Paying for flood mitigation at industrial sites: Review of federal funding and local solutions

Emma Zehner (Project Advised by Buy-In Community Planning, Inc.)

Current and former industrial sites face growing flood risks, which threaten to release contaminants dangerous to human health. This research builds on past studies and aims to identify relevant federal funding and highlight sub-national solutions.

Sixty percent of Superfund sites, which are some of the most contaminated U.S. sites and receive federal cleanup assistance, face climate risks.[i] Flooding poses particularly serious challenges: during Hurricane Harvey in 2017, inundated petrochemical facilities spread a "toxic, industrial soup" throughout Houston, Texas.[ii] Climate change is likely to exacerbate flooding due to increased precipitation and sea level rise. Industrial contaminants (e.g. petroleum) impact human health and can spread via surface and ground water.[iii] These compounding environmental injustices often result from discriminatory land and housing policies, a history of industrial concentration along waterfronts, and limited regulation. Formerly redlined neighborhoods, home to predominately low-income Black and Latinx communities today, have higher hazardous waste site concentrations[iv] and 25 percent more property value with high flood risk than other areas.[v]

While this challenge has recently surfaced in national conversations, residents have highlighted the intersection of extreme weather, contamination, and public health for decades: in 2000, at a public meeting focused on whether the Environmental Protection Agency's (EPA) Superfund program should fund voluntary relocation for residents near sites, a participant asked: why doesn't EPA consider whether a site is in a floodplain when deciding if a community is eligible for relocation?[vi] At the same time, residents may not want to fight industry that provides stable employment, or have time to consider threats: "My community is not prepared or really aware of sea level rise and what can happen…a lot of us are working class people are just trying to survive," said Marisol Cantú, a climate activist with Richmond Progressive Alliance.[vii]

Efforts to quantify the problem are growing. New York City's Environmental Justice Alliance found that the city's six Significant Maritime Industry Areas, located in predominantly low-income communities of color, are in hurricane storm surge zones and the City had not analyzed potential flooding threats.[viii] Toxic Tides, a community-academic partnership, found 400 hazardous facilities in California at risk of flooding by 2100.[ix] The Union of Concerned Scientists determined 71% of all Superfund sites within 10 miles of the East or

Gulf Coast will face flooding by 2100 under a high sea level rise scenario.[x] Researchers analyzed flood risk at former manufacturing facilities: "the strongest predictor of a neighborhood containing a flood-prone site of former hazardous industry is proportion of nonwhite and non-English speaking residents."[xi]

The potential consequences, amplified by possible water damage to household materials or septic tanks, are devastating: "Failure to clean up pollution means 'new' oceanfront property created by sea level rise may become burdened with a toxic stew of water," Thomas Ruppert, Coastal Planning Specialist at the Florida Sea Grant and University of Florida Extension, said.[xii] What federal and sub-national tools exist? This research was conducted for Buy-In Community Planning, a nonprofit that engages communities in planning to address flooding. It sought to identify solutions and potential funding for Buy-In's partners.

Existing Federal Funding: This research identified potentially relevant flood mitigation and remediation funding. *It found that flood mitigation and restoration programs don't yet have explicit, comprehensive policies on contamination, and remediation programs are just starting to account for climate impacts.*

Flood Mitigation: Flood mitigation funding ranges from FEMA's post-disaster Hazard Mitigation Grant Program (HGMP) to National Flood Insurance Program coverage. Some communities are considering buyouts, which can be used to permanently mitigate risk by financially compensating homeowners of flood-prone land. However, studies show that, as currently designed, buyouts, are slow, opaque, and disproportionately benefit whiter neighborhoods and counties.[xiii] FEMA's HGMP and the Office of Housing and Urban Development's (HUD) CDBG-DR and CDBG-MIT fund most buyouts, though other agencies occasionally fund acquisitions (e.g. USDA Floodplain Easements).

