Pew

Regulations Division, Office of General Counsel
Department of Housing and Urban Development
451 7th Street SW, Room 10276
Washington, DC 20410-0500

Re: Comments in support of HUD's Proposed Rule Implementing the Federal Flood Risk Management Standard; Docket No. FR-6272-P-01

The Pew Charitable Trusts (Pew) appreciates this opportunity to comment on the U.S. Department of Housing and Urban Development's (HUD) proposed rule: "Floodplain Management and Protection of Wetlands; Minimum Property Standards for Flood Hazard Exposure; Building to the Federal Flood Risk Management Standard" (FFRMS), 88 Fed. Reg. 17755 (March 24, 2023).

Overall, Pew sees this proposal as a much-needed step to address the significant and growing risk of flood damages and losses. This rule can greatly improve the resilience of affordable housing and other HUD-assisted projects over time by assuring that new construction and substantial improvements are carried out with careful attention to long-term risks. By requiring that project developers evaluate and plan for flood risks over anticipated project lifetimes, HUD will help to rein in the rising costs of flooding disasters and, more importantly, safeguard the lives and livelihoods of the individuals and families who live in or utilize HUD-assisted homes and projects.

In particular,

- Pew strongly supports the proposed rule's preference for the use of a Climate-Informed Science Approach (CISA) to determine the estimated extent and height of the FFRMS floodplain;
- We endorse the proposal for improved protections in areas that have been known as Coastal A zones or areas within the Limit of Moderate Wave Action (LiMWA),[i] and we urge the Department to seriously consider disallowing both construction and reconstruction within that most dangerous portion of the floodplain—the floodway;
- Pew also supports new restrictions on the use of fill within floodplains for HUD-supported projects, at the very least in any case in which a development on fill may redirect flood waters onto properties with existing structures or otherwise cause expansion of the mapped floodplain elsewhere;[ii]
- We welcome HUD's proposal to address the problem of repeatedly flooded properties[iii] and urge the Department to pay close attention to repair and reconstruction of multi-family units where residents have not only lost belongings and been displaced but have also required evacuation and rescue by emergency personnel.[iv] Particularly in communities where such structures comprise a significant portion of the affordable housing stock, we recommend that HUD prioritize new protections to break the cycle of loss that residents may have endured;
- Pew supports the Department's call for hazard notification to occupants and prospective purchasers and renters of HUD-assisted housing[v], and we would encourage the Department to

work with the Federal Emergency Management Agency (FEMA) to provide useful information to buyers and renters about the value of flood insurance;

- We also appreciate the stated commitment "to use nature-based floodplain management approaches where practicable" and to streamline decision-making for activities that would mitigate flood risk, avoid wetland losses, or provide co-benefits that may otherwise assist in reducing climate impacts.[vi]
- Finally, while we understand that the Department may need to determine an appropriate transition period for implementation, we note that the sooner that these important changes go into effect, the larger the impact on the next generation of HUD-supported housing stock and infrastructure projects.

We also offer the following more detailed explanation of why we see this proposal as important and how the proposed rules might be implemented.

Long-term Assets Require Forward-Looking Evaluations and Long-term Protections.

As the background in this proposal explains, the overall objective of Executive Order 11988 was to reduce the damages and recovery costs associated with major flooding.[vii] The 1977 Order sought to promote the location of homes, businesses, and important infrastructure outside of areas prone to flooding to the extent feasible and to assure that when Federally-backed assets had to be located in such areas, those assets would be protected from anticipated flood levels. For decades, the implementation of this Order relied exclusively on the Flood Insurance Rate Maps (FIRMs) produced by FEMA.

The update to that Order, embodied in Executive Order 13690, recognized that the exclusive reliance on FEMA FIRMs had proven grossly inadequate, with federal dollars continuing to be invested into projects that would later require repair or replacement due to flooding damage.[viii] The primary change to EO 11988 envisioned by the new Order, then, was to incorporate a reasonable consideration of future risk into decision-making about long-term assets funded at least in part by Federal taxpayers.[ix]

FIRM Flood Zones Do Not Incorporate Needed Consideration of Future Risk.

