

CERCLA: IT'S TIME TO PRIORITIZE CLIMATE THREATS

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Climate change will bring more extreme weather, including increased flooding and wind damage, to all stretches of the United States. These effects of climate change will cause profound consequences for communities living near sites with a legacy of toxic waste. With 1,883 Superfund sites on the National Priorities List and countless other U.S. properties with some degree of contamination, climate change will result in increased risk of exposure for surrounding local populations and environments. Currently, the Hazard Ranking System does not consider effects of climate change when calculating the risk a site poses to the public. Without considering associated climate risks, the sites are not accurately ranked on the National Priorities list, and resources under CERCLA may not be adequately allocated.

This Comment explores an approach to modifying the current CERCLA regime to account for climate change while calculating a site's score under the Hazard Ranking System. I argue that the process of ranking sites on the National Priorities List must be updated to account for associated climate risks. This change should be made by updating the current formula through rulemaking by the Environmental Protection Agency.

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INTRODUCTION

Climate change will bring profound consequences to the communities near our nation's most heavily polluted areas and particularly to those who live near the 2,500 toxic sites with a moderate-to-high risk of flooding.¹ Almost two million people live near contaminated sites in present-day flood zones.² Remediation efforts at the most severe sites—known colloquially as “Superfund” sites—are strained by limited resources. The Environmental Protection Agency (EPA) therefore must allocate aid by ranking sites according to the risk they present to human health and the environment.³ The EPA's Hazard

1. Hiroko Tabuchi, Nadja Popvich, Blacki Migliozi & Andrew W. Lehren, *Floods Are Getting Worse, and 2,500 Chemical Sites Lie in the Water's Path*, N.Y. TIMES (Feb. 6, 2018), <https://www.nytimes.com/interactive/2018/02/06/climate/flood-toxic-chemicals.html> [<https://perma.cc/FR3U-CYGY>].

2. *327 Toxic Superfund Sites in Climate Change, Flooding Bulls-Eyes*, CBS NEWS (Dec. 22, 2017, 5:46 PM), <https://www.cbsnews.com/news/327-toxic-superfund-sites-climate-change-flooding-bulls-eyes-ap/> [<https://perma.cc/JR7C-JJQU>] (“[Resident] is among nearly 2 million people in the U.S. who live within a mile of 327 Superfund sites in areas prone to flooding or vulnerable to sea-level rise caused by climate change.”).

3. National Priorities List, 83 Fed. Reg. 46,408, 46,408 (Sept. 13, 2018) (to be codified at 40 C.F.R. pt. 300). The National Priorities List is updated at least annually by the EPA and is then published as a rule in the Federal Register. A

Ranking System (HRS) considers a number of factors to determine which sites to prioritize for cleanup, and the Agency adds sites presenting the largest public health risk to the National Priorities List (NPL). Currently, however, this priority-setting system does not take into account the risks presented by climate change. The process of making the NPL must be updated to consider flooding, sea level rise, and other natural occurrences that will increase in frequency if climate change predictions are correct. This change to the HRS could come through legislation, agency action, or a lawsuit, if necessary. All options considered, the most promising method to achieve this change is rulemaking by the EPA.

This Comment begins by describing examples of Superfund sites threatened by climate change. Part II then gives an overview of the relevant laws and regulations that require an update to reflect increasing flood danger at certain Superfund sites—namely, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the NPL, and the HRS. Part III discusses previous legislative updates to these laws. Finally, Part IV considers potential methods that could be used to update the current legal structure to better account for climate change.

I. SUPERFUND SITES IMPERILED BY CLIMATE CHANGE

A. *Damage to the San Jacinto Waste Pits During Hurricane Harvey*

The San Jacinto Waste Pits (“Waste Pits”) in Houston, Texas, are on the site of what was originally Champion Paper’s industrial waste and paper-mill sludge dumping grounds.⁴ The Champion Paper company contracted McGinnes Industrial Maintenance Corporation to dump toxic waste near the bank of

Superfund site is “any land in the United States that has been contaminated by hazardous waste and identified by the EPA as a candidate for cleanup because it poses a risk to human health and/or the environment. These sites are placed on the National Priorities List (NPL).” *TOXMAP FAQ: What Are the Superfund Site “NPL” Statuses?*, U.S. DEP’T HEALTH & HUM. SERVS., <https://toxmap.nlm.nih.gov/toxmap/faq/2009/08/what-are-the-superfund-site-npl-statuses.html> [<https://perma.cc/N63B-ZQXJ>].

4. Dianna Wray, *The San Jacinto River Waste Pit Superfund Site Was Abandoned According to Plan*, HOUS. PRESS (July 21, 2016, 9:00 AM), <https://www.houstonpress.com/news/the-san-jacinto-river-waste-pit-superfund-site-was-abandoned-according-to-plan-8585885> [<https://perma.cc/FZ3W-2DZH>].

the San Jacinto River.⁵ While the dumping occurred as early as the 1960s, the waste pits remained unknown to the public until 2005.⁶ The pits of toxic sludge contain multiple harmful chemicals like dibenzo-p-dioxins (generally called dioxins) and polychlorinated dibenzofurans (generally called furans).⁷ Exposure to dioxins can cause a multitude of health issues in humans, including: cardiovascular disease; diabetes; cancer; endometriosis; early menopause; reduced testosterone and thyroid hormones; altered immunologic response; and skin, tooth, and nail abnormalities.⁸ Some studies have found no safe margin of exposure for humans.⁹ Dioxins' risk to humans is so great that the Food and Drug Administration (FDA) recommends not eating shellfish with dioxin levels higher than 50 parts per trillion. By contrast, the dioxin levels at the San Jacinto Waste Pits are as high as 70 parts per billion.¹⁰ The EPA added a 20-acre area surrounding the Waste Pits to the NPL in 2008,¹¹ at which time the site was slated for cleanup. But little cleanup progress occurred before 2017.¹² EPA officials had not even decided on a treatment plan by May 2017.¹³ Because no significant improvements were made, the site remained largely open to the elements when the center of Hurricane Harvey made landfall in Texas on August 25, 2017.¹⁴

5. *Id.*

6. *Id.* Dredging of that section of river occurred in 2005 for an unrelated purpose, uncovering the long-forgotten drums.

7. *News Releases from Region 06: San Jacinto Waste Pits Superfund Site Cleanup Plan Approved*, ENVTL. PROT. AGENCY (Oct. 11, 2017), <https://www.epa.gov/newsreleases/san-jacinto-waste-pits-superfund-site-cleanup-plan-approved> [<https://perma.cc/JGH3-KLD6>].

8. Sally S. White & Linda S. Birnbaum, *An Overview of the Effects of Dioxins and Dioxin-Like Compounds on Vertebrates, as Documented in Human and Ecological Epidemiology*, 27 J. ENVTL. SCI. & HEALTH 197, 206 (2009) (citation omitted).

9. *See, e.g., id.* at 208.

10. *National Priorities List: San Jacinto River Waste Pits*, ENVTL. PROT. AGENCY (Mar. 2008), <https://semsub.epa.gov/work/06/300055.pdf> [<https://perma.cc/9NVY-28BT>]; *Dioxins and Furans*, ENVTL. PROT. AGENCY, <https://archive.epa.gov/epawaste/hazard/wastemin/web/pdf/dioxifura.pdf> (last visited July 17, 2018) [<https://perma.cc/839H-9XD3>].

11. *National Priorities List*, *supra* note 10.

12. *See Site Update: San Jacinto River Waste Pits Superfund Site*, ENVTL. PROT. AGENCY (May 2017), <https://semsub.epa.gov/work/06/100001830.pdf> [<https://perma.cc/69EQ-DSCR>].

13. *Id.* ("The selected remedy will be contained in a Record of Decision to be finalized in late 2017.")

14. *See* ERIC S. BLAKE & DAVID A. ZELINSKY, NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT: HURRICANE HARVEY 3 (2018), <https://>

Hurricane Harvey reached Category 4 strength before making landfall.¹⁵ The storm caused catastrophic flooding: more than sixty inches of rain fell over southeastern Texas.¹⁶ Because of the unprecedented damage to the city of Houston and tragic loss of life, it is easy to overlook another harrowing consequence of Hurricane Harvey—the damage to the San Jacinto Waste Pits and other local Superfund sites.¹⁷ Hurricane Harvey turned the San Jacinto Waste Pits into a “rushing torrent of muddy water,” which washed away rocks that tenuously separated the river from the toxic pits.¹⁸ The rush of water likely dislodged some toxic sand, sending it downriver where locals fish and catch crab.¹⁹ Because consumption of contaminated food is the most common pathway for human exposure to dioxins, the infiltration of toxic sand into the river is especially problematic.²⁰

The damage caused by the hurricane was unfortunate but not unexpected. Risk of flooding from heavy rainfall or high winds was a known concern at the site prior to Hurricane Harvey.²¹ Sure enough, stormwater from Hurricane Harvey broke through the temporary cap and exposed the underlying waste, which then escaped into the San Jacinto River.²²

www.nhc.noaa.gov/data/tcr/AL092017_Harvey.pdf [<https://perma.cc/AU8S-GKT9>].

15. *Id.*

16. *Id.* at 6.

