

Water, Water Everywhere, Communities on the Brink: Retreat as a Climate Change Adaptation Strategy in the Face of Floods, Hurricanes, and Rising Seas

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In the nearly fifteen years after Hurricane Katrina, hurricane victims' efforts to recover for the Army Corps of Engineers' construction and maintenance of New Orleans's faulty levee systems have slowly wended their way through the courts. After the Federal Circuit held in St. Bernard Parish Government v. United States that the Army Corps of Engineers' construction and maintenance did not constitute a taking, hurricane victims' efforts to recover in the courts hit a dead end. Using Hurricane Katrina and its aftermath as a lens to examine mechanisms to compensate victims and deter future losses, this Note ultimately concludes that the existing methods of recovery after natural disasters, primarily tort and the National Flood Insurance Program, fall short. As climate change increases the threat of catastrophic flooding caused by hurricanes and rising seas, a new mechanism to compensate victims and deter future flood losses is needed. This Note uses takings, a theory rejected by the Federal Circuit in St. Bernard Parish, as a potential mechanism to facilitate retreat from vulnerable areas by buying back flood-prone properties. However, any federal buyback program must grapple with the problematic history of using eminent domain to forcibly displace poor and minority communities. This Note proposes a program to incorporate community input at an early stage in order to keep valuable community ties intact.

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INTRODUCTION

Hurricanes are some of the deadliest and costliest disasters in the United States, with Hurricanes Sandy, Florence, Harvey, Maria, and Katrina generating billions of dollars in damages and causing thousands of deaths. As climate change increases the threat of hurricanes, communities must soon make hard choices regarding the long-term survival of their towns. In some cases, it may be impossible to construct infrastructure to withstand flooding caused by climate change and rising seas, in which case relocation may be the only option.

Although Hurricane Katrina hit over a decade ago, its devastating effects, and Hurricane Katrina victims' failed efforts to recover in the courts, set the stage for the difficult decisions that lie ahead. Even after fourteen years, New Orleans's Lower Ninth Ward is a shadow of its former self, with the hurricane's impacts still visible.¹ Flood liability cases regarding the construction of the Mississippi River Gulf Outlet (MRGO) and the Army Corps of Engineers' failure to maintain New Orleans's levees have slowly made their way through the court system, with the Federal Circuit deciding *St. Bernard Parish Government v. United States*² in 2018. While the Federal Circuit ultimately held that hurricane victims were unable to recover for property loss under a takings theory, takings does have a role to play in adaptation in the face of climate change. Using takings to buy back vulnerable property could be a valid strategy to give flood and hurricane victims the money needed to relocate and also prevent future, risky development. This Note argues that in some cases, retreat from vulnerable areas is the only viable solution in the face of rising seas and more powerful hurricanes, as other methods to provide compensation for victims and prevent future losses fall short.

Using New Orleans and the American Gulf South as a lens, this Note will begin by examining how New Orleans's race- and class-based settlement history resulted in Hurricane Katrina disparately impacting different communities. Part II will address in more detail two lawsuits filed by hurricane victims, *In re Katrina Canal Breaches*³ and *St. Bernard Parish*. These cases showcase the difficulties hurricane victims face attempting to receive compensation for their losses and suggest that using litigation to pursue compensation for victims for flooding and hurricane damage may be futile. Part III discusses the possibilities and drawbacks of using tort law and insurance schemes to compensate victims

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1. Gary Rivlin, *Why the Lower Ninth Ward Looks Like the Hurricane Just Hit*, THE NATION (Aug. 13, 2015), <https://www.thenation.com/article/why-the-lower-ninth-ward-looks-like-the-hurricane-just-hit/>.

2. 887 F.3d 1354, 1354 (2018) [hereinafter "St. Bernard Parish II"].

3. 696 F.3d 436, 436 (5th Cir. 2012).

and deter risky behavior, such as development in flood zones. Ultimately, this Note finds that neither tort actions nor insurance schemes provide a viable option for compensating victims or facilitating adaptation to the threats of climate change, and that an alternative strategy with the goal of enabling retreat is needed.

Part IV discusses the possibility of retreat as a viable climate change adaptation strategy. Part IV also addresses the role that eminent domain will play in evacuations and compensations. Using eminent domain is a drastic solution for a dire problem, and any relocation program must take care to avoid repeating the inequities of past applications of eminent domain as seen in the urban renewal projects that swept through America's cities in the 1950s and '60s. Part V concludes with a proposal for a more equitable relocation program that is tailored to address the needs of individual communities. This Note focuses on low-income and minority communities since such communities are most likely to lack the resources to relocate on their own and often lack political representation. Such a program would involve a "bottom-up" approach to receive input from affected communities, increase compensation to take into account the noneconomic and emotional harms that come from losing one's home and community, and emphasize the need to relocate communities together.

I. THE HISTORY OF NEW ORLEANS'S SETTLEMENT AND THE IMPACT OF HURRICANE KATRINA

Climate change will not affect all populations of the United States equally: populations in low-lying, coastal areas will be more heavily impacted by climate change-induced hurricanes and flooding. Because where people currently live is partly determined by history, looking at historical settlement patterns and land-use decisions is useful in identifying what populations may be most at risk from flooding and hurricanes. The history of New Orleans from its founding in the 1700s to when Hurricane Katrina struck in 2005 reveals that historical inequities in settlement patterns ripple through to the modern day. These settlement patterns contributed not only to the unique, vibrant culture of the Lower Ninth Ward but also reinforce the importance of long-standing community ties and the need to keep those ties intact as we prepare for a future where the survival of low-lying coastal cities such as New Orleans may be uncertain.

Human activity has influenced the flow of water around New Orleans and its environs since colonial settlement.⁴ In 1718, when Sieur de Bienville decided that the lower Mississippi was in need of a port, he founded New Orleans. The site of the future New Orleans was conveniently located in the crescent of dry land bordered by the Mississippi River and a whole ten feet above sea level, one

4. See U.S. ARMY CORPS OF ENGINEERS, REPORT NO. COEMVN/PD-98/09, NATIONAL REGISTER EVALUATION OF NEW ORLEANS DRAINAGE SYSTEM, ORLEANS PARISH, LOUISIANA, 9-16 (1999).

of the area's highest elevations.⁵ Within six years, a catastrophic hurricane hit the newly founded New Orleans, and the fledgling city was rebuilt from scratch.⁶ Without construction of levees, canals, and pumping systems, New Orleans would likely not be habitable, let alone commercially successful. These human interventions allowed for the shipping and oil industries to thrive, but came at the cost of storm-buffering wetlands.⁷

Yet, the combination of climate change, levee and canal construction, and coastal erosion created a perfect storm: in 2005, Hurricane Katrina caused extensive damage to New Orleans, with 80 percent of the city submerged under floodwaters. These effects were not felt equally: the Lower Ninth Ward, with a 95 percent African American population, was almost completely destroyed. While other predominantly white areas suffered damage, including St. Bernard Parish, which was significantly damaged,⁸ African Americans made up a majority of the deaths and suffered the most from the botched federal response. This Part will examine the impact and aftermath of Hurricane Katrina on the Lower Ninth Ward in order to show how retreat from flood zones will require different considerations and have different impacts on lower-income and minority communities.

A. History of Settlement Patterns and the Lower Ninth Ward

Settlement patterns in New Orleans reflected the fact that the city is “inexorably intertwined with the water surrounding it”: the more desirable parts of New Orleans were the higher elevation areas to the west and east and attracted wealthier, whiter residents.⁹ A naturally depressed area, New Orleans's elevation ranges from twenty feet above sea level to six feet below, with 65 percent of the city at or below sea level.¹⁰ Drainage projects began in the 1700s to address standing water problems, although the city continued to suffer from malaria, flooding, and poor sanitation throughout its first century.¹¹

In the late 1800s, the future Ninth Ward, “[t]he swampy expanse downriver,” was home to recent immigrants and free people of color.¹² These resourceful settlers built “clever, elongated houses that ventilated well, and assembled a rural neighborhood” where “people of the Ninth Ward depended on

5. DOUGLAS BRINKLEY, *THE GREAT DELUGE: HURRICANE KATRINA, NEW ORLEANS, AND THE MISSISSIPPI GULF COAST* 5–6 (2006).

6. *Id.* at 6–7.

7. *Id.* at 9.

8. *Id.* at 620–21; Julianne Landry Laviolette, *Hell & High Water How Hurricane Katrina Transformed St. Bernard*, *THE MIAMI HERALD* (Aug. 28, 2015), <https://www.miamiherald.com/news/weather/hurricane/article32639868.html>.

9. Juliette Landphair, “*The Forgotten People of New Orleans*” *Community, Vulnerability, and the Lower Ninth Ward*, 94 *J. AM. HIST.* 837, 839, 842 (2007).

10. David Schlotzhauer & W. Scott Lincoln, *Using New Orleans Pumping Data to Reconcile Gauge Observations of Isolated Extreme Rainfall due to Hurricane Isaac*, 21 *J. HYDRO. ENG'G* 1, 1 (2016).

11. See National Register Evaluation of New Orleans Drainage System, *supra* note 4, at 9–16.

12. Landphair, *supra* note 9, at 839.

each other, organizing mutual-aid and benevolent societies to care for the sick and the indigent.”¹³ With the construction of the Industrial Canal in 1923, the Lower Ninth Ward was severed from the rest of the city and developed its own unique culture due to its “literal and figurative isolation from central and uptown New Orleans.”¹⁴ Beginning in the 1950s, as white residents decamped from the Lower Ninth Ward to the surrounding St. Jefferson and St. Bernard Parishes, fleeing the bugbear of school desegregation, the Lower Ninth Ward’s population became majority African American.¹⁵ Hurricane Betsy, which ravaged the Lower Ninth Ward in 1965, increased the white exodus.¹⁶

Although the Lower Ninth Ward had high crime rates and a poverty rate of 33 percent around the time of Hurricane Katrina,¹⁷ residents “are fiercely attached to it—since the end of slavery the ward has been a haven for African Americans and until Katrina had one of the highest percentages of black homeownership in the city.”¹⁸ While citywide the homeownership rate was 46 percent for all demographics, in the majority-black Lower Ninth Ward, 60 percent of residents owned their homes.¹⁹ Despite the lack of city services, the Lower Ninth Ward fostered a tight-knit sense of community, and residents and their extended families had lived there for decades.²⁰

B. *The MRGO and Its Impact on Flooding in New Orleans*

Besides the Ninth Ward’s Industrial Canal, the federal government began other more complex and expansive drainage and canal projects in New Orleans in the twentieth century. This included construction of a shipping waterway connecting the Mississippi River to Lake Pontchartrain in 1914, and construction of the Gulf Intracoastal Waterway connecting Louisiana and Texas in 1925.²¹ In 1956, the Army Corps of Engineers began construction of the MRGO, which enlarged a navigation channel between the Port of New Orleans and the Gulf of

13. Dan Baum, *The Lost Year*, THE NEW YORKER (Aug. 21, 2006), <https://www.newyorker.com/magazine/2006/08/21/the-lost-year>.

14. Landphair, *supra* note 9, at 840 (noting that “as the century wore on, the Lower Ninth Ward’s literal and figurative isolation from central and uptown New Orleans bred a fierce loyalty among residents to their neighborhoods.”).

15. *Id.* at 841.

16. MICHAEL ERIC DYSON, *COME HELL OR HIGH WATER: HURRICANE KATRINA AND THE COLOR OF DISASTER* 11 (2007).

17. See Landphair, *supra* note 9, at 842. The poverty rate was taken from the 2000 census, the most recent census taken at the time of Hurricane Katrina.

18. Peter Moskowitz, *New Orleans’ Lower Ninth Ward Targeted for Gentrification It’s going to feel like it belongs to the rich*, THE GUARDIAN (Jan. 23, 2015), <https://www.theguardian.com/us-news/2015/jan/23/new-orleans-lower-ninth-ward-condos-gentrification>.

19. BRINKLEY, *supra* note 5, at 45.

20. Peter Whoriskey, *On This Block, Some Traditions Refuse to Die*, WASH. POST (Aug. 28, 2015), <http://www.washingtonpost.com/sf/national/2015/08/28/in-the-lower-ninth-some-traditions-refuse-to-die/>.

21. *St. Bernard Parish Gov’t v. United States*, 121 Fed. Cl. 687, 695–96 (2015) (hereinafter “St. Bernard Parish I”).

Mexico.²² Prior to the construction of the MRGO, the area around the Mississippi supported wetlands comprised of bald cypress and water tupelo.²³ These trees were able to survive because the natural geology of the area prevented the incursion of salt water.²⁴ With the construction of the MRGO, salt water entered the channel from the Gulf, leading to an increase in salinity in the surrounding wetlands that killed off plant life and removed natural barriers that prevented erosion and protected against storm surges.²⁵ In St. Bernard Parish, the MRGO led to the loss of 20,000 acres of wetlands.²⁶ The Army Corps of Engineers was aware of the threat the MRGO posed for wetlands prior to construction.²⁷

The Army Corps of Engineers also knew that the MRGO increased the threats from storm surge.²⁸ Because of the soil composition of the area, the construction of the MRGO led to higher rates of flow through the channel that cut through the city, further increasing erosion.²⁹ It was also posited that the MRGO created a “funnel” allowing storm surges from the Gulf of Mexico to travel up the channel into lakes surrounding the city of New Orleans.³⁰ At the same time as the MRGO’s construction, Congress also authorized the Lake Pontchartrain and Vicinity Hurricane Protection Project (LPV), a series of levees meant to combat flooding on the Mississippi and in New Orleans.³¹ These embankments were constructed along the Mississippi, Lake Pontchartrain, and the MRGO and other man-made channels to prevent the overflow of water.³²

C. Hurricane Katrina’s Impact on New Orleans and the Lower Ninth Ward

Despite, or because of, New Orleans’s extensive network of canals and levees, the arrival of Hurricane Katrina in 2005 decimated the city, becoming one of the most costly and deadly natural disasters in U.S. history.³³ Some of the hardest hit areas were the Lower Ninth Ward and the neighboring St. Bernard Parish. Hurricane Katrina first made landfall as a Category 3 storm near Buras, Louisiana, on August 29, 2005.³⁴ Prior to making landfall, Hurricane Katrina’s

22. *St. Bernard Parish II*, 887 F.3d at 1357–58.

23. *St. Bernard Parish I*, 121 Fed. Cl. at 698.

24. *Id.*

25. *St. Bernard Parish II*, 887 F.3d at 1357–58.

26. *Id.*

27. *See St. Bernard Parish I*, 121 Fed. Cl. at 698–700.

28. *Id.*

29. *See* Christopher R. Dyess, *Off with His Head The King Can Do No Wrong, Hurricane Katrina and the Mississippi River Gulf Outlet*, 9 NW. J.L. & SOC. POL’Y 302, 315. The soil under the MRGO is comprised of “fat clay,” a type of soil that is especially prone to displacement when under load, such as that of a levee. *Id.*

30. *St. Bernard Parish I*, 121 Fed. Cl. at 707.

31. *St. Bernard Parish II*, 887 F.3d at 1357–58.

32. *Id.* at 1358; *see generally* FEMA, WHAT IS A LEVEE? (2016) (describing and defining levees).

33. German Lopez, *Hurricane Katrina*, in *7 Essential Facts*, VOX (Aug. 28, 2015), <https://www.vox.com/2015/8/23/9191907/hurricane-katrina>.

34. *St. Bernard Parish I*, 121 Fed. Cl. at 710.

winds blew water into lakes in St. Bernard Parish and flooded wetlands.³⁵ On August 29, stormwater breached levees in the LPV system, flooding the Lower Ninth Ward of New Orleans.³⁶ While the Lower Ninth Ward, with an average elevation a few feet above sea level, “does not lie particularly low” compared to the rest of New Orleans, it was doomed by its location between the Industrial Canal and the MRGO, which funneled floodwater into the neighborhood.³⁷ The Lower Ninth Ward, which is 95 percent African American, and St. Bernard Parish, which is 70 percent white, suffered severe flooding: 68–98 percent of homes were damaged or destroyed.³⁸

Racial inequities in the city of New Orleans exacerbated Katrina’s devastating impacts. While other majority white neighborhoods such as the more affluent Lakeview neighborhood to the northwest also suffered extensive damage,³⁹ African American residents made up a majority of the deaths from Hurricane Katrina, driven partly by a failure of city officials to implement an evacuation plan that provided transportation for the 27 percent of residents, the majority black and poor, who lacked cars.⁴⁰ The Bush administration’s slow response to the plight of New Orleans also contributed to the death toll, as many people died from exposure to ninety-degree temperatures or from lack of access to medical care in the days immediately following the disaster.⁴¹ The slowness of the federal disaster response to New Orleans suggested that the federal government was less inclined to aid New Orleans victims, who were predominantly poor, African American, and Democrat, than other demographic groups.⁴²

Recovery efforts in the Lower Ninth Ward were slow and controversial, affecting the future demographics of the city for years to come. The Army Corps of Engineers closed the MRGO permanently in 2009, after determining that the MRGO, poorly maintained levees, and “decimated wetlands . . . left the parish vulnerable to future storms.”⁴³ The Lower Ninth Ward was the last place to

35. *Id.* at 707, 709.

36. *Id.* at 711.

37. Baum, *supra* note 13.

38. *St. Bernard Parish I*, 121 Fed. Cl. at 712.

