnty. of El Dorado, 601 U.S. 267, 275-76 (2024); Nollan v. Cal. Coastal Comm'n, 483 U.S. 825, 837 (1987); Dolan v. City of Tigard, 512 U.S. 374, 391 (1994).

Abandonment of infrastructure: Moving toward the most severe end of the "shrink" spectrum is the abandonment of roads, rendering some areas inaccessible. The most famous case on this subject is *Jordan v. St. Johns County*.[330] A county road on a barrier island in Florida provided the only access for several homes. The road was damaged by storms and erosion and became difficult to traverse. The county stopped repairing the road, claiming sole discretion to do so, though the county had not gone through the formal procedures to abandon the road. The residents sued. The court held that the county "has a duty to reasonably maintain [the road] as long as it is a public road dedicated to public use." The court also held that "government inaction—in the face of an affirmative duty to act—can support a claim for inverse condemnation."

In contrast, a North Carolina court upheld a town's decision to stop repairing and rebuilding a road that was repeatedly washed away by storms.[331] Different states have different rules (some from courts, some from statutes or regulations) concerning such items as the duties imposed on governments to maintain roads, the immunities shielding these governments from liability, and the ability of localities to abandon existing roads.[332]

Many local governments will fail to protect their infrastructure from climate impacts. As Mark Nevitt has written, "Climate change is poised to trigger a slew of new inverse condemnation claims as localities stop upgrading and maintaining climate-exposed roads, bridges, and levees. Governments at all levels must walk an adaptation tightrope that balances action and inaction—a difficult task under the best of circumstances."[333] Some governments may conclude that the areas served by this infrastructure are so vulnerable to extreme weather, and serve so few people, that they are not worth large amounts of taxpayer money to save. Where courts follow the lead of *Jordan v. St. Johns County* (which not many have), it will be harder for localities to engage in planned shrinkage. But a declining population will find it increasingly difficult to pay to maintain decaying infrastructure.

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330. 63 So.3d 835 (Fla. Dist. Ct. App. 2011).

331. Kirkpatrick v. Town of Nags Head, 713 S.E.2d 151, 161 (N.C. Ct. Appl. 2011).

332. Shana Jones et al., *Roads to Nowhere in Four States: State and Local Governments in the Atlantic Southeast Facing Sea-Level Rise*, 44 COLUMBIA J. ENVTL. L. 67, 83 (2019).

333. Mark Nevitt, *The Legal Crisis Within the Climate Crisis*, 76 STAN. L. REV. 1051, 1106 (2024).

A key issue is whether a locality's failure to maintain a road, leading to the devaluation of properties that rely on the road, would be a taking. An important 2018 decision from the Court of Appeals for the Federal Circuit found that "the government cannot be liable on a takings theory for inaction" in cases involving flooding caused by lack of maintenance.[334] That case involved the Mississippi River Gulf Outlet, whose poor condition allegedly worsened the impacts of Hurricane Katrina.[335]

Closely related to abandoning roads would be a refusal or cutoff of utility services, such as electricity, natural gas, and water. Unlike roads, however, most public utilities (including water when provided by private companies) are regulated by the state public utility commissions, which impose a "duty to serve." This duty arose from the common law, but now every state has its own statutes and regulations defining it.[336] Just about everywhere it includes a duty to extend service throughout a designated territory (with certain exceptions for remote areas), and to provide continuing reliable service, with limitations on the ability to shut off service. The costs are spread across a broad customer base. The obligations to always provide service almost everywhere, and to socialize the cost so that even people in places that are hard and expensive to serve must only pay about the same as other customers, all assume stationary physical conditions. If the threat of flooding or wildfire becomes so great that a town decides it needs to shrink and to vacate some neighborhoods, the utilities' duty to serve needs to be revised. Most jurisdictions already allow exceptions where extending service or even continuing to provide it in a given instance would foreseeably impose a financial loss on the utility's enterprise. But this exception does not mean that every segment of a network needs to be profitable.[337]

If utility service to an area is cut off because the area is being abandoned, the issue of stranded assets must be confronted. The

334. St. Bernard Parish Gov't v. U.S., 887 F.3d 1354, 1357 (Fed. Cir. 2018).

335. *Id. But see* Arreola v. Cnty. of Monterey, 122 Cal.Rptr.2d 38 (Cal. App. 2002) (finding the county liable for damages when it did not adequately maintain a levee that failed in a flood that should have been anticipated).

336. KRISTIN GEORGE BAGDANOV, DECARBONIZING THE OBLIGATION TO SERVE (Building Decarbonization Coalition, Mar. 2024), https://buildingdecarb.org/wp-content/uploads/FINAL_Decarbonizing-the-Obligation-to-Serve_Oct2024.pdf [https://perma.cc/LN7H-FCAY].

337. Justin Gundlach & Josh Lappen, *Managing Wasteful Competition Between Wires and Pipes Utilities*, 46 ENERGY L.J. (forthcoming 2026).

utility has spent ratepayer money installing equipment that will be retired before the end of its useful life, or even before it is fully amortized, leaving questions about who will bear the cost.[338]

When a neighborhood's population is shrinking, who and what are left behind? Several studies have found that younger, better-educated people are more likely to leave a shrinking town, while older, less-educated people are more likely to stay.[339] Sometimes a checkerboard of occupied and abandoned houses results.[340] The city may have the resources to demolish the abandoned houses and replace them with green space (as in the managed retreat scenario described below); sometimes the houses just deteriorate and their lots become overgrown, creating blight and decreasing every else's property values. Where the houses are vacated but remain standing, sometimes they are bought by investors and become rentals that are then occupied by lower-income people. The investors often maintain the buildings poorly and are quick to evict non-paying tenants.[341] This pattern increases the need for both

338. Heather Payne, *Unservice: Reconceptualizing the Utility Duty to Serve in Light of Climate Change*, 56 U. RICH. L. REV. 603, 642 (2022); Jim Rossi & Michael Panfil, *Climate Resilience and Private Law's Duty to Adapt*, 100 N.C. L. REV. 1135, 1162 (2022); Mark Nevitt, *Destroy, Rebuild, Repeat: How to Break the Climate Disaster Cycle*, 78 VAND. L. REV. 493, 548-551 (2025).

339. Mathew Hauer et al., *Climate Migration Amplifies Demographic Change and Population Aging*, 121 PROCEEDINGS NAT'L ACAD. SCI. 5-6 (Jan. 8, 2024); Yi Fan et al., *Post-flood Selective Migration Interacts with Media Sentiment and Income Effects*, 15 NATURE CLIMATE CHANGE 619, 619 (May 26, 2025). *See* Nicholas Kusnetz, *Norfolk Wants to Remake Itself as Sea Level Rises, but Who Will Be Left Behind?*, INSIDE CLIMATE NEWS (May 21, 2018), https://insideclimatenews.org/news/21052018/norfolk-virginia-navy-sea-level-rise-flooding-urban-planning-poverty-coastal-resilience/ [https://perma.cc/U6JC-LWMT].

340. Glenn Coin, *Aftermath of a Flood: 5 Years Later, Oneida Neighborhood Still Coping*, SYRACUSE.COM (Sep. 26, 2018), https://www.syracuse.com/weather/2018/09/oneida_creek_fema_buyout_city_of_oneida_flood_june_2013.html; Jason Markusoff, *In Calgary's Flood Zone, Most Residents Hang On – And Hope the Water Never Rises Again*, MACLEAN'S (Oct. 30, 2018), https://macleans.ca/politics/in-calgarys-flood-zone-residents-hang-on-hope-water-never-rises-again/.