17. Rebecca Hersher, *A Year After Hurricane Harvey, Band-Aid Fixes to a Superfund Site*, NAT'L PUB. RADIO (Aug. 28, 2018, 4:57 AM), <https://www.npr.org/2018/08/28/642496630/a-year-after-hurricane-harvey-band-aid-fixes-to-a-superfund-site> [<https://perma.cc/FJN5-CNHL>] (“The San Jacinto Waste Pits are an environmental nightmare, more than 5 million cubic feet of sand contaminated with carcinogens sitting in pits in the middle of a river east of Houston.”); *see also* Jason Dearen & Michael Biesecker, *Toxic Waste Sites Flooded in Houston Area*, ASSOCIATED PRESS (Sept. 3, 2017), <https://apnews.com/27796dd13b9549b0ac76ade58a15122> [<https://perma.cc/6AKK-TM5F>] (“[T]he Houston metro area has more than a dozen Superfund sites, designated by the Environmental Protection Agency as being among America’s most intensely contaminated places. Many are now flooded, with the risk that waters were stirring dangerous sediment.”).

18. Hersher, *supra* note 17.

19. *Id.* (“The \$115 million plan is to remove hundreds of thousands of pounds of sand that’s contaminated with dioxins. Dioxins cause cancer and reproductive and developmental problems according to the CDC. And most dioxin exposure in people comes from food, especially seafood.”).

20. *Dioxins and Furans*, *supra* note 10.

21. Hersher, *supra* note 17.

22. Kiah Collier, *Houston-Area Toxic Waste Site Removed from Priority Cleanup List*, TEX. TRIB. (Apr. 16, 2018, 12:00 PM), <https://www.texastribune.org/2018/04/16/san-jacinto-waste-pits-removed-epa-priority-cleanup-list/> [<https://perma.cc/CDN7-M582>].

The aftermath of the hurricane demonstrates the need for a systematic and regulated approach for avoiding these types of disasters.²³ Shortly following the hurricane, then-EPA Administrator Scott Pruitt visited the site and promised to arrive at a permanent solution for the Waste Pits “soon.”²⁴ After the site received personal attention from Administrator Pruitt, the EPA purported to give San Jacinto increased priority and created a cleanup plan for the site.²⁵ Contractors were appointed in 2018 and were given twenty-nine months to develop a specific cleanup blueprint.²⁶ Still, no physical remediation has occurred, and officials now say that cleanup will not begin until at least 2021.²⁷ By that time, the San Jacinto area will have experienced four additional hurricane seasons.

None of these compounding factors—not devastation caused by Harvey, nor the looming threat of additional hurricane seasons, nor even Scott Pruitt’s own words—have inspired meaningful action at San Jacinto. The EPA’s failure here shows the need to afford additional legal protection to sites that are particularly vulnerable in the face of climate change.

23. *Id.*

24. Dianna Wray, *Scott Pruitt Visits San Jacinto Waste Pits Post-Harvey, Promises EPA Decision by October*, HOUS. PRESS (Sept. 19, 2017, 7:00 AM), <https://www.houstonpress.com/news/epa-head-scott-pruitt-promises-decision-on-san-jacinto-waste-pits-by-ut-ou-game-9802625> [https://perma.cc/E48V-2JMB] (“Environmental Protection Agency head Scott Pruitt promised the EPA would arrive at a permanent solution for the San Jacinto Waste Pits before the football rivalry game between the University of Texas and the University of Oklahoma on October 14.”).

25. Rebecca Hersher, *EPA Takes Toxic Site Flooded by Harvey Off Special Cleanup List*, NAT’L PUB. RADIO (Apr. 16, 2018, 5:31 PM), <https://www.npr.org/sections/thetwo-way/2018/04/16/601867839/epa-takes-toxic-site-flooded-by-harvey-off-special-cleanup-list> [https://perma.cc/WB2D-ZLUM]. Former Administrator Scott Pruitt did not technically change San Jacinto’s NPL ranking on the National Priority List because those rankings are made each year by rulemaking procedures; instead, he changed the site’s ranking on his “personal” priority list. Scott Pruitt’s special list, notably, did not come with additional funding. *See, e.g.*, Brady Dennis, *EPA Lists 21 Toxic Superfund Sites that Need “Immediate and Intense” Cleanup*, WASH. POST (Dec. 8, 2017), <https://www.washingtonpost.com/news/energy-environment/wp/2017/12/08/epa-lists-21-toxic-superfund-sites-that-need-immediate-and-intense-cleanup> [https://perma.cc/EW7G-6LJ6]. The “special cleanup list” was a separate priority list developed by Administrator Pruitt; inclusion on the list did not affect NPL listing status.

26. Hersher, *supra* note 25.

27. Perla Trevizo, *Feds Hope to Start San Jacinto Waste Pits Cleanup Within 2 Years*, HOUS. CHRON. (Sept. 9, 2019, 7:37 PM), <https://www.houstonchronicle.com/news/houston-texas/houston/article/Feds-tout-progress-on-San-Jacinto-Waste-Pits-14426397.php> [https://perma.cc/X9AL-ZASY].

B. *The Martin Aaron Industrial Site*

While the story of the San Jacinto Waste Pits and Hurricane Harvey is cautionary evidence of the ever-increasing risks presented by climate change, there are other sites that are, literally, disasters waiting to happen.²⁸ Climate change is expected to increase the frequency and severity of flooding and other natural disasters.²⁹ More than 2,500 sites that handle toxic chemicals are located in flood-prone regions throughout the United States, and most sites are clustered around the nation's coastlines. Unfortunately, this means that many vulnerable sites are located close to major population centers.³⁰ Low-lying communities, especially in states like Florida and New Jersey, can expect rising sea levels and stronger, more frequent storms.³¹ In these two states the majority of Superfund sites are currently in flood-prone areas, with flood risk expected to increase in coming years.³²

New Jersey has thirty-five Superfund sites at high risk of flooding.³³ One site, the Martin Aaron Industrial Site in Camden, New Jersey, received a particularly high hazard ranking score and requires the removal of twelve thousand tons of

28. See Tabuchi et al., *supra* note 1.

29. Donald J. Wuebbles et al., *Executive Summary*, in CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT 22 (Donald J. Wuebbles et al. eds., 2017) (“For Atlantic and eastern North Pacific hurricanes and western North Pacific typhoons, increases are projected in precipitation rates (high confidence) and intensity (medium confidence). The frequency of the most intense of these storms is projected to increase in the Atlantic and western North Pacific (low confidence) and in the eastern North Pacific (medium confidence).”).

30. *Id.*

31. *Id.* at 333–34. As of 2017, there are 1,119 and 1,765 Toxic Release Sites in New Jersey and Florida, respectively. *TRI Basic Data Files: Calendar Years 1987-2017*, ENVTL. PROT. AGENCY, <https://www.epa.gov/toxics-release-inventory-tri-program/tri-basic-data-files-calendar-years-1987-2017> (last visited July 18, 2019) [<https://perma.cc/7NAW-7YUB>]. It should be noted that these are Toxic Release Sites, and not each and every toxic release site becomes a Superfund site with cleanup required by CERCLA, but the effects of a toxic release are often long-lasting and significant. The Toxic Release Inventory is a dataset compiled by the EPA that contains information on the management and any releases of toxic chemicals regulated under Emergency Planning and Community Right-to-Know Act, 42 U.S.C. § 11048 (2018).

32. Tabuchi et al., *supra* note 1.

33. Jason Dearen, Michael Biesecker & Angeliki Kastanis, *AP Finds Climate Change Risk for 327 Toxic Superfund Sites*, ASSOCIATED PRESS (Dec. 22, 2017), <https://apnews.com/31765cc6d10244588805ee738edcb36b> [<https://perma.cc/T5QW-NDWE>].

soil.³⁴ The soil is contaminated with arsenic, polychlorinated biphenyls, and volatile organic compounds—the legacy of decades of use as a site for multiple steel drum reconditioning companies.³⁵ While cleanup efforts are currently underway,³⁶ the site is a present hazard to human health; the threat it poses to public health is exacerbated by its low elevation and extremely dense surrounding population.³⁷ The Martin Aaron case is a success from the point of view that resources are being dedicated to a high-priority site. However, the site poses an even greater risk in the era of climate change, and officials are failing to address the increased threat.

The Martin Aaron and San Jacinto examples are emblematic of the issues facing former industrial sites throughout the United States as climate change takes hold. These are two sites (of many) that pose great risk to surrounding communities and yet confront significant barriers on the path to remediation. The next sections highlight and explain the laws and regulations that govern cleanup and repurposing of damaged lands.

II. SUPERFUND PRIORITIZATION LAW

A Superfund site is a property requiring cleanup due to the presence of contamination that could cause harm to human and environmental health.³⁸ The term refers to the trust fund established by Congress through the CERCLA legislation to finance the cleanup of the nation's most polluted sites,³⁹ though

34. *Soil Cleanup to Begin at the Martin Aaron, Inc. Site*, ENVTL. PROT. AGENCY (Aug. 2016), <https://semspub.epa.gov/work/02/407806.pdf> [<https://perma.cc/5G6R-4TFA>]. The Martin Aaron site received a score of 50.0 at listing.

