

Evaluation of Characteristics and Perceptions of Disaster Assistance Mitigation Loan Option Borrowers

Final Evaluation Report

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EXECUTIVE SUMMARY

PURPOSE. As part of the Small Business Administration (SBA) Office of Disaster Assistance (ODA) Disaster Assistance Loan Program, low-interest loans are provided to homeowners and businesses to help them recover from declared natural and other disasters. Under this program, borrowers are eligible for expanded financial support to purchase mitigation measures post-disaster if (1) there has been verified damage to real estate and (2) the loan already includes funds for physical losses. Approximately 2.15 percent of homeowners and 1.86 percent of business owners who received the physical disaster loan and were eligible for the mitigation funds in FY 2013–2018 also chose to take mitigation funds. The SBA would like to better understand why certain borrowers apply for the SBA’s disaster mitigation increase option and others do not. The SBA also wants to improve communication strategies to increase uptake of the mitigation increase option. The evaluation objective is to answer: **What are the characteristics and perceptions (e.g., perceived susceptibility, benefits, and barriers) of disaster survivors who are eligible for the mitigation increase option?**

What is mitigation?

Mitigation measures are proactive steps taken to eliminate or reduce the impacts and risks of disasters before a disaster occurs. These can be actions such as elevating a building, building a tornado safe room, installing sump pumps or drainage systems, or upgrading doors and windows.

DATA SOURCES AND METHODOLOGIES. Over the course of the evaluation, this study created a logic model and a customer journey map and conducted: an environmental scan of communication materials; an analysis of the DCMS 1.0 loan administration data for descriptive statistics and a regression analysis; a qualitative review of a purposive sample of disaster loan borrower loan verifier report comment sections; individual interviews and small group interviews with business owner and homeowner disaster survivors on their experience with and perceptions of the Disaster Assistance Loan Program and the mitigation option; and interviews with SBA loan officers about their experience working with disaster survivors and discussing the mitigation option.

RESULTS. The evaluation objective was broken into four areas of inquiry. The results by area of inquiry are presented here.

Characteristics of loan borrowers. Mitigation borrowers were more likely than non-mitigation borrowers to be survivors of a flood, though most loan Disaster Assistance Loan applicants were hurricane survivors. Mitigation borrowers were also more likely than non-mitigation borrowers to be covered by hazard insurance (such as flood insurance), live in a high flood risk area, have a high income (\$100,000–\$150,000 for homeowners), have a high credit score (750–800 for homeowners), and receive a lower interest rate.

Use of disaster loans. Mitigation borrowers, in our analysis of the loan verifier report comment sections, mostly used the additional funds to elevate their buildings to prevent future flooding. Other uses included the installation of generators, impact-resistant windows, or sprinkler systems. However, the comment sections were not consistent enough in providing the necessary information to understand the complete picture of the use of disaster loans. Recording loan usage was not the primary purpose of these report comment sections.

Choice to fund mitigation measures. Based on the results from the interview and focus groups, borrowers generally had positive experiences with their loan officers, though most found the loan



application process lengthy and confusing. Most applicants were unaware of the mitigation option, presenting a clear opportunity for the SBA to spread awareness. Disaster survivors that were interviewed noted that they were drawn particularly to the favorable interest rate of the SBA Disaster Assistance Loan.

Communication strategies. The team found nine best practices for communications throughout the environmental scan when working with a borrower during a disaster: convey a concise and straightforward message in a timely manner; foster trust and confidence; use framing to elicit an emotional response; target risk aversion to both debt and disaster; convey empathy; provide actionable guidance; transfer responsibility to the individual; provide action items to promote self-efficacy; and that the SBA should plan ahead and set goals when creating communications.

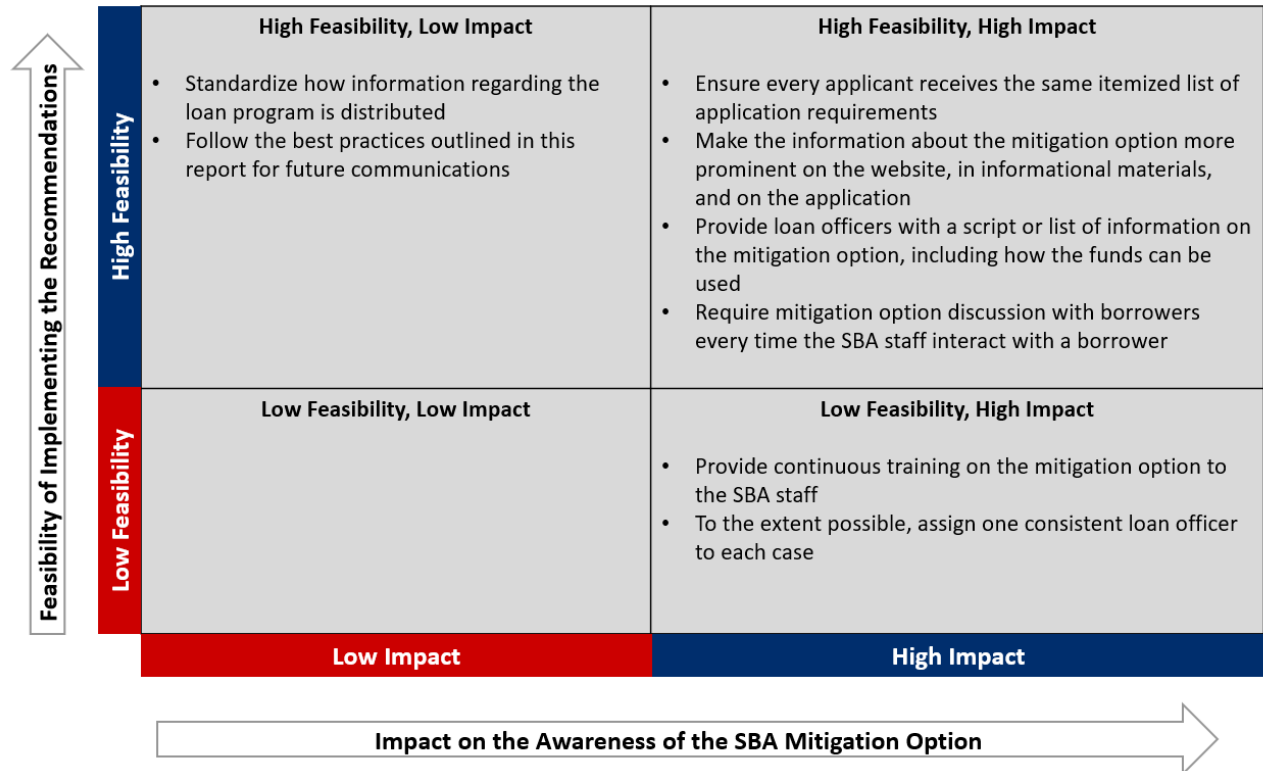
RECOMMENDATIONS. The recommendations provided to the SBA fell into three categories. The recommendations are presented here within their category as well as within a matrix (for *Communications* and *SBA Staff Processes*) presenting the feasibility and impact of each recommendation.

Future research and data collection. Recommendations for future research and data collection include: (1) Perform an in-depth analysis of the file that contains all documentation sent by the borrower to learn more about mitigation option usage; (2) Provide instructions to loan officers to include a brief description of mitigation loan usage in their comment sections whenever a receipt or quote is received if the SBA would like to use the comment sections for future analysis; (3) Use the common mitigation measures identified in this analysis, create a new variable in the DCMS that would assign a code based on mitigation type to better track usage and uptake for future disasters; (4) Perform “exit interviews” with a sample of borrowers each year to inform continuous improvements and ensure borrowers are receiving information on the mitigation option.

Communications. Recommendations for communications include: (1) Ensure every applicant receives the same itemized list of application requirements; (2) To the extent possible, assign one consistent loan officer to each case; (3) Standardize how information regarding the loan program is distributed; (4) Make the information about the mitigation option more prominent on the website, in informational materials, and on the application; (5) Follow the best practices outlined in this report for future communications.

SBA staff processes. Recommendations for SBA staff processes include: (1) Provide continuous training on the mitigation option to SBA staff; (2) Provide loan officers with a script or list of information on the mitigation option, including how the funds can be used; (3) Require a mitigation option discussion with borrowers every time SBA staff interact with a borrower.





1. INTRODUCTION AND PURPOSE

Summit Consulting, LLC (Summit), presents this Final Evaluation Report of the **Evaluation of Characteristics and Perceptions of Disaster Assistance Mitigation Loan Option Borrowers** for the U.S. Small Business Administration's (SBA) Office of Program Performance, Analysis, and Evaluation.

1.1 The physical Disaster Assistance Loan

Established in 1953 by the Small Business Act, the Disaster Assistance Loan Program provides low-interest disaster loans to help businesses and homeowners recover from declared disasters. The program includes several types of financing to provide relief for physical damage or economic injuries to homeowners, renters, business owners, and nonprofit organizations. Homeowners and businesses are generally eligible to apply if they are located within the United States and were recently survivors of a declared disaster. This study will focus on the physical Disaster Assistance Loan.

1.2 The mitigation option

As part of the Disaster Assistance Loan Program, borrowers are eligible for expanded financial support to purchase mitigation measures post-natural disaster. Borrowers are eligible for the expanded financial support when (1) there has been verified damage to real estate, (2) the loan already includes funds for physical losses, and (3) the proposed mitigation measure protects against damage from the same type of occurrence as the declared disaster. Mitigation measures are proactive steps taken to eliminate or reduce the impacts and risks of disasters before a disaster occurs. These can be actions such as elevating a building, building a tornado safe room, installing sump pumps or drainage systems, or upgrading doors and windows. The physical disaster loans accounted for about 80 percent of the SBA's direct disaster loans issued to individuals and households (renters and property owners; prior to the COVID-19 pandemic, 2016 to 2019)¹.

Despite the high use of the physical disaster loans, the additional funds for mitigation are underused. In fact, only 2.15 percent of homeowners and 1.86 percent of business owners who receive the physical disaster loan also choose to take mitigation funds.

1.3 Objectives and research questions

The SBA would like to better understand why certain borrowers take advantage of the SBA's disaster mitigation increase option and others do not. The SBA also wants to improve communication strategies to increase uptake of the mitigation increase option. The evaluation objective is to answer the following question: *What are the characteristics and perceptions (e.g., perceived susceptibility, benefits, and barriers) of disaster survivors who are eligible for the mitigation increase option?*

To address this primary objective, there are four components, each with research questions:

1. **Characteristics of loan borrowers.** Which disaster survivors have chosen to increase the SBA physical disaster loan amounts to fund mitigating measures? What are the characteristics of this population, and how does this population differ from the population that has not chosen to increase their loan amount to fund mitigation measures? Which borrowers relocated to a Non-Special Flood Hazard Area, and what are the characteristics of this population?

¹ Congressional Research Service. *Small Business Administration: A Primer on Programs and Funding*. Updated June 23, 2020. <https://fas.org/sgp/crs/misc/RL33243.pdf>.



2. **Use of disaster loans.** How have the SBA physical disaster loans for mitigation been used by disaster survivors? How does usage vary by disaster type, geography, business vs. homeowner, etc.? (See Section 5 for a detailed discussion of these characteristics.)
3. **Choice to fund mitigation measures.** Why have some disaster survivors chosen to increase the SBA loan amounts to fund mitigating measures? Why haven't others chosen such an increase?
4. **Communication strategies.** What communication strategies have proven successful to promote awareness of this underutilized service (mitigation increase option) among eligible disaster survivors?

1.4 Navigating the final evaluation report

This report includes the following sections: Section 2 describes the data sources used to conduct the evaluation. Section 3 discusses the methodologies used to analyze the data. Section 4 discusses the limitations of the data. Section 5 presents the findings by research question. Section 6 provides a discussion of the conclusions and recommendations for the SBA. Table 1 maps the research questions to the data sources and methodologies to support navigation of this report.

Table 1: Mapping research questions to data sources and methodologies

| Research Question | Data Source | Methodology |
|---|--|---|
| 5.1 Characteristics of loan borrowers | | |
| Which disaster survivors have chosen to increase the SBA physical disaster loan amounts to fund mitigating measures? How do they differ from those of the population that has not chosen to increase their loan amount? | Program administrative data | Descriptive statistics, regression analysis |
| Which borrowers relocated to a Non-Special Flood Hazard Area, and what are the characteristics of this population? | Program administrative data | Descriptive statistics |
| 5.2 Use of disaster loans | | |
| How have the SBA physical disaster loans for mitigation been used by disaster survivors? | Loan verifier report comment sections | Analysis of themes |
| How does usage vary by disaster type, geography, business vs. homeowner, etc.? | | |
| Choice to fund mitigation measures | | |
| Why have some disaster survivors chosen to increase the SBA loan amounts to fund mitigating measures? | Interviews and focus groups | Analysis of themes, customer experience journey map |
| Why have others not chosen such an increase? | | |
| Communication strategies | | |
| What communication strategies have proven successful to promote awareness of this underutilized service (mitigation increase option) among eligible disaster survivors? | Published and gray literature, interviews and focus groups | Environmental scan, literature review, analysis of themes |



2. DATA SOURCES

In this section, we discuss the primary and secondary data sources used for the evaluation.² These include program administrative data and loan verifier report comment sections from the Disaster Credit Management System (DCMS) 1.0, interviews and focus groups, published and gray literature, and SBA documentation.

2.1 Program administrative data (DCMS 1.0)

The DCMS 1.0 administrative data contain details on applications for disaster relief loans issued by the SBA for this evaluation study with fiscal years 2013 through 2018 used. The applications were categorized based on the date of submission to the SBA. Within the population of borrowers for the disaster loans, this study used a series of variables indicating dollar amount for mitigation to distinguish between those who were eligible for the mitigation option (non-renters) and those who chose the mitigation option.

Throughout this section of the report, a comparison is made between mitigation takers and non-takers. Non-takers are defined as the population approved for a loan by SBA, excluding all those who took out mitigation funding. Takers are simply defined as the group of borrowers who elected to take out mitigation funding, regardless as to whether they initially applied for it or later opted for the extra funds. The two groups are mutually exclusive, in that no single borrower falls within both groups. There were multiple variables used to define the taker and non-taker groups. The variable created to identify takers and non-takers was set to “taker” if the entry for current mitigation amount was greater than zero and non-missing. The variable was set to “non-taker” if the total approved amount and the disbursed funds amount were greater than zero, non-missing, and the current mitigation amount was zero.

The data were analyzed in two parts, one for all the individuals applying as homeowners, and another for all the individuals applying as businesses. Despite coming from different sets, there were several variables that the two groups have in common for every applicant (such as application numbers, application submission date, decision status, decision date, and personal details on the applicant). This study also created a variable to track applicants with more than one application. For all applicants approved for a loan (within both the home and business data), there were detailed data on dollar amount of verified loss that they experienced as a result of the disaster, the value of the loan the SBA approved, the terms of the loan the SBA offered them, and the amount they actually took out on a loan. Within each of the verified (value of damages applicable for the loan), approved (amount approved based on the verified value), and current variables (costs incurred after the initial verified amount was approved), there were indicators of what the money was used for—mitigation, mandatory relocation, or another type of expense.

² In addition to reviewing these data sources, there were conversations with SBA staff knowledgeable about the program early in the Work Plan and Evaluation Design phases of the project. These preliminary meetings, referenced as part of the secondary and primary data sources, served to further enhance our understanding of the program and provide nuance to the steps along the way.



2.2 Loan verifier report comment sections (DCMS 1.0)

A sample³ of the comment sections was derived from 240 loan verifier (LV) reports with the mitigation increase. The comment sections are a space in the borrower's file for the LV and other SBA staff to make notes regarding the borrower's application and status; this part of the file is never seen or used by the borrower. The comment sections were provided to inform the research question *How have the SBA physical disaster loans for mitigation been used by disaster survivors?* The initial expectation was that the comment sections would provide greater nuance and detail regarding mitigation increase usage—for example, that the increase was used not only for flood mitigation but also for the specific actions involved, such as waterproofing the basement or raising the foundation. However, this study found that these comment sections did not contain much information relevant to this research question. This is explained in more detail in Section 4 on limitations.

2.3 Interviews and focus groups

Interviews and focus groups with borrowers

This study conducted 19 interviews and two focus groups with disaster loan borrowers (including homeowners and business owners, as well as a mix of borrowers who did and did not increase their loan amount). These interviews and focus groups informed the evaluation by gathering the following data:

- Borrowers' perceptions around susceptibility to future disasters
- Perceptions of the benefits of the mitigation increase option
- Barriers to applying for or receiving the mitigation increase option, as well as their impressions of the communication materials received

The rest of this section describes respondent selection and administration of the interviews and focus groups.

In-depth interviews. This study selected respondents to ensure diversity across the following characteristics:

- Homeowners and business owners
- Disaster type
- Geographic location (mix of regions with low/moderate/high use of mitigation loans)

The matrix in Table 2 provides the characteristics of the two subpopulations (Group 1a and Group 1b) and the number of interviews conducted.

Table 2: Matrix of interviewee characteristics

| Group | Characteristics | Number of Interviews |
|--|-----------------|----------------------|
| Group 1a. Disaster loan borrowers who increased their loan amount to fund protections against future disasters | Homeowners | 9 |
| | Business owners | 6 |
| Group 1b. Disaster loan borrowers who did not increase their loan amount to fund protections against future disasters | Homeowners | 1 |
| | Business owners | 3 |
| Total interviews | | 19 |

³ A non-probabilistic sample selected based on the population's characteristics to answer study research questions.



Focus groups. The team conducted two focus groups with respondents impacted by a natural disaster in the past 5 years. One group was conducted with disaster loan borrowers who increased their loan amount to fund protections against future disasters (Group 1a), and one was with disaster loan borrowers who did not increase their loan amount to fund protections against future disasters (Group 1b). Groups were recruited to ensure diversity across the following characteristics:

- Homeowners and business owners
- Disaster type
- Geographic location (mix of regions with low/moderate/high use of mitigation loans)

Table 3 shows the characteristics of the two focus groups.

Table 3: Matrix of focus group participant characteristics

| Group | Number of Focus Groups |
|--|------------------------|
| Group 1a. Disaster loan borrowers who increased their loan amount to fund protections against future disasters | 1 |
| Group 1b. Disaster loan borrowers who did not increase their loan amount to fund protections against future disasters | 1 |
| Total focus groups | 2 |

The final moderator guide can be found in Appendix A.

Conducting interviews and focus groups. This study pretested the interview guide with three respondents prior to submitting all instruments for OMB approval using the SBA’s Generic Clearance. Pretest interviews were conducted in the same mode used during data collection. The last 10 minutes of the pretesting interviews were reserved for a “debrief” section, which included questions to determine whether probes were clear and understood as intended, how well respondents could remember the topics being discussed, and whether any topics were particularly sensitive. The final interview instruments can be found in Appendix A.

After Office of Management and Budget (OMB) approval was received, interviews were conducted by phone and lasted 20 to 30 minutes. Focus groups were conducted via Microsoft Teams and lasted 60 minutes. The team utilized phone and email contacts (depending upon availability of contact information) to recruit respondents and schedule interviews and focus groups. Up to three contact attempts were made for each potential participant. Recruitment was conducted on a rolling basis; if a borrower had not responded after three contact attempts, the recruiter moved on to the next selected candidate to recruit.

Sample selection. As described above, respondents were selected for recruitment to provide diversity across mitigation taker/non-taker status, homeowners/business owner status, disaster type, and geographic location. A total of 363 borrowers were contacted during the recruitment period, with a response rate of 46 percent, ultimately resulting in 19 interviews and two focus groups. The makeup of borrowers that were contacted is shown below.



Table 4: Borrowers contacted in recruitment

| Group | Number Contacted | Number Completed | Response Rate |
|---------------------------------|------------------|------------------------------------|---------------|
| Group 1a (homeowner) interviews | 31 | 9 | 29.0% |
| Group 1b (homeowner) interviews | 79 | 1 | 1.2% |
| Group 1a (business) interviews | 62 | 6 | 9.7% |
| Group 1b (business) interviews | 87 | 3 | 3.4% |
| Focus groups | 104 | 4 participants (2 focus groups) | 3.8% |
| Total | 363 | 23 | 6.3% |

With respondents' permission, interviews and focus groups were recorded and transcripts were produced for analysis. All respondents were informed that their comments would be reported in aggregate (with the potential for anonymized excerpted quotes in this report) and would not be attributed to specific individuals. Interview notes and recordings were stored securely to protect respondent privacy and confidentiality. All respondents received a \$20 incentive to encourage participation.

Interviews with loan officers

This study also conducted 10 interviews with SBA loan officers who work with disaster survivors. These interviews informed the evaluation by providing data on the following topics:

- Loan officers' familiarity with the mitigation option and its potential uses;
- How a discussion of the mitigation option typically goes with disaster survivors;
- Any barriers to discussing the mitigation option with survivors, such as borrowers' lack of interest or lack of guidance from the SBA; and
- Areas, from the loan officers' perspective, for the SBA to improve its communications with disaster survivors on the mitigation option.

The loan officers chosen for the interview were selected to provide perspectives across levels and types of employment among the core loan officers. Table 5 shows the characteristics of those selected.

Table 5: Matrix of loan officer interview participants

| Group | Number of Interviews |
|--------------------------------|----------------------|
| Supervisory Loan Specialist | 2 |
| Loan Specialist (Cadre) | 2 |
| Loan Specialist (Seasonal) | 2 |
| Loan Specialist (Intermittent) | 2 |
| Loan Specialist (Temporary) | 2 |

Interviews were conducted via Microsoft Teams and lasted for 35 to 45 minutes. With respondents' permission, interviews were recorded and transcripts were produced for analysis. All respondents were informed that their comments would be reported in aggregate (with the potential for anonymized excerpted quotes in this report) and would not be attributed to specific individuals. Interview notes and recordings were stored securely to protect respondent privacy and confidentiality.



2.4 Published and gray literature

This study reviewed a variety of literature on behavioral theories relating to disaster preparedness and mitigation and conducted an environmental scan of mitigation communication strategies⁴. The team used literature from sources including peer-reviewed journals, websites providing disaster information, federal reports, in-use communications from the SBA on disaster mitigation, and in-use communications from other federal agencies and organizations that promote disaster mitigation activities.

2.5 SBA documentation

The SBA provided several documents for this study to review, including (1) standard operating procedures, (2) Federal Emergency Management Agency (FEMA) automated email correspondence with disaster survivors, and (3) informational and marketing materials about disaster preparedness.

Standard operating procedures. This study began the evaluation by reviewing the SBA's *Disaster Assistance Program Standard Operating Procedures (SOP) 50 30 9* to gain a better understanding of the Disaster Assistance Loan Program and the options to increase Disaster Assistance Loans to address mitigation measures. The SOP provided comprehensive details on the program's statutory mandates and regulations, structure, and operations. This set a foundation for the rest of the evaluation and informed the development of the logic model.

FEMA's automated email correspondence. FEMA automatically sends emails to individuals who do not qualify for FEMA's disaster assistance programs. This correspondence includes a referral letter to other services available to the disaster survivor. With this correspondence, FEMA also automatically registers these individuals for the SBA's disaster assistance programs.

Informational and marketing materials. The SBA prepares and provides informational and marketing materials about disaster assistance preparedness, the Disaster Assistance Loan Program, and the mitigation increase option.

⁴ The literature review, included in Appendix G, contains a list of works cited included in the study and the methodology. The environmental scan, included in Appendix F, contains a description of documents and the complete methodology.



3. METHODOLOGIES

This study used a combination of quantitative and qualitative methodologies to address the evaluation objectives. The groups of borrowers that were included in the study are those who received the disaster loan and also received the mitigation loan (Group 1a), those who received the disaster loan but did not apply for the mitigation loan (Group 1b), and those who received the disaster loan for mandatory relocation (Group 2). The quantitative methods included descriptive statistics, correlation matrices, and *t*-tests and regression analysis of the DCMS 1.0 administrative data related to the disaster assistance mitigation option and relocation applicants.

The qualitative methods included documentation review, the development of logic models and preliminary customer experience journey maps, a review of the literature, and an environmental scan. In addition, this study conducted a thematic analysis of data collected from comments in the DCMS loan verifier report comment sections and from disaster loan borrowers participating in the in-depth interviews and focus groups.

3.1 Quantitative methods

Statistics

This study reviewed and produced descriptive statistics on the DCMS 1.0 data provided by the SBA, including counts, means, key cross-group analyses, and testing differences in means (*t*-tests in Appendix B). This provided quantitative information to inform the evaluation objective, looking specifically at the characteristics of mitigation loan borrowers. These descriptive statistics compared the population of approved disaster loan borrowers who did not receive additional funds for mitigation from FYs 2013 to 2018 as presented in the DCMS data with those individuals who received additional funds for mitigation. These comparison statistics included verified loss value, original loan amount, interest rate, payment amount, location, family size, NAICS code, and number of employees.

In addition to the analysis of those individuals who used the additional loan option for mitigation, this study conducted analysis on those who were presented with mandatory relocation. This analysis consisted of descriptive statistics of the variables of interest for those who fall under the mandatory relocation classification.

Regression analysis

In addition to the descriptive statistics of the overall loan borrowers, mitigation borrowers, and relocation borrowers, this study produced a logistic regression model with selected variables that may influence a borrower's decision to choose the mitigation option. Using *t*-tests and correlation matrices, this study selected the most likely variables that influence whether or not a borrower chose the mitigation option for the logistic regression model. The results of this model point to key, statistically significant factors from the DCMS 1.0 data that may influence an individual's decision to choose the mitigation option.



3.2 Qualitative methods

Documentation reviews

This study conducted systematic reviews of the documentation provided by the SBA to collect information contextualizing how the Disaster Assistance Loan Program operates and, specifically, how the option to increase the loan for mitigation measures operates. The primary output of the document reviews was the logic model discussed in Appendix C. The document reviews also informed the development of the customer experience journey map. Whereas the logic model focused on programmatic or administrative operation of the respective loan programs, the customer experience journey map focused on the process a potential mitigation loan recipient takes to learn about and decide whether to increase the disaster loan for mitigation measures.

Logic model

The logic model of the SBA's Disaster Assistance Loan Program and the loan increase option for mitigation measures was created to gain a common understanding of the program's inputs, outputs, activities, and outcomes. A logic model synthesizes the key activities of a program into a picture of how the program should work. Moreover, logic models can provide two key benefits:

1. Allow stakeholders to clarify the program's strategies, which can help improve the program's direction.
2. Reveal assumptions concerning the conditions for program effectiveness and provide a frame of reference for evaluating the program.

To develop a logic model of the SBA's Disaster Assistance Loan Program and the loan increase option for mitigation measures, this study reviewed the SBA's *Disaster Assistance Program Standard Operating Procedures (SOP) 50 30 9*. This review was augmented by two discussions with key staff from the Office of Disaster Assistance who understand how the program operates. Appendix C provides and discusses the logic model for the program.

Customer experience journey map

To achieve this evaluation's goal, the SBA will require a better understanding of the thought process of borrowers and the decisions they make when they decide whether to apply for increases on their approved loans to address mitigation measures. To do this, this study developed a customer experience journey map; this is a visual depiction that traces the steps or walks a customer through a process. As a first step, this study developed a preliminary customer experience journey map drawn from review of *SOP 50 30 9* and the findings from the logic model.

To develop the final customer experience journey map, this study gathered relevant information during the numerous in-depth interviews and focus groups with disaster survivors. Questions that captured not only *what* the customer ultimately did, but also *why* and *how* they took a certain path to reach their objective informed the final map.

Figure 1: Literature review article inclusion



The resulting journey maps start from when a customer begins navigating the process for an initial physical disaster loan either (1) online or (2) in person at a field office. Between these two types of applicants of interest are (1) borrowers who choose to apply for—and who ultimately receive—increases on their physical disaster loan to cover mitigation measures or relocate, and (2) borrowers who could qualify for increases on their loans but choose not to apply for the increase.

The journey maps enable this study to address questions that include:

- How do customers learn about the program?
- What are the steps customers take to achieve their objective—either to receive the Disaster Assistance Loan increase for mitigation measures or to relocate?
- Where are the key decision points and factors involved in reaching decisions?
- What do customers believe is working well? What is not working well?

Collectively, responses to these questions informed Research Objective 3 (why disaster survivors chose to increase or not increase their loans for mitigation measures) by identifying phases or steps in the process where applicants diverge from opting for the mitigation increase. In addition, the responses also informed Research Objective 4 (recommendations on effective communication strategies to promote awareness of the mitigation increase option) by identifying junctures in the process that influenced an applicant's decision.

Literature review

To conduct the literature review, this study followed a rigorous methodology and documentation process as described in the literature review. This included the initial literature search, creation of literature inclusion and exclusion criteria (such as geography and year), analysis, and summary. Prior to conducting the search, this study developed a collection of key search terms and variants. These terms included risk management, perceptions, preparedness, mitigation, risk aversion, disaster, crisis, hazard, willingness to pay, and behavior.

Following the search, 106 articles and reports were saved for evaluation based on the inclusion and exclusion criteria. Following this evaluation, 33 articles remained. These articles were then imported into the qualitative analysis tool NVivo, and the information was coded into themes. These themes included benefits, barriers, income, trust in government, risk aversion to debt and disasters, willingness to pay for insurance and mitigation, and nudges (such as choice architecture, education, and framing). This study synthesized the major themes and information from NVivo by reviewing the nodes across all sources. The findings on the major themes were then summarized based on the coded nodes.

Coding and analysis were conducted using NVivo. This study uploaded all loan verifier (LV) report comment sections and used data visualization tools within NVivo to identify common words and themes across comment sections. After identifying common terms, this study developed the coding hierarchy, a categorical list of themes into which content can be coded. The coding hierarchy provides a starting point for analysis and offers flexibility to add emergent codes as they are identified in the data.

This study next coded all comment sections in NVivo. In this process, sections of text are “tagged” with any relevant thematic codes; text can be coded to multiple topics. To ensure consistency in coding, comment sections were double-coded (a process in which two analysts separately code the same comment section and compare their results) until analysts confirmed that the codes were being applied consistently. After all coding was complete, this study examined the main themes identified and looked for any patterns occurring both within and across groups.



Environmental scan

The environmental scan was conducted to help develop recommendations on effective communication strategies to promote awareness of the mitigation increase option among eligible disaster survivors. This study reviewed the SBA's current communication strategies and materials, as well as those used by partner and comparable agencies.

Existing SBA communications. The team met with the Office of Disaster Assistance (ODA) to review and discuss the following SBA communications:

- Existing communication materials that promote the Disaster Assistance Loan mitigation option to disaster survivors
- Existing instructions on applying for the additional mitigation loan

This study's thorough and organized review of this documentation provided important contextual information to inform the evaluation design (for example, information available and the detail of the information available), interview questions (by identifying potential barriers, such as complicated or confusing requirements), and future communication strategies recommendations.

Other agency communications. The environmental scan also included communications developed by other agencies and states to identify trends indicating best practices in communications.

Communications from the following organizations were included in the environmental scan:

- Ready.gov
- FEMA
- U.S. Department of Agriculture Farm Service Agency (USDA FSA)—Emergency Disaster Program
- USDA Emergency Conservation Program
- USDA Emergency Forest Restoration Program
- National Oceanic and Atmospheric Administration Disaster Preparedness Program
- National Institute of Standards and Technology Disaster Resilience Program
- State communications from Colorado, Florida, Oregon, Texas, and Washington

Review of comments

This study requested and received the purposive sample of 240 loan verifier (LV) report comment sections, which was limited to borrowers who chose the mitigation option. The sample was drawn from two groups sequentially to ensure as much diversity as possible:

- Group 1—Loan type (homeowner or business)
- Group 2—Disaster type (earthquake, fire, flood, hurricane, tornado, other)

It is important to note that the sample was not evenly split among the six disaster types due to variation in the number of borrowers who experienced each disaster type. For example, hurricanes had significantly more individuals who chose the mitigation increase option than earthquakes, which had only five homeowners. Thus, hurricane mitigation had a greater proportion of the sample.

Table 6 lists the number of comment sections in each data set chosen by disaster type.



Table 6: Sample of comment sections by disaster type

| Disaster Type | Number of Home LV Report Comment Sections | Number of Business LV Report Comment Sections |
|---------------|---|---|
| Earthquake | 5 | 2 |
| Fire | 15 | 2 |
| Flood | 41 | 46 |
| Hurricane | 41 | 59 |
| Tornado | 8 | 1 |
| Other | 10 | 10 |
| Total | 120 | 120 |

Note: All loan verifier (LV) report comment sections selected were those who opted for mitigation. In instances where there are only a small number of comment sections selected (such as the two business comment sections that experienced an earthquake), these were the only mitigation report comment sections available to select. Source: LV report comment sections

Analysis of themes

This study coded all interview and focus group transcripts in NVivo to identify themes relevant to these evaluation objectives, including perceived susceptibility to natural disasters, perceived benefits of the mitigation increase option, perceived barriers to applying or receiving the mitigation increase option, and borrower feedback on communication materials. In addition to identifying salient themes across all interviews and focus groups, this study also looked for areas of convergence or divergence between the interviews and focus groups. In particular, this study looked for differences or similarities between respondents who increased their loan amount for mitigation purposes and those who did not.

After the completion of coding, this study created a narrative thematic write-up of the major findings, which can be found in Section 5. The analysis informed the recommendations for effective communication strategies to promote awareness of the mitigation increase option.



4. LIMITATIONS

There are several limitations to the data sources and methodologies which should be noted, as they have an impact on the analyses that could be completed. These limitations are described below, separated out by data source: program data, interviews and focus groups, and loan verifier report comment sections.

Program data limitations. The number of cases using the mitigation increase option is rather small, which impacts the analyses conducted. While the tests of differences in means and the logistic regression analysis did find some statistically significant results, these results may be impacted by the small number of mitigation option takers. Typically, a small population size means that the analysis is less likely to find statistically significant results or the effect sizes may be different than a larger population.

Interview and focus group limitations. The small number of mitigation takers meant there were limited individuals to recruit for interviews and focus groups. Additionally, the response rate was lower than anticipated. During pretesting, the team contacted 91 respondents in an attempt to complete 10 pretesting interviews. As shown in Table 7, 84 respondents did not respond, four were contacted but could not be interviewed (due to lack of eligibility, availability, or interest), and only three interviews were completed.

Table 7: Pretesting recruitment and response rates

| Borrowers contacted | Nonresponse | Contacted but unable to interview | Interviewed |
|---------------------|-------------|-----------------------------------|-------------|
| 91 | 84 | 4 | 3 |

Additionally, the contact information in the DCMS 1.0 was not always up to date, with 7 percent of the attempted contacts having invalid contact information. These factors all made recruitment more difficult, leading to a lower number of completes than anticipated. This study's analysis was therefore limited by the data available; low numbers of completes and lack of representative diversity means that the findings are not generalizable to the full population. Despite these difficulties, however, this study still found frequently repeated themes in the interviews and focus groups, which provide valuable insight into the research questions and can inform recommendations.