Both FEMA and HUD regulations outline rules for properties with contamination, *which may be relevant as flooding spreads industrial contaminants onto residential properties interested in buyouts or abandoned industrial properties face flooding.* 44 CFR Part 80.17 states: "The subrecipient [of a FEMA grant] must take steps to ensure it does not acquire or include in the project properties contaminated with hazardous materials by seeking information…on the use and presence of contaminants affecting the property…or adjacent [properties]. A

contaminated property must be certified clean prior to participation."[xiv] FEMA program staff and reviewers can provide additional insight into contamination policies, but this research found cases where contamination policies prevented streamlined buyouts. In 2015, Woodbury, Vermont, applied for a HGMP grant for a flood-prone former country store.[xv] When petroleum contamination was uncovered, the town remediated the property through a brownfield program before it could be approved (four years after the initial application).[xvi] In the early 2010s, Charlotte-Mecklenburg County Stormwater Services applied for a HGMP grant to acquire a property for conversion into floodable open space.[xvii] Environmental assessments identified contamination from a nearby site, deeming the property ineligible.[xviii] The county instead used local stormwater fee revenue.

HUD's policy appears to be more flexible, in regulation and practice. 24 CFR Part 50.3 states that "all property proposed for use in HUD programs be free of hazardous materials, contamination, toxic chemicals and gasses, and radioactive substances, where a hazard could affect the health and safety of occupants or conflict with the intended utilization of the property."[xix] The regulation specifies that 5+ unit housing must evaluate previous uses and evidence of contamination on or near the site. HUD's cleanup policy, updated in the early 2000s to align with EPA's, requires a "risk-based" approach, meaning that a property must be cleaned up according to its end use.[xx] This is sometimes compared with FEMA's approach, which often requires full remediation regardless of use. The FEMA and HUD buyout environmental review process involves searching a database of hazardous properties. It is less clear how a finding of a brownfield site within a half mile radius of a residential property would affect FEMA and HUD buyout funding. This tendency to avoid flood-prone contaminated sites, due to liability and funding concerns, extends to local grants. For example, Connecticut's Open Space and Watershed Land Acquisition Program does not allow "land with environmental contamination." A resident urged the state to include "properties that require environmental cleanup…and change eligibility requirements to allow for remediation after acquisition."[xxi]

FEMA and HUD don't explicitly outline the level of contamination allowed and whether this differs by property type and several challenges arise: For properties with unknown contamination, local governments may find out during the buyout process that they first need to enter a brownfield program. Time required for

remediation may exceed grant cycles and discourage agencies from funding remediation. Applicants may wonder about liability under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). A resident may be protected from liability as a Contiguous Property Owner ("property may be contaminated but is not the source"). In response to concerns from residents near Superfund sites, in 1991, EPA published a memo stating it would not "take enforcement actions against a residential property owner."[xxii] One lawyer still cautioned, "CERCLA has never provided a blanket exemption from liability merely because the contamination on the landowner's property originated from an adjacent property. The homeowner becomes an 'owner' of a contaminated 'facility'—a status to which CERCLA attaches liability." A local government may also be hesitant to acquire a contaminated property, though the 2018 BUILD Act expanded relief options to encourage local governments to redevelop properties. CERCLA also provides a specific emergency exemption for state or local governments acting in response to a hazardous material release. Applicants may also wonder which parts of cleanup (e.g. storage tank removal) are covered by grants and whether contamination could deem a project ineligible due to cost-benefit analyses concerns.

Remediation: EPA's remediation programs, Superfund and Brownfields grants, are evolving to address climate impacts, but gaps remain. EPA requires Brownfield cleanup applicants to consider climate impacts in their Analysis of Brownfield Cleanup Alternatives[xxiii] and produces guidance related to climate resilient remediation.[xxiv] Under the National Contingency Plan. 40 CFR 300.430(e)(9)(iii), climate resilience is not an explicit criterion for evaluating Superfund remedial actions.[xxv] In 2021, EPA released guidance indicating regions have authority to consider climate resilience in the evaluation and selection of remedies.[xxvi] This encouraged but did not mandate directors to act. EPA could interpret 300.430(e)(9)(iii)'s criteria as requiring consideration of climate resilience in choosing a remedial action[xxvii]: "Alternatives shall be assessed to determine whether they can adequately protect human health and the environment, in both the short- and long-term from unacceptable risks."[xxviii] However, "until then, EPA is unlikely to require the consideration of climate resilience in the selection of remedial actions," said Kathleen Pritchard, Associate at Davis Graham & Stubbs LLP.[xxix] Whether a state can require climate resiliency considerations depends on state statute, implementing regulations, and regulatory opinions.[xxx] Local building codes could also impose requirements.