35. *Id.*

36. According to the EPA website, “EPA and NJDEP have stabilized the site by removing drums, process equipment, tanks, and soil, and maintains a fence to prevent contact with remaining subsurface soil contamination. In 2007, EPA reached an agreement with the responsible parties to undertake the soil cleanup. The responsible parties completed the design of the soil remedy in 2014 and are currently revising the plan for implementation of the remedy design, which is expected to start in 2017.” *Martin Aaron, Inc. Camden, NJ: Cleanup Activities*, ENVTL. PROT. AGENCY, <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0200278> (last visited July 18, 2019) [<https://perma.cc/5T46-YC46>]; see also *National Priorities List (NPL) Sites – By State*, ENVTL. PROT. AGENCY, <https://www.epa.gov/superfund/national-priorities-list-npl-sites-state#NJ> (last visited Oct. 18, 2019) [<https://perma.cc/9LSF-ES67>].

37. Dearen et al., *supra* note 33.

38. 42 U.S.C. § 9601(20)(H)(23) (2018); see also *Superfund*, BLACK'S LAW DICTIONARY (11th ed. 2001).

39. *Superfund*, BLACK'S LAW DICTIONARY, *supra* note 38.

many now use the term to generally describe any site at which cleanup is occurring.⁴⁰ CERCLA provides the statutory framework for creating the National Priorities List using the Hazard Ranking System.⁴¹ These statutory provisions work together to aid in achieving Congress's stated goal of implementing remediation reform.⁴²

A. *The CERCLA Framework*

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), codified at 42 U.S.C. §§ 9601 *et seq.*, was passed in 1980 to “address the pressing national problem of hazardous waste pollution.”⁴³ CERCLA was inspired by certain high-profile events involving toxic waste during the mid-twentieth century,⁴⁴ including the public outcry at the Love Canal toxic site in upstate New York.⁴⁵ Love Canal was a site on which the local government designed and constructed an entire residential neighborhood, including a school and playground, on a former hazardous waste dumpsite.⁴⁶ Af-

40. See sources cited *supra* note 3. The congressionally created fund pays for only a small portion of sites cleaned up under CERCLA, since the law also has provisions allowing private parties to be held liable for cleanup.

41. 42 U.S.C. § 9605(a)(8), (c) (2018).

42. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Pub. L. No. 96-510, 94 Stat. 2767, 2767 (1980) (codified as amended at 42 U.S.C. § 9601).

43. Beverly Z. Alexander, *CERCLA 1980-1985: A Research Guide*, 13 *ECOLOGY L. Q.* 311, 312 (1986).

44. The bill was rushed through Congress, in part because of the upcoming administration change, and in part because of the urgency of the growing hazardous waste pollution problem in the United States. *Id.* at 312. Congress passed CERCLA during a period of strong environmental advocacy. The era, initially inspired by Rachel Carson's *Silent Spring*, saw the passing of most supportive environmental policy at the federal level. Eliza Griswold, *How 'Silent Spring' Ignited the Environmental Movement*, *N.Y. TIMES* (Sept. 21, 2012), <https://www.nytimes.com/2012/09/23/magazine/how-silent-spring-ignited-the-environmental-movement.html> [<https://perma.cc/GL8K-QRX2>]; see also WILLIAM H. RODGERS, JR. & ELIZABETH BURLESON, *ENVIRONMENTAL LAW* § 3:17 (2d ed., 2016). Carson's *Silent Spring* was a wake-up call for many U.S. citizens. The book highlighted the damage that pesticides were causing for many species.

45. Eric R. Pogue, *The Catastrophe Model of Risk Regulation and the Regulatory Legacy of Three Mile Island and Love Canal*, 15 *PA. ST. ENVTL. L. REV.* 463, 475 (2007) (“Despite the sensationalism of many of the elements associated with the aftermath of Love Canal (e.g., a kidnapping and a presidential visit) the most significant government response to the Love Canal accident was the passage of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).”).

46. *Id.* at 466.

ter two decades, heavy rains caused drums of hazardous waste to escape from the ground, causing health and safety concerns for residents.⁴⁷ The events at Love Canal continue to be synonymous with toxic waste, and the tale still serves as inspiration for subsequent generations of activism.⁴⁸ The Love Canal disaster inspired Congress to tackle the land contamination problems caused by the industrial age. These problems undoubtedly still plague the United States today.⁴⁹

The stated purpose of CERCLA is to “provide for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment and the cleanup of inactive hazardous waste disposal sites.”⁵⁰ CERCLA is designed to deal with all likely and actual releases of toxic materials in a timely manner.⁵¹

CERCLA creates a system to clean up existing waste sites that either currently release contaminants or may do so in the future, and provides a blueprint for addressing those toxic releases.⁵² Statutory section 42 U.S.C. § 9605 adapted the National Contingency Plan (NCP), a federal response protocol, for use at hazardous substance release sites.⁵³ The NCP prescribes cleanup standards, process guidance, and other necessary statutory criteria.⁵⁴ The NCP actually predates CERCLA and over time has created a guide for coordination between agencies, from spill to complete cleanup.⁵⁵ Amendments have solved

47. *Id.* at 473.

48. *Id.* at 466 n.7 (“Love Canal, a massive industrial waste disposal area near Niagara Falls, N.Y., became synonymous with cleanups of hazardous chemicals.”).

49. *Id.* at 475. Ironically, the Love Canal disaster was a direct result of local flooding, the exact phenomenon the legal structure of CERCLA is not currently capable of solving.

50. Comprehensive Environmental Response, Compensation, and Liability Act § 9601, 94 Stat. at 2767.

51. JOHNATHAN R. NASH, *ESSENTIALS: ENVIRONMENTAL LAW AND POLICY* 103 (7th ed. 2010). “[A]ll hazardous materials” may be too broad because oil and gas spills are expressly not included under CERCLA, but this petroleum exception is well-established, and discussion is outside the scope of this Comment.

52. Kurt A. Strasser, *Environmental Law in the United States’ Federal System*, 9 CONN. J. INT’L L. 719, 735 (1994) (“Its focus is on cleaning up existing waste sites that are leaking or threatening to leak, and on getting those responsible for the waste site to pay for the cleanup.”).

53. 42 U.S.C. § 9605(a)(B) (2018).

54. John S. Applegate, *The Comprehensive Environmental Response, Compensation, and Liability Act*, 9 J. NAT. RESOURCES & ENVTL. L. 211 (1994).

55. *Id.* at 216. This Comment argues that effects of climate change must be considered much earlier in the NPL process; however, others argue convincingly that climate change must also be considered in later stages of remediation. When

many of the problems of the initial legislation, but cost overruns, bloated timelines, and extensive litigation are still rampant.⁵⁶

CERCLA also focuses on requiring the responsible party to pay for damage to the land; however, it expands the list of “potentially responsible parties” to include those who stored the waste, those who currently own the property, and those who owned the land when the polluting events occurred.⁵⁷ After the EPA determines the parties responsible for cleanup, the Agency develops a plan to respond to the release, or threatened

choosing a method of remediation (done during the Remedial Investigation/Feasibility Study period (RI/FS)), climate change must also be considered. Certain remediation techniques, especially in areas prone to climate-related flooding, require tougher remediation solutions, such as stronger caps or deeper dredging. Considering climate change only during the RI/FS stage is not enough. The RI/FS stage comes after resource allocation, by which point important decisions related to federal funding have already been made. Further, the flexibility inherent to the RI/FS stage is good but is ad hoc and dependent on local figures. Implementing consideration of climate change into the NPL can create meaningful, long-term change to the CERCLA regime, and would be further aided by climate consideration during the RI/FS period. Emily Russell, *Superfund and Climate Change: Lessons from Hurricane Sandy*, 28 NAT. RESOURCES & ENV'T 3 (2014); see also Steven M. Sellers, *Special Report: Climate Change Threatens Superfund Sites*, 79 DAILY ENV'T REP. BB-1 (Apr. 24, 2015), http://web.law.columbia.edu/sites/default/files/microsites/climate-change/cercla_and_climate_change.pdf [<https://perma.cc/BW7X-VKGR>].

56. John S. Applegate, *How to Save the National Priorities List from the D.C. Circuit—and Itself*, 9 J. NAT. RESOURCES & ENV'T L. 211, 212 (1994) (“What appears a perfectly rational decision-making process has become a rigid, time-consuming, and hugely expensive parade of documents, objections, and litigation. . . . I will argue that the statutory structure of CERCLA, its bureaucratic implementation, and its judicial mistreatment have combined to focus enormous resources on the decision-making steps along the way, instead of on the actual clean-up.”). The preferred metric for measuring the success of a cleanup is called a “construction completion.” Walter Mugdan, *Superfund: Still Super, Still Fun*, 32 PRAC. REAL EST. LAW. 8 (2016) (“1,767 proposed, final and deleted National Priorities List (NPL) sites; 1,177 of those sites (67%) have all construction complete.”). The EPA uses construction completion as a measure that “documents the completion of physical construction of all cleanup actions, including actions to address all immediate threats and to bring all long-term threats under control.” *Superfund: Remedial Action Project Completion and Construction Completions*, ENVTL. PROT. AGENCY, <https://www.epa.gov/superfund/superfund-remedial-action-project-completion-and-construction-completions> (last updated June 4, 2018) [<https://perma.cc/K4VN-KB9X>]. A construction completion means either the contamination problem no longer exists, or institutional controls have protected the public from the contamination. *Id.* As of 2015, two-thirds of all sites ever listed on the National Priorities List have achieved construction completion.

