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Via Electronic Delivery

Federal Housing Finance Agency
Office of the Director
400 7th Street S.W, 10th Floor
Washington, D.C. 20219

Climate and Natural Disaster Risk RFI

Ladies and Gentlemen:

The Natural Resources Defense Council (NRDC) is pleased to submit the following comments in response to the Request for Input (RFI) on Climate and Natural Disaster Risk Management issued by the Federal Housing Finance Agency.

The NRDC is an international nonprofit environmental organization with more than 3 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and environment. NRDC has offices in New York City, Washington D.C., Los Angeles, San Francisco, Chicago, Montana, and Beijing.

Our comments are set forth below as responses to certain of the questions posed by the RFI.

I. Identifying and Assessing Climate and Natural Disaster Risk

1. How should FHFA define climate and natural disaster risk?

We encourage FHFA to take a broad, holistic definition of climate/disaster risk, as the impacts to the regulated entities and the housing finance system extend beyond the narrow, immediate effects of specific disaster events.

Our understanding is that, while FHFA and Fannie Mae have not yet adopted formal definitions of climate/disaster risk, Freddie Mac defines "natural disaster risk" as "the credit loss to Freddie

Mac that can occur due to natural perils that cause a borrower to default" and considers those perils to be "typically low probability events that are difficult to predict and measure."[1]

We recommend that FHFA broaden this definition, also considering the following:

- Impacts that are not directly associated with a specific natural hazard but rather the indirect economic, social, and environmental effects that intersect with household financial health and housing security.[2]
- Impacts of chronic hazards such as drought or increased numbers of high-heat days that may not meet the definition of an acute "disaster" but may still contribute to risk for FHFA.
- Cumulative impacts of environmental degradation, natural hazards, and historical/social and health factors that increase vulnerability.

In addition, we urge FHFA to consider outcomes other than solely borrowers defaulting. As our colleagues at the Union of Concerned Scientists point out, the risk here is not just to mortgages but to people, their homes, and their communities.[3] In some cases, climate threats may not pose a large or widespread risk of homeowners falling behind on their loans but rather lead to broader changes in home values,[4] homeownership rates,[5] and the housing market as a whole.

We also recommend that FHFA avoid the term "natural disaster" as scholars and advocates argue that disasters, while they may be triggered by natural hazards such as hurricanes or earthquakes, are in fact the result of human decisions, systems, and institutions that place people in harm's way.[6] Instead, we recommend that FHFA carefully assess whether its policies are in fact considering *hazards*, *exposure*, and/or *vulnerability* and use terminology accordingly. Chapter 2 of the 2012 International Panel on Climate Change (IPCC) report *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* provides a review of these components of disaster risk and a discussion of the social and historical factors that underlie the effects of disasters.[7]

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[1] FHFA Office of the Inspector General, "Disaster Risk for Enterprise Single-Family Mortgages," 23 March 2021, https://www.fhfaoig.gov/sites/default/files/WPR-2021-004.pdf.

[2] Caroline Ratcliffe, William J. Congdon, et al., "Insult to Injury: Natural Disasters and Residents' Financial Health," The Urban Institute, April 2019, https://www.urban.org/research/publication/insult-injury-natural-disasters-and-residents-financial-health.

[3] Rachel Cleetus, "The FHFA Begins to Reckon with Climate Risks to the Housing Market," 5 March 2021, https://blog.ucsusa.org/rachel-cleetus/fhfa-begins-to-reckon-with-climate-risks-to-housing-market.

[4] Jesse M. Keenan, Thomas Hill, and Anurag Gumber, "Climate gentrification: from theory to empiricism in Miami-Dade County, Florida," *Environmental Research Letters* 13, no. 5 (April 2018): 054001, https://iopscience.iop.org/article/10.1088/1748-9326/aabb32.

[5] Tamara L. Sheldon and Crystal Zhan, "The Impact of Natural Disasters on US Home Ownership," *Journal of the Association of Environmental and Resource Economists* 6, no. 6 (November 2019): 1169–1203, https://doi.org/10.1086/705398.

[6] See, e.g., Ksenia Chmutina and Jason von Meding, "A Dilemma of Language: 'Natural Disasters' in Academic Literature," *International Journal of Disaster Risk Science* 10 (2019): 283–292, https://doi.org/10.1007/s13753-019-00232-2.

[7] Omar-Dario Cordona, Maarten K. van Aalst, et al., "Determinants of risk: exposure and vulnerability," in: *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, A*

2. What are the climate and natural disaster risks to the regulated entities, including long- and short-term risks, and how might such risks change over time?

The climate and disaster risks to the regulated entities fall into three general categories, with systemic risk related to the whole financial system as a layer on top of these categories.

First, there are what are often referred to as "physical risks," in this context higher frequency and more intense weather events and other climate-related hazards. These include tropical storms, coastal flooding, drought, wildfires, and more intense heat.[8]

Second, there are what are often referred to as "transition risks," generally the risks generated by the transition to a low carbon economy. These would include job losses in locations that depend heavily on fossil fuel industries. Today, coal communities fall into this category, but oil and gas communities can be expected to experience this distress as well. Extensive job loss in a community can impair homeowners' ability to keep up payments on their mortgages and housing values as well, both having an impact on their mortgage holders.

Finally, there is insurance risk. Insurance companies use data based on past events to calculate premiums. But climate change calls into question whether past data are a reliable predictor of future conditions. As insurers recalibrate their underwriting of residential casualty insurance policies to incorporate the risks posed by climate change, casualty insurance may become more expensive and harder to obtain. This would affect homeowners, of course, but also their mortgage lenders.