39. *See, e.g.*, Baum, *supra* note 13.

40. BRINKLEY, *supra* note 5, at 46–47, 52–53. Brinkley’s book provides a thorough rundown of the events leading up to Hurricane Katrina’s landfall and the immediate rescue response in the week after.

41. *See id.* at 618–21.

42. *See id.* at 618–19. Brinkley ultimately concludes, however, that the botched federal response was due to the fact that “cronyism riddled FEMA and its contractors in the Bush administration, making incompetence and not racism the key to the response.” *Id.* at 618. Unfortunately, this pattern of failing to provide timely federal aid to predominantly minority communities in the wake of a natural disaster is not an isolated incident—the federal response to Hurricane Maria, which devastated Puerto Rico in 2017, was also plagued by delay and incompetence. Nearly 3,000 American citizens died, and the island was left largely without electricity for months. The death toll was not accurately calculated for nearly a year after the hurricane. *See* Sherri Fink, *Nearly a Year After Hurricane Maria, Puerto Rico Revises Death Toll to 2,975*, N.Y. TIMES (Aug. 28, 2018), <https://www.nytimes.com/2018/08/28/us/puerto-rico-hurricane-maria-deaths.html>.

43. *St. Bernard Parish I*, 121 Fed. Cl. at 714 (citing FEMA flood insurance studies).

receive electricity service, and, of all of New Orleans's inundated neighborhoods, was the only one "cordoned off by troops."⁴⁴ While only 3 percent of New Orleans's population lived there, "[t]he Lower Ninth Ward became . . . a vortex of overwrought emotion and intemperate rhetoric, a stand-in for contradicting visions of the city's future."⁴⁵ Mayor Ray Nagin's Bring New Orleans Back Commission's first recovery proposal for the Lower Ninth Ward was to abandon it, while allowing rebuilding to proceed in more affluent and whiter areas such as Lakeview, which had as high a risk of flooding as the Lower Ninth Ward.⁴⁶ Rebuilding efforts were also complicated by the fact that many residents in the Lower Ninth Ward did not have flood insurance, and those with homeowners insurance were locked in multiyear battles with their insurance companies.⁴⁷ Ten years after the storm, New Orleans's population was within 75 percent of its pre-Katrina levels, but only 36 percent of Lower Ninth Ward residents returned.⁴⁸

II. HURRICANE VICTIMS' ATTEMPTS TO RECOVER—*IN RE KATRINA CANAL BREACHES AND ST. BERNARD PARISH*

Once the floodwaters subsided, New Orleanians suffered from both financial and emotional devastation, compounded by the long recovery process. Examining the legal theories of the lawsuits filed in the wake of Hurricane Katrina shows that plaintiffs faced an uphill battle not only in their rebuilding efforts but also when trying to recover for hurricane and flood damage. The difficulties that victims face in recovering from storm damage will only become more salient as climate change makes the threat of natural disaster worse.

After the devastation of Hurricane Katrina, over four hundred lawsuits were filed by property owners in the Lower Ninth Ward and St. Bernard Parish against the federal government; all alleged that the government's construction of the levees and the MRGO contributed to the extensive flood damage.⁴⁹ Plaintiffs attempted to recover under different theories. In *Katrina Canal Breaches*, plaintiffs brought a tort claim against the Army Corps of Engineers for negligently building the MRGO and failing to maintain the levee systems.⁵⁰ Plaintiffs in *St. Bernard Parish I* took a different route, alleging that flooding caused by the construction of the MRGO constituted a "taking" under the Fifth

44. Baum, *supra* note 13.

45. *Id.*

46. *Id.*

47. Joseph B. Treaster & Leslie Eaton, *Insurance Woes for Hurricane Katrina Victims*, N.Y. TIMES (Sept. 7, 2007), <https://www.nytimes.com/2007/09/02/business/worldbusiness/02iht-orleans.4.7353442.html>.

48. Rivlin, *supra* note 1.

49. *St. Bernard Parish I*, 121 Fed. Cl. at 691; *see also* Nate Raymond, *Army Corps not Liable for Katrina Damage Court*, REUTERS (Sept. 25, 2012), <https://www.reuters.com/article/us-katrina-appeals/army-corps-not-liable-for-katrina-damage-court-idUSBRE8800U720120925>.

50. *In re Katrina Canal Breaches Consol. Litig.*, 647 F. Supp. 2d 644, 647–48 (E.D. La. 2009).

Amendment and that flood victims were entitled to just compensation.⁵¹ The failure of both sets of plaintiffs to recover under these lawsuits shows the current limits of litigation to adequately address compensation for hurricane and flood victims, and the need for an alternative approach that not only increases compensation but also reduces the risk of future property losses.

A. Katrina Canal Breaches and the Federal Tort Claims Act

While it is tempting to view the Army Corps of Engineers' construction of the MRGO and failure to maintain New Orleans's levees as a classic example of negligence, *Katrina Canal Breaches* shows that recovering under a negligence theory is functionally precluded by the discretionary function exception under the Federal Tort Claims Act (FTCA).⁵² Prior to the passage of the FTCA,⁵³ plaintiffs could not sue the federal government for negligence under the doctrine of sovereign immunity; they could only petition Congress for compensation.⁵⁴ Passed in 1946 after a U.S. Army B-29 bomber crashed into the Empire State Building,⁵⁵ the FTCA allows the federal government to be held liable for certain torts.⁵⁶ While the FTCA does allow plaintiffs to bring claims against the federal government, there are several limits to what plaintiffs can recover for. One of the limits to recovery is the discretionary function exception, which bars "[a]ny claim . . . based upon the exercise or performance or the failure to exercise or perform a discretionary function or duty on the part of a federal agency or an employee of the Government, whether or not the discretion involved be abused."⁵⁷ In other words, the discretionary functions exception means that any claims for government action involving policy judgments are barred.

The plaintiffs in *Katrina Canal Breaches* filed a lawsuit in the District Court for the Eastern District of Louisiana under the FTCA, alleging that the Army Corps of Engineers negligently constructed and maintained the MRGO.⁵⁸ The district court held that the Army Corps of Engineers' failure to address the widening of the MRGO over time and factor in the loss of wetlands constituted negligence since the Army Corps of Engineers had been aware of scientific studies dating from the time of the channel's construction that the MRGO would likely cause wetland loss, erosion, and increased flooding.⁵⁹ The district court held that neither the due care nor discretionary function exception applied to the

51. *St. Bernard Parish I*, 121 Fed. Cl. at 690–91.

52. For a further examination of tort law and its limitations for compensating disaster victims in general *see infra* Part III.A.

53. 28 U.S.C. § 1346 (2006).

54. Mark C. Niles, "Nothing but Mischief" *The Federal Tort Claims Act and the Scope of Discretionary Immunity*, 54 ADMIN. L. REV. 1275, 1298 (2002).

55. *Id.* at 1276–79, 1297.

56. Dyess, *supra* note 29, at 308.

57. 28 U.S.C. § 2680(a) (2012).

58. These cases were consolidated in *In re Katrina Canal Breaches Consol. Litig.*, 647 F. Supp. 2d at 644.

59. *Id.* at 733.

Army Corps of Engineers when they constructed the MRGO since the decision not to maintain was not based on a “policy” but rather involved technical, safety judgments.⁶⁰ In a procedural quirk,⁶¹ the Fifth Circuit, after first affirming the district court’s decision, abruptly reversed itself, holding that the Army Corps of Engineers could not be liable under the FTCA since their decision to construct and maintain the MRGO was “susceptible to policy analysis” and was thus excluded under the discretionary function exception.⁶² The Fifth Circuit noted, “The Corps’ actual reasons for the delay [in fixing the levees] are varied and sometimes unknown, but there can be little dispute that the decisions here were susceptible to policy considerations.”⁶³

B. St. Bernard Parish

Concurrent with *Katrina Canal Breaches*, property owners from St. Bernard Parish and the Lower Ninth Ward sued in the Court of Federal Claims (Claims Court)⁶⁴ under the Tucker Act, alleging that the federal government’s construction of the MRGO and failure to maintain the levees was a direct cause of the flooding. Plaintiffs argued they were entitled to compensation under the inverse condemnation doctrine, claiming that the flooding caused by the MRGO constituted a taking.⁶⁵ The Fifth Amendment of the Constitution explicitly forbids the government from taking “private property for public use” without “just compensation.”⁶⁶ Previous cases have held that flooding caused by government construction of dams and levees can constitute a “flowage

60. See *id.* at 716–17.

61. See Jane Louise Daley & Judge Stanwood Richardson Duval, Jr., *The Discretionary Function License to Kill? The Federal Tort Claims Act and Hurricane Katrina Implications of the Robinson/MRGO Decisions Can the King Do No Wrong?*, 62 LOY. L. REV. 299, 301 (2016). The U.S. Court of Appeals for the Fifth Circuit treated the government’s petition for a hearing en banc as a petition for a panel hearing “for which no opportunity for argument or briefing was granted. The appellate court withdrew its original opinion and substituted an opinion by which it unanimously reversed the district court’s opinion, as well as its own.” *Id.* at 301.

62. *In re Katrina Canal Breaches Litig.*, 696 F.3d 436, 451 (5th Cir. 2012).

63. *Id.*

64. Plaintiffs filed in the Federal Claims Court as opposed to the U.S. District Court for the Eastern District of Louisiana, because the Tucker Act requires that “any claim against the United States founded either upon the Constitution, or any Act of Congress or any regulation of an executive department, or upon any express or implied contract with the United States, or for liquidated or unliquidated damages in cases not sounding in tort” be filed in the Claims Court. 18 U.S.C. § 1491 (1958); see also Sandra B. Zellmer, *Takings, Torts and Background Principles*, 52 WAKE FOREST L. REV. 193, 201–02 (2017). The Tucker Act does not create an independent cause of action, but rather lays out the mechanism for plaintiffs to make their claims. The Tucker Act also specifically precludes any claims involving negligence or tort. See 18 U.S.C. § 1491.

65. *St. Bernard Parish I*, 121 Fed. Cl. at 690–91. Although the caption is “St. Bernard Parish,” the lawsuit was filed by residents of both St. Bernard Parish and the Lower Ninth Ward who lost property in Hurricane Katrina. This Note focuses on the Lower Ninth Ward specifically because the challenges presented in rebuilding the Lower Ninth Ward will likely be repeated in other communities across the United States as climate change causes more intense storms and flooding.

66. U.S. CONST. amend. V.

easement” for which compensation is required.⁶⁷ In order to recover under this inverse condemnation doctrine, a plaintiff must prove that government action caused injury to or invasion of private property, the invasion was the “direct, natural, or probable result” of an authorized activity, and there is proof that the invasion was either intentional or foreseeable.⁶⁸

The Claims Court found for the plaintiffs, holding that the federal government was liable to property owners for the flood damage since the construction of the MRGO and failure to maintain the levees resulted in flooding and thus “taking” of private property.⁶⁹ The Claims Court awarded plaintiffs \$5.46 million.⁷⁰ Both the government and plaintiffs⁷¹ appealed. The government’s appeal was based on their claim that the Claims Court erred in applying takings to an alleged “inaction” instead of an action and in finding that the plaintiffs sufficiently alleged causation.⁷² The Federal Circuit reversed the Claims Court, holding that plaintiffs had failed to prove that a government action had caused the flood damage.⁷³ The first prong of the court’s reasoning addressed the fact that the government’s “failure to maintain” the MRGO was an inaction, not an action.⁷⁴ As a result, the federal government’s “action” was not a taking under traditional takings doctrine, where liability is limited solely to affirmative government actions.⁷⁵

The Federal Circuit’s determination that takings applies only to affirmative action adheres not only to prior case law but is also defensible from a policy standpoint. Takings claims are designed to allow the government to act affirmatively to protect public health and safety since takings provides for just compensation, in contrast to tort doctrine, which is designed to deter harmful activity and compensate people for unplanned harm.⁷⁶ The principle that takings claims are only valid for affirmative government action stems from the idea that the Constitution enshrines “negative rights”—the Constitution allows the people to be free *from* government action by limiting what the government can do.⁷⁷ Allowing takings claims for government *inaction* would potentially increase

67. See, e.g., *United States v. Dickinson*, 331 U.S. 745 (1947); see also *Ridge Line Inc. v. United States*, 346 F.3d 1346 (2003); see also *Ark. Game & Fish Comm’n v. United States*, 568 U.S. 23 (2012).

68. *St. Bernard Parish II*, 887 F.3d at 1359 (citing *Ridge Line*, 346 F.3d at 1335; *Ark. Game & Fish Comm’n*, 568 U.S. at 24).

69. *St. Bernard Parish II*, 887 F.3d. at 1357.

70. *Id.* at 1359.

71. The plaintiffs’ appeal was based on the size of the damage award. *Id.*

72. *Id.*

73. *Id.* at 1368.

74. See *id.* at 1360.

75. See *id.* at 1362. (“Plaintiffs point to no case where the government incurred takings liability based on inaction. Takings liability must be premised on affirmative government acts.”). See also *Ridge Line Inc.*, 346 F.3d. at 1359; *Moden v. United States*, 404 F.3d 1335, 1339 (Fed. Cir. 2005); *All of Descendants of Tex. Land Grants v. United States*, 37 F.3d 1478, 1481 (Fed. Cir. 1994).

76. See Zellmer, *supra* note 64, at 200–01.

77. Christopher Serkin, *Passive Takings: The State’s Affirmative Duty to Protect Property*, 113 MICH. L. REV. 345, 356 (2014).

government's intrusion into private citizens' lives since governments would have more incentive to act affirmatively if they could be held liable for failing to act.⁷⁸ A counterpoint to limiting the takings doctrine to affirmative government actions is that this creates an incentive for a government to refuse to address potentially harmful actions, since any action taken by the federal government could create potential liability, while refusing to act brings no increased liability.⁷⁹ Additionally, scholars have argued that the idea that the Constitution only protects negative rights is no longer consistent with the modern welfare state, which has led to more instances where the government is *required* to act to secure certain entitlements for its citizens, such as health care, education, and cash assistance.⁸⁰

Despite some of the problems with limiting takings to affirmative action, extending takings claims to government inaction comes with its own set of difficulties. Allowing people to recover for government inactions removes incentives for people to avoid building in flood-prone areas, as property owners can rely on finding *some* government inaction, such as failing to build expensive flood-control infrastructure, that led to flooding and entitles them to compensation.⁸¹ Increasing takings liability to government inaction may also shield other entities from responsibility for their actions—the causes of increased flooding in the Gulf South are complex, stemming from a combination of anthropogenic climate change and land-use decisions made by both public and private actors.⁸²

Besides noting that plaintiffs failed to prove that the government's failure to maintain New Orleans's levees constituted an affirmative action,⁸³ the court also faulted the Claims Court for using the wrong legal standard for causation analysis.⁸⁴ While it was uncontested that the MRGO increased erosion and decreased wetlands, leaving the area more vulnerable to flooding, the court held that the Claims Court erred in looking solely at the effects of the MRGO, and not the LPV's impact in reducing flood risks.⁸⁵ The court also considered it was necessary to consider the impacts of the construction of the MRGO in context with the LPV, as both projects were commenced by the Army Corps of Engineers during the same time period, the LPV was constructed along the MRGO and used dredged materials from the project, and both addressed similar water flow and

78. *Id.* at 387.

79. *Id.* at 347.

80. *Id.* at 357–59.

81. *Id.* at 387.

82. See Mark S. Davis & Christopher J. Dalbom, *Taken by Storm—Property Rights and Natural Disasters*, 29 TUL. ENVTL. L.J. 287, 299 (2017) (“Indeed, when a natural event is tinged by such a plethora of human and governmental factors, it is extremely difficult, if not impossible, to say that the natural event (flood, storm, drought, sea change) was the intended or foreseeable result of an authorized governmental act, a connection that is essential at least for temporary or regulatory takings.”).

83. *St. Bernard Parish II*, 887 F.3d at 1362.

84. See *id.* at 1363–64.

85. *Id.* at 1363.

flooding issues.⁸⁶ Because the MRGO and LPV were “linked,” the court held that the impact of both projects should be considered when determining the cause of the flood.⁸⁷ Even if the MRGO increased the risk of flooding, it was possible that the LPV not only mitigated the risk created by the MRGO but reduced the risk of flooding more than if the LPV and MRGO had not been constructed at all. The court faulted plaintiffs for failing to identify any case where “the government has taken action that creates a risk of flooding and subsequent government action designed to mitigate the risk can be ignored in causation analysis.”⁸⁸ While *St. Bernard Parish II* analyzed the Army Corps of Engineers’ actions under a takings theory, these issues with causation will also become an issue for plaintiffs attempting to prevail under a tort theory for flood and hurricane damage as well.⁸⁹

The Federal Circuit’s holding in *St. Bernard Parish II* foreshadows the difficulties plaintiffs will face trying to recover in court for flooding and hurricane damage under a takings theory. The Claims Court’s decision in *St. Bernard Parish I* made sense on its face: the distinction between action and inaction is to some extent artificial and arbitrary, and it is undeniable that the Army Corps of Engineers’ construction of the MRGO led to erosion and loss of wetlands, creating a higher risk of flooding. However, the Federal Circuit correctly noted that allowing plaintiffs to recover for government inaction would go against case law. The Federal Circuit’s claim that plaintiffs can only recover under a tort theory is also functionally useless since prior rulings in *Katrina Canal Breaches* found that the Army Corps of Engineers’ actions in constructing and maintaining the MRGO were exempt from the FTCA under the discretionary function exception.