Several federal programs address multiple objectives (flood mitigation, remediation, restoration). For example, the Clean Water State Revolving Fund (CWSRF) funds projects that will improve water quality, and acquisition and brownfield remediation are eligible activities, but funding has traditionally been mostly allocated to wastewater treatment plant projects. States must explicitly outline projects in their nonpoint source management plan and CWSRF Intended Use Plan (IUP). Several states have been creative: Texas' 2023 IUP listed a project to buy out 37 homes, where flooding created mold.[xxxi] Permanent relocation is also a CERCLA remedial option but has only been used a handful of times at final and deleted Superfund sites.[xxxii]

In recent years, the Government Accountability Office has raised awareness about climate risks at contaminated sites through several reports. Through the Justice40 Initiative and other investments, there are opportunities to address flood-prone industrial sites. Several Inflation Reduction Act-funded grants, like Climate and Environmental Justice Block Grants, could fund pieces of assessment and cleanup. Cross-agency efforts, like the Community-Driven Relocation Subcommittee, may be relevant.

Sub-National Case Studies: Sub-national actors are pursuing promising approaches. Community-based organizations have led flood mapping efforts, crucial to understanding risk. Residents of a Philadelphia neighborhood proposed a land swap with the city to move residents from low-lying fill near a Superfund site to publicly-owned higher ground in the community.[xxxiii] In fall of 2022, an Urban Land Institute Technical Assistance Panel discussed the technical details of a possible swap (report expected in 2023).[xxxiv] UPROSE, Brooklyn's oldest Latino community-based organization, engages auto shops to address extreme weather."[xxxv]

In January 2022, New York City combined its environmental justice, remediation, and climate change offices.[xxxvi] The city's Brownfield Incentive Grant Program includes bonus funding for properties located in a coastal flood zone that take climate change resilience measures.[xxxvii] An independent task force of San Francisco's Board of Supervisors is studying the impacts of flooding on the City's toxic sites following pushback against conclusions that no further remediation is required.[xxxviii] In 2020, the Hampton Roads Planning District Commission initiated a project in direct response to national news coverage about the GAO

study and others.[xxxix] The Commission engaged the public and noted plans to study gaps in local regulations and ordinances, potential federal funding, and coordination of local data.

New Jersey lawmakers proposed the state buy contaminated residential properties from non-liable owners, in some cases to address gaps in the Superfund program.[xl] North Carolina has historically acquired hog farms in flood-prone areas through its Swine Floodplain Buyout Program, though proposals to include the program in the governor's 2022-2023 budget failed.[xli] Vermont launched the Flood Resilience Communities Fund, which is funded in part by ARPA funds earmarked to meet CSWRF requirements. It theoretically could fund both cleanup and acquisition.[xlii] The New Jersey Department of Environmental Protection worked with community members to develop the state's first "community-based green infrastructure project on a brownfield."[xliii] The Connecticut Brownfield Land Bank aims to make the brownfield process easier for local governments, temporarily holding title to properties and assisting with grants.[xliv] The Buffalo-Niagara River Land Trust acquires potentially contaminated properties on the Buffalo Niagara river to accelerate cleanup.[xlv] ExxonMobil closed a Massachusetts tank farm[xlvi] after the Conservation Law Foundation accused it of failing to prepare facilities for climate impacts, resulting in spills that violate the Clean Water Act and RCRA.[xlvii]

Looking Forward: Community representatives have proposed solutions to these challenges and a variety of other flood-related contamination challenges (e.g. sewage overflows in basements). The EPA Community Resilience in Environmental Industrial Waterfront Communities Work Group recommended a Superfund Community-Based Reuse Area-Wide Planning Grant Program to help communities plan for and to expand the use of community-driven Health Impact Assessments (HIA).[xlviii] Adapting to Rising Tides, a project of the San Francisco Bay Conservation and Development Commission recommended state agencies "establish agreements to use consistent contaminated land data and develop a centralized information system.'"[xlix]

