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January 27, 2022

The Pew Charitable Trusts  
Responses to Selected Questions

**Re: Docket ID FEMA-2021-0024**

**Question 2:**

*The elevation of structures above expected base flood levels, called “freeboard,” is an important precept of floodplain management. “Freeboard” is usually expressed in feet above a base flood elevation for purposes of floodplain management. NFIP communities must require new, “substantially improved,” or “substantially damaged” structures in the SFHA to be elevated to the height of the one percent annual chance flood level, also referred to as the Base Flood Elevation or BFE. Some States and communities require newly constructed buildings to be built higher than the base flood elevation to further reduce the risk of flood damage with freeboard requirements set to a specific height to provide the additional margin of risk reduction above the BFE. The NFIP has strongly encouraged but not required higher elevation standards, such as those included in the I-Codes and ASCE 24. Should FEMA update flood elevation requirements for SFHAs by setting higher freeboard levels? If so, what should FEMA consider for the higher elevation levels for freeboard? What data exists to support higher elevation levels for freeboard or methods that provide a more consistent level of protection? Will freeboard elevation generally raise the market value of properties in SFHAs and if so how would the increase in market value compare to the cost of elevation? Are there other technology advancements or building standards in design and construction that should be considered beyond freeboard levels? If so, do they address other floodplain management criteria (e.g., reasonably safe from flooding; adequately anchored; methods and practices that minimize or are resistant to flood damage; water load values; wind load values; substantially impermeable)?*

When it is not possible to avoid building and rebuilding in at-risk areas, such as the Special Flood Hazard Area (SFHA), incorporating elevation into the design and construction of structures can provide an increased margin of safety. However, FEMA currently only requires that communities participating in the National Flood Insurance Program (NFIP) assure the elevation of new, “substantially improved,” or “substantially damaged” structures to the height of the Base Flood Elevation (BFE). As demonstrated by flood experience and documented in multiple post-storm reviews<sup>1</sup>, this approach has proven inadequate.

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<sup>1</sup> See, for example, Federal Emergency Management Agency, “Elevating Floodprone Buildings Above Minimum NFIP Requirements,” April 2017, [https://www.fema.gov/sites/default/files/2020-07/elevating-flood-prone-buildings\\_iowa-floods-2016.pdf](https://www.fema.gov/sites/default/files/2020-07/elevating-flood-prone-buildings_iowa-floods-2016.pdf); Federal Emergency Management Agency, Mitigation Assessment Team Report, “Hurricane Ike in Texas and Louisiana: Building Performance Observations, Recommendations, and Technical Guidance,” April 2009, <https://www.fema.gov/sites/default/files/2020-08/fema757.pdf>; Federal Emergency Management Agency, Mitigation

Representing the expected elevation of surface water resulting from a flood with a 1% chance of being equaled or exceeded in any given year, the BFE is an imprecise indicator of risk. As FEMA mapping experts know, the level of precision possible for determining both the 1%-annual-chance-flood and its associated BFE can be limited by inherent uncertainties in the available data. Reliance on historical records, sensitivities of the models, the capacity of permit reviewers tasked with assessing and tracking development changes within a mapped flood zone, and the underlying assumption of stationarity all contribute to the ranges of uncertainty. Therefore, while the BFE offers a useful general assessment of relative risk, it should not be taken as a clear demarcation of safe versus unsafe.

Using the magnitude of 100-year floods to determine the BFE can also provide a false sense of safety. Those living in a 100-year floodplain have a 26% chance of experiencing a major flood at least once over a 30-year period, or the typical duration of a mortgage.<sup>2</sup> The reality that these seemingly rare events can occur multiple times in a matter of years is being felt by communities across the country.<sup>3</sup> For example, Harris County, Texas reportedly experienced three 500-year floods from 2015 to 2017. In Ellicott City, Maryland, reported 1,000-year floods occurred in 2016 and again in 2018.<sup>4</sup>

Given these issues and the dynamic nature of flood risk, **Pew recommends that FEMA add a factor of safety to its minimum elevation requirements by mandating freeboard, at a minimum for structures located in the horizontal extent of the SFHA.** Doing so will help communities utilize one of the most effective approaches to reducing flood losses in high-risk areas. This approach has already been adopted in multiple jurisdictions across the country.

According to FEMA, the nation benefits from nearly \$500 million in average avoided losses each year due to structures within floodplains being built with freeboard.<sup>5</sup> At the local level, FEMA’s analysis of the 2013 floods in Colorado, for example, estimated that losses incurred by Boulder County would have increased by 331%, or an additional \$1.5 billion, had the county had not adopted freeboard. The analysis also showed that losses could have been decreased by 70% if freeboard had been increased by 2 feet in Boulder, Larimer, and Weld counties.<sup>6</sup> The National Institute of Building Sciences (NIBS) estimates a 6:1 Benefit-Cost Ratio (BCR) for constructing new buildings to meet 2018 I-Code standards with respect

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Assessment Team Report, “Hurricane Irma in Florida: Building Performance Observations, Recommendations, and Technical Guidance,” December 2018, [https://www.fema.gov/sites/default/files/2020-07/mat-report\\_hurricane-irma\\_florida.pdf](https://www.fema.gov/sites/default/files/2020-07/mat-report_hurricane-irma_florida.pdf); Federal Emergency Management Agency, Mitigation Assessment Team Report, “Hurricane Michael in Florida: Building Performance Observations, Recommendations, and Technical Guidance,” February 2020, [https://www.fema.gov/sites/default/files/2020-07/mat-report\\_hurricane-michael\\_florida.pdf](https://www.fema.gov/sites/default/files/2020-07/mat-report_hurricane-michael_florida.pdf)

<sup>2</sup> United States Geological Survey, “100-Year Flood—It’s All About Chance,” April 2010, <https://pubs.usgs.gov/gip/106/pdf/100-year-flood-handout-042610.pdf>

<sup>3</sup> The Washington Post, “Houston is Experiencing its Third ‘500-year’ Flood in 3 Years. How is that Possible?” Accessed January 27, 2022, <https://www.washingtonpost.com/news/wonk/wp/2017/08/29/houston-is-experiencing-its-third-500-year-flood-in-3-years-how-is-that-possible/>

<sup>4</sup> National Weather Service, Hydrometeorological Design Studies Center Annual Exceedance Probability, Exceedance Probability Analysis for Selected Storm Events, Accessed January 27, 2022, [https://www.weather.gov/owp/hdsc\\_aep](https://www.weather.gov/owp/hdsc_aep)

<sup>5</sup> Federal Emergency Management Agency, “Building Codes Save: A Nationwide Study,” November 2020, [https://www.fema.gov/sites/default/files/2020-11/fema\\_building-codes-save\\_study.pdf](https://www.fema.gov/sites/default/files/2020-11/fema_building-codes-save_study.pdf)

<sup>6</sup> Federal Emergency Management Agency, “Reducing Losses Through Higher Regulatory Standards: A Study of the 2013 Colorado Floods,” March 2015, <https://coloradohazardmapping.com/File/5ab457d3-2ced-433b-b7f0-a64bb7b1310d>

to riverine flooding. According to NIBS, BCR for constructing new buildings in coastal V-zones with 2-feet of freeboard ranged from 6.7:1 to 31.1:1 across Atlantic and Gulf Coast states.<sup>7</sup>

What's more, the typical upfront costs associated with freeboard can be modest when constructing new homes, spread out over time through financing options and often recaptured in a matter of years through reductions in flood insurance premiums. As noted by FEMA,

*...adding 2 feet of freeboard to a new home might add \$20 a month to the mortgage payment, or \$240 per year. The resulting flood insurance savings could be more than \$1,000 a year for a building in Zone AE (for instance, in a riverine flood zone not affected by wave action) and \$2,000 a year in Zone VE.*<sup>8</sup>

Once elevation costs are recouped homeowners that maintain flood insurance stand to benefit from long-term savings due to continued discounts on their premiums.

