

Research in Support of Floodplain Management  
Regulations Compliance of Substantially Damaged Properties

**FINDINGS & RECOMMENDATIONS**

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## EXECUTIVE SUMMARY

Flood damage assessments involve many procedures and protocols that can be easily misunderstood, ignored, partially-avoided, or manipulated by different stakeholders. This can position the National Flood Insurance Program (NFIP) to pay future claims on homes that should be (but are not) elevated, rebuilt, demolished, or removed from floodplain areas. Through an exploratory project, Texas A&M University researchers evaluated how a range of existing and new local capacity building resources and enforcement strategies can be used to achieve better community compliance with the NFIP regulations for substantially damaged structures.

The following report that results from the project identifies and describes twenty-five (25) factors found to have an effect on community compliance with substantial damage (SD) / substantial improvement (SI) regulations of the NFIP. These factors were identified after conducting in-depth discussion panels with local officials in thirteen (13) NFIP participating communities across four different states—Texas, Louisiana, Illinois and North Carolina. The research team, in coordination with the Federal Emergency Management Agency (FEMA) and the project’s National Advisory Committee, processed the information obtained from the discussion panels to detail and prioritize recommendations. A range of stakeholders—including FEMA, states and local communities—can implement the recommendations to improve organizational motivation and capacity to achieve better compliance with SI/SD components of the NFIP regulations, thereby incentivizing compliance and supporting the reduction of future flood damage losses.

Communities selected for study varied in size, general location (coastal vs. inland), type of disaster (flood vs. other), timing of disaster impact, and levels of exposure to natural hazards. It is important to note that the sample size is limited and that community compliance issues with SD/SI regulations identified in this report do not represent all challenges and roadblocks that communities and community officials face nationwide. Further research is needed to provide a complete assessment of community compliance with respect to substantially damaged (SD) and substantially improved (SI) structures located in Special Flood Hazard Areas.

The twenty-five (25) factors affecting regulatory compliance presented in this report are organized into five (5) themes:

- **Local Context**
- **Obstacles to Processing Damage Information**
- **Promising Practices and Protocols**
- **Equity Concerns**
- **Supporting Substantial Damage Mitigation**

Each theme itemizes one or more factors found to have an impact on community regulatory compliance with substantial damage requirements. A careful qualitative evaluation of these factors

led to the development of fifty-five (55) recommendations. A summary table at the end of this report organizes recommendations into six (6) different categories (*data, capacity building, coordination, training/assistance, studies and regulation*), three (3) levels of prioritization (*high, moderate and low*), and two levels of governmental authority (*FEMA national and regional, and state and local governments*). Top-priority recommendations were identified and ranked by compiling input from local officials of participating communities, members of the project’s National Advisory Committee, and FEMA staff about the top five most important high-priority recommendations that, from their perspectives, they considered key to improving community compliance with substantial damage regulations of the NFIP. The following are top-priority recommendations from all responses:

<p><b>Top-Priority Recommendations</b> (from all responses from NAC, FEMA, and Locals) (see Figure 3.1)</p>
<p><b>[2] Data Sharing - Monitoring:</b> Create an open-data system to share information related to flood insurance policies and damage claims, repetitive loss properties, substantially damaged properties, buyouts, elevations, and whether communities are properly enforcing floodplain building and zoning regulations.</p>
<p><b>[27] Mechanisms for Compliance - Inventory:</b> As condition for participation in NFIP and/or CRS program AND as a possible corrective action for identified program deficiencies, require communities to maintain a yearly inventory of structures in SFHAs that includes information on the structure's BFE, Pre/Post FIRM status, and Market Value, as well as any applicable SD/SI information.</p>
<p><b>[10] Assistance for DAs and SD Activities:</b> Provide the necessary support for developing an EMAC-type agreement for floodplain management activities, including the provision of financial support for travel, lodging and meals of SDE-trained professional volunteers.</p>
<p><b>[4] Data Collection - Disaster Impacts Imagery:</b> Develop agreements with the USGS, the Air Force or other appropriate agencies, organizations and private contractors who have the capacity to collect post-disaster imagery AND/OR produce high-water marks maps to make disaster-impact information more broadly, comprehensively and readily available to communities.</p>
<p><b>[24] Consequences for Non-Compliance:</b> Adopt an expanded number of program corrective actions and sanctions to facilitate enforcement, and consistently enforce program corrective actions and sanctions for non-compliance. Make sure that non-compliant behavior, even if somewhat minor, has consequences and that major program violations (e.g., reversals to less stringent floodplain regulations related to Substantial Damage) result in severe sanctions, for example, a one to two level reductions in CRS standing scores or a range of premium penalties for persistent low-performance or chronic.</p>

Further information about these and other recommendations is described in the full project report. The report is based on the real-world experiences and input from local officials, practitioners and national experts about flood hazard mitigation approaches. It identifies the tools and mechanisms that are currently available (or missing) and can be used to achieve greater levels of regulatory

compliance. Some of the recommendations outlined in this report may require action of legislative bodies, others would require states and local governments to adopt new policies, and a few others can be implemented by FEMA without much processing or delays. Improving the nation's resilience to flooding hazards is achievable, and doing so will involve enhanced attention to mitigation program capacity building and greater levels of compliance at all levels of government.

# 1. COMMUNITY COMPLIANCE WITH SUBSTANTIAL DAMAGE REGULATIONS

This exploratory project evaluated how a range of existing and new local capacity building resources and enforcement strategies can be used to achieve community compliance with the National Flood Insurance Program (NFIP) regulations of substantially damaged structures. This study focuses on NFIP participating communities that have had substantially damage structures in Special Flood Hazard Areas (SFHAs) by major disaster events.

## 1.1 Background

The National Flood Insurance Program (NFIP)—*Public Law 90-448; 82-Stat-573*—is the main policy instrument guiding flood mitigation and adaptation strategies in the United States. The program is managed by the Federal Emergency Management Agency (FEMA), through its subcomponent Federal Insurance and Mitigation Administration (FIMA). Since its initiation in 1968, the NFIP is charged with providing appropriate prevention, protection and risk-sharing measures to reduce future flood losses (Brown, 2016).

In creating a federally funded flood insurance program, the NFIP organized its operations around four main initiatives (see Figure 1):

- **Mapping** and the identification of SFHAs, or floodplains, which are areas likely to be impacted by “base floods”—events with a one percent chance of happening each year;
- **Regulations** and the development of floodplain management strategies that can ensure the protection of new and existing development from “base floods”;
- **Insurance**, the provision of low-cost public flood insurance; and
- **Grants** with the provision of opportunities for funding flood mitigation activities.

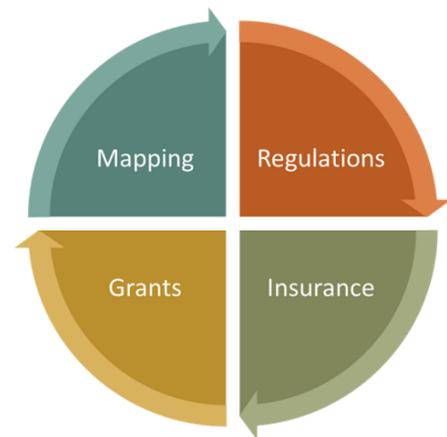


Figure 1 Main NFIP components

These initiatives are mutually supportive and highly interrelated with one another. Two core provisions of the program are that participation is completely voluntary and that the availability of subsidized rates of flood insurance is tied to the formal adoption of minimum floodplain management standards through local or state legislation.

Before a community can join the program, FEMA maps flood hazards on Flood Insurance Rate Maps (FIRMs). These maps designate different flood zones, or SFHAs, that guide risk communication and policy pricing efforts (inside and outside of these areas). To join the program, communities must agree to adopt and enforce floodplain management measures that meet or exceed minimum NFIP criteria. These measures generally require new development in SFHAs to obtain a building permit and raise the structure above the base flood elevation (BFE).

Historically, properties that were built before a community joined the NFIP (referred to as pre-FIRM) were given flood insurance coverage at a discounted rate. About 15 to 20 percent of all insurance policies nationwide are pre-FIRM (Kousky, 2017). Another set of properties exposed to flood hazards that receive discounted premiums are grandfathered policies. Grandfathered properties are those that were built in compliance before their flood hazard map was updated in ways that rendered as-built and previously compliant structures as non-compliant. These properties are below updated BFEs and thus are at a higher risk of flooding and more likely to report higher and/or more frequent claims than other policies. When properties have two or more losses of at least \$1,000 over a 10-year period, they are considered Repetitive Loss Properties (RLPs). According to the U.S. Government Accountability Office (GAO), RLPs represent only one percent of all policies-in-force nationwide, but they account for 38 percent of NFIP claims between 1978 and 2004 (GAO, 2004). The costs associated with paying off RLP claims places a financial strain on the program. For decades, FEMA has pursued a variety of strategies to mitigate RLPs and reduce flood-related losses. One of these strategies is the Substantial Damage / Substantial Improvement (SD/SI) regulatory component of the NFIP.

**Substantial Damage / Substantial Improvement (SD/SI) regulations** are the only way in which Federal floodplain requirements affect existing buildings. Substantial improvement refers to any change made to a structure that equals or exceeds 50 percent of the market value of the structure. These terms also include structures that have incurred “substantial damage,” regardless of the cause of damage or the actual repair work to be performed (FEMA, 2010). After an event or disaster, communities are required to use the “substantial damage” or “50 percent rule” to assess residential damage before residents can begin repairs. According to this rule, if damages or improvements meet or exceed 50% of the pre-disaster market value, the structure must be elevated to BFE, or changed in some other way to comply with local floodplain management regulations for new construction.

It is important to note that, in the context of the NFIP, substantial damage is a very specific term that only applies to a damaged structure in a SFHA (floodplain) regardless of the cause of damage. Substantially damaged structures outside SFHAs are not a regulatory concern of the NFIP and thus are not required to meet federal floodplain regulatory requirements. For decades, community officials nationwide have struggled with the implementation and enforcement of the SD/SI rule, especially after major multi-jurisdiction disasters. Part of the challenge with the implementation of this rule is due to the fact that damage information is gathered in pieces, by different people, at

different times, and for different purposes. For example, at a local level the process of gathering damage information has two main purposes: one to provide the necessary information for state and federal disaster declaration applications (mainly “windshield assessments”) and another that further supports disaster declarations and provides the necessary data for the substantial damage determination process as required by the NFIP (Preliminary Damage Assessments). These two processes can pose an logistical challenge for communities where local officials are tasked with providing a quick assessment of community-wide damages for disaster declaration applications, and, at the same time, are also tasked with identifying specific structures within SFHAs believed to be substantially damaged to then coordinate additional damage assessment teams to complete individualized, more detailed Preliminary Damage Assessments. This report identifies a number of factors that affect how communities understand, interpret and operationalize damage assessment activities in a post-disaster environment, and how those activities have a direct effect on the timeliness and efficiency of the substantial damage determination process.

## **1.2 Purpose and Objectives**

The main purpose of this project was to better understand the challenges and roadblocks that communities and community officials face when implementing the NFIP’s regulations of substantially damaged (SD) and substantially improved (SI) structures located in SFHAs. Specifically, the project had three main objectives:

- To identify and assess the effectiveness of strategies, processes and protocols that communities use to manage floodplain development and implement SI/SD regulatory components of the NFIP.
- To identify enforcement authorities that can help motivate local governments to take enforcement and mitigation actions on substantially damaged properties.
- To develop recommended strategies and actions that FEMA could use to lead, coordinate and/or support local motivation and capacity building to achieve better compliance with SI/SD components of the NFIP regulations.

## **1.3 Project Design**

The original intent of the project was to do an in-depth analysis of four (4) NFIP participating communities located in two states in different stages of disaster recovery, Texas and North Carolina. However, in response to regular monthly meetings with Federal Emergency Management Agency (FEMA) officials and insights from a National Advisory Committee, the scope of work was later expanded to include thirteen (13) communities across four different states with different regulatory and disaster-related challenges—Texas, Louisiana, Illinois and North Carolina. The National Advisory Committee was established exclusively for this project, and this committee included experts from different parts of the country who have vast experience managing, implementing and/or studying Substantial Damage/Substantial Improvement policies of the NFIP. Attachment A includes

the names and contact information of FEMA officials consulted for this project and members of the National Advisory Committee.