Loan verifier report comment section data limitations. As noted in Section 2.2 above, the report comment sections did not include much relevant information to answer the research questions. This study purposefully cast a wide net when identifying themes⁵ in the comment sections (see Section 3.2 above for an in-depth description of the coding and analysis methodology), gathering more information that would likely be relevant to ensure nothing was missed. Even with this expansive first pass through the data, only 154 comment sections (64.2 percent) had any content coded, meaning that 86 comment sections (35.8 percent) did not include relevant information.

After coding and analyzing the data for this study, it is clear these comments are maintained for operational purposes; the intent is for loan verifiers (LVs) and other users to track what has happened and what needs to happen next. As such, they are heavy on procedural comments and light on

⁵ As described in greater depth in Section 3.2, analysis included coding themes identified in the text, a process through which analysts "tag" sections of text to correlate with thematic codes.



substantive information regarding loan usage. The anonymized example below is the full set of comments for one specific comment section, which shows the procedural nature.

Example of LV Report Comments

- LV... received file
- LV... called [PHONE NUMBER] unable to leave message. Called [PHONE NUMBER] left message
- LV... received return call from [BORROWER] set appt for [DATE]
- LV... met with [BORROWER] on site at 2pm completed inspection at 2:15
- Assignment COMPLETED by [LV]
- INITIAL_INSPECTION given status of REVIEWED by [NAME] on [DATE]
- REVERIFICATION requested for the following properties: [PROPERTY #1]
- LV called [PHONE NUMBER]; LVM requesting return call with contact information
- LV called [PHONE NUMBER]; no answer
- LV called [PHONE NUMBER]; LVM requesting return call with contact information
- LV called [PHONE NUMBER]; no answer
- Internal Note: Reverification complete, increase warranted. See comments for details. Borrower has been advised of LVs actions.
- LV received a return call from [BORROWER], discussed increase request, TPC and submitted docs.
- REVERIFICATION given status of REVIEWED by [NAME] on [DATE]

In addition, given the procedural nature of the comment sections, the team suspects that the information that was coded and analyzed is likely not representative due to the piecemeal nature of the entries. When information that informs this project's research questions is included in the comment sections, it is somewhat due to chance. For example, even though all 240 comment sections were from mitigation takers, many comment sections did not include any detailed information about the mitigation usage. This does not mean the information does not exist; it simply was not recorded. This is illustrated in the two excerpts below. In both cases, the cost of flood insurance was added to the loan amount. In the former, the loan verifier noted the amount, while in the latter the loan verifier did not.

- "I have added the first years [sic] flood insurance cost of \$2,386 as requested by the LO⁶"
- "I have added the first year insurance premium as requested by the LO"

The results, while limited by the sparseness of the content of the comment sections, do still provide relevant findings for the research. This is the first analysis of these comment sections and provides a glimpse into what data they may contain. The data, while inconsistent, did shed light on what many individuals use the mitigation option for. This is a good starting point for the discussion of whether the SBA wants to analyze this type of information in the future. If so, there must be standard procedures for recording it. This is further discussed in Section 5.2.

⁶ Loan officer



5. RESULTS BY RESEARCH OBJECTIVE

5.1 Characteristics of loan borrowers

In this section, this study provides a description and analyses of the mitigation loan program and its borrowers using the DCMS 1.0 database. This includes comparison statistics between mitigation-taking and non-mitigation-taking borrowers on variables including verified loss, original loan amount, interest rate, location, family size, NAICS codes, and number of employees. It also includes a brief discussion of the regression analysis performed. Further discussion of this analysis can be found in Appendix E.

| Key Takeaways for Research Objective 1 | |
|--|--|
| Findings | <ol style="list-style-type: none"> 1. Borrowers who took mitigation were more likely to be flood survivors, live in a high flood risk zone, have higher incomes and better credit scores, have hazard insurance, and have lower interest rates. 2. The logistic regression analysis found that flood risk zone and hazard insurance had positive, sizable, and significant relationships with the mitigation option. The interest rate was also found to be sizable and significant; a lower interest rate was related to a higher likelihood of taking the mitigation option. |
| Recommendations | <ol style="list-style-type: none"> 1. Spread awareness of mitigation strategies and mitigation project examples of the most common disaster types. 2. The interest rate is critical to the decision to take the mitigation option; highlight the benefit of a low interest rate to borrowers. |

Physical Disaster Assistance Loan uptake

As shown in Table 8, out of the roughly 36,798 disaster loan applications the SBA received from businesses between FYs 2013 and 2018, 9,655 (26 percent) were approved⁷. Comparatively, 153,882 (43 percent) of homeowners out of 360,460 applicants were approved to receive Disaster Assistance Loans. The homeowner dataset was about 9.8 times larger than the business set, and the approved population was 15.9 times larger.

Table 8: Disaster Assistance Loan uptake in the DCMS

| Loan Decision | Business Owners | | Homeowners | | Total | |
|---------------|-----------------|------------|----------------|------------|----------------|------------|
| | Count | % | Count | % | Count | % |
| Approved | 9,655 | 26.24 | 153,882 | 42.69 | 163,537 | 41.17 |
| Declined | 16,119 | 43.80 | 147,206 | 40.84 | 163,325 | 41.11 |
| Withdrawn | 11,024 | 29.96 | 59,372 | 16.47 | 70,396 | 17.72 |
| Total | 36,798 | 100 | 360,460 | 100 | 397,258 | 100 |

Source: DCMS 1.0, FY 2013–2018

⁷ “Approved” loans are those that, from here on in, were marked as “approved” by the SBA and where the individual was not a renter, the loan was not canceled, and some value of the loan was disbursed. In short, approved means that the applicant took the loan. All tables within this report have removed those loans that were decided as “withdrawn” or “declined,” those that were renters, loans that were canceled, and loans that did not have any amount disbursed.



Loan decision and disaster type

As seen in Table 9, there were a significant number of homeowners affected by hurricanes (76 percent). There was not a significant difference in the decision made on the loan between disaster types. Generally, applicants were approved by the SBA or decided to withdraw at the same rates, regardless of disaster type. This trend not only applied to homeowners, but also to the business applicants (Table 10).

Table 9: Disaster Assistance Loan uptake in the DCMS by disaster type for homeowners

| Homeowners | | | | | | | | |
|---------------|----------------|------------|----------------|------------|---------------|------------|----------------|------------|
| Disaster Type | Approved | | Declined | | Withdrawn | | Total | |
| | Count | % | Count | % | Count | % | Count | % |
| Earthquake | 715 | 0.46 | 306 | 0.21 | 236 | 0.40 | 1,257 | 0.35 |
| Fire | 607 | 0.39 | 1,078 | 0.73 | 1,113 | 1.87 | 2,798 | 0.78 |
| Flood | 17,262 | 11.22 | 20,671 | 14.04 | 6,642 | 11.19 | 44,575 | 12.37 |
| Hurricane | 117,999 | 76.68 | 109,030 | 74.07 | 45,273 | 76.25 | 272,302 | 75.54 |
| Tornado | 1,453 | 0.94 | 1,675 | 1.14 | 977 | 1.65 | 4,105 | 1.14 |
| Other | 15,846 | 10.30 | 14,446 | 9.81 | 5,131 | 8.64 | 35,423 | 9.83 |
| Total | 153,882 | 100 | 147,206 | 100 | 59,372 | 100 | 360,460 | 100 |

Source: DCMS 1.0, FY 2013–2018

Table 10: Disaster Assistance Loan uptake in the DCMS by disaster type for businesses

| Business Owners | | | | | | | | |
|-----------------|--------------|------------|---------------|------------|--------------|------------|---------------|------------|
| Disaster Type | Approved | | Declined | | Withdrawn | | Total | |
| | Count | % | Count | % | Count | % | Count | % |
| Earthquake | 60 | 0.73 | 27 | 0.19 | 35 | 0.38 | 122 | 0.39 |
| Fire | 131 | 1.59 | 217 | 1.56 | 204 | 2.19 | 552 | 1.76 |
| Flood | 1,246 | 15.15 | 1,975 | 14.22 | 1,253 | 13.43 | 4,474 | 14.23 |
| Hurricane | 6,661 | 80.98 | 11,474 | 82.59 | 7,700 | 82.52 | 25,835 | 82.15 |
| Tornado | 127 | 17.39 | 199 | 16.03 | 139 | 18.14 | 465 | 1.48 |
| Other | 1,430 | 1.54 | 2,227 | 1.43 | 1,693 | 1.49 | 5,350 | 17.01 |
| Total | 8,225 | 100 | 13,892 | 100 | 9,331 | 100 | 31,448 | 100 |

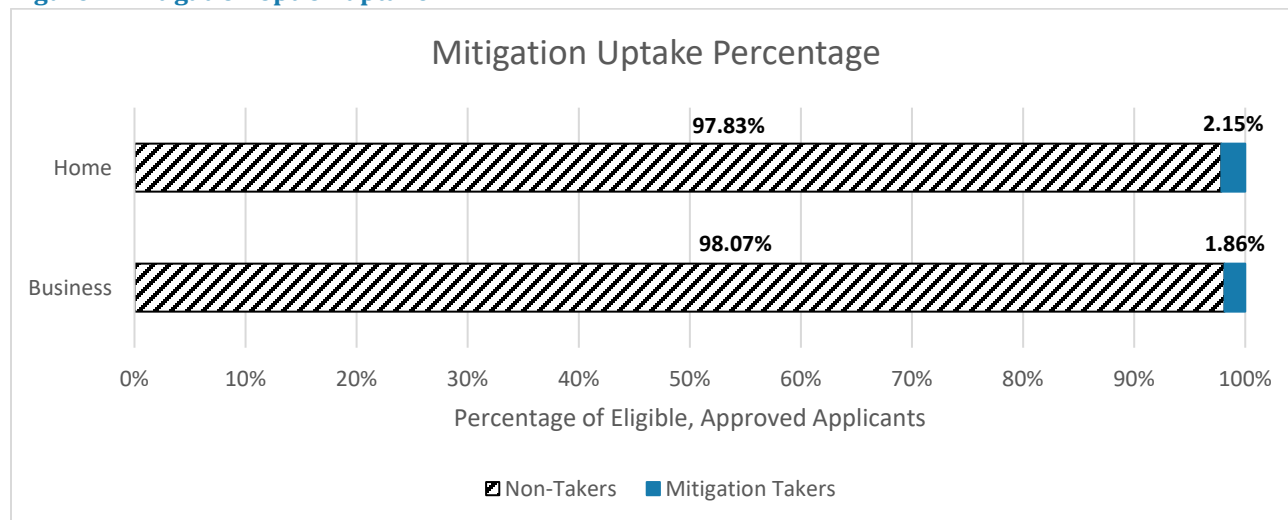
Source: DCMS 1.0, FY 2013–2018

Uptake of the option to increase the Disaster Assistance Loan for mitigation measures

As shown in Figure 2, the uptake rate of the option to increase Disaster Assistance Loans for mitigation measures (the “mitigation takers”) was low for both homeowners (2.15 percent) and businesses (1.86 percent). A primary objective of this evaluation was to use qualitative methods to gain insight on why the uptake rates for these low-interest additions to the Disaster Assistance Loan are not higher (see Section 5.3 for the results of the qualitative methods).



Figure 2: Mitigation option uptake



Source: DCMS 1.0, FY 2013–2018

Note: N=163,564

Another perspective for understanding how applicants made decisions to opt for mitigation increases was to assess the proportion of applicants who applied for the increase at the time of their Disaster Assistance Loan application versus later. Applicants could have either initially specified in their application that they were interested in mitigation funding or, after having been approved for some other form of disaster relief, later request to receive additional funding for mitigation. As shown in Table 11, approximately 5.7 percent of all applicants who opted for the mitigation increase did so at the same time as their application for the Disaster Assistance Loan—the majority of applicants (94.3 percent) made this decision after they submitted applications for the Disaster Assistance Loan, were approved, and took out the loan. The businesses were more than twice as likely (12 percent versus 5 percent) to opt for the mitigation increase in their initial application.

Table 11: Mitigation increase uptake with the Disaster Assistance Loan application versus later

| Mitigation Takers | | | | | | |
|-------------------|------------|------------|--------------|------------|--------------|------------|
| Mitigation Timing | Business | | Home | | Total | |
| | Count | % | Count | % | Count | % |
| Initial | 21 | 11.67 | 179 | 5.40 | 200 | 5.73 |
| Later | 159 | 88.33 | 3,133 | 94.60 | 3,292 | 94.27 |
| Total | 180 | 100 | 3,312 | 100 | 3,492 | 100 |

Source: DCMS 1.0, FY 2013–2018

Which disaster survivors have chosen to increase the SBA physical disaster loan amounts to fund mitigating measures? How do they differ from those of the population that has not chosen to increase their loan amount?

As summarized in Table 8 and Figure 2, 153,903 homeowners were approved for Disaster Assistance Loans with approximately 2.15 percent opting to increase their loans to address mitigation measures. Similarly, out of the 9,655 businesses approved for Disaster Assistance Loans, only 1.86 percent opted to increase their loan for mitigation measures. Borrowers who took mitigation were more likely to be flood

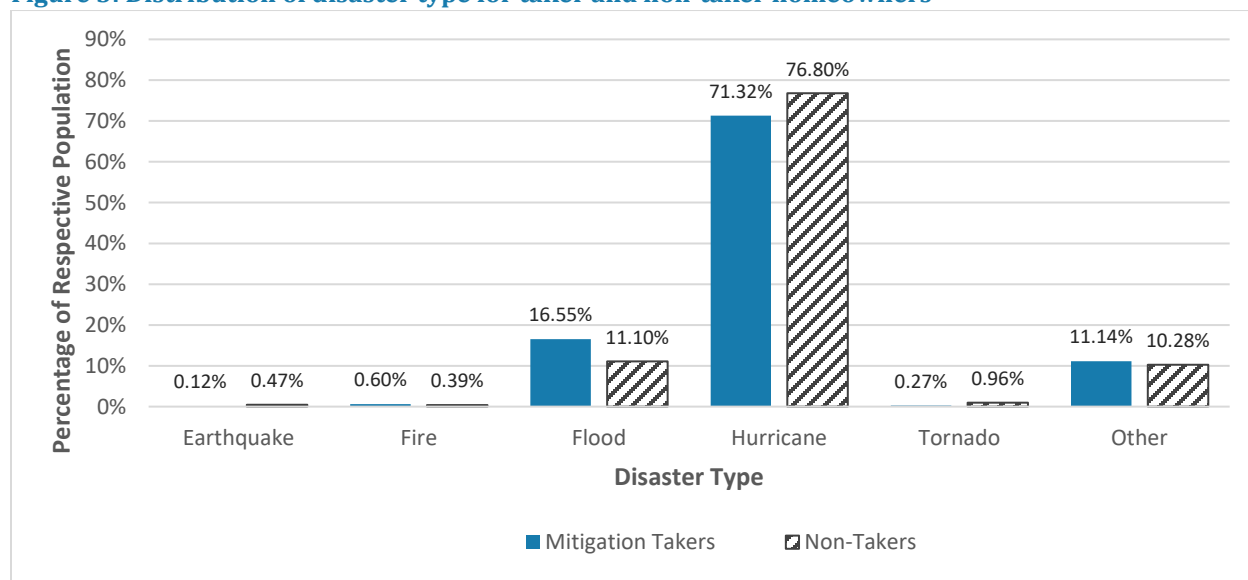


survivors, live in a high flood risk zone, have higher incomes and better credit scores, have hazard insurance, and receive lower interest rates.

What is the distribution of disaster types for Disaster Assistance Loan borrowers? Where were these disasters experienced?

Disaster Assistance Loans were used to cover damages caused by earthquakes, fires, floods, hurricanes, tornadoes, and other similar disasters. The majority of disaster types between FY 2013 and 2018 among fund-receiving homeowners were hurricanes (76.7 percent), followed by floods (11.2 percent) and a combination of other disaster types (10.3 percent) composed of volcanic eruptions, landslides, avalanches, severe storms, and explosions. As shown in Figure 3, the distribution by disaster type did not vary widely between homeowners that opted for mitigation increases and those that decided against the increase (non-takers), though this difference is statistically significant⁸.

Figure 3: Distribution of disaster type for taker and non-taker homeowners



Source: DCMS 1.0, FY 2013–2018
N=153,903

Notably, a review of the geographical distribution of homeowners seeking disaster assistance showed (in the rightmost column of Table 33 in Appendix B) the most prevalent number of physical disaster assistance borrowers were in Texas (TX), Florida (FL), Puerto Rico (PR), Louisiana (LA), and New York (NY). On guidance from the SBA, this study assumed that the large number of mitigation takers in New York (NY) and New Jersey (NJ) were primarily from Hurricane Sandy, after which state and local governments were proponents of the mitigation option. Further exploration of the geographic distribution of homeowners who chose mitigation can be found in Appendix D, where this study presents a heat map of the distribution.

Unsurprisingly, a similar distribution of disaster type and geographic distribution was observed for business Disaster Assistance Loans. As shown in Figure 4, most business loans (69.0 percent) were for

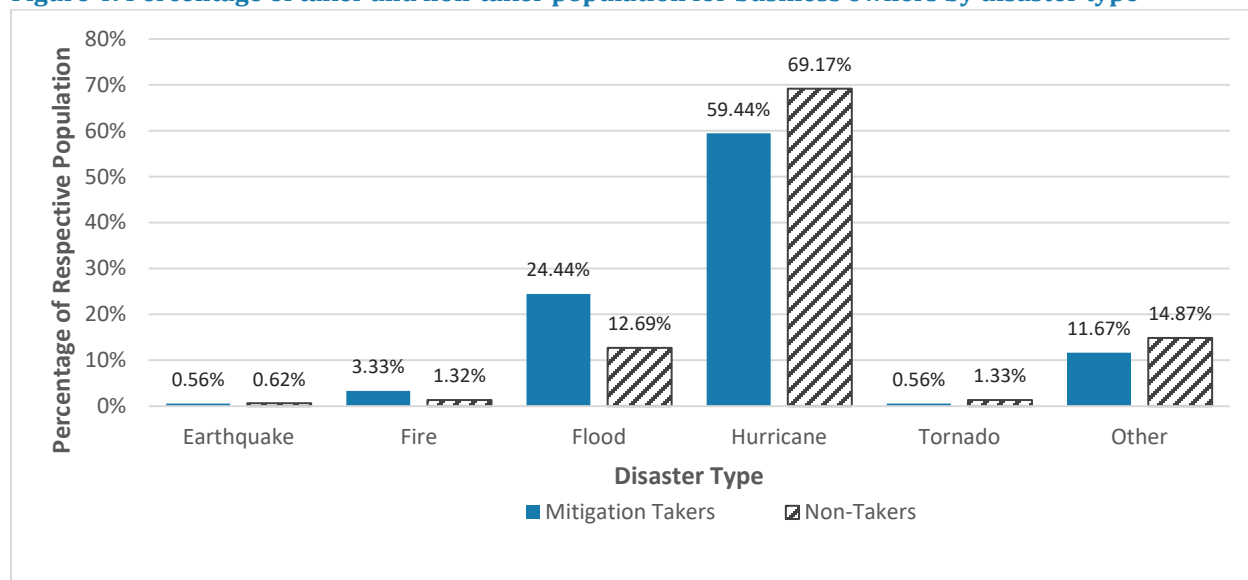
⁸ Appendix B



covering hurricane damage followed by a combination of other types of disasters (14.8 percent) and floods (12.9 percent).

The findings in Appendix B mirrors some of the states for homeowners, business owners in Puerto Rico (PR) did not take up Disaster Assistance Loans at a similar rate to homeowners (16.11 percent versus 26 percent). Moreover, a lower proportion of business owners in NY and NJ (0.97 percent) compared to homeowners took business loans.

Figure 4: Percentage of taker and non-taker population for business owners by disaster type

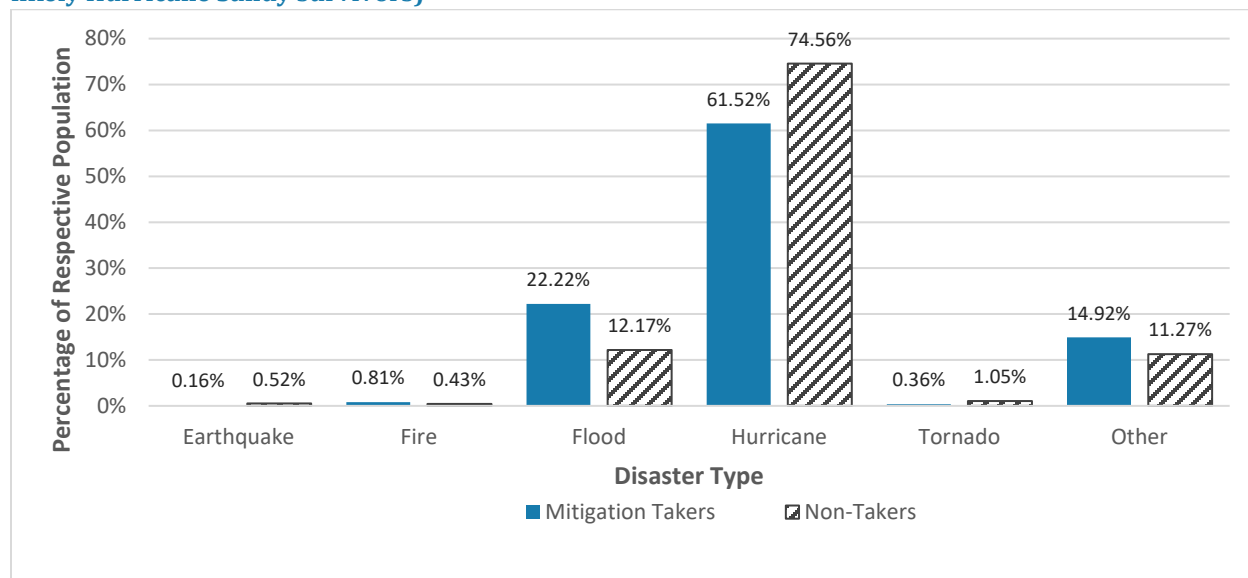


Note: Due to the unprecedented impact that Hurricane Sandy likely had on the distribution of mitigation takers in the homeowner data, this study looked at the distribution of disaster types and state by removing any borrowers who had a hurricane in New York (NY) or New Jersey (NJ) in 2012 or 2013. As shown in Figure 5, the number of hurricane mitigation takers has reduced by about 10 percent once the likely Hurricane Sandy survivors are removed. N=9,661 Source: DCMS 1.0 FY 2013–2018



Table 35 in Appendix B shows the updated distribution by state.

Figure 5: Percentage of taker and non-taker population for homeowners by disaster type (removing likely Hurricane Sandy survivors)



Source: DCMS 1.0, FY 2013–2018
N=139,535

What is the primary language for Disaster Assistance Loan borrowers?

As shown in Table 12 and Table 13, the overwhelming majority of disaster relief loan applicants were native English speakers. Roughly 2 percent of both homeowner and business applicants were native Spanish speakers.

Table 12: Distribution of homeowner language of mitigation takers and non-takers

| Applicant Language | Homeowner | | | | | |
|--------------------|----------------|------------|--------------|------------|----------------|------------|
| | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| English | 147,702 | 98.11 | 3,288 | 99.28 | 150,990 | 98.14 |
| Spanish | 2,835 | 1.88 | 24 | 0.72 | 2,859 | 1.86 |
| Chinese | 1 | 0.00 | 0 | 0.00 | 1 | 0.00 |
| Vietnamese | 3 | 0.00 | 0 | 0.00 | 3 | 0.00 |
| Other | 3 | 0.00 | 0 | 0.00 | 3 | 0.00 |
| Total | 150,544 | 100 | 3,312 | 100 | 153,856 | 100 |

Source: DCMS 1.0, FY 2013–2018



Table 13: Distribution of business owner language of mitigation takers and non-takers

| Business | | | | | | |
|--------------------|--------------|------------|------------|------------|--------------|------------|
| Applicant Language | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| English | 8,396 | 98.05 | 124 | 99.20 | 8,520 | 98.07 |
| Spanish | 154 | 1.80 | 1 | 0.80 | 155 | 1.78 |
| French | 12 | 0.14 | 0 | 0.00 | 12 | 0.14 |
| Other | 1 | 0.01 | 0 | 0.00 | 1 | 0.01 |
| Total | 8,563 | 100 | 125 | 100 | 8,688 | 100 |

Source: DCMS 1.0, FY 2013–2018

What is the distribution for the family size (homeowners) and number of employees (business owners) for Disaster Assistance Loans?

As shown in Table 14, most homeowners who took on Disaster Assistance Loans were in households with two (35.4 percent) household members followed by one (19.5 percent) household member. Households with three and four members accounted for 18.0 percent and 16.9 percent of the distribution, respectively. The distribution among borrowers who opted to take the mitigation increase versus those who did not take the increase was significantly different (see Appendix B).

Table 14: Distribution of homeowner family size

| Homeowner | | | | | | |
|--------------|----------------|------------|--------------|------------|----------------|------------|
| Family Size | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| 1 | 29,505 | 19.60 | 543 | 16.39 | 30,048 | 19.53 |
| 2 | 53,400 | 35.47 | 1,065 | 32.16 | 54,465 | 35.39 |
| 3 | 27,193 | 18.06 | 575 | 17.36 | 27,768 | 18.04 |
| 4 | 25,281 | 16.79 | 708 | 21.38 | 25,989 | 16.89 |
| 5 | 10,615 | 7.05 | 292 | 8.82 | 10,907 | 7.09 |
| 6 | 3,191 | 2.12 | 89 | 2.69 | 3,280 | 2.13 |
| 7 | 899 | 0.60 | 30 | 0.91 | 929 | 0.60 |
| 8+ | 486 | 0.32 | 10 | 0.30 | 496 | 0.32 |
| Total | 150,570 | 100 | 3,312 | 100 | 153,882 | 100 |

Source: DCMS 1.0, FY 2013–2018

As shown in Table 15, approximately 48.41 percent of Disaster Assistance Loans were approved for businesses with five or fewer employees. Businesses with more than 100 employees accounted for almost one-third (29.87 percent) of Disaster Assistance Loans. Comparatively, among businesses that opted for the mitigation increase, 58.59 percent had ten or fewer employees and those with over 100 employees accounted for 29.75 percent of borrowers. The difference in number of employees between those who took mitigation and those who did not was not statistically significant⁹.

⁹ Appendix B: Additional Data Tables



Table 15: Distribution of businesses by number of employees

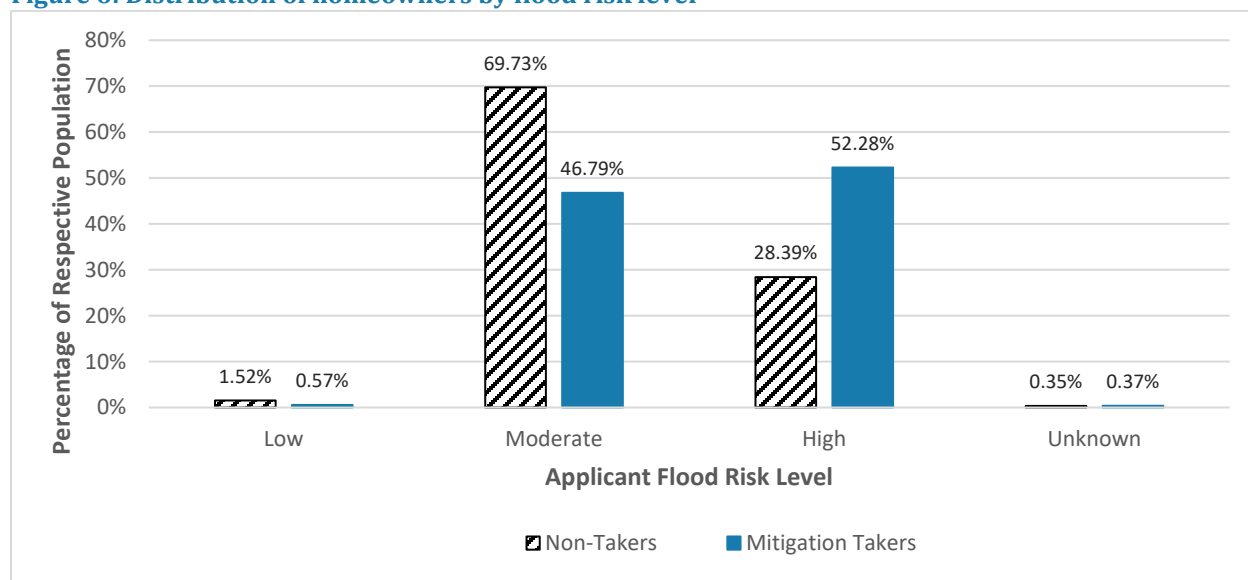
| Number Employees | Business | | | | | |
|------------------|--------------|---------------|------------|---------------|--------------|---------------|
| | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| 1-5 | 3,982 | 48.37 | 76 | 48.41 | 4,058 | 48.37 |
| 6-10 | 841 | 10.22 | 16 | 10.19 | 857 | 10.22 |
| 11-100 | 950 | 11.54 | 28 | 17.83 | 978 | 11.66 |
| 100+ | 2,459 | 29.87 | 37 | 23.57 | 2,496 | 29.75 |
| Total | 8,232 | 100.00 | 157 | 100.00 | 8,389 | 100.00 |

Source: DCMS 1.0, FY 2013–2018

What is the distribution of hazard insurance and flood zone location for Disaster Assistance Loans?

As shown in Figure 6, 98.10 percent of Disaster Assistance Loan borrowers lived in either moderate or high flood risk zones. Homeowners who took the mitigation option were more represented at the high flood risk level (50.15 percent) than the moderate flood risk level (48.91 percent), suggesting that a higher flood risk level would encourage a homeowner to take up the mitigation option. In looking at those who did not take up the mitigation option, only 22.2 percent were in a high flood risk zone compared to 75.9 percent in a moderate flood risk zone. For the business loans, as displayed in Figure 7, similar trends were evident, though not as large in effect size.

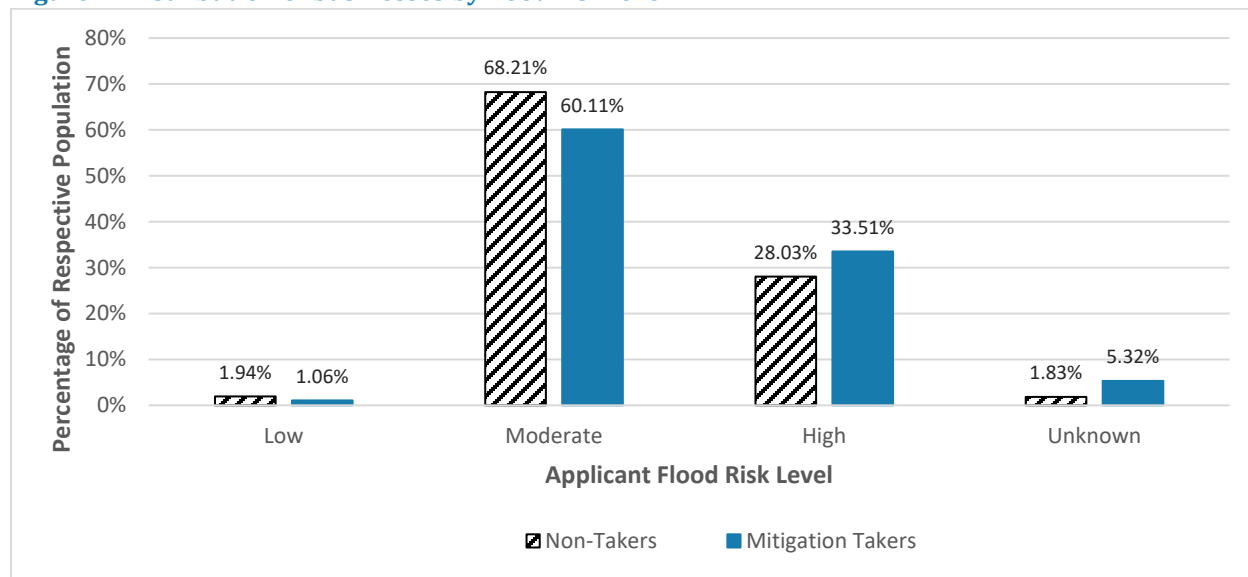
Figure 6: Distribution of homeowners by flood risk level



Source: DCMS 1.0, FY 2013–2018
N=153,856



Figure 7: Distribution of businesses by flood risk level



Source: DCMS 1.0, FY 2013–2018
N=9,655

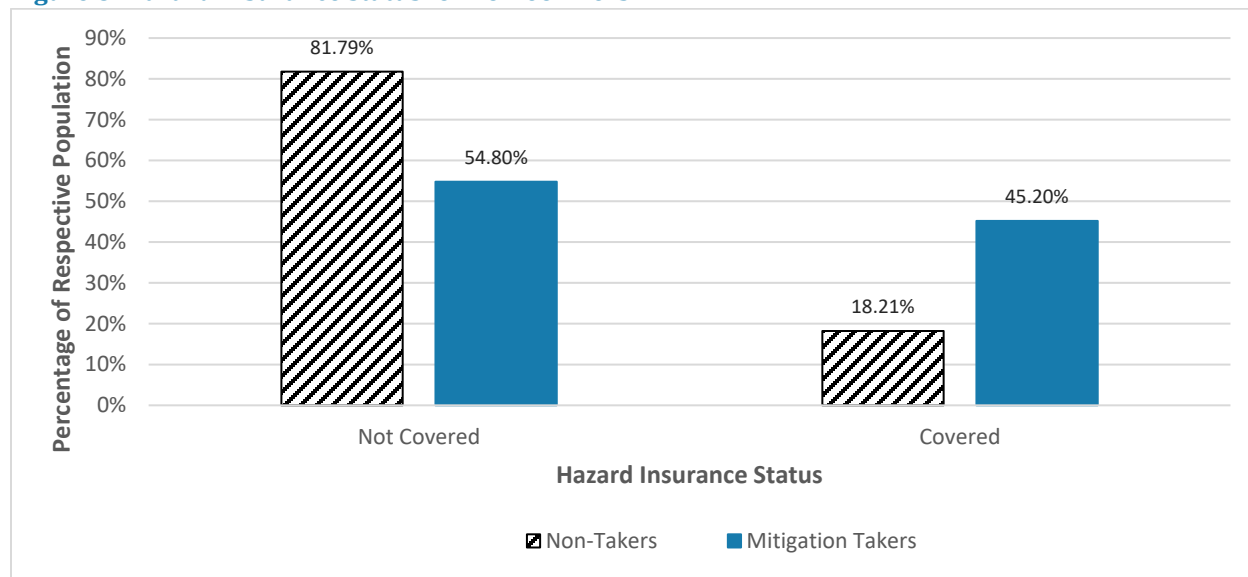
Regression analysis. In the regression analysis performed, estimates of the flood risk variables were positive, sizable, and significant in both the homeowner set and the business set. Survivors of floods and similar water damage appeared to have the highest potential for mitigation fund usage. Throughout the analysis, this study considered funds apportioned toward elevation as a mitigation measure, which is a straightforward application of mitigation funding in the case of a borrower in a high flood risk zone. One business owner interviewed by the team even noted that they used the mitigation funding to “raise the elevation” instead of waterproofing their property, another common flood mitigation method. It could be the case that survivors living in high flood risk zones were not only more familiar with the effects of a flood, but also more familiar with the ways in which damage from a future flood could be mitigated or prevented altogether.