Flood insurance is another area fraught with risk and uncertainty. Many National Flood Insurance Program (NFIP) policies are heavily subsidized by the federal government and the Federal Emergency Management Agency (FEMA) is only beginning to implement more modernized, actuarily sound rate-setting methods.[9] If subsidies are reduced or eliminated and flood insurance rates became fully risk-based, the cost of flood insurance could increase prohibitively for the people who least have the ability to pay; at the same time, however, rate structures that do not reflect true risk send inaccurate price signals. In addition, communities not participating in the program may nevertheless be subject to increased flood risk without available (or affordable) insurance. These considerations increase risk both for homeowners and for their mortgage holders.

Additionally, there are systemic threats resulting from losses in the above categories that can pose a risk to the broader economy and financial system.[10] As the Federal Reserve has described, "climate change could increase financial shocks and financial system vulnerabilities

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Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC), 2012, Cambridge University Press, Cambridge, UK, and New York, NY, USA, https://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Chap2_FINAL-1.pdf.

[8] Bank of England, "Climate change: what are the risks to financial stability?" https://www.bankofengland.co.uk/knowledgebank/climate-change-what-are-the-risks-to-financial-stability

[9] FEMA, "Risk Rating 2.0: Equity in Action," 2 April 2021, https://www.fema.gov/flood-insurance/work-with-nfip/risk-rating

[10] Dee Gill and William Yu, "Is the $1 Trillion Coastal Housing Market a Future Financial Crisis?" UCLA Anderson Review, 31 March 2021, https://anderson-review.ucla.edu/is-the-1-trillion-coastal-housing-market-a-future-financial-crisis/

that could further amplify shocks."[11] These shocks are expected to increase over time, amplifying vulnerabilities.

2 (second question). To what extent, if any, could such risks now or in the future impede the ability of each regulated entity to operate in a safe and sound manner, fulfill its statutory mission, or foster liquid, efficient, competitive, and resilient national housing finance markets?

Climate and disaster risk has the potential to significantly impact the operations of each of the FHFA's regulated entities (and, in the case of the Federal Home Loan Banks (FHLBs), their member institutions), but the impact will differ based on the diversification profile of each entity.

Mortgages will become riskier to hold because of increasingly frequent extreme weather events, such as coastal floods, wildfires, and more intense storms. Since climate change effects are evolving, these threats may affect not just new loans, but also existing loans where conditions change. The effects are local, so a regulated entity's ability to diversify its portfolio will greatly affect its exposure to these events.

Fannie Mae and Freddie Mac acquire mortgages on a national scale. This puts them in the best position to mitigate their climate exposure through diversification. Nevertheless, to operate safely, even these entities must incorporate climate risk into their mortgage acquisition standards. In this regard, these institutions must be extra-vigilant, as mortgage originators may "cherry pick" the mortgages with the greatest climate exposure to sell to them. In addition, they must consider overall portfolio risk and, also, the role of climate resilience or mitigation requirements. In doing so, these entities must be sensitive to potential disparate impacts of portfolio adjustment or climate resilience or mitigation requirements on lower income communities.

Liquidity needs for the regional FHLBs will likely increase as their member banks are more exposed to climate change consequences. Because of their regional ambit, the FHLBs are less diversified than Fannie Mae and Freddie Mac and thus have more concentrated climate risk exposure. The FHFA should therefore incorporate climate risk exposure into its oversight of the regional FHLBs with a view towards this more concentrated exposure. The FHLB's individual member institutions potentially have a much higher climate risk profile. Depending on the geographic area in which they make mortgage loans, they may not be able to diversify out of, say, coastal flood risk, or fossil fuel industry decline risk. Therefore, the FHFA, should investigate what interventions the FHLBs may need to provide to permit member institutions to continue to serve their communities while operating in a safe and sound manner.

3. What methodologies, datasets, variables, assumptions, future climate scenarios, and measurement tools are used to measure and monitor climate risk to the national housing finance markets? Describe any gaps in available data that limit the ability to measure such risks. How could such data gaps be resolved?

There is no one consolidated, integrated source that compiles measured, monitored, and modeled climate hazards, risks, and impacts data for localities across the United States. The

[11] Lael Brainard, "Financial Stability Implications of Climate Change," Transform Tomorrow Today Ceres 2021 Conference, Boston, Massachusetts, 23 March 2021, https://www.federalreserve.gov/newsevents/speech/brainard20210323a.htm

development of a comprehensive, integrated, and searchable data base is an overarching data gap. Currently, data on climate risks may be compiled from multiple sources, as later mentioned in these comments. There is an acute need for developing a national climate information system (see March 2, 2021 GAO High Risk Report, GAO-21-119SP). A review of existing literature and available data sources is needed to derive relevant local information to develop such a risk assessment.

We suggest consultation of NOAA's climate.gov "Dataset Gallery" (available online at https://climate.gov/maps-data/datasets), as well as review of the following peer-reviewed scientific articles to help illuminate the wealth of research available to inform climate risks:

- Chandra-Putra, Handi, and Clinton J. Andrews. "An Integrated Model of Real Estate Market Responses to Coastal Flooding." *Journal of Industrial Ecology*, November 5, 2019, jiec.12957. https://doi.org/10.1111/jiec.12957.
- Courty, Laurent, Miguel Rico-Ramirez, and Adrián Pedrozo-Acuña. "The Significance of the Spatial Variability of Rainfall on the Numerical Simulation of Urban Floods." *Water* 10, no. 2 (February 15, 2018): 207. https://doi.org/10.3390/w10020207.
- Dottori, Francesco, Wojciech Szewczyk, Juan-Carlos Ciscar, Fang Zhao, Lorenzo Alfieri, Yukiko Hirabayashi, Alessandra Bianchi, et al. "Increased Human and Economic Losses from River Flooding with Anthropogenic Warming." *Nature Climate Change* 8, no. 9 (September 2018): 781–86. https://doi.org/10.1038/s41558-018-0257-z.
- Kim, Youjung, and Galen Newman. "Climate Change Preparedness: Comparing Future Urban Growth and Flood Risk in Amsterdam and Houston." *Sustainability* 11, no. 4 (February 18, 2019): 1048. https://doi.org/10.3390/su11041048.
- Li, Zongmin, Xinxin Zhang, Yanfang Ma, Cuiying Feng, and Asaf Hajiyev. "A Multi-Criteria Decision Making Method for Urban Flood Resilience Evaluation with Hybrid Uncertainties." *International Journal of Disaster Risk Reduction*, April 2019, 101140. https://doi.org/10.1016/j.ijdrr.2019.101140.
- Martinich, Jeremy, and Allison Crimmins. "Climate Damages and Adaptation Potential across Diverse Sectors of the United States." *Nature Climate Change* 9, no. 5 (May 2019): 397–404. https://doi.org/10.1038/s41558-019-0444-6.
- Mills, David, Russell Jones, Cameron Wobus, Julia Ekstrom, Lesley Jantarasami, Alexis St. Juliana, and Allison Crimmins. "Projecting Age-Stratified Risk of Exposure to Inland Flooding and Wildfire Smoke in the United States under Two Climate Scenarios." *Environmental Health Perspectives* 126, no. 4 (April 5, 2018): 047007. https://doi.org/10.1289/EHP2594.
- Moore, Frances C., and Nick Obradovich. "Using Remarkability to Define Coastal Flooding Thresholds." *Nature Communications* 11, no. 1 (December 2020): 530. https://doi.org/10.1038/s41467-019-13935-3.
- Smiley, Kevin T. "Social Inequalities in Flooding inside and Outside of Floodplains during Hurricane Harvey." *Environmental Research Letters* 15, no. 9 (September 15, 2020): 0940b3. https://doi.org/10.1088/1748-9326/aba0fe.
- Wang, Ruo-Qian, Huina Mao, Yuan Wang, Chris Rae, and Wesley Shaw. "Hyper-Resolution Monitoring of Urban Flooding with Social Media and Crowdsourcing Data." *Computers & Geosciences* 111 (February 2018): 139–47. https://doi.org/10.1016/j.cageo.2017.11.008.
- Wobus, C., P. Zheng, J. Stein, C. Lay, H. Mahoney, M. Lorie, D. Mills, R. Spies, B. Szafranski, and J. Martinich. "Projecting Changes in Expected Annual Damages From Riverine Flooding in the United States." *Earth's Future* 7 (2019): 516–27. https://doi.org/10.1029/2018EF001119.

- Zhang, Wei, Gabriele Villarini, Gabriel A. Vecchi, and James A. Smith. "Urbanization Exacerbated the Rainfall and Flooding Caused by Hurricane Harvey in Houston." *Nature* 563, no. 7731 (November 2018): 384–88. https://doi.org/10.1038/s41586-018-0676-z.

5. How, if at all, should FHFA incorporate into its assessment of the regulated entities' climate and natural disaster risk the potential for abrupt repricing of real estate properties exposed to acute natural hazards?

It is important that FHFA acknowledge the potential for abrupt repricing of real estate properties from increasing exposure to natural hazards, in many locations.

- The year 2020 outpaced any in the preceding forty years for disaster damage costs. There were 22 separate billion-dollar weather and climate disasters across the United States, costing an estimated $95 billion in damages, not including health-related costs, shattering the previous annual records of 16 events, which occurred in 2017 and 2011. See Adam B. Smith article, January 8, 2021, at: https://www.climate.gov/news-features/blogs/beyond-data/2020-us-billion-dollar-weather-and-climate-disasters-historical)
- There were more hurricanes in 2020 than in any prior U.S. year: a record-breaking 30 named storms and 12 landfalling storms in the continental United States. Storms with high winds, flooding and extreme rainfall can down trees and limbs. Those damages can cause property values to plummet, and often require costly damage removal and repair. Having large trees in yards along streets can increases a home's value from 3 to 15 percent; their loss can inversely decrease property values precipitously (KL Wolf, 2007, *Arborist News* 16(4):34-36, "City trees and property values").

Currently data on climate risks must be compiled from multiple sources, although, as noted above in the answer to Question 3, there is an acute need for developing a national climate information system. See also the March 2, 2021 GAO High Risk Report, GAO-21-119SP, which recommends the federal government "develop a national climate information system" to help make more "progress to reduce its fiscal exposure to climate change."

New types of supporting scientific information frameworks are needed for incorporating climate risks into existing decision frameworks, existing policies, plans, operations, and budget structures.[12]

- FHFA can attempt to incorporate the potential for abrupt repricing of real estate properties by setting forth an interim framework for evaluating local exposure to acute natural hazards; or by requiring regulated entities to submit information documenting the range of local acute natural hazard risks (not necessarily quantitative, but qualitative).
- Some of the already-available data sources include NOAA's Billion Dollar Disasters data from 1980-2020 at: https://www.ncdc.noaa.gov/billions/ (see also the data suggested in the answers to Questions 3, 5, and 6).

[12] RH Moss et al., 2019, "A framework for sustained climate assessment in the United States," BAMS (May 2019), 897-907. DOI:10.1175/BAMS-D-19-0130.