Since the early days of the National Flood Insurance Program (NFIP), FEMA and its predecessor agencies have worked to identify priority areas for protection and insurance uptake. The initial adoption of the 1-percent-annual-chance floodplain as the high-risk flood zone was viewed as a necessary compromise,[x] since some arbitrary level of protection had to be chosen. Over the years, the across-the-board use of this single floodplain depiction, the Special Flood Hazard Area (SFHA), has been criticized as not sufficiently protective and generally misleading to the public.[xi]

Executive Order 13690 and this proposed rule respond to these criticisms, addressing important challenges that numerous experts have noted: Flood risk is highly dynamic and flood risk mapping, though greatly improved over the years, still involves a high degree of uncertainty.[xii]

SFHAs on FEMA maps are statistical constructs based on historical data and current conditions at the time of study. The SFHA covers the land that would be inundated by a flood with an estimated one

percent chance of occurring in any given year – the statistical equivalent of a 1-in-4 chance of flooding over a period of 25 years. While this mapping approach can offer useful information in two dimensions—estimating the lateral extent as well as the height of floods that might be reached or exceeded – even up-to-date, technically credible maps include considerable uncertainty and disregard changing conditions.

Current mapping techniques predict future floods under the assumption that future precipitation and weather patterns will follow those of the past and that critical factors such as wetland loss, urbanization, or shoreline and riverbed erosion will remain unchanged as well.[xiii] With a changing climate and shifting demographics, then, additional data and considerations – beyond those reflected by the SFHAs – must be employed to protect people and property over the long term.

CISA Should be the Preferred Approach for Determining the FFRMS Floodplain.

As this notice points out, the preference for CISA is a departure from HUD's 2016 FFRMS proposal (81 FR 74967). Pew welcomes this change and believes it will provide for the most useful examination of future risks and the most durable protections for HUD-assisted projects. While it is true that the previously preferred Freeboard Value Approach (FVA) as well as the 0.2-percent-annual-chance approach would have offered some measure of protection above what is currently dictated by the NFIP minimum floodplain management standards, the application of those simplified safety factors would not foster the more fulsome yet tailored consideration of risks called for in a CISA approach.

While we recognize that data to support the CISA option may be difficult to access in certain areas (as might detailed Base Flood Elevations (BFEs) or 0.2-percent-annual-chance flood delineations), we also know that the availability of technically credible data on future flood risks has increased substantially since HUD's previous proposal and reliable sources of such data continue to grow.[xiv]

In addition to datasets, climate projections, and other tools that have been created by the National Oceanic and Atmospheric Administration (NOAA) and other federal agencies as well as the ongoing work from the Flood Resilience Interagency Working Group, several states and localities have made significant investments in down-scaled mapping of future flood risks. For example, the New Jersey Department of Environmental Protection has developed a mapping tool for community leaders that models current flood risk factors and can be paired with sea-level rise scenarios to illustrate areas of potential future vulnerability.[xv] In Maryland, a similar tool, the Maryland Coastal Atlas, depicts future sea-level-rise and coastal erosion vulnerability, allowing decision-makers to choose appropriate sites for habitat restoration or shoreline stabilization projects and to identify and, therefore, avoid certain areas of high flood vulnerability.[xvi]

The level of activity in this arena – across federal agencies, states, localities, academia, and the private sector[xvii] – suggests that a collaborative approach for data-sharing and data stewardship will be important to FFRMS implementation overall. While HUD may wish to develop its own level of understanding and expertise around future flood risk projections to serve the specific needs of its programs and clients, we would urge the Department against a "go-it-alone" approach involving creation and/or approval of new maps specific only to the HUD programs and projects.