To better understand the challenges that communities face when implementing the substantial damage component of the NFIP, the project team organized several one- to two-hour discussion panels with local officials in the thirteen (13) NFIP participating communities located in disaster impacted areas of Texas, Louisiana, Illinois and North Carolina. Attachment B includes a copy of the discussion guide used to explore the experiences that local officials had with managing and coordinating activities that support the implementation of substantial damage regulations of the NFIP. The focus of study was on small to medium-sized communities that in the recent past experienced one or more types of natural disasters resulting in substantially damaged structures. Participating communities were selected based on four (4) ranges of population size—5k-10k, 10k-25k, 50k-100k, and 100k-250k—and their exposure to different types (and scales) of disaster impacts (see Table 1, next page). Disasters considered in this work included riverine floods, urban floods, coastal surge, hurricanes and tornadoes.

A total of 32 municipal and county staff members participated in these discussion panels, providing their perspectives in their role(s) as floodplain administrators, emergency managers, extension agents, community planners, building inspectors, building administrators, zoning officials, code enforcement agents, GIS coordinators, city managers, appraisers, and/or engineers. Their comments, suggestions and experiences were coded, categorized, analyzed and subsequently summarized in five main themes:

- Local Context
- Obstacles to Processing Damage Information
- Promising Practices and Protocols
- Equity Concerns
- Supporting Substantial Damage Mitigation

Each theme itemizes specific factors found to have an impact on community regulatory compliance with substantial damage requirements. Section 2 of this report details these factors and provides specific recommendations in support of improving regulatory compliance with SD/SI regulations of the NFIP.

**Table 1: Community Profiles**

Size (thousands)	Community	Disaster experience		Local Context		Recent Impacts		Financial Capacity Indicators			
		Years of recovery between the last two major disasters	Years since the latest major disaster	Percent structures built 2010 or later	Percent householders moved into residence in 2010 or later	Percent of housing stock impacted in latest disaster	Housing Density at time of disaster (du/acre)	Median Housing Value (to nearest ten thousand)	Median Household Income (to nearest ten thousand)	House Value to Yearly Income Ratio	Percent people below poverty level
~5 to 10	Community A	Unknown	0-2 yrs.	3-5%	>60%	Unknown	0.80	\$ 150,000	\$ 50,000	2.9	10-15%
	Community B	0-2 yrs.	0-2 yrs.	<1%	40-50%	5-10%	1.45	\$ 80,000	\$ 40,000	2.2	20-25%
	Community C	0-2 yrs.	0-2 yrs.	1-3%	20-30%	10-20%	0.02	\$ 90,000	\$ 40,000	2.5	25-30%
	Community D	>20 yrs.	0-2 yrs.	1-3%	40-50%	Unknown	0.72	\$ 200,000	\$ 60,000	3.4	15-20%
10 to 25	Community E	>20 yrs.	0-2 yrs.	3-5%	30-40%	Unknown	0.06	\$ 160,000	\$ 40,000	3.6	15-20%
	Community F	Unknown	6-10 yrs.	<1%	30-40%	1-3%	2.19	\$ 320,000	\$ 80,000	4.3	5-10%
	Community G	>20 yrs.	> 20 yrs.	1-3%	40-50%	<1%	1.00	\$ 120,000	\$ 50,000	2.7	10-15%
25 to 50	Community H	0-2 yrs.	0-2 yrs.	5-10%	30-40%	Unknown	0.05	\$ 170,000	\$ 50,000	3.4	15-20%
	Community I	6-10 yrs.	0-2 yrs.	5-10%	40-50%	>50%	0.50	\$ 60,000	\$ 30,000	2.0	>30%
50 to 100	Community J	11-15 yrs.	6-10 yrs.	1-3%	30-40%	<1%	0.08	\$ 130,000	\$ 50,000	2.5	15-20%
	Community K	0-2 yrs.	0-2 yrs.	>10%	>60%	Unknown	0.83	\$ 150,000	\$ 40,000	3.7	10-15%
100 to 250	Community L	6-10 yrs.	0-2 yrs.	5-10%	40-50%	3-5%	1.00	\$ 100,000	\$ 50,000	2.2	15-20%
250 to 500	Community M	>20 yrs.	0-2 yrs.	5-10%	40-50%	10-20%	0.66	\$ 180,000	\$ 50,000	3.5	15-20%

Community data retrieved from most relevant ACS-Census at the time of disaster.

## 2. FACTORS AFFECTING REGULATORY COMPLIANCE

Factors affecting regulatory compliance of substantially damaged structures were derived from in-depth discussion panels with 32 participants representing municipal and county governments in four states. The factors and associated recommendations are organized in five themes: Local Context; Obstacles to Processing Damage Information; Promising Practices and Protocols; Equity Concerns; and Supporting Substantial Damage Mitigation.

The entire list of 55 recommendations presented in this section of the report is compiled and ranked based on level of priority (high, moderate, low) for action in three tables at the end of the report (pages 33-35). The ranking procedure is discussed in section 3. At the end of each recommendation listed below, the brackets indicate: whether the recommendation is cross referenced under another theme; and the number and table in which the recommendation is listed.

### 2.1. Local Context

#### 2.1.1 Type of Disaster and Scale of Impacts

All communities made a reference about how the type of disaster, and the spatial extent and scale of disaster impacts affected their ability to coordinate damage assessments in their jurisdiction. In general, the larger the spatial extent and scale of disaster impacts, the harder it is for communities to organize post-disaster damage assessment field teams to kick-start the substantial damage process. In the case of flood impacts, for example, communities are often forced to wait days if not weeks for waters to recede before being able to visit impacted areas. For other disasters, such as largely wind-type events like tornadoes and hurricanes, delays are often due to other types of disaster impacts such as, large amounts of road debris, limited accessibility to impacted areas/structures (for days or weeks), damage to public buildings, infrastructure service interruptions, the loss of data, servers or historical records, and the evacuation or displacement of local staff members from their homes and/or places of work.

#### *Recommendations:*

- **Data Protection:** Expand HMGP funds to cover projects aimed at protecting data servers and/or set up cloud backup services storing information about housing inventory in SFHAs, permit records, appraisal information, and other critical local information for substantial damage on properties located in SFHAs. [Table 3.3: Recommendation #49]
- **Substantial Damage (SD) Operations & Regular Training:** Develop a SD evaluation training program that includes how to proactively kick-start and manage the Damage Assessment (DA) and Substantial Damage Determination (SDD) processes, the consideration of different disaster impact scenarios, how to use Substantial Damage Estimator (SDE) software effectively, and how to request FEMA assistance with DAs. At a state level, ensure that at least 2 staff members from NFIP participating communities (including the floodplain

management administrator) complete yearly trainings during floodplain management state chapter conferences or workshops. [Table 3.1: Recommendations #14 and #21]

- **Substantial Damage (SD) Packet Resources:** Create a repository for sharing substantial damage evaluation guidelines, information packets, model ordinances (including optional cumulative damage and lower threshold regulations), template forms and other practical information that states officials can use as a reference when developing or revising state NFIP regulatory documentation. [Table 3.2: Recommendation #30]
- **Assistance for Damage Assessments (DAs) & Substantial Damage (SD) Activities:** Provide the necessary support for developing an EMAC-type agreement for floodplain management purposes—Emergency Management Assistance Compact (EMAC), including the provision of financial support for travel, lodging and meals of volunteers with verified experience using the SDE tool. So, when the need arises, trained volunteers can be called upon to assist with substantial damage evaluations in a timely manner (i.e., hours or days after a disaster impact), effectively expanding the (spatial) reach that FEMA staff and other sub-contracted groups could have on large regions impacted by disasters. [Table 3.1: Recommendation #10]

### 2.1.2 Disaster Experience

While communities may be aware of their risk for certain types of major disasters, no one really expects to experience one or more historic-sized disaster event in their tenure. This is particularly the case in communities where there has been a lot of turn-around of staff members, and where available staff has had limited to no experience dealing with any major disaster (including doing damage assessments and reviewing repair estimates.) So, when a community is faced with unprecedented disaster impacts (or multiple disaster impacts in a relatively short span of time), staff members are easily overwhelmed and any damage assessment or mitigation processes take longer as people improvise coping strategies during recovery.

#### Recommendations:

- **SD Operations & Regular Training** [Section 2.1.1] [Table 3.1: Recommendations #14 and #21]
- **Assistance for DAs & SD Activities** [Section 2.1.1] [Table 3.2: Recommendation #10]
- **Substantial Damage (SD) Mentorship:** Create in collaboration with the ASFPM a national floodplain manager Substantial Damage mentoring program for floodplain administrations that matches experienced with junior administrators and requires regular mentor-mentee communications. [Table 3.2: Recommendation #37]

### 2.1.3 Political Pushback

Communities that have been experiencing a lot of urban growth prior to a disaster are more likely to face political pushback when implementing substantial damage regulations. New businesses and moderate to higher-income residents (inside and outside SFHAs), for example, have a strong political voice that can force the rolling back of beyond-minimum floodplain

regulations. Communities facing strong political pushback often find themselves rolling strict floodplain regulations back to the more basic set of NFIP regulations. Since rolling back regulations results in few if any significant program sanctions or setbacks, communities cannot provide residents with a strong argument in support of maintaining strong regulations.

On the other hand, communities in which SFHAs are mostly populated by elderly, renters, and low-income populations have an easier time keeping up with regulatory requirements. As noted by staff members, these groups of residents often do not have the political clout or (financial) capacity to appeal substantial damage determinations or push back regulations. In such cases, communities have an easier time enforcing NFIP regulations. The disproportionate impacts that disasters have on communities that lack political power, however, demands a deeper analysis of what factors (including racial, socioeconomic, financial and physical location) put some people at greater risk than others. Thus, communities could benefit from having access to (and training on) new planning tools and land use strategies that can result in more effective and coordinated planning efforts. It is also essential that marginalized people have a seat and a voice in planning decisions. Meaningful public participation is a cornerstone of high-quality planning. Communities should ensure that any planning process, especially hazard mitigation planning efforts, provide meaningful engagement of marginalized people and follow an inclusive participatory process.

#### Recommendations:

- **Incentives for Resilience Planning:** Provide incentives (e.g., CRS points) to communities that promote integrated urban planning activities (e.g., Plan Integration for Resilience Scorecard) that emphasize avoiding development in hazard-prone areas and promote hazard-proofing of existing structures and infrastructures. At a state level, provide training to participating communities. [Table 3.2: Recommendation #45]
- **Local Hazard Mitigation Plans & Substantial Damage (SD):** Require local hazard mitigation plans to include detailed mitigation projects (specially for clustered buyouts and elevations) and long-term recovery strategies and encourage the use of SDE software in support of this information as well as grant applications. At a state level, provide guidelines on how to ensure an inclusive participatory planning process. [Table 3.1: Recommendation #6]
- **Study on Enforcement:** Commission a study of enforcement to identify and classify program deficiencies and violations that have an impact on SDDs, and develop guidelines for a nationally consistent set of performance-based corrective actions and alternative program sanctions to be used when communities reach different levels of non-compliance. [Table 3.1: Recommendation #22]
- **Consequences for Non-Compliance:** Adopt an expanded number of program corrective actions and sanctions to facilitate enforcement, and consistently enforce program corrective actions and sanctions for non-compliance. Make sure that non-compliant behavior, even if somewhat minor, has consequences and that major program violations (e.g., reversals to less

stringent floodplain regulations related to Substantial Damage) result in severe sanctions, for example, a one to two level reductions in CRS standing scores or a range of premium penalties for persistent low-performance or chronic. [Table 3.1: Recommendation #24]

- **Study on Responding to Opposition Tactics:** Commission a study on best practices for how communities have dealt with and won out political opposition to hazard mitigation planning and enforcement of floodplain regulations. [Table 3.3: Recommendation #55]

## 2.2 Obstacles to Processing Damage Information

### 2.2.1 Availability and Accuracy of Risk Data

Communities that have been more successful at following NFIP requirements of substantial damage recognize that part of their success is due to having readily available in-depth predictive risk data. Information about risk to riverine floods, for example, is (for the most part) very detailed, reliable and accessible free of charge for current and historic events. Thus, communities exposed to riverine flood hazards are able to plan for and respond to flood impacts more efficiently than if they were exposed to other types of natural hazards for which risk information is incomplete, unreliable, dated or simply not available for their locality (e.g., urban floods, tornadoes or hurricanes.)

