

# **Compound Risks – SME Recovery from a Pandemic in the Face of Natural Hazard Risks**

## **Business Recovery/Continuity Collection**

**U.S. Department of Commerce  
National Institute of Standards and Technology  
Generic Clearance for Community Resilience Data Collections  
OMB CONTROL NO. 0693-0078  
Expiration Date 07/31/2022**

For each proposed request using this generic clearance, NIST will submit the actual instrument and related documents (letters, emails to respondents, scripts, etc.), as well as proposed statistical methods to be employed to OMB along with responses to the following questions:

### **1. Explain who will be surveyed and why the group is appropriate to survey.**

The purpose of this research is to build a dataset that allows documentation of (1) the novel resilience-based mitigation actions employed during the COVID-19 pandemic by small- and medium-sized enterprises (SMEs) by sector, (2) challenges in implementing resilience-based mitigation actions, (3) utilization of past strategies and approaches to provide assistance to the current situation, and (4) planned resilience actions and strategies.

The United States' 30 million Small and Medium Enterprises (SMEs) make up 44 % of U.S. economic activity and employs nearly 60 million people. The importance of this research is its timely collection of data that allows for analysis of: (1) resilience planning for natural disasters under constraints (e.g., pandemic), including why SMEs may or may not adopt a given resilience-based mitigation or coping strategy and (2) how experience with natural disaster mitigation informs successful strategies for coping with the pandemic. Given that responses to COVID-19 disruption by SMEs, government, and other entities are expected to continue – quickly understanding the evolving needs of SMEs and reflecting how businesses are learning and responding to these types of events, especially those defined by deep uncertainty, is pertinent.

There is minimal primary data on business interruption following a large-scale natural hazard event, especially in the period of mid-term recovery. Furthermore, to the best of our knowledge, there is no primary data on planning for natural hazard resilience during a pandemic situation, which is highly relevant at a time when much of the US faces potential natural disasters as SMEs recovery from COVID-19. At this point in time owners and managers will still retain information about direct impacts and recovery activities immediately after COVID-19 and plans for dealing with natural hazards (that may have occurred since mid-March or will in the near-term) can be meaningfully recorded and collected for data analysis.

The collection instrument will be answered by owners and managers of SMEs across the US; a subset of these businesses will be geographically located in areas that are prone to natural hazard

events (e.g., flood, hurricane, fire). The particular focus is on areas in the southeast and west coast of the United States. At each establishment, one individual familiar with the recovery efforts will be surveyed — either (1) the owner or (2) the manager (in some cases the same individual will both own and manage a business). In cases where there is the potential to have to both the owner and manager complete the survey, it is preferable to survey the individual who owns the business since this person is likely to know the most about the history of the business and the full recovery process.

This data collection is expected to obtain 2,000 business responses. Each SME approached to respond to this online survey will employ 250 or fewer individuals at a given geographic location. If the business has more than one location, the respondent will be told in the survey directions to respond for a single SME location. It is expected that one-third of respondents will be in a geographic location that is vulnerable to a natural hazard. Given the extent of COVID-19, it is expected that all SMEs surveyed will have been affected in some fashion by COVID-19-specific impacts. The majority of businesses in the sample will be for-profit; however, it is feasible that some non-profits may respond to the data collection.

Initial data collection will be conducted through an online survey instrument. The process of data collections and the findings will be socialized throughout the relevant communities, through stakeholder engagement. Notably, the NIST Associate Director for Laboratory Programs (ADLP) has approved this data collection proposal as a means by which to engage with counterparts in appropriate Federal agencies, such as FEMA, SBA, and EDA, to appropriately frame and provide guidance to SMEs.

## **2. Explain how the survey was developed including consultation with interested parties, pretesting, and responses to suggestions for improvement.**

This survey instrument was developed by the NIST Applied Economics Office (AEO) in the Engineering Laboratory (EL). The main structure of the instrument follows a business survey that the AEO developed for use in South Carolina and Texas post-Hurricanes Irma and Harvey. In that sense, many of questions have been thoroughly vetted in the field, as has the proposed data collection methodology.