After *St. Bernard Parish II* and *Katrina Canal Breaches*, it is clear that courts alone cannot facilitate compensation for flood and hurricane victims nor effectively deter risky behavior that exacerbates the threats of flooding. While correctly decided in light of precedent, the court in *St. Bernard Parish II* declined to recognize the policy implications of their decision. Although the role of the courts is not necessarily to make policy decisions, the court’s analysis in *St. Bernard Parish II* did not sufficiently address the fact that barring recovery under a takings theory, after the denial of the plaintiffs’ tort claims in *Katrina Canal Breaches*, meant that hurricane victims were functionally unable to recover any compensation from the federal government for the damage caused by the Army Corps of Engineers’ construction of the MRGO and failure to maintain the levees. This gap in recovery shows that the legal system alone is not enough to compensate victims in the wake of natural disasters; hurricane and flood victims cannot rely on receiving damages or “just compensation” after they lose their

86. *Id.*

87. *Id.* at 1365–66.

88. *Id.* at 1367.

89. See *infra* Part III.A for a further discussion of the difficulties of proving causation for claims arising from natural disasters.

property in a hurricane or flood arguably due to government actions, suggesting that avoiding such losses is the only viable path forward. This failure to deter building in flood-prone areas or to adequately compensate for flood damage will further be explored in Part III, which looks at the role that tort theory and insurance play after natural disasters.

III. POTENTIAL MECHANISMS FOR COMPENSATING HURRICANE AND FLOOD VICTIMS AND THEIR DRAWBACKS

As climate change causes more frequent floods and powerful hurricanes, losses from natural disasters will only grow, increasing the need for compensation and alternative strategies, such as retreat and adaptation, to reduce future losses. By 2050, scientists expect sea levels to rise by approximately 1.5 feet in the United States due to ice sheet melting,⁹⁰ with levels rising by up to six feet by 2100.⁹¹ Thirty-nine percent of the United States' population is concentrated in coastal shoreline counties, with 52 percent in coastal watersheds, a number expected to grow.⁹² The Atlantic seaboard and Gulf Coast are particularly vulnerable to sea level rise—the low slope of the East Coast's continental shelf and higher rate of subsidence also mean that moderate sea level rise will lead to water encroaching much further inland.⁹³ Additionally, construction of levees and other artificial structures has altered the flow of the Mississippi and devastated wetlands on the Gulf Coast, increasing erosion and subsidence of land, which, combined with rising sea levels, increases the risk of flooding.⁹⁴ Rising ocean temperatures also mean that hurricanes will increase in frequency and strength, as warmer ocean temperatures fuel more evaporation that coalesces to form storms.⁹⁵ Experts expect hurricanes in the future to move slower and contain more moisture, leading to astonishing amounts of rainfall and further increasing flooding risks.⁹⁶ Such storms are already becoming more

90. U.S. Global Change Research Program, *Projected Sea Level Rise and Flooding by 2050* (last visited Dec. 12, 2018), <https://www.globalchange.gov/browse/multimedia/projected-sea-level-rise-and-flooding-2050>.

91. *See id.*

92. NOAA, *National Coastal Population Report Population Trends from 1970 to 2020*, 3 (2013), <https://aamboceanservice.blob.core.windows.net/oceanservice-prod/facts/coastal-population-report.pdf>.

93. John Upton, *Sinking Atlantic Coastline Meets Rapidly Rising Seas*, CLIMATE CENTRAL (Apr. 14, 2016), <http://www.climatecentral.org/news/sinking-atlantic-coastline-meets-rapidly-rising-seas-20247>.

94. *See, e.g.*, Chris Mooney, *Ten Years After Katrina The Next Big One*, WASH. POST (Aug. 21, 2015), <http://www.washingtonpost.com/sf/national/2015/08/21/the-next-big-one/>. For a further discussion of human impacts on flooding on the Louisiana Gulf Coast, *see infra* Part IV.D.

95. NOAA, Geophysical Fluid Dynamics Laboratory, *Global Warming and Hurricanes* (last visited Nov. 10, 2018), <https://www.gfdl.noaa.gov/global-warming-and-hurricanes/>.

96. Jeff Mosier, *Loading the dice' Climate Change Could Make Hurricanes More Devastating*, *Scientists Say*, DALLAS MORNING NEWS (Aug. 24, 2018), <https://www.dallasnews.com/news/harvey/2018/09/12/loading-dice-climate-change-could-make-hurricanes-devastating-scientists-say>.

frequent.⁹⁷ For example, the majority of Hurricane Katrina's storm damage came from flooding, not winds—by the time Hurricane Katrina hit New Orleans, meteorologists had downgraded it to a relatively tame Category 3 storm.⁹⁸ Hurricane Harvey, which hit Houston and the Gulf Coast in 2017, dropped as much as sixty inches of water,⁹⁹ causing Houston to sink two centimeters.¹⁰⁰ In 2018, Hurricane Florence, another slow-moving storm, drenched the Carolinas with 17.5 inches of water, breaking North Carolina's rainfall record.¹⁰¹

This Part primarily focuses on strategies for compensating and reducing losses from flooding and hurricanes for two main reasons: first, flooding is one of the costliest natural disasters in the United States, causing billions of dollars in damages per year,¹⁰² and second, hurricanes and flooding are some of the most visible and dramatic effects of climate change. Images from devastating floods and hurricanes grip the public's attention in ways that other less sudden threats like drought or increased heat waves do not. Hurricane Katrina is embedded in the public's conscience in ways unmatched by other natural disasters.¹⁰³ It is likely that climate change-induced hurricanes and flooding will be some of the most compelling effects of climate change, and the ones governments decide to address first.¹⁰⁴

While the need to improve compensation and adaptation strategies for those who live in flood- and hurricane-prone areas grows ever more urgent, there are currently no solutions that can be sufficiently scaled up to address the fact that millions of people live in areas that will soon become dangerously vulnerable to flooding and hurricanes. Several options exist for addressing and reducing flood and hurricane damage, including torts, insurance, and voluntary land buybacks. However, as exists currently, each of these systems has potential drawbacks and

97. Jonathan Belles, *Hurricane Florence Was the Nation's Second Wettest Storm Behind Harvey*, WEATHER CHANNEL (Sept. 25, 2018), <https://weather.com/storms/hurricane/news/2018-09-19-hurricane-florence-harvey-north-carolina>.

98. See *St. Bernard Parish I*, 121 Fed. Cl. at 710.

99. Belles, *supra* note 97.

100. Alexis C. Madrigal, *The Houston Flooding Pushed the Earth's Crust Down 2 Centimeters*, THE ATLANTIC (Sep. 5, 2017), <https://www.theatlantic.com/technology/archive/2017/09/hurricane-harvey-deformed-the-earths-crust-around-houston/538866/>.

101. See, e.g., Belles, *supra* note 97.

102. The NFIP estimates that 90 percent of natural disasters in the United States involve flooding. Insurance Information Institute, *Spotlight on Flood Insurance* (Feb. 2018), http://www.iii.org/issues_updates/flood-insurance.html.

103. See BRINKLEY, *supra* note 5, at 454 (noting that by September 1, 2005, "Katrina had become one of the half-dozen moments in American television that not only revealed events but actually defined the community of millions responding to it on television").

104. While California's dramatic fire seasons in 2017 and 2018 also generated news coverage and dramatic images, floods and hurricanes tend to attract more national attention and federal funds. See Ken Fisher & Bruce Fisherman, *It's Hard to See Hurricane Maria Through All This Smoke*, USA TODAY (Sept. 20, 2017), <https://www.usatoday.com/story/opinion/2017/09/20/wildfire-crisis-has-been-blanketed-hurricane-hysteria-ken-fisher-bruce-westerman-column/658959001/> (noting that the national media "headlines screamed of Hurricanes Harvey and Irma ravaging coastal states, [while] more than 8 million Western acres have been torched").

may not be adequate to address flooding and hurricane losses, suggesting that an alternate mechanism is needed to encourage relocation away from vulnerable areas.

A. The Role and Limitations of the Tort System in Compensating Victims of Flooding and Hurricanes

While the plaintiffs in *Katrina Canal Breaches* were unsuccessful in recovering under a tort theory for the Army Corps of Engineers' negligence in constructing and maintaining the MRGO and LPV,¹⁰⁵ tort doctrine may still have a role in compensating victims of climate change and reducing risks of property loss.¹⁰⁶ The goals of the tort system seem easily adaptable for the needs of hurricane and flood victims: tort doctrine can provide strong incentives to deter risky behavior, as well as provide compensation for victims.¹⁰⁷ Additionally, tort doctrine has a role in promoting "social cohesion," where society can show support for victims and condemn socially undesirable behavior.¹⁰⁸ A broad interpretation of tort doctrine can encompass administrative remedies such as victims' compensation funds.¹⁰⁹ Establishing an administrative victims' compensation fund for flooding and hurricane victims could be a viable solution. However, this may not be sufficient to actually deter undesirable behavior: because the risk is spread out over a collective group of taxpayers and people living in flood-prone areas are assured of compensation, there is less incentive to avoid building in vulnerable areas, since any one person will not bear the whole loss. Compensation tied to evacuation of flood-prone areas could mitigate the second part of this issue and will be discussed more in depth in Part IV. While the use of an administrative fund to compensate victims is an interesting idea, this Note will focus on a more traditional tort theory, since that is the theory that victims of hurricanes and flooding are most likely to utilize.¹¹⁰

Examining traditional tort doctrine suggests that recovery under tort theory for losses due to anthropogenic climate change, while possible, will prove difficult. Recent lawsuits filed against fossil fuel generators and greenhouse gas emitters show that plaintiffs in the United States face an uphill battle in

105. *Supra* Part II.A

106. See Daniel A. Farber, *Tort Law in the Era of Climate Change, Katrina, and 9/11 Exploring Liability for Extraordinary Risks*, 43 VAL. U.L. REV. 1075, 1113 (2009).

107. *Id.*

108. *Id.*

109. *Id.* at 1077. Farber examines the victims' compensation fund established in the wake of September 11 as an example of a successful administrative remedy. Victims' compensations funds are desirable when imposing fault-based liability could cripple a vital industry, such as the airline industry after September 11. *Id.* at 1107.

110. See Part I.A for a discussion of tort lawsuits filed against the federal government for flooding under Hurricane Katrina. There are fewer incentives to protect liable parties from flooding and hurricane damage because, unlike the September 11 attacks, which threatened to put airlines out of business, it is not likely that a valuable industry would be under threat of going bankrupt. See Farber, *supra* note 109, at 1077, 1107.

recovering under tort for damages linked to climate change. For example, California attempted to sue car manufacturers,¹¹¹ and the cities of San Francisco and Oakland sued oil companies, under a nuisance theory.¹¹² Both cases failed, however, because the court determined that damages from climate change was a “non-justiciable” political question.¹¹³ Additionally, in *American Electric Power Co. v. Connecticut*, the Supreme Court ruled that federal nuisance suits against greenhouse gas (GHG) emitters were displaced under the Clean Air Act.¹¹⁴

Even if not barred as a nonjusticiable political question or displaced by the Clean Air Act, succeeding in a common law tort suit to receive damages for climate change-induced flooding and hurricane damages will be challenging because it will be difficult, if not impossible, to meet many of the required elements. A major challenge will be proving the “causation” element.¹¹⁵ Extreme, unexpected weather events could be considered “acts of God” under tort doctrine and seen as intervening causes that break the chain of causation.¹¹⁶ Even if one were to identify the cause of flood damage as “anthropogenic climate change,” the causation element is still difficult to meet. Climate change is the result of multiple causal actors, including fossil fuel generators, government action and inaction, as well as individual consumer preferences.¹¹⁷ Additionally, courts can be wary of imposing huge damage awards on an industry or government. For example, one of the reasons proposed for the Fifth Circuit’s unusual reversal of their earlier decision in *Katrina Canal Breaches* was the court’s fear of imposing a huge damage award on the federal government and taxpayers.¹¹⁸

Besides the difficulty in proving causation, a significant hurdle faced by flood victims trying to recover is the statutory limitations placed on tort claims

111. See generally *Cal. v. Gen. Motors Corp.*, 2007 WL 2726871 (N.D. Cal. Sept. 17, 2007) (in which the State of California sought damages against automakers for contributing to global warming, a public nuisance).

112. See generally *City of Oakland v. BP P.L.C.*, 2018 WL 3109726 (N.D. Cal. June 26, 2018) (where the City of Oakland sought recourse from oil and gas companies for contributing to global warming).

113. *Id.* at *9; *Gen. Motors Corp.*, 2007 WL 2726871, at *13.

114. 564 U.S. 410, 424 (2011). The court held that because greenhouse gases are regulated under the Clean Air Act, “the Clean Air Act and the EPA actions it authorizes displace any federal common law right to seek abatement of carbon-dioxide emissions from fossil-fuel fired power plants.” *Id.* While this only speaks to nuisance actions under federal common law, wide-scale actions against GHG emitters to recover for flood damage and sea level rise will likely be heard in federal court, as “the international scope of plaintiffs’ claims and that the very instrumentality of the anticipated coastal flooding is uniquely federal.” See also *City of Oakland*, 2018 WL 3109726, at *3.

115. See Farber, *supra* note 106, at 1094–95.

116. See Restatement (Second) of Torts § 451 (1965) (stating “[a]n intervening operation of a force of nature without which the other’s harm would not have resulted from the actor’s negligent conduct prevents the actor from being liable for the harm, if the operation of the force of nature is extraordinary”). However, hurricanes and extreme weather events are becoming more predictable, so are less likely to be seen as “extraordinary” causes.

117. See Davis, *supra* note 82, at 296.

118. See Katie Schaefer, *Reining in Sovereign Immunity to Compensate Hurricane Katrina Victims*, 40 ECOLOGY L.Q. 411, 429–30 (2013).

against the federal government. While the FTCA does allow plaintiffs to bring tort claims against the federal government, the wide discretionary function exception makes it nearly impossible for victims to recover for a government entity's policy decisions, such as the decision to construct the MRGO in *Katrina Canal Breaches*.¹¹⁹ It is likely that any actions by the federal government that contribute to flooding and hurricanes, such as construction of flood control projects¹²⁰ or even broader policy decisions regarding energy use and GHG emissions, would fall under the discretionary function exception.¹²¹

While tort may seem at first glance a reasonable means for compensating hurricane and flood victims and reducing future losses, the practical difficulties in making a case and the limitations imposed by the FTCA show that recovery under tort doctrine is currently not a viable option.

B. Disaster Insurance and the National Flood Insurance Program

Disaster insurance schemes are another potential mechanism to compensate hurricane and flood victims and mitigate future risk. A major drawback with using private insurance, however, is that private insurers are reluctant to take on the risks associated with a major disaster since a single claim could be large enough to put an insurance company out of business.¹²² The history of flood insurance in the United States epitomizes the limits of private disaster insurance: private insurers fled the flood insurance market after major flooding on the Mississippi in 1927, having come to the conclusion that flooding claims were so frequent and costly that it did not make financial sense to continue to insure against flood damage.¹²³ For the next forty years, homeowners were effectively uninsurable against flood damage and increasingly relied on federal disaster relief after catastrophic floods.¹²⁴

119. See *supra* Part II.A for a more in-depth discussion of the discretionary function exception and *In re Katrina Canal Breaches*, 696 F.3d 436.

120. Even if not barred by the discretionary function, the Flood Control Act explicitly immunizes the federal government from flooding caused by breaches of federally constructed levees. 33 U.S.C.S. Section 702c provides that “[n]o liability of any kind shall attach to or rest upon the United States for any damage from or by floods or flood waters at any place.” 33 U.S.C.S. § 702c (2019). While the Supreme Court has argued back and forth as to what constitutes “floodwaters,” other statutory limits to federal tort liability make it unlikely that escaping the floodwaters definition will allow victims to recover. Compare *Central Green Co. v. United States*, 531 U.S. 425 (2005) (holding that water that leaked out of a canal did not count as floodwaters, so government was not immune under Flood Control Act), with *United States v. James*, 478 U.S. 597 (1986) (waters of a reservoir counted under Flood Control Act, so Army Corps was immune from recreational boaters’ injuries).

121. See Schaefer, *supra* note 118, at 440–41.

122. See Farber, *supra* note 106, at 1079.

123. Sarah Fox, *This is Adaptation: The Elimination of Subsidies Under the National Insurance Program*, 39 COLUM. J. ENVTL. L. 205, 219 (2014).

124. Jennifer Wriggins, *Flood Money: The Challenge of U.S. Flood Insurance Reform in a Warming World*, 119 PENN. ST. L. REV. 361, 372–73 (2014).