341. Nora Schwaller et al, *Postdisaster Investment in Single-Family Housing: Insights for Harris County, Texas*, J. OF AM. PLANNING ASSOC. 1-14 [https://doi.org/10.1080/01944363.2026.2641115]; Mark Brennan et al., *A Perfect Storm? Disasters and Evictions*, HOUS, POL'Y DEBATE (2021), https://nlihc.org/sites/default/files/A_Perfect_Storm_Disasters_and_Evictions.pdf [https://doi.org/10.1080/10511482.2021.1942131]; E.L. Raymond et al., *Preventing Evictions After Disasters: The Role of Landlord-Tenant Law*, HOUS. POL'Y DEBATE (2021) at 3, https://nlihc.org/sites/default/files/Preventing-Evictions-After-Disasters-The-Role-of-Landlord-Tenant-Law.pdf [https://doi.org/10.1080/10511482.2021.1931929]; Carlos Martin et al., *Disasters and the Rental Housing Community: Setting a Research and Policy Agenda*, BROOKINGS METRO (Oct. 2023), https://www.brookings.edu/wp-content/uploads/2023/09/Disasters-and-the-Rental-Housing_final.pdf [https://perma.cc/23VS-V8JN]; Terry

stronger landlord-tenant laws and social service providers. In an effort to discourage this pattern of investors buying homes and then neglecting them, on January 20, 2026, President Trump issued an executive order that declared "it is the policy of my Administration that large institutional investors should not buy single-family homes that could otherwise be purchased by families."[342]

In sum, there are many legal techniques that municipalities can use to reduce their population. Whether that reduces the tax base more or less than it reduces the costs of providing services and adequately protecting them from the impacts of climate change—the net fiscal impact—may influence municipalities' receptiveness to this approach.

At the far end of the "shrink" spectrum is abandoning an area entirely. That takes us to the "Leave" scenario.

E. *Leave*

1. *General*

After Hurricane Katrina devastated large parts of New Orleans in 2015, a group of civic leaders hired consulting firms, flew in urban planning professionals, deliberated intensively, and released their recommendation: some of the worst-flooded neighborhoods should be abandoned and allowed to revert to "green space."

The public reaction was not appreciation. It was outrage. The mayor quickly disowned the recommendations and rejected the plan for a moratorium on building permits in the designated areas. "As the example of New Orleans shows," Alexander Lemann concluded, "the views of experts on the wisdom of retreat and the views of the people who live in risky locations often diverge, particularly after a storm. The consensus view in the scholarly and scientific communities on the need to retreat from flood-prone areas thus runs up against a problematic obstacle: nobody wants to

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Castleman, *Outside Buyers Move In On Burn Zones*, L.A. TIMES (Jan. 8, 2026).

342. Exec. Order No. 14376, 91 Fed. Reg. 3023 (Jan. 20, 2026), https://www.whitehouse.gov/presidential-actions/2026/01/stopping-wall-street-from-competing-with-main-street-homebuyers/ [https://perma.cc/5UQW-XJU7] (Stopping Wall Street from Competing with Main Street Homebuyers).

leave."[343] Peter Byrne and Jessica Grannis have written, with some overstatement, that "retreat is at present mostly a legal theory."[344]

The political resistance to retreat was loudly expressed after Hurricane Sandy in 2012. New York City Mayor Michael Bloomberg declared, "[A]s New Yorkers, we cannot and will not abandon our waterfront. It's one of our greatest assets. We must protect it, not retreat from it."[345] Under Governor Chris Christie, New Jersey declared the state is "Stronger Than the Storm."[346] Although not all states have disavowed retreat entirely—Louisiana adopted an elaborate coastal resilience plan that includes elements of managed retreat—questions remain about how vigorously those elements are being implemented.[347]

Various objective indicators are used to predict when people are likely to abandon their homes. Flood risk is the most common, but imperiled drinking water supply, extreme heat that devastates farm productivity, and other factors can also make a place unsuitable for human settlement. But as Radley M. Horton and colleagues have written, mostly in the international context, "environmental stress rarely directly results in migration but works through a complex array of economic, demographic, social, and political proximate determinants that both initiate and sustain or modify flows. In any given population exposed to climate risks, different segments of the population respond to hazards differently and at different points in time."[348] People have widely varying conceptions of habitability. Some will tolerate and manage to adapt to conditions that will cause others to flee.[349] Many families

343. Alexander Lemann, *Stronger Than the Storm: Disaster Law in a Defiant Age*, 78 LA. L. REV. 437, 442 (2017).

344. BYRNE & GRANNIS, *supra* note 328, at 268.

345. Andrew C. Revkin, *Can Cities Adjust to a Retreating Coastline?*, N.Y. TIMES (Aug. 22, 2013), https://archive.nytimes.com/dotearth.blogs.nytimes.com/2013/08/22/can-cities-adjust-to-a-retreating-coastline.

346. Wayne Parry, *Christie Defends 'Stronger Than the Storm' Ads*, NBC10 PHILA. (Aug. 27, 2013), https://www.nbcphiladelphia.com/news/local/chrisite-talks-clean-beaches-water-post-sandy-in-wildwood/1968816.

347. Traci Birch et al., *Managing Retreat? An Empirical Reflection on Adopting Relocation Initiatives as Adaption Policy in Louisiana*, 16 CLIMATE AND DEV. 712 (2024); Jake Bittle, *Louisiana's Landmark Climate Adaptation Program is Running Out of Time*, GRIST (May 26, 2023), https://grist.org/extreme-weather/louisiana-coastal-master-plan-cpra-adaptation.

348. Radley M. Horton et al., *Assessing Human Habitability and Migration*, 372 SCIENCE 1279, 1282 (2021).

349. MARK STEGE, *Atoll Habitability Thresholds*, LIMITS TO CLIMATE CHANGE ADAPTATION 381 (W. Leal Filho & J. Nalau, eds., 2018).

will not leave unless the government takes their house by eminent domain.

When people do leave voluntarily, it usually stems from family-by-family decisions. Organized efforts for an entire community to relocate are "managed retreat." One 2017 estimate was that over the prior three decades, globally approximately 1.3 million people relocated through managed retreat programs; fewer than 100,000 of these were in the United States.[350] Even the phrase "managed retreat" has become so unpopular as a confession of defeat that some are instead referring to "resilient relocation,"[351] though not here.

As already noted, few homeowners can buy a new house if they cannot receive a decent price for their old one, and any house that residents find uninhabitable will sell for bottom dollar. Most efforts at managed retreat rely on heavy government subsidies to allow those leaving to receive a payment loosely approximating the pre-storm value of their homes. FEMA's Hazard Mitigation Grant Program is the leading program to facilitate managed retreat. It was established by the Stafford Act of 1988[352] and expanded under the Hazard Mitigation and Relocation Assistance Act of 1993,[353] which Congress enacted after devastating floods hit the Midwest that year.[354] Funds become available only if the President has declared a disaster; there is no money to relocate people in areas

350. Miyuki Hino et al., *Managed Retreat As A Response To Natural Hazard Risk*, 7 NATURE CLIMATE CHANGE 364 (2017). Several successful efforts are described in WILLIAM BECKER, THE CREEKS WILL RISE: PEOPLE COEXISTING WITH FLOODS 122-129 (2021); and ERICA BOWER & SANJULA WEERASINGHE, LEAVING PLACE, RESTORING HOME: ENHANCING THE EVIDENCE BASE ON PLANNED RELOCATION CASES IN THE CONTEXT OF HAZARDS, DISASTERS, AND CLIMATE CHANGE (Platform on Disaster Displacement 2021), https://disasterdisplacement.org/wp-content/uploads/2021/03/PDD-Restoring_Home-2021-screen_compressed.pdf [https://perma.cc/WY3Z-NR49].