As shown in Figure 8, homeowners who do not take the mitigation option were much less likely to be covered by hazard insurance (81.8 percent). However, out of those who elected the mitigation option, almost half (45.2 percent) were covered by hazard insurance, compared to the non-takers, of which only 18.2 percent were covered. This difference, as suggested by behavioral theory, may indicate that individuals who took the mitigation option were more disaster-averse and so were more likely to have hazard insurance. The difference between the mitigation option takers and non-takers in having hazard insurance was statistically significant at the 99 percent confidence level¹⁰.

¹⁰ Appendix B



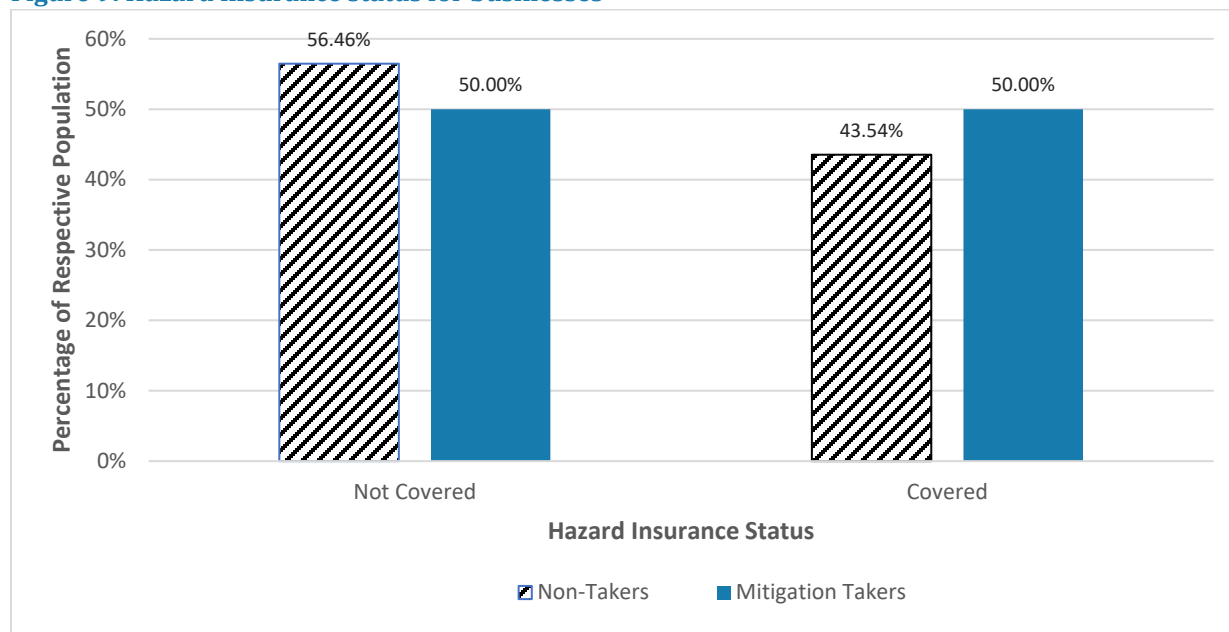
Figure 8: Hazard insurance status for homeowners



Source: DCMS 1.0, FY 2013-2018
N=153,856

As shown in Figure 9, business owners exhibited a similar trend to homeowners regarding hazard insurance and mitigation uptake. This difference was also statistically significant, though at the 90 percent confidence level¹¹.

Figure 9: Hazard insurance status for businesses



Source: DCMS 1.0, FY 2013-2018
N=9,655

¹¹ Appendix B



Regression analysis. The findings from the regression analysis showed a pattern of risk aversion was evident in both datasets, especially when it came to homeowners in possession of hazard insurance. Of the 57,699 homeowner borrowers that had hazard insurance, 1,497 (2.6 percent) of them were mitigation takers. When considering the total population of homeowner mitigation takers, 45.2 percent had some variety of hazard insurance policy on their home. This study recognized a pattern among borrowers who had hazard insurance, such that they had a greater sensitivity to risk in general, as revealed by their decision to purchase hazard insurance. Examples of risks that these individuals were sensitive to include those posed by the threat of an imminent natural disaster. Although the probability of such disasters is quite low in most of the nation, risk-averse people tended to assess low probabilities as much higher than they truly are. In the case of one homeowner, who experienced a “one in a million flood” they believed “would happen again,” mitigation funding was used to waterproof their house, and it paid off when the next flood came around and their basement did not flood. Borrowers with a revealed tendency of risk aversion were more likely to make use of the mitigation option.

Local policy surrounding disaster risk and hazard insurance was also highly interconnected with the relationships discovered through this study’s analysis, particularly regarding the homeowner dataset. With an effect size ranging between 0.64 and 0.85, the hazard insurance indicator also provided slightly more insight than was expected. In many localities where the risk of disaster is substantially higher than the national average, local laws require that homeowners own hazard insurance. Further, many survivors who owned a mortgage and lived in these high-risk areas were also obligated to possess hazard insurance according to the terms of the mortgage. “If you have a mortgage, you have to have flood insurance in a flood zone,” according to one homeowner interviewed by the team. The effect size of the hazard insurance variable in the homeowner regression analysis was telling not only of the survivors’ attitude toward mitigation, but also of the welfare and financial concerns put in place by local governments and mortgage lenders. It is perhaps the case that this legal or contractual requirement to have hazard insurance is leading borrowers to be more proactive and preventative in their approach, though further research would be required to fully understand the interaction.

What is the distribution for the credit score and income (homeowners) for Disaster Assistance Loans?

As shown in Table 16, higher earners were more likely to take up the mitigation option. As suggested by behavioral theory, this may be due to lower earners having a higher risk aversion to debt and being more unwilling to take on the additional debt of the mitigation option. The difference in income between mitigation option takers and non-takers was statistically significant at the 99 percent confidence level¹². The DCMS 1.0 did not have consistent data on the business owners’ income.

¹² Appendix B

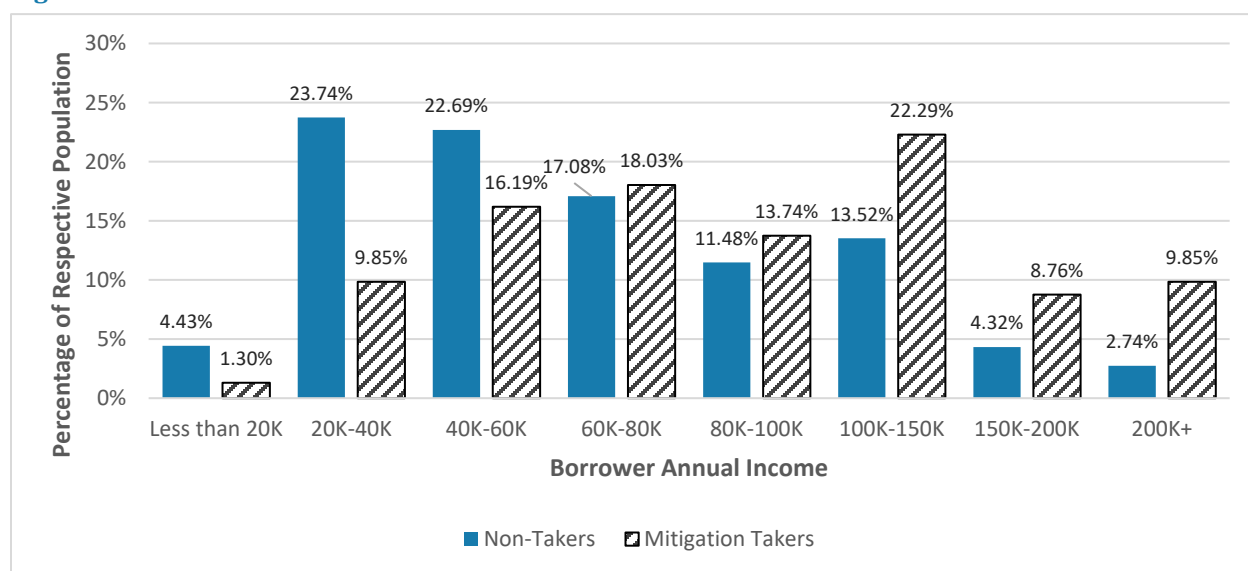


Table 16: Distribution of homeowner income

| Homeowners | | | | | | |
|----------------------------|----------------|------------|--------------|------------|----------------|------------|
| Applicant Annual Income | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| Less than \$20K | 6,673 | 4.43 | 43 | 1.30 | 6,716 | 4.37 |
| \$20K–40K | 35,740 | 23.74 | 326 | 9.85 | 36,066 | 23.44 |
| \$40K–60K | 34,152 | 22.69 | 536 | 16.19 | 34,688 | 22.55 |
| \$60K–80K | 25,710 | 17.08 | 597 | 18.03 | 26,307 | 17.10 |
| \$80K–100K | 17,283 | 11.48 | 455 | 13.74 | 17,738 | 11.53 |
| \$100K–150K | 20,355 | 13.52 | 738 | 22.29 | 21,093 | 13.71 |
| \$150K–200K | 6,500 | 4.32 | 290 | 8.76 | 6,790 | 4.41 |
| \$200K+ | 4,129 | 2.74 | 326 | 9.85 | 4,455 | 2.90 |
| Total | 150,542 | 100 | 3,311 | 100 | 153,853 | 100 |

Source: DCMS 1.0, FY 2013–2018

Figure 10: Distribution of Homeowner Income



Source: DCMS 1.0, FY 2013–2018

As shown in Table 17, homeowners with credit scores between 650 and 700 were more likely to take up the mitigation option. For homeowners, the average credit score was 694.5, the average for non-takers was 694.3, and the average for takers was 703.4. For businesses (Table 18), the owners who took the mitigation option were more likely to have a credit score between 750 and 800. For businesses, the average credit score was 711.1, the average for non-takers was 711.1, and the average for takers was 712.0. The difference was statistically significant for the homeowners at the 99 percent confidence level, however it was not statistically significant for business owners¹³.

¹³ Appendix B

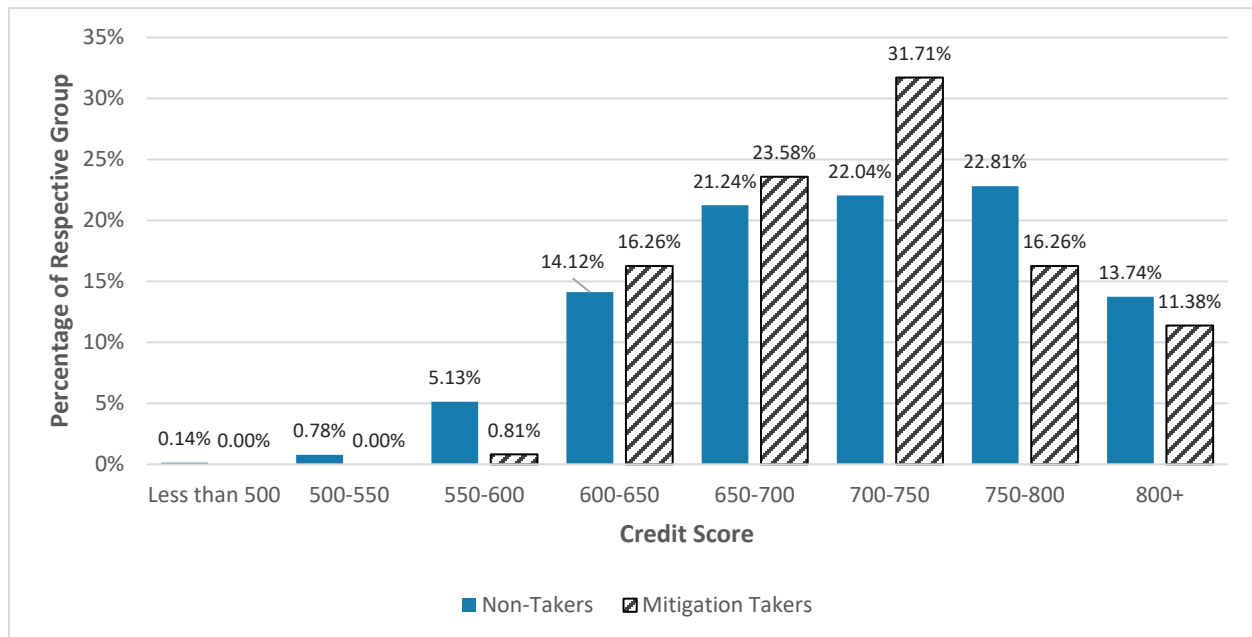


Table 17: Distribution of homeowner credit scores

| Homeowners | | | | | | |
|---------------------------|----------------|------------|--------------|------------|----------------|------------|
| Applicant Credit Score | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| Less than 500 | 341 | 0.23 | 7 | 0.21 | 348 | 0.23 |
| 500–550 | 2,132 | 1.43 | 49 | 1.49 | 2,181 | 1.43 |
| 550–600 | 11,968 | 8.05 | 244 | 7.43 | 12,212 | 8.03 |
| 600–650 | 26,624 | 17.90 | 516 | 15.71 | 27,140 | 17.85 |
| 650–700 | 33,807 | 22.73 | 662 | 20.16 | 34,469 | 22.67 |
| 700–750 | 30,313 | 20.38 | 656 | 19.98 | 30,969 | 20.37 |
| 750–800 | 27,096 | 18.22 | 767 | 23.36 | 27,863 | 18.33 |
| 800+ | 16,461 | 11.07 | 383 | 11.66 | 16,844 | 11.08 |
| Total | 148,742 | 100 | 3,284 | 100 | 152,026 | 100 |

Source: DCMS 1.0, FY 2013–2018

Figure 11: Distribution of homeowner credit scores



Source: DCMS 1.0, FY 2013–2018

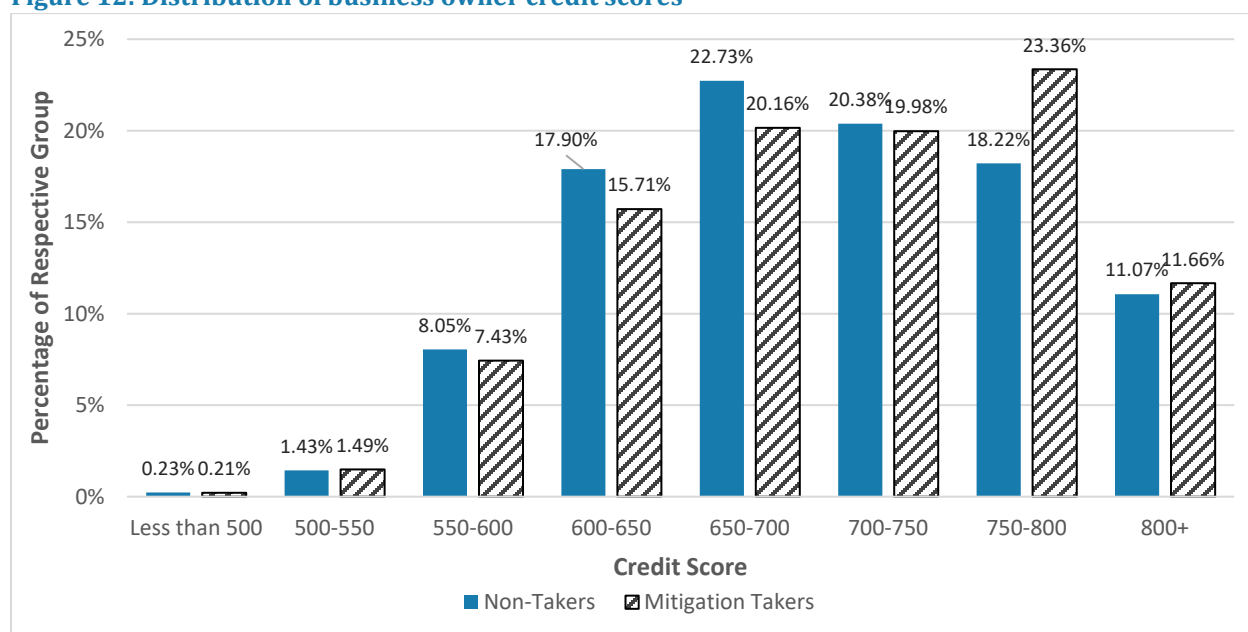


Table 18: Distribution of business owner credit scores

| Business Owners | | | | | | |
|------------------------|--------------|------------|------------|------------|--------------|------------|
| Applicant Credit Score | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| Less than 500 | 11 | 0.14 | 0 | 0.00 | 11 | 0.13 |
| 500–550 | 63 | 0.78 | 0 | 0.00 | 63 | 0.76 |
| 550–600 | 417 | 5.13 | 1 | 0.81 | 418 | 5.07 |
| 600–650 | 1,147 | 14.12 | 20 | 16.26 | 1,167 | 14.16 |
| 650–700 | 1,725 | 21.24 | 29 | 23.58 | 1,754 | 21.28 |
| 700–750 | 1,790 | 22.04 | 39 | 31.71 | 1,829 | 22.19 |
| 750–800 | 1,852 | 22.81 | 20 | 16.26 | 1,872 | 22.71 |
| 800+ | 1,116 | 13.74 | 14 | 11.38 | 1,130 | 13.71 |
| Total | 8,121 | 100 | 123 | 100 | 8,244 | 100 |

Source: DCMS 1.0, FY 2013–2018

Figure 12: Distribution of business owner credit scores



Source: DCMS 1.0, FY 2013–2018

What are the verified, approved, and current disaster loan amounts?

Once an applicant submits a Disaster Assistance Loan, the SBA loan officers determine the value of damages applicable for the loan (the verified amount). Loan amounts are then approved based on the verified value (the approved amount). Borrowers then have the opportunity to increase the loan amount if they can demonstrate that approved additional costs were incurred after the initial verified amount was approved (the current amount).

As shown in Table 19, Table 20, and Table 21, among homeowners, the majority of verified losses were for values less than \$50,000, and approximately 90 percent of verified losses were under \$100,000. Approved loan amounts followed a similar pattern. However, for current loan amounts, a larger number of borrowers borrowed less than \$50,000, about 83 percent. This suggests that either borrowers did not



need the additional funds or were risk-averse to debt and did not want to take on as much debt as they were approved for. Differences among those who chose the mitigation option and those who did not were statistically significant across all three values (verified, approved, and current) at the 99 percent confidence level.

Table 19: Distribution of verified losses for homeowners

| Homeowner | | | | | | |
|-----------------|----------------|------------|--------------|------------|----------------|------------|
| Verified Amount | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| 1-50K | 98,185 | 65.79 | 1,365 | 41.38 | 99,550 | 65.26 |
| 50K-100K | 35,366 | 23.70 | 941 | 28.52 | 36,307 | 23.80 |
| 100K-150K | 10,168 | 6.81 | 464 | 14.06 | 10,632 | 6.97 |
| 150K-200K | 3,001 | 2.01 | 206 | 6.24 | 3,207 | 2.10 |
| 200K-400K | 2,178 | 1.46 | 268 | 8.12 | 2,446 | 1.60 |
| 400K-600K | 239 | 0.16 | 37 | 1.12 | 276 | 0.18 |
| 600K-800K | 60 | 0.04 | 10 | 0.30 | 70 | 0.05 |
| 800K-1M | 28 | 0.02 | 6 | 0.18 | 34 | 0.02 |
| 1M-2M | 7 | 0.00 | 1 | 0.03 | 8 | 0.01 |
| 2M+ | 3 | 0.00 | 1 | 0.03 | 4 | 0.00 |
| Total | 149,235 | 100 | 3,299 | 100 | 152,534 | 100 |

Source: DCMS 1.0, FY 2013–2018

Table 20: Distribution of approved loan amounts for homeowners

| Homeowners | | | | | | |
|-----------------|----------------|------------|--------------|------------|----------------|------------|
| Approved Amount | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| 1–50K | 92,063 | 68.27 | 1,256 | 44.65 | 93,319 | 67.78 |
| 50K–100K | 29,467 | 21.85 | 710 | 25.24 | 30,177 | 21.92 |
| 100K–150K | 8,364 | 6.20 | 369 | 13.12 | 8,733 | 6.34 |
| 150K–200K | 2,452 | 1.82 | 155 | 5.51 | 2,607 | 1.89 |
| 200K–400K | 2,176 | 1.61 | 268 | 9.53 | 2,444 | 1.78 |
| 400K–600K | 239 | 0.18 | 37 | 1.32 | 276 | 0.20 |
| 600K–800K | 60 | 0.04 | 10 | 0.36 | 70 | 0.05 |
| 800K–1M | 28 | 0.02 | 6 | 0.21 | 34 | 0.02 |
| 1M–2M | 7 | 0.01 | 1 | 0.04 | 8 | 0.01 |
| 2M+ | 3 | 0.00 | 1 | 0.04 | 4 | 0.00 |
| Total | 134,859 | 100 | 2,813 | 100 | 137,672 | 100 |

Source: DCMS 1.0, FY 2013–2018



Table 21: Distribution of current loan amounts for homeowners

| Homeowners | | | | | | |
|----------------|----------------|------------|--------------|------------|----------------|------------|
| Current Amount | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| 1–50K | 126,022 | 83.70 | 1,151 | 34.75 | 127,173 | 82.64 |
| 50K–100K | 16,474 | 10.94 | 584 | 17.63 | 17,058 | 11.09 |
| 100K–150K | 4,944 | 3.28 | 466 | 14.07 | 5,410 | 3.52 |
| 150K–200K | 1,757 | 1.17 | 333 | 10.05 | 2,090 | 1.36 |
| 200K–400K | 1,354 | 0.90 | 707 | 21.35 | 2,061 | 1.34 |
| 400K–600K | 19 | 0.01 | 71 | 2.14 | 90 | 0.06 |
| Total | 150,570 | 100 | 3,312 | 100 | 153,882 | 100 |

Source: DCMS 1.0, FY 2013–2018

With regard to business owners (Table 22, Table 23, and Table 24), a similar trend was observed—the majority of verified losses were for values of \$100,000 or less. Again, a larger number of borrowers borrowed less than \$50,000 in their current amount, suggesting either the additional funds were unneeded or risk aversion came into play. Between mitigation takers and non-takers, the differences in the total approved amount and the total current amount were statistically significant at the 99 percent confidence level; the total verified amount differences were not statistically significant.

Table 22: Distribution of verified losses for businesses

| Businesses | | | | | | |
|-----------------|--------------|------------|------------|------------|--------------|------------|
| Verified Amount | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| 1–50K | 2,540 | 36.83 | 59 | 33.15 | 2,599 | 36.74 |
| 50K–100K | 1,366 | 19.81 | 19 | 10.67 | 1,385 | 19.58 |
| 100K–150K | 736 | 10.67 | 19 | 10.67 | 755 | 10.67 |
| 150K–200K | 552 | 8.00 | 15 | 8.43 | 567 | 8.02 |
| 200K–400K | 864 | 12.53 | 40 | 22.47 | 904 | 12.78 |
| 400K–600K | 423 | 6.13 | 7 | 3.93 | 430 | 6.08 |
| 600K–800K | 156 | 2.26 | 8 | 4.49 | 164 | 2.32 |
| 800K–1M | 204 | 2.96 | 4 | 2.25 | 208 | 2.94 |
| 1M–2M | 34 | 0.49 | 4 | 2.25 | 38 | 0.54 |
| 2M+ | 21 | 0.30 | 3 | 1.69 | 24 | 0.34 |
| Total | 6,896 | 100 | 178 | 100 | 7,074 | 100 |

Source: DCMS 1.0, FY 2013–2018



Table 23: Distribution of approved loan amounts for businesses

| Businesses | | | | | | |
|-----------------|--------------|------------|------------|------------|--------------|------------|
| Approved Amount | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| 1–50K | 2,018 | 35.71 | 28 | 22.95 | 2,046 | 35.44 |
| 50K–100K | 1,084 | 19.18 | 15 | 12.30 | 1,099 | 19.04 |
| 100K–150K | 574 | 10.16 | 16 | 13.11 | 590 | 10.22 |
| 150K–200K | 450 | 7.96 | 13 | 10.66 | 463 | 8.02 |
| 200K–400K | 756 | 13.38 | 33 | 27.05 | 789 | 13.67 |
| 400K–600K | 371 | 6.57 | 5 | 4.10 | 376 | 6.51 |
| 600K–800K | 148 | 2.62 | 1 | 0.82 | 149 | 2.58 |
| 800K–1M | 204 | 3.61 | 4 | 3.28 | 208 | 3.60 |
| 1M–2M | 26 | 0.46 | 4 | 3.28 | 30 | 0.52 |
| 2M+ | 20 | 0.35 | 3 | 2.46 | 23 | 0.40 |
| Total | 5,651 | 100 | 122 | 100 | 5,773 | 100 |

Source: DCMS 1.0, FY 2013–2018

Table 24: Distribution of current loan amounts for businesses

| Businesses | | | | | | |
|----------------|--------------|------------|------------|------------|--------------|------------|
| Current Amount | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| 1–50K | 5,020 | 52.98 | 30 | 16.67 | 5,050 | 52.30 |
| 50K–100K | 1,637 | 17.28 | 37 | 20.56 | 1,674 | 17.34 |
| 100K–150K | 714 | 7.54 | 12 | 6.67 | 726 | 7.52 |
| 150K–200K | 506 | 5.34 | 12 | 6.67 | 518 | 5.37 |
| 200K–400K | 882 | 9.31 | 22 | 12.22 | 904 | 9.36 |
| 400K–600K | 357 | 3.77 | 35 | 19.44 | 392 | 4.06 |
| 600K–800K | 159 | 1.68 | 8 | 4.44 | 167 | 1.73 |
| 800K–1M | 70 | 0.74 | 16 | 8.89 | 86 | 0.89 |
| 1M–1.2M | 16 | 0.17 | 0 | 0.00 | 16 | 0.17 |
| 1.2M–1.4M | 74 | 0.78 | 1 | 0.56 | 75 | 0.78 |
| 1.4M–1.6M | 9 | 0.09 | 1 | 0.56 | 10 | 0.10 |
| 1.6M–1.8M | 11 | 0.12 | 1 | 0.56 | 12 | 0.12 |
| 1.8M–2M | 6 | 0.06 | 4 | 2.22 | 10 | 0.10 |
| 2M+ | 14 | 0.15 | 1 | 0.56 | 15 | 0.16 |
| Total | 9,475 | 100 | 180 | 100 | 9,655 | 100 |

Source: DCMS 1.0, FY 2013–2018

How long does it take to receive the loans and what are the loan terms?

As shown in Table 25, approximately 49.3 percent of homeowners received an approval for their Disaster Assistance Loans in 14 days or less, 63 percent in four weeks or less, and 81.8 percent in six weeks or less. Similar trends were observed for borrowers who opted for the mitigation increases, though mitigation increase borrowers received their loans at a slightly slower pace (41.7 percent within



two weeks and 56.3 percent within four weeks). The difference between those who took the mitigation option and those who did not was statistically significant at the 99 percent confidence level¹⁴.

Table 25: Distribution of lag days for homeowners to receive a loan

| Homeowners | | | | | | |
|--------------|----------------|------------|--------------|------------|----------------|------------|
| Lag Days | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| 14 or less | 74,520 | 49.49 | 1,382 | 41.73 | 75,902 | 49.33 |
| 14–28 | 20,685 | 13.74 | 483 | 14.58 | 21,168 | 13.76 |
| 28–42 | 28,205 | 18.73 | 624 | 18.84 | 28,829 | 18.73 |
| 42–56 | 11,165 | 7.42 | 306 | 9.24 | 11,471 | 7.45 |
| 56–70 | 3,993 | 2.65 | 120 | 3.62 | 4,113 | 2.67 |
| 70–84 | 2,457 | 1.63 | 56 | 1.69 | 2,513 | 1.63 |
| 84–98 | 1,749 | 1.16 | 46 | 1.39 | 1,795 | 1.17 |
| 99 or more | 7,793 | 5.18 | 295 | 8.91 | 8,088 | 5.26 |
| Total | 150,567 | 100 | 3,312 | 100 | 153,879 | 100 |

Note: “Lag days” are defined as the number of days passed between application submission and application decision. For example, if a borrower submits their loan application on Monday and the SBA approves them for a loan on Thursday, that borrower has a lag days entry of four.

Source: DCMS 1.0, FY 2013–2018

Conversely, among businesses (Table 26), approximately 12.5 percent of loans were approved within 14 days, 37.5 percent in four weeks or less, and 53.8 percent in six weeks or less. Moreover, approximately 14.8 percent of business loans took 99 days or more to approve compared to just 5.3 percent of homeowner loans. These differences suggest that the steps required for a business Disaster Assistance Loan are more detailed or involve additional verification. The differences between those who took the mitigation option and those who did not was not statistically significant¹⁵.

Table 26: Distribution of lag days for business owners to receive a loan

| Businesses | | | | | | |
|--------------|--------------|------------|------------|------------|--------------|------------|
| Lag Days | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| 14 or less | 1,188 | 12.54 | 16 | 8.89 | 1,204 | 12.47 |
| 14–28 | 2,359 | 24.90 | 55 | 30.56 | 2,414 | 25.00 |
| 28–42 | 1,544 | 16.30 | 35 | 19.44 | 1,579 | 16.35 |
| 42–56 | 1,235 | 13.03 | 17 | 9.44 | 1,252 | 12.97 |
| 56–70 | 850 | 8.97 | 13 | 7.22 | 863 | 8.94 |
| 70–84 | 556 | 5.87 | 4 | 2.22 | 560 | 5.80 |
| 84–98 | 346 | 3.65 | 6 | 3.33 | 352 | 3.65 |
| 99 or more | 1,397 | 14.74 | 34 | 18.89 | 1,431 | 14.82 |
| Total | 9,475 | 100 | 180 | 100 | 9,655 | 100 |

Note: “Lag days” are defined as the number of days passed between application submission and application decision. For example, if a borrower submits their loan application on Monday and the SBA approves them for a loan on Thursday, that borrower has a lag days entry of four.

Source: DCMS 1.0, FY 2013–2018

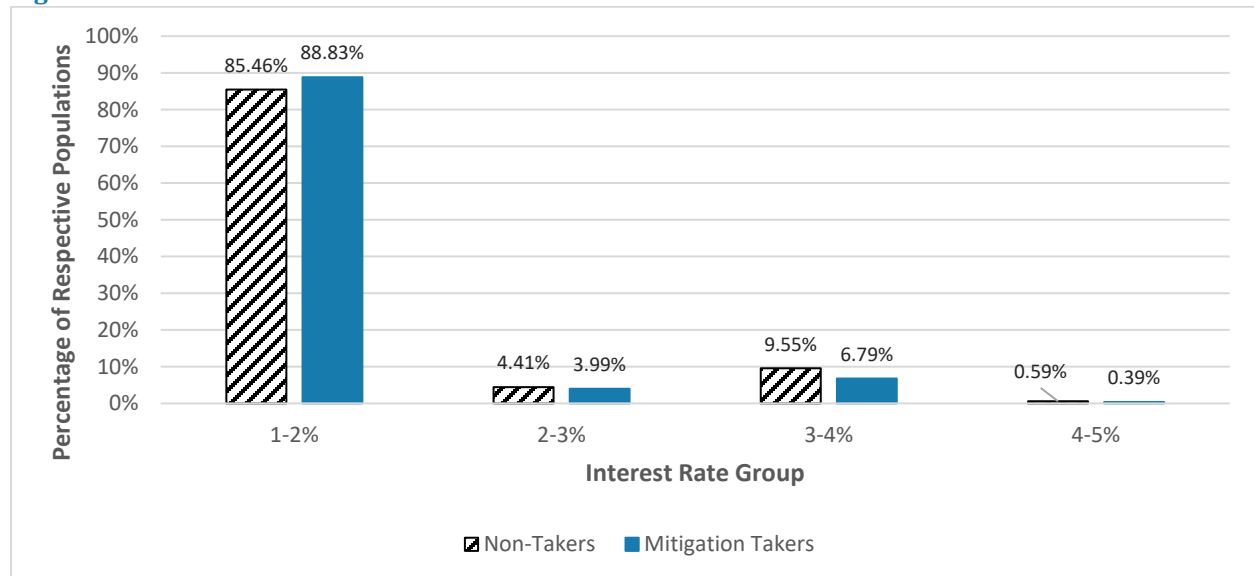
¹⁴ Appendix B

¹⁵ Appendix B



As shown in Figure 13 and Figure 14, homeowner and business Disaster Assistance Loans were approved at relatively low interest rates, with homeowners benefiting from moderately lower interest rates. While approximately 85.53 percent of homeowner loans bore 1 to 2 percent interest rates, business loan borrowers predominantly paid 3 to 4 percent interest (59.35 percent) and 4 to 5 percent interest (29.64 percent). Comparatively, a greater proportion of homeowners that opted for mitigation increases benefited from 1 to 2 percent interest rates compared to non-takers (88.8 percent versus 85.5 percent). Similarly, among businesses, mitigation increase takers benefited from the lowest interest rates (2 to 3 percent) at almost three times the uptake rate (27.2 percent versus 9.18 percent). The differences between mitigation takers and non-takers, in both the business loans and the home loans, were statistically significant at the 99 percent confidence level¹⁶.