The Community Resilience in Environmental Industrial Waterfront Communities Work Group recommended an EPA incentive-based pilot "to help interested industrial businesses adapt to climate change"[l] and that EPA fine facilities "where a facility has a pollution release during or after an extreme

weather event where the release could have been prevented by timely shutdown of operations or best management practices."[li] Researcher Joseph Schilling envisions a National Brownfields Regional Planning Act, a land recycling approach engaging NOAA and FEMA, "which have some responsibility related to vacant/abandoned properties caused by disasters."[lii]

Lawyer Emily Russell believes EPA can better leverage existing enforcement and guidance tools: "EPA's use of settlement agreements, consent decrees, and agency guidance could cause the consideration of climate change in Superfund RI/FS process. Through creative negotiation, EPA regulators can inject climate change analysis into the risk analysis portion of a cleanup."[liii] The CERCLA five-year review process and selection process for National Priority List (Superfund) sites could also better incorporate climate risks.

Shriver Center on Poverty Law researchers also highlighted a broader need for cross-agency solutions (in this case: HUD, FEMA, EPA). While 9,000 federally subsidized properties are located within 1 mile of a Superfund site, most properties pass HUD health inspections, which are focused on building-level threats like asbestos: "Residents are left in a bureaucratic gap between agencies that lack authority or resources to directly address the problem."[liv] They recommend, "agencies promulgate regulations to improve on interagency accountability to communities. Cross-agency collaboration is critical to environmental justice."[lv]

This research identified several additional considerations for federal and state agencies, including, crucially, that solutions reflect local priorities. Federal agencies and states, with funding like the IRA's $32.5 million for the Council on Environmental Quality to improve data collection[lvi], could prioritize data related to flooding and contamination, while being careful not to devalue properties in low-income communities. Federal and state agencies could also fund additional community-led monitoring projects and further develop technical assistance related to resilient remediation interventions. HUD, EPA, and FEMA could assess their contamination policies, determine opportunities for alignment, and ensure policies specify when remediation is required, what degree of remediation is required, and what remediation actions an agency can fund.

The federal government could provide specific CERCLA liability protections to residents living near contaminated sites and remove minor remediation costs from BCAs or assign quantifiable benefits to avoided health costs and EPA could revisit its Superfund Relocation policy. EPA could follow the lead of Australia's Flood Recovery for Contaminated Lands program. Australia's Environmental Protection Agency provided $5 million for residents to test flooded properties for fuels and other contaminants.[lvii] The U.S. could provide funding for residential property owners to test and remediate land following disasters (e.g. funding for mold removal while residents wait for longer-term disaster recovery assistance).

State regulators should assess tools for incentivizing or requiring climate considerations. Russell said: "States can force consideration of climate change through legislation in remedial plans as enforceable standards, known as legally applicable or relevant and appropriate requirements (ARARs). The National Contingency Plan requires remedial actions conform to ARARs. State legislation could require certain infrastructure improvements in [flood-prone] areas. While this would not directly address hazardous substances, it would meet other ARAR criterion ("being 'relevant and appropriate' to threat of release from such a storm")."[lviii]

States could also explore legislation requiring the evaluation of cumulative impacts in permitting processes.[lix] New York's 2022 Cumulative Impacts Bill requires an "existing burden report" for any projects impacting "disadvantaged communities," and New Jersey's law also requires permit renewals to undergo the process. Ana Baptista, associate professor at the New School, celebrated the landmark legislation, but noted, "There's a lot that we can explore and better refine, because the reality is that our cumulative-impacts tools are probably just scratching the surface of what the real impact is on communities."[lx] Could the cumulative impacts permitting framework be used to prevent further cumulative flooding and contamination?

This is not a new issue, but the new lens of climate change could spur action. This research highlights the need to design climate solutions that account for past and ongoing injustices, like contaminated land, and remediation programs that account for future injustices, like flooding.