#### Recommendations:

- **Study on Risk:** Invest in disaster modeling studies that develop new ways to describe and predict localized risk to natural hazards, maybe adopting different scales of analyses or using alternative modelling techniques, such as land use, place-based or structural-based approaches. [Table 3.1: Recommendation #23]
- **Risk Data – Availability:** In association with other federal agencies (e.g., NOAA, or National Weather Service) and non-federal partners, create a website or online atlas to make predictive risk information urban flooding and riverine flooding more widely and readily available to communities. Ensure download options are compatible with GIS, excel and/or FEMA’s SDE software. [Table 3.2: Recommendation #32]

Another challenge with risk data is the accuracy and temporal resolution of Flood Insurance Rate Maps (FIRMs). Many communities have been working with outdated FIRMS (>20 years old), and the process for updating these maps can be lengthy (>10 years). Using old maps affects a community’s ability to regulate areas that are expected to be added to new maps.

#### Recommendations:

- **Risk Data – Map Updates:** Prioritize and expedite the process for updating FIRMs on recently impacted communities and on communities exposed to frequent and/or high-impact, low-probability hazards. [Table 3.2: Recommendation #31]

- **Incentives for SD Mitigation – Locally Identified Risk:** At a state and regional levels, provide assistance to communities on how to best identify, map and communicate flood risk with residents, as well as how to develop and enforce regulations on these areas even if they do not coincide with FEMA’s FIRM maps. Also, at a national scale, expand program benefits and requirements associated with mapped SFHAs to locally identified hazard-prone areas not yet included in effective or preliminary FIRMs. Incentivize communities that follow this practice. [Table 3.1: Recommendation #20 and Table 3.2: Recommendation #46]

### 2.2.2 Lack of Inventory

Many communities do not maintain a clear or comprehensive inventory of structures in SFHAs, and thus are either constantly re-creating a list of impacted structures after each disaster, or developing new GIS layers of impacted structures after each disaster. The substantial damage determination process could be accelerated if communities pre-populate various fields in the SDE software describing general characteristics of properties (e.g., foundation, maintenance, materials, footprint, etc.) as part of the process for maintaining an inventory. While communities participating in the Community Rating System (CRS) program keep track of structures in SFHAs—as part of CRS requirements, communities have to maintain a list of structures in SFHAs and report any flood damage on these structures once a year—most of them rely on ad-hoc spreadsheets or a paper folder-based approach to keep track of changes that happen to structures on SFHAs. As staff members reflect on this approach, they acknowledge that it is inefficient and that it takes a lot of time to summarize relevant information about a property (e.g., historic permits, cumulative damages or cumulative improvements), or come up with a list of potentially impacted structures to hand out to FEMA (or any external help) for substantial damage evaluation.

#### Recommendations:

- **SD Operations** [Section 2.1.1] [Table 3.1: Recommendation #14]
- **Mechanisms for Compliance – Inventory:** As condition for participation in NFIP and/or CRS program and as a possible corrective action for identified program deficiencies, require communities to maintain a yearly inventory of structures in SFHAs that includes information on the structure's Base Flood Elevations (BFEs), Pre/Post-FIRM status, and Market Value, as well as any applicable SD/SI information. At a state or regional level, provide communities with technical training on how to keep track of an inventory of structures in SFHAs using FEMA’s SDE software. [Table 3.1: Recommendation #27]
- **SDE Software Upgrades:** Expand and disseminate SDE training modules to include modules that focus on ways to integrate community information from multiple sources and formats, specifically: [Section 2.3.4] [Table 3.1: Recommendation #8]
  - a) Adding/storing historic records for each structure/parcel;
  - b) Using/integrating satellite imagery;
  - c) Using/integrating building permit information;

- d) Keeping track of cumulative damage/substantial improvement records in ways that are fair and easy to interpret and use (i.e., accounting for inflation rates or using relative measures of damage.); and
- e) Uploading and exporting information to/from GIS, spreadsheets, and other locally used software (e.g., for permitting, tax assessments, or market values.)

### 2.2.3 Accuracy and Consistency of Assessments

Even communities that have been most successful in processing substantial damage requirements of the NFIP noted that delays in the damage assessment process are often due to who is involved in the process. In two different regions, for instance, communities noted that damage assessments carried out by volunteer and professional groups is often unusable because these groups, following organization specific safety rules, are prevented from walking the property. As a result, their assessments are often of limited to no use to communities since local staff is often forced to re-do all the work at a later time during long-term recovery to verify the accuracy of assessments for each and every single property.

#### *Recommendations:*

- **Incentives for SD Mitigation – Locally Identified Risk** [Section 2.2.1] [Table 3.2: Recommendation #46]
- **Volunteers & Damage Assessments (DAs):** Coordinate with national and regional professional organizations on how to support damage assessment and rebuilding efforts in ways that are consistent with state protocols and NFIP regulations, and in ways that incorporate state-of-the-art risk reduction strategies. [Table 3.1: Recommendation #12]
- **Data Sharing – Support Damage Assessments (DAs):** Establish collaborative protocols for sharing information between non-profits, FEMA, state and local organizations involved in the process of completing damage assessments. [Table 3.1: Recommendation #1]

### 2.2.4 Uncertainty with Market Value Information

The main discrepancies found in how communities complete substantial damage determinations lies in how each community comes up with a market value for impacted properties. Depending on the level of concern of staff members and/or established protocols, communities: a) spend significant amounts of time and effort to complete analyses of fair pre-disaster market values for different parts of the community in ways that are fair to all residents; b) rely on tax appraised value records; or c) come up with a multiplier to apply to tax appraised records. None of the communities in the study used depreciated values. While strategies #2 and #3 were used by most communities in the study, these approaches do not account for the inter-regional and sub-sector differences between market and appraised values that most communities have within their jurisdictions. Also, communities spend a lot of time requesting and gathering appraised value

information from tax offices to then transcribe this data into SDE software for substantial damage evaluations.

Recommendations:

- **Market Values:** Develop new guidelines for partnerships between local planning staff members and floodplain administrators (with GIS capabilities) and county tax assessor officials to develop a more streamlined process for determining market values for different sectors of the community. [[Table 3.2: Recommendation #38](#)]

### 2.2.5 Communication and Shared Governance Issues

The efforts made by communities to adopt stricter floodplain regulations (e.g., adopting higher freeboard than minimum standards) are often undermined by FEMA when its staff, in direct communication with residents, indicate that the federal program only requires minimum standards, not the stricter rules set up by the community. As a result, communities face a lot of backlash and political pushback after disasters that often result in the reversal or weakening of local floodplain regulations.

Recommendation:

- **FEMA Communications:** Ensure that FEMA’s customer service agents have access to the most up-to-date information on local free-board regulations so that their communications are consistent with the information provided by local code enforcement and floodplain management administration staff. [[Table 3.1: Recommendation #15](#)]

### 2.2.6 Limited Legal Support for Sanctions

Communities face challenges when enforcing sanctions for non-compliant activities, as they generally have no financial resources to contract or hire an attorney locally to process cases. Also, when following up on cases where residents are blatantly non-compliant, communities do not feel that they have the necessary backing from the state attorney's office to follow through with sanctions. As a result, a number of structures in SFHAs continue to be non-compliant.

*Note: This might be a point for expansion of the project to get a larger sample size as some small communities do not have a problem contracting legal services. Still, the challenge seems to be bringing lawsuits to higher courts (i.e., state attorney’s offices) and get the necessary support and backing from officials to continue the regulatory process and, as applicable, any sanctions.*

Recommendations:

- **Compliance Helpline** [[Section 2.5.6](#)] [[Table3.2: Recommendation #39](#)]

- **Defendable Records:** Ensure that local officials are trained to maintain consistent, equitable and defendable records in all aspects of the substantial damage evaluation process. [Table 3.3: Recommendation #53]
- **Training – Elected Officials:** Provide elected officials (e.g., senators, and state and local elected officials) with training on how to maintain a clear and realistic message about post-disaster mitigation options with community residents in ways that do not undermine substantial damage activities. [Table 3.1: Recommendation #18]

### 2.2.7 Emotional Stress and Staff Training

In general, communities that have staff capable of doing substantial damage estimations (i.e., with ample experience) can process information faster than communities who rely on FEMA or other external help for completing substantial damage determinations. Thus, technical training of staff is an important factor. However, the main challenge community staff members face with the substantial damage determination process is breaking the “bad news” to people in the community, especially the most vulnerable, and managing conflict (or depression) that results from dealing with multiple “bad news” cases. The levels of emotional stress staff members are exposed to in the substantial damage determination process is high, and this stress level is further exacerbated when they (or part of their staff) is also a victim of disaster. As a result, communities may lose staff or, in occasion, bend the rules by accepting unverified supporting damage repair information.

#### Recommendations:

- **Local Hazard Mitigation Plans & Substantial Damage (SD)** [Section 2.1.3] [Table 3.1: Recommendation #6]
- **Local Hazard Mitigation Plans, Substantial Damage (SD) & Equity** [Section 2.4.3] [Table 3.1: Recommendation #35]
- **Mechanism for Compliance – Buyouts & Elevations** [Section 2.4.3] [Table 3.1: Recommendation #28]
- Ensure that floodplain administrators are trained in:
  - 1) **Emotional Intelligence Training for Disasters:** How to manage emotional stress and conflict in disaster activities (also relevant to other disaster management personnel). [Table 3.1: Recommendation #16]
  - 2) **Construction Costs Knowledge:** Basic construction knowledge and how to review damage repair estimates. [Table 3.2: Recommendation #41]
  - 3) Additional training that can help reduce emotional stress for staff working on substantial damage evaluations includes in-depth SDE software training [See Section 2.3.4] [Table 3.1: Recommendation #8]

## 2.3 Promising Practices and Protocols

### 2.3.1 Data and Technology

Having GIS tools and electronically-stored information early on in the damage assessment process allows communities to produce estimates of major damaged areas (for disaster declaration applications), and identify a list of potentially impacted structures within the SFHAs more quickly than if working with paper-based records. The three critical pieces of information that communities identified are needed for substantial damage activities and that should be collected during early stages of damage assessments (i.e., windshield damage assessments) are:

- a. The latitude and longitude information of high-water marks;
- b. One or more aerial disaster impact pictures; and
- c. General graphic/written descriptions on the extent of surface flood waters.

For many communities, the quality and availability of high-water marks is highly dependent on the local technical and technological capacities. For communities with some technological and technical capacity, GIS and compatible, ready-to-use handheld devices are key tools for integrating damage assessment information in an efficient manner. On the other hand, the availability of post-disaster aerial pictures seems to be dependent on the capacity (and willingness to help) of state and other external agents. For instance, one community noted that they were lucky to receive an offer by the Air Force to do flyovers over disaster impacted areas. As noted by several communities, post-disaster images are particularly valuable for supporting substantial damage determination and backing up enforcement activities. However, this resource, is available for most other communities as the process for collecting these data has not yet been formalized in any agreement.

#### *Recommendations:*

- **Technology Access & Training – Geospatial:** Provide communities with access to (and training on) geospatial software tools to map high water marks. [[Table 3.1: Recommendation #17](#)]
- **Mapping Support Networks:** Develop partnerships with non-profits, universities, extension programs and other non-federal partners that have the ability to collect, analyze and display spatial data quickly, and that can support local mapping, planning and engagement efforts during DAs and SDD activities. [[Table 3.2: Recommendation #33](#)]
- **Technical Capacity:** Open grant funding opportunities for communities to invest in GIS software licenses, training and technology. [[Table 3.2: Recommendation #36](#)]
- **Technology Availability:** At a regional or state level, establish standing-contracts with local communication service providers to ensure the availability and support of hand-held devices for disaster situations. [[Table 3.2: Recommendation #40](#)]
- **Data Collection – Disaster Impacts Imagery:** Develop agreements with the USGS, the Air Force or other appropriate agencies, organizations and private contractors who have the capacity to collect post-disaster imagery and produce high-water marks maps to make

disaster-impact information more broadly, comprehensively and readily available to communities. [Table 3.1: Recommendation #4]

### 2.3.2 Early Involvement

Communities that have planning staff and floodplain management administrators involved in early stages of the disaster response process have access to information faster on the most impacted areas in the community which results in faster processing times for damage assessments and substantial damage determinations.