Beyond those studies, we also recommend, as noted above, consultation with NOAA's climate.gov "Dataset Gallery" (available online at https://climate.gov/maps-data/datasets), as well as the following peer-reviewed articles to further illuminate abrupt climate risks:

- Armal, Saman, Jeremy R. Porter, Brett Lingle, Ziyan Chu, Michael L. Marston, and Oliver E. J. Wing. "Assessing Property Level Economic Impacts of Climate in the US, New Insights and Evidence from a Comprehensive Flood Risk Assessment Tool." *Climate* 8, no. 10 (October 12, 2020): 116. https://doi.org/10.3390/cli8100116.
- Buchanan, Maya K, Scott Kulp, Lara Cushing, Rachel Morello-Frosch, Todd Nedwick, and Benjamin Strauss. "Sea Level Rise and Coastal Flooding Threaten Affordable Housing." *Environmental Research Letters* 15, no. 12 (November 30, 2020): 124020. https://doi.org/10.1088/1748-9326/abb266.
- Correll, Rachel M., Nina S. N. Lam, Volodymyr V. Mihunov, Lei Zou, and Heng Cai. "Economics over Risk: Flooding Is Not the Only Driving Factor of Migration Considerations on a Vulnerable Coast." *Annals of the American Association of Geographers*, July 14, 2020, 1–16. https://doi.org/10.1080/24694452.2020.1766409.
- Helderop, Edward, and Tony H. Grubesic. "Hurricane Storm Surge in Volusia County, Florida: Evidence of a Tipping Point for Infrastructure Damage." *Disasters* 43, no. 1 (January 2019): 157–80. https://doi.org/10.1111/disa.12296.
- Tesselaar, Max, W. J. Wouter Botzen, Toon Haer, Paul Hudson, Timothy Tiggeloven, and Jeroen C. J. H. Aerts. "Regional Inequalities in Flood Insurance Affordability and Uptake under Climate Change." *Sustainability* 12, no. 20 (October 21, 2020): 8734. https://doi.org/10.3390/su12208734.

6. With respect to the foregoing questions, FHFA invites interested parties to submit any studies, research, data, or other qualitative or quantitative information that supports a commenter's response or is otherwise relevant to the regulated entities' climate and natural disaster risk.

Because of the absence of a consolidated national climate hazards, risks, and impacts database that can provide searchable information for localities across the United States, in addition to the sources noted above, we suggest consulting the following peer-reviewed scientific articles and relevant reports to help illuminate the wealth of research available to inform climate risks:

- Christopher T. Emrich, Eric Tate, Sarah E. Larson, and Yao Zhou, "Measuring social equity in flood recovery funding," Environmental Hazards 19, no. 3 (2020): 228–250, https://doi.org/10.1080/17477891.2019.1675578
- Congressional Budget Office, "Expected Costs of Damage from Hurricane Winds and Storm-Related Flooding," 10 April 2019, https://www.cbo.gov/publication/55019.
- Doran, Kelly M., Ryan P. McCormack, Eileen L. Johns, Brendan G. Carr, Silas W. Smith, Lewis R. Goldfrank, and David C. Lee. "Emergency Department Visits for Homelessness or Inadequate Housing in New York City before and after Hurricane Sandy." *Journal of Urban Health* 93, no. 2 (April 2016): 331–44. https://doi.org/10.1007/s11524-016-0035-z.
- Junia Howell and James R. Elliott, "Damages Done: The Longitudinal Impacts of Natural Hazards on Wealth Inequality in the United States," Social Problems 66, no. 3 (August 2019): Pages 448–467, https://doi.org/10.1093/socpro/spy016.

- Kevin T. Smiley, "Social inequalities in flooding inside and outside of floodplains during Hurricane Harvey," Environmental Research Letters 15, no. 9 (September 2020): 0940b3, https://iopscience.iop.org/article/10.1088/1748-9326/aba0fe.
- Lily Katz, "Nearly Half of Americans Who Plan to Move Say Natural Disasters, Extreme Temperatures Factored Into Their Decision to Relocate: Survey," Redfin, 5 April 2021, https://www.redfin.com/news/climate-change-migration-survey/.
- Malik, Sidrah, David C. Lee, Kelly M. Doran, Corita R. Grudzen, Justin Worthing, Ian Portelli, Lewis R. Goldfrank, and Silas W. Smith. "Vulnerability of Older Adults in Disasters: Emergency Department Utilization by Geriatric Patients After Hurricane Sandy." *Disaster Medicine and Public Health Preparedness* 12, no. 2 (April 2018): 184–93. https://doi.org/10.1017/dmp.2017.44.
- Michael Neal and Alanna McCargo, "How Economic Crises and Sudden Disasters Increase Racial Disparities in Homeownership," The Urban Institute, June 2020, https://www.urban.org/sites/default/files/publication/102320/how-economic-crises-and-sudden-disasters-increase-racial-disparities-in-homeownership.pdf
- Peacock, Walter Gillis, Shannon Van Zandt, Yang Zhang, and Wesley E. Highfield. "Inequities in Long-Term Housing Recovery After Disasters." *Journal of the American Planning Association* 80, no. 4 (October 2, 2014): 356–71. https://doi.org/10.1080/01944363.2014.980440.
- Rumbach, Andrew, Esther Sullivan, and Carrie Makarewicz. "Mobile Home Parks and Disasters: Understanding Risk to the Third Housing Type in the United States." *Natural Hazards Review* 21, no. 2 (May 2020): 05020001. https://doi.org/10.1061/(ASCE)NH.1527-6996.0000357.
- Sieren Ernst and Laurie Johnson, "FEMA, Flooding, and Household Finances in Horry County, South Carolina," The Climate Cost Project, 6 April 2021, https://b16163f2-d1aa-48b2-860d-f7ba181b24c2.filesusr.com/ugd/738ff5_7b7654f9ed384787b1f4203a2a43dd0e.pdf.
- Stephen B. Billings, Emily Gallagher, and Lowell Ricketts, "Let the Rich Be Flooded: The Distribution of Financial Aid and Distress after Hurricane Harvey," 30 May 2019, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3396611.
- Caroline Ratcliffe, et al., "Insult to Injury: Natural Disasters and Residents' Financial Health," The Urban Institute, April 2019, https://www.urban.org/research/publication/insult-injury-natural-disasters-and-residents-financial-health.