Rather, we would hope to see continuing cooperative, interagency efforts[xviii] to build an accessible and reliable repository of CISA products that can be used to inform siting and design decisions for the full range of federally-supported assets. This is, of course, a large undertaking and will require significant resources and a long-term commitment to producing credible and actionable mapping products. In our view, a "community of practice on future flooding" – as outlined briefly in the recent CISA State of the Science Report[xix] – offers a sensible path forward for meeting this challenge.

The New Rule Should be Treated as a Resilience Performance Standard, Not Simply an Elevation Standard.

As we read this proposal along with the underlying EO and the all-Agency Guidelines previously adopted by the Water Resources Council, we would anticipate a reasonable amount of flexibility and pragmatism in implementation. Where credible scientific data on sea level rise or other future conditions already exists, project sponsors could be directed to access this information and offered guidance on how best to apply the data to the type of project in question. To the extent that projects have alternative siting options, the CISA analysis may influence selection of new, safer locations.

For many HUD-backed projects where re-location is not an option, particularly those involving construction or significant repair of single-family homes, building or first-floor elevation will likely be the simple and practical approach to compliance, and the elevation heights would derive from that data and a comparison to existing flood maps.[xx]

For other projects, including those deemed as "critical," elevation alone may not offer the most cost-effective or durable protections. For critical actions, including community assets such as hospitals, fire stations, and water treatment facilities, HUD should require a careful consideration of criticality and, as appropriate, assure protection of ingress and egress and continued functioning, not simply protection of the structure itself.[xxi]

Flood Protection is Not a Luxury.

One of the more frequent arguments against adoption and enforcement of additional flood protection is that additional requirements will make new housing unaffordable. We see this as an argument that has been proven wrong over and over by flood events. It assumes that the primary or sole focus should be the selling price of a home and contends that because flood resilience improvements have the potential to raise the construction price by some increment, they are inconsistent with objectives of greater access to housing.

What this argument ignores, however, is the fact that the cost of home ownership is not simply the initial price of a house. The cost of home ownership includes the purchase price, but it also includes the cost of living in, maintaining, and insuring that home throughout the lifetime of ownership. In our view, an "affordable" home that is subject to recurrent flooding or situated in a dangerous surge or landslide area is not truly affordable, when its residents must evacuate to safety, lose their belongings, and make costly repairs, often multiple times.

As documented by numerous researchers and disaster experts,[xxii] such costs often fall heavily on lower income groups and racial minorities who may suffer disproportionately from flooding disasters and face a long or unending road to recovery. As FEMA's National Advisory Council noted in its November 2020 Annual Report to the Agency,[xxiii] socioeconomic factors such as race, ethnicity, physical disability, and age, can have a significant impact on disaster vulnerability, leading to stark inequities in disaster recovery. Individuals struggling with income sufficiency, who may also face greater obstacles to seeking recovery assistance, can simply be overwhelmed by the combined economic shocks of disastrous flooding.

Enhanced Protections are Consistent with Principles of Equity and HUD's Mission.

With a fundamental mission to "create strong, sustainable, inclusive communities and quality affordable homes for all," HUD administers a range of programs and approves or otherwise supports a wide assortment of project types. The Department operates important programs aimed at increasing the stock of affordable housing, offers mortgage insurance, and is increasingly relied upon for disaster response and recovery, helping states and localities to rebuild and replace community assets impacted by natural disasters. Unfortunately, as climate change and demographic changes continue to put more people at risk from extreme weather events and flooding, the cost and the urgency of post-disaster aid will continue to climb and HUD's capacity to serve communities in need will be strained. That alone argues for new cautions regarding where and how to build and new standards to address future flood risk.

Continuing flooding and mounting flood losses also work directly at cross-purposes to Federal programs designed to assist some of the nation's most vulnerable households obtain affordable and safe housing, including HUD programs targetting low-income families, the elderly, and persons with disabilities.[xxiv] Again, the literature on disaster and recovery documents the often disparate and extreme impact that disasters, including flooding, can pose for certain groups,[xxv] and these challenges must be considered in finalizing a rule to make the Department's investments and projects flood ready.