Figure 13: Distribution of interest rates for home loans

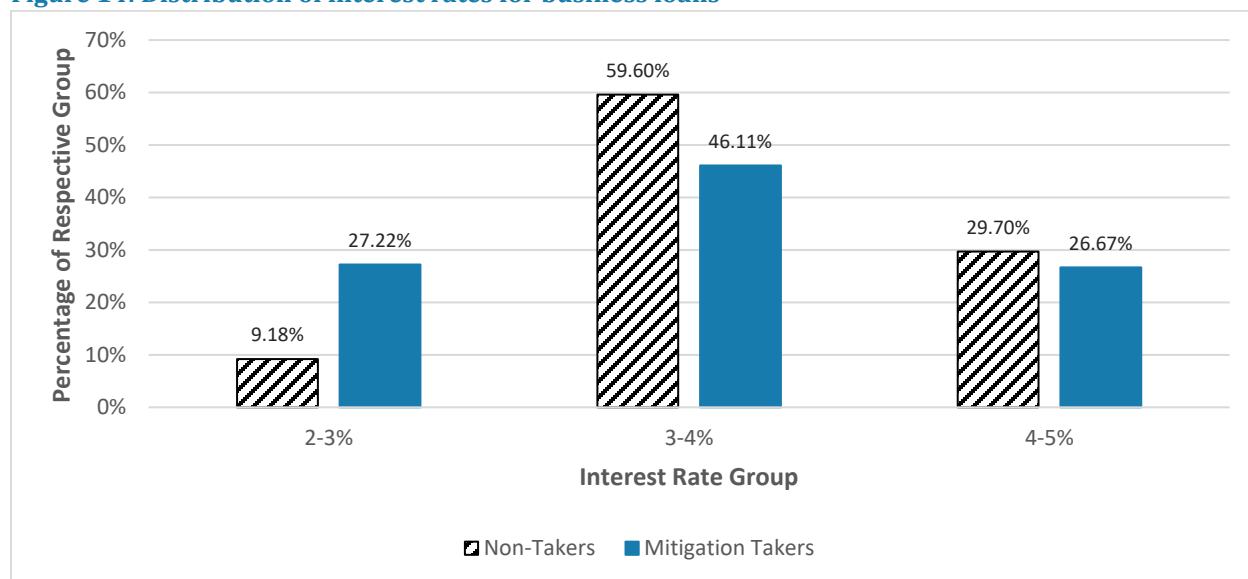


Source: DCMS 1.0, FY 2013–2018

¹⁶ Appendix B



Figure 14: Distribution of interest rates for business loans



Source: DCMS 1.0, FY 2013–2018

A major takeaway from the regression models was the influence of the interest rate variable for both homeowners and businesses. This was particularly evident in the business owner model, where the coefficient estimate on interest rates ranged between -0.44 and -1.18, with great significance throughout each of the four models. It simultaneously accounted for all the qualitative factors that the assigned SBA loan officer was able to understand about each borrower and the relationship between the offered interest rate and the decision to take on additional debt tied to that interest rate. The effect size of interest rate was larger in the business dataset when compared to the home dataset, so it is likely the case that businesses were either better at or more sensitive to taking advantage of favorable loan terms when they are offered. Unlike homeowners, business owners better understood that there is an opportunity cost to turning down a loan offer that has more favorable terms than any commercial loan they may receive at some point in the future. From the perspective of one business owner interviewed, the most beneficial aspect of the disaster relief program is “low-interest loans, low interest.” It is important to note that there is a significant and sizable negative relationship between the offered interest rate and the outcome variable of whether a borrower elected the mitigation option in both the homeowner and business owner datasets. In other words, the lower the interest rate that any given disaster survivor is offered, the higher the likelihood that they will elect the mitigation option.

Which borrowers relocated to a Non-Special Flood Hazard Area, and what are the characteristics of this population?

Of interest to the SBA but not the primary focus for this evaluation were the decisions that Disaster Assistance Loan borrowers made to relocate rather than increase their loans to address mitigation measures. In this section, this study concludes the descriptive statistics of Disaster Assistance Loan borrowers by briefly presenting statistics describing borrowers who relocated and their characteristics.

As shown in Table 27, borrowers who opted to relocate represent a very small proportion of borrowers in the FY 2013 to 2018 DCMS 1.0 data—1,456 borrowers overall, the majority (1,372) being homeowners. Notably, even with this small number, hurricanes and floods were the predominant disasters for those who opted to relocate during this period. For homeowners who opted to relocate,



most applicants had 14 days or less between when their application was submitted and when the decision was made (Table 28).

Table 27: Distribution of disaster type for relocators

| Relocators | | | | | | |
|---------------|-----------|------------|-------------|------------|--------------|------------|
| Disaster Type | Business | | Home | | Total | |
| | Count | % | Count | % | Count | % |
| Earthquake | 0 | 0.00 | 1 | 0.07 | 1 | 0.07 |
| Fire | 5 | 5.95 | 47 | 3.43 | 52 | 3.57 |
| Flood | 14 | 16.67 | 204 | 14.87 | 218 | 14.97 |
| Hurricane | 29 | 34.52 | 717 | 52.26 | 746 | 51.24 |
| Tornado | 0 | 0.00 | 104 | 7.58 | 104 | 7.14 |
| Other | 36 | 42.86 | 299 | 21.79 | 335 | 23.01 |
| Total | 84 | 100 | 1372 | 100 | 1,456 | 100 |

Source: DCMS 1.0, FY 2013–2018

Table 28: Distribution of lag days for relocators

| Relocators | | | | | | |
|--------------|-----------|------------|-------------|------------|--------------|------------|
| Lag Days | Business | | Home | | Total | |
| | Count | % | Count | % | Count | % |
| 14 or less | 6 | 7.14 | 695 | 50.66 | 701 | 48.15 |
| 14–28 | 9 | 10.71 | 178 | 12.97 | 187 | 12.84 |
| 28–42 | 17 | 20.24 | 224 | 16.33 | 241 | 16.55 |
| 42–56 | 25 | 29.76 | 87 | 6.34 | 112 | 7.69 |
| 56–70 | 6 | 7.14 | 34 | 2.48 | 40 | 2.75 |
| 70–84 | 4 | 4.76 | 29 | 2.11 | 33 | 2.27 |
| 84–98 | 5 | 5.95 | 20 | 1.46 | 25 | 1.72 |
| 99 or more | 12 | 14.29 | 105 | 7.65 | 117 | 8.04 |
| Total | 84 | 100 | 1372 | 100 | 1,456 | 100 |

Source: DCMS 1.0, FY 2013–2018

Recommendations

Overall, borrowers who took the mitigation option were more likely to be flood survivors, live in a high flood risk zone, have higher incomes and better credit scores, have hazard insurance, and have lower interest rates. The findings from the regression analysis also support these statements. Using the knowledge of borrower characteristics, the SBA should:

- **Spread awareness of mitigation strategies and mitigation project examples of the most common disaster types.** Flood survivors may be more likely to mitigate due to the knowledge that they can use the funds for elevation. Providing information on what the funds can be used for may increase uptake in other disaster types.
- **Highlight the benefit of the low interest rate to borrowers.** The interest rate is critical to the selection of being a mitigation option taker.



5.2 Use of disaster loans

| Key Takeaways for Research Objective 2 | |
|--|--|
| Findings | <ol style="list-style-type: none">1. The report comment sections contained limited information on the use of the disaster loans and use of the mitigation option.2. About one-quarter of all uses of mitigation listed were code requirements, such as elevating the building. The other most common mitigation was to install a drain system or sump pump. |
| Recommendations | <ol style="list-style-type: none">1. Due to the limited information contained in the report comment sections, this study recommends:<ol style="list-style-type: none">a. An in-depth analysis of the report for each comment section that contains all documentation sent by the borrower, including plans for loan use, receipts, etc.b. The SBA provide instructions to loan verifiers to include a brief description of loan usage in their comment sections whenever a receipt or quote is received.c. Using the common types of mitigation measures identified in this analysis, the SBA could create a new variable in the DCMS that would assign a code based on mitigation type. |

This topic was informed by the LV report comment sections.

How have the SBA physical disaster loans for mitigation been used by disaster survivors?

To address this research question, this study discusses two themes analyzed in the comment sections: loan usage and type of damage experienced. As noted above in Section 2.2, the comment sections did not consistently indicate what the disaster loan was used for; however, this study provides all relevant information that was contained in the comment sections.

Loan use

This study coded all mentions of the disaster loan usage into one of the following categories:

1. **Rebuilding (non-mitigation).** This category included any description of past or future loan use for rebuilding purposes, excluding mitigation.
2. **Mitigation.** This category included any description of past or future loan use for mitigation.
 - a. Code requirement: This category was a subset of the mitigation category and included any past or future loan use for mitigation measures that are code requirements, such as elevating the structure out of a flood zone.
3. **Relocation.** This category included any description of past or future loan use for relocation.

In total, 107 of the 240 report comment sections contained at least vague information on loan use in one of the three categories above, meaning that 133 comment sections contained no information on loan use at all.

Rebuilding (non-mitigation)

In total, 47 comment sections contained information on the original loan use (for non-mitigation purposes). Given the breadth of the damage experienced, a wide variety of tasks were identified. The



following comment highlights how many borrowers needed multiple types of repairs: “[The borrower] said they did not have any bids for furnace, flooring, insulation, drywall, or painting.”

Of the 47 comment sections with information on rebuilding, 15 of these were total reconstruction or the construction of a new replacement building. Other types of rebuilding included:

- Debris removal
- Parking lot or driveway repairs
- Retaining wall repairs
- Roof repairs
- Window or door repairs
- Replacement of destroyed property
- Drywall or insulation
- Furnace, air conditioner, or water heater repairs
- Painting and trim work
- Foundation repairs
- Electrical repairs
- Asbestos removal
- Septic system repairs
- Plumbing repairs

Mitigation

Overall, 97 comment sections contained information on loan use for mitigation. About a quarter of all references to mitigation were code requirements, such as elevating the home out of a flood zone. Counties or townships have these requirements to ensure the safety of inhabitants, and the SBA includes code-required loan uses under the umbrella of mitigation.

In total, 24 comment sections contained information specifically indicating that the loan will be used for mitigation work that fulfilled code requirements¹⁷. The most common code requirement was elevation, which was identified in 16 of the 24 comment sections with information on code requirements. Other less commonly identified code requirements included roofing updates, generators, a sprinkler system, and electrical code compliance.

In terms of mitigation loan uses that were not due to code requirements, the most common usage, as identified in 24 comment sections, was elevation.¹⁸ In addition, 14 comment sections noted the use of mitigation funds to install a drain system or sump pump. Further mitigation uses included:

- Generator installation
- Impact-resistant windows
- Sprinkler system or fire-retardant upgrades
- Typhoon shutters
- Safe room installation
- Solar panels

¹⁷ It is important to note that analysts did not categorize loan use as a code requirement unless the comment section indicated it was required. For example, this study did not assume that property elevation was a code requirement unless it was referenced as such.

¹⁸ As noted above, analysts did not consider elevation a code requirement unless it was indicated in the comment section that it was required.



- Moving power lines

Even though all 240 comment sections analyzed were from borrowers who utilized the mitigation option, 143 comment sections did not include any information on how the loan was used for mitigation.

Relocation

Three of the 240 comment sections included a discussion of relocation. One of the three borrowers planned to relocate a replacement structure “to meet the set back and zoning regulations.” The other two comment sections contained no additional information about the relocation.

Type of damage

This study also examined information in the comment sections about the type of damage that borrowers reported, as this study initially thought this information could shed light on loan usage. This study sorted all mentions of disaster damage into one of two categories:

1. Description of damage: This category included any specific descriptions of the damage that occurred.
2. Nonspecific description of damage: This category included any vague, nonspecific documentation of damage.

Overall, 38 of the 240 comment sections contained information that fell into one of these two categories. The majority of comment sections—202 of 240—contained no information on the type of damage reported.

Description of damage

Only six comment sections provided specific descriptions of the type of damage caused. Although the number of comment sections with specific descriptions was too small to identify any common types of damage reported, examples included:

- “lifting and missing shingles” and “cracks and pot holes [sic] in asphalt parking lots”
- “The original on-site inspector verified heavy rain caused water to accumulate in the parapet roof of the [building]. Water entered the building through the perimeter parapet walls and over topped the parapet walls and cascaded down the exterior and interior walls of the structure damaging real and business property”
- “crack in the wall around the fuse box”
- “Water seepage” that damaged the foundation

Nonspecific description of damage

Thirty-three comment sections included nonspecific descriptions of the type of damage experienced. Examples included:

- “damaged crawlspace”
- “damaged foundation”
- “damage to the septic system”
- “damage to their rental home”

While most of the references to damage in this nonspecific category at least identified the object damaged, 13 of the 33 comment sections contained no detail. These included descriptions of damage, such as “hurricane losses,” “damaged property,” and “disaster related damages.”



How does usage vary by disaster type, geography, business vs. homeowner, etc.?

Given the relatively sparse information contained in the comment sections that was relevant to the previous research question, there were not enough data points to look for patterns across attributes, such as disaster type, in any meaningful way. This was illustrated in the number of comment sections which included information on loan use for mitigation, as discussed in the section above. The percentage of comment sections with information on mitigation remained consistent with the total number of comment sections selected for analysis across all disaster types.

Table 29: Comment sections with information on mitigation by disaster type

| Disaster Type | Number of Comment Sections | Number of Comment Sections with Mitigation Information |
|---------------|----------------------------|--|
| Earthquake | 7 (2.92%) | 2 (2.06%) |
| Fire | 17 (7.08%) | 7 (7.22%) |
| Flood | 87 (36.25%) | 38 (39.18%) |
| Hurricane | 100 (41.67%) | 34 (35.05%) |
| Tornado | 9 (3.75%) | 5 (5.15%) |
| Other | 20 (8.33%) | 11 (11.34%) |
| Total | 240 | 97 |

Source: LV report comment sections

The same pattern was seen when the comment sections with information pertaining to mitigation use are examined by the borrower type (homeowner or business owner).

Table 30: Comment sections with information on mitigation by borrower type

| Borrower Type | Number of Comment Sections | Number of Comment Sections with Mitigation Information |
|----------------|----------------------------|--|
| Homeowner | 120 (50%) | 54 (55.67%) |
| Business owner | 120 (50%) | 43 (44.33%) |
| Total | 240 | 97 |

Source: LV report comment sections

This pattern was also illustrated in the description of the type of damage reported, as discussed in the section above. Only six comment sections included specific descriptions of damage, which was too small a number to look for patterns by attribute. Thirty-three comment sections contained nonspecific information on damage, and the patterns by disaster type simply reflected the most common disaster types seen in Table 31.



Table 31: Comment sections with nonspecific information on damage by disaster type

| Disaster Type | Number of Comment Sections | Number of Comment Sections with Nonspecific Damage Information |
|---------------|----------------------------|--|
| Earthquake | 7 (2.92%) | 0 (0.00%) |
| Fire | 17 (7.08%) | 2 (6.06%) |
| Flood | 87 (36.25%) | 12 (36.36%) |
| Hurricane | 100 (41.67%) | 15 (45.45%) |
| Tornado | 9 (3.75%) | 1 (3.03%) |
| Other | 20 (8.33%) | 3 (9.09%) |
| Total | 240 | 33 |

Source: LV report comment sections

The same pattern was seen when examining these comment sections by the borrower type (homeowner or business owner).

Table 32: Comment sections with nonspecific information on damage by borrower type

| Borrower Type | Number of Comment Sections | Number of Comment Sections with Nonspecific Damage Information |
|----------------|----------------------------|--|
| Homeowner | 120 (50%) | 13 (39.39%) |
| Business owner | 120 (50%) | 20 (60.61%) |
| Total | 240 | 33 |

Source: LV report comment sections

Recommendations

Given this study's conclusion that the loan verifier report comment sections did not contain the needed information to answer this research question, this study suggests three potential ways for the SBA to collect the necessary data moving forward:

1. This study understands each comment section has a separate file that includes all documentation sent by the borrower, including plans for loan use, receipts, etc. An in-depth analysis of this documentation in conjunction with the comment sections may provide the needed information to answer these research questions.
2. Another option is for the SBA to provide instructions to loan verifiers to include a brief description of loan usage in their comment sections whenever a receipt or quote is received. This would ensure the needed data is captured moving forward.
3. Using the common types of mitigation measures identified in this analysis, the SBA could create a new variable in the DCMS that would assign a code based on mitigation type. Moving forward, loan verifiers would record the relevant codes during the loan administration process.



5.3 Choice to fund mitigation measures

Why have some disaster survivors chosen to increase the SBA loan amounts to fund mitigating measures? Why have others chosen not to increase their loan amounts?

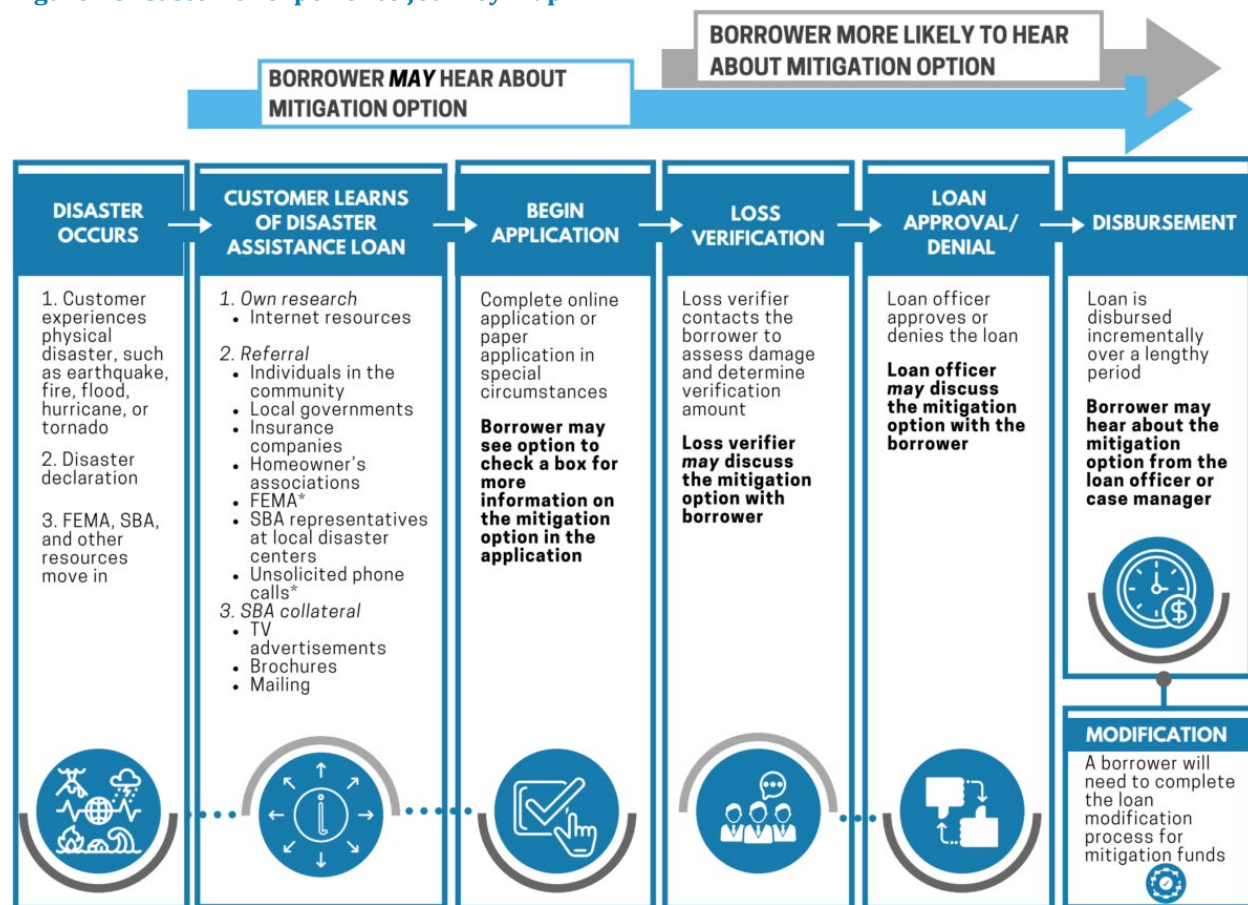
| Key Takeaways for Research Objective 3 | |
|--|---|
| Findings | <ol style="list-style-type: none">1. Applicants had a positive experience with their SBA loan officers.2. Applicants found the loan application process lengthy and confusing, discouraging them from pursuing a second process for mitigation.3. Many applicants were unaware of the mitigation option.4. Disaster survivors were drawn to the favorable interest rate of the SBA Disaster Assistance Loan. |
| Recommendations | <ol style="list-style-type: none">1. To the extent possible, assign one consistent loan officer to each case.2. Ensure every applicant receives the same itemized list of application requirements.3. Emphasize low interest rates in mitigation marketing. |

The following section presents a customer experience journey map that shows what the borrower goes through when making the decision to apply for the mitigation option. This, and the second map that outlines the challenges at each step raised in the interviews and focus groups, provides a foundation to discuss why survivors chose the mitigation option. Following the maps, this study presents a summary of themes from the interviews and focus groups to answer these questions.

This study developed a customer experience journey map to better understand the thought process of borrowers and the decisions they make when they decide whether to apply for increases on their approved loans to address mitigation measures. Outlined below is a visual depiction of the Disaster Assistance Loan process as perceived by disaster survivors. The map captures some of the sentiment shared during interviews and focus groups regarding the choice to fund mitigation measures.

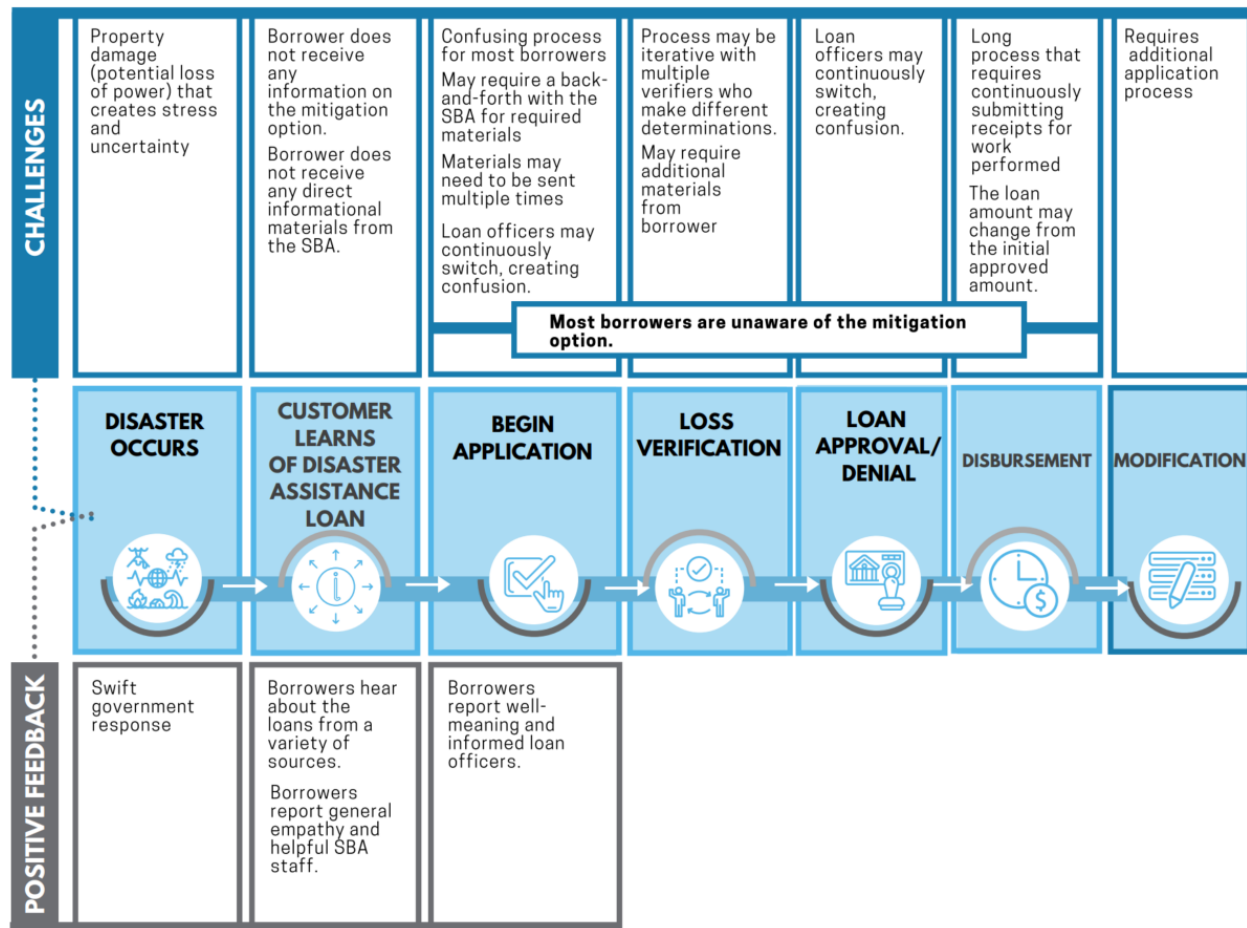


Figure 15: Customer experience journey map



The next map outlines, at each step of the customer's journey, challenges that the customer faces in making their decision. These are potential impediments to a customer deciding to pursue the mitigation option. The challenges are further explored later in this section.

Figure 16: Customer challenges throughout journey map



To understand the decisions SBA Disaster Assistance Loan applicants made to pursue or not pursue the mitigation increase, this study asked interview and focus group participants about their experiences with several components of the application process that may have influenced their decision to pursue mitigation.

Overall, respondents had positive feedback about the SBA loan officers with whom they worked throughout the application process, and a handful said that their loan officer's helpfulness was what motivated them to pursue the mitigation option. However, the rest of the application process was lengthy and confusing for most respondents. The confusion and frustration were largely fueled by unclear application instructions, a need to submit the same document multiple times, and a feeling that the government should already have access to much of the information requested, placing an additional burden on an already traumatic situation for disaster survivors. This negative outlook on the loan application experience likely discouraged many applicants from pursuing another application for the mitigation increase.

Just over half of respondents felt that it is very likely that they will experience another disaster in the future, and a few of these respondents pointed to this as the reason for pursuing the mitigation increase. When asked about their decision to increase their loan amount, these respondents said:

- "I think the deciding factor was for me, I can possibly prevent this from happening again in the future, or at least not be as devastating as it was before."



- “I think it was just... the decision came from long-term protection of the house and the property itself to try and mitigate what we could from losing the driveway again into the backyard [...] We just decided it was a good long-term plan for saving the assets of the house.”

Nine out of 19 respondents were entirely unaware that the mitigation option was available. These respondents unanimously expressed that they would have wanted to learn more about the mitigation option. Addressing this lack of awareness will be a large factor in the SBA’s ability to increase mitigation uptake. When asked if they would have liked to learn about the mitigation at the time, respondents answered:

- “1000 percent. I could have... direly used that money desperately.”
- “If I knew about an option [to] increase, I’d be opting to increase it right now. I’m going to need extra money as it is right now.”
- “I absolutely, absolutely, absolutely would have [applied], just like that. I wish I’d known.”

The expected benefits of the original loan and the decision to increase the loan amount were very consistent across respondents. In addition to simply needing the money to complete the necessary rebuild or prevent future disasters, most respondents referenced that this particular loan was a very good deal. Respondents commonly indicated that the interest rates were very low compared to alternative options. When asked about the benefits applicants expected from the SBA loan, respondents remarked:

- “Well, we were able to get the financing at a really low interest rate... and a long-term loan to cover the work that we otherwise wouldn’t have had the funding for.”
- “It just seemed like a really good deal. I mean, I could have paid for it with credit cards or some other vehicle, but the SBA loan was a really good interest rate from what I recall... So I decided to go that route.”

Recommendations

Overall, the most significant challenges respondents faced were inconsistencies in SBA loan officers, uncertainty regarding the application requirements, repetition of application requirements, and lack of awareness of the mitigation option. To overcome these challenges and promote awareness of the mitigation option, the SBA should:

- **To the extent possible, assign one consistent loan officer to each case.** If a switch is needed, do not leave any gaps in information that the applicant has to fill in.
- **Ensure every applicant receives the same itemized list of application requirements.** Ensuring the simplicity and transparency of application steps may reduce frustration and confusion and make it more likely that applicants are willing to pursue additional steps for the mitigation increase.
- **Emphasize low interest rates in mitigation marketing.** When respondents were asked about the benefits of their SBA loan and/or why they applied for the increase, the most common response was the low interest rate offered by this loan. By emphasizing this advantage in communications, applicants may be more likely to seek the increase.

5.4 Communication strategies

This section presents disaster communication best practices that this study developed based on findings from the environmental scan, which reviewed disaster communications from the SBA as well as other agencies and organizations, and the literature review, which covered peer-reviewed and gray literature on behavioral theories related to disaster preparedness and mitigation. These theories include risk



aversion and perceptions of risk, willingness to pay for disaster mitigation and insurance, and disaster mitigation strategies and behavioral nudges. In the environmental scan, this study identified trends in disaster communications and personal appeals that target the behavioral theories identified in the literature review. These findings informed the development of disaster-communications best practices provided to the SBA.

This section also presents supporting evidence of these best practices based on the findings from interviews and focus groups, which looked at disaster survivors' experiences with the communications they received throughout the loan application process. This study spoke with recipients of the SBA Disaster Assistance Loan who did and did not receive the mitigation increase to gain insight into their application experience, decision to apply, and assessment of communications they received from the SBA throughout the process. This study also spoke with SBA loan officers that work directly with disaster survivors to hear their perspective on the borrower knowledge of the program and the information available to borrowers.

What effective communication strategies are recommended to promote awareness of the mitigation increase option among eligible disaster survivors?

| Key Takeaways for Research Objective 4 | |
|---|--|
| Findings | <ol style="list-style-type: none">1. This study identified nine best practices for disaster communications.2. Applicants had a positive experience with their SBA loan officers but struggled with switching between officers.3. Applicants found the loan application process lengthy and confusing, discouraging them from pursuing a second process for mitigation.4. Many applicants were unaware of the mitigation option but wanted to know about it. |
| Recommendations | <ol style="list-style-type: none">1. Implement the best practices in SBA disaster communications.2. Ensure every applicant receives the same itemized list of application requirements.3. To the extent possible, assign one consistent loan officer to each case.4. Standardize how information regarding the loan program is distributed.5. Make the mitigation option more prominent on both the SBA website and the loan application. |

Best practices for disaster communication

Findings from the environmental scan and literature review present further opportunities to improve communication about the mitigation increase option. Based on the communication trends and strategies identified through the environmental scan, the following nine strategies are recommended to the SBA to increase awareness of the mitigation option.

1. Convey a concise and straightforward message in a timely manner. According to the Centers for Disease Control and Prevention (CDC), two of the most common mistakes in disaster communications are lack of plain language and problems with timeliness (CDC, 2018a). Using plain language rather than technical vocabulary will increase the portion of the community able to benefit from the information. Communication materials should also be concise. Disasters create a high-stress environment, and affected individuals may be less able to digest large amounts of information. According to the Substance



Abuse and Mental Health Services Administration (SAMHSA), messages should be “simple, straightforward, realistic, and measurable” (SAMHSA, 2019).

The SBA should use simple language and keep communication materials about the mitigation option short. Excess information or highly technical language risk losing the reader’s attention or comprehension. Also, ensure that materials are publicly available well ahead of a disaster and that individuals are directed toward them immediately after a disaster. The example below, from an SBA Disaster Assistance Loan communication, effectively uses simple and concise language to convey its message.

EXAMPLE from the SBA

“SBA disaster loans are available to businesses, regardless of size, and nonprofits, including charitable organizations such as churches and private universities. Borrow up to \$2 million to repair or replace damaged or destroyed real estate, machinery and equipment, inventory and other business assets.” (SBA, 2018)

2. Foster trust and confidence. Increased levels of trust and confidence lessen the likelihood that a potential disaster will induce panic. Increased confidence also encourages individuals to act rationally by means of preemptive preparation. According to SAMHSA, to foster trust, communications should convey empathy, expertise, transparency, and dedication to the well-being of the affected individuals (SAMHSA, 2019). The accuracy and consistency of the message, as well as transparency about what information the communicator does and does not know, validates expertise and credibility (CDC, 2018b). Additionally, continued community engagement cultivates an ongoing dialogue and establishes a foundation of trust that will be reflected in the community’s disaster response and preparedness actions (Wilson, McCaffery, & Toman, 2017).

It is recommended that the SBA reach out early and often to increase awareness of the mitigation increase option. Compared with the communication materials available for disaster loans, information regarding mitigation loans is sparse. By increasing outreach to communities and spreading awareness about mitigation assistance prior to disasters, the SBA can establish trust and increase mitigation loan applications.

3. Use framing to elicit an emotional response. Often, good communication personalizes the idea of a natural disaster to appeal to the reader’s emotions. If executed properly, the emotional appeal will motivate the desired response.

The SBA should present facts that make disaster outcomes personal to the reader and increase motivation to seek the mitigation loan. In general, the SBA disaster loan communications focus more on facts and actions than on emotions or hypotheticals. Emotions are a powerful force in motivating action, and the SBA could benefit from using framing as a strategy. Bringing attention to the personal stakes of a disaster and possible consequences of inaction encourages individuals to engage in mitigation activities. The example below presents an opportunity to strengthen the message through framing. The SBA states there is \$2 million available for Disaster Assistance Loans and provides suggestions for the use of these funds. However, adding figures showing the financial damages that typically result from a disaster could elicit a stronger emotional reaction.



EXAMPLE from the SBA

“Borrow up to \$2 million to repair or replace damaged or destroyed real estate, machinery and equipment, inventory and other business assets. Loans may also be used for structural improvements such as adding a retaining wall or sump pump, clearing out overgrown landscaping, building a safe room or elevating the property to lessen the effect of future disasters.” (SBA, 2018)

4. Target risk aversion to both debt and disaster. Disaster communications often target people’s aversion to risk and debt as a technique to capture their attention and motivate action in advance of or in response to disasters. Individuals who are more risk-averse to disaster are more likely to engage in activities that will reduce their chance of experiencing the consequences of a disaster. Those who are more debt-averse will be more likely to engage in activities that reduce their chance of losing money.

This is a relevant way to use framing in mitigation loan communications because readers are likely seeking ways to avoid future disasters and debt. The SBA mitigation communications focus more on risk aversion to debt than on risk aversion to disaster. Targeting both risk aversions increases the likelihood of a strong emotional response. This can be done by presenting the potential financial damages of a natural disaster, as well as the negative implications for individuals’ safety and property.

5. Convey empathy. As noted above, conveying empathy is a key component of fostering trust and confidence. Overall, the SBA communications convey a dedication to the safety of individuals affected by a disaster by offering the resources to help them apply for assistance. However, these communication materials could benefit from statements that directly display empathy, such as “the SBA understands the financial and emotional stress experienced by disaster survivors.” This approach targets emotions, personalizes the message, and cultivates trust between the individual and the SBA.

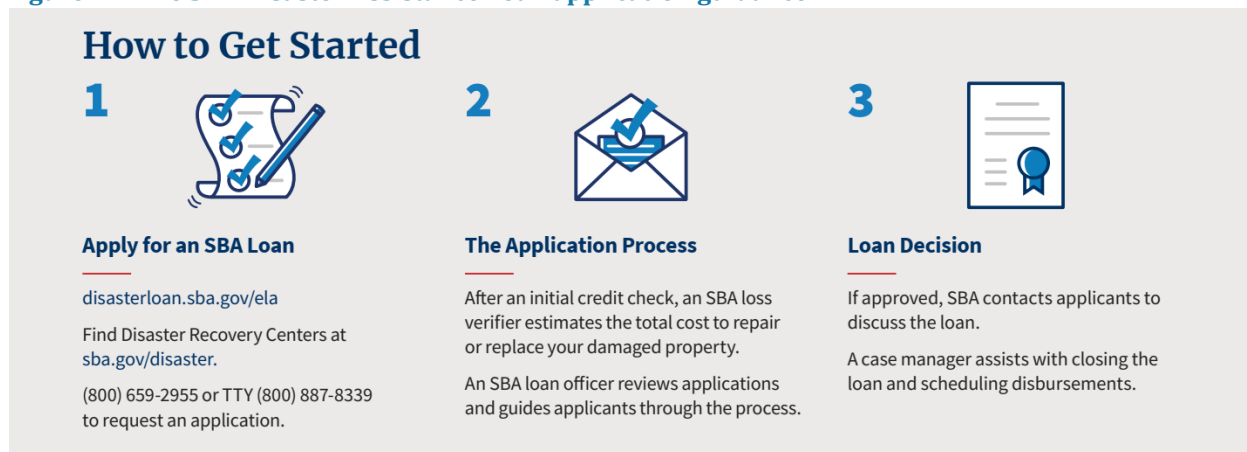
This study recommends that the SBA make statements to explicitly address the stress and difficulty that disaster survivors face. Emphasize the SBA’s understanding of their situation and how SBA support can help.