Acknowledgements: Thank you to my advisors Kelly Main and Risa Hiser, academic advisor David Kooris, and every resident, agency staff member, organization representative, and other person who took the time to talk about challenges and solutions. Thank you to Kathleen Pritchard and Betsy Temkin from Davis Graham & Stubbs LLP for their pro bono review of various documents and legal questions. This project is ongoing and seeks to produce several fact sheets for community partners about relevant regulations and grant requirements, and to broadly continue raising the profile of this issue.

---

[i] Jacob Carter and Casey Kalman, *A Toxic Relationship: Extreme Coastal Flooding and Superfund Sites* (Washington, DC: Center for Science of Democracy at the Union of Concerned Scientists, 2020), https://www.ucsusa.org/sites/default/files/2020-07/a-toxic-relationship.pdf
[ii] Amelia Urry, "Harvey stirs up a toxic, industrial soup," *Grist*, September 1, 2017, https://grist.org/article/harvey-stirs-up-a-toxic-industrial-soup/
[iii] Environmental Protection Agency, *Environmental Contaminants Often Found at Brownfield Sites*, 2019, https://www.epa.gov/sites/default/files/2019-10/documents/environmental_contaminants_often_found_at_brownfield_sites.pdf
[iv] "Environmental Racism: How Historic Redlining Continues to Affect Communities," *Rand Review* (blog), Rand Corporation, June 27, 2022, https://www.rand.org/blog/rand-review/2022/06/environmental-racism-how-historic-redlining-continues.html
[v] ibid
[vi] Environmental Protection Agency, *Superfund National Relocation Policy Dialogue* (Washington, DC, 2000), https://semspub.epa.gov/work/HQ/174938.pdf
[vii] Ezra David Romero, "State Regulators Scrutinize Climate Plan for Controversial Richmond Housing Development," *KQED*, January 12, 2023, https://www.kqed.org/science/1981077/state-regulators-scrutinize-climate-plan-for-controversial-richmond-housing-development
[viii] New York City Environmental Justice Alliance, *Testimony to the City Plan Commission: Proposed Revisions to the Waterfront Revitalization Program*, September 19, 2012, https://nyc-eja.org/wp-content/uploads/2016/08/NYC-EJA_TestimonyToCityPlanningCommissionOnWRPReform_091912.pdf
[ix] Toxic Tides, "Project Background," https://sites.google.com/berkeley.edu/toxictides/home
[x] Jacob Carter and Casey Kalman, *A Toxic Relationship: Extreme Coastal Flooding and Superfund Sites* (Washington, DC: Center for Science of Democracy at the Union of Concerned Scientists, 2020), https://www.ucsusa.org/sites/default/files/2020-07/a-toxic-relationship.pdf
[xi] Marlow, Thomas et. al. "Future flooding increases unequal exposure risks to relic industrial pollution." *Environmental Research Letters* (2022). Volume 17, Number 11. https://iopscience.iop.org/article/10.1088/1748-9326/ac78f7
[xii] Thomas Ruppert, "Take Out the Trash When You Leave: Cleaning Up Properties Abandoned to Rising Seas," Chapter in *A Blueprint for Coastal Adaptation: United Design, Economics, and Policy*. https://www.flseagrant.org/wp-content/uploads/2022/08/A_Blueprint_for-Coastal_Adaptation-Thomas-R-Chapter.pdf
[xiii] J. Elliott, et al. "Racial Inequities in the Federal Buyout of Flood-Prone Homes: A Nationwide Assessment of Environmental Adaptation." *Socius: Sociological Research for a Dynamic World* (2020). Volume 6: 1-15. https://www.researchgate.net/publication/339220999_Racial_Inequities_in_the_Federal_Buyout_of_Flood-Prone_Homes_A_Nationwide_Assessment_of_Environmental_Adaptation
[xiv] 44 CFR 80.17 – Project implementation.
[xv] *Woodbury Town Report*, (Town of Woodbury, 2020) https://drive.google.com/file/d/1w8JTaPdmukokalEi-gtX-0ViKV8E5-mz/view?usp=sharing
[xvi] ibid
[xvii] Tim Trautman, Interview by Emma Zehner, August 16, 2022
[xviii] ibid
[xix] CFR Title 14 Subtitle 24 Part 50 Subpart A 50.3.
[xx] ICF Consulting, Inc. *Study of HUD's Site Contamination Policies*, July 2003, https://www.huduser.gov/Publications/PDF/HUDSiteContamination.pdf
[xxi] *OSWA/UGCG Grant Survey Results Summary*. CT DEEP, https://portal.ct.gov/-/media/DEEP/open_space/OSWA-survey-result-summary-041521.pdf
[xxii] Don R. Clay. *Policy Towards Owners of Residential Property at Superfund Sites*. July 3, 1991. https://drive.google.com/file/d/1fQa2cu1z_5ys1GUn3EG04tVf-pJo2uAM/view
[xxiii] Environmental Protection Agency. "How to Address Changing Climate Concerns in an Analysis of Brownfield Cleanup Alternatives." https://www.epa.gov/sites/default/files/2015-09/documents/epa_oblr_climate_adaptation_checklist.pdf
[xxiv] Environmental Protection Agency, *Climate Smart Brownfields Manual.* (2021). https://www.epa.gov/sites/default/files/2021-06/documents/final_climate_smart_brownfields_manual_6-10-21_508_complaint.pdf
[xxv] 40 CFR 300.430(e)(9)(iii)
[xxvi] EPA, *Consideration of Climate Resilience in the Superfund Cleanup Process for Non-Federal National Priorities List Sites* (June 30, 2021) https://semspub.epa.gov/work/HQ/100002993.pdf
[xxvii] Kathleen Pritchard, Email to Author, February 15, 2023
[xxviii] 40 CFR 300.430 – Remedial investigation/feasibility study and selection of remedy.
[xxix] Kathleen Pritchard, Email to Author, February 15, 2023
[xxx] ibid
[xxxi]Texas Water Development Board, *Intended Use Plan*, 2023, https://www.twdb.texas.gov/financial/programs/CWSRF/doc/SFY2023/SFY2023-CWSRF-IUP.pdf