351. Anne C. Mulkern, *No One Likes 'Managed Retreat.' So It's Getting Rebranded*, E&E NEWS (Nov. 12, 2021), https://www.eenews.net/articles/no-one-likes-managed-retreat-so-its-getting-rebranded/ [https://perma.cc/922P-B8MM].

352. Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. § 5170(c) (1988).

353. Hazard Mitigation and Relocation Assistance Act of 1993, Public Law No. 103-181 (1993). *See* ENVTL L. INST., *Floodplain Buyouts: How Local Governments Can Maximize Community Benefits, Habitat Connectivity, and Resilience* 48 (2018), https://www.eli.org/sites/default/files/eli-pubs/actionguide-web.pdf.

354. PEW CHARITABLE TR., *Property Buyouts Can Be an Effective Solution for Flood-Prone Communities* 4 (2022), https://www.pew.org/-/media/assets/2022/03/property-buyouts-can-be-an-effective-solution-for-flood-prone-communities.pdf [https://perma.cc/BE37-MN92].

where severe flooding is anticipated but has not yet occurred.[355] A different FEMA program, the Building Resilient Infrastructure and Communities (BRIC) program,[356] allowed property acquisition before a disaster as well as other disaster preparedness measures. FEMA eliminated this program in 2025 under President Trump; seventeen states promptly sued.[357] The district court held that diversion of BRIC funds for other purposes was unlawful, in part because it was contrary to the direction of Congress.[358] There are several other federal relocation programs, and a number of states have their own. Each has its own eligibility requirements and application procedures, creating a thoroughly confusing situation for many homeowners.[359] But a common theme is that homeowners will not willingly move unless they can buy a safe place they can afford.[360]

With rare exceptions, these "buyout" programs are entirely voluntary. Typically, the state or local government buys the homes with FEMA money and demolishes them, the land is left for open space, recreational, or wetlands management purposes, and no new buildings are allowed.[361] The homeowners receive the pre-disaster value of their home. From 1989 through 2017, FEMA financed the buyout of more than 43,000 properties in 1,016 counties in 49 states.[362] By far the largest buyout followed a massive

355. Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. § 5170c(a) (1988).

356. National Flood Insurance Reform Act of 1994, 42 U.S.C. §4104c(a) (1994); *Building Resilient Infrastructure and Communities*, FED. EMERGENCY MGMT. AGENCY, https://www.fema.gov/grants/mitigation/learn/building-resilient-infrastructure-communities [https://perma.cc/Y6BN-JPME] (last visited Apr. 30, 2026).

357. State of Wash. v. Federal Emergency Mgmt. Agency, No. 1:25-cv-12006 (D. Mass. Dec. 11, 2025).

358. *Id.*

359. MELISSA TIER, PERSISTENT DATA GAPS IN THE PURSUIT OF EQUITABLE FLOOD RELOCATION: BUYOUTS IN NJ AND NY (New Jersey State Policy Lab, Rutgers University) (forthcoming 2026); HOLLY M. LEICHT, REBUILD THE PLANE NOW: RECOMMENDATIONS FOR IMPROVING GOVERNMENT'S APPROACH TO DISASTER RECOVERY AND PREPAREDNESS (Community Preservation Corp., July 2017), https://www.statenislandusa.com/uploads/8/9/8/7/89877849/improving_disaster_recovery_paper_-_final.pdf [https://perma.cc/EK2X-RBPH].

360. DEBORAH HELAINE MORRIS, *The Climate Crisis is a Housing Crisis: Without Growth We Cannot Retreat*, in GLOBAL VIEWS ON CLIMATE RELOCATION AND SOC. JUSTICE at Sec. 11.4 (Idowu Jola Ajibade & A.R. Siders, eds., 2022).

361. Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. § 5170c(b)(2)(B) (1988).

362. Rob Moore, *As Climate Risks Worsen, U.S. Flood Buyouts Fail to Meet the Need*, YALE ENV'T 360 (Jan. 23, 2020), https://e360.yale.edu/features/as-climate-risks-worsen-u.s.-

flood in 1993 that hit multiple midwestern states; 8,024 properties were purchased.[363] Seventeen disasters account for half of all acquired properties.[364] But numerically, a majority of buyout projects acquire five or fewer properties.[365]

The average time between the flood event and FEMA's purchase of the property (which allows the homeowner to buy something else) is about four years.[366] It can take even longer if FEMA does not have enough money and multiple funding programs need to be coordinated and combined.[367] If the homeowners, meanwhile, repair the house to make it livable until the buyout money comes, they may no longer wish to relocate once money finally arrives because they have already invested in the repairs.[368] One result of the long lag between the flood and the buyout is more of a phenomenon discussed above—private investors swoop in, buy houses at a discount from homeowners who need quick cash, fix them up, and rent them to low-income people, who will then be exposed to flood risk.[369]

One potential success is New Jersey's Blue Acres program, which, through using a combination of federal and state money, has managed to acquire some 1,200 properties at a faster pace than most other buyout programs.[370] New Jersey did so in part by

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flood-buyouts-fail-to-meet-the-need [https://perma.cc/63NP-YMWT].

363. TIER, EQUITABLE FLOOD RELOCATION, *supra* note 359.

364. *Id.*

365. ANNA WEBER & ROB MOORE, GOING UNDER: LONG WAIT TIMES FOR POST-FLOOD BUYOUTS LEAVE HOMEOWNERS UNDERWATER 6 (Nat. Res. Defense Council, Nov. 2019), https://www.nrdc.org/sites/default/files/going-under-post-flood-buyouts-report.pdf [https://perma.cc/TXY6-EHEU].

366. *Id.* at 7. *See also* Brady Dennis, *Hundreds of Residents Signed up for FEMA Buyouts After Helene. Not One Has Been Approved*, WASH. POST (Dec. 26, 2025), https://www.washingtonpost.com/climate-environment/2025/12/26/fema-buyouts-north-carolina-hurricane-helene/.

367. Christopher Flavelle, *America's Last-Ditch Climate Strategy of Retreat Isn't Going So Well*, BLOOMBERG: BUSINESSWEEK (May 2, 2018), https://www.bloomberg.com/news/features/2018-05-02/the-u-s-climate-strategy-of-total-retreat-is-failing.

368. Helen J.P. Wiley & Carolyn Kousky, *Speeding Up Post-Disaster Housing Buyouts*, SOLUTIONS J. 58, 60 (2020), https://esg.wharton.upenn.edu/wp-content/uploads/2021/01/WILEY-Buyouts-Solutions.pdf [https://perma.cc/9W88-NHG2].