II. Enhancing FHFA's Supervisory and Regulatory Framework

7. How should FHFA evaluate the adequacy of a regulated entity's ability to assess and manage the impacts of climate and natural disaster risk, particularly in light of the significant uncertainties and data limitations?

It is important to recognize that the climate science and forecasts have been quite accurate so far and data and modeling of physical risk are already becoming quite robust. Specifically, published research indicates that, climate model simulations published between 1970 and 2007 were skillful in projecting future global mean surface warming. Most climate models examined in a 2020 study showed warming consistent with observations.[13] That does not mean there are not

[13] Zeke Hausfather, Henri F. Drake, Tristan Abbott, and Gavin A. Schmidt, "Evaluating the Performance of Past Climate Model Projections," Geophysical Research Letters 47, no. 1 (2020): e2019GL085378. https://doi.org/10.1029/2019GL085378.

gaps to fill and models to strengthen, especially in better understanding climate impacts at a more local scale.

FHFA and its regulated entities should use their best available data, while recognizing its limitations. Imperfect information is not a reason not to act.

14. Are there alternative risk mitigation strategies, including but not limited to insurance or insurance-based financial instruments, that could transfer risk from the regulated entities' portfolios or products or assist with the market pricing of climate and natural disaster risks?

Market Pricing

Current and prospective homeowners often have minimal access to information about their flood risk. More than one-third of states have no statutory or regulatory requirement that a seller must disclose a property's flood risks or past flood damages to a potential buyer.[14] The other states have varying degrees of disclosure requirements.[15] This hodgepodge of state and local policies, coupled with insufficient access to flood risk information from the National Flood Insurance Program (NFIP), distorts market signals and hinders fully informed decision-making about how to avoid or mitigate flood damage.

The NFIP is the nation's primary policy mechanism for addressing flooding and the management of low-lying areas that are most vulnerable to flooding and sea level rise. As such, the NFIP should do more than to simply help homeowners quickly rebuild after a flood—the program must also ensure that all homeowners and home buyers have a right to know a property's flood history and future risk.

While we recognize that the NFIP was created by Congress and is administered by FEMA, flood risk is an important component of home mortgage risk. Therefore, FHFA, by reason of its role in regulating the home mortgage market, has a strong interest in the NFIP and it should weigh in on how the program should be reformed.

FHFA should work with FEMA to advocate for reform of the NFIP as potential risk mitigation strategy that could assist with the market pricing of climate and disaster risks.

As a primary reform, the NFIP should provide greater access to flood risk data the program collects and should require state-level real estate disclosure laws concerning flooding to participate in the program. The following should be a part of the NFIP:

- "Homeowner Right-to-Know" provisions that would grant current homeowners, regardless of whether they purchase NFIP insurance, their property's flood history;
- "Public Right-to-Know" provision requiring FEMA to create a public, open-data system to share information related to a community or region's flood risk, such as current and historical policy information, the total number of multiple-loss properties in a community, and whether a community was in compliance with the NFIP; and

[14] NRDC, *How States Stack Up on Flood Disclosure* (Mar. 2021) *available at* https://www.nrdc.org/flood-disclosure-map

[15] *Id.*

- Enactment of real estate disclosure requirements concerning past flood damages, mandatory flood insurance coverage, and location in a flood-hazard zone. "Market efficiency may be improved by enhancing communication of climate risk to buyers, for instance through stricter real estate disclosure laws or by directly communicating flood risk information to buyers early in their search process." [16]

As secondary reform, the NFIP should provide more accurate and forward-looking flood maps. Flood maps are the baseline for all building and zoning ordinances adopted by 22,000+ communities in the United States. They are used by government officials, developers, and planners to decide where it is safe to build. Therefore, flood maps must not only be accurate and up to date, but must also depict future conditions, like sea level rise, if sound development decisions are to be made.

As a third reform, the NFIP should continue to move towards full risk-based rates. Full risk-based rates are essential for informing homeowners of their true flood risk. Insurance premiums based on risk "provide individuals with accurate signals to the degree of hazard they face."[17] Further, risk-based premiums encourage policyholders to invest in measures to reduce their flood vulnerability, which can reduce their premium.[18]

However, a transition to full risk-based rates raises equity concerns. As policy premiums transition to full-risk based rates, low-to-moderate income households could be "priced out," choosing either to continue to forgo coverage or drop existing coverage if the cost becomes too burdensome. As such, the NFIP must have a means-tested affordability mechanism to help low-to-moderate homeowners and renters purchase insurance, coupled with providing those households greater access to mitigation assistance (see below for further details).

Hazard Mitigation

Hazard mitigation is an important strategy in reducing flood damage. Some examples of incentive programs to encourage—and subsidize—property owner installation of protective measures are as follows:

- The North Carolina Insurance Underwriting Association (NCIUA), which acts as a residential insurance "market of last resort" under state law, began offering proactive roof replacement grants to policyholders in 2019. Under its Strengthen Your Roof program, NCIUA provides up to $6,000 dollars to eligible coastal policyholders to replace their home's roof with one that meets the Insurance Institute for Business & Home Safety (IBHS) FORTIFIED Roof™ standards. NCIUA determined it was financially worthwhile to pay up front for hurricane-resistant roofs on its highest-risk properties. This pilot program is now in its third year and NCIUA is planning to expand it to other areas across

[16] Miyuki Hino and Marshall Burke, *Does Information About Climate Risk Affect Property Values,* National Bureau of Economic Research, pg. 13 (2020)

[17] Howard Kunreuther, *Reauthorizing the National Flood Insurance Program,* Wharton Risk Management and Decision Process Center (March 2018) *available at* https://riskcenter.wharton.upenn.edu/resilience-lab-notes/reauthorizing-national-flood-insurance-program/.