6. Provide actionable guidance. Disaster communications often provide concrete actions that individuals can take to prepare and protect themselves. This practice fosters self-efficacy¹⁹ among those affected by a disaster and spreads the need to prepare and respond effectively across the community (APA, 2009).

¹⁹ The belief in oneself to perform the necessary actions to achieve a goal.



Figure 17: The SBA Disaster Assistance Loan application guidance



(SBA, 2018)

It is recommended that the SBA present a step-by-step instructional guide on how to obtain the mitigation loan increase in communication materials, such as the one presented above for the Disaster Assistance Loan application process.

7. Transfer responsibility to the individual. Placing more responsibility on the individual increases their likelihood of taking preparedness measures in the absence of assured government assistance. This step may motivate a greater number of individuals to undertake mitigation strategies and prepare for disasters.

In communications about the mitigation option, the SBA should use language that makes it clear the individual needs to act in order to get the loan increase. The example below places the burden of recovering a business on the SBA. Shifting accountability to the business or individuals involved could motivate the affected party to take action.

EXAMPLE from the SBA

“Even with the best preparedness planning, a disaster can affect your business. But rest assured, the U.S. Small Business Administration (SBA) offers two low-interest loans designed to help you get up and running again as quickly as possible.” (SBA, 2018)

8. Provide action items that promote self-efficacy. Individuals’ self-efficacy in the context of a disaster plays a critical role in their motivation to prepare and respond. In addition to providing guidance immediately following a disaster, providing action items throughout the entire recovery process enables individuals to prepare and respond on their own based on guidance from the agency. When emphasizing personal responsibility, information is vital to increasing self-efficacy and enabling the individual to take action.

Going beyond the step-by-step application guide referenced above, the SBA can accomplish this by suggesting mitigation actions after the loan increase is received. The example below from SBA communications about the mitigation option effectively promotes self-efficacy.



Figure 18: SBA mitigation option guidance

Consider these projects with your increased loan

Flood Mitigation

- seal your roof deck
- landscape your property to improve water runoff and drainage
- elevate structures
- relocate your home or business outside the flood plain
- add a sump pump
- convert your lowest floor to flexible space less likely to be damaged in a flood



Wildfire Mitigation

- install a Class A fire-rated roof
- install ⅛-inch mesh screening over all vents to keep embers out of eaves and vents
- install noncombustible gutters, fences and gates
- remove roof and gutter debris that can be ignited by airborne embers
- replace single-pane windows with dual- or multi-pane tempered glass windows



(SBA, 2020)

9. Plan ahead and set goals. Before conveying information to the public, public officials can reduce chaos and stress in the face of a disaster by preparing a communication plan well ahead of time (SAMHSA, 2019). The CDC also stresses the importance of repetition in disaster communications, as affected individuals are in a heightened emotional state, and repetition helps ensure they retain the most important points (CDC, 2018b).

The SBA should develop concrete goals for the outcome of communication materials and organize the content accordingly. For example, to increase mitigation loan uptake, give mitigation a more prominent placement in communications and emphasize it frequently. As seen below, information regarding the mitigation option is currently buried toward the end of the loan application. Awareness could be increased by making this information more prominent and by repeating it throughout the document.



Figure 19: Mentions of mitigation in SBA application forms

| CONSENT | | | |
|---|----------------------|------------------------------|----------------------|
| I authorize my insurance company, bank, financial institution, or other creditors to release to SBA all records and financial information necessary to process this application. | | | |
| SBA has my permission, as required by the Privacy Act, to release any information collected in connection with this application to Federal, state, local, tribal or nonprofit organizations (e.g. Red Cross, Salvation Army, Mennonite Disaster Services, SBA Resource Partners) for the purpose of assisting me with my SBA application, evaluating my eligibility for additional disaster assistance, or notifying me of the availability of such assistance. | | | |
| If my loan is approved, I may be eligible for additional funds to safeguard my property from damages similar to those caused by this disaster. Although it is not necessary for me to provide with my application, a description and cost estimate will be required prior to SBA approval of the mitigation measure. | | | |
| I have received and read a copy of the "STATEMENTS REQUIRED BY LAWS AND EXECUTIVE ORDERS" which was attached to this application. | | | |
| CERTIFICATION AS TO TRUTHFUL INFORMATION: By signing this application, you certify that all information in your application and submitted with your application is true and correct to the best of your knowledge, and that you will submit truthful information in the future. | | | |
| WARNING: Whoever wrongfully misapplies the proceeds of an SBA disaster loan shall be civilly liable to the Administrator in an amount equal to one-and-one half times the original principal amount of the loan under 15 U.S.C. 636(b). In addition, any false statement or misrepresentation to SBA may result in criminal, civil or administrative sanctions including, but not limited to: 1) fines and imprisonment, or both, under 15 U.S.C. 645, 18 U.S.C. 1001, 18 U.S.C. 1014, 18 U.S.C. 1040, 18 U.S.C. 3571, and any other applicable laws; 2) treble damages and civil penalties under the False Claims Act, 31 U.S.C. 3729; 3) double damages and civil penalties under the Program Fraud Civil Remedies Act, 31 U.S.C. 3802; and 4) suspension and/or debarment from all Federal procurement and non-procurement transactions. Statutory fines may increase if amended by the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015. | | | |
| Signature of Applicant | Date | Signature of Joint Applicant | Date |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

(SBA, a)

| | |
|--|----------------------------------|
| 20. PHYSICAL DAMAGE LOANS ONLY. If your application is approved, you may be eligible for additional funds to cover the cost of mitigating measures (real property improvements or devices to minimize or protect against future damage from the same type of disaster event). It is not necessary for you to submit the description and cost estimates with the application. SBA must approve the mitigating measures before any loan increase. By checking this box, I am interested in having SBA consider this increase. <input type="checkbox"/> | |
| 21. If anyone assisted you in completing this application, whether you pay a fee for this service or not, that person must print and sign their name in the space below. | |
| Name and Address of Representative (please include the individual name and their company) | |
| (Signature of Individual) | (Print Individual Name) |
| (Name of Company) | Phone Number (include Area Code) |
| Street Address, City, State, Zip | Fee Charged or Agreed Upon |
| Unless the NO box is checked, I give permission for SBA to discuss any portion of this application with the representative listed above. NO <input type="checkbox"/> | |

(SBA, b)

Supporting findings from interviews and focus groups

Common themes identified in discussions with SBA Disaster Assistance Loan applicants support the need for the best practices presented above. The relevant findings of the in-depth interviews and focus groups with SBA Disaster Assistance Loan recipients for this research question are presented below, along with techniques that could be leveraged to increase awareness of the mitigation increase option.

General impressions. Overall, general impressions of communication materials were consistent across homeowners and business owners. Both homeowners and business owners frequently remarked that their initial loan officers were extremely helpful and informative. One respondent remarked:

- “I can honestly say my loan officer was amazing because anything I didn’t understand, he took the time out to explain it to me, really walk through the steps of what I need to do [...] So he was very thorough in delivering the information to make sure I had a clear understanding before I signed any type of document.”

This praise of helpfulness and empathy from the SBA loan officers was present in most interviews, standing out as a high point of the process for many applicants. Additionally, several respondents found the written application instructions and itemized lists helpful. A focus group participant stated:



- “They have a ‘getting disaster help from the SBA’ one [flyer]. What you need to know, what you need to do. I really liked that, that it was simplistic and just gave a really brief overview.”

Challenges. Despite the positive feedback about loan officers and a handful of respondents who were pleased with application instructions, most applicants struggled with communication throughout the process. Many respondents felt that the requirements of documentation were unclear, also leading to confusion and a prolonged process. Additional frustration was caused by the fact that several respondents found many of the requirements were unnecessary—the SBA required documents that the government should already have access to, or in some cases, the applicant had already submitted one or several times previously. This issue of unnecessary repetition of application steps was extremely common and brought up by several respondents.

The most common complaint was the frequency of changing loan officers. Each switch in the SBA contact slowed down the application process and made many steps repetitive and confusing, indicating a lack of communication between the loan officers. A focus group participant stated:

- “[I] was bounced from case manager to case manager to case manager, and that’s where the inconsistencies took place.”

First heard about the Disaster Assistance Loan. Additionally, the way respondents first heard about the Disaster Assistance Loan was very inconsistent across the board. Respondents first heard about the program through TV advertisements, talking with people in their community, presidential campaigns, local government entities, FEMA, SBA representatives at local disaster centers, unsolicited phone calls, insurance companies, social media, and homeowners’ associations. This inconsistency in advertisement of the SBA Disaster Assistance Loan Program may be a potential area for improvement in promoting awareness of both the loan program itself as well as the mitigation option.

First heard about the mitigation option. The manner in which respondents learned about the mitigation option, however, was largely consistent. One respondent first heard about it through a waterproofing expert and another through respondent-initiated SBA outreach, but the majority of respondents who knew about the mitigation option received additional information when they met with a loan officer or upon applying for the original loan. Although those who knew about the mitigation option learned about it in a consistent manner, there were many applicants who never heard about the option, all of whom expressed that they would have liked to know more about the option. The loan officers were aware of this as well, with five of them noting that borrowers were extremely receptive to learning about the mitigation option. Some representative quotes are below:

- “They’re very interested in—especially people that are returned [not first-time applicants], applicants who have had this [disaster damage] happen over and over and over again. They’re wanting to find some way to prevent it from happening again.”
- “I have noticed that when you start talking about mitigating against future damages, these people really perk up OK, if they’ve had significant damage, their biggest worry, after getting their home and their business back to pre-disaster condition is what am I going to do if this happens again?”

The need for improved communication materials was also demonstrated by the fact that six of the ten loan officers interviewed stated that most borrowers were generally not aware of the mitigation option. As one loan officer put it, “most applicants are totally unaware of it.” Only three loan officers disagreed: one stated that it was a “50/50” split, and two stated that borrowers are told about the mitigation option when their loan is approved, so “they do know about it, they just don’t know how to use it.”



Similarly, loan officers revealed that there are not many resources currently available to borrowers regarding the mitigation loan option; only three loan officers even mentioned materials. Two of these stated there was some information on the SBA website, while a third noted that loan officers were directed to refer borrowers to the FEMA website. One of these three also noted that mitigation information was included on “the initial fact sheets that we sent out, but I don’t think it’s really front and center like it has been” in the past²⁰.

Only two respondents suggested borrowers might be “in the middle” of a 1 to 5 scale rating level of receptiveness, because “they don’t know much about it, and... it’s like, oh, then I got to jump through a bunch more hoops to get the additional funds.” No loan officers felt that borrowers were not receptive to the discussion of the mitigation option.

The loan officers suggested three potential improvements to the current communication materials: improvements to the website, application form, and informational materials for borrowers.

Website. Four loan officers suggested making information about the mitigation option more prominent on the SBA website. As one loan officer explained, “I think we need to make that [mitigation] a much more prominent program on our website... because it’s going to... it makes them [borrowers] very happy.”

Application. Three loan officers suggested highlighting the mitigation option more clearly in the loan application. One stated that the application “fails in the very first part” because it is unclear where it is discussing mitigation. He suggested the application should include examples of potential mitigating measures such as storm shutters or elevation and also include a “link on the SBA website, where it gives an example of what can be mitigated and how it would work and add to your loan and show the 20 percent just working out...” Another noted that the application checkbox indicating interest in mitigation was “kind of hidden within the statements required by law” on the paper applications. He highlighted the need to:

[M]ake sure that when the applicant applies, it is on the forefront [of the application]. That it’s clear in the application that you are eligible for damages to repair or replace your personal property... and you’re eligible for 20 percent above the cost of that for mitigation purposes against...damages from future disasters.

Materials for borrowers. Three loan officers also recommended providing materials specifically to applicants about the mitigation option:

- The SBA should “put together our own packet of information and especially kind of maybe more disaster specific” including examples of mitigating measures for each disaster type.
- “I think in the upfront processing of the loan request, we should have some insert that goes with the package for the borrower.”
- “... I think in any of our correspondence to the borrower, whether it’s the happy letter, letting them know that they were approved for the loan or whether it’s a reconsideration letter,

²⁰ For more on the previous push to inform borrowers of the mitigation option, see the Process Recommendation section in Section 5.5 on interviews with loan officers.



whatever we send to them, I think we ought to include something about the mitigation program.”

Recommendations

Overall, the most significant challenges respondents faced were inconsistencies in SBA loan officers, uncertainty regarding the application requirements, repetition of application requirements, and lack of awareness of the mitigation option. To overcome these challenges and promote awareness of the mitigation option, the SBA should:

- **Ensure every applicant receives the same itemized list of application requirements.** Ensuring the simplicity and transparency of application steps may reduce frustration and confusion and make it more likely that applicants are willing to pursue additional steps for the mitigation increase. These materials could be disaster-specific.
- **To the extent possible, assign one consistent loan officer to each case.** If a switch needs to happen, do not leave any gaps in information that the applicant has to fill in.
- **Standardize how information regarding the loan program is distributed.** If there is a standard method of communication for loan program marketing, it would be easier to ensure that every applicant learns about the mitigation option from the beginning of the process.
- **Make the mitigation option more prominent on both the SBA website and the loan application.** Borrowers want to know about this option and will be more likely to find the information if it is presented to them in an obvious manner, rather than needing to search for it on their own.

5.5 Additional findings from interviews with loan officers

| Key Takeaways for Research Objective 5 | |
|--|---|
| Findings | <ol style="list-style-type: none">1. Borrower challenges included confusing topics (such as new terms) and fears (such as about money shortfalls).2. Staff challenges included a lack of knowledge and resources, inconsistency in processes, and a drive toward production. |
| Recommendations | <ol style="list-style-type: none">1. Provide training and materials to SBA staff.2. Require the discussion of the mitigation option at many points throughout the loan process.3. Reduce the drive toward production to encourage more discussion of the mitigation option. |

The ten interviews with loan officers yielded additional information on the challenges experienced by borrowers, challenges experienced by staff, and loan officer recommendations to increase mitigation update.

Challenges for borrowers

Loan officers were also asked about challenges experienced by borrowers, including topics they commonly find confusing, fears expressed to the loan officer, and other challenges.

Confusing topics. When asked what topics were confusing for borrowers, three loan officers mentioned the term “mitigation” as new or confusing terminology for borrowers. This included “the difference between mitigation and upgrading.”



Two loan officers noted that raising the mitigation option during the loan application process, while the borrowers is “under duress,” can be overwhelming to the borrower. As one loan officer explained:

But I think to at that point in the... timing, they've just been told they're approved for a loan. It's kind of all overwhelming. And so I don't know how much of that [information about the mitigation option] they're actually absorbing.

Other confusing topics included what would be covered by the mitigation increase, the amount of money they could receive, and lack of clarity about the option in the application.

Fears. Five loan officers noted that common fears were related to money. Two of these five loan officers discussed the potential shortfall in funding mitigation measures:

- “I think the biggest, biggest issue is the shortfall.”
- “...if there's a shortfall in the project. And where... where they're going to get the money from because of that 20 percent versus... and that's on usually on lower dollar loans.”

Another loan officer noted that the cost of mitigation measures can be “prohibitive” and that borrowers may fear “they can't get the project completely funded through the SBA and our low interest rate.” Another stated that “thought of just increasing and borrowing more money, I think can be a fear for them.”

One loan officer noted that “sometimes” borrowers worry they will not receive a loan if they are “older.”

Challenges for staff

The challenges experienced by SBA staff can be categorized into three groups: lack of knowledge or resources, inconsistency in processes, and a drive toward production.

Lack of knowledge or resources

Loan officers were asked about their knowledge of the mitigation option and measures that would qualify for the option—respondents in supervisory positions or who referenced their long tenure as loan officers were also asked about their perceptions of newer loan officers' knowledge. This line of questioning revealed a wide variation in the level of knowledge among loan officers.

Staff awareness of the mitigation option. The interviews with loan officers revealed inconsistencies in staff awareness and knowledge of the mitigation option. When asked how knowledgeable they were about the mitigation option generally, four respondents rated themselves or their coworkers as relatively knowledgeable. One respondent, who has been in her position for 20 years, stated she was “very knowledgeable” because she had a personal interest in the topic: “it was something that I was very, very interested in at the very beginning, especially, you know, working in the field, seeing what these people have to go through to [get] themselves back in order, make their lives put their lives back.” Only one respondent felt loan officers were generally not knowledgeable about the mitigation loan option overall. He rated loan officers as 3 on a 1 to 5 scale, noting that they did not have depth of knowledge about the option: “some loan officers are aware of it, and then as I'm having individual conversations and then some of them, yeah, they did mention that somewhere, I heard it somewhere.”



When asked specifically about their knowledge of what mitigation measures would qualify for funding, only three loan officers felt they were knowledgeable. One rated herself a 4 to 5 on the 1 to 5 scale, because she had dealt with a specific case several months ago that included mitigation: “I actually had gone out to the SOP and did a little research while I was trying to talk with him.” When asked if she would have responded differently if asked the question before this particular case, she stated she would have answered “Probably a 2.... I’ve known since I’ve been here that there is a mitigation program and that it’s up to [20 percent] of the verified losses. So that was pretty much all we knew about it.” Similarly, another loan officer rated herself a 5 because “I’ve done this a lot and... I’ve been doing this for years, so I know what it is.” Four respondents negatively rated themselves or their peers on knowledge about measures that would qualify for the mitigation option. One of these, a supervisory loan specialist with decades of experience at the SBA, rated the newer officers as “a 1 on 1 or 2, depending on your experience and specifics.” The last loan officer, when asked about knowledge of what measures would qualify, answered, “No, I don’t have any information on that.”

Lack of knowledge. When asked about the challenges they face, six respondents specifically raised the lack of knowledge about the mitigation option. Of these, three respondents spoke about not having examples to provide:

- “I think it goes back to not having examples. It’s one thing to just say you’re eligible for mitigation of 20 percent above the verified losses and another thing to be able to have that knowledge, to know specifically what would help them prevent future damages or damages from a future disaster.”

Two respondents discussed a general lack of knowledge about the program. One reported being unable to answer borrower questions about mitigation because that process is handled in a different department: “The issue is when the applicant comes to us and they want to know, well, how much more money can I get? And I’m like, well, we don’t do since we don’t that process, we have to refer them to loss verification.” The other referenced “confusion” due to “our lack of knowledge in the program.” Lastly, one respondent noted a lack of training materials, and another reported that it was unclear whether certain measures, such as city-required code upgrades, would be covered under “normal eligibility” or mitigation.

In addition, three loan officers discussed a lack of knowledge specific to new or intermittent loan officers. One noted that with the shift to remote work:

...it’s changed the game, one of the things that happened for new employees at the SBA, they would hear experienced loan officers talking to applicants so they would hear somebody say mitigation is the 20 percent and also in your circumstance, possibly hurricane shutters, possibly a retaining wall, whatever that may be, they would hear it. Now, they’re not going to hear that.

Similarly, another loan officer stated that “loan officers in the first year or two probably aren’t strong enough to tackle... mitigations.” The same loan officer also noted challenges to intermittent employees, who do not work on loan processing year-round: “So we hired so many people just to get through this that they come out and you just have to learn it on the fly.... and that’s where a lot of this stuff falls and fails.”

Lack of resources. When asked if there was specific information or materials that loan officers refer to when having the conversation with an applicant, it became clear that the SOP is the primary source of



information. Five respondents noted that the SOP contains relevant information. However, some respondents noted the SOP may be difficult to understand. As one loan officer explained:

I would be able to review the SOP and walk somebody through it [the mitigation option]. And I'm just confident enough in my skill set to get through that conversation. But I would say 70 percent of our loan officers would not be able to.

Other than the SOP, three loan officers discussed training on the mitigation option. One of these three reported receiving “a pamphlet of the mitigation program and how it works and what information to give” borrowers during training—this is notable, because no other respondents stated they had received any written documentation from the SBA about the mitigation loan option. Although training and the SOP were the primary sources of information, some loan officers also discussed learning about the option through experience or from their team leads.

Inconsistency in processes

Interviews with loan officers revealed a lack of consistency in their understanding of how the conversation around the mitigation options currently happens and how it is supposed to happen. This was revealed in a lack of consensus regarding who raises the topic, when during the process it is discussed, and what topics are discussed.

When asked whether the mitigation option is raised with all borrowers, responses varied widely. Two loan officers reported that they only raise the mitigation option if borrowers specifically ask about it. One of these loan officers noted that “unless they raise the issue, I don’t mention it.” She clarified that applicants who have had previous SBA disaster loans were more likely to be aware of the option, but only “maybe 1 percent” of all borrowers asked her about the option. Two loan officers felt that less than half of borrowers are informed of the option, and another two loan officers noted that they try to (or are supposed to) raise the option, but it does not always happen. As one loan officer explained, “...we do try to mention it. If they are supposed to mention it when we contact them, we try to do most of the time we get it in.” Only one loan officer felt the option was raised with most borrowers, stating that she raises the mitigation option with “about 80 percent” of borrowers based on her assessment of their amount of damage.

Although the mitigation option is not raised with all respondents, most loan officers agreed that when it does come in, it is generally raised first by an SBA employee rather than the borrower. Seven respondents stated that the mitigation option is usually raised by the loan officer or a loan verifier. Only two respondents stated that the borrower typically raises the topic first. One loan officer stated that the borrower “typically” raises the need for more money, at which point the loan officer will explain the mitigation increase:

And sometimes they'll ask me there, sometimes they'll just say, hey, this is not enough. My insurance company said it's going to be this amount. And so then I'll raise the point, like, you know, you can always get an increase in your loan.

Respondents were also split in their perception of when in the loan application and disbursement process mitigation is typically discussed. Five loan officers stated it was usually raised during the application process, during interactions with the loss verifier or loan officer. However, four loan officers



stated it is usually raised later, when the loan reaches the case manager or loan modification. Two of these four loan officers said that “usually” mitigation doesn’t come up until the loan modification stage.

When asked about what topics are covered in the mitigation conversation, the loan officers revealed a wide variety. Three loan officers reported that they only provide the definition of mitigation as 20 percent of total verified losses and provide no other information. According to one loan officer:

...that’s what we’ve been told to do. And we’ve been instructed to tell the applicant that they would need to discuss it with the case manager and that the case manager would give them detailed information on how to apply for that program if it’s available for them.

Four loan officers noted that they provide some details about the option, although there was variation in the amount of detail. Two of these loan officers explain the 20 percent eligibility definition, that borrowers will need an estimate of the work, and that borrowers will need to show “how they’re going to come up with the difference.” The other two loan officers report providing significantly more information:

- “Personally... it depends on the disaster. So, if I’m talking to somebody in Florida, I’m going to tell them that mitigation is an option, the 20 percent, and then give them examples, because if you don’t make it real to them, telling them that hurricane shutters or retaining wall, those types of things could be eligible, they’re not going to understand it.”

Lastly, one loan officer with extensive experience working in loan modifications reported that her team often handles mitigation requests at the loan modification stage. At this point, borrowers “know exactly what they want, because... they have to provide documentation of cost.”

Drive toward production

Five loan officers also discussed the pressure to rapidly close out cases. This was described as pressure to quickly move through cases (particularly in response to specific disasters), which made it difficult to raise the mitigation option during the initial loan application and review process. Some representative quotes are below:

- “...when we have a huge disaster...we’ve been just inundated with stuff and... it’s like you’ve just got to move the files, move the files, move the files, so you sometimes don’t have the time or you don’t necessarily take the extra time to address these things with the applicants, because we need to get them moved to the next level so we can get funds to them.”
- “We’re in kind of a new environment in SBA where it’s all about the numbers you get, get everything done and get it all done. Get it all done and we’ll fix it later. Well, if we got it right the first time, we wouldn’t have to fix it. And then maybe it’s a little easier on the back end where we’re trying to do mitigation or trying to do an increase or relocation and stuff and we’re not having to go back and fix things. I, I don’t know. There’s got to be a balance and we’re a little out of balance somewhere.”
- “I would say they’re [disaster survivors] probably less aware than they have been in the past. I think that we’re driven now toward production more so than we have been in previous years, and so people, in trying to get through the information, don’t tell it [the mitigation option] as much.”



Suggested improvements from SBA staff

Loan officers were asked throughout the interviews to recommend improvements to address the challenges currently experienced by both borrowers and SBA staff. Their recommendations can be split into two categories: recommendations on the process and guidance for SBA staff.

Providing guidance to staff

All loan officers who were asked stated that they would like to receive formal guidance from the SBA regarding the mitigation option. Six loan officers proposed additional trainings and refresher courses. As one loan officer noted, “they typically put us through a mitigation training program, but I think we need to do that on a more continual basis... And I think we ought to do an annual mitigation training just to refresh loan officers and supervisors and legal department on how beneficial mitigation is.” Although one loan officer stated that training materials are always available for reference, another thought these materials were not and suggested it would be helpful to have access to training modules even if staff are not currently enrolled in them:

There probably is some [content on mitigation] in the training modules, but we don't have access to all of those unless we are in a specific training session. We don't have access to all of those. But if we had access to any possible training, I mean, I don't even mind going out. And times when it's a little bit slow with this, we don't have this much work to do, go out into a module that's got training sessions where you can just actually pull them up and go through them yourself without having to have a class, a whole class of people.

In addition to trainings or refreshers, three loan officers suggested additional resources should be provided to staff. All three suggested providing more examples of eligible mitigation measures: “Some examples, what they would be eligible for to help prevent flooding, what they would be eligible for to help prevent damages from hurricanes.” Another loan officer noted that different examples for different disasters would be helpful: “If a person's been in a flood versus been in a tornado there everything is gone, you know what I mean? Or hurricane, depending on what the disaster is. So maybe provide some examples to the newer loan officers in training material that's disbursed to them.” Other suggestions included:

- “A script... so [there are] at least bullet points that they can bring up. And in their discussion [of the mitigation option] ...”
- A pop-up explanation within the DCMS 2.0²¹ that would define mitigation and eligible measures
- “... a fact sheet for loan officers, a one-page thing with examples. What mitigation is, the numbers, and then examples.”
- “And you're going to use different examples.”

Notably, one loan officer reported having received “a pamphlet of the mitigation program and how it works and what information to give” borrowers during training—no other loan officer raised this, and it sounds like the type of material they often requested during interviews.

²¹ The current version of the DCMS that loan officers use.



Process recommendations

In addition to the recommendations above, loan officers also made suggestions on ways to change the loan application and processing procedures. These recommendations are to require the discussion of the mitigation option with all borrowers, recommendations regarding the timing of this discussion during the application process, and addressing the drive toward production.

Require the discussion. Seven loan officers suggested that it should be a requirement to inform borrowers of the mitigation option and document when that discussion happens. One respondent, when asked what changes she would make if she had carte blanche, responded, “I would tell every applicant [about the mitigation option]. I would definitely tell every applicant about it, some people I know are not, they’re not interested, but give them the option. Give more people the option.” Three of these loan officers noted that there used to be more pressure to raise the mitigation option with each applicant, but that requirement is either no longer in effect or no longer pushed. As one loan officer noted, “at some point in the last several years, we may have gotten away from it a little bit.”

Timing. Some of the loan officers also made suggestions regarding when in the loan application and disbursement process the mitigation option should be raised with applicants. Their recommendations varied from the very beginning (at the loan application stage or earlier), later when the application is being processed, or toward the end when the application has been approved or the applicant is requesting a loan modification.

Three loan officers suggested that the discussion should happen as early as possible. One suggested that it should be “on the forefront” and should be made “clear in the application that...you’re eligible for 20 percent above the cost of that [cost to replace or repair property] for mitigation purposes against... damages from future disasters.” Another loan officer recommended the mitigation option should be discussed in the very first communications:

If somebody is in a disaster recovery center, online filling out or talking to the customer. Customer service reps.... It starts there, starts with their communication with the borrower. ‘This is something to think about. You don’t have to decide this today.’... [T]hat’s the other part of it is we’ve got that time limit on... that two year thing on increasing alone, which also includes mitigation. That letting them know it’s not something you’re going to decide today or even tomorrow or you can even wait till after your projects are done and then come back to us and say, ‘hey, I want to add drains or I want to do something or do something else.’ That’s part of the piece, but, you know, that’s and it just starts from day one, if somebody is talking to them, if we’re talking to them every step of the way.

Several loan officers felt that the discussion should occur during the borrower’s interactions with their loan officer or case manager. Three loan officers felt this is the time that mitigation should first be raised. As one explained, “You know, usually because if we decline for a loan, there’s no mitigation. But now... that you’ve been approved for a loan, contact a loan officer, you know. And if we can have loan officers dedicated to maybe just calling borrowers and say, ‘hey, you haven’t taken advantage of mitigation, is there... do you want to take care of it at that point?’ Explain the details of mitigation and what that what mitigation can do for them...”



Two loan officers said the discussion should be originally raised early in the process (such as by the loss verifier), but then reiterated during the borrowers' interactions with their loan officer or case manager:

- The "... case manager who's working with the applicant to disburse funds, would be another impact point for that applicant who is now a borrower. Once we're approving a loan, that case manager works with them on how much funding, sending in the receipts. That would be a good point in time to re-emphasize that as well."
- "And then the... the loss verifier should be able to review some of those and see if they would be eligible for that [mitigation]. And then... when the loan officer gets it, you know, if we had something that said they are interested in talking about shutters they are interested in talking about hurricane windows, they are interested in talking about putting up a retaining wall, then you could have that discussion with them."

One respondent suggested that the loan modification process also allows another opportunity to raise the mitigation option. She explained that earlier in the process borrowers may not be thinking about mitigation opportunities because "they're more thinking about how do I get my house back together so I can flush my own toilet.... I think that's probably a better time [during loan modification] for more concentrated information, for mitigation. I think planting the seed at that original processing when they're approved is a good idea. But those contact points later on as things are progressing, I think is a better option for them to absorb the information."

One respondent specifically noted that it would be important not to hold up processing of the original loan while the borrower obtains total project cost and other documentation for mitigation measures. As he explained, "...I tell people, they say, 'oh, I don't have the title to my car and all that', but let's not hold up the whole loan because... you've got a few thousand dollars you want for your car. But we need \$78,000 now to get you in a home loan. OK, so let me go ahead and process your home loan and then you can come back... back and get your \$2,000 for your car later."

Drive toward production. As discussed above, five loan officers discussed the drive toward production as a challenge they experienced in trying to raise the mitigation option. Although only one respondent explicitly recommended to "stop pushing production and start ... paying more attention to the borrowers," the fact that half the sample raised this as a challenge suggests the suggestion may have merit.

Other

In addition to the suggestions related to staff guidance and the loan application process, loan officers raised a handful of other suggestions. These included:

- Making an additional contact with borrowers after loan disbursement via email "saying this is just to make you aware, we do have a program for mitigation, define it, and possibly provide a few examples."
- Using other modes to contact borrowers about the mitigation option, such as emails or text messages.
- Increasing the limit for mitigation funding from 20 percent or "having a special rate for amortizing" for mitigation measures.

Recommendations

Overall, the most significant challenges noted for borrowers were confusing topics (such as new terminology) and fears (such as what to do with a shortfall). Challenges noted for SBA staff include a lack



of knowledge or resources, inconsistency in processes, and a drive toward production. To overcome these challenges and promote awareness of the mitigation option, the SBA should:

- **Provide training and materials to SBA staff.** Provide a document that loan officers can reference during their discussions of the mitigation option that includes potential uses for the mitigation funds.
- **Require the discussion of the mitigation option at many points throughout the loan process.** Requiring the discussion ensures that it occurs and having the discussion at many points ensures that the borrower is aware that it is always an option.
- **Reduce the drive toward production to encourage more discussion of the mitigation option.** Loan officers may be more inclined to have a more in-depth discussion of the mitigation option if they are not focused on pushing production.



6. CONCLUSIONS AND RECOMMENDATIONS

Borrowers who took mitigation were more likely to be flood survivors, live in a high flood risk zone, have higher incomes and better credit scores, have hazard insurance, and have lower interest rates. Yet they faced significant challenges when making the decision to choose the mitigation option. From the original application process to a lack of resources and awareness of the topic to fears and confusion, borrowers faced many obstacles. Loan officers themselves also faced challenges when discussing the mitigation option with borrowers, largely stemming from a lack of knowledge and resources on the topic.

The following recommendations are meant to alleviate these challenges and increase the awareness and use of the mitigation option. The first set of recommendations are for future research and data collection to continue understanding borrowers and the mitigation option as time goes on. The next two sets of recommendations are focused on specific actions to increase the awareness of the mitigation option, from both the borrower side through communications and from the loan officer side through the SBA processes. The matrix in Figure 20 shows the communication and the SBA process recommendations by feasibility and impact. While all of the recommendations will work to increase the awareness of the SBA mitigation option, focusing on the high-feasibility and high-impact recommendations will prove the easiest to implement and most fruitful for the SBA.

6.1 Recommendations for future research and data collection

The following recommendations are for future research and data collection. Continuing to monitor and evaluate the mitigation option program will allow the SBA to track the progress of the implemented recommendations as well as meet any new challenges with data for support.



1. **Perform in-depth analysis of the file that contains all documentation sent by the borrower.** This study understands that there was an additional file that contained receipts and plans submitted by the borrower. This file may prove fruitful in understanding the use of the loans for mitigation purposes and some difficulties that may have arisen during the mitigation option process.
2. **Provide instructions to loan officers to include a brief description of loan usage in their comment sections whenever a receipt or quote is received.** If the SBA would like to conduct another review of the comment sections for analysis of the mitigation option, it is imperative that there is consistent recording of the uptake and use of the mitigation option. Requiring this information to be input by loan officers would ensure that all relevant information for future study is included.
3. **Using the common mitigation measures identified in this analysis, create a new variable in the DCMS that would assign a code based on mitigation type.** If the SBA prefers to complete a quantitative analysis of the mitigation option uses, including a new variable in the DCMS is necessary. This variable would be a quick and easy way to track mitigation use and can be cross-examined by any number of the variables within the DCMS already.
4. **Perform “exit interviews” with a sample of borrowers each year to inform continuous improvements and ensure borrowers are receiving information on the mitigation option.** One challenge of the evaluation was that it had been so long from the disaster that some survivors did not recall the process or communication materials well during the interviews. Performing a sample of exit interviews each year can ensure discussion of communication materials and



potential improvements, customer satisfaction with the process, and a check to make sure that customers are hearing about the mitigation option.

6.2 Recommendations for the SBA communication materials

The following are recommendations that the SBA can implement to reach borrowers through the SBA's communication materials.