57. RODGERS & BURLESON, *supra* note 44, at 735. Liability and degree of fault are highly contentious and complicated issues in CERCLA litigation but are outside the scope of this Comment.

release, of hazardous substances.⁵⁸ The EPA may clean up a site itself or may issue an order to a third party to clean up the affected site.⁵⁹ If the EPA takes the lead role on cleanup, it may later seek to recover associated costs from the responsible parties.⁶⁰ When the EPA leads remediation efforts on a site, the agency adds the site to the NPL (discussed below).⁶¹ Alternatively, if the EPA assigns cleanup duties directly to a responsible party, the EPA retains the ability to enforce cleanup by imposing daily penalties for noncompliance.⁶²

An overview of how cleanup actions proceed is helpful. The following subsections describe how a site becomes listed on the National Priorities List, and what factors are most emphasized by the current formula used for rankings.

B. The National Priorities List

The NCP includes the requirement that the EPA create and update a list of sites prioritized for CERCLA cleanup efforts: the National Priorities List (NPL).⁶³ The list does not bind the EPA to clean up sites in a particular order, but it does establish the priorities and resource allocation for the

58. JEFFREY M. GABA & DONALD STEVER, LAW OF SOLID WASTE, POLLUTION, PREVENTION, AND RECYCLING § 7.2 (2018); *see also* 42 U.S.C. § 9604 (2018) (“Whenever (A) any hazardous substance is released or there is a substantial threat of such a release into the environment, or (B) there is a release or substantial threat of release into the environment of any pollutant or contaminant which may present an imminent and substantial danger to the public health or welfare, the President is authorized to act, consistent with the national contingency plan, to remove or arrange for the removal of, and provide for remedial action relating to such hazardous substance.”).

59. 42 U.S.C. § 9604(a)(1).

60. *Id.* § 9604(d)(C)(2) (“[T]he President may, after providing sixty days’ notice, seek in the appropriate Federal district court to enforce the contract or to recover any funds advanced or any costs incurred because of the breach of the contract by the State or political subdivision.”).

61. *Id.* § 9605(a)(8)(B). The NCP was challenged and substantially upheld in *Ohio v. United States Environmental Protection Agency*, 997 F.2d 1520 (D.C. Cir. 1993). While the EPA retains authority over all sites, “private parties can agree to conduct an EPA-supervised cleanup of a site that might otherwise be listed on the NPL. Federal funding of the cleanup will not be necessary because private parties are cooperating with the cleanup. Under these circumstances, the EPA may decide against listing the site on the NPL since EPA authority (other than funding) extends equally to listed and non-listed sites.” Martha L. Judy & Katherine N. Probst, *Superfund at 30*, 11 VT. J. ENVTL. L. 191, 198 (2009).

62. 42 U.S.C. § 9605.

63. *Id.* § 9605(a)(8)(B).

Agency.⁶⁴ The following discussion outlines the listing process, but note that all the steps discussed take place well before any physical cleanup actions occur.

First, a problematic site is identified. Identification may come from a mandatory self-report, a release report, an inspection, a citizen complaint, or other evidence of a growing pollution problem.⁶⁵ After a preliminary assessment and a site investigation, the EPA determines what, if any, cleanup is required.⁶⁶ If the site requires physical changes to achieve safe levels of pollution, it will receive a score calculated using the Hazard Ranking System (HRS).⁶⁷ The score is calculated by examining the risks from each route of exposure of the site-specific chemicals to human health.⁶⁸

Second, after a site's inclusion on the NPL, the EPA works with the Agency for Toxic Substance and Disease Registry to further detail what health risks are present at the site and determine an acceptable post-remediation risk level.⁶⁹ As the remediation plan develops, the EPA typically conducts a feasibility test and eventually publishes a record of decision (ROD) memorializing the remediation plan.⁷⁰ The plan becomes "final" when published as a record of decision but is not binding in any way; the Agency or those responsible for the cleanup may change the remediation plan as required during site cleanup.⁷¹ However, significant changes to the plan require an amendment of the ROD.⁷²

The EPA evaluates several factors to select one remediation plan over other possible alternatives for its final plan.⁷³ Relevant factors include the overall protection of public health and the environment, reduction of toxicity, long-term effectiveness of the measures, compliance with relevant cleanup standards, and cost. Of these considerations, the protection of public health and compliance with relevant cleanup standards are

64. 40 C.F.R. § 300.425 (2019).

65. Applegate, *supra* note 56, at 213.

66. *Id.*

67. *See infra*, Section II.C.

68. Applegate, *supra* note 56, at 214.

69. *Id.* at 215. These risks are accounted for through four distinct pathways. *See infra* Section II.C.

70. Applegate, *supra* note 56, at 216.

71. *Id.* at 217.

72. 40 C.F.R. § 300.430 (2019).

73. Adam Babich, *A New Era in Environmental Law*, 20 COLO. LAW. 435, 442 (1991).

paramount and must be prioritized.⁷⁴ Other factors are “modifying criteria,” which must be considered but cannot justify jeopardizing either compliance with cleanup standards or public health.⁷⁵

It is important to emphasize that the NPL does not bind the EPA to any action. Need always dwarfs resources. In 2017, the EPA added seven sites to the NPL and proposed the addition of four more. Only two sites were fully removed from the List.⁷⁶ Notably, the EPA classified eighteen sites for cleanup, but lack of resources prevented the initiation of construction work at all eighteen sites.⁷⁷ Still, the initial risk factor assigned to the site is crucial because those sites on the List are the EPA’s focus for resources; if the risks at a site are not accurately quantified from the outset, adequate resources may never be allocated for that site.⁷⁸

While a spot on the NPL is the “prize” for a high score from the HRS, there are other routes to inclusion on the NPL.⁷⁹ Each state is allowed to designate their highest priority site for inclusion on the NPL.⁸⁰ Conversely, cleanup may occur at a site not listed on the NPL; many sites are cleaned up entirely by private parties and landowners who seek to avoid listing for a

74. *Id.* at 442 (“Nine criteria must be evaluated: (1) overall protection of the public and environment; (2) compliance with ARARs; (3) long-term effectiveness; (4) reduction of toxicity, mobility or volume through treatment; (5) short-term effectiveness and impact; (6) implementability; (7) cost; (8) acceptability to the affected state or Indian tribe; and (9) acceptability to the community.”); *see also* 40 C.F.R. § 300.430(e)(9).

75. Babich, *supra* note 73, at 442.

76. ENVTL. PROT. AGENCY, SUPERFUND ACCOMPLISHMENTS REPORT 12 (2017), <https://semspub.epa.gov/work/HQ/100001654.pdf> [<https://perma.cc/7SZ5-34FG>].

77. *Id.* at 6.

78. 40 C.F.R. § 300.425.

79. There are three ways for a site to get on the NPL. First, the site could score above 28.50 using the HRS (this is the process described above). Second, the site could be designated as first priority by a state or territory. Third, the site could meet the following three criteria: (i) the Agency for Toxic Substances and Disease Registry (ATSDR) of the U.S. Public Health Service issues a health advisory that recommends removing people from the site; (ii) EPA determines the site poses a significant threat to public health; and (iii) EPA anticipates it will be more cost effective to use its remedial authority [available only at NPL sites] than to use its emergency removal authority to respond to a release. Terry C. Clarke, *A Practitioner’s View of the National Priorities List*, 2 ENVTL. LAW. 57, 66 (1995).

80. 42 U.S.C. § 9605(a)(8)(B) (2018) (“[S]hall include among the one hundred highest priority facilities one such facility from each State which shall be the facility designated by the State as presenting the greatest danger to public health or welfare or the environment among the known facilities in such State.”).

variety of reasons.⁸¹ The EPA updates the List each year through informal rulemaking.⁸² Additionally, a high score may not lead to listing; the EPA Administrator “generally will defer final listing” at the request of the state.⁸³

The section above outlines what governmental actions can and likely do occur after a toxic release; the next section explains how the EPA prioritizes resources for sites which have experienced a toxic release.

C. *The Hazard Ranking System*

Congress created the Hazard Ranking System (HRS) through CERCLA section 9605.⁸⁴ The HRS relies on a “quantitative risk assessment” based on current conditions of the site.⁸⁵ The President is required to consider the site’s score when choosing to place a site on the NPL; the priorities list is traditionally organized from highest to lowest site score.⁸⁶ The risk assessment weighs numerous factors under the HRS.⁸⁷ The formula, a root-mean-square equation, averages the potential risk of human exposure through four sub-scores, including groundwater pathway, surface water pathway, soil exposure pathway, and air migration pathway.⁸⁸ The ranking is based on the site-specific physical characteristics, the chemical characteristics of the pollutant, and the risk to human life.⁸⁹ Stated simply, the risk of exposure by any pathway will be weighed more heavily in the formula and reflected in the final

81. Jerry L. Anderson, *The Hazardous Waste Land*, 13 VA. ENVTL. L.J. 1, 4 n.16 (1993) (citing KATHERINE N. PROBST & PAUL R. PORTNEY, RESOURCES FOR THE FUTURE, ASSIGNING LIABILITY FOR SUPERFUND CLEANUPS: AN ANALYSIS OF POLICY ACTIONS 20 (1992)).