#### Recommendations:

- **Local Hazard Mitigation Plans & Substantial Damage (SD)** [Section 2.1.3] [Table 3.1: Recommendation #6]
- **Emergency Operations Center (EOC) Participants:** Ensure emergency response protocols include provisions that state that GIS community planning staff, tax assessors and floodplain management administrators are present (or have direct access to) the Emergency Operations Center during disaster, so that data is more quickly shared among and across local agencies involved in the damage assessments, substantial damage determinations and long-term recovery efforts of the community. [Table 3.1: Recommendation #7]
- **Trust Building & Field Support:** Ensure that FEMA staff is in the field more frequently, including community visits, meetings and regional floodplain management conferences so that local officials are more familiar with FEMA's role in mitigation and recovery processes. [Table 3.2: Recommendation #34]

### 2.3.3 Coordination and Integration with Various Community Planning Functions

Communities that integrate floodplain management activities with community planning functions are more efficient at processing damage assessments than those relying on public work functions as they have at their disposal GIS mapping tools and other relevant resources that can allow tracking progress or changes in SFHAs. Also, a planning department may already have a formalized network of inter-department communications that can be beneficial when trying to pull together information for damage assessment analyses, NFIP/CRS program audits, and/or disaster-related grant applications. Coordination with local tax appraisal offices is also beneficial as appraisers have access to resources that allows them to track the status of roads, structures and parcels in time and across multiple jurisdictions. As noted by a participant “*it is not just about developing new software, it is about people and how well they are organized to carry a task.*”

Also, communities that have a more regulatory and compliance culture as reflected in the permitting process are better positioned to address substantial damage requirements because, for the most part, residents are aware of the need to obtain permits for any type of construction

and/or remodeling activity. So, states that have a stronger regulatory framework have an easier time preventing the inappropriate behaviors that lead to multiple enforcement actions, record fines, and litigation actions against local residents and construction service providers.

Recommendations:

- **Substantial Damage (SD) Management Resources:** Create a repository of best floodplain management practices that examples of how planning, GIS, permitting, tax appraisal, public work and emergency response activities can support DAs and SD activities. [Table 3.3: Recommendation #48]
- **Coordinate Substantial Damage (SD) Activities:** Develop guidelines and protocols for sharing information and coordinating planning, GIS, permitting, tax appraisal, public work and emergency response activities in support of DAs and SD activities. [Table 3.3: Recommendation #51]
- **Support Interdisciplinary Planning Efforts:** Look for ways in which the Association of State Floodplain Managers (ASFPM) and the American Planning Association's (APA), Hazard Mitigation and Disaster Recovery Planning division have a representation or module component in respective state or regional chapter conferences highlighting interdependencies and cross-benefits of collaborative approaches. [Table 3.3: Recommendation #52]

### 2.3.4 Substantial Damage Estimator (SDE) Software

The SDE has been widely accepted and used by multiple communities. The level of experience and staff training with how to use and modify information on this software, however, varies. Communities that have been more successful with substantial damage requirements have used the SDE program to maintain records all structures in SFHAs in the software and make regular updates to these records, especially after each flood event. However, the program is not very flexible (i.e., compatible with other programs) or easy to adapt to account for specific relevant considerations (e.g., impacts of poor maintenance on property values.)

Recommendations:

- **SDE Software Upgrades:** Expand SDE software capabilities to: [Table 3.1: Recommendation #8]
  - a) Facilitate automatic retrieval of information from other community databases (such as tax records and building permits).
  - b) Improve on data integration from multiple sources and data visualization and mapping tools (for tacking past impacts and impacted areas) [See also Section 2.2.2].
  - c) Allow tallying cumulative damage (and substantial improvement) using damage-value ratios, not raw damage dollar values.
  - d) Ensure software compatibility with Microsoft, Android and Apple products. Provide advanced training on new modules.

### 2.3.5 Professional Network

Communities that rely on a network of regional/state floodplain administrator volunteers ready to be deployed to complete damage assessments and substantial damage determinations feel confident in their ability to handle the challenges associated with post-disaster damage assessments and determinations. This network of volunteers seems to have multiple benefits:

- a) It enhances social network of floodplain managers in the region;
- b) It provides hands-on experience to floodplain administrators and other volunteers in training;
- c) If using a common method, it reduces the burden placed on local officials to compile and process substantial damage evaluations;
- d) It has the potential to reduce stress levels on local officials and pushback from communities as substantial damage determinations are made by a group of regional/local trained professionals rather than the local official, and
- d) It has the potential to reduce non-compliant rebuilding as residents are provided with information needed for compliance in a timely fashion.

The main limitations for implementing this network in different regions of the nation would be the available number of volunteers per region, distances involved between disaster impacted areas and volunteers, and the challenges imposed by the scale, type and size of disaster impacts (some of which can be multi-regional and multi-state). Communities can benefit from developing mutual aid agreements with other private and public groups that can support disaster recovery.

#### Recommendations:

- **Assistance for DAs & SD Activities** [Section 2.1.1] [Table 3.1: Recommendation #10]
- **Study on Mutual-Aid Agreements:** Commission a study to explore and summarize best practices communities have with mutual-aid agreements (with county governments, regions, non-profit organizations and other agencies and groups) that benefit DAs and SD activities, enabling disaster mitigation and recovery. [Table 3.2: Recommendation #43]
- **Mutual-Aid Networks:** Provide the necessary support for facilitating mutual-aid agreements between community groups that support critical infrastructures, such as public-works and fire volunteers able and willing to help with removing debris; and networks of private sector companies (e.g., electric or gas) willing to provide aid to local companies. [Table 3.1: Recommendation #11]

### 2.3.6 Substantial Damage Evaluation Packets

Good information passed to building inspectors by the state containing template letters, detailed descriptions of the substantial damage evaluation process, and sample notifications and forms.

## 2.4 Equity Concerns

### 2.4.1 Scope of the “Substantial Damage” Problem for Communities

Flood impacts often exceed the boundaries of SFHAs and residents outside of these areas have a hard time understanding that, even though they’ve flooded (or flooded repetitively), they are ineligible for many financial assistance and recovery programs. While community officials generally agree that having fewer structures in the floodplain would reduce risk to residents, it is unfortunate that they feel that development in SFHAs is almost needed to be able to provide residents with more options for recovery, or have available funds for mitigation projects including buyouts and repetitive loss mitigation. This is particularly relevant for growing communities working with dated flood risk information (i.e., FIRMs). As noted by a participant “we know where [substantial damage properties and repetitive loss properties] are just because it’s happened in history, but we do not track those that are outside [SFHAs] like we do the other ones... because there is no requirement [to do so].”

#### Recommendations:

- **Local Hazard Mitigation Plans & Substantial Damage (SD)** [Section 2.1.3] [Table 3.1: Recommendation #6]
- **Incentives for SD Mitigation – Locally Identified Risk** [Section 2.2.1] [Table 3.1: Recommendation #20, Table 3.2: Recommendation #46]
- **Local Plans, Substantial Damage (SD) & Equity** [Section 2.4.3] [Table 3.2: Recommendation #35]
- **Data Sharing – Monitoring** [Section 2.5.1] [Table 3.1: Recommendation #2]
- **Study on Mitigation Funding Strategies:** Commission a study on best practices to build a diverse portfolio of funding strategies for natural hazards mitigation. [Table 3.2: Recommendation #44]
- **Local Mitigation Funding Strategies:** Require hazard mitigation plans (HMPs) to include a diverse portfolio of funding strategies that taps into various sources of grant funds outside FEMA’s Hazard Mitigation Grant Program and Public Assistance programs to address the needs of low-income communities whether inside or outside SFHAs, such as housing urban development grants, EPA 319 program, stormwater management fees or even their own revenues. [Table 3.3: Recommendation #50]

### 2.4.2 Disproportional Impacts to Vulnerable Community Groups

Low-to-moderate income communities have a more difficult time mitigating substantially damaged properties as the buyout process is lengthy (it can take years if not decades) and can be very costly for residents (e.g., maintaining a mortgage of an uninhabitable structure while also paying for interim housing options). Particularly vulnerable are the poor, elderly and renter population groups. States need to take a lead role on this issue

#### Recommendations already covered in:

- **Local Hazard Mitigation Plans & Substantial Damage (SD)** [Section 2.1.3] [Table 3.1: Recommendation #6]
- **Local Plans, Substantial Damage (SD) and Equity** [Section 2.4.3] [Table 3.2: Recommendation #35]
- **Mechanisms for Compliance – Buyouts & Elevations** [Table 3.1: Recommendation #28]

### 2.4.3 Mitigation Timelines and Long-Term Recovery Issues

In hard hit regions, the loss of population is just the first blow to a community followed by a drop of home values and tax collections that result from abandoned structures. The costs associated with mitigating abandoned properties can be high and time consuming. Some of these costs include: maintaining sites while processing repossessions or condemnations (to avoid blight and further reductions in property values); time and effort spent “chasing down” property owners and processing notifications; contracting asbestos and other environmental surveys for each individual property; demolishing structures; disposing of general and contaminated wastes; and selling/flipping the property. Therefore, it is in the best interest for a community to avoid situations that would result in the abandonment of properties, even if it would mean eliminating the more stringent floodplain regulations from their floodplain management ordinances. As noted by a participant *“the [mitigation/buyout] process takes so long, it is as if it was designed for people to just drop off; [as a community] I can’t just let blighted structures to just sit there and wait for the HMGP to run its course, because it would have an adverse effect on the community’s property values and mental health. People who are recovering and repairing need to move on.”* Still, concerns with reductions of the tax base have led some communities to limit substantial damage mitigation efforts to elevation projects alone, not buyouts.

#### Recommendations:

- **Local Hazard Mitigation Plans & Substantial Damage (SD)** [Section 2.1.3] [Table 3.1: Recommendation #6]
- **Mechanisms for Compliance – Buyouts & Elevations:** As condition for participation in NFIP and/or CRS program AND as a possible corrective action for identified program deficiencies, require states to develop the necessary operational capacity to support and fund an ongoing mitigation program for buyout and elevation projects that: a) is bound to a broader mitigation strategy; b) expedites projects for clusters of properties particularly of vulnerable population groups; c) specifies criteria for eligibility early on after a disaster so that residents know not to concern themselves with rebuilding a home that will be bought out, and d) expands eligibility to properties with or without insurance located within or beyond SFHA boundaries. [Table 3.1: Recommendation #28]
- **Local Plans, Substantial Damage (SD) & Equity:** Require local hazard mitigation plans to identify locations where residents can find affordable replacement housing within the community, or where the community has planned or formalized land annexations with the

purpose of promoting the development of replacement housing. [Table 3.2: Recommendation #35]

- **State Plans & Substantial Damage (SD):** Require state mitigation plans to have better connections with NFIP compliance and substantial damage regulations by outlining strategies on how states plan to operationalize substantial damage activities, and build their capacity to administer mitigation grants and do CAVs and CACs more effectively. [Table 3.1: Recommendation #5]

## 2.5 Supporting Substantial Damage Mitigation

### 2.5.1 Flood Risk Information and Disclosure Requirements

According to participants, current flood insurance requirements for federally-backed mortgage and Small Business Administration (SBA) loans seem to help communities keep new construction compliant with floodplain regulations. The challenge for communities is finding ways to better communicate changing flood risk conditions to buyers, renters and residents living in (or moving into) existing housing inventory, and increase their participation in flood insurance coverage within and beyond SFHAs. *“If there is a way to get more information about flood insurance out to people who are going to stay, whether they have to have it or not, it would be worth looking into.”*

While most communities indicated that residents in SFHAs are generally aware of flood risks in the area, they also noted that people often underestimate their risk because they do not understand what the “100-year floodplain” means for their investment or how risk changes within and beyond the SFHAs over time. If resident were to be provided with specific information about the past or potential impacts on properties, they would likely make different decisions with respect to investments, relocation and flood insurance coverage. Communities also noted that residents beyond SFHAs are often misinformed by insurance and real estate agents about flood risk. In at least four cases, staff members noted that residents were discouraged by agents from getting flood insurance coverage because their property was located outside SFHAs. Communities would benefit from having other ways to inform buyers and renters during real estate transactions about flood risk and the potential need for (and availability of) insurance coverage in the community.