[18] Carolyn Kousky and Howard Kunreuther, *Addressing Affordabiity in the National Flood Insurance Program,* 1 (Aug. 2013)

the state.[19] The South Carolina[20] and Alabama[21] state departments of insurance have similar roof retrofit programs.

- State programs also exist to mitigate risk from other non-weather hazards. For example, the California Earthquake Authority (CEA) offers eligible homeowners grants of up to $3,000 for household seismic retrofits (bracing and bolting a house to its foundation, to make it more resistant to earthquakes). Properly retrofitted homes are offered a premium discount of up to 25%, though homeowners in certain locations do not need to be CEA policyholders to be eligible for the incentive program.[22]

As part of its role in regulating the home mortgage market, FHFA may be in a position to encourage the initiation of similar programs.

In addition, FHFA may be in a position to encourage FEMA to amend the NFIP's minimum building and land use standards. The NFIP is the nation's primary mechanism for addressing the flood-related impacts of climate change. Participating communities must adopt minimum building and land-use standards established by FEMA in order for residents to purchase insurance.

FEMA—as the sole administrator of the NFIP—has the authority to issue and/or amend the NFIP-implementing regulations to develop minimum building and land-use criteria for flood-prone areas.

However, FEMA has not comprehensively amended the standards for building and land-use in flood-prone areas since the early 1970's. As such, not only are the standards ill-equipped to address the floods of today—modern model building codes exceed FEMA's requirements—the standards are also wholly insufficient to prepare communities for the impacts of climate change.

Smart policy and the law both mandate that FEMA revise the NFIP-implementing regulations to adequately account for the increasing risk of flooding due to climate change. Safer and stronger construction and land-use standards—and adequately mapping future conditions—provide communities the opportunity to anticipate and reduce flood risk, saving lives and protecting property.

FHFA should request that FEMA:

- require all new or substantially improved structures to be elevated higher than the 100-year flood to better reduce flood damages in the face of extreme weather events and short-term effects of sea level rise; and

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[19] NCIUA, "Strengthen Your Roof: NCIUA Pilot Program to Build Better Beach Communities," https://strengthenyourroof.com/Home/Index.

[20] South Carolina Department of Insurance, "SC Safe Home Mitigation Grant Program," https://doi.sc.gov/605/SC-Safe-Home#:~:text=About%20the%20South%20Carolina%20Safe,hurricane%20and%20high%2Dwind%20damage.

[21] Alabama Department of Insurance, "Strengthen Alabama Homes," https://strengthenalabamahomes.com/

[22] CEA, "Brace and Bolt Grants," https://www.earthquakeauthority.com/Prepare-Your-House-Earthquake-Risk/Brace-and-Bolt-Grants, https://www.earthquakeauthority.com/Prepare-Your-House-Earthquake-Risk/Brace-and-Bolt-Grants.

- help more homeowners retrofit their homes to meet the growing threat of climate-related flooding by increasing the amount of Increased Cost of Compliance (ICC) funding and broadening the acceptable mitigation activities ICC may fund.

18. Policies to manage climate and natural disaster risk could increase the cost of housing, making it more difficult for lower income households in some areas to obtain affordable housing. Are there policies the regulated entities could pursue to mitigate such adverse effects for lower income households in vulnerable areas without undermining efforts to manage climate and natural disaster risk?

Communities most adversely impacted by climate and disaster impacts are predominately lower-income and communities of color. Housing costs in disaster prone zones need to remain stable and affordable pre-and post-disaster. This is especially important for subsidized and government-assisted housing and communities with naturally occurring affordable housing. Addressing the post-disaster recovery and challenge of what to do with the Fannie and Freddie held mortgages is a significant issue.

Because of this, we encourage FHFA to consider the costs, timing and partnerships needed to ensure that lower income households are still able to obtain affordable housing. FHFA needs to price the risk appropriately so that no one person or entity is left with properties too costly to insure or without value to the holder. FHFA needs to assess a phased approach. Partnering with other federal agencies such as FEMA and HUD on aligned programs will aid to alleviate future housing cost burdens on returning households.

For example, a study in the *Journal of the American Planning Association*, "Affordable Housing, Disasters, and Social Equity: LIHTC as a Tool for Preparedness and Recovery," evaluated how states are using the Low Income Housing Tax Credit (LIHTC) for disaster preparedness, hazard mitigation, and recovery efforts. Of the 53 territories and states evaluated, they found only 24 prioritized disaster preparedness and recovery in LIHTC qualified allocation plans (QAPs). States with higher home ownership rates, lower home values, and lower rents were more likely to have disaster-related provisions. While most states often targeted LIHTC funds for relief following a disaster, having the explicit provisions in the QAP made the distribution more likely. FHFA should advocate for requiring that the provision be explicit in QAPs so that LIHTC is available to support single family and multifamily projects following a disaster FHFA should also consider advocating for a requirement that LIHTC be prioritized for disaster areas to support new projects adjacent to and in close proximity but not in vulnerable zones for displaced residents. These mitigation and preparedness provisions would encourage or require developers to site projects in areas less likely to be affected by disasters, or to incorporate design features that would reduce vulnerability.

FHFA should encourage state partnerships to support disaster recovery housing construction. As an example, the Colorado Division of Housing (DOH) and the Colorado Housing and Finance Authority (CHFA) provided a joint 4% LIHTC/State LIHTC/CDBG-DR (Disaster Recovery) funding round to support flood recovery efforts. To be eligible for State LIHTC, the applicant was required to hold a public hearing prior to submitting an application. A local government contribution to the project was also required. State LIHTC applications for projects in designated disaster areas had to demonstrate eligibility for CDBG-DR funds and submit applications for CDBG-DR funds. State LIHTC awards for these projects were conditioned upon the receipt of an award of CDBG-DR funds.