369. Lisa Song & Al Shaw, *After Harvey, Buyouts Won't be the Answer for Frequent Flood Victims in Texas*, TEX. TRIBUNE (Nov. 2, 2017), https://www.texastribune.org/2017/11/02/harvey-flooding-buyouts-frequent-flooding-victims-texas/ [https://perma.cc/9LQD-K9PH].

370. Emilie Lounsberry, *A New Jersey Buyout Program for Flood-Prone Homes is a National Model*, INSIDE CLIMATE NEWS (Dec. 25, 2025), https://insideclimatenews.org/news/

creating a dedicated staff and assigning a case manager to every applicant to help shepherd them through the process.[371]

Local governments often resist buyouts. As the Congressional Research Service reported,

> Buyouts may reduce state and local income from property taxes, reduce housing stock, cause a decline in real estate values in neighborhoods with large numbers of vacant lots, create fears that low-income communities are being removed, or fragment communities through resident displacement and loss of neighborhood cohesion. The local government is responsible for maintaining parcels of bought-out land and buyout programs generally do not include funding for future design, maintenance, or use of bought-out land. Nonfederal cost-share requirements and the cost of maintaining open space may prove to be a disincentive, particularly for small or disadvantaged communities.[372]

Under the leading FEMA program, the federal government pays 75 percent of the costs; states and cities must pick up the rest. Richer, more densely populated areas have been more likely to implement voluntary buyouts of flood-prone properties; they can afford the cost-share and have the capacity to navigate the FEMA buyout process.[373] To allow the buyout dollars to reach homeowners faster, one study recommended eliminating the cost-share requirement, fast-tracking buyout dollars or allowing for reimbursement for local expenditures on buyouts in the immediate aftermath of a flood, and engaging in stronger pre-disaster planning to expedite post-flood buyouts.[374] The Disaster Mitigation Act of 2020 and FEMA's implementing regulations require the states to have approved hazard mitigation plans as a prerequisite to receiving certain FEMA grants,[375] but in practice these plans are often very general and not well coordinated with local land-use plans and zoning.[376] The second Trump

25122025/new-jersey-flood-prone-homes-buyout-program/ [https://perma.cc/F9Z7-3MGN].

371. *Id.*

372. DIANE P. HORN, 268 SERV., FLOODPLAIN BUYOUTS: FEDERAL FUNDING FOR PROPERTY ACQUISITION (Apr. 22, 2025), https://www.congress.gov/crs-product/IN11911.

373. Katharine J. Mach et al., *Managed Retreat Through Voluntary Buyouts of Flood-Prone Properties*, 5 SCIENCE ADVANCES (Oct. 9, 2019) [https://doi.org/10.1126/sciadv.aax8995].

374. Wiley & Kousky, *supra* note 368.

375. 44 C.F.R. §§ 59.2, 201, 206.

376. Anna Weber et al., *Innovations in Buyouts: Lessons from Lived and Learned Experience*, 7 FRONTIERS IN CLIMATE 1 (Mar. 25, 2025)

administration has made FEMA funding much slower and less reliable, and communities are working to find alternative sources of funding.[377]

Managed retreat programs do not dictate where people will go. Typically, residents choose to move within the same metropolitan area, and thus within driving distance of their existing jobs and other connections.[378] But, as previously discussed, especially in low-income areas, the amount of money that homeowners receive may not be enough to buy decent housing elsewhere, or even to pay off their mortgage. The Uniform Relocation Act (URA) provides that people who are permanently displaced must be offered a comparable replacement dwelling,[379] but it only applies to involuntary relocations, such as from eminent domain. FEMA's buyouts are voluntary, so the URA does not apply to the homeowners. Tenants are treated as involuntarily displaced and are entitled to URA funds, though the process for them is burdensome and lengthy.[380]

In a few places, so many people living in areas highly vulnerable to flooding refused to take voluntary buyouts that the government has proceeded by eminent domain. That happened in Harris County, Texas (which includes Houston), in the years after Hurricane Harvey. As of August 2024, the county had acquired almost all of the roughly 420 properties in the riskiest areas. Of

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[https://doi.org/10.3389/fclim.2025.1533029].

377. Rob Moore et al., *Funding and Financing Voluntary Buyouts and Relocation: Going Beyond Federal Grants* (Nat. Res. Def. Council & Env't Def. Fund, 2025), https://www.nrdc.org/sites/default/files/2025-11/Flood_Buyout_R_25-10-A_04_locked.pdf [https://perma.cc/6K9P-UFG4]; Jennifer DeCesaro & Sarah Labowitz, *The Trump Administration is Quietly Curbing the Flow of Disaster Funding*, CARNEGIE ENDOWMENT FOR INT'L PEACE (Sep. 19, 2025), https://carnegieendowment.org/emissary/2025/09/fema-disaster-relief-fund-drf-budget-hurting-states?lang=en; Kenny Stancil, *Map: Trump Has Often Delayed or Denied Disaster Aid*, REVOLVING DOOR PROJECT (Dec. 23, 2025), https://therevolvingdoorproject.org/trump-disaster-policy-tracker-map/ [https://perma.cc/Y32J-S75K].

378. *See* James R.Elliott & Zheye Wang, *Managed Retreat: A Nationwide Study of the Local, Racially Segmented Resettlement of Homeowners from Rising Flood Risks*, 18 ENVTL. RSCH. LETTERS (Jan. 2023); NEW YORK STATE OFFICE OF RESILIENT HOMES AND COMMUNITIES, MANAGED RETREAT AND RELOCATION: EVALUATING THE RELOCATION OF HOMEOWNERS IN THE NEW YORK RISING BUYOUT AND ACQUISITION PROGRAM 16-18 (2023), https://hcr.ny.gov/system/files/documents/2023/11/20230921_managed-retreat-paper.pdf [

379. 49 C.F.R. § 24.204.

380. Larry Larson, *Overcoming Obstacles to Buyouts*, ASS'N OF STATE FLOODPLAIN MANAGERS (July 29, 2022), https://www.floods.org/news-views/flood-mitigation/overcoming-obstacles-to-buyouts/ [https://perma.cc/X56S-JEBM].

these, 184 properties were voluntarily sold after negotiations and 228 were taken through eminent domain. Those whose property was taken were offered compensation under the URA formulas. However, in many instances, this compensation was considerably lower than what the homeowners needed in order to buy comparable housing, and the county made some supplemental payments. Often these were still too low, and many of the payments were delayed, requiring families to stay in temporary housing for an extended time. Undocumented residents were not eligible for federal benefits, so the county used its own resources to compensate them. A study evaluating this experience found that a "sufficient supply of adequate and affordable housing for residents to relocate to is essential for program success."[381] Harris County is large and, as a capital of the oil and gas industry, has some very wealthy areas, and was able to provide supplemental funding; not all places could do that.

In 2015, the Corps adopted a policy that it will not participate in "nonstructural measures" to reduce human exposure to flood hazards, such as managed retreat, unless eminent domain is retained as an option to remove those who refuse to leave voluntarily.[382] The same year, the Corps proposed to use eminent domain to remove structures identified as being at high risk of coastal flooding in southwestern Louisiana. The Corps received over 2,540 oral and written comments and signatures on a petition to drop this plan, and it did so.[383] In 2020, the Corps reiterated that it could demand eminent domain in connection with these projects, but whether or how often the Corps has actually done so is not clear.[384]

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381. Helen Bonnyman, *Mandatory Home Buyouts in Houston, Texas: Program Overview and Lessons Learned*, NEW AM. (Sep. 12, 2024), https://www.newamerica.org/future-land-housing/briefs/mandatory-home-buyouts-in-houston/ [https://perma.cc/CLW7-QE54].