In order to reduce reliance on federal disaster aid, Congress created the National Flood Insurance Program (NFIP) in 1968.¹²⁵ The NFIP requires that anyone with a federally backed mortgage in a floodplain¹²⁶ purchase flood insurance.¹²⁷ Mortgage companies, not the federal government, are responsible for enforcing the flood insurance provision.¹²⁸ While in theory the NFIP could discourage development in flood-prone areas, since homeowners would have to take into account the cost of insurance when buying a home¹²⁹ and communities would have to adopt land-use policies to be eligible, the opposite occurred: after passage of the NFIP, development in flood-prone areas rapidly increased.¹³⁰ Premiums under the NFIP are artificially low and do not accurately reflect the risk of flooding, effectively subsidizing the purchase and development of land that was previously undesirable—homeowners became less wary about purchasing land in flood-prone areas since flood insurance was now cheap and widely available.¹³¹ After numerous devastating hurricanes, including Hurricanes Katrina, Irma, Sandy, and Harvey, the NFIP is financially insolvent and has had to rely on numerous bailouts from the federal government.¹³² As of August 2018, the NFIP is currently \$20.5 billion in debt to the Federal Treasury.¹³³

The inability to set actuarially sound premiums is only one problem with the NFIP: another one is compliance. Despite the (relatively) low cost of flood insurance and the high likelihood and high cost of flood damage, only approximately 35 percent of households living in floodplains currently carry flood insurance.¹³⁴ Because mortgage companies enforce the flood insurance requirement, people who have paid off their properties face no penalty for not having flood insurance. Additionally, the lender requirement is only applicable to high-risk properties, which are only as current as the most recent mapping.¹³⁵

125. *Id.*

126. FEMA periodically maps areas to determine the boundaries of floodplains for flood insurance purposes. If someone lives in a “100 year” flood zone, (where the risk of flooding is 1 percent a year) the government requires that homeowners purchase flood insurance. *See* FEMA, *Flood Insurance-Mandatory Purchase Requirement*, <https://www.fema.gov/media-library/assets/audio/166198> (last visited June 5, 2019); *see also* FEMA, *Definitions of FEMA Flood Zone Designations*, <https://snmapmod.snco.us/fmm/document/fema-flood-zone-definitions.pdf> (last visited June 5, 2019).

127. Wriggins, *supra* note 124, at 380.

128. *Id.*

129. Ernest A. Abbott, *Flood Insurance and Climate Change Rising Sea Levels Challenge the NFIP*, 26 *FORDHAM ENVTL. L. REV.* 10, 26–27 (2014).

130. Fox, *supra* note 123, at 219.

131. *Id.* at 217; *see also* Daniel D. Barnhizer, *Givings Recapture Funding Public Acquisitions of Private Property Interests on the Coasts*, 27 *HARV. ENVTL. L. REV.* 295, 309–10 (2003).

132. The losses incurred in Hurricanes Rita and Katrina in 2005 exceeded the total premiums the NFIP had collected over the thirty-seven years of its existence. *See* Abbott, *supra* note 129, at 34.

133. Jim Morrison, *Congress Extends NFIP Four Months, Calls for Reform*, *FORBES* (Aug. 1, 2018), <https://www.forbes.com/sites/jimmorrison/2018/08/01/congress-extends-nfip-four-months-calls-for-reform/#367d4870210a>.

134. Barnhizer, *supra* note 131, at 333.

135. *See* Charlene Luke & Aviva Abramovsky, *Managing the Next Deluge A Tax System Approach to Flood Insurance*, 18 *CONN. INS. L.J.* 1, 12–13, 18 (2012).

Because FEMA's floodplain maps may not accurately reflect current flooding risks, people may be exempt from insurance requirements due to out-of-date maps not characterizing the area as "high risk."¹³⁶ Lenders also only enforce the flood insurance requirement at the closing of a sale, so many homeowners let their policies lapse once they have secured their mortgages.¹³⁷ Reasons for why people in flood-prone areas choose to not purchase insurance vary, but include cost, unwillingness to contemplate an uncertain future risk, and a belief that the federal government will bail out homeowners in the event of a catastrophe.¹³⁸ Problems with compliance with the NFIP were noted as early as 1985: "Where the risk [of flooding] is low, compliance is generally good. . . . Where the risk is high, however, as in much of South Louisiana, tomorrow's development still overrides next year's inevitable losses."¹³⁹

Another major drawback of the NFIP is the problem with repetitive loss properties. Statistically, NFIP claims are not evenly distributed—1 percent of properties receive 10 percent of NFIP payouts,¹⁴⁰ with some estimates of the rate of payouts going to repetitive loss properties as high as 40 percent.¹⁴¹ Stories abound of homes being repeatedly flooded and rebuilt, with costs totaling many times the actual value of the home: a house in Texas flooded twenty-two times since 1979 and was repaired to a cost of \$1.8 million.¹⁴² This concentration of a small number of policyholders receiving a disproportionate amount of payouts illustrates the difficulty in implementing an insurance system that can adequately cope with natural disasters. The NFIP is a prime example of the two problems that plague insurance systems: moral hazard and adverse selection. Moral hazard means that insurance companies incentivize unwanted behavior,¹⁴³ for example building in floodplains. Because insured homeowners no longer face the risk of having to pay out of pocket to repair their flooded homes, they have less incentive

136. *See id.*

137. *See id.* at 14–16; *see also* Wriggins, *supra* note 124, at 387 n.145.

138. Christine A. Klein & Sandra B. Zellmer, *Mississippi River Stories: Lessons from a Century of Unnatural Disasters*, 60 SMU L. REV. 1471, 1524–25 (2007).

139. Oliver A. Houck, *Rising Water: The National Flood Insurance Program and Louisiana*, 60 TUL. L. REV. 61, 164 (1985).

140. Mary Williams Walsh, *A Broke, and Broken, Flood Insurance Program*, N.Y. TIMES (Nov. 4, 2017), <https://www.nytimes.com/2017/11/04/business/a-broke-and-broken-flood-insurance-program.html>.

141. *See* Barnhizer, *supra* note 131, at 334. Part of this discrepancy is due to differences in characterization of what constitutes repetitive loss properties. Barnhizer classified 2 percent of properties as "repetitive loss" properties. *Id.*

142. Ruth Simon, *One House, 22 Floods: Repeated Claims Drain Federal Insurance Program*, WALL STREET JOURNAL (Sept. 15, 2017), <https://www.wsj.com/articles/one-house-22-floods-repeated-claims-drain-federal-insurance-program-1505467830>. Other examples of homes being flooded and repeatedly rebuilt include a home worth \$50,000 in Mississippi racking up \$161,000 in repair costs after flooding twenty-five times, and a home in Texas worth \$114,000 flooding sixteen times and receiving \$806,000. David Hunn et al., *Build, Flood, Rebuild: Flood Insurance's Expensive Cycle*, HOUSTON CHRONICLE (Dec. 9, 2017), <https://www.houstonchronicle.com/news/houston-texas/houston/article/Build-flood-rebuild-flood-insurance-s-12413056.php>.

143. Wriggins, *supra* note 124, at 388.

to avoid building in flood-prone areas. Adverse selection applies when only the people with the greatest need for insurance purchase it, driving up the actual cost of insurance since the only policyholders paying premiums are also the ones with the highest risk.¹⁴⁴ The NFIP cannot refuse to insure people in eligible communities, meaning that individuals with the highest risk of flooding are most likely to purchase insurance.¹⁴⁵ Although it may be possible to implement a more functional insurance scheme to address losses due to climate change,¹⁴⁶ the NFIP as it currently exists is unsustainable.

C. Land Buybacks under the NFIP

The difficulties with compensating victims of flooding and hurricane damage and reducing future property losses from major storms are apparent in both tort doctrine and the NFIP. As climate change increases the rate and magnitude of losses, strategies focused solely on compensating victims will be insufficient. In order to deal with climate change losses, strategies should be implemented not only to compensate for losses, but also to reduce future losses by encouraging and facilitating retreat.

While the NFIP has been mostly unsuccessful as an insurance scheme, one aspect of the NFIP that has been somewhat effective is the NFIP's use of voluntary buybacks to allow people to leave repetitive loss properties. Many homeowners in flood-prone areas would like the opportunity to sell and move elsewhere; even with flood insurance, the prospect of rebuilding after repeat flooding is time-consuming and resource-intensive.¹⁴⁷ Owners of repetitive loss properties may find it difficult or impossible to find a private buyer. Because houses are usually people's biggest assets, being unable to sell a house means homeowners would lose a significant portion of their investment and would likely lack the resources to move to higher ground.¹⁴⁸ Currently, the NFIP has a provision that allows for people to sell their homes to the federal government after a natural disaster.¹⁴⁹ After Hurricane Katrina, seven hundred households in the Lower Ninth Ward sold their flood-ravaged properties to the federal government.¹⁵⁰

144. *Id.* at 387.

145. *Id.* at 387–88; *see also* Barnhizer, *supra* note 131, at 333–34.

146. *See infra* Part IV.A.

147. *See* Hunn, *supra* note 142; Walsh, *supra* note 140.

148. *See* Hunn, *supra* note 142.

149. 42 U.S.C. § 5170c(b) provides that FEMA can buy properties that have been affected by a natural disaster. 42 U.S.C.A. § 5170c(b) (West 2018).

150. Greg Allen, *Ghosts of Katrina Still Haunt New Orleans' Shattered Lower Ninth Ward*, NPR (Aug. 3, 2015), <https://www.npr.org/2015/08/03/427844717/ghosts-of-katrina-still-haunt-new-orleans-shattered-lower-ninth-ward>.

However, there are several downsides to the NFIP's current land buyback program. The process is time-consuming and bureaucratic,¹⁵¹ and many homeowners find that by the time FEMA is able to purchase the property, homeowners have been able to fully repair their homes in the ensuing months.¹⁵² Buybacks are also completely voluntary: homeowners are free to rebuild and rebuild again after repeated floods, since the NFIP has no lifetime cap on payouts.¹⁵³ Congress has also focused the majority of the NFIP's and FEMA's budget on rebuilding efforts: "Since 2000, the NFIP has spent \$46.6 billion to repair and rebuild policyholders' homes. Over that same period, FEMA provided just \$804 million to purchase flood-prone properties."¹⁵⁴ While the prospect of continuous flood-repair work may not be a desirable option for homeowners, there are several reasons why people are reluctant to move, even after repeat floodings. Rebuilding after a flood can be seen as an act of resilience: because flood-prone areas tend to be populated by people from lower socioeconomic standing, "[r]ebuilding after a storm can also be an act of defiance against an unfair and discriminatory system."¹⁵⁵ People also have strong emotional attachments to their homes and communities—having to relocate can conjure feelings of grief akin to losing a family member.¹⁵⁶

There are currently few political incentives to increase the funding available for buybacks. The buyback program is funded by FEMA through the Hazard Mitigation Assistance Program.¹⁵⁷ Unsurprisingly, Congress prefers to devote funding to telegenic disaster relief immediately post-disaster, as opposed to allocating funding to the less compelling buyout and insurance process.¹⁵⁸ Ordinary constraints on the federal budget do not apply to disaster relief, making it easier to request massive sums, whereas adding funding to FEMA's Hazard Mitigation Assistance Program for buybacks would have to go through the current Sisyphian appropriations process.¹⁵⁹

151. Completing the paperwork and getting approval for a buyout can take three to four years. Alexander S. Mendelson, *Taking Away the Tighrope: Fixing the National Flood Insurance Program via Eminent Domain*, 83 BROOK. L. REV. 1519, 1532 (2018).

152. *Seeking Higher Ground: How to Break the Cycle of Repeated Flooding with Climate-Smart Flood Insurance Reforms*, NATURAL RESOURCES DEFENSE COUNCIL 6 (July 25, 2017), <https://www.nrdc.org/sites/default/files/climate-smart-flood-insurance-ib.pdf>.

153. Mendelson, *supra* note 151, at 1531.

154. NRDC, *supra* note 152, at 4.

155. Alexander B. Lemann, *Stronger Than the Storm: Disaster Law in a Defiant Age*, 78 LA. L. REV. 437, 474 (2018).

156. Jeffrey T. Powell, *The Psychological Cost of Eminent Domain Taking and Just Compensation*, 30 L. & PSYCHOL. REV. 215, 222 (2006).

157. *Case Studies for Floodplain Buyouts*, RICE KINDER INSTITUTE FOR URBAN RESEARCH 2 (2017), <https://kinder.rice.edu/sites/g/files/bxs1676/f/documents/KI%202018%20Buyout%20Report%20.pdf>.

158. See Barnhizer, *supra* note 131, at 329–30. "Although the scope of disaster relief has been increasing for some time, recent expansions of the program have increased dramatically the ability of the executive and legislative branches to engage in 'disaster gerrymandering' and to award disaster aid as off-budget pork to their constituencies." *Id.*

159. See *id.* at 330.

D. Is Reform of the NFIP Possible?

As currently enacted, the NFIP fails to provide some of the major benefits of insurance: while it does provide compensation for loss, it is not self-sufficient and does nothing to deter risky behavior. However, despite these drawbacks, this does not mean that flood insurance in theory is completely unworkable. Several reforms, such as increasing premiums to adequately reflect risk, capping payouts for repetitive loss properties, and improving the buyout program, could be effective, but will likely be politically difficult to implement. Additionally, shoring up the NFIP will not necessarily address the biggest threat from climate change-induced flooding and hurricane damage, which is that some areas of the United States will likely no longer be habitable as currently developed. While a robust insurance system can compensate victims, it is not fiscally nor morally responsible if such a system merely encourages continued development in flood-prone areas. Expanding the NFIP's land buyback program is one option to encourage retreat, but a voluntary program alone may not be enough to entice people to move from flood zones.

1. Raise NFIP Premiums to More Accurately Reflect the Risk of Flooding

One of the most obvious issues with the current state of the NFIP is the fact that premiums do not adequately account for flood risk nor generate enough funding to keep the NFIP running without periodic bailouts from taxpayers. Congress has attempted to reform the NFIP sporadically through the years, most recently in 2012 and 2014. In 2012, Congress passed the Biggert-Waters Act with the goal of improving the financial health of the NFIP and decreasing its reliance on bailouts from the Treasury. Biggert-Waters phased out grandfathering home premiums in previously low-risk areas that were now classified as high risk on FEMA's updated maps.¹⁶⁰ Biggert-Waters also aimed to reduce subsidies for flood insurance, increase premiums, and improve floodplain mapping.¹⁶¹ The ultimate goal of Biggert-Waters was to gradually raise premiums to more accurately reflect the flooding risk faced by properties.¹⁶²

While Congress intended Biggert-Waters to shore up the NFIP, political pressure from states in the Gulf South,¹⁶³ which rely heavily on subsidized flood insurance, led to its downfall.¹⁶⁴ In 2014, President Obama signed the Affordability Act, which rolled back much of the reforms proposed by Biggert-Waters.¹⁶⁵ The failure of the Biggert-Waters Act demonstrates one of the biggest

160. Fox, *supra* note 123, at 227–28.

161. *Id.*

162. *Id.* at 229–30.

163. Louisiana, Mississippi, Florida, Alabama, and South Carolina sued in 2013 under the Administrative Procedure Act to stop Biggert-Waters from going into effect. *Id.* at 230–31.

164. *See id.*

165. *Id.* at 231–32.

problems with increasing premiums for flood insurance—it is nigh politically impossible to remove federal subsidies from a program that people have relied on for nearly half a century.

Removing subsidies for flood insurance and raising premiums to accurately reflect risk will also disproportionately impact low-income homeowners. Because it is required by law to have flood insurance if a homeowner has a federally backed mortgage, people who are unable to pay higher premiums could potentially lose their mortgages.¹⁶⁶ Raising premiums could also lead to a crash in the property value of people's homes since subsequent buyers may be less inclined to buy homes without cheap and readily available flood insurance.¹⁶⁷ Premiums that accurately reflect the risk of flooding could simply be too high for homeowners to afford, causing them to go without flood insurance and be uninsured when disaster strikes.¹⁶⁸ A possible solution to deal with the hardships of increasing flood-insurance premiums would be to provide financial assistance to low-income homeowners to pay for higher premiums.¹⁶⁹

Although allowing people to remain in their homes is a laudable goal, it does not address the fact that many areas will become uninhabitable over the next several decades as flooding and hurricane damages increase due to the effects of climate change. Providing insurance subsidies provides little incentive for people in vulnerable areas to relocate to higher ground.¹⁷⁰ Additionally, choosing who is eligible for a subsidy may prove politically difficult—as seen in the failure of Biggert-Waters, flood insurance policy in the United States has often been hijacked by vocal, politically powerful interests, such as coastal homeowners in affluent areas or the real estate industry.¹⁷¹ While improving the structure of flood-insurance premiums for the NFIP may be technically possible, political realities make it unlikely to succeed. Even with premiums adjusted for risk, it is not clear if high flood-insurance premiums would be enough to encourage people to retreat from areas facing high flooding risks—the policy goal needed in the face of climate change.

2. *Cap the Amount of Money a Property Can Receive after Repeated Flooding*

As discussed above, compensation alone may not be an adequate strategy to address the growing hurricane and flood losses due to climate change; a

166. *See id.* at 240. However, because lenders are less stringent about enforcing flood-insurance requirements after closing, it is unlikely that banks would rescind mortgages due to lack of flood insurance. *See supra* note 137 and accompanying text.

167. *See id.*

168. *See* Luke, *supra* note 136, at 26–27.

169. Wiggins, *supra* note 124, at 435; Fox, *supra* note 123, at 245–47. Such a strategy is seen in the Affordable Care Act, which provides subsidies for people below a certain income level to pay health insurance premiums.

170. Fox, *supra* note 123, at 246. Fox suggests that subsidies based on need be limited to current homeowners to prevent “another subsidy for coastal development in perpetuity.”