[xxxii] Susan Phillips, "Eastwick residents could become Philly's first climate migrants. A new plan sees them moving to higher ground." *WHYY*, October 17, 2021, https://whyy.org/articles/eastwick-residents-could-become-phillys-first-climate-migrants-a-new-plan-sees-them-moving-to-city-owned-higher-ground/
[xxxiv] Korin Tanftrakul and Tayor Quinland, "Eastwick Flood Resilience Info Sessions – Fall 2022," City of Philadelphia Blog, December 13, 2022, https://www.phila.gov/2022-12-13-eastwick-flood-resilience-info-sessions-fall-2022/
[xxxv] Uprose, "Small Business Resiliency (G.R.A.S.P.), https://www.uprose.org/small-business-services

[xxxvi] Maria Rachal, "NYC mayor reshapes climate approach to put environmental justice at the fore," February 3, 2022, *Smart Cities Dive*, https://www.smartcitiesdive.com/news/new-york-city-mayor-adams-announces-climate-and-environmental-justice-office/618132/
[xxxvii] NYC Office of Environmental Remediation, "BIG Application: Enrollment Grant," https://www.nyc.gov/assets/oer/downloads/pdf/1.10.2020%20Distributable%20BIG%20Program%20Enrollment%20Grant%20Application%20simplified%20version_form.pdf
[xxxviii] Ezra David Romero, "SF Supervisors Unhappy with City's Lack of Action to Protect Bayview-Hunters Point Residents from Toxic Sea Level Rise," September 16, 2022, *KQED*, https://www.kqed.org/science/1980324/sf-supervisors-unhappy-with-citys-lack-of-action-to-protect-bayview-hunters-point-residents-from-toxic-sea-level-rise
[xxxix] Hampton Roads Planning District Commission, "What's in Your Floodplain?" (Presentation), August 6, 2020, https://www.hrpdcva.gov/uploads/docs/04_Presentation_WIF_DUC_090220.pdf
[xl] Phil Gregory, "New Jersey considers streamlining state purchases of homes on contaminated properties," *WHYY*, June 21, 2016, https://whyy.org/articles/new-jersey-considers-streamlining-state-purchase-of-homes-on-contaminated-properties/
[xli] Makaelah Walters, Facing South, "NC hog farm buyout failure leaves vulnerable communities at risk," August 3, 2022, *Clean Water for NC*, https://cwfnc.org/nc-hog-farm-buyout-failure-leaves-vulnerable-communities-at-risk/
[xlii] interview
[xliii] Department of Environmental Protection Community Collaborative Initiative, "Waterfront South Rain Gardens Park, Camden," https://www.nj.gov/dep/cci/waterfront.html
[xliv] "Connecticut Brownfield Land Bank," https://ctblb.org/
[xlv] Buffalo Niagara Land Trust, "What We Do," https://bnrlandtrust.org/what-we-do-2
[xlvi] https://www.clf.org/blog/victory-exxonmobil-shuts-down-dangerous-tank-farm/
[xlvii] ibid