82. Clarke, *supra* note 79, at 59.

83. 61C AM. JUR. 2D POLLUTION CONTROL § 1164 (2019).

84. 42 U.S.C. § 9605(c). The Hazard Ranking System has undergone numerous revisions since the 1980 inception of the law, showing that new amendments to modernize the rankings are certainly possible. *See infra* Section IV.

85. Applegate, *supra* note 56, at 222.

86. DANIEL FARBER & ROGER FINDLEY, ENVIRONMENTAL LAW IN A NUTSHELL 226 (8th ed. 2010).

87. ENVTL. PROT. AGENCY, OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE HAZARD RANKING SYSTEM, 540-R-92-026, HAZARD RANKING SYSTEM GUIDANCE MANUAL (1992) [hereinafter GUIDANCE MANUAL].

88. *Id.*

89. GUIDANCE MANUAL, *supra* note 87, at 2.

score.⁹⁰ Quantifying these pathway scores requires consideration of site-specific data (e.g., soil composition, depth of groundwater, nearest resident population, existence of groundwater wells) and chemical characteristics of the pollutant to determine the risk presented to human life.⁹¹ Current data influence these factors, with no consideration of what hazards might arise in the future, such as climate change.⁹²

The EPA uses this equation to give each site an HRS score.⁹³ If the site scores above 28.50, then it is eligible for a spot on the NPL.⁹⁴ As of November 10, 2018, the highest-ranked site was Big River Mine Tailings/St. Joe Minerals Corp., with a ranking of 84.91.⁹⁵ The EPA originally listed Big River Mine in 1992 due to lead, cadmium, and zinc contamination at the old mining site.⁹⁶ As a result of unique weather patterns onsite, people within four miles of the mine were exposed to contamination.⁹⁷ Completion of cleanup of this site is expected in Fall 2018,⁹⁸ and then inevitably there will be a new highest-ranked site.

CERCLA, the National Priorities List, and Hazard Ranking System together provide tools that attempt to remediate damaged lands across the United States. To a certain extent,

90. The equation: $s = \sqrt{\frac{s_{gw}^2 + s_{sw}^2 + s_s^2 + s_a^2}{4}}$; where, s_{gw} = ground water migration pathway score; s_{sw} = surface water migration pathway score; s_s = soil exposure pathway score; s_a = air migration pathway score; and s = site score (referenced from 1.1: Introduction to the HRS). Note: this formula and means of determining the HRS were not part of the original CERCLA statute—it was added by the SARA amendment in 1986. 42 U.S.C. § 9605(c)(1) (2018).

91. GUIDANCE MANUAL, *supra* note 87, at 25.

92. *Id.* at 107.

93. *Id.*

94. *Id.* at 1.

95. The EPA keeps a current list of all National Priority sites on their website; the data can only be sorted by name, but the Big River Mine Tailings site had the highest HRS value when last accessed. *Superfund: National Priorities List (NPL)*, ENVTL. PROT. AGENCY (May 21, 2019), <https://www.epa.gov/superfund/superfund-national-priorities-list-npl> (last visited Dec. 1, 2019) [<https://perma.cc/8PG8-DY28>].

96. ENVTL. PROT. AGENCY, NPL SITE LISTING NARRATIVE FOR BIG RIVER MINE TAILINGS/ST. JOE MINERALS CORP. (1992).

97. *Id.*

98. *Big River Mine Tailings/St. Joe Minerals Corp. DESLOGE, Mo: Cleanup Activities*, ENVTL. PROT. AGENCY, <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0701639#Status> (last visited July 18, 2019) [<https://perma.cc/3KBU-Z5CP>].

the current system is working. But the failure of the remediation process to consider climate change continues to be a fundamental flaw. The following Part illustrates that this regulatory framework can be (and has been) amended to make small but useful changes to the process.

III. HIGHLIGHTED CERCLA STATUTORY AMENDMENTS

CERCLA is not a static regime. This Part explains how CERCLA's statutory framework has changed since its adoption in 1980. Still, further changes are necessary if CERCLA is to remain relevant in the twenty-first century.

Congress passed CERCLA in 1980, and the EPA published the first NPL, containing 406 sites, in 1983.⁹⁹ The Act underwent its first substantial amendment in 1986;¹⁰⁰ the Superfund Amendments and Reauthorization Act (SARA) revised the HRS to avoid overwhelming the list with low-threat sites.¹⁰¹ Congress's goal when passing SARA was to "promulgate amendments to the hazard ranking system . . . [to] assure, to the maximum extent feasible, that the hazard ranking system accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities."¹⁰² Since implementing the HRS site score formula within the SARA amendments, the system better evaluates exposure threats to humans from drinking water and the food chain.¹⁰³ SARA made amendments to other aspects of CERCLA, but the revisions to the HRS are most relevant to this discussion.

In addition to changes made by statute, the EPA uses rulemaking procedures as another avenue to update the NPL and HRS.¹⁰⁴ A significant change occurred in 2017 when the EPA promulgated rules requiring consideration of vapor intrusion when determining a site's HRS.¹⁰⁵ Vapor intrusion is the

99. *Id.*

100. Dylane Jacobs, *Hanford Nuclear Site: Remediating to a Standard Safe for All or Some?*, 7 SEATTLE J. ENVTL. L. 106, 112 (2017).

101. Clarke, *supra* note 79, at 67.

102. 42 U.S.C. § 9605(c)(1) (2018).

103. Clarke, *supra* note 79, at 67.

104. *See, e.g.*, Kristen M. Harvilla, *Rising to the Surface: The EPA's Addition of Subsurface Intrusion as a Component of the Superfund Hazard Ranking System*, 29 VILL. ENVTL. L.J. 81 (2018).

105. *Id.* at 90 ("At last, more than a decade after releasing its draft guidance on vapor intrusion, in 2015, the EPA released its final guidance, titled Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface

migration of hazardous substances from a contaminated subsurface into a structure on the surface as vapor or a gas.¹⁰⁶ This “intrusion” causes harmful levels of exposure to occupants of aboveground or basement structures.¹⁰⁷ Prior to the adoption of vapor intrusion rules, this pathway of exposure only incidentally affected a site’s ranking.¹⁰⁸ The rulemaking proceedings that lead to this change involved public comment and input opportunities.¹⁰⁹ The final rule emphasizes the need to rank sites “relative to each other with respect to actual or potential hazards”¹¹⁰ and requires the consideration of the vapor intrusion risk as part of the formula’s soil analysis.¹¹¹ Today, all site scores calculated under the HRS consider vapor intrusion as a mandatory component of the HRS calculation.

Overall, the HRS-NPL framework has not been a static legal regime since its inception in 1980. Multiple changes, including addition of vapor intrusion data and tightening of the NPL process, have occurred. The system is dynamic, and the EPA is doing its best to stay current with newly discovered science. Congress and the EPA have shown willingness to identify weaknesses in CERCLA’s regulatory framework and adapt the law to unforeseen problems. It is time for lawmakers to do just that in order to address the unique harms of climate change.

IV. CHANGING THE HRS SYSTEM TO ACCOUNT FOR CLIMATE CHANGE

CERCLA legislation—specifically, the HRS—needs to be updated to include data and predictions for climate change when determining the NPL. Currently, officials rank a site based on its present condition, but this fails to capture the enhanced risks of contamination associated with climate change.

Vapor Sources to Indoor Air.”).

106. *Id.* at 82.

107. *Id.* at 83 (“The threat results mainly from inhalation, but dermal contact and ingestion also are concerns, as is the possibility of concentrations building up sufficiently to pose explosion or fire hazards.”). *See* Addition of a Subsurface Intrusion Component to the Hazard Ranking System, 82 Fed. Reg. 2760 (Jan. 9, 2017) (codified at 40 C.F.R. 300).

108. Harvilla, *supra* note 104, at 83.

109. *Id.*

110. 82 Fed. Reg. 2760-01, 2762 (“The HRS has also been designed so that it can be applied consistently to a wide variety of sites, enabling sites to be ranked relative to each other with respect to actual or potential hazards.”).

111. *Id.*

This Part first explores the looming risks of climate change on hazardous waste sites. It then details the benefits of an EPA rulemaking process for addressing these risks, explains why that process is superior to other avenues of change, and identifies what specific action must be taken in such a rulemaking.

A. *Forecasted Climate Impacts*

Climate change is expected to bring more severe storms, increased coastal and riparian flooding, and warmer temperatures.¹¹² These changes will cause untold damage to more than 1,400 Superfund sites in areas prone to flooding.¹¹³ Increased risk and potential damage to Superfund sites come at a time when the EPA's budget is continually under attack.¹¹⁴ For the 2019 fiscal year, the EPA budget was cut by nearly \$100 million.¹¹⁵ With limited resources, priority setting among Superfund sites becomes crucial. Officials must use the best data available to assess which sites are most in need of remediation. But the current HRS calculation fails to fairly assess the risk of climate change, including the risks of more extreme storms, oscillating weather patterns, and severe wildfires.¹¹⁶

In addition to the ever-increasing threat to sites, there is an environmental justice rationale for updating the rankings.¹¹⁷ Lower-income communities are disproportionately im-

112. Intergovernmental Panel on Climate Change (IPCC), *Summary for Policymakers*, in GLOBAL WARMING OF 1.5 DEGREES CELSIUS 4, 8 ¶¶ A.1.3, B.2.3 (2018).