Appreciating the need for and value-add of increased margins of safety with respect to flooding, numerous states and communities have adopted freeboard. According to the Association of State Floodplain Managers (ASFPM), Indiana, Montana, New York, and Wisconsin require at least 2 feet of freeboard for all construction in the 100-year floodplain. At the local level, at least 190 communities participating in the NFIP that are outside of the states with freeboard requirements have at least 2 feet of freeboard for all construction in the 100-year floodplain, and more than 40 NFIP-participating communities require at least 3 feet of freeboard.<sup>9</sup>

As noted in FEMA's Request for Information, stronger elevation requirements are also incorporated in consensus-based I-Codes and standards. The International Code Council (ICC) included one foot of freeboard in the 2015 and 2018 editions of their International Residential Codes. The ICC's International Building Codes also require compliance with the American Society of Civil Engineers' flood-resistant design standards, which include varying levels of elevation ranging from the Design Flood Elevation, to 2-feet of freeboard, to the height of the 500-year flood based on a structure's flood design class.

While I-Codes offer an enhanced margin of safety compared to NFIP standards they do not account for future risk. The ramifications of this omission could be significant considering that most structures are designed to last decades. Encouragingly, ASCE recently launched a partnership with the National Oceanic and Atmospheric Administration and the University of Maryland to consider engineering codes and standards that account for climate change.<sup>10</sup>

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<sup>7</sup> National Institute of Building Sciences, "Natural Hazard Mitigation Saves: 2019 Report," December 2019, [https://www.nibs.org/files/pdfs/NIBS\\_MMC\\_MitigationSaves\\_2019.pdf](https://www.nibs.org/files/pdfs/NIBS_MMC_MitigationSaves_2019.pdf)

<sup>8</sup> Federal Emergency Management Agency, "Building Higher in Flood Zones: Freeboard – Reduce Your Risk, Reduce Your Premium," Accessed January 27, 2022, <https://www.cartercountync.gov/DocumentCenter/View/2238/Benefits-of-Freeboard>

<sup>9</sup> Natural Resources Defense Council, "Petition Requesting That The Federal Emergency Management Agency Amend Its Regulations Implementing the National Flood Insurance Program," January 5, 2021, <https://www.nrdc.org/sites/default/files/petition-fema-rulemaking-nfip-20210105.pdf>

<sup>10</sup> National Oceanic and Atmospheric Administration, "NOAA, University of Maryland, ASCE to advance climate-smart construction," November 3, 2021. <https://www.noaa.gov/news-release/noaa-university-of-maryland-asce-to-advance-climate-smart-construction>

Requiring communities participating in the NFIP to adopt freeboard could improve alignment with standards across FEMA programs and other federal agencies. For example, non-critical actions supported by FEMA’s Hazard Mitigation Assistance programs involving structure elevation, dry floodproofing, and mitigation reconstruction in the SFHA require a minimum of two feet of freeboard unless doing so would make a project unable to meet applicable program cost-effectiveness requirements.<sup>11</sup> The U.S. Department of Housing and Urban Development typically requires new residential construction and substantial improvements using Community Development Block Grant—Disaster Recovery funds be elevated 2 feet above the BFE. The Federal Housing Administration Office of Multifamily Housing has the same freeboard requirement for new construction projects in the 100-year floodplain.<sup>12</sup>

Considering these factors in aggregate, **Pew recommends FEMA take a layered approach to strengthening its elevation requirement for communities participating in the NFIP. At a minimum, all new, “substantially improved,” or “substantially repaired” structures located in the delineated SFHA, as well as other known flood-prone areas, should incorporate at least two feet of freeboard or levels of freeboard included in the latest edition of I-Codes, whichever is higher.** Given that flood risk can vary across regions, states, and even within communities, FEMA should assess variables such as geography, type and magnitude of flood risk, criticality of structures (see additional comments regarding critical facilities), and age of a community’s flood map to determine where freeboard requirements higher than 2 feet above the BFE may prove necessary. To provide a sufficient factor of safety over the design life of structures, Pew also recommends that FEMA phase-in future conditions requirements in addition to mandating minimum levels of freeboard (see response to Question 12).

### **Question 3:**

*FEMA has not developed higher minimum floodplain management standards for structures and facilities that perform critical actions as defined in 44 CFR 9.4. These structures and facilities must currently comply with the same minimum requirements as non-critical structures and facilities except for structures and facilities that are covered by Executive Order (E.O.) 11988, Floodplain Management. Should FEMA develop higher standards for these structures and facilities? If so, why? Should FEMA consider differences between certain structures and facilities, such as use, occupancy, operational size, or public and private operators in developing higher standards? Should FEMA consider differences such as use, occupancy, operational size, or public and private operators in developing higher standards for structures and facilities performing critical actions?*

Disaster events are traumatic and often leave families, business owners, and others in the community in a state of disarray – worried for both the immediate and long-term future. Damages and losses to hospitals, utilities, fire stations, and other critical services can pose serious risks to public safety, add to a community’s destabilization during a serious flood event, and often contribute to recovery delays. Yet, as

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<sup>11</sup> Federal Emergency Management Agency, “Partial Implementation of the Federal Flood Risk Management Standard for Hazard Mitigation Assistance Programs (Interim),” August 26, 2021, [https://www.fema.gov/sites/default/files/documents/fema\\_policy-fp-206-21-0003-partial-mplementation-ffrms-hma-programs-interim.pdf](https://www.fema.gov/sites/default/files/documents/fema_policy-fp-206-21-0003-partial-mplementation-ffrms-hma-programs-interim.pdf)

<sup>12</sup> U.S. Department of Housing and Urban Development, “Climate Adaptation Plan,” September 2021, <https://www.sustainability.gov/pdfs/hud-2021-cap.pdf>

this question indicates, there are currently no special floodplain requirements related to critical facilities.<sup>13</sup> There should be.

**Pew supports new rules to require that states and communities identify their own critical facilities and impose additional protections for such facilities beyond those for ordinary residential and commercial structures.** The objective of such requirements would be to assure not simply the protection of the structures themselves, but also maintaining the function or rapid resumption of essential services and community “lifelines.” While it may not be feasible to prevent all possible disruptions due to flooding, new safeguards should, at a minimum, be written to avoid catastrophic situations, such as chemical explosions or loss of life involving hospital patients or others with limited mobility.

Appropriate safeguards may include, not only prohibiting construction of certain new critical facilities in flood-prone areas but also employing larger margins of safety with additional freeboard standards, incorporating redundancies for power and other critical utilities in some cases, and assuring dry land access for certain facilities, such as hospitals and medical centers.

For purposes of disaster recovery programs, FEMA has long used what we believe is a reasonably flexible definition of critical action. Under 44 CFR 9.4, critical action “means an action for which even a slight chance of flooding is too great.” The language of this Stafford Act rule is clear in pointing out the importance of any decisions to “create or extend the useful life” of a variety of critical community facilities, including those that may release harmful materials, generating plants and utilities, emergency operations centers, and facilities such as hospitals and nursing homes.

We recommend that FEMA retain this somewhat broad definition in the context of the floodplain management rules but consider calling on participating communities to refine it further, as necessary.

Approaches already adopted by some localities should be considered for inclusion in the Part 60 rules. For example, the Telluride, Colorado ordinance<sup>14</sup> defines a critical facility as “... a structure or other improvement that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired.” The ordinance further classifies these into four categories: essential services, hazardous materials, at-risk populations, and vital to restoring normal services; it goes on to specify protections that apply across the board and uniquely to certain facilities.

Numerous other communities, such as Clark County, Washington,<sup>15</sup> Fort Collins, Colorado,<sup>16</sup> Belle Plaine, Minnesota,<sup>17</sup> and Rising Sun, Arcadia, and Burns Harbor, Indiana,<sup>18</sup> just to name a few, have adopted enhanced safeguards for critical facilities, often with provisions for clear siting restrictions as well as additional freeboard or other floodproofing requirements, and/or additional stipulations regarding

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<sup>13</sup> While the Community Rating System promotes voluntary flood protection for critical facilities to keep them out of the 500-year floodplain or otherwise protect the facilities to that level, the NFIP rules themselves do not require these added precautions.