Federal agencies that provide disaster assistance and best practice guidance to SMEs are often unaware of the range of mitigation and coping strategies SMEs adopt, particularly when adapting to new stresses. Yet, such information is critical to defining relevant and appropriate guidance in a changing business environment. In the current situation of government-mandated restrictions and closures, supply-chain disruptions, and loss of employees, customers, and revenue, SMEs face additional challenges in preparing for and responding to natural hazards. With the National Oceanic and Atmospheric Administration (NOAA) predicting a busy Atlantic hurricane season in 2020, it is not clear how multiple or simultaneous risks (i.e., risks derived from concurrent events, such as natural hazards during a pandemic period) will influence the resilience capacity and the recovery of SMEs.

The AEO in NIST's Engineering Laboratory EL has drafted this survey instrument which addresses compound risk from COVID-19 and potential natural hazards. Input and review has been made by Federal partners (e.g., SBA, NOAA Climate Program Office, NOAA Sea Grant, NOAA Weather Ready Nation (WRN), NIST Manufacturing Extension Partnership (MEP)). These Federal partners will continue to collaborate with NIST AEO to develop a better understanding of business disruption/continuity patterns from extreme events (e.g., hurricane, floods, fire) in the face of a pandemic and in turn provide actionable guidance and assistance to the SMEs they serve.

During development, the survey instrument was also reviewed by academics who conduct boots-on-the-ground research in these areas were provided the tool and time to provide useful feedback relevant to the business climate in their local district(s). This iterative collaboration created a relatively brief and thorough tool that can be accessed online to collect sources of business interruption and how recovery (short- and long-term) were sought.

Several best practices and lessons learned have been implemented in this tool that emerged from review of the business continuity survey that NIST took part in post-Hurricanes Irma and Harvey that are applicable to this proposed business interruption survey tool. Furthermore, a literature review of the business interruption literature for natural hazards, pandemics, and compound risks was carefully curated and reviewed during development of the survey tool.

### **3. Explain how the survey will be conducted, how customers will be sampled if fewer than all customers will be surveyed, expected response rate, and actions your agency plans to take to improve the response rate.**

The survey will be conducted online using the SurveyMonkey interface to obtain a novel longitudinal dataset containing responses of 2,000 SMEs. The survey will take a maximum of 15 minutes to complete. The response may take less time depending upon the situation of the SME (i.e., if the business faces natural hazard risk) and the extent to which the respondent decides to elaborate upon their responses. SME owners/managers will complete the survey. If desired by the respondent, telephone interaction will be available, as necessary.

The data collection should take place as soon as possible to capture the early stage responses as the pandemic develops. Furthermore, capturing data as immediately as possible helps ensure that SMEs that may find themselves out of business in future waves are captured (a current weakness of much SME natural hazard recovery research).

Half of the sample will be drawn from locations that regularly experience natural hazard events (Group 1). Those businesses in the sample located in areas that do not typically experience natural hazard events will be selected to match those in Group 1 by sector and size (employee number) (Group 2). The locations for Groups 1 and 2 were determined by assessing Presidential Disaster Declarations across ZIP codes in the U.S. We have a large verified list of SMEs in the through accessing U.S. Business Data and Dunam Bradstreet records. In this survey, government agencies and medical offices will be excluded.

The survey will be administered as an online survey and in most cases the owner (or manager) of the business will fill-in the survey on computer, smartphone, or other digital device. The tool is expected to take a maximum of 15 minutes to complete.

The response rate expected is 20-30 %. It should be noted that responding to more than 50 % of the survey questions is considered as a complete survey response. All questions are optional; thus, we expect that some businesses will answer only a portion of the questions.

Assuming a 100% response rate, the total maximum burden hours would be 500 hours (2,000 SMEs X 15 minutes survey time/SME / 60 min. per hour). This data will not be stored in a Privacy Act System of Records where information is pulled by a personal identifier; therefore, a SORN is not required. Once 1,500 complete responses have been made to the survey, the link will be snoozed to ensure no overburden to the public.

Given that the survey will be conducted online, resources (staff, time, and funds) that are typically limiting factors to similar on-the-ground in-person surveys are less limited in this case.

In order to improve response rates relevant networks from NIST and partner Federal agencies will be leveraged. For example, the NIST Manufacturing Extension Partnership (MEP) and the NOAA Weather-Ready Nation (WRN) Ambassador networks are expected to send out communications to their networks of SMEs, making them aware of the survey effort, but not requiring/encouraging them to take part.

Additionally, researchers plan to either (1) conduct a web search of the business or (2) place a phone call to businesses in the sample to be surveyed to ensure that these businesses are still in the recorded location and to find out any pertinent information that may affect survey response availability (e.g., changes in opening hours and times when the owner or manager are present). If a call is made, the survey will not be introduced; the purpose is to simply check opening hours and other pertinent information about the business. This type of method has worked well with past business interruption survey work (noted above) in order to yield higher survey response rates.