113. Vann R. Newkirk II, *The Looming Superfund Nightmare*, ATLANTIC (Sept. 12, 2017), <https://www.theatlantic.com/health/archive/2017/09/the-looming-superfund-nightmare/539316/> [<https://perma.cc/4KPG-BS2G>] (“As unprecedented hurricanes assault coastal U.S. communities, residents and experts fear the storms could unleash contamination the EPA has tried to keep at bay.”).

114. Miranda Green, *House Lawmakers Vote to Give Modest Budget Cuts to EPA, Interior*, THE HILL (May 15, 2018, 6:52 PM), <https://thehill.com/business-a-lobbying/387859-house-committee-votes-to-cut-epa-budget> [<https://perma.cc/UP9X-KM22>]. However, the final budget cuts were not nearly as bad as President Trump proposed. See Brady Dennis, *Trump Budget Seeks 23% Cut at EPA, Eliminating Dozens of Programs*, WASH. POST (Feb. 12, 2018) https://www.washingtonpost.com/news/energy-environment/wp/2018/02/12/trump-budget-seeks-23-percent-cut-at-epa-would-eliminate-dozens-of-programs/?utm_term=.f76e2b7e76bf [<https://perma.cc/7ZA8-DNA4>].

115. Green, *supra* note 114.

116. Applegate, *supra* note 56, at 217–18 (“Because Congressional aspirations always exceed regulatory resources, priority setting is always an integral part of environmental control schemes.”).

117. The EPA defines environmental justice “as the fair treatment and

pacted by flooding and natural disasters.¹¹⁸ While it is not feasible to update the present NPL system to consider the disparate effects of Superfund sites in lower-income communities, highlighting this disparity is further motivation to impose change.¹¹⁹ Ignoring the risks associated with climate change also ignores the communities that will be most affected by flood-related releases of toxic waste—often poor and minority communities.¹²⁰

These forecasted climate impacts create an opportune time for action, as discussed in the following section.

B. The Political Climate in Washington Supports Action Now

Now is the appropriate time to make major changes in the face of global warming. The International Panel on Climate Change (IPCC), a conglomerate of international researchers, issued a groundbreaking report that outlined the increasingly significant consequences of ignoring climate change any longer.¹²¹ While changing the HRS-NPL system would not address the root causes of climate change, this Comment's proposal would certainly help mitigate its effects. Moreover, the EPA has taken a reinvigorated interest in Superfund mitiga-

meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development." Jannell Smith & Rachel Spector, *Environmental Justice, Community Empowerment and the Role of Lawyers in Post-Katrina New Orleans*, 10 N.Y.C. L. REV. 277, 277–78 (2006) (citing the Environmental Protection Agency's formal definition of Environmental Justice).

118. Elanor Krause & Richard V. Reeves, *Hurricanes Hit the Poor the Hardest*, BROOKINGS INST. (Sept. 18, 2017), <https://www.brookings.edu/blog/social-mobility-memos/2017/09/18/hurricanes-hit-the-poor-the-hardest/> [<https://perma.cc/F7ZX-RBRD>] (discussing that low-income Americans are more likely to live in neighborhoods or buildings more susceptible to storm shocks; that low-income communities place residents at greater risk to the effects of a severe storm; and that low-income and minority families are also more likely to live closer to noxious industrial facilities and are thus at-risk to chemical spills and toxic leaks resulting from storm damage).

119. Of course, Congress may update CERCLA in any manner it deems appropriate, but the NPL system includes a calculation of relatively easily discernable data. Quantifying increased risk of floods is a more feasible task than attempting to quantify how a site may affect one lower-income community compared to another.

120. Krause & Reeves, *supra* note 118.

121. Intergovernmental Panel on Climate Change, *supra* note 112, 8 ¶ B.2.3 ("Limiting global warming to 1.5°C would require rapid, far-reaching [sic] and unprecedented changes in all aspects of society, the IPCC said in a new assessment.").

tion during the Trump Administration.¹²² Former EPA Administrator Scott Pruitt created a special task force to ensure that the EPA's "land and water cleanup efforts operate effectively and efficiently."¹²³ Although Pruitt's now-defunct task force has come under fire, that such an entity could be created reflects that the EPA has the political capital to tackle action related to CERCLA. That alone is encouraging.¹²⁴ Current Administrator Andrew Wheeler is maintaining the EPA's focus on the Superfund program with continual updates to the "Administrator's Superfund Emphasis List" (a slightly reformulated continuation of Pruitt's task force).¹²⁵

C. EPA Rulemaking as the Preferred Method for Changing the NPL

The best approach to updating the HRS-NPL system is informal rulemaking. The EPA used rulemaking in 2017 to add vapor intrusion to the list of considerations under the HRS, and many applauded the agency's approach in that context.¹²⁶ Additionally, when a federal agency, such as the EPA, goes through the effort to make an informal rule on a subject, it is evidence of "commitment to addressing the issue."¹²⁷

The EPA has specific statutory authority to implement changes to CERCLA's current regulatory scheme. CERCLA, in particular section 9605(a)(8)(A), requires the EPA to amend the HRS "to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health

122. Memorandum from Scott Pruitt, Adm'r, Env'tl. Prot. Agency, *Prioritizing the Superfund Program* (May 22, 2017), https://www.epa.gov/sites/production/files/2017-05/documents/prioritizing_the_superfund_program_memo_5-22-2017.pdf [<https://perma.cc/2S28-V527>].

123. *Id.*

124. Criticisms of Pruitt's taskforce are mostly based on the "pet project" nature of the taskforce and on the appointment of chemical-industry alumni to oversee force. See, e.g., Dino Grandoni, *The Energy 202: EPA Watchdog to Probe Scott Pruitt's Pet Superfund Project*, WASH. POST (Sept. 10, 2018), <https://www.washingtonpost.com/news/powerpost/paloma/the-energy-202/2018/09/10/the-energy-202-epa-watchdog-to-probe-scott-pruitt-s-pet-superfund-project/5b9577cf1b326b47ec9594d3/> [<https://perma.cc/VE33-M3GB>].

125. *Acting Administrator Wheeler Releases Third Update to Administrator's Superfund Emphasis List*, ENVTL. PROT. AGENCY (Nov. 20, 2018), <https://www.epa.gov/newsreleases/acting-administrator-wheeler-releases-third-update-administrators-superfund-emphasis-0> [<https://perma.cc/9VQ4-BM26>].

126. 82 Fed. Reg. 2760, 2762 (Jan. 9, 2017) (codified at 40 C.F.R. 300).

127. Harvilla, *supra* note 104, at 91.

and the environment posed by sites and facilities subject to review.”¹²⁸ Additionally, SARA requires the EPA to amend the HRS to accurately “assess[] the relative degree of risk to human health and environment posed by a site.”¹²⁹ Finally, CERCLA gives the agency broad authority to “promulgate any regulations necessary” to further CERCLA’s goals.¹³⁰

Informal rulemaking would be the most successful approach to changing the NPL because it requires public input, leverages the agency’s technological expertise, and avoids the partisan squabbling of Congress.¹³¹

First, the rulemaking process is preferable because it embeds a public-participation component. For instance, when altering the HRS to include vapor intrusion data, the EPA’s informal rulemaking process included substantial public involvement and listening sessions.¹³² This level of public involvement—along with EPA’s careful consideration of points raised by the public in the final rule—is an essential part of the rulemaking process.¹³³ Public involvement is important to support the legitimacy of the rules and to give citizens near flood-prone sites an opportunity to share their thoughts.

Second, the EPA has the scientific knowledge and expertise to appropriately draft such a rule.¹³⁴ The EPA is best equipped to draft specific language for this regulation; the agency has ample scientific and technical staff on hand to assist in developing the proposed rule. Additionally, the EPA will consider and weigh the expertise of outside groups and scientists that provide their opinions during the public comment pe-

128. 82 Fed. Reg. at 2762.

129. *Id.*

130. *Id.* Also, any judicial challenge would likely pass scrutiny because CERCLA does not outline a specific standard of review applicable to the NPL, so courts use the APA’s arbitrary and capricious standard. *See, e.g.,* Genuine Parts Co. v. Envtl. Prot. Agency, 890 F.3d 304 (D.C. Cir. 2018).

131. *See infra* Section IV.D.2.

132. Addition of a Subsurface Intrusion Component to the Hazard Ranking System, 82 Fed. Reg. at 2,778.

133. *Id.* at 2,771 (“There were minor revisions made based on comments, which help refine the mechanics of assigning an HRS site score.”).