#### Recommendation:

- **Data Sharing – Monitoring:** Create an open-data system to share information related to flood insurance policies and damage claims, repetitive loss properties, substantially damaged properties, buyouts, elevations, and whether communities are properly enforcing floodplain building and zoning regulations. [Table 3.1: Recommendation #2]

- **Mechanism for Compliance - Disclosures:** As condition for participation in NFIP and/or CRS program AND as a possible corrective action for identified program deficiencies, require states to adopt comprehensive statutory or regulatory requirements for deed records and/or real estate transactions to disclose to potential buyers and renters a property's flood risk, including: cumulative flood damages over the past 10 years, whether the property is required to be covered by flood insurance, whether the property is located in a SFHA, actuarial flood insurance costs at the time of transaction, and (as applicable) mitigation history. [Table 3.1: Recommendation #21]
- **Training - Key Stakeholders:** Develop training for insurance agents and community planners on basic NFIP requirements, and how to interpret SFHAs and FIRMs and use this information communicate flood risk more effectively to residents. [Table 3.2: Recommendation # 32]

### 2.5.2 Supporting Cumulative Damage Regulations

Cumulative damage regulations force people who own an existing building that has been repetitively impacted by disaster over a specific period of time (often 10 years) to make a major investment in the property to bring it into compliance with latest floodplain regulations once the costs of improvements and/or repairs equals to or exceeds 50% of the property's market value. As a policy, cumulative damage has the potential to help communities reduce the number of repetitive loss properties in their jurisdictions and slowly upgrade their housing stock in ways that meet new safety standards. In fact, communities that reported having fewer repetitive loss properties and substantially damaged properties over time attribute part of their success to cumulative damage regulations. A number of communities that have not adopted a cumulative damage regulation have not done so (or are hesitant to do so) because the regulation is optional and not part of the model ordinances provided by the state. Also, communities have refused to consider adopting cumulative damage regulations until FEMA can offer buyers, renters, and communities open access to cumulative damage tallies and flood risk history of all insured properties.

#### Recommendations:

- Encourage states to include a cumulative damage regulation as part of state's floodplain ordinances guidelines or template document noting that the regulation is optional and linked to a large number of points toward CRS ratings. Noted as part of **SD Packet Resources** [Section 2.1.1] [Table 3.2: Recommendation #30]
- **Mechanisms for Compliance - Records:** As condition for participation in NFIP and/or CRS program AND as a possible corrective action for identified program deficiencies, require states to adopt a minimum 10-year record retention policy. [Table 3.2: Recommendation #47]
- **Incentives for SD Mitigation - Single Policy Effort:** Incentivize communities to adopt cumulative damage or lower thresholds (see next section) by automatically entering them into the CRS program and/or further increasing the number of CRS points associated with the

adoption of regulation in ways that would allow to improve (or lose with reversals) CRS rating levels easier. [Table 3.1: Recommendation #25]

- **Cumulative Damage Training:** Provide specific training on how to manage cumulative damage regulations. [Table 3.2: Recommendation #42]

### 2.5.3 Supporting Lowering Thresholds

Compliance with the latest NFIP regulations is required when the costs of damage repairs or property improvements equal to or exceed 50% of the property's market value. For the most part, communities indicated that the large majority of detailed damage evaluations completed for the latest disaster resulted in final substantial damage determinations. Also, a number of communities indicated having widespread impacts in their jurisdictions but few "close determinations" of substantial damage. On the one hand, these results suggest that communities are following an evaluation process that is very effective at identifying potentially substantial damage cases early on. This is good in that few local, state and federal resources are being wasted in post-disaster damage assessment efforts. On the other hand, results also suggest that the threshold may be set too low to capture the most common damage levels that the types of structures in communities have, and that the damage assessment process itself may be designed to only identify cases where the devastation is so great that there is little doubt that the proportion of damage-to-value exceeds the 50 percent threshold.

While lowering the damage threshold can result in a longer substantial damage evaluation process for communities (especially for those with low capacity to complete damage assessments), it also can increase the speed at which communities adapt to new risk conditions as a greater proportion of their housing stock impacted by disasters (between 30% and 49%) would be upgraded sooner to newest safety standards.

#### Recommendations:

- **Incentives for SD Mitigation - Single Policy Effort** [Table 3.1: Recommendation #25]
- **Incentives for SD Mitigation - Combined Policy Effort:** Strongly incentive communities to adopt both cumulative damage AND lower thresholds by reducing the required percent match for post-disaster mitigation projects and by making it easier to improve (or lose) a CRS rating standing level. [Table 3.1: Recommendation #26]

### 2.5.4 Providing Better Support for Buyout Programs

Communities that have been more successful with mitigating substantial damage structures have focused their efforts on acquiring and removing the most vulnerable structures in the floodplain. These acquisitions, known as buyouts, are funded primarily by FEMA. As noted earlier in the report, a drawback of buyout programs is that funding can take years to materialize. Another drawback of the largest buyout programs is that eligibility is limited to properties located in

SFHAs (i.e., PDM and HMGP), or insured properties located in SFHAs (i.e., FMA). However, when states financially support FEMA buyout programs with state-run buyout programs, waiting times for residents can be reduced to months and even weeks, and eligibility requirements can be expanded to damaged structures with or without insurance beyond SFHAs.

Also, communities expressed a need for FEMA’s Individual Assistance program (IAs) cooperation to help reach residents whose property would be eligible for buyouts. After a disaster, some residents are forced to move to abandon their property and the community has a very difficult time contacting these residents to extend to them an offer for buyout. As a result, affected residents end up losing their property and the opportunity to be bought out, and communities lose residents and part of their tax-base. There seems to be a communication gap between Individual Assistance, Public Assistance and FIMA programs within the NIFP. If privacy concerns prevent FEMA from sharing contact information about individuals, then maybe FEMA can create a process to forward information to the resident on behalf of the community.

Recommendations:

- See recommendations in Section 4.3 “*Mitigation timelines...*”
- **Data Sharing - Mitigation:** Create a share-records agreement that allows participating communities to contact residents likely registered in FEMA’s Individual Assistance program who are eligible for buyout and elevation offers, or facilitate a forward-record process by which community notifications can be passed along to these residents. [[Table 3.1: Recommendation #3](#)]
- **Inter-Agency & Intra-Agency Communications:** Set up integrated SDE training program at the state level for Individual Assistance, Public Assistance and FIMA programs that identifies how each one of these programs can use or rely on the activities of another program to further support their role under the greater NFIP’s mission. [[Table 3.3: Recommendation #54](#)]

### 2.5.5 Managing Contractors

Most communities included in the study indicated that the mass move of contractors into disaster impacted areas created challenges for permitting processes and substantial damage evaluations. According to communities, a large number of contractors that move into disaster impacted areas are not familiar with local floodplain regulations, building codes and permitting requirements, or assume that the requirements of neighboring jurisdictions apply to all nearby jurisdictions. As a result, the repairs on a damaged home have to be delayed or completely stopped, which causes a lot of frustration both to residents and community officials. Communities that had expressed having an easier time dealing with these issues indicated that they had in place a contractor validation and badging process run through the local police department. The validation process includes a verification of licensing credentials, and the badging process which includes a registration ID number and badge that lets residents know that contractors are registered with the local jurisdiction. This initiative helps, to some degree, reduce contractor fraud cases and

alleviates some of the burden on planning staff handling resident concerns and disaster recovery efforts. Communities would benefit from using this registration process to also provide some basic information about local regulatory requirements, such as: a reference to locally adopted building codes, a reference to locally adopted floodplain regulations that affect building construction and repairs, and a reference to local permitting requirements related to building construction and repairs.

Recommendation:

- **Contractor Management:** Require states to develop guidelines for working with the appropriate local authority to help verify contractor licensing credentials, issue them a disaster-recovery work authorization badge for identification, and provide them with reference materials to local adopted building codes, floodplain regulations that affect building construction and repairs, and building permitting information and required forms. [Table 3.1: Recommendation #13]

### **2.5.6 Community Assistance Contacts (CACs) And Community Assistance Visits (CAVs)**

Communities had different understandings and experiences with CACs and CAVs. Most communities perceived and experienced CACs and CAVs as a purely an auditing process, i.e., a one-way interaction in which auditors ask for records and information and city staff provide them. A handful of communities indicated that they have used CACs and CAVs processes to engage with state officials, advance their standing in the CRS program, and work through different challenges with regulatory compliance. When CACs and CAVs are perceived as a service and coaching process to help communities into compliance, staff members are more likely to proactively seek out assistance and help for state officials to further improve their standing in the NFIP program. When CACs and CAVs are perceived as an audit, staff members are more likely to stay out of the way as much as possible and let the state official run through the process without any questions asked.

Also, it is important to note that a few small communities were not familiar with (or could not recall ever having had) CACs or CAVs, and that a larger number of communities familiar with CACs and CAVs have not had one in a while (i.e., more than 5 years). The limited interaction between a number of participating communities and CACs and CAVs officials may be indicative of understaffing issues of CAC and CAV programs, and a need to increase funding for staff, staff training and other technical and operational resources needed to provide the necessary regulatory support to communities to ensure their compliance with the NFIP.

Recommendation:

- **Compliance Helpline:** Create an anonymous help/assistance program or forum in which local officials can openly ask questions about compliance with NFIP standards, and best ways to

deal with emerging legal and regulatory compliance challenges. [[Table 3.2: Recommendation #39](#)]

- **Compliance Review/Enforcement:** Leverage CACs and CAVs as opportunities for coaching local communities on how to further improve their standing in the program, rather than using these activities as strictly auditing processes. Provide the necessary funding to increase the capacity of CAC and CAV programs to provide more regular support to communities (online or in-person) and train CAC and CAV officials on how to build trust and become a valuable resource for reference and advancement in NFIP and CRS Programs. [[Table 3.1: Recommendation #9](#)]

### 3. RECOMMENDATIONS

In Section 3, the 55 recommendations presented in Section 2 are classified based on level of priority for action, six technical and administrative categories (data, capacity building, training, etc.), and implementation responsibilities. The organization of all recommendations based on this classification system is shown on Tables 3.1, 3.2 and 3.3 at the end of this section. In addition, top priority recommendations were further assessed based on input from local communities, the National Advisory Committee, and FEMA staff (see Figure 3.1).

#### 3.1 Classifications of the Recommendations

The recommendations are classified in three ways. **First**, each recommendation is classified based on levels of prioritization and presented on tables that reflect each level: Table 3.1–High, Table 3.2–Moderate, and Table 3.3–Low. The prioritization process was guided by results from cross-analyzing the discussion panels that included 32 local officials, members of the national advisory committee, and FEMA staff. Definitions of each level of priority include:

**High** – recommendations that can have the greatest positive impact on supporting NFIP, specifically the Damage Assessment and Substantial Damage Evaluation processes.

**Moderate** – recommendations that can further facilitate and support Damage Assessment and Substantial Damage Evaluation processes.

**Low** – recommendations that are desired but not essential for supporting effective Damage Assessment and Substantial Damage Evaluation processes.

**Second**, the recommendations illustrated on each table were organized into six categories:

**Data** –specific digital or hard-copy objects which can include paper forms, electronic records, guideline documentations, reports, imagery, maps, geospatial data, tabular data and various other types of documents describing properties, cases, policies and assistance records, among others.

**Capacity Building** –strategies that can help communities build their social, institutional, technical and operational capacities to plan for, implement, and manage substantial damage requirements of the NFIP. These recommendations include technologies or tools that communities could use to further enhance the efficiency with substantial damage evaluation activities.

**Coordination** –opportunities for collaboration/coordination between agencies, volunteers, interest groups, agents and other stakeholders that play a direct or indirect role in the assessment, evaluation, mitigation and long-term management of impacted, damaged and substantially damaged structures.