<sup>14</sup> <https://telluride.municipal.codes/LUC/8-634>

<sup>15</sup> <https://clark.wa.gov/sites/default/files/dept/files/community-development/dev-engineering/Flood-Plain-Review.pdf>

<sup>16</sup> Fort Collins, Colorado – Municipal Code, Chapter 10 – Flood Prevention and Protection, [https://library.municode.com/co/fort\\_collins/codes/municipal\\_code?nodeId=CH10FLPRPR](https://library.municode.com/co/fort_collins/codes/municipal_code?nodeId=CH10FLPRPR)

<sup>17</sup> Belle Plaine, MN, City Code: 1105.06 – Floodplain districts, <https://www.belleplainemn.com/city-code>

<sup>18</sup> Rising Sun, IN Code of Ordinances: S 151.33 Critical Facility:

[https://codelibrary.amlegal.com/codes/risingsun/latest/risingsun\\_in/0-0-0-4820](https://codelibrary.amlegal.com/codes/risingsun/latest/risingsun_in/0-0-0-4820); Arcadia, IN Code of Ordinances: S 154.28 Critical Facilities: [https://codelibrary.amlegal.com/codes/arcadia/latest/arcadia\\_in/0-0-0-4476](https://codelibrary.amlegal.com/codes/arcadia/latest/arcadia_in/0-0-0-4476); Town of Burns Harbor, Indiana, Town Code: Chapter 4 – Building Code, November 2015, <https://burnsharbor-in.gov/155/Town-Code>



utility protection or redundancy of electrical or mechanical systems or water supply, and standards addressing facility access.

Again, we believe far broader application of similar measures is appropriate and will help avert the catastrophic and cascading impacts that can occur when hospitals, retirement homes, emergency shelters, fire stations, and other facilities must be evacuated and when essential water, sewer, and electrical services are rendered inoperable.

#### **Question 5:**

*In the past 30 years, 1 of every 6 dollars paid out in NFIP claims has gone to a building with a history of multiple floods. What steps should FEMA take to reduce the disproportionate financial impact the multiple loss properties have on the NFIP? Should FEMA consider regulatory changes for properties that have repetitive losses? If so, what should the minimum NFIP floodplain management standards be for those properties? Should these properties be targeted for managed retreat? How should the NFIP consider issues of equity when deciding how to address these properties?*

Pew supports proactive policy solutions that will break the cycle of repeated flooding and rebuilding to better prepare people and property for natural disasters, improve public safety, and put the NFIP on stronger financial footing by reducing the program's debt. We commend the Agency for looking for ways to help break this cycle.

According to the U.S. Government Accountability Office (GAO), the NFIP has paid more than \$22 billion in cumulative claims for repeatedly flooded properties.<sup>19</sup> The Agency's own actuaries have determined that the repetitive loss problem is "the single most important factor that affects the stability of the National Flood Insurance Fund."<sup>20</sup>

**Pew urges FEMA to take steps to address the root causes of repeated flooding, including requiring careful assessment and review of those areas within a community with a demonstrated history of recurrent flooding and repetitive claims.** Such assessments should result in development of clear plans with benchmarks and timelines to address and mitigate, to the extent feasible, the sources of flood problems for identified priority areas. Such assessments and plans should also prompt a review of local ordinances and procedures that might be altered to prevent similar problems in other areas.

Towards that end, we propose a solution that gives flexibility to communities participating in the NFIP to manage these flood-prone areas, while creating a new level of accountability. Specifically, communities with a concentrated number of repeatedly flooded properties – a number we have defined as 50 or more repeatedly flooded properties<sup>21</sup> or at least 5 severe repetitive loss properties<sup>22</sup> – should be required to

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<sup>19</sup> Government Accounting Office, "National Flood Insurance Program: Fiscal Exposure Persists Despite Property Acquisitions," June 25, 2020, <https://www.gao.gov/products/gao-20-508>

<sup>20</sup> 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](https://www.fema.gov/media-library-data/1493905477815-d794671adeed5beab6a6304d8ba0b207/633300_2017_CRS_Coordinators_Manual_508.pdf)

<sup>21</sup> A repeatedly flooded property defined as one that during any 10-year period where there have been 2 or more claims for payments under flood insurance coverage for a total amount that is more than \$1,000.

<sup>22</sup> Severe repetitive loss as defined in section 1366(h) of the National Flood Insurance Act of 1968 (42 U.S.C. 4102)

develop repetitive-loss plans for mitigating continuing flood risks to repeatedly damaged areas. As flooding challenges vary from one community to another, a flexible approach embracing a range of mitigation options – including property buyouts, changes in drainage management or neighborhood landscape alterations, strengthening building codes, enhancing freeboard requirements, and/or updating zoning and subdivision ordinances – should be allowed.

FEMA should provide technical assistance and planning to impacted communities with priority given to those with less financial resources. At the outset, this assistance should include providing appropriate data regarding the property addresses and dates of claims associated with insured properties within the community. In addition, the creation of web-based applications, checklists, and guidance materials will help improve outcomes.

We urge FEMA to apply a carrot-and-stick approach to encouraging communities to mitigate risk. First, communities should be given funding – including priority in receiving grants under the Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA) programs – to implement the plans designed to tackle these problem areas. In addition, communities which fail to make sufficient progress in reducing the flood risks to areas that are repeatedly damaged should be held accountable for their inaction. Potential sanctions should ultimately include ineligibility for participation in the Community Rating System, designation of properties under Section 1316 authorities, making those properties ineligible for flood policies, imposition of probation fees on community policyholders, or suspension from the NFIP, as allowed under law.<sup>23</sup> While some may see these possible penalties as harsh, it is long past time to compel communities to get serious about addressing these problems.

The solution described above has been ensconced in legislation long championed by a bipartisan group of policymakers, including Senators Tim Scott (R-SC) and Brian Schatz (D-HI).<sup>24</sup> While we wholeheartedly support action by Congress to address this issue, we believe FEMA possesses the authority to enact substantive change through regulatory action.

#### **Question 9:**

***Local floodplain managers are often tasked with enforcement of NFIP minimum floodplain management standards. In what ways can FEMA strengthen the NFIP participation and increase enforcement of NFIP minimum floodplain management standards to build community resilience? How can FEMA better assist communities to mitigate flood loss and reduce risk? In what ways could FEMA better support local floodplain managers to effectively enforce the NFIP minimum floodplain management standards?***

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<sup>23</sup> 44 CFR under § 59.24.

<sup>24</sup> The Repeatedly Flooded Communities Preparation Act has been introduced in three successive congresses. The bill was reintroduced this Congress in the House, as [H.R. 1797](#), by Representatives Earl Blumenauer (D-OR) and Ann Wagner (R-MO), and [S. 2153](#) by Senators Tim Scott (R-SC) and Brian Schatz (D-HI) in the Senate. The bill text was also previously included in the National Flood Insurance Program Reauthorization Act of 2017 ([S.1571](#)), authored by then Senate Banking Committee Chairman Mike Crapo (R-ID) and Ranking Member Sherrod Brown (D-OH), to reauthorize the NFIP in the 115th Congress. Additionally, the language was included in the 21st Century Flood Reform Act ([H.R. 2874](#)) passed by the House in 2017.

Ideally, participation in the National Flood Insurance Program (NFIP) signals a local commitment to baseline floodplain management standards, with local engagement and continuous improvement supported by clear state enabling authorities, a model state NFIP ordinance with appropriate minimum standards, and on-the-ground assistance and oversight, as needed, from state-level officials. However, in practice, there are numerous barriers to both NFIP participation and effective floodplain management, including:

- Incomplete and inaccurate mechanisms to assess flood risk at the local, watershed, and statewide scales;
- Lack of understanding regarding appropriate use of and information provided in Flood Insurance Rate Maps (FIRMs);
- Difficulties coordinating among floodplain managers and other officials at the local, county and state levels;
- Lack of capacity and expertise to adequately evaluate and permit development activities accounting for potential floodplain impacts; and
- Lack of state-level enforcement mechanisms to ensure county and municipal enforcement of minimum floodplain management standards.