382. U.S. ARMY CORPS OF ENG'R, PLANNING BULLETIN: CLARIFICATION OF EXISTING POLICY FOR USACE PARTICIPATION IN NONSTRUCTURAL FLOOD RISK MANAGEMENT AND COASTAL STORM DAMAGE REDUCTION MEASURES (Dec. 22, 2015), https://planning.erdc.dren.mil/toolbox/library/pb/PB2016_01.pdf; Fanilla Cheng, *Is Compulsory Managed Retreat Our Future?*, NEW AMERICA, (Nov. 17, 2021), https://www.newamerica.org/future-land-housing/briefs/is-compulsory-managed-retreat-our-future/ [https://perma.cc/C9J6-4KZ8].

383. John Lovett, *Moving to Higher Ground: Protecting and Relocating Communities in Response to Climate Change*, 42 VT. L. Rev. 25, 32–33 (2017).

384. Christopher Flavelle, *Trump Administration Presses Cities to Evict Homeowners From Flood Zones*, N.Y. TIMES (Mar. 11, 2020).

One legal approach when most homeowners are leaving but a few refuse is to offer a life estate. The government acquires title to the property, but the current residents can stay there for the rest of their lives; after they pass, the government takes over and may demolish the house.[385]

Studies have shown that buyout programs tend to benefit mostly white, affluent areas more than low-income communities of color.[386] The latter are more prone to flooding because they tend to be at lower elevations with poorly built or maintained infrastructure.[387] A much smaller percentage of Black households own (as opposed to rent) their homes than white households, and therefore buyouts are more likely to benefit the white households.[388] When Black and Hispanic households do sell as part of a buyout program, they tend to receive lower sale prices than white households.[389] Buyout programs run by state and local governments have been found to be more inclusive and responsive

385. GEORGETOWN CLIMATE CTR., MANAGED RETREAT TOOLKIT: INTRODCUTION TO LIFE ESTATES AND FUTURE INTERESTS, https://www.georgetownclimate.org/adaptation/toolkits/managed-retreat-toolkit/life-estates-and-future-interests.html [https://perma.cc/D23B-TUZS].

386. James R. Elliott, Phylicia Lee Brown & Kevin Loughran, *Racial Inequities in the Federal Buyout of Flood-Prone Homes: A Nationwide Assessment of Environmental Adaptation*, 6 SOCIUS, 2020, at 1.

387. Thomas Frank, *Flooding Disproportionately Harms Black Neighborhoods*, E&E NEWS (June 2, 2020), https://www.eenews.net/articles/flooding-disproportionately-harms-black-neighborhoods/ [https://perma.cc/YF39-72T2]; Laura Gersony, *In Chicago, Flooding Overwhelmingly Strikes Communities of Color*, GREAT LAKES NOW (June 29, 2021), https://www.greatlakesnow.org/2021/06/29/chicago-flooding-infrastructure-communities-color/ [https://perma.cc/MS8B-ALAQ]; Aydali Campa, R*ecord-Breaking Rains in Chicago Underscore the Urgency of Flood Resiliency Projects, City Officials Say*, INSIDE CLIMATE NEWS (July 28, 2023); Raymond Zhong, *Many Thousands Facing Risk If Floods in L.A. Are Extreme*, N.Y. TIMES (Nov. 1, 2022); Juliana Maantay & Andrew Maroko, *Mapping Urban Risk: Flood Hazards*, RACE, & ENTL. JUSTICE IN NEW YORK, 29 APPL. GEOGR. 111 (2009) [https://doi.10.1016/j.apgeog.2008.08.002]; Katy Lackey, *Water Rising: Equitable Approaches to Urban Flooding* (US Water Alliance 2020); Kari Lydersen, *Inundation and Injustice: Flooding Presents a Formidable Threat to the Great Lakes Region*, BORDERLESS (Aug. 3, 2023), https://borderlessmag.org/2023/08/03/inundation-and-injustice-flooding-presents-a-formidable-threat-to-the-great-lakes-region/ [https://perma.cc/778R-QN7L].

388. Shruti Punjabi, *Unequal Ground: The Racialized Landscape of Land Ownership and Federal Buyouts in the United States*, PROGRESS & POVERTY INST., https://progressandpovertyinstitute.org/unequal-ground-the-racialized-landscape-of-land-ownership-and-federal-buyouts-in-the-united-states/ [https://perma.cc/ZG9Q-4E5S]; Sunjana Supekar, *Equitable Resettlement for Climate Change-Displaced Communities in the United States*, 66 UCLA L. REV. 1290, 1304 (2019); REBUILD BY DESIGN & MILLIMAN, CLIMATE DISPLACEMENT IN NEW YORK CITY: MAKING SPACE FOR OUR NEIGHBORS (2022).

389. Kay Jowers, Lala Ma & Christopher D. Timmins, *Racial Gaps in Federal Buyout Compensations*, 113 AEA PAPERS & PROCS. 451, 455 (2023).

to residents' needs than programs run by the federal government.[390] A study of relocation in Harris County found that "homeowners from more privileged neighborhoods resettle closer to their flood-prone homes and to one another, thus helping to preserve the social and economic value of their homes; homeowners from less privileged areas end up farther away from both."[391] Low-income households that are displaced by natural disasters, do not own homes, and do not benefit from buyout programs often have a considerable need for social services and safety net programs, but those are frequently unavailable to them.[392]

In 1998, the United Nations Commission on Human Rights adopted the Guiding Principles on Internal Displacement. They are not legally binding but in 2005 the United States was one of the 193 national governments that recognized the Guiding Principles as an "important international framework for the protection of internally displaced persons."[393] Several international human rights bodies have urged the United States to apply the Guidelines to people who are displaced by floods.[394] Hannah Perls has argued that "[t]here is significant documentation of federal disaster assistance disproportionately benefiting privileged groups," especially in the aftermath of Hurricane Katrina, and that "[u]nder

390. Linda Shi et al., *Equitable Buyouts? Learning from State, County, and Local Floodplain Management Programs*, 174 CLIMATIC CHANGE 29 (2022).

391. James R. Elliott, Kevin Loughran & Phylicia Lee Brown, *Divergent Residential Pathways from Flood-Prone Areas: How Neighborhood Inequalities Are Shaping Urban Climate Adaptation*, 70 SOC. PROBS. 869 (2023).

392. Michelle A. Meyer, *Internal Environmental Displacement: A Growing Challenge to the United States Welfare State*, DISASTER AND SOCIOLEGAL STUDIES 326, 340 (2013); Tianyuan Huang et al., *Built Environment Disparities are Amplified During Extreme Weather Recovery*, 648 NATURE 349 (2025).

393. G.A. Res. 60/1, ¶ 132 (Oct. 24, 2005) (2005 World Summit Outcome); Roberta Cohen, *Lessons Learned from the Development of the Guiding Principles on Internal Displacement*, BROOKINGS (Oct. 21, 2013), https://www.brookings.edu/articles/lessons-learned-from-the-development-of-the-guiding-principles-on-internal-displacement/ [https://perma.cc/ZK8M-58T9].