Calling ahead of the survey may allow the researchers to sort out the error in the sample ahead of conducting the survey. In this way, the research time and potential burden to the public will be reduced and less time will be taken from the SMEs.

Furthermore, an informational sheet and links about this project and the NIST community resilience work, generally, can be included in the collection.

Information will not be retrieved by any personal identifier (such as name), therefore this is not a Privacy Act System and is not subject to a Privacy Act Statement or SORN.

**4. Describe how the results of the survey will be analyzed and used to generalize the results to the entire customer population.**

It is expected that the findings of this survey will inform the understanding of the Federal agencies and other entities (e.g., local economic development offices) that work directly with SMEs as to the (1) the novel resilience-based mitigation actions employed during the COVID-19 pandemic by small- and medium-sized enterprises (SMEs) by sector, (2) challenges in implementing resilience-based mitigation actions, (3) utilization of past strategies and approaches to provide assistance to the current situation, and (4) planned resilience actions and strategies.

There is no clear data yet on the ability of SMEs that have closed during COVID-19 to reopen and whether they will resume operations at the same pre-shock levels. However, early predictions estimate at least 15,000 retail store closures (Bivens, 2020; Thomas, 2020). In a survey on COVID-19 impacts to supply chains, nearly 75 percent of companies report supply chain disruptions in some capacity due to coronavirus-related transportation restrictions, and more than 80 percent believe that their organization will experience some impact because of COVID-19 (Boyd, 2020). Although empirical evidence says that businesses that have been exposed to previous disasters are more likely to be prepared for future disasters and that a disaster experience may lead business owners to reconsider the importance of developing business recovery or mitigation plans (Dahlhamer and Tierney, 1998), there is no research on how individual businesses may use this experience when exposed to compound acute risks (i.e., multiple risks).

Qualitative survey responses will be appropriately coded and mapped within the quantitative dataset. The researchers will also augment this effort with 'big data' sources (e.g., Google analytics identifying which news stories were most searched on a given date) as controls as SME-level data is analyzed. Both qualitative and quantitative analysis will be performed on the data.

Immediate data findings will be produced and communicated to Federal partners to help influence their guidance to SMEs in the face of multiple risks. Once data has been collected and analyzed, NIST researchers will work with counterparts in appropriate Federal agencies, such as FEMA, SBA, and EDA, to appropriately frame and provide guidance to businesses.

Additional data analysis objectives are to: (1) Gain a better understanding of the nature of impacts experienced by small and medium sized businesses; (2) Understand the experience of business owners and managers through different kinds of extremes as well as how their perceptions of risk may change between event types; (3) Provide an analysis of the risk profiles of small business owners in vulnerable areas and the resources they currently have access to that support response, recovery and continuity.

There are four main survey sections in the tool: (1) business interruption related to COVID-19, (2) business information (e.g., ownership or rental), (3) recovery finance, and (4) experience with natural hazards. Analyzing these types of data singularly and in conjunction is expected to extend understanding of business interruption in general and across sectors.

Furthermore, it is expected that administering the survey tool will provide useful information to SMEs on best practices for conducting research on natural hazard readiness, especially while recovering from the impacts of COVID-19.

Finally, the data collected will serve as a baseline in the case that an SME experiences a natural disaster in the mid-term. In the data and literature, there is very minimal information about baselines ahead of such events, opposed to data specific to impacts post-event.

#### References:

Bivens, J. (2020, March 17). Coronavirus shock will likely claim 3 million jobs by summer: Policy is needed now to curb further losses. *Economic Policy Institute*.  
<https://www.epi.org/blog/coronavirus-shock-will-likely-claim-3-million-jobs-by-summer/>

Boyd, J. (2020). *COVID-19 Survey: Impacts on global supply chains*. Institute for Supply Management.

Dahlhamer, J. M., & Tierney, K. J. (1998). Rebounding from disruptive events: Business recovery following the Northridge earthquake. *Sociological Spectrum, 18*(2), 121–141.  
<https://doi.org/10.1080/02732173.1998.9982189>

Thomas, L. (2020, March 16). Retail store closures in the US could explode because of the coronavirus. *CNBC*. <https://www.cnbc.com/2020/03/16/retail-store-closures-in-the-us-could-explode-because-of-coronavirus.html>