Pew is currently working within several states to support policies mandating the development and implementation of statewide flood resilience plans. These efforts have led to our engagement with state practitioners charged to carry out these mandates, and through these state-level relationships, Pew has received feedback which may be helpful to the Agency as it considers rule changes. The following offers a brief summary of comments and observations:

1. At the **local level**, particularly within rural and underserved communities, floodplain managers often fill multiple roles within municipal government. A local floodplain manager may also serve as a town's health inspector, high school football coach, or even mayor. Faced with a competing set of priorities, taking the time necessary to develop a sophisticated understanding of the permit review requirements or to travel and oversee compliance for floodplain construction can be difficult. Conflicting priorities may simply mean that flood risk does not manifest as an urgent priority – until a flooding event occurs or after a floodplain disturbance violation or error has already occurred.
2. At the **state level**, NFIP coordinators themselves may be pressed for resources and capacity. Some lack the tools necessary – either through incentives a state can provide to NFIP-participating communities or through state-delegated floodplain management enforcement mechanisms. A number of State NFIP coordinators have reported to Pew that when they become aware that an NFIP-participating community may not be in compliance with the NFIP requirements, their main recourse is to report – or “write up” – the condition to the FEMA Region and await action.
3. As noted, at the **federal level**, resource constraints likewise limit capacity to effectively address non-compliance. As FEMA knows well, the current structure of the NFIP leaves the Agency with limited options for timely and effective action for addressing serious violations: relying almost solely on the imposition of a penalty fee on all policyholders within the community or suspension of the entire community from the program.



These conditions have, in some instances, led to negative consequences, including local floodplain managers prioritizing other near-term problems over flooding and lacking authority or will to hold a community accountable and state NFIP coordinators with a lack of enforcement tools.

- Local floodplain managers are often incentivized to prioritize other public matters they may be responsible for and outside of their capacity as a floodplain manager.
- Local floodplain managers may ‘look the other way’ when they do become aware of activities rendering their jurisdiction noncompliant with the NFIP requirements, incentivized by a historical precedent under which there are neither obvious benefits for maintaining local compliance or obvious repercussions for noncompliance, up to and including a jurisdiction’s removal from participation in the NFIP.
- Some State NFIP coordinators may lack full authority or resources to play a significant oversight role with respect to local floodplain management.

In light of these issues, Pew makes several recommendations, touching not only the language in the current regulations but also aspects of FEMA’s mapping and grant programs.

First, as noted in the introduction to these comments, Pew does not believe that it is realistic to assume that FEMA itself can address all training and compliance needs. It must work more effectively with states who are capable and willing to assist. On this point, **we recommend that the Agency re-evaluate its current funding levels and formulas for the annual Community Assistance Program, State Support Services Element (CAP-SSSE) allocations.** As of February 2021, CAP-SSSE was reported to allocate only \$10.4 million nationally<sup>25</sup> to fill a variety of important functions on a state-by-state basis, including: Community Assistance Visits (CAVs), Community Assistance Contacts (CACs), floodplain management ordinance reviews, training, and the provision of technical assistance. We recommend not only that FEMA allocate more of its budget to this program but also that it adjusts its allocation methods to recognize shortcomings in some participating communities and to incentivize additional engagement and assistance from the states.

A revised version of CAP-SSSE could be modeled after the Environmental Protection Agency’s (EPA) National Environmental Performance Partnership System (NEPPS), under which that agency enters into Performance Partnership Agreements (PPAs)<sup>26</sup> with state and tribal governments. These PPAs establish mutual expectations for how the state or tribe and the agency will work collaboratively on agreed-upon priorities. Under the EPA construct, the priorities negotiated under PPAs are then supported by Performance Partnership Grants (PPGs).

Floodplain management priorities established under such a structure could vary by state and evolve over time, for example, focusing in one state agreement on training followed by oversight for communities

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<sup>25</sup> FEMA, “CAP-SSSE Funding Methodology: How a New Approach Produced Better Results,” updated February 11, 2021, <https://www.fema.gov/case-study/cap-ssse-funding-methodology-how-new-approach-produced-better-results>

<sup>26</sup> EPA, National Environmental Performance Partnership System (NEPPS), <https://www.epa.gov/ocir/national-environmental-performance-partnership-system-nepps>

with significant numbers of repetitive and severe repetitive loss properties, supporting a state that takes on review of developer-submitted hydrology studies for small communities with limited technical expertise, or allocating additional funds for a state office that coordinates flood reviews and flood risk management across communities on a watershed basis. This type of structure might also accommodate an initiative that authorizes and encourages states to adjust state floodplain management minimums to account for specific geographic issues, such as channel migration in certain riverine settings or serious problems with ground subsidence.

To further fortify its partnerships with states, we also **recommend that the Agency consider revisions to the regulations, which now only briefly address the responsibilities to be carried out on a state level.**

The Subpart B requirements treat the state as a participating community for purposes of providing access to federal flood insurance for state-owned properties and simply require that the state follow the same minimum criteria laid out regarding land disturbance or construction within a designated SFHA (specifically sections 60.3, 60.4, and 60.5). In fact, these regulations allow insurance coverage for state-owned facilities within non-participating jurisdictions; in our view, this allowance flies in the face of overall objectives of the program and disregards the need for flood risk to be managed with an ongoing program that considers cumulative impacts and the dynamic nature of flood risk.

The state role is also addressed in section 60.25, which covers the designation of a state coordinating entity and speaks generally about several important functions such as encouraging and supporting community participation in the NFIP, assisting with delineation of flood-prone areas, coordinating flood risk management activities with other state and local planning programs, offering training, and disseminating information. None of the functions in this section, however, are written as obligations or requirements, and Pew believes that **FEMA should consider amending the rules to set out a reasonable set of basic requirements for all states, even as it supplements those minimums with delegations of greater authority and responsibility to certain states**, as discussed above.

In line with an effort to engage the states more fully, **we also recommend that FEMA consider adopting some threshold criteria to apply to awards of competitive grants.** Under such a model, if a state or local jurisdiction is listed as a beneficiary within a competitive grant application – such as through the Flood Mitigation Assistance (FMA) or Building Resilient Infrastructure and Communities (BRIC) programs – a state NFIP coordinator could be required to certify that the state as well as a sub-applicant jurisdiction is compliant with the basic regulations as a prerequisite for award consideration or a factor in scoring.

Finally on this point, **we fully support more rigorous engagement and oversight by FEMA itself**, understanding full well that there are associated difficulties and downsides to imposing penalties on all policyholders in a community or removing the availability of NFIP-insurance coverage from an entire community. Those enforcement options may appear harsh, but to the extent that the Agency holds off on action to address regulatory failures in recalcitrant communities, it encourages non-compliance and penalizes those jurisdictions abiding by the rules.

Again, we are hopeful that innovative partnerships with more states – who may have additional administrative and financial options for compelling compliance – will lessen the burden and allow the Agency to concentrate on the most serious and consequential violations. One option that both states and the Agency may wish to consider is expanded use of Section 1316 of the National Flood Insurance Act,

under which a state or local agency may declare a specific structure as being in violation of floodplain management regulations, rendering that structure ineligible for flood insurance coverage through the NFIP.<sup>27</sup> More frequent reliance on this authority would impose targeted but appropriate consequences for violations and signal the Agency's determination to improve compliance overall.

**Question 11:**

*There have been recent proposals regarding disclosure of flood risk, recommending development of an affirmative obligation on the part of sellers or lessors of residential properties to disclose information about flood risk to prospective buyers or lessees. These proposals would require States and communities to establish flood risk reporting requirements for sellers and lessors as a condition of participation in the NFIP. Should States and/or local governments be required to establish minimum flood risk reporting requirements for sellers and lessors as a condition for participation in the NFIP? Should there be an affirmative obligation on the part of sellers and/or lessors of residential properties to disclose information about flood risk to prospective buyers or lessees? If so, what is the most effective way to require this disclosure? Should the process be modeled on requirements for sellers to disclose details on environmental hazards, such as lead-based paint hazards? What details should be included in the disclosure, such as knowledge of past floods and/or flood damage, a requirement to maintain flood insurance, knowledge the property is located in a SFHA at the time of offering, and the cost of existing flood insurance?*

There is currently no federal requirement for sellers and lessors to disclose residential property flood risk and history. State laws vary widely: Some states like Texas have updated their laws to require expansive disclosure, while others, including populous, flood-prone states such as Florida and Missouri, lack clear requirements. As noted in the Request for Information, there have been recent Congressional proposals to create a national framework for flood risk disclosure to prospective homebuyers and renters.<sup>28</sup> **Pew supports these proposals and urges FEMA to develop minimum national standards creating an affirmative obligation for disclosure of past flood losses by sellers and lessors, similar to the existing requirement for lead paint disclosure for older homes.**<sup>29</sup>

These disclosures should include, at a minimum, any knowledge of the following: 1) prior physical damage caused by flood to any building located on the property; 2) prior insurance claims for losses covered under NFIP or private flood insurance; 3) any previous notification regarding the designation of the property as a multiple loss property; and 4) any legal obligation to obtain and maintain flood insurance running with the property.