[xlviii] Community Resilience in Environmental Industrial Waterfront Communities Work Group. *Proposed Recommendations for Promoting Community Resilience in Environmental Justice Industrial Waterfront Areas*. (National Environmental Justice Advisory Council, 2015). https://www.epa.gov/sites/default/files/2016-08/documents/communityresilienceinejindustrialwaterfrontcommunities.pdf
[xlix] Adapting to Rising Tides, "Contaminated Land,"http://www.adaptingtorisingtides.org/portfolio/contaminated-lands/
[l] Community Resilience in Environmental Industrial Waterfront Communities Work Group. *Proposed Recommendations for Promoting Community Resilience in Environmental Justice Industrial Waterfront Areas*. (National Environmental Justice Advisory Council, 2015). https://www.epa.gov/sites/default/files/2016-08/documents/communityresilienceinejindustrialwaterfrontcommunities.pdf
[i]bid
[lii] Joseph Schilling, "Beyond Brownfields Redevelopment: A Policy Framework for Regional Land Recycling," Journal of Comparative Urban Law and Policy, Volume 5 Issue 1, https://readingroom.law.gsu.edu/cgi/viewcontent.cgi?article=1111&context=jculp
[liii] Emily Russell, "Superfund and Climate Change: Lessons from Hurricane Sandy," *NR&E*, Winter 2014, https://www.law.uh.edu/faculty/thester/courses/Climate%20Intervention%20Law%202019/Superfund%20and%20Climate%20Change%20by%20Russell.pdf
[liv] Angela Caputo and Sharon Lerner, "House poor, pollution rich," January 13, 2021, *APM Reports*, https://www.apmreports.org/story/2021/01/13/public-housing-near-polluted-superfund-sites
[lv] *Poisonous Homes: The Fight for Environmental Justice in Federally Assisted Housing*, (Shriver Center on Poverty Law), https://www.povertylaw.org/report/poisonoushomes/
[lvi] "Environmental Data in the Inflation Reduction Act," Federation of American Scientists Blog, August 16, 2022, https://fas.org/blogs/sciencepolicy/enviro-data-ira/
[lvii] "Up to $5 million to assess flood-contaminated land," News release, November 2, 2022, https://www.epa.nsw.gov.au/news/media-releases/2022/epamedia221102-up-to-$5-million-to-assess-flood-contaminated-land
[lviii] Emily Russell, "Superfund and Climate Change: Lessons from Hurricane Sandy," *NR&E*, Winter 2014, https://www.law.uh.edu/faculty/thester/courses/Climate%20Intervention%20Law%202019/Superfund%20and%20Climate%20Change%20by%20Russell.pdf
[lix] Stacey Holiday, Roy Prather, Julius Redd, Hilary Jacobs, and Liz Johnson, "New York Enacts Environmental Justice Permitting Law," *Beveridge & Diamond Blog*, January 10, 2023, https://www.bdlaw.com/publications/new-york-enacts-environmental-justice-permitting-law/
[lx] Margaret A. Walls, "Environmental Justice and the Cumulative Impacts of Pollution, with Ana Baptista," *Resources Radio*, February 14, 2023, https://www.resources.org/resources-radio/environmental-justice-and-the-cumulative-impacts-of-pollution-with-ana-baptista/