When considering the approach of no new housing in climate and disaster-prone zones, FHFA must adopt a process for sensitive and thoughtful assessments of where to support new single family and multi-family housing. Household proximity and access to employment, housing, social services, medical care and family must be taken into account. Community context, history, culture, and a legacy of generational trauma from climate and disaster impacts should be considered. Assessing the human impact is as equally important as the financial risk.

For existing homes, a policy proposal that would require additional study (and is referenced in the response to Question 21 below) is to assist low- to moderate-income homeowners (for example forbearance on loan payments) during the lengthy waiting period for federally funded voluntary home buyouts after a catastrophic event that is likely to occur again the future, like flooding in a flood-prone area. If a home is uninhabitable during this time, low to moderate income homeowners with a mortgage may not be able to afford to continue to make payments on their loan, causing homeowners to either walk away from their homes (leading to foreclosure) or repair their home (likely using funds from the federal flood insurance program—despite the fact that the home is very likely to flood again and cause a repeat of the damage and the flood insurance coverage that the buyout is attempting to avoid). Working with FEMA and other disaster related agencies, FHFA's regulated entities could create a program to assist homeowners during the processing and decision-making process for the federally funded voluntary home buyouts.

19. Minority borrowers exhibit higher rates of delinquencies for longer durations following natural disasters. Are there policies the regulated entities could pursue to mitigate such adverse effects for minority borrowers exposed to climate and natural disaster risk?

Households and communities struggling financially before disasters strike are often the hardest hit by the disaster because disasters often lead to substantial, negative impacts on financial health.[23] Lower income households typically do not have sufficient liquid assets to fund the necessary repairs and recovery. Even for those receiving federal assistance post-disaster, important financial needs may remain unmet.[24] Often, there can be a mismatch between when households are impacted by a disaster and when aid is provided. Federal disaster aid is an uncertain source of recovery funds because it is often limited and delayed.[25]

Access to disaster insurance can help address this issue as insurance is a mechanism through which individuals can rapidly fund rebuilding and recovery. People with insurance recover more quickly and fully than those without insurance.[26] However, not all insurance policies are the same. There is a substantial insurance gap in the United States, particularly concerning flood risk.

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[23] Caroline Ratcliffe, William J. Congdon, et al., "Insult to Injury: Natural Disasters and Residents' Financial Health," The Urban Institute, April 2019, https://www.urban.org/research/publication/insult-injury-natural-disasters-and-residents-financial-health.

[24] Id.

[25] Carolyn Kousky and Helen Wiley, "The Role of Insurance in Coastal Adaptation: Workshop Findings," Wharton Risk Management and Decision Processes Center, March 2020, https://riskcenter.wharton.upenn.edu/wp-content/uploads/2020/03/The-Role-of-Insurance-in-Coastal-Adaptation-Workshop-Findings.pdf

[26] See, id. at 2

Affordable Flood Insurance

Climate change is exacerbating flood risk in many coastal and riverine communities. Federal flood insurance provides some financial resiliency but can be cost prohibitive for low-income families.

Per a 2018 report, low-income households are less likely to purchase flood insurance than higher-income households, even though low-income families are more likely to live in high-risk flood zones.[27] The report found that more than 50 percent of households located in the 100-year floodplain that lack NFIP insurance coverage are considered low-income. However, only 26 percent of households located in the 100-year floodplain that have NFIP insurance coverage are considered low-income. Further, the median income of households without flood insurance is only $40,000, slightly more than half that of households located in the 100-year floodplain that have flood insurance.

In comparison, only 41 percent of non-policy holders outside the 100-year floodplain are low-income, with a median income of $56,000. Such findings indicate that homeowners with a lower median income tend to live in higher risk flood areas. With the average policy costing $1098 per year, those that can least afford to pay for flood insurance also can least afford to be without it given their high level of risk.

FEMA has proposed three different ways to assist low-income households purchase flood insurance. One would provide subsidies based on income level. For example, if a homeowner had an income below the Area Median Income (AMI), they could receive a certain percentage off their flood risk policy. Another is to directly link household income to the price of the insurance policy. The homeowner would pay up to a certain cap and then FEMA would cover the rest. The third would consider a household's cost burden, including mortgage, taxes, and insurance and would provide assistance when that burden rose above a certain percentage of the household's income. Under all three proposals, FEMA would inform the policyholders of the full-risk price for the insurance policy to more clearly communicate the risk of flooding, one of the major shortcomings of the current way FEMA provides insurance discounts.

The FHFA should work with FEMA to create a means-tested option for low-to-moderate income policyholders to purchase flood insurance. People with insurance recover more quickly and fully than those without insurance. Insurance not only can help repair a damaged home but can provide non-financial benefits, such as multiplier effects when households are able to rebuild quickly, limiting economic disruption in the community. In addition, federal disaster aid is usually insufficient and delayed, which leaves many low-income families struggling post-flood. These limitations of federal disaster aid highlight the importance of insurance for recovery of low-income families.

However, the FHFA should ensure that such assistance is coupled with greater access to mitigation assistance to reduce flood risk. Thus, a low-income household should not only be able to obtain affordable coverage, but should also be able to reduce their risk of flooding in the first place. Providing greater mitigation assistance, such as near zero interest loans or grants to

[27] Federal Emergency Management Agency, *An Affordability Framework for the National Flood Insurance Program* (April 2018) *available at* https://www.fema.gov/sites/default/files/2020-05/Affordability_april_2018.pdf

fund mitigation actions, in addition to more affordable insurance premiums, is an equitable way to assist low-income households. Reducing a home's exposure to flooding will not only better protect people and property, but could also reduce the FHFA's financial exposure.