171. *See* Wiggins, *supra* note 124, at 437.

mechanism to encourage retreat, as seen in the NFIP's land buyback program, is needed. Because at least 10 percent of NFIP payouts go to 1 percent of properties,¹⁷² a simple way to reform the NFIP and encourage people to move from floodplains would be to cap the amount of money a single property can receive. While NFIP payouts are capped at \$250,000 per payout,¹⁷³ there is no limit to the number of times a property can receive that amount. Limiting NFIP payments to one or two flooding events in a certain period of years could enhance the program's financial stability since the properties that rack up the most NFIP payments would no longer be eligible for NFIP payments after repeat floodings.

Congress has attempted to pass laws reducing payouts for repetitive loss properties; both acts failed to leave committee.¹⁷⁴ The hurdles in passing effective reforms to limit payouts to repetitive loss properties are similar to those seen when attempting to raise premium rates. Homeowners have come to rely on access to cheap flood insurance; suddenly limiting claims on repetitive loss properties will leave homeowners who are prone to flood damage (metaphorically) high and dry. Removing further payments or federal disaster aid may also prove morally distasteful in the wake of a major flood or disaster: what recourse will be left to people whose homes, their largest asset, have been destroyed, if there is no money to rebuild or relocate?

3. *Improve the Voluntary Buyout Program*

One of the most promising reforms to the NFIP would be improving the voluntary buyout process. Many people in flood-prone areas would like to relocate to drier areas, but they cannot afford to move without first selling their house. Private buyers are unlikely to purchase a house at risk of repeated flooding, leaving the government as a buyer of last resort. Allocating more funding to the NFIP's buyout program and streamlining the buyout process could feasibly help homeowners voluntarily leave their properties. However, one drawback of a voluntary buyback program is that it may not be sufficient to encourage reluctant homeowners to move. Additionally, streamlining the buyback program could have the perverse effect of encouraging *more* people to move to flood-prone areas. Investors may be willing to gamble on vulnerable properties in high-value, high-risk areas,¹⁷⁵ knowing that they can always off-load their property on the federal government in the wake of a natural disaster.

172. See Walsh, *supra* note 140; see also Simon, *supra* note 142.

173. Luke, *supra* note 136, at 53.

174. Barnhizer, *supra* note 131, at 334. "Attempts to address the repetitive loss problem routinely have failed in Congress. Two of the most recent legislative sallies—the colorfully named Two Floods and You're Out of the Taxpayer's Pocket Act of 2001 and the Repetitive Flood Loss Reduction Act of 2001—foundered in committee."

175. An example of this is seen in the current real estate market in Miami Beach. Miami is one of the cities most vulnerable to sea level rise impacts, yet it has some of the most valuable coastal properties in the country. See Christopher Flavelle, *Florida Could Be Close to a Real Estate Reckoning*, INSURANCE JOURNAL (Jan. 2, 2018), <https://www.insurancejournal.com/news/southeast/2018/01/02/475789.htm>.

Overall, reforming our nation's flood insurance regime may help keep the NFIP afloat and ensure the continued existence of flood insurance, but it does not address the fact that some properties may rightly be uninsurable—their loss is all but guaranteed. A climate change adaptation strategy should have plans to compensate victims of flooding and hurricanes, but also include incentives to avoid repetitive losses. An insurance scheme, while a possibility in theory, has several drawbacks which are exemplified by the current state of the NFIP and the political and practical difficulties in reforming it.

After examining both the potentials of tort law and insurance to compensate people for climate change-related losses, it is likely that neither system on its own can be enough to address losses from hurricanes and flooding: victims attempting to recover under tort law face several problems meeting the elements necessary to prove negligence, if their claims are not already statutorily barred. Disaster insurance as embodied by the NFIP fails to set premiums high enough to pay out claims, and private insurers are unwilling to fill in the gap. Reforming tort or the NFIP also does not address the issue that at some point, retreat from vulnerable areas will be necessary.

IV. EMINENT DOMAIN AS A VIABLE MECHANISM TO COMPENSATE VICTIMS AND PREVENT FURTHER LOSSES FROM CLIMATE CHANGE

Even though NFIP land buybacks as currently implemented leave much to be desired, as climate change exacerbates the risk from flooding and hurricanes, land buybacks of repeatedly flooded properties may be the best option. To prevent people from being trapped in a cycle of flooding and rebuilding, eminent domain could be a possible mechanism to proactively buy land in areas that will soon be uninhabitable while providing residents adequate resources to resettle elsewhere. While the court in *St. Bernard Parish II* was correct in holding that plaintiffs could not recover for damage under a takings theory, eminent domain does have a role in not only compensating victims of climate change but reducing the threat of future losses. This Part will proceed by discussing the possibilities and downfalls of using a purely voluntary buyback program. Ultimately, the lack of a reliable way to address the problem of holdouts who refuse to sell their land back under any circumstances means relying solely on the voluntary sale of vulnerable lands is not enough. This Part will then discuss the political and legal ramifications of using eminent domain, as well as explore examples where the use of government-funded buybacks and eminent domain were used to evacuate entire towns.

A. The Need for a Robust Voluntary Relocation Program and Its Limitations

Eminent domain is a drastic solution for a desperate problem: the effects of climate change will likely wipe some areas off the map. Eminent domain is not a solution that should be undertaken lightly; besides the costs and logistical difficulties of a wide-scale eminent domain program, it also infringes on people's

autonomy and property rights. A discussion of eminent domain also cannot be complete without an examination of the stark inequities contained in its history.¹⁷⁶ An ideal program would be mainly voluntary, with eminent domain as a last resort for holdouts.

Voluntary retreat from flood-prone areas facilitated by government buyouts is a valid adaptation strategy to climate change: buyouts compensate people for their property, and also prevent future losses. Vulnerable communities in the United States, such as indigenous communities in Alaska and off the coast of Louisiana, have already begun voluntary relocation programs as rising seas submerge their land.¹⁷⁷ As discussed above,¹⁷⁸ expanding and improving the NFIP's land buyback program could provide the assistance necessary for willing homeowners to relocate. However, the biggest hurdle for a successful voluntary program is that there is little recourse if people simply refuse to move. How should governments deal with holdouts?

An obvious option, of course, is to do nothing: let people continue to live where they choose, while making it clear that federally subsidized flood-insurance and disaster aid will dry up.¹⁷⁹ Doing nothing, however, is not a viable option either to compensate victims or deter development in floodplains. Sea level rise will almost certainly result in subsidence and flooding of coastal lands in Louisiana, and without government aid, there is a strong chance that communities will be devastated by flooding without the means to rebuild or move. It is not clear if the threat of withholding disaster aid or insurance is enough to incentivize people to change their behavior: people are notoriously bad at estimating future risk, particularly the risk of flooding, which has a statistically low probability of occurring in any given year but has very high costs.¹⁸⁰

Denying government assistance for people in flood zones also brings up questions of reliance and fairness. People relied on the existence of cheap and readily available flood insurance and disaster aid when they chose to settle in an area. Additionally, many people living in low-lying, flood-prone areas are poor and lack the resources to move elsewhere or have deep ties to the community.¹⁸¹

176. See *infra* Part V.A.

177. Rachel Waldholz, *Congress Poised to Approve \$15M for Village Relocation in Alaska*, ALASKA PUBLIC MEDIA (Mar. 22, 2018), <https://www.alaskapublic.org/2018/03/22/congress-poised-to-approve-15m-for-village-relocation-in-alaska/1>; see also Merrit Kennedy, *Threatened By Rising Seas, Alaska Village Decides To Relocate*, NPR (Aug. 18, 2016), <https://www.npr.org/sections/thetwo-way/2016/08/18/490519540/threatened-by-rising-seas-an-alaskan-village-decides-to-relocate>; see also 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>. For a further discussion of these projects, see *infra* Part V.B.

178. *Supra* Part III.D.3.

179. Fox, *supra* note 123, at 211. Fox argues that it is unlikely that the government will be found either contractually obligated to continue to provide subsidized flood insurance or run into takings lawsuits if subsidies are withdrawn. *Id.* at 238–44.

180. Luke, *supra* note 136, at 36–37.

181. See Fox, *supra* note 123, at 244–45.

As seen in the discussion of the Lower Ninth Ward, some communities settle in more vulnerable areas due to systemic settlement patterns that reflect racial and socioeconomic inequities. Because the government has to some extent encouraged this pattern through policies that promote and subsidize development in floodplains, it seems just that they take responsibility and provide monetary assistance for relocating, even if that assistance is unwanted.

B. The Legal Mechanisms of Using Eminent Domain to Buy Back Flood-Prone Properties

Eminent domain could provide a possible solution to the problem of compensating victims for flood and hurricane disasters while also facilitating retreat from flood-prone areas. Under the Fifth Amendment, the federal government has the authority to take private property for “the public use,” which could include buying up flood-prone property in areas threatened by climate change and sea level rise and allowing it to return to green space. Using eminent domain to buy property from flood-prone areas would provide compensation for homeowners to move from flood zones and prevent development in areas that will be continuously flooded. Allowing land to revert back to open space will also create additional protection from flooding: wetlands reduce the impact and strength of storm surges and flooding.¹⁸² While some states and municipalities have moved to limit takings to only circumstances where land will be in the “public use,”¹⁸³—as opposed to the federal government’s more expansive definition of “public purpose”¹⁸⁴—taking property in flood zones and allowing it to return to open space likely fits in even the narrower definition of “public use.” Buying flood-prone land and letting it revert to public green space as protection from storms is no different than other cases where governments have taken private land to create parks or build floodwalls and levees.¹⁸⁵

C. Potential Problems with the Use of Eminent Domain

While it is hard to argue that government—either state¹⁸⁶ or federal—is not within their authority to take flood-prone property and convert it to the “public

182. See generally Edward B. Barbier et al., *The Value of Wetlands in Protecting Southeast Louisiana from Hurricane Storm Surges*, 8 PLOSOne (2013) (exploring the “role of coastal wetlands and vegetation in reducing storm surge and flood damages”).

183. John J. Costonis, *New Orleans, Katrina and Kelo: American Cities in the Post-Kelo Era*, 83 TUL. L. REV. 395, 407–08 (2008).

184. The Supreme Court explicitly recognized the broadening of public use in *Kelo v. City of New London*, 545 U.S. 469, 480 (2005) (noting “[w]ithout exception, our cases have defined [public purpose] broadly, reflecting our longstanding policy of deference to legislative judgments in this field”).

185. See John Lovett, *Moving to Higher Ground: Protecting and Relocating Communities in Response to Climate Change*, 42 VT. L. REV. 25, 31–32 (2017); see also Shelby C. Stone, *Two Tales of One City: Eminent Domain Post-Katrina and a Response to Kelo*, 53 LOY. L. REV. 115, 121 (2007).

186. Most eminent domain cases are at the state or local level. However, this Note will focus primarily on federal eminent domain since wide-scale land buybacks will likely require significant federal involvement.

use,” there are several practical concerns with this approach. Any attempt by the federal government to use eminent domain to push people out of floodplains will be met with litigation, which is costly and time-intensive.¹⁸⁷ Even if the government prevails in court, a bigger concern may be that eminent domain is politically untenable in the areas most likely to be flooded from climate change. Additionally, the fraught history of using eminent domain to displace minority and lower-income groups means that extra care must be taken to avoid repeating past injustices.

1. Eminent Domain Can Be Costly and Time-Intensive

One of the biggest obstacles for using eminent domain to relocate people from flood zones is that any invocation of “eminent domain” immediately leads to lawsuits, increasing the length and cost of any relocation plan.¹⁸⁸ Assuming that the amount of “just compensation” has been litigated and decided upon,¹⁸⁹ a further barrier to the use of eminent domain is cost—buying vulnerable land outright would require significant outlays of cash up front.¹⁹⁰ It is possible that what is considered “just compensation” can be discounted, since arguably the value of the land is artificially high due to government-subsidized flood insurance.¹⁹¹ If the price of buying back property outright is prohibitively expensive, another option is to condemn a future interest in the property.¹⁹² Because climate change and sea level rise is a gradual process, the government can lay claim to a future interest in property, which will “be a fraction of the present value of the full fee simple interest.”¹⁹³ Buying a future interest could be a win-win outcome because “condemnation of future interests does not intrude as much into the interests of the private owners, who can continue to use the property beneficially for the time being, perhaps for as long as his or her life.”¹⁹⁴ Even without discounting government subsidies or purchasing a future interest, the government may still be able to justify the high cost of buying flood-prone property. As discussed above,¹⁹⁵ the current NFIP spends a fortune rebuilding

187. See Michael Allan Wolf, *Strategies for Making Sea-Level Rise Adaptation Tools Takings-Proof*, 28 J. LAND USE & ENVTL. L. 157, 159 (2013).

188. *Id.* This Note will not address the “the regrettable morass known as regulatory takings,” but acknowledges that downzoning and other limitations on land use will have a role to play in any climate change adaptation strategy. *See id.* at 160.

189. Which is no small assumption.

190. *See* Wolf, *supra* note 187, at 175.

191. Barnhizer, *supra* note 131, at 356. Barnhizer argues that government-subsidized flood insurance and disaster relief constitute a “givings” because “floodplain property values include value solely attributable to government givings in the form of past flood responses. Overcompensation for these givings reinforces market misperceptions of flood risk and distorts property owners’ investment-backed expectations.” *Id.*

192. J. Peter Byrne, *The Cathedral Engulfed: Sea-Level Rise, Property Rights, and Time*, 73 LA. L. REV. 69, 113–14 (2012).

193. *Id.* at 114.

194. *Id.*

195. *Supra* Part III.B.

repetitive loss properties: it is likely that using that money to buy back property will be less costly in the long run since rebuilding after a flood can cost many times more than what the home is worth.¹⁹⁶

2. *Wide-Scale Use of Eminent Domain May be Politically Infeasible*

While the costliness of eminent domain seems daunting, a bigger hurdle to buying back flood-prone property may be a political one. States, local governments, and voters are understandably skittish with broadening the government's taking of private property. For example, after the Supreme Court's decision in *Kelo v. City of New London* allowed a city to condemn private property for private economic development, many states passed laws explicitly limiting "public use" to enumerated categories.¹⁹⁷ While legally many states would be within their rights to use eminent domain to buy property in flood zones, any attempt by the government to require people to move will likely be met with staunch opposition. These political challenges will come from both conservatives, who remain skeptical of government intervention, as well as from the left, since eminent domain has traditionally been used to displace minority and low-income populations.

Many of the areas where eminent domain would be used to buy flood-prone properties are located in politically conservative areas where decision makers remain skeptical of government intervention or even the reality of climate change. Gulf South states, including Alabama, Mississippi, and Louisiana, are deeply conservative, and unlikely to welcome any efforts by the federal government to seize private property.¹⁹⁸ North Carolina, a state whose storm vulnerabilities were dramatically revealed by 2018's Hurricane Florence, had previously passed legislation prohibiting developers from considering the impacts of sea level rise when proposing projects.¹⁹⁹

Implementing a relocation program through eminent domain is a drastic step that will be even more difficult to implement if residents whose property is at risk deny the effects of climate change. Tangier Island is an example of a place at existential threat from climate change that is unwilling to confront the stark reality of rising seas. Tangier Island, located off the Virginia coast in the

196. For example, in the Lower Ninth Ward, rebuilding a home could cost well into six figures, even when the home's market value is around \$50,000. See Whoriskey, *supra* note 20. Whoriskey notes that homeowners are limited to the "market-value of their home." *Id.* This is because many homeowners in the Lower Ninth Ward did not have flood insurance and were only entitled to federal disaster relief. With flood insurance, the payouts would be much higher since the cap on the NFIP is \$250,000. See Walsh, *supra* note 140.

197. Costonis, *supra* note 183, at 412–13.

198. See Gallup, *State of the States*, <https://news.gallup.com/poll/125066/State-States.aspx> (last visited June 5, 2019).

199. Henry Grabar, *How Florence Could Hurt North Carolina*, SLATE (Sept. 12, 2018), <https://slate.com/business/2018/09/how-could-florence-hurt-north-carolina.html>. Although this moratorium expired in 2016, coastal towns were still behind in addressing sea level rise when Hurricane Florence hit in September 2018.

Chesapeake Bay, could be swallowed by sea level rise within twenty-five years.²⁰⁰ Tangier Island was formed during the last ice age, when glaciers pushed the surrounding land down, causing islands to rise in the Bay.²⁰¹ As the land settles, the islands sink back into the Bay.²⁰² The rate of sinking increases as sea levels rise—areas that were dry a few decades ago are now flooded.²⁰³ Despite the visual evidence that the island is sinking,²⁰⁴ residents are unwilling to accept the reality that climate change is behind the increases in flooding.²⁰⁵ Island residents voted overwhelmingly for President Trump, an avowed climate change denier, and hold out hope that construction of a seawall will stave off rising seas and prevent people from having to leave.²⁰⁶

Liberal bastions in conservative states also face problems when attempting to implement climate-resilient policies that restrict or forbid development in flood zones. Houston, which suffered \$125 billion in damage from Hurricane Harvey in 2017,²⁰⁷ has notoriously lax zoning laws; uncontrolled urban sprawl destroyed buffering green space and created impermeable surfaces which channeled floodwaters into people's homes.²⁰⁸ Even if Houston, more progressive than the state of Texas as a whole,²⁰⁹ wanted to embark on a massive public works project to increase flood resilience, such a project would likely require state aid.²¹⁰ The state of Texas has been characteristically stingy in funding Houston's flood control and hurricane recovery efforts—in 2018, Governor Abbott refused Houston's request of \$250 million from the state's \$10 billion dollar "Rainy Day Fund."²¹¹

Even if the tension between liberal cities and more conservative governments is resolved, the use of eminent domain will also be critiqued from the left: historically, eminent domain was used by governments to reinforce structural inequities. After Hurricane Katrina decimated the Lower Ninth Ward, Mayor Nagin and the Bring New Orleans Back Commission put forth a plan

200. Elaina Plott, *The Country's First Climate Casualties?*, PACIFIC STANDARD (Sept. 4, 2018), <https://psmag.com/magazine/the-countrys-first-climate-change-casualties>.