As the legislative proposals outline, we believe that communities should be required to establish these minimum flood risk disclosure standards as prerequisite for participation in the NFIP. Furthermore, those already participating in the program should be suspended from the NFIP if they fail to pass laws

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<sup>27</sup> Federal Emergency Management Agency, "Section 1316." <https://www.fema.gov/glossary/section-1316#:~:text=Section%201316%20of%20the%20National,or%20local%20floodplain%20management%20regulations>

<sup>28</sup> Among other bills, language addressing flood risk disclosure was included in the National Flood Insurance Program Reauthorization Act of 2017 ([S.1571](#)) and the 21st Century Flood Reform Act ([H.R. 2874](#)) passed by the House in 2017.

<sup>29</sup> 40 CFR § 745.107, Disclosure requirements for sellers and lessors.

codifying these standards in a reasonable amount of time. We suggest that a deadline in the range of four or five years should be sufficient.

We cannot emphasize enough the importance of flood risk disclosure. An upfront understanding of risk is fundamental to preparedness and protection for a future homeowner or renter. This information can be used by individuals to inform decisions about where to live and how to protect themselves and their investments from flood loss. Informed about a structure's loss history, homebuyers could consider alternative neighborhoods, purchase flood insurance, or investigate mitigation options, such as landscaping improvements, building elevation, or special placement of electrical equipment. An informed buyer who has not yet finalized financing may be able to roll the costs of flood-resiliency improvements into a long-term loan that will protect the structure and lower insurance rates. For renters, flood knowledge can allow for the same sort of informed decision-making. An individual with mobility issues may choose a safer location. A renter with expensive computer equipment might opt for the second floor rather than the basement apartment. More individuals may also decide that an insurance policy to cover loss of their belongings is a sensible and affordable safeguard.

Our own polling shows that consumers support this approach. A 2019 Pew poll shows that three quarters of Americans support a single, national standard to ensure that potential homebuyers are aware if a property has flooded repeatedly and if that property is required to carry flood insurance.<sup>30</sup>

**Question 12:**

*The United States is experiencing increased flooding and flood risk from climate change. Climate change may exacerbate the risk of flooding to homeowners. Should FEMA base any NFIP minimum floodplain management standard changes on future risk and specifically on projections of climate change and associated impacts, such as sea level rise? What equity considerations should be factored into such decisions if climate change disproportionately harms underserved and vulnerable areas? What other considerations should be factored into an analysis involving climate change? Should the NFIP better distinguish NFIP minimum floodplain management standards between riverine and coastal communities? Should the NFIP minimum floodplain management standards incorporate pluvial (surface/urban) flooding concerns? Are there specific measures and standards that should be taken to ensure structures can withstand the greater intensity, duration, frequency and geographic distribution of flooding events? If so, what are they and how can those measures and standards ensure structures and communities can readily adapt and increase resilience to the impacts of climate change?*

The difficult task of managing flood risk with an eye on future conditions should be one of the top priorities for the Agency as it undertakes this review of existing rules. Pew urges FEMA to quickly initiate much-needed changes with several points in mind.

Overall, Pew believes that the Agency's long-outdated approach to floodplain management conveys a misleading and unrealistic view of risk. It does so, in part, by using the lines on a map delineating the

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<sup>30</sup> The Pew Charitable Trusts, SQL Server Reporting Services, Pew Flood Insurance Survey 2019, <https://www.pewtrusts.org/-/media/assets/2019/06/pew-charitable-trusts-flood-policy-survey-disclosure-summary.pdf>

Special Flood Hazard Area (SFHA) not only for the determination of which properties should be covered by the law's mandatory purchase provision but also for imposing requirements and standards on land disturbance and construction. As a report to the Water Resources Council dated 1982 noted,<sup>31</sup> this approach of using maps created for insurance purposes can have serious shortcomings in terms of protection. It also reinforces widespread public misunderstandings regarding stationarity and flood risk. **Pew strongly supports the consideration of future risks for all land use decisions in or near flood-prone areas, and we urge the Agency to begin transitioning its permitting and design requirements away from the limits of the SFHA.**

We also recognize that such a transition may be a difficult and lengthy one, and that the Agency must also consider the wide range of factors affecting flood risk and the availability of data. While FEMA and its federal partners, such as the National Oceanic and Atmospheric Administration (NOAA), can and should cooperate to provide useful and credible data regarding precipitation trends by region and downscaled sea-level-rise projections for various timeframes, information on other key variables will remain largely in the hands of state and local governments.

Future-conditions hydrology will depend, in many cases, not only on factors such as climate change, but also on local land use decisions and infrastructure investments and maintenance. Data related to these factors may be contained in comprehensive plans, zoning and subdivision ordinances, capital improvements and drainage plans, and other local documents that are not readily accessible to FEMA and are subject to frequent change themselves. As important as the information in such documents can be to determining future risks, Pew believes it is simply not feasible for FEMA itself to incorporate the full range of this data into mapping products.

Rather, it must **restructure its regulations and mapping approaches to better enable and, as necessary, compel participating NFIP communities and states to take on this task and use key local data for risk-informed decision-making.**

Related to this point, we also urge FEMA to consider the real-world limitations on its own ability and the ability of its local and state partners to effectively update, maintain, and utilize map data.—The field of flood risk analysis and flood mapping has evolved dramatically since the start of the NFIP program, and the pace of innovation has only accelerated in recent years. FEMA's mapping program has incorporated many of the most important changes, but the program's mapping needs have long outstripped its resources. While Pew has and will continue to advocate for enhanced funding for flood mapping, we also believe that FEMA should reset its rules and mapping policies with realistic resource expectations.

In the early days of the program, the partnership that was envisioned was that a limited number of communities would be at risk of significant flooding, and the federal agencies would provide the first deep analysis of flood risk, working to provide not just the relatively crude flood hazard boundary maps but also more refined maps with floodway designations and detail on base flood levels. Local governments would then adopt and operate from these maps but also contribute toward their needed "upkeep" by evaluating the implications of new construction and floodplain disturbances and, as

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<sup>31</sup> Kusler, Jon A., "Regulation of Flood Hazard Areas to Reduce Flood Losses, Volume 3," prepared for the U.S. Water Resources Council, March 1982, [https://www.google.com/books/edition/\\_/QEgy5yI0TYUC?hl=en&qbpv=0](https://www.google.com/books/edition/_/QEgy5yI0TYUC?hl=en&qbpv=0)

necessary, submitting and recording map changes related to those alterations. Sometimes for lack of capacity and resources and sometimes for other reasons, this upkeep has not been realized in many instances.

Today, as the Agency knows, floods can occur nearly anywhere across the country, and it is now clear that every locality could use some version of a flood risk assessment and flood map. Nonetheless, many communities still run their programs without the benefit of detailed maps; some communities fail, due to resource limitations or simple reluctance, to effectively evaluate the impacts of new development and land disturbance; some maps remain outdated because federal funds do not stretch far enough; and some maps remain unchanged due to long-drawn out appeals of maps by those who do not wish to buy flood insurance. In our view, none of these issues should stand in the way of FEMA moving forward with additional future-conditions mapping, but they should inform how the Agency structures its rule changes and sets new priorities for mapping efforts that go beyond the rules themselves.