- 1. Ensure every applicant receives the same itemized list of application requirements.** Making sure that every applicant has the same list of information will reduce the information gaps of the borrowers identified during the interviews. This list would include application instructions as well as information on the mitigation option, including lists of ideas on how to use the mitigation funds. This recommendation is both *high feasibility* and *high impact*, due to it directly addressing one of the major challenges discovered during the evaluation as well as directly impacting borrowers.
- 2. To the extent possible, assign one consistent loan officer to each case.** One of the most consistent challenges borrowers noted was the changing of loan officers every time they interacted with the SBA. Having one consistent loan officer would reduce the amount of rework borrowers have to complete as well as allow the loan officer to understand the nuances of the borrower's case. It would also encourage discussion of the mitigation option. This recommendation has *low feasibility* and *high impact*, as it would require a major change in the SBA policies and procedures but would address one of the most consistent challenges borrowers face.
- 3. Standardize how information regarding the loan program is distributed.** Borrowers get information from a variety of sources on the loan program, and not all of them are consistent in breadth and topic. Having one consistent way that the SBA communicates with its borrowers would make it easier for borrowers to find the information they need and make sure all borrowers are getting all of the information, including about the mitigation option. This recommendation is *high feasibility* and *low impact*, as it does not directly address one of the challenges borrowers face but would streamline communications.
- 4. Make the information about the mitigation option more prominent on the website, in informational materials, and on the application.** Across both the borrower interviews and the loan officer interviews, as well as the review of communications, making the mitigation option more prominent on the website, in informational materials, and on the application was consistently one of the most recommended actions. Ensuring that borrowers see any information about the mitigation option will greatly impact their awareness and likely their uptake. This recommendation is both *highly feasible* and *high impact*.
- 5. Follow the best practices outlined in this report for future communications.** Following the best practices outlined in this report will ensure that all communications are maximized for impact. These recommendations come out of the environmental scan of disaster communications and follow industry best practices and trends. This recommendation is *highly feasible* and *low impact* because it does not directly address one of the challenges faced by borrowers.



6.3 Recommendations for the SBA staff processes

The following are recommendations the SBA can implement throughout its own processes to help increase awareness and uptake of the mitigation option.



- 1. Provide continuous training on the mitigation option.** One of the most consistent challenges loan officers face when discussing the mitigation option is a lack of knowledge on the option itself. Providing continuous training on the option, including how to get the funds and how to use them, will ensure that the loan officers are as equipped as possible to have the discussion with borrowers. This recommendation is listed as *low feasibility* and *high impact* due to the need for staff and funds for continuous training.
- 2. Provide loan officers with a script or list of information on the mitigation option, including how the funds can be used.** Again, like the previous recommendation, one of the most consistent challenges loan officers face when discussing the mitigation option is a lack of knowledge. Giving officers a script or list of information, particularly on how the funds can be used, will assist them in having the discussion with borrowers. This recommendation is *highly feasible* and *high impact*.
- 3. Require mitigation option discussion with borrowers every time the SBA staff interact with a borrower.** One of the biggest challenges right now is that there is no requirement that loan officers discuss the mitigation option with borrowers. Requiring that discussion is a way to remedy that. Requiring that discussion at all interactions ensures borrowers are hearing the discussion when they are most receptive. Repetition is also a best practice in communication. This recommendation is *highly feasible* and *high impact*.

Figure 20: Matrix of recommendations feasibility and impact

| Feasibility of Implementing the Recommendations | High Feasibility | Low Feasibility |
|--|------------------------------|-------------------------------|
| | High Feasibility, Low Impact | High Feasibility, High Impact |
| Impact on the Awareness of the SBA Mitigation Option | Low Feasibility, Low Impact | Low Feasibility, High Impact |
| | Low Impact | High Impact |

| | |
|---|--|
| <p>6.2.3 Standardize how information regarding the loan program is distributed</p> <p>6.2.5 Follow the best practices outlined in this report for future communications</p> | <p>6.2.1 Ensure every applicant receives the same itemized list of application requirements</p> <p>6.2.4 Make the information about the mitigation option more prominent on the website, in informational materials, and on the application</p> <p>6.3.2 Provide loan officers with a script or list of information on the mitigation option, including how the funds can be used</p> <p>6.3.3 Require mitigation option discussion with borrowers every time the SBA staff interact with a borrower</p> |
| <p>6.3.1 Provide continuous training on the mitigation option to the SBA staff</p> <p>6.2.2 To the extent possible, assign one consistent loan officer to each case</p> | |



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APPENDIX A INTERVIEW AND FOCUS GROUP GUIDES

SBA Mitigation Loans In-Depth Interview Guide Group 1a (Applied to Increase Loan for Mitigation)

TO BE COMPLETED BY INTERVIEWER:

DISASTER TYPE: _____

DISASTER YEAR: _____

ORIGINAL LOAN AMOUNT: _____

INCREASED LOAN AMOUNT: _____

HOMEOWNER/BUSINESS OWNER & FIRST NAME: _____

Introduction (5 min)

Thank you for taking the time to speak with me today. My name is [NAME] and I am a [POSITION] at Summit Consulting. [INTRODUCE OTHER SUMMIT STAFF ON CALL.]

Summit has been contracted by the U.S. Small Business Administration [SBA] to assist with a study on the SBA Disaster Assistance Loan Program. Our goal is to help the SBA improve its communication materials in order to encourage more disaster survivors to build back stronger by applying for funds to protect their properties against future disasters.

The U.S. Small Business Administration (SBA) has obtained Office of Management and Budget (OMB) approval to conduct this study under 3245-0404, which expires on 2/2/2021.

So today, I'll be asking you questions on three main topics:

1. Your decision to increase your loan amount to protect your property against future disasters
2. Your experience with the loan application process
3. Your feedback on the communications materials that you received from the SBA about the option to increase your loan to fund improvement that prevent again future disasters

We'll be focusing on the physical SBA disaster loan that you received in [YEAR] after [DISASTER], with an original loan amount of [AMOUNT] and an increase of [AMOUNT] to protect your property against future disasters.

Our interview today will take 20 to 30 minutes. With your permission, I'd like to record our discussion. This recording will only be available to researchers working on this project. All information you provide will be anonymous; we will not identify you by name in any reports that we produce. All questions are voluntary. Do I have your permission to record this interview?

Do you have any questions before we get started?

START RECORDING. So that I have it on the recording, today is [DATE] and the time is [TIME]. This interview is with [RESPONDENT NAME].



Perceived susceptibility to a disaster (2–3 min)

- Before you experienced the [DISASTER], had you ever experienced a natural disaster such as a flood, hurricane, or wildfire in your lifetime? IF YES, WHAT AND WHEN?
- On a scale of 1 to 5, with 1 being not confident at all and 5 being extremely confident, how confident are you that you know how to keep yourself or your [HOME/BUSINESS] safe during a disaster?
 - What makes you say [NUMBER]?
- Do you currently have an emergency plan in place in case of a natural disaster?
- Do you have any insurance (such as flood insurance) to protect your property against a natural disaster?
 - **IF YES,** Did you first get this insurance before or after you experienced the [DISASTER]?
 - **IF NO,** Have you ever thought about getting this type of insurance?
- On a scale of 1 to 5, with 1 being not likely at all and 5 being extremely likely, how likely do you think it is that you will experience another natural disaster?
 - What makes you say [NUMBER]?

Communications (5–7 min)

As mentioned earlier, our records indicate that you increased your loan amount by [AMOUNT] to cover improvements to protect your property against future damage. Now I'd like to talk about how you heard about the option to increase your loan amount to protect your property against future disasters and any marketing or information materials that you received about this option.

- First, how did you first hear about the SBA Disaster Loan Program? [i.e., outreach from the SBA after a disaster declaration, SBA local office, FEMA contact, physical mailings, advertisements, word of mouth]
 - Did you ever talk about the SBA Disaster Loan Program with people in your community?
 - How did you find out if you were eligible for the disaster loan?
 - Thinking about any marketing or information materials you received about the SBA Disaster Loan Program, which were the most or the least helpful? Why?
- How did you first hear about the option to increase the loan amount to protect your property against future disasters? [e.g., SBA loan officer, word of mouth]
- Did you receive any marketing or information materials about the option to increase your loan?
 - IF YES:**
 - What marketing or information materials did you receive?
 - Were they easy or difficult to understand? Why?
 - Which were most/least helpful? Why?
- Thinking about all of the communications that you received, was there any information that was missing? Anything that was confusing?
 - Did you have questions that weren't answered by the communication materials you received?
 - IF YES:**
 - What did you do to get your questions answered? Where did you look for answers? Who did you contact? Were your questions answered?
- Would you have liked to receive communications in any other formats or languages?



Application decision (2–3 min)

- Now I'd like to discuss your decision to increase your loan amount. Can you share why you decided to increase your loan amount to protect your property against future disasters?
 - **IF NEEDED,** To pay for protections not covered by the original loan amount, interest rate was low, mandatory code requirements, etc.
 - **IF NEEDED,** What influenced your decision to increase your loan amount? What types of things did you consider when making your decision?
 - Did your experience applying for and receiving the original SBA disaster loan have any influence on your decision to increase the loan amount to protect your property against future disasters?
 - **IF YES,** How did your experience with the original SBA physical disaster loan influence your decision? [i.e., speed of application, personal relationship/trust with loan officer]

Application process and instructions (5 min)

- Let's talk about the process of applying for and receiving the SBA disaster loan. Generally speaking, how easy or difficult was it to apply for the loan?
 - Were there any parts of the application process that were confusing (e.g., collecting documentation, completing paperwork, returning paperwork, determining how the additional money could be used)?
- Now thinking specifically about increasing the loan amount, can you walk me through the process of requesting to increase the loan amount?
 - Were there any parts of this process that were confusing?
 - IF YES:**
 - Which parts were confusing? PROBE TO DETERMINE SOURCE OF CONFUSION
 - Was it easy or difficult to understand the requirements for requesting the increase?
- What materials did you receive that included instructions on how to increase your loan amount? [Handouts, emails, etc.]
 - Were there any specific instructions that were confusing? Any that were particularly helpful?

Usage and benefits received (5 min)

- What were the benefits that you expected to receive from the SBA disaster loan?
- When you requested to increase your disaster loan amount, what did you plan to use the additional funds for?
 - Using these additional funds, what specific improvements did you make to your [HOME/BUSINESS] while rebuilding?
- Were there any improvement projects you wanted to do to protect your [HOME/BUSINESS] that you were not able to do with the increased loan amount?
 - IF YES:**
 - What projects could you not do?
 - What was the reason you could not complete this project?

Closing

Those are all of the questions that I have for you today. Is there anything we haven't discussed that you'd like to mention?

Thanks again for speaking with us today.



SBA Mitigation Loans In-Depth Interview Guide Group 1b (Did Not Apply for Mitigation Loan)

TO BE COMPLETED BY INTERVIEWER:

DISASTER TYPE: _____

DISASTER YEAR: _____

ORIGINAL LOAN AMOUNT: _____

HOMEOWNER/BUSINESS OWNER & FIRST NAME: _____

Introduction (5 min)

Thank you for taking the time to speak with me today. My name is [NAME] and I am a [POSITION] at Summit Consulting. [INTRODUCE OTHER SUMMIT STAFF ON CALL.]

Summit has been contracted by the U.S. Small Business Administration [SBA] to assist with a study on the SBA Disaster Assistance Loan Program. Our goal is to help the SBA improve its communication materials in order to encourage more disaster survivors to build back stronger by applying for funds to protect their properties against future disasters.

The U.S. Small Business Administration (SBA) has obtained Office of Management and Budget (OMB) approval to conduct this study under 3245-0404, which expires on 2/2/2021.

So today, I'll be asking you questions on three main topics:

1. Your decision to apply for the SBA disaster loan
2. Your experience with the disaster loan process
3. Your feedback on any communications materials that you received from the SBA about the physical disaster loan program

We'll be focusing on the physical SBA disaster loan that you received in [YEAR] after [DISASTER], with a loan amount of [AMOUNT].

Our interview today will take 20 to 30 minutes. With your permission, I'd like to record our discussion. This recording will only be available to researchers working on this project. All information you provide will be anonymous; we will not identify you by name in any reports that we produce. All questions are voluntary. Do I have your permission to record this interview?

Do you have any questions before we get started?

START RECORDING. So that I have it on the recording, today is [DATE] and the time is [TIME]. This interview is with [RESPONDENT NAME].

Perceived susceptibility to a disaster (2–3 min)

- Before you experienced the [DISASTER], had you ever experienced a natural disaster such as a flood, hurricane, or wildfire in your lifetime? IF YES, WHAT AND WHEN?



- On a scale of 1 to 5, with 1 being not confident at all and 5 being extremely confident, how confident are you that you know how to keep yourself or your [HOME/BUSINESS] safe during a disaster?
 - What makes you say [NUMBER]?
- Do you currently have an emergency plan in place in case of a natural disaster?
- Do you have any insurance (such as flood insurance) to protect your property against a natural disaster?
 - **IF YES**, Did you first get this insurance before or after you experienced the [DISASTER]?
 - **IF NO**, Have you ever thought about getting this type of insurance?
- On a scale of 1 to 5, with 1 being not likely at all and 5 being extremely likely, how likely do you think it is that you will experience another natural disaster?
 - What makes you say [NUMBER]?

Communications (5–7 min)

Now I'd like to talk about how you heard about the SBA Disaster Loan Programs, and any marketing or information materials that you received about the program.

- First, how did you first hear about the disaster loan program? [Outreach from the SBA after a disaster declaration, FEMA contact, SBA local office, physical mailings, advertisements, word of mouth, etc.]
 - Thinking about any marketing or information materials you received about the SBA Disaster Loan Program, which were the most or the least helpful? Why?

Some borrowers may have been eligible to increase their SBA disaster loan amount to up to 20 percent of the verified physical damage in order to protect their property against future disasters (for example, retaining walls, sump pumps).

- Did you receive any information about this option to increase your loan amount?
 - **IF YES**, What communications or information do you remember receiving about this option?
- Do you know if you were eligible to increase your loan amount?
 - **IF YES**, How did you find out if you were eligible?
- **IF HEARD ABOUT OPTION TO INCREASE LOAN:** Now, thinking about all the marketing and information materials that you received about the option to increase your loan amount, what is your general impression about the communication materials?
 - Were they easy or difficult to understand?
 - Could they be improved in any way?
 - Was anything missing from the materials that you would like to see added?
 - Which were the most or the least helpful? Why?
 - Would you have liked to receive communications in any other formats or languages?
- **IF DID NOT HEAR ABOUT OPTION TO INCREASE LOAN:** Would you have liked to learn more about the option to increase your loan amount to fund protections against future disasters?
 - **IF YES**, What type of information about this option would you have wanted to receive?
 - **IF NO**, What makes you say no?

Application decision (2–3 min)

IF DID NOT HEAR ABOUT OPTION TO INCREASE LOAN, SKIP TO NEXT SECTION

Now let's talk about the option that was available to increase the loan amount. Some borrowers may have been eligible to increase their SBA disaster loan amount to up to 20 percent of the verified physical



damage in order to protect their property against future disasters (for example, retaining walls, sump pumps).

- Can you tell me why you decided not to increase your loan amount?
 - **IF NEEDED**, What influenced your decision to increase your loan amount? Why types of things did you consider when making your decision?
 - Is there any additional information about the option to increase the loan amount that could have been provided, which might have changed your mind?
 - Did your experience applying for and receiving the original SBA disaster loan have any influence on your decision to increase the loan amount to protect your property against future disasters?
 - **IF YES**, How did your experience with the original SBA physical disaster loan influence your decision? [e.g., speed of application, personal relationship/trust with loan officer]
 - Did you know how to apply for the increased loan amount?

Application process (5 min)

- Let's talk about the process of applying for and receiving the SBA disaster loan. Can you walk me through the process of applying for the loan?
 - IF NEEDED:**
 - Were there any parts of the application process that were confusing (e.g., collecting documentation, completing paperwork, returning paperwork, determining how the additional money could be used)?
 - **IF YES**, Which parts were confusing? PROBE TO DETERMINE SOURCE OF CONFUSION
 - Was it easy or difficult to understand the requirements for applying?
- How would you rate your experience overall with the SBA loan officers you interacted with?
 - Could the SBA have done anything to improve your experience with the disaster loan program overall?

Usage and expected benefits (2–3 min)

- What were the benefits that you expected to receive from the SBA disaster loan?
- Were there any improvement projects you wanted to do to protect your [HOME/BUSINESS] that you were not able to do with the SBA disaster loan?
 - IF YES:**
 - What projects could you not do?
 - What was the reason you could not complete this project?

Closing

Those are all of the questions that I have for you today. Is there anything we haven't discussed that you'd like to mention?

Thanks again for speaking with us today.



SBA Mitigation Loans Focus Group Moderator Guide

MODERATOR MARK PARTICIPANT LOCATIONS:

() SAME GEOGRAPHIC LOCATION OR () ACROSS THE U.S.

Introduction (10 min)

Thank you everyone for participating in today's focus group. My name is [NAME] and I am a [POSITION] at Summit Consulting. I will be leading our group discussion today. [INTRODUCE OTHER SUMMIT STAFF ON CALL.]

Summit has been contracted by the U.S. Small Business Administration [SBA] to assist with a study on the SBA Disaster Assistance Loan Program. Our goal is to help the SBA improve its communication materials in order to encourage more disaster survivors to build back stronger by applying for funds to protect their properties against future disasters.

The U.S. Small Business Administration (SBA) has obtained Office of Management and Budget (OMB) approval to conduct this study under 3245-0404, which expires on 2/2/2021.

You were selected for this focus group for several reasons:

1. You all live in [a community/communities] that experienced a natural disaster such as a hurricane, wildfire, or flood.
2. You all received an SBA disaster loan to repair damages to your home or business.
3. [READ FOR ONLY GROUP A] You also increased your loan amount to protect your property against future disasters.

Our discussion today will last no more than 90 minutes, and we'll be discussing the following topics:

1. Your decision to apply for the SBA disaster loan (including your decision to increase your loan amount to protect your property against future disasters)
2. Your feedback on any of the communication materials you received from the SBA about the option to increase your loan amount
3. Your experience with the loan application process

With everyone's permission, we will be recording today's discussion. This helps ensure that we don't miss anything important that you say. This recording will only be available to researchers working on this project. All information you provide will be anonymous; we will not identify you by name in any reports that we produce. Your participation is voluntary. Do I have your permission to record this interview? Do I have everyone's permission to record our discussion today?

Does anyone have any questions at this point?

START RECORDING. So that I have it on the recording, today is [DATE] and the time is [TIME].

Conversation Guidelines

Before we get started, I would like to present some guidelines for this conversation.

- Because we are having this conversation online, to help me keep track of everyone, please do try to turn your video on. (But if you are not able to use your video, that is OK).



- When you speak, please start by stating your first name—this will help me know who’s speaking.
 - For example, I might say, “This is [NAME], and I applied for a loan because...”
- There are no right or wrong answers—everyone’s opinion is important.
- I will moderate our conversation by asking some questions and also ensuring we hear from everyone.
- I would like to hear from everyone equally. If I don’t hear from you at all, I may ask you a specific question.
- If there are certain questions you don’t want to answer or have no opinion on, that’s perfectly fine.
- And finally, everyone please silence your cell phones.

Participant introductions (5 min)

To get us started, I’d like everyone to introduce themselves by their first name and tell us two things:

- First: What was the natural disaster you experienced, after which you took out the disaster loan?
 - For example, my business was damaged by a flood in 2017, or my home was damaged by a wildfire in 2016.
 - Second: Before that disaster, had you ever experienced a natural disaster (such as a flood, hurricane, or wildfire) in your lifetime?

Let’s start by talking about disaster preparedness. What does disaster preparedness mean to you? What comes to mind when you hear that phrase?

Communications (20 min)

| Primary Probe | Subtopics of Interest |
|--|---|
| Let’s talk about any marketing or information materials that you may have received about the SBA loan program. What materials do you remember receiving? | <ul style="list-style-type: none">• General impression about these materials• How easy/difficult they were to understand• Any communications that were particularly helpful or unhelpful• Missing information/questions that were not answered |
| Did anyone speak with you about increasing your loan amount to fund improvements to your property to protect against future disasters? | <ul style="list-style-type: none">• If YES, Who did you speak with (a loan officer, neighbor, etc.)? |



Interview Guide: Loan Officers

Introduction (5 min)

Thank you for taking the time to speak with me today. My name is [NAME] and I am a [POSITION] at Summit Consulting. [INTRODUCE OTHER SUMMIT STAFF ON CALL.]

Summit has been contracted by the SBA to assist with a study on the SBA Physical Disaster Assistance Loan Program, specifically the option for loan recipients to increase their disaster loan for mitigation purposes. The SBA's goal is to use this research to improve its communication materials in order to encourage more disaster survivors to use this option and protect themselves from the impact of future disasters.

We are looking to gather information on the application process and materials available to borrowers and what the SBA can do to better support you in conversations with borrowers on the mitigation option. The interviews we are conducting with loan officers, such as yourself, are an essential part of this study.

Our interview today will take 30 to 45 minutes. With your permission, I'd like to record our discussion. This recording will only be available to researchers working on this project, not shared with the SBA, and will be destroyed once the research is complete. All information you provide will be anonymous; we will not identify you by name in any reports that we produce. All questions are voluntary. Do I have your permission to record this interview?

Do you have any questions before we get started?

START RECORDING. So that I have it on the recording, today is [DATE] and the time is [TIME]. This interview is with [RESPONDENT NAME].

Current process for interacting with disaster survivors (5 min)

First, I am going to just ask a few general questions about your current position.

1. About how long have you been in your current position?
2. As a loan officer, what is your role in the Disaster Assistance Loan process?
3. At what point in the Disaster Assistance Loan process do you typically interact with disaster survivors?
 - a. **FOLLOW UP:** About how often do you interact with survivors?
 - b. **FOLLOW UP:** How long do those conversations usually last?

Discussing the mitigation option with disaster survivors (25 min)

Now, let's dive into your discussions of the mitigation option with disaster survivors. When we talk about the mitigation option, we are specifically referring to the option borrowers have to increase their loan amount by up to an additional 20 percent of the total verified damage to their property to fund mitigation measures.

1. In your experience, are most disaster survivors aware of the mitigation option? (Did not know it existed, aware it exists but not what it is, understands the program)
2. Who usually raises the topic of the mitigation option first: you, another SBA employee, or the borrower?
 - a. **IF LOAN OFFICER:**



- i. How does that conversation usually start?
 - ii. Is there any specific information or materials that you usually use to start the conversation?
3. When you discuss the mitigation option with borrowers, what topics do you usually cover? (Such as types of mitigation, mitigation requirements, using the mitigation option to pay for code requirements)
 - a. **IF NEEDED:**
 - i. Are there any topics that borrowers often find confusing?
 - ii. Are there any topics that are most commonly relevant for borrowers?
4. Are there any common fears or questions that borrowers express when discussing the mitigation option?
 - a. Are there any other challenges raised by the borrowers?
5. In your experience, on a scale of 1 to 5 (with 1 being not at all and 5 being very) how receptive are disaster survivors to discussing the mitigation option?
 - a. Why do you say [NUMBER]?
6. At what point does the conversation about the mitigation option occur with borrowers? (at the beginning of the process, toward the end of the process...?)
 - a. **FOLLOW UP:** Do you find the borrower more receptive to the conversation at different times in the process? How so?
 - b. How often do you discuss the mitigation option? [**IF NEEDED:** None of the time, some of the time, most of the time, or all of the time?]
 - c. Do you discuss the mitigation option with every disaster survivor? If not, what may be some of the reasons?
7. Would you want to receive formal guidance from the SBA on how to discuss the mitigation option with borrowers?
 - a. What information would you like this guidance to contain? (such as when to bring up the mitigation option, suggestions for the use of the mitigation option, etc.)
 - b. What format would you want to receive this guidance in (flyers, brochures, script, etc.)?
8. On a scale of 1 to 5 (with 1 being not at all and 5 being very), how knowledgeable would you say you are on the mitigation option available to borrowers?
 - a. Why do you say [NUMBER]?
 - b. **IF NUMBER IS LOW:** Is there any information that you would like to receive from the SBA about the mitigation option?
9. Again, on a scale of 1 to 5 (with 1 being not at all and 5 being very), how knowledgeable would you say you are on what potential mitigation measures would qualify for funding under the loan? (Such as elevation, sump pumps, storm windows, etc.)
 - a. Why do you say [NUMBER]?
 - b. **IF NUMBER IS LOW:** Is there any information that you would like to receive from the SBA about the potential mitigation measures that could be funded?

Barriers to discussing the mitigation option (10 min)

Now I'd like to focus on any challenges or difficulties you experience when discussing the mitigation option with disaster survivors. Our goal here is to identify any existing challenges that the SBA can address to increase uptake of the mitigation loan option.

1. Generally speaking, what are the most common challenges you experience in discussing the mitigation option with disaster survivors? [For example, time or opportunity to discuss mitigation when discussing the original loan, or borrower receptiveness]



- a. How do you think these challenges could be resolved?
 - b. What could the SBA do to make that discussion easier? [i.e., provide additional materials for borrowers, provide specific guidance for case managers/loan officers]
2. Are there any existing processes or materials that could be improved by the SBA to increase the awareness of borrowers of the mitigation option?
 - a. What about increasing the use of the mitigation option?
3. Based on your experience working with disaster survivors, what additional steps would you suggest the SBA take to increase awareness of the mitigation option?
 - a. What about increasing the use of the mitigation option?

Closing

Those are all of the questions that I have for you today. Is there anything we haven't discussed on this topic that you would like to mention?

Thanks again for speaking with us today.



APPENDIX B ADDITIONAL DATA TABLES

Table 33: Distribution of homeowner Disaster Assistance Loans by state and territory

| Homeowners | | | | | | |
|--------------|----------------|--------------|--------------|-------------|----------------|------------|
| State | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| NJ | 4,679 | 89.86 | 528 | 10.14 | 5,207 | 3.38 |
| TX | 28,123 | 98.28 | 492 | 1.72 | 28,615 | 18.60 |
| FL | 26,111 | 98.15 | 492 | 1.85 | 26,603 | 17.29 |
| NY | 9,641 | 95.99 | 403 | 4.01 | 10,044 | 6.53 |
| PR | 39,683 | 99.18 | 330 | 0.82 | 40,013 | 26.00 |
| LA | 14,590 | 98.30 | 252 | 1.70 | 14,842 | 9.65 |
| SC | 4,848 | 97.33 | 133 | 2.67 | 4,981 | 3.24 |
| IL | 2,252 | 95.02 | 118 | 4.98 | 2,370 | 1.54 |
| MI | 4,657 | 98.08 | 91 | 1.92 | 4,748 | 3.09 |
| CT | 293 | 81.84 | 65 | 18.16 | 358 | 0.23 |
| USVI | 3,074 | 98.09 | 60 | 1.91 | 3,134 | 2.04 |
| CO | 1,233 | 95.73 | 55 | 4.27 | 1,288 | 0.84 |
| CA | 1,442 | 97.24 | 41 | 2.76 | 1,483 | 0.96 |
| NC | 2,354 | 98.29 | 41 | 1.71 | 2,395 | 1.56 |
| OK | 1,072 | 97.45 | 28 | 2.55 | 1,100 | 0.71 |
| Other | 6,518 | 97.27 | 183 | 2.73 | 6,701 | 4.35 |
| Total | 150,570 | 97.85 | 3,312 | 2.15 | 153,882 | 100 |

Source: DCMS 1.0 FY 2013–2018

Note: Table is sorted by the raw number of takers per state.

Table 34: Distribution of business Disaster Assistance Loans by state and territory

| Business Owners | | | | | | |
|-----------------|--------------|------------|------------|------------|--------------|------------|
| State | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| TX | 2,034 | 21.47 | 44 | 24.44 | 2,078 | 21.52 |
| LA | 851 | 8.98 | 24 | 13.33 | 875 | 9.06 |
| FL | 2,157 | 22.77 | 21 | 11.67 | 2,178 | 22.56 |
| SC | 539 | 5.69 | 16 | 8.89 | 555 | 5.75 |
| CA | 232 | 2.45 | 14 | 7.78 | 246 | 2.55 |
| NJ | 81 | 0.85 | 13 | 7.22 | 94 | 0.97 |
| PR | 1,543 | 16.28 | 12 | 6.67 | 1,555 | 16.11 |
| CO | 147 | 1.55 | 12 | 6.67 | 159 | 1.65 |
| NC | 251 | 2.65 | 7 | 3.89 | 258 | 2.67 |
| USVI | 401 | 4.23 | 4 | 2.22 | 405 | 4.19 |
| MI | 277 | 2.92 | 3 | 1.67 | 280 | 2.90 |
| Other | 1,239 | 13.08 | 13 | 7.22 | 1,252 | 12.97 |
| Total | 9,475 | 100 | 180 | 100 | 9,655 | 100 |

Source: DCMS 1.0 FY 2013–2018

Note: Table is sorted by the raw number of takers per state.



Table 35: Distribution of home Disaster Assistance Loans by state and territory (removing likely Hurricane Sandy survivors)

| Homeowners | | | | | | |
|--------------|----------------|------------|--------------|------------|----------------|------------|
| State | Non-Takers | | Takers | | Total | |
| | Count | % | Count | % | Count | % |
| FL | 26,111 | 19.05 | 492 | 14.86 | 26,603 | 18.95 |
| TX | 28,123 | 20.52 | 492 | 14.86 | 28,615 | 20.38 |
| PR | 39,683 | 28.95 | 330 | 9.96 | 40,013 | 28.50 |
| LA | 14,590 | 10.64 | 252 | 7.61 | 14,842 | 10.57 |
| SC | 4,848 | 3.54 | 133 | 4.02 | 4,981 | 3.55 |
| IL | 2,252 | 1.64 | 118 | 3.56 | 2,370 | 1.69 |
| MI | 4,657 | 3.40 | 91 | 2.75 | 4,748 | 3.38 |
| CT | 293 | 0.21 | 65 | 1.96 | 358 | 0.26 |
| USVI | 3,074 | 2.24 | 60 | 1.81 | 3,134 | 2.23 |
| NJ | 310 | 0.23 | 57 | 1.72 | 367 | 0.26 |
| CO | 1,233 | 0.90 | 55 | 1.66 | 1,288 | 0.92 |
| CA | 1,442 | 1.05 | 41 | 1.24 | 1,483 | 1.06 |
| NC | 2,354 | 1.72 | 41 | 1.24 | 2,395 | 1.71 |
| NY | 509 | 0.37 | 28 | 0.85 | 537 | 0.38 |
| OK | 1,072 | 0.78 | 28 | 0.85 | 1,100 | 0.78 |
| Other | 6,518 | 4.76 | 1,029 | 31.07 | 7,547 | 5.38 |
| Total | 137,069 | 100 | 3,312 | 100 | 140,381 | 100 |

Source: DCMS 1.0 FY 2013–2018

Note: Table is sorted by the raw number of takers per state.