**Training and Assistance** –training and assistance programs needed to help communities overcome identified obstacles to processing damage information and adopt disaster resilient practices that can support the successful assessment, evaluation, mitigation and long-term management of impacted, damaged and substantially damaged structures.

**Studies** –studies to cover current knowledge gaps that affect the implementation, management, monitoring and enforcement of substantial damage regulations of the NFIP.

**Regulations** –changes to rules, regulations, incentives and sanctions associated with the substantial damage component of the NFIP to more effectively reduce the number of damaged properties, reduce the financial burned on the NFIP, and outline a more successful path to enhance community resilience to floods and other disasters.

**Third**, the three tables show the implementation responsibilities assigned to each recommendation that include FEMA national, FEMA regional, state, and local levels of government. A few recommendations fall under the shared authority and leadership of multiple levels of government: FEMA National/Regional and State and Local Governments.

### 3.2 Top Priorities

From the list of 55 recommendations, two groups of respondents selected the five most important top-priority recommendations that, from their perspectives, were considered key to help improve community compliance with substantial damage regulations of the NFIP (Figure 3.1).

Respondents then ranked each of the five selections. The groups include: FEMA staff and members of the National Advisory Committee (NAC); and local officials from participating communities (Locals). Column 1 of Figure 3.1, lists the policies selected from all responses and Column 2 specifies the ranking from all responses (NAC, FEMA, and Locals). Column 3 of Figure 3.1 specifies the ranking from NAC and FEMA. Column 4 of Figure 3.1 specifies the ranking from Locals. While all respondents from both groups agreed on several policy priorities, each group ranks the recommendations differently. Several policies tied in their level of priority, thus, only the top three policy recommendations are ranked.

**Figure 3.1: Top Priority Recommendations** (Several rankings resulted in ties as indicated)

<b>Top-Priority Recommendations</b> (ranked by all responses from NAC, FEMA, and Locals)	<b>Ranking from all responses</b>	<b>Ranking from NAC &amp; FEMA alone</b>	<b>Ranking from Locals alone</b>
<b>[2] Data Sharing - Monitoring:</b> Create an open-data system to share information related to flood insurance policies and damage claims, repetitive loss properties,	1	1	3

substantially damaged properties, buyouts, elevations, and whether communities are properly enforcing floodplain building and zoning regulations.			
<b>[27] Mechanisms for Compliance - Inventory:</b> As condition for participation in NFIP and/or CRS program AND as a possible corrective action for identified program deficiencies, require communities to maintain a yearly inventory of structures in SFHAs that includes information on the structure's BFE, Pre/Post FIRM status, and Market Value, as well as any applicable SD/SI information.	1	1	3
<b>[10] Assistance for DAs and SD Activities:</b> Provide the necessary support for developing an EMAC-type agreement for floodplain management activities, including the provision of financial support for travel, lodging and meals of SDE-trained professional volunteers.	2	3	3
<b>[4] Data Collection - Disaster Impacts Imagery:</b> Develop agreements with the USGS, the Air Force or other appropriate agencies, organizations and private contractors who have the capacity to collect post-disaster imagery AND/OR produce high-water marks maps to make disaster-impact information more broadly, comprehensively and readily available to communities.	3	(not ranked)	1
<b>[24] Consequences for Non-Compliance:</b> Adopt an expanded number of program corrective actions and sanctions to facilitate enforcement, and consistently enforce program corrective actions and sanctions for non-compliance. Make sure that non-compliant behavior, even if somewhat minor, has consequences and that major program violations (e.g., reversals to less stringent floodplain regulations related to Substantial Damage) result in severe sanctions, for example, a one to two level reductions in CRS standing scores or a range of premium penalties for persistent low-performance or chronic.	3	2	(not ranked)
<b>[1] Data Sharing - Support DAs:</b> Establish collaborative protocols for sharing damage information between non-profits, FEMA and state and local organizations.	(not ranked)	(not ranked)	2
<b>[5] State Plans and SD:</b> Require state mitigation plans to have better connections with NFIP compliance and substantial damage regulations by outlining strategies on how states plan to operationalize substantial damage activities, and build their capacity to administer mitigation grants and do CAVs and CACs more effectively.	(not ranked)	3	(not ranked)
<b>[14] SD Operations:</b> Develop a SD evaluation training program that includes how to proactively kick-start and manage the DA and SDD processes, the consideration of different disaster impact scenarios, how to use SDE	(not ranked)	(not ranked)	3

software effectively, and how to request FEMA assistance with DAs. Require floodplain administrators to complete yearly trainings.			
<b>[17] Technology Access and Training</b> - Geospatial: Provide communities with access to (and training on) geospatial software tools to map high water marks.	(not ranked)	(not ranked)	3

Table 3.1: Summary of High Priority Recommendations

Category	ID Number	High-Priority Recommendations	Relevant Authority		TOP PRIORITIES		MOST CRITICAL FOR SUBSTANTIAL DAMAGE
			FEMA	STATE & LOCAL GOV'TS	STRATEGIC	OPERATIONAL	
Data	1	<b>Data Sharing - Support DAs:</b> Establish collaborative protocols for sharing damage information between non-profits, FEMA and state and local organizations. [Section 2.3 Accuracy and consistency of assessments] [STATE AND LOCAL GOV'TS - Coordinate, endorse and provide enabling authority]	●	●		2	
	2	<b>Data Sharing - Monitoring:</b> Create an open-data system to share information related to flood insurance policies and damage claims, repetitive loss properties, substantially damaged properties, buyouts, elevations, and whether communities are properly enforcing floodplain building and zoning regulations. [Section 5.1 Flood risk information and disclosure requirements] [STATE AND LOCAL GOV'TS - Coordinate, endorse and provide enabling authority]	●	●	1	3	1
	3	<b>Data Sharing - Mitigation:</b> Create a share-records agreement that allows participating communities to contact residents likely registered in FEMA's Individual Assistance program who are eligible for buyout and elevation offers, or facilitate a forward-record process by which community notifications can be passed along to these residents. [Section 5.4 Providing better support for buyout programs] [STATE AND LOCAL GOV'TS - Co-lead and operationalize]	●	●			
	4	<b>Data Collection - Disaster Impacts Imagery:</b> Develop agreements with the USGS, the Air Force or other appropriate agencies, organizations and private contractors who have the capacity to collect post-disaster imagery AND/OR produce high-water marks maps to make disaster-impact information more broadly, comprehensively and readily available to communities. [Section 3.1 Data and technology] [STATE AND LOCAL GOV'TS - Co-lead and operationalize]	●	●		1	3
Capacity building	5	<b>State Plans and SD:</b> Require state mitigation plans to have better connections with NFIP compliance and substantial damage regulations by outlining strategies on how states plan to operationalize substantial damage activities, and build their capacity to administer mitigation grants and do CAVs and CACs more effectively. [Section 4.3 Mitigation timelines and long-term recovery issues]	●		3		
	6	<b>Local Plans and SD:</b> Require local Hazard Mitigation Plans to include detailed mitigation projects (specially for clustered buyouts and elevations) and long-term recovery strategies, and encourage the use of SDE software in support of this information as well as grant	●				
	7	<b>EOC Participants:</b> Require that GIS community planning staff, tax assessors and floodplain management administrators are present (or have direct access to) the EOC during a disaster, so that data is more quickly shared and processed across local agencies involved in DAs and disaster recovery. [Section 3.2 Early involvement]	●				
	8	<b>SDE Software Upgrades:</b> Expand SDE software capabilities to: a) facilitate automatic retrieval of information from other community databases (such as tax records and building permits); b) improve on data integration from multiple sources and data visualization and mapping tools (for tacking past impacts and impacted areas); c) allow tallying cumulative damage (and substantial improvement); and d) ensure software compatibility with Microsoft, Android and Apple products. Provide advanced training on new modules. [Section 2.2 Lack of inventory and Section 3.4 SDE software]	●				
	9	<b>Compliance Review/Enforcement:</b> Leverage CACs and CAVs as opportunities for coaching local communities on how to further improve their standing in the program, rather than using these activities as strictly auditing processes. Provide the necessary funding to increase the capacity of CAC and CAV programs to provide more regular support to communities (online or in-person) and train CAC and CAV officials on how to build trust and become a valuable resource for reference and advancement in NFIP and CRS Programs. [Section 5.6 CACs and CAVs] [STATE AND LOCAL GOV'TS - If managing CACs and CAVS, support, operationalize]	●	●	3		
Coordination	10	<b>Assistance for DAs and SD Activities:</b> Provide the necessary support for developing an EMAC-type agreement for floodplain management activities, including the provision of financial support for travel, lodging and meals of SDE-trained professional volunteers. [Section 1.1 Type of disaster and scale of impacts and Section 3.5 Professional networks] [STATE AND LOCAL GOV'TS - Support, endorse and implement]	●	●		3	2
	11	<b>Mutual-aid networks:</b> Provide the necessary support for facilitating mutual-aid agreements between community groups that support critical infrastructures, such as public-works and fire volunteers able and willing to help with removing debris; and networks of private sector companies (e.g., electric or gas) willing to provide aid to local companies. [Section 3.5 Professional networks]	●	●			
	12	<b>Volunteers and DAs:</b> Coordinate with national and regional professional organizations on how to support damage assessment and rebuilding efforts in ways that are consistent with state protocols and NFIP regulations, and in ways that incorporate state-of-the-art risk reduction strategies. [Section 2.3 Accuracy and consistency of assessments]	●				
	13	<b>Contractor Management:</b> Require states to develop guidelines for working with the appropriate local authority to help verify contractor licensing credentials, issue them a disaster-recovery work authorization badge for identification, and provide them with reference materials to local adopted building codes, floodplain regulations that affect building construction and repairs, and building permitting information and required forms. [Section 5.5 Managing contractors] [STATE AND LOCAL GOV'TS - Support, endorse and implement]	●	●			
Training/ Assistance	14	<b>SD Operations:</b> Develop a SD evaluation training program that includes how to proactively kick-start and manage the DA and SDD processes, the consideration of different disaster impact scenarios, how to use SDE software effectively, and how to request FEMA assistance with DAs. Require floodplain administrators to complete yearly trainings. [Section 1.1 Type of disaster and scale of impacts, Section 1.2 Disaster experience, and Section 2.2 Lack of inventory] [STATE AND LOCAL GOV'TS - Set requirements for local floodplain administrators AND Require regular training as specified in #21: "Regular SD Training"]	●	●		3	
	15	<b>FEMA Communications:</b> Ensure that FEMA's customer service agents have access to the most up-to-date information on local free-board regulations so that their communications are consistent with the information provided by local code enforcement and floodplain management administration staff. [Section 2.5 Communication and shared governance]	●				
	16	<b>Emotional Intelligence Training for Disasters:</b> Develop a training module on how to manage emotional stress and conflict in disaster recovery activities. [Section 2.7 Emotional stress and staff training]	●				
	17	<b>Technology Access and Training - Geospatial:</b> Provide communities with access to (and training on) geospatial software tools to map high water marks. [Section 3.1 Data and technology]	●	●		3	
	18	<b>Training - Elected Officials:</b> Provide elected officials (e.g., senators) with training on how to maintain a clear and realistic message about post-disaster mitigation options in ways that do not undermine substantial damage activities. [Section 2.6 Limited legal support for sanctions] [STATE AND LOCAL GOV'TS - Target training to state and local level elected officials]	●	●			
	19	<b>Training - Key Stakeholders:</b> Develop training for insurance agents and community planners on basic NFIP requirements, and how to interpret SFHAs and FIRMs and use this information communicate flood risk more effectively to residents. [Section 5.1 Flood risk information and disclosure requirements] [STATE AND LOCAL GOV'TS - Training with a focus on state and local level regulations]	●	●			
	20	<b>Locally Identified Risk:</b> Provide necessary technical and technological assistance to communities on how to best identify, map and communicate flood risk with residents, as well as how to develop and enforce regulations on these areas even if they do not coincide with FEMA's FIRM maps. [Section 2.1 Availability and accuracy of risk data]	●	●			
	21	<b>Regular SD Training:</b> Require floodplain administrators and at least another staff member to complete yearly trainings during floodplain management state chapter conferences or workshops of modules outlined in recommendation #14 above "SD Operations." [Section 1.1 Type of disaster and scale of impacts, and Section 1.2 Disaster experience]	●	●			
Studies	22	<b>Study on Enforcement:</b> Identify and classify program deficiencies and violations that have an impact on SDDs, and develop guidelines for a nationally consistent set of performance-based corrective actions and alternative program sanctions to be used when communities reach different levels of non-compliance. [Section 1.3 Political pushback]	●				
	23	<b>Study on Risk:</b> Invest in disaster modeling studies that develop new ways to describe and predict localized risk to natural hazards, maybe adopting different scales of analyses or using alternative modelling techniques, such as land use, place-based, or structural-based approaches. [Section 2.1 Availability and accuracy of risk data]	●				
Regulation	24	<b>Consequences for Non-Compliance:</b> Adopt an expanded number of program corrective actions and sanctions to facilitate enforcement, and consistently enforce program corrective actions and sanctions for non-compliance. Make sure that non-compliant behavior, even if somewhat minor, has consequences and that major program violations (e.g., reversals to less stringent floodplain regulations related to Substantial Damage) result in severe sanctions, for example, a one to two level reductions in CRS standing scores or a range of premium penalties for persistent low-performance or chronic. [Section 1.3 Political push back] [STATE AND LOCAL GOV'TS - Support, endorse and set up necessary enabling authority]	●	●	2		3
	25	<b>Incentives for SD Mitigation - Single Policy Effort:</b> Incentivize communities to adopt cumulative damage or lower thresholds by automatically entering them into the CRS program and/or further increasing the number of CRS points associated with the adoption of regulation in ways that would allow to improve (or lose with reversals) CRS rating levels easier. [Section 5.2 Supporting cumulative damage regulations and Section 5.3 Supporting lowering thresholds] [STATE AND LOCAL GOV'TS - Provide training & technical support]	●	●			
	26	<b>Incentives for SD Mitigation - Combined Policy Effort:</b> Strongly incentive communities to adopt both cumulative damage AND lower thresholds by reducing the required percent match for post-disaster mitigation projects and by making it easier to improve (or lose) a CRS rating standing level. [Section 5.2 Supporting cumulative damage regulations and Section 5.3 Supporting lowering thresholds] [STATE AND LOCAL GOV'TS - Provide training & technical support]	●	●			
	27	Create strong incentives for the following recommendations: <b>Mechanisms for Compliance - Inventory:</b> As condition for participation in NFIP and/or CRS program AND as a possible corrective action for identified program deficiencies, require communities to maintain a yearly inventory of structures in SFHAs that includes information on the structure's BFE, Pre/Post FIRM status, and Market Value, as well as any applicable SD/SI information. [Section 2.2 Lack of inventory] [STATE AND LOCAL GOV'TS - Support, endorse, set up necessary enabling authority AND Provide communities with training on how to create this inventory using FEMA's SDE software]	●	●	1	3	1
	28	<b>Mechanisms for Compliance - Buyouts &amp; Elevations:</b> As condition for participation in NFIP and/or CRS program AND as a possible corrective action for identified program deficiencies, require states to develop the necessary operational capacity to support and fund an ongoing mitigation program for buyout and elevation projects that: a) is bound to a broader mitigation strategy; b) expedites projects for clusters of properties particularly of vulnerable population groups; c) specifies criteria for eligibility early on after a disaster so that residents know not to concern themselves with rebuilding a home that will be bought out, and d) expands eligibility to properties with or without insurance located within or beyond SFHA boundaries. [Section 4.3 Mitigation timelines and long-term recovery issues] [STATE AND LOCAL GOV'TS - Support, endorse and set up necessary enabling authority]	●	●			
	29	<b>Mechanism for Compliance - Disclosures:</b> As condition for participation in NFIP and/or CRS program AND as a possible corrective action for identified program deficiencies, require states to adopt comprehensive statutory or regulatory requirements for deed records and/or real estate transactions to disclose to potential buyers and renters a property's flood risk, including: cumulative flood damages over the past 10 years, whether the property is required to be covered by flood insurance, whether the property is located in a SFHA, actuarial flood insurance costs at the time of transaction, and (as applicable) mitigation history. [Section 5.1 Flood risk information and disclosure requirements] [STATE AND LOCAL GOV'TS - Support, endorse and set up necessary enabling authority]	●	●			