By advancing multiple NFIP rule changes, adjusting research and mapping priorities, leveraging important work on future conditions already undertaken by other federal agencies and multiple states, and making key policy changes, FEMA can substantially improve the management of flood risk across the country. Our recommendations for future conditions mapping include the following:

**FEMA should initiate a collaboration with NOAA and other appropriate federal agencies to assess the current state of available down-scaled sea level rise information for all coastal areas, to make such data accessible and usable by NFIP-participating coastal communities, and to maintain an inventory of existing data sources.** The inventory aspects of this effort could be set up following the model for LiDAR data that is jointly managed by several federal agencies.<sup>32</sup> By creating a single website where users can find available data, including information on the recency, geographic coverage, and other quality control factors, FEMA and cooperating agencies can enable efficient use of resources. As with the existing LiDAR inventory, an SLR inventory could also include data from non-federal sources, such as the down-scaled data developed by multiple states.<sup>33</sup>

**In cooperation with other federal agencies, FEMA should also begin addressing any existing gaps in the availability of down-scaled SLR data, prioritizing filling data gaps for areas of anticipated high growth and likely significant rates of relative sea-level rise over the coming years.**<sup>34</sup> While we understand that there may be resistance to using this data for the flood insurance law's mandatory purchase determinations, we believe it should be included as an additional layer on FIRMs and the National Flood Hazard Layer as coastal maps are updated, and the **regulations should require participating coastal communities to incorporate this data into the reviews and standards that**

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<sup>32</sup> U.S. Interagency Elevation Inventory, <https://coast.noaa.gov/inventory/>

<sup>33</sup> See, for example, information in "An Overview of State Coastal Zone Management Policies Designed to Promote Coastal Resilience," The Environmental Analysis & Communications Group, Bloustein School of Planning and Public Policy and The Rutgers Climate Institute, Rutgers, The State University of New Jersey, March 2019, <https://climatechange.rutgers.edu/?view=article&id=896:an-overview-of-state-coastal-zone-management-policies-designed-to-promote-coastal-resilience&catid=265>

<sup>34</sup> Maryland Coast Smart – Climate Ready Action Boundary (CRAB) Inundated Zones, Jan 17, 2021, <https://www.arcgis.com/home/item.html?id=93218f38c5014853bb308dacdaf23a9c>; New Jersey Department of Environmental Protection, "NJ Protecting Against Climate Threats: Resilient Environment and Landscapes," December 22, 2020, <https://www.nj.gov/dep/workgroups/docs/njpact-real-20201222.pdf>



**pertain to new construction and major reconstructions.** By considering likely conditions over the expected life of new assets, communities will direct new growth and development into areas that will remain safe over time rather than add to the nation's growing stock of at-risk buildings. To the extent that down-scaled data sufficient for use in land use planning and zoning is not available in these areas, we believe the Agency must set and publish a schedule for adding such data to the inventory and requiring participating NFIP coastal communities to utilize this data where sea level is projected to rise.

**Pew also urges FEMA to create new tools and employ new ongoing training to help all communities assess the multiple factors beyond sea level rise that impact future conditions.** As floodplain management experts have known for decades, the flood maps developed by FEMA and its state and local partners offer a snapshot of flood risk from that statistically-derived large regional flood at a given moment in time. As central as the maps are to effective floodplain management, they should not be taken as precise predictions, and the lines on the map can shift – both laterally and horizontally – when the conditions on the ground that undergird the mapping models change. There are a variety of factors that can lessen or exacerbate flood risk, and we believe that it is crucial for all communities to develop a good understanding of the factors that are most critical and most in need of observation and management for the safety and protection of their residents.

That is why we are hopeful that the Agency will act outside of regulations change to help communities undertake work in the vein of that that occurred in Charlotte-Mecklenburg, North Carolina, where scenario analyses made a compelling case for the community to improve its approach to floodplain management: in that case, changing not only floodplain requirements but also altering zoning and subdivision rules and enhancing stormwater management requirements. By providing smaller, under-resourced communities with tools that enable them to assess multiple future development scenarios in the light of flood risk, FEMA can help those communities better manage risk and, as was the case in Charlotte-Mecklenburg, build public support for local ordinance and rule changes.

**Finally, we urge FEMA to quickly phase in a requirement for future conditions flood zones that cover future flooding and problem flooding areas not currently mapped as SFHA.** Ideally, all participating communities would have the information and the tools to identify those areas beyond the SFHA where subdivision and other construction proposals may impact flood risks, considering risks over the expected lifetime of new structures and the potential to divert floodwaters onto other structures in that timeframe. Where information is available, it would be sensible to add layers to a community's FIRM, capturing not only land that might currently be considered flood prone due to factors not fully incorporated into the designation of SFHAs, such as so-called urban or pluvial flooding or location on a barrier island, but also those land areas where local development or other factors will increase the risk of flooding. Creation of such a locality-specific SFHA, much in the way that Charlotte-Mecklenburg and several other localities have done, would be ideal, but that ideal is likely to remain elusive for some time. In meantime, however, **Pew urges FEMA to begin requiring localities with serious flooding threats to use expanded flood zones for review of new construction, at a minimum, extending reviews to non-SFHA areas which have already been impacted by recurrent flooding.**

**Question 15:**

*FEMA recognizes the vital role that State, local, Tribal, and territorial governments play in floodplain management and that they may have innovative solutions to complex floodplain management challenges. What successful mitigation policies, building design standards, building construction standards, T&E species protections, and/or other floodplain management approaches to mitigate flood loss and reduce risk have been taken by State, local, Tribal, and territorial governments? In what ways do the current NFIP minimum floodplain management standards present barriers or opportunities to the successful implementation of those approaches? What capabilities and capacity impacts should FEMA address as it considers changes to the NFIP minimum floodplain management standards and to strengthen NFIP protection of T&E species and their habitats?*

**Pew recommends that FEMA look at issues and solutions that hold promise for providing multiple benefits, including promoting floodplain management on a watershed scale and advancing policies that better sustain and protect the natural functioning of wetlands and floodplains.**

While land use decisions, for the most part, will continue to be made at a local level, the impacts of those decisions and the floodplain management successes or failures of individual communities almost always affect much wider geographies. The impacts of storm-water runoff, drainage dynamics, and downstream flows can only truly be understood and reconciled by looking beyond any given community's jurisdiction – by looking at the hydrologic unit.

Flood experts have long known this to be a major issue where upstream development causes downstream flooding, but FEMA has lagged behind several states and localities in taking a watershed approach to addressing the increasing flood problem.<sup>35</sup> **To the fullest extent possible, FEMA must now adjust its regulations and its programs toward this more regional framing for floodplain management, helping additional states and localities to more effectively understand and manage the impacts of the built and environment and development patterns.**

Pew sees strong evidence—in the data on flood losses and the scientific literature—supporting the fact that a watershed approach to flood risk management can not only reduce flood losses over time but also better protect natural functions, habitat, and Threatened and Endangered species.

More specifically, naturally-occurring wetlands are increasingly being highlighted for their role in protecting property from flooding events by reducing flood velocities, flood peaks, and providing areas for storing precipitation-based flood waters.<sup>36</sup> In particular, research demonstrates that freshwater or

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<sup>35</sup> For example, in 2019 Texas implemented a state-wide regional flood planning initiative based on watershed units. With guidance from the Texas Water Development Board, stakeholder groups are being formed for each watershed that will draft a plan addressing flood management problems. The first regional flood plan is due in January 2023. Also, in 2016 Louisiana implemented its state watershed initiative (LWI). This holistic approach to watershed management goes beyond conventional mitigation measures and incorporates nature-based solutions. LWI is also developing computer models to better understand flood risk and help select projects best suited for investment in each watershed region. This initiative represents a comprehensive approach to surface water management that takes into consideration both the natural functions of floodplains and land use decisions affecting the built environment.

<sup>36</sup> Acreman, M., Holden, J. How Wetlands Affect Floods. *Wetlands* 33, 773–786, 2013.  
<https://doi.org/10.1007/s13157-013-0473-2>

“palustrine” wetlands, even those seemingly disconnected from navigable waters, can significantly reduce the amount of flood losses to residential communities.

Multiple studies have shown that naturally occurring wetlands provide flood mitigation by maintaining a properly functioning water cycle.<sup>37</sup> Both anecdotal and empirical research suggests that wetlands may reduce or slow flooding. In a comprehensive literature review from 2003, researchers note that 23 of 28 studies on wetlands and flooding found that “floodplain wetlands reduce or delay floods”.<sup>38</sup> Field-based, simulated, and observation research all points to the same conclusion: The presence of naturally-occurring wetlands protects residents from the adverse impacts of floods and altering these natural habitats results in increased financial losses to property owners. Palustrine wetlands, with the ability to absorb, store, and slowly release water, should be considered the most effective land cover for mitigating the effects of rainfall-based flooding.<sup>39</sup> For example, a study of Gulf of Mexico coastal watersheds from 2008-2014 found that large, expansive, and continuous patches of naturally-occurring open spaces most effectively reduce losses from flood events.<sup>40</sup>

Studies such as these underscore the relevance of conserving and restoring wetlands and other coastal and riverine ecosystems for flood risk management and suggest that **FEMA should work to align its floodplain management rules and programs with these important environmental objectives.**

Related to this goal, **we again urge FEMA to consider major rule changes regarding fill,**<sup>41</sup> which has very commonly been used to “remove” structures from the designated SFHA but can have serious detrimental impacts on the environment and worsen flooding problems.