Parametric Microinsurance

Beyond flood-related disasters, lower income households are often underinsured for other disasters as indemnity-based disaster policies can be too expensive in many areas of the United States.[28] As an alternative, parametric microinsurance can be a potential tool to help improve the financial resilience of lower income households. Parametric insurance, unlike indemnity insurance, pays out a pre-determined amount based on observable measures of the disaster, such as wind speed in a certain geographic location. Given that the loss-adjustment process required for indemnity insurance is not needed for parametric policies, the transaction costs are much lower, opening an ability to provide lower limit insurance policies for which premium revenue would otherwise be insufficient to cover expenses.[29]

Parametric microinsurance products are in their infancy in the United States,[30] and must be designed to comply with differing state level insurance laws.[31] However, allowing parametric microinsurance for disasters will create new alternatives for affordable coverage. Quick access to funds from a low-cost insurance product could help strengthen the financial resilience of many vulnerable households. Because disaster event risk is a significant component of home mortgage risk, FHFA, as part of its role in regulating the home mortgage market, may be in a position to advocate for parametric microinsurance products. For example, FHFA should partner with the Federal Insurance Office to work with state regulators to examine the potential for selling parametric microinsurance products.

21. What specific issues or topics should FHFA consider for future research on climate and natural disaster risk to the regulated entities and the national housing finance markets?

Relevant topics for future research include:

- Climate risk for different, specific geographical locations (for example, what is the relative wildfire risk or coastal flooding risk in different locations) and impact on home values
- Resilience measures that homeowners could build into their houses, cost/benefit analysis of these measures, and mortgage performance improvements due to averted loss resulting from resilience measures
- In federally funded voluntary home buyout programs (for homes where catastrophic events are likely to recur), how to help homeowners contend with substantial delay in

[28] Carolyn Kousky, Helen Wiley, and Len Shaban, "Can Parametric Microinsurance Improve the Financial Resilience of Low-Income Households in the United States," Wharton Risk Management and Decision Processes Center, pg. 2-3 (Sept. 2020), https://riskcenter.wharton.upenn.edu/wp-content/uploads/2021/01/Proof-of-Concept-report-2020.pdf

[29] See, id. at 3

[30] Id. at 10 (discussing Puerto Rico's introduction of new regulations for parametric microinsurance for catastrophes).

[31] Id.

payment, as mentioned in response to Question 18 above. FHFA could study the possibilities for a program pausing mortgage payments for homes during the lengthy waiting period for federally funded voluntary home buyouts. Study aspects could include effects on participation/attrition in buyout programs, the resulting financial impacts for federal disaster/hazard mitigation funding programs and the federal government as a whole, impacts on foreclosure rates after disasters, and planning benefits for state/local governments implementing buyout programs
- Effects of climate risk on marginalized communities, including communities of color
- Comprehensive examination of the housing market's vulnerability to climate change

Some of this work could be in collaboration with FSOC and OFR, as it relates to risks to the entire financial system and economy.

22. What data or housing market information would be beneficial for FHFA to make available, to the extent permitted by privacy considerations, to researchers and other interested parties to support the assessment of climate and natural disaster risk to the regulated entities or the national housing finance markets?

Better information on uninsured flood risk, private flood insurance policies, and flood insurance uptake inside and outside of the mapped Special Flood Hazard Area (SFHA) (the NFIP mandatory purchase area) would provide researchers with a more comprehensive picture of flood risk and damages. Most publicly available data on flood damages comes from the NFIP and many conclusions about residential flood risk rest on this information. However, there are only about 5 million NFIP policies, compared to FEMA's classification of 8.7 million properties in the Special Flood Hazard Area (and the First Street Foundation's independent estimate of 14.6 million households at a similar level of risk).[32] Especially in the case of inland flood disasters, affected residents are often uninsured. For example, in the devastating South Carolina floods of October 2015, counties with a federal disaster declaration had an average NFIP penetration rate of only 5%.[33] The following reports point out data gaps in flood insurance data:

- Lloyd Dixon, Noreen Clancy, Seth A. Seabury, and Adrian Overton, "Evaluating National Flood Insurance," RAND Research Brief RB-9176-FEMA, 2006, https://www.rand.org/pubs/research_briefs/RB9176.html
- National Academies of Sciences, Engineering, and Medicine, "Affordability of National Flood Insurance Program Premiums: Report 2," The National Academies Press, 2016, https://doi.org/10.17226/21848.

24. Are there existing or potential government agencies or programs that FHFA could partner with to enhance the Agency's supervision and regulation of climate and natural disaster risk to the regulated entities?

The Federal Reserve System should be a key partner in view of your joint roles on FSOC to consider macroprudential risks. We also note that it is the largest current buyer of agency-backed mortgages, another reason for close coordination.

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[32] First Street Foundation, "First Street Foundation Mission: National Risk Overview," https://firststreet.org/mission/

[33] Diane P. Horn, "Closing the Flood Insurance Gap," Congressional Research Service, IN10890, November 26, 2019, https://crsreports.congress.gov/product/pdf/IN/IN10890

As a member of FSOC, FHFA (through FSOC) should also work with the Department of the Treasury's Office of Financial Research on a comprehensive examination of the housing market's vulnerability to climate change.

Agencies that administer disaster aid and/or hazard mitigation funding programs, including FEMA, HUD, and SBA, are key sources of information on risk to the built environment and potential partners in addressing these issues.

Thank you for the opportunity to submit these comments.

Very truly yours,

Natural Resources Defense Council