201. *Id.*

202. *Id.*

203. *Id.*

204. The schoolhouse had been raised six to eight feet, and residents built eighteen-inch platforms to park their golf carts on, since standing water levels on the island had noticeably increased. *Id.*

205. *Id.*

206. *Id.*

207. Chris Mooney, *Hurricane Harvey was Year's Costliest U.S. Disaster at \$125 Billion in Damages*, TEXAS TRIBUNE, (Jan. 8, 2018), <https://www.texastribune.org/2018/01/08/hurricane-harvey-was-years-costliest-us-disaster-125-billion-damages/>.

208. Mimi Swartz, *Troubled Waters A Year After Harvey, Has Houston Learned Anything?*, TEXAS MONTHLY (Aug. 24, 2018), <https://www.texasmonthly.com/news/harvey-anniversary-houston-preparing-next-big-storm/>.

209. See Sonia Smith, *Texas Mayors Pledge to Fight Climate Change*, TEXAS MONTHLY (Dec. 15, 2017), <https://www.texasmonthly.com/energy/texas-mayors-pledge-fight-climate-change/>.

210. See Swartz, *supra* note 208 (noting that both the cities of New Orleans and Houston relied on state and federal aid for disaster relief to fund future flood control projects).

211. Swartz, *supra* note 208.

where the destroyed Lower Ninth Ward would not be redeveloped after the flood.²¹² Critics accused the plan of ignoring the needs of poor and minority communities while choosing to rebuild whiter, richer neighborhoods that were just as badly damaged as the Lower Ninth Ward and just as prone to repeated flood damage.²¹³ Using eminent domain to relocate residents from flood-prone areas will admittedly be hugely difficult from a political perspective, but as the following subpart illustrates, it may be our only option.

*D. Eminent Domain May Be the Only Viable Solution to Encourage
Retreat from Vulnerable Floodplains*

Despite the many obstacles presented, using eminent domain to claim property and facilitate retreat from floodplains may be the only feasible adaptation strategy for some vulnerable communities threatened by climate change. Other alternatives to combat flooding risks, such as wetland restoration and infrastructure development, will likely be insufficient to combat rising seas.

1. The Limits of Wetland and River Restoration

Louisiana and the Gulf South's unique hydrology and geology make it particularly vulnerable to sea level rise and hurricanes and their accompanying flood damage. Louisiana's coastline is continuously eroding and being built up with silt from the Mississippi River.²¹⁴ Human activity, including dredging and the construction of levees, has altered the flow of the Mississippi, which naturally flooded and shifted course every one to two thousand years.²¹⁵ Human intervention altered the rate of flow and minimized the number of times the Mississippi overflowed its banks, ultimately reducing the amount of sediment deposited by the river.²¹⁶ Without the sediment deposited by the river, Louisiana is being washed away.²¹⁷ While it is possible that restoration of natural wetlands and the Mississippi River could mitigate flooding risks,²¹⁸ the extent of the damage, and the length of time restoration takes, means that restoration alone will not be enough to outrun sea level rise. Additionally, restoration programs face considerable opposition in Louisiana: the fishing industry has opposed

212. Baum, *supra* note 13.

213. Landphair, *supra* note 9, at 844.

214. Mooney, *supra* note 94; Barbier, *supra* note 182.

215. Mooney, *supra* note 94; see, e.g., Richard H. Kesel, *The Role of the Mississippi River in Wetland Loss in Southeastern Louisiana, U.S.A.*, 13 ENVTL. GEO. & WATER SCIENCES 183, 183 (1989).

216. Hard-armoring can increase the rate of flow, which reduces the amount of sediment deposited. Historically, the periodic flooding of the Mississippi also spread sediment over a wider area. See Joan Florsheim et al., *Bank Erosion as a Desirable Attribute of Rivers*, 58 BIOSCIENCE 519, 519 (2008); see also John McPhee, *Atchafalaya*, THE NEW YORKER (Feb. 23, 1987), <https://www.newyorker.com/magazine/1987/02/23/atchafalaya>.

217. Mooney, *supra* note 94; see generally Harry H. Roberts, *Dynamic Changes of the Holocene Mississippi River Delta Plain The Delta Cycle*, 13 J. COASTAL RES. 605, 605 (1997) (reviewing the Holocene Mississippi River delta-building process).

218. See Barbier, *supra* note 182.

efforts to allow rivers to flow more naturally and deposit sediment to rehabilitate wetlands and decrease erosion.²¹⁹ Allowing rivers to flow naturally would also be detrimental to the oil and gas and shipping industries in Louisiana, who would be unlikely to support a wetland restoration project.²²⁰ Even if these three major Louisiana industries were to sign on to wetland restoration, the option of naturally restoring wetlands will likely be too little too late to prevent further subsidence in Louisiana.²²¹

2. *The Technological and Financial Limits of Flood-Control Infrastructure*

Investing more in infrastructure and flood control could be another climate change adaptation strategy besides retreat. However, due to the geology and hydrology of vulnerable areas, such flood control measures may not be technically possible. For example, after Hurricane Katrina, New Orleans, Louisiana, and the federal government spent over \$20 billion in flood control projects, including new levees, a pump system, and a floodwall.²²² However, the 1.8 mile, twenty-six-foot-tall wall cannot withstand a five-hundred-year flood at its current height; a taller wall was infeasible because the land where the floodwall was built was too swampy for the wall to be built any taller without becoming structurally unstable.²²³ Climate change also makes the frequency of catastrophic flooding more likely: one-hundred-year floods are fast becoming twenty-year floods, with a 5 percent chance of occurring per year.²²⁴ Other means of flood control, such as hard armoring and seawalls, may cause problems as well: shoreline armoring can increase erosion around nonfortified land, among other ill-effects on coastal habitat.²²⁵

We could turn to other low-lying countries to see if adaptation through infrastructure is possible. The Netherlands is a quintessential example of how governments can rely on engineering to peacefully exist below sea level. After the North Sea breached dikes in the Netherlands in 1953, killing 1,800 people, the Netherlands embarked on a massive, multibillion dollar-, forty-four-year infrastructure project.²²⁶ No Dutch person has died in a flood since.²²⁷ However,

219. *Id.*

220. See BRINKLEY, *supra* note 5, at 31–32.

221. See, e.g., Mooney, *supra* note 94 (noting that despite increased wetland restoration projects, a scientist states “[t]he reality is, even the most beautiful, successful, clever river diversions are not going to be able to keep up with rising sea levels if climate change goes on unabated”).

222. Mark Schleifstein & John Schwartz, *New Orleans, Fortified but Still in Peril*, SEATTLE TIMES (Mar. 2, 2018), <https://www.seattletimes.com/nation-world/new-orleans-fortified-but-still-in-peril/>.

223. *Id.*

224. *Id.*

225. See generally Jenifer E. Dugan et al., *Estuarine and Coastal Structures: Environmental Effects, A Focus on Shore and Nearshore Structures*, in TREATISE ON ESTUARINE AND COASTAL SCIENCE 17 (2011) (discussing the effects of armoring on coastlines).

226. Tony Freemantle, *In Harvey's Wake, Dutch Have Much to Teach Houston*, HOUSTON CHRONICLE, <https://www.houstonchronicle.com/news/houston-texas/houston/article/In-Harvey-s-wake-Dutch-have-much-to-teach-Houston-12445243.php>.

227. *Id.*

the Netherlands' impressive levee system may not be transferrable to the parts of the United States most susceptible to flooding. Attitudes to government projects are different in the Netherlands, a country that has embraced more interventionist government policies:²²⁸ even if flood-prone cities like New Orleans or Houston were to wholeheartedly embrace a massive, government-funded public works project, it is less likely that the states of Texas or Louisiana would be on board.²²⁹ The Netherlands' land-use policies are also more prescriptive than the United States': when planning for future sea level rise, the Netherlands has proactively decided to let rivers flood and allow for some privately owned land to revert to the river, removing the risk of property loss and providing an outlet for floodwaters.²³⁰

In contrast to the United States, the Netherlands has no flood insurance, either private or publicly subsidized—if residents choose to live outside of government-proscribed areas, they can expect no assistance in the event of a flood.²³¹ The lack of disaster aid and insurance in the event of flooding is another mechanism the Dutch utilize to keep people from living in vulnerable flood zones. Even if the United States had the political willpower of the Dutch to embark on a decades-long levee building spree, that on its own would not be enough. As seen in the Netherlands, even the most robust flood-protection system requires that people move and adapt to the inevitable rising tide.

3. *Community-Wide Relocation Is a Viable Option*

It is likely that no human intervention will be able to mitigate the flooding and hurricane risks caused by climate change in parts of the Gulf South and other vulnerable areas, leaving relocation as the only option. Eminent domain enacted on a community-wide or city-wide basis would be admittedly costly and logistically difficult, but it has worked before in recent U.S. history, mostly for relocation due to toxic waste contamination.

An example of governments buying out whole towns is seen in Picher, Oklahoma, once a booming lead mining town. By 1970, mining operations ceased, but the toxic remnants from processing 1.7 million tons of lead and 8.8 million tons of zinc remained.²³² Tests conducted in the mid-1990s showed that 63 percent of residents suffered from some form of lead poisoning,²³³ and in

228. See Teun Terpstra & Jan M. Gutteling, *Households' Perceived Responsibilities in Flood Risk Management in The Netherlands*, 24 INT'L J. WATER RESOURCES DEV. 555, 565 (finding that 73 percent of Dutch respondents "regard the government as primarily responsible for protection . . . against flood damage").

229. See Swartz, *supra* note 208.

230. This plan, called "Make Room for the River," involved intentional lowering of dikes and relocations of communities which allowed for rivers to reclaim flood plains. Freemantle, *supra* note 226.

231. *Id.*

232. Ben Paynter, *Take a Tour of America's Most Toxic Town*, WIRED (Aug. 30, 2010), https://www.wired.com/2010/08/ff_madmaxtown/.

233. *Id.*

1983 the EPA declared Picher a Superfund site.²³⁴ More than one-third of the homes in Picher were structurally unsound due to instability caused by mining.²³⁵ The final blow to the town came in 2008 when a tornado hit, destroying 114 homes.²³⁶ Residents decided not to rebuild, and by 2009 the police department, public school system, and the town's government had dissolved.²³⁷ The EPA and state governments offered buyouts, and the vast majority of residents left, leaving only a ghost town behind.²³⁸ The fate of Picher highlights that sometimes the wisest course of action after a disaster is to retreat and not rebuild.

The evacuation of a toxic town also occurred in Centralia, Pennsylvania. In 1962, a fire ignited in an underground coal seam, continuously burning for over fifty years and expected to burn for 250 more.²³⁹ In 1984, the government began a \$42 million federal buyout program to relocate 1,100 residents.²⁴⁰ Unlike in Picher, where buyouts were voluntary, in 1992 the state of Pennsylvania condemned the remaining homes in Centralia using eminent domain.²⁴¹ A handful of residents refused to leave and filed a lawsuit. In 2013, the plaintiffs settled, with the state allowing them to remain in their homes for their lifetimes, but the property reverting to the state after their deaths.²⁴² This idea of condemning a future interest could also be applied to areas threatened by climate change—instead of forcefully removing residents, the government could allow people who refuse to leave to stay for their lifetimes and then take possession after their deaths.²⁴³

The use of relocation and eminent domain in contaminated towns could provide helpful guidance to communities facing increased risks of flooding and climate change. While contamination from abandoned mines and industrial activity is not identical to the threat of sea level rise, flooding, and hurricanes, both involve hard decisions where mitigation is futile and relocation is the only option.

234. Dan Shepherd, *Last Residents of Picher Won't Give Up the Ghost (Town)*, NBC NEWS (Apr. 26, 2014), <https://www.nbcnews.com/news/investigations/last-residents-picher-oklahoma-won-t-give-ghost-town-n89611>.

235. Paynter, *supra* note 232.

236. *Id.*

237. *Id.*

238. *Id.*

239. Linda Poon, *Dispatches From the Town That's Always on Fire*, CITY LAB (Jul. 23, 2015), <https://www.citylab.com/environment/2015/07/dispatches-from-the-town-thats-always-on-fire/399401/>.

240. *Id.*

241. *Id.*

242. John Beauge, *Remaining Handful of Residents Can Stay in Centralia for the Rest of their Lives, Settlement Says*, PENNLIVE (Oct. 30, 2013), https://www.pennlive.com/midstate/index.ssf/2013/10/centralia_condemnation_fight_e.html.

243. *See supra* notes 192–194 and accompanying text.

V. AN EQUITABLE APPROACH TO RELOCATION IN THE
FACE OF CLIMATE CHANGE

By using Hurricane Katrina and its aftermath as a lens to examine displacement and relocation in the midst of climate change-linked natural disasters, this Note does not mean to suggest that the need for relocation will only be limited to minority and low-income communities. If the time comes that the Lower Ninth Ward is evacuated, other lower-lying, richer, and whiter areas in New Orleans and around the United States will likely have to evacuate as well.²⁴⁴ Indeed, coastal settlements tend to be more affluent than the general U.S. population,²⁴⁵ and major population centers such as New York, San Francisco, Houston, and Miami will also need to make hard choices as sea level rise and storm surges threaten their cities. This Note chooses to explore relocation as it relates to minority and low-income communities because, once the need for retreat becomes inevitable, those communities have the most to lose from displacement, and will often lack the resources to move and relocate cohesively without government assistance. Additionally, because of historical settlement patterns, low-income and minority groups often own property in more flood-prone land than other groups.²⁴⁶

A strategy based on retreat must be equitably carried out. The idea that the government, either through voluntary or involuntary buybacks, should take possession of flood-prone land is not a new one; however, much of the existing literature focuses on the legal mechanism and cost-effectiveness of using takings,²⁴⁷ and not on the reality of what will happen to homeowners and residents once the government takes possession of their land. Any strategy that involves retreat must consider the injustices of past urban renewal projects, where poor and minority communities were forced out of their homes to make way for richer, whiter newcomers.²⁴⁸ Because of the inequitable history of using blight as an excuse to deploy eminent domain to displace minorities and the poor, any approach that uses eminent domain to relocate communities must be sure to avoid the trauma that such displacement causes. In order to see retreat as not just a way to avoid economic flood losses but to ensure the continued survival of vulnerable communities, governments should adopt a number of strategies,

244. St. Bernard Parish, which is 90 percent white, is similar in elevation to the Lower Ninth Ward and suffered more flood damage than the Lower Ninth Ward in Hurricane Katrina. Lakeview, an affluent community, is at or below sea level.

245. See NOAA, *supra* note 92, at 7. Forty-seven percent of people living in coastal communities earn more than \$100,000 a year, compared to the national average of 39 percent.

246. See *supra* Part I.A for a discussion of the history of settlement patterns in New Orleans.

247. See, e.g., Lovett, *supra* note 185; see also Mendelson, *supra* note 151; Barnhizer, *supra* note 131.

248. See Dick M. Carpenter & John K. Ross, *Testing O'Connor and Thomas Does the Use of Eminent Domain Target Poor and Minority Communities?*, 46 URBAN STUD. 2447, 2449 (2009). Carpenter notes that “[f]or years, researchers have noted the trend in urban redevelopment strategies to attract wealthier middle classes back to the inner city, resulting in the replacement or succession of one population with another.”

including soliciting community engagement and involvement, selecting communities based on their flooding risk and not just limiting it to the poor, increasing compensation to account for the emotional attachments people have to their homes, and taking proactive steps to preserve community ties.

A. The Fraught History of Using Eminent Domain to Displace the Poor and Minorities

No discussion of eminent domain could be complete without acknowledging that eminent domain has historically been a tool to displace minorities and low-income communities under the guise of “urban renewal” or “economic development.”²⁴⁹ Examining the problematic history of eminent domain before discussing the mechanisms of a climate change relocation program is necessary to avoid repeating the mistakes of the past.