134. *Am. Elec. Power Co. v. Connecticut*, 564 U.S. 410, 428 (2011) (“It is altogether fitting that Congress designated an expert agency, here, EPA, as best suited to serve as primary regulator of greenhouse gas emissions. The expert agency is surely better equipped to do the job than individual district judges issuing ad hoc, case-by-case injunctions. Federal judges lack the scientific, economic, and technological resources an agency can utilize in coping with issues of this order.”).

riod.¹³⁵

Third, EPA rulemaking avoids the hyper-partisanship and stagnation of Congress. Congressional gridlock and the inability or unwillingness of legislators to tackle climate change issues are well documented.¹³⁶ And, because the HRS calculation is embedded within EPA regulations, a rulemaking would likely be necessary to implement the HRS change even after legislative changes. Meanwhile, Congressional action on environmental legislation is fraught with wider concerns: Congress may choose to reevaluate other substantive parts of CERCLA, and any changes to the liability or funding provisions would create unintended and unwelcome changes to the CERCLA regime.¹³⁷

Rulemaking does, of course, come with some drawbacks—though they pale in comparison to the drawbacks of other avenues like litigation, legislation, or state action. One downside to rulemaking is also one of its strengths: the public comment period required under the Administrative Procedures Act (APA).¹³⁸ While the public comment period provides a much-needed opportunity for concerned citizens to speak, other groups also take advantage of this requirement.¹³⁹ Rulemaking inherently involves a concern over the susceptibility of the public comment process to seizure by industry—a reality contributing to the phenomenon of “agency capture.”¹⁴⁰ However, because the risk of undue industry influence exists with any

135. The then-EPA administrator, Scott Pruitt, proposed a number of rules to further the goal of using stronger science during the rulemaking process. *See EPA Adm'r Pruitt Proposes Rule to Strengthen Science Used in EPA Regulations*, ENVTL. PROT. AGENCY: PRESS OFFICE (Apr. 24, 2018), <https://www.epa.gov/newsreleases/epa-administrator-pruitt-proposes-rule-strengthen-science-used-epa-regulations> [<https://perma.cc/UY6P-G6M4>] (“The era of secret science at EPA is coming to an end. The ability to test, authenticate, and reproduce scientific findings is vital for the integrity of the rulemaking process.”).

136. *Vital Statistics on Congress: Data on the U.S. Congress, Updated March 2019*, BROOKINGS INST. tbl. 6-3 (“Recorded Votes in the House and the Senate, 80th–115th Congresses, 1947–2018”) (Mar. 4, 2019), <https://www.brookings.edu/wp-content/uploads/2019/03/6-3-Full.pdf> [<https://perma.cc/9J53-PCKD>]; *see also* Amber Phillips, *Congress’s Long History of Doing Nothing on Climate Change, in 6 Acts*, WASH. POST (Dec. 1, 2015), <https://www.washingtonpost.com/news/the-fix/wp/2015/12/01/congresss-long-history-of-inaction-on-climate-change-in-6-parts/> [<https://perma.cc/28YB-3LK6>].

137. *See infra*, Section IV.D.2.

138. 5 U.S.C. § 564 (2018).

139. 5 U.S.C. § 564(a) allows for comments from all interested parties.

140. *See* Bradford C. Mank, *Superfund Contractors and Agency Capture*, 2 N.Y.U. ENVTL. L.J. 34, 50 (1993).

potential course of action, this concern does not decrease the attractiveness of informal rulemaking.¹⁴¹

Another drawback to rulemaking is the potential for rapid policy shift with a new administration. Such criticism is fair. If an administration makes an about-face policy shift without data to support its choice, however, the action can be challenged as arbitrary and capricious.¹⁴² A final concern about the rulemaking approach is the glacial speed of bureaucracy. But this can also be viewed as a positive characteristic. Deliberate policymaking leads to well-developed and researched regulations. Keeping the drawbacks of rulemaking in mind, the approach is likely still more successful than other methods discussed below.

D. Other Avenues for Change

Rulemaking is not the only possible approach to updating the NPL system to account for climate change. Litigation, legislation, or state action could potentially reach the same result—though likely with more strife in the process.

1. Litigation

CERCLA does include a citizen's suit provision, which allows an individual to sue in two separate circumstances.¹⁴³ A person may bring a suit to allege a violation of CERCLA against any person or governmental agency.¹⁴⁴ Alternatively, a person may bring a suit if they feel the EPA is not performing its required duties under CERCLA.¹⁴⁵ Litigation could be

141. Agency capture is, of course, not a concern with traditional legislation, though capture by private interest groups is always a concern. The change proposed in this Comment is important and best left to agency expertise. Congress is unlikely to involve itself in the minutiae of an environmental statute, no matter how important the effects of such a minor change.

142. *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins.*, 463 U.S. 29, 43 (1983) (“[A]n agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.”); *see also* *Chevron, U.S.A., Inc. v. NRDC*, 467 U.S. 837 (1984).

143. 42 U.S.C. § 9659 (2018).

144. *Id.*

145. *Id.*

brought in the D.C. Circuit (where all CERCLA cases must be brought), alleging that the EPA's failure to consider threats of climate change in the HRS violates CERCLA.¹⁴⁶

However, litigation is not an effective strategy or the right approach to changing the HRS-NPL system because the EPA so rarely loses such cases.¹⁴⁷ Courts are so deferential to an Agency's discretion that the EPA has only lost one case since the 1990s pertaining to an NPL listing decision.¹⁴⁸ In May 2018, the EPA's listing of the West Vermont Drinking Water Contamination site in Marion County, Indiana, was challenged, and the court found the listing to be inadequately explained and therefore arbitrary and capricious.¹⁴⁹ However, experts do not read this decision as the beginning of a larger trend but rather as a fact-specific holding in which the agency failed to adequately explain itself.¹⁵⁰ Additionally, creative climate change suits have not had much recent success.¹⁵¹ A recent study comparing the different strategies of climate change litigation found that cases based on the human health impacts are rare and, perhaps, underutilized.¹⁵² A case with a novel le-

146. 42 U.S.C. § 9613 (2018) ("Review of any regulation promulgated under this chapter may be had upon application by any interested person only in the Circuit Court of Appeals of the United States for the District of Columbia.").

147. See, e.g., Amanda Reilly, *Experts Scratch Heads over Rare EPA Defeat in Listing Case*, E&E NEWS (May 23, 2018) <https://www.eenews.net/stories/1060082527/print> [<https://perma.cc/PQ6A-7LVW>].

148. *Id.*

149. *Id.*

150. *Id.* ("EPA has to work pretty hard to lose these cases,' [wrote] Seth Jaffe, an attorney at Foley Hoag LLP. . . . Cases are 'oftentimes very fact-dependent on exactly the relationship between aquifers and exactly what conclusions EPA has drawn about what the threats are,' [said Craig Johnston, a hazardous waste law expert at Lewis & Clark Law School]. 'So oftentimes, there isn't a whole lot of precedential value in a particular decision.'").

151. See, e.g., Benjamin Hulac, *Kids' Climate Case Again in Limbo After 9th Circuit Order*, E&E NEWS (Nov. 13, 2018), <https://www.eenews.net/climatewire/stories/1060106047/search> [<https://perma.cc/YB3J-T93G>] ("Trial was supposed to begin Oct. 29 at the federal district court in Eugene, Ore., but had been temporarily stayed by the Supreme Court and now again by the 9th U.S. Circuit Court of Appeals."); see also *Juliana v. United States*, 217 F. Supp. 3d 1224 (D. Or. 2016) (appeal pending); *Bd. of Cty. Comm'rs of Boulder Cty. v. Suncor Energy (U.S.A.) Inc.*, Case No. 1:2018cv01672, (D. Colo. June 29, 2018) (case relying on common law claims such as unjust enrichment and nuisance brought against energy companies on behalf of the citizens of Boulder County, CO).

152. Sabrina McCormick et al., *Strategies in and Outcomes of Climate Change Litigation in the United States*, 8 NATURE CLIMATE CHANGE 829, 830 (2018). The researchers studied litigation on the impact of climate change on human health from 1990–2016 and found a total of one case where regulation was favored, one case where an anti-regulatory position was taken, and nine cases that were

gal theory could buck the trend of litigation losses, but it is unlikely that litigation would be a successful route to change because the presumption in favor of the agency is so strong.¹⁵³

2. Congressional Action

Alternatively, an act of Congress could update the NPL, similar to the SARA amendments of 1986.¹⁵⁴ However, the 1986 amendments to CERCLA were intended to rectify major problems in the original statute, which legislators were concerned had become an “employment act” for lawyers.¹⁵⁵ The changes in SARA included improvements to the NPL, reauthorization of a tax imposed under the original CERCLA legislation, and a more robust emergency response system.¹⁵⁶ These broad changes had bipartisan support and changed a statute that Congress had only recently passed.¹⁵⁷ Neither condition exists today. Furthermore, a bill to update CERCLA is unwise: many involved parties are unhappy with other substantive parts of CERCLA (liability, cost, etc.), and opening debate on amending the entire law could bring much broader, unintended consequences. Under no circumstances should efforts to bring a small but important change to the NPL create the opportunity to gut the CERCLA statutory framework. The fundamental, substantive aspects of CERCLA are too important—and work too well—to risk reopening the statutory framework.

3. State-Level Approaches

State action may be a means of achieving progress in the

otherwise resolved.

153. *Chevron, U.S.A., Inc. v. NRDC*, 467 U.S. 837 (1984).

154. 99 Cong. Rec. P.L. 99-499 (daily ed. June 20, 1985) (statements of Rep. Lent and Rep. Broyhill).

155. *Id.* (statement of Rep. Lent) (“[This bill] makes much needed structural reforms in a program that has been more like a full employment act for lawyers than an environmental cleanup program. It is in every way a tougher, expanded, and more workable Superfund program.”).