We appreciate this opportunity to offer comments on this important rule, and we look forward to HUD completing work on the final rule in the coming months.

[i] See discussion of Coastal A zone in National Research Council, "Mapping the Zone: Improving Flood Map Accuracy," National Academies Press, 2009, https://doi.org/10.17226/12573 . Chapter 7, "Mapping and Risk Communication: Moving to the Future," discusses findings dating back to 1995 and Hurricane Opal that damage and losses in these zones could rank on par with losses in mapped high velocity zones. Note also that the State of Florida's building code, among others, requires V zone protections in LiMWA areas, and that the NFIP Community Rating System provides credits for communities who adopt and enforce these more protective standards. Such a requirement is also consistent with American Society of Civil Engineers "Flood Resistant Design and Construction" (ASCE 24).

[ii] See Atoba, Kayode Olugbenga, "Fill and Floods: Analysis of the Impact of Parcel Fill on Residential Flood Damages," Doctoral dissertation, Texas A & M University, https://oaktrust.library.tamu.edu/handle/1969.1/173455.

[iii] FEMA's actuaries have determined that the repetitive loss problem is "the single most important factor that affects the stability of the National Flood Insurance Fund." See Federal Emergency Management Agency, "National Flood Insurance Program Community Rating System Coordinator's Manual," FIA-15/2017. https://www.fema.gov/media-library-data/1493905477815-d794671adeed5beab6a6304d8ba0b207/633300_2017_CRS_Coordinators_Manual_508.pdf .

[iv] See press stories regarding flooding of HUD-supported housing, including Mervosh, Sarah, "Unsafe to Stay, Unable to Go: Half a Million Face Flooding Risk in Government Homes," The New York Times, April 11, 2019, https://www.nytimes.com/2019/04/11/us/houston-flooding.html#:~:text=The%20complex%2C%20Arbor%20Court%20Apartments%2C%20which%20is%20run,the%20owner%2C%20for%20about%20%241.6%20million%20a%20year ; Cusick, Daniel, "'We want the opportunity to rebuild out of the floodplain'," E&E News, October 10, 2018, https://subscriber.politicopro.com/article/eenews/1060102125 .

[v] Testimony of The Pew Charitable Trusts submitted to the Texas House of Representatives County Affairs Committee, "Flood Disclosure as a Key Element of Flood Preparedness," March 5, 2019, https://www.pewtrusts.org/-/media/assets/2019/03/pew-urges-texas-to-adopt-policies-that-can-reduce-the-impacts-of-floodsmar.pdf .

[vi] See, for example, FEMA, "Building Community Resilience with Nature-Based Solutions: A Guide for Local Communities," June 2021, https://www.fema.gov/sites/default/files/documents/fema_riskmap-nature-based-solutions-guide_2021.pdf ; Schrass, K. and A.V. Mehta, "Improved Use and Understanding of NNBF in the Mid-Atlantic," National Wildlife Federation, 2017, https://www.nwf.org/-/media/Documents/PDFs/NWF-Reports/2017/NWF-MARCO_NNBF-Mid-Atlantic-report.ashx?la=en&hash=9420948B55385301DA7EFFE7183869D1F6B1838D ; Todd S. Bridges, et. al., "Use of Nature and Nature-Based Features (NNBF) for Coastal Resilience," January 2015, http://hdl.handle.net/11681/4769 .

[vii] General Accounting Office, "Comptroller General's Report to Congress: National Attempts to Reduce Losses from Floods by Planning for and Controlling the Uses of Flood-Prone Lands", 1975, https://www.gao.gov/products/red-75-327 .