**Table 3.2: Summary of Moderate Priority Recommendations**

Category	ID Number	Moderate-Priority Recommendations	Relevant Authority	
			FEMA	STATE & LOCAL GOV'TS
Data	30	<b>SD Packet Resources:</b> Create a repository for sharing SD guidelines, information packets, model ordinances (including optional cumulative damage and lower threshold regulations), template forms and other practical information that states officials can use as a reference when developing or revising state NFIP regulatory documentation. [Section 1.1 Type of disaster and scale of impacts, and Section 5.2 Supporting cumulative damage regulations]	●	
	31	<b>Risk Data - Map Updates:</b> Prioritize and expedite the process for updating FIRMs on recently impacted communities. [Section 2.1 Availability and accuracy of risk data]	●	
	32	<b>Risk Data - Availability:</b> In association with other federal agencies (e.g., NOAA, or National Weather Service) and non-federal partners, create a website or online atlas to make predictive risk information for urban flooding and riverine flooding more widely and readily available to communities. Ensure download options are compatible with GIS, excel and/or FEMA's SDE software. [Section 2.1 Availability and accuracy of risk data] [STATE AND LOCAL GOV'TS - Support and facilitate ways to operationalize]	●	●
Capacity building	33	<b>Mapping Support Networks:</b> Develop partnerships with non-profits, universities, extension programs and other non-federal partners that have the ability to collect, analyze and display spatial data quickly and support mapping, planning and engagement efforts during DAs and SDDs activities. [Section 3.1 Data and technology]	●	
	34	<b>Trust Building &amp; Field Support:</b> Ensure that FEMA staff is in the field more frequently, including community visits, meetings and regional floodplain management conferences so that local officials are more familiar with FEMA's role in mitigation and recovery processes. [Section 3.2 Early involvement]	●	
	35	<b>Local Plans, SD &amp; Equity:</b> Require HMPs to identify locations where residents can find affordable replacement housing within the community. [Section 4.3 Mitigation timelines and long-term recovery issues]	●	
	36	<b>Technical Capacity:</b> Open grant funding opportunities for communities to invest in GIS software licenses, training and technology. [Section 3.1 Data and technology]		●
Coordination	37	<b>SD Mentorships:</b> Create in collaboration with ASFPM a national SD mentoring program for floodplain administrators. [Section 1.2 Disaster experience]	●	
	38	<b>Market Values:</b> Develop guidelines on how tax assessors can contribute to expediting the determination of pre-market property values. [Section 2.4 Uncertainty with market value information]		●
Training/ Assistance	39	<b>Compliance Helpline:</b> Create an anonymous help/assistance program or forum in which local officials can openly ask questions about compliance with FEMA officials, and best ways to deal with emerging legal and regulatory compliance challenges. [Section 5.6 CACs and CAVs]	●	
	40	<b>Technology Availability:</b> Establish standing-contracts with local communication service providers to ensure the availability and support of hand-held devices for disaster situations. [Section 3.1 Data and technology]		●
	41	<b>Construction Costs Knowledge:</b> Ensure all floodplain administrators are trained on basic construction knowledge so that they are better prepared to review damage repair estimates. [Section 2.7 Emotional stress and staff training]		●
	42	<b>Cumulative Damage Training:</b> Provide specific training on how to manage cumulative damage regulations. [Section 5.2 Supporting cumulative damage regulations]		●
Studies	43	<b>Study on Mutual-Aid Agreements:</b> Commission a study on best practices to create post-disaster mutual aid agreements to benefit DAs and SD activities. [Section 3.5 Professional Networks]	●	
	44	<b>Study on Mitigation Funding Strategies:</b> Commission a study on best practices to build a diverse portfolio of funding strategies for natural hazards mitigation. [Section 4.1 Scope of the "substantial damage" problem for communities]	●	
Regulation	45	<b>Incentives for Resilience Planning:</b> Add CRS incentives for communities doing integrated planning activities. Provide training as needed. [Section 1.3 Political pushback] [STATE AND LOCAL GOV'TS - Support, endorse and lead training efforts]	●	●
	46	<b>Incentives for SD Mitigation - Locally identified risk:</b> Expand program benefits and requirements associated with mapped SFHAs to locally identified hazard-prone areas not yet included in effective or preliminary FIRMs. Also, provide greater CRS point incentives for communities that follow this practice. [Section 2.1 Availability and accuracy of risk data, and Section 2.3 Accuracy and consistency of assessments] [STATE AND LOCAL GOV'TS - Support, endorse and set up necessary enabling authority to implement]	●	●
	47	<b>Mechanisms for Compliance - Records:</b> As condition for participation in NFIP and/or CRS program AND as a possible corrective action for identified program deficiencies, require states to adopt a minimum 10-year record retention policy. [Section 5.2 Supporting cumulative damage regulations] [STATE AND LOCAL GOV'TS - Support, endorse and set up necessary enabling authority to implement]	●	●

**Table 3.3: Summary of Low Priority Recommendations**

Category	ID Number	Low-Priority Recommendations	Relevant Authority	
			FEMA	STATE & LOCAL GOV'TS
Data	48	<b>SD Management Resources:</b> Create a repository of best floodplain management practices that examples of how planning, GIS, permitting, tax appraisal, public work and emergency response activities can support DAs and SD activities. [Section 3.3 Coordination and integration with various community planning functions]	●	
	49	<b>Data Protections:</b> Expand HMGP funds to cover projects aimed at protecting data servers and/or set up cloud backup services storing information about housing inventory in SFHAs, permit records, appraisal information, and other critical local information for substantial damage on properties located in SFHAs. [Section 1.1 Type of disaster and scale of impacts]	●	
Capacity building	50	<b>Local Mitigation Funding Strategies:</b> Require HMPs to include a diverse portfolio of funding strategies that taps into various sources of grant funds outside FEMA's HMGP and PA programs to address the needs of low-income communities whether inside or outside SFHAs, such as housing urban development grants, EPA 319 program, stormwater management fees or even their own revenues. [Section 4.1 Scope of the "substantial damage" problem for communities] [STATE AND LOCAL GOV'TS - Co-Lead and provide necessary training and guidelines]	●	●
Coordination	51	<b>Coordinate SD Activities:</b> Develop guidelines and protocols for sharing information and coordinating planning, GIS, permitting, tax appraisal, public work and emergency response activities in support of DAs and SD activities. [Section 3.3 Coordination and integration with various community planning functions]		●
	52	<b>Support Interdisciplinary Planning Efforts:</b> Look for ways in which the Association of State Floodplain Managers (ASFPM) and the American Planning Association's (APA), Hazard Mitigation and Disaster Recovery Planning division have a representation or module component in respective state or regional chapter conferences highlighting interdependencies and cross-benefits of collaborative approaches. [Section 3.3 Coordination and integration with various community planning functions]		●
Training/ Assistance	53	<b>Defendable Records:</b> Ensure that local officials are trained to maintain consistent, equitable and defendable records in all aspects of the substantial damage evaluation process. [Section 2.6 Limited legal support for sanctions]		●
	54	<b>Inter-Agency and Intra-Agency Communications:</b> Set up integrated SDE training program at the state level for Individual Assistance, Public Assistance and FIMA programs that identifies how each one of these programs can use or rely on the activities of another program to further support their role under the greater NFIP's mission. [Section 5.4 Providing better support for buyout programs]		●
Studies	55	<b>Study on Responding to Opposition Tactics:</b> Best practices on how communities have dealt with and won political opposition to hazard mitigation planning and enforcement of floodplain regulations. [Section 1.3 Political pushback]	●	

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## APPENDIX A: RESEARCH TEAM

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### Research team at Texas A&M University

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# APPENDIX B: DISCUSSION PANEL GUIDE

## Project Overview

This project aims to better understand the challenges and roadblocks that communities and community officials face when implementing NFIP regulations of substantially damaged structures.

### What is substantial damage?

Substantial damage applies to a structure in a Special Flood Hazard Area (or 1-percent or greater annual chance flood area) for which the total cost of repairs is 50 percent or more of the structure's market value before a disaster occurs. Property owners of residential and non-residential structures can reduce their vulnerability by elevating, relocating, or demolishing and rebuilding to NFIP standards.