Table 36: Variable naming key

| Naming Key for Supplementary Variables | | |
|--|---|--|
| Variable | Definition | Formula from DCMS 1.0 |
| disastertype_c | Disaster Type | A recoded version of "DAMAGETYPE" |
| zip_c | ZIP Code | "ASE_ZIP" |
| hazardinsurance_bin | Applicant Has Hazard Insurance (Y/N) | A filtered version of "AIO_POLICY_TYPE_CD" |
| floodrisk_n | Flood Risk Level (Unknown, Low, Med, High) | "FLOOD_ZONE" |
| applicant_annualincome | Applicant Annual Income | "GAI_AMT" |
| creditscore | Applicant Credit Score | "PRI_APP_FICO" |
| interestrate | Interest Rate Offered to Applicant by the SBA | "INTERESTRATE" |
| applicant_famsize | Homeowner Applicant Family Size | "PRI_APP_FAMILY_SIZE" |
| term_months | Loan Repayment Term Length (Months) | Recoded "TERM" |
| totalapproved | Total Approved Amount | "ORIG_LOAN_AMOUNT" |
| totalcurrent | Total Current Amount | "CURRENTLOAN_AMOUNT" |
| totalverified | Total Verified Loss Amount | Sum of all "VERIFIED_AMT_XX" |
| applicationlag_days | Days from Application to Decision | "DECISION_DATE" - "APP_DT" |
| approvedmitigation | Approved Mitigation Amount | "APPROVED_AMT_26" + "APPROVED_AMT_41" |
| floodrisk_U | Unknown Flood Risk Binary | "FLOOD_ZONE" = D, N, Z |
| floodrisk_L | Low Flood Risk Binary | "FLOOD_ZONE" = B |
| floodrisk_M | Medium Flood Risk Binary | "FLOOD_ZONE" = C, X |
| floodrisk_H | High Flood Risk Binary | "FLOOD_ZONE" = A, V |
| disasterEQ | Earthquake Disaster Type Binary | "DAMAGETYPE" = Earthquake |
| disasterFI | Fire Disaster Type Binary | "DAMAGETYPE" = Fire |
| disasterTD | Tornado Disaster Type Binary | "DAMAGETYPE" = Tornado |
| disasterOR | Other Disaster Type Binary | "DAMAGETYPE" = Other |
| disasterFL | Flood Disaster Type Binary | "DAMAGETYPE" = Flood |
| disasterHC | Hurricane Disaster Type Binary | "DAMAGETYPE" = Hurricane |
| shortnaics_c | Two-Digit Abbreviated NAICS Code | "NAICSCODE" |
| naics_c3 | Three-Digit Abbreviated NAICS Code | "NAICSCODE" |
| n_employees | Business Applicant Number of Employees | "OFEMPLOYEES" |
| bigBusiness | Binary for Businesses with >100 Employees | "OFEMPLOYEES" |
| naics_RE | Binary for Real Estate Industry | "NAICSCODE" = 53 |
| naics_FD | Binary for Food and Accommodation Industry | "NAICSCODE" = 72 |
| naics_TD | Binary for Retail Trade Industry | "NAICSCODE" = 44/45 |



Table 37: Correlation matrix for homeowners

| Variable Correlation Table for Homeowners | | | | | | | | | | | | | | | | | | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| (1) zip_c | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| (2) hazardinsurance_bin | 0.10 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| (3) floodrisk_n | 0.01 | 0.50 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| (4) applicant_annualincome | 0.16 | 0.17 | 0.10 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| (5) creditscore | -0.01 | 0.10 | 0.08 | 0.06 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| (6) interestrate | 0.03 | -0.02 | -0.04 | 0.15 | 0.19 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - |
| (7) applicant_famsize | 0.10 | 0.05 | 0.00 | 0.20 | -0.10 | 0.00 | 1.00 | - | - | - | - | - | - | - | - | - | - | - |
| (8) term_months | -0.04 | -0.03 | -0.04 | -0.11 | -0.01 | -0.23 | 0.00 | 1.00 | - | - | - | - | - | - | - | - | - | - |
| (9) totalapproved | 0.20 | 0.22 | 0.16 | 0.22 | 0.11 | -0.12 | 0.10 | 0.23 | 1.00 | - | - | - | - | - | - | - | - | - |
| (10) currentmitigation | -0.01 | 0.14 | 0.12 | 0.10 | 0.03 | -0.01 | 0.03 | 0.04 | 0.14 | 1.00 | - | - | - | - | - | - | - | - |
| (11) totalverified | 0.16 | 0.23 | 0.17 | 0.22 | 0.10 | -0.08 | 0.08 | 0.16 | 0.80 | 0.18 | 1.00 | - | - | - | - | - | - | - |
| (12) applicationlag_days | -0.10 | 0.04 | 0.02 | 0.00 | -0.06 | -0.05 | 0.01 | 0.05 | 0.05 | 0.04 | 0.09 | 1.00 | - | - | - | - | - | - |
| (13) floodrisk_L | 0.14 | 0.03 | -0.33 | 0.01 | -0.02 | -0.01 | 0.02 | 0.02 | 0.04 | -0.01 | 0.03 | 0.01 | 1.00 | - | - | - | - | - |
| (14) floodrisk_M | -0.10 | -0.55 | -0.78 | -0.11 | -0.07 | 0.05 | -0.01 | 0.04 | -0.20 | -0.13 | -0.20 | -0.03 | -0.22 | 1.00 | - | - | - | - |
| (15) floodrisk_H | 0.06 | 0.56 | 0.93 | 0.11 | 0.08 | -0.05 | 0.01 | -0.04 | 0.19 | 0.14 | 0.19 | 0.03 | -0.07 | -0.95 | 1.00 | - | - | - |
| (16) disasterFI | 0.11 | -0.03 | -0.04 | 0.03 | 0.02 | 0.01 | -0.01 | 0.01 | 0.12 | 0.00 | 0.30 | 0.01 | -0.01 | 0.02 | -0.03 | 1.00 | - | - |
| (17) disasterFL | 0.18 | -0.09 | -0.06 | 0.00 | -0.05 | 0.13 | -0.01 | -0.15 | -0.14 | -0.01 | -0.13 | -0.10 | -0.04 | 0.08 | -0.08 | -0.02 | 1.00 | - |
| (18) disasterHC | -0.43 | 0.04 | -0.03 | -0.03 | 0.00 | -0.07 | 0.01 | 0.18 | 0.03 | 0.02 | 0.01 | 0.15 | 0.05 | 0.02 | -0.03 | -0.11 | -0.65 | 1.00 |



Table 38: Correlation matrix for business owners

| Variable Correlation Table for Business Owners | | | | | | | | | | | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| (1) zip_c | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| (2) hazardinsurance_bin | 0.01 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| (3) floodrisk_n | 0.03 | 0.04 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| (4) creditscore | 0.04 | 0.12 | 0.05 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| (5) interestrate | 0.13 | -0.03 | 0.06 | 0.00 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| (6) naics_c3 | -0.05 | 0.00 | 0.04 | -0.02 | -0.03 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - |
| (7) bigBusiness | -0.07 | -0.08 | -0.08 | -0.03 | -0.06 | -0.01 | 1.00 | - | - | - | - | - | - | - | - | - | - | - |
| (8) totalapproved | 0.14 | 0.18 | 0.10 | 0.17 | -0.04 | -0.01 | -0.08 | 1.00 | - | - | - | - | - | - | - | - | - | - |
| (9) currentmitigation | 0.06 | 0.03 | -0.09 | -0.02 | -0.02 | 0.04 | -0.01 | 0.14 | 1.00 | - | - | - | - | - | - | - | - | - |
| (10) totalverified | 0.14 | 0.15 | 0.10 | 0.12 | -0.01 | -0.03 | -0.06 | 0.81 | 0.11 | 1.00 | - | - | - | - | - | - | - | - |
| (11) applicationlag_days | -0.08 | 0.07 | 0.02 | -0.01 | -0.03 | 0.00 | -0.03 | 0.17 | 0.02 | 0.25 | 1.00 | - | - | - | - | - | - | - |
| (12) floodrisk_M | -0.12 | -0.09 | -0.66 | -0.04 | -0.05 | -0.02 | 0.08 | -0.13 | -0.07 | -0.15 | 0.00 | 1.00 | - | - | - | - | - | - |
| (13) floodrisk_H | 0.09 | 0.08 | 0.88 | 0.04 | 0.06 | 0.03 | -0.08 | 0.13 | 0.01 | 0.14 | 0.01 | -0.93 | 1.00 | - | - | - | - | - |
| (14) disasterFI | 0.08 | 0.04 | -0.07 | 0.02 | -0.04 | 0.01 | 0.02 | 0.04 | 0.25 | 0.12 | -0.01 | 0.00 | -0.03 | 1.00 | - | - | - | - |
| (15) disasterOR | 0.30 | -0.08 | 0.14 | 0.01 | 0.28 | 0.00 | -0.06 | 0.06 | -0.01 | 0.04 | -0.08 | -0.13 | 0.15 | -0.03 | 1.00 | - | - | - |
| (16) disasterFL | 0.11 | -0.06 | -0.05 | -0.05 | 0.30 | 0.00 | -0.05 | -0.09 | -0.03 | -0.06 | -0.06 | 0.05 | -0.05 | -0.03 | -0.16 | 1.00 | - | - |
| (17) disasterHC | -0.35 | 0.11 | -0.04 | 0.03 | -0.44 | 0.00 | 0.09 | 0.02 | 0.00 | 0.00 | 0.12 | 0.04 | -0.05 | -0.12 | -0.59 | -0.63 | 1.00 | - |
| (18) naics_RE | 0.10 | -0.01 | -0.09 | 0.06 | 0.09 | -0.13 | 0.18 | -0.05 | 0.00 | 0.00 | -0.03 | 0.07 | -0.09 | -0.01 | 0.00 | 0.11 | -0.10 | 1.00 |



Table 39: T-tests for homeowners

| T-Testing Between Takers and Non-Takers for Homeowners | | | | | | | | |
|--|--------|-------|---------|----------|----------|---------|----------|---------|
| Variable | NT Obs | T Obs | NT Mean | T Mean | diff | Std Err | t-value | p-value |
| disastertype_c*** | 150542 | 3311 | 5.616 | 5.573 | 0.042 | 0.014 | 3.011 | 0.003 |
| zip_c | 150542 | 3311 | 36372.9 | 35835.8 | 537.1 | 546.1 | 0.984 | 0.325 |
| hazardinsurance_bin*** | 150542 | 3311 | 0.182 | 0.452 | -0.270 | 0.007 | -39.495 | 0.000 |
| floodrisk_n*** | 150542 | 3311 | 2.200 | 2.488 | -0.289 | 0.008 | -35.575 | 0.000 |
| applicant_annualincome*** | 150542 | 3311 | 73587.9 | 110556.2 | -36968.2 | 1434.1 | -25.779 | 0.000 |
| creditscore*** | 149858 | 3299 | 694.335 | 703.362 | -9.027 | 1.680 | -5.373 | 0.000 |
| interestrate*** | 150542 | 3311 | 1.924 | 1.861 | 0.063 | 0.010 | 6.598 | 0.000 |
| applicant_famsize*** | 150505 | 3310 | 2.667 | 2.874 | -0.207 | 0.024 | -8.612 | 0.000 |
| term_months*** | 150399 | 3311 | 286.325 | 326.014 | -39.688 | 1.852 | -21.432 | 0.000 |
| totalapproved*** | 150542 | 3311 | 47381.7 | 77162.3 | -29780.6 | 794.2 | -37.495 | 0.000 |
| totalcurrent*** | 150542 | 3311 | 32190.7 | 120918.0 | -88727.3 | 659.4 | -134.562 | 0.000 |
| totalverified*** | 149217 | 3299 | 48852.6 | 90864.0 | -42011.4 | 962.5 | -43.647 | 0.000 |
| applicationlag_days*** | 150542 | 3311 | 31.135 | 40.427 | -9.292 | 0.697 | -13.331 | 0.000 |
| approvedmitigation*** | 141885 | 3164 | 11.6 | 2370.3 | -2358.7 | 41.284 | -57.133 | 0.000 |
| floodrisk_U | 150542 | 3311 | 0.004 | 0.004 | 0.000 | 0.001 | -0.119 | 0.905 |
| floodrisk_L*** | 150542 | 3311 | 0.016 | 0.006 | 0.010 | 0.002 | 4.587 | 0.000 |
| floodrisk_M*** | 150542 | 3311 | 0.759 | 0.489 | 0.269 | 0.008 | 35.687 | 0.000 |
| floodrisk_H*** | 150542 | 3311 | 0.222 | 0.501 | -0.279 | 0.007 | -38.040 | 0.000 |
| disasterEQ*** | 150542 | 3311 | 0.005 | 0.001 | 0.004 | 0.001 | 2.942 | 0.003 |
| disasterFI* | 150542 | 3311 | 0.004 | 0.006 | -0.002 | 0.001 | -1.944 | 0.052 |
| disasterTD*** | 150542 | 3311 | 0.010 | 0.003 | 0.007 | 0.002 | 4.045 | 0.000 |
| disasterOR | 150542 | 3311 | 0.103 | 0.111 | -0.009 | 0.005 | -1.618 | 0.106 |
| disasterFL*** | 150542 | 3311 | 0.111 | 0.166 | -0.055 | 0.006 | -9.868 | 0.000 |
| disasterHC*** | 150542 | 3311 | 0.768 | 0.713 | 0.055 | 0.007 | 7.413 | 0.000 |

Key: *** p<0.01, ** p<0.05, * p<0.1



Table 40: T-tests for business owners

| T-Testing Between Takers and Non-Takers for Business Owners | | | | | | | | |
|---|--------|-------|----------|----------|-----------|---------|---------|---------|
| Variable | NT Obs | T Obs | NT Mean | T Mean | diff | Std Err | t-value | p-value |
| disastertype_c | 9475 | 180 | 5.452 | 5.344 | 0.107 | 0.072 | 1.498 | 0.134 |
| zip_c*** | 9475 | 180 | 43560.3 | 52200.1 | -8639.8 | 2283.9 | -3.783 | 0.000 |
| shortnaics_c*** | 9475 | 180 | 55.459 | 63.767 | -8.308 | 1.166 | -7.128 | 0.000 |
| hazardinsurance_bin* | 9475 | 180 | 0.435 | 0.500 | -0.065 | 0.037 | -1.732 | 0.083 |
| floodrisk_n | 9475 | 180 | 2.187 | 2.239 | -0.052 | 0.041 | -1.268 | 0.205 |
| creditscore | 8165 | 123 | 711.06 | 711.97 | -0.903 | 7.985 | -0.113 | 0.910 |
| interestrate*** | 9475 | 180 | 3.489 | 3.298 | 0.191 | 0.042 | 4.562 | 0.000 |
| naics_c3*** | 9475 | 180 | 557.182 | 639.644 | -82.462 | 11.577 | -7.123 | 0.000 |
| n_employees | 7107 | 144 | 16.075 | 7.222 | 8.853 | 51.507 | 0.172 | 0.864 |
| bigBusiness | 9475 | 180 | 0.260 | 0.206 | 0.054 | 0.033 | 1.638 | 0.101 |
| totalapproved*** | 9475 | 180 | 160096.5 | 267226.7 | -107130.1 | 19271.5 | -5.559 | 0.000 |
| totalcurrent*** | 9475 | 180 | 122211.3 | 358859.4 | -236648.1 | 16643.3 | -14.219 | 0.000 |
| totalverified | 7079 | 180 | 220619.9 | 239565.6 | -18945.7 | 40673.0 | -0.466 | 0.641 |
| totaldisbursed*** | 9475 | 180 | 119776.4 | 343136.7 | -223360.3 | 16404.6 | -13.616 | 0.000 |
| applicationlag_days | 9475 | 180 | 59.290 | 59.333 | -0.043 | 5.157 | -0.008 | 0.993 |
| approvedmitigation*** | 6726 | 176 | 15.48 | 4638.6 | -4623.2 | 315.4 | -14.658 | 0.000 |
| floodrisk_U*** | 9475 | 180 | 0.019 | 0.056 | -0.036 | 0.010 | -3.462 | 0.001 |
| floodrisk_L | 9475 | 180 | 0.013 | 0.011 | 0.002 | 0.009 | 0.231 | 0.817 |
| floodrisk_M*** | 9475 | 180 | 0.729 | 0.572 | 0.157 | 0.034 | 4.691 | 0.000 |
| floodrisk_H*** | 9475 | 180 | 0.238 | 0.361 | -0.123 | 0.032 | -3.821 | 0.000 |
| disasterEQ | 9475 | 180 | 0.006 | 0.006 | 0.001 | 0.006 | 0.114 | 0.910 |
| disasterFI** | 9475 | 180 | 0.013 | 0.033 | -0.020 | 0.009 | -2.314 | 0.021 |
| disasterTD | 9475 | 180 | 0.013 | 0.006 | 0.008 | 0.009 | 0.903 | 0.366 |
| disasterOR | 9475 | 180 | 0.149 | 0.117 | 0.032 | 0.027 | 1.199 | 0.231 |
| disasterFL*** | 9475 | 180 | 0.127 | 0.244 | -0.118 | 0.025 | -4.666 | 0.000 |
| disasterHC*** | 9475 | 180 | 0.692 | 0.594 | 0.097 | 0.035 | 2.796 | 0.005 |
| naics_RE | 9475 | 180 | 0.365 | 0.394 | -0.029 | 0.036 | -0.805 | 0.421 |
| naics_FD*** | 9475 | 180 | 0.072 | 0.178 | -0.105 | 0.020 | -5.354 | 0.000 |
| naics_TD** | 9475 | 180 | 0.078 | 0.033 | 0.045 | 0.020 | 2.221 | 0.026 |

Key: *** p<0.01, ** p<0.05, * p<0.1



APPENDIX C LOGIC MODEL

As introduced in Section 3.2, this study developed a logic model of the Disaster Assistance Loan Program and the loan increase option for mitigation measures to gain a common understanding of the program's inputs, outputs, activities, and outcomes. This appendix begins with a discussion of the context or environment that the disaster assistance program operates.

SBA Disaster Assistance Loan Program environment

ODA operates the disaster loan program out of its nine Disaster Assistance Centers, including the Disaster Assistance Field Operations Centers East and West (FOC-E and FOC-W).²² When a disaster occurs, the FOC-E or FOC-W open temporary Disaster Field Offices called Business Recovery Centers (BRCs), Disaster Recovery Centers (DRCs), and Disaster Loan Outreach Centers (DLOC).²³ For most people and businesses who start their disaster loan program applications in person, the BRC, DRC, or DLOC is their first contact with the SBA. These applicants are initially assisted by Disaster Recovery Specialists—customer service representatives trained to assist the borrowers in understanding the process the SBA has available to assist with recovery. They are not specialized in loan origination and underwriting services or in the technical aspects of mitigation options borrowers could consider. During this initial engagement with the Disaster Recovery Specialist, disaster survivors are counseled on available recovery resources such as temporary shelter and food assistance, if needed. They are also offered written material about the different loan options available to them, including the option to increase a Disaster Assistance Loan to address mitigation measures.

In presidential declarations, some disaster survivors do not qualify for FEMA's Individual and Households Program (IHP) services. Applicants with a household income below the minimum income levels in the Income Test Tables provided by the SBA are classified as Failed Income Test (FIT). These individuals are referred by FEMA directly to the IHP, bypassing the SBA loan process, and are not counted as part of the SBA interview process.

Inquirers not classified as FIT are registered by FEMA and referred to SBA disaster programs through automated means (including email, calls, and letters). These individuals and businesses are able to apply for SBA disaster loans, including business loans and Economic Injury Disaster Loans (EIDL).²⁴ Automatically registered disaster survivors may initiate their disaster loan program application process

²² There are two Field Operations Centers (FOC). FOC East is located in Atlanta, Georgia, and FOC West is located in Sacramento, California.

²³ The Business Recovery Centers are established and staffed by the SBA, other organizations, and SBA resource partners during an agency or presidential declaration to assist businesses.

The Disaster Recovery Centers are joint federal/state public facilities where representatives of all participating federal, state, and local disaster relief agencies and organizations issue program applications, related information, and other services to survivors.

The Disaster Loan Outreach Centers are public facilities established and staffed by the SBA during an agency or presidential declaration to assist disaster loan applicants in obtaining, completing, and returning loan applications. The SBA is usually the only agency at these centers.

Source: Appendix 3, *Disaster Assistance Program Standard Operating Procedures (SOP) 50 30 9*

²⁴ Notably, there are no FITs for business applicants, and all business inquirers are referred to the SBA.



either online²⁵ or in person at a BRC. Regardless of how an application is initiated, applicants can complete their applications online with the assistance of SBA case managers.

Components of the logic model

As shown in **Figure 21**, once an applicant has successfully been screened in the field office or Disaster Assistance Center, the first phase of receiving a mitigation loan involves verification of damages to the property, the SBA loan officers determining loan eligibility, and the borrower meeting credit check requirements. Upon meeting these requirements, the SBA can approve an initial Disaster Assistance Loan. After an applicant receives their initial Disaster Assistance Loan, the program provides for eligibility for additional funding (as shown in the bottom section of **Figure 21**, shaded in yellow) to cover costs for devices or measures to mitigate future damage—the option to increase the Disaster Assistance Loan for mitigation measures—of up to 20 percent of the physical loss estimate.²⁶ Applicants are also eligible to apply for relocation within the declared disaster area. Finally, they are eligible to increase their physical loan to cover additional costs not covered during the initial loss verification of damages.

The key components of the SBA Disaster Assistance Loan Program logic model include:

- **Inputs.** These are the SBA staff (such as case managers, loss verifiers, and loan officers) and funds dedicated to the program. Inputs also include the participation of program partners, such as the Insurance Institute for Business & Home Safety, who conduct research and analysis for protective measures, disseminating this information to the public.
- **Activities.** These include the specific actions and processes used to achieve program goals. For example, the SBA Office of Communications & Public Liaison works with public information officers to undertake various outreach, education, and awareness-raising activities to inform borrowers about their options to seek Disaster Assistance Loans and their option to increase the loan for mitigation measures. Another example is BRC activities that help survivors navigate the loan application process, starting with the initial disaster survivor contact. Once a borrower is approved for an initial loan, activities like applying for increases in the loan could lead to the approval of additional funds to address mitigation measures.
- **Outputs.** These are the immediate products that result from the activities on the left side of **Figure 21**. For example, outputs include marketing materials (or other information) about the option to increase the Disaster Assistance Loan for mitigation measures. To accomplish these outputs, SBA headquarters prepares disaster and mitigation assistance materials (including information on the option to increase Disaster Assistance Loans for mitigation measures) and, in collaboration with public information officers in the field, implements a marketing and outreach program. Approved Disaster Assistance Loans are the primary output for potential loan borrowers. These approved loans become the critical input for borrowers who then seek to execute the option to increase the Disaster Assistance Loan for mitigation measures.
- **Short-term outcomes.** This refers to changes in knowledge about the loan programs, awareness, attitudes, and skills resulting from program outputs that are causally linked to the program. For example, the program's outputs are intended to increase borrower awareness of (and interest in) the option to increase their loan to include additional mitigation measures.
- **Intermediate outcomes.** This includes changes in behavior and outcomes resulting from meeting the short-term outcomes. For example, engaging in mitigation measures will enable

²⁵ <https://www.sba.gov/page/disaster-loan-applications>

²⁶ SOP 3.29



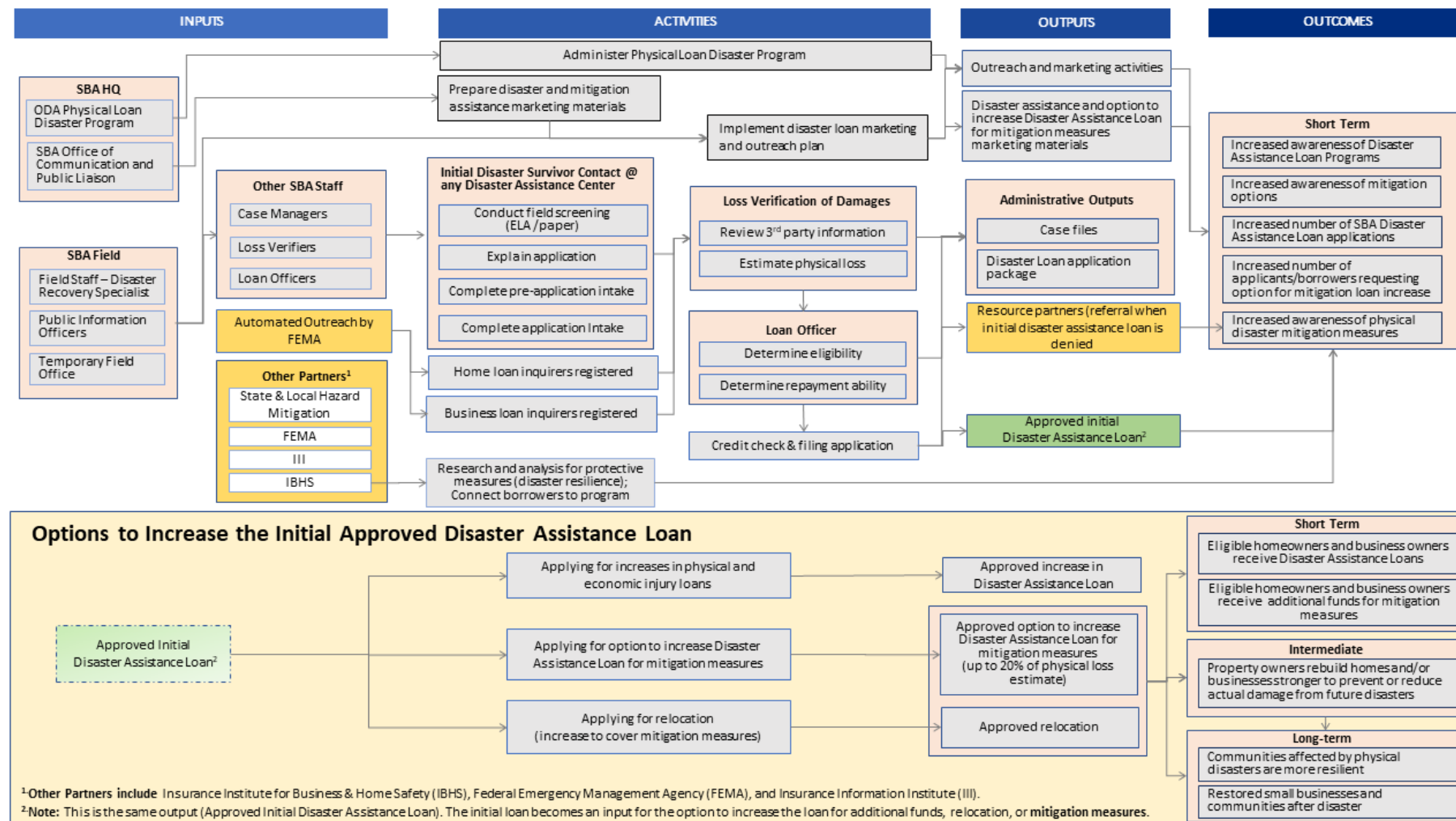
property owners to rebuild homes and businesses stronger to prevent or reduce damage from future disasters.

- **Long-term outcomes.** These are the changes in economic or social conditions that align with the ultimate goals of the program. Long-term outcomes for the program include the emergence of communities that are more resilient and the restoration of small businesses and communities after a disaster.
- **External influences.** These are factors outside the program's control that may affect the ability of the program to realize its objectives (such as Congress, regulations, allocated funding, and the breadth, depth, and timing of the natural disasters).

To finalize the logic model, this study collected additional information for both customer groups (those who opted to increase their Disaster Assistance Loan and those who chose not to do so), leveraging the borrower interviews and focus groups.



Figure 21: Logic model of the SBA Disaster Assistance Loan Program

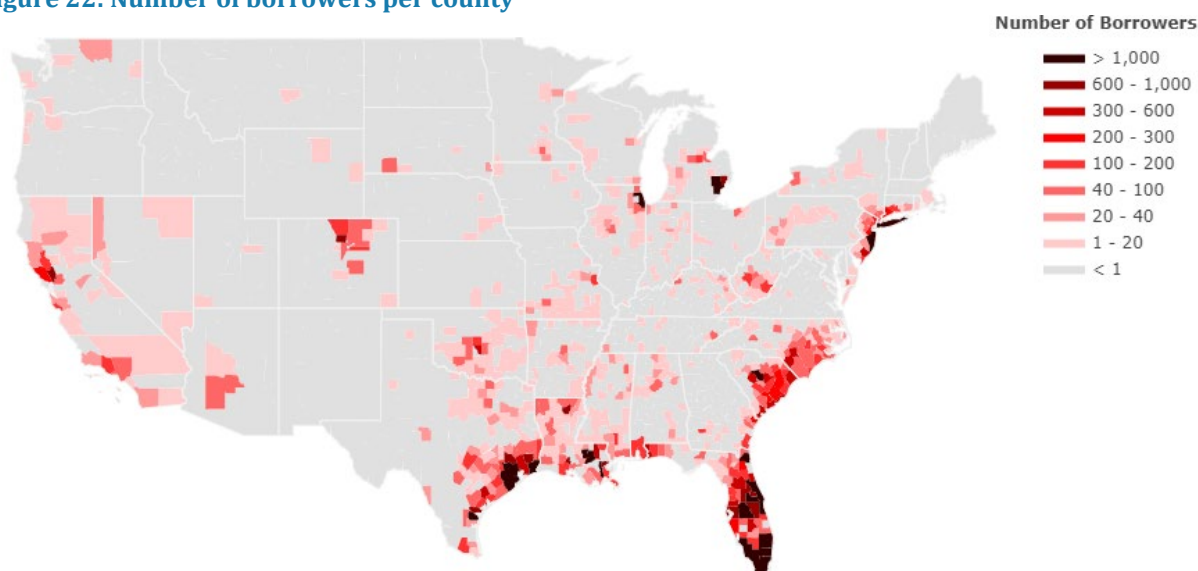


APPENDIX D FURTHER READING ON THE GEOGRAPHIC DISTRIBUTION OF MITIGATION-TAKING HOMEOWNERS

This study constructed the following maps to better understand the relationship between the location of a borrower and their mitigation take-up decision. Much like the descriptive statistics, DCMS 1.0 was utilized in the creation of these visualizations. Due to a lack of observations in the business owner dataset, the maps are limited to the set of homeowner borrowers. All three maps are bounded to the continental United States and present a certain variable of interest at the county level.

In Figure 22, for example, the total number of borrowers per county can be viewed. As shown by the color legend, a darker shade of red indicates a higher number of borrowers residing in that county. The map closely mimics the national map of natural disaster incidence in the continental United States, suggesting that most regions affected by natural disasters in the continental U.S. have been able to access the SBA's disaster relief funding in some form. There is a noticeable skew toward hurricane zones such as the East Coast and Gulf Coast areas, reinforced by the fact that 56.7 percent of all borrowers from the homeowner dataset reside in either NY, NJ, TX, FL, or LA. The dataset also primarily consists of hurricane survivors, representing 76.7 percent of all homeowners that took a disaster loan. When examining the map of all borrowers, it is difficult to understate the visibility of hurricanes in the Southeast coastal areas.

Figure 22: Number of borrowers per county

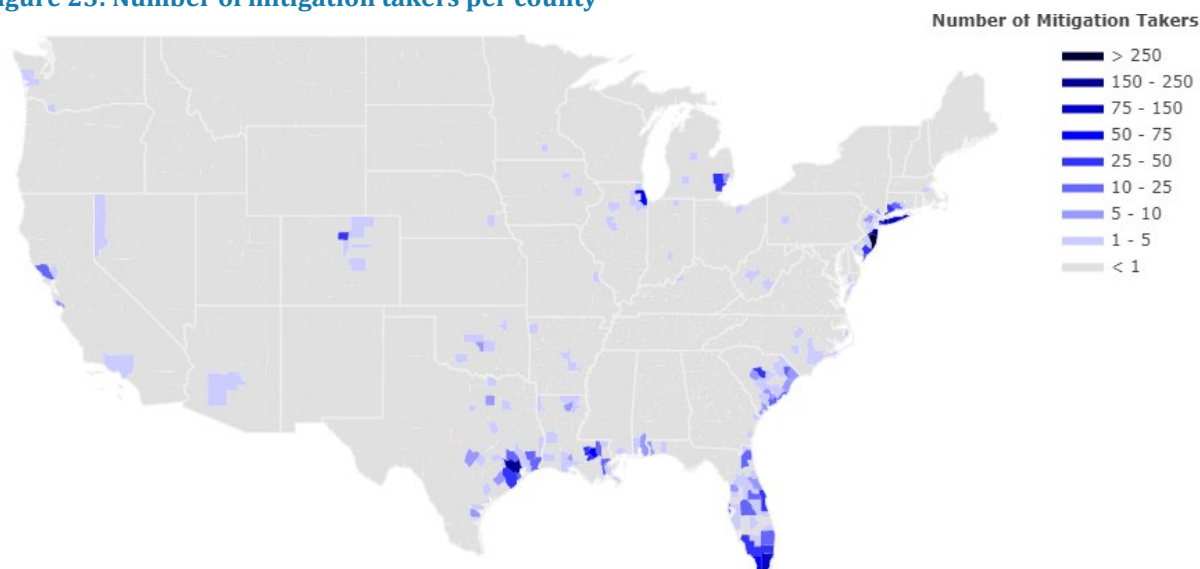


Outside of hurricanes, there is a visible representation of other disaster types on the map, including wildfires and tornadoes, despite how few borrowers there are from these disasters. Between central Oklahoma and the greater Chicago area, Tornado Alley can be identified on the map, with a sparse but evenly distributed number of borrowers per county. Wildfires were prominent in the greater San Francisco, Los Angeles, and Denver regions between 2013 and 2018, as conveyed by the red clusters that darken toward densely populated counties. Although wildfires and tornadoes make up less than 2 percent of the borrowers in the homeowner dataset, their place on the map of borrowers can still be identified.



Figure 23 represents the number of mitigation takers present in each county of the continental U.S. Because of how few mitigation takers there were in the homeowner dataset, the scale was adjusted to 25 percent of that in Figure 22. Much like Figure 22, however, the distribution of mitigation takers on the map closely followed the general pattern of natural disaster incidence in the U.S. A noticeable difference between the two maps can be seen in the areas between disaster hot spots, where mitigation takers were extremely rare. This “node effect” may exist because of the way information spreads through population centers. Borrowers residing nearer to information centers were more likely to be aware of the mitigation option and how they could put mitigation funding to use.

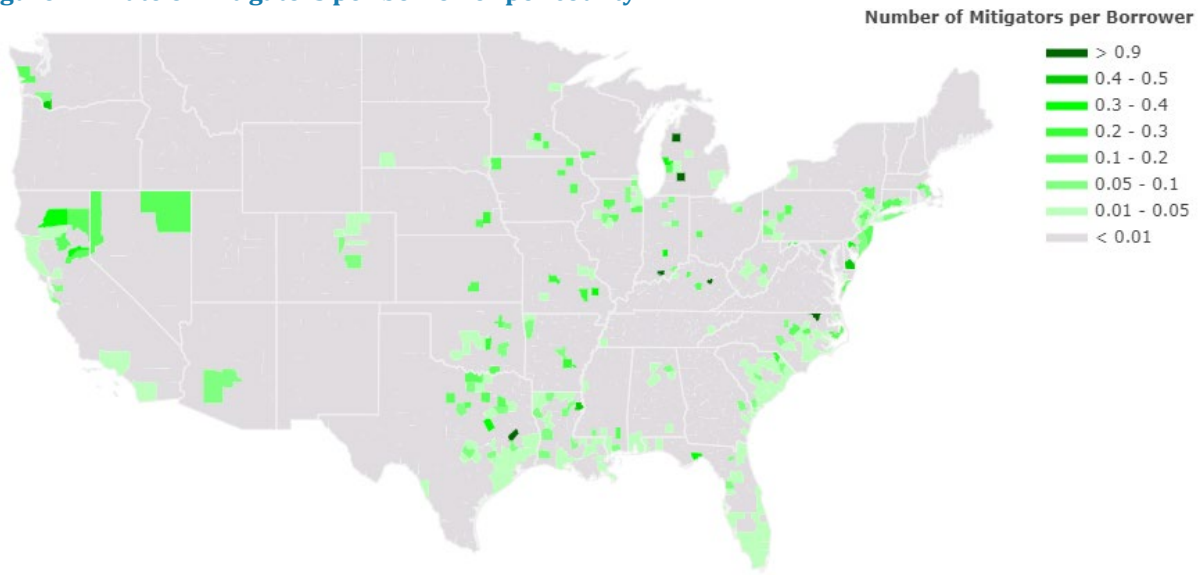
Figure 23: Number of mitigation takers per county



A recurring notion of this investigation has been that borrowers were more likely to elect for mitigation funding when they were more familiar with the ways in which that funding may be used. This can be confirmed in the map, particularly when it comes to flood survivors, who made up 16.6 percent of all mitigation takers. Most borrowers residing in high flood risk zones were aware that they can elevate or waterproof their property, both straightforward upgrades, to protect against future flood damage. In Illinois, for example, where flood survivors made up 96.0 percent of all borrowers, the rate of mitigation take-up was 4.98 percent, which can be seen on the map as the dark blue area surrounding Chicago. Compare that to the take-up rate of 2.5 percent in Oklahoma, where most disaster survivors were affected by tornadoes. Figure 21 supports the idea that borrowers were more likely to mitigate when they knew how the funding might be utilized to their benefit.

In contrast to the red and blue maps, Figure 24 does not represent a tally of borrowers but instead a rate of mitigators per borrower. This map was assembled to identify any geographical trends at the county level related to mitigation take-up. This study expected to see patterns of darker green in areas where mitigation is understood as financially worthwhile, but there were hardly any patterns present. The counties shaded in the darkest green, with the highest number of mitigators per borrower, appear to have no geographical relationship with one another. The lack of a pattern suggests that knowledge of the mitigation option is not yet sufficiently widespread.

Figure 24: Rate of mitigators per borrower per county



When examined holistically and in comparison with one another, the three heat maps provide evidence that confirms much of what has been uncovered by this study. The geographic distribution of borrowers is much like the geographic distribution of natural disasters and population, down to the county level of specificity. Mitigators were more prevalent in the disaster hot spots and less so in the less populated areas, supporting the theory of a “node effect” where knowledge of the mitigation option was not yet widespread among the entire community of borrowers. Overall, these maps were contributory pieces of support for the recommendations made at the conclusion of this report.

APPENDIX E FURTHER READING ON THE REGRESSION ANALYSIS

In assembling a statistical model that would shed light on the causal factors of an applicant's decision to mitigate or not, this study decided that a logistic regression model would be well suited for this application. Logistic regression analysis is utilized to describe the relationship between one binary dependent variable and one or more independent variables, which can be either binary or continuous. This model was chosen in this case primarily because the outcome variable, whether a loan applicant elects for mitigation funding or not, is a binary indicator. The model was entirely and exclusively built based on the DCMS 1.0 data provided by the SBA, which included the details of all loan applications processed between the years of 2013 and 2018. When assessing how the outcome variable is being directed, if at all, by any potential combination of independent variables from the DCMS, this study generated correlation and significant difference (*t*-test) reports from all the variables of interest. The construction of the following logistic regression models was primarily informed by the results of those statistical reports.

Homeowners. The homeowner dataset consisted of 153,882 borrowers in total, 3,312 (2.15 percent) of which elected for mitigation funds. Although the two populations (mitigation takers and non-takers) were imbalanced, there was a large enough volume of data on either side of the decision to support the validity of the model. The results of statistical significance presented in Appendix B and below supported this claim.