Efforts to exert government control over housing development began with slum clearing during the Progressive Era in the late 1800s.²⁵⁰ Cities established more stringent zoning and city-planning ordinances in the 1920s as cityscapes grew taller and more of the population moved to urban centers.²⁵¹ Beginning in the 1950s, governments became more aggressive, using eminent domain to clear out low-income and minority populations in the name of combatting blight.²⁵² For example, in 1952, the District of Columbia Redevelopment Land Agency began an urban renewal project in southwest Washington, DC that would result in the forced displacement of over 20,000 African American residents.²⁵³ In *Berman v. Parker*,²⁵⁴ the Supreme Court held that taking land for private development was constitutional, and chided the lower court for substituting its own policy judgments over Congress’s.²⁵⁵ Argued a mere four months after the seminal *Brown v. Board of Education*²⁵⁶ decision, *Berman* was interesting in that neither side raised questions of civil rights and due process even though a majority of the residents slated to lose their property were African American.²⁵⁷ Justice Douglas noted that African Americans comprised 97.5 percent of the soon-to-be-displaced population, but focused more on the poor quality of the housing stock than any questions of racial justice.²⁵⁸

249. See, e.g., Wendell E. Pritchett, *The “Public Menace” of Blight: Urban Renewal and the Private Uses of Eminent Domain*, 21 YALE L. & POL’Y REV. 1, 1 (2003).

250. *Id.* at 7.

251. *Id.* at 14.

252. *Id.* at 37.

253. *Id.* at 41.

254. 348 U.S. 26 (1954).

255. Pritchett, *supra* note 249, at 45.

256. 347 U.S. 483 (1954).

257. See Pritchett, *supra* note 249, at 44.

258. *Id.* at 44–45 (citing *Berman*, 348 U.S. at 26, 30).

After *Berman*, urban renewal projects increased across metro areas throughout the United States.²⁵⁹ Many urban renewal projects, such as the demolishing of Poletown in Detroit to make way for a General Motors car plant,²⁶⁰ resulted in the displacement of long-established immigrant and minority communities.²⁶¹ The Court solidified the expansion of “public use” to “public purpose” in *Kelo*, which allowed for even nonblighted land to be sold to private developers in the name of economic development.²⁶² The dissent in *Kelo* argued against the use of eminent domain to facilitate private development, arguing “no compensation is possible for the subjective value of these lands to the individuals displaced and the indignity inflicted by uprooting them from their homes. . . . [E]xtending the concept of public purpose . . . guarantees that these losses will fall disproportionately on poor communities.”²⁶³

As the dissent noted in *Kelo*, using eminent domain to relocate poor and minority communities results not only in property loss, but also in emotional harm.²⁶⁴ Property does not just have economic value, but “play[s] an important role in routine American life, creating both social identity and status, which is formed from a sense of control over an individual’s life circumstances.”²⁶⁵ When urban redevelopment occurs, residents scatter, losing community and business ties.²⁶⁶ This “forced displacement” can result in “the destruction of the security of supportive neighborhoods” resulting in “life crisis for many residents and communities.”²⁶⁷ Studies show that “displaced residents experience actual pain and emotional suffering resulting from forced relocation and loss of familiar communal support.”²⁶⁸

As the history of urban renewal shows us, governments must tread carefully when implementing relocation plans. In the case of climate change, where relocation is unavoidable, leaders should take steps to minimize losses, including noneconomic ones.

259. *Id.* at 1 (noting that *Berman* “set the stage for a nation-wide expansion of the urban renewal program”).

260. In 2018, GM announced it was closing this plant, which calls into question whether displacing communities in the name of private economic development is actually worth the economic and emotional toll. See Kyle Swenson, *Thousands Lost Their Homes in Epic Fight to Build GM’s Detroit Plant. Now It’s Closing.*, WASH. POST (Nov. 27, 2018), <https://www.washingtonpost.com/nation/2018/11/27/thousands-lost-their-homes-epic-fight-build-gms-detroit-plant-now-its-closing/>.

261. Jeffrey T. Powell, *The Psychological Cost of Eminent Domain Taking and Just Compensation*, 30 L. & PSYCHOL. REV. 215, 221 (2006).

262. *Kelo v. City of New London*, 545 U.S. 469, 483 (2005). The distinction between “public use” and “public purpose” is discussed in Part IV.A.

263. *Id.* at 522 (Thomas, J., dissenting).

264. *Id.*

265. Powell, *supra* note 260, at 222.

266. *Id.* at 220.

267. *Id.*

268. *Id.* at 223.

B. Strategies for a More Equitable Use of Eminent Domain

Although it is concerning that the people who will lose homes to climate change are the same people who have already suffered systematic prejudice, it does not mean that the idea of retreat must be abandoned entirely. The inevitability of land loss caused by sea level rise means that these people will lose homes and property regardless of what actions the government takes;²⁶⁹ utilizing a program of eminent domain as a last resort means that property owners will at least receive some compensation for their property and reduce future property losses. A plan that takes into account the reality of climate change while also taking care to provide adequate assistance and keep communities intact will not only reduce losses but also increase communities' resiliency, since a proactive plan that emphasizes community input will mean people will not be scattered once the inevitable hurricane, flood, or sea level rise makes evacuation necessary. Without a realistic strategy for proactive retreat, communities may face a worst-case scenario where a disaster forces them to leave their homes and communities, with little to no mechanism for keeping communities together or providing adequate compensation. For example, after Hurricane Katrina, hurricane evacuees retreated to Houston, Baton Rouge, and other southern cities.²⁷⁰ Over ten years later, they have yet to return, and the Lower Ninth Ward remains a shadow of its former vibrant self.²⁷¹

To avoid the trauma of displacement and to allow people the opportunity to relocate with their communities, a new process should be implemented, one that prioritizes community ties. While technically enacted under the guise of "eminent domain," this proposal looks beyond the traditional arguments regarding what constitutes "public use" and "fair compensation" and adopts strategies designed to mitigate the trauma of displacing communities.

1. Create a Transparent Process with Opportunities for Community Input

Unlike the urban renewal projects discussed in Part V.A, where governments ignored the needs of poor and minority groups in order to make way for new development, a land buyback project needs to ensure that community members' voices will be heard. Because courts gave wide leeway to decisions by legislatures regarding whether urban renewal was for the "public use," and legislatures are less likely to reflect the interests of poor and minority groups, officials made decisions regarding redevelopment with little to no input

269. The current projection from the IPCC is for temperatures to rise by at least 1.5 degrees Celsius by 2100. See IPCC, *Global Warming of 1.5 degree C Summary for Policymakers* (Oct. 6, 2018), <https://www.ipcc.ch/sr15/chapter/summary-for-policy-makers/>.

270. See Laura Bliss, *10 Years Later, There's So Much We Don't Know About Where Katrina Survivors Ended Up*, CITYLAB, (Aug. 25, 2015), <https://www.citylab.com/equity/2015/08/10-years-later-theres-still-a-lot-we-dont-know-about-where-katrina-survivors-ended-up/401216/>.

271. See Rivlin, *supra* note 1.

from the people already living there.²⁷² In contrast to the urban renewal cases, where parties turned to litigation to resolve disputes, an iterative process that emphasizes community involvement at an early stage and incorporates community input would build community trust and consensus for deciding on a relocation plan.

The goals of a relocation plan should be in line with the environmental justice movement, which holds that structural and systemic inequality results in low-income and minority groups disproportionately suffering from the effects of environmental degradation.²⁷³ Because communities at risk of flooding may often be low-income and minority, the environmental justice movement's equitable principles can provide a helpful lens for considering how to best implement a relocation program. One aspect of environmental justice that will be pertinent when planning for relocation is the concept of procedural justice, defined as: "[T]he right to treatment as an equal. That is the right, not to an equal distribution of some good or opportunity, but to equal concern and respect in the political decision about how these goods and opportunities are to be distributed."²⁷⁴ Traditional political avenues of effecting change, such as through legislation, do not adequately represent the interests of the poor and minority groups as "[t]he difficulty in passing legislation goes to the central issue of environmental injustice—the political and economic powerlessness of minority and poor communities."²⁷⁵ Unlike the traditional legislative process, which fails to foster and encourage participation from vulnerable communities, a relocation plan should adopt the key principles of the environmental justice movement to ensure adequate community representation.

The National Environmental Policy Act (NEPA), an act passed to improve transparency and increase public participation, can serve as a basis for increasing and facilitating community participation in a relocation plan. Passed in 1969, NEPA requires agencies to prepare an environmental analysis for each agency action.²⁷⁶ NEPA's reporting requirements can serve as a possible guide for identifying and prioritizing which areas will need to be evacuated. Identifying areas most at risk from climate change will be difficult because the risk of flooding or hurricane damage has a high degree of uncertainty. Using models to project the rate of climate change and likelihood that a hurricane will hit a specific area is a possible option, but like all models, there is room for error. The government must also invest in remapping and reanalyzing existing floodplains

272. See Pritchett, *supra* note 249, at 41 (noting that beginning in the mid-1940s the Supreme Court began giving greater deference to decisions by local governments regarding "public use").

273. Robert R. Kuehn, *A Taxonomy of Environmental Justice*, 30 ENVTL. L. REP. 10681, 10682 (2000); see also Sheila Foster, *Environmental Justice in an Era of Devolved Collaboration*, 26 HARV. ENVTL. L. REV. 459, 461 (2002).

274. Kuehn, *supra* note 273, at 10688 (quoting RONALD DWORKIN, *TAKING RIGHTS SERIOUSLY* 273 (1977)).

275. R. Gregory Roberts, *Environmental Justice and Community Empowerment: Learning from the Civil Rights Movement*, 48 AM. U.L. REV. 229, 246–47 (1998).

276. COUNCIL ON ENVIRONMENTAL QUALITY, *A CITIZEN'S GUIDE TO NEPA*, 2, 9–10 (2007).

since most of the maps currently used by FEMA and the NFIP for flood insurance are woefully out of date.²⁷⁷ NEPA's planning process will be able to best consider these technical issues while also allowing the public to provide sufficient feedback.

Determining which areas are "too risky" and must be bought out is at its core a value judgment—while it may seem unjust to spend billions to invest in flood control and climate adaptation projects in San Francisco, Houston, and New York while encouraging residents of poorer cities and towns in the Gulf South to leave, the costs and benefits of investing in relocation versus adaptation must be evaluated. For example, it may make more economic sense to spend billions on floodwalls and other armaments on cities where millions of people live and work. Similar to the relocation of cities from EPA Superfund sites discussed above in Part IV.C.3 where remediation was prohibitively expensive and lengthy, coastal-town relocation would often be cheaper and faster. Additionally, any city that does decide to build flood-control infrastructure will likely face a choice similar to the Netherlands' climate adaptation projects²⁷⁸ where even with the world's most technologically advanced flood-control infrastructure, some residents still had to relocate.

Once relocation becomes a possible option for a community, governments need to take proactive steps to solicit community engagement. While NEPA has established detailed reporting requirements, NEPA is far from a model in how to improve community engagement. NEPA's required notice and comment and public hearings are not sufficient to protect minority interests.²⁷⁹ The current structure and function of administrative hearings do not facilitate meaningful discussion, and participants are not likely to take time off work or with their family to sit through long hearings where decision makers seem to not value their input.²⁸⁰ The limits to the current notice and comment period are seen in the existing process of siting "locally undesirable uses," such as landfills, industrial activity, and other potentially polluting uses in low-income and minority communities.²⁸¹ Public hearings are often held at inconvenient times for people with inflexible work schedules, family obligations, and transportation needs.²⁸² The technical nature and length of environmental reports can also make

277. See Luke & Abramovsky, *supra* note 136, at 18.

278. See Freemantle, *supra* note 226.

279. See LeRoy Paddock, *Environmental Accountability and Public Involvement*, 21 PACE ENVTL. L. REV. 243, 250 (2004).

280. See *generally id.* at 255 (calling for greater public participating in environmental decision making).

281. See Roberts, *supra* note 275, at 249–50.

282. See Luke W. Cole, *Empowerment as the Key to Environmental Protection: The Need for Environmental Poverty Law*, 19 ECOLOGY L.Q. 619, 646–47 (1992) (noting that the political process behind environmental decisions systematically puts poor and minority communities at a disadvantage); see also Roberts, *supra* note 275, at 253–54 (describing how the "public choice process" is more receptive to participation from middle- and upper-class communities).

accessing and interpreting the content of reports difficult.²⁸³ While NEPA's goal to increase transparency and improve reporting provides some guidance to an equitable relocation plan, as currently implemented, NEPA does not do enough to solicit and respond to poor and minority communities.

The identification process for potential sites for relocation must also consider structural inequities and work to encourage community engagement even before embarking on a relocation plan. Unlike New Orleans's aborted Bring New Orleans Back Commission's plan, which called for sacrificing the Lower Ninth Ward while rebuilding the equally low-lying but whiter and richer Lakeview,²⁸⁴ decisions to relocate must be based on sound risk assessment, and not be used as an excuse to push out poor residents after a disaster. A relocation plan should stem from members of the community themselves deciding that relocation is a feasible adaptation strategy.²⁸⁵ Once the government completes a comprehensive risk assessment of areas, the government can solicit applications from communities possibly interested in a government land buyback and relocation. It is likely that the process for deciding on relocation will be an iterative one: communities initially interested in relocation will have an opportunity to modify or rescind their plans if new data comes to light or other mitigation strategies become feasible. If particularly vulnerable communities refuse to consider relocation, the government can work on education and information campaigns, including exploring options such as condemning a future interest in property, which would allow current residents to remain in their homes for their lifetimes.²⁸⁶

Choosing potential communities for relocation will be a time intensive process—the process of relocating the residents of Isle de Jean Charles, an island off the coast of Louisiana slowly sinking into the Gulf of Mexico, took nearly two decades.²⁸⁷ Negotiations between the government and residents regarding the abandonment of Picher and Centralia discussed in Part IV.C.3 also took years.²⁸⁸ While the slowness of such a program is not ideal, it highlights one of the reasons to proactively address retreat *before* the most extreme effects of climate change are felt: removal takes time to plan. The long-term, time-intensive planning process may also be less of a problem in the face of climate change when compared with more acute threats: climate change is somewhat gradual, with the most dire effects predicted to be felt several decades out.²⁸⁹ Additionally, as the threats of flooding and hurricanes become more apparent,

283. See Foster, *supra* note 273, at 470–71.

284. Baum, *supra* note 13.

285. Current relocation efforts in Alaska and the Isle de Jean Charles began due to the initiative of community members. See *supra* note 177.

286. See *supra* note 243 and accompanying text.

287. Davenport & Robertson, *supra* note 177. For a more in-depth discussion of Isle de Jean Charles, see *infra* Part V B.4.

288. See Paynter, *supra* note 232; Shepherd, *supra* note 234.

289. See IPCC, *supra* note 269.

and as more communities begin to move, reluctant communities may also see relocation as a more viable option.

In order to be successful, a community engagement model needs to move away from a top-down “announce and defend” approach and embrace a decision-making process where community members are on more equal footing.²⁹⁰ The collaborative environmental decision-making approach provides a model for how soliciting community input earlier in the process can reduce conflict and result in decisions that better address community members’ needs and concerns. While in theory NEPA is designed to facilitate public comment, in practice much of the hashing-out of the finer policy points occurs after the EPA and other agencies issue a rule or decision, in protracted and time-consuming litigation.²⁹¹ A collaborative decision-making approach can succeed in involving stakeholders earlier in the process, even before a community decides to relocate.

A collaborative decision-making process would theoretically involve government actors traveling to communities identified as being at risk, identifying areas of concern, and working with stakeholders to implement solutions. One of the benefits of a decision-making process tailored to local concerns is that it can engage a range of interests and overcome the inertia of collective action, where participants assume that someone else will solve the problem.²⁹² Collaborative decision making, which grew out of recent legal trends towards mediation and alternative dispute resolution,²⁹³ is designed to build consensus between stakeholders and decision makers and capitalize on the specialized knowledge and expertise of people closest to the problems.²⁹⁴

The community empowerment model expressed in the environmental justice movement provides further insights into how the government can implement an equitable relocation strategy, both when identifying potential sites for relocation and finalizing a relocation plan. The goal of community empowerment is to give individuals the power to make decisions for themselves, instead of relying on outside government actors.²⁹⁵ While traditionally a community empowerment model is used for addressing new development or toxic site cleanup,²⁹⁶ there is no reason why such a model could not be adopted when deciding on a relocation strategy. The goals of community empowerment,

290. See *id.* at 470 (noting that while decisions must follow a “tightly structured and open public process,” in actuality “this requirement is frequently manipulated into ‘announce and defend’ decision making, in which meaningful outside input is effectively stillborn”).

291. See John Randolph & Michael Bauer, *Improving Environmental Decision-Making Through Collaborative Methods*, 16 POL’Y STUD. REV. 168, 170 (1999) (noting that conflicts between regulated entities, regulators, and environmental interest groups usually result “in litigation—a protracted, contentious, and inefficient approach to solving problems”).

292. See Foster, *supra* note 273, at 472. Foster describes this decentralized and local decision-making process as “devolved collaboration.”

293. Randolph & Bauer, *supra* note 291, at 170–71.

294. *Id.* at 172.

295. See Roberts, *supra* note 275, at 247–49.

296. The environmental justice movement first focused on the disproportionate concentration of toxic sites and polluting industries in poor communities and communities of color. See *id.* at 231–32.

which are described as “improving education; building the movement; and addressing the root-cause of the problem,”²⁹⁷ are not on their face incompatible with proactively engaging with the government in discussion regarding a potential land buyback or relocation strategy. “Building the movement” refers to “the creation of an active community group that will remain intact and active long after the problem at issue is resolved.”²⁹⁸ One of the goals of preemptively relocating communities in the face of climate change is to keep communities intact, which fits into the community empowerment framework. The last goal, “addressing the root-cause of the problem,” is one that is hardest to square with the community empowerment model—the sad fact is that retreat in the face of hurricanes and floods is the result of society’s consistent failure to address the root cause of climate change.