394. Hannah Perls, *U.S. Disaster Displacement in the Era of Climate Change: Discrimination & Consultation Under the Stafford Act*, 44 HARV. ENVTL. L. REV. 511, 517-18 (2020); *see also* Robin Bronen, *Climate-Induced Community Relocations: Creating an Adaptive Governance Framework Based on Human Rights Doctrine*, 35 N.Y.U. REV. L. & SOC. CHANGE 356 (2011); Kelly Carson, *The Water is Coming: How Policies for Internally Displaced Persons Can Shape the U.S. Response to Sea Level Rise and the Redistribution of the American Population*, 72 HASTINGS L.J. 1279 (2021); M.S. Cartier, *Equity Concerns Raised in Federal Flood Property Buyouts*, EOS (Oct. 9, 2019), https://eos.org/articles/equity-concerns-raised-in-federal-flood-property-buyouts [https://perma.cc/M9XK-8HAC].

the Guiding Principles, these disparate impacts violate the prohibition against discrimination, even without a showing of intent or animus."[395] Both the Stafford Act and the Housing and Community Development Act (HCDA) contain nondiscrimination provisions,[396] but the First Circuit has held that the HCDA does not create an independent private right of action,[397] and the federal courts have so severely narrowed the application of the Stafford Act's nondiscrimination provision that no plaintiff has ever brought a successful claim under it, generally because intentional discrimination has not been shown.[398]

A fundamental problem with buyouts is that they cannot possibly scale up to meet the problem. If five million homes (a number smaller than the number of houses identified as vulnerable at the beginning of this chapter) are bought at $425,000 (the median sales price of houses sold in the United States in recent years[399]), that is $2.125 trillion. By way of comparison, the appropriations for the U.S. Department of Defense in Fiscal Year 2024 came to $824.3 billion.[400] It is inconceivable that Congress would appropriate anything approaching those amounts, even if spread over several years. Thus buyouts cannot be a comprehensive solution, but they may be helpful in particular situations.

To bring the scaling problem down to a local level, it is worth looking again at Harris County. It has one of the most advanced buyback programs. Between 1985 and 2023, just over 4,000 parcels were bought out.[401] In contrast, more than 200,000 homes or businesses were damaged or destroyed by Hurricane Harvey; about 20,000 structures lie within two reservoirs that are especially likely

395. Perls, *supra* note 394, at 538-39. The principle that internally displaced persons should not face discrimination was reaffirmed in Report of the Special Rapporteur on the human rights of internally displaced persons. *Human rights of internally displaced persons*, ¶ 26, U.N. Doc. A/80/212 (July 21, 2025).

396. 42 U.S.C. § 5151 (Stafford Act); 42 U.S.C. § 5309(a) (HDCA).

397. Latinos Unidos de Chelsea en Accion v. Sec'y of Hous. & Urb. Dev., 799 F.2d 774, 794 (1st Cir. 1986).

398. Perls, *supra* note 394, at 540.

399. FED. RESERVE BANK OF ST. LOUIS, MEDIAN SALES PRICE OF HOUSES SOLD FOR THE UNITED STATES, https://fred.stlouisfed.org/series/MSPUS (last visited July 27, 2025).

400. CONG. RSCH. SERV., IN12234, FY2024 DEFENSE APPROPRIATIONS: SUMMARY OF FUNDING (Apr. 22, 2024), https://www.congress.gov/crs-product/IN12234.

401. Sean Saldana, *Harris County Provides Model for Flood Buyouts*, TEX. STANDARD (Apr. 24, 2023), https://www.texasstandard.org/stories/harris-county-texas-houston-flood-control-district-buyouts-hurricane-harvey/ [https://perma.cc/UM4H-2ZCD].

to flood in the next Harvey-like event.[402]

2. *Community Relocations*

In contrast to managed retreat programs involving buyouts, there have been a few attempts by entire communities to relocate together. Several other countries have done this successfully after disasters like floods or earthquakes, including Japan and Australia.[403] Efforts in the United States have been mixed. A number of towns attempted to move after the Mississippi River floods of 1993; several were unable. One that succeeded found that the governmental assistance funds "came wrapped in plenty of red tape," and that "[m]ore than twenty-five different federal, state, and local agencies participated in the review process following the initial environmental assessment of the relocation site," leading to extensive delays.[404] A greatly simplified process will be important if relocations—or new cities, for that matter—are to succeed.

There are two prominent recent examples of community relocation in the United States due largely to climate change—one in Louisiana, one in Alaska.[405] Both involved indigenous communities. Neither went quickly or smoothly.

Isle de Jean Charles is a narrow strip of land about 90 miles

402. *Hurricane Harvey: A Look Back Seven Years Later*, NAT'L ENVTL. SATELLITE, DATA, AND INFO. SERV. (Aug. 26, 2024), https://www.nesdis.noaa.gov/news/hurricane-harvey-look-back-seven-years-later; Jim Blackburn, *Houston Flooding 3.5 Years After Harvey* 7,13, RICE UNIV. BAKER INST. FOR PUB. POL'Y (Mar. 2, 2021), https://www.bakerinstitute.org/research/houston-flooding-35-years-after-harvey.

403. Ann Forsyth & Richard Peiser, *Lessons from Planned Resettlement and New Town Experiences for Avoiding Sprawl*, 205 LANDSCAPE & URB. PLAN. (Jan. 2021) [https://doi.org/10.1016/j.landurbplan.2020.103957]; Nicholas Pinter et al., *Large-scale Managed Retreat and Structural Protection Following the 2011 Japan Tsunami*, 96 NAT. HAZARDS 1429 (2019) [https://doi.org/10.1007/s11069-019-03602-7]. An examination of 16 climate-change planned relocations across 10 countries found the results to be mixed. Some people felt they were better off after the move, some felt they were worse off. Annah Piggott-McKellar, Jasmine Pearson & Celia McMichael, *Life After Climate-related Planned Relocation: A Review of Well-being Outcomes*, CLIMATE AND DEV. (2025) [https://doi.org/10.6084/m9.figshare.30818541].

404. Dennis M. Knobloch, *Moving a Community in the Aftermath of the Great 1993 Midwest Flood*, 130 J. CONTEMP. WATER RSCH. & EDUC. 41, 44 (2005); *see also* Jamie Horwitz, *Leaky Walls: The Doubled Vsion of Homeplace*, 20 THRESHOLDS 30 [https://doi.org/10.1162/THLD_A_00462]

405. There have been many other examples in U.S. history of managed retreat (though not necessarily by that name), though few since 2000 have involved wholesale relocation of communities. Nicholas Pinter, *The Lost History of Managed Retreat and Community Relocation in the United States*, 9 ELEMENTA: SCI. OF THE ANTHROPOCENE (Aug. 21, 2021) at 1 [https://doi.org/10.1525/elementa.2021.00036].

southwest of New Orleans.[406] It was settled in the late 19th century by survivors of the Trail of Tears—the forced displacement of Native Americans between 1830 and 1850. In 1955, Isle de Jean Charles had over 35 square miles. In the early 2000s, the Corps built a 98-mile-long levee system designed to shield against hurricane-induced storm surges. However, the Corps did not extend the system to protect Isle de Jean Charles, citing the cost. Storms, sea level rise, erosion, and subsidence worsened by canals built by oil and gas companies, have shrunk the isle to less than one square mile. The only access road is often flooded, leaving residents stranded. In 2002, the Corps offered to move everyone off the isle, but some residents declined and the Corps dropped the offer. Later that decade the parish government offered to build more than 60 houses for the islanders in a new subdivision nearby, but the residents there resisted and that plan collapsed. At its peak, Isle de Jean Charles had 78 homes and 400 residents, but a series of hurricanes destroyed many of the homes, leaving only 25 homes in 2008; those living in the other homes had scattered.