[viii] See, for example, U.S. Government Accountability Office, "Climate Change: Financial Risks to Federal and Private Insurers in Coming Decades are Potentially Significant," March 2007, http://www.gao.gov/products/GAO-07-760T ; Department of Housing and Urban Development, "Hurricane Sandy Rebuilding Strategy: Stronger Communities, A Resilient Region," August 2013, https://www.hud.gov/sites/documents/hsrebuildingstrategy.pdf ; U.S. Government Accountability Office, "Federal Disaster Assistance: Federal Departments and Agencies Obligated at Least $277.6 Billion during Fiscal Years 2005 through 2014," September 2016, https://www.gao.gov/pdf/product/679977 .

[ix] The principle of forward-looking planning for flood protection has been endorsed by a wide array of interest groups and community leaders; see, for example, National Research Council, "Informing Decisions in a Changing Climate," National Academies Press, 2009, https://doi.org/10.17226/12626; FEMA Technical Mapping Advisory Council, "Future Conditions Risk Assessment and Modeling Report," 2015, https://www.fema.gov/sites/default/files/documents/fema_tmac_2015_future_conditions_risk_assessment_modeling_report.pdf ; letter to FEMA from the American Society of Civil Engineers, October 21, 2016,

https://www.infrastructurereportcard.org/wp-content/uploads/2017/08/ASCE-FEMA-FFRMS-FINAL.pdf; and signatories to a statement of principles "Prioritizing Flood-Ready Infrastructure, March 2018, https://www.pewtrusts.org/-/media/assets/2018/03/statement-of-principles.pdf .

[x] See, for example, FEMA Region 10, "The 100 Year Flood Myth," undated, https://training.fema.gov/hiedu/docs/hazrm/handout%203-5.pdf .

[xi] See, for example, Blessing, Russell Bennett, Antonia Scalia, and Samuel D. Brody, "Flood Risk Delineation in the United States: How Much Loss Are We Capturing?," Natural Hazards Review, Volume 18, January 2017, https://www.researchgate.net/publication/312599017_Flood_Risk_Delineation_in_the_United_States_How_Much_Loss_Are_We_Capturing ; Hunn, David, Matt Dempsey, and Mihir Zaveri, "Harvey's floods: Most homes damaged by Harvey were outside flood plain, data show," Houston Chronicle, March 30, 2018, https://www.houstonchronicle.com/news/article/In-Harvey-s-deluge-most-damaged-homes-were-12794820.php ; and U.S. Government Accountability Office, "FEMA Flood Maps: Better Planning and Analysis Needed to Address Current and Future Flood Hazards," October 2021, https://www.gao.gov/assets/gao-22-104079.pdf .

[xii] See, for example, Bell, Heather M. and Graham A.Tobin, "Efficient and effective? The 100-year flood in the communication and perception of flood risk," Environmental Hazards, Vol. 7, 2007, https://www.sciencedirect.com/science/article/abs/pii/S1747789107000361; Satija, Neena, Kiah Collier, and Al Shaw, "Boom town, flood town: How Houston's development increases flood risk," UPI, December 7, 2016, https://www.upi.com/Top_News/US/2016/12/07/Boom-town-flood-town-How-Houstons-development-increases-flood-risk/9161481127606/ .

[xiii] See, for example, AECOM, "The Impact of Climate Change and Population Growth on the National Flood Insurance Program through 2100," June 2013, https://aecom.com/fema-climate-change-report/ ; Brody, Samuel D., Sammy Zahran, Wesley E. Highfield, Himanshu Grover, and Arnold Vedlitz, "Identifying the impact of the built environment on flood damage in Texas," Disasters, Volume 32, March 2008, https://pubmed.ncbi.nlm.nih.gov/18217915/ ; Hemmati, Mona, Bruce R. Ellingwood, and Hussam N. Mahmoud, "The Role of Urban Growth in Resilience of Communities Under Flood Risk," Earth's Future, Volume 8, March 2020, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7375139/ .

[xiv] See, for example, The National Climate Task Force's "Federal Flood Risk Management Standard Climate-Informed Science Approach (CISA) State of the Science Report," March 2023, https://www.whitehouse.gov/wp-content/uploads/2023/03/Federal-Flood-Risk-Management-Standard-Climate-Informed-Science-Approach-CISA-State-of-the-Science-Report.pdf .