Overall, the use of fill within the FEMA-defined floodplain can result in unintended impacts, especially on neighboring properties.<sup>42</sup> FEMA itself warns that fill can increase the chance of flooding in places that would not flood otherwise.<sup>43</sup> In particular, large amounts of fill can cause losses downstream during peak flow conditions. This issue makes it particularly important to examine flood impacts at a watershed scale to better understand the implications of upstream alterations. Raising land elevations within the floodplain

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<sup>37</sup> Mitsch, William & Gosselink, James. The Value of Wetlands: Importance of Scale and Landscape Setting. *Ecological Economics*. Vol.35. 25-33., 2000, 10.1016/S0921-8009(00)00165-8, <https://www.sciencedirect.com/science/article/abs/pii/S0921800900001658?via%3Dihub>; Lewis, W. M., *Wetlands Explained: Wetland Science, Policy and Politics in America* Oxford University Press, New York, NY (2001)

<sup>38</sup> Bullock, Andrew & Acreman, Mike. (2003). The Role of Wetlands in the Hydrological Cycle. *Hydrology and Earth System Sciences*. 7. 10.5194/hess-7-358-2003, [https://www.researchgate.net/publication/29626943\\_The\\_Role\\_of\\_Wetlands\\_in\\_the\\_Hydrological\\_Cycle](https://www.researchgate.net/publication/29626943_The_Role_of_Wetlands_in_the_Hydrological_Cycle)

<sup>39</sup> Brody, S. D., Highfield, W. E., & Blessing, R. (2015). An analysis of the effects of land use and land cover on flood losses along the Gulf of Mexico coast from 1999 to 2009. *JAWRA Journal of the American Water Resources Association*: 51(6): 1556-1567.

<sup>40</sup> Brody, Samuel, Highfield, W., Blessing, R., Makino, T., Shepard, C. (2017). Evaluating the Effects of Open Space Configurations in Reducing Flood Damage along the Gulf of Mexico Coast. *Landscape and Urban Planning* 167: 225-231.

<sup>41</sup> The Pew Charitable Trusts, *Pew comments FEMA RFI July 21 2021 FINAL*, Docket ID FEMA-2021-0011

<sup>42</sup> Atoba, K. O. (2018). *Fill and Floods: Analysis of the Impact of Parcel Fill on Residential Flood Damages* (Doctoral dissertation).

<sup>43</sup> FEMA. (2001). *Ensuring That Structures Built on Fill In or Near Special Flood Hazard Areas Are Reasonably Safe From Flooding in accordance with the National Flood Insurance Program*. Technical Bulletin FIA-TB-10. FEMA Mitigation Directorate, 2001, <http://www.fema.gov/media-library-data/20130726-1511-20490-3169/tb1001.pdf>; FEMA. (2013). *Community Rating System. Coordinator's Manual*.

without adequate provision for compensatory storage can significantly increase losses in adjacent areas with limited infrastructure to deal with those losses. Natural compensatory storage provisions are extremely limited when fill is used in floodplains.<sup>44</sup> Floodplain levels are also expected to rise when fill is used on the floodplain fringe.<sup>45</sup>

As our earlier comments indicated, we believe that **FEMA should seriously consider disallowing new build on fill. At a minimum, we urge FEMA to require that local floodplain administrators explicitly and clearly consider potential adverse impacts on adjacent areas when new subdivisions or major development proposals call for the use of fill in flood-prone areas.** We note that the program's primary and enforceable regulations in 60.3, 60.4, and 60.5 focus nearly exclusively on preventing damage to the proposed new structures. Those rules should be amended to assure protection for existing structures and other buildable land.

In cases where compensatory storage, such as detention ponds and open space protection, is proposed to accommodate increased runoff and rise in elevation created from upstream fill, the regulations should also address appropriate mechanisms for assuring long-term maintenance and adherence to any assumed restrictions. At the same time, FEMA might also work to incentivize adoption of "zero-rise" and "no adverse impact" policies, assuring that any authorization to use fill is linked to additional purchase of adjacent easements to make way for residual flooding and compensatory flood storage. Another option might include additional freeboard requirements, possibly in the range of one to two feet or more in watersheds where extensive fill has been used.

***Question 18: Hazard mitigation planning reduces loss of life and property by minimizing the impact of disasters, including floods. It begins with State, local, and Tribal governments identifying natural disaster risks and vulnerabilities that are common in the area and then developing long-term strategies for protecting people and property from similar events. Mitigation plans are key to breaking the cycle of disaster damage and reconstruction. How should FEMA consider integrating mitigation planning with other Federal, State, or local mitigation planning such as community planning, economic planning, coastal zone planning, and other types of planning activities to improve the overall effectiveness of mitigation planning and floodplain management activities? Are there planning best practices, processes, or data that could better inform planning decision-making and the development and implementation of floodplain management standards?***

Pew considers the issues raised in question 18 as critical to assuring real, on-the-ground improvements in flood risk management. We read into the question a supposition that **effective and enduring resiliency can be achieved as floodplain management and flood mitigation planning are woven into the myriad planning activities that drive and sustain the growth and development of local communities.** We concur strongly with that supposition, and we believe that the Agency can move toward enabling this much-needed integration, despite the wide range of existing capabilities and approaches in the more than 22,000 communities participating in the NFIP. In fact, to the extent that important actions that are now siloed specifically into purview of floodplain management can be integrated into other community

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<sup>44</sup> Larson, L. & D. Plasencia. (2001). No adverse impact: New direction in floodplain management policy. *Natural Hazards Review* 2: 167-181.

<sup>45</sup> FEMA, Community Rating System: Coordinator's Manual, 2013

functions, each community's effort to assess and prepare for floods may become a more manageable, shared responsibility.

To consider how such integration might be promoted in the context of the federal flood insurance law, we believe it may be useful to draw from experiences with the state and local hazard mitigation planning required by federal disaster assistance law.

The concept of hazard mitigation planning, while it predated the 1988 Robert T. Stafford Disaster Relief and Emergency Assistance Act, gained enormous and critical momentum as a result of the passage of the Disaster Mitigation Act of 2000, which directly tied state and local eligibility for certain categories of federal hazard mitigation grants to FEMA approval and local or state adoption of hazard mitigation plans. Simply put, the objective was to engage the states and localities in breaking an increasingly costly cycle of build, disaster, and rebuild. However, certain shortcomings quickly became apparent, and as later documented in a report to FEMA, for the most part, many mitigation plans failed to establish linkages to other local plans, make clear connections to future land-use and development trends, or consider how those might affect hazards and risks, for ill or for good. Many communities were slow to adopt plans, and many plans were simply box-checking exercises completed for purposes of grant submissions.

In response to the problems identified, FEMA and the American Planning Association (APA), began collaborating to explore how local planners and planning agencies, who are generally trained in public outreach and long-term visioning and who manage many other planning processes in their communities, could assume a greater role in the mitigation planning process and how planners might partner with emergency managers to move mitigation planning beyond the stage of hazard identification to the implementation of effective mitigation strategies.