Most of the residents are members of the Jean Charles Choctaw Nation, and some are members of the United Houma Nation. Both are recognized as tribes by the state but not by the federal

406. This account of the Isle de Jean Charles situation is drawn from Scott Dance, *How a 'Model' for Climate Migration Became a Cautionary Tale*, N.Y. TIMES (updated May 18, 2026), https://www.nytimes.com/2026/05/16/climate/isle-jean-charles-relocation; Terry L. Jones & Evan Simon, *As Millions Face Climate Relocation, the Nation's First Attempt Sparks Warnings and Regret*, LA. ILLUMINATOR (Sep. 26, 2025), https://lailluminator.com/2025/09/26/climate-relocation/; Olga Loginova & Zak Cassel, *Leaving the island: The Messy, Contentious Reality of Climate Relocation*, CTR. FOR PUB. INTEGRITY (Aug. 17, 2022), https://publicintegrity.org/environment/harms-way/leaving-isle-de-jean-charles-climate-relocation/ [Dalie Faheid & Katie Livingstone, *To Flee, or to Stay Until the End and Be Swallowed by the Sea*, INSIDE CLIMATE NEWS (July 18, 2021), https://insideclimatenews.org/news/18072021/to-flee-or-to-stay-until-the-end-and-be-swallowed-by-the-sea/ [https://perma.cc/PM7T-UTYG]; Adam C. Crepelle, *Tribal Recognition, Consultation, and Lessons from the First Climate Relocation*, NAT. RES. & ENV'T. 13, (2020); *Displaced Louisiana Tribe Files Civil Rights Complaint Against State's Office of Community Development*, EARTHRIGHTS INT'L (Dec. 21, 2023), https://earthrights.org/media_release/displaced-louisiana-tribe-files-civil-rights-complaint-against-states-office-of-community-development/ [https://perma.cc/6CUE-LWSS]; Alex Lubben, *They Left Their Sinking Louisiana Island with State Help. But Will Their New Community Unravel?*, TIMES-PICAYUNE (Feb. 24, 2025), https://www.nola.com/news/ environment/isle-de-jean-charles-relocation-insurance-taxes-louisiana-coastline/article_bba315d8-f071-11ef-9954-2387748d80b4.html; Kelsey Stankard, *Climate, Culture, and Mothers: The Effects of Relocation on Isle de Jean Charles's Choctaw Nation*, 8 WOMEN LEADING CHANGE 19 (2024); Jennifer O'Rourke, *The Overlooked Communities of Forced Displacement in the United States: Humanizing the Relocation of Indigenous Tribes in the Face of Climate Change*, 92 U. CIN. L. REV. 850 (2024); and ABRAHM LUSTGARTEN, ON THE MOVE 192-194 (2024).

government. The leaders of the two tribes are not always on the same page, and the inter-tribal dynamics complicated the resettlement.

The Jean Charles Choctaw Nation developed a Tribal resettlement plan, in close collaboration with experts in resilient design. In 2014, the State of Louisiana applied for funds under HUD's National Disaster Resilience Competition, and included the Jean Charles Choctaw Nation's plan as part of its application. HUD awarded the state $48.3 million in 2016 to resettle the residents of the isle. HUD hailed this agreement as a model of wholesale voluntary relocation. National news media called the island's residents the country's first climate refugees.[407] Using the HUD money, the state acquired a site 40 miles away on a former sugarcane field, close to a Chevron oil field services yard, and called it New Isle.

The plan from the Jean Charles Choctaw Nation envisioned the relocation as an opportunity for the entire tribe to reunite in one place. After receiving the grant, the state changed the scope to a resettlement of the isle rather than of the Tribe, citing concerns that it would violate the Fair Housing Act to create a new community for the Tribe per se. In 2018, the tribal leaders urged HUD to revoke the money due to this switch; HUD did not respond.

In 2020, the state began construction of 37 houses at New Isle and offered them for free to the households that were still living on Isle de Jean Charles in 2012 and had agreed to move. These households had not had to pay property taxes on their old houses because the homes' value was so low. The new houses, however, were valued at more than $300,000. Many of these households rely entirely on Social Security benefits and could not afford the taxes and insurance. Nonetheless, many of the new houses became occupied by 2022. The state also indicated that some former isle residents could build on empty lots in New Isle at their own expense.

In 2020, five tribes and native organizations from Alaska and

407. *See, e.g.*, Coral Davenport & Campbell Robertson, *Resettling the First American "Climate Refugees"*, N.Y. TIMES (May 2, 2016), https://www.nytimes.com/2016/05/03/us/resettling-the-first-american-climate-refugees.html; Carolyn Van Houten, *The First Official Climate Refugees in the U.S. Race Against Time*, NAT'L GEOGRAPHIC (May 25, 2016), https://www.nationalgeographic.com/science/article/160525-isle-de-jean-charles-louisiana-sinking-climate-change-refugees.

Louisiana, including the Jean Charles Choctaw Nation, submitted a complaint to ten United Nations special rapporteurs alleging that the U.S. government was violating their human rights by failing to address climate impacts that are forcing displacement. The members of these tribes seem to fit within the UN definition of "internally displaced persons" as those "who have been forced ... to leave their homes ... as a result of ... armed conflicts ... or natural or human-disasters, and who have not crossed an internationally recognized state border."[408] The Inter-American Commission on Human Rights held a public hearing. Its special rapporteur visited the affected sites and recommended, among other things, that the United States "[g]uarantee[] the effective participation and inclusion of community members in the decision-making process for climate adaptation projects."[409]

In December 2023, the Jean Charles Choctaw Nation, represented by Earthrights International, filed a complaint with HUD under Title VI of the Civil Rights Act of 1964. It charged that Tribal members who had agreed to participate in the resettlement were being provided with structurally unsound homes in a new area that lacks critical disaster and cultural protections, and that the tribe has been excluded from decision-making. The complaint demands, among other things, that all tribal members, including those who had already fled the island, be provided with no-cost housing in New Isle. As of this writing, HUD is investigating the complaint.

The other prominent instance where an indigenous community has moved together is Newtok, Alaska.[410] Most of Alaska's more than 200 native villages are affected by flooding and

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408. U.N. OFF. FOR THE COORDINATION OF HUMANITARIAN AFFAIRS, *Guiding Principles on Internal Displacement*, at 1 (1998).

409. INTER-AM. COMM'N ON HUMAN RIGHTS, REDESCA, CONCLUDING OBSERVATIONS AND RECOMMENDATIONS FROM REDESCA AFTER ITS VISIT TO LOUISIANA AND ALASKA: CLIMATE INDUCED DISPLACEMENT OF INDIGENOUS COMMUNITIES (August 2023), ¶ 85.II.