[xv] See New Jersey Department of Environmental Protection, Coastal Management Program, "Coastal Vulnerability Index Mapping," updated March 24, 2022, https://www.nj.gov/dep/cmp/czm_cvi.html#:~:text=The%20NJCMP%20developed%20CVI%20mapping%20for%20the%20entire,community.%20These%20maps%20can%20be%20found%20at%20www.nj.gov%2Fdep%2Fcmp%2Fczm_cvi_maps.html.

[xvi] See background on the tool and the "coast-smart data model" from the Maryland Department of Environmental Service at https://storymaps.arcgis.com/stories/bd1ab6827c77457a9c6aec5ca1eb4af2; additional information and access to the data is also available at https://data.imap.maryland.gov/datasets/maryland::maryland-coast-smart-climate-ready-action-boundary-crab-coastal-flood-depth-grid/about .

[xvii] See, for example, Pasternack, Alex, "NYC: Few Cities Are Doing More to Map and Respond to Rising Waters," ESRI Blog, Climate Action, March 28, 2023, https://www.esri.com/about/newsroom/blog/new-york-city-flood-mapping/; Olick, Diana, "Mortgage giant Fannie Mae tackles climate risk, but changes to underwriting may take several years," CNBC, March 20, 2023, https://www.cnbc.com/2023/03/20/mortgage-giant-fannie-mae-tackles-climate-risk.html .

[xviii] See two instructive examples of multi-agency data sharing: the Integrated Working Group on Ocean and Coastal Mapping, https://iocm.noaa.gov/ and the 3D Elevation Program, https://www.usgs.gov/3d-elevation-program.

[xix] National Climate Task Force, "Federal Flood Risk Management Standard Climate-Informed Science Approach (CISA) State of the Science Report," March 2023, https://www.whitehouse.gov/wp-content/uploads/2023/03/Federal-Flood-Risk-Management-Standard-Climate-Informed-Science-Approach-CISA-State-of-the-Science-Report.pdf .

[xx] We agree that information contained in preliminary or advisory maps should be considered, and we concur with the notion that elevation levels lower than indicated on the existing FIRMs or lower than those required under

stricter state or local requirements should not be allowed. Construction below current BFEs would cause such structures to be out of compliance with the NFIP regulations and local codes.

[xxi] The Spaulding Rehabilitation Hospital in Charlestown, Massachusetts is just one useful example of a critical facility designed with future climate conditions in mind. Sited on the waterfront, the Spaulding facility was designed around sea level rise projections out to the year 2100. The facility's first floor was placed as high as possible; critical mechanical and electrical equipment are on the roof, and patient-critical functions have been kept off the ground floor. Building designers included a combined heat and power plant for backup power; elevated all vents; incorporated operable windows; and designed the landscaping to offer reef-like barriers to mitigate against storm surge. See Urban Land Institute, "Developing Urban Resilience: Spaulding Rehabilitation Hospital," 2018, https://developingresilience.uli.org/case/spaulding-rehabilitation-hospital/ .