The study produced by APA,<sup>46</sup> has been important in promoting new, more multi-disciplinary hazard mitigation planning teams and in refocusing attention to the intersection of resilience with the wide range of ongoing community programs, from land use and transportation planning to stormwater management and conservation planning. That shift in thinking has accelerated in recent years, particularly within the planning and allied professions,<sup>47</sup> and multiple jurisdictions have pioneered new approaches to flood risk management.<sup>48</sup>

Pew believes that work and the follow-ups that ensued will now help FEMA **adjust the NFIP regulations and its policies to foster more direct linkages between floodplain management and land-use planning and other environmental planning.**

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<sup>46</sup> Schwab, James C., ed. Hazard Mitigation: Integrating Best Practices into Planning. 2010. Chicago: American Planning Association. Available at <https://www.planning.org/publications/report/9026884/>

<sup>47</sup> James Schwab, then manager of APA's Hazards Planning Center, addressed this trend as part of an opening plenary panel at the 2015 Natural Hazards Workshop in Colorado. Using 20 years of attendance data from the APA National Planning Conference, he showed that attendance at disaster-related or climate-related sessions had grown from 73 people at two sessions in 1995 to nearly 3,000 people attending 23 sessions in Seattle in 2015

<sup>48</sup> See, for example, See, e.g., Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials. March 31, 2013. Washington, D.C.: FEMA. Available at <https://www.fema.gov/media-collection/integrating-hazard-mitigation-local-planning-case-studies-and-tools-community>. Also see Plan Integration: Linking Local Planning Efforts, July 2015, available at [https://www.fema.gov/sites/default/files/2020-06/fema-plan-integration\\_7-1-2015.pdf](https://www.fema.gov/sites/default/files/2020-06/fema-plan-integration_7-1-2015.pdf); FEMA has also issued two-page flyers such as this one, dealing with integrating hazards into comprehensive plans: <https://www.fema.gov/sites/default/files/2020-07/integrating-hazard-mitigation-local-plan.pdf>

We note a few examples that may offer models or ideas for new initiatives and for adjustments to the rules to clarify and strengthen section 60.22 and related requirements.

As part of a technical assistance effort during the recovery from the devastating 2008 Midwest floods,<sup>49</sup> the U.S. Environmental Protection Agency's (EPA) Office of Smart Growth and FEMA signed a Memorandum of Understanding. Their joint work with the Rebuild Iowa Office (RIO) assisted in the 2010 passage of the Iowa Smart Planning Act, which outlined 10 principles of smart growth and 13 elements for inclusion in local comprehensive plans, including an element specifically related to hazard mitigation planning.<sup>50</sup> While the element is focused on all-hazards approach, flooding remains by far the dominant natural hazard affecting communities in Iowa. Sensibly, the law did not ignore the federal requirements for hazard mitigation planning but requires reference to such plans. State laws, which promote or require the integration of hazard planning into local comprehensive planning and vice-versa, offer useful support for effective floodplain management.

EPA also partnered with Vermont as that state worked to recover from Hurricane Irene in 2011. A pilot project in the state's Mad River watershed,<sup>51</sup> led to a report that has functioned as a practical guidebook for choosing local land use policies and strategies to improve flood resilience. "Planning for Flood Recovery and Long-Term Resilience in Vermont,"<sup>52</sup> and the accompanying "Flood Resilience Checklist,"<sup>53</sup> though created with the authorities and policies of that state in mind, might readily be adapted to other jurisdictions to promote the integration of flood mitigation into the day-to-day management of key local functions.

Another example comes from Colorado, which created the Colorado Resiliency Office (CRO) after major flooding in 2013. Now residing within the state's Department of Local Affairs,<sup>54</sup> the CRO focuses heavily on recovery from disasters but also reinforces the principle that the path to resilience is through effective hazard mitigation and adaptation. The difficult circumstances that spawned this initiative included the cascading disasters of drought, fire, and flood. As such threats multiply in many states, they produce strong motivation for not only considering floods but a multi-hazard approach in a holistic planning approach such as Colorado has undertaken.<sup>55</sup>

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<sup>49</sup> The 2008 floods forced evacuation of 10 percent of the city of Cedar Rapids and caused an estimated \$15 billion in damages throughout the region. See

<https://www.everycrsreport.com/reports/R40201.html#:~:text=The%202008%20floodwaters%20caused%20local,%20in%20saturated%20upland%20areas>; Most other overall estimates are substantially similar

<sup>50</sup> For a concise summary, see Iowa Smart Planning: Legislative Guide, March 2011, available at [https://rio.urban.uiowa.edu/sites/rio/files/iowa\\_Smart\\_Planning\\_Overview\\_0.pdf](https://rio.urban.uiowa.edu/sites/rio/files/iowa_Smart_Planning_Overview_0.pdf)

<sup>51</sup> Zind, Steve, "Mad River Towns are Models for National Flood Planning," Vermont Public Radio, July 8, 2014, <https://www.vpr.org/vpr-news/2014-07-08/mad-river-towns-are-models-for-national-flood-planning>

<sup>52</sup> EPA, Office of Sustainable Communities, "Planning for Flood Recovery and Long-Term Resilience in Vermont: Smart Growth Approaches for Disaster-Resilient Communities," July 2014, <https://www.epa.gov/sites/default/files/2014-07/documents/vermont-sgia-final-report.pdf>

<sup>53</sup> Environmental Protection Agency, "Flood Resilience Checklist," 2014, <https://www.epa.gov/sites/default/files/2014-07/documents/flood-resilience-checklist.pdf>

<sup>54</sup> One essential function of CRO is the maintenance of a website that provides a great deal of guidance for local planning. The website can be found at <https://www.coresiliency.com/>

<sup>55</sup> See, e.g., Brian Varrella, Colorado Framework for Hazard Mitigation, presentation at the 2017 ASFPM Annual National Conference ([https://asfpm-library.s3-us-west-2.amazonaws.com/Website/CON/Plenary3\\_Varrella.pdf](https://asfpm-library.s3-us-west-2.amazonaws.com/Website/CON/Plenary3_Varrella.pdf)); Varrella, with the Colorado Department of Transportation, formerly worked as an engineer with the City of Fort Collins during recovery from the 2013 floods and previously discussed that experience in a multi-hazard context in October 2014 at ASFPM's Sixth Triennial Flood Mitigation and Flood Proofing Workshop in Broomfield, Colorado. Although presentations from the 2014 event do not appear to be available online, discussion of the event is available in Jim Schwab's "Home of the Brave" blog at <http://www.jimswab.com/Hablarbooks/2014/11/02/one-thing-leads-to-another/>



One important result of that State's ongoing work has been the development of the Colorado Resiliency Framework.<sup>56</sup> In clear language, this report discusses Colorado's risks and vulnerabilities, ways of advancing resiliency across sectors and departments, the state's priorities for resiliency, and how to take action. The state's commitment to integration is clear in this document, which sets out six resiliency priorities: future-ready economy and workforce; climate and natural hazard resiliency; building and infrastructure sustainability; agriculture and food security; housing attainability; and community capacity. While the Framework is focused largely on a collaborative, multi-sector approach to resiliency across state agencies, its innovative and integrated approaches to problem-solving offer useful lessons and models that could also be adopted at local levels.

In addition to these state initiatives, we highlight work by academic researchers who have looked at plan integration by testing scorecard methodologies in specific communities. With grant support from the U.S. Department of Homeland Security (DHS), Berke and colleagues tested what is termed the Plan Integration of Resilience Scorecard (PIRS) in two distinctly different municipal settings: Norfolk, Virginia and Nashua, New Hampshire.

The PIRS tool was used to identify inconsistencies or conflicts across plans that may have gone unnoticed by siloed personnel in various agencies and that may have presented obstacles to effective risk management. Its use may highlight not only problems but also opportunities for better plan integration. In the case of Norfolk, for instance, the findings led to significant revisions of its comprehensive plan. In Nashua, the city strengthened the role of the Office of Emergency Management by giving it a role in scrutinizing proposed developments to highlight opportunities for reducing vulnerability through specific practices. As one member of the plan evaluation team noted, PIRS provided "a methodology to establish a coordination process between both disciplines like emergency management and urban planning, and a source of stimulation to institutionalize coordination moving forward."<sup>57</sup>

Pew recommends that FEMA consider employing more extensive use of this or similar tools to promote the integration of flood risk management and resilience efforts into local planning and development.

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<sup>56</sup> See, 2020 Colorado resiliency Framework, [https://drive.google.com/file/d/1efF8j0JLAmAnxi8\\_U4jq75uEWTAKxrGm/view](https://drive.google.com/file/d/1efF8j0JLAmAnxi8_U4jq75uEWTAKxrGm/view)

<sup>57</sup> Berke, Philip, et al. 2021. Using a resilience scorecard to improve local planning for vulnerability to hazards and climate change: An application in two cities. *Cities* 119 (2021) 103408), <https://doi.org/10.1016/j.cities.2021.103408>