156. *Id.* (statement of Rep. Broyhill) (“I would like to briefly highlight some of the key components of this bill. It contains a strict but reasonable schedule for the cleanup of sites on the national priority list. . . . [It also] establishes a comprehensive, Federal community right to know and emergency response program.”).

157. *Id.* (statement of Rep. Ritter) (“I am pleased to join today with my colleagues as part of this bipartisan effort to reauthorize Superfund.”).

short term, but action on the federal level is necessary for broader, more meaningful reform. Before the EPA implemented vapor intrusion guidance, states took action on state-level cleanup projects.¹⁵⁸ For instance, New York and California were both “particularly proactive [in] enacting legislation that regulates vapor intrusion directly.”¹⁵⁹ Nonetheless, there is value in federal action for consistency’s sake.¹⁶⁰ It is challenging for companies in the remediation sector to conform to patchwork regulatory coverage in fifty different states. Furthermore, all citizens in this nation deserve equally strong protections against the increased risk of toxic release created by climate change.¹⁶¹

Nevertheless, if federal politics are too paralyzed for action, state-level approaches may be appropriate until the EPA can catch up. Currently, the Washington State Senate is considering a bill that would require toxic sites in marine areas to be prioritized in a manner that “incorporates projected climate change impacts.”¹⁶² The bill would require the state’s Department of Ecology to “consider the potential impacts from climate

158. Jeff Polubinski, Note, *Adapting CERCLA to Address Vapor Intrusion by Amending the Hazard Ranking System*, 37 VT. L. REV. 467, 467 (2012) (“Following the lead of several progressive state programs, EPA recently announced that it will add a vapor intrusion component to the Hazard Ranking System (HRS).”).

159. *Id.* at 475.

160. State action is also subject to the threat of preemption by the federal government if the state law and the federal law cannot coexist. A case involving preemption of state law in the CERCLA context was heard in the October 2019 term by the Supreme Court. See *Atlantic Richfield Co. v. Mont. Second Judicial Dist. Court*, 139 S. Ct. 2690 (June 10, 2019), *cert. granted sub nom.* *Atlantic Richfield Co. v. Christian*, 408 P.3d 515, 517 (Mont. 2017).

161. Two examples shed light on why patchwork environmental regulations by states are best avoided. The first example is the impetus for the recent fuel efficiency standard policy updates, which was to avoid requiring the automotive and fuel industries to deal with too many separate regulations. See Rachel Brewster, *Stepping Stone or Stumbling Block: Incrementalism and National Climate Change Legislation*, 28 YALE L. & POL’Y REV. 245, 263 (2010) (“Differing national, state, or municipal standards can create a patchwork of environmental regulations that raises the costs of doing business for key industry groups. This effect is visible in the recent federally coordinated compromise on automotive fuel efficiency standards.”). The second example of issues caused by patchwork environmental regulations is the current roll out—or repeal, depending on the jurisdiction—of President Obama’s 2015 Waters of the United States (WOTUS) rule. See *Definition of “Waters of the United States”: Rule Status and Litigation Update*, ENVTL. PROT. AGENCY, <https://www.epa.gov/cwa-404/definition-waters-united-states-under-clean-water-act> (last visited July 18, 2019) [<https://perma.cc/ZR94-V2PK>].

162. S.B. 6422, 65th Leg., Reg. Sess. (Wa. 2018).

change on the long-term effectiveness of the remedial action[s]” undertaken at marine toxic sites.¹⁶³ While this bill does not require the site’s state-ranking to change based on the threat of climate change, it requires consideration of potential effects when planning remediation.¹⁶⁴ Though not exactly the proposal advocated by this Comment, the Washington bill is an important and creative measure being proposed on the state level and reflects the role of state legislatures as laboratories for innovative policy ideas.

E. What Will Agency Rulemaking Look Like?

When drafting a new rule that addresses the concerns raised in this Comment, the EPA must consider three substantive points. First, the rule must impose mandatory consideration of climate change within the HRS framework. The rule must include language to the effect of: “flooding and other climate change risks *as discovered* must be accounted for in the HRS formula.” This consideration of climate change may take one of several approaches. The first option is for each site in a flood-prone area or particularly vulnerable to climate change area to receive “bonus points” added to the site’s final HRS score. The second option is to add a sub-score that accounts for climate change within the calculation of risk in each exposure pathway: air, soil, water, and vapor intrusion.¹⁶⁵ Finally, the third option is to add a fifth component to the calculation that represents an amalgamation of the risks climate change presents, including flooding, warmer temperatures, and other factors. This final approach seems like the most efficient way to incorporate the effects of climate change because as new research evolves to discover new risks, they can be included in this fifth “climate change variable” without reworking the entire formula. From an accuracy and efficiency standpoint, adding a fifth “climate change variable” is likely most favorable. However, if it would be politically untenable to introduce a new variable that explicitly references the term “climate

163. *Id.* § (3)(1)(b).

164. *Id.*

165. The current equation ($s = \sqrt{\frac{s_{gw}^2 + s_{sw}^2 + s_s^2 + s_a^2}{4}}$, where s_{gw} = ground water migration pathway score; s_{sw} = surface water migration pathway score; s_s = soil exposure pathway score; s_a = air migration pathway score; and s = site score) could be updated. GUIDANCE MANUAL, *supra* note 87.

change,” then perhaps the second option (adding a subcomponent to each pathway) may be the better option.

Second, the final rule *must* require a rescoring of the currently existing NPL. It is essential that the rankings are updated so that resources are applied fairly and to the sites in most need of urgent change. In 1990, Congress revised the HRS (as part of the SARA amendments). Unfortunately, when the system changed at that juncture, sites were not automatically rescored.¹⁶⁶ To avoid a similar outcome today, language requiring a rescore of sites already on the NPL is necessary. Of course, the most thorough approach is to rescore the entire list. But rescoring the entire list may incite criticism because of the inefficiency of the exercise. Thus, alternatively, only sites in flood-prone areas, or sites that already have a current score above a certain threshold, could be rescored. Regulators should add language like the following: “the EPA shall rescore sites on the previous year’s iteration of the National Priorities List whose final score will be materially affected by the amendment to the Hazard Ranking System formula.”

Third, the final rule should give the EPA authority to rescore sites that fall near the listing threshold. Under the 1990 amendments to the HRS, sites near the 28.50 cutoff for inclusion *could* be rescored if an EPA regional office or a State receives information that shows evidence of “threats to . . . the environment.”¹⁶⁷ Similar language would be beneficial in this round of updates. A mandatory requirement to rescore sites near the cutoff seems ill-advised, but granting the discretion to regional EPA and state environmental agencies is appropriately protective.¹⁶⁸ Commentators have made valid critiques about the waste of resources during the planning and ranking stages, leaving less money for actual remediation.¹⁶⁹ To avoid similar animosity toward the new rankings, care should be taken to draft language that is not overly broad, which could

166. ENVTL. PROT. AGENCY, 9320.7-02FS, THE REVISED HAZARD RANKING SYSTEM: QS AND AS, at 4 (“CERCLA Section 105(c)(3), added by SARA, specifically states that it is not necessary for EPA to rescore sites that were placed on the NPL using the original HRS.”).

167. *Id.* at 5.

168. It is important to keep in mind the effort and scope that a full rescoring will entail.

169. Applegate argues that the “bureaucratic implementation . . . and its judicial mistreatment” of the NPL wastes excessive resources before cleanup even begins. Applegate, *supra* note 56, at 212.

lead to needless resource expenditure.

Overall, any language granted under this proposal must (1) effectively update the HRS to consider climate change factors, (2) ensure rescoring of sites on the current list, and (3) give the EPA authority to rescore sites at or near the cutoff that may be affected by the new guidance.

CONCLUSION

It is time to amend the HRS-NPL system to address the looming threat Superfund sites present to communities affected by flooding and natural disasters. Change by informal rule-making from the EPA is the most realistic and effective strategy for altering the HRS rankings. Although a listing on the NPL is not a prerequisite to a CERCLA enforcement action, “the focus of EPA’s enforcement actions has been and will continue to be on NPL sites.”¹⁷⁰ Because a site’s ranking is imperative for cleanup to occur, site rankings must factor in the full constellation of risks, including the flood risks associated with climate change. The communities that live near these sites rely on the EPA to prioritize the cleanup of sites that put them at the highest risk of danger. People are truly concerned about the effects of toxic chemicals—in fact, so concerned that “toxic” was voted the word of the year for 2018.¹⁷¹ This is a growing problem—we should no longer ignore the ever-increasing evidence that storms like Hurricane Harvey have provided and the risk they pose to communities near toxic sites.

170. National Priorities List for Uncontrolled Hazardous Waste Sites, 56 Fed. Reg. 5,598, 5,599 (February 11, 1991) (codified at 40 C.F.R. 300).

171. Barbara Campbell, *Toxic* is Oxford Dictionaries’ Word of 2018, NAT’L PUB. RADIO (Nov. 15, 2018, 1:07 AM), <https://www.npr.org/2018/11/15/668041894/toxic-is-oxford-dictionaries-word-of-2018> [https://perma.cc/VQZ2-7AK6] (“Here at NPR, we’ve reported on the Internet’s toxic content, the ill effects of toxic stress and, of course, the dangers of toxic chemicals.”).