### What happens to your comments?

Responses from all participants will be categorized and summarized in a study report. This information will be used to develop a number of recommended strategies and actions that the Federal Emergency Management Agency (FEMA) could take to help build the capacity of local governments to achieve compliance with NFIP regulations. The report will be shared with the study sponsor, FEMA, and some results may also be reported in research journal publications. Please know that any publication associated with this work will use pseudonyms and **will not include** the name of your community or your name (even if you waive this condition).

During our meeting, we may use a tape recorder to supplement our note taking. These recordings will not be shared with anyone outside the university research team, and all recordings will be erased once we verify our discussion notes. If you are uncomfortable with this, please let us know and we will stop or not use any recordings.

### Questions?

If you have any questions about this research, or would like to add any additional comments to your responses today, feel free to email us at pberke@arch.tamu.edu (Dr. Phil Berke), jmasterson@arch.tamu.edu (Ms. Jaimie Masterson) or plorente@tamu.edu (Dr. Paula Lorente).

Community Compliance with the National Flood Insurance Program (NFIP)

## Mitigation Requirements for Substantially Damaged Structures

Thank you for your willingness to participate in a discussion about substantial damage in your community. We look forward to learn from your experiences with the implementation and enforcement of NFIP regulations, in particular the substantial damage provisions of your local regulations.

### What to expect?

During our discussion with you, we want to explore your community's recent experiences with achieving compliance with NFIP requirements of substantially damaged structures. We will ask you a range of questions covering adequacy of NFIP rules, local capability to manage substantially damaged structures, and issues associated with financial assistance. Our focus will be on community-level operations and any roadblocks or barriers that communities face when trying to build their resilience to disaster impacts.

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*Please know that **this project is not an evaluation** of you, your work, or your community/organization, and that in an effort to prevent any potential use of your comments to your detriment or the detriment of your organization, we will take reasonable steps to **protect your confidentiality**.*

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### How (if at all) could this affect you?

As mentioned above, all discussions will focus on your official role within your organization and your experiences with substantial property damage issues in your community. While none of the topics are considered confidential, some of your comments may include sensitive information about your organization, state/federal programs or third parties. With this in mind, we will endeavor to **keep your identity hidden** by not including your name or the names of anyone you may mention in study reports, and by disguising any particular identifying details as much as possible.

However, it is important to note that there are limits to the anonymity that we can offer. Some of our discussions will involve groups and, considering the limited number of communities we will interview and the relatively small size of disaster planning officials, it may be possible for someone familiar with your work to unmask your identity or recognize your comments. If you are uncomfortable with any of our questions, **you may choose** to skip the question or stop your participation. We will honor your wishes and will not contact you again or follow-up to share any results.

### Thank you!

We appreciate your participation very much

Texas A&M University

# General Outline of Discussion

## Context

- The last disaster

## Damage Assessment

- Planning
- Preparation/Coordination
- Process
- Challenges
- Prioritization
- Preparation
- Experience

## Substantial Damage Determination

- Quality standard
- Processing
- Challenges
- Timing
- Experience

## Community

- Information
- Ongoing challenges
- Inventory
- Disclosures

## Building Permits & Inspections

- Pre-disaster operations
- Inspections
- Sanctions
- Post-disaster challenges
- Learning experiences

## Mitigation & Funding

- Sources
- Limitations
- Challenges

## Long-term Management

- Compliance program
- Needed changes
- Pressing issues

## Meeting Start

Can you tell us/the group about yourself?

- Name
- Official title
- Role(s) in community
- Year(s) experience in current position
- Year(s) in community

## 1. CONTEXT: The Last Disaster

Understanding your community

- What/when was your last disaster?
- How many homes flooded? \_\_\_\_\_ How many were substantially damaged? \_\_\_\_\_
- Has the community had other disasters in the past? (names/dates)
- Were you here at the city at the time of those disasters?

So, hold that disaster in your mind. We're going to walk through the timeline (during and after the disaster).

## 2. DAMAGE ASSESSMENTS

### During Disaster & Post-Disaster

Damage information is gathered in pieces by different people and for different purposes. As we understand it, the process of gathering damage information has two main purposes: one to provide the necessary information for disaster declaration applications (*mainly windshield assessments*) and another one that further supports disaster declarations and provides the necessary data for the substantial damage process (*Preliminary Damage Assessments*).

- 1) Could you walk us through the process that your community follows in each one of these stages?

*Make sure to listen for*

- a. How do you prioritize which areas to deploy damage assessments efforts first? (*Drone information, analysis of flood gauges, 311 calls, traffic cams, flood risk maps, other?*)
- b. Damage assessment method (*minor-major-total vs. other*) and actors/people involved
- c. Data collection mode (*visual, written, electronic, etc.*)
- d. Reporting/recording methods and people involved
- e. How (if at all) damage reports from one stage are used for another?
- f. How (if at all) do you keep track of cases or revisions made to original damage assessments?
- g. How do you ensure/verify accuracy of assessments?

- 2) What were the main challenges gathering and summarizing damage information?

*Make sure to listen for*

- a. Avoiding duplicate efforts / completeness / legibility / consistency
- b. Maintaining an annotated map of affected areas and areas covered during each phase
- c. Gathering information from different actors (*volunteers, Red Cross, FEMA, Insurance?*)
- d. Gathering all information in a common format/medium
- e. Sharing information with others about progress made
- f. Separating PDAs for private (Individual Assistance) and public sectors (Public Assistance)

### 3. SUBSTANTIAL DAMAGE DETERMINATIONS

→ Detailed PDA for SDD → FEMA verification with SDEs in SFHAs

Now, let's talk about the process of substantial damage determinations

- 4) Can you take us through the process of translating an initial DAs or PDAs into a SDD?
  - a. How do you select cases for substantial damage review?
  - b. Do you verify (if at all) the damage information on these cases? (e.g., *FEMA SDE software?*, *resident repair quotes?*, *official repair tables?*, *other?*)
    - i. How (if at all) did you resolve conflicting information?
  - c. What primary source of information did you use to determine market property values?
    - i. Did you face any major issues/push back using these data?
    - ii. Any delays with the use/production of these data? (e.g., *waiting for CAD updates?*)
  - d. How many people were/are involved in the damage estimation review process?
  - e. How many close SDD determinations did you have?
- 5) On average, how long does it take to process SDD cases in your community? E.g., #cases/day
  - a. Do you have a record of the number of cases reviewed for SD and the actual number of SDDs?
  - b. How long did it take to complete the majority of SDDs in your community?
  - c. What were some of the factors that slowed down the SDD process?
- 6) How easy is it for residents to contest SDDs? How many determinations have you reversed so far? What were the main reasons for reversals?

#### Reflecting on Pre-Disaster Damage Assessment Preparedness

Damage Assessments (DAs) are the combined responsibility of federal, state, county and local governments.

- 7) Looking back, what actions were (or would be) most useful in preparing your community to carry out its role and to complement and support the job of others? (*If many, identify top 2-3 actions*)
- 8) Based on your experience, how would you describe a strong damage assessment? What items/level of detail should it have? What percentage of DAs that your office received would you say met that criteria? What did you do with low-quality DAs?
- 9) Use a scale of 1-5 to answer the following questions, where 1 is “not comfortable at all” and 5 is “very comfortable”. When you first started processing and managing SDDs, what was your comfort level? How would you say your comfort level is now?

### 4. COMMUNITY

Now, let's go back to the time before the last disaster that impacted your community.

- 10) Can you tell us what type of information was your community using to identify flood risk areas? (*FEMA Flood Insurance Rate Maps, Watershed plans, Hazard mitigation plans, Other?*)
  - a. For the above, listed or probe for
    - i. When were they last produced (year)? How often are they updated?
    - ii. How much confidence do you have on the accuracy of information?
    - iii. How many jurisdictions/entities/agencies are involved in their production?

- iv. How useful is the information provided by these sources for guiding planning policies?
  - b. After the latest disaster experience, is your community considering using other types of information/studies about risk? If so, which ones?
- 11) Historically (in non-disaster years), what have been the biggest challenges that the community faced when managing development in flood risk areas?

*Probes*

- a. New development vs. Existing development
  - b. Concerns with quality/availability of flood risk *information*
  - c. Lack of *awareness/knowledge*?
  - d. Resident *unwillingness* to follow local regulations?
  - e. General limited financial *capacity*?
  - f. *Weak* state/local regulations? *Unclear* NFIP requirements?
  - g. Resident concerns with *property values*?
  - h. *Conflicting* local development policies
  - i. Community concerns with *tax revenue*? Or, with *equity/displacement issues*?
  - j. Limited municipal financial capacity for *buy-outs*?
  - k. Limited permitting/inspections *staff*?
  - l. Other? (*after all answers, maybe ask to rank top 3*)
- 12) How does your community keep track of properties in Special Flood Hazard Areas (SFHAs)?
- a. Do you have an estimate of the number of structures located in these areas and their level of compliance?
  - b. If you had to guess, what percent level of compliance has your community been able to attain?
- 13) Communities face different challenges with implementing the SD component of NFIP regulations... Do you think a 100% compliance is even feasible for your community? If not, why not? If yes, how is your community achieving this goal?
- 14) In reading news reports from disaster impacted communities, one common comment from residents is that they did not know about their risk. Are there any outreach strategies [the community] has used to make people aware of their risk?

## 5. THE BUILDING PERMIT & INSPECTIONS

### Pre-Disaster

- 15) In non-disaster situations, how does the building permit application process work? (e.g., *fees, timing, length for approval, complexity, inspections scope & frequency, people involved*)
- 16) How can you (if at all) identify property owners that build/repair without permits?
- a. How many building inspectors do you have on staff?
  - b. How frequently do inspectors check on outstanding permits?
  - c. How do inspectors prioritize cases?
  - d. Do you have an estimate of an average number of violations/yr. in the community?
  - e. What are some of the reasons property owners give for not applying for building permits?
- 17) How are building permit violations most often resolved? new agreements, variances, sanctions, fees, other? Are these sanctions effective?

### Post-Disaster

- 18) After a disaster, how does the building application process change? (e.g., *fees, timing, length for approval, complexity, inspections scope & frequency, people involved*)

- 19) What are the main challenges you as a *permitting official* faced during...
- The first 1-4 weeks;
  - The first 6 months;
  - The first-year post disaster

*Probes:* damages to official buildings/equipment/records, utility service interruptions, employees impacted by disaster, staff availability, illness, moving across the community (inspections), personal hardship

- 20) How do you monitor (if at all) the mitigation of substantial damaged properties?

### **The Next Disaster**

- 21) If you had funds to increase the capacity of the building permit process, before or after a disaster, how would that be best invested?

## **6. MITIGATION & FUNNDING**

Funding for disaster recovery can come from many different agencies and organizations.

- 22) Can you please name the sources of financial assistance that your community has used to fund mitigation of substantial damage?
- 23) What are the main challenges when using these sources of funding to address substantial damage issues? How did those challenges affect recovery and mitigation efforts?
- Application length / complexity / wait times
  - Eligibility concerns / matching requirements
  - Uncertainty in the allocation of funds
  - Insufficient amounts to off-set actual costs
  - Need for specialized experience / external consultants / lawyers
- 24) How (if at all) does your community monitor funds used to mitigate SD sites?
- 25) How (if at all) does individual availability of recovery funds affect the permitting process? Or the substantial damage process? In other words, did you have any issues with funding not being tied to local regulations?

## **7. LONG-TERM MANAGEMENT**

FEMA has implemented Community Assistance Contacts (CACs) and Community Assistance Visits (CAVs) to assist communities in the long-term management of development in flood risk areas.

- 26) Did you receive information that was useful in helping you prepare for damage assessments and the substantial damage determination process? If yes, what was most useful?
- If not, what additional data, resources, technology or tools would you like to have access to help your community prepare for the anticipate, monitor and manage SD issues?
- 27) Has your community consider participating in the CRS program of NFIP? If no, why not? If participating? How easy is it to maintain and/or increase your CRS score?
- 28) In sum, what is the main challenge your community faced with substantial damage associated with the last disaster?

## **THE END**

To close, would you like to participate in a follow up discussion of this study's results (online, in person, by phone)?