The logistic regression model was built using only a handful of both influential variables and control variables from the homeowner portion of the DCMS. As presented in Table 41 below, the risk-related variables included in the model were (1) a binary indicator for whether an applicant was affected by a flood, (2) a binary indicator for whether the affected property was in a high flood risk zone, and (3) a final binary indicator for whether an applicant held hazard insurance of any kind. Given that the variables best suited for a logistic regression model were all associated with flood risk, that was the primary disaster type included within the scope of this analysis.

These risk-related variables were selected to be a part of the model due to their relationship with the outcome variable as either being strongly correlational, statistically significant between the two populations of interest, or both. As shown in Appendix B, for example, the high flood risk zone binary indicator (floodrisk_H) had a mean difference between populations of -0.279 at a level of statistical significance such that $p < 0.01$. The high flood risk zone binary variable also had a correlation of 0.135 with the current mitigation amount. The two other risk-related variables were similarly shown to have a notable relationship with the outcome variable.

Likewise, control variables were included based not only on their relationship with the outcome variable, but also their relationship with the flood risk variables from above already determined to be of value. The control variables chosen included (1) applicant annual income, (2) property ZIP code, and (3) interest rate offered by the SBA. The control variables were included not only for their individual explanatory power, but also for their ability to account for factors that this study cannot access within the bounds of the dataset provided, such as other demographic, socioeconomic, or geographic factors.

The model does not contain a long list of input variables because there were only a handful of variables shown to meet the criterion of being worthy to include in the model. Additionally, extensive testing of



non-correlative and insignificant variables was undertaken to ensure that no causal variables were left out of the resulting model.

As the iterations of the model were built upon each other, from Model 1 to Model 5, the flood risk variables were factored into the analysis and causal relationships began to become apparent. Model 6 and Model 7 were included to supplement the analysis and demonstrate the influence of certain control variables. In assessing the influence of an applicant's annual income alone on their decision of whether to mitigate, the relationship was positive yet minute (9.86×10^{-6}). In other words, an applicant with a high level of annual income was slightly more likely to mitigate according to the conclusions of the model, but a very small amount more likely. Importantly, Model 1 also had a relatively low pseudo-R-squared (PR^2) term (0.0288), which conveyed that the model itself did not contain much explanatory power related to causal relationships between variables. Compared to the PR^2 of Model 5 (0.0678), for example, it was evident that models with a higher number of truly influential variables were more explanatory. With each additional variable included, the PR^2 increased slightly, from 0.0346 in Model 3 to 0.0624 in Model 4 and 0.0678 in Model 5. Also notice that in Model 6 and Model 7, where control variables were excluded, the PR^2 value decreased in both cases. Through the iterations of each model, control variables generally returned a negligible effect size, yet generated an increase in overall explanatory power.

The statistical reports identified the suitability of the flood risk variables for good reason. Out of the 17,262 flood survivors who were approved for a loan by the SBA, 548 (3.17 percent) decided to take up mitigation, making them the disaster type group with the highest mitigation take-up rate. Outside of hurricane survivors, those affected by a flood were also the most prominent mitigators, representing 16.6 percent of all mitigating homeowners. When compared to non-takers, flood survivors only represented 11.1 percent of borrowers. This trend was also witnessed in Model 3, where the flood survivor binary variable had a coefficient of 0.591, conveying that flood survivors were more likely to mitigate than survivors of any of the other disasters.

As shown in the regression table, the other flood risk variables were also proven to be influential in a borrower's decision to mitigate. In Model 4, the coefficient of the high flood risk variable was 1.121 and maintained the highest level of significance. In Model 5, which included all considered variables, all three of the flood risk variables had an estimate greater than 0.63 at a significance of $p < 0.01$. In Model 6, where control variables were excluded, all flood risk variables had estimates greater than 0.72, also with a high level of significance. In Model 7, interest rate was included as a control variable, and all flood risk variables maintained estimates greater than 0.77. From Model 3 to Model 7, all three flood risk variables demonstrated a positive relationship with the outcome variable that was both sizable and statistically significant.



Table 41: Results of homeowner logistic regression model

| Homeowners Logistic Regression Model | | | | | | | | |
|--------------------------------------|-------------------------|---------------------------|----------------------------|----------------------------|----------------------------|----------------------------|-----------------------|-----------------------|
| Explanatory Variables | | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
| Control Variables | Annual Income | 9.86e-06*** (3.04e-07) | 1.03e-05*** (3.07e-07) | 1.05e-05*** (3.09e-07) | 8.72e-06*** (3.22e-07) | 7.69e-06*** (3.37e-07) | | |
| | ZIP Code | | -4.33e-06*** (6.02e-07) | -5.83e-06*** (6.33e-07) | -5.80e-06*** (6.42e-07) | -5.72e-06*** (6.43e-07) | | |
| | Interest Rate | | | | | | | -0.319*** (0.0418) |
| | | | | | | | | |
| Risk Variables | Flood Survivor | | | 0.591*** (0.0498) | 0.781*** (0.0508) | 0.828*** (0.0511) | 0.722*** (0.0490) | 0.781*** (0.0495) |
| | High Flood Risk | | | | 1.121*** (0.0374) | 0.762*** (0.0476) | 0.798*** (0.0461) | 0.777*** (0.0462) |
| | Hazard Insurance Status | | | | | 0.636*** (0.0495) | 0.847*** (0.0466) | 0.852*** (0.0467) |
| | | | | | | | | |
| Constant | | -4.651*** (0.0340) | -4.530*** (0.0372) | -4.576*** (0.0378) | -4.847*** (0.0416) | -4.835*** (0.0420) | -4.477*** (0.0280) | -3.881*** (0.0818) |
| Pseudo R2 | | 0.0288 | 0.0305 | 0.0346 | 0.0624 | 0.0678 | 0.0514 | 0.0536 |
| Prob > Chi2 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Observations | | 152,315 | 152,315 | 152,315 | 152,315 | 152,315 | 152,315 | 152,315 |

*** p<0.01, ** p<0.05, * p<0.1***

Note: Standard errors are presented below each coefficient.



Business owners. A similar process was undertaken to construct a meaningful logistic regression model for the business owner borrowers. The business dataset provided by the SBA contained 9,661 borrowers in total, 180 of which elected for mitigation funding (1.86 percent). Because the business owner dataset was smaller and the two populations of interest were even more lopsided than in the homeowner data, some of the results were not as statistically compelling as they were in the logistic regression analysis performed on the homeowner data above. This is visible in Table 42, where the standard error figures were generally higher and the estimates were not as consistently significant as denoted by the number of asterisks beside each estimate.

Like the model developed above, there were only a small number of variables assessed to be of value for the business owner model. As presented in Table 42 below, the risk-related variables included in the model were (1) a binary indication of whether a borrower was a flood victim, (2) a binary indicator of whether the business owner's property was in a high flood risk zone, and (3) a binary indicator for whether the business fell under the NAICS Real Estate industry classification. The risk variables chosen were much like those from the homeowner analysis above, excluding the industry classification variable.

These risk-related variables were also chosen for the same reasons as those from the analysis above, based on the correlation and significant difference testing performed by the team. As shown in Appendix B, the flood victim binary variable (disasterFL) had a correlation R value of 0.11 with the outcome variable (approvedsubpop_bin) of whether a borrower elected for mitigation. Additionally, the flood victim binary had a mean difference between populations of 0.118, significant at $p < 0.01$. A similar trend was apparent for the high flood risk binary variable. The real estate binary indicator, however, fulfilled fewer of the selection criteria and was instead included in this study's final supplementary model primarily due to the large proportion of business borrowers that were from the real estate industry (37.8 percent).

Control variables were selected to be included in the business owner model for the same reasons as those in the homeowner model. The control variables included (1) the three-digit NAICS subsector code, (2) the ZIP code of the affected property, (3) a binary indicator of whether the business had more than 100 employees, and (4) the interest rate of the offered loan. These control variables accounted for factors that were not present in the DCMS, such as industry implications, geography, or the financial health of the business.

As the models increased in their number of input variables, statistical validity increases and influences on the outcome variable began to make themselves clear. Much like the control variables of the homeowner analysis, NAICS subsector and ZIP code had negligible estimates which were significant, such as the estimate for subsector in Model 1. Although unimportant for their effect on the outcome variable, these two control variables were important for contribution to the explanatory power of the model, quantified in the PR^2 figure. From Model 1 to Model 6, the PR^2 value increased from 0.03 to 0.062, and the conclusions on causal relationships were more statistically valid. As previously mentioned, Model 7 was included supplementarily and served as a test on the NAICS control variable, which when missing resulted in a decrease to the PR^2 value.

Once included in the model, the flood risk variables were proven to have a causal relationship with the outcome variable. In Model 5, the flood victim binary had an effect size of 0.8 at the highest level of significance. In Model 6 and Model 7, where other risk variables were accounted for, the flood victim binary continued to grow in influence. In Model 6, the high flood risk zone binary had an effect size of 0.64, which was also significant at the highest level. Given that these effect sizes were both positive and



sizable, they would suggest, all other factors being considered equal, that flood victims and those with property affected in a high flood risk zone were more likely to elect mitigation funding than those who do not fit either of those descriptions.



Table 42: Results of business owner logistic regression model

| Business Owners Flood Risk Logistic Regression Model | | | | | | | | |
|--|----------------------|--------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Explanatory Variables | | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
| Control Variables | NAICS Subsector | 0.00372*** (0.000524) | 0.00377*** (0.000523) | 0.00376*** (0.000522) | 0.00308*** (0.000571) | 0.00273*** (0.000587) | 0.00265*** (0.000586) | |
| | ZIP Code | | 1.02e-05*** (2.57e-06) | 9.96e-06*** (2.57e-06) | 1.07e-05*** (2.58e-06) | 9.73e-06*** (2.65e-06) | 9.47e-06*** (2.68e-06) | 9.28e-06*** (2.67e-06) |
| | >100 Employees | | | -0.267 (0.187) | -0.306 (0.188) | -0.286 (0.188) | -0.254 (0.189) | -0.316* (0.189) |
| | Interest Rate | | | | -0.439*** (0.165) | -0.566*** (0.169) | -0.612*** (0.170) | -1.179*** (0.172) |
| | | | | | | | | |
| Risk Variables | Flood Victim | | | | | 0.801*** (0.184) | 0.845*** (0.185) | 1.016*** (0.183) |
| | High Flood Risk | | | | | | 0.643*** (0.159) | 0.687*** (0.159) |
| | Real Estate Industry | | | | | | | 0.408** (0.167) |
| | | | | | | | | |
| Constant | | -6.194*** (0.343) | -6.709*** (0.371) | -6.632*** (0.373) | -4.755*** (0.789) | -4.213*** (0.817) | -4.203*** (0.817) | -0.881 (0.561) |
| Pseudo R2 | | 0.0296 | 0.0386 | 0.0398 | 0.0442 | 0.0536 | 0.0621 | 0.0533 |
| Prob > Chi2 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Observations | | 9,655 | 9,655 | 9,655 | 9,655 | 9,655 | 9,655 | 9,655 |

*** p<0.01, ** p<0.05, * p<0.1***

Note: Standard errors are presented below each coefficient.



APPENDIX F ENVIRONMENTAL SCAN MATRIX OF MATERIALS REVIEWED

Note: All references are from the United States.

| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|--|--|------|------------------|---|
| 1 | FCC. "How to Communicate Before, During, and After a Major Disaster." Available at: https://www.fcc.gov/news-events/blog/2011/09/21/fcc-and-fema-how-communicate-during-and-after-major-disaster | Federal Communications Commission (FCC) | 2020 | All | Guide for disaster survivors to communicate before, during, and after a disaster. |
| 2 | FEMA. Family Emergency Communication Guide. Available at: https://www.ready.gov/sites/default/files/2020-03/create-your-family-emergency-communication-plan.pdf | Federal Emergency Management Agency (FEMA) | 2020 | All | Guide to creating an emergency family communication plan for disaster survivors. |
| 3 | CDC. "CDC Public Service Announcements for Natural Disasters & Severe Weather." Available at: https://www.cdc.gov/disasters/psa?Sort=title%3A%3Adesc | CDC | 2020 | All | CDC Public Service Announcements (PSAs) and podcasts provide timely messages about what you can do to protect yourself and your family during natural disasters and severe weather. These media resources are available in a variety of formats, including text, audio, and video. Some video resources were specifically produced in American Sign Language for web visitors who are hard of hearing. The PSAs have been developed for a variety of disasters, and they can be modified to fit the specific needs and circumstances of a particular event. |
| 4 | CDC. "CERC Manual." Available at: https://emergency.cdc.gov/cerc/manual/index.asp | CDC | 2020 | All | CDC's Crisis and Emergency Risk Communication (CERC) manual is based on psychological and communication sciences, studies in issues management, and practical lessons learned from emergency responses. The CERC manual is intended for public health response officials and communicators who have a basic knowledge of public health communication, working with the media and social media, and local and national response structures. |



| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|--|----------------------------------|------|------------------|---|
| 5 | DHS. "Preparing your pets for emergencies makes sense. Get ready now." Available at: https://www.ready.gov/sites/default/files/2020-04/pet-owners-fact-sheet_printer-friendly.pdf | DHS | 2020 | All | Guide to preparing pets for a disaster. |
| 6 | OSHA. "Small Business Handbook." Available at: https://www.osha.gov/sites/default/files/publications/small-business.pdf | OSHA | 2005 | All | Handbook for small business owners, which includes programs for hazard prevention and control and self-inspection guides for fire protection. |
| 7 | OSHA. "How to Plan for Workplace Emergencies and Evacuations." Available at: https://www.osha.gov/Publications/osh3088.pdf | OSHA | 2001 | All | Handbook for dealing with workplace emergencies, including floods, hurricanes, tornadoes, and fires. |
| 8 | SBA. "The Three Step Process: Disaster Loans." | SBA | 2018 | All | Step-by-step guide to applying for disaster loans. |
| 9 | SBA. "Disaster Preparedness for Small Businesses." | SBA | | All | Steps for preparing for a disaster. |
| 10 | SBA. "A Reference Guide to the SBA Disaster Loan Program." | SBA | 2015 | All | An SBA guide to disaster preparation, recovery, and assistance. |
| 11 | SBA. "Disaster Assistance Loans: Businesses and Nonprofits." | SBA | | All | Information sheet on Disaster Assistance Loans. Describes the different types of loans and how to apply. |
| 12 | SBA. "Disaster Assistance Loans: Businesses and Nonprofits: Community Impact." | SBA | | All | Information sheet on Disaster Assistance Loans. Describes the different types of loans and how to apply. |
| 13 | SBA. "Disaster Assistance Loans: Businesses and Nonprofits: Homeowners and Renters." | SBA | | All | Information sheet on Disaster Assistance Loans. Describes the different types of loans and how to apply. |
| 14 | SBA. "Disaster Loan Assistance: Federal Disaster Loans for Businesses, Private Nonprofits, Homeowners, and Renters." | SBA | | All | Website with resources for loan applications, types of loans, glossary of terms, and fact sheets. |
| 15 | SBA. "Disaster Loan Assistance: FAQ." | SBA | | All | FAQ for loan applicants. |
| 16 | SBA. "Disaster Business Loan Application." | SBA | | All | SBA loan application for business disaster survivors. |
| 17 | SBA. "Disaster Home/Sole Proprietor Loan Application." | SBA | | All | SBA loan application for homeowner/sole proprietor disaster survivors. |
| 18 | FEMA. "Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards." Available at: https://www.fema.gov/sites/default/files/2020-06/fema-mitigation-ideas_02-13-2013.pdf | FEMA | 2013 | All | The purpose of this document is to provide a resource that communities can use to identify and evaluate a range of potential mitigation actions for reducing risk to natural hazards and disasters. |



| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|---|---|------|------------------|--|
| 19 | FEMA. "State Mitigation Planning Key Topics Bulletins: Mitigation Strategy." Available at: https://www.fema.gov/sites/default/files/2020-06/fema-state-mitigation-strategy-planning-bulletin_10-26-2016_0.pdf | FEMA | 2016 | All | This document lays out the steps for mitigation planning strategy at the state government level for all natural disasters. |
| 20 | FEMA. "State Mitigation Planning Key Topics Bulletins: Risk Assessment." Available at: https://www.fema.gov/sites/default/files/2020-06/fema-state-mitigation-plan-risk-assessment-bulletin_06-03-2016.pdf | FEMA | 2016 | All | This document gives instructions for assessing risk associated with a natural disaster at the state level. |
| 21 | ECHO. "When Disaster Strikes: Emergency Planning for Community Associations." Available at: https://www.echo-ca.org/article/when-disaster-strikes-emergency-planning-community-associations | Educational Community for HOA Homeowners (ECHO) | | All | Website advising HOA on how to create a disaster preparedness plan. |
| 22 | TRP. "Disaster Mitigation Measures and Preparedness Elements." Archived at: https://web.archive.org/web/20150330072006/http://www.emergency-response-planning.com/blog/disaster-mitigation-measures-and-preparedness-elements | TRP | 2015 | All | Website identifying specific risk mitigation measures companies should evaluate to increase their disaster preparedness. |
| 23 | National Trust for Historic Preservation. "10 Steps to Mitigate Natural Disaster Damage." Available at: https://savingplaces.org/stories/10-tips-to-mitigate-natural-disaster-damage#.X3yvemhKg2w | National Trust for Historic Preservation | 2016 | All | Ten-step list for mitigating natural disasters for historical property owners. |
| 24 | FEMA. "Developing and Promoting Mitigation Best Practices and Case Studies: Communication Strategy." Available at: https://gema.georgia.gov/document/publication/mitigation-communication-strategy/download | FEMA | 2004 | All | Extensive FEMA report on strategies and best practices for mitigation communication. |
| 25 | ADT. "Home Safety Tips for Natural Disasters." Available at: https://www.protectyourhome.com/blog/home-safety-tips/home-safety-tips-for-natural-disasters | | 2017 | All | Website with tips for prevention and mitigation of various natural disasters. |



| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|--|---|------|------------------|---|
| 26 | FEMA. "Reduce Your Risk from Natural Disaster." Available at: https://www.fema.gov/pdf/rebuild/recover/reduce.pdf | FEMA | 2005 | All | Mitigation brochure for various natural disasters. |
| 27 | Northeastern University. "Natural Disaster Mitigation: 4 Ways to Reduce Vulnerability and Prepare Your Community." Available at: https://www.northeastern.edu/graduate/blog/natural-disaster-mitigation/ | | 2019 | All | Website with recommendations on preparing for and mitigating natural disasters. |
| 28 | Nonprofit MarCommunity. "Key steps for updating your nonprofit's messaging during a disaster." Available at: https://nonprofitmarcommunity.com/updating-your-nonprofits-messaging-during-a-disaster/ | | 2020 | All | Four steps for improving nonprofit communications in a disaster. |
| 29 | Colorado Nonprofit Association. "Crisis Communication Plan Nonprofit Toolkit." Available at: https://sustainingplaces.files.wordpress.com/2014/03/crisiscomm.pdf | | 2014 | All | Guidebook for creating crisis communication plans. |
| 30 | National Institute of Building Sciences. "Natural Hazard Mitigation Saves." Available at: https://www.nibs.org/projects/natural-hazard-mitigation-saves-2019-report | | 2019 | All | Cost-benefit analysis of investment in natural hazard mitigation. |
| 31 | HUD. "Community Development Block Grant Disaster Recovery Program." Available at: https://www.hud.gov/program_offices/comm_planning/cdbg-dr | Department of Housing and Urban Development (HUD) | | All | Landing page for the HUD disaster recovery block grant program. |



| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|---|----------------------------------|------|------------------|---|
| 32 | CDC. 2011. Public Health Emergency Response Guide for State, Local and Tribal Public Health Directors. Available at: https://emergency.cdc.gov/planning/pdf/cdcreponseguide.pdf | CDC | | All | This guide is intended to assist state, local, and tribal public health professionals in the initiation of response activities during the first 24 hours of an emergency or disaster. It should be used in conjunction with existing emergency operations plans, procedures, guidelines, resources, assets, and incident management systems. It is not a substitute for public health emergency preparedness and planning activities. The response to any emergency or disaster must be a coordinated community effort. |
| 33 | FEMA. Are You Ready? An In-depth Guide to Citizen Preparedness. Available at: https://www.fema.gov/pdf/areyouready/areyouready_full.pdf | FEMA | | All | This guide has been prepared for direct dissemination to the general public and is based on the most reliable hazard awareness and emergency education information available at the time of publication, including advances in scientific knowledge, more accurate technical language, and the latest physical research on what happens in disasters. |
| 34 | SAMHSA. 2019. "Communicating in a Crisis: Risk Communication Guidelines for Public Officials." Available at: https://store.samhsa.gov/product/communicating-in-a-crisis-risk-communication-guidelines-public-officials/pep19-01-01-005 | SAMHSA | 2019 | All | The guide provides public officials as well as others involved in disaster and emergency communications with information about effective communication, working with the media, using social media, and addressing errors and controlling rumors. |
| 35 | FEMA. 2011. "National Disaster Recovery Framework." Available at: https://www.fema.gov/pdf/recoveryframework/n-dr-framework.pdf | FEMA | 2011 | All | The National Disaster Recovery Framework (NDRF) provides guidance that enables effective recovery support to disaster-impacted states, tribes and local jurisdictions. It provides a flexible structure that enables disaster recovery managers to operate in a unified and collaborative manner. It also focuses on how best to restore, redevelop, and revitalize the health, social, economic, natural, and environmental fabric of the community and build a more resilient nation. |



| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|--|----------------------------------|------|------------------|--|
| 36 | SAMHSA. 2017. Supplemental Research Bulletin: Greater Impact: How Disasters Affect People of Low Socioeconomic Status. Available at: https://www.samhsa.gov/sites/default/files/dtac/srb-low-ses_2.pdf | SAMHSA | 2017 | All | Disaster behavioral health professionals can use this issue of the Supplemental Research Bulletin to inform their disaster behavioral health planning for low socioeconomic status (SES) populations. The issue helps to clarify the ways in which people of low SES may be at greater risk than other groups in disasters, as well as barriers to disaster preparedness and other adverse situations or experiences they may face during the phases of disaster impact, response, and recovery. The issue also includes suggestions for policies to support better outcomes for people of low SES in and after disasters. |
| 37 | U.S. DOJ. 2016. "Tips and Tools for Reaching Limited English Proficient Communities in Emergency Preparedness, Response, and Recovery." | DOJ | 2016 | All | Effective communication with limited English proficient individuals increases the safety of the entire community, saves lives, and is consistent with your mission and the law. |
| 38 | CERC. 2014. Crisis Emergency Risk Communication. Available at: https://emergency.cdc.gov/cerc/ppt/cerc_2014edition_Copy.pdf | CERC | 2014 | All | CERC is the attempt by public health professionals to provide information that allows individuals, stakeholders, and entire communities to make the best possible decisions for their well-being during a crisis or emergency. CERC includes communicating to these groups regarding decisions made by response organizations within nearly impossible time constraints. CERC principles teach us to accept the imperfect nature of choices as the situation evolves. |
| 39 | CERC. 2014. Crisis Emergency Risk Communication: Understanding Roles of Federal, State, and Local Community Health Partners. Available at: https://emergency.cdc.gov/cerc/ppt/CERC_Understanding%20the%20Roles%20of%20Partners.pdf | CERC | 2014 | All | To help explore the interaction of multiple groups during a disaster, this chapter reviews the roles and relationships of health partner organizations. |
| 40 | CERC. 2018. Crisis Emergency Risk Communication: Community Engagement. Available at: https://emergency.cdc.gov/cerc/ppt/CERC_CommunityEngagement.pdf | CERC | 2018 | All | A quick guide to the essentials in planning and executing community engagement. It can help officials navigate a discussion with people in the community before and during those times when community-level emergency actions must be taken. |



| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|---|----------------------------------|------|------------------|---|
| 41 | CERC. 2018. Crisis Emergency Risk Communication: Messages and Audiences. Available at: https://emergency.cdc.gov/cerc/ppt/CERC_Messages_and_Audiences.pdf | CERC | 2018 | All | Guide to learning about your audience and communicating the most effective message in the context of a crisis. |
| 42 | USA GOV. 2020. Disaster Financial Assistance. Available at: https://www.usa.gov/disaster-financial-help | USA GOV | 2020 | All | Find out how to get emergency financial help from the government if you've been affected by the coronavirus pandemic or a natural disaster. Get help with food, housing, bills, and more. Learn about stimulus checks and read what's included in the Coronavirus Aid, Relief, and Economic Security (CARES) Act. |
| 43 | U.S. DHS. Best Practice Crisis Communications Planning: Overview. Available at: https://www.hSDL.org/?view&did=765483 | DHS | 2020 | All | Best practices in crisis communications. |
| 44 | Colorado State Forest Service. "Protecting Your Home from Wildfire: Creating Wildfire-Defensible Zones." Available at: https://static.colostate.edu/client-files/csfs/pdfs/FIRE2012_1_DspaceQuickGuide.pdf | | 2012 | Wildfire | Fact sheet for protecting against wildfires. |
| 45 | Boulder County. "Wildfire Mitigation Quick Checklist." Available at: https://assets.bouldercounty.org/wp-content/uploads/2017/03/wildfire-mitigation-quick-checklist.pdf | | | Wildfire | One-page checklist for mitigating fire risk. |
| 46 | American Red Cross. "How to Prevent Wildfires." Available at: https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/wildfire/how-to-prevent-wildfires.html | | | Wildfire | Website with resources for wildfire prevention. |
| 47 | Washington State Department of Natural Resources. "Wildfire prevention." Available at: https://www.dnr.wa.gov/WildfirePrevention | | | Wildfire | Website with safety tips to prevent wildfires in Washington. |
| 48 | FEMA. "Your Role in Fire-Adapted Communities." Available at: https://www.usfa.fema.gov/downloads/pdf/publications/fire_adapted_communities.pdf | FEMA | 2012 | Wildfire | FEMA report explaining fire-adapted communities, their goals, and how they function. |



| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|---|---|------|------------------|--|
| 49 | National Fire Protection Association. "Seven ways residents can reduce the risk that their homes & properties will become fuel for a wildfire." Available at: https://www.nfpa.org/-/media/Images/Public-Education/By-topic/Outdoors/7-Firewise-Tips-(1).pdf | National Fire Protection Association (NFPA) | | Wildfire | One-pager with tips for preventing a fire. |
| 50 | USDA Southern Research Station. "The Economic Benefits of Wildfire Prevention Education." Available at: https://www.srs.fs.usda.gov/factsheet/pdf/fire-economic.pdf | U.S. Department of Agriculture (USDA) | | Wildfire | Guidance on most effective wildfire education strategies. |
| 51 | SBA. "Protect Against Future Disasters." | SBA | | Wildfire | Recommendations for projects to fund with loans to mitigate future disasters. |
| 52 | https://www.ready.gov/wildfires | DHS | 2020 | Wildfire | Landing page for federal wildfire guidance for disaster survivors. |
| 53 | CDC. "Wildfires and At-Risk Populations: Public Service Announcement: PUBLIC SERVICE ANNOUNCEMENT." Available at: https://www.cdc.gov/disasters/psa/at-risk.html | CDC | 2020 | Wildfire | Wildfire smoke's greatest health threat is to those with heart and lung conditions, older adults and children. Listen for advice from local authorities and limit your exposure to any smoke, including low levels. Keep your indoor air as clean as possible. If you have asthma or other lung conditions, follow your respiratory management plan. See a doctor if you have a hard time breathing or if your normal symptoms worsen. |
| 54 | Human Ecology Review. "Informing the Network: Improving Communication with Interface Communities During Wildland Fire" Available at: https://www.fs.fed.us/psw/publications/chavez/psw_2007_chavez(taylor)002.pdf | | 2007 | Wildfire | An interagency research team studied fire communications that took place during different stages of two wildfires in southern California: one small fire of short duration and one large fire of long duration. |
| 55 | Oxford encyclopedia of climate science. "Wildfire communication and climate risk mitigation." Available at: https://www.fs.usda.gov/treesearch/pubs/54984 | | 2017 | Wildfire | Study that identifies important themes in wildfire communication for risk mitigation. |



| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|--|----------------------------------|------|------------------|--|
| 56 | National Wildfire Coordinating Group. "Communicator's Guide for Wildland Fire Management: Fire Education, Prevention, and Mitigation Practices." Available at: https://gacc.nifc.gov/swcc/dc/azpdc/operations/documents/prevention-education/Reference-Material/Chapter%205%20Communication%20Materials.pdf | NWCG | 2006 | Wildfire | Guide to different communication materials (e.g., multimedia, print, PSAs) and advantages/disadvantages of each. |
| 57 | OSHA. "OSHA Fact Sheet: Fire Safety." Available at: https://www.osha.gov/Publications/OSHA3527.pdf | OSHA | | Wildfire | Brief manual on training employees on fire safety. |
| 58 | FEMA. "Prepare Your Organization for a Wildfire Playbook." Available at: https://www.fema.gov/sites/default/files/2020-03/fema_faith-communities_wildfire-playbook_0.pdf | FEMA | 2020 | Wildfire | Step-by-step guide to preparing your staff for a wildfire. |
| 59 | Boulder County. "Boulder County Community Wildfire Protection Plan." Available at: https://assets.bouldercounty.org/wp-content/uploads/2017/02/community-wildfire-protection-plan-book-low-res.pdf | | 2017 | Wildfire | 16-chapter plan for protecting against wildfires. |
| 60 | Boulder County. "Wildfire Mitigation FAQ." Available at: https://www.bouldercounty.org/disasters/wildfires/mitigation/frequently-asked-questions/ | | | Wildfire | FAQ |
| 61 | FEMA. "Hurricane Mitigation: A Handbook for Public Facilities." Available at: https://web.archive.org/web/20180826070343/www.fema.gov/media-library/assets/documents/16562 | FEMA | 2005 | Hurricane | Extensive handbook on mitigation strategies. |
| 62 | University of Hawaii. "Hurricane Hazards Mitigation." Available at: https://hilo.hawaii.edu/natural-hazards/hurricanes/ | | | Hurricane | Website with guidance on preparing for hurricanes. |



| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|---|----------------------------------|------|------------------|---|
| 63 | American Red Cross. "3 Easy Steps to Prepare for an Emergency." Available at: https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/hurricane.html | American Red Cross | 2017 | Hurricane | YouTube video. |
| 64 | https://www.ready.gov/hurricanes | DHS | 2020 | Hurricane | Landing page for federal guidance for hurricane disaster survivors. |
| 65 | American Meteorological Society. "Creation and Communication of Hurricane Risk Information." Available at: https://journals.ametsoc.org/bams/article/93/8/1133/60244 | | 2012 | Hurricane | To understand and improve hurricane risk communication, this article examines how National Weather Service forecasters at the National Hurricane Center and local weather forecast offices, local emergency managers, and local television and radio media create and convey hurricane risk information. |
| 66 | International Journal of Disaster Risk Reduction. "Understanding communication dynamics on Twitter during natural disasters: A case study of Hurricane Sandy." Available at: https://www.sciencedirect.com/science/article/pii/S2212420918310434 | | 2019 | Hurricane | This study investigates Twitter usage during Hurricane Sandy following the survey of the general population and exploring communication dynamics on Twitter through different modalities. |
| 67 | Heliyon. "Using Twitter for crisis communications in a natural disaster: Hurricane Harvey." Available at: https://www.sciencedirect.com/science/article/pii/S2405844020316479 | | 2020 | Hurricane | This article examines the use of social media, specifically Twitter, in crisis communications during a natural disaster and how it can provide information, guidance, reassurance and hope to victims while keeping others across the nation and the world apprised of the situation so they can provide assistance, as needed. |
| 68 | FCC. April 19, 2011. Public Notice: Federal Communications Commission Announces Forum on Earthquake Communications Preparedness. Available at: https://www.fcc.gov/document/commission-announces-forum-earthquake-communications-preparedness | FCC | | Earthquake | Announcement of an FCC forum for earthquake communications. |
| 69 | Earthquake Country Alliance. 2020. Reconnect and Restore. Available at: https://www.earthquakecountry.org/step7/ | Earthquake Country Alliance | | Earthquake | Advice on what to do in the first days and weeks following an earthquake and what to do if you cannot stay in your home. |



| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|---|--|------|------------------|---|
| 70 | Seismological Society of America. Actions for Managing Earthquake Risk. Available at: https://www.seismosoc.org/us-government-relations/actions-managing-earthquake-risk/ | Seismological Society of America (SSA) | | Earthquake | The people, businesses, and government agencies in Northern California risk suffering life, structural, and financial losses when major earthquakes strike. Scientists, engineers, and emergency management experts gathering for the 100th Anniversary Earthquake Conference call on the region's citizens, businesses, and policymakers to take the following actions to increase safety, reduce losses, and ensure a speedier recovery from the next major earthquake. |
| 71 | PBEM. Portland Basic Earthquake Emergency Communications Node (BEECN) Guidelines and Instructions. Available at: https://www.portlandoregon.gov/pbem/article/557545 | Portland Bureau of Emergency Management (PBEM) | | Earthquake | In the event of a major earthquake in Portland, the communications systems that Portlanders rely on are unlikely to function. Cell phones, landlines, texting, and internet service are not resilient enough to endure the damage anticipated from a Cascadia Subduction Zone earthquake. Therefore, a major earthquake means that residents in Portland neighborhoods will find it difficult, if not impossible, to receive information and request help from local government in the aftermath. Damaged roads and infrastructure will also cut off many Portland neighborhoods from emergency responders. |
| 72 | FEMA. Tornado Communication Plan. Available at: https://community.fema.gov/ProtectiveActions/s/article/Tornado-Communication-Plan | FEMA | | Tornado | Develop a communications plan. Your family may not be together when a tornado occurs, so it is important to know how you will contact one another and how you will get back together in case of an emergency. |
| 73 | FEMA. Tornado Information Sheet. Available at: https://www.ready.gov/sites/default/files/2020-03/tornado-information-sheet.pdf | | | Tornado | Tips for individuals who are likely to experience a tornado. |
| 74 | DOL. Tornado Preparedness and Response. Available at: https://www.osha.gov/dts/weather/tornado/preparedness.html | | | Tornado | Preparedness involves a continuous process of planning, equipping, training, and exercising. Planning for tornadoes requires identifying a place to take shelter, being familiar with and monitoring your community's warning system, and establishing procedures to account for individuals in the building. |
| 75 | https://www.cdc.gov/disasters/extremeheat/social_media.html | CDC | 2020 | Extreme Heat | "Beat the heat" podcast discussing how to identify the warning signs of extreme heat related illnesses, how to prepare, prevent and respond. |



| Number | Reference | Agency or NGO (if applicable) | Year | Disaster Type | Brief Description |
|--------|---|----------------------------------|------|------------------|---|
| 76 | https://www.ready.gov/floods | DHS | 2020 | Flood | Landing page for federal guidance on floods for disaster survivors. |

APPENDIX G LITERATURE REVIEW WORKS CITED

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