One may argue that since climate change relocation may be inevitable, devoting scarce resources to community involvement is merely “window-dressing”—no amount of community engagement can change the fact that floodwaters are rising and retreat may be the only option. However, engaging the community early in a transparent process will generate goodwill and foster trust, which will make implementing a buyback program smoother. More importantly, soliciting community feedback helps implementers of the land buyback better understand the needs of a specific community, which can help with choosing a new site and determining what the community needs in terms of infrastructure and other support.

2. Increase Compensation and Provide Relocation Assistance

An equitable relocation program must also include compensation for noneconomic losses. As discussed above in Part V.A, property loss is not only economic, but also has an emotional component. The same reasons why people continue to rebuild after repeated flooding is the same reason why relocation is so difficult—people’s identities are intertwined with where they live, and losing a home is akin to losing a sense of self. Historically, takings case law defined “just compensation” as the economic value of the property, with no calculation of any consequential damages.²⁹⁹

The current paradigm of using the fair-market value of a home as a starting point for compensation has two main problems. First, from a public relations aspect, using the pure economic value of a home seems to discount people’s suffering and is not likely to inspire community buy-in. Second, paying the market value of a home may not be sufficient for people to pay for moving expenses and to buy property elsewhere. For example, the fair-market values of

297. *Id.* at 255.

298. *Id.* at 256.

299. James J. Kelly, Jr., “*We Shall not be Moved*” *Eminent Domain and the Socioeconomics of Just Compensation*, 80 ST. JOHN’S L. REV. 923, 939 (2006) (citing *Monongahela Nav. Co. v. United States*, 148 U.S. 312, 326 (1893)).

properties in the Lower Ninth Ward were as low as \$50,000;³⁰⁰ it is not clear if that amount would be able to pay for a move and new housing in a less flood-prone area. Providing increased compensation for homes in flood-prone areas can also reduce the economic losses that come with relocations: when communities are uprooted, people lose not just their friends but also valuable economic relationships between businesses and customers.

A practical argument against increasing compensation is that this increases the overall cost of buying back land, which is already a major hurdle to implementing wide-scale land buybacks.³⁰¹ Although the “sticker-price” of buybacks may not be that exorbitant compared to disaster relief and flood insurance, buybacks involve different appropriations mechanisms and political incentives than disaster relief.³⁰² Another argument against increasing compensation is that homeowners in flood-prone areas already received significant subsidies from the federal government in the form of subsidized flood insurance, federally funded flood control projects, and disaster relief.³⁰³ Some may argue that increasing compensation beyond the fair-market value would be throwing good taxpayer money after bad.³⁰⁴

Even if the flood victims who receive more than market value for their property receive “double-takes,” from both a fairness and practical standpoint, increasing payouts can be justified. Wide-scale implementation of eminent domain will be politically unpopular and increasing payouts can be a way to lessen the sting of losing property to the government. Increasing payouts can also encourage community buy-in at an earlier point in the process: if a certain percentage of a community accepts an attractive payout and agrees to relocate, other members will follow suit since once enough people agree to leave there is less incentive to stay as the population shrinks and businesses leave. From a fairness perspective, increasing payouts also makes sense: people moved to and developed flood zones based on a reliance on government flood-control efforts, disaster relief, and subsidized insurance.³⁰⁵ Increasing compensation can also

300. Whoriskey, *supra* note 20.

301. See Barnhizer, *supra* note 131, at 353.

302. *Id.* at 353–54. See *supra* note 158 and accompanying text (describing disaster funding as a politically easy way to curry favor with constituents).

303. *Id.*; Klein, *supra* note 138, at 1525.

304. See Barnhizer, *supra* note 131, at 354–55. Barnhizer argues that providing nondiscounted, fair-market value would amount to “unjust compensation” since

[t]he high cost of purchasing high-risk or environmentally sensitive properties to remove floodplain development is ironic since much of the value of the properties to be purchased derives directly or indirectly from governmental givings through past responses to flooding. To succeed on the large scale necessary to effect a meaningful retreat from high-risk floodplain development and preserve or restore floodplain environments, property acquisition programs must begin to recapture or otherwise avoid overcompensating landowners for government givings attributable to past flood controls.

Id. at 355.

305. See Fox, *supra* note 123, at 244–45.

provide some measure of restitution for communities who were pushed into flood zones and vulnerable areas due to inequitable settlement patterns.

To reduce the risk of “double-takes,” distinctions could be made between property in flood zones that are people’s primary residences and others that are vacation homes or investment properties. Although government-subsidized flood control allowed for property values along the coasts to skyrocket and investors to cash in,³⁰⁶ this does not take into account that a significant proportion of people who live in flood-zones are poor and minorities. A sliding-scale for such a payout may help address this inequity, with people who are lower income receiving more in the way of compensation. A way to increase the pool of money available to fund buyouts could also be found in administrative compensation schemes collecting payments from GHG generators and emitters, similar to what the federal government implemented after September 11.³⁰⁷ It may be just to have GHG emitters on the hook for partially funding buyouts: Louisiana has heavily subsidized the oil and gas industry by constructing infrastructure that not only drained the public purse but also destroyed wetlands, making coastal low-lying areas more susceptible to devastating floods.³⁰⁸ Levying a tax on GHG emitters and using it to facilitate buyouts is one solution, although it is more likely that funding for relocation may come from taxpayers in general, channeled either through FEMA or a newly created agency.

3. *The Need to Tailor Programs to Individual Communities*

An equitable relocation program will not be a one-size-fits-all solution. Different areas, with different histories and settlement programs, will need different strategies to cope with relocation. A comparison of Miami Beach with New Orleans provides an example of how relocation programs will have to vary across different regions.

Miami Beach shares several key similarities with New Orleans. Like the Louisiana Coast, Southern Florida’s geology and hydrology makes it susceptible to flooding. Miami is built on porous limestone, which allows saltwater to seep through during high tides.³⁰⁹ The development of Miami, similar to New Orleans, relied extensively on man-made interventions. The drainage of the Everglades allowed for more urban development, but also wreaked havoc with the water table, allowing salt water to encroach inland and threaten Miami’s freshwater supply.³¹⁰ The loss of the Everglades removed a buffer from storms and flooding and increased saltwater incursion, since flowing freshwater was no

306. Barnhizer, *supra* note 131, at 316–18.

307. See Farber, *supra* note 106, at 1107.

308. See BRINKLEY, *supra* note 5, at 32.

309. Carolyn Kormann, *Miami Faces an Underwater Future*, THE NEW YORKER (Jul. 3, 2018), <https://www.newyorker.com/news/news-desk/miami-faces-an-underwater-future>.

310. Elizabeth Kolbert, *The Siege of Miami*, THE NEW YORKER (Dec. 21, 2015), <https://www.newyorker.com/magazine/2015/12/21/the-siege-of-miami>.

longer able to displace rising saltwater.³¹¹ Miami development is also susceptible to hurricane damage and flooding caused by sea level rise: some of the most valuable properties are oceanfront, mere feet from the steadily-rising Atlantic Ocean.³¹² Already, king tides, unusually high tides that occur at a full moon, have caused more extensive and frequent flood damage to Miami.³¹³ As climate change and coastal erosion³¹⁴ exacerbate the risk of flooding, parts of Miami may be flooded out entirely.³¹⁵

Miami, like New Orleans, will thus likely face an existential threat from climate change, and it is likely that retreat from certain areas will be necessary, since at the very least, a sea level rise of three to six feet will inundate oceanfront property. However, unlike New Orleans, the people who will have to retreat will be more affluent as coastal property values in Miami are higher than those on higher ground farther away from the coast.³¹⁶ Economists predict that climate change retreat will result in “climate gentrification” as richer people move from the coast to the previously less-desirable properties inland.³¹⁷

The type of retreat experienced by Miami residents will be different than that of New Orleans and other communities. Unlike the Lower Ninth Ward, which has been inhabited for over a hundred years, much of the luxury real estate in Miami is relatively recent, having been developed in the 1980s. Many properties were also built as investment properties or second homes, so it is less likely that people have as strong attachments to them as those who have been living in neighborhoods for generations.³¹⁸ A mandatory buyout program in Miami would thus likely require fewer safeguards than other vulnerable communities. Paying fair-market compensation for a luxury development would provide sufficient resources for someone to relocate, and additional funds for relocation may not be necessary. While the relatively higher-market value of

311. *Id.*

312. See Flavelle, *supra* note 175.

313. See *id.* Residents in certain Miami neighborhoods have adopted ad hoc solutions to dealing with the flooding problem, including avoiding parking their cars on certain streets during king tides. Natalie Delgadillo, *The Realities of Sea-Level Rise in Miami's Low-Income Communities*, CITYLAB (Oct. 23, 2016), <https://www.citylab.com/environment/2016/10/sea-level-rise-is-affecting-miami-low-income-communities/505109/>.

314. See Henry Grabar, *South Florida, Out of Beach, Wants to Buy Sand from the Bahamas*, SLATE (Nov. 2, 2017), <https://slate.com/business/2017/11/south-floridas-beaches-are-disappearing-and-the-state-wants-to-import-sand-from-the-bahamas.html>.

315. Kormann, *supra* note 309.

316. See Richard Florida, *'Climate Gentrification' Will Deepen Urban Inequality*, CITYLAB (Jul. 5, 2018), https://www.citylab.com/equity/2018/07/the-reality-of-climate-gentrification/564152/?utm_content=edit-promo&utm_medium=social&utm_source=twitter%E2%80%A6.

317. See *id.* “Climate gentrification” also brings a whole host of issues and will displace low-income and minority groups. This piece does not have room to address “climate gentrification” with the fullness it deserves and will leave the subject to a future scholar.

318. See Kenneth Rapoza, *Look Who's Buying Up Miami Real Estate Now*, FORBES (Aug. 31, 2017), <https://www.forbes.com/sites/kenrapoza/2017/08/31/look-whos-buying-up-miami-real-estate-now/#71433a431232> (noting the rise in international buyers buying vacation homes and investment properties in Miami).

Miami's homes would at first suggest that investments in fortification should be made, it is likely that armaments and seawalls for the lowest lying parts may not be economically or technologically feasible.³¹⁹

4. *Keep Communities Intact*

Besides monetary assistance, relocation strategies should provide the means to keep communities together. People are not just attached to their physical homes, but also to their neighbors, family, and friends. Taking steps that will provide for communities to move together will lessen not only the emotional loss of losing property but also keep emotionally and economically important relationships intact.

The wholesale relocation of a community is not merely a pipe dream; it has in fact begun in Louisiana. The Isle de Jean Charles is an island off the coast of Terrebonne Parish, populated predominantly by members of the Biloxi-Chitimacha-Choctaw Indian tribe. The land is steadily sinking into the Gulf of Mexico and is likely to be uninhabitable in the next few decades.³²⁰ Ninety percent of the landmass has disappeared since 1955.³²¹ Beginning in 2002, the federal Department of Housing and Urban Development and the state of Louisiana worked with island residents to implement a plan to abandon the island.³²² In 2017, the government approved a plan to relocate residents, and in 2018 the government selected a sugar farm as a new location.³²³ Although the Isle de Jean Charles could be a successful relocation story, island residents expressed reservations about the plan in January 2019 due to concerns that the state failed to communicate and understand the needs of the community.³²⁴ Island residents and tribal members were hesitant with the prospect that relocating would mean that they would lose title to their homes,³²⁵ and felt that State officials did not show the proper respect for their cultural ties to the land.³²⁶ Louisiana went ahead with the land purchase, and as of February 2019 discussions between the tribe and state continue.³²⁷ The pitfalls of the Isle de

319. See Kolbert, *supra* note 310.

320. Davenport & Robertson, *supra* note 177.

321. *Id.*

322. *Id.*

323. *Id.*

324. Julie Dermansky, *Isle de Jean Charles Tribe Turns Down Funds to Relocate First US Climate Refugees' as Louisiana Buys Land Anyway*, DESMOG (Jan. 11, 2019), <https://www.desmogblog.com/2019/01/11/isle-de-jean-charles-tribe-turns-down-funds-relocate-climate-refugees-louisiana>.

325. It is unclear why the concern over legal title was a driving issue in the debate, as many tribal members had already moved off the island. Additionally, in the event that the island becomes submerged, the lands would revert back to the state according to the public trust doctrine. See Byrne, *supra* note 192, at 80–81.

326. Dermansky, *supra* note 324.

327. Scott Yoshonis, *Island Residents' Concerns Over Relocation Discussed*, HOUMA COURIER (Jan. 27, 2019), <https://www.houmatoday.com/news/20190127/island-residents-concerns-over-relocation-discussed>; Julie Dermansky, *Louisiana and Isle de Jean Charles Tribe Seek to Resolve*

Jean Charles planned relocation reinforce the necessity of engaging with community members through each step of the process.

Other communities across the United States may soon have to relocate in the next several decades due to climate change. The Gullah Geechee people, descendants of Central and West African people who settled the islands off the coast of the Carolinas in the 1800s, may soon have to retreat as sea levels rise and disrupt the small-scale agriculture and shrimping operations that residents rely on.³²⁸ Indigenous villages in Alaska have also begun to address the prospect of relocating. The village of Newtok in Alaska received a grant of \$15 million to relocate to another area in March 2018,³²⁹ and other Alaskan villages are beginning to look into the relocation process.³³⁰

The contrast between the Isle de Jean Charles and Tangier Island discussed in Part IV.B.2 is striking. While residents of the Isle de Jean Charles resisted efforts to relocate, eventually the community signed on, accepting that a relocation plan would allow their community to remain intact.³³¹ Although there is currently a dispute between residents and Louisiana over the location of the new community, island residents do not deny the existence of climate change or the need for a plan to leave the island.³³² The inhabitants of Tangier Island, however, deny the reality of climate change, and still hold out hope that hard-armoring will save the island.³³³ Perhaps residents of Tangier Island will be more willing to accept a relocation plan once the impacts of climate change become too obvious to be ignored, but the future of Tangier Island poses a thought-provoking question: how does a society handle communities whose hometown's survival in the face of climate change is in question, and when does government involvement cross the line into infringement on individuals' rights?³³⁴

While this Part began with a discussion of eminent domain, a truly successful relocation strategy will have little in common with past urban renewal

Differing Visions for Resettling Climate Refugees, DESMOG (Feb. 5, 2019), <https://www.desmogblog.com/2019/02/05/louisiana-isle-de-jean-charles-tribe-plans-resettlement-climate-refugees>.

328. Erica Chayes Wida, *The Sinking Islands of the Southern US*, BBC (Sept. 5, 2018), <http://www.bbc.com/travel/story/20180904-the-sinking-islands-of-the-southern-us>.

329. Waldholz, *supra* note 177.

330. Kennedy, *supra* note 177.

331. Davenport & Robertson, *supra* note 177.

332. See Melissa Watson, *'Like a cancer,' Isle de Jean Charles Land Loss Forces Community to Move to Federally-Funded Site*, THE VERMILLION (Jan. 29, 2019), https://www.thevermillion.com/news/like-a-cancer-isle-de-jean-charles-land-loss-forces/article_7eba1bf6-235b-11e9-b859-3f310ddf6acb.html. Watson quotes Pat Forbes, executive director of the Louisiana Office of Community Development, who claims that relocation is heavily supported by the tribe, with "70 percent choos[ing] to get to higher and drier land."

333. Plott, *supra* note 200.

334. It is possible that race may play a role in what communities are receptive to relocation. Tangier Island is majority white, compared to the indigenous residents of Alaskan villages and the Isle de Jean Charles. It is also possible that political attitudes toward climate change and government intervention in general are the more salient factors, with race a stand-in for political affiliation. Future research is needed to more fully address this question.

projects. By utilizing an iterative process that engages communities before final decisions are made, a relocation program can receive community buy-in earlier, giving communities agency to determine their own futures. Addressing the option of relocation before the most dire impacts of climate change are felt will also give communities the time and resources needed to keep important social and economic ties intact. An equitable relocation program cannot be a one-size-fits-all option, but must be flexible enough to take into account the needs and values of individual communities.

CONCLUSION

It is tragic that the areas most imminently affected by climate change are areas with long histories and unique cultural traditions. The cultural fabric of the United States will be less vibrant with the loss of low-lying and island communities. However, the irreversible impact of climate change means that continued habitation in vulnerable areas may soon be unsustainable. Looking at the current state of flood insurance and tort law in the United States shows that the current legal mechanisms to compensate for property loss and deter future losses are insufficient. The threat of flooding and hurricanes is not limited to New Orleans; Hurricane Katrina and its aftermath are merely harbingers of what's to come. As sea level rise and the threat of hurricanes becomes ever more dire, other low-lying areas will likely have to relocate in the near future. In order to make relocation successful, the government should undertake efforts to increase community engagement, facilitate higher pay-outs that take into account people's emotional investment in their homes and their communities, and prioritize keeping communities intact. This way, a desperate solution to an unstoppable tide of climate change can at least be a justly implemented one.³³⁵

We welcome responses to this Note. If you are interested in submitting a response for our online journal, *Ecology Law Currents*, please contact cse.elq@law.berkeley.edu. Responses to articles may be viewed at our website, <http://www.ecologylawquarterly.org>.