410. In addition to the sources cited below, this account draws from Special Rapporteur, *supra* note 395; Julie Koppel Maldonado et al., *The Impact of Climate Change on Tribal Communities in the US: Displacement, Relocation, and Human Rights*, 120 CLIMATIC CHANGE 601 (2013); Robin Bronen, *Climate-Induced Community Relocations: Creating an Adaptive Governance Framework Based on Human Rights Doctrine*, 35 N.Y.U. REV. L. & SOC. CHANGE 356 (2011); U.S. Gov't Accountability Off., *Climate Change: A Climate Migration Pilot Program Could Enhance the Nation's Resilience and Reduce Federal Fiscal Exposure* (July 2020); *From Newtok to Mertarvik: A Native Alaskan Tribal Village Relocation*, ADAPTATION CLEARINGHOUSE, https://www.adaptationclearinghouse.org/resources/from-newtok-to-mertarvik-a-native-alaskan-tribal-village-relocation.html [https://perma.cc/R3B6-JCPS].

erosion. 31 villages have been identified as facing imminent threats, and at least 12 have decided to relocate or to explore relocation options.[411] Only Newtok has actually relocated; none of the others has even started.[412]

Newtok is a Yup'ik Eskimo village located near the Bering Sea. It is eroding at a rate of around 80 feet per year due to a combination of river scour, permafrost melting due to climate change, and storm surge. It had approximately 400 residents in 60 homes. No roads lead there; it is accessible only by a gravel air strip, seaplane, or boat. In 1994, the village initiated the relocation process. The residents chose a site nine miles away and named it Mertarvik. They obtained title to the land in 2003 through a land-exchange agreement with the U.S. Fish and Wildlife Service. Several federal and state agencies became involved in the relocation process and contributed funds, but no agency was in charge of planning, coordinating, or administering the funding. FEMA rejected a major disaster declaration because the damage "was not associated with a specific and identifiable incident," but rather was because of gradual degradation.[413] Most of the responsibility for managing the relocation was left to the tiny Newtok Village Council, which "lacked the expertise to manage the project and has faced high turnover and internal political conflict."[414] The total cost of relocation has been estimated at around $150 million, or about $375,000 per resident.

People started moving to Mertarvik in phases in 2019. Meanwhile, throughout the lengthy process, Newtok was becoming increasingly uninhabitable. The lack of a sanitary village landfill and sewage treatment facility created a public health crisis for the community; residents needed to dump their "honey buckets" directly into a dried-up riverbed or onto the ground. A 2005 storm

411. U.S. GOV. ACCOUNTABILITY OFF., GAO-20-488, ALASKA NATIVE VILLAGES: LIMITED PROGRESS HAS BEEN MADE ON RELOCATING VILLAGES THREATENED BY FLOODING AND EROSION (June 2009).

412. Jeff Brady & Claire Harbage, *Houses Floated Away in This Alaska Native Village, Now Residents Want to Move*, NPR (Dec. 15, 2025), https://www.npr.org/2025/12/15/nx-s1-5596136/alaska-storm-native-climate-change [https://perma.cc/ZTJ7-SV2G].

413. FEMA, PRELIMINARY DAMAGE ASSESSMENT REPORT: NEWTOK VILLAGE – FLOODING, PERSISTENT EROSION, AND PERMAFROST DEGRADATION (Jan. 18, 2017), https://www.fema.gov/sites/default/files/2020-03/PDAReportDenial-NewtokVillage.pdf.

414. Emily Schwing, *Newtok, Alaska, Was Supposed to Be a Model for Climate Relocation. Here's How It Went Wrong*, PROPUBLICA (May 29, 2025), https://www.propublica.org/article/newtok-alaska-climate-relocation [https://perma.cc/ZTJ7-SV2G].

destroyed the Ninglick River barge landing, making it difficult to deliver fuel and other essential supplies. After the school's generator caught fire, the children were forced to attend school in an old church with a leaking roof and no running water or restrooms.

In 2018, the first Trump administration approved some funding for the long-delayed relocation of Newtok.[415] In November 2022, the Biden administration announced the launch of a new Voluntary Community-Driven Relocation program, led by the Department of the Interior, to assist tribal communities endangered by climate change. The last Newtok residents moved in 2024, 30 years after the relocation planning process began. Shortly afterward, it was reported that "much of the infrastructure [in Mertarvik] is already failing. Residents lack running water, use 5-gallon buckets as toilets and must contend with intermittent electricity and deteriorating homes that expose them to the region's fierce weather."[416]

Upon taking office in 2025, the second Trump administration froze the federal money that was supposed to pay for more housing construction in Mertarvik. It also took down many of the relevant reports, but some are archived.[417] Many of the infrastructure projects discussed in the EIS have not been built.

III. CONCLUSION

The overwhelming desire of most people in most places is to stay in their current homes. Moving because of worsening climate conditions is usually the last resort, and most people lack the resources that would allow them to buy an equivalent home elsewhere. Cities in many parts of the United States will face more frequent and severe flooding that overwhelms drainage systems that were not designed for these conditions. Many cities will try to improve their ability to handle flooding—some already are—and will try to find a sweet spot where a tolerable level of expenditure leads to a tolerable degree of flood exposure. For many

415. Rachel Waldholz, *Newtok to Congress: Thank You for Saving our Village*, ALASKA PUB. MEDIA (Mar. 27, 2018), https://alaskapublic.org/news/2018-03-28/newtok-to-congress-thank-you-for-saving-our-village [https://perma.cc/BH7S-DMMA].

416. Schwing, *supra* note 414.

417. *See, e.g.*, FEMA, FEMA EFFORTS ADVANCING COMMUNITY-DRIVEN RELOCATION (Dec. 9, 2024), https://web.archive.org/web/20250130143031/https:/www.fema.gov/fact-sheet/fema-efforts-advancing-community-driven-relocation.

neighborhoods, and an increasing number as the years go by, there will be no sweet spot. Instead, many people will decide to leave, often suffering major losses until they do. Extreme heat, wildfire smoke, and water shortages will also lead to attempted measures to adapt and, over time, more people will decide to move. Quite a few businesses will also make similar choices, taking their jobs with them.

The current legal and policy situation for addressing land uses that are vulnerable to climate change is chaotic. Some places will attempt to throw up physical defenses; a few local governments will consciously decide to move back from the threat; in most towns and cities, there will be no plan, or insufficient resources and political will to implement a plan, that is adequate to the threat, and more suffering will result. As with most environmental dangers, those most likely to suffer will be members of low income and minority communities.

This article has laid out five scenarios for urban futures in the face of worsening climate impacts—sprout, grow, stay, shrink, and leave. Although the default scenario for the great majority of places is stay, that will become increasingly intolerable in many places. Regardless, all five of these scenarios raise profound legal, financial, and social challenges.

Tragically, the United States—like most of the rest of the world—has failed to build the momentum for the rapid transition away from fossil fuels that is needed to prevent the worst impacts of climate change. During some presidential administrations the country moves backwards. Climate conditions in the United States are also strongly affected by the actions of other countries over which the United States has no control, by the global development of technologies and industries that have dynamics of their own, and by physical phenomena like the behavior of the Antarctic ice sheets that current science cannot confidently predict.

All of this increases the need for every level of government—federal, state and local—to make conscious decisions about which scenarios to follow in which locations, where to sprout, grow, stay, shrink, or leave, and to erect the legal structures that are needed to implement the chosen scenarios.