[xxii] See, for example, Kousky, Carolyn, Testimony before the U.S. House Committee on Financial Services Subcommittee on Housing, Community Development, and Insurance, United States House of Representatives May 25, 2022, https://www.bing.com/ck/a?!&&p=20bd612d870efef3JmltdHM9MTY4NjAwOTYwMCZpZ3VpZD0xYTgzYzdlNy0zZjZmLTYxOGUtMTMwNS1jYjBiM2ViZjYwY2YmaW5zaWQ9NTQyMw&ptn=3&hsh=3&fclid=1a83c7e7-3f6f-618e-1305-cb0b3ebf60cf&psq=Kousky%2c+testimony%2c+house+financial+services%2c+2022&u=a1aHR0cHM6Ly9kZW1vY3JhdHMtZmluYW5jaWFsc2VydmljZXMuaG91c2UuZ292L3VwbG9hZGVkZmlsZXMvaG10Zy0xMTctYmEwNC13c3RhdGUta291c2t5Yy0yMDIyMDUyNS5wZGYjOn46dGV4dD1Xcml0dGVuJTIwVGVzdGltb255JTIwb2YlMjBDYXJvbHluJTIwS291c2t5JTIwRXhlY3V0aXZlJTIwRGlyZWN0b3IlMkMlMjBXaGFydG9uLFVuaXRlZCUyMFN0YXRlcyUyMEhvdXNlJTIwb2YlMjBSZXByZXNlbnRhdGl2ZXMlMjBNYXklMjAyNSUyQyUyMDIwMjI&ntb=1 ; Alice Fothergill, Enrique G. M. Maestas, and JoAnne DeRouan Darlington, "Race, Ethnicity and Disasters in the United States: A Review of the Literature." Disasters, Volume 23, 1999, https://pubmed.ncbi.nlm.nih.gov/10379098/ ; Fussell, Elizabeth and Elizabeth Harris , "Homeownership and Housing Displacement after Hurricane Katrina among Low-income African-American Mothers in New Orleans." Social Science Quarterly, Volume 25, September 2014, https://www.researchgate.net/publication/265731993_Homeownership_and_Housing_Displacement_After_Hurricane_Katrina_Among_Low-Income_African-American_Mothers_in_New_Orleans#:~:text=Objective%20We%20evaluate%20the%20effect%20of%20pre-Katrina%20housing,than%20those%20of%20subsidized%20housing%20residents%2C%20ceteris%20paribus ; Farrell, Diana and Fiona Greig, "Weathering the Storm: The Financial Impacts of Hurricanes Harvey and Irma on One Million Households," JPMorgan Chase & Co Institute, 2017, https://www.jpmorganchase.com/content/dam/jpmc/jpmorgan-chase-and-co/institute/pdf/institute-weathering-the-storm.pdf .

[xxiii] FEMA National Advisory Council, "November 2020 Report to the Administrator," https://www.fema.gov/sites/default/files/documents/fema_nac-report_11-2020.pdf .

[xxiv] Note earlier examples of multi-housing units impacted by flood disasters, with temporary or permanent post-flood closures precipitating serious price shocks to local housing markets. See also Jingnan, Huo, Rebecca Hersher, Tegan Wendland, Steve Newborn, and Daniel Rivero, "The Federal Government Sells Flood-Prone Homes To Often Unsuspecting Buyers, NPR Finds," NPR Morning Edition, September 13, 2021, https://www.npr.org/2021/09/13/1033993846/the-federal-government-sells-flood-prone-homes-to-often-unsuspecting-buyers-npr-

[xxv] See, for example, Manning, Anne, "What a small city in North Carolina can tell us about resilience," Colorado State University, Walter Scott, Jr. School of Engineering, March 1, 2019, https://engr.source.colostate.edu/what-a-small-city-in-north-carolina-can-tell-us-about-resilience/ ; Wing, Oliver, Carolyn Kousky, Jeremy Porter, and Paul Bates, "New flood maps show US damage rising 26% in next 30 years due to climate change alone, and the inequity is stark," The Conversation, January 31, 2022, https://theconversation.com/new-flood-maps-show-us-damage-rising-26-in-next-30-years-due-to-climate-change-alone-and-the-inequity-is-stark-175958 ; Howell, Julia and James R. Elliott, "Damages done: The longitudinal impacts of natural hazards on wealth inequality in the United States," Social Problems, 2018, https://doi.org/10.1093/socpro/spy016 ; Turken, Sam, "At A Crossroads: Sea level rise could make it even harder to find affordable housing," WHRO, December 13, 2021, https://whro.org/news/local-news/24962-at-a-crossroads-sea-level-rise-could-make-it-even-harder-to-find-affordable-housing